RS/6000 7043 43P Series

Models 140 and 240 Service Guide

SA38-0512-02

Third Edition (October 1997)

Contents

Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

Federal Communications Commission (FCC) Statement

Note: The IBM 7043 Model 140 and 240 have been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from authorized dealers. Neither the provider nor the manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

International Business Machines Corporation
Old Orchard Road
Armonk, New York 10504
Telephone: (919) 543-2193

European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe B respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

Canadian Department of Communications Compliance Statement

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

VCCI Statement

この装置は，第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）基準に適合しております。

しかし，本装置をラジオ，テレビジョン受信機に近接してご使用になると，受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

The following is a summary of the VCCI Japanese statement in the box above.

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

When used near a radio or TV receiver, it may become the cause of radio interference.

Read the instructions for correct handling.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG–Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.

Safety Notices

A *danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury. *Danger* notices appear on the following pages:

A *caution* notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury. *Caution* notices appear on the following pages:

Laser Safety Information

The optical drive in the RS/6000 43P Series is a laser product. The optical drive has a label that identifies its classification. The label, located on the drive, is shown below.

CLASS 1 LASER PRODUCT
LASER KLASSE 1
LUOKAN 1 LASERLAITE
APPAREIL À LASER DE CLASSE 1
IEC 825:1984 CENELEC EN 60 825:1991

The optical drive in the RS/6000 43P Series is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 (1st edition 1984) and CENELEC EN 60 825:1991 for Class 1 laser products.

CAUTION:
A class 3 laser is contained in the device. Do not attempt to operate the drive while it is disassembled. Do not attempt to open the covers of the drive as it is not serviceable and is to be replaced as a unit.

Class 1 laser products are not considered to be hazardous. The optical drive contains internally a Class 3B gallium-arsenide laser that is nominally &Milli. at 830 nanometers. The design incorporates a combination of enclosures, electronics, and redundant interlocks such that there is no exposure to laser radiation above a Class 1 level during normal operation, user maintenance, or servicing conditions.

About This Book

This book provides reference information, maintenance analysis procedures (MAPs), error codes, and removal and replacement procedures. This book also provides information on diagnostics, System Management Services, and firmware flow. A parts catalog is also included.

MAPs that are common to all systems are contained in the Diagnostics Information for Multiple Bus Systems.

This book is used by the service technician to repair system failures. This book assumes that the service technician has had training on the system unit.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

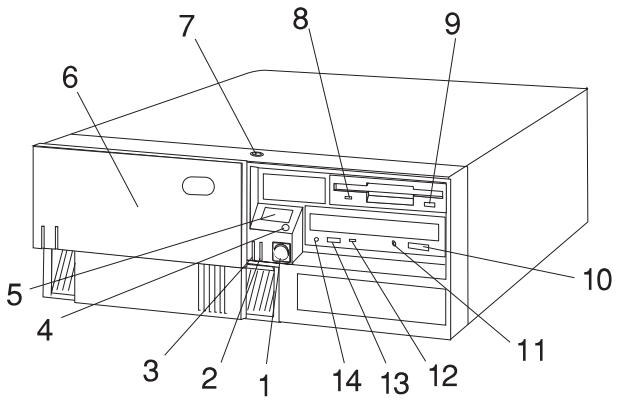
Related Publications

The following publications are available for purchase:

- The Diagnostics Information for Multiple Bus Systems, order number SA38-0509, contains common diagnostic procedures, error codes, service request numbers, and failing function codes. This manual is intended for trained service technicians.
- The *Adapters, Devices, and Cable Information for Multiple Bus Systems*, order number SA38-0516, contains information about adapters, external devices, and cabling. This manual is intended to supplement information found in the Diagnostics Information for Multiple Bus Systems.
- The *RS/6000 7043 43P Series Models 140 and 240 Setup Instructions*, order number SA38-0510, is a pictorial guide designed to help system users set up their systems.
- The *RS/6000 7043 43P Series Models 140 and 240 User's Guide*, order number SA38-0511, provides information about installing options, system operation, and running diagnostics.

Chapter 1. Reference Information

Front View (Model 140 and Model 240)



1 Power Switch: Turns computer power on and off.

2 Power-On Light: Glows when computer is on.

3 Hard Disk Drive In-Use Light: Glows when computer is reading from or writing to the hard disk.

4 Reset Button: Function depends upon the operating system installed.

5 Operator Panel Display: Function depends upon the operating system installed; may display current status of system unit startup, or diagnostic information in the event of a hardware problem.

6 Media Bay Cover: Covers the diskette and CD-ROM drives when they are not in use.

7 Cover Lock: Security feature. Prevents the cover from being removed and locks the media bay cover in the closed position.

8 Diskette-Drive In-Use Light: Glows when computer is reading from or writing to a diskette.

9 Diskette Eject Button: Releases diskette from 3.5-inch diskette drive.

10 CD-ROM Eject Button: Releases the CD-ROM from the CD-ROM drive.

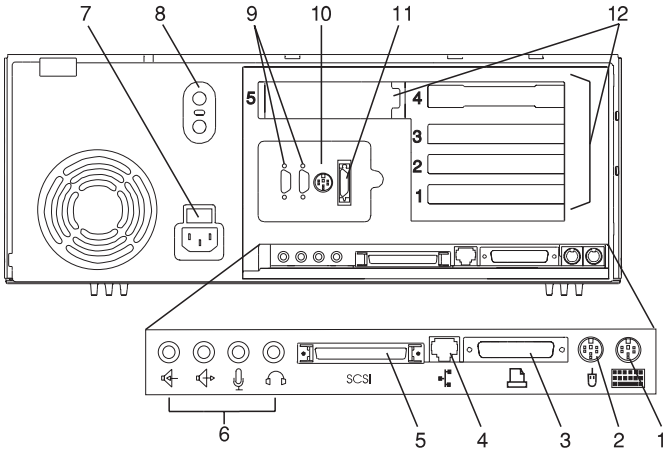
11 CD-ROM Emergency Eject: Ejects CD-ROM from the CD-ROM drive if power is not available.

12 CD-ROM Status Light: Indicates when the CD-ROM drive is active.

13 CD-ROM Volume Control: Controls the volume for the CD-ROM headphone jack.

14 CD-ROM Headphone Jack: CD-ROM Headphone connector.

Rear View (Model 140 and Model 240)



1 Keyboard Port: ( ): For keyboard connection.

2 Mouse Port ( ): For mouse connection.

3 Parallel Port ( ): For connecting a parallel printer or other parallel devices.

4 10BaseT Ethernet Port ( ): For attaching your computer to an Ethernet/Twisted pair connection through a 10baseT connector.

5 External SCSI Port ( ): For connecting external SCSI devices.

6 Audio Ports:

- Headphone.
- Microphone.
- Audio line out.
- Audio line in.

7 Voltage-Selection Switch: Select either 115-V or 230-V setting.

8 Security tether attachment: Attachment point for a security tether.

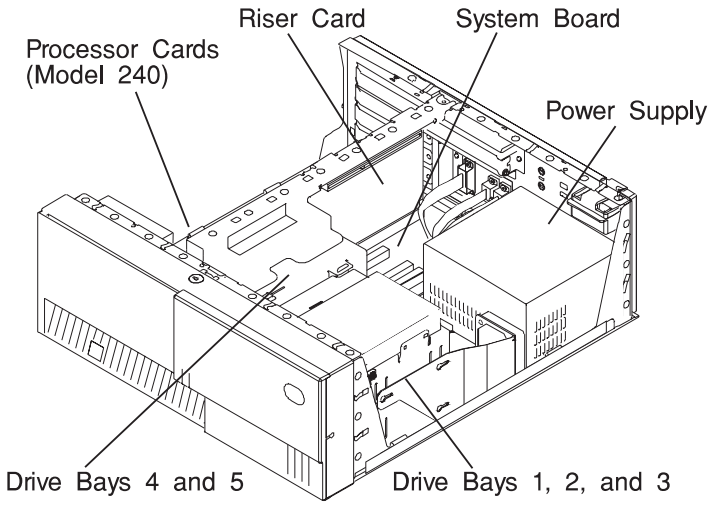
9 9-Pin Serial Ports (1 and 2): For a TTY terminal, Modem, or other serial devices.

10 Tablet Port ( ): For attaching a digitizing tablet to your computer.

11 10Base5 Ethernet Port ( ): For attaching your computer to an Ethernet thick connection (or Ethernet thin connection, using an optional transceiver) through a 10base5 connector.

12 Expansion Slots: For adding ISA and PCI adapters.

Front View without Covers



Specifications (for Model 140)

The mechanical packaging, cooling, power supply, and environmental requirements for the workstation is shown in the following:

Dimensions

- In horizontal orientation
  - Height - 165 mm (6.5 inches)
  - Depth - 460 mm (18.1 inches)
  - Width - 420 mm (16.5 inches)
- In vertical orientation
  - Height - 450 mm (17.7 inches)
  - Depth - 460 mm (18.1 inches)
  - Width - 235 mm (9.25 inches)

Weight

14.5 kg (29 lb) Minimum to 18.2 kg (40 lb) Maximum

Maximum Support Capacity (Horizontal Position)

27.3 kg (60 lbs)

Operating Environment - Class B

Temperature - 16° to 32°C (60° to 90°F)

Humidity - 8% to 80% noncondensing

Maximum Altitude - 2135 m (7000 feet)

Power Source Loading

0.3k VA typical

0.5k VA maximum

Power Supply

250 watts

Operating Voltage

100 to 125V ac; 50 to 60 Hz

200 to 240V ac; 50 to 60 Hz

Heat Output (Maximum)

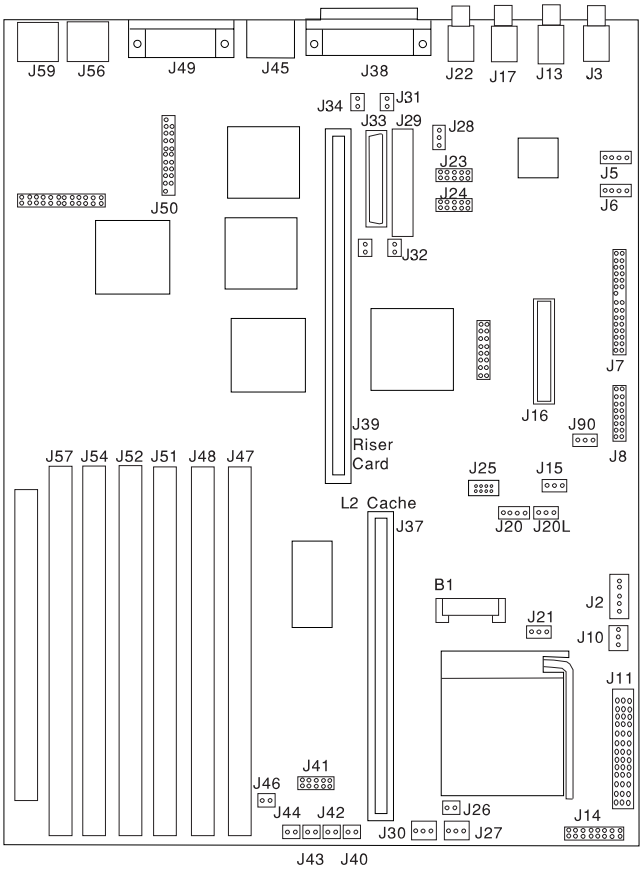
Operating 796 BTUs per hour

Idling 597 BTUs per hour

Acoustics

- Average sound-pressure levels:
  - At operator position:
    - 43 dB operating
    - 38 dB idle
  - At bystander position (1 meter)
    - 38 dB operating
    - 36 dB idle
- Declared (upper limit) sound power levels:
  - 5.3 Bels operating
  - 5.0 Bels idle

System Board Locations (for Model 140)



J3 Audio input connector

J13 Audio output connector

J17 Microphone jack

J22 Headphone jack

J38 External SCSI connector

J45 Ethernet twisted pair connector

J49 Parallel port connector

J56 Mouse port connector

J59 Keyboard port connector

J24 Serial port connector 1

J23 Serial port connector 2

J5, J6 CD-ROM audio connectors

J15 Automatic Power-up Jumper

J25, J20, J20L Tablet port connectors

B1 Battery connector

J2 5x5 Auxiliary 5v connector

J10 Media Fan connector

J11 Voltage Regulator Card connector

J21 Privileged-Access Password jumper

J57 Memory connector F

J54 Memory connector E

J52 Memory connector D

J51 Memory connector C

J48 Memory connector B

J47 Memory connector A

J41 Op Panel Connector

J16 Diskette drive connector

J50 Ethernet AUI

J7 Power connector

J8 Power connector

J90 Power-On Password jumper

J39 Riser card connector

J37 L2 Cache Card connector

J33 Internal SCSI 16-bit connector

J29 Internal SCSI 8-bit connector (not supported)

J28, J31, J32, J34 SCSI security jumpers

J14 CPU ESP connector

J26 CPU fansink connector

J27 System fan connector

J30 System fan connector

J40 Power Switch connector

J42 Power Indicator LED connector

J43 Hard disk activity LED connector

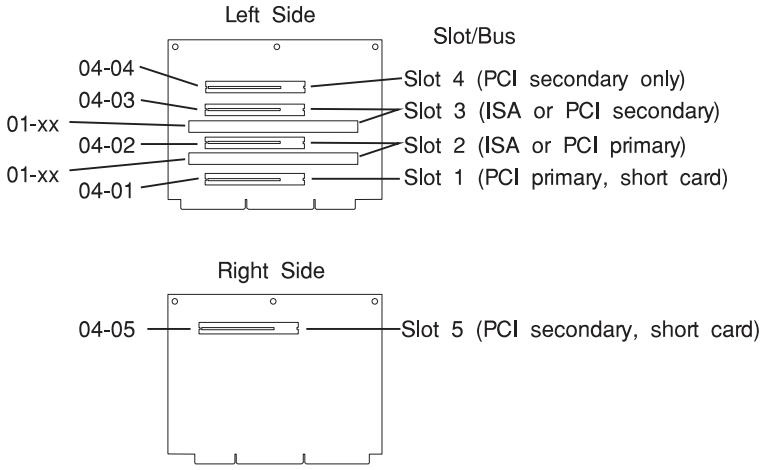
J46 Internal Speaker connector

Model 140 System Board Jumper Settings

For a more complete description of the function of these jumpers, see the system unit ***User's Guide***.

Jumper	Description	Settings
J15	Automatic power-up	Default: automatic power-up disabled. To enable automatic power-up, place jumper on two leftmost pins.
J21	Privileged-Access Password	Default: disabled. To enable the writing or changing of the privileged-access password, place jumper on the two leftmost pins.
J28, J31, J32, J34	SCSI Security	Default: external SCSI enabled To disable external SCSI connector, remove the jumpers from J31, J32, and J34; move the jumper on J28 to the to the front two pins.
J90	Power-On Password	Default: power-on password enabled (can be set). To disable the power-on password (for instance, if it has been forgotten), place jumper on the two rightmost pins.

Riser Card (Model 140)



Note: The **xx** digits in the ISA slot location codes are determined by the order in which the ISA adapters are configured.

Specifications (for Model 240)

The mechanical packaging, cooling, power supply, and required environment for the system is shown in the following:

Dimensions

- In horizontal orientation
  - Height - 165 mm (6.5 inches)
  - Depth - 460 mm (18.1 inches)
  - Width - 420 mm (16.5 inches)
- In vertical orientation
  - Height - 450 mm (17.7 inches)
  - Depth - 460 mm (18.1 inches)
  - Width - 235 mm (9.25 inches)

Weight

14.5 kg (32 lb) Minimum to 18.2 kg (40 lb) Maximum

Maximum Support Capacity (Horizontal Position)

27.3 kg (60 lbs)

Operating Environment - Class B

Temperature - 16° to 32°C (60° to 90°F)

Humidity - 8% to 80% noncondensing

Maximum Altitude - 2135 m (7000 feet)

Power Source Loading

0.3k VA typical

0.5k VA maximum

Power Supply

250 watts

Operating Voltage

100 to 127V ac; 50 to 60 Hz

200 to 240V ac; 50 to 60 Hz

Heat Output (Maximum)

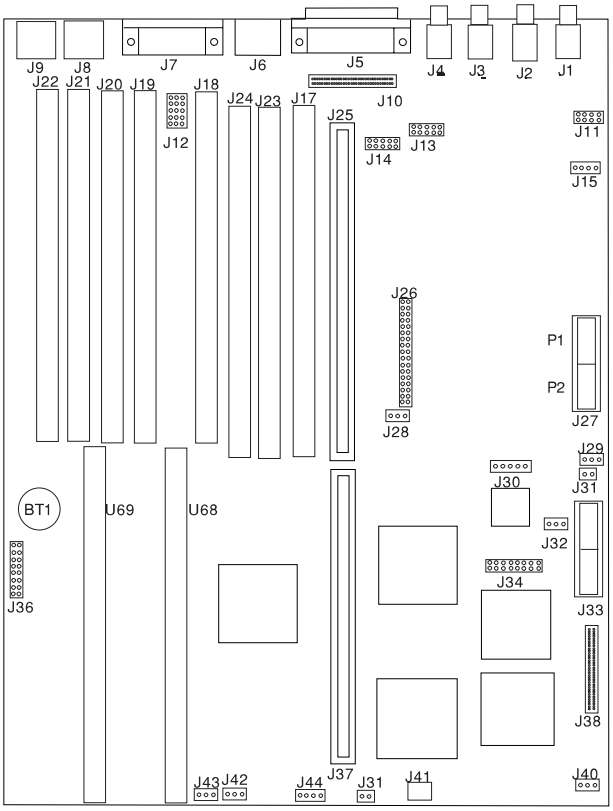
Operating 796 BTUs per hour

Idling 597 BTUs per hour

Acoustics

- Average sound-pressure levels:
  - At operator position:
    - 40 dB operating
    - 37 dB idle
  - At bystander position (1 meter)
    - 37 dB operating
    - 35 dB idle
- Declared (upper limit) sound power levels:
  - 5.3 Bels operating
  - 5.0 Bels idle

System Board Locations (Model 240)



J1 Audio input connector

J2 Audio output connector

J3 Microphone jack

J4 Headphone jack

J5 External SCSI connector

J6 Ethernet twisted pair connector

J7 Parallel port connector

J8 Mouse port connector

J9 Keyboard port connector

J10 Internal SCSI connector

J13 Serial port 2 connector

J14 Serial port 1 connector

J12 SCSI security jumpers

J15 CD-ROM audio connector

J22 Memory connector A (DIMM 0)

J21 Memory connector B (DIMM 1)

J20 Memory connector C (DIMM 2)

J19 Memory connector D (DIMM 3)

J18 Memory connector E (DIMM 4)

J24 Memory connector F (DIMM 5)

J23 Memory connector G (DIMM 6)

J17 Memory connector H (DIMM 7)

J25 Riser card connector

J26 Diskette drive connector

J27 Power connectors P1, P2

J28 Power-On Password override jumper
(change jumper position to bypass password)

J29 Automatic power-up jumper

J30 Power connector P9: aux 5V dc power connector

J31 Power switch connector

J32 Privileged-Access Password jumper

J33 Power connector P10

J34 Ethernet AUI

J35 Power connector P11

J36 RISC watch connector

J37 Riser card connector (64 bit PCI)

J38 Internal SCSI connector

J40 Media bay fan connector

J41 Speaker connector

J42 Fan connector

J43 Fan connector

J44 Power good and disk activity LED connector

U69 Microprocessor Connector 0

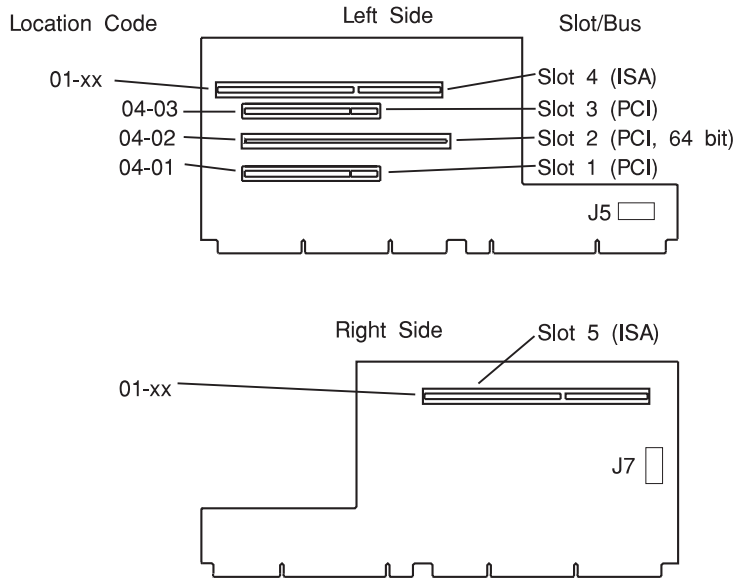
U68 Microprocessor Connector 1

Model 240 System Board Jumper Settings

For a more complete description of the function of these jumpers, see the system unit ***User's Guide***.

Jumper	Description	Settings
J29	Automatic power-up	Default: automatic power-up disabled. To enable automatic power-up, place jumper on the two leftmost pins.
J32	Privileged-Access Password	Default: disabled. To enable the writing or changing of the privileged-access password, place jumper on the two leftmost pins.
J12	SCSI Security	Default: external SCSI enabled To disable external SCSI connector, move the jumpers to the two pins farthest from the riser card.
J28	Power-On Password	Default: power-on password enabled (can be set). To disable the power-on password (for instance, if it has been forgotten), place jumper on the two rightmost pins.

Riser Card (Model 240)



Note: The **xx** digits in the ISA slot location codes are determined by the order in which the ISA adapters are configured.

J5 Operator panel connector

J7 Tablet port connector

SCSI Bus Termination

Both the Model 140 and Model 240 include a fast/wide SCSI-2 bus which can support internal and external SCSI devices. However, each controller on these SCSI busses must have a unique SCSI id, and the SCSI busses must be properly terminated both internally and externally (if external devices are used) to ensure SCSI signal integrity.

For directions on setting the SCSI id on each device, consult the documentation for that device, as well as the *Adapters, Devices, and Cable Information for Multiple Bus Systems*.

Model 140 Internal SCSI Bus Termination

The Model 140 internal SCSI chain must be terminated by the last drive in the chain, which must be configured as a self-terminating drive by setting jumpers on the drive. Please consult the documentation that came with your SCSI device.

Note: Only the last drive in each SCSI chain should be configured as self-terminating.

External SCSI chains must be terminated by a separate SCSI terminator.

Power Cables

To avoid electrical shock, a power cable with a grounded attachment plug is provided. Use only properly grounded outlets.

Power cables used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA). These power cords consist of:

- Electrical cables, Type SVT or SJT.
- Attachment plugs complying with National Electrical Manufacturers Association (NEMA) 5-15P. That is:

"For 115 V operation, use a UL listed cable set consisting of a minimum 18 AWG, Type SVT or SJT three-conductor cord a maximum of 15 feet in length and a parallel blade, grounding type attachment plug rated at 15 A, 125 V."

"For 230 V operation in the United States use a UL listed cable set consisting of a minimum 18 AWG, Type SVT or SJT three-conductor cable a maximum of 15 feet in length, and a tandem blade, grounding type attachment plug rated at 15 A, 250 V."

- Appliance couplers complying with International Electrotechnical Commission (IEC) Standard 320, Sheet C13.

Power cables used in other countries consist of the following:

- Electrical cables, Type HD21.
- Attachment plugs approved by the appropriate testing organization for the specific countries where they are used.

"For units set at 230 V (outside of U.S.): use a cable set consisting of a minimum 18 AWG cable and grounding type attachment plug rated 15 A, 250 V. The cable set should have the appropriate safety approvals for the country in which the equipment will be installed and should be marked HAR'."

Refer to Chapter 6, “Parts Information” on page 6-1 to find the power cables that are available.

Service Inspection Guide

Perform a service inspection on the system when:

- The system is inspected for a maintenance agreement.
- Service is requested and service has not recently been performed.
- An alterations and attachments review is performed.
- Changes have been made to the equipment that may affect the safe operation of the equipment.
- External devices with separate power supplies have been attached.

If the inspection indicates an unacceptable safety condition, the condition must be corrected before anyone can service the machine.

Note: The correction of any unsafe condition is the responsibility of the owner of the system.

Perform the following checks:

1. Check the covers for sharp edges and for damage or alterations that expose the internal parts of the system unit.
2. Check the covers for proper fit to the system unit. They should be in place and secure.
3. Gently rock the system unit from side to side to determine if it is steady.
4. Set the power switch of the system unit to Off.

5. Disconnect the power cable.
6. Remove the covers.
7. Check for alterations or attachments. If there are any, check for obvious safety hazards such as broken wires, sharp edges, or broken insulation.
8. Check the internal cables for damage.
9. Check for dirt, water, and any other contamination within the system unit.
10. Check the voltage switch on the back of the system unit to ensure that it matches the voltage at the outlet.
11. Check the external power cable for damage.
12. With the external power cable connected to the system unit, check for 0.1 ohm or less resistance between the ground lug on the external power cable plug and the metal frame.
13. Perform the following checks on each device that has its own power cables:
    a. Check for damage to the power cord.
    b. Check for the correct grounded power cable.
    c. With the external power cable connected to the device, check for 0.1 ohm or less resistance between the ground lug on the external power cable the metal frame of the device.
14. Install the covers.

Chapter 2. Maintenance Analysis Procedures (MAPs)

Entry MAP

Use the following table to determine your starting point.

Notes:

1. Licensed programs frequently rely on network configuration or system board information to authorize program use. If the MAPs indicate that the system board or network adapter should be replaced, notify the system owner that new keys for licensed programs may be required.
2. If a network adapter or the system board is replaced, the network administrator must be notified so that the client IP addresses used by the server can be changed. In addition, the operating system configuration of the network controller may need to be changed in order to enable system startup.

Symptom	Action
Service Actions	
You have parts to exchange or a corrective action to perform.	1. Go to the *Removal and Replacement Procedures*. 2. Go to the *Repair Checkout Procedure* in the Diagnostics Information for Multiple Bus Systems.
You need to verify that a part exchange or corrective action corrected the problem.	Go to the *Repair Checkout Procedure* in the Diagnostics Information for Multiple Bus Systems.
You need to verify correct system operation.	Go to the *System Checkout Procedure* in the Diagnostics Information for Multiple Bus Systems.
Symptom Analysis	
You do not have a determined symptom.	Go to “MAP 1020: Problem Determination” on page 2-5.
You have an 8-digit error code displayed on the system console.	Record the error code. Go to Chapter 3, “Error Code to FRU Index” on page 3-1.
You have an SRN.	Go to the Fast Path MAP in the Diagnostics Information for Multiple Bus Systems.
The system POST indicators are displayed on the system console, the system pauses and then restarts. The term "POST indicators" refer to the icons (graphic display) or device mnemonics (ASCII terminal) that appear during the power-on self-test (POST).	Go to “Fxx Code Boot Problems” on page 3-18.

Symptom	Action
The system stops and POST indicators are displayed on the system console. The term "POST indicators" refer to the icons (graphic display) or device mnemonics (ASCII terminal) that appear during the power-on self-test (POST).	1. Use MAP 1540 to isolate the problem.
The system stops and the message "STARTING SOFTWARE PLEASE WAIT..." is displayed on ASCII terminal, the boot indicator () is displayed on a graphics terminal.	Go to “Firmware Checkpoints” on page 3-14.
The system will not respond to the password being entered or the system login prompt is displayed when booting in service mode.	Verify that the password is being entered from the ASCII terminal or keyboard defined as the system console. If so, then the keyboard or its controller may be faulty. 1. If entering the password from the keyboard which is attached to the system, replace the keyboard. If replacing the keyboard does not fix the problem, replace the system board. (See notes on 2-1.) 2. If entering the password from a keyboard which is attached to a ASCII terminal, suspect the ASCII terminal. Use the Problem Determination Procedures for the terminal. Replace the system board if these procedures do not reveal a problem.
Nothing is displayed on the system console, and the operator panel is blank.	1. If using a graphic display, go to the *Problem Determination Procedures* for the display. 2. If you do not find a problem then replace the display adapter. 3. Go to “MAP 1540: Minimum Configuration” on page 2-15.

Symptom	Action
All display problems.	1. If using a graphics display, go to the *Problem Determination Procedures* for the display. 2. If you do not find a problem then replace the display adapter. 3. If the problem is with the ASCII terminal: a. Make sure that the ASCII terminal is connected to S1. b. If problems persist, go to the *Problem Determination Procedures* for the terminal. 4. If you do not find a problem then suspect the system board. Go to “MAP 1540: Minimum Configuration” on page 2-15.
A flashing 888 is displayed in the control panel followed by a additional error codes.	Go to the Fast Path MAP in the Diagnostics Information for Multiple Bus Systems.
The system stops and a 3-digit number is displayed in the operator panel display.	If the number displayed begins with the character "F" then go to “Firmware Checkpoints” on page 3-14. If the number is 000, 185, or 888, go to “MAP 1540: Minimum Configuration” on page 2-15. For all other numbers record SRN 101-xxx, where **xxx** is the three-digit number displayed in the operator panel, then go to the Fast Path MAP in the Diagnostics Information for Multiple Bus Systems.
The system stops and a 4-digit number beginning with the characters "FF" is displayed in the operator panel display.	Go to “MAP 1540: Minimum Configuration” on page 2-15.
The power light does not come on, or stay on.	Go to “MAP 1520: Power” on page 2-9.
No codes are displayed on the operator panel within a few seconds of turning on the system.	Reseat the operator panel cable. If problem not resolved, replace in order: 1. Operator Panel. 2. Riser card (Model 240 only). 3. System board (See notes on 2-1.)

Symptom	Action
The SMS configuration list or Boot sequence selection menu shows more SCSI devices attached to a controller/adapter than are actually attached.	A device may be set to use the same scsi bus ID as the controller/adapter. Note the ID being used by the controller/adapter (this can be checked and/or changed via an SMS utility), and verify that no device attached to the controller is set to use that ID. If settings do not appear to be in conflict: 1. Replace the SCSI cable. 2. Replace the device. 3. Replace the SCSI adapter (or system board if connected to the integrated SCSI controller on the system board). **Note:** In a "Twin-tailed" configuration where there is more than one initiator device (normally another system) attached to the SCSI bus, it may be necessary to change the ID of the SCSI controller or adapter with the System Management Services.
You cannot load diagnostics.	Go to “MAP 1020: Problem Determination” on page 2-5.
You have a problem that does not prevent the system from booting.	Go to the Fast Path MAP in the Diagnostics Information for Multiple Bus Systems.
You suspect a cable problem.	See the *Adapters, Devices, and Cable Information for Multiple Bus Systems*.
You Cannot Find the Symptom in this Table	
All other problems.	Go to “MAP 1020: Problem Determination” on page 2-5.

MAP 1020: Problem Determination

Purpose of This MAP

Use this MAP to get an error code if you were not provided one by the customer or you are unable to load diagnostics. If you are able to load the diagnostics, go to MAP 0020 in the Diagnostics Information for Multiple Bus Systems.

Be prepared to record code numbers and use those numbers in the course of analyzing a problem. Go to "Step 1020-1."

Step 1020-1

The following steps analyze a failure to load the diagnostic programs.

Note: You will be asked questions regarding the operator panel display You will also be asked to perform certain actions based on displayed POST indicators. Please be observant of these conditions.

1. Insert the diagnostic CD-ROM disc into the CD-ROM drive.
2. Turn the power off.
3. Turn the power on.
4. If the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard and hand icon on a graphical display), press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal.

5. Enter any requested passwords.
6. Wait until the diagnostics are loaded or the system appears to stop.
7. Find your symptom in the following table; then follow the instructions given in the Action column.

Symptom	Action
The disk LED is blinking rapidly, or FEA or FEB is displayed on the operator panel.	The flash EPROM data is corrupted. The recovery procedure for the flash EPROM should be executed. See “Firmware Recovery” on page 4-26.
The system stops with a prompt to enter a password.	Enter the password. You will not be allowed to continue until a correct password has been entered. When you have entered a valid password go to the beginning of this table and wait for one of the other conditions to occur.
The diagnostics loaded.	Go to MAP 0020 in the Diagnostics Information for Multiple Bus Systems.
The system login prompt is displayed.	You may not have pressed the correct key or you may not have pressed the key soon enough when you were to indicate a Service Mode IPL of the diagnostic programs. If this was the case start over at the beginning of this Step. **Note:** Perform the systems shutdown procedure before turning off the system. If you are sure you pressed the correct key in a timely manner, go to “Step 1020-2” on page 2-7.
The system does not respond when the password is entered.	Go to “Step 1020-2” on page 2-7.
The system stopped and a POST indicator is displayed on the system console and an eight-digit error code is not displayed.	If the POST indicator represents: • memory, record error code M0MEM002. • keyboard, record error code M0KBD000. • SCSI, record error code M0CON000. • network, record error code M0NET000. • speaker (audio), record error code M0BT0000. Go to “Step 1020-3” on page 2-7.
All other symptoms.	If you were directed here from the Entry MAP, go to “MAP 1540: Minimum Configuration” on page 2-15. Otherwise, find the symptom in the “Entry MAP” on page 2-1.

Step 1020-2

There is a problem with the keyboard.

Find the type of keyboard you are using in the following table; then follow the instructions given in the Action column.

Keyboard Type	Action
Type 101 keyboard (U.S.). Identify by the size of the Enter key. The Enter key is in only one horizontal row of keys.	Record error code M0KBD001; then go to "Step 1020-3."
Type 102 keyboard (W.T.). Identify by the size of the Enter key. The Enter key extends into two horizontal rows.	Record error code M0KBD002; then go to "Step 1020-3."
Type 106 keyboard. (Identify by the Japanese characters.)	Record error code M0KBD003; then go to "Step 1020-3."
ASCII terminal keyboard	Go to the documentation for this type of ASCII terminal and continue problem determination.

Step 1020-3

Take the following actions:

1. Find the eight-digit error code in Chapter 3, "Error Code to FRU Index" on page 3-1

   Note: If the eight-digit error code is not listed in Chapter 3, "Error Code to FRU Index," look for it in the following:

   - Any supplemental service manual for the device
   - The diagnostic problem report screen for additional information
   - The Service Hints service aid
   - The CEREADME file (by using the Service Hints service aid).

2. Perform the action listed.

Step 1020-4

1. Turn off, then turn on the system unit.
2. When the keyboard indicator appears, press the F1 key on a directly attached keyboard or the 1 key on an ASCII terminal.
3. When the System Management Services appear, check the error log for any errors.
   - Choose Utilities
   - Choose Error Log
   - If an error is logged, check the time stamp.
   - If the error was logged during the current boot attempt, record it.
   - Look up the error in the Chapter 3, “Error Code to FRU Index” on page 3-1 and do the listed action.
   - If no recent error is logged in the error log, go to “MAP 1540: Minimum Configuration” on page 2-15.

MAP 1520: Power

Note: This is not a start of call MAP. Use this Power MAP only if you have been directed here from a MAP step in this book or the Diagnostics Information for Multiple Bus Systems.

This procedure is used to locate power problems in system units. If a problem is detected, this procedure helps you isolate the problem to a failing unit.

Observe the following safety notice during service procedures.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent and electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. You must disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.

CAUTION:
This product is equipped with a three–wire power cable and plug for the user's safety. Use this power cable with a properly grounded electrical outlet to avoid electrical shock.

Step 1520-1

You may be directed to this MAP for several reasons:

1. There is no indication of activity when the power button is pressed. None of the LEDs light and none of the fans, including the fan in the power supply, start to turn.

   Go to “Step 1520-2.”

2. When the power switch is pressed, the system begins to power on, but the power does not stay on.

   Go to “Step 1520-3” on page 2-11.

Step 1520-2

1. Turn the power off.
2. Check that the voltage selection switch on the power supply is in the correct position.
3. Check that the external power cable to the system unit has continuity.
4. Check that the power outlet has been wired correctly with the correct voltage.
5. Check that the external power cable is plugged into both the system unit and the power outlet.

Did you find a problem?

NO Go to “Step 1520-3” on page 2-11.

YES Correct the problem. Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

Step 1520-3

1. Turn the power off.
2. Unplug the system unit power cable from the electrical outlet.
3. Remove external cables (keyboard, mouse, etc.)
4. Remove the top cover.
5. Record the slot numbers of all the installed adapters. Label and record the location of any cables attached to the adapters. Remove all the adapters.
6. Remove all the memory modules.
7. Remove the processor cards (Model 240 only).
8. Remove the L2 cache card (Model 140 only).
9. Remove the riser card and SCSI cables from the system board.
10. Unplug the diskette drive signal cable and power cable from the system board.
11. Unplug the power cables from all the SCSI devices.
12. Unplug internal serial port and Ethernet cable from the system board.
13. Unplug the front fans and media fan.
14. Unplug the speaker.

    Note: Do not disconnect the power-on LED or the power switch.
15. Connect the system unit power cable to the electrical outlet.
16. Turn the power on.

Does the fan in the power supply turn on and the power LED come on and stay on?

NO Go to “Step 1520-4” on page 2-12.

YES Go to “Step 1520-5” on page 2-13.

Step 1520-4

Note: Either the power supply, the system board, or the power switch is defective.

To test each FRU, exchange the FRUs that have not already been exchanged in the following order.

- Power supply
- Power Switch
- System board (See notes on 2-1.)

1. Turn the power off.
2. Unplug the system unit power cable from the wall outlet.
3. Exchange one of the FRUs in the list.
4. Connect the system unit power cable to the wall outlet.
5. Turn the power on.

Does the fan in the power supply turn on and the power LED come on and stay on?

NO Reinstall the original FRU.

Repeat this step until the defective FRU is identified.

YES Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

Step 1520-5

One of the parts that was removed or unplugged is causing the problem. Install or connect the parts in the following order.

1. Fans.
2. Riser card.
3. Processor cards (Model 240 only).
4. L2 cache card (Model 140 only).
5. Memory modules.
6. System board cables.
7. Diskette power cable.
8. SCSI power cable, lowest bay to highest bay.
9. Adapter cards, lowest slot to highest slot.

Turn the power on after each part is installed or connected. If the system does not power on or the power does not stay on, the most recently installed or connected part is causing the failure.

1. Turn the power off.
2. Unplug the system unit power cable from the wall outlet.
3. Install or connect one of the parts in the list.
4. Connect the system unit power cable to the wall outlet.
5. Turn the power on.

Does the fan in the power supply turn on and the power LED come on and stay on?

NO Replace the last part you installed. (If this part was a network adapter, see notes on 2-1.)

Repeat these steps until all the parts have been installed.

If the symptom did not change and all the parts have been replaced, call your service support person for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to “Step 1520-1” on page 2-10 in this MAP and follow the instructions for the new symptom.

YES Repeat these steps until all the parts have been installed.

Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

MAP 1540: Minimum Configuration

Note: If you were sent to this MAP from the Diagnostics Information for Multiple Bus Systems as a result of an SRN 101-xxx problem, go to “Fxx Code Boot Problems” on page 3-18 and follow the instructions there before using the MAP 1540 steps.

Purpose of this MAP

This MAP is used to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally-configured system. If a failure is detected on the minimally-configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

Notes:

1. This MAP assumes that a CD-ROM drive is installed and connected to the integrated SCSI adapter, and a Diagnostics CD-ROM disc is available.
2. If a power-on password or privileged-access password is installed, you will be prompted to enter the password before the diagnostic CD-ROM will load.
3. The term "POST indicators" refer to the icons (graphic display) or device mnemonics (ASCII terminal) that appear during the power-on self-test (POST).

Because the minimum configurations for the Model 140 and Model 240 differ, this MAP is divided into 1540A for the Model 140 and 1540B for the Model 240.

- **MAP 1540A for the Model 140** begins on 2-16.
- **MAP 1540B for the Model 240** begins on 2-31.

MAP 1540A: Minimum Configuration for the Model 140

Step 1540A-1

1. Ensure that the diagnostics and the operating system are shut down.
2. Insert the diagnostic CD-ROM into the CD-ROM drive.
3. Turn the power off.
4. Turn the power on.
5. When the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard and hand icon on a graphical display), press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal.
6. If the Console Selection screen is displayed, choose the system console.
7. Enter the appropriate password when prompted to do so.

Is the "Please define the System Console" screen displayed?

NO Go to “Step 1540A-2” on page 2-17.

YES Go to “Step 1540A-13” on page 2-29.

Step 1540A-2

1. Turn the power off.
2. Disconnect all external cables.
3. Remove the top cover.
4. Record the slot numbers of the ISA and PCI adapters. Label and record the location of any cables attached to the adapters. Remove all the adapters.
5. Record the slot numbers of the memory modules, and then remove all but one memory module in memory slot A (DIMM 0).
6. Remove the L2 cache card.
7. Disconnect the SCSI cable from the SCSI connectors on the system board.
8. Disconnect the diskette drive cable from the diskette drive connector on the system board.
9. Disconnect the internal serial, ethernet, and tablet port cables.
10. Turn the power on.

Does the operator panel stabilize for more than 60 seconds with code FDC, FF2, FF3, or F4D displayed, or is one of these codes displayed immediately before the system unit attempts to restart?

NO Go to “Step 1540A-3” on page 2-18.

YES Go to “Step 1540A-4” on page 2-19.

Step 1540A-3

One of the FRUs remaining in the system unit is defective.

1. Turn the power off.
2. Exchange one of the FRUs in the following list.
   a. System board (See notes on 2-1.)
   b. Riser card
   c. Memory module
3. Turn the power on.

Does the operator panel stabilize for more than 60 seconds with code FDC, FF2, FF3, or F4D displayed, or is one of these codes displayed immediately before the system unit attempts to restart?

NO Reinstall the original FRU.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to “Step 1540A-1” on page 2-16 in this MAP and follow the instructions for the new symptom.

YES Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

Step 1540A-4

No failure was detected with this configuration.

1. Turn the power off.
2. Install a memory module.
3. Turn the power on.

Does the operator panel stabilize for more than 60 seconds with code FDC, FF2, FF3, or F4D displayed, or is one of these codes displayed immediately before the system unit attempts to restart?

NO Go to “Step 1540A-5.”

YES Repeat this step until all the memory modules are installed and tested.

After all the memory modules are installed and tested, turn the power to off.

Go to “Step 1540A-7” on page 2-21.

Step 1540A-5

The failure may be caused by the last memory module installed. To isolate the failing FRU, do the following:

1. Turn the power off.
2. Exchange the last memory module installed.
3. Turn the power on.

Does the operator panel stabilize for more than 60 seconds with code FDC, FF2, FF3, or F4D displayed, or is one of these codes displayed immediately before the system unit attempts to restart?

NO Go to “Step 1540A-6” on page 2-20.

YES Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

Step 1540A-6

One of the FRUs remaining in the system unit is defective.

1. Turn the power off.
2. Exchange one of the FRUs in the following list.
   - System board (See notes on 2-1.)
   - Power supply.
3. Turn the power on.

Does the operator panel stabilize for more than 60 seconds with code FDC, FF2, FF3, or F4D displayed, or is one of these codes displayed immediately before the system unit attempts to restart?

NO Reinstall the original FRU.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to “Step 1540A-1” on page 2-16 in this MAP, and follow the instructions for the new symptom.

YES Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

Step 1540A-7

1. Turn the power off.
2. Install the L2 cache card.

Does the operator panel stabilize for more than 60 seconds with code FDC, FF2, FF3, or F4D displayed, or is one of these codes displayed immediately before the system unit attempts to restart?

NO The system board or L2 cache card is defective.

1. Replace the L2 cache card and repeat this step.
2. Replace the system board and install the original L2 cache card and repeat this step.
3. Replace the L2 cache card and repeat this step.
4. If the symptom did not change and both the system board and L2 cache card have been replaced, call your service support person for assistance.

See notes on 2-1 regarding system board replacement.

YES Go to “Step 1540A-8” on page 2-22.

Step 1540A-8

1. Turn the power off.
2. Reconnect the system console.

   Notes:

   a. If an ASCII terminal has been defined as the system console, attach the ASCII terminal cable to the to the S1 connector on the rear of the system unit. Also connect the internal serial and Ethernet cables to the system board.

   b. If a display attached to a display adapter has been defined as the system console, install the display adapter and connect the display to it. Plug the keyboard into the keyboard connector on the rear of the system unit.

3. Turn the power on.
4. If the ASCII terminal or graphics display (including display adapter) are connected differently than before, the Console Selection screen will appear and require that a new console be selected.
5. When the keyboard indicator is displayed, press the F1 key on the directly attached keyboard or the number 1 key on an ASCII terminal. This triggers the SMS.
6. Enter the appropriate password when prompted to do so.
7. Wait until the SMS screen is displayed or the system appears to stop.

Is the SMS screen displayed?

NO One of the FRUs remaining in the system unit is defective.

In the following order, exchange the FRUs that have not been exchanged:

1. Go to the Problem Determination Procedures (test procedures) for the device attached to the S1 serial port or the display attached to the graphics adapter, and test those devices. If a problem is found, follow the procedures for correcting the problem on that device.
2. Graphics adapter (if installed).
3. Cable (async or graphics, including internal async cable).
4. Riser card.
5. System board. (See notes on 2-1.)

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, return to “Step 1540A-1” on page 2-16 and follow the instructions for the new symptom.

YES Go to “Step 1540A-9” on page 2-24.

Step 1540A-9

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn the power off.
3. Plug the SCSI cable into the SCSI connector on the system board.
4. Disconnect the signal and power connectors from all the SCSI devices except the CD-ROM drive.
5. Make sure that the SCSI chain is still properly terminated; see “SCSI Bus Termination” on page 1-16.
6. Turn the power on.
7. After the keyboard indicator is displayed, press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal keyboard.
8. Enter the appropriate password when prompted to do so.

Is the "Please define the System Console" screen displayed?

NO One of the FRUs remaining in the system unit is defective.

In the following order, exchange the FRUs that have not been exchanged:

1. SCSI cable termination (see “SCSI Bus Termination” on page 1-16)
2. SCSI cable
3. Last SCSI device connected (CD-ROM drive, tape drive, etc)
4. The graphics adapter, if the system console is defined as a graphical display.
5. The riser card.
6. System board (See notes on 2-1.)
7. Power Supply.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged call your service support person for assistance.

If the symptom has changed check for loose cards, cables, and obvious problems. If you do not find a problem return to “Step 1540A-1” on page 2-16 in this MAP and follow the instructions for the new symptom.

YES Repeat this step, adding one SCSI device at a time, until all the SCSI devices that were attached to the integrated SCSI adapter are connected and tested.

Go to “Step 1540A-10” on page 2-26.

Step 1540A-10

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed is probably defective.

1. Make sure the diagnostic CD-ROM disc is inserted into the CD-ROM drive.
2. Turn the power off.
3. Plug the diskette drive cable into the diskette drive connector on the system board.
4. Turn the power on.
5. After the keyboard indicator is displayed, press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal keyboard.
6. Enter the appropriate password when prompted to do so.

Is the "Please define the System Console" screen displayed?

NO One of the FRUs remaining in the system is defective.

In the following order, exchange the FRUs that have not been exchanged.

1. Diskette drive
2. Diskette drive cable
3. System board (See notes on 2-1.)
4. Power supply

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom has changed check for loose cards, cables, and obvious problems. If you do not find a problem return to “Step 1540A-1” on page 2-16 in this MAP and follow the instructions for the new symptom.

YES Go to “Step 1540A-11” on page 2-27.

Step 1540A-11

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed is probably defective,

1. Turn the power off.
2. Install a FRU (adapter) and connect any cables and devices that were attached to it.
3. Turn the power on.
4. Make sure the diagnostic CD-ROM disc is inserted into the CD-ROM drive.
5. If the Console Selection screen is displayed, choose the system console.
6. After the keyboard indicator is displayed, press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal keyboard.
7. Enter the appropriate password when prompted to do so.

Is the "Please define the System Console" screen displayed?

NO Go to “Step 1540A-12” on page 2-28.

YES Repeat this step until all of the FRUs (adapters) are installed, then go to the *Repair Checkout Procedure* in the Diagnostics Information for Multiple Bus Systems.

Step 1540A-12

1. Make sure the diagnostic CD-ROM disc is inserted into the CD-ROM drive.
2. Turn the power off.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Turn the power on.
5. If the Console Selection screen is displayed, choose the system console.
6. After the keyboard indicator begins blinking, press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal keyboard.
7. Enter the appropriate password when prompted to do so.

Is the "Please define the System Console" screen displayed?

NO Repeat this step until the defective device or cable is identified or all the devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the following order:

1. Adapter (last one installed)
2. Riser card
3. System board
4. Power supply

   If a network adapter or system board is replaced, see notes on 2-1.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom has changed check for loose cards, cables, and obvious problems. If you do not find a problem return to “Step 1540A-1” on page 2-16 in this MAP and follow the instructions for the new symptom.

YES The last device or cable that you disconnected is defective.

Exchange the defective device or cable.

Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

Step 1540A-13

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. If the terminal type has not been defined, you must use the Initial Terminal option on the FUNCTION SELECTION menu to initialize the AIX operating system environment before you can continue with the diagnostics. This is a separate and different operation than selecting the console display.
4. Select Advanced Diagnostic Routines.
5. When the DIAGNOSTIC MODE SELECTION menu displays, select System Verification.
6. Start with the first item on the list and test all the adapters and devices.

Did you get an SRN?

NO Go to “Step 1540A-15” on page 2-30.

YES Go to “Step 1540A-14.”

Step 1540A-14

Look at the FRU part numbers associated with the SRN.

Have you exchanged all the FRUs that correspond to the failing function codes?

NO Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged.

If a network adapter or system board is replaced, see notes on 2-1.

Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

YES If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

Step 1540A-15

Consult the ISA and PCI adapter configuration documentation for your operating system to verify that all installed adapters are configured correctly.

Go to "MAP 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

MAP 1540B: Minimum Configuration for the Model 240

Step 1540B-1

1. Ensure that the diagnostics and the operating system are shut down.
2. Insert the diagnostic CD-ROM into the CD-ROM drive.
3. Turn the power off.
4. Turn the power on.
5. When the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard and hand icon on a graphical display), press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal.
6. If the Console Selection screen is displayed, choose the system console.
7. Enter the appropriate password when prompted to do so.

Is the "Please define the System Console" screen displayed?

NO Go to “Step 1540B-2” on page 2-32.

YES Go to “Step 1540B-12” on page 2-44.

Step 1540B-2

1. Turn the power off.
2. Disconnect all external cables.
3. Remove the top cover.
4. Record the slot numbers of the ISA and PCI adapters. Label and record the location of any cables attached to the adapters. Remove all the adapters.
5. Remove the second processor card.
6. Record the slot numbers of the memory modules, and then remove all but one pair of the memory modules in memory slots A and B (DIMMs 0 and 1).
7. Disconnect the SCSI cable from the SCSI connectors on the system board.
8. Disconnect the diskette drive cable from the diskette drive connector on the system board.
9. Disconnect the internal serial, Ethernet, and tablet port cables.
10. Turn the power on.

Does the operator panel stabilize for more than 60 seconds with code FDC, FF2, FF3, or F4D displayed, or is one of these codes displayed immediately before the system unit attempts to restart?

NO Go to “Step 1540B-3” on page 2-33.

YES Go to “Step 1540B-4” on page 2-34.

Step 1540B-3

One of the FRUs remaining in the system unit is defective.

If the following steps call for a system board to be replaced, see notes on 2-1.

1. If the disk LED is on, turn the power off and exchange the following FRUs in order:
   a. Memory modules (pair)
   b. Riser card
   c. System board (See notes on 2-1.)
2. If the disk LED is off, turn the power off and exchange the following FRUs in order:
   a. Processor cards
   b. Memory modules (pair)
   c. Riser card
   d. System board (See notes on 2-1.)

Does the operator panel stabilize for more than 60 seconds with code FDC, FF2, FF3, or F4D displayed, or is one of these codes displayed immediately before the system unit attempts to restart?

NO Reinstall the original FRU.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to “Step 1540B-1” on page 2-31 in this MAP and follow the instructions for the new symptom.

YES Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

Step 1540B-4

No failure was detected with this configuration.

1. Turn the power off.
2. Install a pair memory modules.
3. Turn the power on.

Does the operator panel stabilize for more than 60 seconds with code FDC, FF2, FF3, or F4D displayed, or is one of these codes displayed immediately before the system unit attempts to restart?

NO Go to “Step 1540B-5.”

YES Repeat this step until all the memory modules are installed and tested.

After all the memory modules are installed and tested, turn the power to off.

Go to “Step 1540B-7” on page 2-36.

Step 1540B-5

The failure may be caused by the last pair of memory modules installed. To isolate the failing FRU, do the following:

1. Turn the power off.
2. Exchange the last memory module pair installed.
3. Turn the power on.

Does the operator panel stabilize for more than 60 seconds with code FDC, FF2, FF3, or F4D displayed, or is one of these codes displayed immediately before the system unit attempts to restart?

NO Go to “Step 1540B-6” on page 2-35.

YES Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

Step 1540B-6

One of the FRUs remaining in the system unit is defective.

1. Turn the power off.
2. Exchange the following FRUs the order listed.
   a. System board (See notes on 2-1.)
   b. Power supply.
3. Turn the power on.

Does the operator panel stabilize for more than 60 seconds with code FDC, FF2, FF3, or F4D displayed, or is one of these codes displayed immediately before the system unit attempts to restart?

NO Reinstall the original FRU.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to “Step 1540B-1” on page 2-31 in this MAP, and follow the instructions for the new symptom.

YES Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

Step 1540B-7

1. Turn the power off.
2. Reconnect the system console.

   Notes:

   a. If an ASCII terminal has been defined as the system console, attach the ASCII terminal cable to the to the S1 connector on the rear of the system unit. Also connect the internal serial and Ethernet cables to the system board.

   b. If a display attached to a display adapter has been defined as the system console, install the display adapter and connect the display to it. Plug the keyboard into the keyboard connector on the rear of the system unit.
3. Turn the power on.
4. If the ASCII terminal or graphics display (including display adapter) are connected differently than before, the Console Selection screen will appear and require that a new console be selected.
5. When the keyboard indicator is displayed, press the F1 key on the directly attached keyboard or the number 1 key on an ASCII terminal. This triggers the SMS.
6. Enter the appropriate password when prompted to do so.
7. Wait until the SMS screen is displayed or the system appears to stop.

Is the SMS screen displayed?

NO One of the FRUs remaining in the system unit is defective.

In the following order, exchange the FRUs that have not been exchanged:

1. Go to the Problem Determination Procedures (test procedures) for the device attached to the S1 serial port or the display attached to the graphics adapter, and test those devices. If a problem is found, follow the procedures for correcting the problem on that device.
2. Graphics adapter (if installed).
3. Cable (async or graphics, including internal async cable).
4. Riser card.
5. System board. (See notes on 2-1.)

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, return to “Step 1540B-1” on page 2-31 and follow the instructions for the new symptom.

YES Go to “Step 1540B-8” on page 2-38.

Step 1540B-8

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn the power off.
3. Plug the internal SCSI cable into both SCSI connectors on the system board.
4. Disconnect the signal and power connectors from all the SCSI devices except the CD-ROM drive.
5. Make sure the SCSI chain is properly terminated; see “SCSI Bus Termination” on page 1-16.
6. Turn the power on.
7. After the keyboard indicator is displayed, press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal keyboard.
8. Enter the appropriate password when prompted to do so.

Is the "Please define the System Console" screen displayed?

NO One of the FRUs remaining in the system unit is defective.

In the following order, exchange the FRUs that have not been exchanged:

1. SCSI cable
2. Last SCSI device connected (CD-ROM drive, tape drive, etc)
3. The graphics adapter, if the system console is defined as a graphical display.
4. The riser card.
5. System board (See notes on 2-1.)
6. Processor card
7. Power Supply.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged call your service support person for assistance.

If the symptom has changed check for loose cards, cables, and obvious problems. If you do not find a problem return to “Step 1540B-1” on page 2-31 in this MAP and follow the instructions for the new symptom.

YES Repeat this step, adding one SCSI device at a time, until all the SCSI devices that were attached to the integrated SCSI adapter are connected and tested.

Go to “Step 1540B-9” on page 2-40.

Step 1540B-9

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed is probably defective.

1. Make sure the diagnostic CD-ROM disc is inserted into the CD-ROM drive.
2. Turn the power off.
3. Plug the diskette drive cable into the diskette drive connector on the system board.
4. Turn the power on.
5. After the keyboard indicator is displayed, press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal keyboard.
6. Enter the appropriate password when prompted to do so.

Is the "Please define the System Console" screen displayed?

NO One of the FRUs remaining in the system is defective.

In the following order, exchange the FRUs that have not been exchanged.

1. Diskette drive
2. Diskette drive cable
3. System board (See notes on 2-1.)
4. Power supply

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom has changed check for loose cards, cables, and obvious problems. If you do not find a problem return to “Step 1540B-1” on page 2-31 in this MAP and follow the instructions for the new symptom.

YES Go to “Step 1540B-10” on page 2-41.

Step 1540B-10

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed is probably defective,

1. Turn the power off.
2. Install the second processor card if one was removed. If a second processor was not removed, or has already been reinstalled and verified, install a FRU (adapter) and connect any cables and devices that were attached to it.
3. Turn the power on.
4. If the Console Selection screen is displayed, choose the system console.
5. After the keyboard indicator is displayed, press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal keyboard.
6. Enter the appropriate password when prompted to do so.

Is the "Please define the System Console" screen displayed?

NO Go to “Step 1540B-11” on page 2-42.

YES Repeat this step until all of the FRUs (adapters) are installed, then go to the *Repair Checkout Procedure* in the Diagnostics Information for Multiple Bus Systems.

Step 1540B-11

The last FRU installed or one of its attached devices is probably defective.

1. Make sure the diagnostic CD-ROM disc is inserted into the CD-ROM drive.
2. Turn the power off.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Turn the power on.
5. If the Console Selection screen is displayed, choose the system console.
6. After the keyboard indicator appears, press the F5 key on the directly-attached keyboard or the number 5 key on an ASCII terminal keyboard.
7. Enter the appropriate password when prompted to do so.

Is the "Please define the System Console" screen displayed?

NO Repeat this step until the defective device or cable is identified or all the devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the following order:

1. Adapter (last one installed)
2. Riser card
3. System board

   If
   the system board or a network adapter is replaced, see notes on 2-1.
4. Power supply

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

If the symptom has changed check for loose cards, cables, and obvious problems. If you do not find a problem return to “Step 1540B-1” on page 2-31 in this MAP and follow the instructions for the new symptom.

YES The last device or cable that you disconnected is defective.

Exchange the defective device or cable.

Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

Step 1540B-12

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. If the terminal type has not been defined, you must use the Initial Terminal option on the FUNCTION SELECTION menu to initialize the AIX operating system environment before you can continue with the diagnostics. This is a separate and different operation than selecting the console display.
4. Select Advanced Diagnostic Routines.
5. When the DIAGNOSTIC MODE SELECTION menu displays, select System Verification.
6. Start with the first item on the list and test all the adapters and devices.

Did you get an SRN?

NO Go to “Step 1540B-14” on page 2-45.

YES Go to “Step 1540B-13.”

Step 1540B-13

Look at the FRU part numbers associated with the SRN.

Have you exchanged all the FRUs that correspond to the failing function codes?

NO Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged.

If
the system board or a network adapter is replaced, see notes on 2-1.

Go to "Map 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

YES If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

Step 1540B-14

Consult the ISA and PCI adapter configuration documentation for your operating system to verify that all installed adapters are configured correctly.

Go to "MAP 0410: Repair Checkout" in the Diagnostics Information for Multiple Bus Systems.

If the symptom did not change and all the FRUs have been exchanged, call your service support person for assistance.

Chapter 3. Error Code to FRU Index

The Error Code to FRU Index lists error symptoms and possible causes. The most likely cause is listed first. Use this index to help you decide which FRUs to replace when servicing the system.

If the codes in the following tables indicate a device which is present more than once in the system unit, a location code is needed to specify which device generated the error. Go to “Step 1020-4” on page 2-8 to display the System Management Services error log and obtain a location code. Location code descriptions can be found under “Firmware Location Codes” on page 3-21.

Notes:

1. Licensed programs frequently rely on network configuration or system board information to authorize program use. If the following tables indicate that the system board or network adapter should be replaced, notify the system owner that new keys for licensed programs may be required.
2. If a network adapter or the system board is replaced, the network administrator must be notified so that the client IP addresses used by the server can be changed. In addition, the operating system configuration of the network controller may need to be changed in order to enable system startup.

If you replace FRUs and the problem is still not corrected, go to MAP 0030 in the Diagnostics Information for Multiple Bus Systems unless otherwise indicated in the tables.

POST Error Codes

Table 3-1 (Page 1 of 2). POST Error Codes

Error Code	Description	Action/ Possible Failing FRU
M0CON000	The system hung during POST.	Go to “MAP 1540: Minimum Configuration” on page 2-15.
M0CPU000	The CPU POST failed.	1. CPU Card (Model 240) 2. System Board (See notes on 3-1.)
M0CPU001	Checkstop occurred.	1. CPU card (Model 240) 2. System board (See notes on 3-1.)
M0FD0000	The system hung during diskette POST.	1. System board (See notes on 3-1.) 2. Diskette drive.
M0GA0000	Graphics adapter POST failed.	Graphics adapter
M0HD0000	The system hung during boot POST.	Go to “MAP 1540: Minimum Configuration” on page 2-15.
M0KBD000	The system hung during keyboard POST.	1. System board (See notes on 3-1.) 2. Keyboard
M0KBD001	The system did not respond to a keyboard entry.	Type 101 keyboard
M0KBD002	The system did not respond to a keyboard entry.	Type 102 keyboard
M0KBD003	The system did not respond to a keyboard entry.	Type 106 keyboard
M0MC0001	A machine check occurred.	Go to “MAP 1540: Minimum Configuration” on page 2-15.
M0MEM000	No good memory could be found.	1. Memory 2. System board (See notes on 3-1.) Note: If only one memory module is installed, (or pair for a Model 240), replace it. If there are multiple memory modules installed, go to “MAP 1540: Minimum Configuration” on page 2-15.
M0MEM001	No good memory could be found.	1. Memory 2. System board. (See notes on 3-1.)
M0MEM002	The system hung during memory POST.	Go to “MAP 1540: Minimum Configuration” on page 2-15.
M0PS0000	Power failure.	Go to “MAP 1520: Power” on page 2-9.

Table 3-1 (Page 2 of 2). POST Error Codes

Error Code	Description	Action/ Possible Failing FRU
M0SCSI00	Unable to load diagnostics.	Go to “MAP 1540: Minimum Configuration” on page 2-15.
M0SCSI01	Unable to load diagnostics.	Go to “MAP 1540: Minimum Configuration” on page 2-15.
M0SPK000	A continuous beep is heard from the system.	System board (See notes on 3-1.)
M0SPK001	The system does not beep.	1. Speaker 2. System board. (See notes on 3-1.)
M0BT0000	Speaker (audio) error	Record the code displayed on the operator panel. If the code is listed in “Firmware Checkpoints” on page 3-14 then perform the indicated action. If the code is not listed, go to “MAP 1540: Minimum Configuration” on page 2-15.
M0NET000	Network error	Record the code displayed on the operator panel. If the code is listed in “Firmware Checkpoints” on page 3-14 then perform the indicated action. If the code is not listed, go to “MAP 1540: Minimum Configuration” on page 2-15.

Firmware Error Codes

If you replace FRUs and the problem is still not corrected, go to MAP 0030 in the Diagnostics Information for Multiple Bus Systems unless otherwise indicated in the tables.

Table 3-2 (Page 1 of 9). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU
20100xxx	Power Supply	
20A80xxx	Remote initial program load (RIPL) error	
xxx=000	Insufficient information to boot.	Verify the IP address.
001	Client IP address is already in use by other network device	Change IP address.
002	Cannot get gateway IP address	Refer to “Firmware Checkpoints” on page 3-14 table using code **F74**.
003	Cannot get server hardware address	Refer to “Firmware Checkpoints” on page 3-14 table using code **F74**.
004	Bootp failed	Refer to “Firmware Checkpoints” on page 3-14 table using code **F75**.
005	File transmission (TFTP) failed.	Check network connection, try again.
20D00xxx	Unknown/Unrecognized device	
xxx=00F	Selftest failed on device, no SRN/location code information available	Check the System Management Services error log entry (if present) for the location code of the failing device. The error log is described in “Step 1020-4” on page 2-8 If the error code specifies a network adapter, see 3-1.
010	Selftest failed on device, can't locate package.	Contact your service support representative for assistance.
20E00xxx	Security	
xxx=000	Power on Password entry error.	Retry installing the password.
001	Privileged-access password entry error.	Retry installing the password.
002	Privileged-access password jumper not enabled.	The privileged-access password jumper is not in the correct position for password initial entry. Consult the system's User's Guide for jumper location and position.

Table 3-2 (Page 2 of 9). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU
003	Power on Password must be set for Unattended mode	Unattended mode requires the setting of the Power On password before can be enabled.
004	Battery drained or needs replacement	1. Replace battery. 2. Replace system board. (See notes on 3-1.)
005	EEPROM locked	1. Turn off, then turn on system unit. 2. Replace the system board. (See notes on 3-1.)
008	CMOS corrupted or tampering evident, CMOS initialized	Check your machine for evidence of tampering. If no tampering evident: 1. Replace battery, restore NVRAM data (passwords, startup data) 2. Replace system board. (See notes on 3-1.)
009	Invalid password entered - system locked	The password has been entered incorrectly 3 times. Turn off, then turn on the system unit, then enter the password correctly.
00A	EEPROM lock problem	If for priviliged-access password install, is jumper in correct position? Consult the system's User's Guide for jumper location and position. 1. Turn off, turn on system unit. 2. Replace system board. (See notes on 3-1.)
00B	EEPROM write problem	1. Turn off, turn on system unit. 2. Replace system board. (See notes on 3-1.)
00C	EEPROM read problem	1. Turn off, turn on system unit. 2. Replace system board. (See notes on 3-1.)
017	Cold boot needed for password entry	Turn off, turn on system unit.
20EE0xxx	Informational	
xxx=003	SMS: Invalid RIPL IP address (requires 3 dots ".")	Enter valid RIPL IP address. Example: 000.000.000.000

Table 3-2 (Page 3 of 9). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU
004	SMS: Invalid RIPL IP address	Enter valid RIPL IP address. Example: 000.000.000.000
005	SMS: Invalid portion of RIPL IP address (>255)	Enter valid RIPL IP address. Example: 255.192.002.000
006	SMS: No SCSI controllers present	The system board should always have (at least) an integrated PCI SCSI controller; replace system board. See notes on 3-1. regarding system board replacement.
007	Console Selection: Keyboard not found	1. Plug in keyboard 2. Replace system board (See notes on 3-1.)
008	No configurable adapters found in the system	This warning occurs when the selected SMS function cannot locate any devices/adapters supported by the function. If a supported device is installed: 1. Replace the device or adapter 2. Replace riser card 3. Replace system board
21A00xxx	SCSI disk drive	1. Before replacing any system components: a. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID. b. Ensure SCSI bus is properly terminated. See “SCSI Bus Termination” on page 1-16. c. Ensure SCSI signal and power cables are securely connected and not damaged. 2. The location code information is required to identify the ID of SCSI device failures as well as to indicate the location of the controller to which the device is attached.
xxx=001	Test Unit Ready Failed - hardware error	1. SCSI device 2. SCSI cable 3. SCSI controller. If on system board, see 3-1.

Table 3-2 (Page 4 of 9). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU
002	Test Unit Ready Failed - sense data available	1. Media (Removable media devices) 2. SCSI device
003	Send Diagnostic Failed	1. SCSI device
004	Send Diagnostic Failed - DevOfl cmd	1. SCSI device
21E00xxx	SCSI Tape	Refer to 21A00xxx (SCSI disk drive) for xxx definitions
21ED0xxx	SCSI Changer	Refer to 21A00xxx (SCSI disk drive) for xxx definitions
21EE0xxx	Other SCSI device type	Refer to 21A00xxx (SCSI disk drive) for xxx definitions
21F00xxx	SCSI CDROM	Refer to 21A00xxx (SCSI disk drive) for xxx definitions
21F20xxx	SCSI Read/Write Optical	Refer to 21A00xxx (SCSI disk drive) for xxx definitions
25010xxx	Flash	
xxx=000	No diskette in drive	Insert diskette containing firmware image.
001	Diskette seek error	1. Retry function. 2. Replace diskette drive 3. Replace diskette cable 4. Replace system board. (See notes on 3-1.)
002	Diskette in drive does not contain an *.IMG file.	Insert diskette with firmware update file.
003	Cannot open OPENPROM package	Replace system board. (See notes on 3-1.)
004	Cannot find OPENPROM node	Replace system board. (See notes on 3-1.)
006	System id does not match image system id	Make sure correct firmware update diskette is being used with this system.
007	Image has bad CRC	Replace firmware updated diskette
008	Flash is write protected, update cancelled	1. Turn off, turn on system unit and retry. 2. Replace system board. (See notes on 3-1.)
009	Flash module is unsupported or not recognized	Make sure correct firmware update diskette is being used with this system.

Table 3-2 (Page 5 of 9). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU
00A	Flash write protected.	1. Turn off, turn on system unit, retry. 2. Replace system board. (See notes on 3-1.)
25A0xxy0	Cache: L2 controller failure	Refer to error code 2B2xxyrr for a description of the “xx” and “y” values. For Model 140: 1. L2 Cache 2. System board (See notes on 3-1.) For Model 240: 1. Processor card 2. System board (See notes on 3-1.)
25A1xxy0	Cache: L2 SRAM failure	Refer to Error code 2B2xxyrr for a description of the “xx” and “y” values. For Model 140: 1. L2 Cache 2. System board (See notes on 3-1.) For Model 240: 1. Processor card 2. System board (See notes on 3-1.)
25A80xxx	NVRAM	**Note:** Errors reported against NVRAM can be caused by low Battery voltage and (more rarely) power outages that occur during normal system usage. With the exception of the 25A80000 error, these errors are warnings that the NVRAM data content had to be re-established and do not require any FRU replacement unless the error is persistent. When one of these errors occurs, any system customization (eg. boot device list) information has been lost, the system may need to be reconfigured. If the error is persistent, replace the battery. If the error is persistent after battery replacement, or the error code is 25A80000, replace the system board. (See notes on 3-1.)
xxx=000	Initialization failed, device test failed	

Table 3-2 (Page 6 of 9). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU
001	init-nvram invoked, ALL of NVRAM initialized	
002	init-nvram invoked, GE area preserved, remaining areas initialized.	
011	Data corruption detected, ALL of NVRAM initialized	
012	Data corruption detected, GE area preserved, remaining areas initialized	
100	NVRAM data validation check failed.	Turn off, turn on system unit and retry the operation.
25AA0xxx	EEPROM	**Note:** Ensure that the EEPROM Security jumper is in the correct position if doing a priviliged-access password install. Consult the system's User's Guide for jumper location and position. Retry the operation. If retries do not solve the problem, replace the system board.
xxx=000	Unable to unlock EEPROM	
001	Read-Recv error	
002	Read-Trans error	
003	Write-enable error	
004	Write-recv error	
005	Write-disable error	
006	Write-Trans error	
007	Unable to lock EEPROM	
25Cyyxxx	Memory	

Table 3-2 (Page 7 of 9). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU
xxx=001	DIMM fails memory test.	For more information: 1. Use the location code obtained from the SMS Error Log utility (described in “Step 1020-4” on page 2-8) to identify which DIMM is defective. 2. The "yy" values specify type of memory causing error. See “Memory PD Bits” on page 3-13 for definition of "yy." **Note:** On the Model 240, there may be 2 DIMM related memory errors reported to indicate a DIMM pair. One of the 2 indicated DIMMs may be good, when replacing memory on this system replace 1 DIMM at a time, not both.
xxx=002	DIMM is not supported.	Remove unsupported DIMM. The "yy" values specify type of memory causing error. See “Memory PD Bits” on page 3-13 for definition of "yy." **Note:** Memory DIMMs must be installed/removed in pairs on the Model 240.
28030xxx	Real-time clock (RTC) error.	**Note:** Errors reported against the Real Time Clock can be caused by low battery voltage and (more rarely) power outages that occur during normal system usage. These errors are warnings that the Real Time Clock data content needs to be re-established and do not require any FRU replacement unless the error is persistent. When one of these errors occurs, the power-on password and time and date information have been lost. • To set/restore a power-on password, use the SMS utility. • To set/restore the time and date, use the operating system facility. If the error is persistent, replace the battery. If the error is persistent after battery replacement, replace the system board. (See notes on 3-1.)

Table 3-2 (Page 8 of 9). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU
xxx=001	RTC not updating	RTC initialization required
002	Bad time/date values	Set Time/Date
29000002	Keyboard/Mouse controller failed self-test	Replace system board. (See notes on 3-1.)
29A00003	Keyboard not present/detected	1. Keyboard 2. System Board (See notes on 3-1.)
29B00004	Mouse not present/detected	1. Mouse 2. System Board (See notes on 3-1.)
2B200042	Unknown processor type Contact your service support representative.	
2B2xxyrr		**Note:** Processor and Cache type combinations are identified by the **xx** and **y** fields as follows: **xx** Processor type/speed **21** 166 Mhz 604e **22** 200 Mhz 604e **31** 233 Mhz 604e **34** 332 Mhz 604e **y** Cache information **0** Integrated cache or cache information unavailable **5** 512KB **6** 1MB **7** 256KB **D** ICBM 1MB

Table 3-2 (Page 9 of 9). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU
rr = 22		Bad Processor/CPU 1. Processor (card) 2. System board (See notes on 3-1.)
31		Disabled due to Asymetrical MP configuration (Model 240) 1. Go to the System Management Services error log (described in "Step 1020-4" on page 2-8) and use the location code for this error.

Memory PD Bits

The following table expands the firmware error code **25Cyyxxx** on page 3-10, where **yy** is the PD values in the table below. Use these values to identify the type of memory that generated the error.

If you replace FRUs and the problem is still not corrected, go to MAP 0030 in the Diagnostics Information for Multiple Bus Systems unless otherwise indicated in the tables.

Table 3-3. Memory DIMM PD bits

PD value	Size	Speed (nsecs)	Parity/ ECC	Single/ Dual
64	8MB	60	ECC	Single
69	16MB	60	ECC	Single
6B	32MB	60	ECC	Single
6D	64MB	60	ECC	Single
6F	128MB	60	ECC	Single

Firmware Checkpoints

The following Fxx code checkpoints are displayed on the operator panel during system startup, and can be be used for diagnostic purposes.

If you replace FRUs and the problem is still not corrected, go to MAP 0030 in the Diagnostics Information for Multiple Bus Systems unless otherwise indicated in the tables.

Table 3-4 (Page 1 of 5). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
F01	Performing system memory test (May take several minutes if large amount of memory installed.)	1. Memory modules. 2. System board
F05	Transfer control to Operating System (normal boot).	See “Fxx Code Boot Problems” on page 3-18.
F22	No memory detected (system lockup) Note: The disk drive light is on continuously.	1. Memory modules 2. System board. (See 3-1.)
F2C	Processor card mismatch (Model 240)	If more than one processor card is installed in the Model 240, both processor cards must be of the same speed and type.
F4D	Loading boot image	See “Fxx Code Boot Problems” on page 3-18.
F4F	NVRAM initialization	Go to “MAP 1540: Minimum Configuration” on page 2-15.
F51	Probing primary PCI bus	1. PCI Adapters 2. Riser card 3. System board. If a network adapter or system board is replaced, see 3-1.
F52	Probing for adapter FCODE, evaluate if present	1. PCI Adapters 2. Riser card 3. System board. If a network adapter or system board is replaced, see 3-1.

Table 3-4 (Page 2 of 5). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
F55	Probing PCI bridge secondary bus	1. PCI Adapters 2. Riser card 3. System board. If a network adapter or system board is replaced, see 3-1.
F5B	Transferring control to Operating System (service mode boot)	See “Fxx Code Boot Problems” on page 3-18.
F5F	Probing for adapter FCODE, evaluate if present	1. PCI Adapters 2. Riser card 3. System board. If a network adapter or system board is replaced, see 3-1.
F74	Establishing host connection	Refer to “Fxx Code Boot Problems” on page 3-18 for general considerations. 1. Turn off then on, and retry the boot operation. 2. Verify the network connection (network could be down). 3. Verify that IP paramters are correct. 4. Try to “Ping” the target server. 5. Have network administrator verify the server configuration for this client. 6. Check the network cable 7. Check the network adapter. If trying to boot using integrated ethernet controller, replace system board. (See 3-1.)

Table 3-4 (Page 3 of 5). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
F75	BootP request	Refer to “Fxx Code Boot Problems” on page 3-18 for general considerations. 1. Turn off then on, and retry the boot operation. 2. Verify the network connection (network could be down). 3. Verify that IP paramters are correct. 4. Have network administrator verify the server configuration for this client.
F9E	Real time clock (RTC) initialization	Refer to error code 28030xxx in “Firmware Error Codes” on page 3-4.
FDC	Dynamic console selection.	Refer to “Fxx Code Console Problems” on page 3-20.
FDD	Processor exception	1. System board (See notes on 3-1.) 2. For Model 240, processor cards.
FDE	Alternating pattern of FDE and FAD indicates a processor exception has been detected.	1. System board (See notes on 3-1.) 2. For Model 240, processor cards.

Table 3-4 (Page 4 of 5). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
FEA	Firmware flash corrupted, load from diskette.	Ensure that the diskette installed contains recovery image appropriate for this system unit. The System Management Services recovery procedure for the flash EEPROM should be executed. See “Firmware Update” on page 4-25. If the diskette is installed with the correct recovery image, then suspect 1. Diskette 2. Diskette drive 3. Diskette cable 4. System board (See notes on 3-1.)
FEB	Firmware flash corrupted, load from diskette.	Ensure that the diskette installed contains recovery image appropriate for this system unit. The System Management Services recovery procedure for the flash EEPROM should be executed. See “Firmware Update” on page 4-25. If the diskette is installed with the correct recovery image, then suspect 1. Diskette 2. Diskette drive 3. Diskette cable 4. System board (See notes on 3-1.)
FF2	Power-On Password prompt.	If a console is attached but nothing is displayed on it, go to the “Entry MAP” on page 2-1 with the symptom "All display problems."
FF3	Privileged-Access Password prompt	If a console is attached but nothing is displayed on it, go to the “Entry MAP” on page 2-1 with the symptom "All display problems."

Table 3-4 (Page 5 of 5). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
FFB	SCSI bus initialization	1. Verify proper SCSI bus termination. 2. Verify that there are no ID conflicts among SCSI devices. 3. Verifiy that the system board SCSI security jumpers are set properly, if external devices are attached to the system board SCSI bus. 4. Suspect the SCSI cable. 5. Suspect the drives. 6. Suspect the system board.
FFD	The operator panel will alternate between the code FFD and another Fxx code, where Fxx is the point at which the error occurred.	If the Fxx is not listed in this table, go to “MAP 1540: Minimum Configuration” on page 2-15.
Not listed here		Go to “MAP 1540: Minimum Configuration” on page 2-15.

Fxx Code Boot Problems

Depending on the boot device, a checkpoint may be displayed on the operator panel for an extended period of time while the boot image is retrieved from the device. This is particularly true for Tape and Network boot attempts. If the checkpoint/code is displayed for an extended time there may be a problem loading the boot image from the device. If booting from CDROM or Tape, watch for “activity” on the drive's LED indicator. A blinking LED means that the loading of either the boot image or additional information required by the operating system being booted is still in progress.

For network boot attempts, if the system is not connected to an active network or if the target server is inaccessible (this can also result from incorrect IP parameters being supplied), the system will still attempt to boot and because time-out durations are necessarily long to accommodate retries, the system may appear to be hung.

1. Restart the system and get to the Firmware SMS utilities. In the utilities check:
   - Is the intended boot device correctly specified in the boot sequence?

- For network boot attempts:
  - Are the IP parameters correct?
  - Attempt to “Ping” the target server using the SMS “Ping” utility.

2. If the checkpoint F05 or F5B is displayed for an extended time, there may be a problem with the integrity of the boot image.
   - Try to boot and run standalone diagnostics against the system, particularly against the intended boot device. If the diagnostics are successful, it may be necessary to perform an operating system specific recovery process, or reinstall the operating system.
3. If attempting to boot from a Harddisk, CDROM, or Tape drive:
   a. Try a different CD/Tape (unless booting from Harddisk)
   b. Verify proper SCSI bus termination
   c. Replace SCSI cable
   d. It is possible that another attached SCSI device is causing the problem.

      Disconnect any other SCSI devices attached to the same controller as the one the boot device is attached to and retry the boot operation. If this is successful, one of the devices removed is causing the problem, re-attach devices one by one and retry the boot operation until the problem recurs and replace the device that caused the problem.
   e. Replace SCSI adapter (if drive is attached to a card rather than the system board)
   f. Replace SCSI drive
   g. It is possible that another installed adapter is causing the problem.

      Remove all installed adapters except the one the boot device is attached to, try to boot the standalone diagnostics from a CDROM drive attached to the scsi controller on the system board, and run the diagnostics against the system.

      If this is successful, re-install adapters (and attached devices as applicable) that were removed, one at a time, and run the standalone diagnostics against the system.
   h. Replace riser card
   i. Replace system board
4. If attempting to boot from a Network controller:
   a. Power Off then On and retry the boot operation
   b. Verify the network connection (network could be down)
   c. Verify that IP parameters are correct
   d. Try to “Ping” the target server
   e. Have network administrator verify the server configuration for this client
   f. Replace network cable
   g. Replace network adapter (unless trying to boot using the ethernet controller on the system board)
   h. It is possible that another installed adapter is causing the problem.

Remove all installed adapters except the one you are trying to boot, and try to boot the standalone diagnostics from a CDROM drive attached to the scsi controller on the system board. If this is successful, run the diagnostics against the system, particularly against the target network boot controller/adapter.

If this is successful, re-install adapters (and attached devices as applicable) that were removed, one at a time, and run the diagnostics against the system.

i. Replace riser card
j. Replace system board (if not replaced in previous step)

5. If you replaced the indicated FRUs and the problem is still not corrected, or the above descriptions did not address your particular situation, go to "MAP 1540: Minimum Configuration".

Fxx Code Console Problems: This section describes console problems indicated by a code in the table under “Firmware Checkpoints” on page 3-14.

If a console is attached but nothing is displayed on it, follow the steps associated with “All display problems” in the “Entry MAP” on page 2-1. If the console selection screens can be seen on the terminals but there is no response to attempts to select the console:

1. If selecting the console with a keyboard attached to the system, replace the keyboard. If replacing the keyboard does not fix the problem, replace the system board.
2. If selecting the console with an ASCII terminal, suspect the ASCII terminal. Use the Problem Determination Procedures for the terminal. Replace the system board if these procedures do not reveal a problem.

   Note: Terminal settings should be set to:
   - 9600 bps (bits per second)
   - No Parity
   - 8 Data bits
   - 1 Stop bit

If you replace FRUs and the problem is still not corrected, go to MAP 0030 in the Diagnostics Information for Multiple Bus Systems unless otherwise indicated in the tables.

Firmware Location Codes

These codes can be found in the System Management Services error log as described in “Step 1020-4” on page 2-8.

Location codes vary in length depending on the device being referenced. In general, if a location code is referring to an adapter or controller, the location code is 4 digits (eg. 04-01 identifies the device/controller/adapter on the PCI bus, in physical slot 1). If a device is optional and plugs into an adapter/controller, it is normally 8 digits (eg. 01-C0-00-00 is identifying the first diskette drive).

Location Code format

The basic format of the location code is:

- For non-SCSI devices/drives
  AB-CD-EF-GH
- For SCSI devices/drives (not controllers/adapters)
  AB-CD-EF-G,H

  “G” is the SCSI bus ID (PUN) of the device and “H” is the Logical Unit Number (LUN).

The “AB” value identifies the bus type as follows:

00	Processor bus
01	ISA bus
04	PCI bus
05	PCMCIA bus

The “CD” value depends on whether the device is integrated or a plug in adapter. For plug in adapters, the value is a decimal number in the range of 01 to 99 that identifies the system slot. For integrated devices (eg. the integrated PCI Ethernet controller), the value of “C” is an uppercase alphabetic character in the range from A to Z and is generated based on the device “discovery” order as specified in the Open Firmware 1275 specification for the “probe” process which translates into “Device Tree” order. The “D” value is set to 0.

The “EF” value, as generated by the firmware, is always 00.

The “GH” value (except for SCSI devices) is a subsystem dependent “index” value indicating subordinate devices of the parent identified by the “AB-CD-EF” value.

Examples:

Note: The values used in the examples are representative of the format and relationships described above.

00-00	System board
00-00-00-01	Memory SIMM/DIMM in socket 1
01-A0	ISA bus Primary IDE controller
01-C0	ISA bus Diskette Controller
01-C0-00-01	2nd ISA bus Diskette drive
00-00	2nd ISA bus Serial Port (SRN value differentiates between 1st and 2nd)
04-01	PCI Adapter in system slot 1
04-01-00-13,0	SCSI device at SCSI bus ID 13 (decimal) attached to the PCI SCSI controller in system slot 1
04-B0	2nd Integrated PCI device (eg. Ethernet controller)
04-C0	3rd Integrated PCI device (eg. SCSI controller)
04-C0-00-13,0	SCSI device at SCSI bus ID 13 (decimal) attached to the PCI SCSI controller integrated on the system board.
00-00	1st Processor on Model 240 (Proc 0)
00-01	2nd Processor on Model 240 (Proc 1)

Chapter 4. Loading the System Diagnostics

If no keys are pressed after the system unit power is turned on, the system unit searches a list of devices (the **default boot list**) for a bootable image. If a bootable image is found, then the system unit loads and starts the operating system. This is called a **normal boot**.

The system unit can also be booted from a **custom boot list**, which can be changed through the System Management Services.

If certain keys are pressed during system startup, the system unit searches the default or custom boot list for a bootable image to start in **service mode** instead of normal mode. After a successful service mode boot, the diagnostic programs are started automatically.

The following pages describe the default and custom boot lists, and how to boot from these in either normal or service mode.

Default Boot List

The **default boot list** is composed of the first device found of each of the following types:

1. Diskette drive
2. CD-ROM drive
3. Disk Drive
4. Network device

If this default boot list is used during system startup, the system unit attempts to boot from the diskette drive, then the first CD-ROM drive encountered, then the first disk drive encountered, and finally the first network connection encountered.

Custom Boot List

The contents of the **custom boot list** can be defined by using the graphical System Management Services (see “Boot” on page 4-11) or the text-based System Management Services (see “Select Boot Devices” on page 4-30). When the custom boot list is utilized during system startup, system unit attempts to boot in turn from each specific device in the custom boot list.

Note: Only the specific devices contained in the custom boot list are checked for a bootable image. Other devices of the same type are **not** searched for a bootable image unless they are also specified in the custom boot list.

If no bootable image is found in the custom boot list, then the system restarts and attempts to boot again.

If the custom boot list is discovered to be corrupted, the system rebuilds the custom boot list according to the default boot list.

Service Mode Boot: Loading Diagnostics

The system unit can be booted in **service mode** (instead of **normal mode**) from either the default boot list or custom boot list. After a successful service mode boot, the diagnostic programs are started automatically.

Booting in Service Mode from the Default Boot List

To boot in service mode from the **default** boot list, do the following:

1. Verify with the system administrator and users that all programs will be stopped, then do so.
2. Insert the diagnostic CD-ROM into the CD-ROM drive, if you intend to run standalone diagnostics.
3. Turn off the system.
4. Wait 30 seconds, then turn on the system.
5. When the keyboard indicator appears during startup, press the **F5** key if the system console is a directly-attached keyboard, or the **5** key if the system console is an ASCII terminal.
6. Enter any passwords.

Diagnostics loaded from CD-ROM are called **standalone** diagnostics. Since the default boot list checks the CD-ROM drive before the disk drive, this procedure is used to start standalone diagnostics.

Booting in Service Mode from the Custom Boot List

To boot in service mode from the **custom** boot list, do the following:

1. Verify with the system administrator and users that all programs will be stopped, then do so.
2. Turn off the system.
3. Wait 30 seconds, then turn on the system.

4. When the keyboard indicator appears during startup, press the **F6** key if the system console is a directly-attached keyboard, or the **6** key if the system console is an ASCII terminal.
5. Enter any passwords.

Diagnostics loaded from a disk drive or network are called **online** diagnostics. (Online diagnostics can be used only if AIX is installed.) Since the custom boot list should list the disk drive or network device before the CD-ROM drive, this procedure is used to start online diagnostics. To ensure that using the custom boot list starts online diagnostics, do not insert the diagnostics CD-ROM.

Standalone vs. Online Diagnostics

When the system unit attempts to boot in service mode (from either the default or custom boot list) and locates a diagnostics CD-ROM before any other bootable image, then the system unit starts **standalone diagnostics**.

Standalone diagnostics can be used on system units installed with any supported operating system.

When the system unit attempts to boot in service mode (from either the default or custom boot list) and first locates a bootable image on disk drive or network connection, then the system unit starts **online diagnostics**.

Online diagnostics can only be used on system units installed with the AIX operating system.

Because the type of diagnostics started (standalone or online) depends on the source from which they are loaded, changing the boot list used during system startup can affect which diagnostics are run.

Recommended Boot Options

The procedures under “Service Mode Boot: Loading Diagnostics” on page 4-2 produce the following recommended results:

- Default boot list (F5 or 5 key) with diagnostics CD-ROM inserted loads **Standalone Diagnostics**.
- Custom boot list (F6 or 6 key) without diagnostics CD-ROM inserted loads **Online Diagnostics**, if AIX is installed on a device in the custom boot list.

Summary: Boot Options and Control Keys

The following keys can be pressed when the keyboard POST indicator appears.

Key	Result
F1 (display keyboard)	Normal mode boot, graphical System Management Services starts.
1 (ASCII keyboard)	Normal mode boot, text-based System Management Services starts.
F5 (display keyboard)	Service mode boot, default boot list.
5 (ASCII keyboard)	Service mode boot, default boot list.
F6 (display keyboard)	Service mode boot, custom boot list.
6 (ASCII keyboard)	Service mode boot, custom boot list.
F8 (display keyboard)	Normal mode boot, Open Firmware command line.
8 (ASCII keyboard)	Normal mode boot, Open Firmware command line.

System Management Services

The System Management Services make it possible for you to view information about your computer and to perform such tasks as setting passwords and changing device configurations.

If you have chosen a graphical display as your system console, you can use the graphical System Management Services described below. If you are using an ASCII display as your system console, see “Text-Based System Management Services” on page 4-27.

Graphical System Management Services

To start the Open Firmware command line or graphical System Management Services, turn on or restart the computer.

The firmware version installed in your system unit is displayed at the bottom right-hand corner of the initial logo screen. Please note the version number; processor upgrades may require a specified version of firmware to be installed in your system unit. (Update System Firmware is an option under the Utilities menu in the System Management Services.)

After the logo is displayed, initialization icons appear across the bottom of the screen.

To enter the Open Firmware command line, you must press the **F8** key *after the keyboard icon appears* during startup.

If you have pressed the **F8** key, the Open Firmware command line (an "OK" prompt) appears after the initialization and power-on self test (POST) are complete.

Note: If you have installed a privileged-access password, you will be prompted for this password before gaining access to the Open Firmware command line.

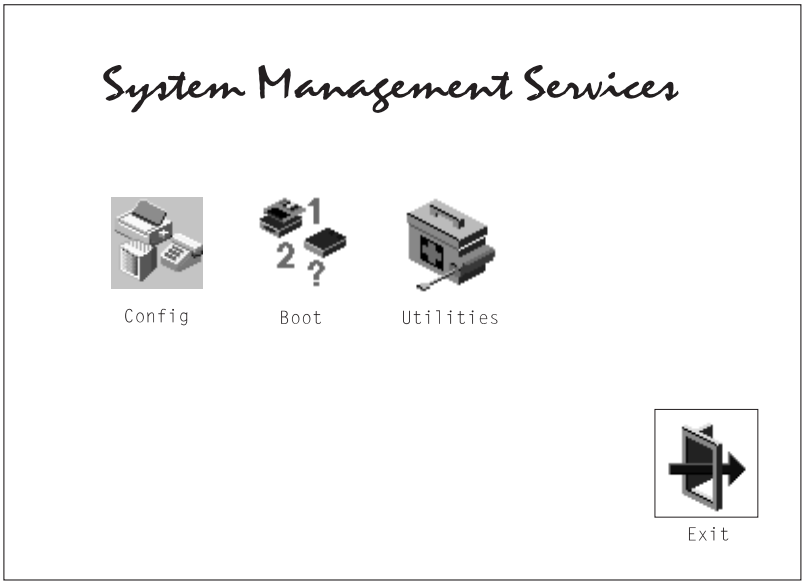
The Open Firmware command line can be used to set up adapters that are not configurable with the System Management Services. Your adapter documentation directs you to use this option if it is needed.

To enter the graphical System Management Services instead of the Open Firmware command line, you must press the **F1** key *after the keyboard icon appears* during startup.

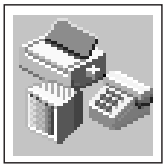
If you have pressed the **F1** key, the System Management Services appears after the initialization and power-on self test (POST) are complete.

Note: If you have installed a privileged-access password, you will be prompted for this password before gaining access to the System Management Services menu.

After the System Management Services starts, the following screen appears.

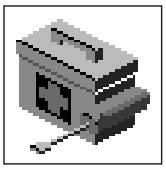


The System Management Services screen contains the following choices.

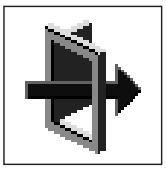


Config: Enables you to view your system setup.

Boot: Allows you to set the sequence in which devices are searched for operating system startup code.



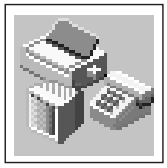
Utilities: Enables you to set and remove passwords, control the playing of system tones, enable the unattended start mode, set and view the addresses of your system's SCSI controllers, select the active console, view or clear the firmware error log, and update your system unit's firmware program.



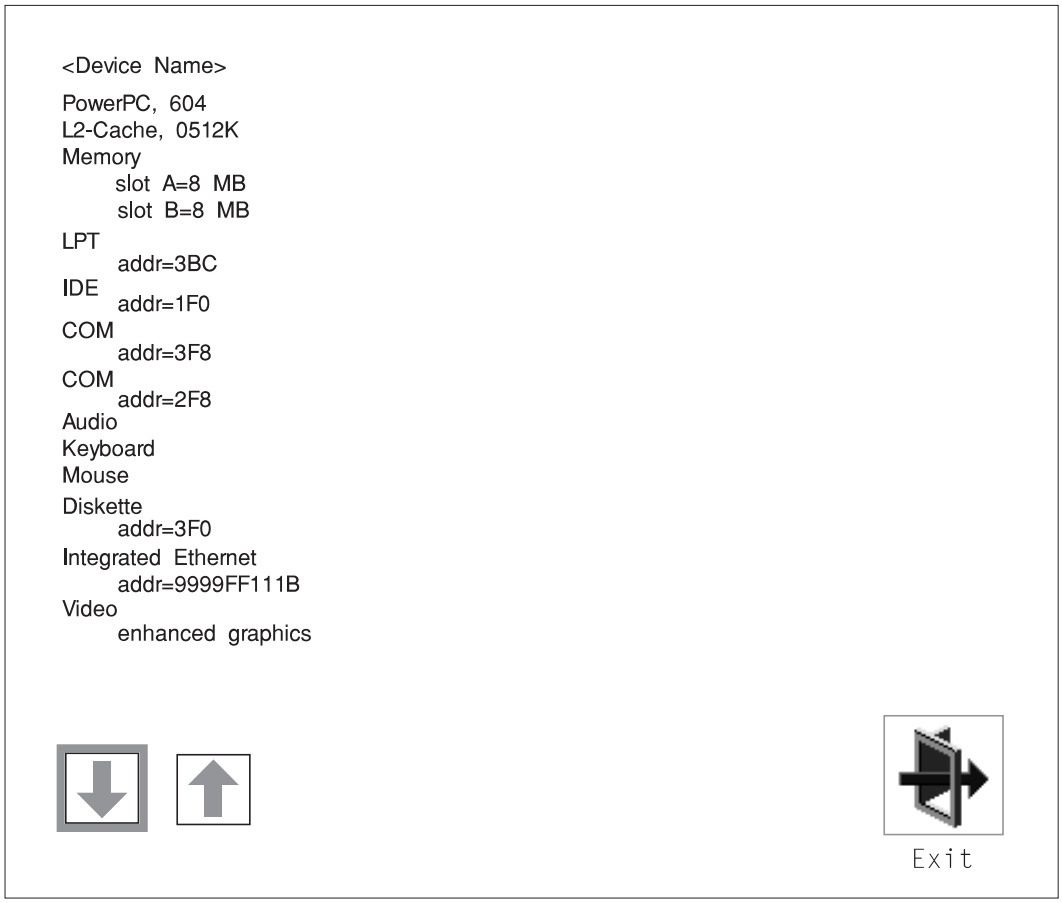
Exit: Returns you to the previous screen.

To select an icon, move the cursor with the arrow keys to choose which icon is highlighted, then press the **Enter** key. You can also select an icon by clicking on it with your left mouse button. To leave the current screen, either press the **Esc** key or select the **Exit** icon.

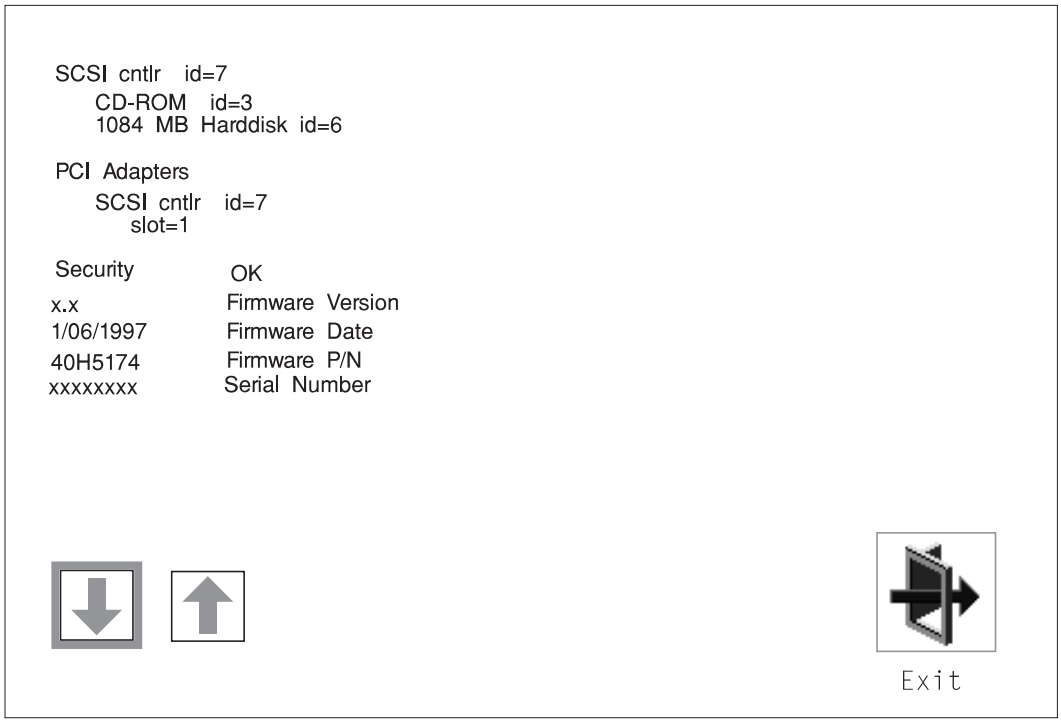
Config



Selecting this icon makes it possible for you to view information about the setup of your system unit. A list similar to the following appears when you select the **Config** icon.



Selecting the down arrow displays the next configuration screen, which lists your system unit's firmware version, the date of its development, and the firmware part number.



Note that this configuration information does not include ISA adapters installed in the system unit.

Boot

This selection enables you to view and change the custom boot list (the sequence in which devices are searched for operating system startup code).

New		List of Boot Devices
-	[1]	Diskette
1	[2]	SCSI CD-ROM id=3 (slot=1)
3	[3]	SCSI 2168 MB Harddisk id=6 (slot=1)
2	[4]	Ethernet (Integrated)

Save

Default

Exit

Attention: If you change your startup sequence, you must be extremely careful when performing *write* operations (for example, copying, saving, or formatting). You can accidentally overwrite data or programs if you select the wrong drive.

The default boot list consists of the first device found of each of the following types.

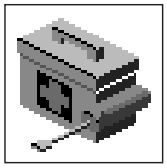
- Diskette drive
- CD-ROM drive
- Hard disk drive
- Network device.

To change the custom boot list, enter a new order in the **New** column, then select **Save**. The List of Boot Devices is updated to reflect the order you have chosen.

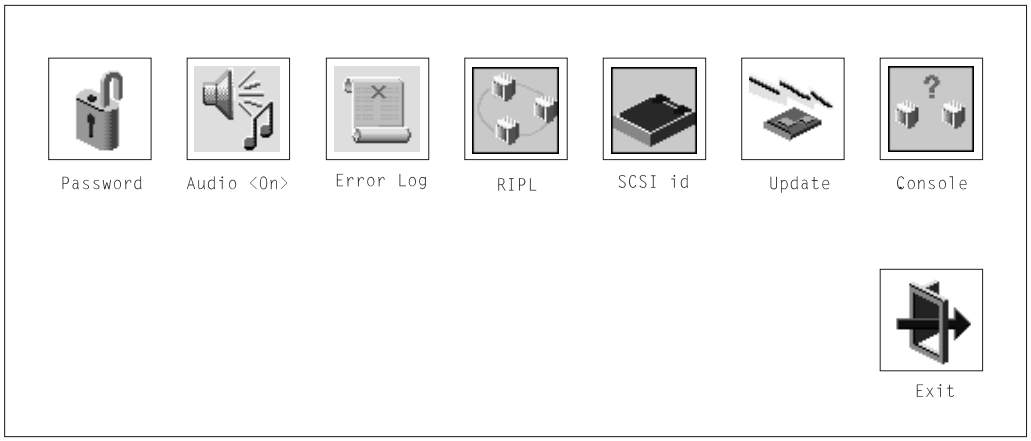
You can choose 1 to 4 devices for the custom boot list. To change the boot sequence back to the default values, select **Default**. (The default sequence is automatically saved.)

Attention: If no user-defined boot-list exists, and the privileged-access password has been enabled, you will be asked for the privileged-access password at startup every time you boot up your system. See "Privileged-Access Password" on page 4-17 for more information on the privileged-access password.

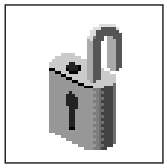
Utilities



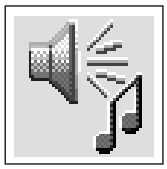
Selecting this icon enables you to perform various tasks and view additional information about your system unit.



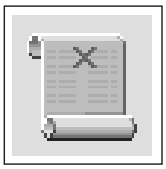
The following describes the choices available on this screen.



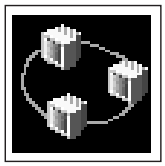
Password: Enables you to set password protection for turning on the system unit and for using system administration tools.



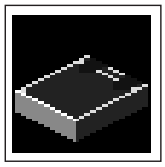
Audio: Enables you to turn on or off the system tones heard when the system is turned on.



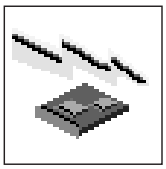
Error Log: Enables you to view and clear the firmware error log information for your system unit.



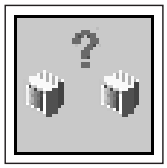
RIPL (Remote Initial Program Load): Allows you to select a remote system from which to load programs via a network adapter when your system unit is first turned on. This option also allows you to configure network adapters which require setup.



SCSI ID: Allows you to view and change the addresses (IDs) of the SCSI controllers attached to your system unit.

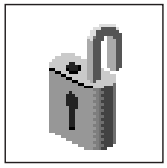


Update: Allows you to update the system firmware program.

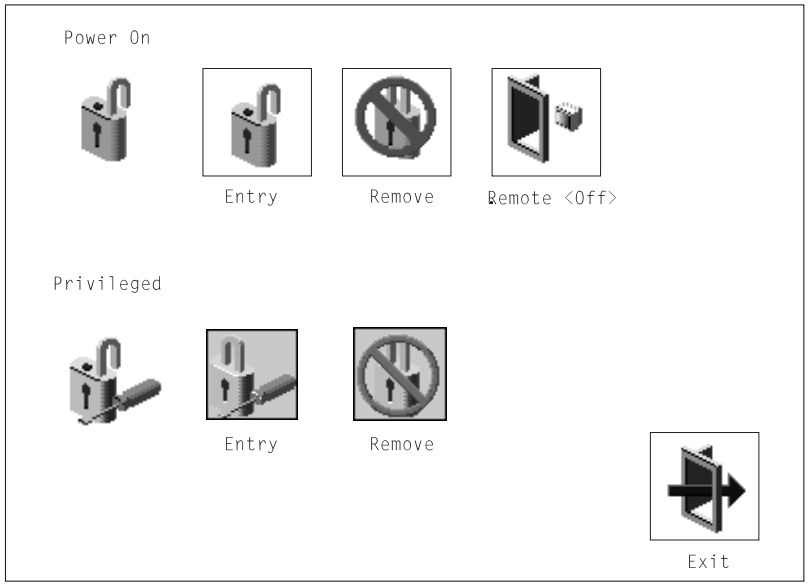


Console: If you have more than one keyboard and display attached to your system unit, or if you have an ASCII terminal attached to your system unit in addition to a keyboard and display, this tool allows you to define which one is active.

Password



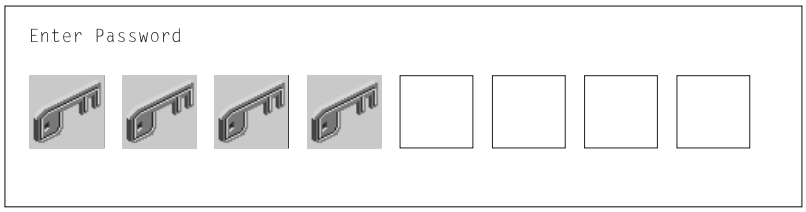
When you select this icon, the following screen is displayed.



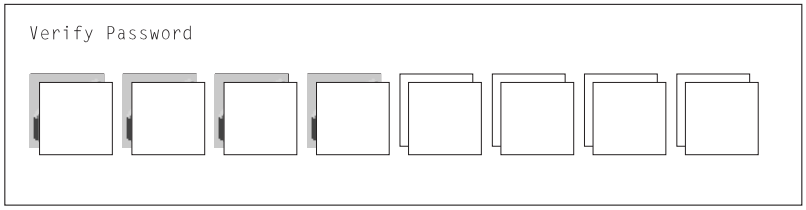
Power-On Password

Setting a power-on password helps protect information stored in your system unit. If a power-on password is set for your system unit, the Power-On status icon is shown in the locked position; if a power-on password is not set, then the Power-On status icon is shown in the unlocked position (as in the screen above).

When you select the Entry icon, a screen with 8 empty boxes appears. Type your password in these boxes. You can use any combination of up to eight characters (A–Z, a–z, and 0–9) for your password. As you type a character, a key appears in the box.



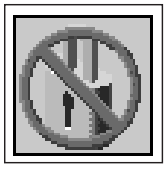
Press **Enter** when you are finished; you must type the password again for verification.



If you make a mistake, press the **Esc** key and start again.

After you have entered and verified the password, the power-on password status icon flashes and changes to the locked position to indicate that the power-on password is installed.

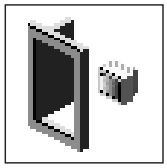
If you previously had set a power-on password and want to remove it, select the Remove icon.



Notes:

1. If you want to disable an installed power-on password (but not erase it) move the power-on password jumper as described in ref.. the section beginning on 1-1. Moving the jumper back to the default position will re-enable the power-on password, unless it has been removed in the System Management Services Utilities or by removing the battery.
2. If you *forget* the power-on password, you can erase the password by shutting down the system unit and removing the battery for at least 30 seconds. See “Battery” on page 5-35 for details.
3. The system unit power cable **must** be disconnected before removing the battery.

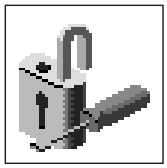
A password becomes effective only after the system is turned off and back on again.



Remote Mode: The remote mode, when enabled, allows the system to start from the defined boot device. This mode is ideal for network servers and other system units that operate unattended. You *must* set a power-on password before you can enable the remote mode. When the remote mode is set, the icon changes to **Remote <On>**.

If you remove the power-on password, the remote mode is automatically reset, and the icon returns to **Remote <Off>**.

Note: In order to use the remote mode feature for booting unattended devices, you must enable the automatic power-up feature. See the ***User's Guide*** for instructions on enabling the automatic power-up feature, which allows the system unit to turn on whenever AC power is applied to the system (instead of having the system unit wait for the power button to be pushed).

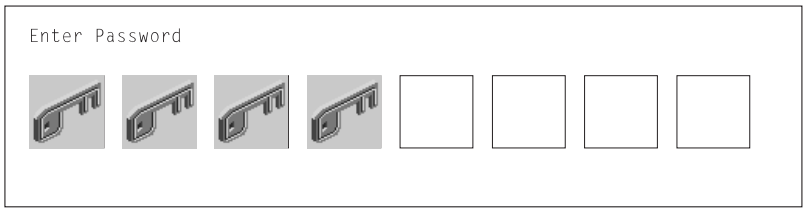


Privileged-Access Password

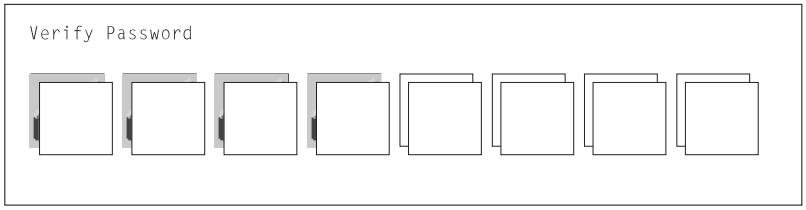
The privileged-access password protects against the unauthorized starting of the system programs. To set the privileged-access password, you must first change a jumper on the system board. See “Front View without Covers” on page 1-3 to locate and change the password-enabling jumper, then return here.

If the password-enabling jumper has been changed, select the Entry icon to set and verify the privileged-access password.

When you select the Entry icon, a screen with 8 empty boxes appears. Type your password in these boxes. You can use any combination of up to eight characters (A–Z, a–z, and 0–9) for your password. As you type a character, a key appears in the box.



Press **Enter** when you are finished; you must type the password again for verification.



If you make a mistake, press the **Esc** key and start again.

Note: If an error occurs when you attempt to set the privileged-access password, then make sure the password-enabling jumper has been changed. (See the ***User's Guide*** for instructions on changing the password-enabling jumper.)

After you have entered and verified the password, the privileged-access password icon flashes and changes to the locked position to indicate that your system unit now requires the password you just entered before running system programs.

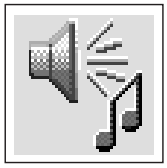
Attention: Once the password-enabling jumper has been changed and the privileged-access password has been set, great care must be taken to preserve the privileged-access password. *If you set the privileged-access password and later misplace it, your system must be returned for service.*

In order to prevent loss of system use, please record the privileged-access password immediately whenever it is changed.

Attention: If no user-defined boot-list exists, and the privileged-access password has been enabled, you will be asked for the privileged-access password at startup every time you boot up your system.

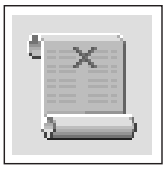
Moving the password-enabling jumper back to the default position does **not** disable or erase the privileged-access password. Removing the jumper or moving the jumper back to the default position only prohibits changing or disabling this password with the System Management Services.

Audio

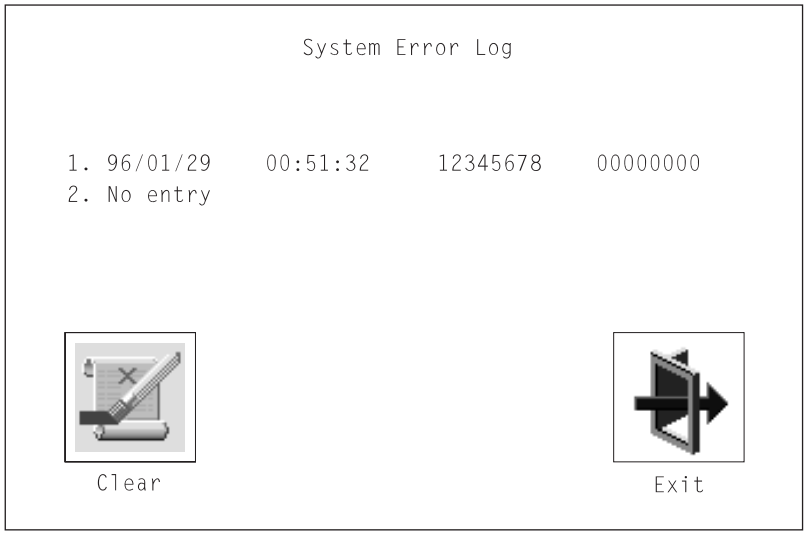


This icon enables you to turn on or off the system tones heard at power-on time. To change the audio status, use the arrow keys or mouse to highlight the audio icon, then press the Enter key.

Error Log

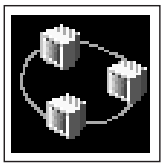


Selecting this icon displays the log of errors your system unit has encountered during operations.

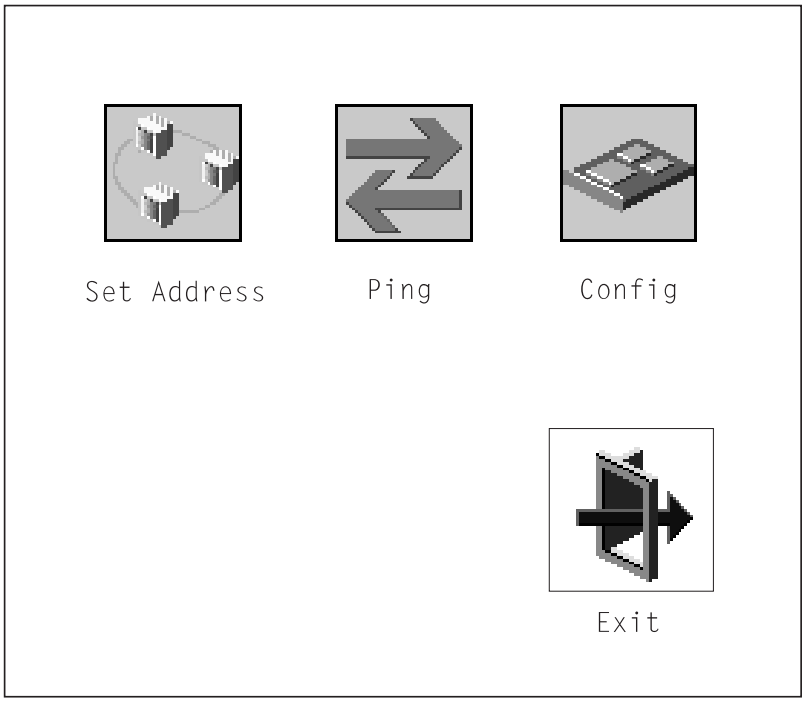


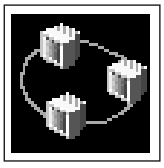
Selecting the Clear icon erases the entries in this log.

RIPL

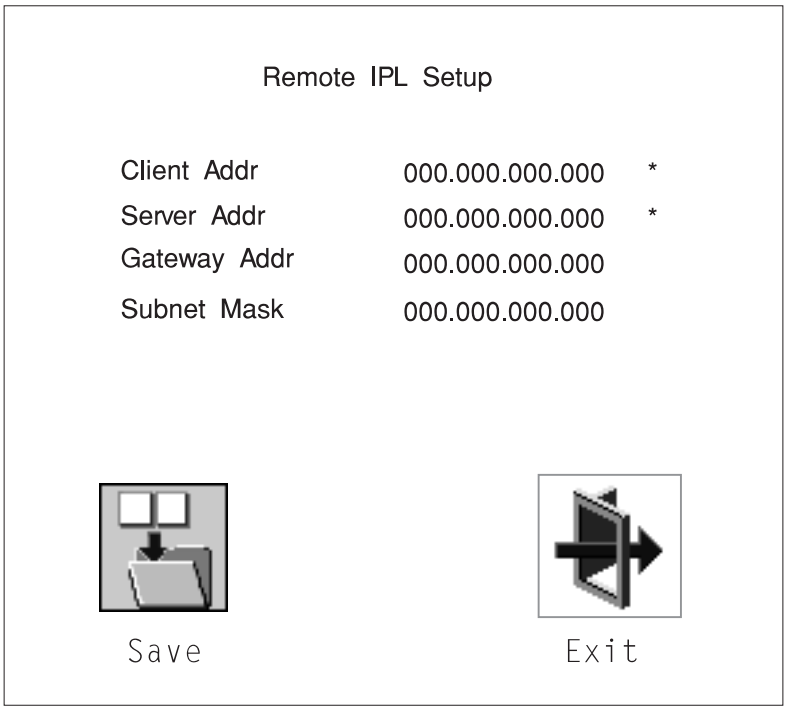


Selecting the Remote Initial Program Load (RIPL) icon above gives you access to the following selections.



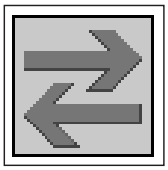


The Set Address icon allows you to define addresses from which your system unit can receive RIPL code.



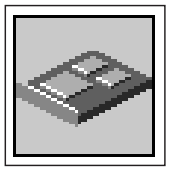
Note: Those addresses indicated with an asterisk (*****) are required.

If any of the addresses is incomplete or contains a number other than 0 to 255, an error message is displayed when you select the Save icon. To clear this error, change the improper address and select Save again.

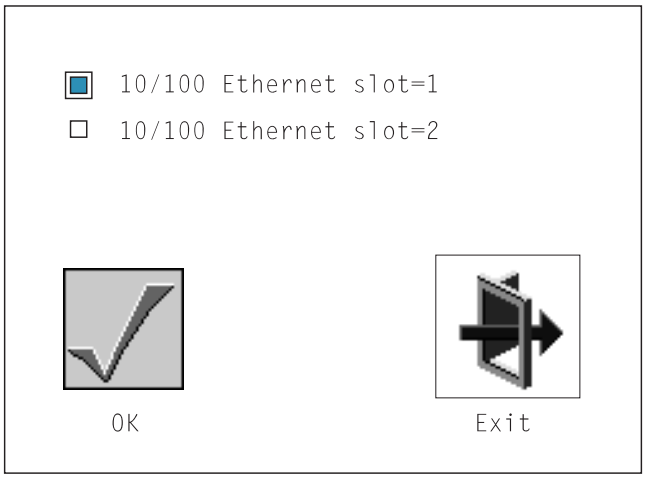


The Ping icon allows you to confirm that a specified address is valid by sending a test transmission to that address.

After choosing the Ping option, you may be asked to indicate which communications adapter (Token Ring or Ethernet) should be used to send the test transmission.



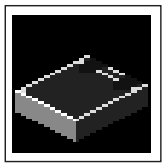
The Config icon allows you to configure network adapters which require setup. Selecting the Config icon presents a list of the adapters requiring cofiguration. Use the arrow keys or mouse to highlight an adapter, press the spacebar to select the adapter, then highlight the OK icon and press the Enter key.



The next screen allows you to select the type of adapter you have just chosen (or allow the system to select the type automatically). Use the arrow keys or mouse to highlight a selection. To choose the highlighted selection, press the spacebar, then highlight the OK icon and press the Enter key.

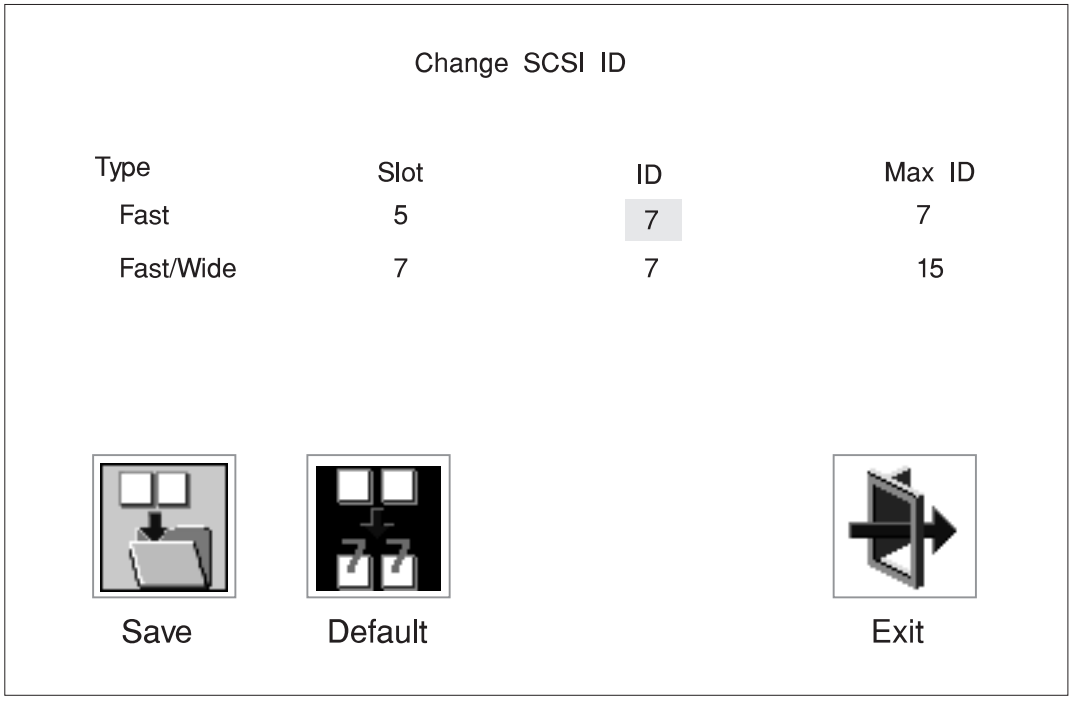
After choosing the adapter to configure, you can select the communications mode of the chosen adapter (or allow the system to select the communications mode automatically). As on the previous screen, use the arrow keys or mouse to highlight, then press the spacebar to select. When you have selected the communications mode, highlight the OK icon and press the Enter key.

SCSI ID

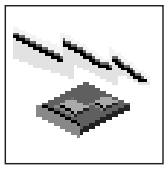


This selection allows you to view and change the addresses (IDs) of the SCSI controllers attached to your system unit. To change an ID, highlight the entry by moving the arrow keys, then enter another number. After you have entered the new address, use the arrow keys or mouse to highlight the Save icon and press the Enter key.

At any time in this process, you can select the Default icon to change the SCSI IDs to the default values.



Firmware Update



This selection allows you to update the firmware in your system unit from an image on a 3.5 inch diskette.

In order to create a firmware diskette with the latest level of firmware available, see

`http://www.rs6000.ibm.com/support/micro`

When prompted, insert the firmware update diskette containing the new firmware image.

ATTENTION: While the new firmware image is being copied into your system unit, you must **not** turn off the system unit. Turning off the system unit during the update process may render your system unit inoperable.

After the firmware update is complete, shut down and restart the system unit.

If the firmware update does not complete successfully or the system unit does not restart after the firmware update, contact your IBM authorized reseller or IBM marketing representative.

Firmware Recovery

If a troubleshooting procedure has indicated that the firmware information in your system unit has been damaged, then you must perform a firmware recovery.

To perform a firmware recovery, do the following:

1. Locate your firmware update diskette.
2. Using another system unit, rename the ***.img** file on the firmware update diskette to **precover.img**
3. Make sure your system unit is turned off.
4. Insert the firmware recovery diskette into your system unit.
5. Turn on your system unit.
6. When the keyboard indicator appears, press the **1** key if the system console is an ASCII terminal, or the **F1** key if the system console is a directly-attached keyboard.
7. When the System Management Services appear, choose Utilities and perform a Firmware Update as described above.

Text-Based System Management Services

The text-based Open Firmware command line and System Management Services are available if an ASCII terminal is attached to your system unit. The text-based Open Firmware command line allows you to configure some adapters, and the System Management Services makes it possible for you to view information about your system unit and to perform such tasks as setting passwords and changing device configurations.

To enter the Open Firmware command line, you must press the **8** key *after the keyboard text symbol appears* during startup.

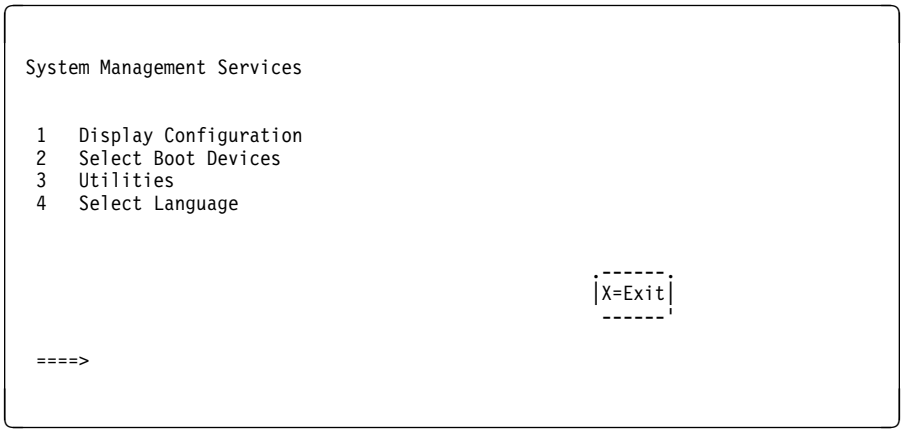
If you have pressed the **8** key, the Open Firmware command line (an "OK" prompt) appears after the initialization and power-on self tests (POST) are complete.

The Open Firmware command line can be used to set up adapters that are not configurable with the System Management Services. Your adapter documentation directs you to use this option if it is needed.

To start the text-based System Management Services instead of the Open Firmware command line, press 1 on the ASCII terminal keyboard when the keyboard text symbol appears during startup.

After the text-based System Management Services starts, the following screen appears.

Note: The version of firmware currently installed in your system unit is displayed at the top of each screen in the text-based System Management Services. Please note the version number; processor upgrades may require a specified version of firmware to be installed in your system unit. Update System Firmware is an option under the Utilities menu.

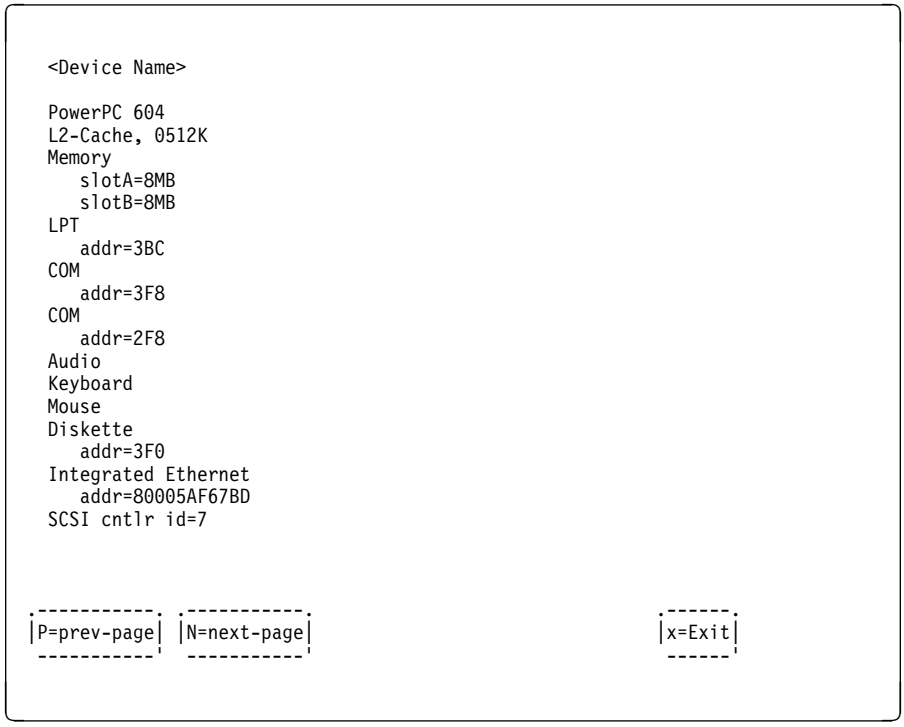


Selecting the numbered options provide capabilities described on the following pages.

After you have finished using the text-based System Management Services, entering **x** (for exit) boots your system unit.

Display Configuration

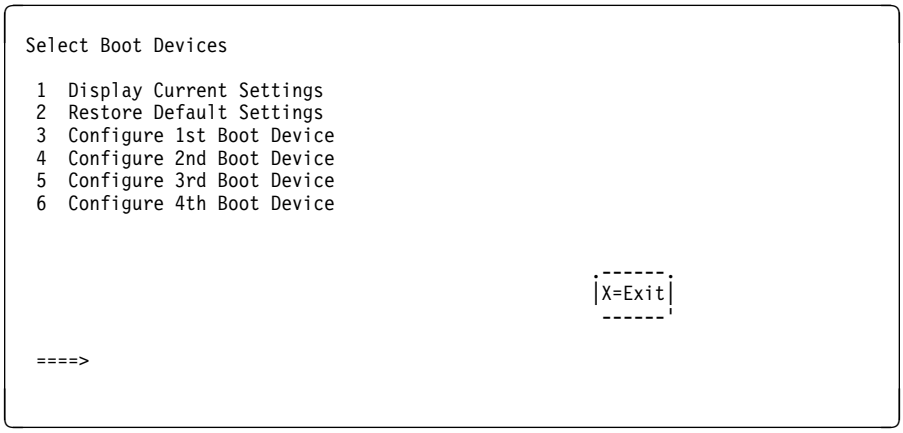
This option provides information about the setup of your computer. A screen similar to the following is displayed.



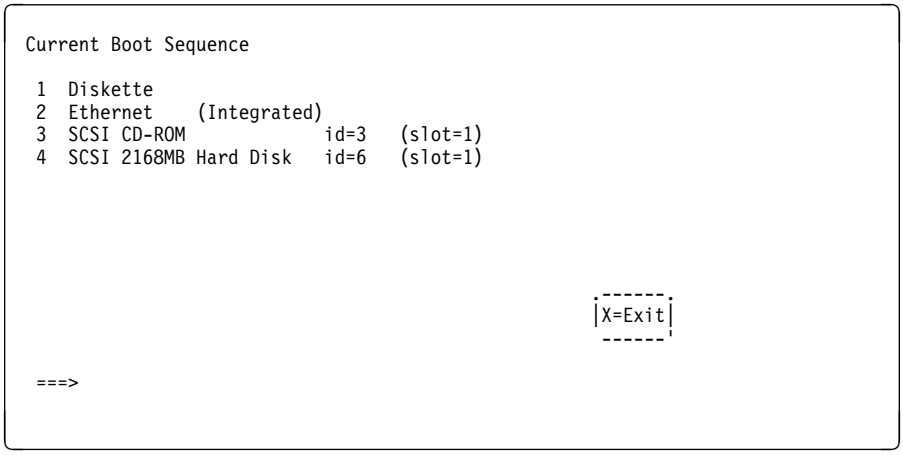
Note that this configuration information does not include ISA adapters installed in the system unit.

Select Boot Devices

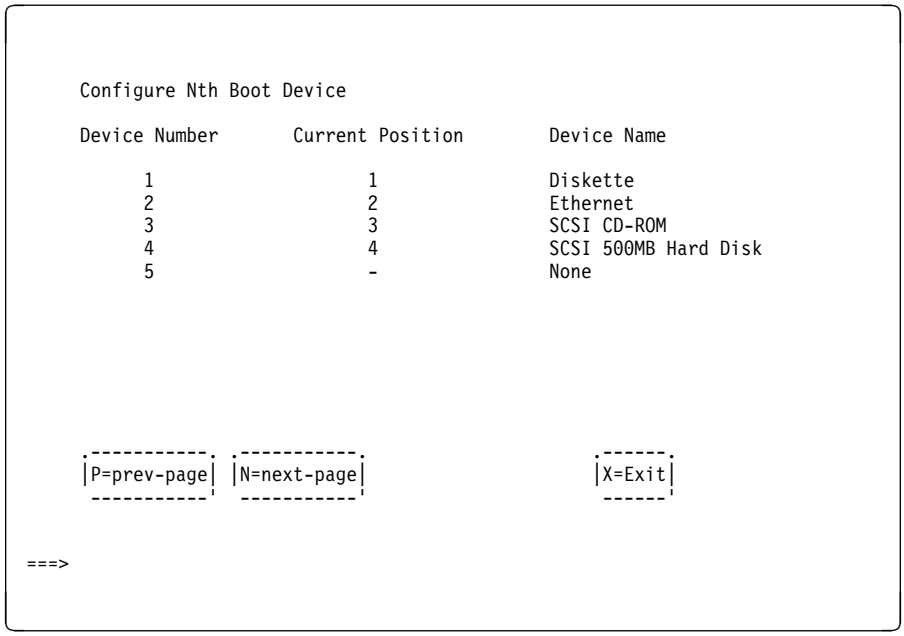
This selection enables you to view and change the custom boot list, which is the sequence of devices read at startup time.



Selecting the Display Current Settings option lists the current order of devices in the boot list. The following screen shows an example of this display.



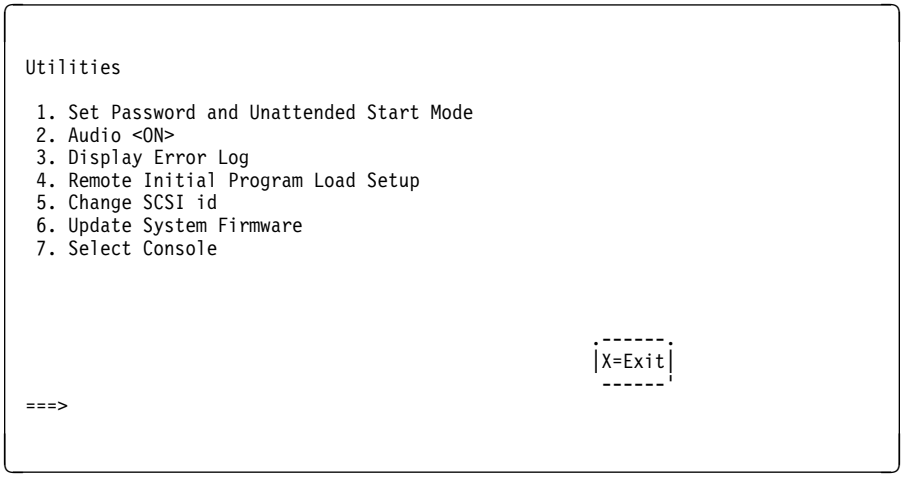
Selecting any of the Configure Boot Device options displays the following screen.



Attention: If no user-defined boot-list exists, and the privileged-access password has been enabled, you will be asked for the privileged-access password at startup every time you boot up your system. See "Set Privileged-Access Password" on page 4-33 for more information on the privileged-access password.

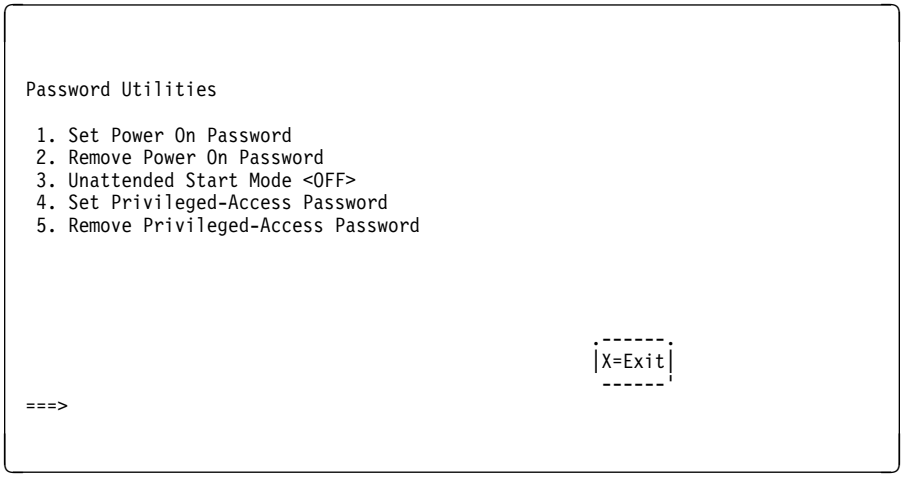
Utilities

The Utilities screen enables you to select from the following system management tools.



Set Password and Unattended Start Mode

Entering this selection permits access to the following options.



Set Power On Password: Setting a power-on password helps protect information stored in your computer. You can use any combination of up to eight characters (A–Z, a–z, and 0–9) for your password. The password you type is not displayed on the screen. Press **Enter** when you are finished; you must type the password again for verification.

If you previously had set a power-on password and wanted to remove it, select **Remove Power-On Password**.

Notes:

1. If you want to disable an installed power-on password (but not erase it) move the power-on password jumper as described in the section beginning on 1-1. Moving the jumper back to the default position will re-enable the power-on password, unless it has been removed in the System Management Services Utilities or by removing the battery.
2. If you *forget* your password, you can erase the password by shutting down the system unit and removing the battery for at least 30 seconds. See “Battery” on page 5-35 for details.
3. The system unit power cable must be disconnected before removing the battery.

A password becomes effective only after the system is turned off and back

Set Privileged-Access Password: The privileged-access password protects against the unauthorized starting of the system programs.

To set the privileged-access password, you must first change a jumper on your computer's system board. See “Front View without Covers” on page 1-3 to locate and change the password-enabling jumper.

If the password-enabling jumper has been changed, select Set privileged-access password to set and verify the privileged-access password.

Attention: Once the password-enabling jumper has been changed and the privileged-access password has been set, great care must be taken to preserve the privileged-access password. *If you set the privileged-access password and later misplace it, your system must be returned for service.*

In order to prevent loss of system use, please record the privileged-access password immediately whenever it is changed.

Attention: If no user-defined boot-list exists, and the privileged-access password has been enabled, you will be asked for the privileged-access password at startup every time you boot up your system.

Moving the password-enabling jumper back to the default position does **not** disable or erase the privileged-access password. Removing the jumper of moving the jumper back to the default position only prohibits changing or disabling this password with the System Management Services. Removing the battery does not affect the state of the privileged-access password at all.

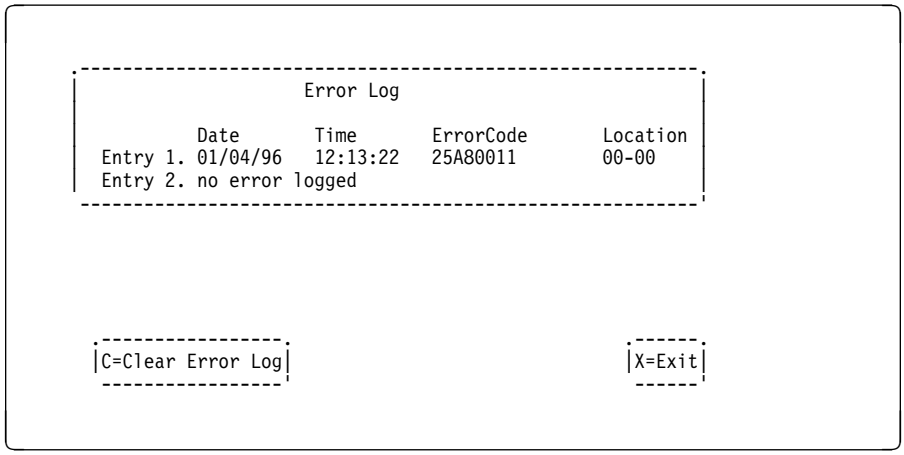
If you previously had set a privileged-access password and want to remove it, select **Remove Priviledged-Access Password**.

Audio

Selecting this utility turns on or off the system tones heard at power-on time.

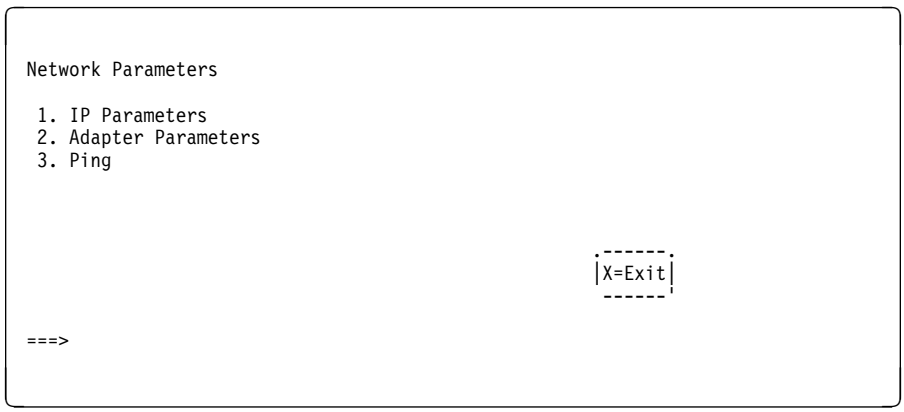
Display Error Log

A screen similar to the following is displayed when you select this option. Here, you can view or clear your computer's error log.

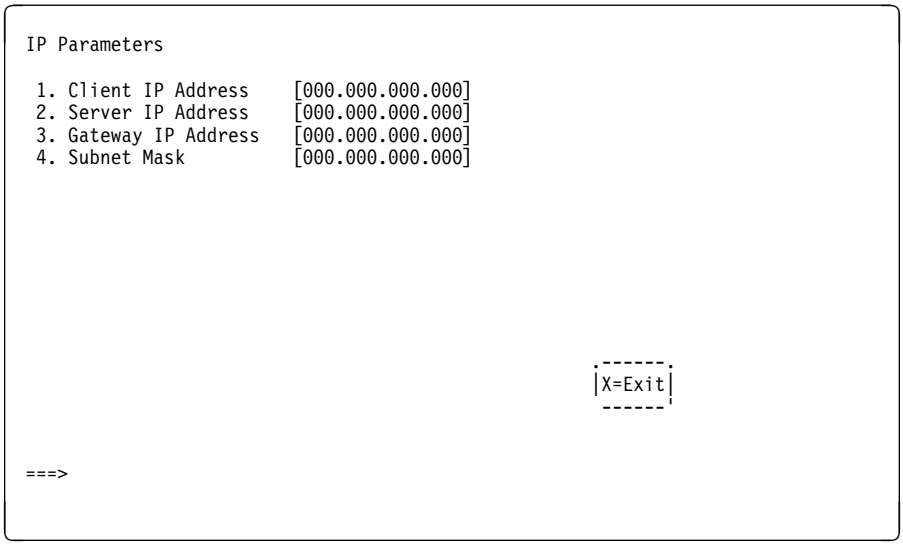


Remote Initial Program Load Setup

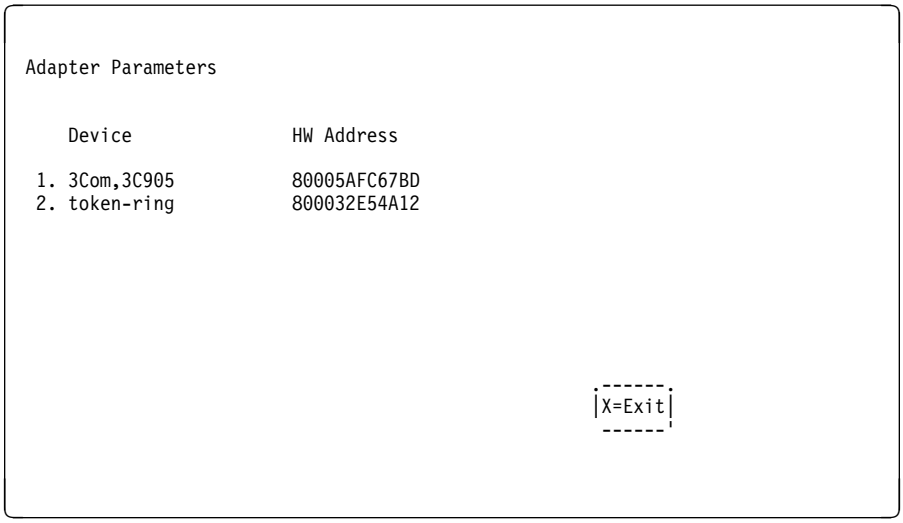
This option allows you to enable and set up the remote startup capability of your computer. First, you are asked to specify the network parameters.



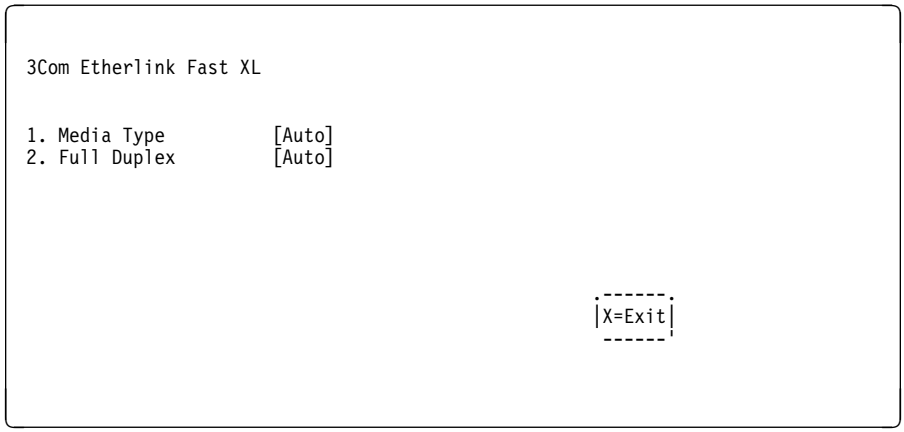
Selecting the IP Parameters option displays the following screen.



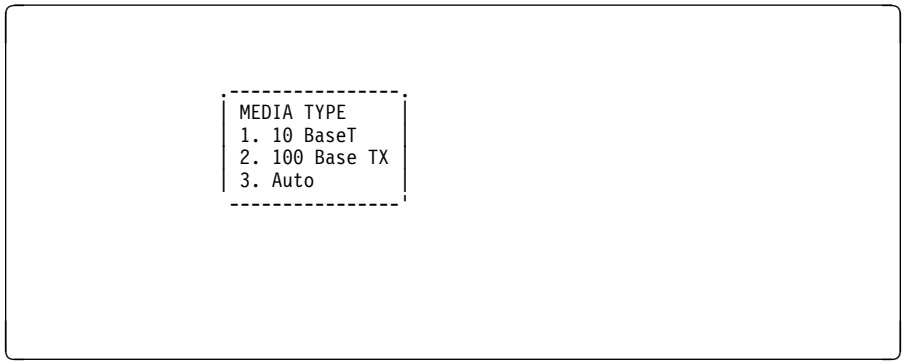
Selecting the Adapter Parameters option allows you to view an adapter's hardware address, as well as configure network adapters that require setup.



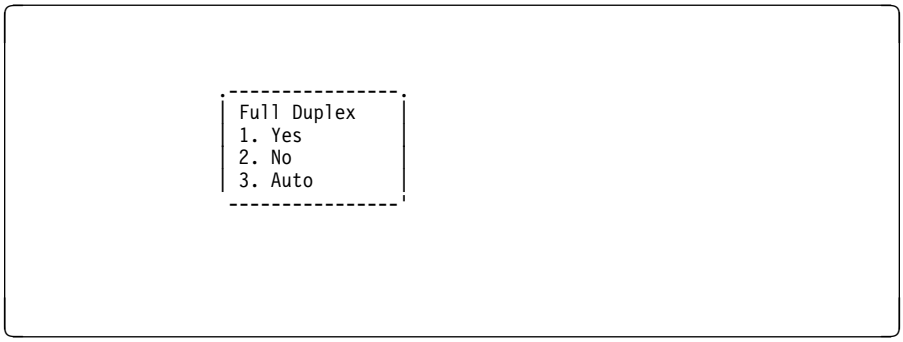
Selecting option 1 (3Com,3C905) displays the following 100Mb Ethernet configuration menus:



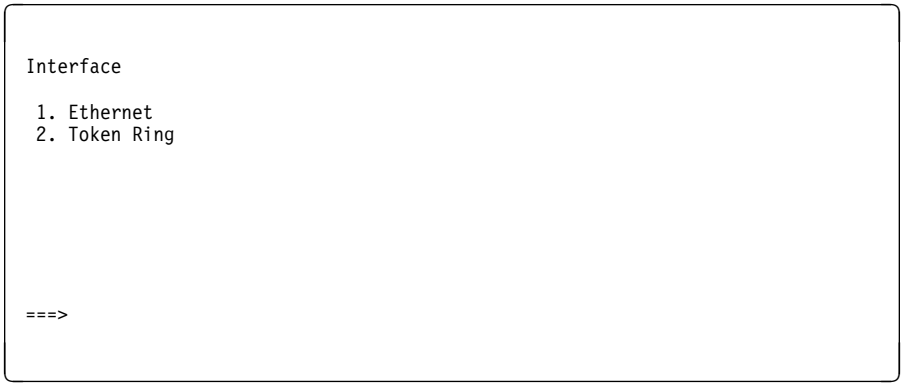
Selecting the Media Type option allows you the change the media employed by the Ethernet adapter:



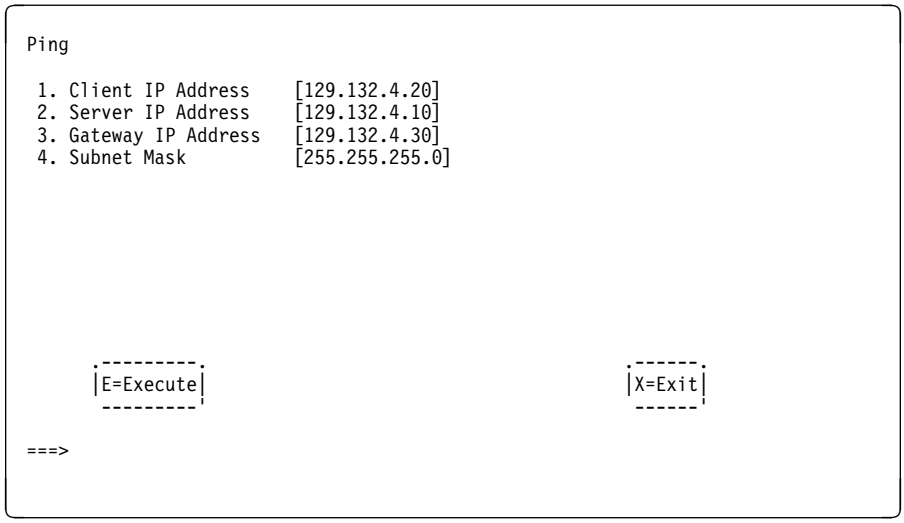
Selecting the Full Duplex option allows you to change how the Ethernet adapter communicates with the network:



Ping, the last option available from the Network Parameters menu, allows you to test a connection to a remote system unit. After selecting the Ping option, you must choose which adapter communicates with the remote system.



After choosing which adapter to use to ping the remote system, you must provide the addresses needed to communicate with the remote system.



Change SCSI ID

This option allows you to view and change the addresses of the SCSI controllers attached to you computer.

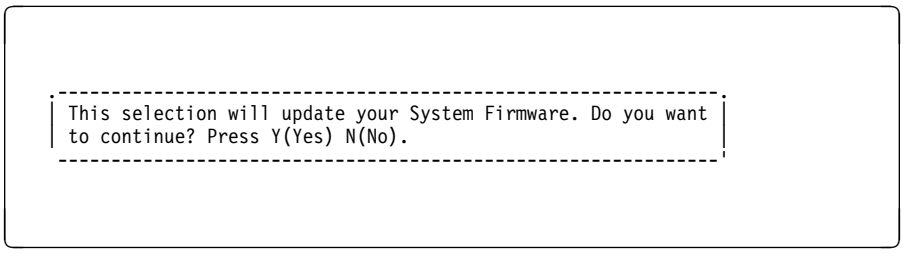
Update System Firmware

This option allows you to update your system firmware. Note that you must insert a diskette containing the firmware update image after you see the following confirmation screen.

In order to create a firmware diskette with the latest level of firmware available, see

`http://www.rs6000.ibm.com/support/micro`

When prompted, insert the firmware update diskette containing the new firmware image.



Firmware Recovery: If a troubleshooting procedure has indicated that the firmware information in your system unit has been damaged, then you must perform a firmware recovery.

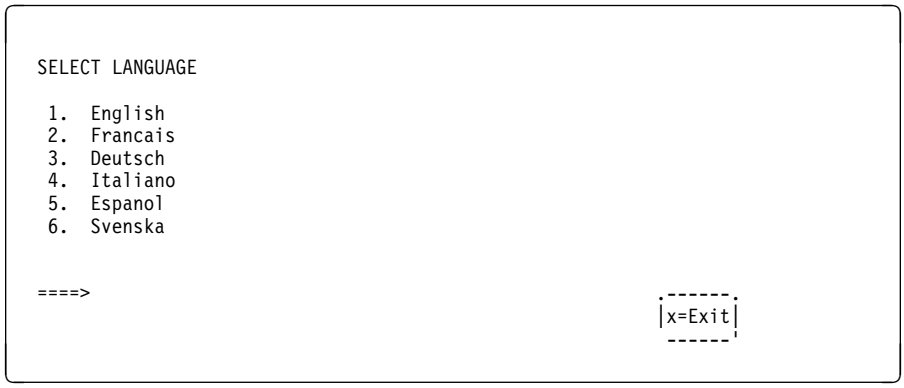
To perform a firmware recovery, do the following:

1. Locate your firmware update diskette.
2. Using another system unit, rename the ***.img** file on the firmware update diskette to **precover.img**
3. Make sure your system unit is turned off.
4. Insert the firmware recovery diskette into your system unit.
5. Turn on your system unit.
6. When the keyboard indicator appears, press the **1** key on the system console ASCII terminal.
7. When the System Management Services appear, choose Utilities and perform a System Firmware Update as described above.

Select Console: Selecting this option allows you to define which display is used by the system for system management.

Select Language

This option allows you to change the language used by the text-based System Management Services screens.



Note: Your tty must support the ISO-8859 character set in order to properly display languages other than English.

Chapter 5. Removal and Replacement Procedures

Before performing any of the removal or replacement procedures in this chapter, read the following notice.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. You must disconnect all power cables from the existing system before opening the system unit to add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.

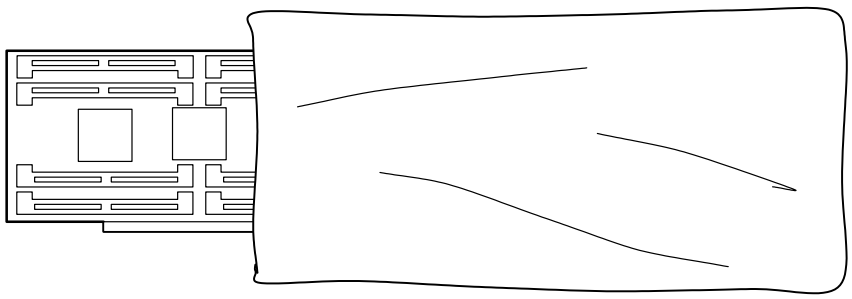
CAUTION:
This product is equipped with a 3-wire power cable and plug for the user's safety. Use this power cable in conjunction with a properly grounded electrical outlet to avoid electrical shock.

Handling Static–Sensitive Devices

Warning: Adapters, planars, diskette drives, and disk drives are sensitive to static electricity discharge. These devices are wrapped in antistatic bags, as shown in this illustration, to prevent this damage.

Take the following precautions:

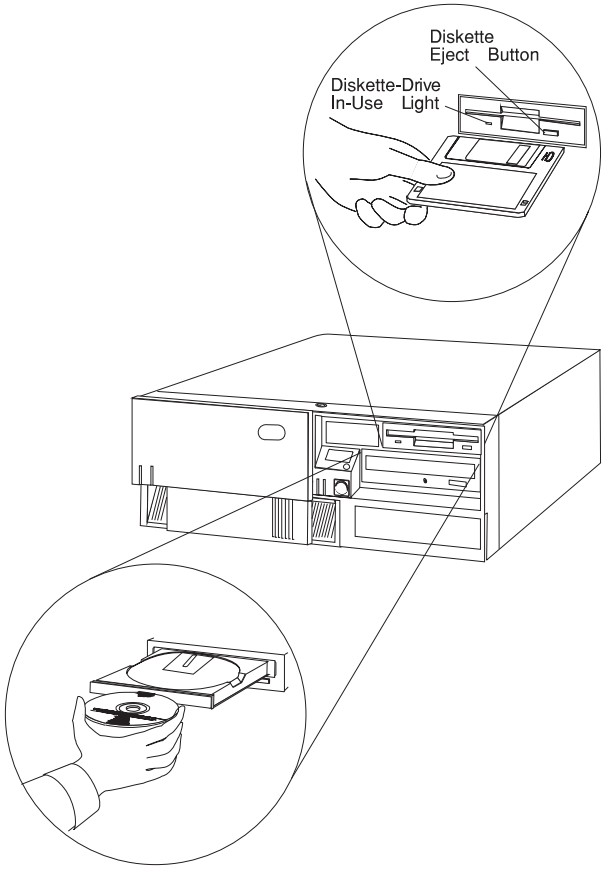
- If you have an antistatic wrist strap available, use it while handling the device.
- Do not remove the device from the antistatic bag until you are ready to install the device in the system unit.
- With the device still in its antistatic bag, touch it to a metal frame of the system.
- Grasp cards and boards by the edges. Hold drives by the frame. Avoid touching the solder joints or pins.
- If you need to lay the device down while it is out of the antistatic bag, lay it on the antistatic bag. Before picking it up again, touch the antistatic bag and the metal frame of the system unit at the same time.
- Handle the devices carefully in order to prevent permanent damage.



Cover

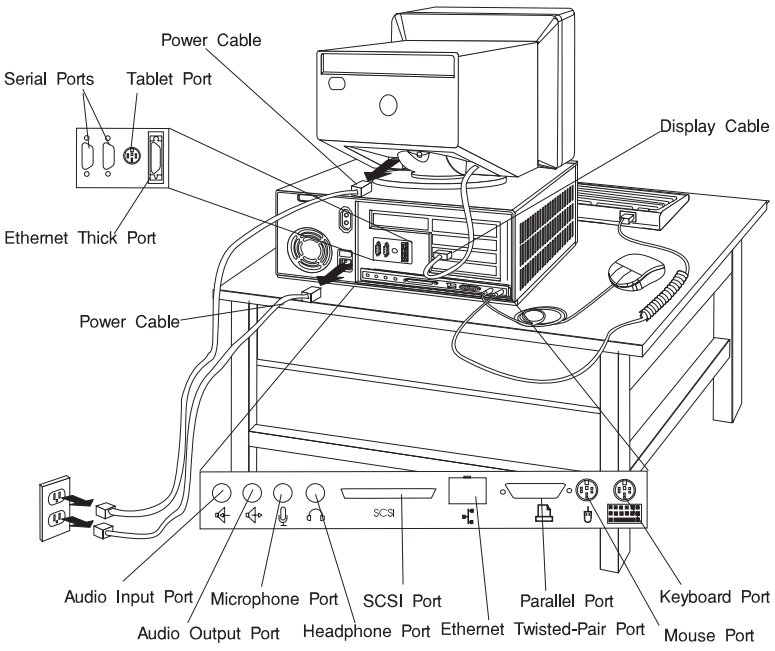
Removal

1. Unlock the cover lock and slide the drive bay cover all the way to the left.
2. Remove any media (diskettes, or CDs) from the drives.

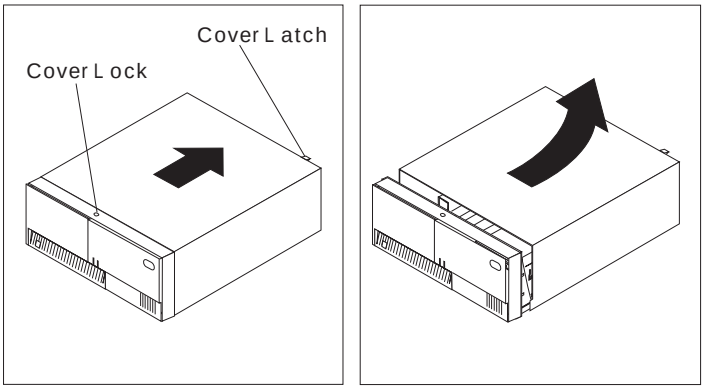


3. Turn off all attached devices and the computer.
4. If you have a modem or fax machine attached to the computer, disconnect the telephone line from the wall outlet and the computer.
5. Unplug all power cords (cables) from electrical outlets.

6. Make a note of where the other cables and cords are connected to the back of the computer; then disconnect them.

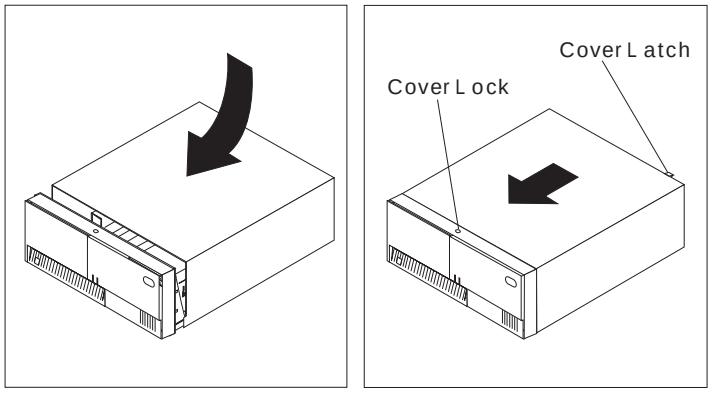


7. If you have not already done so, remove the display from the top of the computer.
8. Unlock the cover. Then, while holding down the cover latch at the rear of the system unit, slide the cover to the rear approximately 1 inch. Grasp the cover on both sides and lift it away from the system unit.

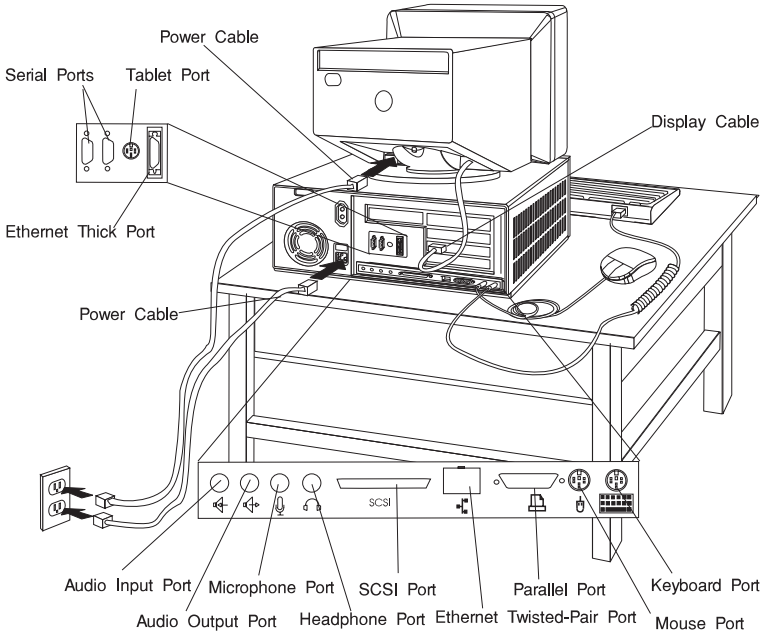


Replacement

1. Install the cover by placing it close to the front of the system unit, as shown. Slide the cover toward the front of the system unit while holding down the cover latch.



2. Reconnect all device cables, such as the printer and display; then plug the power cords into properly grounded electrical outlets.



3. If you have a modem or fax machine attached to the computer, reconnect the telephone line to the computer and the wall outlet.

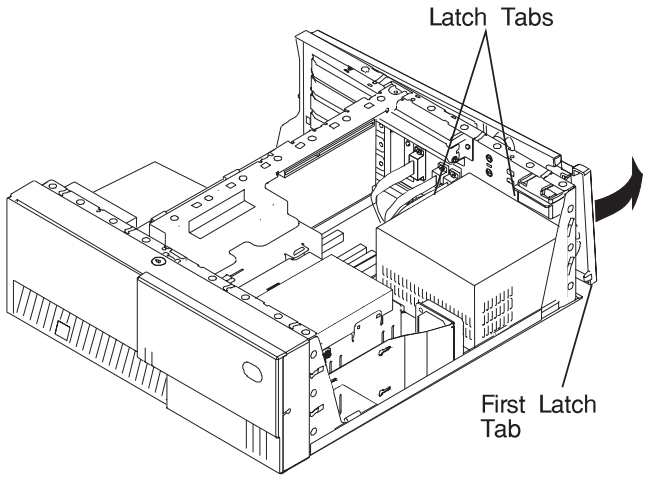
Power Supply

DANGER

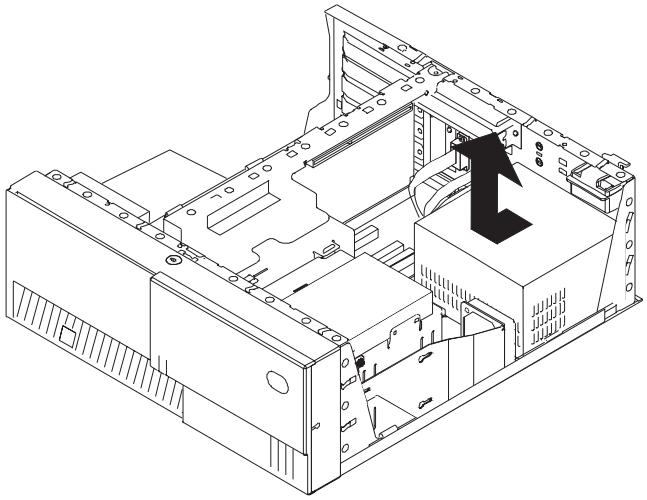
> **Do not attempt to open the covers of the power supply. Power supplies are not servicable and are to be replaced as a unit.**

Removal

1. Unplug all power cords (cables) from electrical outlets.
2. If you have not already done so, remove the cover as described in “Cover” on page 5-3.
3. Disconnect the power supply cables from the system board connectors and any installed drives.
4. Remove the rear bezel from the system unit by releasing the three latches and swinging the bezel away from the right side of the system unit.



5. Remove the mounting screws from the rear of the power supply.
6. Remove the power supply from the system by moving it forward and then upward.



Replacement

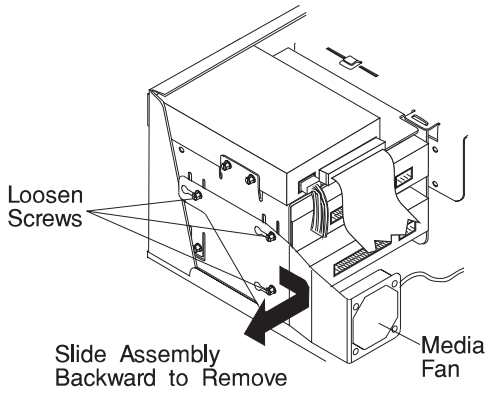
Replace in reverse order, noting the following power supply cable attachments.

- System board power cables
- Diskette drive power cable
- Disk drive power cables
- Media drive power cables

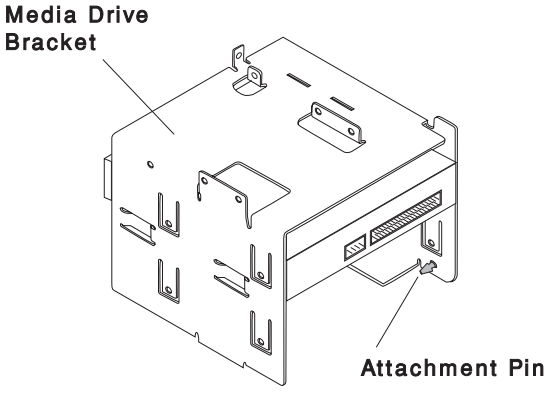
Front Bezel and Power Switch

Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 5-3.
2. Do the removal procedure under “Fan and Speaker Assembly” on page 5-32.
3. Remove the media fan assembly and disconnect the media fan cable.



4. Snap off the media drive bracket attachment pin located at the left rear corner of the media drive bracket.



5. Remove the screw which secures the media drive bracket to the side of the chassis, then slide the media drive bracket assembly to the rear of the system unit.

6. All of the latches attaching the front bezel to the chassis are now accessible just inside the front of the system unit. Release these latches and pull the front bezel away from the chassis.
7. To remove the power switch, remove the two screws which secure it to the chassis, then disconnect the power switch cable from the system board.

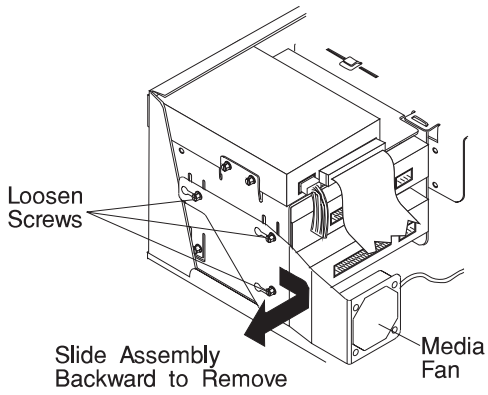
Replacement

Replace in reverse order.

Media Fan

Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 5-3.
2. Disconnect the media fan power cable.
3. Loosen the three screws which secure the media fan assembly to the side of the media drive bracket.
4. Remove the media fan assembly.



Replacement

Replace in the reverse order.

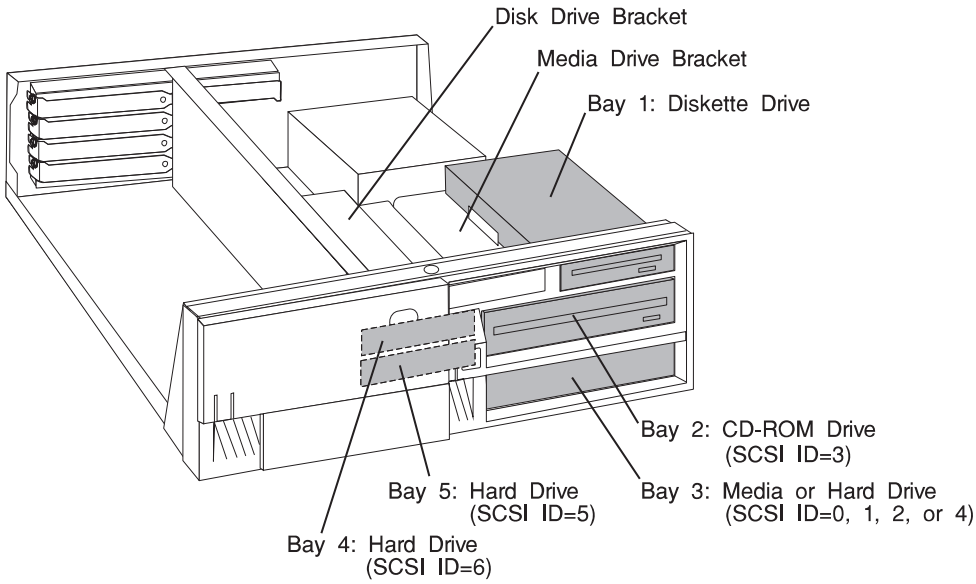
Drives

Removing Internal Drives

1. If you have not already done so, remove the covers as described in “Cover” on page 5-3.

   Note: If you are removing a CD-ROM drive refer to “Laser Safety Information” on page xii.

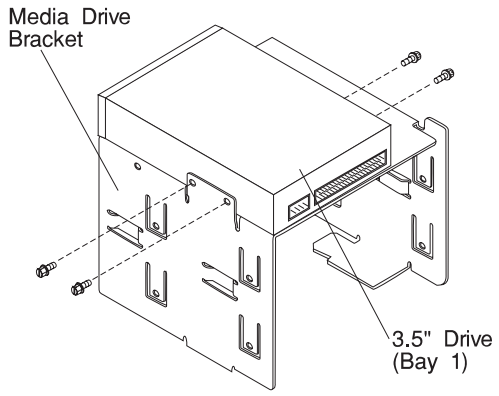
   Disk and media drives are installed in drive bays shown below.



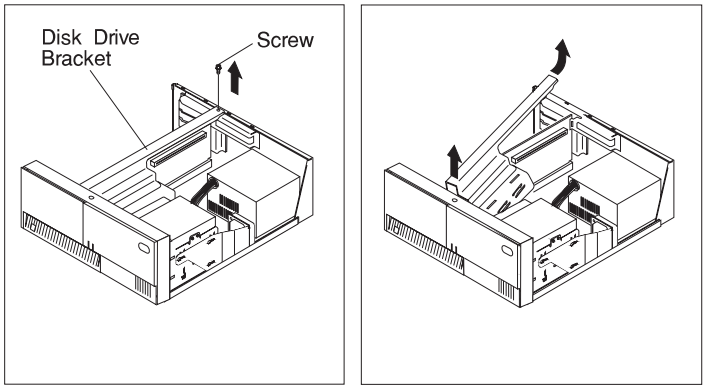
2. To remove a diskette drive from bay 1, do the following:

   a. Unplug the diskette power and signal cables from the back of the drive.

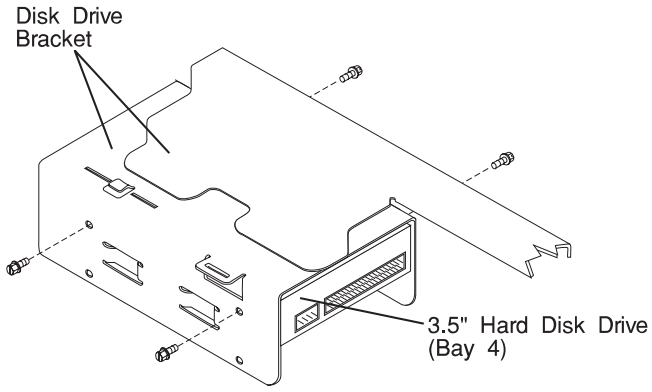
   b. Remove the screws which secure the diskette drive to the media drive bracket.



3. To remove disk drives from bays 4 and 5, do the following:
   a. Remove the disk drive bracket assembly from the system unit.

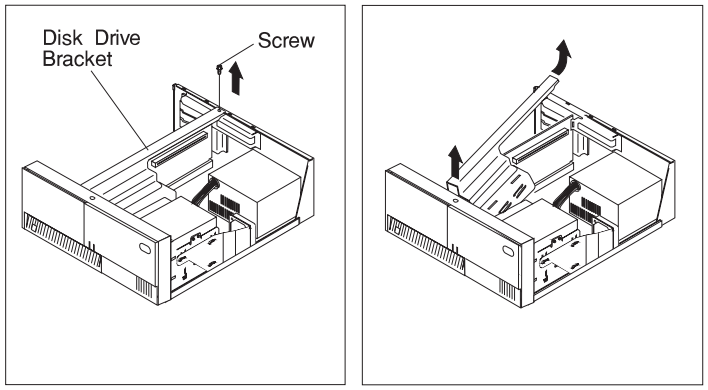


   b. Unplug the power and signal cables from the back of the disk drive or drives.
   c. Remove the screws which secure the disk drive to the disk drive bracket.

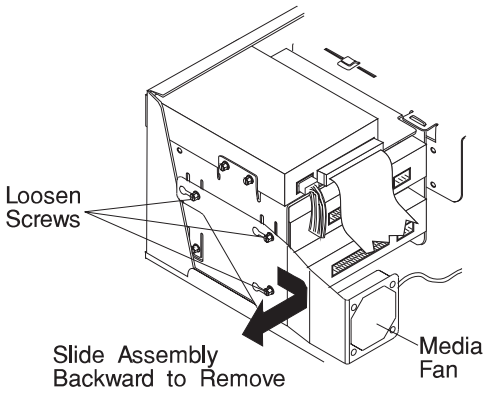


4. To remove a media or disk drive from bays 2 or 3, do the following:

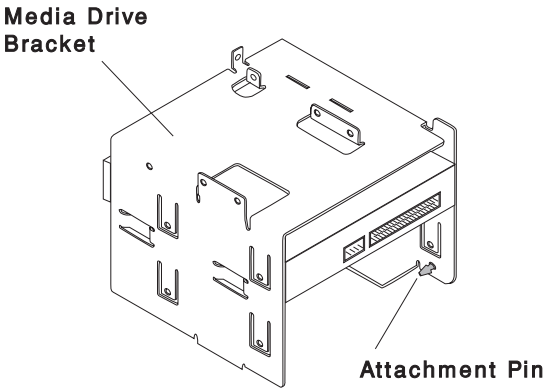
   a. Remove the disk drive bracket assembly from the system unit and carefully place it on top of the power supply.



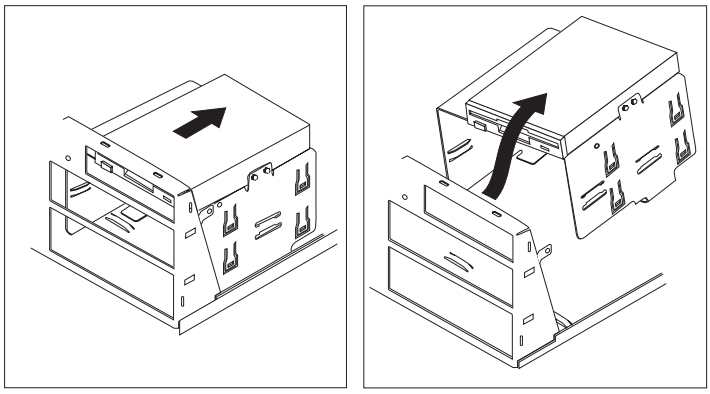
   b. Remove the media fan assembly and disconnect the media fan cable.



c. Snap off the media drive bracket attachment pin located at the left rear corner of the media drive bracket.



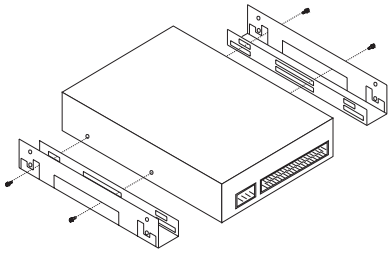
d. Remove the screw which secures the media drive bracket to the side of the chassis, then remove the media drive bracket assembly.



e. Remove the screws which secure the media or disk drive within the media drive bracket.

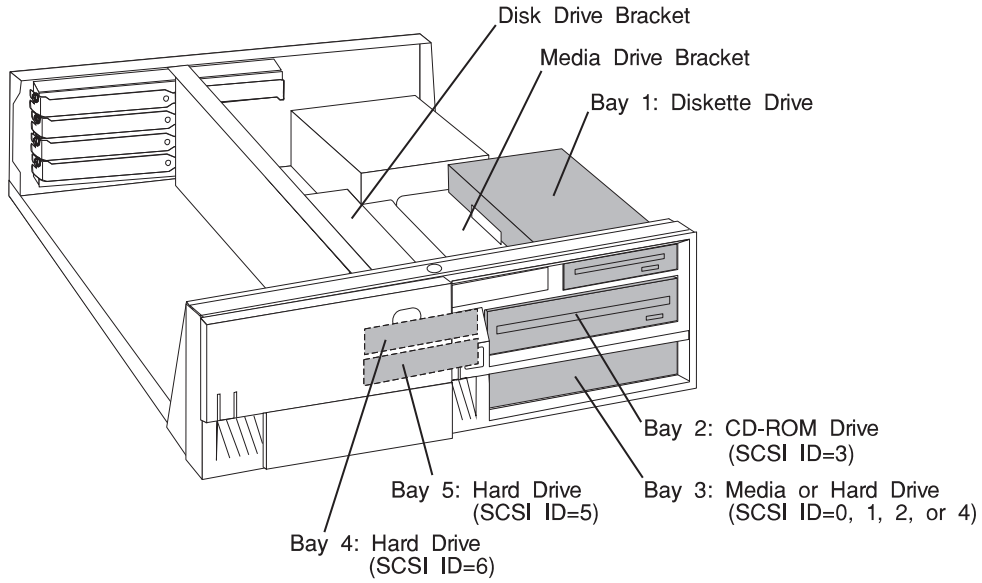
f. If you are removing a 3.5-inch disk drive, remove the screws which secure the disk drive mounting brackets to the disk drive.

Note: The screws which secure disk drive mounting brackets to a disk disk drive are **not** the same as those used in the the rest of the assembly. Be sure to retain these screws in order to attach the disk drive mounting brackets on the replacement disk drive.



Replacement

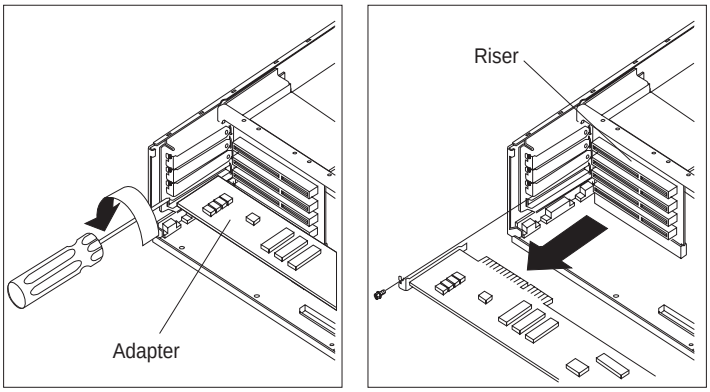
To replace, perform the removal steps in the reverse order. Be sure to match the SCSI addresses of the replacement disk drives with those of the removed disk drives. Recommended SCSI addresses are shown in the following illustration.



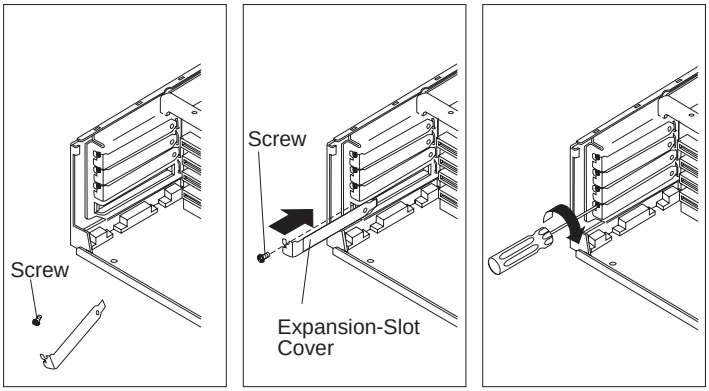
Adapter

Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 5-3.
2. Note the location of the adapter you are removing.
3. Remove the expansion-slot screw for the adapter; then grasp the adapter and pull it free from the socket.



4. If you are not replacing the adapter in this slot, install an expansion-slot cover into the empty expansion slot.



Replacement

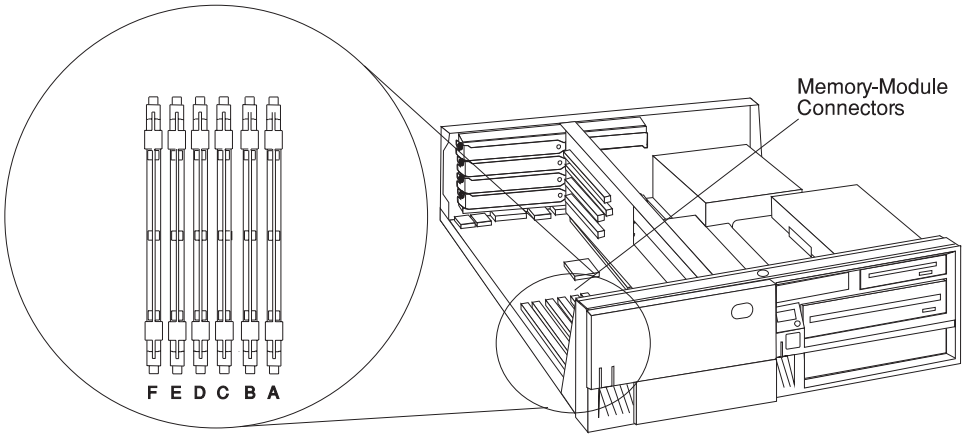
Replace in reverse order.

Memory Modules

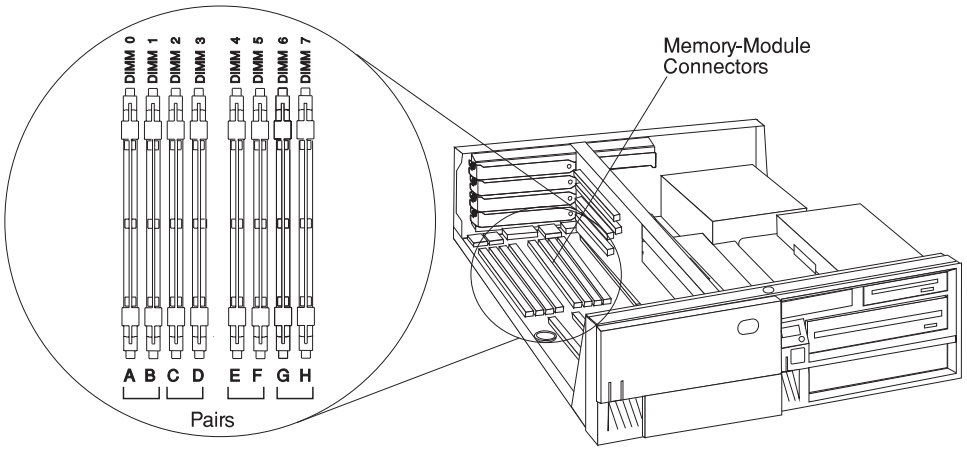
Removal

1. Locate the memory-module connectors.

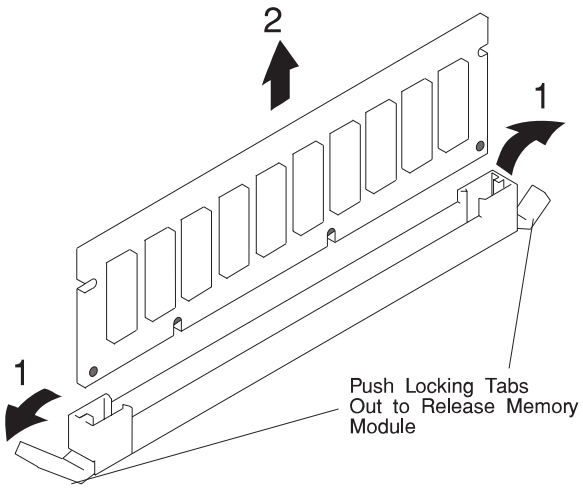
   To locate the six memory-module slots in the Model 140, use the following figure.



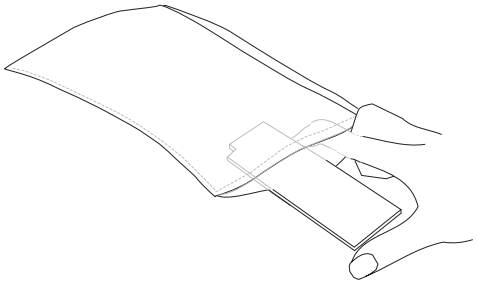
The following figure shows the location of the eight memory-module slots in the Model 240.



2. Remove any adapters that are blocking the memory-module connectors (see “Adapter” on page 5-17)
3. Remove the memory module by first pushing out the locking tabs, then carefully pulling upward on the memory module.



4. Store any memory modules you are no longer using in a static-protective package.

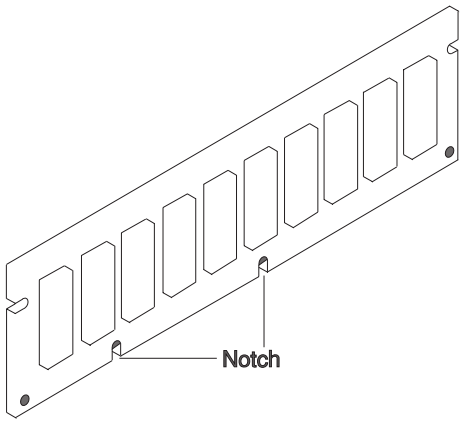


5. Install any adapters you removed into their original connectors. If you need further information on installing adapters, see “Adapter” on page 5-17

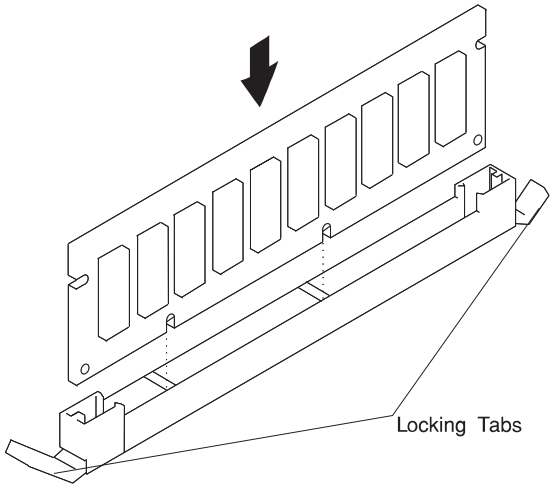
Replacement

Note: When installing memory module, install the new modules into the first available connector, starting at slot A (DIMM 0). Memory modules for the Model 240 must be installed in identical pairs (size and speed).

1. The memory modules are keyed so that they can only be inserted one way. Align the memory module notches with the keys in the memory connector.



2. Insert the memory module into the next unused memory connector. Push down on the memory module until the latch tabs lock the memory module into the connector. (Do not attempt to move the latch tabs yourself. They will lock automatically when you have fully inserted the memory module.)



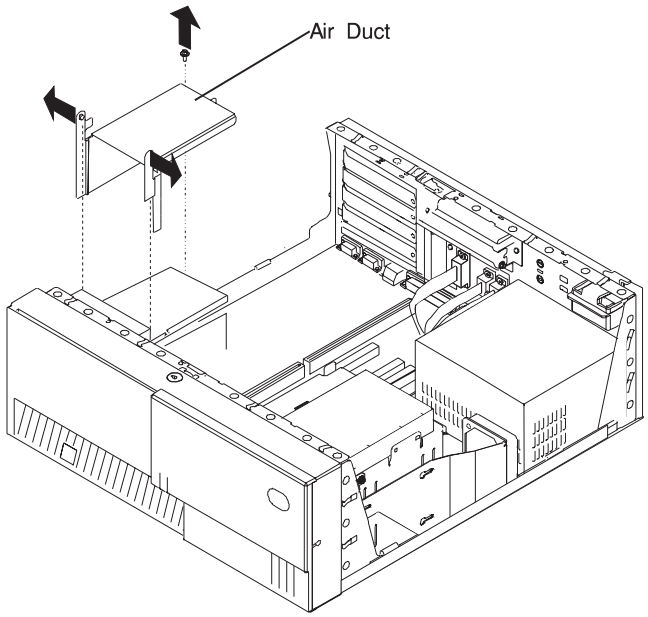
Warning: Inserting the memory module at an angle may cause damage.

3. Inspect each memory module and ensure the gold connector is fully inserted in the socket.
4. Reinstall any adapters you removed into their original connectors. (If you need further information for installing adapters, see “Adapter” on page 5-17).

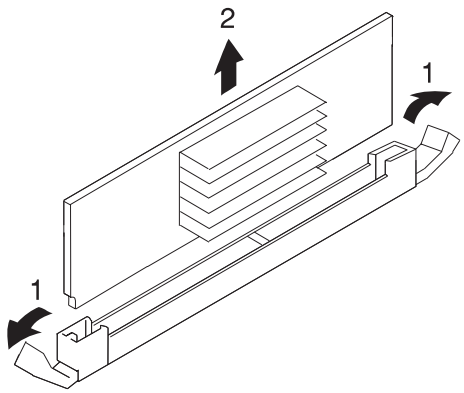
Processor Card (for the Model 240)

Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 5-3.
2. Do the removal procedure under “Adapter” on page 5-17 as necessary.
3. Remove the screw that holds the air duct to the system board.
4. Spread the arms on the air duct and remove it from the system.



5. Push down the latches on the processor card connector to release the processor card, and lift the card straight up and out of the system unit.



Replacement

Replace in reverse order.

Note: If more than one processor card is installed, both must be of the same speed and type.

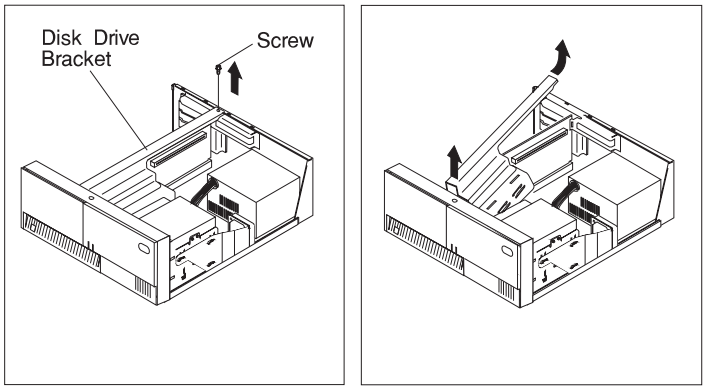
Notes:

1. Do not push on the heatsink while installing or removing a processor card. This could damage the processor.
2. Make sure to push down on the processor card until the latch tabs lock the processor card in place.

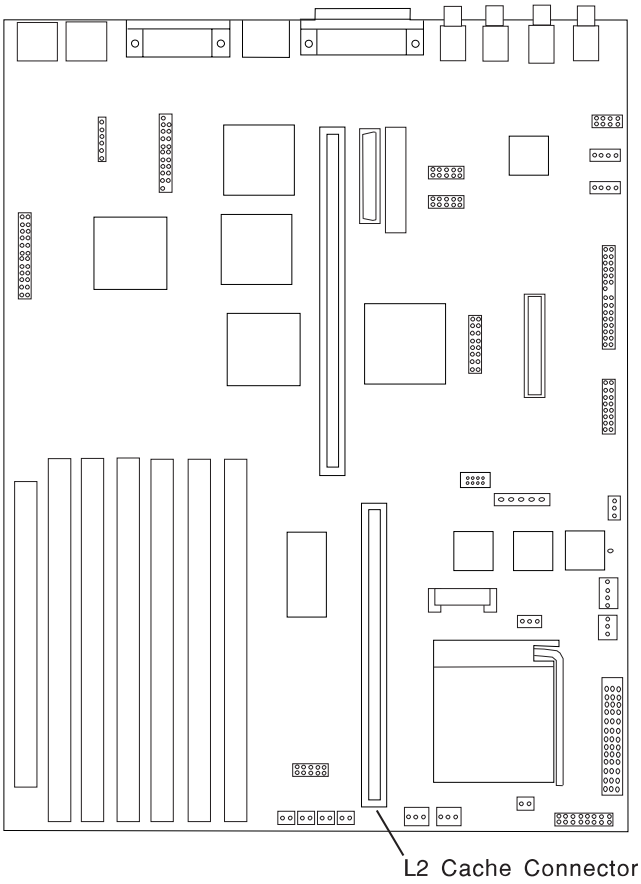
L2 Cache Card (for Model 140 Only)

Removal

1. Remove the disk drive bracket assembly from the system unit and carefully place it on top of the power supply.



2. Locate the L2 cache connector on the system board.



3. Gently pull upward on the L2 cache card, remove it from the system unit, and store it in a safe place.

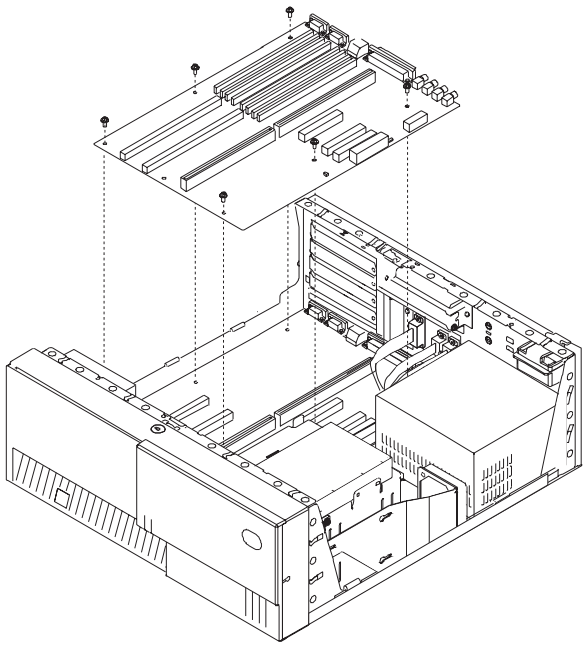
Replacement

Replace in the reverse order.

System Board

Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 5-3.
2. Do the removal procedure under “Adapter” on page 5-17.
3. Do the removal procedure under “Riser Card” on page 5-29.
4. Disconnect all cables from the system board.
5. Do the removal procedure under “Memory Modules” on page 5-18.
6. Do the removal procedure under “Processor Card (for the Model 240)” on page 5-22.
7. Remove the screws from the system board.



8. Lift the system board out of the system unit.

Replacement

Replace in reverse order.

Notes:

1. The jumpers on the new system board should be set to match the board being replaced.
2. Licensed programs frequently rely on network configuration or system board information to authorize program use. Notify the system owner that new keys for licensed programs may be required.
3. The network administrator must be notified so that the client IP addresses used by the server may be changed.
4. Because some applications use the date upon system startup, the date should be reset immediately by doing the following:
   a. Boot the system unit in Service Mode by pressing the 5 or F5 key after the keyboard symbol appears during startup.
   b. Enter the Service Aid menu, and select the AIX temporary shell.
   c. Use smitty to set the time and date.
   d. Shut down and restart the system unit.

For the Model 140, note the following cables must be reattached.

Location	Description
J7, J8	System Board Power Supply
J16	Diskette Drive Signal Cable
J5	CD-ROM Audio
J33	Internal SCSI
J27	System Fan
J30	System Fan
J40	Power Switch
J42	Power Indicator LED
J43	Disk Drive activity LED
J46	Speaker
J24	Serial Port 1
J23	Serial Port 2
J50	Ethernet AUI
J25	Tablet
J41	Operator Panel
J2	System Board auxiliary voltage power supply
J10	Media Fan power cable

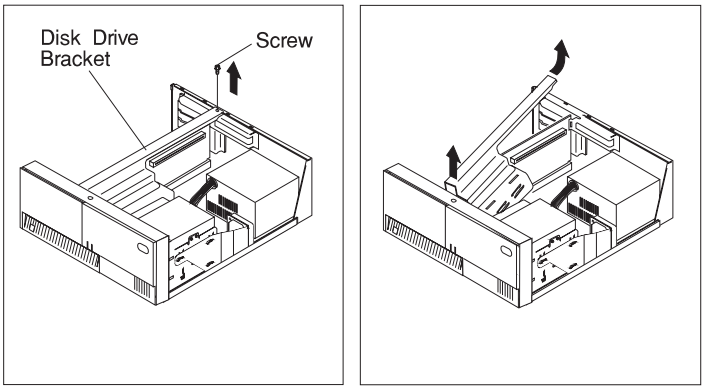
For the Model 240, note the following cables must be reattached.

Location	Description
J27, J30, J33	System Board Power Supply
J26	Diskette Drive Signal Cable
J15	CD-ROM Audio
J38, J10	Internal SCSI (16-bit)
J31	Power Switch
J44	Power Indicator LED
J44	Disk Drive activity LED
J41	Speaker
J14	Serial Port 1
J13	Serial Port 2
J34	Ethernet AUI
J7	Tablet (on riser card)
J5	Operator panel (on riser card)
J42, J43	Front fan
J40	Media fan

Riser Card

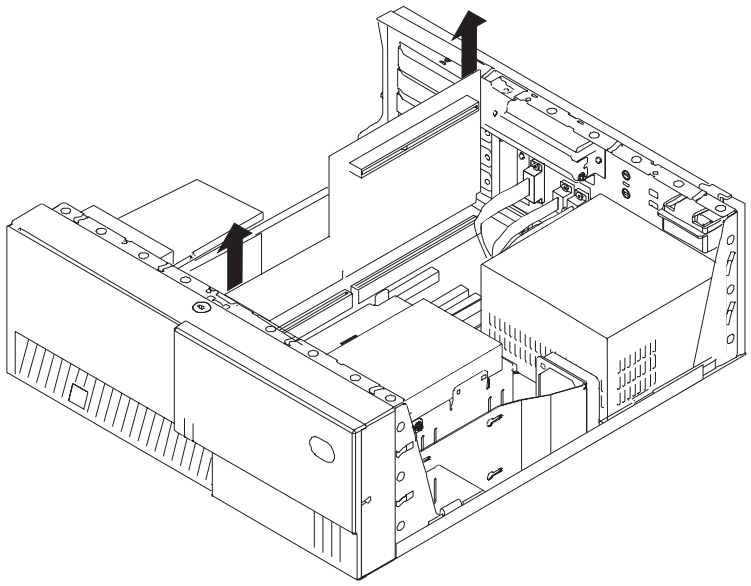
Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 5-3.
2. Remove all adapters; see “Adapter” on page 5-17.
3. Remove the drive bracket assembly and carefully lay it on the power supply.



4. Disconnect all cables attached to the riser card.

5. Pull the riser card straight up and out of the system unit. (The Model 240 is shown in the following illustration.)



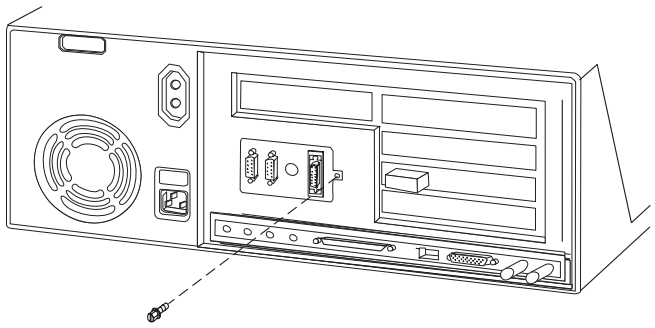
Replacement

Replace in reverse order.

I/O Panel

Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 5-3.
2. Disconnect the following cables from the system board:
   - Serial Port 1
   - Serial Port 2
   - Tablet Port (2 connectors in some Model 140 systems)
   - Ethernet AUI
3. Remove the screw securing the I/O panel to the rear of the chassis.



Replacement

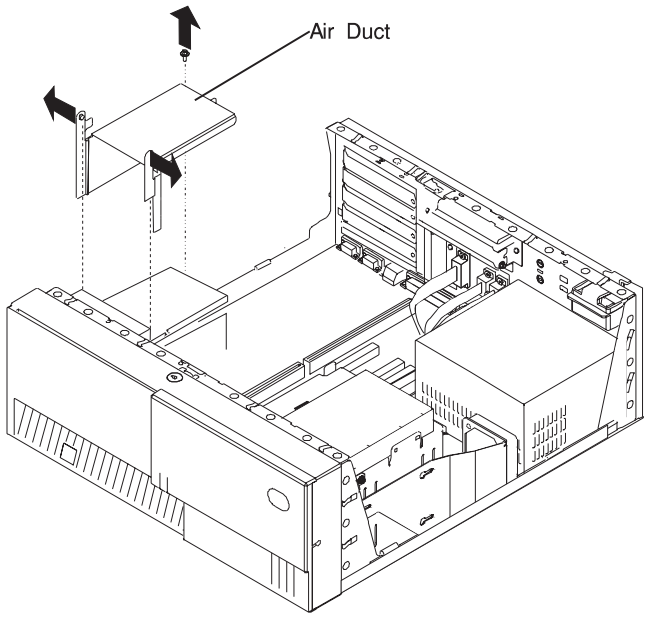
Replace in the reverse order.

If the replacement I/O panel has a second connector on the tablet cable, refer to “System Board Locations (for Model 140)” on page 1-6 for the connector locations.

Fan and Speaker Assembly

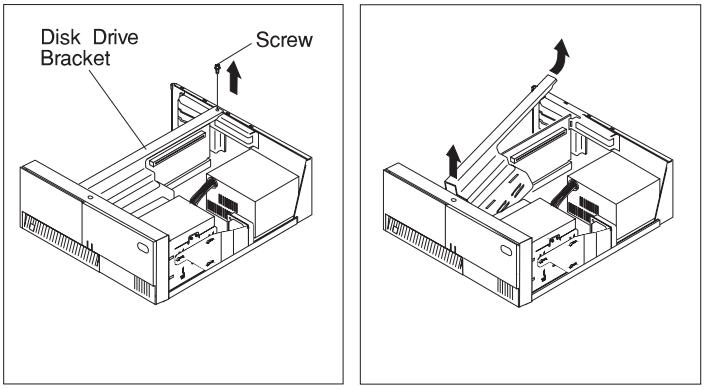
Removal

1. Do the cover removal procedure in “Cover” on page 5-3.
2. For the Model 240:
   - Remove the screw that holds the air duct to the system board.
   - Spread the arms on the air duct enough to disengage them from the mounting pins and remove it from the system unit.

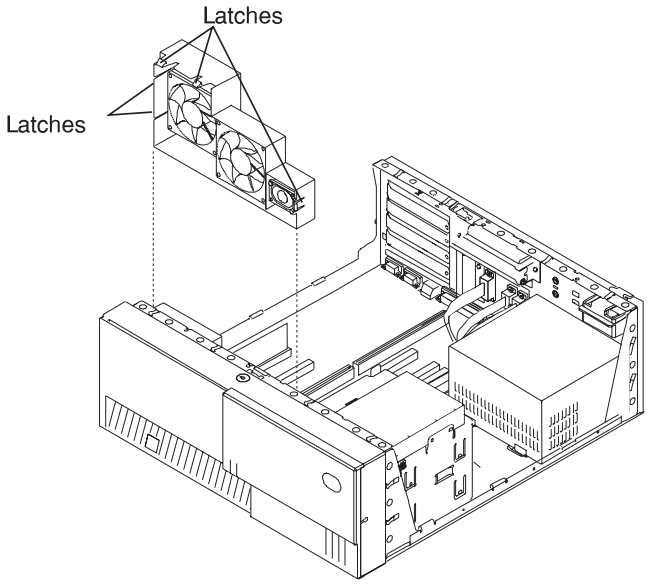


3. Do the removal procedure under “Adapter” on page 5-17 if any installed adapters are long enough to interfere with the fan and speaker assembly.

4. For the Model 240, do the procedure in “Processor Card (for the Model 240)” on page 5-22.
5. Remove the drive bracket assembly and carefully lay it on top of the power supply.



6. Disconnect the fan and speaker assembly cables from the system board.
7. Starting with the latch on the right side of the fan and speaker assembly, press the latches to release the fan and speaker assembly and lift it up and out of the system unit.



Replacement

Replace in reverse order.

Battery

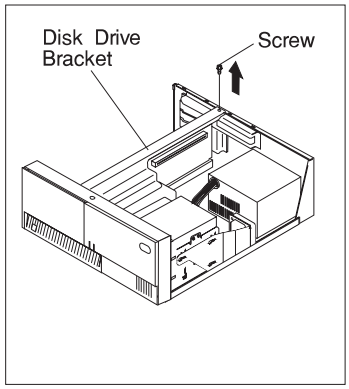
CAUTION:
A lithium battery can cause fire, explosion, or a severe burn. Do not recharge, disassemble, heat above 100°C (212°F), solder directly to the cell, incinerate, or expose cell contents to water. Keep away from children. Replace only with the part number specified for for your system. Use of another battery may present a risk of fire or explosion.

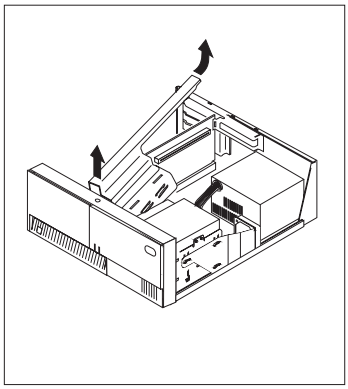
The battery connector is polarized; do not attempt to reverse the polarity.

Dispose of the battery according to local regulations.

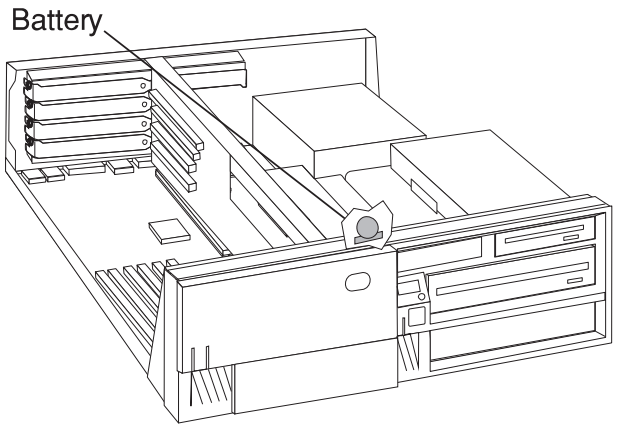
Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 5-3.
2. For the Model 140:
   a. Remove the disk drive bracket assembly from the system unit and carefully place it on top of the power supply.

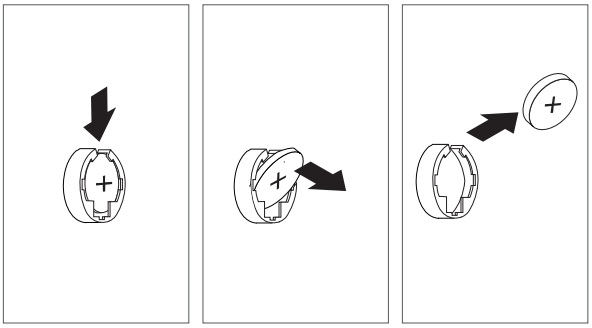




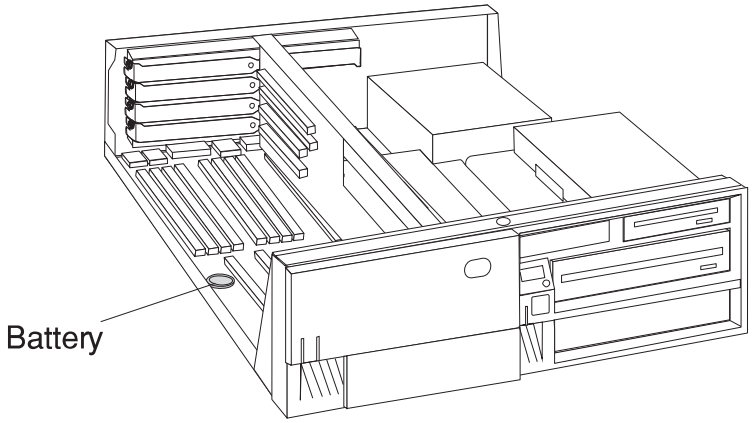
b. The following figure shows the location of the battery in the Model 140.



c. Remove the battery as shown.

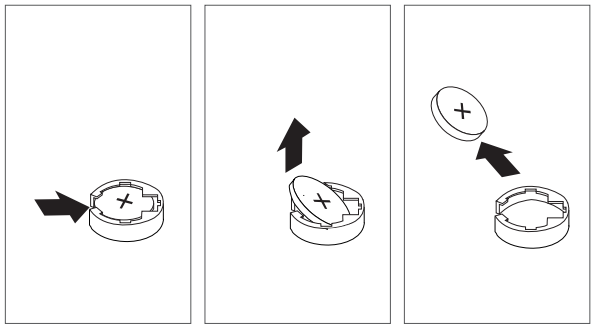


3. For the Model 240.



a. If adapters must be removed in order to reach the battery, refer to “Adapter” on page 5-17.

b. Remove the battery as shown.



Replacement

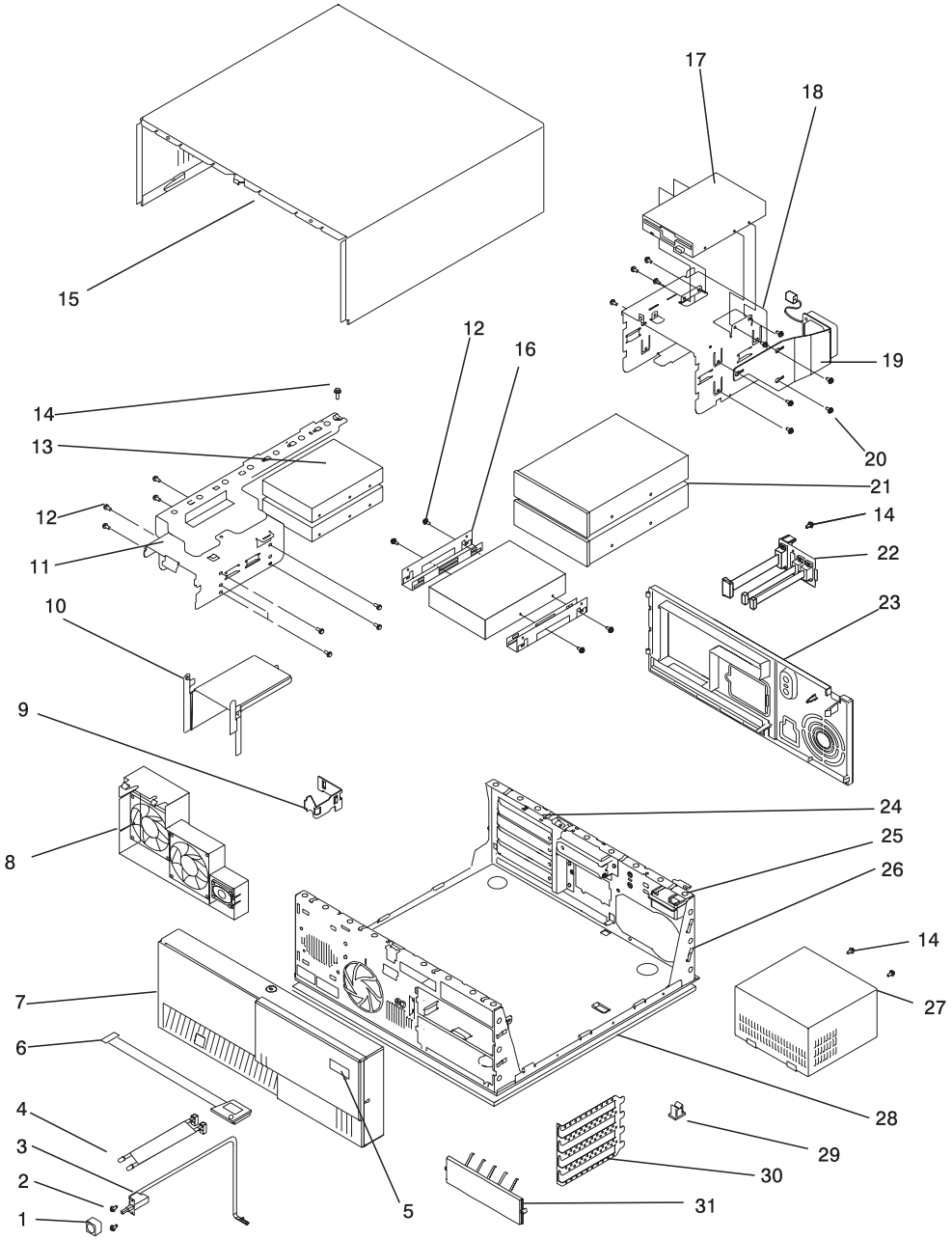
Install the new battery in the reverse order.

Note: Skin oils can cause corrosion and loss of battery contact if left on the battery for long periods of time. Using a paper tissue when changing the battery minimizes skin contact with the battery and can preserve proper battery function.

ATTENTION: Replacing the battery may erase the Power-on Password, the current time and date, the customized boot list, and any other customized configuration information. After changing the battery, these values must be reset using the System Management Services and the operating system.

Chapter 6. Parts Information

System Unit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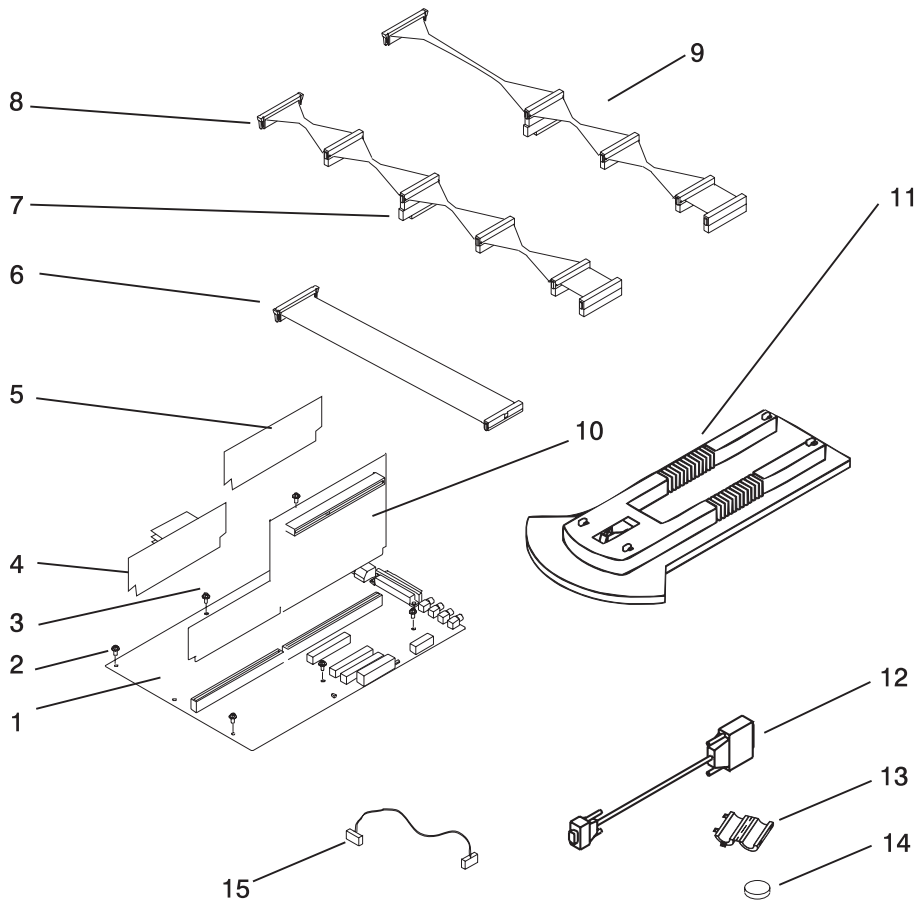
Index Number	FRU Number	Units Per Assy	Description
1	11H6764	1	Power Button
2	33G3907	2	Screw
3	73H0438	1	Power Switch Assembly
4	93H9162	1	Power-On and Disk Activity Light Assembly
5	94H0550	1	Logo
6	73H3766	1	Operator Panel Circuit Assembly
7	07L6776	1	Front Bezel, Keylock, Keys (without Operator Panel)
8	40H7584	1	Fan and Speaker Assembly (Model 140)
	93H1820	1	Fan and Speaker Assembly (Model 240)
9	93H1819	1	Operator Panel Bracket
10	11H9747	1	Air flow baffle (Model 240 Only)
11	**See Note 1**	1	Disk Drive Bracket
12	40H7603	1-24	Screw, #6-32 (Disk Drive)
13	**See Note 2**	1-2	Disk Drive
14	27F4212	24	Screw, M3.5
15	**See Note 1**	1	Top Cover Assembly
16	88G2216	1	3.5-inch Disk Drive Mounting Brackets
17	93F2361	1	Diskette Drive
18	**See Note 1**	1	Media Drive Bracket
19	93H1817	1	Media Fan Assembly
20	33G3907	12	Screw, M3 (Media Drive)
21	**See Note 2**	1-2	Disk Drives or removable-media drives
22	93H5982	1	Cable and Bracket Assembly (Model 140)
	73H3765	1	Cable and Bracket Assembly (Model 240)
23	06H8488	1	Rear Panel
24	**See Note 1**	1	PCI/ISA Bulkhead
25	06H6706	1	Top Cover Latch
26	**See Note 1**	1	Chassis
27	40H7563	1	Power Supply without Power Factor Correction
	40H7566	1	Power Supply with Power Factor Correction
28	**See Note 1**	1	Bottom Panel
29	93H4574	5	Cable Tie (Adhesive Base)
30	**See Note 1**	1	4-slot EMC shield
31	12H0649	1	Bay Panel

Notes:

1. This part is included in the Cover Assembly FRU 40H5854 for the Model 140, or Cover Assembly FRU 93H3509 for the Model 240.
2. See the documentation for the specific device, or refer to the *Adapters, Devices, and Cable Information for Multiple Bus Systems*.

System Board, Cables, and Accessories



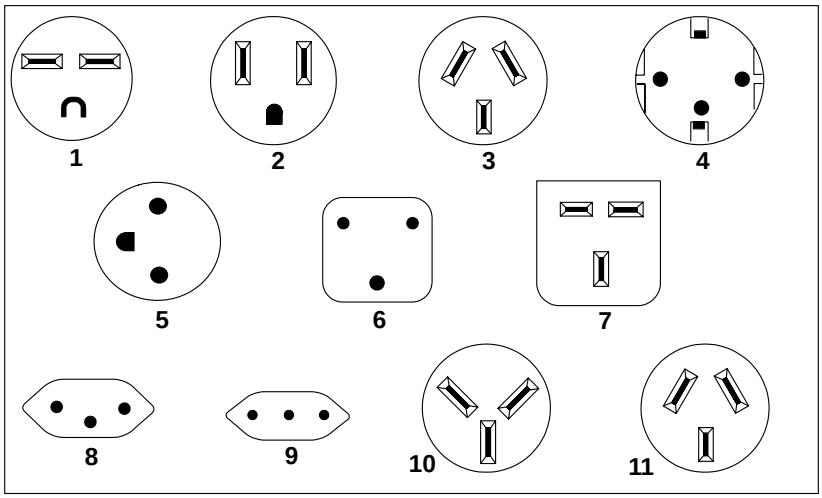
Index Number	FRU Number	Units Per Assy	Description
1	93H7142	1	System Board 166-MHz (Model 140)
	93H7143	1	System Board 200-MHz (Model 140)
	93H6022	1	System Board 233-MHz (Model 140)
	93H9334	1	System Board 332-MHz (Model 140)
	11H7516	1	System Board (Model 240)
2	40H7603	6	Screw
3	39H8697	1	Hex Standoff
4	11H7517	1	166MHz Processor and Cache Card (Model 240 Only)
	93H5163	1	233MHz Processor and Cache Card (Model 240 Only)
	75H5462	1	512KB L2 Cache Card (Model 140 Only)
	75H5463	1	1MB L2 Cache Card (Model 140 Only)
5	42H2772	1-6 (Model 140), 2-8 (Model 240)	16MB DIMM
	42H2773	1-6 (Model 140), 2-8 (Model 240)	32MB DIMM
	42H2774	1-6 (Model 140) 2-8 (Model 240)	64MB DIMM
	93H6823	1-6 (Model 140)	128MB DIMM (Model 140)
	93H6822	2-8 (Model 240)	128MB DIMM (Model 240)
6	93H1821	1	Diskette Cable Assembly
7	92F2565	1	Interposer
8	73H0435	1	SCSI Cable Assembly (Model 140)
	40H7572	1	SCSI Cable Assembly (Model 240)
9	93H6151	1	Ultra SCSI Cable Assembly (Optional)
10	73H4532	1	Riser Card (Model 140)
	73H3712	1	Riser Card (Model 240)
11	11H6955	1	Vertical Stand
12	40H6328	2	9-pin to 25-pin Serial Port Converters
13	11H2168	1	Display Cable Toroid Kit
14	15F8409	1	Battery
15	65G8850	1	CD-ROM drive audio cable

Note: Model 240 memory modules must be installed in groups of matched pairs.

Keyboard and Mouse

Index Number	Part Number	Units Per Assy	Description
1	8131596	1	Keyboard, Arabic
	1391414	1	Keyboard, Belgian Dutch
	1391526	1	Keyboard, Belgian French
	64F7707	1	Keyboard, Brazilian Portuguese
	1399583	1	Keyboard, Bulgarian
	82G3279	1	Keyboard, Canadian French
	82G2383	1	Keyboard, Chinese Traditional
	1399570	1	Keyboard, Czechoslovakian
	1931407	1	Keyboard, Danish
	1391511	1	Keyboard, Dutch
	1391402	1	Keyboard, French
	1391403	1	Keyboard, German/Austrian
	1399046	1	Keyboard, Greek
	1391408	1	Keyboard, Hebrew
	1399581	1	Keyboard, Hungarian
	1391407	1	Keyboard, Icelandic
	1393395	1	Keyboard, Italian
	66G0507	2	Keyboard, Japanese
	52G9658	1	Keyboard, Korean
	82G3292	1	Keyboard, Latin American Spanish
	1391409	1	Keyboard, Norwegian
	1399580	1	Keyboard, Polish
	1391410	1	Keyboard, Portuguese
	1399582	1	Keyboard, Romanian
	1399579	1	Keyboard, Russian
	1399571	1	Keyboard, Slovak
	1391405	1	Keyboard, Spanish
	1391411	1	Keyboard, Swedish/Finnish
	1391412	1	Keyboard, Swiss
	82G2383	1	Keyboard, Traditional Chinese
	1393286	1	Keyboard, Turkish, #179
	8125409	1	Keyboard, Turkish, #440
	1391406	1	Keyboard, UK English, #166
	82G3295	1	Keyboard, US English, #103P
2	8185429	1	Three-button Mouse

Power Cables



Index	Part Number	Country
1	1838574	Bahamas, Barbados, Bolivia, Brazil, Canada, Costa Rica, Dominican Republic, El Salvador, Ecuador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Netherlands Antilles, Panama, Peru, Philippines, Taiwan, Thailand, Trinidad, Tobago, U.S.A. (except Chicago), Venezuela
2	6952300	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Puerto Rico, Saudi Arabia, Suriname, Trinidad, Taiwan, U.S.A. (except Chicago), Venezuela
2	62X0663	Chicago, U.S.A., stackable
3	6952311	Argentina, Australia, New Zealand
4	13F9979	Abu Dhabi, Austria, Belgium, Bulgaria, Botswana, Egypt, Finland, France, Germany, Greece, Iceland, Indonesia, Korea (South), Lebanon, Luxembourg, Macau, Netherlands, Norway, Portugal, Saudi Arabia, Spain, Sudan, Sweden, Turkey, Yugoslavia
5	13F9997	Denmark
6	14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka
7	14F0033	Bahrain, Bermuda, Brunei, Channel Islands, Cyprus, Ghana, Hong Kong, India, Iraq, Ireland, Jordan, Kenya, Kuwait, Malawi, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Arab Emirates (Dubai), United Kingdom, Zambia

Index	Part Number	Country
8	14F0051	Liechtenstein, Switzerland
9	14F0069	Chile, Ethiopia, Italy
10	14F0087	Israel
11	6952291	Paraguay, Colombia, Uruguay

Index

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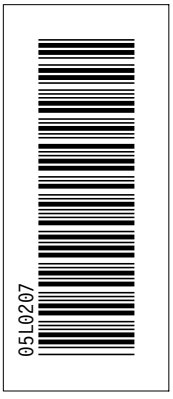

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Models 140 and 240
Service Guide