```
                        EXTERNAL SYMBOL LIST

SYMBOL    TYPE                                    VER 15, MOD 00  05/01/22  PAGE   1

#UALLO    MODULE
```

```
ERR LOC   OBJECT CODE      ADDR STMT SOURCE STATEMENT           VER 15, MOD 00  05/01/22  PAGE   2

    0000                         1 #UALLO START 0
                                 2        PRINT ON,NODATA
                                 3 *      @SYS  EXP-Y
                                 5+       PRINT ON
```

```
                                 7+*************************************************************************
                                 8+*        CPU EQUATES                                                    *
                                 9+*************************************************************************
                                10+*
                                11+***      REGISTER EQUATES
                                12+*
                    0002        13+@REGL   EQU    2                          HARDWARE REGISTER LENGTH
                    0001        14+@BR     EQU    1                          BASE REGISTER
                    0002        15+@XR     EQU    2                          USABLE INDEX REGISTER
                    0004        16+@PSR    EQU    4                          PROGRAM STATUS REGISTER
                    0008        17+@ARR    EQU    8                          ADDRESS RECALL REGISTER
                    0010        18+@IAR    EQU    16                         INSTRUCTION ADDRESS REGISTER
                    0020        19+@P1IAR  EQU    32                         PROGRAM LEVEL 1 IAR
                    0040        20+@P2IAR  EQU    64                         PROGRAM LEVEL 2 IAR
                    00C0        21+@I1IAR  EQU    X'C0'                      INTERRUPT LEVEL 1 IAR Q-CODE
                                22+*
                                23+***      EQUATES FOR BYTES OF AN INSTRUCTION
                                24+*
                    0001        25+@Q      EQU    1                          Q-CODE BYTE
                    0001        26+@VQ     EQU    1                          VARIABLE Q CODE FOR LENGTH
                    0002        27+@D1     EQU    2                          1ST DISPLACEMENT
                    0003        28+@OP1    EQU    3                          1ST ADDRESS
                    0004        29+@DOP2   EQU    4                          2ND ADDR OF 5 BYTE INSTR.
                    0004        30+@OPD2   EQU    4                          2ND DISP OF 5 BYTE INSTR.
                    0003        31+@DD2    EQU    3                          2ND DISP OF 4 BYTE INSTR.
                    0005        32+@OP2    EQU    5                          2ND ADDR OF 5 BYTE INSTR.
                    0003        33+@INST3  EQU    3                          LENGTH OF 1 DISP INSTRUCTION
                    0004        34+@INST4  EQU    4                          LENGTH OF 1 ADDR INSTRUCTION
                    0005        35+@INST5  EQU    5                          LENGTH OF 1 DISP 1 ADDR INSTR.
                    0006        36+@INST6  EQU    6                          LENGTH OF 2 ADDR INSTR.
                                37+*
                                38+***      CONDITION CODES FOR BRANCHES
                                39+*
                    0087        40+@UCB    EQU    X'87'                      UNCONDITIONAL BRANCH
                    0080        41+@NOP    EQU    X'80'                      NO BRANCH
                    0084        42+@BH     EQU    X'84'                      BRANCH HIGH
                    0082        43+@BL     EQU    X'82'                      BRANCH LOW
                    0081        44+@BE     EQU    X'81'                      BRANCH EQUAL
                    0004        45+@BNH    EQU    X'04'                      BRANCH NOT HIGH
                    0002        46+@BNL    EQU    X'02'                      BRANCH NOT LOW
                    0001        47+@BNE    EQU    X'01'                      BRANCH NOT EQUAL
                    0088        48+@BOZ    EQU    X'88'                      BRANCH OVERFLOW ZONED
                    00A0        49+@BOL    EQU    X'A0'                      BRANCH OVERFLOW LOGICAL
                    0008        50+@BNOZ   EQU    X'08'                      BRANCH NO OVERFLOW ZONED
                    0020        51+@BNOL   EQU    X'20'                      BRANCH NO OVERFLOW LOGICAL
                    0010        52+@BT     EQU    X'10'                      BRANCH TRUE
                    0090        53+@BF     EQU    X'90'                      BRANCH FALSE
                    0084        54+@BP     EQU    X'84'                      BRANCH PLUS
                    0082        55+@BM     EQU    X'82'                      BRANCH MINUS
                    0081        56+@BZ     EQU    X'81'                      BRANCH ZERO
                    0004        57+@BNP    EQU    X'04'                      BRANCH NOT PLUS
                    0002        58+@BNM    EQU    X'02'                      BRANCH NOT MINUS
                    0001        59+@BNZ    EQU    X'01'                      BRANCH NOT ZERO
                                60+*
                                61+***      MISCELLANEOUS CONSTANTS
                                62+*
```

```
                          0000   63+@ZERO  EQU   0                              ZERO
                          0001   64+@B1    EQU   1                              BINARY ONE
                          00F0   65+@DZERO EQU   X'F0'                          DECIMAL ZERO
                          0040   66+@BLANK EQU   C' '                           EBCDIC BLANK
                          006B   67+@COMMA EQU   C','                           EBCDIC COMMA
                          0061   68+@SLASH EQU   C'/'                           EBCDIC FORWARD SLASH
                          005B   69+@DOLAR EQU   C'$'                           EBCDIC DOLLAR SIGN
                          005C   70+@ASTER EQU   C'*'                           EBCDIC ASTERISK
                          007B   71+@NUMBR EQU   C'#'                           EBCDIC NUMBER #
                          007C   72+@ASIGN EQU   C'@'                           EBCDIC ASSIGN @
                          00C1   73+@CHARA EQU   C'A'                           EBCDIC CHAR A
                          00C6   74+@CHARF EQU   C'F'                           EBCDIC CHAR F
                          00D9   75+@CHARR EQU   C'R'                           EBCDIC CHAR R
                          00E9   76+@CHARZ EQU   C'Z'                           EBCDIC CHAR Z
                          001E   77+@EOS   EQU   X'1E'                          RETURN CARRIAGE
                          001C   78+@EOF   EQU   X'1C'                          END OF FILE CHARACTER
                          005A   79+@UPARW EQU   X'5A'                          UPARROW FROM KEYBOARD INPUT
                          004E   80+@CPLUS EQU   C'+'                           EBCDIC PLUS SIGN
                          0060   81+@MINUS EQU   C'-'                           EBCDIC MINUS SIGN
                          0001   82+@DCALK EQU   X'01'                          DCAL REQUESTED INDICATOR
                          0020   83+@PGCSZ EQU   32                             CORE SIZE IN PAGES
                          2000   84+@MINCR EQU   256*@PGCSZ                     CORE SIZE IN BYTES
                          00F4   85+@LINSZ EQU   244                            LENGTH OF INPUT LINE BUFFER
                          0018   86+@DTRSZ EQU   24                             NO. OF DISK SECTORS PER TRACK
                          0030   87+@SECCY EQU   48                             SECTORS PER CYLINDER
                          0060   88+@CARDL EQU   96                             LENGTH OF 3700 INPUT CARD
                          0050   89+@BCRDL EQU   80                             LENGTH OF 5081 INPUT CARD
                          0005   90+@MAPEN EQU   5                              DISP TO END OF FE CORE MAP
                          0007   91+@SDFLN EQU   7                              LENGTH OF SDF
                          0006   92+@VOLID EQU   6                              LENGTH OF DISK ID FIELD
                          0007   93+@HDRLN EQU   7                              LENGTH OF PROGRAM HEADER
                          0011   94+@CLON  EQU   X'11'                          TURN ON COMMAND LITE Q-CODE
                          0010   95+@CLOFF EQU   X'10'                          TURN Off COMMAND LITE Q-CODE

                                 97+*************************************************************************
                                 98+*        DISK REGION EQUATES                                          *
                                 99+*************************************************************************
                                100+*
                          0100  101+@SCTSZ EQU   256                            LENGTH OF ONE SECTOR
                          0500  102+@WSFIT EQU   X'0500'                        SECTOR ADDR OF WS FIT SCTRS
                          0503  103+@WSTBL EQU   X'0503'                        SECTOR ADDR OF WORKING STORAGE
                          0005  104+@DWBCY EQU   5                              BASE CYL SYSTEM WORK FILE
                          0003  105+@DWTB1 EQU   3                              LOGICAL SCTR 1ST TEXT BLOCK
                          00C0  106+@DWSIZ EQU   192                            NO. OF WORK FILE DISK SECTORS
                          0004  107+@DSBCY EQU   4                              BASE CYL SYSTEM ROUTINES
                          0000  108+@DSCS1 EQU   0                              COMPILER SUBROUTINE 1ST SCTR
                          0007  109+@DVBCY EQU   7                              BASE CYL VIRTUAL MEMORY
                          0000  110+@VMFD1 EQU   0                              FILE DIRECTORY 1 PAGE
                          0001  111+@VMFD2 EQU   1                              FILE DIRECTORY 2 PAGE
                          0001  112+@VMTRL EQU   1                              TRACE REFERENCE LIST PAGE
                          0002  113+@VMRS3 EQU   2                              START OF VM RESIDENT SUBROUTINE
                          0056  114+@VENTA EQU   86                             FIRST PSEUDO CODE PAGE IN VM
                          00FE  115+@VMDDV EQU   254                            FUNC AND ARRAY TABLE - PAGE ONE
                          0009  116+@DCBCY EQU   9                              BASE CYL COMPILER VADDR TABLES
                          0040  117+@DCST1 EQU   64                             STMT ADDRESS TABLE 1ST SECTOR
                          0050  118+@DCBT1 EQU   80                             BRANCH ADDRESS TABLE 1ST SECTOR
```

```
                          120+********************************************************************
                          121+*        DISK IOCR EQUATES                                         *
                          122+********************************************************************
                          123+*
                          124+***    DISK PARAMETER LIST (DPL) EQUATES
                          125+*
                0000      126+@DCTRL EQU   0                          CONTROL PARAMETER
                0001      127+@DCYL  EQU   1                          LOGICAL CYLINDER NUMBER
                0002      128+@DSAD  EQU   2                          HEAD/SECTOR ADDRESS
                0003      129+@DCNT  EQU   3                          SECTOR COUNT
                0004      130+@DBFR1 EQU   4                          1ST BYTE OF DATA AREA
                0005      131+@DBFR2 EQU   5                          DATA AREA ADDRESS
                0002      132+@DSPIN EQU   X'02'                      SPINDLE BIT IN DISK ADDRESS
                0006      133+@DPLNG EQU   6                          LENGTH OF DSL
                0000      134+@DPOS  EQU   X'00'                      DPL - SEEK FUNCTION CODE
                0001      135+@DGET  EQU   X'01'                      DPL - READ FUNCTION CODE
                0002      136+@DPUT  EQU   X'02'                      DPL - WRITE FUNCTION CODE
                0031      137+@DVRFY EQU   X'31'                      DPL - VERIFY FUNCTION CODE
                00FF      138+@DWAIT EQU   X'FF'                      DPL - WAIT I/O COMPLETE FUNC COD
                0003      139+@DSIVF EQU   X'03'                      SIO CTRL CODE FOR VERIFY
                          140+*
                0002      141+@DADDR EQU   2                          LENGTH OF DISK ADDRESS
                0002      142+@VADDR EQU   2                          LENGTH OF VIRTUAL ADDRESS
                0002      143+@CADDR EQU   2                          LENGTH OF CORE ADDRESS

                          145+********************************************************************
                          146+*        PRINT PARAMETER LIST (PPL) EQUATES                         *
                          147+********************************************************************
                          148+*
                0004      149+@PPLNG EQU   4                          LENGTH OF PPL
                0000      150+@PCTRL EQU   0                          CONTROL BYTE DISPLACEMENT
                0001      151+@PRCNT EQU   1                          COUNT BYTE DISPLACEMENT
                0003      152+@PDATA EQU   3                          DATA ADDR DISPLACEMENT
                0040      153+@PRINT EQU   X'40'                      PRINT CONTROL
                0080      154+@RETRN EQU   X'80'                      RETURN CARRIER CONTROL
                00C0      155+@PRETR EQU   @PRINT+@RETRN              PRINT AND RETURN CARRIER
                0010      156+@TBLEF EQU   X'10'                      TAB LEFT CONTROL
                0001      157+@INDEX EQU   X'01'                      INDEX FORMS CONTROL
                0011      158+@TBLIX EQU   @TBLEF+@INDEX              TAB LEFT AND INDEX CONTROL
                00FF      159+@PWAIT EQU   X'FF'                      WITH AND CHECK ERROR CONTROL
                004F      160+@RLDWN EQU   X'4F'                      ROLL DOWN CONTROL (CRT ONLY)
                0000      161+@TBCNT EQU   0                          TAB LEFT COUNT
                0080      162+@RTRNC EQU   X'80'                      CARRIER RETURN COUNT
                0075      163+@EOFTC EQU   X'75'                      EOF RECORD TYPE CODE
                          164+*
                          165+***    STATEMENT/SEGMENT HEADER EQUATES
                          166+*
                0000      167+@SDF0  EQU   0                          DISP TO NULL SEG INDICATOR
                0001      168+@SDF1  EQU   1                          DISP TO LENGTH OF SEGMENT
                0002      169+@SDF2  EQU   2                          DISP TO SEGMENTATION CODE
                0003      170+@SDF3  EQU   3                          DISP TO END OF SDF
                0005      171+@SBLN  EQU   5                          DISP TO STMT BINARY LINE NO.
                0006      172+@STYPE EQU   6                          DISP TO STMT TYPE CODE
                0007      173+@STEXT EQU   7                          DISP TO 1ST TEXT BYTE OF STMT
                0080      174+@SNULL EQU   X'80'                      MASK FOR NULL SEG INDICATOR
                          175+*                                       * 1 = SEGMENT IS NULL
```

```
                               176+*                                     * 0 = SEGMENT IS NOT NULL
                               177+*
                               178+*                        FOLLOWING ARE THE MASKS FOR THE SEGMENTATION
                               179+*                        CODE. THE SEGMENTATION IS INDICATED BY VALUE
                               180+*                        IN @SDF2 AS FOLLOWS:
                 0000          181+@SONLY EQU    0                        ONLY SEG. IN RECORD
                 0001          182+@SIST  EQU    1                        1ST SEG. OF A MULTI-SEG RCD
                 0003          183+@SMIDL EQU    3                        MIDDLE SEG. OF A MULTI-SEG RCD
                 0002          184+@SLAST EQU    2                        LAST SEG. OF MULTI-SEG RCD
                 0002          185+@SBLNL EQU    2                        LENGTH OF STMT BINARY LINE NO.
                               186+*
                               187+****    FILE INDEX TABLE EQUATES SECTION
                               188+*
                               189+*                        ALL DISPLACEMENT ARE CALCULATED FROM THE
                               190+*                        * FIRST BYTE OF THE FIT TO THE RIGHTMOST BYTE
                               191+*                        * OF THE SPECIFIED FIELD UNLESS OTHERWISE
                               192+*                        * NOTED.
                               193+*
                 0002          194+@FDLNC EQU    2                        DISP TO FILE LINE COUNT
                 0002          195+@FLLNC EQU    2                        LNG OF FILE LINE COUNT FIELD
                 0000          196+@FDDBC EQU    0                        DISP TO FILE DATA BLOCK COUNT
                 0001          197+@FLDBC EQU    1                        LNG OF FILE DATA BLOCK COUNT
                 0009          198+@FLACE EQU    9                        DISP O ADDR OF CURR ENTRY
                 000B          199+@FDFNA EQU    11                       DISP TO ADDR OF 1ST NULL ENTRY
                 0002          200+@FLFNA EQU    2                        LNG OF ADDR OF 1ST NULL ENTRY
                 000C          201+@FDE1  EQU    12                       DISP TO 1ST BYTE OF 1ST ENTRY
                 0004          202+@FLENT EQU    4                        LNG OF A FIT ENTRY
                               203+*
                               204+*                        ENTRY FIELD DISPLACEMENTS ARE CALCULATED FROM
                               205+*                        * THE 1ST BYTE OF THE ENTRY.
                               206+*
                 0000          207+@FDSD  EQU    0                        DISP TO DB SECTOR DISP
                 0001          208+@FLSD  EQU    1                        LNG OF DB SECTOR DISP FIELD
                 0002          209+@FDHLN EQU    2                        DISP TO HIGH LINE NO. FIELD
                 0002          210+@FLHLN EQU    2                        LNG OF HIGH LINE NO. FIELD
                 0003          211+@FDNSC EQU    3                        DISP TO DB NULL SPACE CNT FIELD
                 0001          212+@FLNSC EQU    1                        LNG OF DB NULL SPACE CNT FIELD
                               213+*
                               214+*        END OF SYSTEM SOFTWARE EQUATES
                               215+        PRINT ON
                               216 *        @ERM  EXP-Y
                               218+        PRINT ON
```

```
                        220+*****************************************************************************
                        221+*        ERROR MESSAGES EQUATES                                            *
                        222+*****************************************************************************
                0000  223+@@E100 EQU    0                          FIRST CHARACTER NOT
                      224+*                                        * ALPHABETIC
                0001  225+@@E101 EQU    @@E100+1                    FIRST CHARACTER NOT
                      226+*                                        * <ALPHAMERIC CHARACTER>
                0002  227+@@E102 EQU    @@E101+1                    PASSWORD OR FILENAME LONGER
                      228+*                                        * THEN 8 CHARACTERS
                0003  229+@@E103 EQU    @@E102+1                    <DISK LABEL> LONGER THEN 6
                      230+*                                        * CHARACTERS
                0004  231+@@E110 EQU    @@E103+1                    COMMA FOLLOWED BY NOTHING
                      232+*                                        *
                0005  233+@@E112 EQU    @@E110+1                    <ARITHMETIC CONSTANT> CONTAINS
                      234+*                                        * 2 DECIMAL POINTS
                0006  235+@@E113 EQU    @@E112+1                    DECIMAL POINT WITHOUT
                      236+*                                        * <ARITHMETIC CONSTANT>
                0007  237+@@E114 EQU    @@E113+1                    INCOMPLETE <CHARACTER
                      238+*                                        * CONSTANT>
                0008  239+@@E115 EQU    @@E114+1                    INVALID <SYSTEM CONSTANT>
                      240+*                                        *
                0009  241+@@E116 EQU    @@E115+1                    VARIABLE IS NOT FOLLOWED BY A
                      242+*                                        * COMMA OR EQUAL SIGN
                000A  243+@@E117 EQU    @@E116+1                    INVALID EXPONENT IN CONSTANT
                      244+*                                        *
                000B  245+@@E120 EQU    @@E117+1                    NON-NUMERIC CHARACTER IN <LINE
                      246+*                                        * NUMBER> OR INEGER
                000C  247+@@E122 EQU    @@E120+1                    MORE THAN 4 DIGITS IN <LINE
                      248+*                                        * NUMBER> OR INTEGER
                000D  249+@@E123 EQU    @@E122+1                    UNBALANCED LINE NUMBER SERIES
                      250+*                                        *
                000E  251+@@E124 EQU    @@E123+1                    LINE NUMBER IS NOT GREATER
                      252+*                                        * THAN PREVIOUS LINE NUMBER
                000F  253+@@E129 EQU    @@E124+1                    PARAMETER FOUND WHERE NONE
                      254+*                                        * IS ALLOWED
                0010  255+@@E130 EQU    @@E129+1                    REQUIRED PARAMETER MISSING
                      256+*                                        *
                0011  257+@@E131 EQU    @@E130+1                    INVALID PARAMETER
                      258+*                                        *
                0012  259+@@E133 EQU    @@E131+1                    TOO MANY <PARAMETERS>
                      260+*                                        *
                0013  261+@@E134 EQU    @@E133+1                    DUPLICATE <PARAMETER>
                      262+*                                        *
                0014  263+@@E135 EQU    @@E134+1                    INVALID USE OF ONE OR TWO
                      264+*                                        * STAR FILENAME
                0015  265+@@E136 EQU    @@E135+1                    INVALID COMBINATION OF KEYWORDS
                      266+*                                        * <PARAMETERS>
                0016  267+@@E137 EQU    @@E136+1                    NO <LINE-NUMBER-LIST>
                      268+*                                        * SPECIFIED
                0017  269+@@E138 EQU    @@E137+1                    UNBALANCED QUOTES IN
                      270+*                                        * <CHARACTER CONSTANT>
                0018  271+@@E139 EQU    @@E138+1                    INVALID <DELIMITER>
                      272+*                                        *
                0019  273+@@E142 EQU    @@E139+1                    INCOMPLETE KEYWORD
                      274+*                                        * MISSING DASH
                001A  275+@@E143 EQU    @@E142+1                    INCOMPLETE KEYWORD
```

```
                              276+*                                     * SECOND WORD UNRECOGNIZABLE
                         001B 277+@@E150 EQU    @@E143+1                INVALID BASIC VARIABLE
                              278+*                                     *
                         001C 279+@@E151 EQU    @@E150+1                VARIABLE SUBSCRIPT NOT
                              280+*                                     * AN INTEGER
                         001D 281+@@E160 EQU    @@E151+1                MIXED DATA TYPE IN
                              282+*                                     * ASSIGNMENT
                         001E 283+@@E162 EQU    @@E160+1                UNBALANCED <LABEL-PAIR>
                              284+*                                     *
                         001F 285+@@E163 EQU    @@E162+1                DIFFERENT VARIABLE TYPES
                              286+*                                     * IN <LABEL-PAIR>
                         0020 287+@@E164 EQU    @@E163+1                ODD TRACK NUMBER NOT
                              288+*                                     * ALLOWABLE
                         0021 289+@@E200 EQU    @@E164+1                NO CURRENT <PASSWORD> OR
                              290+*                                     * DISK DEFINED
                         0022 291+@@E205 EQU    @@E200+1                HELP TEXT NOT FOUND
                              292+*                                     *
                         0023 293+@@E210 EQU    @@E205+1                <PASSWORD> NOT ON SPCIFIED
                              294+*                                     * DISK
                         0024 295+@@E211 EQU    @@E210+1                SPECIFIED FILE NOT FOUND
                              296+*                                     *
                         0025 297+@@E212 EQU    @@E211+1                DUPLICATE DISK LABELS
                              298+*                                     * ON SYSTEM
                         0026 299+@@E213 EQU    @@E212+1                FILE NOT ON SYSTEM
                              300+*                                     *
                         0027 301+@@E215 EQU    @@E213+1                SPECIFIED FILE PROTECTED
                              302+*                                     *
                         0028 303+@@E216 EQU    @@E215+1                DISK LABEL NOT ON SPECIFIED
                              304+*                                     * LOCATION
                         0029 305+@@E217 EQU    @@E216+1                SPECIFIED DISK NOT ON
                              306+*                                     * SYSTEM
                         002A 307+@@E220 EQU    @@E217+1                NO <WORK FILE> DEFINED
                              308+*                                     * .
                         002B 309+@@E221 EQU    @@E220+1                <WORK FILE> IS PROGRAM
                              310+*                                     * GENERATED
                         002C 311+@@E222 EQU    @@E221+1                WORK FILE IS PROTECTED
                              312+*                                     *
                         002D 313+@@E223 EQU    @@E222+1                NO PROGRAM FILE IN
                              314+*                                     * <WORK FILE>
                         002E 315+@@E225 EQU    @@E223+1                NO PROGRAM IN PAUSE STATE
                              316+*                                     *
                         002F 317+@@E226 EQU    @@E225+1                <WORK FILE> IS EMPTY
                              318+*                                     * .
                         0030 319+@@E227 EQU    @@E226+1                SPECIFIED FILE NOT
                              320+*                                     * A PROGRAM FILE
                         0031 321+@@E228 EQU    @@E227+1                ONE-STAR OR TWO-STAR
                              322+*                                     * FILE PROTECTED
                         0032 323+@@E229 EQU    @@E228+1                DESIRED CONDITION ALREADY
                              324+*                                     * PRESENT-FUNCTION IGNORED
                         0033 325+@@E230 EQU    @@E229+1                FUNCTION REQUIRES WORK AREA
                              326+*                                     *
                         0034 327+@@E232 EQU    @@E230+1                FUNCTION INVALID IN
                              328+*                                     * PAUSE STATE
                         0035 329+@@E234 EQU    @@E232+1                ONLY MOUNT OR INITIALIZE
                              330+*                                     * COMMAND VALID
                         0036 331+@@E237 EQU    @@E234+1                ORIGINAL MODE OF EXECUTION
```

```
      @ERMEQ - GENERAL ERROR MESSAGE EQUATES
```

```
                         332+*                                          * NOT 'TRACE'
                    0037 333+@@E240 EQU    @@E237+1                      DATA RECORDER NOT ON SYSTEM
                         334+*                                          *
                    0038 335+@@E241 EQU    @@E240+1                      CRT NOT ON SYSTEM
                         336+*                                          *
                    0039 337+@@E242 EQU    @@E241+1                      DRIVE 2 NOT ON SYSTEM
                         338+*                                          *
                    003A 339+@@E248 EQU    @@E242+1                      CRT SPECIFIED WHEN INPUT IS
                         340+*                                          * FROM CARDS OR PROCEDURE
                    003B 341+@@E249 EQU    @@E248+1                      CARD OUTPUT SPECIFIED WHEN
                         342+*                                          * INPUT IS FROM CARDS
                    003C 343+@@E250 EQU    @@E249+1                      VARIABLE NOT IN PROGRAM
                         344+*                                          *
                    003D 345+@@E251 EQU    @@E250+1                      <ARITHMETIC CONSTANT> NOT IN
                         346+*                                          * RANGE 1E-99 < X < 1E99
                    003E 347+@@E252 EQU    @@E251+1                      SUBSCRIPT EXCEEDS <ARRAY SIZE
                         348+*                                          * LIMIT>.
                    003F 349+@@E253 EQU    @@E252+1                      ARRAY NOT IN PROGRAM.
                         350+*                                          *
                    0040 351+@@E254 EQU    @@E253+1                      NO NON-ARRAY <VARIABLES> IN
                         352+*                                          * PROGRAMS
                    0041 353+@@E255 EQU    @@E254+1                      NO <VARIABLES> IN PROGRAM
                         354+*                                          *
                    0042 355+@@E256 EQU    @@E255+1                      INCONSISTENT NUMBER
                         356+*                                          * OF SUBSCRIPTS
                    0043 357+@@E300 EQU    @@E256+1                      REQUIRED <FILE LIBRARY AREA>
                         358+*                                          * SPACE NOT AVAILABLE
                    0044 359+@@E301 EQU    @@E300+1                      PREVIOUS FILENAME NOT
                         360+*                                          * ALLOCATED
                    0045 361+@@E302 EQU    @@E301+1                      NEW FILENAME ALREADY
                         362+*                                          * ALLOCATED
                    0046 363+@@E303 EQU    @@E302+1                      TWELVE FILES ALREADY ALLOCATED
                         364+*                                          * FOR WORK FILE PROGRAM
                    0047 365+@@E304 EQU    @@E303+1                      'NEW' FILE SPECIFIED ALREADY
                         366+*                                          * IS IN USER LIBRARY
                    0048 367+@@E305 EQU    @@E304+1                      'SPACE' PARAMETER EXECEEDS 256
                         368+*                                          * .
                    0049 369+@@E308 EQU    @@E305+1                      SPECIFIED <LINE NUMBER>
                         370+*                                          * DOES NOT EXIST
                    004A 371+@@E310 EQU    @@E308+1                      USER FILE POOLED
                         372+*                                          *
                    004B 373+@@E315 EQU    @@E310+1                      <PROGRAM-GENERATED DATA FILE>
                         374+*                                          * LARGER THEN WORK FILE
                    004C 375+@@E316 EQU    @@E315+1                      NO EXECUTED BASIC PROGRAM
                         376+*                                          * .
                    004D 377+@@E320 EQU    @@E316+1                      SCP NOT AVAILABLE ON SYSTEM
                         378+*                                          * DISK
                    004E 379+@@E325 EQU    @@E320+1                      LINE NUMBER LIST TOO LONG
                         380+*                                          *
                    004F 381+@@E330 EQU    @@E325+1                      HELP KEYWORD NOT RECOGNIZED
                         382+*                                          *
                    0050 383+@@E335 EQU    @@E330+1                      LINE NO. LIST SPECIFIED FOR
                         384+*                                          * <PROGRAM-GENERATED FILE>
                    0051 385+@@E338 EQU    @@E335+1                      INVALID COMBINATION OF
                         386+*                                          * <PARAMETERS>
                    0052 387+@@E340 EQU    @@E338+1                      NO ONE-STAR OR TWO STAR
```

```
                      388+*                                * LIBRARIES ON SYSTEM
              0053  389+@@E350 EQU    @@E340+1              83 <PASSWORDS> ALREADY DEFINED
                      390+*                                * ON DISK
              0054  391+@@E351 EQU    @@E350+1              NO <FILE LIBRARY AREA> ON
                      392+*                                * SPECIFIED DISK
              0055  393+@@E352 EQU    @@E351+1              FILE LIBRARY FRAGMENTED,
                      394+*                                * USE PACK COMMAND
              0056  395+@@E360 EQU    @@E352+1              MERGED FILE WOULD CONTAIN
                      396+*                                * MORE THEN 990 LINES
              0057  397+@@E361 EQU    @@E360+1              INCOMPATIBLE FILE TYPES
                      398+*                                * FOR <MERGE>
              0058  399+@@E362 EQU    @@E361+1              MERGED FILE WOULD EXCEED
                      400+*                                * <WORK FILE> SIZE LIMIT
              0059  401+@@E371 EQU    @@E362+1              <REMOVE> COMMAND NOT
                      402+*                                * PREVIOUSLY ISSUED
              005A  403+@@E380 EQU    @@E371+1              <PASSWORD> PREVIOUSLY DEFINED
                      404+*                                *
              005B  405+@@E390 EQU    @@E380+1              POOLED FILENAME ALREADY
                      406+*                                * DEFINED
              005C  407+@@E400 EQU    @@E390+1              CURRENT PASSWORD/DISK NOT THE
                      408+*                                * SAME AS CREATING USER
              005D  409+@@E410 EQU    @@E400+1              DISK LABEL NOT SAME AS LAST
                      410+*                                * MOUNTED
              005E  411+@@E415 EQU    @@E410+1              INVALID COMMAND KEY
                      412+*                                *
              005F  413+@@E417 EQU    @@E415+1              INVALID COMMAND SPECIFICATION
                      414+*                                *
              0060  415+@@E420 EQU    @@E417+1              USER FILENAME ALREADY DEFINED
                      416+*                                *
              0061  417+@@E430 EQU    @@E420+1              INVALID PARTIAL <RENUMBER>
                      418+*                                * .
              0062  419+@@E432 EQU    @@E430+1              MAX <LINE NUMBER> WOULD BE
                      420+*                                * EXCEEDED IF RENUMBERED
              0063  421+@@E433 EQU    @@E432+1              <RENUMBER> <INCREMENT> IS ZERO
                      422+*                                *
              0064  423+@@E450 EQU    @@E433+1              ANOTHER PROGRAM IS SUSPENSION
                      424+*                                *
              0065  425+@@E451 EQU    @@E450+1              SCRATCH FILE IN USE
                      426+*                                *
              0066  427+@@E460 EQU    @@E451+1              RIGHT MARGIN EXCEEDS
                      428+*                                * PRINTER SIZE
              0067  429+@@E461 EQU    @@E460+1              <WIDTH> LESS THAN 18
                      430+*                                *
              0068  431+@@E464 EQU    @@E461+1              NO SUSPENDED PROGRAM
                      432+*                                *
              0069  433+@@E465 EQU    @@E464+1              MISSING 'OPEN' DISK FILE
                      434+*                                *
              006A  435+@@E466 EQU    @@E465+1              SUSPENDED CONFIGURATION
                      436+*                                * DIFFERS FROM CURRENT SYSTEM
              006B  437+@@E467 EQU    @@E466+1              'OPEN' DISK FILE HAS BEEN
                      438+*                                * MODIFIED
              006C  439+@@E469 EQU    @@E467+1              DISK FOUND DEFECTIVE
                      440+*                                *
              006D  441+@@E470 EQU    @@E469+1              TRACK ALREADY ASSIGNED OR
                      442+*                                * NOT AVAILABLE
              006E  443+@@E471 EQU    @@E470+1              INVALID SECONDARY
```

```
                          444+*                                    * INITIALIZATION
                     006F 445+@@E473 EQU    @@E471+1               DISK ALREADY CONTAINS A
                          446+*                                    * <FILE LIBRARY AREA>
                     0070 447+@@E474 EQU    @@E473+1               SPACE NOT AVAILABLE FOR FILE
                          448+*                                    *
                     0071 449+@@E475 EQU    @@E474+1               NO MORE ALTERNATE TRACKS
                          450+*                                    *
                     0072 451+@@E476 EQU    @@E475+1               CRT, PROCESSING UNIT,
                          452+*                                    * COMMAND KEY CONFLICT
                     0073 453+@@E477 EQU    @@E476+1               INVALID KEYBOARD TYPE
                          454+*                                    *
                     0074 455+@@E478 EQU    @@E477+1               ACTIVE FILE(S) ON DISK
                          456+*                                    *
                     0075 457+@@E479 EQU    @@E478+1               SPECIFIED FILE NOT ON DISK
                          458+*                                    *
                     0076 459+@@E480 EQU    @@E479+1               FILES IN AREA TO BE DELETED
                          460+*                                    *
                     0077 461+@@E481 EQU    @@E480+1               CYLINDER 0 DEFECTIVE
                          462+*                                    *
                     0078 463+@@E482 EQU    @@E481+1               SPECIFIED <TRACK> EXCEEDS DISK
                          464+*                                    * CAPACITY
                     0079 465+@@E483 EQU    @@E482+1               VTOC FULL
                          466+*                                    *
                     007A 467+@@E484 EQU    @@E483+1               SPACE NOT AVAILABLE BEGINNING
                          468+*                                    * AT <TRACK> SPECIFIED
                     007B 469+@@E485 EQU    @@E484+1               WORK AREA SPACE ALLOCATED FOR
                          470+*                                    * ANOTHER PURPOSE
                     007C 471+@@E486 EQU    @@E485+1               <TRACK> NOT USABLE
                          472+*                                    *
                     007D 473+@@E487 EQU    @@E486+1               NUMBER OF TRACKS REQUESTED
                          474+*                                    * EXCEEDS DISK CAPACITY
                     007E 475+@@E488 EQU    @@E487+1               CONTRACTION PARAMETER EXCEED
                          476+*                                    * LIBRARY SIZE
                     007F 477+@@E489 EQU    @@E488+1               RELEASE LEVEL ON HELP
                          478+*                                    * TEXT IS INCORRECT
                     0080 479+@@E490 EQU    @@E489+1               NO SUSPECTED DEFECTIVE
                          480+*                                    * TRACKS
                     0081 481+@@E491 EQU    @@E490+1               INVALID COMPONENT NAME
                          482+*                                    *
                     0082 483+@@E492 EQU    @@E491+1               NO 'HDR' OR 'PTF' STATEMENT
                          484+*                                    *
                     0083 485+@@E493 EQU    @@E492+1               INCORRECT CHECKSUM
                          486+*                                    *
                     0084 487+@@E494 EQU    @@E493+1               NO 'PTF' FILE ON DISK
                          488+*                                    *
                     0085 489+@@E495 EQU    @@E494+1               SYSTEM RELEASE LEVEL
                          490+*                                    * INCORRECT
                     0086 491+@@E496 EQU    @@E495+1               THIS PTF NOT IN 'PTF'
                          492+*                                    * DISK FILE
                     0087 493+@@E497 EQU    @@E496+1               NO WORKAREA ON 'CURRENT'
                          494+*                                    * SYSTEM DISK
                     0088 495+@@E498 EQU    @@E497+1               TRACK NOT ASSIGNED
                          496+*                                    *
                     0089 497+@@E500 EQU    @@E498+1               LINE LENGTH LIMIT EXCEED-1
                          498+*                                    * OR MORE LINES TRUNCATED
                     008A 499+@@E501 EQU    @@E500+1               <WORK FILE> SIZE LIMIT
```

```
                              500+*                                       * EXCEEDED - FILE TRUNCATED
                         008B 501+@@E530 EQU    @@E501+1                   <WORK FILE> SIZE LIMIT
                              502+*                                       * EXCEEDED
                         008C 503+@@E531 EQU    @@E530+1                   <WORK FILE> SIZE LIMIT
                              504+*                                       * EXCEEDED
                         008D 505+@@E535 EQU    @@E531+1                   WRONG/ NO <WORKAREA> ON R1 OR F1
                              506+*                                       *
                         008E 507+@@E540 EQU    @@E535+1                   RIGHT MARGIN EXCEEDED
                              508+*                                       * LINE IGNORED
                         008F 509+@@E541 EQU    @@E540+1                   'CURRENT' PASSOWRD/DISK LABEL
                              510+*                                       * CANCELLED
                         0090 511+@@E542 EQU    @@E541+1                   DISK CYLINDER SIZE DOES NOT
                              512+*                                       * MATCH MACHINE CAPACITY
                         0091 513+@@E543 EQU    @@E542+1                   R1 DISK NOT INITIALIZED
                              514+*                                       *
                         0092 515+@@E544 EQU    @@E543+1                   F1 DISK NOT INITIALIZED
                              516+*                                       *
                         0093 517+@@E545 EQU    @@E544+1                   R2 DISK NOT INITIALIZED
                              518+*                                       *
                         0094 519+@@E546 EQU    @@E545+1                   F2 DISK NOT INITIALIZED
                              520+*                                       *
                         0095 521+@@E547 EQU    @@E546+1                   MINIMUM CONFIGURATION
                              522+*                                       * RECORD ASSUMED
                         0096 523+@@E549 EQU    @@E547+1                   PRINTER UNAVAILABLE DUE TO
                              524+*                                       * PREVIOUS PRINTER FAILURE
                         0097 525+@@E550 EQU    @@E549+1                   TRAGIC DISK ERROR - BAD
                              526+*                                       * WORK FILE
                         0098 527+@@E551 EQU    @@E550+1                   TRAGIC DISK ERROR - BAD
                              528+*                                       * SAVED FILE
                         0099 529+@@E552 EQU    @@E551+1                   TRAGIC DISK ERROR - 'CURRENT'
                              530+*                                       * PASSWORD NOT FOUND
                         009A 531+@@E553 EQU    @@E552+1                   TRAGIC DISK ERROR - POOLED
                              532+*                                       * FILE NOT IN DIRECTORY
                         009B 533+@@E554 EQU    @@E553+1                   TRAGIC DISK ERROR - BAD
                              534+*                                       * FILENAME IN POOLED DIRECTORY
                         009C 535+@@E555 EQU    @@E554+1                   TRAGIC DISK ERROR - 'OPEN'
                              536+*                                       * DISK FILE GONE
                         009D 537+@@E556 EQU    @@E555+1                   TRAGIC DISK ERROR - PARAMETERS
                              538+*                                       * HAVE BEEN DESTROYED
                         009E 539+@@E558 EQU    @@E556+1                   CURRENT SYSTEM PROGRAM FILE
                              540+*                                       * ON DISK SPECIFIED
                         009F 541+@@E570 EQU    @@E558+1                   ONE OR MORE LINES TRUNCATED
                              542+*                                       * WHEN PUNCHED
                         00A0 543+@@E571 EQU    @@E570+1                   ONE OR MORE DISABLED LINES
                              544+*                                       * PUNCHED
                         00A1 545+@@E572 EQU    @@E571+1                   WRONG OR NO <WORKAREA> ON F1
                              546+*                                       *
                         00A2 547+@@E573 EQU    @@E572+1                   WRONG OR NO <WORKAREA> ON R1
                              548+*                                       *
                         00A3 549+@@E574 EQU    @@E573+1                   NEXT AUTOMATIC LINE NUMBER
                              550+*                                       * WILL EXCEED 9999
                         00A4 551+@@E578 EQU    @@E574+1                   RESPONSE NOT ALLOWED WITH
                              552+*                                       * CARDS OR PROCEDURE INPUT
                         00A5 553+@@E585 EQU    @@E578+1                   REQUESTED TRACK SPACE EXCEEDS
                              554+*                                       * DISK CONFIGURATION
                         00A6 555+@@E600 EQU    @@E585+1                   DIM ARRAY NAME PREVIOUSLY
```

```
                          556+*                                              * DEFINED
               00A7  557+@@E601 EQU    @@E600+1                 REFERENCED MATRIX NOT
                          558+*                                              * PREVIOUSLY DEFINED.
               00A8  559+@@E602 EQU    @@E601+1                 MATRIX REFERENCED AS VECTOR
                          560+*                                              *
               00A9  561+@@E603 EQU    @@E602+1                 VECTOR REFERENCED AS MATRIX
                          562+*                                              *
               00AA  563+@@E604 EQU    @@E603+1                 DUPLICATE DEFINITION OF USER
                          564+*                                              * FUNCTION
               00AB  565+@@E606 EQU    @@E604+1                 <NEXT> STATEMENT OUT OF
                          566+*                                              * SEQUENCE
               00AC  567+@@E607 EQU    @@E606+1                 <FOR>/NEXT NESTED INCORRECTLY
                          568+*                                              *
               00AD  569+@@E608 EQU    @@E607+1                 MORE THAN 9 NESTED <FOR>/NEXT
                          570+*                                              * LOOPS
               00AE  571+@@E609 EQU    @@E608+1                 <FOR>/NEXT LOOP INCOMPLETE
                          572+*                                              *
               00AF  573+@@E610 EQU    @@E609+1                 COMPILED PROGRAM TOO LARGE
                          574+*                                              *
               00B0  575+@@E611 EQU    @@E610+1                 TOO MANY ARRAY ELEMENTS
                          576+*                                              *
               00B1  577+@@E612 EQU    @@E611+1                 TOO MANY LINE NUMBER
                          578+*                                              * REFERENCES
               00B2  579+@@E613 EQU    @@E612+1                 STORAGE SPACE REQUIRED FOR
                          580+*                                              * FILES TOO LARGE
               00B3  581+@@E614 EQU    @@E613+1                 FILE LINE PREVIOUSLY TRUNCATED
                          582+*                                              *
               00B4  583+@@E700 EQU    @@E614+1                 NON-EXISTENT LINE NUMBER
                          584+*                                              * REFERENCED
               00B5  585+@@E701 EQU    @@E700+1                 NON-EXISTENT USER FUNCTION
                          586+*                                              * REFERENCED
               00B6  587+@@E710 EQU    @@E701+1                 REQUIRED FILE NOT ALLOCATED
                          588+*                                              *
               00B7  589+@@E712 EQU    @@E710+1                 INCONSISTENT INPUT/OUTPUT FILE
                          590+*                                              * USAGE
               00B8  591+@@E713 EQU    @@E712+1                 ALLOCATED FILE NOT A DATA FILE
                          592+*                                              *
               00B9  593+@@E714 EQU    @@E713+1                 INSUFFICIENT DATA FOR <GET>
                          594+*                                              *
               00BA  595+@@E715 EQU    @@E714+1                 OUTPUT FILE EXCEEDED
                          596+*                                              *
               00BB  597+@@E716 EQU    @@E715+1                 NO SPACE FOR ALLOCATED SCRATCH
                          598+*                                              * FILE
               00BC  599+@@E717 EQU    @@E716+1                 ALLOCATED DEVICE NOT ON SYSTEM
                          600+*                                              *
               00BD  601+@@E718 EQU    @@E717+1                 INVALID DATA ITEM FROM CARD
                          602+*                                              * FILE
               00BE  603+@@E720 EQU    @@E718+1                 NO <DATA STATEMENT> SPECIFIED
                          604+*                                              *
               00BF  605+@@E721 EQU    @@E720+1                 INSUFFICIENT DATA FOR READ
                          606+*                                              *
               00C0  607+@@E723 EQU    @@E721+1                 INVALID <FOR> LOOP EXECUTION
                          608+*                                              *
               00C1  609+@@E724 EQU    @@E723+1                 NO PRINT IMAGE IN 0,01;E
                          610+*                                              * STATEMENT,
               00C2  611+@@E725 EQU    @@E724+1                 REFERENCED STATEMENT NOT AN
```

```
                              612+*                                      * IMAGE
                   00C3  613+@@E726 EQU     @@E725+1                <RETURN> EXECUTED WITHOUT
                              614+*                                      * ACTIVE <WSW>
                   00C4  615+@@E727 EQU     @@E726+1                INVALID VARIABLE ASSIGNED
                              616+*                                      *
                   00C5  617+@@E728 EQU     @@E727+1                RECURSIVE FUNCTION REFERENCE
                              618+*                                      *
                   00C6  619+@@E729 EQU     @@E728+1                STATEMENT BRANCHES TO ITSELF
                              620+*                                      *
                   00C7  621+@@E730 EQU     @@E729+1                EXPRESSION TOO COMPLEX TO
                              622+*                                      * EXECUTE
                   00C8  623+@@E732 EQU     @@E730+1                MORE THAN 10 ACTIVE USER
                              624+*                                      * FUNCTIONS
                   00C9  625+@@E752 EQU     @@E732+1                ASSIGNED MATRIX NOT
                              626+*                                      * 2-DIMENSIONAL
                   00CA  627+@@E753 EQU     @@E752+1                MATRIX MULTIPLIER NOT
                              628+*                                      * 2-DIMENSIONAL
                   00CB  629+@@E754 EQU     @@E753+1                MATRIX FUNCTION ARGUMENT NOT
                              630+*                                      * 2-DIMENSIONAL
                   00CC  631+@@E755 EQU     @@E754+1                ASSIGNED MATRIX DIMS NOT SAME
                              632+*                                      * AS EXPR
                   00CD  633+@@E756 EQU     @@E755+1                MATRIX DIMENSIONS NOT REVERSED
                              634+*                                      *
                   00CE  635+@@E757 EQU     @@E756+1                ASSIGNED MATRIX DIMS NOT SAYE
                              636+*                                      * AS INV ARG
                   00CF  637+@@E758 EQU     @@E757+1                MATRIX EXPR DIMENSIONS NOT
                              638+*                                      * CONFORMABLE
                   00D0  639+@@E759 EQU     @@E758+1                ATTEMPTED MATRIX
                              640+*                                      * MULTIPLICATION IN PLACE
                   00D1  641+@@E760 EQU     @@E759+1                SUBSCRIPT OUT OF <ARRAY SIZE
                              642+*                                      * LIMIT>
                   00D2  643+@@E761 EQU     @@E760+1                DIMENSIONED OUTSIDE MAX <ARRAY
                              644+*                                      * SIZE LIMIT>
                   00D3  645+@@E762 EQU     @@E761+1                MATRIX EXPRESSION DIMENSIONS
                              646+*                                      * NOT IDENTICAL
                   00D4  647+@@E763 EQU     @@E762+1                NEARLY SINGULAR MATRIX
                              648+*                                      *
                   00D5  649+@@E764 EQU     @@E763+1                MATRIX TOO LARGE TO INVERT
                              650+*                                      *
                   00D6  651+@@E765 EQU     @@E764+1                ATTEMPTED MATRIX INVERSION IN
                              652+*                                      * PLACE
                   00D7  653+@@E766 EQU     @@E765+1                MATRIX NOT SQUARE
                              654+*                                      *
                   00D8  655+@@E767 EQU     @@E766+1                ATTEMPTED MATRIX TRANSPOSITION
                              656+*                                      * IN PLACE
                   00D9  657+@@E768 EQU     @@E767+1                SEC FUNCTION ARGUMENT > 1E6
                              658+*                                      *
                   00DA  659+@@E769 EQU     @@E768+1                CSC FUNCTION ARGUMENT > 1E6
                              660+*                                      *
                   00DB  661+@@E770 EQU     @@E769+1                SIN FUNCTION ARGUMENT > 1E6
                              662+*                                      *
                   00DC  663+@@E771 EQU     @@E770+1                COS FUNCTION ARGUMENT > 1E6
                              664+*                                      *
                   00DD  665+@@E772 EQU     @@E771+1                TAN FUNCTION ARGUMENT > 1E6
                              666+*                                      *
                   00DE  667+@@E773 EQU     @@E772+1                COT FUNCTION ARGUMENT > 1E6
```

```
                          668+*                                        *
                   00DF   669+@@E774 EQU    @@E773+1                    EXPONENTIATION ERROR
                          670+*                                        *
                   00E0   671+@@E775 EQU    @@E774+1                    SOR FUNCTION ARGUMENT < ZERO
                          672+*                                        *
                   00E1   673+@@E776 EQU    @@E775+1                    EXP FUNCTION ARGUMENT > 227.96
                          674+*                                        *
                   00E2   675+@@E777 EQU    @@E776+1                    LOG FUNCTION ARGUMENT 0 OR
                          676+*                                        * NEGATIVE
                   00E3   677+@@E778 EQU    @@E777+1                    LSI FUNCTION ARGUMENT 0 OR
                          678+*                                        * NEGATIVE
                   00E4   679+@@E779 EQU    @@E778+1                    LTW FUNCTION ARGUMENT 0 OR
                          680+*                                        * NEGATIVE
                   00E5   681+@@E780 EQU    @@E779+1                    COT FUNCTION RESULT GOES TO
                          682+*                                        * INFINITY
                   00E6   683+@@E781 EQU    @@E780+1                    SEC FUNCTION RESULT GOES TO
                          684+*                                        * INFINITY
                   00E7   685+@@E782 EQU    @@E781+1                    CSC FUNCTION RESULT GOES TO
                          686+*                                        * INFINITY
                   00E8   687+@@E783 EQU    @@E782+1                    ASN FUNCTION ARG NOT IN RANGE
                          688+*                                        * -1 < X < 1
                   00E9   689+@@E784 EQU    @@E783+1                    ACS FUNCTION ARC NOT IN RANGE
                          690+*                                        * -1 < X < 1
                   00EA   691+@@E785 EQU    @@E784+1                    HSN FUNCTION--ARGUMENT > 225
                          692+*                                        *
                   00EB   693+@@E786 EQU    @@E785+1                    HCS FUNCTION--ARGUMENT > 225
                          694+*                                        *
                   00EC   695+@@E790 EQU    @@E786+1                    DIVISION BY ZERO
                          696+*                                        *
                   00ED   697+@@E791 EQU    @@E790+1                    OVERFLOW - VALUE NOT LESS THAN
                          698+*                                        * 1E99
                   00EE   699+@@E792 EQU    @@E791+1                    UNDERFLOW - VALUE LESS THAN
                          700+*                                        * 1E-99
                   00EF   701+@@E793 EQU    @@E792+1                    TAN FUNCTION ARGUMENT > 100
                          702+*                                        *
                   00F0   703+@@E794 EQU    @@E793+1                    COT FUNCTION ARGUMENT > 100
                          704+*                                        *
                   00F1   705+@@E795 EQU    @@E794+1                    SIN FUNCTION ARGUMENT > 100
                          706+*                                        *
                   00F2   707+@@E796 EQU    @@E795+1                    COS FUNCTION ARGUMENT > 100
                          708+*                                        *
                   00F3   709+@@E797 EQU    @@E796+1                    SEC FUNCTION ARGUMENT > 100
                          710+*                                        *
                   00F4   711+@@E798 EQU    @@E797+1                    CSC FUNCTION ARGUMENT > 100
                          712+*                                        *
                   00F5   713+@@E900 EQU    @@E798+1                    INVALID FUNCTION IN PROCEDURE
                          714+*                                        * STEP
                   00F6   715+@@E901 EQU    @@E900+1                    PROCEDURE ALREADY DEFINED
                          716+*                                        *
                   00F7   717+@@E902 EQU    @@E901+1                    PROCEDURE NOT DEFINED
                          718+*                                        *
                   00F8   719+@@E903 EQU    @@E902+1                    PROCEDURE > 512 CHARACTERS
                          720+*                                        *
                   00F9   721+@@E905 EQU    @@E903+1                    DESK CALCULATOR REQUIRES WITDH
                          722+*                                        * > 63
                   00FA   723+@@E906 EQU    @@E905+1                    INVALID CHARACTER IN PROCEDURE
```

```
                                  724+*                                        * DEFINITION
                           00FB   725+@@E910 EQU    @@E906+1                    INVALID OPERATION
                                  726+*                                        *
                           FFFF   727+@@E548 EQU    -1                         PRINTER FAILLQE, OUTPUT
                                  728+*                                        *
                           FFFF   729+@@E575 EQU    -1                         CHANGED LINE EXCEEDS WIDTH OF
                                  730+*                                        *
                           FFFF   731+@@E579 EQU    -1                         VTOC FILES EXIST, RE-IPL, USE
                                  732+*                                        *
                           FFFF   733+@@E580 EQU    -1                         DUPLICATE DISK LABELS -
                                  734+*                                        *
                           FFFF   735+@@E595 EQU    -1                         INVALID RESPONSE - TYPE ALPHA
                                  736+*                                        *
                           FFFF   737+@@E597 EQU    -1                         LLLLLL NOT ON UU
                                  738+*                                        *
                           FFFF   739+@@E598 EQU    -1                         DATA ON ABOVE TRACK
                                  740+*                                        *
                           FFFF   741+@@E800 EQU    -1                         INVALID INPUT DATA-NUMERIC
                                  742+*                                        *
                           FFFF   743+@@E801 EQU    -1                         INVALID INPUT DATA--CHARACTER
                                  744+*                                        *
                           FFFF   745+@@E802 EQU    -1                         TOO MANY INPUT DATA ELEMENTS
                                  746+*                                        *
                           FFFF   747+@@E803 EQU    -1                         NOT ENOUGH DATA ELEMENTS
                                  748+*                                        *
                           FFFF   749+@@E804 EQU    -1                         NOT ENOUGH ARRAY ROW ELEMENTS
                                  750+*                                        *
                           0000   751+@@E001 EQU    0                          MISSING <ARITHMETIC
                                  752+*                                        * EXPRESSION>
                           0001   753+@@E003 EQU    @@E001+1                   UNBALANCED <PARENTHESES>
                                  754+*                                        *
                           0002   755+@@E004 EQU    @@E003+1                   <ARITHMETIC CONSTANT> CONTAINS
                                  756+*                                        * 2 DECIMAL POINTS
                           0003   757+@@E005 EQU    @@E004+1                   DECIMAL POINT WITHOUT
                                  758+*                                        * <ARITHMETIC CONSTANT>
                           0004   759+@@E006 EQU    @@E005+1                   INCOMPLETE <ARITHMETIC
                                  760+*                                        * EXPRESSION>
                           0005   761+@@E007 EQU    @@E006+1                   INVALID CHARACTER FOLLOWING
                                  762+*                                        * <OPERATOR>
                           0006   763+@@E008 EQU    @@E007+1                   <CHARACTER VARIABLE> IN
                                  764+*                                        * <ARITHMETIC EXPRESSION>
                           0007   765+@@E009 EQU    @@E008+1                   INVALID EXPRESSION FIRST
                                  766+*                                        * CHARACTER
                           0008   767+@@E010 EQU    @@E009+1                   INVALID <SECONDARY KEYWORD>
                                  768+*                                        *
                           0009   769+@@E011 EQU    @@E010+1                   COMMA NOT FOLLOWING LINE
                                  770+*                                        * NUMBER
                           000A   771+@@E012 EQU    @@E011+1                   INVALID <DELIMITER>
                                  772+*                                        *
                           000B   773+@@E013 EQU    @@E012+1                   INCOMPLETE <CHARACTER
                                  774+*                                        * CONSTANT>
                           000C   775+@@E014 EQU    @@E013+1                   INVALID FILE SPECIFICATION
                                  776+*                                        *
                           000D   777+@@E015 EQU    @@E014+1                   VARIABLE NOT PRESENT IN INPUT
                                  778+*                                        * LIST
                           000E   779+@@E016 EQU    @@E015+1                   INVALID VARIABLE
```

```
                        780+*                                    *
              000F      781+@@E017 EQU    @@E016+1               INVALID EXPONENT IN CONSTANT
                        782+*                                    *
              0010      783+@@E018 EQU    @@E017+1               <OPERATOR> WITHOUT VALID
                        784+*                                    * PRECEDING OPERAND
              0011      785+@@E019 EQU    @@E018+1               <OPERATOR> REQUIRED BTWN LAST
                        786+*                                    * 2 CHARACTERS CHECKED
              0012      787+@@E020 EQU    @@E019+1               INVALID CONSTANT
                        788+*                                    *
              0013      789+@@E021 EQU    @@E020+1               <LINE NUMBER> TOO LONG
                        790+*                                    *
              0014      791+@@E023 EQU    @@E021+1               INVALID <SYSTEM CONSTANT>
                        792+*                                    *
              0015      793+@@E024 EQU    @@E023+1               INVALID OR MISSING <LINE
                        794+*                                    * NUMBER>
              0016      795+@@E025 EQU    @@E024+1               INVALID <PRIMARY KEYWORD>
                        796+*                                    *
              0017      797+@@E026 EQU    @@E025+1               NO EQUAL SIGN AFTER
                        798+*                                    * <ARITHMETIC VARIABLE>
              0018      799+@@E027 EQU    @@E026+1               INVALID SIMPLE <ARITHMETIC
                        800+*                                    * VARIABLE>
              0019      801+@@E028 EQU    @@E027+1               INVALID <CONTROL VARIABLE>
                        802+*                                    * CHARACTER
              001A      803+@@E029 EQU    @@E028+1               MISSING <RELATIONAL OPERATOR>
                        804+*                                    *
              001B      805+@@E030 EQU    @@E029+1               INVALID OR MISSING <CHARACTER
                        806+*                                    * EXPRESSION>
              001C      807+@@E031 EQU    @@E030+1               INVALID <DEF> FUNCTION
                        808+*                                    * DEFINITION
              001D      809+@@E032 EQU    @@E031+1               NO EQUAL SIGN AFTER VALID
                        810+*                                    * FUNCTION DEFINITION
              001E      811+@@E035 EQU    @@E032+1               INVALID CHARACTER AFTER VALID
                        812+*                                    * STATEMENT
              001F      813+@@E036 EQU    @@E035+1               VARIABLE IS NOT FOLLOWED BY A
                        814+*                                    * COMMA OR EQUAL SIGN
              0020      815+@@E037 EQU    @@E036+1               CHARACTER AND ARITHMETIC
                        816+*                                    * <VARIABLES> INTERmIxED
              0021      817+@@E038 EQU    @@E037+1               INVALID <CHARACTER VARIABLE>
                        818+*                                    *
              0022      819+@@E039 EQU    @@E038+1               INVALID <ARRAY NAME>
                        820+*                                    *
              0023      821+@@E040 EQU    @@E039+1               INVALID DIMENSION
                        822+*                                    *
              0024      823+@@E041 EQU    @@E040+1               INVALID <DELIMITER> AFTER
                        824+*                                    * VALID ARRAY DEFINITION
              0025      825+@@E042 EQU    @@E041+1               INVALID MATRIX EXPRESSION ON
                        826+*                                    * RIGHT OF EQUAL SIGN
              0026      827+@@E043 EQU    @@E042+1               INVALID <mATRIX> NAME,
                        828+*                                    *
              0027      829+@@E044 EQU    @@E043+1               MISSING MULTIPLICATION
                        830+*                                    * <OPERATOR>
              0028      831+@@E045 EQU    @@E044+1               STATEMENT TERMINATED
                        832+*                                    * PREMATURELY
              0029      833+@@E046 EQU    @@E045+1               <ARITHMETIC CONSTANT> NOT IN
                        834+*                                    * RANGE 1E-99 < X < 1E99
              002A      835+@@E060 EQU    @@E046+1               EXPRESSION TOO COMPLEX
```

```
        @ERMEQ - GENERAL ERROR MESSAGE EQUATES
```
```
                         836+*                                    *
            002B 837+@@E080 EQU   @@E060+1                  DATA FILE LINE TOO LONG
                         838+*        END OF ERROR MESSAGES EQUATES
                         839+        PRINT ON
                         840 *       @SPF  EXP-Y
                         842+        PRINT ON
```

```
                          844+*****************************************************************************
                          845+*         SYSTEM PROGRAM FILE (SPF) EQUATES                                  *
                          846+*****************************************************************************
                          847+*
                0000      848+#$#0TR EQU    X'0000'                      DISK ADDR OF ##0TRK
                0700      849+#$$#0T EQU    X'0700'                      CORE LOAD ADDRESS OF ##0TRK
                0018      850+#$@#0T EQU    24                           SECTOR COUNT OF ##0TRK
                          851+*
                0080      852+#$#1TR EQU    X'0080'                      DISK ADDR OF ##1TRK
                0000      853+#$$#1T EQU    X'0000'                      CORE LOAD ADDRESS OF ##1TRK
                0018      854+#$@#1T EQU    24                           SECTOR COUNT OF ##1TRK
                          855+*
                0000      856+#$#DRT EQU    X'0000'                      DISK ADDR OF ##DRTY
                0000      857+#$$#DR EQU    X'0000'                      CORE LOAD ADDRESS OF ##DRTY
                0008      858+#$@#DR EQU    08                           SECTOR COUNT OF ##DRTY
                          859+*
                0020      860+#$INST EQU    X'0020'                      DISK ADDR OF #INSTD
                0600      861+#$$INS EQU    X'0600'                      CORE LOAD ADDRESS OF #INSTD
                0010      862+#$@INS EQU    16                           SECTOR COUNT OF #INSTD
                          863+*
                0080      864+#$BCOM EQU    X'0080'                      DISK ADDR OF #BCOMP
                0600      865+#$$BCO EQU    X'0600'                      CORE LOAD ADDRESS OF #BCOMP
                0018      866+#$@BCO EQU    24                           SECTOR COUNT OF #BCOMP
                          867+*
                0100      868+#$LOAD EQU    X'0100'                      DISK ADDR OF #LOADR
                0600      869+#$$LOA EQU    X'0600'                      CORE LOAD ADDRESS OF #LOADR
                0013      870+#$@LOA EQU    19                           SECTOR COUNT OF #LOADR
                          871+*
                014C      872+#$DPRI EQU    X'014C'                      DISK ADDR OF #DPRIN
                0700      873+#$$DPR EQU    X'0700'                      CORE LOAD ADDRESS OF #DPRIN
                0005      874+#$@DPR EQU    05                           SECTOR COUNT OF #DPRIN
                          875+*
                0180      876+#$KGOS EQU    X'0180'                      DISK ADDR OF #KGOSL
                0C00      877+#$$KGO EQU    X'0C00'                      CORE LOAD ADDRESS OF #KGOSL
                0002      878+#$@KGO EQU    02                           SECTOR COUNT OF #KGOSL
                          879+*
                0188      880+#$KEDI EQU    X'0188'                      DISK ADDR OF #KEDIT
                0C00      881+#$$KED EQU    X'0C00'                      CORE LOAD ADDRESS OF #KEDIT
                000E      882+#$@KED EQU    14                           SECTOR COUNT OF #KEDIT
                          883+*
                01C4      884+#$KENA EQU    X'01C4'                      DISK ADDR OF #KENAB
                0C00      885+#$$KEN EQU    X'0C00'                      CORE LOAD ADDRESS OF #KENAB
                0006      886+#$@KEN EQU    06                           SECTOR COUNT OF #KENAB
                          887+*
                0200      888+#$DREA EQU    X'0200'                      DISK ADDR OF #DREAD
                0889      889+#$$DRE EQU    X'0889'                      CORE LOAD ADDRESS OF #DREAD
                0001      890+#$@DRE EQU    01                           SECTOR COUNT OF #DREAD
                          891+*
                0204      892+#$KMOU EQU    X'0204'                      DISK ADDR OF #KMOUN
                0C00      893+#$$KMO EQU    X'0C00'                      CORE LOAD ADDRESS OF #KMOUN
                0004      894+#$@KMO EQU    04                           SECTOR COUNT OF #KMOUN
                          895+*
                0214      896+#$KRMO EQU    X'0214'                      DISK ADDR OF #KRMOV
                0C00      897+#$$KRM EQU    X'0C00'                      CORE LOAD ADDRESS OF #KRMOV
                0003      898+#$@KRM EQU    03                           SECTOR COUNT OF #KRMOV
                          899+*
```

```
                          0220  900+#$KPAS EQU  X'0220'               DISK ADDR OF #KPASW
                          0C00  901+#$$KPA EQU  X'0C00'               CORE LOAD ADDRESS OF #KPASW
                          0005  902+#$@KPA EQU  05                    SECTOR COUNT OF #KPASW
                                903+*
                          0234  904+#$KEXT EQU  X'0234'               DISK ADDR OF #KEXTR
                          0C00  905+#$$KEX EQU  X'0C00'               CORE LOAD ADDRESS OF #KEXTR
                          0003  906+#$@KEX EQU  03                    SECTOR COUNT OF #KEXTR
                                907+*
                          0240  908+#$DSPL EQU  X'0240'               DISK ADDR OF #DSPLY
                          2800  909+#$$DSP EQU  X'2800'               CORE LOAD ADDRESS OF #DSPLY
                          0004  910+#$@DSP EQU  04                    SECTOR COUNT OF #DSPLY
                                911+*
                          0250  912+#$TSYK EQU  X'0250'               DISK ADDR OF #TSYKT
                          1000  913+#$$TSY EQU  X'1000'               CORE LOAD ADDRESS OF #TSYKT
                          0003  914+#$@TSY EQU  03                    SECTOR COUNT OF #TSYKT
                                915+*
                          0280  916+#$KRNU EQU  X'0280'               DISK ADDR OF #KRNUM
                          0700  917+#$$KRN EQU  X'0700'               CORE LOAD ADDRESS OF #KRNUM
                          0003  918+#$@KRN EQU  03                    SECTOR COUNT OF #KRNUM
                                919+*
                          028C  920+#$KROV EQU  X'028C'               DISK ADDR OF #KROVL
                          0D00  921+#$$KRO EQU  X'0D00'               CORE LOAD ADDRESS OF #KROVL
                          000A  922+#$@KRO EQU  10                    SECTOR COUNT OF #KROVL
                                923+*
                          0290  924+#$KOVM EQU  X'0290'               DISK ADDR OF #KOVME
                          0E00  925+#$$KOV EQU  X'0E00'               CORE LOAD ADDRESS OF #KOVME
                          0009  926+#$@KOV EQU  09                    SECTOR COUNT OF #KOVME
                                927+*
                          02B4  928+#$KWRI EQU  X'02B4'               DISK ADDR OF #KWRIT
                          0C00  929+#$$KWR EQU  X'0C00'               CORE LOAD ADDRESS OF #KWRIT
                          0002  930+#$@KWR EQU  02                    SECTOR COUNT OF #KWRIT
                                931+*
                          02BC  932+#$KREA EQU  X'02BC'               DISK ADDR OF #KREAD
                          0C00  933+#$$KRE EQU  X'0C00'               CORE LOAD ADDRESS OF #KREAD
                          0002  934+#$@KRE EQU  02                    SECTOR COUNT OF #KREAD
                                935+*
                          02C4  936+#$KWID EQU  X'02C4'               DISK ADDR OF #KWIDT
                          0C00  937+#$$KWI EQU  X'0C00'               CORE LOAD ADDRESS OF #KWIDT
                          0002  938+#$@KWI EQU  02                    SECTOR COUNT OF #KWIDT
                                939+*
                          02CC  940+#$KRUN EQU  X'02CC'               DISK ADDR OF #KRUNI
                          0C00  941+#$$KRU EQU  X'0C00'               CORE LOAD ADDRESS OF #KRUNI
                          0003  942+#$@KRU EQU  03                    SECTOR COUNT OF #KRUNI
                                943+*
                          0300  944+#$KDNT EQU  X'0300'               DISK ADDR OF #KDNTE
                          0C00  945+#$$KDN EQU  X'0C00'               CORE LOAD ADDRESS OF #KDNTE
                          0010  946+#$@KDN EQU  16                    SECTOR COUNT OF #KDNTE
                                947+*
                          030C  948+#$KMER EQU  X'030C'               DISK ADDR OF #KMERG
                          0D00  949+#$$KME EQU  X'0D00'               CORE LOAD ADDRESS OF #KMERG
                          0003  950+#$@KME EQU  03                    SECTOR COUNT OF #KMERG
                                951+*
                          0350  952+#$TDCK EQU  X'0350'               DISK ADDR OF #TDCKT
                          1000  953+#$$TDC EQU  X'1000'               CORE LOAD ADDRESS OF #TDCKT
                          0003  954+#$@TDC EQU  03                    SECTOR COUNT OF #TDCKT
                                955+*
```

```
                        035C  956+#$KDEL EQU   X'035C'                 DISK ADDR OF #KDELE
                        0C00  957+#$$KDE EQU   X'0C00'                 CORE LOAD ADDRESS OF #KDELE
                        0010  958+#$@KDE EQU   16                      SECTOR COUNT OF #KDELE
                              959+*
                        03BC  960+#$KCTL EQU   X'03BC'                 DISK ADDR OF #KCTL0
                        0C00  961+#$$KCT EQU   X'0C00'                 CORE LOAD ADDRESS OF #KCTL0
                        0009  962+#$@KCT EQU   09                      SECTOR COUNT OF #KCTL0
                              963+*
                        0400  964+#$KLIS EQU   X'0400'                 DISK ADDR OF #KLIST
                        0C00  965+#$$KLI EQU   X'0C00'                 CORE LOAD ADDRESS OF #KLIST
                        0011  966+#$@KLI EQU   17                      SECTOR COUNT OF #KLIST
                              967+*
                        0444  968+#$KLOG EQU   X'0444'                 DISK ADDR OF #KLOGO
                        0C00  969+#$$KLO EQU   X'0C00'                 CORE LOAD ADDRESS OF #KLOGO
                        0008  970+#$@KLO EQU   08                      SECTOR COUNT OF #KLOGO
                              971+*
                        0484  972+#$SPSY EQU   X'0484'                 DISK ADDR OF #SPSYN
                        0C00  973+#$$SPS EQU   X'0C00'                 CORE LOAD ADDRESS OF #SPSYN
                        0001  974+#$@SPS EQU   01                      SECTOR COUNT OF #SPSYN
                              975+*
                        0488  976+#$KSAV EQU   X'0488'                 DISK ADDR OF #KSAVE
                        0C00  977+#$$KSA EQU   X'0C00'                 CORE LOAD ADDRESS OF #KSAVE
                        0011  978+#$@KSA EQU   17                      SECTOR COUNT OF #KSAVE
                              979+*
                        04CC  980+#$SPAC EQU   X'04CC'                 DISK ADDR OF #SPACK
                        0C00  981+#$$SPA EQU   X'0C00'                 CORE LOAD ADDRESS OF #SPACK
                        0004  982+#$@SPA EQU   04                      SECTOR COUNT OF #SPACK
                              983+*
                        04DC  984+#$SPOV EQU   X'04DC'                 DISK ADDR OF #SPOVL
                        0806  985+#$$SPO EQU   X'0806'                 CORE LOAD ADDRESS OF #SPOVL
                        0003  986+#$@SPO EQU   03                      SECTOR COUNT OF #SPOVL
                              987+*
                        0508  988+#$KPOO EQU   X'0508'                 DISK ADDR OF #KPOOL
                        0C00  989+#$$KPO EQU   X'0C00'                 CORE LOAD ADDRESS OF #KPOOL
                        000D  990+#$@KPO EQU   13                      SECTOR COUNT OF #KPOOL
                              991+*
                        053C  992+#$KCHA EQU   X'053C'                 DISK ADDR OF #KCHAN
                        0C00  993+#$$KCH EQU   X'0C00'                 CORE LOAD ADDRESS OF #KCHAN
                        000C  994+#$@KCH EQU   12                      SECTOR COUNT OF #KCHAN
                              995+*
                        058C  996+#$KSVL EQU   X'058C'                 DISK ADDR OF #KSVLA
                        0980  997+#$$KSV EQU   X'0980'                 CORE LOAD ADDRESS OF #KSVLA
                        0002  998+#$@KSV EQU   02                      SECTOR COUNT OF #KSVLA
                              999+*
                        0594 1000+#$KSSP EQU   X'0594'                 DISK ADDR OF #KSSPN
                        0C00 1001+#$$KSS EQU   X'0C00'                 CORE LOAD ADDRESS OF #KSSPN
                        000B 1002+#$@KSS EQU   11                      SECTOR COUNT OF #KSSPN
                             1003+*
                        05C0 1004+#$KNAM EQU   X'05C0'                 DISK ADDR OF #KNAME
                        0C00 1005+#$$KNA EQU   X'0C00'                 CORE LOAD ADDRESS OF #KNAME
                        0008 1006+#$@KNA EQU   08                      SECTOR COUNT OF #KNAME
                             1007+*
                        0600 1008+#$KSYM EQU   X'0600'                 DISK ADDR OF #KSYMB
                        0C00 1009+#$$KSY EQU   X'0C00'                 CORE LOAD ADDRESS OF #KSYMB
                        000F 1010+#$@KSY EQU   15                      SECTOR COUNT OF #KSYMB
                             1011+*
```

```
                          063C 1012+#$KPRT EQU   X'063C'                DISK ADDR OF #KPRTC
                          0C00 1013+#$$KPR EQU   X'0C00'                CORE LOAD ADDRESS OF #KPRTC
                          0009 1014+#$@KPR EQU   09                     SECTOR COUNT OF #KPRTC
                               1015+*
                          0680 1016+#$KSET EQU   X'0680'                DISK ADDR OF #KSETI
                          0E00 1017+#$$KSE EQU   X'0E00'                CORE LOAD ADDRESS OF #KSETI
                          0004 1018+#$@KSE EQU   04                     SECTOR COUNT OF #KSETI
                               1019+*
                          0690 1020+#$GRAP EQU   X'0690'                DISK ADDR OF #GRAPR
                          0889 1021+#$$GRA EQU   X'0889'                CORE LOAD ADDRESS OF #GRAPR
                          0003 1022+#$@GRA EQU   03                     SECTOR COUNT OF #GRAPR
                               1023+*
                          06A4 1024+#$KALL EQU   X'06A4'                DISK ADDR OF #KALLO
                          0C00 1025+#$$KAL EQU   X'0C00'                CORE LOAD ADDRESS OF #KALLO
                          000F 1026+#$@KAL EQU   15                     SECTOR COUNT OF #KALLO
                               1027+*
                          0700 1028+#$KRLA EQU   X'0700'                DISK ADDR OF #KRLAB
                          0700 1029+#$$KRL EQU   X'0700'                CORE LOAD ADDRESS OF #KRLAB
                          0004 1030+#$@KRL EQU   04                     SECTOR COUNT OF #KRLAB
                               1031+*
                          0710 1032+#$KRVL EQU   X'0710'                DISK ADDR OF #KRVLA
                          0800 1033+#$$KRV EQU   X'0800'                CORE LOAD ADDRESS OF #KRVLA
                          000D 1034+#$@KRV EQU   13                     SECTOR COUNT OF #KRVLA
                               1035+*
                          0744 1036+#$KDIS EQU   X'0744'                DISK ADDR OF #KDISP
                          0D00 1037+#$$KDI EQU   X'0D00'                CORE LOAD ADDRESS OF #KDISP
                          0005 1038+#$@KDI EQU   05                     SECTOR COUNT OF #KDISP
                               1039+*
                          0780 1040+#$KDOV EQU   X'0780'                DISK ADDR OF #KDOVR
                          0E00 1041+#$$KDO EQU   X'0E00'                CORE LOAD ADDRESS OF #KDOVR
                          000C 1042+#$@KDO EQU   12                     SECTOR COUNT OF #KDOVR
                               1043+*
                          07B4 1044+#$VCRT EQU   X'07B4'                DISK ADDR OF #VCRTI
                          2000 1045+#$$VCR EQU   X'2000'                CORE LOAD ADDRESS OF #VCRTI
                          0008 1046+#$@VCR EQU   08                     SECTOR COUNT OF #VCRTI
                               1047+*
                          07D4 1048+#$EXMS EQU   X'07D4'                DISK ADDR OF #EXMSG
                          0C00 1049+#$$EXM EQU   X'0C00'                CORE LOAD ADDRESS OF #EXMSG
                          0003 1050+#$@EXM EQU   03                     SECTOR COUNT OF #EXMSG
                               1051+*
                          0800 1052+#$#COR EQU   X'0800'                DISK ADDR OF ##CORE
                          0000 1053+#$$#CO EQU   X'0000'                CORE LOAD ADDRESS OF ##CORE
                          003A 1054+#$@#CO EQU   58                     SECTOR COUNT OF ##CORE
                               1055+*
                          0928 1056+#$#ERM EQU   X'0928'                DISK ADDR OF ##ERMS
                          0000 1057+#$$#ER EQU   X'0000'                CORE LOAD ADDRESS OF ##ERMS
                          0032 1058+#$@#ER EQU   50                     SECTOR COUNT OF ##ERMS
                               1059+*
                          0A30 1060+#$KHEL EQU   X'0A30'                DISK ADDR OF #KHELP
                          0C00 1061+#$$KHE EQU   X'0C00'                CORE LOAD ADDRESS OF #KHELP
                          000C 1062+#$@KHE EQU   12                     SECTOR COUNT OF #KHELP
                               1063+*
                          0A80 1064+#$MIPP EQU   X'0A80'                DISK ADDR OF #MIPPE
                          0C00 1065+#$$MIP EQU   X'0C00'                CORE LOAD ADDRESS OF #MIPPE
                          000D 1066+#$@MIP EQU   13                     SECTOR COUNT OF #MIPPE
                               1067+*
```

```
                          0AC8 1068+#$KSOV EQU   X'0AC8'                  DISK ADDR OF #KSOVR
                          0C20 1069+#$$KSO EQU   X'0C20'                  CORE LOAD ADDRESS OF #KSOVR
                          000D 1070+#$@KSO EQU   13                       SECTOR COUNT OF #KSOVR
                               1071+*
                          0B00 1072+#$VXIT EQU   X'0B00'                  DISK ADDR OF #VXITI
                          0600 1073+#$$VXI EQU   X'0600'                  CORE LOAD ADDRESS OF #VXITI
                          0002 1074+#$@VXI EQU   02                       SECTOR COUNT OF #VXITI
                               1075+*
                          0B08 1076+#$#VUF EQU   X'0B08'                  DISK ADDR OF ##VUFA
                          0600 1077+#$$#VU EQU   X'0600'                  CORE LOAD ADDRESS OF ##VUFA
                          0002 1078+#$@#VU EQU   02                       SECTOR COUNT OF ##VUFA
                               1079+*
                          0B80 1080+#$VLOA EQU   X'0B80'                  DISK ADDR OF #VLOAD
                          0600 1081+#$$VLO EQU   X'0600'                  CORE LOAD ADDRESS OF #VLOAD
                          0002 1082+#$@VLO EQU   02                       SECTOR COUNT OF #VLOAD
                               1083+*
                          0B88 1084+#$VODK EQU   X'0B88'                  DISK ADDR OF #VODKA
                          0600 1085+#$$VOD EQU   X'0600'                  CORE LOAD ADDRESS OF #VODKA
                          0016 1086+#$@VOD EQU   22                       SECTOR COUNT OF #VODKA
                               1087+*
                          0BAC 1088+#$TVKB EQU   X'0BAC'                  DISK ADDR OF #TVKBT
                          0FC0 1089+#$$TVK EQU   X'0FC0'                  CORE LOAD ADDRESS OF #TVKBT
                          0001 1090+#$@TVK EQU   01                       SECTOR COUNT OF #TVKBT
                               1091+*
                          0C00 1092+#$VVMR EQU   X'0C00'                  DISK ADDR OF #VVMRS
                          0000 1093+#$$VVM EQU   X'0000'                  CORE LOAD ADDRESS OF #VVMRS
                          0030 1094+#$@VVM EQU   48                       SECTOR COUNT OF #VVMRS
                               1095+*
                          0D00 1096+#$FMST EQU   X'0D00'                  DISK ADDR OF #FMSTD
                          0200 1097+#$$FMS EQU   X'0200'                  CORE LOAD ADDRESS OF #FMSTD
                          0052 1098+#$@FMS EQU   82                       SECTOR COUNT OF #FMSTD
                               1099+*
                          0EA8 1100+#$UEXL EQU   X'0EA8'                  DISK ADDR OF #UEXLI
                          0C00 1101+#$$UEX EQU   X'0C00'                  CORE LOAD ADDRESS OF #UEXLI
                          000E 1102+#$@UEX EQU   14                       SECTOR COUNT OF #UEXLI
                               1103+*
                          0F00 1104+#$UALL EQU   X'0F00'                  DISK ADDR OF #UALLO
                          0C00 1105+#$$UAL EQU   X'0C00'                  CORE LOAD ADDRESS OF #UALLO
                          0011 1106+#$@UAL EQU   17                       SECTOR COUNT OF #UALLO
                               1107+*
                          0F80 1108+#$KCND EQU   X'0F80'                  DISK ADDR OF #KCNDI
                          0C00 1109+#$$KCN EQU   X'0C00'                  CORE LOAD ADDRESS OF #KCNDI
                          0010 1110+#$@KCN EQU   16                       SECTOR COUNT OF #KCNDI
                               1111+*
                          1000 1112+#$#CSA EQU   X'1000'                  DISK ADDR OF #CSAV
                          0000 1113+#$$#CS EQU   X'0000'                  CORE LOAD ADDRESS OF #CSAV
                          003A 1114+#$@#CS EQU   58                       SECTOR COUNT OF #CSAV
                               1115+*
                          1128 1116+#$#SSA EQU   X'1128'                  DISK ADDR OF #SSAV
                          0000 1117+#$$#SS EQU   X'0000'                  CORE LOAD ADDRESS OF #SSAV
                          0001 1118+#$@#SS EQU   01                       SECTOR COUNT OF #SSAV
                               1119+*
                          1180 1120+#$#SAV EQU   X'1180'                  DISK ADDR OF ##SAVM
                          0000 1121+#$$#SA EQU   X'0000'                  CORE LOAD ADDRESS OF ##SAVM
                          0108 1122+#$@#SA EQU   264                      SECTOR COUNT OF ##SAVM
                               1123+*
```

```
                          1700 1124+#$FIST EQU   X'1700'               DISK ADDR OF #FISTD
                          0E00 1125+#$$FIS EQU   X'0E00'               CORE LOAD ADDRESS OF #FISTD
                          0009 1126+#$@FIS EQU   09                    SECTOR COUNT OF #FISTD
                               1127+*
                          1724 1128+#$FILN EQU   X'1724'               DISK ADDR OF #FILNG
                          0E00 1129+#$$FIL EQU   X'0E00'               CORE LOAD ADDRESS OF #FILNG
                          0009 1130+#$@FIL EQU   09                    SECTOR COUNT OF #FILNG
                               1131+*
                          1780 1132+#$#RSP EQU   X'1780'               DISK ADDR OF ##RSPG
                          0000 1133+#$$#RS EQU   X'0000'               CORE LOAD ADDRESS OF ##RSPG
                          0030 1134+#$@#RS EQU   48                    SECTOR COUNT OF ##RSPG
                               1135+*
                          1780 1136+#$BOLV EQU   X'1780'               DISK ADDR OF #BOVLY
                          0800 1137+#$$BOV EQU   X'0800'               CORE LOAD ADDRESS OF #BOVLY
                          0018 1138+#$@BOV EQU   24                    SECTOR COUNT OF #BOLVY
                               1139+*
                          1800 1140+#$SFSY EQU   X'1800'               DISK ADDR OF #SFSYN
                          0C00 1141+#$$SFS EQU   X'0C00'               CORE LOAD ADDRESS OF #SFSYN
                          0011 1142+#$@SFS EQU   17                    SECTOR COUNT OF #SFSYN
                               1143+*
                          1844 1144+#$SFOV EQU   X'1844'               DISK ADDR OF #SFOVR
                          1500 1145+#$$SFO EQU   X'1500'               CORE LOAD ADDRESS OF #SFOVR
                          0003 1146+#$@SFO EQU   03                    SECTOR COUNT OF #SFOVR
                               1147+*
                          1850 1148+#$STRO EQU   X'1850'               DISK ADDR OF #STROV
                          1600 1149+#$$STR EQU   X'1600'               CORE LOAD ADDRESS OF #STROV
                          0002 1150+#$@STR EQU   02                    SECTOR COUNT OF #STROV
                               1151+*
                          1880 1152+#$#FSP EQU   X'1880'               DISK ADDR OF ##FSPG
                          0000 1153+#$$#FS EQU   X'0000'               CORE LOAD ADDRESS OF ##FSPG
                          0030 1154+#$@#FS EQU   48                    SECTOR COUNT OF ##FSPG
                               1155+*
                          1880 1156+#$GUFU EQU   X'1880'               DISK ADDR OF #GUFUD
                          0C00 1157+#$$GUF EQU   X'0C00'               CORE LOAD ADDRESS OF #GUFUD
                          0010 1158+#$@GUF EQU   16                    SECTOR COUNT OF #GUFUD
                               1159+*
                          18C0 1160+#$ERRP EQU   X'18C0'               DISK ADDR OF #ERRPG
                          0C00 1161+#$$ERR EQU   X'0C00'               CORE LOAD ADDRESS OF #ERRPG
                          0003 1162+#$@ERR EQU   03                    SECTOR COUNT OF #ERRPG
                               1163+*
                          18D4 1164+#$#BLN EQU   X'18D4'               DISK ADDR OF ##BLNB
                          0000 1165+#$$#BL EQU   X'0000'               CORE LOAD ADDRESS OF ##BLNB
                          0001 1166+#$@#BL EQU   01                    SECTOR COUNT OF ##BLNB
                               1167+*
                          1900 1168+#$ECMA EQU   X'1900'               DISK ADDR OF #ECMAN
                          0C00 1169+#$$ECM EQU   X'0C00'               CORE LOAD ADDRESS OF #ECMAN
                          0006 1170+#$@ECM EQU   06                    SECTOR COUNT OF #ECMAN
                               1171+*
                          1918 1172+#$SFLO EQU   X'1918'               DISK ADDR OF #SFLOA
                          0F00 1173+#$$SFL EQU   X'0F00'               CORE LOAD ADDRESS OF #SFLOA
                          0005 1174+#$@SFL EQU   05                    SECTOR COUNT OF #SFLOA
                               1175+*
                          192C 1176+#$SDSY EQU   X'192C'               DISK ADDR OF #SDSYN
                          0C00 1177+#$$SDS EQU   X'0C00'               CORE LOAD ADDRESS OF #SDSYN
                          0004 1178+#$@SDS EQU   04                    SECTOR COUNT OF #SDSYN
                               1179+*
```

```
                          193C 1180+#$SFFI EQU   X'193C'              DISK ADDR OF #SFFIN
                          0E00 1181+#$$SFF EQU   X'0E00'              CORE LOAD ADDRESS OF #SFFIN
                          0008 1182+#$@SFF EQU   08                   SECTOR COUNT OF #SFFIN
                               1183+*
                          1980 1184+#$UPAC EQU   X'1980'              DISK ADDR OF #UPACK
                          0C00 1185+#$$UPA EQU   X'0C00'              CORE LOAD ADDRESS OF #UPACK
                          0004 1186+#$@UPA EQU   04                   SECTOR COUNT OF #UPACK
                               1187+*
                          1990 1188+#$EFKE EQU   X'1990'              DISK ADDR OF #EFKEY
                          0C00 1189+#$$EFK EQU   X'0C00'              CORE LOAD ADDRESS OF #EFKEY
                          0002 1190+#$@EFK EQU   02                   SECTOR COUNT OF #EFKEY
                               1191+*
                          19B8 1192+#$UCNF EQU   X'19B8'              DISK ADDR OF #UCNFI
                          0C00 1193+#$$UCN EQU   X'0C00'              CORE LOAD ADDRESS OF #UCNFI
                          0009 1194+#$@UCN EQU   09                   SECTOR COUNT OF #UCNFI
                               1195+*
                          19DC 1196+#$UCPL EQU   X'19DC'              DISK ADDR OF #UCPLI
                          0700 1197+#$$UCP EQU   X'0700'              CORE LOAD ADDRESS OF #UCPLI
                          000F 1198+#$@UCP EQU   15                   SECTOR COUNT OF #UCPLI
                               1199+*
                          1A38 1200+#$UATR EQU   X'1A38'              DISK ADDR OF #UATRC
                          0900 1201+#$$UAT EQU   X'0900'              CORE LOAD ADDRESS OF #UATRC
                          000C 1202+#$@UAT EQU   12                   SECTOR COUNT OF #UATRC
                               1203+*
                          1A88 1204+#$UINI EQU   X'1A88'              DISK ADDR OF #UINIT
                          0C00 1205+#$$UIN EQU   X'0C00'              CORE LOAD ADDRESS OF #UINIT
                          000F 1206+#$@UIN EQU   15                   SECTOR COUNT OF #UINIT
                               1207+*
                          1AD8 1208+#$UCDI EQU   X'1AD8'              DISK ADDR OF #UCDIS
                          0900 1209+#$$UCD EQU   X'0900'              CORE LOAD ADDRESS OF #UCDIS
                          000B 1210+#$@UCD EQU   11                   SECTOR COUNT OF #UCDIS
                               1211+*
                          1B24 1212+#$UDEL EQU   X'1B24'              DISK ADDR OF #UDELV
                          0C00 1213+#$$UDE EQU   X'0C00'              CORE LOAD ADDRESS OF #UDELV
                          000E 1214+#$@UDE EQU   14                   SECTOR COUNT OF #UDELV
                               1215+*
                          1B5C 1216+#$UDIS EQU   X'1B5C'              DISK ADDR OF #UDISV
                          0C00 1217+#$$UDI EQU   X'0C00'              CORE LOAD ADDRESS OF #UDISV
                          0008 1218+#$@UDI EQU   08                   SECTOR COUNT OF #UDISV
                               1219+*
                          1B9C 1220+#$ZTRA EQU   X'1B9C'              DISK ADDR OF #ZTRAC
                          1000 1221+#$$ZTR EQU   X'1000'              CORE LOAD ADDRESS OF #ZTRAC
                          0001 1222+#$@ZTR EQU   01                   SECTOR COUNT OF #ZTRAC
                               1223+*
                          1BA4 1224+#$ZDUM EQU   X'1BA4'              DISK ADDR OF #ZDUMP
                          1100 1225+#$$ZDU EQU   X'1100'              CORE LOAD ADDRESS OF #ZDUMP
                          0008 1226+#$@ZDU EQU   08                   SECTOR COUNT OF #ZDUMP
                               1227+*
                          1BC4 1228+#$ZLOA EQU   X'1BC4'              DISK ADDR OF #ZLOAD
                          1100 1229+#$$ZLO EQU   X'1100'              CORE LOAD ADDRESS OF #ZLOAD
                          000C 1230+#$@ZLO EQU   12                   SECTOR COUNT OF #ZLOAD
                               1231+*
                          1C14 1232+#$ZUTM EQU   X'1C14'              DISK ADDR OF #ZUTMO
                          0C00 1233+#$$ZUT EQU   X'0C00'              CORE LOAD ADDRESS OF #ZUTMO
                          0014 1234+#$@ZUT EQU   20                   SECTOR COUNT OF #ZUTMO
                               1235+*
```

```
                        1C84 1236+#$INLN EQU    X'1C84'               DISK ADDR OF #INLNG
                        0600 1237+#$$INL EQU    X'0600'               CORE LOAD ADDRESS OF #INLNG
                        0010 1238+#$@INL EQU    16                    SECTOR COUNT OF #INLNG
                        1239+*
                        1CC4 1240+#$KCAL EQU    X'1CC4'               DISK ADDR OF #KCALL
                        0C00 1241+#$$KCA EQU    X'0C00'               CORE LOAD ADDRESS OF #KCALL
                        000C 1242+#$@KCA EQU    12                    SECTOR COUNT OF #KCALL
                        1243+*
                        1D24 1244+#$KRSU EQU    X'1D24'               DISK ADDR OF #KRSUM
                        0C00 1245+#$$KRS EQU    X'0C00'               CORE LOAD ADDRESS OF #KRSUM
                        000A 1246+#$@KRS EQU    10                    SECTOR COUNT OF #KRSUM
                        1247+*
                        1D5C 1248+#$UPTF EQU    X'1D5C'               DISK ADDR OF #UPTFI
                        0C00 1249+#$$UPT EQU    X'0C00'               CORE LOAD ADDRESS OF #UPTFI
                        0012 1250+#$@UPT EQU    18                    SECTOR COUNT OF #UPTFI
                        1251+*
                        1D24 1252+#$UPOV EQU    X'1D24'               DISK ADDR OF #UPOVL
                        0C00 1253+#$$UPO EQU    X'0C00'               CORE LOAD ADDRESS OF #UPOVL
                        0005 1254+#$@UPO EQU    05                    SECTOR COUNT OF #UPOVL
                        1255+*
                        1E00 1256+#$FMLN EQU    X'1E00'               DISK ADDR OF #FMLNG
                        0200 1257+#$$FML EQU    X'0200'               CORE LOAD ADDRESS OF #FMLNG
                        0052 1258+#$@FML EQU    82                    SECTOR COUNT OF #FMLNG
                        1259+*
                        2000 1260+#$#CNF EQU    X'2000'               DISK ADDR OF ##CNFI
                        0000 1261+#$$#CN EQU    X'0000'               CORE LOAD ADDRESS OF ##CNFI
                        0001 1262+#$@#CN EQU    01                    SECTOR COUNT OF ##CNFI
                        1263+*
                        2004 1264+#$KLLA EQU    X'2004'               DISK ADDR OF #KLLAY
                        0920 1265+#$$KLL EQU    X'0920'               CORE LOAD ADDRESS OF #KLLAY
                        0001 1266+#$@KLL EQU    01                    SECTOR COUNT OF #KKLAY
                        1267+*
                        2008 1268+#$ZLBM EQU    X'2008'               DISK ADDR OF #ZLBMA
                        1100 1269+#$$ZLB EQU    X'1100'               CORE LOAD ADDRESS OF #ZLBMA
                        0002 1270+#$@ZLB EQU    02                    SECTOR COUNT OF #ZLBMA
                        1271+*
                        2010 1272+#$ZL1M EQU    X'2010'               DISK ADDR OF #ZL1MA
                        0F00 1273+#$$ZL1 EQU    X'0F00'               CORE LOAD ADDRESS OF #ZL1MA
                        0007 1274+#$@ZL1 EQU    07                    SECTOR COUNT OF #ZL1MA
                        1275+*
                        2030 1276+#$ZL2M EQU    X'2030'               DISK ADDR OF #ZL2MA
                        0F00 1277+#$$ZL2 EQU    X'0F00'               CORE LOAD ADDRESS OF #ZL2MA
                        000D 1278+#$@ZL2 EQU    13                    SECTOR COUNT OF #ZL2MA
                        1279+*
                        2088 1280+#$ZL3M EQU    X'2088'               DISK ADDR OF #ZL3MA
                        0C00 1281+#$$ZL3 EQU    X'0C00'               CORE LOAD ADDRESS OF #ZL3MA
                        000A 1282+#$@ZL3 EQU    10                    SECTOR COUNT OF #ZL3MA
                        1283+*
                        20B0 1284+#$ZLVR EQU    X'20B0'               DISK ADDR OF #ZLVRL
                        0F00 1285+#$$ZLV EQU    X'0F00'               CORE LOAD ADDRESS OF #ZLVRL
                        0006 1286+#$@ZLV EQU    06                    SECTOR COUNT OF #ZLVRL
                        1287+*
                        2100 1288+#$KKEY EQU    X'2100'               DISK ADDR OF #KKEYS
                        0C00 1289+#$$KKE EQU    X'0C00'               CORE LOAD ADDRESS OF #KKEYS
                        0006 1290+#$@KKE EQU    06                    SECTOR COUNT OF #KKEYS
                        1291+*
```

```
       @SPFEQ - SYSTEM PROGRAM FILE EQUATES


ERR LOC   OBJECT CODE      ADDR STMT SOURCE STATEMENT           VER 15, MOD 00  05/01/22  PAGE  27

                           2118 1292+#$#CKT EQU   X'2118'                        DISK ADDR OF #CKTB
                           0000 1293+#$$#CK EQU   X'0000'                        CORE LOAD ADDRESS OF #CKTB
                           0004 1294+#$@#CK EQU   04                             SECTOR COUNT OF #CKTB
                                1295+*
                           212C 1296+#$#INV EQU   X'212C'                        DISK ADDR OF ##INVD
                           0000 1297+#$$#IN EQU   X'0000'                        CORE LOAD ADDRESS OF ##INVD
                           003A 1298+#$@#IN EQU   58                             SECTOR COUNT OF ##INVD
                                1299+*
                           2300 1300+#$#PWR EQU   X'2300'                        DISK ADDR OF ##PWRK
                           0000 1301+#$$#PW EQU   X'0000'                        CORE LOAD ADDRESS OF ##PWRK
                           00C0 1302+#$@#PW EQU   192                            SECTOR COUNT OF ##PWRK
                                1303+*       END OF SYSTEM PROGRAM FILE EQUATES
                                1304+        PRINT ON
                                1305 *       @FXD  EXP-Y
                                1307+        PRINT ON
```

```
                          1309+************************************************************************
                          1310+*      GLOBAL INDICATORS STORED IN THE SYSTEM NUCLEUS, ENTRY POINTS  *
                          1311+*      FOR SYSNUC INTERFACE ROUINES.                                  *
                          1312+************************************************************************
  0000                    1313+      ORG   X'0000'                     *
         0000 1314+$$ZERO EQU   *                            ENTRY POINT TO LOAD DUMP PGM
         0004 1315+$FEARR EQU   $$ZERO+4                     VALUE OF ADDR IN ARR ON FE AID
              1316+*
         0025 1317+$DISKN EQU   $$ZERO+37                    ADDR OF ENTRY TO DISK IOCS
         00DE 1318+$KE090 EQU   $$ZERO+X'00DE'               ADDR OF DKDISK ERR-PEND EXIT
         01D5 1319+$KE130 EQU   $$ZERO+X'01D5'               ADDR OF DKDISK HARD ERROR EXIT

  0345                    1321+      ORG   X'0345'                     *
         0345 1322+$ERLOG EQU   *                            ADDR OF ENTRY TO LOG I/O ERRORS
         0363 1323+$ER050 EQU   $$ZERO+X'0363'               START OF DISK OPS IN NERLOG


                          1325+************************************************************************
                          1326+*      COMMUNICATION AREA REFERENCING NUCLEUS                         *
                          1327+************************************************************************
                          1328+*
  03C0                    1329+      ORG   X'03C0'                     *
         03C0 1330+$NUCBS EQU   *                            START OF COMMUNICATION AREA
         03C0 1331+$RMRGN EQU   $NUCBS                       ADDR OF BYTE CONTAINING THE
              1332+*                                         * SOFTWARE RIGHT MARGIN VALUE
         03C1 1333+$LMRGN EQU   $RMRGN+1                     ADDR OF BYTE CONTAINING THE
              1334+*                                         * SOFTWARE LEFT MARGIN VALUE
         03C2 1335+$PRPOS EQU   $LMRGN+1                     ADDR OF BYTE CONTAINING CURRENT
              1336+*                                         * POSITION OF MATRIX PRINTER
              1337+*                                         * HEAD
         03C3 1338+$KEYCD EQU   $PRPOS+1                     ADDR OF BYTE CONTAINING KEYBOARD
              1339+*                                         * INDICATORS. A LIST OF THE
              1340+*                                         * INDICATORS AND MASKS FOLLOW
         0001 1341+$CARDI EQU   X'01'                        INPUT SOURCE INDR MASK
              1342+*                                         * 0 - KEYBOARD INPUT
              1343+*                                         * 1 - CARD OR PROC INPUT
         0002 1344+$IOYES EQU   X'02'                        I/O ROUTINES IN CORE INDR MASK
              1345+*                                         * 0 - I/O ROUTINES NOT IN CORE
              1346+*                                         * 1 - I/O ROUTINES IN CORE
         0004 1347+$NOLST EQU   X'04'                        NO LIST INDR MASK
              1348+*                                         * 0 - LISTING REQUIRED
              1349+*                                         * 1 - NO LISTING RESIRED
         0008 1350+$GUFIR EQU   X'08'                        GUFUDI ABORT INDR
              1351+*                                         * 1 - GUFUDI INTERRUPT, NOT ABOR
              1352+*                                         * 0 - GUFUDI ABORTED
              1353+*                                         * FOR THE ABOVE INDICATOR TO BE
              1354+*                                         * VALID, $INTRP MUST BE PRESENT
         0010 1355+$KYBSY EQU   X'10'                        KEYBOARD BUSY INDR
              1356+*                                         * 0 - LINE FINISHED
              1357+*                                         * 1 - LINE NOT YET COMPLETE
         0020 1358+$INRPT EQU   X'20'                        INTERRUPT INDR
              1359+*                                         * 0 - PROGRAM NOT ABORTED
              1360+*                                         * 1 - PROGRAM ABOPRTED
         0040 1361+$DTNMB EQU   X'40'                        * 1 - AUTOMATIC LINE NUMBERS
              1362+*                                         * GENERATED FOR CARD INPUT
         0080 1363+$TRUNK EQU   X'80'                        TRUNCATED LINE INDR
              1364+*                                         * 1 - LAST LINE TRUNCATED
```

@FXDEQ - FIXED ADDRESSES FOR SYSTEM NUCLEUS

                        1365+*   * 0 - LAST LINE COMPLETED

```
                        1367+*********************************************************************
                        1368+*        REGISTER SAVE AREAS. THESE AREAS ARE AVAILABLE FOR           *
                        1369+*        TEMPORARELY USE BY ANY PROGRAM                                *
                        1370+*********************************************************************

              03C5 1372+$BRSAV EQU    $KEYCD+2                  ADDR OF 2 BYTE BASE REG SAVE
              03C7 1373+$XRSAV EQU    $BRSAV+2                  ADDR OF 2 BYTE XR SAVE AREA

              03CB 1375+$TABLN EQU    $XRSAV+4                  CURRENT AUTOMATIC LINE NUMBER
                        1376+*                                 * TO BE INSERTED IF TAB KEY
                        1377+*                                 * PRESSED. (ADDR OF LINE NO.)
              03CD 1378+$CAERR EQU    $TABLN+2                  ADDR OF ERROR CODE SAVED FOR
                        1379+*                                 * INTERFACE WITH ERRPGM
              03CF 1380+$INLNO EQU    $CAERR+2                  ADDR OF EXECUTION TIME LINE
                        1381+*                                 * NUMBER FOR INTERPRETER
              03CE 1382+$ERRPG EQU    $INLNO-1                  ADDR OF INDICATOR BYTE IF
                        1383+*                                 * SPECIAL FUNCTION REQUESTED
                        1384+*                                 * OF ERROR PROGRAM
              0030 1385+$ERSTK EQU    X'30'                     TO BE MOVED TO $ERRPG IF A STACK
                        1386+*                                 * OF ERROR CODES IS TO BE PROCES
              0035 1387+$ERSFL EQU    X'35'                     SYNTAX CHECKERS $ERRPG SETTING
              0040 1388+$ERFIL EQU    X'40'                     TO BE MOVED TO $ERRPG IF FILE
                        1389+*                                 * LINE ERROR OCCURS
              0050 1390+$ER1N2 EQU    X'50'                     TO BE MOVED TO $ERRPG IF LEVEL
                        1391+*                                 * 1 AND 2 MESSAGES REQUIRED
              0080 1392+$ERKEY EQU    X'80'                     STANDARD ERROR SETTING USED BY
                        1393+*                                 * COMMAND ANALYZER ONLY
              03CF 1394+$ERRCT EQU    $INLNO                    ADDR OF COUNT BYTE FOR STACK
                        1395+*                                 * OF ERROR MESSAGES
```

@FXDEQ - FIXED ADDRESSES FOR SYSTEM NUCLEUS

```
                    1397+********************************************************************
                    1398+*       SYSTEM STATUS EQUATES                                      *
                    1399+********************************************************************
                    1400+*
               03D0 1401+$XIND1 EQU    $INLNO+1                  ADDR OF PRIMARY EXEC MODE INDRS
                    1402+*                                       * ENTRIES FOLLOW
               0001 1403+$RUNIT EQU    X'01'                     1 - EXECUTE IN RUN MODE
               0002 1404+$STEPT EQU    X'02'                     1 - EXECUTE IN STEP MODE
               0004 1405+$TRACE EQU    X'04'                     1 - EXECUTE IN TRACE MODE
                    1406+*                                       THE THREE MODE INDICATORS ARE
                    1407+*                                       MUTUALLY EXCLUSIVE. IF $TRACE
                    1408+*                                       IS ON, AT LEAST 1 OF THE TRACE
                    1409+*                                       TYPE CODE MUST ALSO BE ON.
               0008 1410+$TFLOW EQU    X'08'                     1 - TRACE FLOW
               0010 1411+$TRALL EQU    X'10'                     1 - TRACE ALL
               0020 1412+$TRVAR EQU    X'20'                     1 - TRACE SELECTED VARIABLES
               0040 1413+$XPREC EQU    X'40'                     EXECUTION PRECISION INDR
                    1414+*                                       * 0 - SHORT PRECISION
                    1415+*                                       * 1 - LONG PRECISION
               0080 1416+$VMDEF EQU    X'80'                     VM USAGE INDR
                    1417+*                                       * 1 - VIRTUAL MEMORY NOT EMPTY
                    1418+*                                       * 0 - VIRTUAL MEMORY EMPTY

               03D1 1420+$XIND2 EQU    $XIND1+1                  ADDR OF EXECUTION INDICATORS
                    1421+*                                       * MASK AND INDRS FOLLOW
               0001 1422+$EXCMD EQU    X'01'                     EXECUTION INDR
                    1423+*                                       * 1 - IN EXECUTION
               0002 1424+$PAUSE EQU    X'02'                     * 1 - PROGRAM IN PAUSE STATE
               0004 1425+$PSTEP EQU    X'04'                     * 1 - PAUSE CAUSED BY STEP MODE
               0008 1426+$PSTMT EQU    X'08'                     * 1 - PAUSE CAUSED BY PAUSE STMT
               0010 1427+$ABORT EQU    X'10'                     * 1 - ABORT EXECUTION

               03D2 1429+$IOIND EQU    $XIND2+1                  I/O STATUS INDICATORS
                    1430+*                                       * MASKS AND EXPLANATION FOLLOW
               0001 1431+$MPDWN EQU    X'01'                     MP STATE
                    1432+*                                       * 0 - MATRIX PRINTER OPERATIONAL
                    1433+*                                       * 1 - MATRIX PRINTER DOWN
               0002 1434+$CRTAV EQU    X'02'                     CRT AVAILABILITY
                    1435+*                                       * 0 - NO CRT ON SYSTEM
                    1436+*                                       * 1 - CRT ON THE SYSTEM
               0004 1437+$CRTNO EQU    X'04'                     SYSPRNT ON CRT
                    1438+*                                       * 0 - CRT NOT AVAIL FOR SYSPRNT
                    1439+*                                       * 1 - CRT MAY BE USED FOR SYSPRN
               0008 1440+$CMDKY EQU    X'08'                     KEYBOARD MODE
                    1441+*                                       * 0 - NORMAL KEYBOARD INPUT
                    1442+*                                       * 1 - COMMAND KEYS USE ONLY
               0010 1443+$PGMST EQU    X'10'                     PGM START KEY
                    1444+*                                       * 0 - MAY BE USED FOR AUTO LINE
                    1445+*                                       * 1 - NOT USED FOR AUTO LINE #
               0020 1446+$HRDER EQU    X'20'                     HARD ERROR INDICATOR
                    1447+*                                       * 0 - SOFT ERROR
                    1448+*                                       * 1 - HARD ERROR
               0040 1449+$DTRDR EQU    X'40'                     DATA RECORDER
                    1450+*                                       * 0 - DATA RECORDER NOT ON SYSTE
                    1451+*                                       * 1 - DATA RECORDER IS ON SYSTEM
               0080 1452+$LNPTR EQU    X'80'                     MP OPTION
```

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       @FXDEQ - FIXED ADDRESSES FOR SYSTEM NUCLEUS
```
```
                 1453+*                                        * 1 - 50 LPM OPTION AVAILABLE

           03D3 1455+$CRTIN EQU    $IOIND+1                    CRT COMMAND INDICATORS
                 1456+*                                        * MASKS AND EXPLANATION FOLLOW
           0001 1457+$CRTUP EQU    X'01'                       1 - CRT IN ROLL UP MODE
           0002 1458+$CRTDN EQU    X'02'                       1 - CRT IN ROLL DOWN MODE
           0004 1459+$CRTPU EQU    X'04'                       1 - POP UP CONDITION REQUESTED
           0008 1460+$CRTSP EQU    X'08'                       1 - ROLL STOP REQUESTED

           03D4 1462+$INDR1 EQU    $CRTIN+1                    WORK FILE STATUS INDICATORS
                 1463+*                                        * MASKS AND EXPLANATION FOLLOW
           0001 1464+$PROCI EQU    X'01'                       PROCEDURE FILE INDR
                 1465+*                                        * 0 - NOT A PROCEDURE
                 1466+*                                        * 1 - A PROCEDURE
           0002 1467+$PRESN EQU    X'02'                       WORK FILE PRECISION INDR
                 1468+*                                        * 0 - SHORT PRECISION USED
                 1469+*                                        * 1 - LONG PRECISION BEING USED
           0004 1470+$WSIND EQU    X'04'                       WORKING STORAGE INDR MASK
                 1471+*                                        * 0 - WORKING STOR ON DISK IS EM
                 1472+*                                        * 1 - WORKING STORAGE IS NOT EMP
           0008 1473+$WFLOK EQU    X'08'                       WORK FILE LOCK INDR
                 1474+*                                        * 0 - FILE NOT PROTECTED
                 1475+*                                        * 1 - FILE PROTECTED
           0010 1476+$FITIN EQU    X'10'                       FIT SECTORS INDR MASK
                 1477+*                                        * 0 - FIT SECTORS NOT PRESENT
                 1478+*                                        * 1 - FIT SECTORS IN CORE
           0020 1479+$PGMDT EQU    X'20'                       PGM DATA FILE INDR
                 1480+*                                        * 1 - PROGRAM GENERATED
                 1481+*                                        * DATA FILE IN WORK FILE
           0040 1482+$KEYDT EQU    X'40'                       KEYBOARD OR CARD FILE INDR
                 1483+*                                        * 1 - KYBRD OR CARD GENERATED
                 1484+*                                        * DATA FILE IN WORK FILE
           0080 1485+$BASIC EQU    X'80'                       BASIC PROGRAM INDR
                 1486+*                                        * 1 - BASIC PGM IN WORK FILE

           03D5 1488+$INDR2 EQU    $INDR1+1                    ADDR OF SYSTEM 1-BIT INDRS
                 1489+*                                        * MASKS AND EXPLANATION FOLLOW
           0002 1490+$CMODE EQU    X'02'                       CONVERSATIONAL MODE INDR MASK
                 1491+*                                        * 0 - UTILITY MODE
                 1492+*                                        * 1 - CONVERSATIONAL MODE
           0004 1493+$ERPND EQU    X'04'                       ERROR LOG PENDING INDR
                 1494+*                                        * 0 - NO LOGGING REQUIRED
                 1495+*                                        * 1 - ERROR LOGGING PENDING
           0008 1496+$DKERR EQU    X'08'                       DISK ERROR INDR
                 1497+*                                        * 0 - ERROR WAS NOT DISK
                 1498+*                                        * 1 - ERROR WAS DISK, 2 ENTRIES
                 1499+*                                        * REQUIRED IN HISTORY LOG
           0010 1500+$FCIND EQU    X'10'                       CRUSH INDR MASK
                 1501+*                                        * 1 - SINGLE LINE NO DELETION
                 1502+*                                        * THROUGH THE CMD ANALYZER REQUI
                 1503+*                                        * IF $FUIND, $FCIND AND $FDIND A
                 1504+*                                        * ALL ZERO, CRUCHING OP REQUIRED
           0020 1505+$FUIND EQU    X'20'                       LINE PASSED INDR MASK
                 1506+*                                        * 1 - LINE PASSED
           0040 1507+$FDIND EQU    X'40'                       LINE NUMBER LIST
                 1508+*                                        * 1 - LINE NO LIST IS DELETED
```

```
                           0080 1509+$READY EQU   X'80'                    PRINT READY INDR
                                1510+*                                     * 0 - READY WILL BE PRINTED
                                1511+*                                     * 1 - READY WON'T BE PRINTED

                           03D6 1513+$INDR3 EQU   $INDR2+1                 ADDR OF SYSTEM 1-BIT INDRS
                                1514+*                                     * MASKS AND EXPLANATION FOLLOW
                           0001 1515+$DBLOK EQU   X'01'                    SAVE PROTECTED WORK FILE MASK
                                1516+*                                     * 1 - FILE MAY BE SAVED TO $$LIB
                           0002 1517+$LIST  EQU   X'02'                    KLISTN INDR
                                1518+*                                     * 0 - IGNORE ROLL DOWN KEY
                                1519+*                                     * 1 - EXCEPT ROLL DOWN KEY
                           0004 1520+$ERHRD EQU   X'04'                    ERRPGM HARD ERROR INDR
                                1521+*                                     * 1 - ERRPGM WILL EXECUTE HARD
                                1522+*                                     *     HALT AFTER PRINTING MSG
                           0008 1523+$NOENB EQU   X'08'                    KEYBOARD ENABLE INDR
                                1524+*                                     * 0 - KEYBOARD NOT ENABLED -
                                1525+*                                     *     GUFUDI WILL ENABLE
                                1526+*                                     * 1 - KEYBOARD HAS ALREADY
                                1527+*                                     *     BEEN ENABLED
                           0010 1528+$CLBFR EQU   X'10'                    CLEAR INPUT LINE BUFFER INDR
                                1529+*                                     * 0 - DON'T CLEAR LINE BUFFER
                                1530+*                                     * 1 - CLEAR THE INPUT LINE BUFF
                           0020 1531+$MOUNT EQU   X'20'                    MOUNT KEYBOARD INDR MASK
                                1532+*                                     * 1 - ONLY MOUNT COMMAND VALID
                           0040 1533+$NWRKR EQU   X'40'                    REMOVABLE DISK WORK AREA INDR
                                1534+*                                     * 0 - CORRECT WORK AREA ON R1
                                1535+*                                     * 1 - NO WORK AREA ON R1
                           0080 1536+$NWRKF EQU   X'80'                    FIXED DISK WORK AREA INDR
                                1537+*                                     * 0 - CORRECT WORK AREA ON F1
                                1538+*                                     * 1 - NO WORK AREA ON F1

                           03D7 1540+$DKSIZ EQU   $INDR3+1                 ADDR OF DISK SIZE INDR
                                1541+*                                     * MASKS AND EXPLANATION FOLLOW
                           0001 1542+$DK100 EQU   X'01'                    1 - SYSTEM HAS 100 CYLS
                           0002 1543+$DK200 EQU   X'02'                    1 - SYSTEM HAS 200 CYLS
                           0004 1544+$DK400 EQU   X'04'                    1 - SYSTEM HAS 400 CYLS
                           0008 1545+$DK600 EQU   X'08'                    1 - SYSTEM HAS 600 CYLS
                           0010 1546+$DK800 EQU   X'10'                    1 - SYSTEM HAS 800 CYLS

                           03D8 1548+$XIND3 EQU   $DKSIZ+1                 PAST $XIND1
                                1549+*                                     * SEE $XIND1 FOR INDR MASKS

                           03DA 1551+$FILIB EQU   $XIND3+2                 ADDR OF CURRENT FILE LIB DADDR
                           03DC 1552+$USRDR EQU   $FILIB+2                 ADDR OF REL DISP TO 1ST USER BK
                           03DD 1553+$CONFG EQU   $USRDR+1                 CONFIGURATION INDRS
                           0001 1554+$22IMP EQU   X'01'                    0 - 13 INCH MATRIX PRINTER
                                1555+*                                     1 - 22 INCH MATRIX PRINTER
                           0002 1556+$16K   EQU   X'02'                    1 - CPU HAS 12 KBYTE
                           0004 1557+$12K   EQU   X'04'                    1 - CPU HAS 16 KBYTE
                                1558+*                                     * IF BOTH OFF: CPU HAS 8 KBYTE
                           0008 1559+$16CKY EQU   X'08'                    0 - KEYBOARD HAS  8 CMD KEYS
                                1560+*                                     1 - KEYBOARD HAS 16 CMD KEYS
                           0080 1561+$BIGCD EQU   X'80'                    1 - CPU HAS 129 DATA RECORDER

                           03DF 1563+$LEVEL EQU   $CONFG+2                 ADDR OF SYSTEM LEVEL NUMBER
```

```
       @FXDEQ - FIXED ADDRESSES FOR SYSTEM NUCLEUS
```

```
                        03E0 1565+$DBGUF EQU   $LEVEL+1                 ADDR OF GUFUDI DEBUG INDR
                        0080 1566+$CRUSH EQU   X'80'                    0 - CRUSH THE FILE
                        0040 1567+$REORD EQU   X'40'                    0 - REORDER THE FILE
                        0020 1568+$IRKEY EQU   X'20'                    1 - ENABLE KEYBOARD INPUT
                        0010 1569+$IOPGS EQU   X'10'                    D1 PAGES INDR: 0 - ONE
                        0008 1570+$CALLI EQU   X'08'                    PROCEDURE CALL INDR
                             1571+*                                     * 0 - NOT A CALL
                             1572+*                                     * 1 - A CALL

                        03E1 1574+$KEYBD EQU   $DBGUF+1                 KEYBOARD TYPE INDR
                             1575+*                                     * THIS VALUE WILL BE A BINARY
                             1576+*                                     * VALUE FROM 1 TO 12 INDICATING
                             1577+*                                     * WHICH DATA TABLE IS IN USE

                        03E2 1579+$CRPOS EQU   $KEYBD+1                 ADDR OF CURRENT CURSOR POSITION
                        03E3 1580+$BUFPT EQU   $CRPOS+1                 LINE PRINTER BUFFER POINTER  1-3
                        03E4 1581+$LPRP3 EQU   $BUFPT+1                 LINE PRINTER FLAGS          1-3
                        03E5 1582+$LPROS EQU   $LPRP3+1                 TRUE LINE PRINTER PRINT POS. 1-3

                        03E6 1584+$NEXTB EQU   $LPROS+1                 REL DADDR PROCEDURE CALL     1-4
                        03E7 1585+$NEXTL EQU   $NEXTB+1                 DISPLACEMENT WITHIN DB       1-4
                        03E8 1586+$DFDET EQU   $NEXTL+1                 GRAPRO INTERNAL INDR         1-4
                        03EA 1587+$LPRIO EQU   $DFDET+2                 LINE PRINTER BUF INC. + PDAR 1-4

                        03F5 1589+$PTCH1 EQU   $DKSIZ+30                LAST BYTE OF NUCLUES AREA
                             1590+****************************************************************************
                             1591+*         TABLES AND SYSTEM WORK AREAS                                    *
                             1592+****************************************************************************
                        03F6 1593+$VOLID EQU   $PTCH1+1                 ADDR OF LEFT BYTE VOLID TABLE
                        03F6 1594+$VOLR1 EQU   $VOLID                   ADDR LEFT BYTE VOLID FOR R1
                        03FE 1595+$VOLF1 EQU   $VOLR1+8                 ADDR LEFT BYTE VOLID FOR F1
                        0406 1596+$VOLR2 EQU   $VOLF1+8                 ADDR LEFT BYTE VOLID FOR R2
                        040E 1597+$VOLF2 EQU   $VOLR2+8                 ADDR LEFT BYTE VOLID FOR F2
                        0419 1598+$PKERT EQU   $VOLID+35                ADDR OF 1ST ENTRY IN PACK ERROR
                             1599+*                                     * RATE TABLE
                        042D 1600+$PASWD EQU   $PKERT+20                ADDR OF CURRENT PASSWORD
                        042E 1601+$HISTE EQU   $PASWD+1                 LEFT BYTE OF HISTORY LOG ENTRY
                        0435 1602+$HIST1 EQU   $HISTE+7                 ADDR OF 1ST ENTRY OF HIST LOG
                        043A 1603+$DATE  EQU   $HIST1+5                 ADDR OF CURRENT DATE
                        043B 1604+$EXFTR EQU   $DATE+1                  ADDR OF CORE EXPANSION FACTOR
                             1605+*                                     * THIS VALUE WILL BE ADDED TO
                             1606+*                                     * BUFFER ADDRESS (SET FOR 8K)
                             1607+*                                     * TO RE-POSITION THEM FOR
                             1608+*                                     * LARGER MACHINES
                        0443 1609+$WFNME EQU   $EXFTR+8                 ADDR OF WORK FILE NAME
                        0040 1610+$WFDEF EQU   X'40'                    WORK FILE DEFINED INDR
                             1611+*                                     * THIS MASK IS USED ON $WFNME
                             1612+*                                     * 0 - WORK FILE UNDEFINED
                             1613+*                                     * 1 - WORK FILE DEFINED
                        0449 1614+$DPLSV EQU   $WFNME+6                 ADDR OF 6 BYTE DPL SAVE AREA
                             1615+*                                     * FOR KEYBOARD PROGRAMS
                        044B 1616+$PRDEV EQU   $DPLSV+2                 ADDR OF 2 BYTE FIELD POINTING
                             1617+*                                     * TO THE SYSTEM PRINTER IOCR
                        044D 1618+$CRTAD EQU   $PRDEV+2                 ADDR OF ENTRY TO RELOCATE CRT
                        0454 1619+$PLST1 EQU   $CRTAD+7                 ADDR OF THREE 7-BYTES ENTRY I/O
                        045B 1620+$PLST2 EQU   $PLST1+7                 * PARM LISTS MOST RECENTLY USED
```

                            0462 1621+$PLST3 EQU $PLST2+7   * THE 1ST ENTRY IS MOST RECENT
                            0464 1622+$C0001 EQU $PLST3+2   ADDR OF 2 BYTE CONSTANT 1

```
                          1624+*******************************************************************
                          1625+*        ENTRY POINTS TO INTERFACE ROUTINES AND THEIR WORK AREAS        *
                          1626+*******************************************************************
                     0465 1628+$SPRNT EQU    $C0001+1                    ADDR OF ENTRY TO THE SYSTEM
                          1629+*                                         * PRINTER IOCR
                     0469 1630+$CAERK EQU    $SPRNT+4                     ADDR OF ENTRY TO ERR ROUTINE
                          1631+*                                         * INTERFACE. ERROR CODE MUST
                          1632+*                                         * BE STORED PREVIOUS TO ENTRY
                     046F 1633+$ERDPL EQU    $CAERK+6                     ADDR OF LEFT BYTE OF ERRPGM
                          1634+*                                         * LOAD DPL
                     0472 1635+$ERMAD EQU    $ERDPL+3                     ADDR OF DK ADDR, CNT OF ERRPGM
                     0476 1636+$CIMSK EQU    $ERMAD+4                     ADDR OF THE INQUIRY REQUEST INDR
                          1637+*                                         * X'87' IR NOT DISABLED
                          1638+*                                         * X'80' IR MASKED
                     0480 1639+$CIEXT EQU    $CIMSK+10                    ADDR OF IR EXIT INSTRUCTION
                     0483 1640+$CIENT EQU    $CIEXT+3                     ADDR OF ENTRY FOR IR
                     048D 1641+$UNMSK EQU    $CIENT+10                    ADDR OF ENTRY TO UNMASK IR
                          1642+*                                         * IF NO SUSPENDED IR, CALLING
                          1643+*                                         * PROGRAM RETURNED TO
                     0496 1644+$CISUS EQU    $UNMSK+9                     ADDR OF INDR FOR SUSPENDED IR
                          1645+*                                         * IF X'80' AN IR OCCURRED WHILE
                          1646+*                                         * IR WAS MASKED
                          1647+*                                         * IF X'87' NO IR TOOK PLACE
                          1648+*                                         * WHILE IR WAS MASKED
                     049D 1649+$CAIPL EQU    $CISUS+7                     ADDR OF ENTRY TO ABORT CURRENT
                          1650+*                                         * OP AND RE-ENABLE KEYBOARD AND
                     04A1 1651+$CARPL EQU    $CAIPL+4                     ADDR OF ENTRY TO ABORT CURRENT
                          1652+*                                         * OP AND ENABLE IR
                     04B4 1653+$CABLD EQU    $CARPL+X'13'                 ADDR OF ENTRY TO ABORT CURRENT O
                     04BA 1654+$PAUSD EQU    $CABLD+6                     ADDR OF ENTRY OF ROUTINE TO
                          1655+*                                         * SWAP CORE
                     04D6 1656+$RSTR  EQU    $PAUSD+X'1C'                 ADDR OF ENTRY TO ENTRY CORE
                          1657+*                                         * FROM DISK
                     04F2 1658+$PSDXR EQU    $RSTR+X'1C'                  ADDR OF SAVED XR IN NPAUSE
                     04FA 1659+$PSDBR EQU    $PSDXR+8                     ADDR OF SAVED BR IN NPAUSE
                     04FE 1660+$SRTRN EQU    $RSTR+X'28'                  ADDR OF RETURN ADDR FROM $PAUSD
                     050D 1661+$SFAID EQU    $SRTRN+15                    ADDR OF RETURN IF FE AID REQUEST
                          1662+*                                         * IF THE ABOVE TWO ADDRESSES ARE
                          1663+*                                         * EQUAL, RETURN TO $RSTR WILL BE
                          1664+*                                         * BE FROM THE FE AID PROGRAM
                     050E 1665+$CSDPL EQU    $RSTR+X'38'                  ADDR OF LEFT BYTE OF SAVE/RSTR D
                     0511 1666+$SWPCR EQU    $CSDPL+3                     ADDR OF DKADDR, COUNT FOR CORE
                          1667+*                                         * SAVE AREA
                     0517 1668+$EXADR EQU    $SWPCR+6                     ADDRR OF DK ADDR, COUNT OF EXEC
                          1669+*                                         * TIME MESSAGE PROGRAM
                     051A 1670+$LOADR EQU    $EXADR+3                     ADDR OF ENTRY TO BLAST LOAD
                          1671+*                                         * PROGRAM NOT RESIDING ON CYL 4
                          1672+*                                         * RETURN IS TO CALLING PROGRAM
                     051E 1673+$RLOAD EQU    $LOADR+4                     ADDR OF ENTRY TO BLAST LOAD
                          1674+*                                         * PROGRAM NOT RESIDING ON CYL 4
                     0522 1675+$BLOAD EQU    $RLOAD+4                     ADDR OF ENTRY TO BLAST LOAD
                          1676+*                                         * PROGRAM RESIDING ON CYL 4
                     054A 1677+$LOADB EQU    $BLOAD+X'28'                 ADDR OF SPECIAL ENTRY TO
                          1678+*                                         * NBLOAD FOR SFLOAD/SFFIND
                          1679+*                                         * AND FZPINV
```

```
                            054E 1680+$TROVR EQU    $BLOAD+X'2C'                ADDR OF FE TRACE INDR
                                 1681+*                                        * @NOP - NO TRACE PERFORMED
                                 1682+*                                        * @UCB - TRACE PERFORMED
                            0550 1683+$BLRTN EQU    $TROVR+2                    ADDR OF RETURN POINT FROM ZTRACE
                            0569 1684+$BLNOE EQU    $BLRTN+X'19'                ADDR OF NO EXECUTE INDR-NBLOAD
                                 1685+*                                        * @NOP - CALLING PGM RETURNED TO
                                 1686+*                                        * @UCB - LOADED PROGRAM EXECUTED
                                 1687+*                                        * ENTRY TO $LOADR SETS THE ABOVE
                                 1688+*                                        * INDR TO @NOP.  IF THE CALLING
                                 1689+*                                        * SETS THE INDR TO @NOP BEFORE
                                 1690+*                                        * CALLING $BLOAD, RETURN WILL BE
                                 1691+*                                        * MADE UPON COMPLETION OF THE
                                 1692+*                                        * ABSOLUE LOAD
                            0571 1693+$LDRTN EQU    $BLOAD+X'4F'                ADDR OF THE RETURN ADDR IN NBLOA
                            0579 1694+$BLDPL EQU    $BLOAD+X'57'                ADDR OF LEFT BYTE OF $BLOAD'S
                                 1695+*                                        * DPL (DPL OF LAST PGM LOADED)
                            057F 1696+$WAITF EQU    $BLDPL+6                    ADDR OF LEFT BYTE OF DISK
                                 1697+*                                        * WAIT AND CHECK ERRORS DPL
                            0583 1698+$GUFIO EQU    $WAITF+4                    ADDR OF DK ADDR, COUNT OF GUFUDI
                            0587 1699+$BSADR EQU    $GUFIO+4                    ADDR OF DADDR RELOCATION FACTOR
                                 1700+*                                        * FOR PGMS NOT RESIDING ON CYL 6
                            0588 1701+$FEMAP EQU    $BSADR+1                    ADDR OF START OF CORE MAP
                            05A2 1702+$ZTRAD EQU    $FEMAP+X'1A'                ADDR OF ZTRACE DADDR

      05FF                       1704+       ORG    X'05FF'
                            05FF 1705+$IPLDV EQU    *                          ADDR OF IPL INDR
                                 1706+*                                        * X'00' - IPL WAS FROM R1
                                 1707+*                                        * X'01' - IPL WAS FROM F1
                            0600 1708+$ENDNU EQU    $IPLDV+1                    ADDR OF THE FIRST BYTE
                                 1709+*                                        * FOLLOWING SYSNUC
                                 1710+*      END OF FIXED ADDRESSES SYSTEM NUCLEUS EQUATES
                                 1711+       PRINT ON
                                 1712 *      @WKA  EXP-Y
                                 1714+       PRINT ON
```

```
                              1716+***********************************************************************
                              1717+*        THIS EQUATE MODULE PROVIDES THE FIXED PHYSICAL DISK          *
                              1718+*        ADDRESSES OF PGM'S AND WA'S IN THE SYSTEM WORK AREA.          *
                              1719+***********************************************************************
                              1720+*
                              1721+***      SELECTED SYSTEM PROGRAMS AND BAD LINE
                              1722+*
                    0400 1723+#@WAR1 EQU   X'0400'                  DADDR OF SELECTED PGM AREA
                    0401 1724+#@WAF1 EQU   X'0401'                  DADDR OF SELECTED PGM AREA
                    0400 1725+#@BOVL EQU   X'0400'                  PHYSICAL DADDR OF #BOVLY
                    0018 1726+#@@BOV EQU   24                       SECTOR COUNT OF #BOVLY
                    0480 1727+#@SFSY EQU   X'0480'                  PHYSICAL DADDR OF #SFSYN
                    0011 1728+#@@SFS EQU   17                       SECTOR COUNT OF #SFSYN
                    0401 1729+#@GUFU EQU   X'0401'                  PHYSICAL DADDR OF #GUFUD
                    0010 1730+#@@GUF EQU   16                       SECTOR COUNT OF #GUFUD
                    04AD 1731+#@SDSY EQU   X'04AD'                  PHYSICAL DADDR OF #SDSYN
                    0004 1732+#@@SDS EQU   4                        SECTOR COUNT OF #SDSYN
                    0441 1733+#@ERRP EQU   X'0441'                  PHYSICAL DADDR OF #ERRPG
                    0003 1734+#@@ERR EQU   3                        SECTOR COUNT OF #ERRPG
                    044D 1735+#@LDSV EQU   X'044D'                  PHYS DADDR OF #LOADR SAVE AREA
                    0002 1736+#@@LDS EQU   2                        SECTOR COUNT OF #LOADR SA
                    0455 1737+#@#BAD EQU   X'0455'                  PHYSICAL DADDR OF THE BAD LINE
                    0001 1738+#@@#BA EQU   1                        SECTOR COUNT OF ##BADL
                    0481 1739+#@ECMA EQU   X'0481'                  PHYSICAL DADDR OF #ECMAN
                    0006 1740+#@@ECM EQU   6                        SECTOR COUNT OF #ECMAN
                    0499 1741+#@SFLO EQU   X'0499'                  PHYSICAL DADDR OF SFLOAD
                    0005 1742+#@@SFL EQU   5                        SECTOR COUNT OF SFLOAD
                    04BD 1743+#@SFFI EQU   X'04BD'                  PHYSICAL DADDR OF SFFIND
                    0008 1744+#@@SFF EQU   8                        SECTOR COUNT OF SFFIND
                    0459 1745+#@#IO1 EQU   X'0459'                  PHYSICAL DADDR OF 1ST I/O SECTOR
                    045D 1746+#@#IO2 EQU   X'045D'                  PHYSICAL DADDR OF 2ST I/O SECTOR
                    0002 1747+#@@#SC EQU   2                        SECTOR COUNT OF I/O SECTOR
                    0008 1748+#@@#08 EQU   8                        NO. ENTRIES IN 1ST I/O SECTOR
                    0004 1749+#@@#04 EQU   4                        NO. ENTRIES IN 2ND I/O SECTOR
                    0001 1750+#@@#IO EQU   1                        SECTOR COUNT OF I/O SECTOR
                    04C4 1751+#@SFOV EQU   X'04C4'                  PHYSICAL DADDR OF #SFOVR
                    0005 1752+#@@SFO EQU   5                        SECTOR COUNT OF #SFOVR
                              1753+*
                              1754+***      WORK FILE ADDRESSES
                              1755+*
                    0500 1756+#@#WFT EQU   X'0500'                  PHYSICAL DADDR 1ST SCTR OF FIT
                    0003 1757+#@@#WF EQU   3                        SCTR COUNT OF FIT
                    050C 1758+#@#WDB EQU   X'050C'                  PHYSICAL DADDR OF 1ST DATA BLOCK
                    00BD 1759+#@@#WD EQU   189                      SCTR COUNT OF DATA BLOCKS
                              1760+*
                              1761+***      VIRTUAL MEMORY ADDRESSES
                              1762+*
                    0700 1763+#@#VFP EQU   X'0700'                  PHYSICAL DADDR FIRST PAGE OF VM
                    0708 1764+#@VTRL EQU   X'0708'                  DADDR OF SAVED 'TRACE' VAR.LIST
                    0001 1765+#@@VTR EQU   1                        SCTR COUNT SAVED 'TRACE' VAR.LIS
                    093D 1766+#@#VLP EQU   X'093D'                  PHYSICAL DADDR LAST PAGE OF VM
                    0100 1767+#@@#VM EQU   256                      SCTR COUNT OF VIRTUAL MEMORY
                              1768+*
                              1769+***      TEMPORARELY WORK AREA ADDRESSES
                              1770+*
                    0941 1771+#@#TFS EQU   X'0941'                  PHYSICAL DADDR 1ST SCTR TEMP WK
```

@WKAEQ - SYSTEM WORK AREA ADDRESSES

                        0020 1772+#@@#TW EQU   32   SCTR COUNT OF TEMP WORKAREA
                        0941 1773+#@#TAT EQU   X'0941'   PHYSICAL DADDR STMT ADDR TABLE
                        0010 1774+#@@#TA EQU   16   SCTR COUNT OF STMT ADDR TABLE
                        0941 1775+#@#TSY EQU   X'0941'   PHYSICAL DADDR SYMBOL TBL SAVE A
                        0005 1776+#@@#TS EQU   5   SCTR COUNT OF SYMBOL TBL SAVE AR
                        09A1 1777+#@#TBA EQU   X'09A1'   PHYSICAL DADDR BRANCH ADDR TABLE
                        0010 1778+#@@#TB EQU   16   SCTR COUNT OF BRANCH ADDR TABLE
                        09A1 1779+#@VSFI EQU   X'09A1'   PHYSICAL DADDR VSFINT
                        0010 1780+#@@VSF EQU   16   SCTR COUNT OF VSFINT
                        000F 1781+#@@VSL EQU   15   SCTR COUNT OF VSFLOA
                             1782+*   END OF WORK AREA EQUATES
                             1783+   PRINT ON
                             1784 *   @DIR EXP-Y
                             1786+   PRINT ON

```
      @DIREQ - FILE LIBRARY DIRECRORY EQUATES
```

```
                         1788+*********************************************************************
                         1789+*        USER LIBRARY DIRECRORY EQUATES
                         1790+*********************************************************************
                         1791+*
                         1792+***     RELATIVE DISK ADDRESS EQUATES
                         1793+*
              0000 1794+##RN    EQU   X'0000'                    REL. DADDR OF NULL DIRCTY
              0001 1795+##RP    EQU   X'0001'                    REL. DADDR OF PASSWORD DIRCTY
              0005 1796+##R2    EQU   X'0005'                    REL. DADDR OF TWO-STAR DIRCTY
              0007 1797+##R1    EQU   X'0007'                    REL. DADDR OF ONE-STAR DIRCTY


                         1799+*********************************************************************
                         1800+*                     DISPLACEMENT EQUATES
                         1801+*********************************************************************
                         1802+*
                         1803+***     PASSWORD DIRECTORY
                         1804+*
              0000 1805+##DPHC EQU   0                          DISP TO PSWD HDR COUNT FIELD
              0003 1806+##DPHR EQU   3                          DISP TO END OF DIRECTORY HEADER
              0004 1807+##DPE1 EQU   4                          DISP TO 1ST PSWD ENTRY
              0007 1808+##DPEN EQU   7                          DISP TO PSWD IN ENTRY
              0009 1809+##DPEA EQU   9                          DISP TO REL ADDR IN PSWD ENTRY
              000B 1810+##DPER EQU   11                         DISP TO END OF ENTRY
                         1811+*
                         1812+***     USER DIRECTORY
                         1813+*
              0001 1814+##DUHA EQU   1                          DISP TO CURR BLOCK REL. DADDR
              0003 1815+##DUHB EQU   3                          DISP TO FORWARD LINK
              0004 1816+##DUHC EQU   4                          DISP TO BLOCK ENTRY COUNT
              000B 1817+##DUHR EQU   11                         DISP TO END OF DIRECTORY HEADER
              000C 1818+##DUE1 EQU   12                         DISP TO 1ST ENTRY
              0007 1819+##DUEN EQU   7                          DISP TO FILE NAME
              0009 1820+##DUEA EQU   9                          DISP TO REL DADDR OF FILE
              000B 1821+##DUEF EQU   11                         DISP TO FILE LENGTH
              000C 1822+##DUEI EQU   12                         DISP TO FIT LENGTH
              000D 1823+##DUES EQU   13                         DISP TO STATUS BYTE
              000F 1824+##DUEL EQU   15                         DISP TO NUMBER OF LINES
              0012 1825+##DUED EQU   18                         DISP TO DATE (RIGHT MOST BYTE)
              002B 1826+##DUEH EQU   43                         DISP TO FILE HEADER
              0031 1827+##DUER EQU   49                         DISP TO END OF ENTRY
                         1828+*
                         1829+***     NULL DIRECTORY
                         1830+*
              0000 1831+##DNHC EQU   0                          DISP TO ENTRY COUNT
              0001 1832+##DNHY EQU   1                          DISP TO LIBR CYL COUNT
              0003 1833+##DNHR EQU   3                          DISP TO END OF DIRECTORY HEADER
              0004 1834+##DNE1 EQU   4                          DISP TO 1ST ENTRY
              0001 1835+##DNEA EQU   1                          DISP TO REL STARTING DADDR
              0003 1836+##DNEF EQU   3                          DISP TO NUMBER OF SECTORS
              0005 1837+##DNER EQU   5                          DISP TO END OF ENTRY


                         1839+*********************************************************************
                         1840+*                      LENGTH EQUATES
                         1841+*********************************************************************
                         1842+*
                         1843+***     GENERAL
```

```
                     1844+*
          0001 1845+##LAHC EQU    1                          LENGTH OF ENTRY COUNT FIELD
          0002 1846+##LAAA EQU    2                          LNG OF RELATIVE DISK ADDRESSES
                     1847+*
                     1848+***    PASSWORD DIRECTORY
                     1849+*
          0004 1850+##LP   EQU    4                          LNG OF DIRECTORY IN SECTORS
          0003 1851+##LPHZ EQU    3                          LNG OF HEADER RESERVED AREA
          0008 1852+##LPEN EQU    8                          LNG OF PASSWORD
          0002 1853+##LPEZ EQU    2                          LNG OF ENTRY RESERVED AREA
          0004 1854+##LPH  EQU    4                          LNS OF PASWD DIRCTY HEADER
          000C 1855+##LPE  EQU    12                         LNG OF PASWD DIRCTY ENTRY
                     1856+*
                     1857+***    USER DIRECTORY
                     1858+*
          0002 1859+##LU   EQU    2                          LNG OF EACH DIRCTY BLK IN SCTRS
          0007 1860+##LUHZ EQU    7                          LNG OF HEADER-RESERVED AREA
          000C 1861+##LUH  EQU    12                         LNG OF USER DIRCTY WADER
          0008 1862+##LUEN EQU    8                          LNG OF FILE NAME
          0002 1863+##LUEF EQU    2                          LNG OF FILE LENGTH FIELD
          0001 1864+##LUEI EQU    1                          LNG OF FIT LENGTH FIELD
          0001 1865+##LUES EQU    1                          LNG OF STATUS FIELD
          0002 1866+##LUEL EQU    2                          LNG OF NO. OF LINES FIELD
          0003 1867+##LUED EQU    3                          LNG OF DATE
          0019 1868+##LUEH EQU    25                         LNG OF FILE READER
          0006 1869+##LUEZ EQU    6                          LNG OF ENTRY RESERVED AREA
          0032 1870+##LUE  EQU    50                         LNG OF USER DIRCTY ENTRY
                     1871+*
                     1872+***    NULL DIRECTORY
                     1873+*
          0001 1874+##LN   EQU    1                          LNG OF DIRECTORY IN SECTORS
          0001 1875+##LNHY EQU    1                          LNG OF CYL COUNT FIELD
          0002 1876+##LNHZ EQU    2                          LNG OF HEADER RESERVED AREA
          0004 1877+##LNH  EQU    4                          LNG OF NULL DIRCTY HEADER
          0002 1878+##LNEF EQU    2                          LNG OF NUMBER OF SECTORS FIELD
          0002 1879+##LNEZ EQU    2                          LNG OF HENTRY RESERVED AREA
          0006 1880+##LNE  EQU    6                          LNG OF NULL DIRCTY ENTRY


                     1882+**********************************************************************
                     1883+*                      MASK EQUATES
                     1884+**********************************************************************
                     1885+*
                     1886+***    PASSWORD DIRECTORY
                     1887+*
          0055 1888+##MPHM EQU    85                         MAX. NO. OF PASSWORDS ALLOWED
                     1889+*
                     1890+***    USER DIRECTORY
                     1891+*
          000A 1892+##MUHM EQU    10                         MAX. NO. ENTRIES PER DIRCTY BLOC
          0080 1893+##MUEP EQU    X'80'                      '1' - BASIC PROGRAM FILE
          0040 1894+##MUEK EQU    X'40'                      '1' - KEYBRD DATA FILE
          0020 1895+##MUEG EQU    X'20'                      '1' - PROD. GEN. DATA FILE
          0010 1896+##MUEX EQU    X'10'                      '1' - FILE IS POOLED
          0008 1897+##MUER EQU    X'08'                      '1' - FILE IS PROTECTED
          0004 1898+##MUE0 EQU    X'04'                      '1' - FILE IS OPEN
          0002 1899+##MUEV EQU    X'02'                      '0' - SHORT PREC DATA FILE
```

                          1900+*   '1' - LONG PREC DATA FILE
                          1901+***   NULL DIRECTORY
                          1902+*
                     002A 1903+##MNHM EQU   42   MAX. NO. ENTRIES IN NULL DIRCTY
                          1904+*   END OF USER LIB DIR EQUATES
                          1905+   PRINT ON
                          1906 *   @CY0 EXP-Y
                          1908+   PRINT ON

@CY0EQ - CYLINDER ZERO EQUATES

```
                    1910+***********************************************************************
                    1911+*        DISK TABLE EQUATES                                           *
                    1912+***********************************************************************
      0006 1913+#VOLNG EQU    6                              LENGTH OF VOL ID
      0005 1914+#VOLOC EQU    5                              DISPLACEMENT OF VOL ID ON SCTR
      0008 1915+#VLTBE EQU    #VOLNG+2                       LENGTH OF VOLID TABLE ENTRY

                    1917+***********************************************************************
                    1918+*        SDS (ERROR LOG) EQUATES                                      *
                    1919+***********************************************************************
      0003 1920+#PKRTD EQU    3                              DISP TO END OF PK ERR/RATE ENTRY
      0003 1921+#PKRDD EQU    3                              DISP TO RESPECTIVE READ COUNTER
      0001 1922+#PKWTD EQU    1                              DISP TO RESPECTIVE WRITE COUNTER
      0002 1923+#PKCNT EQU    2                              LENGTH OF IN-CORE COUNTERS
      002B 1924+#PKMRW EQU    43                             DISP TO MASTER RD/WT COUNTERS
      000B 1925+#PKVRD EQU    11                             DISP TO VOLUME RD COUNTERS IN SD
      0007 1926+#PKVWD EQU    7                              DISP TO VOLUME WT COUNTERS IN SD
      0004 1927+#PKRTL EQU    4                              LENGTH PACK ERROR RATE ENTRY
      0004 1928+#RDWTL EQU    4                              LENGTH RD/WT ERROR RATE COUNTER

      0001 1930+#CNDIS EQU    1                              SECTOR DISPLACEMENT OF
                    1931+*                                     * CONFIGURATION RECORD

                    1933+***********************************************************************
                    1934+*        ERROR HISTORY TABLE EQUATES                                  *
                    1935+***********************************************************************
      0008 1936+#HISLN EQU    8                              LENGTH OF HISTORY TABLE ENTRY
      0002 1937+#DKEXT EQU    #HISLN-#VOLNG                  HIST LOG EXTENSION FOR DISK ERRO
      0001 1938+#HSENT EQU    1                              DISP OF DISP TO NEXT OBR ENTRY
      0003 1939+#HISDX EQU    3                              DISP OF DISP PAST LAST ENTRY
      0000 1940+#HISTQ EQU    0                              DISP OF SIO Q BYTE
      0001 1941+#HISTR EQU    1                              DISP OF SIO CNTL BYTE
      0003 1942+#HISN1 EQU    3                              DISP OF PRIMARY  SENSE REG
      0005 1943+#HISN2 EQU    5                              DISP OF SECONDARY SENSE REG
      0006 1944+#HISCT EQU    6                              DISP OF RETRY COUNT
      0007 1945+#HSEND EQU    7                              DISP OF END OF 1ST ENTRY
      0007 1946+#HISTC EQU    7                              DISP OF DCF F-BYTE
      0008 1947+#HISTS EQU    8                              DISP OF DCF S-BYTE
      0009 1948+#HISTN EQU    9                              DISP OF DCF N-BYTE
      000F 1949+#HISTV EQU    15                             DISP OF DISK VOL-ID

                    1951+***********************************************************************
                    1952+*        CYLINDER ZERO DISK ADDRESSES                                 *
                    1953+***********************************************************************
      0010 1954+#CORSV EQU    X'0010'                        DADDR OF TEMP CORE SAVE AREA
      0005 1955+#@CORS EQU    5                              SCTR COUNT TEMP CORE SAVE AREA
      009C 1956+#NEROV EQU    X'009C'                        DADDR OF NERLOG OVERLAY
      0003 1957+#@NERO EQU    3                              SCTR COUNT NERLOG OVERLAY
      001D 1958+#OBRAD EQU    X'001D'                        DADDR OF OBR TABLE
      0002 1959+#@OBRA EQU    2                              SCTR COUNT OF OBR
      000C 1960+#VLSDR EQU    X'000C'                        DADDR OF VOL STATISTICS SCTR R1
      0001 1961+#@VLSD EQU    1                              SCTR COUNT OF VOL STATISTICS
      000D 1962+#MVSDR EQU    X'000D'                        DADDR OF MASTER VOL STAT SCTR
      0001 1963+#@MVSD EQU    1                              SCTR COUNT OF MASTER VOL STAT
      0011 1964+#SDRDK EQU    X'0011'                        DADDR OF DISK SDR SCTR
      0019 1965+#IOSDR EQU    X'0019'                        DADDR OF NON-DISK SDR SCTR
```

```
       @CY0EQ - CYLINDER ZERO EQUATES
```

ERR LOC   OBJECT CODE   ADDR STMT SOURCE STATEMENT   VER 15, MOD 00 05/01/22 PAGE 44

```
                       0005 1966+#CNFIG EQU   X'0005'              DADDR OF CONFIG RECORD
                       0001 1967+#FIGSC EQU   1                    SCTR COUNT OF CONFIG RECORD
                       0009 1968+#VOLF1 EQU   X'0009'              DADDR OF VOLUME LABEL (F1)
                       0008 1969+#VOLR1 EQU   X'0008'              DADDR OF VOLUME LABEL (R1)
                       0001 1970+#@VLAB EQU   1                    SCTR COUNT OF VOLUME LABEL
                       0024 1971+#VTCR1 EQU   X'0024'              DADDR OF R1 VTOC
                       0025 1972+#VTCF1 EQU   X'0025'              DADDR OF F1 VTOC
                       0026 1973+#VTCR2 EQU   X'0026'              DADDR OF R2 VTOC
                       0027 1974+#VTCF2 EQU   X'0027'              DADDR OF F2 VTOC
                       0002 1975+#@VCNT EQU   2                    SCTR COUNT OF VTOC
                       00DC 1976+#PTFDA EQU   X'00DC'              DADDR OF PTF LOG
                       0001 1977+#@PTFS EQU   1                    SCTR COUNT FOR PTF LOG
                       0006 1978+#@PTFL EQU   6                    LENGTH OF ENTRY IN PTF LOG
                            1979+*     END OF CYLINDER ZERO EQUATES
                            1980+      PRINT ON
                            1981 *     @VOL  EXP-Y
                            1983+      PRINT ON
```

```
                    1985+*********************************************************************
                    1986+*          VOLUME LABEL EQUATES                                      *
                    1987+*********************************************************************
          0002 1988+$#TVOL EQU    X'02'                      START OF VOLUME LABEL ('VOL')
          0008 1989+$#TLBL EQU    X'08'                      VOLUME LABEL
          000A 1990+$#TVTC EQU    X'0A'                      VTOC POINTER
          005B 1991+$#TOID EQU    X'5B'                      OWNER ID
          005C 1992+$#TCYL EQU    X'5C'                      NUMBER OF CYLINDERS ON DISK
          0069 1993+$#TCET EQU    X'69'                      CE TRACK INDICATOR         1-5
          0075 1994+$#TALT EQU    X'75'                      ALTERNATE TRACK ASSIGNMENT
          00A8 1995+$#TUSE EQU    X'A8'                      TACK USAGE MASK
          00EF 1996+$#TSUS EQU    X'EF'                      SUSPECTED DEFECTIVE TRACKS
          00F0 1997+$#THVT EQU    X'F0'                      HELP FILE VTOC TAG NO.
          00F2 1998+$#THAD EQU    X'F2'                      HELP FILE DADDR
          00F3 1999+$#TPTF EQU    X'F3'                      PTF VTOC TAG NO.
          00F4 2000+$#TPSZ EQU    X'F4'                      PTF SIZE
          00F6 2001+$#TPAD EQU    X'F6'                      PTF DADDR
          00F7 2002+$#TLSZ EQU    X'F7'                      PTF SIZE
          00F8 2003+$#TLIB EQU    X'F8'                      LIBRARY VTOC TAG NO.
          00F9 2004+$#TWRK EQU    X'F9'                      WORK AREA VTOC TAG NO.
          00FA 2005+$#TSYS EQU    X'FA'                      SYSTEM PGM FILE VTOC TAG NO.
          00FC 2006+$#TBIS EQU    X'FC'                      BIS SYSTEM FILE DADDR
          00FE 2007+$#TLAD EQU    X'FE'                      BIS USER LIBRARY DADDR
          00FF 2008+$#TIDR EQU    X'FF'                      BIS FILES INDICATOR
          00D7 2009+$#TWAL EQU    215                        DISP TO WKAREA RELEASE LEVEL
          00D7 2010+$#TRES EQU    215                        DISP TO END OF BIS RESERVED AREA

               2012+*                                        BIS FILES INDR BYTE:
          0080 2013+$#TSYM EQU    X'80'                      BIT 0 - SYSTEM PROGRAM FILE.
          0040 2014+$#TWR1 EQU    X'40'                      *   1 - WORK AREA R1
          0020 2015+$#TWF1 EQU    X'20'                      *   2 - WORK AREA F1
          0010 2016+$#TLIF EQU    X'10'                      *   3 - LIBRARY FILE
          0008 2017+$#TPFL EQU    X'08'                      *   4 - PTF DATA FILE
          0004 2018+$#THEL EQU    X'04'                      *   5 - HELP FILE
               2019+*          END OF VOLUME LABEL EQUATES
               2020+        PRINT ON
               2021 *        @VTC  EXP-Y
               2023+        PRINT ON
```

```
       @VTCEQ - VTOC INDEX AND FORMAT 1 EQUATES


ERR LOC   OBJECT CODE      ADDR STMT SOURCE STATEMENT         VER 15, MOD 00  05/01/22  PAGE  46

                          2025+*******************************************************************************
                          2026+*       VTOC INDEX AND FORMAT 1 EQUATES.
                          2027+*******************************************************************************
                          2028+*
           000D 2029+$@$FIL EQU    X'0D'                     FIRST FILE NAME IN VTOC INDEX
           0008 2030+$@$LNG EQU    X'08'                     LENGTH OF FILE NAME
           0001 2031+$@$SCT EQU    X'01'                     SCTR ADDR OF SCTR CONTAIN REC
                          2032+*                                    * RELATIVE TO FILE NAME
           0002 2033+$@$BYT EQU    X'02'                     BYTE DISP OF REC WITHIN SCTR
                          2034+*                                    * RELATIVE TO FILE NAME
           000A 2035+$@$INC EQU    X'0A'                     INC FACTOR TO NEXT FILE NAME
           0032 2036+$@$TGS EQU    X'32'                     TOTAL # TAGS WITHIN VTOC
           0006 2037+$@$LUE EQU    6                         LENGTH OF UNUSED BYTES (AT FIRST
                          2038+*                                    * AND LAST OF VTOC INDEX)
                          2039+*
                          2040+***     FILE LABEL (FL'S) RELATIVE TO FIRST BYTE
                          2041+*
           0040 2042+$@$LTH EQU    X'40'                     LENGTH OF FILE LABEL
           000A 2043+$@$FIN EQU    X'0A'                     FILE NAME
           0011 2044+$@$RTN EQU    X'11'                     RETAIN TYPE                1-5
           0012 2045+$@$TYP EQU    X'12'                     FILE TYPE
           0020 2046+$@$SRT EQU    X'20'                     START DADDR OF FILE (CYL #)
           00FF 2047+$@$AVL EQU    X'FF'                     NO. FREE TAGS LEFT
                          2048+*                                    RELATIVE TO SCTR (2) OF VTOC
           0022 2049+$@$END EQU    X'22'                     END DADDR OF FILE (CIL #)
                          2050+*       END OF VTOC INDEX AND FORMAT 1 EQUATES
                          2051+        PRINT ON
```

```
     UALLOC - ASSIGN WORKFILE UTILITY

ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT          VER 15, MOD 00  05/01/22  PAGE  47

                          2053 *        HDR #UALLO,1
                          2054 ****************************************************************************
                          2055 *   PROGRAM HEADER FOR DISK LOAD                                         *
                          2056 ****************************************************************************
                          2057 *#$UALL EQU   X'0F00'                    DISK ADDR AF #UALLO
                          2058 *#$$UAL EQU   X'0C00'                    CORE LOAD ADDRESS OF #UALLO
                          2059 *#$@UAL EQU   017                        SECTOR CNT OF #UALLO
    0C00                  2060        ORG   #$$UAL                      CORE LOAD ADDRESS
                     0C00 2061 $$$$$$ EQU   *                           FIRST LOCATION IN PROGRAM
    0C00 7BE4C1D3D3D6     0C05 2062        DC    CL6'#UALLO'            PROGRAM NAME
    0C06 3E              0C06 2063        DC    IL1'062'               PROGRAM NUMBER OF #UALLO
                     0C07 2064 #UALL  EQU   *                           ENTRY POINT TO PROGRAM
                          2065 *** END OF EXPANSION ***
```

```
                        2067 ********************************************************************
                        2068 * 5703-XM1      COPYRIGHT IBM CORP. 1970                        *
                        2069 *                    REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083   *
                        2070 *                                                                *
                        2071 ********************************************************************
                        2072 *STATUS                                                          *
                        2073 *    VERSION 1 MODIFICATION 0                                     *
                        2074 *                                                                *
                        2075 *FUNCTION                                                         *
                        2076 *    * UALLOC IS INVOKED WHEN THE ASSIGN SYSTEM COMMAND IS ENTERED BY  *
                        2077 *      THE USER. UALLOC WILL ALLOCATE DISK SPACE FOR THE FILE LIBRARY   *
                        2078 *      OR THE SYSTEM WORKK AREA.  FOR THE FILE LIBRARY, A STARTING       *
                        2079 *      TRACK AND A TRACK COUNT MAY BE SPECIFIED BY THE USER             *
                        2080 *    * TO ALLOCATE SPACE ON A DISK, VARIOUS FUNCTIONS MUST BE           *
                        2081 *      PERFORMED THE FUNCTION IS TO CHECK THE TRACK USAGE MASK IN THE    *
                        2082 *      VOLUME LABEL IN ORDER TO DETERMINE IF CONTIGUOUS SPACE IN THE     *
                        2083 *      AMOUNT REQUESTED BEGINNING AT THE CYLINDER SPECIFIED IS          *
                        2084 *      AVALABLE.  IF SPACE IS AVAILABLE, THE TRACK USAGE MASK IS        *
                        2085 *      UPDATED TO REFLECT THAT THE SPACE IS NO LONGER AVAILABLE.        *
                        2086 *    * THE SECOND FUNCTION IS TO CREATE AN ENTRY IN THE VOLUME TABLE OF*
                        2087 *      CONTENTS. THIS ENTRY CONSISTS OF TWO PARTS - AN INDEX ENTRY (1),*
                        2088 *      WHICH POINTS TO A FILE LABEL (2). THE FILE LABEL POINTS TO THE   *
                        2089 *      PHYSICAL BEGINNING DISK ADDRESS AND THE ENDING DISK ADDRESS.     *
                        2090 *      THE DATA SET NAME IS ALSO PLACED IN THE FILE LABEL.             *
                        2091 *    * IF THE COMMAND SPECIFIED 'WORKAREA' AS THE FILE TO BE ALLOCATED,*
                        2092 *      THE WORK OF UALLOC IS COMPLETED.                               *
                        2093 *    * IF NO AREA TO BE ALLOCATED WAS FOR THE FILE LIBRARY, ADDITIONAL *
                        2094 *      WORK MUST BE DONE.  THIS NOW CONSISTS OF MAKING AN ENTRY IN THE *
                        2095 *      NULL, PASSWORD, POOLED AND IBM SUPPLIED PROGRAMS DIRECTORY.      *
                        2096 *                                                                *
                        2097 *ENTRY POINTS                                                     *
                        2098 *    * THE ENTRY POINT IS UALLOC                                   *
                        2099 *                                                                *
                        2100 *INPUT                                                            *
                        2101 *    * THE INPUT IS THE READING OF THE VOLUME LABEL, VTOC INDEX AND     *
                        2102 *      FORMAT 1 ENTRY                                                *
                        2103 *                                                                *
                        2104 *OUTPUT                                                           *
                        2105 *    * THE OUTPUT IS THE WRITING OF THE VOLUME LABEL, VTOC INDEX AND    *
                        2106 *      FORMAT 1 ENTRY                                                *
                        2107 *                                                                *
                        2108 *EXTERNAL REFERENCES                                              *
                        2109 *     $DISKN - ADDRESS ENTRY TO DISK IOCR                          *
                        2110 *     $XRSAV - ADDRESS OF 2 BYTES XR SAVE AREA                      *
                        2111 *     SCANIT - ADDRESS OF ENTRY TO SCAN ROUTINE                     *
                        2112 *     $CAERR - ADDRESS OF ERROR CODE IN ERROR PGM                   *
                        2113 *     SDISKS - ADDRESS OF ENTRY TO DISK SPECIFICATION ROUTINE        *
                        2114 *     $CAERK - ADDRESS OF ENTRY TO ERROR PGM                        *
                        2115 *     $DITBL - ADDRESS OF DISK SPECIFICATION IN SDISKS ROUTINE       *
                        2116 *     TVSDSK - ADDRESS OF VTOC FOR UTVTOC ROUTINE                    *
                        2117 *     TKSYLN - ADDRESS OF INITIAL CYLINDER NUMBER IN UTKUSE ROUTINE   *
                        2118 *     TKSCYL - ADDRESS OF NUMBER OF CYLINDERS                        *
                        2119 *     UTVIST - ADDRESS OF ENTRY POINT TO INSERT A VTOC FILE           *
                        2120 *     $CIMSK - ADDRESS OF INQUIRY REQUEST INDR                      *
                        2121 *     $INDR3 - ADDRESS OF SYSTEM 1-BIT INDICATORS                    *
                        2122 *     DL2RAD - ADDRESS OF RELATIVE DISK ADDRESS IN DL2ICS ROUTINE     *
```

```
                              2123 *      DL2ICS - ADDRESS OF ENTRY TO DISK IOCR (RELATIVE)            *
                              2124 *      SWFNME - ADDRESS OF WORK FILE NAME                           *
                              2125 *      SUTOBA - ADDRESS OF ENTRY TO SWITCH BASIC/UTILITY MODES      *
                              2126 *      $SPRNT - ADDRESS OF ENTRY TO PRINTER IOCR                    *
                              2127 *      TKSBFI - ADDRESS OF BIS FILE INDICATOR FOR VTOC ROUTINES     *
                              2128 *      UTVDEL - ADDRESS OF ENTRY POINT TO DELETE VTOC FILE          *
                              2129 *      SDINID - ADDRESS OF CODE TO VERIFY VOL-ID WHEN USING SDISKS  *
                              2130 *      SCAMMA - ADDRESS OF CODE TO BYPASS ONE COMMA IN SCANIT ROUTINE *
                              2131 *      SCYEXT - ADDRESS OF CODE TO CHECK NUMBER OF TRACKS IN SCYLOK *
                              2132 *      SCYLDK - ADDRESS OF ENTRY TO CONVERT TRACK SPECIFICATIONS    *
                              2133 *      SCYADR - ADDRESS OF BYTE TO CHECK IF ODD TRACK SPECIFIED IN SCYL*
                              2134 *      $VOLID - ADDRESS OF VOLUME-ID TABLE                          *
                              2135 *      TVSFIL - ADDRESS OF FILE NAME HOLDER IN TVSAVE AREA          *
                              2136 *      UTVDFT - ADDRESS OF ENTRY POINT                              *
                              2137 *      $DKSIZ - ADDRESS OF DISK SIZE IN NUCLEUS                     *
                              2138 *      $CARPL - ADDRESS OF ENTRY TO ABORT CURRENT OPERATION         *
                              2139 *      SDISKP - ADDRESS OF CODE IN SDISKS TO BY-PASS VOL-ID CHECK   *
                              2140 *                                                                   *
                              2141 *EXITS,NORMAL                                                       *
                              2142 *      NORMAL EXIT IS BACK TO GUFLDI VIA A BRACH TO $CARPL          *
                              2143 *                                                                   *
                              2144 *EXITS,ERROR                                                        *
                              2145 *      ERROR EXIYS IS TO THE ERROR PGM VIA A BRANCH TO $CAERK       *
                              2146 *                                                                   *
                              2147 *TABLES/WORK AREAS                                                  *
                              2148 *    * KHETB2 IS A TABLE OF CHARACTER CONSTANTS FROM A TO Z -- IT IS *
                              2149 *      USED FOR CONVERTING A CHARACTER RESPONSE TO A NUMERIC RESPONSE. *
                              2150 *    * KHESPK IS THE SAVE AREA FOR THE INPUT CHARACTER STRING WITH NO *
                              2151 *      EMBEDDED BLANKS.                                             *
                              2152 *                                                                   *
                              2153 *ATTRIBUTES                                                         *
                              2154 *    THIS ROUTINE IS NOT REUSABLE                                   *
                              2155 *                                                                   *
                              2156 *CHARACTER CODE DEPENDENCY                                          *
                              2157 *    THE OPERATION OF THIS MODULE DOES NOT DEPENDS UPON A PARTICULAR *
                              2158 *    INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET          *
                              2159 *                                                                   *
                              2160 *NOTES                                                              *
                              2161 *    ERROR PROCEDURES                                               *
                              2162 *      UALLOC IS EXITTED TO THE ERROR PGM VIA A BRANCH FOR THE      *
                              2163 *      FOLLOWING ERROR CONDITIONS:                                  *
                              2164 *      1. SPACE REQUESTED IS NOT AVAILABLE.                         *
                              2165 *      2. SPACE NOT AVAILABLE BEGINNING AT CYLINDER SPECIFIED.      *
                              2166 *      3. VTOC FULL.                                                *
                              2167 *      4. SPECIFIED DISK ALREADY HAS SPACE ALLOCATED FOR THE LIBRARY. *
                              2168 *      5. THE DISK SPECIFIED ALREADY HAS THE WORK AREA SPACE ALLOCATED.*
                              2169 *         FOR ANOTHER PURPOSE.                                      *
                              2170 *      6. INVALID SYNTAX.                                           *
                              2171 *      7. THE VOLUME-ID SPECIFIED DOES NOT MATCH THE VOLUME-ID IN THE *
                              2172 *         VOLUME LABEL.                                             *
                              2173 *      8. 000 TRACK SPECIFIED.                                      *
                              2174 *      9. INVALID # TRACKS / TRACK # SPECIFIED.                     *
                              2175 *                                                                   *
                              2176 *      INDEX REGISTER1 (@BR) AND 2 (@XR) ARE SAVED AND RESTORED. EACH *
                              2177 *      REGISTER IS USED DURING EXECUTION.                           *
                              2178 *                                                                   *
```

```
                              2179 *    SAVED/RESTORED AREAS                                          *
                              2180 *      NONE                                                        *
                              2181 *                                                                  *
                              2182 *    REQUIRED MODULES                                              *
                              2183 *      @SYSEO - COMMON SYSTEM EQUATES                              *
                              2184 *      @EXDEQ - SYSTEM NUCLEUS ADDRESSES AND INDICATOR VALUES EQUATES  *
                              2185 *      @DIREQ - FILE LIBRARY EQUATES                               *
                              2186 *      @CANEQ - SYSTEM LOCATION EQUATES                            *
                              2187 *      @WKAEQ - SYSTEM WORK AREA DADDR EQUATES                     *
                              2188 *      @CY0EQ - CYLINDER ZERO EQUATES                              *
                              2189 *      @VOLEQ - VOLUME LABEL EQUATES                               *
                              2190 *      @VTCEQ - VTOC EQUATES                                       *
                              2191 *      SUTOBA - SWITCH SYSTEM MODE TO BASIC OR UTILITY MODULE      *
                              2192 *      SALPNA - ALPHANUMERIC SYNTAX CHECKER MODULE                *
                              2193 *      SDISKS - COMPLETE DISK SPEC CHECKER MODULE                 *
                              2194 *      SCYLCK - CONVERT TRACK ADDRESS MODULE                      *
                              2195 *      TKSAVE - VOLUME LABEL COMMON MODULE                        *
                              2196 *      TVSAVE - VTOC COMMON MODULE                                *
                              2197 *      UTKUSE - TRACK USAUE MASK MODULE                           *
                              2198 *      UTVTOC - VTOC ROUTINES                                     *
                              2199 *                                                                  *
                              2200 *    OTHER                                                         *
                              2201 *      NONE                                                        *
                              2202 *****************************************************************************


                              2204 *
                              2205 *                    EQUATES USED IN UALLOC
                              2206 *
                         0001 2207 UALONE EQU    1                            REMOVABLE/FIXED DISK BIT
                         0002 2208 UALTWO EQU    2                            DISK SPINDLE BIT
                         0004 2209 UALFOR EQU    4                            CYL '4' (WORKAREA)
                         0024 2210 UALVTX EQU    X'24'                        SECTOR '9' DADDR
                         0006 2211 UALSIX EQU    6                            # CYLS IN SYSTEM WORK AREA
                         000A 2212 UALTEN EQU    10                           # CYLS (DEFAULT-WORKAREA)
                         0014 2213 UALTWT EQU    20                           # TRACKS BY DEFAULT
                         0080 2214 UALTRK EQU    X'80'                        ODD TRACK # BIT
                         0030 2215 UALMAX EQU    48                           NUMBER OF SECTORS TO TRANSFER
                         000C 2216 UAL012 EQU    12                           # SCTRS TO COPY SYSTEM
                              2217 *
                              2218 *                    INITIALIZE & SAVE REGISTERS
                              2219 *
                              2220 *UALLOC ENTER BASE-UAL900,EXIT-UALED,@BR,@XR
                         10A5 2221        USING UAL900,@BR                     BASE ADDRESS SPECIFICATION
                         0C07 2222 UALLOC EQU    *                            MODULE ENTRY POINT
   0C07 34 01 10C8           2223        ST    UALED0+@OP1,@BR                SAVE @BR
   0C0B C2 01 10A5           2224        LA    UAL900,@BR                     LOAD BASE REGISTER
   0C0F 74 02 27             2225        ST    UALED1+@OP1(,@BR),@XR          SAVE @XR
                              2226 *** END OR EXPANSION ***
   0C12 C0 87 0C42           2227        B     UAL050                         BRANCH TO ENTRY POINT
                              2228 *      MTEXT @@M400-@PRETR
                              2229 *****************************************************************************
                              2230 *                    PPL'S AND TEXT FOR MESSAGE
                              2231 *****************************************************************************
   0C16 C0             0C16 2232 @@M400 DC     AL1(@PRETR)                    PRINT CONTROL RLNCTION
   0C17 19             0C17 2233        DC     IL1'25'                        LENGTH OF MESSAGE
```

```
      UALLOC - ASSIGN WORKFILE UTILITY


ERR LOC   OBJECT CODE      ADDR STMT SOURCE STATEMENT              VER 15, MOD 00  05/01/22  PAGE  51

    0C18 0C1A             0C19 2234          DC    AL(@CADDR)(@@T400)       ADDR OF MESSAGE
                               2235 *
                         0C1A 2236 @@T400 EQU   *                          LEFT BYTE OF MESSAGE
    0C1A C6C9D3C540C1D3D3 0C32 2237          DC    CL025'FILE ALLOCATION COMPLETED'
                               2238 *
                               2239 *   PATCH AREA FOR MESSAGES
                               2240 *
    0C33                 0C41 2241 $$$001 DS   CL15                        MSG EXPANSION PATCH AREA
                               2242 *** END OF EXPANSION ***
    0C42 3C 00 10E1           2243 UAL050 MVI  UALDIR,@DPOS                INIT SEEK OPERATION
                               2244 *      DISK  UALDIR                    SEEK TO CYL 0
    0C46 C0 87 0025           2245        B     $DISKN                     PERFORM PHYSICAL DISK OP
    0C4A 10E1            0C4B 2246          DC    AL2(UALDIR)               DPL ADDRESS
                               2247 *** END OF EXPANSION ***
    0C4C 3C 01 10E1           2248        MVI   UALDIR,@DGET               RESTORE READ RUNCTION
    0C50 35 02 03C7           2249 UAL100 L     $XRSAV,@XR                 POINT VR TO PARAMETER
                               2250 ***********************************************************************
                               2251 *               SYNTAX CHECK OF WORKAREA & LIBRARY
                               2252 ***********************************************************************
    0C54 6D 07 52 07          2253        CLC   UALIBR-1(UALEN2-UALEN1-1,@BR),UALEN2-UALEN1-2(,@XR)
                               2254 *                                      'LIBRARY' ?
    0C58 C0 81 0E4F           2255        BE    UAL600                     BRANCH IF 'LIBRARY'
    0C5C 6D 08 5C 08          2256        CLC   UALWRK(UALEN3-UALEN2,@BR),UALEN3-UALEN2-1(,@XR)
                               2257 *                                      'WORKAREA' ?
    0C60 F2 81 2A             2258        JE    UAL120                     JUMP IF 'WORKAREA'
    0C63 34 02 0C75           2259        ST    UAL105+@OP1,@XR            SAVE VR
    0C67 C0 87 1264           2260        B     SCANIT                     SCAN ACROSS BLANKS
    0C6B BD 1E 00             2261        CLI   0(,@XR),@EOS               EOS ?
    0C6E C0 81 0E5C           2262        BE    UAL610                     BRANCH TO ERROR PGM
    0C72 C2 02 0000           2263 UAL105 LA    *-*,@XR                    RESTORE XR
    0C76 BD 60 00             2264        CLI   0(,@XR),UALDSH             DASH MISSING ?
    0C79 F2 81 07             2265        JE    UAL110                     YES
    0C7C 3C 19 03CD           2266        MVI   $CAERR,@@E142              MOVE ERROR CODE
    0C80 F2 87 3F             2267        J     UAL185                     JUMP TO ERROR PGM
    0C83 3C 1A 03CD           2268 UAL110 MVI   $CAERR,@@E143              MOVE ERROR CODE
    0C87 E2 02 01             2269        LA    UALONE(,@XR),@XR           BUMP XR BY 1
    0C8A F2 87 35             2270        J     UAL185                     JUMP TO ERROR PGM


                               2272 ***********************************************************************
                               2273 *               PROCESS WORK AREA ALLOCATION
                               2274 ***********************************************************************
    0C8D E2 02 09             2275 UAL120 LA    UALEN3-UALEN2(,@XR),@XR    INCREMENT XR BY 'WORKAREA'
    0C90 C0 87 1264           2276        B     SCANIT                     SCAN ACROSS BLANKS
    0C94 BD 1E 00             2277        CLI   0(,@XR),@EOS               EOS ?
    0C97 F2 01 08             2278        JNE   UAL140                     JUMP IF NOT EOS
    0C9A C2 02 1102           2279        LA    UALEN3,@XR                 POINT XR TO DUMMY PARM
    0C9E 3A 01 1123           2280        SBN   UALSAV,UALONE              SET ON DEFAULT BIT R1/F1
                               2281 *                                      FORCE R1/F1 DEFAULT ALLOC
    0CA2 3C 87 143A           2282 UAL140 MVI   SDISKP,SDIUCB              BYPASS VOL-ID CHECKING
    0CA6 C0 87 13DC           2283 UAL160 B     SDISKS                     COMPLETE FILE SPECS
    0CAA F2 82 15             2284        JL    UAL185                     JUMP IF ERROR
    0CAD C0 87 1264           2285 UAL180 B     SCANIT                     SCAN ACROSS BLANKS
    0CB1 38 01 1123           2286        TBN   UALSAV,UALONE              WORKAREA DEFAULT ?
    0CB5 F2 10 0E             2287        JT    UAL190                     JUMP IF DEFAULT
    0CB8 BD 1E 00             2288        CLI   0(,@XR),@EOS               EOS ?
    0CBB F2 81 08             2289        JE    UAL190                     JUMP IF EOS
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   0CBE 3C 12 03CD         2290         MVI    $CAERR,@@E133           MOVE ERROR CODE
   0CC2 C0 87 0469         2291 UAL185 B      $CAERK                  BRANCH TO ERROR PGM

                           2293 ***********************************************************************
                           2294 *                    INITIALIZE TO ALLOCATE WORKAREA
                           2295 ***********************************************************************
   0CC6 D2 02 00           2296 UAL190 LA     @ZERO(,@BR),@XR         POINT XR OUT OF INPUT LINE BFR
   0CC9 3C 91 03CD         2297         MVI    $CAERR,@@E543           SET ERROR CODE
   0CCD 39 03 14C6         2298         TBF    SDITBL+2,UALHX3         TEST IF INITIALIZED
   0CD1 F2 10 22           2299         JT     UAL200                  JUMP IF UNINITIALIZED
   0CD4 38 01 14C6         2300         TBN    SDITBL+2,UALHX1         TEST IF INITIALIZED
   0CD8 F2 90 0A           2301         JF     UAL195                  JUMP IF UNINITIALIZED
   0CDB 1E 00 03CD 9E      2302         ALC    $CAERR,UALLC2(1,@BR)    CHANGE ERROR CODE
   0CE0 1E 01 0CF9 B1      2303         ALC    UAL200+@OP1(@CADDR),UALCON(,@BR)   SET UP TO TEST NEXT DISK
   0CE5 38 02 14C4         2304 UAL195 TBN    SDITBL,UALHX2           TEST FOR INITIALIZATION
   0CE9 F2 90 0A           2305         JF     UAL200                  JUMP IF NOT
   0CEC 1E 00 03CD 81      2306         ALC    $CAERR,UALDLT(1,@BR)    ADJUST ERROR CODE
   0CF1 1E 01 0CF9 B3      2307         ALC    UAL200+@OP1,UALX16(@CADDR,@BR)   SET TO NEW TBL ENTRY
   0CF6 3D 00 0008         2308 UAL200 CLI    #VOLR1+*-*,@ZERO        TEST TBL ENTRY
   0CFA F2 81 0F           2309         JE     UAL205                  CALL ERR PGM IF BAD
   0CFD 38 01 1123         2310         TBN    UALSAV,UALONE          WORKAREA DEFAULT ?
   0D01 F2 90 0C           2311         JF     UAL210                  NO, SO SET UP FILE
   0D04 3D 00 03FE         2312         CLI    $VOLF1,@ZERO           F1 INITIALIZED ?
   0D08 3C 93 03CD         2313         MVI    $CAERR,@@E545           SET ERROR CODE
   0D0C C0 81 0469         2314 UAL205 BE     $CAERK                  CALL ERR PGM IF F1 NOT INITLZED
   0D10 C0 87 10A5         2315 UAL210 B      UAL900                  SET UP FILE IDR/DATA SET
   0D14 1C 01 0CF9 97      2316 UAL220 MVC    UAL200+@OP1(@CADDR),UALTRY(,@BR)   RESET ADDR OF VOL-ID TBL
   0D19 3A 24 14C6         2317         SBN    SDITBL+2,UALVTX         MASK SCTR '9' IN DISK DADDR
   0D1D 0C 01 15AC 14C6    2318         MVC    TVSDSK(@CADDR),SDITBL+2   MOVE DISK DADDR FOR 'LTVTOC'
   0D23 4C 01 74 14C6      2319         MVC    UALKEP(@CADDR,@BR),SDITBL+2   SAVE DISC SPEC
   0D28 3C 04 1599         2320         MVI    TKSYLN,UALFOR          INITIAL  CYL# = '4'
   0D2C 3C 06 159A         2321         MVI    TKSCYL,UALSIX          INITIAL #CYLS = '6'

                           2323 ***********************************************************************
                           2324 *                    ALLOCATE WORKAREA
                           2325 ***********************************************************************
   0D30 C0 87 1794         2326         B      UTVIST                  INSERT FILE
   0D34 C0 94 0E18         2327         BC     UAL520,UALBFH          SUCCESSFUL INSERT ?
   0D38 F2 87 0B           2328         J      UAL260                  JUMP IF SUCESSFULL
   0D3B 3C 7B 03CD         2329 UAL230 MVI    $CAERR,@@E485           MOVE ERROR CODE
   0D3F D2 02 00           2330 UAL235 LA     0(,@BR),@XR            POINT XR OLT OR IVI:T SFR
   0D42 C0 87 0469         2331 UAL240 B      $CAERK                  BRANCH TO ERROR PGM
   0D46 3C 80 0476         2332 UAL260 MVI    $CIMSK,@NOP             MASK IR
   0D4A 38 01 1123         2333         TBN    UALSAV,UALONE          R1/F1 DEFAULT BIT SET ON ?
   0D4E F2 90 1A           2334         JF     UAL310                  JUMP IF NOT DEFAULT
   0D51 38 01 14C6         2335         TBN    SDITBL+2,UALONE        FIXED DISK ?
   0D55 F2 10 08           2336         JT     UAL300                  JUMP IF FIXED
   0D58 C2 02 1105         2337         LA     UALEN3+3,@XR           POINT XR TO F1
   0D5C C0 87 0CA2         2338         B      UAL140                  BRANCH TO INSERT F1

                           2340 ***********************************************************************
                           2341 *                    COPY SYSTEM PROGRAM FILE FILE TO WORKAREA
                           2342 ***********************************************************************
   0D60 C0 87 0D80         2343 UAL300 B      UAL320                  COPY R1
   0D64 C0 87 0D96         2344         B      UAL330                  COPY F1
   0D68 F2 87 93           2345         J      UAL380                  PRINT COMPLETION MESSAGE
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   0D6B 38 01 14C6           2346 UAL310 TBN    SDITBL+2,UALONE        FIXED DISK ?
   0D6F F2 90 07             2347        JF     UAL312                JUMP IF NOT FIXED DISK
   0D72 C0 87 0D96           2348        B      UAL330                COPY FIXED DISK
   0D76 F2 87 85             2349        J      UAL380                PRINT COMPLETION KESSAX
   0D79 C0 87 0D80           2350 UAL312 B      UAL320                COPY REMOVABLE DISK
   0D7D F2 87 7E             2351 UAL315 J      UAL380                PRINT COMPLETION MESSAGE
   0D80 5C 01 83 87          2352 UAL320 MVC    UALRED(@DADDR,@BR),UALPR1(,@BR)   SET REM PROG FILE BASE
   0D84 5C 01 85 8B          2353        MVC    UALWRT(@DADDR,@BR),UALWR1(,@BR)   SET REM WORK FILE BASE
   0D88 38 02 1119           2354        TBN    UALKEP,UALTWO         SPINDLE 2 ?
   0D8C F2 10 1A             2355        JT     UAL340                JUMP IF SPINDLE 2
   0D8F 3B 40 03D6           2356        SBF    $INDR3,$NWRKR         SET OFF NO WORK AREA BIT
   0D93 F2 87 13             2357        J      UAL340                GO COPY FILE
   0D96 5C 01 83 89          2358 UAL330 MVC    UALRED(@DADDR,@BR),UALPF1(,@BR)   SET FIX PROG FILE BASE
   0D9A 5C 01 85 8D          2359        MVC    UALWRT(@DADDR,@BR),UALWF1(,@BR)   SET FIX WORK FILE BASF
   0D9E 38 02 1119           2360        TBN    UALKEP,UALTWO         SPINDLE 2 ?
   0DA2 F2 10 04             2361        JT     UAL340                JUMP IF SPINDLE 2
   0DA5 3B 80 03D6           2362        SBF    $INDR3,$NWRKF         SET OFF NO WORK AREA BIT
   0DA9 34 08 0DFD           2363 UAL340 ST     UAL360+@OP1,@ARR      SAVE RETURN ADDR
   0DAD 4E 01 83 0587        2364        ALC    UALRED(@DADDR,@BR),$BSADR
   0DB2 38 02 1119           2365        TBN    UALKEP,UALTWO         SPINDLE 2 ?
   0DB6 F2 90 13             2366        JF     UAL345                JUMP IF NOT SPINDLE 2
   0DB9 3A 02 112A           2367        SBN    UALWRT,UALTWO         SET ON SPINDLE 2 BIT
   0DBD 3A 02 1128           2368        SBN    UALRED,UALTWO         SET ON DRIVE 2 BIT
   0DC1 38 01 14C6           2369        TBN    SDITBL+2,UALONE                                        1-5
   0DC5 F2 10 04             2370        JT     UAL345                                                1-5
   0DC8 3B 01 1128           2371        SBF    UALRED,UALONE                                         1-5
   0DCC 7C 00 47             2372 UAL345 MVI    UALDPL+@DSAD(,@BR),@ZERO    SET SCTR 0
   0DCF 7C 01 45             2373 UAL350 MVI    UALDPL+@DCTRL(,@BR),@DGET   SET READ CONTROL
   0DD2 1C 01 11F3 83        2374        MVC    DL2RAD(@DADDR),UALRED(,@BR) SET READ BASE ADDR
   0DD7 C0 87 115B           2375        B      DL2ICS                READ 12 SCTRS FROM PROS FILE
   0DDB 10EA        0DDC     2376        DC     AL2(UALDPL)           DPL ADDR
   0DDD 1C 01 11F3 85        2377        MVC    DL2RAD(@DADDR),UALWRT(,@BR)  SET WRITE BASE
   0DE2 7C 02 45             2378        MVI    UALDPL+@DCTRL(,@BR),@DPUT   SET WRITE CONTROL
   0DE5 C0 87 115B           2379        B      DL2ICS                WRITE 12 SCTRS TO WORK FILE
   0DE9 10EA        0DEA     2380        DC     AL2(UALDPL)           DPL ADDR
   0DEB 5E 00 47 8F          2381        ALC    UALDPL+@DSAD(UALONE,@BR),UALC12(,@BR) SET NEXT 12 SCTRS
   0DEF 7D 30 47             2382        CLI    UALDPL+@DSAD(,@BR),UALMAX  COMPLETION OF COPYING
   0DF2 C0 01 0DCF           2383        BNE    UAL350                GO READ ANOTHER 12 IF NOT
   0DF6 3B 40 0443           2384        SBF    $WFNME,$WFDEF         SET OFF WORK FILE BIT
   0DFA C0 87 0000           2385 UAL360 B      *-*                   RETURN TO CALLING ROUTINE

                             2387 *********************************************************************
                             2388 *                   PRINT COMPLETION MESSAGE
                             2389 *********************************************************************
   0DFE C0 87 12A5           2390 UAL380 B      SUTOBA                SWITCH TO BASIC MODE
                             2391 *UAL400 SPRNT UALRET                 CARRIAGE RETURN
   0E02 C0 87 0465           2392 UAL400 B      $SPRNT                PRINT ON SYSTEM PAINTER
   0E06 10E8        0E07     2393        DC     AL2(UALRET)           PPL ADDRESS
                             2394 *** END OF EXPANSION ***
                             2395 *      B       $SPRNT               PRINT COMPLETION MESSASE
   0E08 C0 87 0465           2396        B      $SPRNT                PRINT ON SYSTEM PRINTER
   0E0C 0C16        0E0D     2397        DC     AL2(@@M400)           PPL ADDRESS
                             2398 *** END OF EXPANSION ***
   0E0E C0 87 0465           2399        B      $SPRNT                WAIT I/O COMPLETION
   0E12 10E7        0E13     2400        DC     AL2(UALWIT)           PPL OF PART LIST
   0E14 C0 87 10C5           2401        B      UALED0                BRANCH TO EXIT
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                              2403 ************************************************************************
                              2404 *               OVERIDE WRONG WORKAREA IF R1 OR F1
                              2405 ************************************************************************
     0E18 C2 02 1C09          2406 UAL520 LA    UTVAR1,@XR              POINT XR TO TOP OF VOL LABEL
     0E1C B8 20 FF            2407        TBN   $#TIDR(,@XR),$#TWF1     BIS FILE F1 SET ON ?
     0E1F F2 10 21            2408        JT    UAL540                 JUMP IF F1 ALLOCATED
     0E22 B8 40 FF            2409        TBN   $#TIDR(,@XR),$#TWR1     BIS FILE R1 SET ON ?
     0E25 F2 10 14            2410        JT    UAL535                 JUMP IF TRUE
     0E28 C0 84 0469          2411        BH    $CAERK                 ERR- SCP FILE THERE BY SAKE NAME
     0E2C 3D 33 1BF3          2412        CLI   UTVTAG,UTVUPR+1        VTOC FULL ?
     0E30 C0 01 0D3B          2413        BNE   UAL230                 BRANCH IF VTOC NOT FLLL
     0E34 3C 79 03CD          2414 UAL530 MVI   $CAERR,@@E483          MOVE ERROR CODE
     0E38 C0 87 0D3F          2415        B     UAL235                 BRANCH TO ERROR TRVT
     0E3C 3C 40 1598          2416 UAL535 MVI   TKSBFI,$#TWR1          MOVE R1 BIS FILE INDR
     0E40 F2 87 04            2417        J     UAL560                 JUMP TO DELETE FILE
     0E43 3C 20 1598          2418 UAL540 MVI   TKSBFI,$#TWF1          MOVE F1 BIS FILE INDR
     0E47 C0 87 1778          2419 UAL560 B     UTVDEL                 DELETE WORKAREA FILE
     0E4B C0 87 0CC6          2420        B     UAL190                 BRANCH TO CHECK DISK SPEC


                              2422 ************************************************************************
                              2423 *               INITIALIZE TO ALLOCATE LIBRARY FILE
                              2424 ************************************************************************
     0E4F E2 02 08            2425 UAL600 LA    UALEN2-UALEN1-1(,@XR),@XR  INCREMENT XR BY 'LIBRARY'
     0E52 C0 87 1264          2426        B     SCANIT                 SCAN ACROSS BLANKS
     0E56 BD 1E 00            2427        CLI   0(,@XR),@EOS           EOS ?
     0E59 F2 01 07            2428        JNE   UAL620                 JUMP IF NOT COS
     0E5C 3C 10 03CD          2429 UAL610 MVI   $CAERR,@@E130          MOVE ERROR CODE
     0E60 F2 87 0B            2430        J     UAL630                 BRANCH TO ERROR ?ROM
     0E63 3C 80 1484          2431 UAL620 MVI   SDINID,SDIVOF          SET CODE TO VERIFY VOL-ID
     0E67 C0 87 13DC          2432        B     SDISKS                 CHECK DISK SPEC
     0E6B F2 84 04            2433        JH    UAL640                 JUMP IF NO ERROR
     0E6E C0 87 0469          2434 UAL630 B     $CAERK                 BRANCH TO ERROR PGM
     0E72 0C 00 0FC5 14C6     2435 UAL640 MVC   UAL803+@Q(UALONE),SDITBL+2  SAVE DISK SPEC
     0E78 3A 24 14C6          2436        SBN   SDITBL+2,UALVTX        MASK VTOC INDEX DADDR
     0E7C 0C 01 15AC 14C6     2437        MVC   TVSDSK(@CADDR),SDITBL+2 MOVE DISK DADDR
     0E82 3C 01 1281          2438        MVI   SCAMMA,SCACOM          MOVE CODE TO BY-PASS ONE COMMA
     0E86 C0 87 1264          2439        B     SCANIT                 SCAN ACROSS BLANKS, ONE COMMA
     0E8A C0 82 0D3F          2440        BL    UAL235                 BRANCH TO ERROR PGM
     0E8E 3C 0A 159A          2441        MVI   TKSCYL,UALTEN          SET 20 TRACKS ALLOCATION
     0E92 BD 1E 00            2442        CLI   0(,@XR),@EOS           EOS ?
     0E95 F2 81 6E            2443        JE    UAL680                 JUMP IF EOS
     0E98 3A 02 1124          2444        SBN   UALZZZ,UALTWO          SET IND FOR TRACKS SPECIFIED
     0E9C 3C 80 14F6          2445        MVI   SCYEXT,SCYNOP          SET CODE FOR ? TRACKS
     0EA0 C0 87 14CD          2446        B     SCYLCK                 CONVERT TRACK SPEC
     0EA4 0C 00 159A 157C     2447        MVC   TKSCYL(UALONE),SCYADR-1 MOVE ' CYLINDERS
     0EAA C0 81 0F37          2448        BZ    UAL690                 SUCESSFUL CONVERSION ?
     0EAE C0 04 0D42          2449        BNH   UAL240                 SUCESSFUL CONVERSION ?
     0EB2 3D 0B 03CD          2450 UAL650 CLI   $CAERR,@@E120          ERROR CODE ?
     0EB6 F2 01 08            2451        JNE   UAL653                 NO
     0EB9 3C 11 03CD          2452 UAL652 MVI   $CAERR,@@E131          MOVE ERROR CODE
     0EBD C0 87 0469          2453        B     $CAERK                 BRANCH TO ERROR PRGM
     0EC1 38 80 157D          2454 UAL653 TBN   SCYADR,UALTRK          ODD TRACK ?
     0EC5 F2 10 36            2455        JT    UAL669                 YES
     0EC8 3C 01 1281          2456 UAL657 MVI   SCAMMA,SCACOM          BYPASS COMMAS
     0ECC C0 87 1264          2457        B     SCANIT                 SCAN ACROSS BLANKS,@NE COMMA *
     0ED0 C0 82 0CC2          2458        BL    C4BERR                 BRANCH TO ERROR PRGM
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    0ED4 BD 1E 00           2459 UAL660 CLI   0(,@XR),@EOS            EOS ?
    0ED7 F2 81 2C           2460        JE    UAL680                 EOS
    0EDA 3A 02 1123         2461        SBN   UALSAV,UALTWO          SET BIT FOR CYL SPECIFICATION
    0EDE C0 87 14CD         2462        B     SCYLCK                 CONVERT TRACK SPEC
    0EE2 0C 00 1599 157C    2463        MVC   TKSYLN(UALONE),SCYADR-1  MOVE CYLINDER NUMBER
    0EE8 C0 81 0EF0         2464        BZ    UAL667                 BRANCH IF POINTER NOT MOVED
    0EEC C0 04 0D42         2465        BNH   UAL240                 BRANCH TO ERROR PRDM
    0EF0 BD 1E 00           2466 UAL667 CLI   0(,@XR),@EOS           EOS ?
    0EF3 C0 01 0EB9         2467        BNE   UAL652                 NO
    0EF7 38 80 157D         2468        TBN   SCYADR,UALTRK          ODD TRACK ?
    0EFB F2 90 08           2469        JF    UAL680                 JUMP IF EVEN TRACK
    0EFE 3C 20 03CD         2470 UAL669 MVI   $CAERR,@@E164          MOVE ERROR CODE
    0F02 C0 87 0D3F         2471 UAL670 B     UAL235                 BRANCH TO ERROR PRGM

                            2473 **************************************************************************
                            2474 *              ALLOCATE LIBRARY FILE
                            2475 **************************************************************************
    0F06 BD 1E 00           2476 UAL680 CLI   0(,@XR),@EOS           EOS ?
    0F09 F2 81 08           2477        JE    UAL683                 YES
    0F0C 3C 12 03CD         2478        MVI   $CAERR,@@E133          MOVE ERROR CODE
    0F10 C0 87 0D42         2479        B     UAL240                 BRANCH TO ERROR DR5M
    0F14 1C 01 0D3E B5      2480 UAL683 MVC   UAL230+@OP1,UALDRS(@CADDR,@BR)  RETURN ADDRESS
    0F19 C2 02 03FC         2481 UAL684 LA    $VOLID+UALSIX,@XR      POINT XR TO VOL-ID TABLE
    0F1D 0C 00 0F2B 14C4    2482        MVC   UAL685+2(UALONE),SDITBL  MOVE DISPLACEMENT TO ENTRY
    0F23 0C 00 0FCE 14C4    2483        MVC   UAL804+2(UALONE),SDITBL  MOVE DISPLACEMENT
    0F29 BD 00 00           2484 UAL685 CLI   *-*(,@XR),@ZERO        LIBRARY ALREADY EXIST ?
    0F2C F2 81 08           2485        JE    UAL690                 JUMP IF LIBRARY , ARNED
    0F2F 3C 6F 03CD         2486        MVI   $CAERR,@@E473          MOVE ERROR CODE
    0F33 C0 87 0D3F         2487        B     UAL235                 BRANCH TO ERROR PRGM
    0F37 0C 07 15A8 10F8    2488 UAL690 MVC   TVSFIL(UALEN2-UALEN1-1),UALIBR  MOVE LIBRARY DATA
    0F3D 3C 10 1598         2489        MVI   TKSBFI,$#TLIF          SET ON LIBRARY BIT
    0F41 38 02 1123         2490        TBN   UALSAV,UALTWO          CYLINDER # SPECIFIED ?
    0F45 F2 10 2E           2491        JT    UAL720                 JUMP IF CYL# SPECIFIED
    0F48 C0 87 1789         2492        B     UTVDFT                 INSERT FILE (BY DEFAULT)
    0F4C F2 84 2B           2493        JH    UAL730                 CALL ERR PGM IF SCP FILE THERE
    0F4F F2 10 3F           2494        JT    UAL750                 JUMP IF SUCESSFUL INSERT
    0F52 3D 32 1BF3         2495        CLI   UTVTAG,UTVUPR          VTOC FULL ?
    0F56 C0 84 0E34         2496        BH    UAL530                 BRANCH IF VTOC FULL
    0F5A 38 02 1124         2497        TBN   UALZZZ,UALTWO          NO. OF TRACKS SPECIFIED ?
    0F5E F2 10 0D           2498        JT    UAL700                 YES, GIVE ERR MSG-NO SPACE
    0F61 1F 00 159A 81      2499        SLC   TKSCYL(UALONE),UALDLT(,@BR)  DECREMENT #CYLS
    0F66 3D 00 159A         2500        CLI   TKSCYL,@ZERO           #CYLINDERS = 0 ?
    0F6A C0 01 0F37         2501        BNE   UAL690                 BRANCH IF 3CYLS = 0
    0F6E 3C 70 03CD         2502 UAL700 MVI   $CAERR,@@E474          MOVE ERROR CODE
    0F72 C0 87 0D3F         2503        B     UAL235                 BRANCH TO ERROR PRGM
    0F76 C0 87 1794         2504 UAL720 B     UTVIST                 INSERT FILE
    0F7A C0 84 0469         2505 UAL730 BH    $CAERK                 CALL ERR PGM IF SCP FILE THERE
    0F7E F2 10 10           2506        JT    UAL750                 JUMP IF SUCESSFUL INSERT
    0F81 3D 33 1BF3         2507        CLI   UTVTAG,UTVUPR+1        VTOC FULL ?
    0F85 C0 81 0E34         2508        BE    UAL530                 BRANCH IF VTOC FULL
    0F89 3C 7A 03CD         2509        MVI   $CAERR,@@E484          MOVE ERROR CODE
    0F8D C0 87 0D3F         2510        B     UAL235                 BRANCH TO ERROR PGM

                            2512 **************************************************************************
                            2513 *              CREATE ENTRY IN NULL DIRECTORY
                            2514 **************************************************************************
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     0F91 38 01 03D7               2515 UAL750 TBN    $DKSIZ,$DK100               70 CYL DISK CONFIGURED ?
     0F95 F2 90 0A                 2516        JF     UAL760                     NO, CHECK 100 CYL DISK
     0F98 0D 00 16F7 111A          2517        CLC    UTKCNT(UALONE),UALSZ1      WITHIN LIMITS ?
     0F9E C0 84 10D1               2518        BH     UAL960                     NO, OUT OF LIMITS
     0FA2 38 02 03D7               2519 UAL760 TBN    $DKSIZ,$DK200              100 CYL DISK CONFIGURED ?
     0FA6 F2 90 0A                 2520        JF     UAL800                     NO
     0FA9 0D 00 16F7 111B          2521        CLC    UTKCNT(UALONE),UALSZ2      WITHIN LIMITS ?
     0FAF C0 84 10A5               2522        BH     UAL900                     NO
     0FB3 C2 02 1C09               2523 UAL800 LA     UTVAR1,@XR                 POINT XR TO TOP OF VOL LABEL
     0FB7 2C 01 11F3 FE            2524        MVC    DL2RAD(@CADDR),$#TLAD(,@XR)  SET UP DADDR
     0FBC 6C 00 7E FD              2525        MVC    UALSAV(UALONE,@BR),$#TLAD-1(,@XR)  MOVE CYL #
     0FC0 6C 00 74 F7              2526        MVC    UALKEP(UALONE,@BR),$#TLSZ(,@XR)  MOVE LIB SITE
     0FC4 3A 00 11F3               2527 UAL803 SBN    DL2RAD,*-*                 MASK DISK SPEC
     0FC8 C2 02 03FC               2528        LA     $VOLID+UALSIX,@XR          POINT XR TO DADDR
     0FCC 8C 00 00 1123            2529 UAL804 MVC    *-*(UALONE,@XR),UALSAV     MOVE CYL #
     0FD1 C2 02 1C09               2530        LA     UTVAR1,@XR                 POINT XR TO TOP OF NULL DIR
     0FD5 8C 00 00 1126            2531        MVC    ##DNHC(##LAHC,@XR),UALDLT  SET ENTRY COLNT
     0FDA 8C 00 01 1119            2532        MVC    ##DNHY(##LNHY,@XR),UALKEP  MOVE LIB SHE
     0FDF 8C 01 03 1122            2533        MVC    ##DNHR(##LNHZ,@XR),UALZER  CLEAR RESERVE AREA
     0FE4 E2 02 04                 2534        LA     ##DNE1(,@XR),@XR           UPDATE XR
     0FE7 8C 01 01 113E            2535        MVC    ##DNEA(##LAAA,@XR),UAL009  SET REL START ADDRESS
     0FEC 3C 01 1123               2536        MVI    UALSAV,UALONE              INITIALIZE COUNTER
     0FF0 8C 01 03 1142            2537        MVC    ##DNEF(##LNEF,@XR),UAL048  INCREMENT # SECTORS
     0FF5 4D 00 7E 1119            2538 UAL805 CLC    UALSAV(UALONE,@BR),UALKEP  FOLLOWING ALGO: # SCTRS
     0FFA F2 81 0D                 2539        JE     UAL810                     C * 48 - 9 WHERE C= # CYLS
     0FFD 8E 01 03 1142            2540        ALC    ##DNEF(##LNEF,@XR),UAL048  INCREMENT # SECTORS
     1002 5E 00 7E 81              2541        ALC    UALSAV(UALONE,@BR),UALDLT(,@BR)  INCREMENT COUNTER
     1006 C0 87 0FF5               2542        B      UAL805                     BRANCH TO CONTINUE
     100A 8F 01 03 113E            2543 UAL810 SLC    ##DNEF(##LNEF,@XR),UAL009  SUBTRACT 9 FROM C * 48
     100F 3C 02 10E1               2544        MVI    UALDIR,@DPUT               SET FOR DISK HRITE
                                   2545 *      DSKL2 UALDIR,WAIT                 WRITE NULL DIRECTORY TO DISK
     1013 C0 87 115B               2546        B      DL2ICS                     PERFORM RELATIVE DISK OP
     1017 10E1             1018    2547        DC     AL2(UALDIR)                DPL ADDRESS
     1019 C0 87 0025               2548        B      $DISKN                     HAIT AND CHECK DISK ERRORS
     101D 057F             101E    2549        DC     AL2($WAITF)                WAIT DPL ADDRESS
                                   2550 *** END OF EXPANSION ***

                                   2552 ************************************************************************
                                   2553 *              CREATE ENTRY IN PASSWORD DIRECTORY
                                   2554 ************************************************************************
     101F 5C 01 3E 91              2555 UAL820 MVC    UALDIR+2(@CADDR,@BR),UALDS1(,@BR)  ADD DISP TO SCTR
     1023 C2 02 1C09               2556        LA     UTVAR1,@XR                 POINT XR TO TOP OF NEW DIR
     1027 9C 00 00 9E              2557        MVC    ##DPHC(##LAHC,@XR),UALLC2(,@BR)  MOVE EN-4Y COUNT
     102B 9C 02 03 7D              2558        MVC    ##DPHR(##LPHZ,@XR),UALZER(,@BR)  MOVE RESERVE AREA
     102F E2 02 04                 2559        LA     ##LPH(,@XR),@XR            UPDATE XR
     1032 9C 07 07 A6              2560        MVC    ##DPEN(##LPEN,@XR),UALBLK(,@BR)  MOVE PASSWORD ONE
     1036 9C 01 09 A9              2561        MVC    ##DPEA(##LAAA,@XR),UALPS1(,@BR)  MOVE REL DISK DADDR
     103A 9C 01 0B 7D              2562        MVC    ##DPER(##LPEZ,@XR),UALZER(,@BR)  MOVE RESERVE AREA
     103E B6 02 0C                 2563        A      ##LPE(,@XR),@XR            INCREMENT XR BY DIR LENGTH
     1041 9C 07 07 A7              2564        MVC    ##DPEN(##LPEN,@XR),UALPWD(,@BR)  MOVE PASSWORD TWO
     1045 9C 01 09 AB              2565        MVC    ##DPEA(##LAAA,@XR),UALPS2(,@BR)  MOVE REL DISK DADDR
     1049 9C 01 0B 7D              2566        MVC    ##DPER(##LPEZ,@XR),UALZER(,@BR)  MOVE RESERVE AREA
     104D 3C 02 10E1               2567        MVI    UALDIR,@DPUT               SET WRITE FUNCTION
                                   2568 *UAL830 DSKL2 UALDIR,WAIT               WRITE PASSWORD TO DISK
     1051 C0 87 115B               2569 UAL830 B      DL2ICS                     PERFORM RELATIVE DISK OP
     1055 10E1             1056    2570        DC     AL2(UALDIR)                DPL ADDRESS
```

```
     UALLOC - ASSIGN WORKFILE UTILITY


ERR LOC   OBJECT CODE      ADDR STMT SOURCE STATEMENT           VER 15, MOD 00  05/01/22  PAGE  57

    1057 C0 87 0025          2571       B     $DISKN                    WAIT AND CHECK DISK ERRORS
    105B 057F           105C 2572       DC    AL2($WAITF)               WAIT DPL ADDRESS
                             2573 *** END OF EXPANSION ***

                             2575 *****************************************************************************
                             2576 *              CREATE ENTRY IN POOLED DIRECTORY
                             2577 *****************************************************************************
    105D 5C 01 3E 93         2578 UAL840 MVC   UALDIR+2(@CADDR,@BR),UALDS2(,@BR)  ADD DISP TO SCTR
    1061 5C 01 AD A9         2579       MVC   UALBKC(##LAAA,@BR),UALPS1(,@BR)  MOVE BLOCK ADDR
    1065 C0 87 1079         2580       B     UAL860                    CREATE ENTRIES

                             2582 *****************************************************************************
                             2583 *              CREATE ENTRY IN IBM SUPPLIED PROGS DIRECTORY
                             2584 *****************************************************************************
    1069 5C 01 3E 95         2585 UAL850 MVC   UALDIR+2(@CADDR,@BR),UALDS3(,@BR)  ADD DISP TO SCTR
    106D 5C 01 AD AB         2586       MVC   UALBKC(##LAAA,@BR),UALPS2(,@BR)  MOVE BLOCK ADDR
    1071 C0 87 1079         2587       B     UAL860                    CREATE ENTRIES
    1075 C0 87 0E02         2588       B     UAL400                    PRINT COMPLETION MESSAGE

                             2590 *****************************************************************************
                             2591 *              CREATE ENTRIES IN DIRECTORIES
                             2592 *****************************************************************************
    1079 34 08 10A4          2593 UAL860 ST    UAL870+@OP1,@ARR          SAVE ARR FOR EXIT
    107D C2 02 1C09         2594       LA    UTVAR1,@XR                POINT XR TO TOP OF DIRECTORY
    1081 9C 01 01 AD         2595       MVC   ##DUHA(##LAAA,@XR),UALBKC(,@BR)  MOVE BLOCK ADDRESS
    1085 9C 01 03 AF         2596       MVC   ##DUHB(##LAAA,@XR),UALFRW(,@BR)  MOVE FORWARD ADDRESS
    1089 9C 00 04 AF         2597       MVC   ##DUHC(##LAHC,@XR),UALFRW(,@BR)  MOVE ENTRY COUNT
    108D 9C 06 0B 7D         2598       MVC   ##DUHR(##LUHZ,@XR),UALZER(,@BR)  MOVE RESERVE AREA
    1091 3C 02 10E1          2599       MVI   UALDIR,@DPUT              SET FOR WRITE FUNCTION
                             2600 *       DSKL2 UALDIR,WAIT               WRITE DIRECTORY TO DISK
    1095 C0 87 115B         2601       B     DL2ICS                    PERFORM RELATIVE DISK OP
    1099 10E1           109A 2602       DC    AL2(UALDIR)               DPL ADDRESS
    109B C0 87 0025         2603       B     $DISKN                    WAIT AND CHECK DISK ERRORS
    109F 057F           10A0 2604       DC    AL2($WAITF)               WAIT DPL ADDRESS
                             2605 *** END OF EXPANSION ***
    10A1 C0 87 0000         2606 UAL870 B     *-*                       EXIT TO CALLING ROUTINE

                             2608 *****************************************************************************
                             2609 *              FOLLOWING SETS FILE IDS & DATE SET NAME
                             2610 *****************************************************************************
    10A5 38 01 14C6          2611 UAL900 TBN   SDITBL+2,UALONE           FIXED DISK ?
    10A9 F2 10 0C            2612       JT    UAL920                    JUMP IF FPO DISK
    10AC 1C 07 15A8 6A       2613       MVC   TVSFIL(UALEN5-UALEN4),UALWKR(,@BR)  MOVE WORKAREA(R1)
                             2614 *                                    DATA SET NAME TO HO_DER
    10B1 3C 40 1598          2615       MVI   TKSBFI,$#TWR1             SET ON WORKAREA(R1) BIT ?
    10B5 F2 87 09            2616       J     UAL950                    EXIT TO CALLING ROUTINE
    10B8 1C 07 15A8 72       2617 UAL920 MVC   TVSFIL(UALEN6-UALEN5),UALWKF(,@BR)  MOVE WORKAREA(F1)
                             2618 *                                    DATA SET NAME TO HOLDER
    10BD 3C 20 1598          2619       MVI   TKSBFI,$#TWF1             SET ON WORKAREA(F1) BIT
    10C1 C0 87 0D14         2620 UAL950 B     UAL220                    EXIT TO CALLING ROUTINE
                             2621 *UALED  EXIT  @BR,@XR
    10C5 C2 01 0000         2622 UALED0 LA    *-*,@BR                   RESTORE @BR
    10C9 C2 02 0000         2623 UALED1 LA    *-*,@XR                   RESTORE @XR
                             2624 *** END OF EXPANSION ***
    10CD C0 87 04A1         2625       B     $CARPL                    BRANCH TO GUFUDI
    10D1 3C 10 1598          2626 UAL960 MVI   TKSBFI,$#TLIF             SET INDR FOR LIBRARY
```

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     UALLOC - ASSIGN WORKFILE UTILITY
```

```
     10D5 C0 87 1778          2627         B     UTVDEL                  DELETE LIBRARY
     10D9 3C A5 03CD          2628         MVI   $CAERR,@@E585           MOVE ERROR CODE
     10DD C0 87 0469          2629         B     $CAERK                  BRANCH TO ERROR PRGM

                              2631 *********************************************************************
                              2632 *               DPL LIST TO READ/WRITE FILE DIRECTORIES
                              2633 *********************************************************************
                              2634 *ALDIR $DPL  FUNC-@DGET,CNT-UALONE,CADDR-UTVAR1
                         10E1 2635+UALDIR EQU   *                       DISK PARAMETER LIST
     10E1 01             10E1 2636+       DC    AL1(@DGET)              REQUESTED FUNCTION
     10E2 0000           10E3 2637+       DC    AL2(*-*)                DISK ADDRESS
     10E4 01             10E4 2638+       DC    AL1(UALONE)             SECTOR COUNT
     10E5 1C09           10E6 2639+       DC    AL2(UTVAR1)             BUFFER ADDRESS
                              2640+*** END OF EXPANSION ***

                              2642 *********************************************************************
                              2643 *               PPL LIST TO PRINT COMPLETION MESSASE
                              2644 *********************************************************************
     10E7 FF             10E7 2645 UALWIT DC    AL1(@DWAIT)             PPL OF PART LIST
                              2646 *UALRET PPL   FUNC-@RETRN,CNT-@RTRNC
                         10E8 2647 UALRET EQU   *                       PPL ADDRESS
     10E8 80             10E8 2648        DC    AL1(@RETRN)             FUNCTION REQUESTED
     10E9 80             10E9 2649        DC    AL1(@RTRNC)             PRINT COUNT
     10EA 0000           10EB 2650        DC    AL2(*-*)                DATA ADDRESS
                              2651 *** END OF EXPANSION ***
     10EA                     2652        ORG   *-2
                              2653 *********************************************************************
                              2654 *               DPL LIST TO COPY SYSTEM PROG FILE TO WORKAREA
                              2655 *********************************************************************
                              2656 *ALDPL $DPL  DADDR-@ZERO,CNT-UAL012,CADDR-SALPH8
                         10EA 2657+UALDPL EQU   *                       DISK PARAMETER LIST
     10EA               10EA 2658+       DS    CL1                     CONTROL CODE
     10EB 0000           10EC 2659+       DC    AL2(@ZERO)              DISK ADDRESS
     10ED 0C             10ED 2660+       DC    AL1(UAL012)             SECTOR COUNT
     10EE 1311           10EF 2661+       DC    AL2(SALPH8)             BUFFER ADDRESS
                              2662+*** END OF EXPANSION ***

                              2664 *********************************************************************
                              2665 *               CONSTANTS USED IN UALLOC
                              2666 *********************************************************************
                         10F0 2667 UALEN1 EQU   *
     10F0 60D3C9C2D9C1D9E8 10F8 2668 UALIBR DC    CL9'-LIBRARY '          LIBRARY PARAMETER
                         10F9 2669 UALEN2 EQU   *
     10F9 60E6D6D9D2C1D9C5 1101 2670 UALWRK DC    CL9'-WORKAREA'          WORKAREA PARAMETER
                         1102 2671 UALEN3 EQU   *
     1102 D9F140C6F140     1107 2672 UALDFT DC    CL6'R1 F1 '             FORCE R1/F1 DEFAULT
                         1108 2673 UALEN4 EQU   *
     1108 E6D2C1D9C5C1D940 110F 2674 UALWKR DC    CL8'WKAREAR '           R1 DATA SET NAME
                         1110 2675 UALEN5 EQU   *
     1110 E6D2C1D9C5C1C640 1117 2676 UALWKF DC    CL8'WKAREAF '           F1 DATA SET NAME
                         1118 2677 UALEN6 EQU   *
                         1118 2678 UALEN7 EQU   *
     1118                1119 2679 UALKEP DS    CL(@CADDR)              DADDR SAVE AREA
     111A 48             111A 2680 UALSZ1 DC    IL(UALONE)'72'          72 CYLINDER COUNT
     111B 66             111B 2681 UALSZ2 DC    IL(UALONE)'102'         102 CYLINDER COUNT
     111C 00000000000000 1122 2682 UALZER DC    7IL(UALONE)'0'          CONSTANT FACTOR
```

```
     1123 00                  1123 2683 UALSAV DC    IL(UALONE)'0'            CONSTANT FACTOR
     1124 00                  1124 2684 UALZZZ DC    XL1'00'                 SET ON IF TRACKS SPECIFIED
     1125 0001                1126 2685 UALDLT DC    IL(@CADDR)'1'           CONSTANT FACTOR
     1127                     1128 2686 UALRED DS    CL(@DADDR)              READ PROG FILE BASE ADDR
     1129                     112A 2687 UALWRT DS    CL(@DADDR)              WRITE WORK FILE BASE ADDR
     112B 1780                112C 2688 UALPR1 DC    AL2(#$#RSP)             REMOVABLE DISK WORKAREA
     112D 1880                112E 2689 UALPF1 DC    AL2(#$#FSP)             FIXED DISK WORKAREA
     112F 0400                1130 2690 UALWR1 DC    AL2(#@WAR1)             R1 WORK FILE ADDR
     1131 0401                1132 2691 UALWF1 DC    AL2(#@WAF1)             F1 WORK FILE ADDR
     1133 000C                1134 2692 UALC12 DC    AL2(UAL012)             12 SCTR INCREMENT
     1135 0001                1136 2693 UALDS1 DC    AL2(##RP)               *
     1137 0005                1138 2694 UALDS2 DC    AL2(##R2)               POOLD DIRECTORY INC FACTOR
     1139 0007                113A 2695 UALDS3 DC    AL2(##R1)               IBM DIRECTORY INC FACTOR
     113B 0008                113C 2696 UALTRY DC    AL(@CADDR)(#VOLR1)      VOL-ID TABLE
     113D 0009                113E 2697 UAL009 DC    IL(@DADDR)'9'           RELATIVE START DADDR
     113F 0018                1140 2698 UAL024 DC    IL(@DADDR)'24'          # SECTORS PER TRACK
     1141 0030                1142 2699 UAL048 DC    IL(@DADDR)'48'          # SECTORS ALGO FACTOR
     1143 02                  1143 2700 UALLC2 DC    IL(UALONE)'2'           ENTRY COUNT (PASWRD DIRECTORY)
     1144 5C5C404040404040    114B 2701 UALBLK DC    CL8'**      '           PASSWORD TWO
     114C 40                  114C 2702 UALPWD DC    CL1' '                  PASSWORD ONE (PASSWORD DIR)
     114D 0005                114E 2703 UALPS1 DC    IL(@DADDR)'5'           REL DADDR PSWRD ONE
     114F 0007                1150 2704 UALPS2 DC    IL(@DADDR)'7'           REL DADDR PSWRD TWO
     1151                     1152 2705 UALBKC DS    CL(@DADDR)              BLOCK ADDRESS TEMP SAVE
     1153 0000                1154 2706 UALFRW DC    IL(@DADDR)'0'           FORWARD ADDRESS (POOLED/IBM)
     1155 0008                1156 2707 UALCON DC    XL2'8'                  DISTANCE TO NEXT VAL-ID TBL ENTRY
     1157 0010                1158 2708 UALX16 DC    XL2'10'                 DISTANCE TO 2ND VOL-ID TBL ENTRY
     1159 0F19                115A 2709 UALDRS DC    AL2(UAL684)

                              0001 2711 UALHX1 EQU   1                       LENGTH1
                              0002 2712 UALHX2 EQU   2                       LENSTH2
                              0003 2713 UALHX3 EQU   3                       LENGTH3
                              0094 2714 UALBFH EQU   X'94'                   CONDITION CODE - FALSE OR HIGH
                              0060 2715 UALDSH EQU   C'-'                    DASH
                              0CC2 2716 C4BERR EQU   UAL185                  ERROR EXIT
                              0E02 2717 SUTERR EQU   UAL400                  ERROR EXIT
                              0000 2718 UALPRT EQU   UALEN7-UALEN6           LENGTH COMPLETION MSG
                                   2719 *      $DL2P
```

```
                              2721+************************************************************************
                              2722+*  5703-XM1   COPYRIGHT IBM CORP 1970                                  *
                              2723+*             REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE. 120-2083       *
                              2724+*                                                                      *
                              2725+************************************************************************
                              2726+*STATUS -                                                              *
                              2727+*   VERSION 1 MODIFICATION 0                                           *
                              2728+*                                                                      *
                              2729+*FUNCTION                                                              *
                              2730+*    * DL2ICS CONVERTS A RELATIVE DISK ADDRESS TO A PHYSICAL DISK       *
                              2731+*      ADDRESS AND COMBINES IT WITH A BASE ADDRESS PLACED IN DL2RAD     *
                              2732+*      BY THE CALLER.                                                  *
                              2733+*    * THE RELATIVE DISK ADDRESS IS A TWO BYTE CYLINDER SECTOR COUNT    *
                              2734+*      IN THE CALLERS DISK PARAMETER LIST (DPL).                        *
                              2735+*    * THE COUNT IS A CYLINDER SECTOR DISPLACEMENT FROM THE BASE        *
                              2736+*      ADDRESS PLACED IN DL2RAD                                         *
                              2737+*    * DL2ICS IS USED TO PROCESS DATA ON THE FIXED OR REMOVABLE DISK    *
                              2738+*      ON EITHER DRIVE AND PROVIDES THE INTERFACE TO $DISKN.            *
                              2739+*    * THE PHYSICAL DISK ADDRESS IS PLACED IN A COPY OF THE USERS DPL   *
                              2740+*      IN DL2ICS AND A CALL IS MADE TO $DISKN TO PERFORM THE REQUESTED  *
                              2741+*      OPERATION.                                                      *
                              2742+*                                                                      *
                              2743+*ENTRY POINTS                                                          *
                              2744+*    * THE ENTRY IS DL2ICS. THE BASE REGISTER IS SAVED AND RESTORED     *
                              2745+*      ON RETURN. THE INDEX REGISTER IS NOT USED.                       *
                              2746+*    * THE FORMAT OF THE CALLING SEQUENCE IS AS FOLLOWS:                *
                              2747+*         B   DL2ICS                                                   *
                              2748+*         DC  AL2(PARMLT)                                              *
                              2749+*      WHERE PARMLT IS THE ADDR OF THE PARAMETER LIST TO BE PROCESSED. *
                              2750+*                                                                      *
                              2751+*INPUT                                                                 *
                              2752+*    * THE INPUT IS A TWO BYTE BASE DISK ADDRESS PLACED IN              *
                              2753+*      DL2RAD AND A SIX BYTE DPL. THE SAME FORMAT AS THE DPL FOR        *
                              2754+*      $DISKN EXCEPT FOR THE DISK ADDRESS WHICH IS A RELATIVE CYLINDER *
                              2755+*      AND SECTOR DISPLACEMENT FROM THE BASE ADDRESS IN DL2RAD.         *
                              2756+*                                                                      *
                              2757+*OUTPUT                                                                *
                              2758+*    NONE.                                                             *
                              2759+*                                                                      *
                              2760+*EXTERNAL REFERENCES                                                   *
                              2761+*     $DISKN - ENTRY TO PHYSICAL DISK ROUTINE IS THE SYSTEM NUCLEUS.   *
                              2762+*                                                                      *
                              2763+*EXITS, NORMAL                                                         *
                              2764+*     NORMAL - EXIT IS TO THE FIRST INSTRUCTION FOLLOWING THE POINTER  *
                              2765+*      TO THE DPL. THE BASE REGISTER IS RESTORED. THE RETURN ADDRESS    *
                              2766+*      IS THE ADDRESS RECALL REGISTER (ARR) +2.                        *
                              2767+*                                                                      *
                              2768+*EXITS, ERROR                                                          *
                              2769+*     NONE                                                             *
                              2770+*                                                                      *
                              2771+*TABLES/WORK AREAS                                                     *
                              2772+*    * THE CONSTANTS AND WORK AREAS RESIDE AT THE END OF THE EXECUTABLE*
                              2773+*      CODE AND ARE REFERENCED BY A DISPLACEMENT RELATIVE TO THE VALUE *
                              2774+*      IN INDEX REGISTER 1 (@BR).                                      *
                              2775+*    * DL2SEC AND DL2SAD ARE EQUATED TO OPERAND LOCATIONS IN THE       *
                              2776+*      EXECUTABLE CODE TO ELIMINATE EXCESS WORKING STORAGE.            *
```

```
                                2777+*                                                           *
                                2778+*ATTRIBUTES                                                 *
                                2779+*   * DL2ICS IS REUSABLE                                    *
                                2780+*                                                           *
                                2781+*CHARACTER CODE DEPENDENCY                                  *
                                2782+*     THE OPERATION OF THIS MODULE DOES NOT DEPEND UPON A PARTICULAR  *
                                2783+*      INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET.         *
                                2784+*                                                           *
                                2785+*NOTES                                                      *
                                2786+*    ERROR PROCEDURES                                       *
                                2787+*       NONE                                                *
                                2788+*                                                           *
                                2789+*    REGISTER USAGE                                         *
                                2790+*      INDEX REGISTER 1 (@BR) IS SAVED AND RESTORED. THIS REGISTER IS *
                                2791+*      USED DURING EXECUTION. REGISTER 2 (@BR) IS NOT USED. *
                                2792+*                                                           *
                                2793+*    SAVED/RESTORED AREAS                                   *
                                2794+*       NONE                                                *
                                2795+*                                                           *
                                2796+*    MODIFICATION CONSIDERATIONS                            *
                                2797+*       NONE                                                *
                                2798+*                                                           *
                                2799+*    REQUIRED MODULES                                       *
                                2800+*      @SYSEQ - COMMON SYSTEM EQUATES.                       *
                                2801+*      @FXDEQ - SYSTEM NUCLEUS ADDRESSES AND INDICATORS VALUES EQUATES *
                                2802+*                                                           *
                                2803+*    OTHER                                                  *
                                2804+*      DL2ICS MAY BE USED TO CONVERT THE DISK ADDRESS ONLY AND NOT TO *
                                2805+*      CALL $DISKN IF THE USER MOVES A UCB CODE TO DL2SWH.  *
                                2806+*      THIS OPTION IS NOT STANDARD USAGE.                    *
                                2807+***********************************************************************
                           115F 2808+      USING DL2000,@BR                  ESTABLISH ADDRESSABILITY
                                2809+*
                      0001 2810+DL2E01 EQU   X'01'                           FIELD LENGTH OF 1
                      0002 2811+DL2E02 EQU   X'02'                           FIELD LENGTH OF 2
                      0018 2812+DL2E18 EQU   X'18'                           HEX TRACK SECTOR COUNT
                      0060 2813+DL2E60 EQU   X'60'                           PHYSICAL SECTOR COUNT
                      0083 2814+DL2TSD EQU   X'83'                           MASK OFF TRACK SPINDLE DISK
                      007C 2815+DL2E7C EQU   X'7C'                           MASK OUT SECTOR COUNT
                      115B 2816+DL2ICS EQU   *                               ENTRY POINT
     115B 34 01 11DC       2817+       ST    DL2900+@OP1,@BR                 SAVE OLD BASE
                      115F 2818+DL2000 EQU   *                               START PROCESSING
     115F C2 01 115F       2819+       LA    DL2000,@BR                      SET BASE ADDRESS
     1163 76 08 8A         2820+       A     DL2C01(,@BR),@ARR               BUMP TO RIGHT BYTE OF ADDR
     1166 74 08 14         2821+       ST    DL2001+@DOP2(,@BR),@ARR         ADDR OF PARAM
     1169 76 08 8A         2822+       A     DL2C01(,@BR),@ARR               BUMP TO RETURN ADDR
     116C 74 08 81         2823+       ST    DL2910+@OP1(,@BR),@ARR          SAVE RETURN ADDR
                           2824+*
     116F 4C 01 1D 0000    2825+DL2001 MVC   DL2002+@DOP2(@DADDR,@BR),*-* SETUP ADDR OF DPL
     1174 5E 01 1D 8C      2826+       ALC   DL2002+@DOP2(@CADDR,@BR),DL2C05(,@BR) DUMP TO RIGHT END
     1178 4C 05 92 0000    2827+DL2002 MVC   DL2DPL(@DPLNG,@BR),*-*    MOVE USER DPL TO WORK AREA
     117D 5F 00 8F 86      2828+DL2005 SLC   DL2LST+@DSAD(DL2E01,@BR),DL2C48(,@BR) ADJUST SCTR/CYL
     1181 F2 82 07         2829+       JM    DL2006                          GO TO RESTORE TO CONTINUE
     1184 5E 00 8E 8A      2830+       ALC   DL2LST+@DCYL(DL2E01,@BR),DL2C01(,@BR) BUMP CYLINDER COUNT
     1188 D0 87 1E         2831+       B     DL2005(,@BR)                    BACK FOR NEXT CYLINDER
     118B 5E 00 8F 86      2832+DL2006 ALC   DL2LST+@DSAD(DL2E01,@BR),DL2C48(,@BR) RESTORE POSITIVE
```

```
                             2833+*
                             2834+*        GET THE LOGICAL SECTOR FROM THE DPL. THE NUMBER IS LEFT ADJUSTED
                             2835+*        TO COMAE IT MTN THE POINTER ESTABLISHED PRIOR TO AN ENTRY.
    118F 5C 00 1D 8F         2836+         MVC   DL2SEC(DL2E01,@BR),DL2LST+@DSAD(,@BR) GET SECTOR NUMBER
    1193 7C 00 8F            2837+         MVI   DL2LST+@DSAD(,@BR),@ZERO  CLEAR SECTOR BYTE
                             2838+*
                             2839+*        MOVE THE RELATIVE START TO THE DFL
                             2840+*
    1196 5E 01 8F 94         2841+         ALC   DL2LST+@DSAD(DL2E02,@BR),DL2RAD(,@BR) DL2RAD TO DPL
    119A 7D 18 1D            2842+         CLI   DL2SEC(,@BR),DL2E18       IS COUNT OVER A TRACK
    119D F2 82 08            2843+         JL    DL2008                    NO GO CHANGE A PHYSICAL ADOR
    11A0 5E 01 8F 85         2844+         ALC   DL2LST+@DSAD(DL2E02,@BR),DL2K80(,@BR) BUMP TRACK VALUE
    11A4 5F 00 1D 88         2845+         SLC   DL2SEC(1,@BR),DL2K18(,@BR) DECR BY TRACK VALUE
    11A8 5E 00 1D 1D         2846+DL2008 ALC   DL2SEC(1,@BR),DL2SEC(,@BR) SHIFT LEFT 1
    11AC 5E 00 1D 1D         2847+         ALC   DL2SEC(1,@BR),DL2SEC(,@BR) SHIFT LEFT
    11B0 5C 00 14 8F         2848+         MVC   DL2SAD(DL2E01,@BR),DL2LST+@DSAD(,@BR) GET SECTOR ADDRESS
                             2849+*
                             2850+*        ZERO OUT THE SECTOR COUNT AND LEAVE THE DISK. SPINDLE AND
                             2851+*        TRACK BITS AS IS TO BE RE INSERTED AFTER THE SECTOR HAS BEEN
                             2852+*        LOCATES.
                             2853+*
    11B4 7B 7C 8F            2854+         SBF   DL2LST+@DSAD(,@BR),DL2E7C TURN OFF
    11B7 7B 83 14            2855+         SBF   DL2SAD(,@BR),DL2TSD       OFF TRACK SPINDLE DISK
    11BA 5E 00 14 1D         2856+         ALC   DL2SAD(DL2E01,@BR),DL2SEC(,@BR) COMBINE SECTOR COUNTS
    11BE 7D 60 14            2857+DL2010 CLI   DL2SAD(,@BR),DL2E60       TEST IF TRACK CROSSED
    11C1 F2 82 08            2858+         JL    DL2100
                             2859+*
                             2860+*        INCREMENT TRACK BIT. OVERFLOW INTO THE CYLINDER COUNT.
                             2861+*
    11C4 5E 01 8F 85         2862+         ALC   DL2LST+@DSAD(DL2E02,@BR),DL2K80(,@BR)
    11C8 5F 00 14 83         2863+         SLC   DL2SAD(1,@BR),DL2K60(,@BR) DECR BY TRACK VALUE
                             2864+*
    11CC 5E 00 8F 14         2865+DL2100 ALC   DL2LST+@DSAD(1,@BR),DL2SAD(,@BR) INSERT SECTOR COUNT
                             2866+*
    11D0 F2 80 06            2867+DL2110 JC    DL2900,@NOP               CONVERSION SWITCH
         11D1                2868+DL2SWH EQU   DL2110+@Q                 ADDR OF Q CODE FOR SWITCH
    11D3 C0 87 0025          2869+         B     $DISKN                  GO PROCESS I/O
    11D7 11EC          11D8  2870+         DC    AL2(DL2LST)             ADDRESS OF DPL
    11D9 C2 01 0000          2871+DL2900 LA    *-*,@BR                  RESTORE CALLERS BASE
    11DD C0 87 0000          2872+DL2910 B     *-*        ************************************************
                             2873+************************************************************************
                             2874+*        CONSTANTS
                             2875+************************************************************************
    11E1 0060          11E2  2876+DL2K60 DC    XL2'0060'               SECTOR COUNT OF 24 LEFT ADJUSTD
    11E3 0080          11E4  2877+DL2K80 DC    XL2'0080'               BIT FOR INCREMENTING TRACK
    11E5 30            11E5  2878+DL2C48 DC    IL1'48'                 CYLINDER VALUE FOR 1 DISK
    11E6 0018          11E7  2879+DL2K18 DC    XL2'18'                 HEX SECTORS PER TRACK
    11E8 0001          11E9  2880+DL2C01 DC    IL2'1'                  CONSTANT FOR REGISTER MODE
    11EA 0005          11EB  2881+DL2C05 DC    IL2'5'                  DISP TO RIGHT END OF DPL
                             2882+************************************************************************
                             2883+*        WORK AREA
                             2884+************************************************************************
                       11EC  2885+DL2LST EQU   *                       LIST HIGH END
    11EC                     11F1  2886+DL2DPL DS    CL(@DPLNG)              WORKING DPL
                       11EE  2887+DL2PHY EQU   DL2LST+@DSAD            POINTER TO PHYSICAL DADDR
                       1173  2888+DL2SAD EQU   DL2001+@DOP2            SAVE SECTOR BYTE FROM DPI
```

```
                         117C 2889+DL2SEC EQU   DL2002+@DOP2           WORKING SECTOR ADDRESS FIELD
     11F2                11F3 2890+DL2RAD DS    CL(@DADDR)             USER RELATIVE STARTING ADDR.
                         11F4 2891+DL2END EQU   *                      END OF DL2ICS
                              2892+***                         END OF DL2ICS                           ***
```

```
     #UALLO C4BIN2 -- CONVERT DECIMAL TO BINARY


ERR LOC   OBJECT CODE      ADDR STMT SOURCE STATEMENT          VER 15, MOD 00  05/01/22  PAGE  64

                                2894 ******************************************************************************
                                2895 *   SERIALLY REUSABLE SUBROUTINE TO CONVERT A 4 BYTE DECIMAL VALUE TO *
                                2896 *   A 2 BYTE BINARY NUMBER.                                           *
                                2897 *   ON ENTRY @XR POINTS TO THE LEFT BYTE OF THE DECIMAL VALUE.        *
                                2898 *   IMBEDDED BLANKS ARE ALLOWED WHEN C4BLNK IS SET TO @NOP.           *
                                2899 *   ON RETURN C4BVAL IS THE RIGHT BYTE OF THE 2 BYTES BINARY VALUE.   *
                                2900 *   IN THE PROGRAM STATUS RESISTER (@PSR):                            *
                                2901 *   * NON-ZERO CONDITION - NO ERROR DETECTED.                         *
                                2902 *   * LOW CONDITION - MORE THAN 4 CHAR CONVERTED.                     *
                                2903 *   C4BNMC CONTAINS THE RESIDU NUMBER OF THE CONVERSION COUNT.        *
                                2904 *   THE 4 BYTES DECIMAL VALUE IS NOT ALTERED.                         *
                                2905 *   @XR IS NOT ALTERED.                                               *
                                2906 *   @BR IS SAVED AND RESTORED AT EXIT.                                *
                                2907 ******************************************************************************

                                2909 *
                                2910 *                        INITIALIZATION
                                2911 *
                           11F4 2912 C4BIN2 EQU   *                        MODULE ENTRY POINT
                           11F4 2913        USING C4BIN2,@BR               BASE VALUE
     11F4 34 01 1256             2914        ST    C4B800+@OP1,@BR          SAVE CALLERS BASE REGISTER
     11F8 C2 01 11F4             2915        LA    C4BIN2,@BR               LOAD BASE VALUE
     11FC 74 08 66               2916        ST    C4B850+@OP1(,@BR),@ARR   SAVE RETURN ADDRESS
     11FF 74 02 6E               2917        ST    C4BSAV(,@BR),@XR         SAVE VALUE OF POINTER
     1202 3C 0C 03CD             2918        MVI   $CAERR,@@E122            SET ERROR CODE IN CASE NEEDED
     1206 5C 01 6A 6B            2919        MVC   C4BVAL(C4BLVL,@BR),C4BINI(,@BR)   INIT VALUE TO ZERO
     120A 3C 04 1263             2920 C4B100 MVI   C4B900,4                 INIT CHARACTER COUNT
                                2921 *
                                2922 *               DETERMINE IF CHAR NUMERIC AND DECR CHAR COUNT
                                2923 *
     120E F2 80 32               2924 C4B200 JC    C4B600,@NOP              SET TO UCB IF IMBEDDED BLANKS
                                2925 *                                     * ALLOWED
     1211 BD F0 00               2926 C4B300 CLI   0(,@XR),C4BLOW           THIS CHAR NUMERIC ?
     1214 F2 82 35               2927        JL    C4B700                   NO, GOTO RETURN
     1217 5F 00 6F 4E            2928        SLC   C4B900(1,@BR),C4B590+@D1(,@BR)   DECR CHAR COUNT
     121B F2 82 35               2929        JL    C4B800                   BR TO ERROR EXIT IF TOO MANY
                                2930 *
                                2931 *                  MULTIPLY PREVIOUS VALUE BY TEN
                                2932 *
     121E 5E 01 6A 6A            2933        ALC   C4BVAL(C4BLVL,@BR),C4BVAL(,@BR) DOUBLE PREVIOUS VALUE
     1222 5C 01 68 6A            2934        MVC   C4BWRK(C4BLVL,@BR),C4BVAL(,@BR) SAVE DOUBLED VALUE
     1226 5E 01 6A 6A            2935        ALC   C4BVAL(C4BLVL,@BR),C4BVAL(,@BR) QUADRUPLE PREVIOUS VALUE
     122A 5E 01 6A 6A            2936        ALC   C4BVAL(C4BLVL,@BR),C4BVAL(,@BR) OCTUPLE PREVIOUS VALUE
     122E 5E 01 6A 68            2937        ALC   C4BVAL(C4BLVL,@BR),C4BWRK(,@BR) ADD IN SAVED DOUBLE
                                2938 *
                                2939 *                ADD IN VALUE. OF THIS CHAR AND INCR POINTER
                                2940 *
     1232 68 03 6C 00            2941        MNN   C4BCHR(,@BR),0(,@XR)       FETCH NUMERIC VALUE OF NEW CHAR
     1236 5E 01 6A 6C            2942        ALC   C4BVAL(C4BLVL,@BR),C4BCHR(,@BR)  INCR VALUE BY THIS CHAR
                                2943 *
     123A E2 02 01               2944        LA    @B1(,@XR),@XR            INCR POINTER TO NEXT CHAR
     123D D0 87 1A               2945        B     C4B200(,@BR)             GOTO DO IT AGAIN
                                2946 *
                                2947 *                  ROUTINE TO SCAN BLANKS
                                2948 *
     1240 E2 02 01               2949 C4B590 LA    @B1(,@XR),@XR            INCR POINTER TO NEXT CHAR
```

```
    1243 BD 40 00              2950 C4B600 CLI   0(,@XR),@BLANK           IS THIS CHAR BLANK ?
    1246 D0 01 1D              2951        BNE   C4B300(,@BR)             RETURN IF NOT
    1249 D0 87 4C              2952        B     C4B590(,@BR)             GET NEXT CHAR IF SO
                               2953 *
                               2954 *              ENDING ROUTINE
                               2955 *
    124C 74 02 68              2956 C4B700 ST    C4BLEN(,@BR),@XR         PLACE VALUE OF POINTER
    124F 5F 01 68 6E           2957        SLC   C4BLEN(2,@BR),C4BSAV(,@BR)  SUBTRACT ENTERING VALUE
    1253 C2 01 0000            2958 C4B800 LA    *-*,@BR                  RESTORE CALLERS BR
    1257 C0 87 0000            2959 C4B850 B     *-*                      RETURN TO CALLING ROUTINE
                               2960 *
                               2961 *              WORK AREA AND CONSTANT
                               2962 *
    125B              125C 2963 C4BWRK DS    CL2                      SAVE AREA FOR DOUBLED VALUE
                      125D 2964 C4BYT1 EQU   *                        FIRST BYTE OF BINARY VALUE
    125D              125E 2965 C4BVAL DS    CL2                      SAVE AREA FOR BINARY VALVE
    125F 00           125F 2966 C4BINI DC    XL1'00'                  INITIALIZE WA TO ZERO
    1260              1260 2967 C4BCHR DS    CL1                      SAVE AREA FOR EACH NEW CHAR
    1260              2968        ORG   *-1                      INITIALIZE
    1260 00           1260 2969        DC    XL1'00'                  * TO ZERO
    1261              1262 2970 C4BSAV DS    CL2                      SAVE AREA FOR XR
    1263              1263 2971 C4B900 DS    CL1                      SAVE AREA FOR CHAR COUNTER
                               2972 *
                               2973 *              EQUATES FOR C4BIN2
                               2974 *
                      125C 2975 C4BLEN EQU   C4BWRK                   ON RETURN WILL CONTAIN COUNT
                               2976 *                                * @XR INCREMENTED BY
                      0004 2977 C4BCHC EQU   4                        NUMBER OF CHAR TO CONVERT
                      00F0 2978 C4BLOW EQU   C'0'                     LOWEST NUMERIC CHARACTER
                      0002 2979 C4BLVL EQU   C4BVAL-C4BWRK            LENGTH OF BINARY VALUE
                      120F 2980 C4BLNK EQU   C4B200+@Q                LOCATION OF IMBEDDED BLANK INDR
                      0087 2981 C4BSPC EQU   @UCB                     MOVED TO C4BLNK TO ALLOW BLANKS
                      120B 2982 C4BNMC EQU   C4B100+@Q                LOCATION OF CONVERSION COUNT
                      0080 2983 C4BNOP EQU   @NOP                     CHANGED IF IMBEDDED BLANKS OK
                               2984 *                END
                               2985 *** END OF EXPANSION ***
```

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                          2987 *       $CANI
```

```
2989+**********************************************************************************
2990+*  5703-XM1    COPYRIGHT IBM CORP. 1970                                     *
2991+*                   REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083     *
2992+*                                                                           *
2993+**********************************************************************************
2994+*STATUS                                                                      *
2995+*    VERSION 1 MODIFICATION 0                                                *
2996+*                                                                            *
2997+*FUNCTION                                                                    *
2998+*    THE FUNCTION OF SCANIT IS TO SCAN PAST VALID DELIMITERS AND             *
2999+*    RETURN A POINTER TO THE FIRST CHARACTER THAT'S NOT A DELIMITER.         *
3000+*                                                                            *
3001+*ENTRY POINTS                                                                *
3002+*    * THE ENTRY POINT IS SCANIT.                                            *
3003+*    * THE CALLING SEQUENCE IS AS FOLLOWS:                                   *
3004+*              B      SCANIT                                                  *
3005+*      WITH REGISTER 2 (@XR) POINTING TO THE FIRST CHARACTER TO BE           *
3006+*      EXAMINED.                                                             *
3007+*                                                                            *
3008+*INPUT                                                                       *
3009+*    NONE                                                                    *
3010+*                                                                            *
3011+*OUTPUT                                                                      *
3012+*    NONE                                                                    *
3013+*                                                                            *
3014+*EXTERNAL REFERENCES                                                         *
3015+*    $CAERR - ERROR CODE SAVE AREA                                           *
3016+*                                                                            *
3017+*EXITS, NORMAL                                                               *
3018+*    NORMAL EXIT FROM SCANIT IS TO THE BYTE FOLLOWING THE BRANCH TO          *
3019+*    SCANIT IN THE CALLING ROUTINE. THE PSR (REGISTER 4) WILL CONTAIN        *
3020+*    A ZERO IF NO DELIMITERS WERE FOUND OR A HIGH CONDITION IF ONE OR        *
3021+*    MORE DELIMITERS WERE SCANNED.                                           *
3022+*                                                                            *
3023+*EXITS, ERROR                                                                *
3024+*    ERROR EXIT FROM SCANIT IS TO THE BYTE FOLLOWING THE BRANCH TO           *
3025+*    SCANIT IN THE CALLING ROUTINE. THE PSR WILL CONTAIN A LOW               *
3026+*    CONDITION.                                                              *
3027+*                                                                            *
3028+*TABLES/WORKAREAS                                                            *
3029+*    * SCACNT - AREA CONTAINING NUMBERS OF DELIMITERS SCANNED                *
3030+*    * SCAMMA - LOC WHERE SCACOM MAY BE MOVED IF ONE COMMA IS ALSO           *
3031+*      TO BE CONSIDERED A DELIMITER. MOVING SCACOF BACK INTO SCAMMA          *
3032+*      INDICATES THAT ONLY BLANKS SHOULD BE CONSIDERED DELIMITERS.           *
3033+*                                                                            *
3034+*ATTRIBUTES                                                                  *
3035+*    RELOCATABLE AND RE-USABLE                                               *
3036+*                                                                            *
3037+*CHARACTER CODE DEPENDENCY                                                    *
3038+*    THE OPERATION OF THIS MODULE DOES NOT DEPEND UPON A PARTICULAR          *
3039+*    INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET.                  *
3040+*                                                                            *
3041+*NOTES                                                                       *
3042+*    ERROR PROCEDURES                                                        *
3043+*        THE ONLY ERROR CONDITION DETECTED BY SCANIT IS THE CASE WHERE       *
3044+*        A CARRIAGE-RETURN CODE FOLLOWS A COMMA.  UPON RETURN TO THE         *
```

```
                          3045+*      CALLING ROUTINE, @PSR WILL BE SET TO A LOW CONDITION, THE       *
                          3046+*      ERROR CODE IS SET IN $CAERR, AND MG WILU BE POINTING TO THE     *
                          3047+*      CARRIAGE-RETURN CHARACTER.                                      *
                          3048+*                                                                      *
                          3049+*   REGISTER USAGE                                                     *
                          3050+*      REGISTER 2 (@XR) IS USED AS A POINTER ACROSS THE AREA BEING      *
                          3051+*      SCANNED FOR DELIMETERS.                                         *
                          3052+*                                                                      *
                          3053+*   SAVED/RESTORED AREAS                                               *
                          3054+*      UPON ENTRY TO SCANIT, REGISTER 8 (@ARR) IS SAVED AND USED AS     *
                          3055+*      THE RETURN ADDRESS.                                             *
                          3056+*                                                                      *
                          3057+*   MODIFICATION CONSIDERATIONS                                        *
                          3058+*      NONE                                                            *
                          3059+*                                                                      *
                          3060+*   REQUIRED MODULES                                                   *
                          3061+*      * @SYSEQ - COMMON SYSTEM EQUATES                                 *
                          3062+*      * @FXDEQ - FIXED NUCLEUS ADDRESSES EQUATES                       *
                          3063+*                                                                      *
                          3064+*   OTHER                                                              *
                          3065+*      SCANIT IS INITIALIZED TO BYPASS BLANKS ONLY. IF SCACOM IS        *
                          3066+*      MOVED TO SCAMMA, ONE COMMA WILL BE SCANNED ALONG WITH BLANKS.    *
                          3067+*      THE INSTRUCTION TO DO THIS IS AS FOLLOWS:                        *
                          3068+*            MVI    SCAMMA,SCACOM                                       *
                          3069+*                                                                      *
                          3070+*      TO DROP THE COMMA FROM ITS DELIMITER STATUS, SCACOF SHOULD BE    *
                          3071+*      MOVED TO SCAMMA, USING THE FOLLOWING INSTRUCTION:                *
                          3072+*            MVI    SCAMMA,SCACOF                                       *
                          3073+*                                                                      *
                          3074+************************************************************************


                          3076+*
                          3077+*                      EQUATES USED IN THIS SUBROUTINE
                          3078+*
                     0001 3079+SCAINC EQU    1                        TO INCREMENT POINTER
                     0001 3080+SCACOM EQU    @BNE                     SWITCH TO ALLOW SCANNING COMMA
                     0087 3081+SCACOF EQU    @UCB                     SWITCH TO SET OFF THE INDICATON
                          3082+*                                      * FOR SCANNING A COMMA
                     1264 3083+SCANIT EQU    *                        ENTRY POINT TO THIS SUBROUTINE
     1264 34 08 12A0      3084+       ST     SCA500+@OP1,@ARR         SAVE RETURN ADDRESS
     1268 34 02 12A2      3085+       ST     SCASVE,@XR               SAVE POINTER VALUE
     126C 3C 04 03CD      3086+       MVI    $CAERR,@@E110            SET ERROR CODE
     1270 F2 87 03        3087+       J      SCA200                   GO TO PROCESS
     1273 E2 02 01        3088+SCA100 LA     SCAINC(,@XR),@XR         INCREMENT POINTER TO NEXT CHAR
     1276 BD 40 00        3089+SCA200 CLI    0(,@XR),@BLANK           IS THIS CHAR BLANK ?
     1279 C0 81 1273      3090+       BE     SCA100                   YES, FETCH NEXT ONE
     127D BD 6B 00        3091+       CLI    0(,@XR),@COMMA           IS IT A COMMA ?
     1280 F2 87 10        3092+SCA250 JC     SCA400,@UCB              UCS TO RETURN -- OR NOP IF
                          3093+*                                      * SCAMMA IS ACTIVE AND CHAR
     1283 E2 02 01        3094+SCA300 LA     SCAINC(,@XR),@XR         INCREMENT POINTER TO NEXT CHAR
     1286 BD 40 00        3095+       CLI    0(,@XR),@BLANK           IS THIS CHAR A BLANK ?
     1289 C0 81 1283      3096+       BE     SCA300                   YES, FETCH NEXT ONE
     128D BD 1F 00        3097+       CLI    0(,@XR),@EOS+1           IS THIS EOS ?
     1290 F2 82 0A        3098+       JL     SCA500                   IF NOT, SKIP ERROR ROUTINE
     1293 34 02 12A4      3099+SCA400 ST     SCACNT,@XR               SAVE NEW POINTER VALUE
```

```
      SCANIT - DELIMETER SCAN MODULE

ERR LOC   OBJECT CODE    ADDR STMT SOURCE STATEMENT              VER 15, MOD 00  05/01/22  PAGE  69

    1297 0F 01 12A4 12A2      3100+       SLC   SCACNT(2),SCASVE           SET PSR TO EQUAL IF POINTER
                              3101+*                                      * NOT ADVANCED
    129D C0 87 0000           3102+SCA500 B     *-*                       YES, RETURN
                         1281 3103+SCAMMA EQU   SCA250+@Q                 TO SET SCAN COMMA INDICATOR
                              3104+*
                              3105+*                 SAVE AREA
                              3106+*
                         12A1 3107+SCASV1 EQU   *                         FIRST BYTE OF SCASVE
    12A1                 12A2 3108+SCASVE DS    CL2                       ORIGINAL POINTER VALUE SAVE
    12A3                 12A4 3109+SCACNT DS    CL2                       SAVE AREA FOR TOTAL CHAR SCAN
                              3110+***                      END OF SCANIT                       ***
```

```
                        3112 **********************************************************************
                        3113 *  5703-XM1    COPYRIGHT IBM CORP. 1970                              *
                        3114 *                 REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083 *
                        3115 *                                                                    *
                        3116 **********************************************************************
                        3117 *STATUS                                                              *
                        3118 *    VERSION 1 MODIFICATION 0                                         *
                        3119 *                                                                    *
                        3120 *FUNCTION                                                            *
                        3121 *    SUTOBA IS RESPONSIBLE FOR CHANGING THE APPROPRIATE INDICATORS AND *
                        3122 *    DISK ADDRESSES FOR #GUFUD AND #ERRPG, DEPENDING ON THE STATUS OF  *
                        3123 *    THE NUCLEUS WORKAREA INDICATORS. $NWRKR AND $NWRFT.              *
                        3124 *                                                                    *
                        3125 *ENTRY POINTS                                                        *
                        3126 *    * THE ENTRY POINT IS SUTOBA.                                     *
                        3127 *    * THE CALLING SEQUENCE IS AS FOLLOWS:                            *
                        3128 *         B     SUTOBA                                                *
                        3129 *                                                                    *
                        3130 *INPUT                                                               *
                        3131 *    INPUT TO SUTOBA IS THE STATUS OF $NWRKR AND $NWRFT, THE WORKAREA  *
                        3132 *    INDICATORS.                                                      *
                        3133 *                                                                    *
                        3134 *OUTPUT                                                              *
                        3135 *    OUTPUT FROM SUTOBA IS THE CORRECT SYSTEM MODE AND THE CORRECT     *
                        3136 *    DISK ADDRESSES OF #GUFUD AND #ERRPG IN THE NUCLEUS SET.          *
                        3137 *                                                                    *
                        3138 *EYTERWAL REFERENCES                                                 *
                        3139 *    * $CAERR - ERROR CODE SAVE AREA                                  *
                        3140 *    * $INDR3 - NUCLEUS BYTE CONTAINING $NWRKR AND $NWRKF, THE         *
                        3141 *              WORKAREA INDICATORS                                    *
                        3142 *    * $INDR2 - NUCLEUS BYTE CONTAINING $CMODE. SYSTEM MODE INDICATOR  *
                        3143 *    * $GUFIO - LOCATION IN NUCLEUS OF DISK ADDRESS OF #GUFUD          *
                        3144 *    * $EQMAD - LOCATION IN NUCLEUS OF DISK ADDRESS OF #ERRPG          *
                        3145 *    * $BSADR - SYSTEM PROGRAM FILE BASE ADDRESS                       *
                        3146 *    * #@GUFU - WORKAREA ADDRESS OF #GUFUD                             *
                        3147 *    * #@ERRP - WORKAREA ADDRESS OF #ERRPG                             *
                        3148 *    * #SGUFU - SYSTEM PROGRAM FILE ADDRESS OF #GUFUD                  *
                        3149 *    * #SERRP - SYSTEM PROGRAM FILE ADDRESS OF #ERRPG                  *
                        3150 *                                                                    *
                        3151 *EXITS,NORMAL                                                        *
                        3152 *    NORMAL EXIT FROM SUTOBA IS TO THE BYTE FOLLOWING THE BRANCH TO    *
                        3153 *    SUTOBA IN THE CALLING ROUTINE.                                   *
                        3154 *                                                                    *
                        3155 *EXITS, ERROR                                                        *
                        3156 *    ERROR EXIT FROM SUTOBA IS TO THE USER-DEFINED LABEL, SUTERR.      *
                        3157 *                                                                    *
                        3158 *TABLES/NORKAREAS                                                    *
                        3159 *    NONE                                                            *
                        3160 *                                                                    *
                        3161 *ATTRIBUTES                                                          *
                        3162 *    RELOCATABLE AND RE-USABLE                                        *
                        3163 *                                                                    *
                        3164 *CHARACTER CODE DEPENDENCY                                           *
                        3165 *    THE OPERATION OF THIS MODULE DOES NOT DEPEND UPON A PARTICULAR    *
                        3166 *    INTERNAL REPRESENTATION OF THE ETTETNAI. CHARACTER SET.          *
                        3167 *                                                                    *
```

```
                                  3168 *NOTES                                                          *
                                  3169 *    ERROR PROCEDURES                                           *
                                  3170 *      SUTOBA DETECTS AN ERROR CONDITION IF THE SYSTEM MODE UPON ENTRY*
                                  3171 *      IS BASIC AND THE CALLING ROUTINE HAS DELETED THE WOREAREA ON  *
                                  3172 *      EITHER R1 OR F1, WHEN THIS OCCURS, SUTOBA PLACES THE SYSTEM IN *
                                  3173 *      UTILITY MODE AND EXITS TO THE USER-DEFINED LABEL, SUTERR,      *
                                  3174 *      WITH THE APPROPRIATE ERROR CODE SET IN $CAERR.            *
                                  3175 *                                                                *
                                  3176 *    REGISTER USAGE                                              *
                                  3177 *      REGISTER 8 (@ARR) IS SAVED UPON ENTRY TO SUTOBA AND IS USED AS *
                                  3178 *      THE RETURN ADDRESS TO THE CALLING ROUTINE.               *
                                  3179 *                                                                *
                                  3180 *    SAVED/RESTORED AREAS                                        *
                                  3181 *      NONE                                                      *
                                  3182 *                                                                *
                                  3183 *    MODIFICATION CONSIDERATIONS                                 *
                                  3184 *      NONE                                                      *
                                  3185 *                                                                *
                                  3186 *    REQUIRED MODULES                                            *
                                  3187 *      * @SYSEQ - COMMON SYSTEM EQUATES                          *
                                  3188 *      * @FXDEQ - NUCLEUS FIXED ADDRESS EQUATES                  *
                                  3189 *      * @SPFEQ - SYSTEM PROGRAM FILE EQUATES FOR #GUFUD AND #ERRPG  *
                                  3190 *      * @ERMEQ - ERROR MESSAGE EQUATES (SELECTED ERROR CODES)  *
                                  3191 *      * @WKAEQ - SYSTEM WOREAREA EQUATES                        *
                                  3192 *                                                                *
                                  3193 *    OTHER                                                       *
                                  3194 *      NONE                                                      *
                                  3195 *****************************************************************************


                                  3197 *
                                  3198 *                      SWITCH TO BASIC MODE
                                  3199 *
                       12A5       3200 SUTOBA EQU   *                            ENTRY POINT FOR SUTOBA
         12A5 34 08 1307          3201        ST    SUT500+@OP1,@ARR             SAVE USERS RETURN ADDRESS
                                  3202 *
         12A9 3C A1 03CD          3203        MVI   $CAERR,@@E572                NO WA ON F1-UTIL ENTERED ERR
         12AD 39 80 03D6          3204        TBF   $INDR3,$NWRKF                IS A WORK AREA ON FIXED DISK ?
         12B1 F2 90 0B            3205        JF    SUT100                       IF NOT, JUMP TO SET ERROR CODE
                                  3206 *
         12B4 39 40 03D6          3207        TBF   $INDR3,$NWRKR                IS A WORK AREA ON REMOVABLE DK ?
         12B8 F2 10 12            3208        JT    SUT200                       IF YES, SKIP SETTING ERROR CODE
                                  3209 *
         12BB 3C A2 03CD          3210        MVI   $CAERR,@@E573                NO WA ON R1-UTIL ENTERED ERR
         12BF 38 02 03D5          3211 SUT100 TBN   $INDR2,$CMODE                IS THIS BASIC MODE ?
         12C3 F2 90 1A            3212        JF    SUT300                       NO, GO PUT USER IN UTILITY MOE
                                  3213 *
         12C6 3C 87 1301          3214        MVI   SUT400+@Q,@UCB               ELSE, SET SW TO TAKE ERROR EXIT
         12CA F2 87 13            3215        J     SUT300                       JUMP INTO UTILITY SECTION
                                  3216 *
         12CD 3A 02 03D5          3217 SUT200 SBN   $INDR2,$CMODE                SET BASIC MODE INDR ON
         12D1 0C 01 0582 130A     3218        MVC   $GUFIO-1(@DADDR),SUTWGU      STORE WORK FILE ADDRESSES OF
         12D7 0C 01 0471 130C     3219        MVC   $ERMAD-1(@DADDR),SUTWER      * GUFUDI AND ERRPGM IN NUCLEUS
         12DD F2 87 20            3220        J     SUT400                       RETURN TO CALLING ROUTINE
                                  3221 *
                                  3222 *                      SWITCH TO UTILITY MODE
```

```
     UALLOC ?????? - ????


ERR LOC   OBJECT CODE      ADDR STMT  SOURCE STATEMENT            VER 15, MOD 00  05/01/22  PAGE  72

                           3223 *
     12E0 3B 02 03D5       3224 SUT300 SBF    $INDR2,$CMODE               SET UTILITY MODE INDR ON
                           3225 *
     12E4 0E 01 130E 0587  3226        ALC    SUTPGU(@DADDR),$BSADR       INCR PROD FILE ADDRESSES OF
     12EA 0E 01 1310 0587  3227        ALC    SUTPER(@DADDR),$BSADR       * GUFUDI AND ERRPGM BY 4BSADR
                           3228 *
     12F0 0C 01 0582 130E  3229        MVC    $GUFIO-1(@DADDR),SUTPGU     STORE INCREMENTED ADDRESSES OF
     12F6 0C 01 0471 1310  3230        MVC    $ERMAD-1(@DADDR),SUTPER     * GUFUDI AND ERRPGM IN NUCLEUS
                           3231 *
     12FC 31 10 1308       3232        LIO    SUTCL1,@CLOFF               TURN OFF COMMAND LIGHT ONE
     1300 C0 80 0E02       3233 SUT400 BC     SUTERR,@NOP+*-*             IF BASIC DESIRED AND UTILITY
                           3234 *                                        * ENTERED. GO TO SUTERR
     1304 C0 87 0000       3235 SUT500 B      *-*                        ELSE, RETURN TO USER
                           3236 *
                           3237 *              CONSTANTS AND SAVE AREAS IN SOMA
                           3238 *
     1308 01          1308 3239 SUTCL1 DC     IL1'1'                     KEY NO. FOR COMMAND LIGHT ONE
     1309 0401        130A 3240 SUTWGU DC     AL(@DADDR)(#@GUFU)         SET UP CONSTANTS WHOSE ADDRESS
     130B 0441        130C 3241 SUTWER DC     AL(@DADDR)(#@ERRP)         * IS THE WORK AREA ADDRESS
                           3242 *
                      130D 3243 SUT600 EQU    *                          START OF GUFUDI SPF ADDR
     130D             130E 3244 SUTPGU DS     AL(@DADDR)                 AREA TO CONTAIN SYSTEM PROGRAM
     130D                  3245        ORG    SUT600                     * FILE DISK ADDRESS OF GUFUDI,
     130D 1880        130E 3246        DC     AL(@DADDR)(#$GUFU)         * INITIALLY
                           3247 *
                      130F 3248 SUT700 EQU    *                          START OR ERRPSM SPF ADDR
     130F             1310 3249 SUTPER DS     AL(@DADDR)                 AREA TO CONTAIN SYSTEM PROGRAM.
     130F                  3250        ORG    SUT700                     * FILE DISK ADDRESS OF ERRPGM
     130F 18C0        1310 3251        DC     AL(@DADDR)(#$ERRP)         * INITIALLY
```

UALLOC ?????? - ????

                        3253 * $ALPH

```
                           3255+****************************************************************************
                           3256+*  5703-XM1    COPYRIGHT IBM CORP. 1970                              *
                           3257+*               REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083  *
                           3258+*                                                                     *
                           3259+****************************************************************************
                           3260+*STATUS                                                                *
                           3261+*    VERSION 1 MODIFICATION 0                                          *
                           3262+*                                                                      *
                           3263+*FUNCTION                                                              *
                           3264+*    THE FUNCTION OF SALPHA IS TO SYNTAX CHECK AN 8 CHARACTER OR 6     *
                           3265+*    CHARACTER ALPHAMERIC PARAMETER DETERMINED BY THE ENTRY POINT,     *
                           3266+*    SALPH8 OR SALPH6 RESPECTIVELY. ENTRY AT SALPHA IMPLIES A REQUEST  *
                           3267+*    THAT THE FIRST CHARACTER BE ALPHABETIC. A SYNTACTICALLY CORRECT   *
                           3268+*    PARAMETER WILL BE SAVED AT SALPHR (LEFTMOST BYTE ADDRESS), THE    *
                           3269+*    COUNT OF THE NUMBER OF VALID CMARACTERS, IF NEEDED, IS FOOD IN    *
                           3270+*    SALCNT. UPON ENTRY, SALPHA REQUIRES INDEX RESISTER 2 (OM TO BE    *
                           3271+*    ADDRESSING THE FIRST CHARACTER 0, THE PARAMETER TO BE SYNTAX      *
                           3272+*    CHECKED. UPON NORMAL RETURN INDEX REGISTER 2 (@XR) WILL BE        *
                           3273+*    ADDRESSING THE FIRST NON-DELIMITER FOLLOWING THE PARAMETER (NOTE  *
                           3274+*    INPUT),                                                           *
                           3275+*                                                                      *
                           3276+*ENTRY POINTS                                                          *
                           3277+*    * SALPH8 - ENTRY POINT TO SYNTAX CHECK AN EIGHT CHARACTER         *
                           3278+*              ALPHAMERIC PARAMETER WHOSE FIRST CHARACTER MUST BE      *
                           3279+*              ALPHABETIC.                                             *
                           3280+*    * SALPH6 - ENTRY POINT TO SYNTAX CHECK A SIX CHARACTER            *
                           3281+*              ALPHAMERIC PARAMETER WHICH HAS NO RESTRICTIONS ON        *
                           3282+*              THE TYPE OF THE FIRST CHARACTER. (NOTE MODIFICA-        *
                           3283+*              TION CONSIDERATIONS)                                    *
                           3284+*                                                                      *
                           3285+*INPUT                                                                 *
                           3286+*    UPON ENTRY TO SALPHA, AT EITHER ENTRY POINT, INDEX REGISTER 2     *
                           3287+*    (@XR) SHOULD BE ADDRESSING THE LEFTMOST CHARACTER OF THE PARAMETER*
                           3288+*    TO BE SYNTAX CHECKED. ALSO, THE SWITCH 'SCAMMA' IN SCANIT SHOULD  *
                           3289+*    BE SET FOR THE TYPE OF DELIMITER SCAN REQUESTED AFTER THE SYNTAX  *
                           3290+*    CHECK. (IE. BLANKS ONLY OR BLANKS WITH 1 COMMA).                  *
                           3291+*                                                                      *
                           3292+*OUTPUT                                                                *
                           3293+*    OUTPUT FROM SALPHA INCLUDES THE SYNTAX CHECKED PARAMETER AT SALPHR*
                           3294+*    (LEFTMOST BYTE OF SAVE AREA) AND THE COUNT OF VALID CHARACTERS    *
                           3295+*    IN SALCNT, AND INDEX REGISTER 2 (@XR) WILL BE POINTING AT THE     *
                           3296+*    FIRST NON-DELIMITER AFTER THE PARAMETER. THE ONLY EXCEPTION TO    *
                           3297+*    THIS IS UPON DETECTION OF AN ERROR (SEE ERROR EXITS AND PROC.)    *
                           3298+*                                                                      *
                           3299+*EXTERNAL REFERENCES                                                   *
                           3300+*         SCANIT - DELIMITER SCAN MODULE                               *
                           3301+*         $CAERR - ADDR IN SYSTEM NUCLEUS-ERROR CODE SAVE AREA         *
                           3302+*                                                                      *
                           3303+*EXITS, NORMAL                                                         *
                           3304+*    NEXT SEQUENTIAL INSTRUCTION IN CALL ROUTINE WITH INDEX            *
                           3305+*    REGISTER 2 (@XR) POINTING TO THE NEXT NON-DELIMITER               *
                           3306+*    FOLLOWING THE PARAMETER AND WITH A NON-LOW CONDITION CODE         *
                           3307+*    IN THE PROGRAM STATUS RESISTER (@PSR),                            *
                           3308+*                                                                      *
                           3309+*EXITS, ERROR                                                          *
                           3310+*    NEXT SEQUENTIAL INSTRUCTION IN CALL ROUTINE WILH INDEX            *
```

```
3311+*    REGISTER 2 (@XR) POINTING TO THE LEFTMOST CHARACTER OF THE      *
3312+*    INVALID PARAMETER AND WITH A LOW CONDITION CODE IN THE          *
3313+*    PROGRAM STATUS REGISTER (@PSR),                                 *
3314+*                                                                    *
3315+*TABLES/WORK AREAS                                                   *
3316+*    ALL OF THE CONSTANTS AND WORK AREAS IN SALPHA ARE LOCATED AT THE *
3317+*    END OF THE MODULE AND ARE ADDRESSED BY INDEX REGISTER 1 (RBR).  *
3318+*                                                                    *
3319+*ATTRIBUTES                                                          *
3320+*    REUSABLE, RELOCATABLE                                           *
3321+*                                                                    *
3322+*CHARACTER CODE DEPENDENCY                                           *
3323+*    CHARACTER CODE DEPENDENCY CLASS - E                             *
3324+*    THE OPERATION OF THIS MODULE DEPENDS UPON THE FOLLOWING PROPERTIES*
3325+*    OF THE INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET:   *
3326+*    * THE FOLLOWING SPECIAL ALPHABETIC CHARACTERS ARE PART OF       *
3327+*      @SYSEQ AND ARE SPECIFICALLY COMPARED FOR:                     *
3328+*        * @DOLAR                                                    *
3329+*        * @NUMBR                                                    *
3330+*        * @ASIGN                                                    *
3331+*    * THE REMAINING-ALPHABETIC CHARACTERS ARE DEFINED TO BE         *
3332+*      INCLUSIVELY IN THE RANGE DEFINED BY THE FOLLOWING IN @SYSEQ:  *
3333+*        * @CHARA                                                    *
3334+*        * @CHARZ                                                    *
3335+*                                                                    *
3336+*    THE DECIMAL NUMBERS FALL INTO THE CATEGORY OF BEING GREATER     *
3337+*    THAN AN @CHARZ (IE. THIS IS DEFAULTED TO BY CHECKING METHOD)    *
3338+*    THE SPECIFIC INSTRUCTIONS WHICH REQUIRE MODIFICATION IF THESE   *
3339+*    PROPERTIES OF THE CHARACTER SET ARE CHANGED MAY BE IDENTIFIED BY: *
3340+*      * SAL200 - FOR THE THREE SPECIAL CHARACTERS                   *
3341+*      * SAL250 - FOR THE REMAINING ALPHABETIC RANGE                 *
3342+*      * SAL425 - BRANCHES 'TO' THIS LOCATION IMPLY DEFAULT TO NUMERIC *
3343+*                                                                    *
3344+*NOTES                                                               *
3345+*    ERROR PROCEDURES                                                *
3346+*      THE FOLLOWING ERROR CONDITIONS WILL RESULT IN AN ERROR CODE   *
3347+*      BEING SET IN $CAERR AND AN ERROR EXIT BEING MADE (SEE EDITS,  *
3348+*      ERROR):                                                       *
3349+*      * A NON-ALPHABETIC FIRST CHARACTER WHEN ENTRY WAS AT          *
3350+*        SALPH8.                                                     *
3351+*      * A NON-ALPHAMERIC CHARACTER EMBEDDED IN A PARAMETER WHICH     *
3352+*        SALPH8 WAS CALLED TO CHECK.                                 *
3353+*      * A NON-ALPHAMERIC CHARACTER BEING FIRST OR EMBEDDED IN A      *
3354+*        PARAMETER WHICH SALPH6 WAS CALLED TO CHECK.                  *
3355+*      * A PARAMETER OF GREATER THAN EIGHT CHARACTERS WHEN ENTRY      *
3356+*        WAS AT SALPH8.                                              *
3357+*      * A PARAMETER OF GREATER THAN SIX CHARACTERS WHEN ENTRY        *
3358+*        WAS AT SALPH6.                                              *
3359+*                                                                    *
3360+*    REGISTER USAGE                                                  *
3361+*      INDEX REGISTER 1 (@BR) IS USED AS A BASE REGISTER THROUGHOUT   *
3362+*      THE EXEQUTION OF THE MODULE. IT IS SAVED FOR THE CALL PROGRAM  *
3363+*      UPON ENTRY AND RESTORED UPON EXIT.                            *
3364+*      INDEX REGISTER 2 (@XR) IS USED AS A PARAMETER PASSING REGISTER. *
3365+*      UPON ENTRY IT CONTAINS THE ADDRESS OF THE LEFTMOST BYTE OF     *
3366+*      PARAMETER TO BE SYNTAX CHECKED AND UPON EXIT IT CONTAINS THE   *
```

SALPHA - SYNTAX CHECKER MODULE

```
                                3367+*     ADDRESS OR THE FIRST NON-DELIMITER FOLLOWING THE PARAMETEP.      *
                                3368+*      (NOTE ERROR EXITS AND PROCEDURES),                             *
                                3369+*                                                                     *
                                3370+*    SAVED/RESTORED AREAS                                             *
                                3371+*     N/A                                                             *
                                3372+*                                                                     *
                                3373+*    MODIFICATION CONSIDERATIONS                                      *
                                3374+*     BECAUSE OF ITS CHARACTER CODE DEPENDENCY AND PARAMETER LENGTH   *
                                3375+*     QUALIFICATIONS, ONE MUST TAKE SPECIAL CARE IN MODIFYING SALPHA, *
                                3376+*     ESPECIALLY THE CONSTANTS AND WORK AREAS AND THEIR RE-INITIAL,   *
                                3377+*     IZATION. SALPHA IS MOST COMMONLY USED TO SYNTAX FILENAMES,      *
                                3378+*     PASSWORDS, AND VOL-IDS AND IS THEREFORE USED BY THE MODULE      *
                                3379+*     SUFFER (FILE SPECIFICATION SYNTAX CHECKER). THEREFORE, ANY      *
                                3380+*     SIGNIFICANT CHANGE IN SALPHA WILL REQUIRE AN INVESTIGATION INTO *
                                3381+*     ITS USE AND IMPACT ON SUFFER.                                   *
                                3382+*        SPECIAL NOTE: AN IRREGULAR USE OF SALPHA WHICH CAN BE        *
                                3383+*        EFFECTED IS THE SYNTAY CHECK OF A PARAMETER WITH A MAXIMUM   *
                                3384+*        OF 10 CHARACTERS. THIS IS DONE BY MODIFYING THE Q-CODE OF    *
                                3385+*        THE INSTRUCTION AT SAL450 PRIOR TO ENTRANCE AT SALPH6, WITH  *
                                3386+*        X'0A' OR ITS EQUIVALENT. (NOTE: ONE SUCH MODULE WHICH        *
                                3387+*        USES THIS OPTION IS UINITL)                                  *
                                3388+*                                                                     *
                                3389+*    REQUIRED MODULES                                                 *
                                3390+*     SCANIT - DELIMITER SCAN ROUTINE                                 *
                                3391+*     @DIREQ - SYSTEM LIBRARY DIRECTORY EQUATES                       *
                                3392+*     @ERMEQ - ERROR MESSAGE EQUATES                                  *
                                3393+*     @FXDEQ - COMMON CORE LOCATIONS WITHIN THE SYSTEM NUCLEUS        *
                                3394+*     @SYSEQ - COMMON SYSTEM SOFTWARE EQUATES                         *
                                3395+*                                                                     *
                                3396+*    OTHER                                                            *
                                3397+*     N/A                                                             *
                                3398+************************************************************************

                                3400+************************************************************************
                                3401+*
                                3402+*                    SALPNA MODULE EQUATES
                                3403+*
                                3404+************************************************************************
                      0008      3405+SALCT8 EQU   ##LUEN                    COUNT COMPARE FIELD
                                3406+*
                      0006      3407+SALCT6 EQU   @VOLID                    COUNT COMPARE FIELD

                                3409+************************************************************************
                                3410+*
                                3411+*                    INITIALIZATION OF MODULE
                                3412+*
                                3413+************************************************************************

                                3415+*SALPH8 ENTER CHECK                       FILENAME OR PASSWORD
                      1311      3416+SALPH8 EQU   *                         MODULE ENTRY POINT
                                3417+*** END OF EXPANSION ***
        1311 3A 80 13CC         3418+     SBN   SALIDR,SAL008            SET ON SALPH8 INDR
                                3419+*
                                3420+*SALPH6 ENTER BASE-SALBSE,EXIT-SALND,@BR,,@ARR   VOL-ID CHECK
                      1331      3421+     USING SALBSE,@BR               BASE ADDRESS SPECIFICATION
```

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     SALPHA - SYNTAX CHECKER MODULE


ERR LOC   OBJECT CODE     ADDR STMT SOURCE STATEMENT            VER 15, MOD 00  05/01/22  PAGE  77

                          1315 3422+SALPH6 EQU    *                           MODULE ENTRY POINT
     1315 34 01 13C7            3423+       ST     SALND0+@OP1,@BR             SAVE ABA
     1319 C2 01 1331            3424+       LA     SALBSE,@BR                  LOAD BASE RESISTER
     131D 74 08 9A              3425+       ST     SALND2+@OP1(,@BR),@ARR      SAVE RETURN ADDRESS
                                3426+*** END OF EXPANSION ***
     1320 74 02 34              3427+       ST     SAL375+@OP1(,@BR),@XR       SAVE ERROR POINTER


                                3429+*******************************************************************************
                                3430+*
                                3431+*              INITIALIZE WORK AREAS AND VARIABLE INSTRUCTIONS
                                3432+*
                                3433+*******************************************************************************
     1323 7C 40 A8              3434+SAL100 MVI    SALPR7(,@BR),@BLANK         BLANK OUT SALPAR FOR PROCESSING
     1326 5C 08 A7 A8           3435+       MVC    SALPR6(##LPEN+@B1,@BR),SALPR7(,@BR)
     132A 7C 00 9C              3436+       MVI    SALCNT(,@BR),@ZERO          ZERO OUT COUNTER
     132D 5C 01 63 AA           3437+       MVC    SAL525+@OP1(2,@BR),SALPHS(,@BR) MODIFY MOVE OF CHARACTER


                                3439+*******************************************************************************
                                3440+*
                                3441+*              CHECK EBCDIC CHARACTERS
                                3442+*
                                3443+*******************************************************************************
                                3444+*
                          1331 3445+SALBSE EQU    *                           MODULE BASE ADDR
     1331 BD 5B 00              3446+SAL200 CLI    @ZERO(,@XR),@DOLAR          IS IT A '$' ?
     1334 F2 81 32              3447+       JE     SAL400                      YES, PROCESS CHARACTER
     1337 BD 7B 00              3448+       CLI    @ZERO(,@XR),@NUMBR          IS IT A '#' ?
     133A F2 81 2C              3449+       JE     SAL400                      YES, PROCESS CHARACTER
     133D BD 7C 00              3450+       CLI    @ZERO(,@XR),@ASIGN          IS IT A '@' ?
     1340 F2 81 26              3451+       JE     SAL400                      YES, PROCESS CHARACTER
                                3452+*
     1343 BD C1 00              3453+       CLI    @ZERO(,@XR),@CHARA          IS IT AN ALPHA (A-Z) ?
     1346 F2 82 53              3454+SAL250 JL     SAL750                      NO, CHECK FOR DELIMITERS
     1349 BD E9 00              3455+       CLI    @ZERO(,@XR),@CHARZ          IS IT AN ALPHA (A-Z) ?
     134C F2 04 1A              3456+       JNH    SAL400                      YES, PROCESS CHARACTER
     134F 78 80 9B              3457+       TBN    SALIDR(,@BR),SAL008         ENTERED AT SALPH8 ?
     1352 F2 90 17              3458+       JF     SAL425                      NO, CHECK IF NUMERIC
                                3459+*
     1355 78 01 9B              3460+       TBN    SALIDR(,@BR),SALFST         WAS FIRST CHAR FOUND ALPHA ?
     1358 3C 00 03CD            3461+       MVI    $CAERR,@@E100               ALPHA CHAR REQUIRED--ERROR
     135C F2 10 0D              3462+       JT     SAL425                      YES, CONTINUE
     135F 75 04 16              3463+SAL350 L      SALERR(,@BR),@PSR           LOAD ERROR CODE - LOW
     1362 C2 02 0000            3464+SAL375 LA     *-*,@XR                     RESTORE ERROR POINTER
     1366 F2 87 58              3465+       J      SAL800                      TAKE ERROR FAIT


                                3467+*******************************************************************************
                                3468+*
                                3469+*              PROCESS ALPHAMERIC CHARACTER
                                3470+*
                                3471+*******************************************************************************
     1369 7A 01 9B              3472+SAL400 SBN    SALIDR(,@BR),SALFST         SET ON ALPHA :NOR
                                3473+*
     136C 5E 00 9C 9E           3474+SAL425 ALC    SALCNT(1,@BR),SAL001(,@BR) ADD 1 TO CHARACTER COUNTER
     1370 78 80 9B              3475+       TBN    SALIDR(,@BR),SAL008         WAS ENTRY AT SALPH8 ?
     1373 D0 90 52              3476+       BF     SAL450(,@BR)                NO, CHECK COUNT FOR VALUE OF SIX
     1376 7D 08 9C              3477+       CLI    SALCNT(,@BR),##LPEN         HAS COUNT EXCEEDED 8 ?
```

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       SALPHA - SYNTAX CHECKER MODULE


ERR LOC   OBJECT CODE     ADDR STMT SOURCE STATEMENT           VER 15, MOD 00  05/01/22  PAGE  78

    1379 3C 02 03CD            3478+      MVI    $CAERR,@@E102               PASSWORD/FILENAME LENGTH ERROR
    137D D0 84 2E              3479+      BH     SAL350(,@BR)                YES, TAKE ERROR EXIT
    1380 F2 87 0A              3480+      J      SAL500                      NO, CONTINUE PROCESSING
    1383 7D 06 9C              3481+SAL450 CLI   SALCNT(,@BR),@VOLID         HAS COUNT EXCEEDED 6 ?
    1386 3C 03 03CD            3482+      MVI    $CAERR,@@E103               INVALID VOL-ID LENGTH
    138A D0 84 2E              3483+      BH     SAL350(,@BR)                YES, TAKE ERROR EXIT

                              3485+*
                              3486+*                    MODIFY MOVE OF CHARACTER
                              3487+*
    138D 5E 01 63 9E          3488+SAL500 ALC   SAL525+@OP1(2,@BR),SAL001(,@BR)
    1391 2C 00 0000 00        3489+SAL525 MVC   *-*,@ZERO(1,@XR)            MOVE CHARACTER TO OUTPUT AREA
    1396 E2 02 01             3490+      LA     @B1(,@XR),@XR               INCREMENT XR BY I
    1399 D0 87 00             3491+      B      SAL200(,@BR)                CHECK NEXT CHARACTER

                              3493+*****************************************************************************
                              3494+*
                              3495+*                    CHECK ERRORS AND BYPASS DELIMITERS
                              3496+*
                              3497+*****************************************************************************
    139C 7D 00 9C             3498+SAL750 CLI   SALCNT(,@BR),@ZERO          ANY VALID CHARACTERS ?
    139F 3C 10 03CD           3499+SAL755 MVI   $CAERR,@@E130               REQUIRED PARAM MISSING
    13A3 F2 01 17             3500+      JNE    SAL775                      YES, BYPASS DELIMITERS, EYIT
    13A6 BD 1E 00             3501+      CLI    @ZERO(,@XR),@EOS            IS IT EOS ?
    13A9 F2 81 0E             3502+      JE     SAL760                      YES, ERROR EVIL
    13AC 78 80 9B             3503+      TBN    SALIDR(,@BR),SAL008         ENTERED AT SALPH8 ?
    13AF 3C 00 03CD           3504+      MVI    $CAERR,@@E100               ALPHABETIC CHAR REQUIRED
    13B3 F2 10 04             3505+      JT     SAL760                      ERROR EYIT
    13B6 3C 01 03CD           3506+      MVI    $CAERR,@@E101               ALPHAMERIC CHAR REQUIRED
    13BA D0 87 2E             3507+SAL760 B     SAL350(,@BR)                ERROR EYIT
    13BD C0 87 1264           3508+SAL775 B     SCANIT                      BYPASS DELIMITERS

                              3510+*****************************************************************************
                              3511+*
                              3512+*               SET OFF INDICATORS FOR POSSIBLE SALDHA RE-ENTRY
                              3513+*
                              3514+*****************************************************************************
    13C1 7C 00 9B             3515+SAL800 MVI   SALIDR(,@BR),@ZERO

                              3517+*****************************************************************************
                              3518+*
                              3519+*                    END OF MODULE PROCESSING
                              3520+*
                              3521+*****************************************************************************
                              3522+*SALND  EXIT  @BR,,RETURN                    EXIT
    13C4 C2 01 0000           3523+SALND0 LA    *-*,@BR                     RESTORE @BR
    13C8 C0 87 0000           3524+SALND2 B     *-*                         RETURN TO CALLING PROGRAM
                              3525+*** END OF EXPANSION ***

                              3527+*****************************************************************************
                              3528+*
                              3529+*                    DATA CONSTANTS, BUFFERS, AND WORK AREAS
                              3530+*
                              3531+*****************************************************************************
    13CC                13CC 3532+SALIDR DS    CL1                         1 BYTE OF FLAGS
    13CC                     3533+      ORG    *-1
```

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      SALPHA - SYNTAX CHECKER MODULE

ERR LOC   OBJECT CODE      ADDR STMT SOURCE STATEMENT           VER 15, MOD 00  05/01/22  PAGE  79

    13CC 00               13CC 3534+          DC    XL1'00'                    INITIALIZED TO ZERO

                          0080 3536+SAL008 EQU   X'80'                        ENTRY POINT INDICATOR
                               3537+*                                         * 0 - ENTERED AT SALPH6
                               3538+*                                         * 1 - ENTERED AT SALPH8
                          0001 3539+SALFST EQU   X'01'                        FIRST CHARACTER IS ALPHA / INDR
                               3540+*                                         * 0 - CHARACTER IS NOT ALPHA
                               3541+*                                         * 1 - CHARACTER IS ALPHA
    13CD                  13CD 3542+SALCNT DS    CL1                          BYTE CHARACTER COUNTER
    13CD                       3543+          ORG   *-1
    13CD 00               13CD 3544+          DC    XL1'00'                    INITIALIZED TO ZERO
    13CE 0001             13CF 3545+SAL001 DC    XL2'0001'                    COUNTER INCREMENT
                          13D0 3546+SALPHR EQU   *
    13D0                  13D9 3547+          DS    CL(##LUEN+2*@B1)           SYNTAX SAVE UNIT
    13DA 13CF             13DB 3548+SALPHS DC    AL2(SALPHR-1)                ADDR FOR MODIFYING MOVE
                          13D9 3549+SALPR7 EQU   SALPHR+##DPEN+2*@B1          ADDR IN SALPHR FOR CLANKINS
                          13D8 3550+SALPR6 EQU   SALPHR+##DPEN+@B1            * OUT THE FIELD
                          1347 3551+SALERR EQU   SAL250+@Q                    ADDR ERROR CODE FOR LOAD
                               3552+***                      END OF SALPHA                            ***
```

```
                          3554 ***************************************************************************
                          3555 * 5703-XM1      COPYRIGHT IBM CORP. 1970                              *
                          3556 *                   REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083  *
                          3557 *                                                                     *
                          3558 ***************************************************************************
                          3559 *STATUS                                                               *
                          3560 *    VERSION 1 MODIFICATION 0                                          *
                          3561 *                                                                     *
                          3562 *FUNCTION                                                             *
                          3563 *    * SDISKS CHECKS THE INPUT LINE BUFFER FOR A VALID COMPLETE DISK  *
                          3564 *      SPECIFICATION.                                                 *
                          3565 *    * THE DISK AND DRIVE BITS ARE SET IN A TWO-BYTE DISK ADDRESS     *
                          3566 *      FIELD IN THE OUTPUT AREA.                                      *
                          3567 *    * THE DISK LABEL IS PLACED IN THE OUTPUT AREA.                   *
                          3568 *    * A POINTER TO THE VOL-ID TABLE ENTRY FOR THE SPECIFIED DISK IS  *
                          3569 *      PLACED IN THE OUTPUT AREA.                                     *
                          3570 *                                                                     *
                          3571 *ENTRY POINTS                                                         *
                          3572 *    SDISKS -- THIS IS THE ONLY ENTRY POINT                           *
                          3573 *    THE CALLING SEQUENCES ARE AS FOLLOWS:                            *
                          3574 *    *    B    SDISKS          - CHECK FOR A VALID COMPLETE DISK      *
                          3575 *         MVI SDISKP,SDIUCB    - CHECK FOR A VALID DISK-DRIVE         *
                          3576 *         B    SDISKS           SPECIFICATION ONLY                    *
                          3577 *                               SPECIFICATION                         *
                          3578 *    *    MVI SDIBLN,SDIVOF    - DISALLOW A COMMA SCAN FOLLOWING THE  *
                          3579 *         B    SDISKS           DISK LABEL                            *
                          3580 *    *    MVI SDINID,SDIVOF    - CHECK IN THE VOL-ID TABLE FOR THE    *
                          3581 *         B    SDISKS           SPECIFIED DISK LABEL ON THE SPECIFIED *
                          3582 *                               DISK                                  *
                          3583 *                                                                     *
                          3584 *INPUT                                                                *
                          3585 *    * THE INPUT IS A POINTER IN THE INDEX REGISTER TO THE FIRST BYTE *
                          3586 *      OF THE DISK SPECIFICATION.                                     *
                          3587 *    * UPON EXIT FROM THIS ROUTINE THE INDEX REGISTER IS POINTING     *
                          3588 *      TO THE NEXT PARAMETER IN THE INPUT LINE                        *
                          3589 *    * THE BASE REGISTER IS SAVED AND RESTORED BEFORE RETURNING       *
                          3590 *                                                                     *
                          3591 *OUTPUT                                                               *
                          3592 *    SDITBL - TABLE CONTAINING THE FOLLOWING--LEFT BYTE               *
                          3593 *    *    BYTE DISPLACEMENT INTO THE VOL-ID TABLE OF THE LEFT BYTE OF *
                          3594 *         THE ENTRY FOR THE SPECIFIED DISK. -- ONE BYTE -- PRECEDED   *
                          3595 *         BY ONE BYTE OF ZERO.                                        *
                          3596 *    *    DISK ADDRESS -- TWO BYTES -- ZERO EXCEPT FOR DISK-DRIVE BITS *
                          3597 *    *    DISK LABEL -- SIX BYTES -- PADDED WITH BLANKS               *
                          3598 *    THE ABOVE ELEMENTS ARE ORDERED IN THE TABLE AS THEY ARE LISTED   *
                          3599 *                                                                     *
                          3600 *EXTERNAL REFERENCES                                                  *
                          3601 *         SCANIT   - ENTRY TO SCAN VALID DELIMITERS                   *
                          3602 *         SALPH6   - ENTRY TO SYNTAX CHECK VOL-ID                     *
                          3603 *         $CAERR   - ADDRESS OF ERROR CODE SAVE ARIA                  *
                          3604 *         $VOLID   - ADDRESS OF TABLE CONTAINING CURRENT DISK LABELS  *
                          3605 *         $OKSIZ   - ADDRESS OF DISK SIZE INDICATOR                   *
                          3606 *         SALPHR   - ADDRESS OF DISK LABEL IN SALPHA                  *
                          3607 *                                                                     *
                          3608 *EXITS, NORMAL                                                        *
                          3609 *    * NORMAL EXIT IS TO THE INSTRUCTION FOLLOWING THE ALL TO SDISKS  *
```

```
3610 *   * THE PROGRAM STATUS REGISTER (PSR) IS SET HIGH            *
3611 *   * THE INDEX REGISTER IS POINTING TO THE NEXT PARAMETER OR @EOS  *
3612 *   * THE BASE REGISTER IS RESTORED                           *
3613 *                                                             *
3614 *EXITS, ERROR                                                 *
3615 *   * ERROR EXIT IS TO THE INSTRUCTION FOLLOWING THE CALL TO SDISKS  *
3616 *   * THE PROGRAM STATUS REGISTER (PSR) IS SET LOW            *
3617 *   * THE INDEX REGISTER IS POINTING TO THE PARAMETER OR DELIMITER IN *
3618 *     ERROR FOR SYNTAX ERRORS. FOR NON-SYNTAX ERRORS IT IS POINTING  *
3619 *     OUTSIDE THE INPUT LINE BUFFER.                          *
3620 *   * THE BASE REGISTER IS RESTORED.                          *
3621 *   * THE APPROPRIATE ERROR CODE IS SET AT $CAERR             *
3622 *                                                             *
3623 *TABLES/WORKAREAS                                             *
3624 *   SDITBL -- SEE OUTPUT FOR DESCRIPTION                      *
3625 *                                                             *
3626 *ATTRIIBUTES                                                  *
3627 *   SDISKS IS REUSABLE                                        *
3628 *                                                             *
3629 *CHARACTER CODE DEPENDENCY                                    *
3630 *   THE OPERATION OF THIS MODULE DEPENDS UPON AN INTERNAL     *
3631 *   REPRESENTATION OF THE EXTERNAL CHARACTER SET WHICH IS EQUIVALENT *
3632 *   TO THE ONE USED AT ASSEMBLY TIME. THE CODING HAS BEEN ARRANGED  *
3633 *   SO THAT REDEFINITION OF CHARACTER CONSTANTS, BY REASSEMBLY, WILL *
3634 *   RESULT IN A CORRECT MODULE FOR THE NEW DEFINITIONS.       *
3635 *                                                             *
3636 *NOTES                                                        *
3637 *   ERROR PROCEDURES                                          *
3638 *   * THE INDEX REGISTER IS SET FOR PROCEDURES ON DISPLAYING AN  *
3639 *     UP-ARROW.                                                *
3640 *   * THE PROGRAM STATUS REGISTER IS SET LOW.                 *
3641 *   * THE APPROPRIATE ERROR CODE IS SET AT $CAERR.            *
3642 *                                                             *
3643 *   REGISTER USAGE                                            *
3644 *   * THE BASE REGISTER IS SAVED AND RESTORED                 *
3645 *   * THE INDEX REGISTER IS SET UP ACCORDING TO THE EXIT FROM SDISKS *
3646 *     SEE EXITS,NORMAL AND EYITS,ERROR                        *
3647 *   * THE PROGRAM STATUS REGISTER IS SET TO INDICATE WHETHER OR NOT  *
3648 *     AN ERROR WAS FOUND. HIGH-NO ERROR --- LOW-ERROR         *
3649 *   * THE ADDRESS RECALL REGISTER IS STORED IN THE RETURN BRANCH  *
3650 *     INSTRUCTION UPON ENTRY TO SDISKS                        *
3651 *                                                             *
3652 *   SAVED/RESTORED AREAS                                      *
3653 *     N/A                                                     *
3654 *                                                             *
3655 *   MODIFICATION CONSIDERATIONS                               *
3656 *     SDISKS IS USED BY MOST FUNCTIONS WHICH REQUIRE A COMPLETE DISK *
3657 *     SPECIFICATION AND MAY BE USED BY FUNCTIONS REQUIRING A PARTIAL *
3658 *     DISK SPECIFICATION (I.E. R1).                           *
3659 *                                                             *
3660 *   REQUIRED MODULES                                          *
3661 *     SCANIT - SCAN BLANKS AND COMMA                          *
3662 *     SALPHA - CHECK VALIDITY OF DISK LABEL                   *
3663 *     @SYSEQ - COMMON SYSTEM EQUATES                          *
3664 *     @FXDEQ - SYSTEM NUCLEUS ADDRESSES AND INDICATOR EQUATES *
3665 *     @ERMEQ - ERROR MESSAGE EQUATES                          *
```

```
                                3666 *                                                                    *
                                3667 *    OTHER                                                           *
                                3668 *      N/A                                                           *
                                3669 ********************************************************************************

                                3671 ********************************************************************************
                                3672 *
                                3673 *                         INITIALIZATION
                                3674 *
                                3675 ********************************************************************************
                                3676 *SDISKS ENTER BASE,SDISKS,EXIT,SDIEX, RW?PARR
                      13DC 3677            USING SDISKS,@BR               BASE ADDRESS SPECIFICATION
                      13DC 3678 SDISKS EQU   *                           MODULE ENTRY POINT
    13DC 34 01 14B2              3679            ST    SDIEX0+@OP1,@BR        SAVE PAR
    13E0 C2 01 13DC              3680            LA    SDISKS,@BR            LOAD BASE REGISTER
    13E4 74 08 DA                3681            ST    SDIEX2+@OP1(,@BR),@ARR  SAVE RETURN ADDRESS
                                3682 *** END OF EXPANSION ***
    13E7 74 02 C4                3683            ST    SDI550+@OP1(,@BR),@XR   SAVE THE VALUE IN THE INDEX MEG
    13EA 5F 08 F0 F0             3684            SLC   SDIRBL(,@BR),SDIRBL(SDILN9,@BR)  CLEAR OUTPUT FIELD
                                3685 *
                                3686 *                    DETERMINE DISK AND DRIVE
                                3687 *
    13EE BD D9 00                3688            CLI   0(,@XR),@CHARR        IS THE REMOV. DISK SPECIFIED ?
    13F1 F2 81 09                3689            JE    SDI100               IF SO GO TO DETERMINE DRIVE
    13F4 BD C6 00                3690            CLI   0(,@XR),@CHARF        IS THE FIXED DISK SPECIFIED ?
    13F7 F2 01 0C                3691            JNE   SDI150               RETURN TO CALLING PROGRAM
    13FA 7A 01 EA                3692 SDI050 SBN   SDIDRK(,@BR),SDIMK1    SET BIT ON FOR FIXED DISK
    13FD BD F1 01                3693 SDI100 CLI   1(,@XR),SDI001        IS DRIVE 1 SPECIFIED ?
    1400 F2 81 28                3694            JE    SDI200               IF $O INCREMENT POINTER
    1403 BD F2 01                3695            CLI   1(,@XR),SDI002        IS DRIVE 2 SPECIFIED ?
    1406 3C 11 03CD              3696 SDI150 MVI   $CAERR,@@E131        SET ERROR CODE FOR INVALID
                                3697 *                                      DISK-DRIVE SPECIFICATION
    140A F2 01 94                3698            JNE   SDI600               EXIT TO CALLING PROGRAM
    140D 7A 02 EA                3699            SBN   SDIDRK(,@BR),SDIMK2   SET BIT FOR DRIVE 2
                                3700 *
                                3701 * TEST IF DRIVE REQUESTED IS WITHIN THE SYSTEM CONFIGURATION
                                3702 *
    1410 3C 39 03CD              3703            MVI   $CAERR,@@E242        SET ERROR CODE
    1414 78 01 EA                3704            TBN   SDIDRK(,@BR),SDIMK1   TEST OF FIXED DISK
    1417 F2 90 0A                3705            JF    SDI160               NO - TAKE JUMP
    141A 38 10 03D7              3706            TBN   $DKSIZ,$DK800        TEST IF F2 IS IN SYSTEM
    141E F2 10 0A                3707            JT    SDI200               JUMP IF F2 ON SYSTEM
    1421 F2 87 75                3708            J     SDI530               F2 NOT PRESENT - TAKE ERR EXIT
    1424 39 18 03D7              3709 SDI160 TBF   $DKSIZ,$DK600+$DK800  TEST IF R2 IS ON SYSTEM
    1428 F2 10 6E                3710            JT    SDI530               NO - TAKE ERROR EXIT

                                3712 ********************************************************************************
                                3713 *
                                3714 *                    CHECK VOLID SPECIFIED
                                3715 *
                                3716 ********************************************************************************
    142B E2 02 02                3717 SDI200 LA    SDIX02(,@XR),@XR      INCREMENT @XR BY 2
    142E 3C 01 1281              3718            MVI   SCAMMA,SCACOM        SET INDICATOR TO ALLOW SCANNING
                                3719 *                                      * OF COMMAS
    1432 C0 87 1264              3720            B     SCANIT               SCAN PAST BLANKS AND COMMAS
```

```
    1436 F2 82 76         3721        JL    SDIEX0                    IF DANGLING COMMA -- RETURN
    1439 F2 80 7B         3722 SDI255 JC    SDI800,@NOP               JUMP IF ONLY DISK-DRIVE SPEC
    143C F2 01 11         3723        JNZ   SDI270                    IF THERE IS NO ERROR GOTO SALPHA
    143F 3C 10 03CD       3724        MVI   $CAERR,@@E130             SET ERROR CODE - 'MISSING PARM'
    1443 BD 1E 00         3725        CLI   0(,@XR),@EOS              CHECK FOR EOS DIRECTLY FOLLOWING
                          3726 *                                     * DISK-DRIVE SPEC
    1446 F2 81 58         3727        JE    SDI600                    TAKE ERROR EXIT
    1449 3C 11 03CD       3728 SDI260 MVI   $CAERR,@@E131             SET ERROR CODE - 'INV PARAMETER'
    144D F2 87 4D         3729        J     SDI550                    GO TO SET UP INDEX REGISTER
    1450 F2 87 0B         3730 SDI270 JC    SDI300,@UCB               UNLESS RESET ALLOW COMMA SCAN
    1453 3C 87 1451       3731        MVI   SDIBLN,@UCB               RESET INDR TO ALLOW COMMA SCAN
    1457 3C 87 1281       3732        MVI   SCAMMA,SCACOF             SCAN BLANKS ONLY
    145B 74 02 C4         3733        ST    SDI550+@OP1(,@BR),@XR     SAVE POINTER TO VOLUME LABEL
    145E C0 87 1315       3734 SDI300 B     SALPH6                    GO TO SALPHA TO CHECK SYNTAX OR
                          3735 *                                     * VOLID
    1462 4C 05 F0 13D7    3736        MVC   SDIRBL(@VOLID,@BR),SALPHR+@VOLID+@B1  PLACE VALID FROM
                          3737 *                                         * SALPHA INTO SDITBK
    1467 F2 82 45         3738        JL    SDIEX0                    IF ERROR WAS FOUND BY SALPHA
                          3739 *                                     * RETURN TO CALLING ROUTINE
    146A F2 01 06         3740 SDI350 JNZ   SDI400                    IF THERE IS NO ERROR FROM SALPHA
                          3741 *                                     * FIND DISPLACEMENT INTO TABLE
    146D BD 1E 00         3742        CLI   0(,@XR),@EOS              TEST FOR EOS
    1470 D0 01 6D         3743        BNE   SDI260(,@BR)              IF OTHER THAN EOS TAKE ERR EXIT
                          3744 *
                          3745 *                  DISPLACEMENT INTO VALID TABLE
                          3746 *
    1473 5C 00 E8 EA      3747 SDI400 MVC   SDITBL(1,@BR),SDIDRK(,@BR)   MOVE DISK DRIVE SPECIFICATION
                          3748 *                                         * TO FIRST BYTE OF TABLE
    1477 5E 00 E8 E8      3749        ALC   SDITBL(,@BR),SDITBL(1,@BR)   ADD THIS SPECIFICATION TO
    147B 5E 00 E8 E8      3750        ALC   SDITBL(,@BR),SDITBL(1,@BR)   * ITSELF 3 TIMES WHICH GIVES
    147F 5E 00 E8 E8      3751        ALC   SDITBL(,@BR),SDITBL(1,@BR)   * THE DISPLACEMENT INTO THE
                          3752 *                                         * VOLID TABLE
                          3753 *
                          3754 *                  CHECK VOL-ID TABLE
                          3755 *
    1483 F2 87 25         3756 SDI450 JC    SDI750,@UCB               IF INDICATOR IS NOT SET,SKIP
                          3757 *                                     ROUTINE FOR CHECKING VALID
    1486 5E 01 B1 E8      3758        ALC   SDI500+@OP1(,@BR),SDITBL(@CADDR,@BR)   ADD DISPLACEMENT
                          3759 *                                         * INTO VALID TABLE
    148A 1D 05 03FB F0    3760 SDI500 CLC   SDIID5,SDIRBL(@VOLID,@BR) IS VALID GIVEN IN VALID TABLE ?
    148F 3C 28 03CD       3761        MVI   $CAERR,@@E216             SET ERROR CODE FOR ENTRY NOT IN
                          3762 *                                     VALID IN CASE NEEDED
    1493 7C 87 A8         3763        MVI   SDINID(,@BR),SDIUCB       RESET INDICATOR FOR CHECKING
                          3764 *                                     * VOLID
    1496 F2 81 12         3765        JE    SDI750                    RETURN TO CALLING ROUTINE
    1499 5C 01 C4 00      3766 SDI530 MVC   SDI550+@OP1(@CADDR,@BR),SDISKS(,@BR)   INCREMENT POINTER
                          3767 *                                         * PAST BUFFER

                          3769 *
                          3770 *                  EXIT ROUTINE
                          3771 *
    149D C2 02 0000       3772 SDI550 LA    *-*,@XR                   RESTORE INDEX RESISTER
    14A1 7D F2 E7         3773 SDI600 CLI   SDITBL-1(,@BR),SDI002     SET @PSR TO BRANCH LOW -- ERROR
    14A4 F2 81 08         3774        JE    SDIEX0                    RETURN TO CALLER
    14A7 3C 80 143A       3775 SDI650 MVI   SDISKP,@NOP               RESET INDR TO CHECK VOLID
    14AB 5F 01 B1 E8      3776 SDI750 SLC   SDI500+@OP1(,@BR),SDITBL(@CADDR,@BR)   REINITIALIZE POINTER
```

```
     UALLOC SDISKS - ???
```

```
                              3777 *SDIEX0 EXIT  @BR,,RETURN
     14AF C2 01 0000          3778 SDIEX0 LA    *-*,@BR                        RESTORE @BR
     14B3 C0 87 0000          3779 SDIEX2 B     *-*                            RETURN TO CALLING PROGRAM
                              3780 *** END OF EXPANSION ***

                              3782 *
                              3783 *                     SYNTAX CHECK FOR DISK-DRIVE SPEC
                              3784 *
     14B7 D0 01 CB            3785 SDI800 BNZ   SDI650(,@BR)                   NO ERROR -- RETURN TO CALLER
     14BA BD 1E 00            3786        CLI   0(,@XR),@EOS                   CHECK FOR @EOS
     14BD D0 81 CB            3787        BE    SDI650(,@BR)                   TAKE THE NORMAL EXIT
     14C0 D0 87 6D            3788        B     SDI260(,@BR)                   GO TO SET THE ERROR CODE
                              3789 *
                              3790 *
                              3791 *                     EQUATED CONSTANTS
                              3792 *
          0009                3793 SDILN9 EQU   9                              LENGTH OF OUTPUT FIELD
          0002                3794 SDIX02 EQU   X'02'                          LENGTH FOR INCREMENTING @XR
                              3795 *
                              3796 *                     CONSTANTS AND WORK AREAS
                              3797 *
     14C3 00             14C3 3798        DC    XL1'00'                        BYTE FOR ADDING DISPLACEMENT TO
                              3799 *                                           * A TWO BYTE FIELD
     14C4               14CC 3800 SDIRBL DS    CL(SDILN9)                     SPACE ALLOCATED FOR OUTPUT TABLE
                              3801 *
                              3802 *                     EQUATES
                              3803 *
          14C4                3804 SDITBL EQU   SDIRBL-8                       LEFTMOST BYTE OF OUTPUT TABLE
          14C6                3805 SDIDRK EQU   SDITBL+2                       BYTE CONTAINING DISK-DRIVE BITS
          14C7                3806 SDIVID EQU   SDITBL+3                       AREA CONTAINING VOLID
          00F1                3807 SDI001 EQU   C'1'                           SYMBOL FOR DRIVE 1
          00F2                3808 SDI002 EQU   C'2'                           SYMBOL FOR DRIVE 2
          03FB                3809 SDIID5 EQU   $VOLID+5                       RIGHT BYTE OF VOLID IN TABLE
          0087                3810 SDIUCB EQU   @UCB                           INDICATOR FOR NOT CHECKING VOLID
          0080                3811 SDIVOF EQU   @NOP                           INDICATOR FOR CHECKING VOLID
          143A                3812 SDISKP EQU   SDI255+@Q                      Q-CODE OF AN INSTRUCTION
          1451                3813 SDIBLN EQU   SDI270+@Q                      INDR TO SET FOR SCANNING BLANKS
          146B                3814 SDISLH EQU   SDI350+@Q                      INDR TO SET TO ALLOW SLASH
                              3815 *                                           * FOLLOWING VOLID
          0001                3816 SDIMK1 EQU   X'01'                          MASK FOR FIYED DISK
          0002                3817 SDIMK2 EQU   X'02'                          MASK FOR DRIVE 2
          1484                3818 SDINID EQU   SDI450+@Q                      Q-CODE OF AN INSTRUCTION
```

```
                          3820 *******************************************************************************
                          3821 *  5703-XM1     COPYRIGHT IBM CORP. 1970                          *
                          3822 *                      REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083  *
                          3823 *                                                                 *
                          3824 *******************************************************************************
                          3825 *STATUS                                                          *
                          3826 *    VERSION 1 MODIFICATION 0                                     *
                          3827 *                                                                 *
                          3828 *FUNCTION                                                         *
                          3829 *    * SCYLCK CHECKS AND CONVERTS A TRACK SPECIFICATION TO A TWO-BYTE  *
                          3830 *      PHYSICAL DISK ADDRESS.                                      *
                          3831 *    * AS A SPECIAL CASE SCYLCK WILL ALSO CHECK AND CONVERT A TRACK   *
                          3832 *      SIZE SPECIFICATION TO A CYLINDER SIZE SPECIFICATION          *
                          3833 *                                                                 *
                          3834 *ENTRY POINTS                                                     *
                          3835 *    SCYLCK -- THIS IS THE ONLY ENTRY POINT                        *
                          3836 *    THE CALLING SEQUENCES ARE AS FOLLOWS:                         *
                          3837 *    *    B    SCYLCK           - PROCESS A TRACK ADDRESS SPECIFICATION  *
                          3838 *    *    MVI SCYEXT,SCYNOP   - PROCESS A TRACK SIZE SPECIFICATION   *
                          3839 *         B    SCYLCK                                              *
                          3840 *                                                                 *
                          3841 *INPUT                                                            *
                          3842 *    * THE INPUT IS A POINTER IN THE INDEX RESISTER TO TIE FIRST BYTE  *
                          3843 *      OF A DECIMAL TRACK SPECIFICATION                            *
                          3844 *    * THE BASE REGISTER IS SAVED AND RESTORED                     *
                          3845 *                                                                 *
                          3846 *OUTPUT                                                           *
                          3847 *    SCYADR - TWO-BYTE PHYSICAL DISK ADDRESS - LABEL REFERENCES THE  *
                          3848 *                  RIGHT BYTE. THIS ADDRESS SPECIFIES THE CYLNDER AND  *
                          3849 *                  TRACK ONLY. THE DISK AND DRIVE BITS HAVE NOT BEEN SET.  *
                          3850 *                                                                 *
                          3851 *EXTERNAL REFERENCES                                              *
                          3852 *        SCANIT - ENTRY TO SCAN VALID DELIMITERS                   *
                          3853 *        C4BIN2 - ENTRY TO CONVERT FROM DECIMAL TO BINARY          *
                          3854 *        C4BVAL - ADDRESS OF CONVERTED VALUE FROM C4BIN2           *
                          3855 *        $CAERR - ADDRESS OF ERROR CODE SAVE AREA                  *
                          3856 *        $DKSIZ - ADDRESS OF DISK SIZE INDICATOR                   *
                          3857 *                                                                 *
                          3858 *EXITS, NORMAL                                                    *
                          3859 *    * NORMAL EXIT IS TO THE INSTRUCTION FOLLOWING THE CALL TO SCYLCK  *
                          3860 *    * THE PROGRAM STATUS REGISTER (PSR) IS SET HIGH                *
                          3861 *    * THE INDEX REGISTER IS POINTING TO THE NEXT PARAMETER OR @EOS  *
                          3862 *    * THE BASE REGISTER IS RESTORED                               *
                          3863 *                                                                 *
                          3864 *EXITS, ERROR                                                     *
                          3865 *    * ERROR EMIT IS TO THE INSTRUCTION FOLLOWING THE CALL TO SCYLCK  *
                          3866 *    * THE PROGRAM STATUS REGISTER IS SET LOW                       *
                          3867 *    * THE INDEX. REGISTER IS POINTING TO THE PARAMETER OR DELIMITER IN*
                          3868 *      ERROR FOR SYNTAX ERRORS. FOR NON-SYNTAX ERRORS IT IS POINTING  *
                          3869 *      OUTSIDE THE INPUT LINE BUFFER.                              *
                          3870 *    * THE BASE REGISTER IS RESTORED                               *
                          3871 *    * THE APPROPRIATE ERROR CODE IS SET AT $CAEFF                 *
                          3872 *                                                                 *
                          3873 *TABLES/WORKAREA                                                  *
                          3874 *        SCYVAL - BINARY VALUE CONVERTED BY C4BIN2 - TWO-BYTES      *
                          3875 *        SCYADR - PHYSICAL DISK ADDRESS--SEE OUTPUT                *
```

```
                          3876 *                                                          *
                          3877 *ATTRIBUTES                                                *
                          3878 *    SCYLCK IS REUSABLE                                    *
                          3879 *                                                          *
                          3880 *CHARACTER CODE DEPENDENCY                                 *
                          3881 *    THE OPERATION OF THIS MODULE DEPENDS UPON AN INTERNAL *
                          3882 *    REPRESENTATION OF THE EXTERNAL CHARACTER SET WHICH IS EQUIVALENT *
                          3883 *    TO THE ONE USED AT ASSEMBLY TIME. THE CODING HAS BEEN ARRANGED *
                          3884 *    SO THAT REDEFINITION OF CHARACTER CONSTANTS, BY REASSEMBLY, WILL *
                          3885 *    RESULT IN A CORRECT MODULE FOR THE NEW DEFINITIONS.   *
                          3886 *                                                          *
                          3887 *NOTES                                                     *
                          3888 *    ERROR PROCEDURES                                      *
                          3889 *     * THE INDEY REGISTER IS SET FOR PROCEDURES ON DISPLAYING AN *
                          3890 *       UP-ARROW                                           *
                          3891 *     * THE PROGRAM STATUS REGISTER IS SET LOW             *
                          3892 *     * THE APPROPRIATE ERROR CODE IS SET AT $CAERR        *
                          3893 *                                                          *
                          3894 *    RESISTER USAGE                                        *
                          3895 *     * THE BASE REGISTER IS SAVED AND RESTORED.           *
                          3896 *     * THE INDEX REGISTER IS SET UP ACCORDING TO THE EXIT FROM SCYLCK.*
                          3897 *       SEE EXITS, NORMAL AND EXITS, ERROR.                *
                          3898 *     * THE PROGRAM STATUS REGISTER IS SET TO INDICATE WHETHER OR NOT *
                          3899 *       AN ERROR WAS DETECTED. HIGH-NO ERROR --- LOW-ERROR *
                          3900 *     * THE ADDRESS RECALL REGISTER IS STORED IN THE RETURN BRANCH *
                          3901 *       INSTRUCTION UPON ENTRY TO SCYLCK.                  *
                          3902 *                                                          *
                          3903 *    SAVED/RESTORED AREA                                   *
                          3904 *       N/A                                                *
                          3905 *                                                          *
                          3906 *    MODIFICATION CONSIDERATIONS                           *
                          3907 *       SCYLCK IS USED BY MOST FUNCTIONS WHICH ALLOW A TRACK *
                          3908 *       SPECIFICATION PERTAINING TO AN ADDRESS OR SIZE     *
                          3909 *                                                          *
                          3910 *    REQUIRED MODULES                                      *
                          3911 *     * SCANIT - SCAN BLANKS AND COMMA                     *
                          3912 *     * C4BIN2 - CONVERT DECIMAL VALUE TO BINARY           *
                          3913 *     * @SYSEQ - COMMON SYSTEM EQUATES                     *
                          3914 *     * @FXDEQ - SYSTEM NUCLEUS LOCATION EQUATES           *
                          3915 *     * @ERMEQ - ERROR MESSAGE EQUATES                     *
                          3916 *                                                          *
                          3917 *    OTHER                                                 *
                          3918 *       UPON RETURN FROM SCYLCK, A ZERO CONDITION IN THE PROGRAM STATUS*
                          3919 *       REGISTER WAS SET BY SCANIT INDICATING THAT A NEITHER A BLANK *
                          3920 *       NOR COMMA FOLLOWED THE TRACK SPECIFICATION.  IN THIS CASE THE *
                          3921 *       PERFORMED ROUTINE MUST DETERMINE WHETHER OR NOT THIS *
                          3922 *       CONSTITUTES AN ERROR CONDITION.                    *
                          3923 ***********************************************************************


                          3925 *
                          3926 *                    INITIALIZATION
                          3927 *
                          3928 *SCYLCK ENTER BASE-SCY025,EXIT-SCYEX,@BR,,@ARR
                     14EC 3929        USING SCY025,@BR              BASE ADDRESS SPECIFICATION
                     14CD 3930 SCYLCK EQU *                        MODULE ENTRY POINT
```

```
      UALLOC ?????? - ????


ERR LOC   OBJECT CODE     ADDR STMT  SOURCE STATEMENT            VER 15, MOD 00  05/01/22  PAGE  87

    14CD 34 01 1575       3931         ST    SCYEX0+@OP1,@BR           SAVE @BR
    14D1 C2 01 14EC       3932         LA    SCY025,@BR               LOAD BASE REGISTER
    14D5 74 08 8D         3933         ST    SCYEX2+@OP1(,@BR),@ARR   SAVE RETURN ADDRESS
                          3934 *** END OF EXPANSION ***
    14D8 74 02 58         3935         ST    SCY330+@OP1(,@BR),@XR    SAVE POINTER TO PARAMETER
    14DB C0 87 11F4       3936         B     C4BIN2                   CONVERT PARAMETER TO BINARY
                          3937 *
                          3938 *                 TEST VALIDITY OF SPECIFICATION
                          3939 *
    14DF F2 82 8D         3940         JL    SCY500                   IF THERE WERE MORE THAN FOUR
                          3941 *                                      *  DIGITS RETURN TO THE CALLER
    14E2 F2 01 07         3942         JNZ   SCY025                   NO ERROR FROM C4BIN2--CONTINUE
    14E5 3C 0B 03CD       3943         MVI   $CAERR,@@E120            SET ERROR CODE FOR NUMERIC CHAR
                          3944 *                                      * NEEDED BUT NOT FOUND
    14E9 F2 81 83         3945         JZ    SCY500                   IF FIRST CHARACTER WAS NOT
                          3946 *                                      * NUMERIC RETURN TO CALLER
    14EC 4C 01 8F 125E    3947 SCY025 MVC   SCYVAL(@DADDR,@BR),C4BVAL   SAVE CONVERTED VALUE FROM C4BIN
    14F1 5C 00 4A 0A      3948        MVC   SCY323+@Q(1,@BR),SCYEXT(,@BR)  SAVE INDR-TO SET ERROR CODE
    14F5 F2 87 12         3949 SCY035 JC    SCY050,@UCB              UNLESS INDICATED-SKIP DECR VALUE
    14F8 3C 11 03CD       3950        MVI   $CAERR,@@E131            ERROR CODE--'INV PARAMETER'
    14FC 5D 01 8F 97      3951        CLC   SCYVAL(@DADDR,@BR),SCYZER(,@BR)  ZERO SPECIFIED ?
    1500 F2 81 3E         3952        JE    SCY330                   RETURN TO CALLING ROUTINE
    1503 5F 01 8F 95      3953        SLC   SCYVAL(@DADDR,@BR),SCYINC(,@BR)  DECR VALUE BY 1
    1507 F2 87 08         3954        J     SCY100                   SKIP ALT TRACK CHECK
    150A 1D 01 125E 99    3955 SCY050 CLC   C4BVAL,SCY007(@DADDR,@BR)  DOES THE CONVERTED PARAMETER
                          3956 *                                      * REFERENCE AN ALTERNATE TRACK
    150F F2 04 1F         3957        JNH   SCY320                   ERROR IF ALTERNATE TRACK SPEC
                          3958 *
                          3959 *                 DETERMINE SIZE OF DISK
                          3960 *
    1512 3D 04 03D7       3961 SCY100 CLI   $DKSIZ,$DK400            IS IT A 200 CYLINDER DISK?
    1516 F2 82 0A         3962        JL    SCY200                   IF NOT TEST AGAIN FOR SIZE
    1519 5D 01 8F 9B      3963        CLC   SCYVAL(,@BR),SCYSZL(SCYLN2,@BR)  IS THE TRACK SPEC
                          3964 *                                      * VALID FOR THIS SIZE
    151D F2 84 0A         3965        JH    SCY280                   INVALID SPECIFICATION GO TO
                          3966 *                                      * ERROR ROUTINE
    1520 F2 87 28         3967        J     SCY350                   NOW CONVERT TRACK SPECIFICATION
    1523 5D 01 8F 9D      3968 SCY200 CLC   SCYVAL(,@BR),SCYSZM(SCYLN2,@BR)  IS THE TRACK SPEC
                          3969 *                                      * VALID FOR 100 CYLINDER DISK ?
    1527 F2 04 21         3970        JNH   SCY350                   IF SO GO TO CONVERT TRACK
                          3971 *                                      * SPECIFICATION
                          3972 *
                          3973 *                 ERROR ROUTINE
                          3974 *
    152A 3C 78 03CD       3975 SCY280 MVI   $CAERR,@@E482            SET ERROR CODE TO INVALID
                          3976 *                                      * CYLINDER FOR DISK
    152E F2 87 04         3977        J     SCY323                   RETURN TO CALLING ROUTINE
    1531 3C 7C 03CD       3978 SCY320 MVI   $CAERR,@@E486            SET ERROR CODE FOR TRACK NOT
                          3979 *                                      * USABLE
    1535 F2 87 04         3980 SCY323 JC    SCY325,@UCB              BRANCH UNLESS INDR IS SET
    1538 3C 7D 03CD       3981        MVI   $CAERR,@@E487            RESET ERROR CM WISH JSPL$ET
    153C 4C 01 58 14CD    3982 SCY325 MVC   SCY330+@OP1(@CADDR,@BR),SCYLCK   INCREMENT POINTER PAST BUF
    1541 C2 02 0000       3983 SCY330 LA    *-*,@XR                  RESTORE INDE REGISTER
    1545 7D 02 95         3984 SCY340 CLI   SCYINC(,@BR),SCYLN2      SET PSR TO BRANCH LOW
    1548 F2 87 24         3985        J     SCY500                   RETURN TO CALLING ROUTINE
                          3986 *
```

```
                                   3987 *                          CHANGE TO CYLINDER -- HEAD SPECIFICATION
                                   3988 *
     154B 0C 01 157D 125E          3989 SCY350 MVC    SCYADR,C4BVAL(SCYLN2)      TRANSFER CONVERTED PARAMETER
                                   3990 *                                        * TO SCYLCK'S WORK AREA
     1551 1F 00 157E 92            3991        SLC    SCYCTR,SCYCTR(SCYLN1,@BR)  ZERO FIELD FOR COUNTER
     1556 1E 01 157D 91            3992 SCY400 ALC    SCYADR,SCYADR(SCYLN2,@BR)  ADD THE BINARY VALUE TO ITS
     155B 1E 00 157E 95            3993        ALC    SCYCTR,SCYINC(SCYLN1,@BR)  INCREMENT COUNTER BY 1
     1560 7D 07 92                 3994        CLI    SCYCTR(,@BR),SCYMX7        COMPARE COUNTER TO 7
     1563 C0 82 1556               3995        BL     SCY400                     IF LESS THAN 7 ADD AGAIN
                                   3996 *
                                   3997 *                          CLEAN UP AND RETURN TO CALLING ROUTINE
                                   3998 *
     1567 3C 01 1281               3999 SCY450 MVI    SCAMMA,SCACOM              SET INDICATOR TO ALLOW SCANNING
                                   4000 *                                        * OF COMMAS
     156B C0 87 1264               4001 SCY483 B      SCANIT                     SCAN PAST BLANKS AND COMMAS
     156F 7C 87 0A                 4002 SCY500 MVI    SCYEXT(,@BR),@UCB          RESET INDR SET ON BY CALLER
                                   4003 *SCYEXT EXIT  @BR,,RETURN
     1572 C2 01 0000               4004 SCYEX0 LA     *-*,@BR                    RESTORE @BR
     1576 C0 87 0000               4005 SCYEX2 B      *-*                        RETURN TO CALLING OROGRAM
                                   4006 *** END OF EXPANSION ***
                                   4007 *
                                   4008 *                          CONSTANTS AND WORK AREAS
                                   4009 *
     157A              157B        4010 SCYVAL DS     CL(@DADDR)                 SAVE AREA FOR TRACK SPEC
     157C              157D        4011 SCYADR DS     CL(@DADDR)                 DISK ADDRESS MOVED TO AND
                                   4012 *                                        * CONVERTED HERE
     157E              157E        4013 SCYCTR DS     CL1                        SPACE ALLOCATED FOR COUNTER IN
                                   4014 *                                        * ADDITION LOOP
     157F              157F        4015 SCYIND DS     CL1                        INDR TO SUBROUTINE CAUSING 8?
     1580 0001         1581        4016 SCYINC DC     XL(@DADDR)'01'             FOR INCREMENTING COUNTER
     1582 0000         1583        4017 SCYZER DC     XL(@DADDR)'00'             INVALID NO. OF TRACKS REQUESTED
     1584 0007         1585        4018 SCY007 DC     XL(@DADDR)'07'             INVALID TRACK SPECIFICATION
     1586 0195         1587        4019 SCYSZL DC     XL(@DADDR)'0195'           MAXIMUM SPECIFICATION FOR A 200
                                   4020 *                                        * CYLINDER DISK
     1588 00CD         1589        4021 SCYSZM DC     XL(@DADDR)'00CD'           MAXIMUM SPECIFICATION FOR A 100
                                   4022 *                                        * CYLINDER DISK
                                   4023 *
                                   4024 *                          EQUATES FOR SCYLCK
                                   4025 *
     0001               4026 SCYLN1 EQU    1                          LENGTH OF COUNTER
     0002               4027 SCYLN2 EQU    2                          LENGTH OF CONVERTED VALUE
     0007               4028 SCYMX7 EQU    X'07'                      VALUE OF COUNTER WHEN PARAMETER
                                   4029 *            CONVERSION IS COMPLETE
     14F6               4030 SCYEXT EQU    SCY035+@Q                  INDR FOR SPECIAL CASE
     0080               4031 SCYNOP EQU    @NOP                       INDR FOR SETTING SPECIAL CASE
```

```
                              4033 *********************************************************************
                              4034 *  5703-XM1     COPYRIGHT IBM CORP. 1970                          *
                              4035 *               REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083 *
                              4036 *                                                                 *
                              4037 *********************************************************************
                              4038 *STATUS                                                           *
                              4039 *    VERSION 1 MODIFICATION 0                                      *
                              4040 *                                                                 *
                              4041 *FUNCTION                                                         *
                              4042 *    * TKSAVE IS A COMMON SAVE ARE AND EQUATE MAODULE USED TP PROVIDE *
                              4043 *      COMMUNICATION BETWEEN MODULES AND THE VOLUME LABEL.         *
                              4044 *    * TKSAVE IS USED AS A PARAMETER HOLDER MODULE FOR MODULES USING *
                              4045 *      THE MODULE UTVTOC (VTOC ROUTINES)                           *
                              4046 *    * THE PARAMETERS PASSED TO TKSAVE BY THE VTOC ROUTINE USERS   *
                              4047 *      ARE AS FOLLOWS: BIS FILES INDICATOR, INITIAL CYLINDER NUMBER, *
                              4048 *      NUMBER OF CYLINDERS TO PROCESS, CORE ADDRESS OF VOLUME LABEL, *
                              4049 *      DISK ADDRESS OF VOLUME LABEL.                               *
                              4050 *                                                                 *
                              4051 *ENTRY POINTS                                                     *
                              4052 *    NONE                                                         *
                              4053 *                                                                 *
                              4054 *INPUT                                                            *
                              4055 *    NONE                                                         *
                              4056 *                                                                 *
                              4057 *OUTPUT                                                           *
                              4058 *    NONE                                                         *
                              4059 *                                                                 *
                              4060 *EXTERNAL REFERENCES                                              *
                              4061 *    NONE                                                         *
                              4062 *                                                                 *
                              4063 *EXITS, NORMAL                                                    *
                              4064 *    NONE                                                         *
                              4065 *                                                                 *
                              4066 *EXITS, ERROR                                                     *
                              4067 *    NONE                                                         *
                              4068 *                                                                 *
                              4069 *TABLES/WORK AREAS                                                *
                              4070 *    NONE                                                         *
                              4071 *                                                                 *
                              4072 *ATTRIBUTES                                                       *
                              4073 *    NONE                                                         *
                              4074 *                                                                 *
                              4075 *CHARACTER CODE DEPENDENCY                                        *
                              4076 *    NONE                                                         *
                              4077 *                                                                 *
                              4078 *NOTES                                                            *
                              4079 *    ERROR PROCEDURES                                             *
                              4080 *        NONE                                                     *
                              4081 *                                                                 *
                              4082 *    REGISTER USAGE                                               *
                              4083 *        NONE                                                     *
                              4084 *                                                                 *
                              4085 *    SAVED/RESTORED AREAS                                         *
                              4086 *        NONE                                                     *
                              4087 *                                                                 *
                              4088 *    MODIFICATION C0NSIDERATIONS                                  *
```

                         4089 *   NONE   *
                         4090 *   *
                         4091 *   REQUIRED MODULES   *
                         4092 *   NONE   *
                         4093 *   *
                         4094 *   OTHER   *
                         4095 *   NONE   *
                         4096 **

                    158A 4098 TKSAVE EQU   *   START OF VOLUMM LABEL AREA
                    158B 4099 TKSVTC EQU   TKSAVE+1   VTOC POINTER
                    158C 4100 TKSPTG EQU   TKSVTC+1   PTF VTOL TAG NO.
                    158D 4101 TKSPTZ EQU   TKSPTG+1   PTF SIZE
                    158F 4102 TKSPAD EQU   TKSPTZ+2   PTF DADDR
                    1590 4103 TKSLSZ EQU   TKSPAD+1   LIBRARY SIZE
                    1591 4104 TKSLTG EQU   TKSLSZ+1   LIBRARY VTOL TAG NO.
                    1592 4105 TKSWAT EQU   TKSLTG+1   WORK AREA VTOL NO.
                    1593 4106 TKSSPF EQU   TKSWAT+1   SYS.PROG.FILE VTOC NO.
                    1595 4107 TKSBIS EQU   TKSSPF+2   BIS SYSTEM FILE DADDR
                    1597 4108 TKSBLD EQU   TKSBIS+2   BIS USER LIBRARY DADDR
                    1598 4109 TKSBFI EQU   TKSBLD+1   BIS FILES INN
                    1599 4110 TKSYLN EQU   TKSBFI+1   CYLINDER #
                    159A 4111 TKSCYL EQU   TKSYLN+1   # CYLINDERS
                    159C 4112 TKSADR EQU   TKSCYL+2   DADDR OF VOLUMN LABEL
                    159E 4113 TKSDSK EQU   TKSADR+2   DISK ADDRESS
    158A   4114   ORG   TKSAVE
    158A 4040404040404040 159F 4115 TKSLNK DC   22CL1' '   INITIALIZE AREA TO BLANKS

```
                         4117 *********************************************************************
                         4118 *  5703-XM1    COPYRIGHT IBM CORP. 1970                            *
                         4119 *                REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083 *
                         4120 *                                                                  *
                         4121 *********************************************************************
                         4122 *STATUS                                                            *
                         4123 *    VERSION 1 MODIFICATION 0                                      *
                         4124 *                                                                  *
                         4125 *FUNCTION                                                          *
                         4126 *    * TVSAVE IS A COMMON SAVE AREA AND EQUATE MODULE USED TO PROVIDE *
                         4127 *      COMMUNICATION BETWEEN MODULFS AND THE VTOC (VOLUME TABLE OF  *
                         4128 *      CONTENTS),                                                  *
                         4129 *    * TVSAVE IS USED AS A PARAMETER HOLDER MODULE FOR MODULES USING *
                         4130 *      THE MODULE UTVTOC (VTOC ROUTINES).                           *
                         4131 *    * THE PARAMETERS PASSED TO TVSAVE BY THE VTOC ROUTINE USERS    *
                         4132 *      ARE AS FOLLOWS: FILE NAME. DISK ADDRESS OF VTOC INDEX.       *
                         4133 *                                                                  *
                         4134 *ENTRY POINTS                                                      *
                         4135 *    NONE                                                          *
                         4136 *                                                                  *
                         4137 *INPUT                                                             *
                         4138 *    NONE                                                          *
                         4139 *                                                                  *
                         4140 *OUTPUT                                                            *
                         4141 *    NONE                                                          *
                         4142 *                                                                  *
                         4143 *EXTERNAL REFERENCES                                               *
                         4144 *    NONE                                                          *
                         4145 *                                                                  *
                         4146 *EXITS, NORMAL                                                     *
                         4147 *    NONE                                                          *
                         4148 *                                                                  *
                         4149 *EXITS, ERROR                                                      *
                         4150 *    NONE                                                          *
                         4151 *                                                                  *
                         4152 *TABLES/WORK AREAS                                                 *
                         4153 *    NONE                                                          *
                         4154 *                                                                  *
                         4155 *ATTRIBUTES                                                        *
                         4156 *    NONE                                                          *
                         4157 *                                                                  *
                         4158 *CHARACTER CODE DEPENDENCY                                         *
                         4159 *    NONE                                                          *
                         4160 *                                                                  *
                         4161 *NOTES                                                             *
                         4162 *    ERROR PROCEDURES                                              *
                         4163 *      NONE                                                        *
                         4164 *                                                                  *
                         4165 *    REGISTER USAGE                                                *
                         4166 *      NONE                                                        *
                         4167 *                                                                  *
                         4168 *    SAVED/RESTORED AREAS                                          *
                         4169 *      NONE                                                        *
                         4170 *                                                                  *
                         4171 *    MODIFICATION C0NSIDERATIONS                                   *
                         4172 *      NONE                                                        *
```

```
                                4173 *                                                                    *
                                4174 *    REQUIRED MODULES                                                *
                                4175 *       NONE                                                         *
                                4176 *                                                                    *
                                4177 *    OTHER                                                           *
                                4178 *       NONE                                                         *
                                4179 ********************************************************************

                          15A0  4181 TVSTRT EQU     *                          START OR VTOC INDEV
                          15A8  4182 TVSFIL EQU     TVSTRT+8                    FILE NAME PER SE
                          15AA  4183 TVSDAD EQU     TVSFIL+2                    DAADR OF VTOC INDEX
                          15AC  4184 TVSDSK EQU     TVSDAD+2                    DISK ADDRESS OF VTOC INDEX
     15A0                       4185        ORG     TVSTRT
     15A0 4040404040404040 15AD 4186        DC      14CL1' '                    INITIALIZE AREA TO BLANKS
                                4187 *** END OF EXPANSION ***
```

```
                          4189 **********************************************************************
                          4190 * 5703-XM1      COPYRIGHT IBM CORP. 1970                           *
                          4191 *                   REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083  *
                          4192 *                                                                   *
                          4193 **********************************************************************
                          4194 *STATUS                                                             *
                          4195 *    VERSION 1 MODIFICATION 0                                        *
                          4196 *                                                                   *
                          4197 *FUNCTION                                                            *
                          4198 *    * UTKUSE IS A UTILITY ROUTINE USED TO PROCESS THE TRACK USAGE   *
                          4199 *      MASK, WHICH IS LOCATED WITHIN THE VOLUME LABEL, LOCATED ON    *
                          4200 *      CYLINDER 0 (SECTOR 2) OF EVERY DISK PACK.                     *
                          4201 *    * THE TRACK USAGE MASK IS A FIELD OF 51 BYTES WHICH CONTAINS A  *
                          4202 *      MASK OF BITS IN A ONE-TO-ONE CORRESPONDENCE WITH EACH TRACK ON *
                          4203 *      THE DISK. IF THE BIT FOR A TRACK IS OFF, THE TRACK IS UNUSED. IF*
                          4204 *      THE BIT IS ON, THE TRACK HAS BEEN ASSIGNED OR IS NOT AVAILABLE. *
                          4205 *      THE LOGICAL ORDER OF THE BIT MASKS IS FROM RIGHT TO LEFT WITH  *
                          4206 *      TWO BITS ASSIGNED TO EACH CYLINDER. THE RIGHTMOST BIT OF EACH  *
                          4207 *      TWO BIT REFERENCES TRACK 0 OF THE CYLINDER AND TO ITS LEFT IS  *
                          4208 *      TRACK 1 OF THE CYLINDER IN QUESTION,                           *
                          4209 *    * THE TYPES OF FUNCTIONS AVAILABLE ARE:                          *
                          4210 *      1. ASSIGN SPACE                                                *
                          4211 *      2. RELEASE SPACE                                               *
                          4212 *      3. TEST FOR SPACE AVAILABILITY                                 *
                          4213 *      4. TEST FOR ABSOLUTE NON-AVAILABILITY OF SPACE                 *
                          4214 *      5. TEST FOR SPECIFIED CYLINDER SPACE AS CLOSE TO CYLINDER NUMBER*
                          4215 *         TEN (10) AS POSSIBLE                                        *
                          4216 *                                                                   *
                          4217 *ENTRY POINTS                                                        *
                          4218 *    THE ENTRY POINTS TO UTKUSE ARE UTKINP OR UTKPRC DEPENDING UPON   *
                          4219 *    WHETHER THE VOLUME LABEL IS READ OR NOT BEFORE PROCESSING THE    *
                          4220 *    TRACK USAGE MASK                                                *
                          4221 *                                                                   *
                          4222 *INPUT                                                               *
                          4223 *    THE INPUT IS THE READING OF THE VOLUME LABEL IF UTKINP IS THE    *
                          4224 *    ENTRY POINT                                                     *
                          4225 *                                                                   *
                          4226 *OUTPUT                                                              *
                          4227 *    NONE                                                            *
                          4228 *                                                                   *
                          4229 *EXTERNAL REFERENCES                                                 *
                          4230 *     TKSYLN - INITIAL CYLINDER NUMBER TO PROCESS                    *
                          4231 *     TKSCYL - NUMBER OF CYLINDERS TO PROCESS                        *
                          4232 *     TKSADR - CORE ADDRESS OF VOLUME LABEL                          *
                          4233 *     $DISKN - DISK IOCR                                             *
                          4234 *                                                                   *
                          4235 *EXITS, NORMAL                                                       *
                          4236 *    NORMAL EXIT IS BACK TO THE CALLING ROUTINE WITH THE PSR REGISTER *
                          4237 *    SET TO TRUE                                                     *
                          4238 *                                                                   *
                          4239 *EXITS, ERROR                                                        *
                          4240 *    ERROR EXIT IS BACK TO THE CALLING ROUTINE WITH THE PSR REGISTER  *
                          4241 *    SET TO FALSE                                                    *
                          4242 *                                                                   *
                          4243 *TABLES/WORK AREAS                                                   *
                          4244 *    CONSTANTS AND THE DPL LIST TO INPUT THE VOLUME LABEL ARE LOCATED *
```

```
                               4245 *    AT THE END OF THE EXECUTABLE CODE                          *
                               4246 *                                                              *
                               4247 *ATTRIBUTES                                                    *
                               4248 *    RELOCATABLE AND REUSABLE                                  *
                               4249 *                                                              *
                               4250 *CHARACTER CODE DEPENDENCE                                     *
                               4251 *    THE OPERATION OF THIS MODULE DOES NOT DEPEND UPON A PARTICULAR  *
                               4252 *    INTERNAL REPRESENTATION OR THE EXTERNAL CHARACTER SET     *
                               4253 *                                                              *
                               4254 *NOTES                                                         *
                               4255 *    ERROR PROCEDURES                                          *
                               4256 *        UTKUSE IS EXITED WITH THE PSR SET TO FALSE IF:        *
                               4257 *        1. ILLEGAL NUMBER OF CYLINDERS TO PROCESS.            *
                               4258 *        2. ILLEGAL INITIAL CYLINDER NUMBER.                   *
                               4259 *        3. THE END OF THE TRACK USAGE MASK IS ENCOUNTERED BEFORE ALL  *
                               4260 *           CYLINDERS HAVE BEEN PROCESSED.                     *
                               4261 *                                                              *
                               4262 *    REGISTER USAGE                                            *
                               4263 *    INDEX RESISTER 1 (@BR), INDEX REGISTER 2 (@XR), AND THE ARR  *
                               4264 *    REGISTERS ARE SAVED AND RESTORED. THE INDEX REGISTER 2 (@XR)  *
                               4265 *    IS USED.                                                  *
                               4266 *                                                              *
                               4267 *    SAVED/RESTORED ARES                                       *
                               4268 *        NONE                                                  *
                               4269 *                                                              *
                               4270 *    MODIFICATION CONSIDERATIONS                               *
                               4271 *        NONE                                                  *
                               4272 *                                                              *
                               4273 *    REQUIRED MODULES                                          *
                               4274 *        @SYSEQ - COMMON SYSTEM EQUATES                        *
                               4275 *        TVSAVE - VTOC COMMON SAVE AREAS AND EQUATES           *
                               4276 *        TKSAVE - VOLUME LABEL COMMON SAVE AREAS AND EQUATES   *
                               4277 *                                                              *
                               4278 *    OTHER                                                     *
                               4279 *        NONE                                                  *
                               4280 ***********************************************************************


                               4282 *UTKUSE ENTER EXIT-UTKED,@BR,@XR,@ARR
                          15AE 4283 UTKUSE EQU     *                        MODULE ENTRY POINT
    15AE 34 01 16BD            4284         ST    UTKED0+@OP1,@BR           SAVE @BR
    15B2 34 02 16C1            4285         ST    UTKED1+@OP1,@XR           SAVE @XR
    15B6 34 08 16C5            4286         ST    UTKED2+@OP1,@ARR          SAVE RETURN ADDRESS
                               4287 *** END OF EXPANSION ***
    15BA C0 87 16C6            4288 UTK025 B      UTKREP                    BRANCH TO HUAD DISK
    15BE F2 87 0C              4289        J      UTK070                    JUMP TO PROCESS MASK
                               4290 *UTK050 ENTER EXIT-UTKEDAR,@XR,@ARR
                          15C1 4291 UTK050 EQU     *                        MODULE ENTRY POINT
    15C1 34 01 16BD            4292         ST    UTKED0+@OP1,@BR           SAVE @BR
    15C5 34 02 16C1            4293         ST    UTKED1+@OP1,@XR           SAVE @XR
    15C9 34 08 16C5            4294         ST    UTKED2+@OP1,@ARR          SAVE RETURN ADDRESS
                               4295 *** END OF EXPANSION ***
                               4296 *
                               4297 *                    FOLLOWING CHECKS FOR VALID #CYLINDERS/
                               4298 *                    CYLINDER #
                               4299 *
```

```
    15CD 3C 00 16F8            4300 UTK070 MVI   UTKDEF,@ZERO              ZERO DEFAULT FLAG
    15D1 0C 00 16F9 1599       4301        MVC   UTKFLS(UTKUPD),TKSYLN    SAVE FILE NAME
    15D7 3D FF 1599            4302        CLI   TKSYLN,UTKFLG            DEFAULT CASE ?
    15DB F2 01 08              4303        JNE   UTK075                   JUMP IF NOT A DEFAULT
    15DE 3C FF 16F8            4304        MVI   UTKDEF,UTKFLG            SET FLAG FOR DEFAULT
    15E2 3C 0A 1599            4305        MVI   TKSYLN,UTKTEN            SET CYL # TO 10
    15E6 0D 00 16EC 159A       4306 UTK075 CLC   UTKONE(UTKUPD),TKSCYL    VALID # CYLINDERS ?
    15EC F2 84 BD              4307        JH    UTK600                   FORCE ERROR EXIT
    15EF 0D 00 16F0 159A       4308        CLC   UTKLIM(UTKUPD),TKSCYL    VALID # CYLINDERS ?
    15F5 F2 82 B4              4309        JL    UTK600                   FORCE ERROR EMIT
                              4310 *
                              4311 *              INITIALIZE FOR TRACK USAGE MASK ALGORITHM
                              4312 *
    15F8 0C 00 16F7 1599       4313 UTK080 MVC   UTKCNT(UTKUPD),TKSYLN    SET UP CYLINDER COUNT
    15FE 3C 00 16EE            4314        MVI   UTKCYL,@ZERO            CLEAR CYLINDER COUNT
    1602 0C 00 1645 1599       4315        MVC   UTK300+4(UTKUPD),TKSYLN  MOVE CYLINDER #
    1608 3C FF 16EA            4316        MVI   UTKCHK,UTKFLG           SET FLAG FOR SUCESSFUL EXIT
    160C 0C 01 164D 159C       4317        MVC   UTK400+3(@CADDR),TKSADR  SET UP TOP OF VOL LABEL
    1612 0E 01 164D 16F4       4318        ALC   UTK400+3(@CADDR),UTKLBB  POINT TO TRACK USAGE MASK
    1618 0C 01 16F2 164D       4319        MVC   UTKEND(@CADDR),UTK400+3  MOVE SART OF MASK
    161E 0F 01 16F2 16F6       4320        SLC   UTKEND(@CADDR),UTKFAR    CALCULATE END OF MASK
                              4321 *
                              4322 *              FOLLOWING PERFORMS ALGORITHM:
                              4323 *              DIVIDE CYLINDER # BY 4
                              4324 *              QUOTIENT  = INIT DISP. WITHIN TRACK USAGE MASK
                              4325 *              REMAINDER = INIT DISPLACEMENT WITHIN CYL TABLE
                              4326 *
    1624 0D 00 1645 16ED       4327 UTK100 CLC   UTK300+4(UTKUPD),UTKFOR  REMAINDER < 4 ?
    162A F2 82 10              4328        JL    UTK250                   JUMP IF REM < 4
    162D 0F 00 1645 16ED       4329 UTK200 SLC   UTK300+4(UTKUPD),UTKFOR  SUBTRACT '4' FROM CYLINDER #
    1633 0F 01 164D 16EC       4330        SLC   UTK400+3(@CADDR),UTKONE  MOVE POINTER TO NEYT
    1639 C0 87 1624            4331        B     UTK100                   BRANCH TO CONTINUE PROCESS
                              4332 *
                              4333 *              FOLLOWING SCANS TRACK USAGE MASK PERFORMING
                              4334 *              FUNCTION SPECIFIED WITH BOUNDS CHECKS
                              4335 *
    163D C2 02 16E6           4336 UTK250 LA    UTKTBL,@XR               POINT XR TO TOP OF CYLINDER TOL
    1641 2C 00 164B 00        4337 UTK300 MVC   UTK400+1(UTKUPD),*-*(,@XR)  MOVE RELATIVE BIT TEST
    1646 38 01 16EC           4338        TBN   UTKONE,UTKUPD           FORCE PSR EQUAL
    164A 38 80 0000           4339 UTK400 TBN   *-*,@NOP                PERFORM FUNCTION REQUESTED
    164E F2 10 1A             4340        JT    UTK500                   JUMP IF CONDITION TRUE
    1651 38 FF 16F8           4341        TBN   UTKDEF,UTKFLG           DEFAULT FLAG SET ?
    1655 F2 90 54             4342        JF    UTK600                   JUMP IF NOT A DEFAULT
    1658 0E 00 1599 16EC      4343        ALC   TKSYLN(UTKUPD),UTKONE   INCREMENT CYLINDER POINTER
    165E 0D 00 1599 16F0      4344        CLC   TKSYLN(UTKUPD),UTKLIM   CYLINDER # WITHIN LIMITS ?
    1664 F2 81 45             4345        JE    UTK600                   JUMP TO ERROR PROGH
    1667 C0 87 15F8           4346        B     UTK080                   BRANCH TO FOR REQURSIVE SEW,"
    166B 0E 00 16EE 16EC      4347 UTK500 ALC   UTKCYL(UTKUPD),UTKONE   UPDATE CYLINDER COUNT
    1671 0D 00 16EE 159A      4348        CLC   UTKCYL(UTKUPD),TKSCYL   COMPARE CYL COUNT WITH # CYLS
    1677 F2 81 36             4349        JE    UTK650                   JUMP IF COMPLETED ALL CYLS
    167A 0E 00 16F7 16EC      4350        ALC   UTKCNT(UTKUPD),UTKONE   INCREMENT CYL COUNT
    1680 0E 00 1645 16EC      4351        ALC   UTK300+4(UTKUPD),UTKONE  INCREMENT DISPLACEMENT
    1686 0D 01 164D 16F2      4352        CLC   UTK400+3(@CADDR),UTKEND  END OF TRACK USAGE MASK ?
    168C F2 01 07             4353        JNE   UTK525                   JUMP IF NOT AT END
    168F 3D 03 1645           4354        CLI   UTK300+4,UTKTRE         VERY LAST CYL ?
    1693 F2 81 16             4355        JE    UTK600                   JUMP IF LAST CYLINDER
```

```
     1696 3D 04 1645           4356 UTK525 CLI    UTK300+4,UTKBOT          BOTTOM OF CYL TABLE ?
     169A C0 01 1641           4357        BNE    UTK300                   BRANCH IF NOT AT BOTTOM
     169E 3C 00 1645           4358        MVI    UTK300+4,@ZERO           MOVE POINTER TO TOP OF CYL TBL
     16A2 0F 01 164D 16EC      4359        SLC    UTK400+3(@CADDR),UTKONE  UPDATE POINTER
     16A8 C0 87 1641           4360 UTK550 B      UTK300                   GO PROCESS NEXT ENTRY
     16AC 3C 00 16EA           4361 UTK600 MVI    UTKCHK,@ZERO             FORCE UNSUCESSFUL EXIT
                               4362 *
                               4363 *               FOLLOWING CHECK FOR RELEASE/ASSIGN FUNCTION
                               4364 *               AND WRITES VOLUMN LABEL TO DISK IF NOT
                               4365 *               A TEST FUNCTION
                               4366 *
     16B0 38 FF 16EA           4367 UTK650 TBN    UTKCHK,UTKFLG            TEST FLAG FOR E'!T
     16B4 0C 00 1599 16F9      4368        MVC    TKSYLN(UTKUPD),UTKFLS    RESTORE FILE NAME
                               4369 *UTKED   EXIT   @BR,@XR,RETURN
     16BA C2 01 0000           4370 UTKED0 LA     *-*,@BR                  RESTORE @BR
     16BE C2 02 0000           4371 UTKED1 LA     *-*,@XR                  RESTORE @XR
     16C2 C0 87 0000           4372 UTKED2 B      *-*                      RETURN TO CALLING PROGRAM
                               4373 *** END OF EXPANSION ***
                               4374 *
                               4375 *               FOLLOWING ROUTINE READ/WRITES VOLUMN
                               4376 *               LABEL TO DISK
                               4377 *
     16C6 34 08 16E5           4378 UTKREP ST     UTKSTP+3,@ARR            SAVE ARR FOR RETURN
     16CA 0C 01 16FF 159C      4379        MVC    UTKAD1+5(@CADDR),TKSADR  SET UP DATA ADDRESS
     16D0 0C 01 16FC 159E      4380        MVC    UTKAD1+2(@CADDR),TKSDSK  SET UP DISK ADDRESS
                               4381 *UTKOUT DISK   URKADI-WAIT              WRITE/READ DISK & WAIT
     16D6 C0 87 0025           4382 UTKOUT B      $DISKN                   PERFORM PHYSICAL DISC OP
     16DA 16FA         16DB    4383        DC     AL2(UTKAD1)              DPL ADDRESS
     16DC C0 87 0025           4384        B      $DISKN                   WAIT AND CHECK DISK ERRORS
     16E0 057F         16E1    4385        DC     AL2($WAITF)              WAIT DPL ADDRESS
                               4386 *** END OF EYPANSION ***
     16E2 C0 87 0000           4387 UTKSTP B      *-*                      RETURN TO CALL
                               4388 *
                               4389 *               CONSTANTS USED IN UTKUSE
                               4390 *
     16E6 03           16E6    4391 UTKTBL DC     XL1'03'                  CYLINDER TABLE TO CHECK
     16E7 0C           16E7    4392        DC     XL1'0C'                  EACH TWO-BIT ENTRY IN
     16E8 30           16E8    4393        DC     XL1'30'                  EACH BYTE OF THE TRACK
     16E9 C0           16E9    4394        DC     XL1'C0'                  USEAGE MASK
     16EA             16EA    4395 UTKCHK DS     CL1                      EXIT FLAG
     16EB 0001         16EC    4396 UTKONE DC     IL2'1'                   UPDATE FACTOR
     16ED 04           16ED    4397 UTKFOR DC     IL1'4'                   DIVISION FACTOR
     16EE             16EE    4398 UTKCYL DS     CL1                      CYLINDER COUNT
     16EF 00           16EF    4399 UTKZER DC     IL1'00'                  MIN CYL #
     16F0 CB           16F0    4400 UTKLIM DC     IL1'203'                 MAX # CYLINDERS
     16F1             16F2    4401 UTKEND DS     CL(@CADDR)               TEMPORARY SAVE AREA
     16F3 00A8         16F4    4402 UTKLBB DC     AL2($#TUSE)              DISPLACEMENT OF TRACK
     16F5 0032         16F6    4403 UTKFAR DC     AL2(UTKLST)              LENGTH OF MASK
     16F7             16F7    4404 UTKCNT DS     CL1                      PRESENT CYLINDER #
     16F8             16F8    4405 UTKDEF DS     CL1                      CYL# 10 DEFAULT FLAG
     16F9             16F9    4406 UTKFLS DS     CL1                      TKSYLN TEMPORARY SAVE
                               4407 *
                               4408 *               DPL OF PARAMETER LIST TO READ/WRITE
                               4409 *               VOLUMN LABEL TO DISK
                               4410 *
                               4411 *UTKAD1 DPL FUNC-@DGET,DADDR-#VOLR1,CNT-#@VLAB
```

```
        UALLOC UTKUSE - PROCESS THE TRACK USAGE MASK
```

```
                          16FA 4412 UTKAD1 EQU   *                       DISK PARAMETER LIST
      16FA 01             16FA 4413        DC    AL1(@DGET)              REQUESTED FUNCTION
      16FB 0008           16FC 4414        DC    AL2(#VOLR1)             DISK ADDRESS
      16FD 01             16FD 4415        DC    AL1(#@VLAB)             SECTOR COUNT
      16FE 0000           16FF 4416        DC    AL2(*-*)                BUFFER ADDRESS
                               4417 *** END OF EXPANSION ***
                               4418 *
                               4419 *                  EQUATES USED IN UTKUSE
                               4420 *
                          0001 4421 UTKUPD EQU   1                       UPDATE FACTOR
                          15C1 4422 UTKPRC EQU   UTK050                  ENTRY POINT TO
                               4423 *                                   BYPASS DISK READ
                          15AE 4424 UTKINP EQU   UTKUSE                  ENTRY POINT TO READ DISK
                          164A 4425 UTKTYP EQU   UTK400                  TYPE OF FUNCTION TO PERFORM
                          0038 4426 UTKTBN EQU   X'38'                   TEST FOR ALLOCATION OF SPACE
                          0039 4427 UTKTBF EQU   X'39'                   TEST FOR NON-ALLOCATION
                          003A 4428 UTKSBN EQU   X'3A'                   ASSIGN DISK SPACE
                          003B 4429 UTKSBF EQU   X'3B'                   RELEASE DISK SPACE
                          0004 4430 UTKBOT EQU   4                       BOTTOM OF CYLINDER TABLE
                          00FF 4431 UTKFLG EQU   X'FF'                   EXIT FLAG
                          0032 4432 UTKLST EQU   X'32'                   END OF MASK
                          0003 4433 UTKTRE EQU   3                       LAST CYL# BIT POSIT
                          000A 4434 UTKTEN EQU   X'0A'                   CYLINDER #10 DEFAULT
```

```
         UALLOC UTKUSE - PROCESS THE TRACK USAGE MASK

ERR LOC   OBJECT CODE    ADDR STMT SOURCE STATEMENT          VER 15, MOD 00  05/01/22  PAGE  98
                              4436 *        PATCH 120
                              4437 ***********************************************************************
                              4438 * PATCH AREA 1
                              4439 ***********************************************************************
    1700                 1777 4440 $$$$$1 DS    CL120                    PATCH AREA FOR PROGRAM
                              4441 ***********************************************************************
```

```
                          4443 *************************************************************************
                          4444 * 5703-XM1      COPYRIGHT IBM CORP. 1970                            *
                          4445 *                  REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083  *
                          4446 *                                                                   *
                          4447 *************************************************************************
                          4448 *STATUS                                                             *
                          4449 *    VERSION 1 MODIFICATION 0                                       *
                          4450 *                                                                   *
                          4451 *FUNCTION                                                           *
                          4452 *    * UTVTOC PERFORMS VARIOUS FILE SPECIFICATION FUNCTIONS UPON THE *
                          4453 *      VTOC (VOLUME TABLE OF CONTENTS) AND VOLUME LABEL. THE FUNCTIONS *
                          4454 *      ARE ENVOKED THROUGH PARAMETERS PROVIDED BY THE USER PROGRAM.  *
                          4455 *    * UTVTOC IS A UTILITY PROGRAM USED TO MANIPULATE FILE           *
                          4456 *      SPECIFICATIONS WITHIN THE VTOC AND VOLUME LABEL. ANY OF THE   *
                          4457 *      FIVE (5) BASIC BIS FILES OR ANY FILE SPECIFIED BY THE FILE NAME *
                          4458 *      CAN BE PROCESSED.                                            *
                          4459 *    * THE TYPES OF FUNCTIONS WITH ENTRY POINTS ARE:                 *
                          4460 *      UTVDEL - DELETE FILE                                          *
                          4461 *      UTVEXP - EXPAND FILE                                          *
                          4462 *      UTVSHK - CONTRACT FILE                                        *
                          4463 *      UTVIST - INSERT FILE                                          *
                          4464 *      UTVDFT - INSERT FILE AS CLOSE TO SPF FILE AS POSSIBLE         *
                          4465 *      UTVINF - OBTAIN INFORMATION ABOUT VTOC FILE                   *
                          4466 *                                                                   *
                          4467 *ENTRY POINTS                                                       *
                          4468 *    THE ENTRY IS BASED UPON THE DESIRED FUNCTION                    *
                          4469 *                                                                   *
                          4470 *INPUT                                                              *
                          4471 *    THE INPUT IS THE READING OF THE VOLUME LABEL, VTOC INDEX, *     *
                          4472 *    FORMAT 1 ENTRIES FROM DISK                                      *
                          4473 *                                                                   *
                          4474 *OUTPUT                                                             *
                          4475 *    THE OUTPUT IS THE WRITING OF THE VOLUME LABEL, VTOC INDEX,      *
                          4476 *    FORMAT 1 ENTRIES TO DISK                                        *
                          4477 *                                                                   *
                          4478 *EXTERNAL REFERENCES                                                *
                          4479 *      TKSYLN - INITIAL CYLINDER NUMBER TO PROCESS (1 BYTE)          *
                          4480 *      TKSCYL - NUMBER OF CYLINDERS TO PROCESS (1 BYTE)              *
                          4481 *      TVSFIL - FILE NAME (8 BYTES)                                  *
                          4482 *      TKSADR - ADDRESS OF VOLUME LABEL IN CORE (2 BYTES)            *
                          4483 *      TVSDSK - DISK DADDR OF VTOC INDE, (2 BYTES)                   *
                          4484 *      $CIMSK - ADDR OF THE INQUIRY REQUEST INDICATOR                *
                          4485 *      $DISKN - ENTRY POINT TO DISK IOCR                             *
                          4486 *      TKSBFI - BIS FILE INDICATOR (1 BYTE)                          *
                          4487 *                                                                   *
                          4488 *EXITS, NORMAL                                                      *
                          4489 *    NORMAL EXIT IS BACK TO THE CALLING ROUTINE WITH PSR REGISTER    *
                          4490 *    SET TO TRUE                                                     *
                          4491                                                                     *
                          4492 *EXITS, ERROR                                                       *
                          4493 *    ERROR EXIT IS BACK TO THE CALLING ROUTINE WITH THE PSR REGISTER *
                          4494 *    SET TO FALSE                                                    *
                          4495 *                                                                   *
                          4496 *TABLESWORK AREAS                                                   *
                          4497 *    * CONSTANTS AND THE DPL LIST TO INPUT/OUTPUT VOLUME LABEL, VTOC  *
                          4498 *      INDEX AND FORMAT 1 ENTRIES ARE AT THE END OR THE EXEC CODE    *
```

```
                                 4499 *   * UTVTOC MUST BE THE LAST ASSEMBLED; FOR THE INPUT/OUTPUT        *
                                 4500 *      BUFFERS ARE DIRECTLY BEHIND TO CONSTANT AREA                  *
                                 4501 *                                                                    *
                                 4502 *ATTRRIBUTES                                                         *
                                 4503 *    RELOCATABLE AND REUSABLE                                        *
                                 4504 *                                                                    *
                                 4505 *CHARACTER CODE DEPENDENCY                                           *
                                 4506 *    THE OPERATION OF THIS MODULE DOES NOT DEPEND UPON A PARTICULAR  *
                                 4507 *    INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET           *
                                 4508 *NOTES                                                               *
                                 4509 *    ERROR PROCEDURES                                                *
                                 4510 *      UTVTOC IS EXITED WITH THE PSR SET TO FALSE IF:                *
                                 4511 *       1. INVALID VTOC DISK ADDRESS PARAMETER                       *
                                 4512 *       2. INABILITY TO FIND FILE NAME                               *
                                 4513 *       3. INVALID NUMBER OF CYLINDERS AND/OR INITIAL CYLINDER NUMBER *
                                 4514 *       4. INVALID FILE INDICATOR (BIS FILE)                         *
                                 4515 *      UTVTOC IS EXITED WITH THE PSR SET TO LOW IF AN ATTEMPT IS MADE *
                                 4516 *      TO PERFORM A FUNCTION (OTHER THAN INSERTION) WHEN FILE DOES    *
                                 4517 *      NOT EXIST.                                                    *
                                 4518 *                                                                    *
                                 4519 *    REGISTER USAGE                                                  *
                                 4520 *      INDEX REGISTER 1 (@BR), INDEX REGISTER 2 (@XR), AND THE ARR    *
                                 4521 *      REGISTER ARE SAVED AND RESTORED. THE INDEX REGISTER 2 (@XR) IS *
                                 4522 *      USED.                                                         *
                                 4523 *                                                                    *
                                 4524 *    SAVED/RESTORED AREAS                                            *
                                 4525 *      NONE                                                          *
                                 4526 *                                                                    *
                                 4527 *    MODIFICATION CONSIDERATIONS                                     *
                                 4528 *      NONE                                                          *
                                 4529 *                                                                    *
                                 4530 *    REQUIRED MODULES                                                *
                                 4531 *      @SYSEQ - COMMON SYSTEM EQUATES                                *
                                 4532 *      TVSAVE - VTOC COMMON SAVE AREAS AND EQUATES                   *
                                 4533 *      TKSAVE - VOLUME LABEL COMMON SAVE AREAS AND EQUATES           *
                                 4534 *      UTVUSE - TRACK USAGE MASK PROGRAM                             *
                                 4535 *      @VOLEQ - VOLUME LABEL EQUATES                                 *
                                 4536 *      @VTCEQ - VTOC EQUATES                                         *
                                 4537 *                                                                    *
                                 4538 *    OTHER                                                          *
                                 4539 *      NONE                                                          *
                                 4540 *********************************************************************************

                            1778 4542 UTVTOC EQU    *                        DELETE VTOC ENTRY POINT
    1778 3C 01 1BE9               4543        MVI    UTVCOD,UTVFG1            MOVE FLAG FOR DELETION
    177C 3C 00 1BF1               4544        MVI    UTVSAV,@ZERO            MOVE ZERO TO LAST BYTE OF UTVSAV
    1780 0C 06 1BF0 1BF1          4545        MVC    UTVSAV-1($@$LNG-1),UTVSAV  REQURSIVELY ZERO HOLDER
    1786 F2 87 3B                 4546        J      UTV145                  JUMP TO READ VTOC INDEV
    1789 3C 10 1BE9               4547 UTV050 MVI    UTVCOD,UTVFG5            SET CODE FOR CYL# 10 INSERT
    178D 3C FF 1599               4548        MVI    TKSYLN,UTKFLG            SET DEFAULT CODE
    1791 F2 87 04                 4549        J      UTV115                  JUMP TO MOVE FILE NAME
    1794 3C 02 1BE9               4550 UTV100 MVI    UTVCOD,UTVFG2            MOVE CODE FOR INSERTION
    1798 0C 07 1BF1 15A8          4551 UTV115 MVC    UTVSAV($@$LNG),TVSFIL    TEMPORARILY SAVE FILE NAME
    179E 0C 07 1C02 15A8          4552        MVC    UTVSV1($@$LNG),TVSFIL    SAVE FILE NAME
    17A4 3C 00 15A8               4553        MVI    TVSFIL,@ZERO            MOVE ZERO TO LAST BYTE OF TVSFIL
```

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ERR LOC   OBJECT CODE      ADDR STMT SOURCE STATEMENT           VER 15, MOD 00  05/01/22  PAGE 101

    17A8 0C 06 15A7 15A8       4554          MVC    TVSFIL-1($@$LNG-1),TVSFIL  RECURSIVELY ZERO HOLDER
    17AE F2 87 08              4555          J      UTV125                     JUMP TO READ VTOC INDEX
    17B1 3C FF 1BE8            4556 UTV117 MVI    UTVTYP,UTVFLG               INIT FOR INFO PROCESS
    17B5 3C 04 1BE9            4557 UTV120 MVI    UTVCOD,UTVFG3              MOVE CODE FOR EXPANSION
    17B9 3C 39 164A            4558 UTV125 MVI    UTKTYP,UTKTBF              SET CODE FOR SPACE TEST
    17BD F2 87 08              4559          J      UTV170                     JUMP TO SAVE FILE NAME
    17C0 3C 08 1BE9            4560 UTV140 MVI    UTVCOD,UTVFG4              MOVE FLAG FOR SHRINKAGE
    17C4 3C 3B 164A            4561 UTV145 MVI    UTKTYP,UTKSBF              SET CODE TO RELEASE SPACE
    17C8 3C FF 1BF2            4562 UTV170 MVI    UTVCHK,UTVFLG              SET CODE FOR SUCESSFUL EXIT
    17CC 0C 01 1C04 159C       4563          MVC    UTVSV2(@CADDR),TKSADR      SAVE DISK DADDR
    17D2 0C 00 1C05 159A       4564          MVC    UTVSV3(UTVONE),TKSCYL      SAVE # CYLINDERS
    17D8 0C 00 1C06 1599       4565          MVC    UTVSV4(UTVONE),TKSYLN      SAVE INITIAL CYLINDER ?
    17DE 39 12 1BE9            4566          TBF    UTVCOD,UTVFG2+UTVFG5       INSERTION ?
    17E2 F2 90 06              4567          JF     UTV175                     JUMP IF INSERTION
    17E5 0C 07 1C02 15A8       4568          MVC    UTVSV1($@$LNG),TVSFIL      SAVE FILE NAME
    17EB 0C 01 159C 1BF9       4569 UTV175 MVC    TKSADR(@CADDR),UTVADR      SET VOL LABEL DADDR
                              4570 *UTV180 ENTER EXIT,UTVED,@BR,@XR,@ARR
    17F1               4571 UTV180 EQU    *                          MODULE ENTRY POINT
    17F1 34 01 1B79            4572          ST     UTVED0+@OP1,@BR           SAVE @BR
    17F5 34 02 1B7D            4573          ST     UTVED1+@OP1,@XR           SAVE @XR
    17F9 34 08 1B81            4574          ST     UTVED2+@OP1,@ARR          SAVE RETURN ADDRESS
                              4575 *** END OF EXPANSION ***
                              4576 *
                              4577 *              READ VTOC INDEX/VOLUMN LABEL (IF NON-BIS)
                              4578 *
    17FD 3C 01 1BDB            4579          MVI    UTVIDX,@DGET              SET FOR READ (DISK)
    1801 3C 80 0476            4580          MVI    $CIMSK,@NOP               MASK CONSOLE INTERRUPTS
    1805 0C 01 1BDD 15AC       4581          MVC    UTVIDX+2(@CADDR),TVSDSK   MOVE DISK DADDR TO DPL LIST
                              4582 *       DISK   UTVIDX,WAIT               REAL VTOC INDEX, WAIT
    180B C0 87 0025            4583          B      $DISKN                    PERFORM PHYSICAL DISK OP
    180F 1BDB          1810 4584          DC     AL2(UTVIDX)               DPL ADDRESS
    1811 C0 87 0025            4585          B      $DISKN                    WAIT AND CHECK DISK ERRORS
    1815 057F          1816 4586          DC     AL2($WAITF)               WAIT DPL ADDRESS
                              4587 *** END OF EXPANSION ***
    1817 3C 01 1BF3            4588          MVI    UTVTAG,UTVONE             ZERO TAG INDEX COUNTER
    181B 3C 33 1BF4            4589          MVI    UTVLIM,UTVUPR+1           SET MAY NUMBER OF TAGS
    181F 3D 00 1598            4590          CLI    TKSBFI,@ZERO              BIS FILE ?
    1823 F2 81 92              4591          JE     UTV350                    JUMP IF NOT BIS FILE
    1826 3C 08 1BD7            4592 UTV200 MVI    UTVVOL+2,UTVEGT            INITIALIZE FOR MIN DISK
    182A 38 01 15AC            4593          TBN    TVSDSK,UTVONE             REMOVABLE DISK ?
    182E F2 90 04              4594          JF     UTV220                    JUMP IF NOT REMOVABLE
    1831 3A 01 1BD7            4595          SBN    UTVVOL+2,UTVONE           SET REMOVABLE BIT ON
    1835 38 02 15AC            4596 UTV220 TBN    TVSDSK,UTVTWO             SPINDLE 2 ?
    1839 F2 90 04              4597          JF     UTV250                    JUMP IF NOT SPINDLE 2
    183C 3A 02 1BD7            4598          SBN    UTVVOL+2,UTVTWO           SET SPINDLE 2 BIT ON
    1840 3C 01 1BD5            4599 UTV250 MVI    UTVVOL,@DGET              SET FOR READ FACTION (DISK)
                              4600 *       DISK   UTVVOL,WAIT               READ VOLUMN LABEL (DISK)
    1844 C0 87 0025            4601          B      $DISKN                    PERFORM PHYSICAL DISK OP
    1848 1BD5          1849 4602          DC     AL2(UTVVOL)               DPL ADDRESS
    184A C0 87 0025            4603          B      $DISKN                    WAIT AND CHECK DISK ERRORS
    184E 057F          184F 4604          DC     AL2($WAITF)               WAIT DPL ADDRESS
                              4605 *** END OF EXPANSION ***
                              4606 *
                              4607 *              INITIALIZE TO SEARCH VTOC INDEX
                              4608 *
    1850 39 12 1BE9            4609          TBF    UTVCOD,UTVFG2+UTVFG5       AN INSERTION ?
```

```
1854 F2 90 61              4610        JF    UTV350                   JUMP IF AN INSERTION
1857 C2 02 1C09            4611 UTV260 LA    UTVAR1,@XR               POINT XR TO TOP OF VOL ;ABEL
185B 0C 00 1862 1598       4612        MVC   UTV265+UTVONE(UTVONE),TKSBFI  MOVE BIT CODE
1861 B8 00 FF              4613 UTV265 TBN   $#TIDR(,@XR),*-*         FILE EXIST ?
1864 F2 10 08              4614        JT    UTV267                   YES, FILE EYISTS
1867 3D 01 1BF7            4615        CLI   UTVZER,UTVONE            FORCE LOW CONDITION
186B C0 87 1B76            4616        B     UTVED0                   EXIT FROM ROUTINE
186F 38 80 1598            4617 UTV267 TBN   TKSBFI,$#TSYM            SYSTEM PROG FILE ?
1873 F2 90 08              4618        JF    UTV270                   JUMP IF NOT SPF FILE
1876 2C 00 1BF4 FA         4619        MVC   UTVLIM(UTVONE),$#TSYS(,@XR)  MOVE SPF TAG # TO INDEX
187B F2 87 3A              4620        J     UTV350                   JUMP TO SEARCH VTOC INDEX
187E 39 60 1598            4621 UTV270 TBF   TKSBFI,$#TWR1+$#TWF1     WORK AREA R1/F1 FILE ?
1882 F2 10 08              4622        JT    UTV290                   JUMP IF NOT WORK AREA FILE
1885 2C 00 1BF4 F9         4623        MVC   UTVLIM(UTVONE),$#TWRK(,@XR)  MOVE WORK AREA TAG# T0 INDEX
188A F2 87 2B              4624        J     UTV350                   JUMP TO SEARCH VTOC INDEX
188D 38 10 1598            4625 UTV290 TBN   TKSBFI,$#TLIF            LIBRARY FILE ?
1891 F2 90 08              4626        JF    UTV300                   JUMP IF NOT LIBRARY FILE
1894 2C 00 1BF4 F8         4627        MVC   UTVLIM(UTVONE),$#TLIB(,@XR)  MOVE LIB FILE TAG# TO INDEX
1899 F2 87 1C              4628        J     UTV350                   JUMP TO SEARCH VTOC INDEX
189C 38 08 1598            4629 UTV300 TBN   TKSBFI,$#TPFL            PTF FILE ?
18A0 F2 90 08              4630        JF    UTV325                   JUMP IF NOT PTF FILE
18A3 2C 00 1BF4 F3         4631        MVC   UTVLIM(UTVONE),$#TPTF(,@XR)  MOVE PTF TAG TO INDEX
18A8 F2 87 0D              4632        J     UTV350                   JUMP TO SEARCH VTOC
18AB 38 04 1598            4633 UTV325 TBN   TKSBFI,$#THEL            HELP FILE ?
18AF C0 90 1A85            4634        BF    UTV465                   BRANCH IF NOT HELP FILE
18B3 2C 00 1BF4 F0         4635        MVC   UTVLIM(UTVONE),$#THVT(,@XR)  MOVE HELP FILE TAG ?
                          4636 *
                          4637 *             SEARCH VTOC INDEX FOR TAG # /FILE NAME
                          4638 *
18B8 C2 02 1D16           4639 UTV350 LA    UTVAR2+$@$FIL,@XR         POINT XR TO FIRST FILE NAME
18BC 0D 00 1BF3 1BF4      4640 UTV360 CLC   UTVTAG(UTVONE),UTVLIM     TAG NUMBER FOUND
18C2 F2 81 15             4641        JE    UTV370                   JUMP IF NOT FOUND
18C5 2D 07 15A8 00        4642        CLC   TVSFIL($@$LNG),0(,@XR)    NON-BIS FILE NAME FCJND ?
18CA F2 81 18             4643        JE    UTV390                   JUMP IF FILE NAME FOUND ?
18CD E2 02 0A             4644 UTV365 LA    $@$INC(,@XR),@XR          UPDATE TO NEYT TAG
18D0 0E 00 1BF3 1BF5      4645        ALC   UTVTAG(UTVONE),UTVDLT     INCREMENT TAG NUMBER
18D6 C0 87 18BC           4646        B     UTV360                   BRANCH TO CHECK FILE NAME
18DA 3D 33 1BF3           4647 UTV370 CLI   UTVTAG,UTVUPR+1          TAG # IN LIMITS ?
18DE F2 01 13             4648        JNE   UTV395                   JUMP IF NOT END OF VTOC
18E1 C0 87 1A85           4649        B     UTV465                   BRANCH TO ERROR MOM
18E5 3D 00 1598           4650 UTV390 CLI   TKSBFI,@ZERO            BIS FILE ?
18E9 F2 81 08             4651        JE    UTV395                   BRANCH TO UPDATE TO NEYT TAG
18EC 39 12 1BE9           4652        TBF   UTVCOD,UTVFG2+UTVFG5     INSERTION ?
18F0 C0 10 18CD           4653        BT    UTV365                   BRANCH IF NOT INSERTION
18F4 38 01 1BE9           4654 UTV395 TBN   UTVCOD,UTVFG1            DELETION FUNCTION ?
18F8 F2 90 63             4655        JF    UTV420                   JUMP IF NOT DELETION
                          4656 *
                          4657 *             PROCESS VTOC DELETION FUNCTION
                          4658 *
18FB 8C 07 00 1BF1        4659 UTV400 MVC   0($@$LNG,@XR),UTVSAV     ZERO VTOC FILE NAME
1900 C0 87 1B82           4660        B     UTV900                   BRANCH TO READ FILE LABEL
1904 2C 00 1599 1F        4661        MVC   TKSYLN(UTVONE),$@$SRT-1(,@XR)  MOVE START DADDR OF FILE
1909 0C 00 1BE7 1599      4662        MVC   UTVCLS(UTVONE),TKSYLN     SAVE INIT CYLINDER #
190F 2C 00 159A 21        4663        MVC   TKSCYL(UTVONE),$@$END-1(,@XR)  CALCULATE FILE SIZE F1
1914 2F 00 159A 1F        4664        SLC   TKSCYL(UTVONE),$@$SRT-1(,@XR)  FINDING DIFF BETWEEN END
1919 AF 3E 3F 3F          4665        SLC   $@$LTH-1($@$LTH-1,@XR),$@$LTH-1(,@XR)  ZERO F1 ENTRY
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    191D C0 87 15C1          4666        B     UTKPRC              RELEASE CYLINDER SPACE
    1921 C0 90 1A85          4667        BF    UTV465              BRANCH TO ERR PGM IF FALSE
    1925 3C 02 1BE1          4668        MVI   UTVFIL,@DPUT        SET DPL TO WRITE
                             4669 *       DISK  UTVFIL             WRITE MODIFIED FL ENTRY TO DISK
    1929 C0 87 0025          4670        B     $DISKN              PERFORM PHYSICAL DISK OP
    192D 1BE1         192E   4671        DC    AL2(UTVFIL)         DPL ADDRESS
                             4672 *** END OF EXPANSION ***
    192F C2 02 1E09          4673        LA    UTVAR2+UTVFLG+1,@XR INITIALIZE XR
    1933 8E 00 FF 1BF5       4674        ALC   $@$AVL(UTVONE,@XR),UTVDLT UPDATE # TAGS FREE
    1938 3C 02 1BDB          4675        MVI   UTVIDX,@DPUT        SET FOR DISK WRITE
                             4676 *       DISK  UTVIDX,WAIT         WRITE VTOC TO DISK
    193C C0 87 0025          4677        B     $DISKN              PERFORM PHYSICAL DISK OP
    1940 1BDB         1941   4678        DC    AL2(UTVIDX)         DPL ADDRESS
    1942 C0 87 0025          4679        B     $DISKN              WAIT AND CHECK DISK ERRORS
    1946 057F         1947   4680        DC    AL2($WAITF)         WAIT DPL ADDRESS
                             4681 *** END OF   EXPANSION ***
    1948 0C 00 1BF3 1BF7     4682        MVC   UTVTAG(UTVONE),UTVZER ZERO VOL LABEL TAG #
    194E 0C 00 159A 1BF7     4683        MVC   TKSCYL(UTVONE),UTVZER ZERO VOL LABEL START DADDY
    1954 0C 00 1599 1BF7     4684        MVC   TKSYLN(UTVONE),UTVZER ZERO VOL LABEL FILE SIZE
    195A C0 87 1ABF          4685        B     UTV600              JUMP TO PROCESS VOL LABEL
                             4686 *
                             4687 *                      PROCESS INSERTION FUNCTION
                             4688 *
    195E 34 02 1A0F          4689 UTV420 ST    UTV430+3,@XR        SAVE XR POINTER IN VTOC
    1962 39 12 1BE9          4690        TBF   UTVCOD,UTVFG2+UTVFG5 INSERTION ?
    1966 F2 10 31            4691        JT    UTV424              NO, GO READ FILE LABEL
    1969 3C 01 1C08          4692        MVI   UTVSCP,UTVONE       INITLZ VTOC ENTRIES CTR TO 1
    196D C2 02 1D16          4693        LA    UTVAR2+$@$FIL,@XR   POINT REGISTER TO FIRST ENTRY
    1971 2D 07 1BF1 00       4694 UTV421 CLC   UTVSAV($@$LNG),0(,@XR) IF A SCP FILE WITH SATE NAME AS
    1976 3C 74 03CD          4695        MVI   $CAERR,@@E478       * ONE DESIRED HERE. SET ERR CODE
    197A F2 01 08            4696        JNE   UTV422              * AND RETURN - ELSE SEARCH MORE
    197D 3D 00 1BF5          4697        CLI   UTVDLT,@ZERO        FORCE PSR HIGH
    1981 C0 87 1B76          4698        B     UTVED0              TAKE ERROR EXIT
    1985 0E 00 1C08 1BF5     4699 UTV422 ALC   UTVSCP(1),UTVDLT    POINT TO NEYT INDEY ENTRY
    198B E2 02 0A            4700        LA    $@$INC(,@XR),@XR    POINT REGISTER TO NEXT ENTRY
    198E 3D 33 1C08          4701        CLI   UTVSCP,UTVUPR+1     END OF VTOC INDEX ?
    1992 C0 82 1971          4702        BL    UTV421              NO, BRANCH BACK TO KEEP LOOKING
    1996 35 02 1A0F          4703        L     UTV430+3,@XR        RESET XR TO INDEX ENTRY
    199A C0 87 1B82          4704 UTV424 B     UTV900              READ FILE LABEL
    199E 39 12 1BE9          4705        TBF   UTVCOD,UTVFG2+UTVFG5 INSERTION ?
    19A2 F2 10 9C            4706        JT    UTV450              JUMP IF AN INSERTION
    19A5 C0 87 15C1          4707        B     UTKPRC              TEST FOR SPACE AVAILABLE
    19A9 F2 90 D9            4708        JF    UTV465              ERROR EMIT-NO SPACE
    19AC 38 10 1BE9          4709        TBN   UTVCOD,UTVFG5       INSERTION ?
    19B0 F2 90 12            4710        JF    UTV425              JUMP IF NOT INSERTION
    19B3 0C 00 1599 16F7     4711        MVC   TKSYLN(UTVONE),UTKCNT MOVE LAST CYL
    19B9 0F 00 1599 159A     4712        SLC   TKSYLN(UTVONE),TKSCYL SUBTRACT # CYLS
    19BF 0E 00 1599 1BF5     4713        ALC   TKSYLN(UTVONE),UTVDLT INCREMENT BY 1
    19C5 3C 3A 164A          4714 UTV425 MVI   UTKTYP,UTKSBN       SET CODE FOR SPACE ALLOCATION
    19C9 C0 87 15C1          4715        B     UTKPRC              ALLOCATE SPACE
    19CD C0 90 1A85          4716        BF    UTV465              BRANCH TO ERR PGM IF FALSE
    19D1 8C 07 0A 1BF1       4717        MVC   $@$FIN($@$LNG,@XR),UTVSAV  INSERT FILE NAME
    19D6 8C 01 12 1BF7       4718        MVC   $@$TYP(@CADDR,@XR),UTVZER  ZERO FILE TYPE
    19DB 38 10 1BE9          4719        TBN   UTVCOD,UTVFG5       INSERTION ?
    19DF F2 90 1B            4720        JF    UTV427              JUMP IF NOT INSERTION
    19E2 8C 00 21 16F7       4721        MVC   $@$END-1(UTVONE,@XR),UTKCNT  MOVE LAST CYL
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   19E7 8E 00 21 1BF5        4722        ALC   $@$END-1(UTVONE,@XR),UTVDLT  POINT ADDR TO NEXT AVAIL TRK
   19EC AC 00 1F 21          4723        MVC   $@$SRT-1(UTVONE,@XR),$@$END-1(,@XR)  MOVE START DADDR
   19F0 8F 00 1F 159A        4724        SLC   $@$SRT-1(UTVONE,@XR),TKSCYL  SUBTRACT . CYLINDERS
   19F5 2C 00 1C07 1F        4725        MVC   UTVSRT(UTVONE),$@$SRT-1(,@XR)  SAVE INIT CYL
   19FA F2 87 0F             4726        J     UTV430                  JUMP TO PROCESS VILE NAME
   19FD 8C 00 1F 1599        4727 UTV427 MVC   $@$SRT-1(UTVONE,@XR),TKSYLN  MOVE FILE START DADDR
   1A02 8C 00 21 1599        4728        MVC   $@$END-1(UTVONE,@XR),TKSYLN  MOVE FILE START DADDR
   1A07 8E 00 21 159A        4729        ALC   $@$END-1(UTVONE,@XR),TKSCYL  CALCULATE END DADDR
   1A0C C2 02 0000           4730 UTV430 LA    *-*,@XR                 POINT XR IN FILE LABEL
   1A10 8C 07 00 1BF1        4731        MVC   0($@$LNG,@XR),UTVSAV     MOVE FILE NAME TO LABEL
   1A15 C2 02 1E09           4732        LA    UTVAR2+UTVFLG+1,@XR      INITIALIZE XR
   1A19 8F 00 FF 1BF5        4733        SLC   $@$AVL(UTVONE,@XR),UTVDLT  SUBTRACT # FREE TAGS
   1A1E 3C 02 1BDB           4734        MVI   UTVIDX,@DPUT            SET FOR DISK WRITE
                             4735 *        DISK  UTVIDX,WAIT           WRITE VTOC TO DISK
   1A22 C0 87 0025           4736        B     $DISKN                 PERFORM PHYSICAL DISK OP
   1A26 1BDB          1A27   4737        DC    AL2(UTVIDX)             DPL ADDRESS
   1A28 C0 87 0025           4738        B     $DISKN                 WAIT AND CHECK DISK ERRORS
   1A2C 057F          1A2D   4739        DC    AL2($WAITF)            WAIT DPL ADDRESS
                             4740 *** END OF EXPANSION ***
   1A2E 3C 02 1BE1           4741 UTV435 MVI   UTVFIL,@DPUT            SET FOR DISK WRITE
                             4742 *        DISK  UTVFIL,WAIT           WRITE FILE LABEL TO DISK
   1A32 C0 87 0025           4743        B     $DISKN                 PERFORM PHYSICAL DISK OP
   1A36 1BE1          1A37   4744        DC    AL2(UTVFIL)            DPL ADDRESS
   1A38 C0 87 0025           4745        B     $DISKN                 WAIT AND CHECK DISK ERRORS
   1A3C 057F          1A3D   4746        DC    AL2($WAITF)            WAIT OFT ADDRESS
                             4747 *** END OF EXPANSION ***
   1A3E F2 87 7E             4748 UTV440 J     UTV600                 JUMP TO PROCESS VOL LABEL
                             4749 *
                             4750 *              PROCESS SHRINKAGE FUNCTION
                             4751 *
   1A41 38 08 1BE9           4752 UTV450 TBN   UTVCOD,UTVFG4          SHRINK FUNCTION ?
   1A45 F2 90 2A             4753        JF    UTV460                 JUMP IF EXPANSION
   1A48 2C 00 1599 21        4754        MVC   TKSYLN(UTVONE),$@$END-1(,@XR)  MOVE END DADDR
   1A4D 0F 00 1599 159A      4755        SLC   TKSYLN(UTVONE),TKSCYL  CALCULATE START CYL DADDR
   1A53 8C 00 21 1599        4756        MVC   $@$END-1(,@XR),TKSYLN   MOVE CYLINDER #
   1A58 C0 87 15C1           4757        B     UTKPRC                 RELEASE SPACE
   1A5C F2 90 26             4758        JF    UTV465                 JUMP TO ERR PGM IF FALSE
   1A5F 2C 00 159A 21        4759        MVC   TKSCYL(UTVONE),$@$END-1(,@XR)  CALCULATE FILE SIZE
   1A64 2F 00 159A 1F        4760        SLC   TKSCYL(UTVONE),$@$SRT-1(,@XR)  SUBTRACT END - START
   1A69 2C 00 1599 1F        4761        MVC   TKSYLN(UTVONE),$@$SRT-1(,@XR)  MOVE START DADDR
   1A6E C0 87 1A2E           4762        B     UTV435                 JUMP TO PROCESS VOL LABEL
                             4763 *
                             4764 *              PROCESS EXPANSION FUNCTION
                             4765 *
   1A72 2C 00 1599 21        4766 UTV460 MVC   TKSYLN(UTVONE),$@$END-1(,@XR)  FORM END DADDR
   1A77 3D FF 1BE8           4767        CLI   UTVTYP,UTVFLG           INFO PROCESS ?
   1A7B F2 81 1F             4768        JE    UTV500                 JUMP IF INFO PROCESS
   1A7E C0 87 15C1           4769        B     UTKPRC                 TEST FOR SPACE AVAILABLE
   1A82 F2 10 07             4770        JT    UTV470                 JUMP IF AVAILABLE
   1A85 3C 00 1BF2           4771 UTV465 MVI   UTVCHK,@ZERO           FORCE ERROR EXIT
   1A89 F2 87 CE             4772        J     UTV750                 JUMP TO EXIT ROUTINE
   1A8C 3C 3A 164A           4773 UTV470 MVI   UTKTYP,UTKSBN          SET CODE TO ASSIGN SPACE
   1A90 C0 87 15C1           4774        B     UTKPRC                 ASSIGN SPACE
   1A94 C0 90 1A85           4775        BF    UTV465                 BRANCH TO ERR PGM IF FALSE
   1A98 8E 00 21 159A        4776        ALC   $@$END-1(,@XR),TKSCYL   CALCULATE END DADDR
   1A9D 2C 00 159A 21        4777 UTV500 MVC   TKSCYL(UTVONE),$@$END-1(,@XR)  CALCULATE FILE SIZE
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    1AA2 2F 00 159A 1F        4778           SLC   TKSCYL(UTVONE),$@$SRT-1(,@XR)  VOLUME LABEL
    1AA7 2C 00 1599 1F        4779           MVC   TKSYLN(UTVONE),$@$SRT-1(,@XR)  FROM START DADDR
    1AAC 38 FF 1BE8           4780           TBN   UTVTYP,UTVFLG              INFO PROCESS ?
    1AB0 C0 90 1A2E           4781           BF    UTV435                    BRANCH IF NOT INFO
    1AB4 3C 00 1BE8           4782           MVI   UTVTYP,@ZERO              INIT FOR REGULAR PROCESS
    1AB8 3D 00 1BF7           4783           CLI   UTVZER,@ZERO             FORCE PSQ NON-LOW
    1ABC F2 87 B7             4784           J     UTVED0                    EXIT FROM ROUTINE
                             4785 *
                             4786 *                    PROCESS VOLUMN LABEL
                             4787 *
    1ABF 3D 00 1598          4788 UTV600 CLI  TKSBFI,@ZERO               BIS FILE ?
    1AC3 F2 81 94            4789           JE    UTV750                    JUMP IF NOT BIS FILE
    1AC6 C2 02 1C09          4790           LA    UTVAR1,@XR               POINT XR TO TOP OF VOL LABEL
    1ACA 38 80 1598          4791           TBN   TKSBFI,$#TSYM            SYSTEM PROGRAM FILE ?
    1ACE F2 90 0D            4792           JF    UTV620                    JUMP IF NOT 5PF FILE
    1AD1 8C 00 FA 1BF3       4793           MVC   $#TSYS(UTVONE,@XR),UTVTAG    SAVE SP, TAG. TO VOL LBL
    1AD6 8C 00 FB 1599       4794           MVC   $#TBIS-1(UTVONE,@XR),TKSYLN  MOVE SPF FILE DADDR
    1ADB F2 87 50            4795           J     UTV670                    JUMP TO PROCESS FILE !DR
    1ADE 39 60 1598          4796 UTV620 TBF  TKSBFI,$#TWR1+$#TWF1      WORK AREA FILE (RI/F1)?
    1AE2 F2 10 0D            4797           JT    UTV640                    JUMP IF NOT WARY AREA FILE
    1AE5 8C 00 F9 1BF3       4798           MVC   $#TWRK(UTVONE,@XR),UTVTAG  MOVE WORK AREA TAG.
    1AEA 8C 00 D7 03DF       4799           MVC   $#TWAL(UTVONE,@XR),$LEVEL  SET WORKAREA RELEASE LEVEL
    1AEF F2 87 3C            4800           J     UTV670                    JUMP TO PROCESS FILE IDR
    1AF2 38 10 1598          4801 UTV640 TBN  TKSBFI,$#TLIF            LIBRARY FILE ?
    1AF6 F2 90 12            4802           JF    UTV660                    JUMP IF NOT LIB FILE
    1AF9 8C 00 F8 1BF3       4803           MVC   $#TLIB(UTVONE,@XR),UTVTAG  MOVE LIBRARY TAG. TO VOL LBL
    1AFE 8C 00 F7 159A       4804           MVC   $#TLSZ(UTVONE,@XR),TKSCYL  MOVE LIBRARY SIZE TO VOL LBL
    1B03 8C 00 FD 1599       4805           MVC   $#TLAD-1(UTVONE,@XR),TKSYLN  MOVE LIBRARY DADDR
    1B08 F2 87 23            4806           J     UTV670                    JUMP TO PROCESS FILE IDR
    1B0B 38 08 1598          4807 UTV660 TBN  TKSBFI,$#TPFL            PTF FILE
    1B0F F2 90 12            4808           JF    UTV665                    JUMP IF NOT PTF FILE
    1B12 8C 00 F4 159A       4809           MVC   $#TPSZ(UTVONE,@XR),TKSCYL  MOVE PTF SIZE TO VOL LBL
    1B17 8C 00 F5 1599       4810           MVC   $#TPAD-1(UTVONE,@XR),TKSYLN  MOVE PTF DADDR
    1B1C 8C 00 F3 1BF3       4811           MVC   $#TPTF(UTVONE,@XR),UTVTAG  MOVE PTF TAG# TO VOL LBL
    1B21 F2 87 0A            4812           J     UTV670                    JUMP TO INIT FILE INDR
    1B24 8C 00 F0 1BF3       4813 UTV665 MVC  $#THVT(UTVONE,@XR),UTVTAG  MOVE HELP FILE TAG #
    1B29 8C 00 F1 1599       4814           MVC   $#THAD-1(UTVONE,@XR),TKSYLN  MOVE HELP FILE DADDR
    1B2E 0C 00 1B42 1598     4815 UTV670 MVC  UTV680+1(UTVONE),TKSBFI    INITIALIZE FILE INDR
    1B34 0C 00 1B48 1598     4816           MVC   UTV700+1(UTVONE),TKSBFI    TO MODIFY VOLUMN LABEL
    1B3A 38 01 1BE9          4817           TBN   UTVCOD,UTVFG1            DELETION ?
    1B3E F2 10 06            4818           JT    UTV700                    JUMP IF NOT INSERTION
    1B41 BA 00 FF            4819 UTV680 SBN  $#TIDR(,@XR),*-*          SET FILE INDR ON
    1B44 F2 87 03            4820           J     UTV720                    JUMP TO WRITE VOL LABEL TO DISK
    1B47 BB 00 FF            4821 UTV700 SBF  $#TIDR(,@XR),*-*          SET FILE INDR OFF
    1B4A 3C 02 1BD5          4822 UTV720 MVI  UTVVOL,@DPUT              SET FOR DISK WRITE FUNCTION
                             4823 *        DISK  UTVVOL,WAIT              WRITE VOL LABEL TO DISK
    1B4E C0 87 0025          4824           B     $DISKN                    PERFORM PHYSICAL DISK OP
    1B52 1BD5        1B53    4825           DC    AL2(UTVVOL)              DPL ADDRESS
    1B54 C0 87 0025          4826           B     $DISKN                    WAIT AND CHECK DISK ERRORS
    1B58 057F        1B59    4827           DC    AL2($WAITF)              WAIT DPL ADDRESS
                             4828 *** END OF EXPANSION ***
    1B5A 38 FF 1BF2          4829 UTV750 TBN  UTVCHK,UTVFLG             TEST FOR SUCESSFUL EXIT
    1B5E 0C 07 15A8 1C02     4830           MVC   TVSFIL($@$LNG),UTVSV1    SAVE FILE NAME
    1B64 0C 01 159C 1C04     4831           MVC   TKSADR(@CADDR),UTVSV2    SAVE DISK DADDR
    1B6A 0C 00 159A 1C05     4832           MVC   TKSCYL(UTVONE),UTVSV3    SAVE # CYLINDERS
    1B70 0C 00 1599 1C06     4833           MVC   TKSYLN(UTVONE),UTVSV4    SAVE INITIAL CAL #
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      UALLOC ?????? - ????


ERR LOC   OBJECT CODE      ADDR STMT SOURCE STATEMENT          VER 15, MOD 00  05/01/22  PAGE 106

                            4834 *UTVED  EXIT  @BR,@XR,RETURN
     1B76 C2 01 0000        4835 UTVED0 LA    *-*,@BR                      RESTORE @BR
     1B7A C2 02 0000        4836 UTVED1 LA    *-*,@XR                      RESTORE @XR
     1B7E C0 87 1B7E        4837 UTVED2 B     *                           RETURN TO CALLING PROGRAM
                            4838 *** END OF EXPANSION ***
                            4839 *
                            4840 *                    FOLLOWING:
                            4841 *                       1. CALCULATES FILE LABEL DADDR FROM VTOC TAG
                            4842 *                       2. READS FILE LABEL SECTOR FROM DISK
                            4843 *                       3. POINTS NR TO FILE LABEL
                            4844 *
     1B82 34 08 1BD4        4845 UTV900 ST    UTV960+3,@ARR               SAVE ARR FOR EXIT
     1B86 3C 01 1BE1        4846        MVI   UTVFIL,@DGET                SET FOR READ FUNCTION
     1B8A 2C 00 1BE3 01     4847        MVC   UTVFIL+2(UTVONE),$@$SCT(,@XR)  MOVE SCTR #
     1B8F 38 01 1BDD        4848        TBN   UTVIDX+2,UTVONE             FIXED DISK DRIVE ?
     1B93 F2 90 04          4849        JF    UTV920                      JUMP IF NOT FL
     1B96 3A 01 1BE3        4850        SBN   UTVFIL+2,UTVONE             SET ON FIXED BIT
     1B9A 38 02 1BDD        4851 UTV920 TBN   UTVIDX+2,UTVTWO             SPINDLE 2 ?
     1B9E F2 90 04          4852        JF    UTV930                      JUMP IF NOT SPINDLE 2
     1BA1 3A 02 1BE3        4853        SBN   UTVFIL+2,UTVTWO             SET SPINDLE 2 BIT ON
     1BA5 2C 00 1BC2 02     4854 UTV930 MVC   UTV950+2(UTVONE),$@$BYT(,@XR)  MOVE DISP
     1BAA 0F 00 1BC2 1BFA   4855        SLC   UTV950+2(UTVONE),UTVLGH     CALCULATE 1ST BYTE OF FILE LBL
                            4856 *                                       FILE LABEL SECTOR
                            4857 *        DISK  UVFIL,WAIT                READ FILE LABEL,NAIT
     1BB0 C0 87 0025        4858        B     $DISKN                      PERFORM PHYSICAL DISK OP
     1BB4 1BE1        1BB5  4859        DC    AL2(UTVFIL)                 DPL ADDRESS
     1BB6 C0 87 0025        4860        B     $DISKN                      WAIT AND CHECK DISK ERRORS
     1BBA 057F        1BBB  4861        DC    AL2($WAITF)                 WAIT DPL ADDRESS
                            4862 *** END OF EXPANSION ***
     1BBC C2 02 1F09        4863        LA    UTVAR3,@XR                  POINT XR TO FILE LABEL SECTOR
     1BC0 E2 02 00          4864 UTV950 LA    *-*(,@XR),@XR               INCREMENT XR TO FILE LABEL
     1BC3 B8 80 22          4865        TBN   $@$END(,@XR),UTVBIT         IS THIS RELEASE ONE ADDRESS ?
     1BC6 F2 10 08          4866        JT    UTV960                      NO, GO RETURN
                            4867 *                    ADJUST ADDR TO REFLECT NEXT AVAILABLE TRACK
                            4868 *                    IF THE ADDR IS LEFTOVER FROM THE FIRST RELEASE
     1BC9 8E 00 21 1BF5     4869        ALC   $@$END-1(1,@XR),UTVDLT      INCR CYL BY ONE
     1BCE BC 00 22          4870        MVI   $@$END(,@XR),@ZERO          SET TRK TO ZERO
     1BD1 C0 87 0000        4871 UTV960 B     *-*                         EXIT TO CALLING ROLTINE
                            4872 *
                            4873 *                    DPL LIST TO READ/WRITE VOLUMN LABEL TO DISK
                            4874 *
                            4875 *UTVVOL DPL   FUNC-@DGET,DADDR-VOLR1,CNT-#@VLAB,CADDR-UTVAR1
                       1BD5 4876 UTVVOL EQU   *                           DISK PARAMETER LIST
     1BD5 01          1BD5  4877        DC    AL1(@DGET)                  REQUESTED FUNCTION
     1BD6 0008        1BD7  4878        DC    AL2(#VOLR1)                 DISK ADDRESS
     1BD8 01          1BD8  4879        DC    AL1(#@VLAB)                 SECTOR COUNT
     1BD9 1C09        1BDA  4880        DC    AL2(UTVAR1)                 BUFFER ADDRESS
                            4881 *** END OF EXPANSION
                            4882 *
                            4883 *                    DPL LIST TO READ/WRITE VTOC INDEX TO DISK
                            4884 *
                            4885 *UTVIDX DPL   FUNC-@DGET,DADD-$VTCRI,CNT-#@VCNT,CADDR-UTVAR2
                       1BDB 4886 UTVIDX EQU   *                           DISK PARAMETER LIST
     1BDB 01          1BDB  4887        DC    AL1(@DGET)                  REQUESTED FUNCTION
     1BDC 0024        1BDD  4888        DC    AL2(#VTCR1)                 DISK ADDRESS
     1BDE 02          1BDE  4889        DC    AL1(#@VCNT)                 SECTOR COUNT
```

```
    1BDF 1D09            1BE0 4890          DC    AL2(UTVAR2)              BUFFER ADDRESS
                              4891 *** END OF EXPANSION ***
                              4892 *
                              4893 *              DPL LIST TO READ/WRITE FILE LABEL TO DISK
                              4894 *
                              4895 *UTVFIL DPL   FUNC-@DGET,CNT-#@VLAB,CADOR-UTVAR3
                         1BE1 4896 UTVFIL EQU    *                        DISK PARAMETER LIST
    1BE1 01             1BE1 4897          DC    AL1(@DGET)               REQUESTED FUNCTION
    1BE2 00             1BE2 4898          DC    AL1(*-*)                 CYLINDER ADDRESS
    1BE3 00             1BE3 4899          DC    AL1(*-*)                 HEAD/SECTOR/DRIVE/DISK SPEC
    1BE4 01             1BE4 4900          DC    AL1(#@VLAB)              SECTOR COUNT
    1BE5 1F09           1BE6 4901          DC    AL2(UTVAR3)              BUFFER ADDRESS
                              4902 *** END OF EXPANSION ***
                              4903 *
                              4904 *              CONSTANTS USED IN UTVTOC
                              4905 *
    1BE7                1BE7 4906 UTVCLS DS     CL1                      INITIAL CYL #
    1BE8 00             1BE8 4907 UTVTYP DC     XL1'00'                  INFO FLAG
    1BE9                1BE9 4908 UTVCOD DS     CL1                      FUNCTION FLAG
    1BEA                1BF1 4909 UTVSAV DS     CL8                      TEMPORARY FILE NAME
    1BF2                1BF2 4910 UTVCHK DS     CL1                      (UN)SUCCESSFUL EXIT CODE
    1BF3                1BF3 4911 UTVTAG DS     CL1                      TAG NUMBER COUNT
    1BF4                1BF4 4912 UTVLIM DS     CL1                      MAXIMUM TAG NUMBER
    1BF5 01             1BF5 4913 UTVDLT DC     IL1'01'                  INC FACTOR
    1BF6 0000           1BF7 4914 UTVZER DC     IL(@CADDR)'00'           CONSTANT FACTOR
    1BF8 1C09           1BF9 4915 UTVADR DC     AL2(UTVAR1)              DADDR OF VOLUMN LABEL
    1BFA 3F             1BFA 4916 UTVLGH DC     AL1($@$LTH-1)            LENGTH OF FILE LABEL-1
    1BFB                1C02 4917 UTVSV1 DS     CL8                      FILE SAVE AREA
    1C03                1C04 4918 UTVSV2 DS     CL(@CADDR)               DISK DADDR
    1C05                1C05 4919 UTVSV3 DS     CL1                      # CYLINDERS
    1C06                1C06 4920 UTVSV4 DS     CL1                      INITIAL CYL #
    1C07                1C07 4921 UTVSRT DS     CL1                      SAVED INIT CYL #
    1C08                1C08 4922 UTVSCP DS     XL1                      COUNTER FOR VTOC SEARCH
                              4923 *
                              4924 *              EQUATES USED IN UTVTOC
                              4925 *
                         0001 4926 UTVFG1 EQU   X'01'                    VTOC FILE DELETION
                         0002 4927 UTVFG2 EQU   X'02'                    VTOC FILE INSERTION
                         0004 4928 UTVFG3 EQU   X'04'                    VTOC FILE EXPANSION
                         0008 4929 UTVFG4 EQU   X'08'                    VTOC FILE SHRINKAGE
                         0010 4930 UTVFG5 EQU   X'10'                    VTOC FILE INSERT
                         00FF 4931 UTVFLG EQU   X'FF'                    SUCCESSFUL EXIT CODE
                         0080 4932 UTVBIT EQU   X'80'                    TRACK 1 BIT
                         1778 4933 UTVDEL EQU   UTVTOC                   ENTRY POINT FOR DELETION
                         1789 4934 UTVDFT EQU   UTV050                   ENTRY POINT FOR INSERT
                         1794 4935 UTVIST EQU   UTV100                   ENTRY POINT FOR INSERTION
                         17B1 4936 UTVINF EQU   UTV117                   ENTRY POINT FOR INFO
                         17B5 4937 UTVEXP EQU   UTV120                   ENTRY POINT FOR EXPANSION
                         17C0 4938 UTVSHK EQU   UTV140                   ENTRY POINT FOR SHRINKAGE
                         0001 4939 UTVONE EQU   1                        CONSTANT FACTOR
                         0002 4940 UTVTWO EQU   2                        CONSTANT FACTOR
                         0008 4941 UTVEGT EQU   8                        CONSTANT FACTOR
                         0032 4942 UTVUPR EQU   X'32'                    MAXIMUM # TAGS
                         1C09 4943 UTVAR1 EQU   *                        VOLUMN LABEL BUFFER AREA
                         1D09 4944 UTVAR2 EQU   UTVAR1+256               VTOC INDEX BUFFER AREA
                         1F09 4945 UTVAR3 EQU   UTVAR2+512               FILE LABEL BUFFER AREA
```

```
     UALLOC ?????? - ????

ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT          VER 15, MOD 00  05/01/22  PAGE 108

                          2009 4946 UTVAR4 EQU    UTVAR3+256
                               4947        PRINT ON
                          FFFF 4948        END

TOTAL STATEMENTS IN ERROR IN THIS ASSEMBLY =      0
```

```
$$$$$$   001  0C00 2061
$$$$$1   120  1777 4440
$$$001   015  0C41 2241
$$ZERO   001  0000 1314   1315  1317  1318  1319  1323
$#TALT   001  0075 1994
$#TBIS   001  00FC 2006   4794*
$#TCET   001  0069 1993
$#TCYL   001  005C 1992
$#THAD   001  00F2 1998   4814*
$#THEL   001  0004 2018   4633
$#THVT   001  00F0 1997   4635  4813*
$#TIDR   001  00FF 2008   2407  2409  4613  4819* 4821*
$#TLAD   001  00FE 2007   2524  2525  4805*
$#TLBL   001  0008 1989
$#TLIB   001  00F8 2003   4627  4803*
$#TLIF   001  0010 2016   2489  2626  4625  4801
$#TLSZ   001  00F7 2002   2526  4804*
$#TOID   001  005B 1991
$#TPAD   001  00F6 2001   4810*
$#TPFL   001  0008 2017   4629  4807
$#TPSZ   001  00F4 2000   4809*
$#TPTF   001  00F3 1999   4631  4811*
$#TRES   001  00D7 2010
$#TSUS   001  00EF 1996
$#TSYM   001  0080 2013   4617  4791
$#TSYS   001  00FA 2005   4619  4793*
$#TUSE   001  00A8 1995   4402
$#TVOL   001  0002 1988
$#TVTC   001  000A 1990
$#TWAL   001  00D7 2009   4799*
$#TWF1   001  0020 2015   2407  2418  2619  4621  4796
$#TWRK   001  00F9 2004   4623  4798*
$#TWR1   001  0040 2014   2409  2416  2615  4621  4796
$@$AVL   001  00FF 2047   4674* 4733*
$@$BYT   001  0002 2033   4854
$@$END   001  0022 2049   4663  4721* 4722* 4723  4728* 4729* 4754  4756* 4759  4766  4776* 4777
                          4865  4869* 4870*
$@$FIL   001  000D 2029   4639  4693
$@$FIN   001  000A 2043   4717*
$@$INC   001  000A 2035   4644  4700
$@$LNG   001  0008 2030   4545  4551  4552  4554  4568  4642  4659  4694  4717  4731  4830
$@$LTH   001  0040 2042   4665  4665  4665* 4916
$@$LUE   001  0006 2037
$@$RTN   001  0011 2044
$@$SCT   001  0001 2031   4847
$@$SRT   001  0020 2046   4661  4664  4723* 4724* 4725  4727* 4760  4761  4778  4779
$@$TGS   001  0032 2036
$@$TYP   001  0012 2045   4718*
$ABORT   001  0010 1427
$BASIC   001  0080 1485
$BIGCD   001  0080 1561
$BLDPL   001  0579 1694   1696
$BLNOE   001  0569 1684
$BLOAD   001  0522 1675   1677  1680  1693  1694
$BLRTN   001  0550 1683   1684
$BRSAV   001  03C5 1372   1373
```

```
$BSADR  001  0587 1699    1701  2364  3226  3227
$BUFPT  001  03E3 1580    1581
$CABLD  001  04B4 1653    1654
$CAERK  001  0469 1630    1633  2291  2314  2331  2411  2434  2453  2505  2629
$CAERR  001  03CD 1378    1380  2266* 2268* 2290* 2297* 2302* 2306* 2313* 2329* 2414* 2429* 2450
                          2452* 2470* 2478* 2486* 2502* 2509* 2628* 2918* 3086* 3203* 3210* 3461*
                          3478* 3482* 3499* 3504* 3506* 3696* 3703* 3724* 3728* 3761* 3943* 3950*
                          3975* 3978* 3981* 4695*
$CAIPL  001  049D 1649    1651
$CALLI  001  0008 1570
$CARDI  001  0001 1341
$CARPL  001  04A1 1651    1653  2625
$CIENT  001  0483 1640    1641
$CIEXT  001  0480 1639    1640
$CIMSK  001  0476 1636    1639  2332* 4580*
$CISUS  001  0496 1644    1649
$CLBFR  001  0010 1528
$CMDKY  001  0008 1440
$CMODE  001  0002 1490    3211  3217  3224
$CONFG  001  03DD 1553    1563
$CRPOS  001  03E2 1579    1580
$CRTAD  001  044D 1618    1619
$CRTAV  001  0002 1434
$CRTDN  001  0002 1458
$CRTIN  001  03D3 1455    1462
$CRTNO  001  0004 1437
$CRTPU  001  0004 1459
$CRTSP  001  0008 1460
$CRTUP  001  0001 1457
$CRUSH  001  0080 1566
$CSDPL  001  050E 1665    1666
$C0001  001  0464 1622    1628
$DATE   001  043A 1603    1604
$DBGUF  001  03E0 1565    1574
$DBLOK  001  0001 1515
$DFDET  001  03E8 1586    1587
$DISKN  001  0025 1317    2245  2548  2571  2603  2869  4382  4384  4583  4585  4601  4603  4670
                          4677  4679  4736  4738  4743  4745  4824  4826  4858  4860
$DKERR  001  0008 1496
$DKSIZ  001  03D7 1540    1548  1589  2515  2519  3706  3709  3961
$DK100  001  0001 1542    2515
$DK200  001  0002 1543    2519
$DK400  001  0004 1544    3961
$DK600  001  0008 1545    3709
$DK800  001  0010 1546    3706  3709
$DPLSV  001  0449 1614    1616
$DTNMB  001  0040 1361
$DTRDR  001  0040 1449
$ENDNU  001  0600 1708
$ERDPL  001  046F 1633    1635
$ERFIL  001  0040 1388
$ERHRD  001  0004 1520
$ERKEY  001  0080 1392
$ERLOG  001  0345 1322
$ERMAD  001  0472 1635    1636  3219* 3230*
$ERPND  001  0004 1493
```

```
$ERRCT  001  03CF 1394
$ERRPG  001  03CE 1382
$ERSFL  001  0035 1387
$ERSTK  001  0030 1385
$ER050  001  0363 1323
$ER1N2  001  0050 1390
$EXADR  001  0517 1668   1670
$EXCMD  001  0001 1422
$EXFTR  001  043B 1604   1609
$FCIND  001  0010 1500
$FDIND  001  0040 1507
$FEARR  001  0004 1315
$FEMAP  001  0588 1701   1702
$FILIB  001  03DA 1551   1552
$FITIN  001  0010 1476
$FUIND  001  0020 1505
$GUFIO  001  0583 1698   1699  3218* 3229*
$GUFIR  001  0008 1350
$HISTE  001  042E 1601   1602
$HIST1  001  0435 1602   1603
$HRDER  001  0020 1446
$INDR1  001  03D4 1462   1488
$INDR2  001  03D5 1488   1513  3211  3217* 3224*
$INDR3  001  03D6 1513   1540  2356* 2362* 3204  3207
$INLNO  001  03CF 1380   1382  1394  1401
$INRPT  001  0020 1358
$IOIND  001  03D2 1429   1455
$IOPGS  001  0010 1569
$IOYES  001  0002 1344
$IPLDV  001  05FF 1705   1708
$IRKEY  001  0020 1568
$KEYBD  001  03E1 1574   1579
$KEYCD  001  03C3 1338   1372
$KEYDT  001  0040 1482
$KE090  001  00DE 1318
$KE130  001  01D5 1319
$KYBSY  001  0010 1355
$LDRTN  001  0571 1693
$LEVEL  001  03DF 1563   1565  4799
$LIST   001  0002 1517
$LMRGN  001  03C1 1333   1335
$LNPTR  001  0080 1452
$LOADB  001  054A 1677
$LOADR  001  051A 1670   1673
$LPRIO  001  03EA 1587
$LPROS  001  03E5 1582   1584
$LPRP3  001  03E4 1581   1582
$MOUNT  001  0020 1531
$MPDWN  001  0001 1431
$NEXTB  001  03E6 1584   1585
$NEXTL  001  03E7 1585   1586
$NOENB  001  0008 1523
$NOLST  001  0004 1347
$NUCBS  001  03C0 1330   1331
$NWRKF  001  0080 1536   2362  3204
$NWRKR  001  0040 1533   2356  3207
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                              CROSS REFERENCE

SYMBOL   LEN VALUE DEFN    REFERENCES                      VER 15, MOD 00  05/01/22  PAGE 112

$PASWD   001  042D 1600    1601
$PAUSD   001  04BA 1654    1656
$PAUSE   001  0002 1424
$PGMDT   001  0020 1479
$PGMST   001  0010 1443
$PKERT   001  0419 1598    1600
$PLST1   001  0454 1619    1620
$PLST2   001  045B 1620    1621
$PLST3   001  0462 1621    1622
$PRDEV   001  044B 1616    1618
$PRESN   001  0002 1467
$PROCI   001  0001 1464
$PRPOS   001  03C2 1335    1338
$PSDBR   001  04FA 1659
$PSDXR   001  04F2 1658    1659
$PSTEP   001  0004 1425
$PSTMT   001  0008 1426
$PTCH1   001  03F5 1589    1593
$READY   001  0080 1509
$REORD   001  0040 1567
$RLOAD   001  051E 1673    1675
$RMRGN   001  03C0 1331    1333
$RSTR    001  04D6 1656    1658  1660  1665
$RUNIT   001  0001 1403
$SFAID   001  050D 1661
$SPRNT   001  0465 1628    1630  2392  2396  2399
$SRTRN   001  04FE 1660    1661
$STEPT   001  0002 1404
$SWPCR   001  0511 1666    1668
$TABLN   001  03CB 1375    1378
$TFLOW   001  0008 1410
$TRACE   001  0004 1405
$TRALL   001  0010 1411
$TROVR   001  054E 1680    1683
$TRUNK   001  0080 1363
$TRVAR   001  0020 1412
$UNMSK   001  048D 1641    1644
$USRDR   001  03DC 1552    1553
$VMDEF   001  0080 1416
$VOLF1   001  03FE 1595    1596  2312
$VOLF2   001  040E 1597
$VOLID   001  03F6 1593    1594  1598  2481  2528  3809
$VOLR1   001  03F6 1594    1595
$VOLR2   001  0406 1596    1597
$WAITF   001  057F 1696    1698  2549  2572  2604  4385  4586  4604  4680  4739  4746  4827  4861
$WFDEF   001  0040 1610    2384
$WFLOK   001  0008 1473
$WFNME   001  0443 1609    1614  2384*
$WSIND   001  0004 1470
$XIND1   001  03D0 1401    1420
$XIND2   001  03D1 1420    1429
$XIND3   001  03D8 1548    1551
$XPREC   001  0040 1413
$XRSAV   001  03C7 1373    1375  2249
$ZTRAD   001  05A2 1702
$12K     001  0004 1557
```

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$16CKY   001  0008 1559
$16K     001  0002 1556
$22IMP   001  0001 1554
#$$#BL   001  0000 1165
#$$#CK   001  0000 1293
#$$#CN   001  0000 1261
#$$#CO   001  0000 1053
#$$#CS   001  0000 1113
#$$#DR   001  0000 0857
#$$#ER   001  0000 1057
#$$#FS   001  0000 1153
#$$#IN   001  0000 1297
#$$#PW   001  0000 1301
#$$#RS   001  0000 1133
#$$#SA   001  0000 1121
#$$#SS   001  0000 1117
#$$#VU   001  0600 1077
#$$#0T   001  0700 0849
#$$#1T   001  0000 0853
#$$BCO   001  0600 0865
#$$BOV   001  0800 1137
#$$DPR   001  0700 0873
#$$DRE   001  0889 0889
#$$DSP   001  2800 0909
#$$ECM   001  0C00 1169
#$$EFK   001  0C00 1189
#$$ERR   001  0C00 1161
#$$EXM   001  0C00 1049
#$$FIL   001  0E00 1129
#$$FIS   001  0E00 1125
#$$FML   001  0200 1257
#$$FMS   001  0200 1097
#$$GRA   001  0889 1021
#$$GUF   001  0C00 1157
#$$INL   001  0600 1237
#$$INS   001  0600 0861
#$$KAL   001  0C00 1025
#$$KCA   001  0C00 1241
#$$KCH   001  0C00 0993
#$$KCN   001  0C00 1109
#$$KCT   001  0C00 0961
#$$KDE   001  0C00 0957
#$$KDI   001  0D00 1037
#$$KDN   001  0C00 0945
#$$KDO   001  0E00 1041
#$$KED   001  0C00 0881
#$$KEN   001  0C00 0885
#$$KEX   001  0C00 0905
#$$KGO   001  0C00 0877
#$$KHE   001  0C00 1061
#$$KKE   001  0C00 1289
#$$KLI   001  0C00 0965
#$$KLL   001  0920 1265
#$$KLO   001  0C00 0969
#$$KME   001  0D00 0949
#$$KMO   001  0C00 0893
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#$$KNA   001  0C00 1005
#$$KOV   001  0E00 0925
#$$KPA   001  0C00 0901
#$$KPO   001  0C00 0989
#$$KPR   001  0C00 1013
#$$KRE   001  0C00 0933
#$$KRL   001  0700 1029
#$$KRM   001  0C00 0897
#$$KRN   001  0700 0917
#$$KRO   001  0D00 0921
#$$KRS   001  0C00 1245
#$$KRU   001  0C00 0941
#$$KRV   001  0800 1033
#$$KSA   001  0C00 0977
#$$KSE   001  0E00 1017
#$$KSO   001  0C20 1069
#$$KSS   001  0C00 1001
#$$KSV   001  0980 0997
#$$KSY   001  0C00 1009
#$$KWI   001  0C00 0937
#$$KWR   001  0C00 0929
#$$LOA   001  0600 0869
#$$MIP   001  0C00 1065
#$$SDS   001  0C00 1177
#$$SFF   001  0E00 1181
#$$SFL   001  0F00 1173
#$$SFO   001  1500 1145
#$$SFS   001  0C00 1141
#$$SPA   001  0C00 0981
#$$SPO   001  0806 0985
#$$SPS   001  0C00 0973
#$$STR   001  1600 1149
#$$TDC   001  1000 0953
#$$TSY   001  1000 0913
#$$TVK   001  0FC0 1089
#$$UAL   001  0C00 1105   2060
#$$UAT   001  0900 1201
#$$UCD   001  0900 1209
#$$UCN   001  0C00 1193
#$$UCP   001  0700 1197
#$$UDE   001  0C00 1213
#$$UDI   001  0C00 1217
#$$UEX   001  0C00 1101
#$$UIN   001  0C00 1205
#$$UPA   001  0C00 1185
#$$UPO   001  0C00 1253
#$$UPT   001  0C00 1249
#$$VCR   001  2000 1045
#$$VLO   001  0600 1081
#$$VOD   001  0600 1085
#$$VVM   001  0000 1093
#$$VXI   001  0600 1073
#$$ZDU   001  1100 1225
#$$ZLB   001  1100 1269
#$$ZLO   001  1100 1229
#$$ZLV   001  0F00 1285
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#$$ZL1  001  0F00 1273
#$$ZL2  001  0F00 1277
#$$ZL3  001  0C00 1281
#$$ZTR  001  1000 1221
#$$ZUT  001  0C00 1233
#$#BLN  001  18D4 1164
#$#CKT  001  2118 1292
#$#CNF  001  2000 1260
#$#COR  001  0800 1052
#$#CSA  001  1000 1112
#$#DRT  001  0000 0856
#$#ERM  001  0928 1056
#$#FSP  001  1880 1152   2689
#$#INV  001  212C 1296
#$#PWR  001  2300 1300
#$#RSP  001  1780 1132   2688
#$#SAV  001  1180 1120
#$#SSA  001  1128 1116
#$#VUF  001  0B08 1076
#$#0TR  001  0000 0848
#$#1TR  001  0080 0852
#$@#BL  001  0001 1166
#$@#CK  001  0004 1294
#$@#CN  001  0001 1262
#$@#CO  001  003A 1054
#$@#CS  001  003A 1114
#$@#DR  001  0008 0858
#$@#ER  001  0032 1058
#$@#FS  001  0030 1154
#$@#IN  001  003A 1298
#$@#PW  001  00C0 1302
#$@#RS  001  0030 1134
#$@#SA  001  0108 1122
#$@#SS  001  0001 1118
#$@#VU  001  0002 1078
#$@#0T  001  0018 0850
#$@#1T  001  0018 0854
#$@BCO  001  0018 0866
#$@BOV  001  0018 1138
#$@DPR  001  0005 0874
#$@DRE  001  0001 0890
#$@DSP  001  0004 0910
#$@ECM  001  0006 1170
#$@EFK  001  0002 1190
#$@ERR  001  0003 1162
#$@EXM  001  0003 1050
#$@FIL  001  0009 1130
#$@FIS  001  0009 1126
#$@FML  001  0052 1258
#$@FMS  001  0052 1098
#$@GRA  001  0003 1022
#$@GUF  001  0010 1158
#$@INL  001  0010 1238
#$@INS  001  0010 0862
#$@KAL  001  000F 1026
#$@KCA  001  000C 1242
```

```
                          CROSS REFERENCE

SYMBOL  LEN VALUE DEFN   REFERENCES                    VER 15, MOD 00  05/01/22  PAGE 116

#$@KCH  001  000C 0994
#$@KCN  001  0010 1110
#$@KCT  001  0009 0962
#$@KDE  001  0010 0958
#$@KDI  001  0005 1038
#$@KDN  001  0010 0946
#$@KDO  001  000C 1042
#$@KED  001  000E 0882
#$@KEN  001  0006 0886
#$@KEX  001  0003 0906
#$@KGO  001  0002 0878
#$@KHE  001  000C 1062
#$@KKE  001  0006 1290
#$@KLI  001  0011 0966
#$@KLL  001  0001 1266
#$@KLO  001  0008 0970
#$@KME  001  0003 0950
#$@KMO  001  0004 0894
#$@KNA  001  0008 1006
#$@KOV  001  0009 0926
#$@KPA  001  0005 0902
#$@KPO  001  000D 0990
#$@KPR  001  0009 1014
#$@KRE  001  0002 0934
#$@KRL  001  0004 1030
#$@KRM  001  0003 0898
#$@KRN  001  0003 0918
#$@KRO  001  000A 0922
#$@KRS  001  000A 1246
#$@KRU  001  0003 0942
#$@KRV  001  000D 1034
#$@KSA  001  0011 0978
#$@KSE  001  0004 1018
#$@KSO  001  000D 1070
#$@KSS  001  000B 1002
#$@KSV  001  0002 0998
#$@KSY  001  000F 1010
#$@KWI  001  0002 0938
#$@KWR  001  0002 0930
#$@LOA  001  0013 0870
#$@MIP  001  000D 1066
#$@SDS  001  0004 1178
#$@SFF  001  0008 1182
#$@SFL  001  0005 1174
#$@SFO  001  0003 1146
#$@SFS  001  0011 1142
#$@SPA  001  0004 0982
#$@SPO  001  0003 0986
#$@SPS  001  0001 0974
#$@STR  001  0002 1150
#$@TDC  001  0003 0954
#$@TSY  001  0003 0914
#$@TVK  001  0001 1090
#$@UAL  001  0011 1106
#$@UAT  001  000C 1202
#$@UCD  001  000B 1210
```

```
#$@UCN   001  0009 1194
#$@UCP   001  000F 1198
#$@UDE   001  000E 1214
#$@UDI   001  0008 1218
#$@UEX   001  000E 1102
#$@UIN   001  000F 1206
#$@UPA   001  0004 1186
#$@UPO   001  0005 1254
#$@UPT   001  0012 1250
#$@VCR   001  0008 1046
#$@VLO   001  0002 1082
#$@VOD   001  0016 1086
#$@VVM   001  0030 1094
#$@VXI   001  0002 1074
#$@ZDU   001  0008 1226
#$@ZLB   001  0002 1270
#$@ZLO   001  000C 1230
#$@ZLV   001  0006 1286
#$@ZL1   001  0007 1274
#$@ZL2   001  000D 1278
#$@ZL3   001  000A 1282
#$@ZTR   001  0001 1222
#$@ZUT   001  0014 1234
#$BCOM   001  0080 0864
#$BOLV   001  1780 1136
#$DPRI   001  014C 0872
#$DREA   001  0200 0888
#$DSPL   001  0240 0908
#$ECMA   001  1900 1168
#$EFKE   001  1990 1188
#$ERRP   001  18C0 1160   3251
#$EXMS   001  07D4 1048
#$FILN   001  1724 1128
#$FIST   001  1700 1124
#$FMLN   001  1E00 1256
#$FMST   001  0D00 1096
#$GRAP   001  0690 1020
#$GUFU   001  1880 1156   3246
#$INLN   001  1C84 1236
#$INST   001  0020 0860
#$KALL   001  06A4 1024
#$KCAL   001  1CC4 1240
#$KCHA   001  053C 0992
#$KCND   001  0F80 1108
#$KCTL   001  03BC 0960
#$KDEL   001  035C 0956
#$KDIS   001  0744 1036
#$KDNT   001  0300 0944
#$KDOV   001  0780 1040
#$KEDI   001  0188 0880
#$KENA   001  01C4 0884
#$KEXT   001  0234 0904
#$KGOS   001  0180 0876
#$KHEL   001  0A30 1060
#$KKEY   001  2100 1288
#$KLIS   001  0400 0964
```

```
SYMBOL   LEN VALUE DEFN   REFERENCES                              VER 15, MOD 00  05/01/22  PAGE 118

#$KLLA   001  2004 1264
#$KLOG   001  0444 0968
#$KMER   001  030C 0948
#$KMOU   001  0204 0892
#$KNAM   001  05C0 1004
#$KOVM   001  0290 0924
#$KPAS   001  0220 0900
#$KPOO   001  0508 0988
#$KPRT   001  063C 1012
#$KREA   001  02BC 0932
#$KRLA   001  0700 1028
#$KRMO   001  0214 0896
#$KRNU   001  0280 0916
#$KROV   001  028C 0920
#$KRSU   001  1D24 1244
#$KRUN   001  02CC 0940
#$KRVL   001  0710 1032
#$KSAV   001  0488 0976
#$KSET   001  0680 1016
#$KSOV   001  0AC8 1068
#$KSSP   001  0594 1000
#$KSVL   001  058C 0996
#$KSYM   001  0600 1008
#$KWID   001  02C4 0936
#$KWRI   001  02B4 0928
#$LOAD   001  0100 0868
#$MIPP   001  0A80 1064
#$SDSY   001  192C 1176
#$SFFI   001  193C 1180
#$SFLO   001  1918 1172
#$SFOV   001  1844 1144
#$SFSY   001  1800 1140
#$SPAC   001  04CC 0980
#$SPOV   001  04DC 0984
#$SPSY   001  0484 0972
#$STRO   001  1850 1148
#$TDCK   001  0350 0952
#$TSYK   001  0250 0912
#$TVKB   001  0BAC 1088
#$UALL   001  0F00 1104
#$UATR   001  1A38 1200
#$UCDI   001  1AD8 1208
#$UCNF   001  19B8 1192
#$UCPL   001  19DC 1196
#$UDEL   001  1B24 1212
#$UDIS   001  1B5C 1216
#$UEXL   001  0EA8 1100
#$UINI   001  1A88 1204
#$UPAC   001  1980 1184
#$UPOV   001  1D24 1252
#$UPTF   001  1D5C 1248
#$VCRT   001  07B4 1044
#$VLOA   001  0B80 1080
#$VODK   001  0B88 1084
#$VVMR   001  0C00 1092
#$VXIT   001  0B00 1072
```

```
SYMBOL   LEN VALUE DEFN   REFERENCES                              VER 15, MOD 00  05/01/22  PAGE 119

#$ZDUM   001  1BA4 1224
#$ZLBM   001  2008 1268
#$ZLOA   001  1BC4 1228
#$ZLVR   001  20B0 1284
#$ZL1M   001  2010 1272
#$ZL2M   001  2030 1276
#$ZL3M   001  2088 1280
#$ZTRA   001  1B9C 1220
#$ZUTM   001  1C14 1232
##DNEA   001  0001 1835   2535*
##DNEF   001  0003 1836   2537* 2540* 2543*
##DNER   001  0005 1837
##DNE1   001  0004 1834   2534
##DNHC   001  0000 1831   2531*
##DNHR   001  0003 1833   2533*
##DNHY   001  0001 1832   2532*
##DPEA   001  0009 1809   2561* 2565*
##DPEN   001  0007 1808   2560* 2564* 3549  3550
##DPER   001  000B 1810   2562* 2566*
##DPE1   001  0004 1807
##DPHC   001  0000 1805   2557*
##DPHR   001  0003 1806   2558*
##DUEA   001  0009 1820
##DUED   001  0012 1825
##DUEF   001  000B 1821
##DUEH   001  002B 1826
##DUEI   001  000C 1822
##DUEL   001  000F 1824
##DUEN   001  0007 1819
##DUER   001  0031 1827
##DUES   001  000D 1823
##DUE1   001  000C 1818
##DUHA   001  0001 1814   2595*
##DUHB   001  0003 1815   2596*
##DUHC   001  0004 1816   2597*
##DUHR   001  000B 1817   2598*
##LAAA   001  0002 1846   2535  2561  2565  2579  2586  2595  2596
##LAHC   001  0001 1845   2531  2557  2597
##LN     001  0001 1874
##LNE    001  0006 1880
##LNEF   001  0002 1878   2537  2540  2543
##LNEZ   001  0002 1879
##LNH    001  0004 1877
##LNHY   001  0001 1875   2532
##LNHZ   001  0002 1876   2533
##LP     001  0004 1850
##LPE    001  000C 1855   2563
##LPEN   001  0008 1852   2560  2564  3435  3477
##LPEZ   001  0002 1853   2562  2566
##LPH    001  0004 1854   2559
##LPHZ   001  0003 1851   2558
##LU     001  0002 1859
##LUE    001  0032 1870
##LUED   001  0003 1867
##LUEF   001  0002 1863
##LUEH   001  0019 1868
```

```
##LUEI   001  0001 1864
##LUEL   001  0002 1866
##LUEN   001  0008 1862   3405   3547
##LUES   001  0001 1865
##LUEZ   001  0006 1869
##LUH    001  000C 1861
##LUHZ   001  0007 1860   2598
##MNHM   001  002A 1903
##MPHM   001  0055 1888
##MUEG   001  0020 1895
##MUEK   001  0040 1894
##MUEP   001  0080 1893
##MUER   001  0008 1897
##MUEV   001  0002 1899
##MUEX   001  0010 1896
##MUE0   001  0004 1898
##MUHM   001  000A 1892
##RN     001  0000 1794
##RP     001  0001 1795   2693
##R1     001  0007 1797   2695
##R2     001  0005 1796   2694
#@#BAD   001  0455 1737
#@#IO1   001  0459 1745
#@#IO2   001  045D 1746
#@#TAT   001  0941 1773
#@#TBA   001  09A1 1777
#@#TFS   001  0941 1771
#@#TSY   001  0941 1775
#@#VFP   001  0700 1763
#@#VLP   001  093D 1766
#@#WDB   001  050C 1758
#@#WFT   001  0500 1756
#@@#BA   001  0001 1738
#@@#IO   001  0001 1750
#@@#SC   001  0002 1747
#@@#TA   001  0010 1774
#@@#TB   001  0010 1778
#@@#TS   001  0005 1776
#@@#TW   001  0020 1772
#@@#VM   001  0100 1767
#@@#WD   001  00BD 1759
#@@#WF   001  0003 1757
#@@#04   001  0004 1749
#@@#08   001  0008 1748
#@@BOV   001  0018 1726
#@@ECM   001  0006 1740
#@@ERR   001  0003 1734
#@@GUF   001  0010 1730
#@@LDS   001  0002 1736
#@@SDS   001  0004 1732
#@@SFF   001  0008 1744
#@@SFL   001  0005 1742
#@@SFO   001  0005 1752
#@@SFS   001  0011 1728
#@@VSF   001  0010 1780
#@@VSL   001  000F 1781
```

```
#@@VTR 001  0001 1765
#@BOVL 001  0400 1725
#@CORS 001  0005 1955
#@ECMA 001  0481 1739
#@ERRP 001  0441 1733   3241
#@GUFU 001  0401 1729   3240
#@LDSV 001  044D 1735
#@MVSD 001  0001 1963
#@NERO 001  0003 1957
#@OBRA 001  0002 1959
#@PTFL 001  0006 1978
#@PTFS 001  0001 1977
#@SDSY 001  04AD 1731
#@SFFI 001  04BD 1743
#@SFLO 001  0499 1741
#@SFOV 001  04C4 1751
#@SFSY 001  0480 1727
#@VCNT 001  0002 1975   4889
#@VLAB 001  0001 1970   4415  4879  4900
#@VLSD 001  0001 1961
#@VSFI 001  09A1 1779
#@VTRL 001  0708 1764
#@WAF1 001  0401 1724   2691
#@WAR1 001  0400 1723   2690
#CNDIS 001  0001 1930
#CNFIG 001  0005 1966
#CORSV 001  0010 1954
#DKEXT 001  0002 1937
#FIGSC 001  0001 1967
#HISCT 001  0006 1944
#HISDX 001  0003 1939
#HISLN 001  0008 1936   1937
#HISN1 001  0003 1942
#HISN2 001  0005 1943
#HISTC 001  0007 1946
#HISTN 001  0009 1948
#HISTQ 001  0000 1940
#HISTR 001  0001 1941
#HISTS 001  0008 1947
#HISTV 001  000F 1949
#HSEND 001  0007 1945
#HSENT 001  0001 1938
#IOSDR 001  0019 1965
#MVSDR 001  000D 1962
#NEROV 001  009C 1956
#OBRAD 001  001D 1958
#PKCNT 001  0002 1923
#PKMRW 001  002B 1924
#PKRDD 001  0003 1921
#PKRTD 001  0003 1920
#PKRTL 001  0004 1927
#PKVRD 001  000B 1925
#PKVWD 001  0007 1926
#PKWTD 001  0001 1922
#PTFDA 001  00DC 1976
#RDWTL 001  0004 1928
```

```
#SDRDK   001  0011 1964
#UALL    001  0C07 2064
#UALLO   001  0000 0001
#VLSDR   001  000C 1960
#VLTBE   001  0008 1915
#VOLF1   001  0009 1968
#VOLNG   001  0006 1913   1915   1937
#VOLOC   001  0005 1914
#VOLR1   001  0008 1969   2308   2696   4414   4878
#VTCF1   001  0025 1972
#VTCF2   001  0027 1974
#VTCR1   001  0024 1971   4888
#VTCR2   001  0026 1973
@@E001   001  0000 0751   0753
@@E003   001  0001 0753   0755
@@E004   001  0002 0755   0757
@@E005   001  0003 0757   0759
@@E006   001  0004 0759   0761
@@E007   001  0005 0761   0763
@@E008   001  0006 0763   0765
@@E009   001  0007 0765   0767
@@E010   001  0008 0767   0769
@@E011   001  0009 0769   0771
@@E012   001  000A 0771   0773
@@E013   001  000B 0773   0775
@@E014   001  000C 0775   0777
@@E015   001  000D 0777   0779
@@E016   001  000E 0779   0781
@@E017   001  000F 0781   0783
@@E018   001  0010 0783   0785
@@E019   001  0011 0785   0787
@@E020   001  0012 0787   0789
@@E021   001  0013 0789   0791
@@E023   001  0014 0791   0793
@@E024   001  0015 0793   0795
@@E025   001  0016 0795   0797
@@E026   001  0017 0797   0799
@@E027   001  0018 0799   0801
@@E028   001  0019 0801   0803
@@E029   001  001A 0803   0805
@@E030   001  001B 0805   0807
@@E031   001  001C 0807   0809
@@E032   001  001D 0809   0811
@@E035   001  001E 0811   0813
@@E036   001  001F 0813   0815
@@E037   001  0020 0815   0817
@@E038   001  0021 0817   0819
@@E039   001  0022 0819   0821
@@E040   001  0023 0821   0823
@@E041   001  0024 0823   0825
@@E042   001  0025 0825   0827
@@E043   001  0026 0827   0829
@@E044   001  0027 0829   0831
@@E045   001  0028 0831   0833
@@E046   001  0029 0833   0835
@@E060   001  002A 0835   0837
```

```
                              CROSS REFERENCE

SYMBOL   LEN VALUE DEFN    REFERENCES                        VER 15, MOD 00  05/01/22  PAGE 123

@@E080   001  002B 0837
@@E100   001  0000 0223    0225  3461  3504
@@E101   001  0001 0225    0227  3506
@@E102   001  0002 0227    0229  3478
@@E103   001  0003 0229    0231  3482
@@E110   001  0004 0231    0233  3086
@@E112   001  0005 0233    0235
@@E113   001  0006 0235    0237
@@E114   001  0007 0237    0239
@@E115   001  0008 0239    0241
@@E116   001  0009 0241    0243
@@E117   001  000A 0243    0245
@@E120   001  000B 0245    0247  2450  3943
@@E122   001  000C 0247    0249  2918
@@E123   001  000D 0249    0251
@@E124   001  000E 0251    0253
@@E129   001  000F 0253    0255
@@E130   001  0010 0255    0257  2429  3499  3724
@@E131   001  0011 0257    0259  2452  3696  3728  3950
@@E133   001  0012 0259    0261  2290  2478
@@E134   001  0013 0261    0263
@@E135   001  0014 0263    0265
@@E136   001  0015 0265    0267
@@E137   001  0016 0267    0269
@@E138   001  0017 0269    0271
@@E139   001  0018 0271    0273
@@E142   001  0019 0273    0275  2266
@@E143   001  001A 0275    0277  2268
@@E150   001  001B 0277    0279
@@E151   001  001C 0279    0281
@@E160   001  001D 0281    0283
@@E162   001  001E 0283    0285
@@E163   001  001F 0285    0287
@@E164   001  0020 0287    0289  2470
@@E200   001  0021 0289    0291
@@E205   001  0022 0291    0293
@@E210   001  0023 0293    0295
@@E211   001  0024 0295    0297
@@E212   001  0025 0297    0299
@@E213   001  0026 0299    0301
@@E215   001  0027 0301    0303
@@E216   001  0028 0303    0305  3761
@@E217   001  0029 0305    0307
@@E220   001  002A 0307    0309
@@E221   001  002B 0309    0311
@@E222   001  002C 0311    0313
@@E223   001  002D 0313    0315
@@E225   001  002E 0315    0317
@@E226   001  002F 0317    0319
@@E227   001  0030 0319    0321
@@E228   001  0031 0321    0323
@@E229   001  0032 0323    0325
@@E230   001  0033 0325    0327
@@E232   001  0034 0327    0329
@@E234   001  0035 0329    0331
@@E237   001  0036 0331    0333
```

```
@@E240   001  0037 0333   0335
@@E241   001  0038 0335   0337
@@E242   001  0039 0337   0339  3703
@@E248   001  003A 0339   0341
@@E249   001  003B 0341   0343
@@E250   001  003C 0343   0345
@@E251   001  003D 0345   0347
@@E252   001  003E 0347   0349
@@E253   001  003F 0349   0351
@@E254   001  0040 0351   0353
@@E255   001  0041 0353   0355
@@E256   001  0042 0355   0357
@@E300   001  0043 0357   0359
@@E301   001  0044 0359   0361
@@E302   001  0045 0361   0363
@@E303   001  0046 0363   0365
@@E304   001  0047 0365   0367
@@E305   001  0048 0367   0369
@@E308   001  0049 0369   0371
@@E310   001  004A 0371   0373
@@E315   001  004B 0373   0375
@@E316   001  004C 0375   0377
@@E320   001  004D 0377   0379
@@E325   001  004E 0379   0381
@@E330   001  004F 0381   0383
@@E335   001  0050 0383   0385
@@E338   001  0051 0385   0387
@@E340   001  0052 0387   0389
@@E350   001  0053 0389   0391
@@E351   001  0054 0391   0393
@@E352   001  0055 0393   0395
@@E360   001  0056 0395   0397
@@E361   001  0057 0397   0399
@@E362   001  0058 0399   0401
@@E371   001  0059 0401   0403
@@E380   001  005A 0403   0405
@@E390   001  005B 0405   0407
@@E400   001  005C 0407   0409
@@E410   001  005D 0409   0411
@@E415   001  005E 0411   0413
@@E417   001  005F 0413   0415
@@E420   001  0060 0415   0417
@@E430   001  0061 0417   0419
@@E432   001  0062 0419   0421
@@E433   001  0063 0421   0423
@@E450   001  0064 0423   0425
@@E451   001  0065 0425   0427
@@E460   001  0066 0427   0429
@@E461   001  0067 0429   0431
@@E464   001  0068 0431   0433
@@E465   001  0069 0433   0435
@@E466   001  006A 0435   0437
@@E467   001  006B 0437   0439
@@E469   001  006C 0439   0441
@@E470   001  006D 0441   0443
@@E471   001  006E 0443   0445
```

```
                              CROSS REFERENCE

SYMBOL   LEN VALUE DEFN    REFERENCES                    VER 15, MOD 00  05/01/22  PAGE 125

@@E473   001  006F 0445    0447  2486
@@E474   001  0070 0447    0449  2502
@@E475   001  0071 0449    0451
@@E476   001  0072 0451    0453
@@E477   001  0073 0453    0455
@@E478   001  0074 0455    0457  4695
@@E479   001  0075 0457    0459
@@E480   001  0076 0459    0461
@@E481   001  0077 0461    0463
@@E482   001  0078 0463    0465  3975
@@E483   001  0079 0465    0467  2414
@@E484   001  007A 0467    0469  2509
@@E485   001  007B 0469    0471  2329
@@E486   001  007C 0471    0473  3978
@@E487   001  007D 0473    0475  3981
@@E488   001  007E 0475    0477
@@E489   001  007F 0477    0479
@@E490   001  0080 0479    0481
@@E491   001  0081 0481    0483
@@E492   001  0082 0483    0485
@@E493   001  0083 0485    0487
@@E494   001  0084 0487    0489
@@E495   001  0085 0489    0491
@@E496   001  0086 0491    0493
@@E497   001  0087 0493    0495
@@E498   001  0088 0495    0497
@@E500   001  0089 0497    0499
@@E501   001  008A 0499    0501
@@E530   001  008B 0501    0503
@@E531   001  008C 0503    0505
@@E535   001  008D 0505    0507
@@E540   001  008E 0507    0509
@@E541   001  008F 0509    0511
@@E542   001  0090 0511    0513
@@E543   001  0091 0513    0515  2297
@@E544   001  0092 0515    0517
@@E545   001  0093 0517    0519  2313
@@E546   001  0094 0519    0521
@@E547   001  0095 0521    0523
@@E548   001  FFFF 0727
@@E549   001  0096 0523    0525
@@E550   001  0097 0525    0527
@@E551   001  0098 0527    0529
@@E552   001  0099 0529    0531
@@E553   001  009A 0531    0533
@@E554   001  009B 0533    0535
@@E555   001  009C 0535    0537
@@E556   001  009D 0537    0539
@@E558   001  009E 0539    0541
@@E570   001  009F 0541    0543
@@E571   001  00A0 0543    0545
@@E572   001  00A1 0545    0547  3203
@@E573   001  00A2 0547    0549  3210
@@E574   001  00A3 0549    0551
@@E575   001  FFFF 0729
@@E578   001  00A4 0551    0553
```

SYMBOL	LEN	VALUE	DEFN	REFERENCES	
@@E579	001	FFFF	0731		
@@E580	001	FFFF	0733		
@@E585	001	00A5	0553	0555	2628
@@E595	001	FFFF	0735		
@@E597	001	FFFF	0737		
@@E598	001	FFFF	0739		
@@E600	001	00A6	0555	0557	
@@E601	001	00A7	0557	0559	
@@E602	001	00A8	0559	0561	
@@E603	001	00A9	0561	0563	
@@E604	001	00AA	0563	0565	
@@E606	001	00AB	0565	0567	
@@E607	001	00AC	0567	0569	
@@E608	001	00AD	0569	0571	
@@E609	001	00AE	0571	0573	
@@E610	001	00AF	0573	0575	
@@E611	001	00B0	0575	0577	
@@E612	001	00B1	0577	0579	
@@E613	001	00B2	0579	0581	
@@E614	001	00B3	0581	0583	
@@E700	001	00B4	0583	0585	
@@E701	001	00B5	0585	0587	
@@E710	001	00B6	0587	0589	
@@E712	001	00B7	0589	0591	
@@E713	001	00B8	0591	0593	
@@E714	001	00B9	0593	0595	
@@E715	001	00BA	0595	0597	
@@E716	001	00BB	0597	0599	
@@E717	001	00BC	0599	0601	
@@E718	001	00BD	0601	0603	
@@E720	001	00BE	0603	0605	
@@E721	001	00BF	0605	0607	
@@E723	001	00C0	0607	0609	
@@E724	001	00C1	0609	0611	
@@E725	001	00C2	0611	0613	
@@E726	001	00C3	0613	0615	
@@E727	001	00C4	0615	0617	
@@E728	001	00C5	0617	0619	
@@E729	001	00C6	0619	0621	
@@E730	001	00C7	0621	0623	
@@E732	001	00C8	0623	0625	
@@E752	001	00C9	0625	0627	
@@E753	001	00CA	0627	0629	
@@E754	001	00CB	0629	0631	
@@E755	001	00CC	0631	0633	
@@E756	001	00CD	0633	0635	
@@E757	001	00CE	0635	0637	
@@E758	001	00CF	0637	0639	
@@E759	001	00D0	0639	0641	
@@E760	001	00D1	0641	0643	
@@E761	001	00D2	0643	0645	
@@E762	001	00D3	0645	0647	
@@E763	001	00D4	0647	0649	
@@E764	001	00D5	0649	0651	
@@E765	001	00D6	0651	0653	
@@E766	001	00D7	0653	0655	

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                              CROSS REFERENCE

SYMBOL  LEN VALUE DEFN    REFERENCES                        VER 15, MOD 00  05/01/22  PAGE 127

@@E767  001  00D8 0655    0657
@@E768  001  00D9 0657    0659
@@E769  001  00DA 0659    0661
@@E770  001  00DB 0661    0663
@@E771  001  00DC 0663    0665
@@E772  001  00DD 0665    0667
@@E773  001  00DE 0667    0669
@@E774  001  00DF 0669    0671
@@E775  001  00E0 0671    0673
@@E776  001  00E1 0673    0675
@@E777  001  00E2 0675    0677
@@E778  001  00E3 0677    0679
@@E779  001  00E4 0679    0681
@@E780  001  00E5 0681    0683
@@E781  001  00E6 0683    0685
@@E782  001  00E7 0685    0687
@@E783  001  00E8 0687    0689
@@E784  001  00E9 0689    0691
@@E785  001  00EA 0691    0693
@@E786  001  00EB 0693    0695
@@E790  001  00EC 0695    0697
@@E791  001  00ED 0697    0699
@@E792  001  00EE 0699    0701
@@E793  001  00EF 0701    0703
@@E794  001  00F0 0703    0705
@@E795  001  00F1 0705    0707
@@E796  001  00F2 0707    0709
@@E797  001  00F3 0709    0711
@@E798  001  00F4 0711    0713
@@E800  001  FFFF 0741
@@E801  001  FFFF 0743
@@E802  001  FFFF 0745
@@E803  001  FFFF 0747
@@E804  001  FFFF 0749
@@E900  001  00F5 0713    0715
@@E901  001  00F6 0715    0717
@@E902  001  00F7 0717    0719
@@E903  001  00F8 0719    0721
@@E905  001  00F9 0721    0723
@@E906  001  00FA 0723    0725
@@E910  001  00FB 0725
@@M400  001  0C16 2232    2397
@@T400  001  0C1A 2236    2234
@ARR    001  0008 0017    2363   2593   2820*  2821   2822*  2823   2916   3084   3201   3425   3681   3933
                          4286   4294   4378   4574   4845
@ASIGN  001  007C 0072    3450
@ASTER  001  005C 0070
@BCRDL  001  0050 0089
@BE     001  0081 0044
@BF     001  0090 0053
@BH     001  0084 0042
@BL     001  0082 0043
@BLANK  001  0040 0066    2950   3089   3095   3434
@BM     001  0082 0055
@BNE    001  0001 0047    3080
@BNH    001  0004 0045
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@BNL    001  0002 0046
@BNM    001  0002 0058
@BNOL   001  0020 0051
@BNOZ   001  0008 0050
@BNP    001  0004 0057
@BNZ    001  0001 0059
@BOL    001  00A0 0049
@BOZ    001  0088 0048
@BP     001  0084 0054
@BR     001  0001 0014   2221   2223   2224*  2225   2253   2256   2296   2302   2303   2306   2307   2316
                         2319   2330   2352   2352   2353   2353   2358   2358   2359   2359   2364   2372
                         2373   2374   2377   2378   2381   2381   2382   2480   2499   2525   2526   2538
                         2541   2541   2555   2555   2557   2558   2560   2561   2562   2564   2565   2566
                         2578   2578   2579   2579   2585   2585   2586   2586   2595   2596   2597   2598
                         2613   2617   2622*  2808   2817   2819*  2820   2821   2822   2823   2825   2826
                         2826   2827   2828   2828   2830   2830   2831   2832   2832   2836   2836   2837
                         2841   2841   2842   2844   2844   2845   2845   2846   2846   2847   2847   2848
                         2848   2854   2855   2856   2856   2857   2862   2862   2863   2863   2865   2865
                         2871*  2913   2914   2915*  2916   2917   2919   2919   2928   2928   2933   2933
                         2934   2934   2935   2935   2936   2936   2937   2937   2941   2942   2942   2945
                         2951   2952   2956   2957   2957   2958*  3421   3423   3424*  3425   3427   3434
                         3435   3435   3436   3437   3437   3457   3460   3463   3472   3474   3474   3475
                         3476   3477   3479   3481   3483   3488   3488   3491   3498   3503   3507   3515
                         3523*  3677   3679   3680*  3681   3683   3684   3684   3692   3699   3704   3733
                         3736   3743   3747   3747   3749   3749   3750   3750   3751   3751   3758   3758
                         3760   3763   3766   3766   3773   3776   3776   3778*  3785   3787   3788   3929
                         3931   3932*  3933   3935   3947   3948   3948   3951   3951   3953   3953   3955
                         3963   3963   3968   3968   3982   3984   3991   3992   3993   3994   4002   4004*
                         4284   4292   4370*  4572   4835*
@BT     001  0010 0052
@BZ     001  0081 0056
@B1     001  0001 0064   2944   2949   3435   3490   3547   3549   3550   3736
@CADDR  001  0002 0143   2234   2303   2307   2316   2318   2319   2437   2480   2524   2555   2578   2585
                         2679   2685   2696   2826   3758   3766   3776   3982   4317   4318   4319   4320
                         4330   4352   4359   4379   4380   4401   4563   4569   4581   4718   4831   4914
                         4918
@CARDL  001  0060 0088
@CHARA  001  00C1 0073   3453
@CHARF  001  00C6 0074   3690
@CHARR  001  00D9 0075   3688
@CHARZ  001  00E9 0076   3455
@CLOFF  001  0010 0095   3232*
@CLON   001  0011 0094
@COMMA  001  006B 0067   3091
@CPLUS  001  004E 0080
@DADDR  001  0002 0141   2352   2353   2358   2359   2364   2374   2377   2686   2687   2697   2698   2699
                         2703   2704   2705   2706   2825   2890   3218   3219   3226   3227   3229   3230
                         3240   3241   3244   3246   3249   3251   3947   3951   3953   3955   4010   4011
                         4016   4017   4018   4019   4021
@DBFR1  001  0004 0130
@DBFR2  001  0005 0131
@DCALK  001  0001 0082
@DCBCY  001  0009 0116
@DCBT1  001  0050 0118
@DCNT   001  0003 0129
@DCST1  001  0040 0117
```

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@DCTRL   001  0000 0126   2373* 2378*
@DCYL    001  0001 0127   2830*
@DD2     001  0003 0031
@DGET    001  0001 0135   2248   2373   2636   4413   4579   4599   4846   4877   4887   4897
@DOLAR   001  005B 0069   3446
@DOP2    001  0004 0029   2821* 2825* 2826* 2888   2889
@DPLNG   001  0006 0133   2827   2886
@DPOS    001  0000 0134   2243
@DPUT    001  0002 0136   2378   2544   2567   2599   4668   4675   4734   4741   4822
@DSAD    001  0002 0128   2372* 2381* 2382   2828* 2832* 2836   2837* 2841* 2844* 2848   2854* 2862*
                          2865* 2887
@DSBCY   001  0004 0107
@DSCS1   001  0000 0108
@DSIVF   001  0003 0139
@DSPIN   001  0002 0132
@DTRSZ   001  0018 0086
@DVBCY   001  0007 0109
@DVRFY   001  0031 0137
@DWAIT   001  00FF 0138   2645
@DWBCY   001  0005 0104
@DWSIZ   001  00C0 0106
@DWTB1   001  0003 0105
@DZERO   001  00F0 0065
@D1      001  0002 0027   2928
@EOF     001  001C 0078
@EOFTC   001  0075 0163
@EOS     001  001E 0077   2261   2277   2288   2427   2442   2459   2466   2476   3097   3501   3725   3742
                          3786
@FDDBC   001  0000 0196
@FDE1    001  000C 0201
@FDFNA   001  000B 0199
@FDHLN   001  0002 0209
@FDLNC   001  0002 0194
@FDNSC   001  0003 0211
@FDSD    001  0000 0207
@FLACE   001  0009 0198
@FLDBC   001  0001 0197
@FLENT   001  0004 0202
@FLFNA   001  0002 0200
@FLHLN   001  0002 0210
@FLLNC   001  0002 0195
@FLNSC   001  0001 0212
@FLSD    001  0001 0208
@HDRLN   001  0007 0093
@IAR     001  0010 0018
@INDEX   001  0001 0157   0158
@INST3   001  0003 0033
@INST4   001  0004 0034
@INST5   001  0005 0035
@INST6   001  0006 0036
@I1IAR   001  00C0 0021
@LINSZ   001  00F4 0085
@MAPEN   001  0005 0090
@MINCR   001  2000 0084
@MINUS   001  0060 0081
@NOP     001  0080 0041   2332   2867   2924   2983   3233   3722   3775   3811   4031   4339   4580
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@NUMBR  001  007B 0071   3448
@OPD2   001  0004 0030
@OP1    001  0003 0028   2223* 2225* 2259* 2303* 2307* 2316* 2363* 2480* 2593* 2817* 2823* 2914*
                         2916* 3084* 3201* 3423* 3425* 3427* 3437* 3488* 3679* 3681* 3683* 3733*
                         3758* 3766* 3776* 3931* 3933* 3935* 3982* 4284* 4285* 4286* 4292* 4293*
                         4294* 4572* 4573* 4574*
@OP2    001  0005 0032
@PCTRL  001  0000 0150
@PDATA  001  0003 0152
@PGCSZ  001  0020 0083   0084
@PPLNG  001  0004 0149
@PRCNT  001  0001 0151
@PRETR  001  00C0 0155   2232
@PRINT  001  0040 0153   0155
@PSR    001  0004 0016   3463*
@PWAIT  001  00FF 0159
@P1IAR  001  0020 0019
@P2IAR  001  0040 0020
@Q      001  0001 0025   2435* 2868  2980  2982  3103  3214* 3551  3812  3813  3814  3818  3948*
                         4030
@REGL   001  0002 0013
@RETRN  001  0080 0154   0155  2648
@RLDWN  001  004F 0160
@RTRNC  001  0080 0162   2649
@SBLN   001  0005 0171
@SBLNL  001  0002 0185
@SCTSZ  001  0100 0101
@SDFLN  001  0007 0091
@SDF0   001  0000 0167
@SDF1   001  0001 0168
@SDF2   001  0002 0169
@SDF3   001  0003 0170
@SECCY  001  0030 0087
@SIST   001  0001 0182
@SLASH  001  0061 0068
@SLAST  001  0002 0184
@SMIDL  001  0003 0183
@SNULL  001  0080 0174
@SONLY  001  0000 0181
@STEXT  001  0007 0173
@STYPE  001  0006 0172
@TBCNT  001  0000 0161
@TBLEF  001  0010 0156   0158
@TBLIX  001  0011 0158
@UCB    001  0087 0040   2981  3081  3092  3214  3730  3731  3756  3810  3949  3980  4002
@UPARW  001  005A 0079
@VADDR  001  0002 0142
@VENTA  001  0056 0114
@VMDDV  001  00FE 0115
@VMFD1  001  0000 0110
@VMFD2  001  0001 0111
@VMRS3  001  0002 0113
@VMTRL  001  0001 0112
@VOLID  001  0006 0092   3407  3481  3736  3736  3760
@VQ     001  0001 0026
@WSFIT  001  0500 0102
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@WSTBL  001  0503 0103
@XR     001  0002 0015   2225  2249* 2253  2256  2259  2261  2263* 2264  2269  2269* 2275  2275*
                         2277  2279* 2288  2296* 2330* 2337* 2406* 2407  2409  2425  2425* 2427
                         2442  2459  2466  2476  2481* 2484  2523* 2524  2525  2526  2528* 2529
                         2530* 2531  2532  2533  2534  2534* 2535  2537  2540  2543  2556* 2557
                         2558  2559  2559* 2560  2561  2562  2563  2563* 2564  2565  2566  2594*
                         2595  2596  2597  2598  2623* 2917  2926  2941  2944  2944* 2949  2949*
                         2950  2956  3085  3088  3088* 3089  3091  3094  3094* 3095  3097  3099
                         3427  3446  3448  3450  3453  3455  3464* 3489  3490  3490* 3501  3683
                         3688  3690  3693  3695  3717  3717* 3725  3733  3742  3772* 3786  3935
                         3983* 4285  4293  4336* 4337  4371* 4573  4611* 4613  4619  4623  4627
                         4631  4635  4639* 4642  4644  4644* 4659  4661  4663  4664  4665  4665
                         4673* 4674  4689  4693* 4694  4700  4700* 4703* 4717  4718  4721  4722
                         4723  4723  4724  4725  4727  4728  4729  4730* 4731  4732* 4733  4754
                         4756  4759  4760  4761  4766  4776  4777  4778  4779  4790* 4793  4794
                         4798  4799  4803  4804  4805  4809  4810  4811  4813  4814  4819  4821
                         4836* 4847  4854  4863* 4864  4864* 4865  4869  4870
@ZERO   001  0000 0063   2296  2308  2312  2372  2484  2500  2659  2837  3436  3446  3448  3450
                         3453  3455  3489  3498  3501  3515  4300  4314  4358  4361  4544  4553
                         4590  4650  4697  4771  4782  4783  4788  4870
C4BCHC  001  0004 2977
C4BCHR  001  1260 2967   2941* 2942
C4BERR  004  0CC2 2716   2458
C4BINI  001  125F 2966   2919
C4BIN2  001  11F4 2912   2913  2915  3936
C4BLEN  002  125C 2975   2956* 2957*
C4BLNK  003  120F 2980
C4BLOW  001  00F0 2978   2926
C4BLVL  002  0002 2979   2919  2933  2934  2935  2936  2937  2942
C4BNMC  004  120B 2982
C4BNOP  001  0080 2983
C4BSAV  002  1262 2970   2917* 2957
C4BSPC  001  0087 2981
C4BVAL  002  125E 2965   2919* 2933  2933* 2934  2935  2935* 2936  2936* 2937* 2942* 2979  3947
                         3955  3989
C4BWRK  002  125C 2963   2934* 2937  2975  2979
C4BYT1  001  125D 2964
C4B100  004  120A 2920   2982
C4B200  003  120E 2924   2945  2980
C4B300  003  1211 2926   2951
C4B590  003  1240 2949   2928  2952
C4B600  003  1243 2950   2924
C4B700  003  124C 2956   2927
C4B800  004  1253 2958   2914* 2929
C4B850  004  1257 2959   2916*
C4B900  001  1263 2971   2920* 2928*
DL2C01  002  11E9 2880   2820  2822  2830
DL2C05  002  11EB 2881   2826
DL2C48  001  11E5 2878   2828  2832
DL2DPL  006  11F1 2886   2827*
DL2END  001  11F4 2891
DL2E01  001  0001 2810   2828  2830  2832  2836  2848  2856
DL2E02  001  0002 2811   2841  2844  2862
DL2E18  001  0018 2812   2842
DL2E60  001  0060 2813   2857
DL2E7C  001  007C 2815   2854
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                          CROSS REFERENCE

SYMBOL  LEN VALUE DEFN   REFERENCES                          VER 15, MOD 00  05/01/22  PAGE 132

DL2ICS  001 115B 2816    2375   2379   2546   2569   2601
DL2K18  002 11E7 2879    2845
DL2K60  002 11E2 2876    2863
DL2K80  002 11E4 2877    2844   2862
DL2LST  001 11EC 2885    2828*  2830*  2832*  2836   2837*  2841*  2844*  2848   2854*  2862*  2865*  2870
                         2887
DL2PHY  001 11EE 2887
DL2RAD  002 11F3 2890    2374*  2377*  2524*  2527*  2841
DL2SAD  005 1173 2888    2848*  2855*  2856*  2857   2863*  2865
DL2SEC  005 117C 2889    2836*  2842   2845*  2846   2846*  2847   2847*  2856
DL2SWH  003 11D1 2868
DL2TSD  001 0083 2814    2855
DL2000  001 115F 2818    2808   2819
DL2001  005 116F 2825    2821*  2888
DL2002  005 1178 2827    2825*  2826*  2889
DL2005  004 117D 2828    2831
DL2006  004 118B 2832    2829
DL2008  004 11A8 2846    2843
DL2010  003 11BE 2857
DL2100  004 11CC 2865    2858
DL2110  003 11D0 2867    2868
DL2900  004 11D9 2871    2817*  2867
DL2910  004 11DD 2872    2823*
SALBSE  001 1331 3445    3421   3424
SALCNT  001 13CD 3542    3436*  3474*  3477   3481   3498
SALCT6  001 0006 3407
SALCT8  001 0008 3405
SALERR  003 1347 3551    3463
SALFST  001 0001 3539    3460   3472
SALIDR  001 13CC 3532    3418*  3457   3460   3472*  3475   3503   3515*
SALND0  004 13C4 3523    3423*
SALND2  004 13C8 3524    3425*
SALPHR  001 13D0 3546    3548   3549   3550   3736
SALPHS  002 13DB 3548    3437
SALPH6  001 1315 3422    3734
SALPH8  001 1311 3416    2661
SALPR6  001 13D8 3550    3435*
SALPR7  001 13D9 3549    3434*  3435
SAL001  002 13CF 3545    3474   3488
SAL008  001 0080 3536    3418   3457   3475   3503
SAL100  003 1323 3434
SAL200  003 1331 3446    3491
SAL250  003 1346 3454    3551
SAL350  003 135F 3463    3479   3483   3507
SAL375  004 1362 3464    3427*
SAL400  003 1369 3472    3447   3449   3451   3456
SAL425  004 136C 3474    3458   3462
SAL450  003 1383 3481    3476
SAL500  004 138D 3488    3480
SAL525  005 1391 3489    3437*  3488*
SAL750  003 139C 3498    3454
SAL755  004 139F 3499
SAL760  003 13BA 3507    3502   3505
SAL775  004 13BD 3508    3500
SAL800  003 13C1 3515    3465
SCACNT  002 12A4 3109    3099*  3100*
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                          CROSS REFERENCE

SYMBOL  LEN VALUE DEFN    REFERENCES                          VER 15, MOD 00  05/01/22  PAGE 133

SCACOF  001 0087 3081    3732
SCACOM  001 0001 3080    2438  2456  3718  3999
SCAINC  001 0001 3079    3088  3094
SCAMMA  003 1281 3103    2438* 2456* 3718* 3732* 3999*
SCANIT  001 1264 3083    2260  2276  2285  2426  2439  2457  3508  3720  4001
SCASVE  002 12A2 3108    3085* 3100
SCASV1  001 12A1 3107
SCA100  003 1273 3088    3090
SCA200  003 1276 3089    3087
SCA250  003 1280 3092    3103
SCA300  003 1283 3094    3096
SCA400  004 1293 3099    3092
SCA500  004 129D 3102    3084* 3098
SCYADR  002 157D 4011    2447  2454  2463  2468  3989* 3992  3992*
SCYCTR  001 157E 4013    3991  3991* 3993* 3994
SCYEXT  003 14F6 4030    2445* 3948  4002*
SCYEX0  004 1572 4004    3931*
SCYEX2  004 1576 4005    3933*
SCYINC  002 1581 4016    3953  3984  3993
SCYIND  001 157F 4015
SCYLCK  001 14CD 3930    2446  2462  3982
SCYLN1  001 0001 4026    3991  3993
SCYLN2  001 0002 4027    3963  3968  3984  3989  3992
SCYMX7  001 0007 4028    3994
SCYNOP  001 0080 4031    2445
SCYSZL  002 1587 4019    3963
SCYSZM  002 1589 4021    3968
SCYVAL  002 157B 4010    3947* 3951  3953* 3963  3968
SCYZER  002 1583 4017    3951
SCY007  002 1585 4018    3955
SCY025  005 14EC 3947    3929  3932  3942
SCY035  003 14F5 3949    4030
SCY050  005 150A 3955    3949
SCY100  004 1512 3961    3954
SCY200  004 1523 3968    3962
SCY280  004 152A 3975    3965
SCY320  004 1531 3978    3957
SCY323  003 1535 3980    3948* 3977
SCY325  005 153C 3982    3980
SCY330  004 1541 3983    3935* 3952  3982*
SCY340  003 1545 3984
SCY350  006 154B 3989    3967  3970
SCY400  005 1556 3992    3995
SCY450  004 1567 3999
SCY483  004 156B 4001
SCY500  003 156F 4002    3940  3945  3985
SDIBLN  003 1451 3813    3731*
SDIDRK  009 14C6 3805    3692* 3699* 3704  3747
SDIEX0  004 14AF 3778    3679* 3721  3738  3774
SDIEX2  004 14B3 3779    3681*
SDIID5  001 03FB 3809    3760
SDILN9  001 0009 3793    3684  3800
SDIMK1  001 0001 3816    3692  3704
SDIMK2  001 0002 3817    3699
SDINID  003 1484 3818    2431* 3763*
SDIRBL  009 14CC 3800    3684  3684* 3736* 3760  3804
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                                CROSS REFERENCE

SYMBOL   LEN VALUE DEFN   REFERENCES                        VER 15, MOD 00  05/01/22  PAGE 134

SDISKP   003 143A 3812   2282* 3775*
SDISKS   001 13DC 3678   2283  2432  3677  3680  3766
SDISLH   003 146B 3814
SDITBL   009 14C4 3804   2298  2300  2304  2317* 2318  2319  2335  2346  2369  2435  2436* 2437
                        2482  2483  2611  3747* 3749  3749* 3750  3750* 3751  3751* 3758  3773
                        3776  3805  3806
SDIUCB   001 0087 3810   2282  3763
SDIVID   009 14C7 3806
SDIVOF   001 0080 3811   2431
SDIX02   001 0002 3794   3717
SDI001   001 00F1 3807   3693
SDI002   001 00F2 3808   3695  3773
SDI050   003 13FA 3692
SDI100   003 13FD 3693   3689
SDI150   004 1406 3696   3691
SDI160   004 1424 3709   3705
SDI200   003 142B 3717   3694  3707
SDI255   003 1439 3722   3812
SDI260   004 1449 3728   3743  3788
SDI270   003 1450 3730   3723  3813
SDI300   004 145E 3734   3730
SDI350   003 146A 3740   3814
SDI400   004 1473 3747   3740
SDI450   003 1483 3756   3818
SDI500   005 148A 3760   3758* 3776*
SDI530   004 1499 3766   3708  3710
SDI550   004 149D 3772   3683* 3729  3733* 3766*
SDI600   003 14A1 3773   3698  3727
SDI650   004 14A7 3775   3785  3787
SDI750   004 14AB 3776   3756  3765
SDI800   003 14B7 3785   3722
SUTCL1   001 1308 3239   3232
SUTERR   004 0E02 2717   3233
SUTOBA   001 12A5 3200   2390
SUTPER   002 1310 3249   3227* 3230
SUTPGU   002 130E 3244   3226* 3229
SUTWER   002 130C 3241   3219
SUTWGU   002 130A 3240   3218
SUT100   004 12BF 3211   3205
SUT200   004 12CD 3217   3208
SUT300   004 12E0 3224   3212  3215
SUT400   004 1300 3233   3214* 3220
SUT500   004 1304 3235   3201*
SUT600   001 130D 3243   3245
SUT700   001 130F 3248   3250
TKSADR   001 159C 4112   4113  4317  4379  4563  4569* 4831*
TKSAVE   001 158A 4098   4099  4114
TKSBFI   001 1598 4109   2416* 2418* 2489* 2615* 2619* 2626* 4110  4590  4612  4617  4621  4625
                        4629  4633  4650  4788  4791  4796  4801  4807  4815  4816
TKSBIS   001 1595 4107   4108
TKSBLD   001 1597 4108   4109
TKSCYL   001 159A 4111   2321* 2441* 2447* 2499* 2500  4112  4306  4308  4348  4564  4663* 4664*
                        4683* 4712  4724  4729  4755  4759* 4760* 4776  4777* 4778* 4804  4809
                        4832*
TKSDSK   001 159E 4113   4380
TKSLNK   001 159F 4115
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                          CROSS REFERENCE

SYMBOL   LEN VALUE DEFN   REFERENCES                        VER 15, MOD 00   05/01/22   PAGE 135

TKSLSZ   001 1590 4103    4104
TKSLTG   001 1591 4104    4105
TKSPAD   001 158F 4102    4103
TKSPTG   001 158C 4100    4101
TKSPTZ   001 158D 4101    4102
TKSSPF   001 1593 4106    4107
TKSVTC   001 158B 4099    4100
TKSWAT   001 1592 4105    4106
TKSYLN   001 1599 4110    2320* 2463* 4111  4301  4302  4305* 4313  4315  4343* 4344  4368* 4548*
                         4565  4661* 4662  4684* 4711* 4712* 4713* 4727  4728  4754* 4755* 4756
                         4761* 4766* 4779* 4794  4805  4810  4814  4833*
TVSDAD   001 15AA 4183    4184
TVSDSK   001 15AC 4184    2318* 2437* 4581  4593  4596
TVSFIL   001 15A8 4182    2488* 2613* 2617* 4183  4551  4552  4553* 4554  4554* 4568  4642  4830*
TVSTRT   001 15A0 4181    4182  4185
UALBFH   001 0094 2714    2327
UALBKC   002 1152 2705    2579* 2586* 2595
UALBLK   008 114B 2701    2560
UALCON   002 1156 2707    2303
UALC12   002 1134 2692    2381
UALDFT   006 1107 2672
UALDIR   001 10E1 2635    2243* 2246  2248* 2544* 2547  2555* 2567* 2570  2578* 2585* 2599* 2602
UALDLT   002 1126 2685    2306  2499  2531  2541
UALDPL   001 10EA 2657    2372* 2373* 2376  2378* 2380  2381* 2382
UALDRS   002 115A 2709    2480
UALDSH   001 0060 2715    2264
UALDS1   002 1136 2693    2555
UALDS2   002 1138 2694    2578
UALDS3   002 113A 2695    2585
UALED0   004 10C5 2622    2223* 2401
UALED1   004 10C9 2623    2225*
UALEN1   001 10F0 2667    2253  2253  2425  2488
UALEN2   001 10F9 2669    2253  2253  2256  2256  2275  2425  2488
UALEN3   001 1102 2671    2256  2256  2275  2279  2337
UALEN4   001 1108 2673    2613
UALEN5   001 1110 2675    2613  2617
UALEN6   001 1118 2677    2617  2718
UALEN7   001 1118 2678    2718
UALFOR   001 0004 2209    2320
UALFRW   002 1154 2706    2596  2597
UALHX1   001 0001 2711    2300
UALHX2   001 0002 2712    2304
UALHX3   001 0003 2713    2298
UALIBR   009 10F8 2668    2253  2488
UALKEP   002 1119 2679    2319* 2354  2360  2365  2526* 2532  2538
UALLC2   001 1143 2700    2302  2557
UALLOC   001 0C07 2222
UALMAX   001 0030 2215    2382
UALONE   001 0001 2207    2269  2280  2286  2310  2333  2335  2346  2369  2371  2381  2435  2447
                         2463  2482  2483  2499  2517  2521  2525  2526  2529  2536  2538  2541
                         2611  2638  2680  2681  2682  2683  2700
UALPF1   002 112E 2689    2358
UALPRT   001 0000 2718
UALPR1   002 112C 2688    2352
UALPS1   002 114E 2703    2561  2579
UALPS2   002 1150 2704    2565  2586
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                                    CROSS REFERENCE

SYMBOL   LEN VALUE DEFN    REFERENCES                          VER 15, MOD 00  05/01/22  PAGE 136

UALPWD   001 114C 2702    2564
UALRED   002 1128 2686    2352* 2358* 2364* 2368* 2371* 2374
UALRET   001 10E8 2647    2393
UALSAV   001 1123 2683    2280* 2286  2310  2333  2461* 2490  2525* 2529  2536* 2538  2541*
UALSIX   001 0006 2211    2321  2481  2528
UALSZ1   001 111A 2680    2517
UALSZ2   001 111B 2681    2521
UALTEN   001 000A 2212    2441
UALTRK   001 0080 2214    2454  2468
UALTRY   002 113C 2696    2316
UALTWO   001 0002 2208    2354  2360  2365  2367  2368  2444  2461  2490  2497
UALTWT   001 0014 2213
UALVTX   001 0024 2210    2317  2436
UALWF1   002 1132 2691    2359
UALWIT   001 10E7 2645    2400
UALWKF   008 1117 2676    2617
UALWKR   008 110F 2674    2613
UALWRK   009 1101 2670    2256
UALWRT   002 112A 2687    2353* 2359* 2367* 2377
UALWR1   002 1130 2690    2353
UALX16   002 1158 2708    2307
UALZER   001 1122 2682    2533  2558  2562  2566  2598
UALZZZ   001 1124 2684    2444* 2497
UAL009   002 113E 2697    2535  2543
UAL012   001 000C 2216    2660  2692
UAL024   002 1140 2698
UAL048   002 1142 2699    2537  2540
UAL050   004 0C42 2243    2227
UAL100   004 0C50 2249
UAL105   004 0C72 2263    2259*
UAL110   004 0C83 2268    2265
UAL120   003 0C8D 2275    2258
UAL140   004 0CA2 2282    2278  2338
UAL160   004 0CA6 2283
UAL180   004 0CAD 2285
UAL185   004 0CC2 2291    2267  2270  2284  2716
UAL190   003 0CC6 2296    2287  2289  2420
UAL195   004 0CE5 2304    2301
UAL200   004 0CF6 2308    2299  2303* 2305  2307* 2316*
UAL205   004 0D0C 2314    2309
UAL210   004 0D10 2315    2311
UAL220   005 0D14 2316    2620
UAL230   004 0D3B 2329    2413  2480*
UAL235   003 0D3F 2330    2415  2440  2471  2487  2503  2510
UAL240   004 0D42 2331    2449  2465  2479
UAL260   004 0D46 2332    2328
UAL300   004 0D60 2343    2336
UAL310   004 0D6B 2346    2334
UAL312   004 0D79 2350    2347
UAL315   003 0D7D 2351
UAL320   004 0D80 2352    2343  2350
UAL330   004 0D96 2358    2344  2348
UAL340   004 0DA9 2363    2355  2357  2361
UAL345   003 0DCC 2372    2366  2370
UAL350   003 0DCF 2373    2383
UAL360   004 0DFA 2385    2363*
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UAL380   004  0DFE 2390    2345   2349   2351
UAL400   004  0E02 2392    2588   2717
UAL520   004  0E18 2406    2327
UAL530   004  0E34 2414    2496   2508
UAL535   004  0E3C 2416    2410
UAL540   004  0E43 2418    2408
UAL560   004  0E47 2419    2417
UAL600   003  0E4F 2425    2255
UAL610   004  0E5C 2429    2262
UAL620   004  0E63 2431    2428
UAL630   004  0E6E 2434    2430
UAL640   006  0E72 2435    2433
UAL650   004  0EB2 2450
UAL652   004  0EB9 2452    2467
UAL653   004  0EC1 2454    2451
UAL657   004  0EC8 2456
UAL660   003  0ED4 2459
UAL667   003  0EF0 2466    2464
UAL669   004  0EFE 2470    2455
UAL670   004  0F02 2471
UAL680   003  0F06 2476    2443   2460   2469
UAL683   005  0F14 2480    2477
UAL684   004  0F19 2481    2709
UAL685   003  0F29 2484    2482*
UAL690   006  0F37 2488    2448   2485   2501
UAL700   004  0F6E 2502    2498
UAL720   004  0F76 2504    2491
UAL730   004  0F7A 2505    2493
UAL750   004  0F91 2515    2494   2506
UAL760   004  0FA2 2519    2516
UAL800   004  0FB3 2523    2520
UAL803   004  0FC4 2527    2435*
UAL804   005  0FCC 2529    2483*
UAL805   005  0FF5 2538    2542
UAL810   005  100A 2543    2539
UAL820   004  101F 2555
UAL830   004  1051 2569
UAL840   004  105D 2578
UAL850   004  1069 2585
UAL860   004  1079 2593    2580   2587
UAL870   004  10A1 2606    2593*
UAL900   004  10A5 2611    2221   2224   2315   2522
UAL920   005  10B8 2617    2612
UAL950   004  10C1 2620    2616
UAL960   004  10D1 2626    2518
UTKAD1   001  16FA 4412    4379*  4380*  4383
UTKBOT   001  0004 4430    4356
UTKCHK   001  16EA 4395    4316*  4361*  4367
UTKCNT   001  16F7 4404    2517   2521   4313*  4350*  4711   4721
UTKCYL   001  16EE 4398    4314*  4347*  4348
UTKDEF   001  16F8 4405    4300*  4304*  4341
UTKED0   004  16BA 4370    4284*  4292*
UTKED1   004  16BE 4371    4285*  4293*
UTKED2   004  16C2 4372    4286*  4294*
UTKEND   002  16F2 4401    4319*  4320*  4352
UTKFAR   002  16F6 4403    4320
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                                    CROSS REFERENCE

SYMBOL   LEN VALUE DEFN    REFERENCES                      VER 15, MOD 00  05/01/22  PAGE 138

UTKFLG   001  00FF 4431    4302   4304   4316   4341   4367   4548
UTKFLS   001  16F9 4406    4301*  4368
UTKFOR   001  16ED 4397    4327   4329
UTKINP   001  15AE 4424
UTKLBB   002  16F4 4402    4318
UTKLIM   001  16F0 4400    4308   4344
UTKLST   001  0032 4432    4403
UTKONE   002  16EC 4396    4306   4330   4338   4343   4347   4350   4351   4359
UTKOUT   004  16D6 4382
UTKPRC   001  15C1 4422    4666   4707   4715   4757   4769   4774
UTKREP   004  16C6 4378    4288
UTKSBF   001  003B 4429    4561
UTKSBN   001  003A 4428    4714   4773
UTKSTP   004  16E2 4387    4378*
UTKTBF   001  0039 4427    4558
UTKTBL   001  16E6 4391    4336
UTKTBN   001  0038 4426
UTKTEN   001  000A 4434    4305
UTKTRE   001  0003 4433    4354
UTKTYP   004  164A 4425    4558*  4561*  4714*  4773*
UTKUPD   001  0001 4421    4301   4306   4308   4313   4315   4327   4329   4337   4338   4343   4344   4347
                          4348   4350   4351   4368
UTKUSE   001  15AE 4283    4424
UTKZER   001  16EF 4399
UTK025   004  15BA 4288
UTK050   001  15C1 4291    4422
UTK070   004  15CD 4300    4289
UTK075   006  15E6 4306    4303
UTK080   006  15F8 4313    4346
UTK100   006  1624 4327    4331
UTK200   006  162D 4329
UTK250   004  163D 4336    4328
UTK300   005  1641 4337    4315*  4327   4329*  4351*  4354   4356   4357   4358*  4360
UTK400   004  164A 4339    4317*  4318*  4319   4330*  4337*  4352   4359*  4425
UTK500   006  166B 4347    4340
UTK525   004  1696 4356    4353
UTK550   004  16A8 4360
UTK600   004  16AC 4361    4307   4309   4342   4345   4355
UTK650   004  16B0 4367    4349
UTVADR   002  1BF9 4915    4569
UTVAR1   001  1C09 4943    2406   2523   2530   2556   2594   2639   4611   4790   4880   4915   4944
UTVAR2   001  1D09 4944    4639   4673   4693   4732   4890   4945
UTVAR3   001  1F09 4945    4863   4901   4946
UTVAR4   001  2009 4946
UTVBIT   001  0080 4932    4865
UTVCHK   001  1BF2 4910    4562*  4771*  4829
UTVCLS   001  1BE7 4906    4662*
UTVCOD   001  1BE9 4908    4543*  4547*  4550*  4557*  4560*  4566   4609   4652   4654   4690   4705   4709
                          4719   4752   4817
UTVDEL   001  1778 4933    2419   2627
UTVDFT   004  1789 4934    2492
UTVDLT   001  1BF5 4913    4645   4674   4697   4699   4713   4722   4733   4869
UTVED0   004  1B76 4835    4572*  4616   4698   4784
UTVED1   004  1B7A 4836    4573*
UTVED2   004  1B7E 4837    4574*
UTVEGT   001  0008 4941    4592
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UTVEXP   004 17B5 4937
UTVFG1   001 0001 4926    4543   4654   4817
UTVFG2   001 0002 4927    4550   4566   4609   4652   4690   4705
UTVFG3   001 0004 4928    4557
UTVFG4   001 0008 4929    4560   4752
UTVFG5   001 0010 4930    4547   4566   4609   4652   4690   4705   4709   4719
UTVFIL   001 1BE1 4896    4668*  4671   4741*  4744   4846*  4847*  4850*  4853*  4859
UTVFLG   001 00FF 4931    4556   4562   4673   4732   4767   4780   4829
UTVIDX   001 1BDB 4886    4579*  4581*  4584   4675*  4678   4734*  4737   4848   4851
UTVINF   004 17B1 4936
UTVIST   004 1794 4935    2326   2504
UTVLGH   001 1BFA 4916    4855
UTVLIM   001 1BF4 4912    4589*  4619*  4623*  4627*  4631*  4635*  4640
UTVONE   001 0001 4939    4564   4565   4588   4593   4595   4612   4612*  4615   4619   4623   4627   4631
                         4635   4640   4645   4661   4662   4663   4664   4674   4682   4683   4684   4692
                         4711   4712   4713   4721   4722   4723   4724   4725   4727   4728   4729   4733
                         4754   4755   4759   4760   4761   4766   4777   4778   4779   4793   4794   4798
                         4799   4803   4804   4805   4809   4810   4811   4813   4814   4815   4816   4832
                         4833   4847   4848   4850   4854   4855
UTVSAV   008 1BF1 4909    4544*  4545   4545*  4551*  4659   4694   4717   4731
UTVSCP   001 1C08 4922    4692*  4699*  4701
UTVSHK   004 17C0 4938
UTVSRT   001 1C07 4921    4725*
UTVSV1   008 1C02 4917    4552*  4568*  4830
UTVSV2   002 1C04 4918    4563*  4831
UTVSV3   001 1C05 4919    4564*  4832
UTVSV4   001 1C06 4920    4565*  4833
UTVTAG   001 1BF3 4911    2412   2495   2507   4588*  4640   4645*  4647   4682*  4793   4798   4803   4811
                         4813
UTVTOC   001 1778 4542    4933
UTVTWO   001 0002 4940    4596   4598   4851   4853
UTVTYP   001 1BE8 4907    4556*  4767   4780   4782*
UTVUPR   001 0032 4942    2412   2495   2507   4589   4647   4701
UTVVOL   001 1BD5 4876    4592*  4595*  4598*  4599*  4602   4822*  4825
UTVZER   002 1BF7 4914    4615   4682   4683   4684   4718   4783
UTV050   004 1789 4547    4934
UTV100   004 1794 4550    4935
UTV115   006 1798 4551    4549
UTV117   004 17B1 4556    4936
UTV120   004 17B5 4557    4937
UTV125   004 17B9 4558    4555
UTV140   004 17C0 4560    4938
UTV145   004 17C4 4561    4546
UTV170   004 17C8 4562    4559
UTV175   006 17EB 4569    4567
UTV180   001 17F1 4571
UTV200   004 1826 4592
UTV220   004 1835 4596    4594
UTV250   004 1840 4599    4597
UTV260   004 1857 4611
UTV265   003 1861 4613    4612*
UTV267   004 186F 4617    4614
UTV270   004 187E 4621    4618
UTV290   004 188D 4625    4622
UTV300   004 189C 4629    4626
UTV325   004 18AB 4633    4630
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UTV350   004  18B8  4639    4591   4610   4620   4624   4628   4632
UTV360   006  18BC  4640    4646
UTV365   003  18CD  4644    4653
UTV370   004  18DA  4647    4641
UTV390   004  18E5  4650    4643
UTV395   004  18F4  4654    4648   4651
UTV400   005  18FB  4659
UTV420   004  195E  4689    4655
UTV421   005  1971  4694    4702
UTV422   006  1985  4699    4696
UTV424   004  199A  4704    4691
UTV425   004  19C5  4714    4710
UTV427   005  19FD  4727    4720
UTV430   004  1A0C  4730    4689*  4703   4726
UTV435   004  1A2E  4741    4762   4781
UTV440   003  1A3E  4748
UTV450   004  1A41  4752    4706
UTV460   005  1A72  4766    4753
UTV465   004  1A85  4771    4634   4649   4667   4708   4716   4758   4775
UTV470   004  1A8C  4773    4770
UTV500   005  1A9D  4777    4768
UTV600   004  1ABF  4788    4685   4748
UTV620   004  1ADE  4796    4792
UTV640   004  1AF2  4801    4797
UTV660   004  1B0B  4807    4802
UTV665   005  1B24  4813    4808
UTV670   006  1B2E  4815    4795   4800   4806   4812
UTV680   003  1B41  4819    4815*
UTV700   003  1B47  4821    4816*  4818
UTV720   004  1B4A  4822    4820
UTV750   004  1B5A  4829    4772   4789
UTV900   004  1B82  4845    4660   4704
UTV920   004  1B9A  4851    4849
UTV930   005  1BA5  4854    4852
UTV950   003  1BC0  4864    4854*  4855*
UTV960   004  1BD1  4871    4845*  4866
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TOTAL STATEMENTS IN ERROR IN THIS ASSEMBLY =   0

OL105 I   THE CODE LENGTH OF #UALLO IS 7177 DECIMAL.
OL103 I   TOTAL NUMBER OF LIBRARY SECTORS REQUIRED IS   22
          NAME-#UALLO,PACK-R1R1R1,UNIT-R1,RETAIN-P,LIBRARY-R,CATEGORY-000

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         OVERLAY LINKAGE EDITOR CORE USAGE MAP     05/01/22


   START      CATEGORY   NAME AND        CODE LENGTH
  ADDRESS                 ENTRY     HEXADECIMAL DECIMAL

   0C00           0      #UALLO          1C09    7177


OL100 I   THE TOTAL CORE USED BY #UALLO IS   7177 DECIMAL.
OL101 I   THE START CONTROL ADDRESS OF THIS MODULE IS 0C00.
OL104 I   TOTAL NUMBER OF LIBRARY SECTORS REQUIRED IS    29
          NAME-#UALLO,PACK-R1R1R1,UNIT-R1,RETAIN-P,LIBRARY-O
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