

FRONT

PICTURE 1

February 25, 1992

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NOTICES Notices

+--- **Note!** -----+
|
| Before using this information and the product it supports, be sure |
| to read the general information under "Notices" in topic FRONT_1. |
|
+-----+

EDITION Edition Notice
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- General Safety*
- Electrical Safety.*

Second Edition (February 1992)

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Subtopics

FRONT_1.1 Trademarks and Service Marks

FRONT_1.1 Trademarks and Service Marks

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IBM
Micro Channel
Personal System/2
PS/2.

1.0 Product Description

The IBM (*) Personal System/2 (*) Models 56 SX, 56 LS, 56 SLC and 56 SLC LS (referred to as the *Model 56* in this publication) computers feature the IBM Micro Channel (*) architecture. Other features include:

- Security:
 - Cover lock
 - Power-on password
 - Keyboard password
 - U-bolt feature
- System board:
 - 20-MHz microprocessor (see "Microprocessor" in topic 1.2.1)
 - 256KB (KB equals 1024 bytes) of read-only memory (ROM)
 - Initial Machine Load (IML)
 - Socket for a 80387SX or equivalent math coprocessor
 - A minimum of 4MB (MB equals 1 048 576 bytes) random access memory (RAM) expandable to 16MB on the system board
 - 64 bytes of complementary metal-oxide semiconductor (CMOS) random access memory (RAM) with a real-time clock and a 8KB CMOS RAM extension
 - Read-only memory basic input/output system (ROM BIOS)
 - 16-bit VGA graphics controller
 - Bus adapter with three 16-bit expansion slots
 - Serial port
 - Parallel port
 - Diskette-drive controller
 - Small computer system interface (SCSI) controller with an internal and external connector
 - Keyboard connector
 - Pointing-device connector
 - Display connector
- 118 watt power supply, automatically switchable to 100-125 V ac or 200-240 V ac, 50 or 60 Hz
- Speaker
- Battery (to keep CMOS RAM active when power is off)
- Keyboard:
 - Space Saving Keyboard (84/85 key)
 - PS/2 (*) Enhanced Keyboard (101/102 key)
 - PS/2 Host Connected Keyboard (122 key)
- Diskette drives supported (see "Diskette Drives" in topic 2.2)
- Hard disk drive (fixed disk drive) supported (see "SCSI Devices" in topic 2.1).

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Subtopics

- 1.1 Security
- 1.2 System Board
- 1.3 Power Supply
- 1.4 System Memory
- 1.5 Testing Programs and System Utilities

1.1 Security

Subtopics

1.1.1 Cover Lock

1.1.2 Power-On Password and Keyboard Password

1.1.3 U-Bolt Security Feature

1.1.1 Cover Lock

The cover lock is located on the system unit front panel, in the bottom left corner, and can be unlocked with the user's key.

If the keys for the cover lock are lost, a new cover lock assembly can be ordered (see the parts section in the *Hardware Maintenance Service* pamphlet). The new cover lock assembly contains two keys.

1.1.2 Power-On Password and Keyboard Password

A power-on password or a keyboard password denies access to the system when the system is powered-on. To service a system with an active and unknown password:

1. Power-off the system.
2. See "System Board" in topic 6.4 for the location of the password-override connector (J18 or J7) on the system board.
3. Move the jumper on J18 or J7 so that it connects the center pin and the pin on the opposite end of the connector. To move the jumper, lift it straight up.

Note: Leave the jumper in this position until the next time you need to reset the password.

To reactivate the password:

1. Start the system.
2. Select **Set features** from the Main Menu.
3. Select **Set password and unattended start mode** and follow the instructions on the screen.

Note: If the workstation is a medialess system, make the Reference Diskette image available at the file server for the workstation (ask your LAN administrator for assistance); then power-on the workstation and display to start the system programs.

1.1.3 U-Bolt Security Feature

A U-bolt can be attached to the back of the system unit. A security cable or other similar device then can be used to attach the system unit to a table, desk, or other secure object.

1.2 System Board

The major features of the system board are:

- 20-MHz microprocessor (see "Microprocessor" in topic 1.2.1)
- Socket for a 80387SX or equivalent math coprocessor
- CMOS RAM and CMOS RAM extension
- 16-bit VGA graphics controller
- Serial port
- Parallel port
- Diskette-drive controller
- SCSI controller
- Keyboard connector and pointing-device (mouse) connector.

Subtopics

- 1.2.1 Microprocessor
- 1.2.2 Math Coprocessor Socket
- 1.2.3 CMOS RAM and CMOS RAM Extension
- 1.2.4 16-bit VGA Graphics Controller
- 1.2.5 Serial Port
- 1.2.6 Parallel Port
- 1.2.7 Diskette-Drive Controller
- 1.2.8 SCSI Device Controller
- 1.2.9 Keyboard Connector and Pointing-Device Connector

1.2.1 *Microprocessor*

The Model 56 SX and Model 56 LS use a 386SX microprocessor; the Model 56 SLC and Model 56 SLC LS use an IBM386 SLC microprocessor, a high-performance 80386-compatible microprocessor with an 8KB of internal cache memory. Both microprocessors have a 32-bit internal bus with a 16-bit external data bus and a 24-bit external address bus. These microprocessors operate at 20 MHz in both the real-address mode and the virtual-address (protected) mode.

1.2.2 Math Coprocessor Socket

A 80387SX or equivalent math coprocessor can be installed into the coprocessor socket on the system board to increase performance with some software programs.

1.2.3 CMOS RAM and CMOS RAM Extension

The CMOS RAM provides 64 bytes of storage. The real-time clock uses the first 14 bytes to track the date, time, and battery level. The remaining 50 bytes are used to store system-configuration and security information. The 8KB CMOS RAM extension stores additional configuration and system-status information.

The data stored in the CMOS RAM and CMOS RAM extension is kept active by the battery when the system is powered-off. If the stored data is lost due to a depleted or removed battery, the data can be restored using one of the following methods:

- If the user has a customized configuration that uses settings other than the default, run **Restore configuration** from the system programs stored on the hard disk drive.
- If the configuration settings use the default, select **Run automatic configuration** from the system programs stored on the hard disk drive.

Note: If the workstation is a medialess system, make the Reference Diskette image available at the file server for the workstation (ask your LAN administrator for assistance); then power-on the workstation and display to start the system programs.

1.2.4 16-bit VGA Graphics Controller

The 16-bit VGA graphics controller is on the system board. The controller supports color and monochrome analog direct-drive displays in a variety of modes, including alphanumeric text mode and all-points-addressable (APA) graphics mode.

The controller supports a maximum of 1056 x 400 picture elements (PELs) in the text mode and a maximum of 640 x 480 PELs in the graphics mode. Up to 256 colors or 64 shades of gray can be used at one time. The 3278-compatibility modes 2, 3, 4, and 5 are supported; composite video is not supported.

1.2.5 Serial Port

The serial port is fully programmable and supports asynchronous communications. The 25-pin, D-shell connector provides the signals to drive a device with a standard 25-contact, RS232-C connector. The connected device is identified by the system configuration Serial 1 (primary) through Serial 16 (alternates) address.

If an option adapter with a serial port is installed in the system, the device address should be identified as one of the alternate Serial Ports 2 through 16.

Note: Conflicts occur when using multiple devices if two or more devices are addressed the same. Select **Set configuration** from the system programs stored on the hard disk drive. Select **View configuration** to verify that no ports have the same address.

1.2.6 Parallel Port

The parallel port enables the attachment of devices that accept eight bits of parallel data at standard transistor-transistor-logic (TTL) levels. The port has a 25-pin, D-shell connector and is designed primarily for printers. However, the port can be used as a general input/output port for any device or application that has the same input/output capabilities. The connected device is identified (addressed) by the system configuration as Parallel 1, Parallel 2, Parallel 3, or Parallel 4.

When an option adapter with an additional parallel port is installed, it should be identified as Parallel 2, 3, or 4. The system can support two different devices, each addressed separately.

1.2.7 Diskette-Drive Controller

The controller connects to the diskette drives through a single 40-pin connector on the system board. Signals and voltages are supplied through the diskette-drive cable that plugs into the drive connector. Up to two diskette drives can be supported.

1.2.8 SCSI Device Controller

The SCSI device controller is an interface that transfers system data to and from SCSI devices. The SCSI controller has two connectors: a 50-pin internal device connector that enables the attachment of internal SCSI devices, and a 60-pin external device connector that enables the attachment of external SCSI devices. A total of seven SCSI devices are supported.

1.2.9 Keyboard Connector and Pointing-Device Connector

The two 6-pin connectors at the back of the system unit are for a keyboard and a pointing device (mouse). The keyboard connector is marked with a small keyboard symbol; the mouse connector is marked with a small mouse symbol. The interface logic enables the keyboard and the pointing device to be interchanged.

1.3 Power Supply

The power supply switches to either the 100--125 V ac or the 200--240 V ac range automatically when the power cord is plugged into an outlet. The ac input is converted to dc outputs that supply the system with the proper operating voltages.

When the system is powered-off and then powered-on, the power supply generates a 'power good' signal that resets the system logic. The presence of the 'power good' signal indicates that the power supply is operating properly.

The 'power good' signal turns on the green power-good light on the front of the system unit, indicating that all system-board power requirements have been met.

There can be a 3 to 5 second delay before output voltages are generated after power-on, due to system sequencing requirements.

1.4 System Memory

The Model 56 has at least 4MB of memory installed at the time of shipment. Additional memory-module kits can be installed in the second (Mem2) and third (Mem3) memory-module connectors on the system board. The maximum system-board memory capacity is 16MB, in any combination of 2, 4, or 8MB memory-module kits.

Note: The amount of usable memory will be less than the amount of installed memory. (The system software and some functions, such as video and SCSI, use some of the memory space.) The difference between the usable memory and the installed memory is most noticeable when the installed memory is greater than 12MB.

Subtopics

1.4.1 Interleaved Memory Configurations

1.4.1 Interleaved Memory Configurations

The memory controller supports interleaved memory when memory-module kits of the same size and speed are installed as shown in the following table.

MEM 1	MEM 2	MEM 3
2MB	Empty	Empty
2MB	2MB	Empty
2MB	2MB	2MB*
4MB	4MB	Empty
4MB	4MB	4MB*
* The memory in MEM3 does not operate as interleaved memory.		

Installing memory in one of these combinations can increase performance.

During the memory tests, an "i" will appear next to the test number indicating that an interleaved memory configuration is being tested.

Note: Interleaved memory is not supported when memory is disabled.

When memory is added or removed from the system, run **Set configuration** from the system programs stored on the hard disk drive.

Note: If the workstation is a medialess system, make the Reference Diskette image available at the file server for the workstation (ask your LAN administrator for assistance); then power-on the workstation and display to start the system programs.

If a memory error occurs, the Model 56 reallocates system-board memory in 1MB blocks for 2MB memory-module kits and in 1MB to 4MB blocks for 4MB and 8MB memory-module kits. If the POST detects a memory error in any byte within 1MB of system-board memory, the entire 1MB is deactivated and an error code is displayed.

1.5 Testing Programs and System Utilities

The Model 56 with an installed hard disk drive uses a technique called Initial Machine Load (IML) to store the power-on self-test (POST) and basic input/output system (BIOS) code. With IML, some of the code is still stored in ROM and performs some preliminary testing during power-on. But the balance of the POST and BIOS code (called the system programs) is stored in a protected partition (called the System Partition) on the default hard disk drive. This hard disk drive must be set to SCSI ID 6. The system programs are loaded onto the installed hard disk drive at the time the system is manufactured. The System Partition is not affected when the drive is formatted using the operating system FORMAT command.

Subtopics

1.5.1 POST

1.5.2 System Programs and Diagnostic Tests

1.5.1 POST

Some POST code (stage 1) is stored in ROM. This code performs some preliminary testing at the start of the power-on sequence. The balance of the POST code (stage 2) is stored in the System Partition.

When stage 1 POST begins at power-on, it:

- Checks the basic system-board functions
- Initializes the video function
- Initializes the memory subsystem and tests any byte within 1MB of memory
- Verifies that the default hard disk drive is functioning
- Verifies that the system programs are in the System Partition on the hard disk drive with SCSI ID 6
- Loads the stage 2 POST code into RAM from the hard disk drive.

Stage 2 POST performs additional tests of the hardware and then initializes the system. When the POST finishes, system control is given to the operating system.

If the POST detects an error, an error code (usually eight digits) is displayed.

Note: If the error occurs during the stage 2 POST code loading sequence, or if the stage 2 POST code on the hard disk drive is missing, damaged, or incorrect, an I999XXXX error code is displayed ("X" can be any number). Most of these errors can be resolved without replacing any FRUs. Refer to the procedure in the *Hardware Maintenance Service* pamphlet to resolve these problems.

For more information on POST, see the *Diagnostic Information for Micro Channel Computers* pamphlet.

1.5.2 System Programs and Diagnostic Tests

To access the system programs or customer or advanced diagnostic tests:

1. Press and hold **Ctrl+Alt**, then press **Del**.
2. Release the keys and closely watch the flashing cursor in the top-left corner of the screen.
3. When the cursor moves to the top-right corner of the screen, press and hold **Ctrl+Alt**, then press **Ins**.

After a few moments, the Main Menu will appear. You can then access the customer diagnostic test or press **Ctrl+A** to access advanced diagnostic test.

For more information on the system programs or the customer and advanced diagnostic tests, see the *Diagnostic Information for Micro Channel Computers* pamphlet.

Note: If the workstation is a medialess system, make the Reference Diskette image available at the file server for the workstation (ask your LAN administrator for assistance); then power-on the workstation and display to start the system programs.

2.0 Option Compatibility

The Model 56 supports many options designed for IBM Personal System/2 Micro Channel computers. Most of these are listed in the parts section of the *Hardware Maintenance Service* pamphlet.

Subtopics

- 2.1 SCSI Devices
- 2.2 Diskette Drives
- 2.3 Terminators
- 2.4 Drive and Diskette Compatibility

2.1 SCSI Devices

The Small Computer System Interface (SCSI) controller on the system board will support up to seven SCSI devices. Two of these devices can be installed inside the system unit.

Note: The total length of all SCSI cables attached to a SCSI controller should not exceed 6 m (19.7 ft). Configurations that exceed this maximum length are not supported. The total length includes all internal and external SCSI cables. The Model 56 internal SCSI cable length is 0.4 m (1.3 ft).

Subtopics

2.1.1 Hard Disk Drive

2.1.1.1 Hard Disk Drive

The Model 56 supports one hard disk drive in the lower drive location. The hard disk drive and hard-disk-drive interface must be the same. For supported hard disk drives, see the parts section in the *Model 56 Hardware Maintenance Service* pamphlet.

The installed hard disk drive (SCSI ID 6) has a System Partition that contains the system programs. For more information about these programs, see "Testing Programs and System Utilities" in topic 1.5. The hard disk drive automatically positions the read/write heads in nondata areas when the system is powered-off.

Option hard disk drives are shipped without a System Partition. If the drive you are replacing is an option hard disk drive, start the system with the customer's back up copy of the Reference Diskette, select **Backup/Restore system programs** from the Main Menu, then **Restore the System Partition** to create a System Partition and copy the system programs onto the new hard disk drive.

Note: If the system programs have been loaded onto the hard disk drive but the customer's operating system has not been loaded, the Diskette and F1 prompts will appear on the screen.

2.2 Diskette Drives

The Model 56 supports one 1.2MB 5.25-inch diskette drive in the lower drive location, or one or two 3.5-inch diskette drives in the upper and the lower drive location. (The lower drive location supports either a diskette drive or a hard disk drive.)

2.3 Terminators

Terminator requirements for:

- Diskette Drives: do not use or require terminators.
- SCSI Hard Disk Drives and other SCSI devices:
 - The last device in a SCSI chain (both internal and external) must have the terminator installed. Some devices might require more than one terminator.
 - All other SCSI devices must have the terminators removed.
- SCSI Adapter: Terminator requirements for the SCSI adapter vary depending on the configuration of the system and the type of adapter.

The location and appearance of the terminators may vary from device to device. An identification label or tag (usually "T-RES") is attached to each terminator for easy identification on SCSI adapters and devices. The terminator on the system board is shown in "System Board" in topic 6.4.

2.4 Drive and Diskette Compatibility

The following table provides information concerning the identification of 3.5-inch diskette drives.

Diskette Drive	Identifying Mark
3.5-Inch - 1.44MB	1.44 on the Eject Button
3.5-Inch - 2.88MB	2.88 on the Eject Button

The following table provides information concerning the compatibility of 3.5-inch diskettes to 3.5-inch diskette drives.

Diskette Capacity	1.44MB Drive	2.88MB Drive
1.0MB	Read/Write	Read/Write
2.0MB	Read/Write	Read/Write
4.0MB	Not Compatible	Read/Write

The following table provides information concerning the identification of 5.25-inch diskette drives.

Diskette Drive	Identifying Mark
5.25-Inch - 360KB (External)	Asterisk on Bezel
5.25-Inch - 1.2MB (Internal)	1.2 on the Eject Button

The following table provides information concerning the compatibility of 5.25-inch diskettes to 5.25-inch diskette drives.

Diskette Capacity	360KB Drive	1.2MB Drive
360KB	Read/Write	Read/Write
1.2MB	Not Compatible	Read/Write

Note: A 360KB diskette written to or formatted on a 1.2MB drive can be read reliably only on a 1.2MB drive.

For additional information, see "Diskette Drives and Diskettes" in the *IBM Personal System/2 Hardware Maintenance Reference General Information* pamphlet.

3.0 Specifications

Size

- Width: 360 mm (14.2 in.)
- Depth: 395 mm (15.6 in.)
- Height: 115 mm (4.5 in.).

Weight

- Maximum configuration: 11.8 kg (26 lb).

Environment

- Temperature:
 - Power on: 10° to 35°C (50° to 95°F)
 - Power off: 10° to 43°C (50° to 110°F).
- Humidity:
 - Power on: 8% to 80%
 - Power off: 8% to 80%.
- Maximum altitude: 2134 m (7000 ft).

Heat Output

671 British thermal units (BTUs) per hour (197 watts) maximum.

Electrical

- Input Voltage - Sinewave input (50 or 60 Hz)
 - Low Range:
 - Minimum: 100 V ac
 - Maximum: 125 V ac.
 - High Range:
 - Minimum: 200 V ac
 - Maximum: 240 V ac.
- Input kilovolt-amperes (kVA)
 - Configuration as shipped from IBM: 0.063 kVA
 - Maximum configuration: 0.3 kVA.

4.0 Special Tools

The following special tools are required to service the Model 56.

Volt-Ohm Meter

A meter similar to the Triplet Model 310. (1)

Wrap Plug

The Tri-Connector wrap plug (IBM part number 72X8546) is used during advanced diagnostic tests of serial and parallel ports.

PICTURE 2

(1) Manufactured by Triplet Corporation, Bluffton, Ohio 45817,
U.S.A.

5.0 Removals and Replacements

This section contains information on removals and replacements, locations, and grounds.

The arrows in the removals and replacements figures show the direction of movement to remove a field replaceable unit (FRU), to turn a screw, or to press a tab to release a FRU. The arrows are marked in numeric order to show the correct sequence of removal.

When other FRUs must be removed prior to removing the failing FRU, they are listed at the top of the page. Go to the removal procedure for each FRU listed, remove the FRU, then continue with the removal of the failing FRU.

To replace a FRU, reverse the removal procedure and follow any notes that pertain to replacement. See "Locations" in topic 6.0 for internal cable connection and arrangement information.

CAUTION:

Before removing any FRU, power-off the system, unplug all power cords from electrical outlets, and disconnect any interconnecting cables.

Warning: The system board, adapters, memory modules, math coprocessor, and circuit boards on the drives are sensitive to, and can be damaged by, electrostatic discharge. Establish personal grounding by touching a ground point with one hand before touching these units.

Note: An electrostatic discharge (ESD) strap may be used to establish personal grounding.

Subtopics

- 5.1 1005 Cover
- 5.2 1010 Adapters
- 5.3 1015 Front Retainer Plate
- 5.4 1020 Bus Adapter
- 5.5 1025 Hard Disk Drive
- 5.6 1030 Diskette Drive
- 5.7 1035 Cover Plates
- 5.8 1040 Cover Lock Assembly
- 5.9 1045 Control Assembly
- 5.10 1050 Battery
- 5.11 1055 Power Supply
- 5.12 1060 Math Coprocessor
- 5.13 1065 Memory-Module Kits
- 5.14 1067 Cached Processor Option
- 5.15 1070 System Board
- 5.16 1075 Adapter Card Guide
- 5.17 1080 SCSI Terminator

5.1 1005 Cover

CAUTION:

Before removing any FRU, power-off the system, unplug all power cords from electrical outlets, and disconnect any interconnecting cables.

Note: Unlock the cover first.

PICTURE 3

PICTURE 4

5.2 1010 Adapters

Cover (1005).

Notes:

1. Before replacing an adapter, note the locations of the adapter and cables. Disconnect any cables attached to the adapter. When replacing an adapter, install the replacement adapter in the same slot as the adapter that was removed.
2. If you are replacing a SCSI adapter attached the external terminator, remove the terminator. Reinstall the terminator on the new adapter.
3. Stored configuration information depends on the location of the adapter. If the replacement adapter is installed in a different location, select **Set configuration** from the hard disk drive to reset the system-configuration information.

PICTURE 5

5.3 1015 Front Retainer Plate

□ Cover (1005)

PICTURE 6

PICTURE 7

5.4 1020 Bus Adapter

- Cover (1005)
- Adapters (1010).

Note: When a new bus adapter is installed, select **Set features** from the system programs on the hard disk drive to set the time and date, and to restore the configuration data.

PICTURE 8

PICTURE 9

5.5 1025 Hard Disk Drive

Warning: Improper shipping or handling can result in permanent loss of all data and formatting on the hard disk drive. Have the user back up all information on the hard disk drive.

- Cover (1005)
- Front Retainer Plate (1015).

PICTURE 10

PICTURE 11

5.6 1030 Diskette Drive

- Cover (1005)
- Front Retainer Plate (1015).

Note: Some drives, such as the 3.5-inch diskette drives, do not use the 4-pin power supply connector.

PICTURE 12

PICTURE 13

5.7 1035 Cover Plates

- Cover (1005)
- Front Retainer Plate (1015).

Notes:

1. Cover plates must be removed from bottom to top. Remove the lower cover plate first. If a drive is to be installed in the lower drive location, remove only the lower cover plate.
2. To remove the lower cover plate, simultaneously press the two latches 2 at the right end of the lower cover plate to the left, until the lower cover plate pops out.
3. To remove the upper cover plate, simultaneously press the two latches 1 at the top and the right end of the upper cover plate to the inside, until the upper cover plate pops out.

PICTURE 14

5.8 1040 Cover Lock Assembly

- Cover (1005).

PICTURE 15

5.9 1045 Control Assembly

- Cover (1005)
- Front Retainer Plate (1015).

PICTURE 16

PICTURE 17

5.10 1050 Battery

CAUTION:

The lithium battery (IBM part number 33F8354) in your system can cause a fire, explosion, or severe burn risk. Use of another battery could result in its ignition or explosion. The battery must be replaced by trained service personnel.

- Cover (1005)
- Adapters (1010)
- Bus Adapter (1020).

Note: The battery is located on the bus adapter. Use care when removing the battery. When a new battery is installed, select **Set configuration** from the system programs on the hard disk drive to set the time and date, and to restore the configuration data.

PICTURE 18

5.11 1055 Power Supply

- Cover (1005)
- Control Assembly (1045).

PICTURE 19

5.12 1060 Math Coprocessor

- Cover (1005)
- Control Assembly (1045)
- Adapters (1010)
- Bus Adapter (1020).

Warning: Remove the math coprocessor carefully. Do not bend the pins when removing the math coprocessor. The math coprocessor can be damaged by electrostatic discharge, prying between the module and socket, or prying between the socket and system board. Establish personal grounding by touching a ground point with one hand before touching the math coprocessor.

The system will not operate properly if the math coprocessor is installed incorrectly or is the wrong type for the system.

Notes:

1. The Model 56 requires a 20-MHz 80387SX (or equivalent) math coprocessor.
2. When replacing the math coprocessor, make sure the dot or dimple on the coprocessor is aligned with the beveled corner of the socket. (Looking from the front of the system, the bevel is on the right rear corner of the computer.)
3. If a cached processor option is installed, the math coprocessor socket is on the option.

PICTURE 20

5.13 1065 Memory-Module Kits

- Cover (1005)
- Adapters (1010).

Note: Looking from the front of the system, install the memory-module kits from right to left (Mem1, Mem2, then Mem3). Remove the memory-module kits from left to right (Mem3, Mem2, then Mem1).

PICTURE 21

5.14 1067 *Cached Processor Option*

- Cover (1005)
- Control Assembly (1045).
- Math Coprocessor, if installed (1060).

Notes:

1. This option should be installed in the Model 56 SX or the Model 56 LS.
2. To install this option on a new system board, first remove the coprocessor socket from the 11 by 11-pin connector on the system board. Then install the option into the 11 by 11 pin connector.

PICTURE 22

5.15 1070 System Board

- Cover (1005)
- Adapters (1010)
- Front Retainer Plate (1015)
- Diskette Drive (1030)
- Hard Disk Drive (1025)
- Control Assembly (1045)
- Bus Adapter (1020)
- Math Coprocessor, if installed (1060)
- Memory-Module Kits (1065)
- Cached Processor Option, if installed (1067).

Notes:

1. Disconnect all cables and screws from the system board.
2. When a new system board is installed, select **Set features** from the system programs on the hard disk drive to set the time and date, and to restore the configuration data.
3. If the SCSI Terminator 1 has been removed from the old system board, remove it also from the new system board you are installing (see "1080 SCSI Terminator" in topic 5.17 for more information).

PICTURE 23

5.16 1075 Adapter Card Guide

- Cover (1005)
- Adapters (1010).

PICTURE 24

5.17 1080 SCSI Terminator

Warning: Establish personal grounding by touching a ground point with one hand before touching the SCSI terminator. The SCSI terminator can be damaged by electrostatic discharge.

- Cover (1005)
- Control Assembly (1045).

PICTURE 25

6.0 Locations

Subtopics

- 6.1 Front View
- 6.2 Rear View
- 6.3 Interior View
- 6.4 System Board
- 6.5 Cached Processor Option
- 6.6 Safety Label

6.1 Front View

- 1 Cover lock
- 2 Diskette-drive bay
- 3 Diskette-drive in-use light
- 4 Diskette eject button
- 5 Hard-disk-drive bay
- 6 Hard-disk-drive in-use light
- 7 Power-good light
- 8 Power switch
- 9 Serial number.

PICTURE 26

6.2 Rear View

- 1 Power connector
- 2 External SCSI port
- 3 Display connector
- 4 Bolt-down holes (U-bolt opening)
- 5 Serial port
- 6 Cover screw
- 7 Parallel port
- 8 Keyboard connector
- 9 Pointing-device connector.

PICTURE 27

6.3 Interior View

- 1 Power supply
- 2 Hard-disk-drive cable
- 3 Diskette-drive cable
- 4 Diskette drive
- 5 Bus adapter
- 6 Hard disk drive
- 7 Adapter-card guide
- 8 System board.

PICTURE 28

6.4 System Board

- 1 Pointing-device connector
- 2 Keyboard connector
- 3 Parallel-port connector
- 4 Password-override connector (J7 or J18)
- 5 Serial-port connector
- 6 Display connector
- 7 External SCSI connector
- 8 SCSI terminator
- 9 Control-assembly connector
- 10 Power-supply connector P2
- 11 Internal SCSI connector
- 12 Power-supply connector P1
- 13 Diskette-drive connector
- 14 Math coprocessor socket
- 15 Video memory connectors
- 16 Bus-adapter connector
- 17 Memory-module connector 1 (Mem1)
- 18 Memory-module connector 2 (Mem2)
- 19 Memory-module connector 3 (Mem3).

PICTURE 29

6.5 *Cached Processor Option*

- 1 Cached Processor Option
- 2 Coprocessor socket
- 3 Standoffs

PICTURE 30

6.6 Safety Label

The following safety label is installed on the top of the power supply.

PICTURE 31

1 Danger label

DANGER:
DO NOT OPEN. DANGEROUS VOLTAGE INSIDE.

7.0 Grounds

- 1 Chassis ground
- 2 Primary ground.

PICTURE 32

Notes:
Notes: