SMS Scientific Micro Systems, Inc.

SMS 1000 Model 40 Microcomputer System

FEATURES

- LSI-11 Q-bus Compatible
- Integrated Foundation Module
- Flexible Configuration
- Optimized Performance
- 5¼-Inch Winchester
- 8-Inch or 5¼-Inch Floppy
- Ease of Service

DESCRIPTION

The SMS 1000 MODEL 40 is a complete microcomputer system based upon DEC's* popular Q-bus architecture. The MODEL 40 includes a system enclosure in either floor mount or rack mount versions, a high output D.C. power supply, and a Q-bus backplane. The system contains a sophisticated foundation module that includes the peripheral controller, serial ports, and the "Support Monitor Subsystem." It also offers a choice of one or two 5¼-inch Winchester disks in a variety of capacities, 5¼-inch or 8-inch floppy disk drives, ¼-inch cartridge tape, and an LSI-11/23 or LSI-11/73 CPU with up to 2.5 megabytes of main memory.

LSI-11 Q-BUS COMPATIBLE: The MODEL 40 contains a quad-wide 22-bit Q-bus backplane with six usable slots. The MODEL 40 uses an enhanced version of the Mass Storage Control Protocol (MSCP) and emulates the DU handler/ device driver. All application and system software developed for the LSI-11/23 and LSI-11/73 CPU's may be operated on this system without modification.

INTEGRATED FOUNDATION MODULE: The MODEL 40 contains a single board foundation module that is located under the disk drives and does not require a Q-bus backplane slot. The foundation module includes the Winchester and floppy disk controller, two RS-232 serial ports, and the hardware to operate the "Support Monitor Subsystem."

The "Support Monitor Subsystem" allows different levels of users to perform diagnostics, isolate component failures, examine system status, change system parameters, and perform functions such as backup and load operations. The support monitor is accessible from the user friendly front panel or from a menu driven console terminal.

FLEXIBLE CONFIGURATIONS: The MODEL 40 is a family of products that provides users the flexibility to choose configurations that meet their current requirements, and the option to expand or upgrade the system later to meet future needs.

The system can be configured with a wide range of 5¼-inch Winchester disks, an 8-inch floppy disk, and 5¼-inch floppy disks. An "add-on" start/stop cartridge tape subsystem is available for high speed/high capacity backup. This start/ stop tape is TSV05 compatible and has a capacity of 21.4 megabytes. The MODEL 40 will also support an integrated

streaming tape in the near future. The streaming tape will have a QIC-2 interface and will support over 40 megabytes of data per cartridge.

The MODEL 40 is available in either floor stand or rack mount models. The floor stand model is an attractive design for office environments. The rack mount model is a rugged design for industrial applications.

OPTIMIZED PERFORMANCE: The MODEL 40 is a high performance multi-user system designed for high throughput applications.

Total system performance is determined by the interaction of four major factors: disk controller architecture, disk technology, CPU capabilities, and system software.

The MODEL 40 disk controller architecture is compatible with the DEC Mass Storage Control Protocol (MSCP). The MSCP architecture enhances the performance of a Winchester system by taking advantage of the sophisticated characteristics of Winchester technology. The SMS implementation of the MSCP protocol provides performance features such as: non-interleaved disk format, overlapped seeking, seek ordering, flaw mapping, and error correction. The disk controller also supports block mode transfers between the disk and main memory.

Drive dependent functions such as data throughput and average access time are critical parameters in determining disk performance. The MODEL 40 uses the latest in 5¼-inch Winchester technology to enhance total system performance. The transfer rate is 625 Kb/sec and average access time is as fast as 30 msec.

The MODEL 40 may be configured with the LSI-11/23 or LSI-11/73 CPU. The LSI-11/73 (J-11) is a 16 bit, high performance microcomputer that utilizes the latest CMOS/VLSI technology. The LSI-11/73 offers PDP-11/70 capabilities that include: memory management of up to 4 megabytes of main memory, an 8K byte memory cache, integral floating point processor, and separate instruction and data space.

The MODEL 40 supports both high performance real-time and time sharing operating systems. RT-11, RSX-11M* and RSX-11M-PLUS have set industry standards for real time applications. RSTS/E*, UNIX*, and TSX-PLUS* are well accepted time sharing systems.

DESCRIPTION (continued)

5¼-INCH WINCHESTER DISK: The Winchester disk is an integral part of the MODEL 40 system. The non-removable disk offers very high reliability, rapid access to data, and provides a wide range of capacity choices. Dual Winchester configurations are also available to further increase capacity and performance.

8-INCH OR 5¼-INCH FLOPPY: The MODEL 40 is available in a wide range of configurations that include an 8-inch floppy or 5¼-inch floppies.
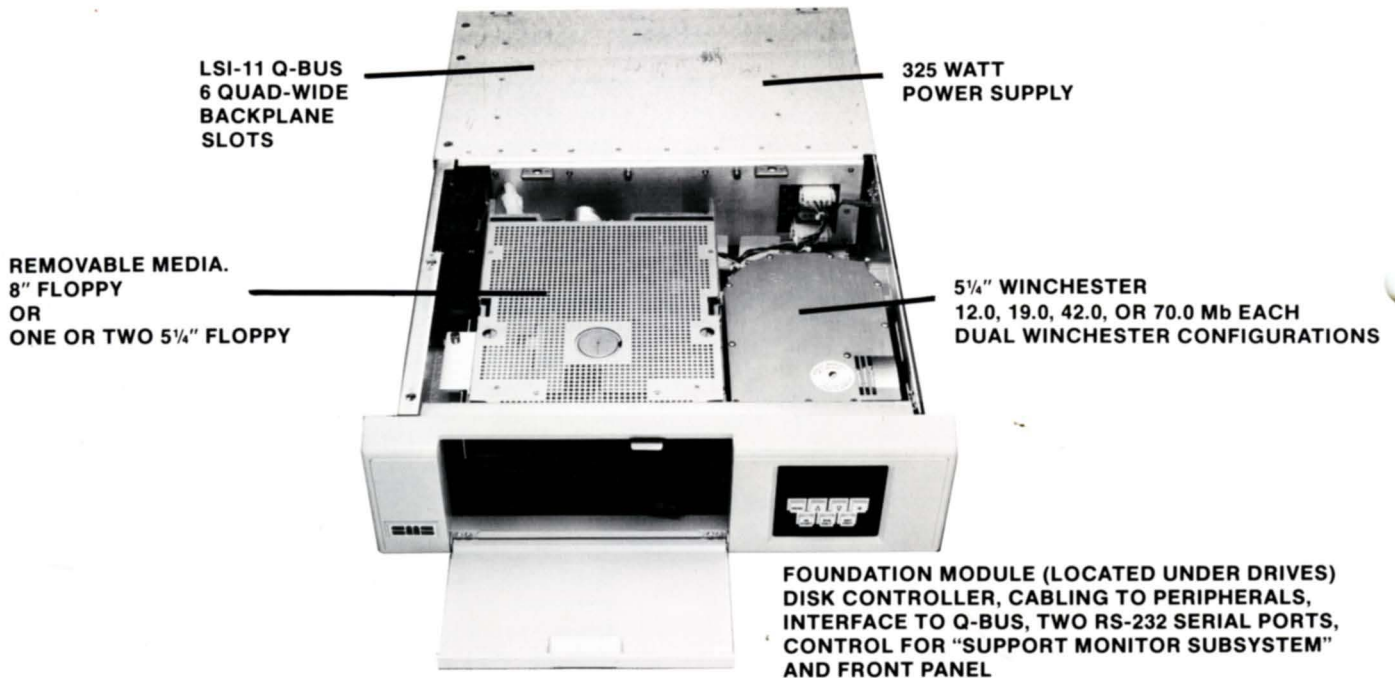
The system is available with a double sided/double density 8-inch floppy drive. Floppy formats supported include; RX01, RX02, RX03, IBM 3740, and IBM 2D. Floppies formatted in IBM 2D format contain 1.2 megabytes of formatted data.

As an alternative, the MODEL 40 may be configured with 5¼-inch floppy drives. Single or dual floppy drive configurations are available. The 5¼-inch floppy is DEC RX50 compatible and in addition is double sided to provide twice the capacity of the standard RX50 drive.
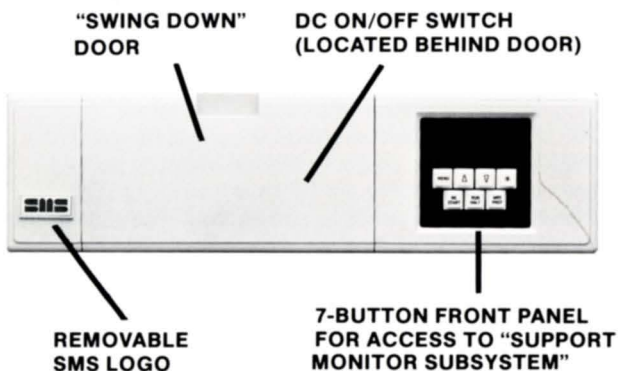
EASE OF SERVICE: The MODEL 40 is a modular design that allows easy access to all major components. Disk drives, power supply, disk controller foundation module, and Q-bus backplane are easily serviced.

The MODEL 40 is warranted for six months, with extended coverage available. The SMS Emergency Service Program guarantees critical part replacement within 24 hours if circumstances dictate.
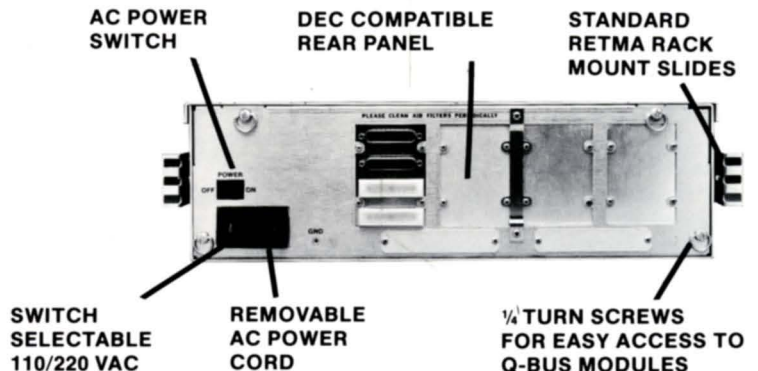
OPEN TOP VIEW

LSI-11 Q-BUS
6 QUAD-WIDE
BACKPLANE
SLOTS

325 WATT
POWER SUPPLY

REMOVABLE MEDIA.
8" FLOPPY
OR
ONE OR TWO 5¼" FLOPPY

5¼" WINCHESTER
12.0, 19.0, 42.0, OR 70.0 Mb EACH
DUAL WINCHESTER CONFIGURATIONS

FOUNDATION MODULE (LOCATED UNDER DRIVES)
DISK CONTROLLER, CABLING TO PERIPHERALS,
INTERFACE TO Q-BUS, TWO RS-232 SERIAL PORTS,
CONTROL FOR "SUPPORT MONITOR SUBSYSTEM"
AND FRONT PANEL

FRONT VIEW

"SWING DOWN"
DOOR

DC ON/OFF SWITCH
(LOCATED BEHIND DOOR)

REMOVABLE
SMS LOGO

7-BUTTON FRONT PANEL
FOR ACCESS TO "SUPPORT
MONITOR SUBSYSTEM"

REAR VIEW

AC POWER
SWITCH

DEC COMPATIBLE
REAR PANEL

STANDARD
RETMA RACK
MOUNT SLIDES

SWITCH
SELECTABLE
110/220 VAC

REMOVABLE
AC POWER
CORD

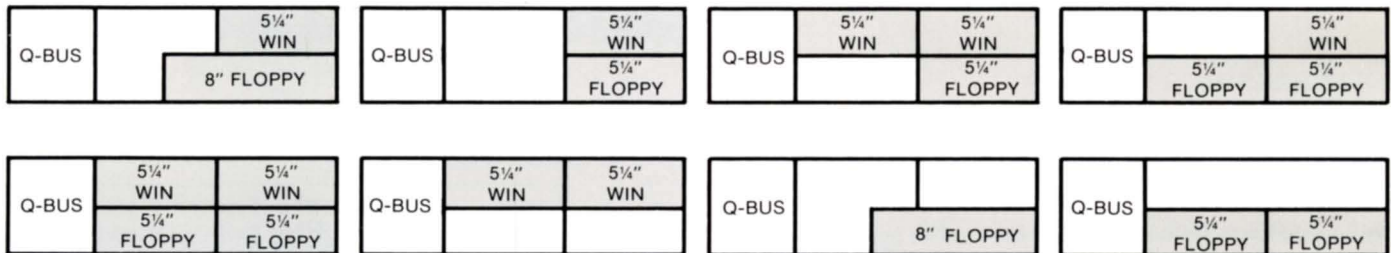¼ TURN SCREWS
FOR EASY ACCESS TO
Q-BUS MODULES

SMS 1000 MODEL 40 CONFIGURATION GUIDE

BASE SYSTEM

The MODEL 40 Base System includes the following standard features:

- LSI-11 Q-BUS BACKPLANE—Six quad-wide backplane slots that can accommodate any Q-bus compatible module
- FOUNDATION MODULE—Single board module, requires no Q-bus slot, provides disk controller, cabling to peripherals, front panel access, interface to Q-bus, "Support Monitor Subsystem," and two RS-232 serial ports.
- SUPPORT MONITOR SUBSYSTEM—Diagnostics, system configuration and options, status, and utilities accessible from front panel or console terminal
- FRONT PANEL—7 button front panel that provides access to "Support Monitor Subsystem"
- TWO RS-232 SERIAL PORTS—Reside on foundation module, require no Q-bus slots, emulate DLV-11, programmable baud rate, includes cables to rear panel
- DEC COMPATIBLE REAR PANEL—Standard cabling and connectors for interface modules
- POWER SUPPLY—Switch selectable 110/220 VAC, 325 Watts
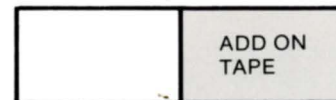- FLOOR STAND OR RACK MOUNT MODELS

CHOICE OF PERIPHERALS

The MODEL 40 supports a wide range of 5¼-inch Winchester disk drives. Current capacities range between 10 and 70 megabytes. Contact SMS for details concerning the latest high capacity Winchester drives.

The system may be configured with one 8-inch slim-line floppy. The floppy supports all DEC and IBM 8-inch floppy formats.

The system may be configured with one or two 5¼-inch floppy drives. The floppy is double sided and can read DEC's single sided floppy distributions.

An "add-on" ¼-inch start/stop cartridge tape is also available for high speed/high capacity distribution and backup. This start/stop tape is TSV05 compatible and emulates the MS handler/device driver.

CHOICE OF CPU'S: The system may be configured with the LSI-11/23 or LSI-11/73 CPU. The CPU is a dual-wide module that requires half a slot. The system is available with or without the LSI-11 CPU and memory.

CHOICE OF MEMORY: The system may be configured with memory ranging from 256Kb to 2.5 megabytes. 256Kb and 512Kb modules are available.

CHOICE OF SERIAL INTERFACES: The standard base system includes two RS-232 serial ports. Additional users can be accommodated by configuring four port DLV11-J's. Remote dial-up users can be accommodated by adding the 4 port DZV-11 module.
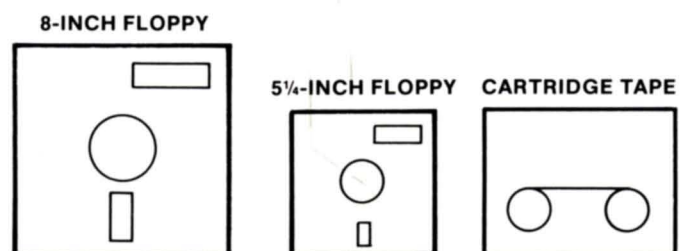
MODEL 40 Q-BUS BACKPLANE

	A	B	C	D
1	LSI-11 CPU		2	MEMORY
4			3	
5			6	
8			7	
9			10	
12			11	

CHOICE OF OPERATING SYSTEMS

The MODEL 40 supports a wide range of operating systems and application software:

- RT-11 real time operating system is available on 5¼-inch floppy, 8-inch floppy, or cartridge tape distribution media.
- Full RSX-11M or RSX-11M-PLUS distribution is available on 8-inch floppy or cartridge tape.
- TSX-PLUS* multi-user system is available on 5¼-inch floppy, 8-inch floppy or cartridge tape.
- RSTS/E*, UNIX*, MICRO/RSX, and MICRO/RSTS are also supported by the MODEL 40.

8-INCH FLOPPY

5¼-INCH FLOPPY   **CARTRIDGE TAPE**

TECHNICAL SPECIFICATIONS

Size: 19.0"W x 5.25"H x 25.0"D

Weight: Rack Mount — 50 to 60 pounds based on configuration
Floor Mount — 65 to 75 pounds based on configuration

Operating Temperature: 10°C - 40°C

Storage Temperature: -20°C - 50°C

Humidity: 20% - 80%

FCC: Meets Class A

AC Power: Switch Selectable
90-130 VAC, 6 Amps (max)
180-260 VAC, 3 Amps (max)
AC on/off switch located on rear panel

DC Power: Any combination of the following up to 325 watts:
5V at 45 Amps
+12V at 4 Amps to backplane
+12V at 10 Amps for peripherals
-12V at 4 Amps
+24V at 2.5 Amps for peripherals and fans
DC on/off switch located on front panel

PERIPHERAL SPECIFICATIONS

5¼" Winchester

Drive Type	Unformatted Capacity	Average Access Time	Transfer Rate (max)	No. Heads	No. Cylinders	Sector/ Track	Bytes/ Sector
ST412 Compatible	12.0 Mb	85 ms	625 Kb/Sec	4	306	18	512
ST419 Compatible	19.0 Mb	85 ms	625 Kb/Sec	6	306	18	512
Q540	42.0 Mb	45 ms	625 Kb/Sec	8	512	18	512
V170	70.0 Mb	30 ms	625 Kb/Sec	7	987	18	512

¼" Cartridge Tape

Type	Recording Density	Number of Tracks	Tape Speed	Fast Speed	Data Transfer Rate Bits/Sec	Capacity
K6455	6400 BPI	4	30 IPS	90 IPS	192,000	21.4 Mbytes MAXIMUM

MEDIA TYPE: 3M DC300, DC300XL, or DC600A

5¼" Floppy

Format Density	Sector/ Track	No. Heads	Bytes/ Sector	Formatted Capacity	Tracks Per Inch
DEC RX50	10	1	512	.4 Mb	96 TPI
DEC RX50/DS	10	2	512	.8 Mb	96 TPI

8" Floppy

Format Density	Sector/ Track	No. Heads	Bytes/ Sector	Formatted Capacity
DEC RX01	26	1	128	.25 Mb
DEC RX02	26	1	256	.5 Mb
DEC RX03	26	2	256	1.0 Mb
IBM Single	26	1	128	.25 Mb
IBM Single	26	2	128	.5 Mb
IBM Double	16	1	512	.6 Mb
IBM Double	16	2	512	1.2 Mb
IBM Double	15	2	512	1.1 Mb

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