RS/6000 7043 43P Series



Service Guide

SA38-0512-03

Fourth Edition (October 1998)

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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, Model 150, and Model 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
New 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、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
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:

2-15
8-1
8-6

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:

xii
2-15
8-1
8-36

Laser Safety Information

The optical drive in this system unit 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 this system unit 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 0.14 milliwatts 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.

Environmental Notices

Product Recycling and Disposal

Components of the system unit, such as structural parts and circuit cards, can be recycled where recycling facilities exist. Companies are available to disassemble, reutilize, recycle, or dispose of electronic products. Contact your account representative for more information. This system unit contains batteries and circuit boards with lead solder. Before you dispose of this unit, these batteries and circuit boards must be removed and discarded according to local regulations or recycled where facilities exist. This book contains specific information on each battery type where applicable.

Battery Return Program

In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM batteries and battery packs. For information on proper disposal of the batteries in this unit, please contact IBM at 1-800-426-4333. Please have the IBM part number that is listed on the battery available when you make your call. For information on battery disposal outside the United States, contact your local waste disposal facility.

Environmental Design

The environmental efforts that have gone into the design of this system signifies IBM's commitment to improve the quality of its products and processes. Some of these accomplishments include the elimination of the use of Class I ozone-depleting chemicals in the manufacturing process and reductions in manufacturing wastes. For more information, contact an IBM account representative.

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 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 User's Guide*, order number SA38-0511, provides information about installing options, system operation, and running diagnostics.

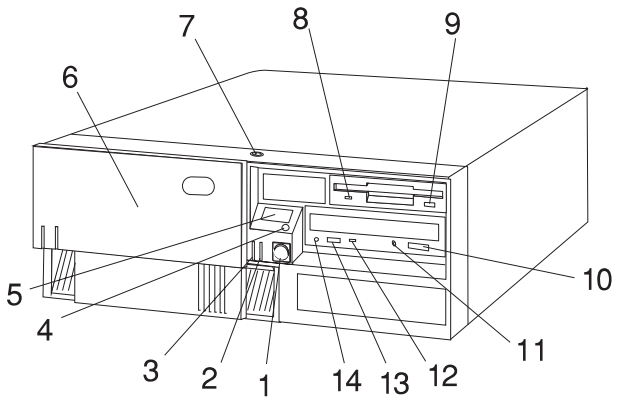
Trademarks

AIX is a registered trademark of International Business Machines Corporation.

PowerPC is a trademark of International Business Machines Corporation.

Chapter 1. Reference Information

Front View



1 Power Switch: Turns system unit power on and off.

2 Power-On Light: Glows when system unit is on.

3 Hard Disk Drive Status Light: Glows when system unit 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 Status Light: Glows when system unit 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.

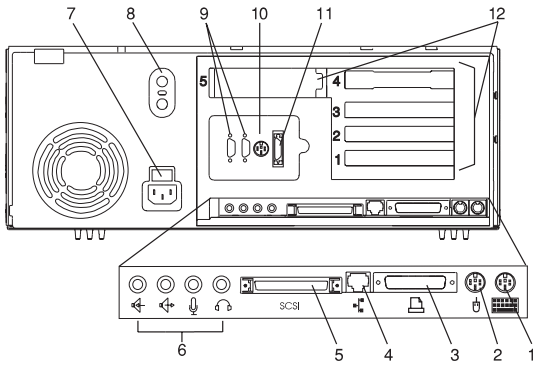
11 CD-ROM Emergency Eject: Ejects CD-ROM from the CD-ROM drive if power is not available.

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



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 Ethernet Port (🖧): For attaching your system unit to an Ethernet/Twisted pair connection through a 10 Base T or 100/10 Base T connector. (Model 140 and Model 240 uses 10 Base T; Model 150 uses 100/10 Base T.)

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

6 Audio Ports:

- 🎧 Headphone
- 🎙 Microphone
- Audio line out
- Audio line in

7 Voltage-Selection Switch (Model 140 and Model 240 only): Select either 115-V or 230-V setting. Voltage selection is not needed on Model 150 as it uses an autoranging power supply.

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

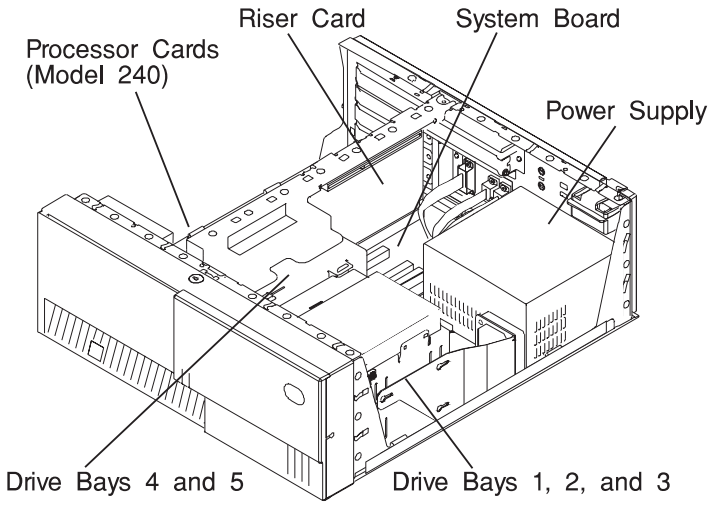
9 9-Pin Serial Ports (1 and 2): For a TTY terminal, Modem, or other serial devices.

10 Tablet Port (🖊): For attaching a digitizing tablet to your system unit.

11 Ethernet Port (🖧): For attaching your system unit to an Ethernet thick connection (or Ethernet thin connection, using an optional transceiver) through a 10 Base 5 or 100/10 Base 5 connector. (Model 140 and Model 240 uses 10 Base 5; Model 240 uses 100/10 Base 5.)

12 Expansion Slots: For adding ISA and PCI adapters.

Front View without Covers



Specifications (for Model 140, Model 150, and Model 240)

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)

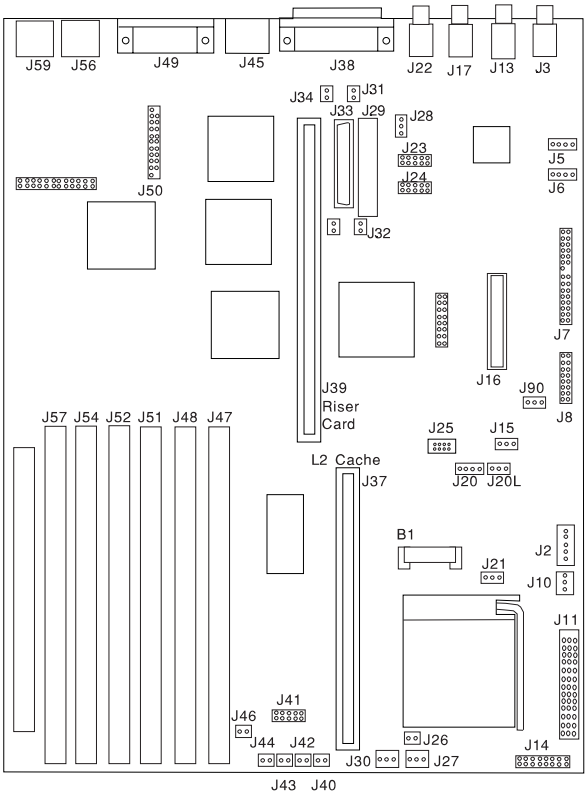
Operating 796 BTUs per hour

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)



B1 Battery connector

J2 Auxiliary 5V connector

J3 Audio input connector

J5 CD-ROM audio connector

J6 CD-ROM audio connector

J7 Power connector

J8 Power connector

J10 Media Fan connector

J11 Voltage Regulator Card connector

J13 Audio output connector

J15 Remote Power-up Jumper

J16 Diskette drive connector

J17 Microphone jack

J20 Tablet port connector

J20L Tablet port connector

J21 Privileged-Access Password jumper

J22 Headphone jack

J23 Serial port connector 2

J24 Serial port connector 1

J25 Tablet port connector

J28 SCSI security jumper

J29 Internal SCSI 8-bit connector (not supported)

J33 Internal SCSI 16-bit connector

J37 L2 Cache Card connector

J38 External SCSI connector

J39 Riser card connector

J41 Operator Panel Connector

J45 Ethernet twisted pair connector

J47 Memory connector A

J48 Memory connector B

J49 Parallel port connector

J50 Ethernet AUI

J51 Memory connector C

J52 Memory connector D

J54 Memory connector E

J56 Mouse port connector

J57 Memory connector F

J59 Keyboard port connector

J90 Power-On Password jumper

J31 SCSI security jumper

J32 SCSI security jumper

J34 SCSI security jumper

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

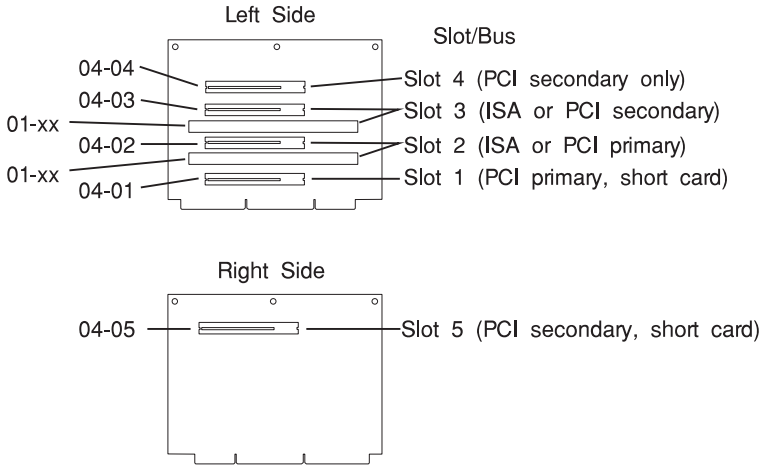
J46 Internal Speaker connector

Model 140 System Board Jumper Settings

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

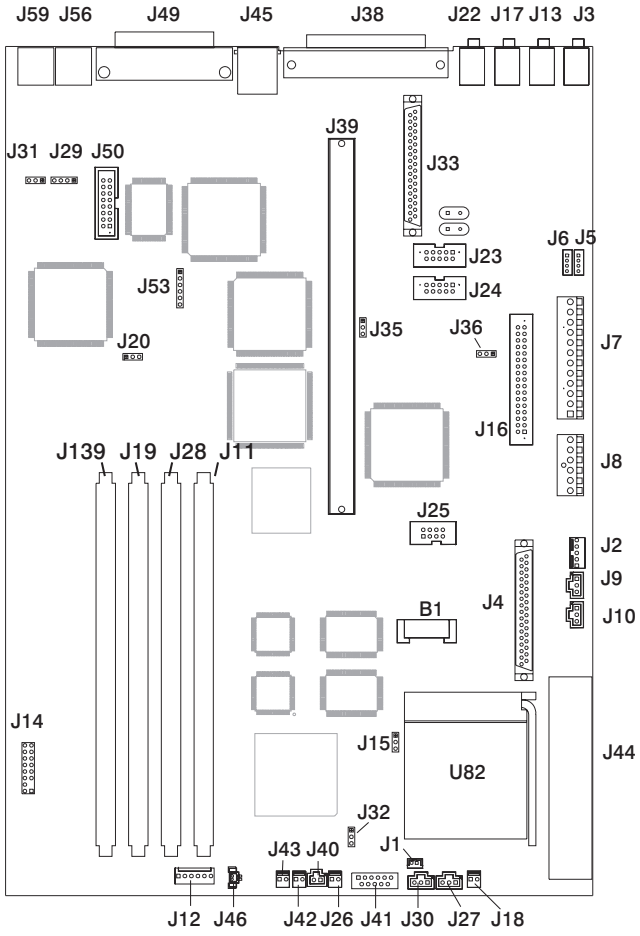
Jumper	Description	Settings
J15	Remote power-up	Default: Remote power-up disabled. To enable Remote power-up, place jumper on two leftmost pins.
J21	Privileged-Access Password	Default: disabled. To enable the writing or changing of the privileged-access password, place jumper on the two leftmost pins.
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 (for Model 140)



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

System Board Locations (for Model 150)



B1 Battery connector

J2 5x5 Auxiliary 5v connector

J3 Audio input connector

J4 Internal SCSI connector #2

J5 CD-ROM audio connector

J6 CD-ROM audio connector

J7 Power connector

J8 Power connector

J10 Media Fan connector

J11 Memory Connector 1

J13 Audio output connector

J15 Remote Power-up Jumper

J16 Diskette drive connector

J17 Microphone jack

J18 Reset Connector

J19 Memory Connector 3

J20 Power-on Password jumper

J22 Headphone jack

J23 Serial port connector 2

J24 Serial port connector 1

J25 Tablet port connector

J26 CPU fansink connector

J27 System fan connector

J28 Memory Connector 2

J30 System fan connector

J32 Priviliged-Access Password jumper

J33 Internal SCSI 16-bit connector

J35 SCSI security jumper

J36 SCSI security jumper

J38 External SCSI connector

J39 Riser card connector

J40 Power Switch connector

J41 Op Panel Connector

J42 Power Indicator LED connector

J43 Hard disk activity LED connector

J44 Voltage Regulator connector

J45 Ethernet twisted pair connector

J46 Internal Speaker connector

J49 Parallel port connector

J50 Ethernet AUI

J53 Ethernet EPROM connector

J56 Mouse port connector

J59 Keyboard port connector

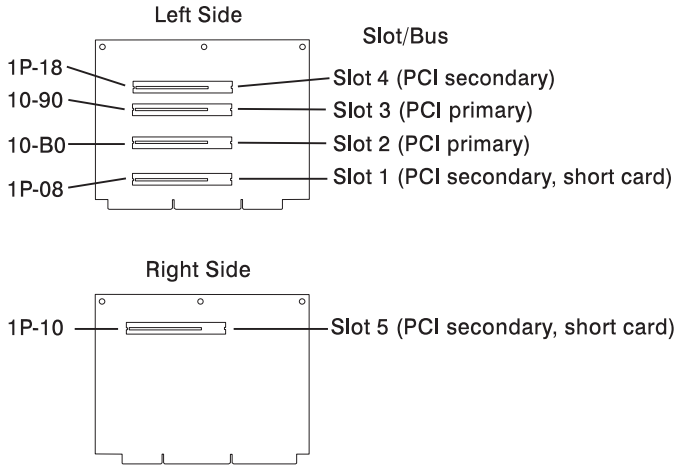
J139 Memory Connector 4

System Board Jumper Settings (for Model 150)

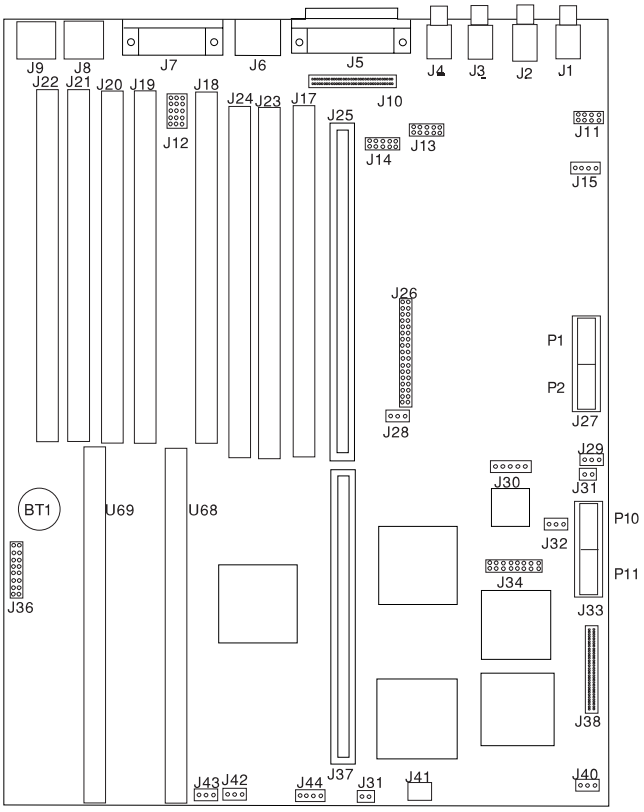
For a more complete description of the function of these jumpers, see the system unit ***User's Guide***.

Jumper	Description	Settings
J15	Remote Power-up	Default: Remote power-up disabled. To enable Remote power-up, place jumper on the two pins closest to the rear of the system unit.
J32	Privileged-Access Password	Default: disabled. To enable the writing or changing of the privileged-access password, place jumper on the two pins closest to the rear of the system unit.
J35, J36	SCSI Security	Default: external SCSI enabled To disable external SCSI connector, move the jumper on J35 to the front two pins, and the jumper on J36 to the right two pins.
J20	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 (for Model 150)



System Board Locations (for 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

J12 SCSI security jumpers

J13 Serial port 2 connector

J14 Serial port 1 connector

J15 CD-ROM audio connector

J17 Memory connector H (DIMM 7)

J18 Memory connector E (DIMM 4)

J19 Memory connector D (DIMM 3)

J20 Memory connector C (DIMM 2)

J21 Memory connector B (DIMM 1)

J22 Memory connector A (DIMM 0)

J23 Memory connector G (DIMM 6)

J24 Memory connector F (DIMM 5)

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 Remote 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

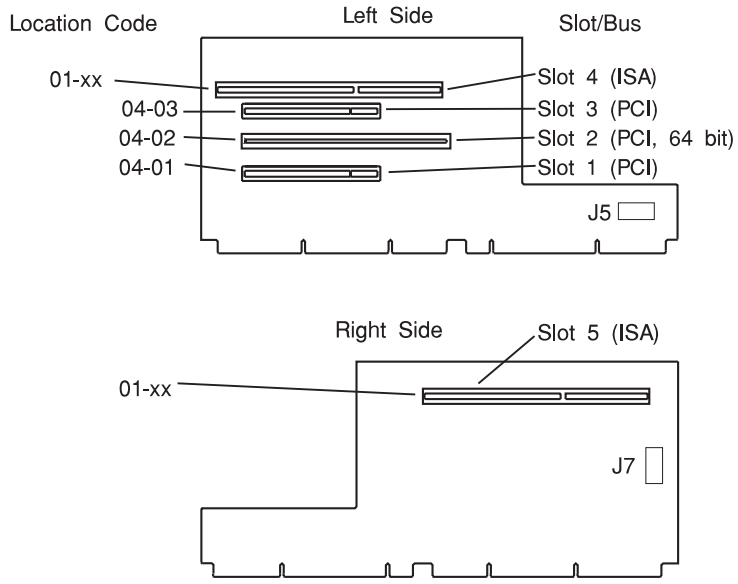
U68 Microprocessor Connector 1

System Board Jumper Settings (for Model 240)

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

Jumper	Description	Settings
J29	Remote power-up	Default: Remote power-up disabled. To enable Remote 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 (for 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

The Model 140 and Model 240 have 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 9, “Parts Information” on page 9-1 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 (Model 140 and M240. only.)
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)

This chapter contains Maintenance Analysis Procedures (MAPs) for the Model 140, Model 150, and Model 240.

Entry MAP

Notes:

1. When possible, run Online Diagnostics in Service Mode. Online Diagnostics perform additional functions, compared to Standalone Diagnostics. This ensures that the error state of the system is captured in NVRAM for your use in fixing the problem. The AIX error log and SMIT are only available when diagnostics are run from the hard drive.
2. Licensed programs frequently rely on either network configuration, vital product data (VPD) stored on the operator panel control assembly, or system board information to authorize program use. If the MAPs indicate that the network adapter, operator panel, or system board should be replaced, notify the system owner that new keys for licensed programs may be required.
3. 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, and any client or server that addresses this system should be updated. After completing the recommended actions in this chapter, go to "MAP 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*.

Quick Entry MAP

Use the following table to determine your starting point in the Entry Map.

Quick Entry MAP Table of Contents

Problem Description	Page No.
Service Actions	2-2
System Stops or Hangs with Alternating Numbers Displayed in the Operator Panel Display	2-2
System Stops With an Error or Checkpoint Code Displayed	2-2
There Appears to be a Display Problem (Distortion, Blurring, etc.)	2-3
Power and Cooling Problems	2-4
Other Symptoms or Problems	2-4
You Cannot Find the Symptom in this Table	2-6

Use the following table to determine your starting point.

Symptom	Action
Service Actions	
You have parts to exchange or a corrective action to perform.	1. Go to Chapter 8, “Removal and Replacement Procedures” on page 8-1. 2. Go to "MAP 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*.
You need to verify that a part exchange or corrective action corrected the problem.	Go to "MAP 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*.
You need to verify correct system operation.	Go to "MAP 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*.
System Stops or hangs with alternating numbers displayed in the Operator Panel display.	
The Operator Panel display alternates between the code "E1FD" and another "Exxx" code.	Record both codes. Go to the entry for "E1FD" on page 4-23.
The Operator Panel display alternates between the codes "E1DE" and "E1AD".	Record the error codes. Go to the entry for "E1DE" on page 4-21,
System Stops With an Error or Checkpoint Code Displayed	
The system stops and an 8-digit error code starting with the character "M" is displayed.	Record the error code. Go to “POST Error Codes” on page 3-2.

Symptom	Action
The system stops and an 8-digit error code starting with the number "2" is displayed.	Record the error code. If you are working on a Model 140 or Model 240, go to “Firmware Error Codes” on page 3-4. If you are working on a Model 150, go to “Error Codes” on page 4-1.
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 2-21.
The system stops and a 4digit number beginning with the character "E" is displayed in the operator panel display.	Record the code. Go to “Firmware Checkpoints” on page 4-13.
The system stops and a 4digit number not beginning with neither the characters "FF" or "E" is displayed in the operator panel display.	Record SRN 101xxx, where xxx is the last three digits of the fourdigit number displayed, then go to the "Fast Path MAP" in the *Diagnostics Information for Multiple Bus Systems*. **Note:** If the operator panel displays 2 sets of numbers, use the bottom set of numbers as the error code.
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 2-21. Record SRN 101-xxx, where xxx is the 3-digit number displayed in the operator panel display, then go to the "Fast Path MAP" in the *Diagnostics Information for Multiple Bus Systems*.
888 is displayed in the control panel followed by additional error codes.	Go to the Fast Path MAP in the *Diagnostics Information for Multiple Bus Systems*.
There Appears to be a Display Problem (Blank, Distortion, Blurring, Etc.)	

Symptom	Action
All display problems.	1. If using a graphics display: a. Go to the Problem Determination Procedures for the display. b. If you do not locate the problem, replace the display adapter. c. If you do not locate the problem, suspect the systm board. Go to “MAP 1540: Minimum Configuration” on page 2-21. 2. If using an ASCII terminal: Make sure that the ASCII terminal is connected to S1. a. If the problems persist, go to the Problem Determination Procedures for the terminal. b. If you do not locate the problem, suspect the system board. Go to “MAP 1540: Minimum Configuration” on page 2-21.
Power and Cooling Problems	
The power LEDs on the operator panel and power supply do not start flashing within 30 seconds of A/C power application.	Go to “MAP 1520: Power” on page 2-15.
The power LEDs on the operator panel and power supply do not come on or stay on.	Go to “MAP 1520: Power” on page 2-15.
The power LED on the operator panel comes on and the system powers on automatically when A/C power is applied.	Automatic power-up is a feature on all models of the 7043 43P series. Refer to the System Board Jumper Settings for your model in Chapter 1 for the correct settings. If the jumper is set in the disabled position, replace the system board,
The power LEDs on the operator panel come on and stay on but the system does not power on.	Go to “MAP 1520: Power” on page 2-15.
The cooling fan(s) do not come on or come on but do not stay on.	Go to “MAP 1520: Power” on page 2-15.
Other Symptoms or Problems	
You do not have a determined symptom.	Go to “MAP 1020: Problem Determination” on page 2-7.

Symptom	Action
The system POST indicators are displayed on the system console, the system pauses and then then restarts. The term "POST indicators" refer to the icons (graphic display) or device mnemonics (ASCII terminal) that appear during the poweron selftest (POST).	If you are working on a Model 140 or Model 240, go to “Fxx Code Boot Problems” on page 3-18. If you are working on a Model 150, go to “Boot Problems/Concerns” on page 4-27.
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).	Go to “MAP 1540: Minimum Configuration” on page 2-21. to isolate the problem.
The system stops and the message "STARTING SOFTWARE PLEASE WAIT..." is displayed on the ASCII terminal, or the boot indicator () is displayed on a graphics terminal.	Go to “Firmware Checkpoints” on page 3-14.
The system does 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 a keyboard or ASCII terminal defined as the system console. If so, then the keyboard or its controller may be faulty. 1. If the password is being entered from a keyboard attached to the system, replace the keyboard. If that does not fix the problem, replace the system board. See notes on page 2-1. 2. If the password is being entered from an ASCII terminal use the Problem Determination Procedures for the ASCII terminal. Make sure the ASCII terminal is connected to S1. Replace the system board if these procedures do not reveal a problem.
No codes are displayed on the operator panel within a few seconds of turning on the system. The operator panel is blank before the system is powered on.	Reseat the operator panel cable. If the problem is not resolved, replace these parts in the following order: 1. Operator Panel Assembly. Update the VPD information in the new operator panel. 2. Riser card (Model 240 only). 3. System board (See notes on page 2-1)
The power LED on the operator panel comes on and the system powers on automatically when A/C power is applied.	Automatic power-up is a feature on all models of the 7043 43P series. Refer to the System Board Jumper Settings for your model in Chapter 1 for the correct settings. If the jumper is set in the disabled position, replace the system board,

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 control 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, go to “Boot Problems/Concerns” on page 4-27.
The System Management Services menu is displayed.	The device or media you are attempting to boot from may be faulty. 1. Check the SMS error log for any errors. To check the error log: a. Choose error log b. If an error is logged, check the time stamp. c. If the error was logged during the current boot attempt, record it. d. Look up the error in Chapter 6 "Error Code to FRU Index" and do the listed action. e. If no recent error is logged in the error log, continue to the next step below. 2. Try to boot from an alternate boot device connected to the same controller as the original boot device. If the boot succeeds, replace the original boot device (for removable media devices try the media first). 3. Go to “MAP 1540: Minimum Configuration” on page 2-21.
You cannot load diagnostics.	Go to “MAP 1020: Problem Determination” on page 2-7.
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 do not have a symptom.	Go to MAP 0020 in the *Diagnostics Information for Multiple Bus Systems*
You have an SRN.	Go to the Fast Path MAP in the *Diagnostics Information for Multiple Bus Systems*.
You suspect a cable problem.	Go to 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 2-7.

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 are asked questions regarding the operator panel display. You are also 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 EIEA, EIEB, 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 7-25.
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 2-10.
The system does not respond when the password is entered.	Go to “Step 1020-2” on page 2-10.
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 2-10.
The system stops and an 8-digit error code starting with the character "M" is displayed.	Record the error code. Go to “POST Error Codes” on page 3-2.
The system stops and an 8-digit error code starting with the number "2" is displayed.	Record the error code. If you are working on a Model 140 or Model 240, go to “Firmware Error Codes” on page 3-4. If you are working on a Model 150, go to “Error Codes” on page 4-1.

Symptom	Action
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 2-21.
The system stops and a 4digit number beginning with the character "E" is displayed in the operator panel display.	Record the code. Go to “Firmware Checkpoints” on page 4-13.
The system stops and a 4digit number not beginning with neither the characters "FF" or "E" is displayed in the operator panel display.	Record SRN 101xxx, where xxx is the last three digits of the fourdigit number displayed, then go to the "Fast Path MAP" in the *Diagnostics Information for Multiple Bus Systems*. **Note:** If the operator panel displays 2 sets of numbers, use the bottom set of numbers as the error code.
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 2-21. Record SRN 101-xxx, where xxx is the 3-digit number displayed in the operator panel display, then go to the "Fast Path MAP" in the *Diagnostics Information for Multiple Bus Systems*.
The System Management Services application appears on the screen.	Go to sub-step 3 on page 2-11 in “Step 1020-4” on page 2-11.
All other symptoms.	If you were directed here from the Entry MAP, go to “MAP 1540: Minimum Configuration” on page 2-21. 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. If you are working on a Model 140 or Model 240, find the eight-digit error code in Chapter 3, "Error Code to FRU Index for the Model 140 and Model 240" on page 3-1. If you are working on a Model 150, find the eight-digit error code in Chapter 4, "Error Code to FRU Index for the Model 150" on page 4-1.

   Note: If the eight-digit error code is not listed in Chapter 3, "Error Code to FRU Index for the Model 140 and Model 240" or Chapter 4, "Error Code to FRU Index for the Model 150," 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).

   Note: Service aids can be found in the *Diagnostics Information for Multiple Bus Systems*.

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.
   - If you are working on a Model 140 or Model 240, look up the error in the Chapter 3, “Error Code to FRU Index for the Model 140 and Model 240” on page 3-1 and do the listed action. If you are working on a Model 150, look up the error in the Chapter 4, “Error Code to FRU Index for the Model 150” on page 4-1 and do the listed action.
   - If no recent error is logged in the error log, go to “MAP 1540: Minimum Configuration” on page 2-21.

MAP 1240: Memory Problem Resolution

Purpose of This MAP

Note: The firmware checkpoint that sent you here could be one of the following: E122, E213, E214, E220 or E3xx.

These checkpoints are referred to as "a memory checkpoint" in this MAP.

Use this MAP to trouble shoot a problem during the memory test when the system stops at a memory checkpoint and no error code is displayed on the system console.

General Memory Information

Be sure to unplug the power cable before removing or installing the memory modules to avoid damage to them.

Model 150 memory modules do not need to be installed in pairs and can be installed in any slot on the system board. There is no requirement that one slot be installed before the other.

Refer to “Memory Modules” on page 8-20 for locations of the memory modules and instructions on module removal and installation.

Note: If the symptom changes, check for loose cards, cables, and obvious problems. If you do not find the problem, go to “MAP 1540: Minimum Configuration” on page 2-21.

Step 1240-1

1. Ensure that the diagnostics and the operating system are shut down.
2. Power off the system. Refer to "Powering Off the System".
3. Remove and re-install any installed memory module(s).
4. Power on the system. Refer to "Powering On the System".

Does the system stop with a memory checkpoint displayed on the operator panel?

NO Reseating the memory modules has corrected the problem.

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

YES If there is only one memory module installed, go to “Step 1240-3” on page 2-13.

If there is more than one memory module installed, go to “Step 1240-2.”

Step 1240-2

1. Power off the system. Refer to "Powering Off the System".
2. Remove all but one of the installed memory modules. Record the position of the memory modules removed so that when instructed to re-install them, they can be installed in their original positions.
3. Power on the system. Refer to "Powering On the System".

Does the system stop with a memory checkpoint displayed on the operator panel?

NO Repeat this step until all the memory modules have been installed and tested.

If all the memory modules have been installed, reseating the memory modules has corrected the problem.

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

YES Go to “Step 1240-3.”

Step 1240-3

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

1. Power off the system. Refer to "Powering Off the System".
2. Exchange the last memory module installed.
3. Power on the system. Refer to "Powering On the System".

Does the system stop with a memory checkpoint displayed on the operator panel?

NO Go to "MAP 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*.

YES Go to “Step 1240-4” on page 2-14.

Step 1240-4

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

1. Power off the system. Refer to "Powering Off the System".
2. Exchange the following FRUS in the order listed:
   a. System Board
   b. Power Supply
3. Power on the system. Refer to "Powering On the System".

Does the system stop with a memory checkpoint displayed on the operator panel?

NO Go to "MAP 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*.

YES 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, go to “MAP 1540: Minimum Configuration” on page 2-21.

MAP 1520: Power

Notes:

1. This is not a start of call MAP. Use this Power MAP only if you have been directed here from a MAP step in the *Diagnostics Information for Multiple Bus Systems*.
2. The Model 150 has a power LED located on the operator panel. When the system is powered on the LED should be on solid.

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 2-17.

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 2-17.

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 diskette drive 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 2-18.

YES Go to “Step 1520-5” on page 2-19.

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 2-16 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 are prompted to enter the password before the diagnostic CD-ROM loads.
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: Minimum Configuration (for the Model 140 and Model 150) begins on 2-22.
- MAP 1540B: Minimum Configuration (for the Model 240) begins on 2-39.

MAP 1540A: Minimum Configuration (for the Model 140 and Model 150)

Step 1540A-1

1. Ensure that the diagnostics and the operating system are shut down.
2. Turn the power off.
3. Turn the power on.
4. Insert the diagnostic CD-ROM into the CD-ROM drive.
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 2-23.

YES Go to “Step 1540A-13” on page 2-35.

Step 1540A-2

1. Turn the power off.
2. Disconnect all external cables.
3. Remove the top cover.
4. Record the slot numbers of any adapter cards installed in the system unit. Label and record the location of any cables attached to the adapters. Remove all the adapters from the system unit.
5. Record the slot numbers of the memory modules, and then remove all but the memory module in memory slot A (DIMM 0) on the Model 140, or DIMM 1 on the Model 150.
6. Remove the L2 cache card. (Model 140 only)
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 do one of the following:

- **Stop with any code other than**
  - **FDC, FF2, FF3, or F4D (Model 140)**
  - **E1DC, E1F2, E1F3, E1F7, or E14D (Model 150)**
- **Alternate between**
  - **FFD and any other code (Model 140)**
  - **E1FD and any other code (Model 150)**

NO Go to “Step 1540A-4” on page 2-25.

YES Go to “Step 1540A-3” on page 2-24.

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 do one of the following:

- **Stop with any code other than**
  - **FDC, FF2, FF3, or F4D (Model 140)**
  - **E1DC, E1F2, E1F3, E1F7, or E14D (Model 150)**
- **Alternate between**
  - **FFD and any other code (Model 140)**
  - **E1FD and any other code (Model 150)**

NO Go to "Map 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*.

YES 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 2-22 in this MAP and follow the instructions for the new symptom.

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 do one of the following:

- **Stop with any code other than**
  - **FDC, FF2, FF3, or F4D (Model 140)**
  - **E1DC, E1F2, E1F3, E1F7, or E14D (Model 150)**
- Alternate between
  - FFD and any other code (Model 140)
  - E1FD and any other code (Model 150)

NO 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.

For Model 140, go to “Step 1540A-7 (Model 140 only)” on page 2-28.

For Model 150 or Model 240, go to “Step 1540A-8” on page 2-29.

YES Go to “Step 1540A-5” on page 2-26.

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 do one of the following:

- **Stop with any code other than**
  - **FDC, FF2, FF3, or F4D (Model 140)**
  - **E1DC, E1F2, E1F3, E1F7, or E14D (Model 150)**
- **Alternate between**
  - **FFD and any other code (Model 140)**
  - **E1FD and any other code (Model 150)**

NO Go to "Map 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*.

YES Go to “Step 1540A-6” on page 2-27.

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 do one of the following:

- **Stop with any code other than**
  - **FDC, FF2, FF3, or F4D (Model 140)**
  - **E1DC, E1F2, E1F3, E1F7, or E14D (Model 150)**
- **Alternate between**
  - **FFD and any other code (Model 140)**
  - **E1FD and any other code (Model 150)**

NO Go to "Map 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*.

YES 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 2-22 in this MAP, and follow the instructions for the new symptom.

Step 1540A-7 (Model 140 only)

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

Does the operator panel do one of the following:

- **Stop with any code other than**
  - **FDC, FF2, FF3, or F4D (Model 140)**
- Alternate between
  - FFD and any other code (Model 140)

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 2-29.

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 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 2-22 and follow the instructions for the new symptom.

YES Go to “Step 1540A-9” on page 2-31.

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 1-18.
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 1-18)
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 page 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 2-22 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.”

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 page 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 2-22 in this MAP and follow the instructions for the new symptom.

YES Go to “Step 1540A-11” on page 2-33.

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, if any, 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 2-34.

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, if there are any devices and cables attached to it, 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, if any were attached, is identified or all the devices and cables have been disconnected.

If all the devices and cables have been removed, or there were none attached, 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 page 2-1.

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

Repeat this step until all of the FRUs have been exchanged.

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 2-22 in this MAP and follow the instructions for the new symptom.

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

Exchange the defective FRU, 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 Advance Diagnostics Routines.
5. If the NEW RESOURCE screen displays, select an option from the bottom of the screen.

   Note: Adapters or devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require a supplemental media, select option 1.
6. When the DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select All Resources (if you were sent here from "Step 1540A-17" on page 2-37, select the Adapter/Device you loaded from the supplemental media).

Did you get an SRN?

NO Go to "Step 1540A-15" on page 2-37.

YES Go to "Step 1540A-14" on page 2-36.

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 page 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

Does the system have adapters or devices that require supplemental media?

NO Go to “Step 1540A-16.”

YES Go to “Step 1540A-17.”

Step 1540A-16

Consult the 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.

Step 1540A-17

Select TASK SELECTION.

Select Process Supplemental Media and follow the on screen instructions to process the media.

Supplemental media must be loaded and processed one at a time.

Did the system return to the TASK SELECTION list after the supplemental media was processed?

NO Go to “Step 1540A-18” on page 2-38.

YES Press F3 to return to the FUNCTION SELECTION screen.

Go to “Step 1540A-13” substep 4 on page 2-35.

Step 1540A-18

The adapter or device is probably defective.

If the supplemental media is for an adapter replace the FRUs in the following order:

1. Adapter
2. Riser card
3. System board.

If the supplemental media is for a device replace the FRUs in the following order:

1. Device and any associated cables
2. The adapter the device is attached to.

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 2-22 for the new symptom.

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

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 2-40.

YES Go to “Step 1540B-12” on page 2-50.

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 2-41.

YES Go to “Step 1540B-4” on page 2-42.

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 page 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 page 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 page 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 2-39 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 2-44.

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 2-43.

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 page 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 2-39 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 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 appears and requires 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 page 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 2-39 and follow the instructions for the new symptom.

YES Go to “Step 1540B-8” on page 2-46.

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 1-18.
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. Riser card
5. System board (See notes on page 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 2-39 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.”

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 page 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 2-39 in this MAP and follow the instructions for the new symptom.

YES Go to “Step 1540B-10” on page 2-48.

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 2-49.

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 page 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 2-39 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. If the NEW RESOURCE screen displays, select an option from the bottom of the screen.

   Note: Adapters or devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require a supplemental media, select option 1.
6. When DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select All Resources (if you were sent here from “Step 1540A-17” on page 2-37, select the Adapter/Device you loaded from the supplemental media).

Did you get an SRN?

NO Go to “Step 1540B-14” on page 2-51.

YES Go to “Step 1540B-13” on page 2-51.

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 page 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

Does the system have adapters or devices that require supplemental media?

NO Go to “Step 1540B-15” on page 2-52.

YES Go to “Step 1540B-16” on page 2-52.

Step 1540B-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.

Step 1540B-16

Select TASK SELECTION.

Select Process Supplemental Media and follow the on screen instructions to process the media.

Supplemental media must be loaded and processed one at a time.

Did the system return to the TASK SELECTION list after the supplemental media was processed?

NO Go to “Step 1540B-17” on page 2-53.

YES Press F3 to return to the FUNCTION SELECTION screen.

Go to “Step 1540B-12” substep 4 on page 2-50.

Step 1540B-17

The adapter or device is probably defective.

If the supplemental media is for an adapter replace the FRUs in the following order:

1. Adapter.
2. Riser card
3. System board

If the supplemental media is for a device replace the FRUs in the following order:

1. Device and any associated cables.
2. The adapter the device is attached to.

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 2-39 for the new symptom.

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

Chapter 3. Error Code to FRU Index for the Model 140 and Model 240

Note: For Error Code and Checkpoint information for the Model 150, see Chapter 4, “Error Code to FRU Index for the Model 150” on page 4-1.

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 2-11 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.

If you replace FRUs and the problem is still not unresolved, go to “MAP 1540: Minimum Configuration” on page 2-21 unless otherwise indicated in the tables. If you replace FRUs and the problem has been resolved, go to "MAP 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems* unless otherwise indicated in the tables.

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.

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 2-21.
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 2-21.
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 2-21.
M0MEM000	No good memory could be found.	1. Memory 2. System board (See notes on page 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 2-21.
M0MEM001	No good memory could be found.	1. Memory 2. System board. (See notes on page 3-1.)
M0MEM002	The system hung during memory POST.	Go to “MAP 1540: Minimum Configuration” on page 2-21.
M0PS0000	Power failure.	Go to “MAP 1520: Power” on page 2-15.

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 2-21.
M0SCSI01	Unable to load diagnostics.	Go to “MAP 1540: Minimum Configuration” on page 2-21.
M0SPK000	A continuous beep is heard from the system.	System board (See notes on page 3-1.)
M0SPK001	The system does not beep.	1. Speaker 2. System board. (See notes on page 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 2-21.
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 2-21.

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	Self-test 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 2-11 If the error code specifies a network adapter, see 3-1.
010	Self-test 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 page 3-1.)
005	EEPROM locked	1. Turn off, then turn on system unit. 2. Replace the system board. (See notes on page 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 page 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 page 3-1.)
00B	EEPROM write problem	1. Turn off, turn on system unit. 2. Replace system board. (See notes on page 3-1.)
00C	EEPROM read problem	1. Turn off, turn on system unit. 2. Replace system board. (See notes on page 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 page 3-1. regarding system board replacement.
007	Console Selection: Keyboard not found	1. Plug in keyboard 2. Replace system board (See notes on page 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 1-18. 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 page 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 page 3-1.)
004	Cannot find OPENPROM node	Replace system board. (See notes on page 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 page 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 page 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 page 3-1.) For Model 240: 1. Processor card 2. System board (See notes on page 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 page 3-1.) For Model 240: 1. Processor card 2. System board (See notes on page 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 page 3-1.)

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

Error Code	Description	Action/ Possible Failing FRU
xxx=000	Initialization failed, device test failed	
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 2-11) 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 page 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 page 3-1.)
29A00003	Keyboard not present/detected	1. Keyboard 2. System Board (See notes on page 3-1.)
29B00004	Mouse not present/detected	1. Mouse 2. System Board (See notes on page 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 page 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 2-11) 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 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 2-21.
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 page 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 page 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 7-24. 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 page 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 7-24. 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 page 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 alternates 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 2-21.
Not listed here		Go to “MAP 1540: Minimum Configuration” on page 2-21.

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 still attempts 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 2-11.

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. Error Code to FRU Index for the Model 150

Note: This chapter contains error code and checkpoint information for the Model 150 only. For information on the Model 140 and Model 240, refer to Chapter 3, “Error Code to FRU Index for the Model 140 and Model 240” on page 3-1.

If you replace FRUs and the problem is still unresolved, go to “MAP 1540: Minimum Configuration” on page 2-21, unless otherwise indicated in the tables. If you replace FRUs and the problem has been resolved, go to "MAP 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*, unless otherwise indicated in the tables.

Error Codes

The error codes listed in Table 4-1, in most cases, identifies the failing device/FRU. Refer to Appendix A, “Interpreting Firmware Error Codes” on page A-1 for information on interpreting 8-digit error codes. A physical location code may be displayed with the error code. If so, use the physical location code to identify the suspected FRU.

Table 4-1 (Page 1 of 11). Firmware Error Codes

Error Code	Function / Description	Repair Action/Possible Failing FRU
Remote Initial program load (RIPL) errors		
20A80000	Insufficient information to boot	Verify the IP address
20A80001	Client IP address is already in use by another network device	Change IP address
20A80002	Cannot get gateway IP address	Refer to Firmware Checkpoints using code E174
20A80003	Cannot get server hardware address	Refer to Firmware Checkpoint using code E174
20A80004	Bootp failed	Refer to Firmware Checkpoint using code E175
20A80005	File transmission (TFTP) failed	Check network connection, try again.
20A80006	Boot Image Too Large	Contact your service representative for assistance.
Unknown/Unrecognized device		

Table 4-1 (Page 2 of 11). Firmware Error Codes		
Error Code	**Function / Description**	**Repair Action/Possible Failing FRU**
20D0000F	Selftest failed on device, no error/location code information available	Check the SMS error log entry for this error code. The location code (if present) in the error log entry should identify the location of the failing device.
20D00010	Selftest failed on device, can't locate package	Software Error (Contact your service representative for assistance.)
20D00011	Cannot determine Machine Model.	The Machine Model is part of the System Vital Product Data. Perform corrective actions listed for errors 2BA00050, 2BA00051.
Security		
20E00000	Power on Password entry error	The password has been entered incorrectly. Retry installing the password.
20E00001	Privilege Password entry error	The password has been entered incorrectly. Retry installing the password.
20E00002	Privilege Password Jumper not enabled	The Privileged Password jumper is not in the correct position for password initial entry. Consult the system's User's Guide for pin location and jumper position.
20E00003	Power on Password must be set for Unattended mode	Unattended mode requires the setting of the Power On password before it is enabled.
20E00004	Battery drained or needs replacement	1. Replace battery 2. Replace System Planar
20E00005	EEPROM locked	1. Power Off/On machine 2. Replace System Planar
20E00008	CMOS corrupted or tampering evident, CMOS initialized	Check your machine for evidence of tampering If NO tampering: 1. Replace battery, restore NVRAM data (passwords, startup data) 2. Replace System Planar
20E00009	Invalid password entered - system locked	The password has been entered incorrectly 3 times. Power Off/On the machine and enter the password correctly
20E0000A	EEPROM lock problem	If for PAP install, is jumper in correct position? Consult the system's User's Guide for pin location and jumper position. 1. Power Off/On machine 2. Replace System Planar

Table 4-1 (Page 3 of 11). Firmware Error Codes		
Error Code	**Function / Description**	**Repair Action/Possible Failing FRU**
20E0000B	EEPROM write problem	1. Power Off/On machine 2. Replace System Planar
20E0000C	EEPROM read problem	1. Power Off/On machine 2. Replace System Planar
20E00017	Cold boot needed for password entry	Power Off/On machine
Informational		
20EE0003	IP parameter requires 3 dots "."	Enter valid IP parameter Example: 000.000.000.000
20EE0004	Invalid IP parameter	Enter valid (numeric) IP parameter Example: 000.000.000.000
20EE0005	Invalid IP parameter (>255)	Enter valid (numeric) IP parameter in the range of 0 to 255 Example: 255.199.002.000
20EE0006	No SCSI controllers present	The System Planar should always have (at least) the 2 integrated PCI SCSI controllers 1. Replace System Planar
20EE0007	Keyboard not found	1. Plug in keyboard 2. Replace System Planar
20EE0008	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 System Planar

Table 4-1 (Page 4 of 11). Firmware Error Codes

Error Code	Function / Description	Repair Action/Possible Failing FRU
20EE000A	Pointer to Operating System not found in non-volatile storage	Values normally found in non-volatile storage that point to the location of an Operating System were not found. This can happen for two reasons, either your installed Operating System doesn't support storing the values or some event occurred that caused the system to lose non-volatile storage information (drainage or replacement of the battery). If you are running AIX, this information can be reconstructed by running the bootlist command specifying the device that the Operating System is installed on. Please refer to your AIX documentation for the exact syntax and usage of the bootlist command. In order to boot the Operating System so that the above mentioned values can be reconstructed, power the system down and power it back up again, this should cause the system to look for the Operating System in the devices contained in the custom boot list or in the default boot list, depending on the condition of the system. If this is not successful, modify the Boot Sequence (also known as boot list) to include devices that are known to contain a copy of the Operating System. This can be accomplished by using the System Management Services Menus. For example, select a hard disk known to have a copy of the Operating System as the first and only device in the boot sequence (boot list) and attempt to boot again.
20EE000B	The system was not able to find an Operating System on the device list that was attempted.	Modify the Boot Sequence (also known as boot list) to include devices that are known to contain a copy of the Operating System. This can be accomplished by powering down the system, powering it back up again, and using the System Management Services Menus. For example, select a hard disk known to have a copy of the Operating System as the first and only device in the boot sequence (boot list) and attempt to boot again.

SCSI Device errors

SCSI device error notes:

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.
   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.

Table 4-1 (Page 5 of 11). Firmware Error Codes		
Error Code	**Function / Description**	**Repair Action/Possible Failing FRU**
21A00001	Test Unit Ready Failed - hardware error	Refer to SCSI device error notes above 1. Replace SCSI device 2. Replace SCSI cable 3. Replace SCSI controller
21A00002	Test Unit Ready Failed - sense data available	Refer to SCSI device error notes above 1. Replace Media (Removable media devices) 2. Replace SCSI device
21A00003	Send Diagnostic Failed	Refer to SCSI device error notes above 1. Replace SCSI device
21A00004	Send Diagnostic Failed - DevOfl cmd	Refer to SCSI device error notes above 1. Replace SCSI device
21E00xxx	SCSI Tape	Refer to **21A00xxx** error codes for a description and repair action for the specific “xxx” value.
21ED0xxx	SCSI Changer	Refer to **21A00xxx** error codes for a description and repair action for the specific “xxx” value.
21EE0xxx	Other SCSI device type	Refer to **21A00xxx** error codes for a description and repair action for the specific “xxx” value.
21F00xxx	SCSI CDROM	Refer to **21A00xxx** error codes for a description and repair action for the specific “xxx” value.
21F20xxx	SCSI Read/Write Optical	Refer to **21A00xxx** error codes for a description and repair action for the specific “xxx” value.
Network Controller problem		
22000001	Internal wrap test failed.	Replace the card.
22001001	Internal wrap test failed.	Replace the card.
22010001	Adapter failed to complete hardware initilization.	Replace the card.
22011001	Adapter failed to complete hardware initilization.	Replace the card.
22020001	Adapter failed to complete hardware initilization.	Replace the card.
Memory Controller problem		
25000000	Memory controller failed	Replace System Planar
Flash Update problem		

Table 4-1 (Page 6 of 11). Firmware Error Codes

Error Code	Function / Description	Repair Action/Possible Failing FRU
25010000	No diskette in drive	Insert diskette containing firmware update file
25010001	Diskette seek error	1. Retry function. 2. Replace diskette drive 3. Replace diskette cable 4. Replace System Planar
25010002	Diskette in drive does not contain an *.IMG file	Insert diskette with firmware update file
25010003	Cannot open OPENPROM package	1. Replace System Planar
25010004	Cannot find OPENPROM node	1. Replace System Planar
25010006	System id does not match image system id	Make sure correct firmware update diskette is being used with this system.
25010007	Image has bad CRC	1. Replace firmware updated diskette
25010008	Flash is write protected, update cancelled	1. Power Off/On machine and retry 2. Replace System Planar
25010009	Flash module is unsupported or not recognized	Make sure correct firmware update diskette is being used with this system.
2501000A	Flash write protected.	1. Power Off/On machine and retry 2. Replace System Planar
NVRAM problems **NVRAM problem resolution:** 1. 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 really just 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 re-configured. 2. If the error is persistent, replace the battery. 3. If the error is persistent after battery replacement, or the error code is 25A80000, replace the System Planar.		
25A80000	Initialization failed, device test failed	Refer to NVRAM problem resolution above
25A80001	init-nvram invoked, ALL of NVRAM initialized	Refer to NVRAM problem resolution above

Table 4-1 (Page 7 of 11). Firmware Error Codes

Error Code	Function / Description	Repair Action/Possible Failing FRU
25A80002	init-nvram invoked, some data partitions may have been preserved	Refer to NVRAM problem resolution above
25A80011	Data corruption detected, ALL of NVRAM initialized	Refer to NVRAM problem resolution above
25A80012	Data corruption detected, some data partitions may have been preserved	Refer to NVRAM problem resolution above
25A80100	NVRAM data validation check failed	Power Off/On machine and retry the operation before replacing any system components. Refer to NVRAM problem resolution above
25A80201	Unable to expand target partition while saving configuration variable	Refer to NVRAM problem resolution above
25A80202	Unable to expand target partition while writing error log entry	Refer to NVRAM problem resolution above
25A80203	Unable to expand target partition while writing VPD data	Refer to NVRAM problem resolution above
25A80210	Setenv/$Setenv parameter error - name contains a null character	Refer to NVRAM problem resolution above
25A80211	Setenv/$Setenv parameter error - value contains a null character	Refer to NVRAM problem resolution above

Table 4-1 (Page 8 of 11). Firmware Error Codes

Error Code	Function / Description	Repair Action/Possible Failing FRU
25A80998	NVRAMRC script evaluation error - command line execution error	Execution of a command line within the nvram configuration variable “nvramrc” (script) resulted in a “throw” being executed. This script can be modified by the system firmware **SMS** utilities, the operating system, PCI adapter rom code or utility, or an operator (via the open firmware script editing command “nvedit”). It may not be possible to resolve the problem without a detailed analysis of the nvram script, the current system configuration, and device tree contents. 1. The problem can be caused by a SCSI adapter,whose SCSI bus ID has been changed from the default setting, no longer appearing in the system. This can be caused either by removing a SCSI adapter, or a problem with a SCSI adapter. a. Select the “SCSI ID” utility from the **SMS** menu(s). 1) Verify the list of SCSI controllers/adapters. If the list is not correct, suspect a problem with the adapter(s) installed but not listed. 2) Select the option to “Save” the configuration information. 3) Restart the system. b. If the problem persists, boot the operating system and verify the SCSI bus IDs of any installed/available SCSI controllers (change as necessary), and restart the system. 2. Contact your service support representative for further assistance.
EEPROM problems **EEPROM problem resolution:** 1. Ensure that the EEPROM Security jumper is in the correct position if doing a PAP install. 2. Retry the operation. 3. If retries do not solve the problem, replace the System Planar.		
25AA0000	Unable to unlock eeprom	Refer to EEPROM problem resolution above
25AA0001	Read-Recv error	Refer to EEPROM problem resolution above
25AA0002	Read-Trans error	Refer to EEPROM problem resolution above
25AA0003	Write-enable error	Refer to EEPROM problem resolution above
25AA0004	Write-recv error	Refer to EEPROM problem resolution above
25AA0005	Write-disable error	Refer to EEPROM problem resolution above
25AA0006	Write-Trans error	Refer to EEPROM problem resolution above

Table 4-1 (Page 9 of 11). Firmware Error Codes		
Error Code	**Function / Description**	**Repair Action/Possible Failing FRU**
25AA0007	Unable to lock eeprom	Refer to EEPROM problem resolution above
Memory errors Use the location code obtained from the SMS Error Log utility (described in Map Step 1020-4) to identify which memory DIMM the error is reported against. Memory error codes are in the form **25Cyyrrr** where **yy** indicates Memory DIMM PD-bits and **rrr** indicates the last three digits of the error code. See “Memory PD Bits” on page 4-13 for information on how to interpret PD bits.		
25Cyy002	Memory DIMM failed memory test	1. Replace Memory DIMM 2. Replace System Planar See “Memory PD Bits” on page 4-13 for information on how to interpret PD bits.
PCI adapter problem		
26020001	Invalid PCI adapter Vendor ID	1. Move card to another slot 2. Run AIX adapter diagnostics 3. Replace card 4. Update system firmware 5. Replace power supply
26020002	Invalid PCI adapter Device ID	1. Move card to another slot 2. Run AIX adapter diagnostics 3. Replace card 4. Update system firmware 5. Replace power supply
26020003	Invalid PCI adapter Class Code	1. Move card to another slot 2. Run AIX adapter diagnostics 3. Replace card 4. Update system firmware 5. Replace power supply
26020004	Invalid PCI adapter ROM VPD Structure	1. Update card firmware 2. Move card to another slot 3. Run AIX adapter diagnostics 4. Replace card 5. Update system firmware 6. Replace power supply
26020005	PCI adapter firmware is too large to load	1. Update card firmware 2. Move card to another slot 3. Run AIX adapter diagnostics 4. Replace card 5. Update system firmware 6. Replace power supply

Table 4-1 (Page 10 of 11). Firmware Error Codes

Error Code	Function / Description	Repair Action/Possible Failing FRU
26020006	PCI adapter firmware failed evaluation (has a bug)	1. Update card firmware 2. Move card to another slot 3. Run AIX adapter diagnostics 4. Replace card 5. Update system firmware 6. Replace power supply
26020007	Unable to allocate Bus resources to PCI adapter (partial allocation may have succeeded)	1. Move card to another slot (bridge) 2. Update card firmware 3. Run AIX adapter diagnostics 4. Replace card 5. Update system firmware 6. Replace power supply
RTC errors **RTC problem resolution:** 1. 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. Most of these errors are really just 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 has probably been lost. • To set/restore a Power On Password, use the S.M.S. utility. • To set/restore the Time and Date, use the Operating System facility. 2. If the error is persistent, replace the battery on the System Planar. 3. If the error is persistent after battery replacement, replace the System Planar.		
28030001	RTC initialization required - RTC not updating, corrected	1. Set/Restore the Time and Date 2. Refer to RTC problem resolution above if problem persists.
28030002	Bad time/date values	1. Set the Time and Date 2. Refer to RTC problem resolution above if problem persists.
28030003	RTC initialization required - RTC not updating, not corrected	1. Replace the System Planar.
28030004	RTC operating mode parameters changed (ie. data format)	1. Set/Restore the Time and Date 2. Refer to RTC problem resolution above if problem persists.
28030005	RTC Battery error	1. Replace the battery **Note:** Password, Time, and Date needs to be set 2. Refer to RTC problem resolution above if problem persists.
Keyboard/Mouse problems		

Table 4-1 (Page 11 of 11). Firmware Error Codes		
Error Code	**Function / Description**	**Repair Action/Possible Failing FRU**
29000002	Keyboard/Mouse controller failed selftest	1. Replace System Planar
29A00003	Keyboard not present/detected	1. Keyboard 2. Replace System Planar
29A00004	Keyboard stuck key detected	1. Keyboard 2. Replace the System Planar.
29B00004	Mouse not present/detected	1. Mouse 2. Replace System Planar

Bus SRN to FRU Reference Table

This table is used to locate defective FRUs within the I/O board PCI and ISA buses. The table indicates which devices should be tested for each SRN. For this procedure, if possible, diagnostics are run on the I/O board bus devices with all adapters removed from the failing bus. If a failure is detected on this system with all adapters removed from the failing bus, the I/O board is the isolated FRU. If a failure is not detected, the adapters are added back one at a time, to their original slot location, and the configuration is tested until a failure is detected. The failure is then isolated to the failing FRU.

If a failure has not been detected and all the FRUs have been tested call your technical service support person for assistance.

Table 4-2 (Page 1 of 2). Bus SRN to FRU Reference Table			
SRN	**Bus Identification**	**Possible Failing Device and AIX Location Code**	**Associated FRU**
9CC-100	PCI Bus 00	Internal SCSI port 1 (10-60)	I/O board. (See note at the bottom of this table.)
		Internal/External SCSI port 2 (30-58)	I/O board. (See note at the bottom of this table.)
		Internal Ethernet port (10-80)	I/O board. (See note at the bottom of this table.)
		Device installed in I/O Slot 3P (10-68 to 10-6F)	Adapter

Table 4-2 (Page 2 of 2). Bus SRN to FRU Reference Table

SRN	Bus Identification	Possible Failing Device and AIX Location Code	Associated FRU
		Device installed in I/O Slot 4P (10-70 to 10-77)	Adapter
		Device installed in I/O Slot 5P (10-78 to 10-7F)	Adapter
9CC-101	PCI Bus 01	Device installed in I/O Slot 1P (20-58 to 20-5F)	Adapter
		Device installed in I/O Slot 2P (20-60 to 20-67)	Adapter
651-730	ISA Bus	Diskette Drive port/device (01-D1-00-00)	I/O board. (See note at the bottom of this table.)
		Parallel port/device (01-R1)	I/O board. (See note at the bottom of this table.)
		Serial ports (1-2)/device (01-S1 to 01-S2)	I/O board. (See note at the bottom of this table.)
		Mouse port/device (01-K1-01-00)	I/O board. (See note at the bottom of this table.)
		Keyboard port/device (01-K1-00-00)	I/O board. (See note at the bottom of this table.)
		Audio port/device (01-FF)	I/O board. (See note at the bottom of this table.)
		Tablet port/device (01-FF)	I/O board. (See note at the bottom of this table.)

Note: If a network adapter, or the I/O 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. Also check to ensure that any client or server that addresses this system is updated.

Memory PD Bits

The following table expands the firmware error code **25Cyyrrr** on 4-9, 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.

PD Value	Size	Speed (nsecs)	Parity/ECC
38	128MB	10	ECC
3A	128MB	8	ECC
48	64MB	10	ECC
4A	64MB	8	ECC
68	256MB	10	ECC
6A	256MB	8	ECC

Firmware Checkpoints

The following is a list of checkpoints issued by the firmware during initialization.

Table 4-3 (Page 1 of 13). Firmware Checkpoints

Checkpoint (hex)	Description	Repair Action
E100	Reserved/Unused	See “Unresolved problems” on page 4-26
E101	Video enabled, extended memory test (Quick restart path)	See “Unresolved problems” on page 4-26
E102	Firmware restart with cfg'd parms (Quick restart path)	See “Unresolved problems” on page 4-26
E103	Set memory refresh (composite img)	See “Unresolved problems” on page 4-26
E104	Set memory refresh (recovery block)	See “Unresolved problems” on page 4-26
E105	Transfer control to O.S. (normal boot)	See “Boot Problems/Concerns” on page 4-27
E108	Run recovery block base memory (test 2k), set stack	See “Unresolved problems” on page 4-26

Table 4-3 (Page 2 of 13). Firmware Checkpoints

Checkpoint (hex)	Description	Repair Action
E109	Copy CRC verification code to RAM	See “Unresolved problems” on page 4-26
E10A	Turn on cache	See “Unresolved problems” on page 4-26
E10B	Flush cache	See “Unresolved problems” on page 4-26
E10C	Jump to CRC verification code in RAM	See “Unresolved problems” on page 4-26
E10D	Compute composite image CRC	See “Unresolved problems” on page 4-26
E10E	Jump back to ROM	See “Unresolved problems” on page 4-26
E10F	Transfer control to Open Firmware	See “Unresolved problems” on page 4-26
E110	Turn off cache, Check if composite image CRC is valid	See “Unresolved problems” on page 4-26
E111	GOOD CRC - jump to composite image	See “Unresolved problems” on page 4-26
E112	BAD CRC - initialize base memory, stack	See “Unresolved problems” on page 4-26
E113	BAD CRC - copy uncompressed recovery block code to RAM	See “Unresolved problems” on page 4-26
E114	BAD CRC - jump to code in RAM	See “Unresolved problems” on page 4-26
E115	BAD CRC - turn on cache	See “Unresolved problems” on page 4-26
E116	BAD CRC - copy recovery block data section to RAM	See “Unresolved problems” on page 4-26
E117	BAD CRC - Invalidate and flush cache, set TOC	See “Unresolved problems” on page 4-26
E118	BAD CRC - branch to high level recovery control routine	See “Unresolved problems” on page 4-26

Table 4-3 (Page 3 of 13). Firmware Checkpoints

Checkpoint (hex)	Description	Repair Action
E119	Initialize base memory, stack	See “Unresolved problems” on page 4-26
E11A	Copy uncompressed recovery block code to RAM	See “Unresolved problems” on page 4-26
E11B	Jump to code in RAM	See “Unresolved problems” on page 4-26
E11C	Turn on cache	See “Unresolved problems” on page 4-26
E11D	Copy recovery block data section to RAM	See “Unresolved problems” on page 4-26
E11E	Invalidate and flush cache, set TOC	See “Unresolved problems” on page 4-26
E11F	Branch to high level control routine	See “Unresolved problems” on page 4-26
E120	Initialize I/O and early memory block	See “Unresolved problems” on page 4-26
E121	Initialize S.P.	See “Unresolved problems” on page 4-26
E122	No memory detected (system lockup) Note: Harddisk light is on continuously	See “MAP 1240: Memory Problem Resolution” on page 2-12
E123	No SIMM found in the socket	See “Unresolved problems” on page 4-26
E124	Disable defective memory bank	See “Unresolved problems” on page 4-26
E125	Clear PCI devices command reg, go forth	See “Unresolved problems” on page 4-26
E126	Check valid image - start	See “Unresolved problems” on page 4-26
E127	Check valid image - successful	See “Unresolved problems” on page 4-26
E128	Disable interrupts, set int vectors for O.F.	See “Unresolved problems” on page 4-26
E129	Validate target RAM address	See “Unresolved problems” on page 4-26
E12A	Copy ROM to RAM, flush cache	See “Unresolved problems” on page 4-26

Table 4-3 (Page 4 of 13). Firmware Checkpoints		
Checkpoint (hex)	**Description**	**Repair Action**
E12B	Set MP operational parameters (eg. L.E.?, Real?)	See “Unresolved problems” on page 4-26
E12C	Set MP CPU node characteristics	See “Unresolved problems” on page 4-26
E12D	Park secondary processors in parking lot	See “Unresolved problems” on page 4-26
E12E	Primary processor sync	See “Unresolved problems” on page 4-26
E12F	Unexpected return from Open Firmware (system lockup)	See “Unresolved problems” on page 4-26
E130	Build device tree	See “Unresolved problems” on page 4-26
E131	Create ROOT node	See “Unresolved problems” on page 4-26
E132	Create CPUs node	See “Unresolved problems” on page 4-26
E133	Create L2 Cache node	See “Unresolved problems” on page 4-26
E134	Create memory node	See “Unresolved problems” on page 4-26
E135	Create memory SIMM/DIMM node	See “Unresolved problems” on page 4-26
E136	Test memory	See “Unresolved problems” on page 4-26
E137	Create openprom node	See “Unresolved problems” on page 4-26
E138	Create options node	See “Unresolved problems” on page 4-26
E139	Create aliases node and system aliases	See “Unresolved problems” on page 4-26
E13A	Create packages node	See “Unresolved problems” on page 4-26
E140	PReP style load	See “Unresolved problems” on page 4-26
E149	Create boot mgr node	See “Unresolved problems” on page 4-26

Table 4-3 (Page 5 of 13). Firmware Checkpoints

Checkpoint (hex)	Description	Repair Action
E14C	Create terminal-emulator node	See “Unresolved problems” on page 4-26
E14D	Load boot image	See “Boot Problems/Concerns” on page 4-27
E14E	Create Client Interface node/dictionary	See “Unresolved problems” on page 4-26
E14F	NVRAM validation, config variable token generation	See “Unresolved problems” on page 4-26
E150	Create host (primary) PCI controller node	See “Unresolved problems” on page 4-26
E151	Probe primary PCI bus	1. Replace PCI Adapter(s) 2. Replace System Planar See “Unresolved problems” on page 4-26
E152	Probe for adapter FCODE, evaluate if present	1. Replace PCI Adapter(s) 2. Replace System Planar See “Unresolved problems” on page 4-26
E153	End adapter FCODE probe/evaluation	See “Unresolved problems” on page 4-26
E154	Create PCI bridge node	See “Unresolved problems” on page 4-26
E155	Probe PCI bridge secondary bus	1. Replace PCI Adapter(s) 2. Replace System Planar See “Unresolved problems” on page 4-26
E156	Create PCI ethernet node	See “Unresolved problems” on page 4-26
E15A	Create 64 bit host (primary) PCI controller node	See “Unresolved problems” on page 4-26
E15B	Transfer control to O.S. (Service mode boot)	See “Boot Problems/Concerns” on page 4-27
E15C	Probe primary 64 bit PCI bus	See “Unresolved problems” on page 4-26
E15D	Create host PCI controller node	See “Unresolved problems” on page 4-26
E15E	Create MPIC node	See “Unresolved problems” on page 4-26

Table 4-3 (Page 6 of 13). Firmware Checkpoints

Checkpoint (hex)	Description	Repair Action
E15F	Adapter VPD probe	See “Unresolved problems” on page 4-26
E160	CPU Node VPD Creation	See “Unresolved problems” on page 4-26
E161	ROOT Node VPD Creation	See “Unresolved problems” on page 4-26
E162	SP Node VPD Creation	See “Unresolved problems” on page 4-26
E164	Create PCI graphics node (P9)	See “Unresolved problems” on page 4-26
E168	Create PCI graphics node (S3)	See “Unresolved problems” on page 4-26
E16C	GXT1000P Subsystem Open request	See “Unresolved problems” on page 4-26
E16D	GXT1000P Planar not detected/failed diagnostics	See “Unresolved problems” on page 4-26
E16E	GXT1000P Subsystem Open successful	See “Unresolved problems” on page 4-26
E16F	GXT1000P Close Subsystem	See “Unresolved problems” on page 4-26
E170	Start of PCI Bus Probe	See “Unresolved problems” on page 4-26
E171	Executing PCI-Delay function	See “Unresolved problems” on page 4-26
E174	Establish host connection	Refer to “Boot Problems/Concerns” on page 4-27 for some general information concerning network booting.
E175	BootP request	Refer to “Boot Problems/Concerns” on page 4-27 for some general information concerning network booting. 1. Power Off then On and retry the boot operation 2. Verify the network connection 3. Have network administrator verify the server configuration for this client
E176	TFTP file transfer	See “Unresolved problems” on page 4-26
E177	Transfer failure due to TFTP error condition	See “Unresolved problems” on page 4-26
E178	Create PCI token ring node	See “Unresolved problems” on page 4-26

Table 4-3 (Page 7 of 13). Firmware Checkpoints

Checkpoint (hex)	Description	Repair Action
E180	SP Command setup	See “Unresolved problems” on page 4-26
E183	SP Post	See “Unresolved problems” on page 4-26
E190	Create ISA node	See “Unresolved problems” on page 4-26
E193	Initialize Super I/O	See “Unresolved problems” on page 4-26
E196	Probe ISA bus	See “Unresolved problems” on page 4-26
E19B	Create Service Processor node	See “Unresolved problems” on page 4-26
E19C	Create tablet node	See “Unresolved problems” on page 4-26
E19D	Create nvram node	See “Unresolved problems” on page 4-26
E19E	RTC node creation and initialization	Refer to Error Code 28030xxx
E19F	Create eeprom node	See “Unresolved problems” on page 4-26
E1AD	See description of checkpoint E1DE.	See “Unresolved problems” on page 4-26
E1B0	Create lpt node	Replace System Planar See “Unresolved problems” on page 4-26
E1B1	Create serial node	See “Unresolved problems” on page 4-26
E1B2	Create audio node	Replace System Planar See “Unresolved problems” on page 4-26
E1B3	Create 8042 node	Replace System Planar See “Unresolved problems” on page 4-26
E1B6	Probe for (ISA) keyboard	Replace System Planar See “Unresolved problems” on page 4-26
E1BA	Enable L2 cache	See “Unresolved problems” on page 4-26
E1BB	Set cache parms for burst	See “Unresolved problems” on page 4-26
E1BC	Set cache parms for 512KB	See “Unresolved problems” on page 4-26

Table 4-3 (Page 8 of 13). Firmware Checkpoints

Checkpoint (hex)	Description	Repair Action
E1BD	Probe for (ISA) mouse	Replace System Planar See “Unresolved problems” on page 4-26
E1BE	Create op-panel node	See “Unresolved problems” on page 4-26
E1BF	Create pwr-mgmt node	See “Unresolved problems” on page 4-26
E1C0	Create ISA ethernet node	See “Unresolved problems” on page 4-26
E1C5	Create ISA interrupt controller (pic) node	Replace System Planar See “Unresolved problems” on page 4-26
E1C6	Create dma node	See “Unresolved problems” on page 4-26
E1D0	Create PCI scsi node	See “Unresolved problems” on page 4-26
E1D3	Create (* wildcard *) SCSI block device node (SD)	See “Unresolved problems” on page 4-26
E1D4	Create (* wildcard *) SCSI byte device node (ST)	See “Unresolved problems” on page 4-26
E1DB	Create floppy controller (fdc) node	Replace System Planar See “Unresolved problems” on page 4-26

Table 4-3 (Page 9 of 13). Firmware Checkpoints

Checkpoint (hex)	Description	Repair Action
E1DC	Dynamic console selection	If a console is attached but nothing is displayed on it, follow the steps associated with “All display problems” in the Entry MAP tables. If selection screen(s) can be seen on the terminals and the appropriate key on the input device associated with the desired display or terminal is pressed, within approximately 60 seconds, but there is no response to the keystrokes: 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 Planar. 2. If selecting the console with an ASCII terminal, suspect the ASCII terminal. Use the Problem Determination Procedures for the terminal. Replace the System Planar if these procedures do not reveal a problem. **Note:** Terminal settings should be set to: • 9600 Baud • No Parity • 8 Data bits • 1 Stop bit
E1DD	Early processor exception	1. Replace System Planar See “Unresolved problems” on page 4-26
E1DE	An alternating pattern of E1DE and E1AD is used to indicate a "Default Catch" condition before the Open Firmware "checkpoint" word (function) is available.	1. Replace System Planar See “Unresolved problems” on page 4-26
E1DF	Create diskette drive (disk) node	See “Unresolved problems” on page 4-26
E1E0	Program flash	See “Unresolved problems” on page 4-26
E1E1	Flash update complete	See “Unresolved problems” on page 4-26
E1E2	Initialize System I/O	See “Unresolved problems” on page 4-26
E1E3	PReP boot image initialization	See “Unresolved problems” on page 4-26

Table 4-3 (Page 10 of 13). Firmware Checkpoints

Checkpoint (hex)	Description	Repair Action
E1E4	Initialize Super I/O with default values	See “Unresolved problems” on page 4-26
E1E5	XCOFF boot image initialization	See “Unresolved problems” on page 4-26
E1E6	Set up early memory allocation heap	See “Unresolved problems” on page 4-26
E1E7	PE boot image initialization	See “Unresolved problems” on page 4-26
E1E8	Initialize primary diskette drive (polled mode)	See “Unresolved problems” on page 4-26
E1E9	ELF boot image initialization	See “Unresolved problems” on page 4-26
E1EA	Load flash EPROM recovery image from diskette	1. Firmware flash image corrupted, load recovery image from diskette. 2. Ensure diskette installed contains a recovery image appropriate for this machine. 3. The recovery procedure for the flash EEPROM should be executed. See “Firmware Recovery” on page 7-25. 4. If diskette installed with correct recovery image a. Try another diskette b. Replace Diskette drive c. Replace Diskette cable d. Replace System Planar See “Unresolved problems” on page 4-26
E1EB	Verify flash EPROM recovery image	1. Firmware flash recovery image on disktte corrupted or invalid for this system. 2. Ensure diskette installed contains a recovery image appropriate for this machine. 3. The recovery procedure for the flash EEPROM should be executed. See “Firmware Recovery” on page 7-25. 4. If diskette installed with correct recovery image a. Try another diskette b. Replace Diskette drive c. Replace Diskette cable d. Replace System Planar See “Unresolved problems” on page 4-26
E1EC	Get recovery image entry point	See “Unresolved problems” on page 4-26
E1ED	Invalidate instruction cache	See “Unresolved problems” on page 4-26

Table 4-3 (Page 11 of 13). Firmware Checkpoints

Checkpoint (hex)	Description	Repair Action
E1EE	Jump to composite image	See “Unresolved problems” on page 4-26
E1EF	Erase flash	See “Unresolved problems” on page 4-26
E1F0	Start O.B.E.	See “Unresolved problems” on page 4-26
E1F1	Begin selftest sequence on boot device(s)	See “Unresolved problems” on page 4-26
E1F2	Power On Password prompt	Prompt should be visible on the system console. If a console is attached but nothing is displayed on it, follow the steps associated with “All display problems” in the Entry MAP tables.
E1F3	Priviledged Access Password prompt	Prompt should be visible on the system console. If a console is attached but nothing is displayed on it, follow the steps associated with “All display problems” in the Entry MAP tables.
E1F5	Build boot device list	See “Unresolved problems” on page 4-26
E1F6	Determine boot device sequence	See “Unresolved problems” on page 4-26
E1F7	No boot image located	See “Unresolved problems” on page 4-26
E1FB	Scan SCSI bus for attached devices	See “Unresolved problems” on page 4-26
E1FD	Default Catch	The operator panel will alternate between the code “E1FD” and another “Exxx” code where “Exxx” is the initialization point at which the error occurred. If the “Exxx” code is not listed in this table, go to “MAP 1540: Minimum Configuration”
E201	Setup PHB BARC addresses	1. Replace System Planar
E202	Initialize PHB registers and PHB's PCI configuration registers	1. Replace System Planar
E203	Look for PCI to ISA bridge	1. Replace System Planar
E204	Setup ISA bridge PCI config. registers and initialize	1. Replace System Planar

Table 4-3 (Page 12 of 13). Firmware Checkpoints		
Checkpoint (hex)	**Description**	**Repair Action**
E206	Look for PRISM on PCG and switch to 50MHz	1. Replace System Planar
E207	Setup Data gather mode and 64/32-bit mode on PCG	1. Replace System Planar
E208	Assign bus number on PCG	1. Replace System Planar
E209	Assign PCI I/O addresses on PCI	1. Replace System Planar
E20A	Assign PCI I/O addresses on PCG	1. Replace System Planar
E20B	Check MCERs stuck at fault	1. Replace System Card
E20C	Testing L2 cache	1. Replace CPU Card
E210	Processors L1 data cache array test fails. System Hangs.	1. Replace System Planar
E211	IPL ROS CRC checking	1. Replace System Planar
E212	Processor POST	1. Replace CPU Card
E213	Initial memory configuration	See “MAP 1240: Memory Problem Resolution” on page 2-12
E214	Memory test	See “MAP 1240: Memory Problem Resolution” on page 2-12
E216	Copy ROS into RAM. Setup Translation and C environment	1. Replace Memory Card
E21A	System has some good memory	1. See “Unresolved problems” on page 4-26
E220	Final memory configuration	See “MAP 1240: Memory Problem Resolution” on page 2-12
E240	Setup Winbond ISA bridge	1. Replace System Planar
E241	Reset PCI Bus	1. Replace System Planar
E242	Initialize ISA DMA channel	1. Replace System Planar

Table 4-3 (Page 13 of 13). Firmware Checkpoints

Checkpoint (hex)	Description	Repair Action
E243	Set up Grackle configuration registers	1. Replace System Planar
E244	Enable system speaker and send a beep	1. Replace System Planar
E246	System firmware corrupted, take recover path	1. Replace System Planar
E247	Capture DIMM SPDs into NVRAM	1. Replace System Planar
E249	Enter recover path's main code	1. Replace System Planar
E24C	L2 cache array test fails. System hangs.	1. Replace System Planar
E24D	L2 cache array test fails. System hangs.	1. Replace System Planar
E298	Take firmware soft load path	1. Replace Softload Image
E299	Start C code execution.	See “Unresolved problems” on page 4-26
E3xx	Memory test	See “MAP 1240: Memory Problem Resolution” on page 2-12
E440	Validate nvram, initialize partitions as needed	1. Verify that the system firmware is at the current release level. Update as necessary. 2. See “Unresolved problems” on page 4-26
E441	Generate /options node nvram configuration variable properties	1. Verify that the system firmware is at the current release level. Update as necessary. 2. See “Unresolved problems” on page 4-26
E442	Validate nvram partitions	1. Verify that the system firmware is at the current release level. Update as necessary. 2. See “Unresolved problems” on page 4-26
E443	Generate nvram configuration variable dictionary words	1. Suspect a system firmware problem. If problem persists, verify that the system firmware is at current release level, update downlevel system firmware. 2. See “Unresolved problems” on page 4-26

Unresolved problems: Go to MAP 1540A or 1540B for any of the following conditions:

- A 4-digit code in the range of “E100” through “EFFF” is displayed on the operator panel display but is not listed in Table 4-3 on page 4-13.
- A 4-digit code is displayed and is listed in Table 4-3 on page 4-13, but there are no repair actions or FRUs listed for the code.
- All of the FRUs listed in repair actions have been replaced and the problem has not been corrected.

Boot Problems/Concerns

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 tape and network boot attempts. 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 progess. If the checkpoint is displayed for an extended period of time and the drive LED is not indicating any activity there may be a problem loading the boot image from the device.

Note: 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 still attempts to boot and because time-out durations are necessarily long to accommodate retries, the system may appear to be hung.

This procedure assumes that a CD-ROM drive is installed and a Diagnostics CD-ROM is available.

1. Restart the system and get to the Firmware SMS Main Menu. Select Multiboot.
   - Check if the intended boot device is correctly specified in the boot sequence.
   - If the intended boot device is not correctly identified in the boot sequence, add it to the boot sequence using the SMS menus (if the intended boot device cannot be added to the boot sequence go to step 3).
   - If attempting to boot from the network go to step 2.
   - If attempting to boot from a disk drive or CD-ROM go to step 3.
2. If attempting to boot from the network:
   - Verify that IP parameters are correct.
   - Attempt to "Ping" the target server using the SMS "Ping" utility. If the ping is successful, have network administrator verify the server configuration for this client.
   - Turn power Off, then On and retry the boot operation.
   - Check network cabling to adapter.
3. Try to boot and run standalone diagnostics against the system, particularly against the intended boot device.
   - If the intended boot device is not listed in the "NEW RESOURCE" list go to "MAP 0290: Missing Resource Problem Resolution" in the *Diagnostics Information for Multiple Bus Systems*.
   - If a SRN, not an 8-digit error code, is reported, go to the *Diagnostics Information for Multiple Bus Systems* manual.
   - If the diagnostics are successful, it may be necessary to perform an operating system specific recovery process, or reinstall the operating system.
   - If unable to load standalone diagnostics:

a. Verify proper SCSI bus termination.

b. Check SCSI cabling.

c. It is possible that another attached SCSI device is causing the problem.

- Disconnect the signal and power cables from any other SCSI devices attached to the SCSI adapter that the CD-ROM drive is attached to.
- Try to boot the standalone diagnostics again.
- If unable to load standalone diagnostics go to step 4.
- If standalone diagnostics load, one of the disconnected devices removed is causing the problem. Reconnect the devices one at a time and retry the boot operation until the problem recurs and replace the device that caused the problem. (If the problem appears to be one of the SCSI devices, be aware it could be either the SCSI device or the SCSI adapter). Go to "MAP 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*.

4. It is possible that another installed adapter is causing the problem.
   - Remove all installed adapters except the one the CD-ROM drive is attached to and the one used for the console.
   - Try to boot the standalone diagnostics again.
   - If unable to load standalone diagnostics go to step 5.
   - If standalone diagnostics load, re-install adapters (and attached devices as applicable) one at a time and retry the boot operation until the problem recurs. Then replace the adapter or device that caused the problem (system board can also cause the device or adapter to fail). Go to "MAP 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*.
5. Either the CD-ROM drive, SCSI adapter, the graphics adapter, or the system board is most likely defective. A tty terminal attached to the serial port also can be used to determine if the graphics adapters is causing the problem. This is done by removing the graphics adapter, attaching a tty to the serial, and retrying standalone diagnostics. If the standalone diagnostics load, the graphic adapter should be replaced.
   - If the CD-ROM drive is attached to a SCSI adapter card rather than the integrated SCSI adapter on the system board.
     – Replace SCSI adapter.
     – Replace riser card.
   - Replace system board.
   - 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” on page 2-21.
   - Go to "MAP 0410: Repair Checkout" in the *Diagnostics Information for Multiple Bus Systems*.

Chapter 5. Location Codes (Model 150 only)

This system unit uses physical location codes in conjunction with AIX location codes to provide mapping of the failing field replaceable units. The location codes are produced by the system unit's firmware and AIX.

Physical Location Codes

Physical location codes provide a mapping of logical functions in a platform (or expansion sites for logical functions, such as connectors or ports) to their specific locations within the physical structure of the platform.

Location Code Format

The format for the location code is an alphanumeric string of variable length, consisting of a series of location identifiers, separated by the standard dash (-) or slash (/) character. The series is hierarchical; that is, each location identifier in the string is a physical child of the one preceding it.

- The - (dash) separator character represents a normal structural relationship where the child is a separate physical package and it plugs into (or is connected to) the parent. For example, P1-C1 is a CPU card (C1) plugged into a planar (P1), or P1-M1 is a memory card (M1) plugged into a planar (P1).
- The / (slash) separator character separates the base location code of a function from any extended location information. A group of logical devices can have the same base location code because they are all on the same physical package, but may require extended location information to describe the connectors they support. For example, P2/S1 describes the location of the serial port 1 controller and its connector (S1), which is located on planar P2 (its base location code), but the / indicates that further devices can be connected to it at the external S1 serial connector. The keyboard controller and its connector likewise have location code P2/K1, which means they have the same base location code (P2) as serial port 1, but a different external connector. In contrast, the location code P2-K1 actually points to the device connected to connector K1; that is, the keyboard. The location code P2/Z1 indicates an integrated SCSI controller which drives connector Z1, while location codes of P2-Z1-... point to the actual SCSI bus and devices.

Each location identifier consists of one alpha prefix character that identifies a location type, and a decimal integer number (typically one or two digits) that identifies a specific instance of this location type. Certain location types may also support secondary sub-locations, which are indicated by appending a period (".") character and a sub-location instance number.

Specifically, the format of a location code is defined as follows:

pn[.n][- or /]pn[.n][- or /]...

Where p is a defined alpha location type prefix, n is a location instance number, and [.n] is a sub-location instance number (where applicable). Sub-location notation is used only for location types which have clearly defined and limited expansion sites; for example, memory module slots on a memory card. Primarily, the [.n] sub-location notation is intended for use as an abbreviation of the location code in cases where:

1. Based on the device structure, the abbreviated sub-location code conveys the same information in a more concise form than an additional level of location identifier - for example:
   - P1-M1.4 (pluggable module 4 on Memory Card 1 on Planar 1), rather than P1-M1-M4
   - P1-C1.1 (pluggable CPU 1 on CPU Card 1 on Planar 1), rather than P1-C1-C1
   - P2-Z1-A3.1 (LUN 1 at SCSI ID 3 on integrated SCSI bus 1 from Planar 2), rather than P2-Z1-A3-A1
2. The sub-location is either a basic physical extension or sub-enclosure of the base location, but does not represent additional function or connectivity; for example, a drawer in a rack (U1.2) or a riser card on an I/O board (P2.1).

Name	AIX Location Code	Location Code	Physical Connection	Logical Identification
System Planar	00-00	P1		
Riser Card		P1.1	J39	
Memory DIMM 1	00-00	P1-M1	J11	
Memory DIMM 2	00-00	P1-M2	J28	
Memory DIMM 3	00-00	P1-M3	J19	
Memory DIMM 4	00-00	P1-M4	J39	
Diskette Drive	01-D1-00-00	P1-D1	J16	Base Address 0x03F0
Keyboard	01-K1-00-00	P1-K1	J59	Base Address 0x0060
Mouse	01-K1-01-00	P1-O1	J56	Base Address 0x0060
Audio Port	01-Q2	P1/Q2		
Diskette Port	01-D1	P1/D1	J16	Base Address 0x03F0

Name	AIX Location Code	Location Code	Physical Connection	Logical Identification
Keyboard Port	01-K1-00	P1/K1	J59	Base Address 0x0060
Mouse Port	01-K1-01	P1/O1	J56	Base Address 0x0060
Serial Port 1	01-S1	P1/S1	J24	Base Address 0x03F8
Serial Port 2	01-S2	P1/S2	J23	Base Address 0x02F8
Parallel Port	01-R1	P1/R1	J49	Base Address 0x0378
Ethernet Port	10-60	P1/E1	J45	Host Bridge ID00, Device 12
SCSI Port	10-80	P1/Z1	J33/J38	Host Bridge ID00, Device 16
Tablet Port	01-Q1	P1/Q1		
Card in PCI Slot 1	1P-08	P1.1-I1	J1	PCI Bridge ID01, Device 18
Card in PCI Slot 2	10-b0	P1.1-I2	J2	Host Bridge ID00, Device 22
Card in PCI Slot 3	10-90	P1.1-I3	J3	Host Bridge ID00, Device 18
Card in PCI Slot 4	1P-18	P1.1-I4	J5	PCI Bridge ID01, Device 19
Card in PCI Slot 5	1P-10	P1.1-I5	J4	PCI Bridge ID01, Device 19
Base CDROM in Bay 2		P1-Z1-A3		Primary SCSI Bus ID 3
Media Drive in Bay 3		P1-Z1-A2 or A6		Primary SCSI Bus ID 2 or 6
DASD in Bay 4		P1-Z1-A4		Primary SCSI Bus ID 4
DASD in Bay 5		P1-Z1-A5		Primary SCSI Bus ID 5
Fan # 1		F1	J27/J30	
Operator Panel		L1	J41	
Power Supply		V1	J7/J8/J2/J9	

AIX Location Codes

The basic formats of the AIX location codes are:

- For non-SCSI devices/drives

  AB-CD-EF-GH

- For SCSI devices/drives

  AB-CD-EF-G,H

For planars, cards, and non-SCSI devices the location code is defined as:

```
AB-CD-EF-GH
 |  |  |  |
 |  |  |  Device/FRU/Port ID
 |  |  Connector ID
 |  devfunc Number, Adapter Number or Physical Location
 Bus Type or PCI Parent Bus
```

- The AB value identifies a bus type or PCI parent bus as assigned by the firmware.
- The CD value identifies adapter number, adapter's devfunc number, or physical location. The devfunc number is defined as the PCI device number times 8, plus the function number.
- The EF value identifies a connector.
- The GH value identifies a port, address, device, or FRU.

Adapters and cards are identified with just AB-CD.

The possible values for AB are:

00	Processor bus
01	ISA bus
02	EISA bus
03	MCA bus
04	PCI bus used in the case where the PCI bus cannot be identified
05	PCMCIA buses
xy	For PCI adapters where x is equal to or greater than 1. The x and y are characters in the range of 0-9, A-H, J-N, P-Z (O, I, and lower case are omitted) and are equal to the parent bus's ibm, aix-loc Open Firmware Property.

The possible values for CD depend on the adapter/card.

For pluggable PCI adapters/cards, CD is the device's devfunc number (PCI device number times 8, plus the function number). The C and D are characters in the range

of 0-9, and A-F (hex numbers). This allows the location code to uniquely identify multiple adapters on individual PCI cards.

For pluggable ISA adapters, CD is equal to the order the ISA cards defined/configured either by SMIT or the ISA Adapter Configuration Service Aid.

For integrated ISA adapters, CD is equal to a unique code identifying the ISA adapter. In most cases this is equal to the adapter's physical location code. In cases where a physical location code is not available, CD is be FF.

EF is the connector ID. It is used to identify the adapter's connector that a resource is attached to.

GH is used to identify a port, device, or FRU. For example:

- For async devices GH defines the port on the fanout box. The values are 00 to 15.
- For a diskette drive H defines which diskette drive 1 or 2. G is always 0.
- For all other devices GH is equal to 00.

For integrated adapter, EF-GH is the same as the definition for a pluggable adapter. For example, the location code for a diskette drive is 01-D1-00-00. A second diskette drive is 01-D1-00-01.

For SCSI the location code is defined as:

```
AB-CD-EF-G,H
 |  |  | | |
 |  |  | | Logical Unit address of the SCSI Device
 |  |  | Control Unit Address of the SCSI Device
 |  |  Connector ID
 |  devfunc Number, Adapter Number or Physical Location
 Bus Type or PCI Parent Bus
```

Where AB-CD-EF are the same as non-SCSI devices.

G defines the control unit address of the device. Values of 0 to 15 are valid.

H defines the logical unit address of the device. Values of 0 to 255 are valid.

There is also a bus location code that is generated as '00-XXXXXXXX' where XXXXXXXX is equivalent to the node's unit address.

Chapter 6. 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 or the text-based System Management Services 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. Refer

to Chapter 7, “System Management Services” on page 7-1 for more information on custom boot lists.

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. Before stopping the programs and operating system, notify your system administrator and users that the system is going to be shut down.
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 are to 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 6-2 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.

Chapter 7. 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 7-26.

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.)

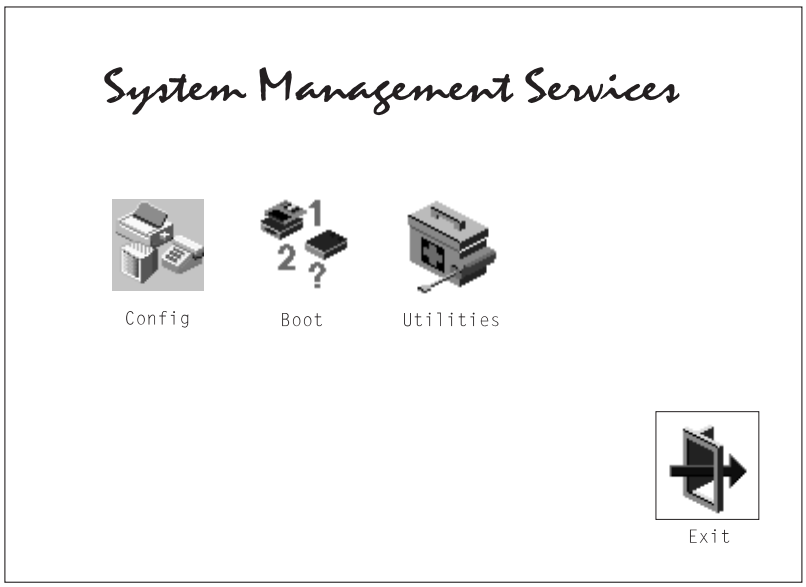
After the logo is displayed, initialization icons appear across the bottom of the screen.

To enter the graphical System Management Services, you must press the **F1** key *after the keyboard icon appears* during startup.

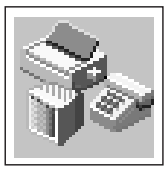
If you have pressed the **F1** key, the System Management Services appears after the initialization and power-on self test (POST) are complete.

Note: If you have installed a privileged-access password, you are 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.



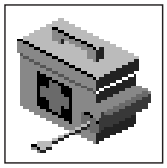
Config: Enables you to view your system setup.



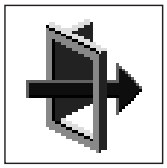
Multi-Boot (Model 150 only): Enables you to set and view the default operating system, modify the boot sequence, access the Open Firmware command prompt, and other options.



Boot (Model 140 and Model 240): Allows you to modify the boot sequence.



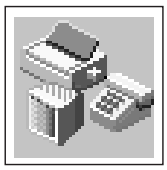
Utilities: Enables you to set and remove passwords, control the playing of system tones, enable the unattended start mode, set and view the addresses of your system's SCSI controllers, select the active console, view or clear the firmware error log, and update your system unit's firmware program.



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.

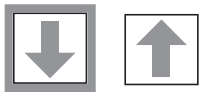
Config



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.

<Device Name>

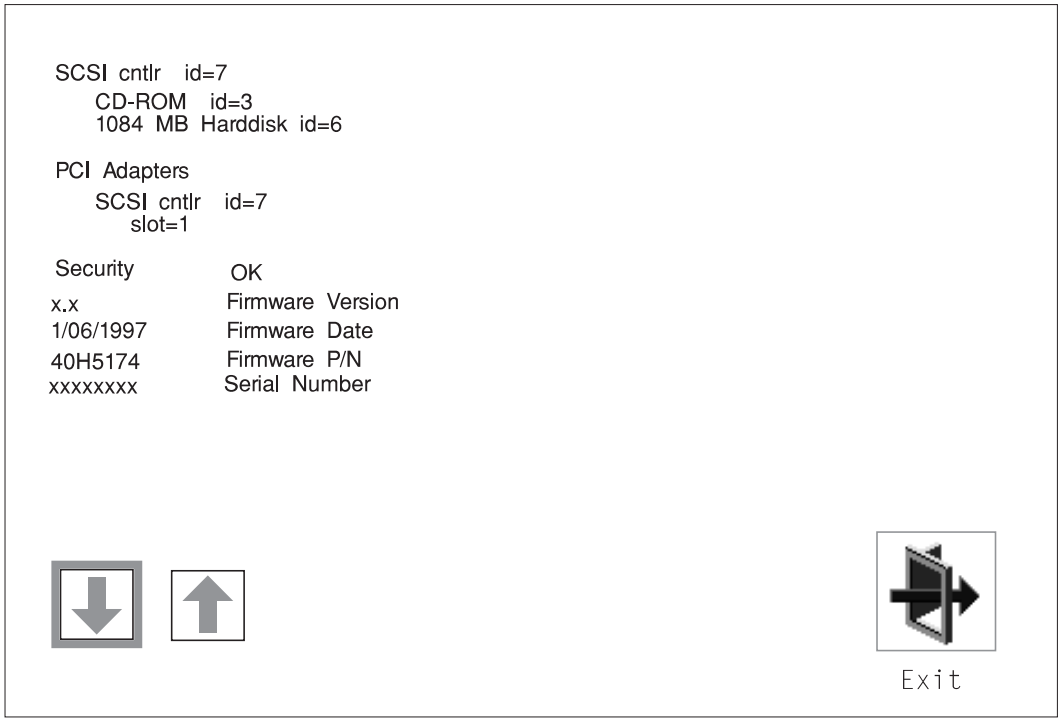
PowerPC, 604
L2-Cache, 0512K
Memory
slot A=8 MB
slot B=8 MB
LPT
addr=3BC
IDE
addr=1F0
COM
addr=3F8
COM
addr=2F8
Audio
Keyboard
Mouse
Diskette
addr=3F0
Integrated Ethernet
addr=9999FF111B
Video
enhanced graphics



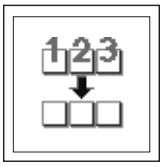


Exit

If more than one screen of information is available, a blue arrow in the top right corner of the screen appears. Use the Page Up and Page Down keys to scroll through the pages.

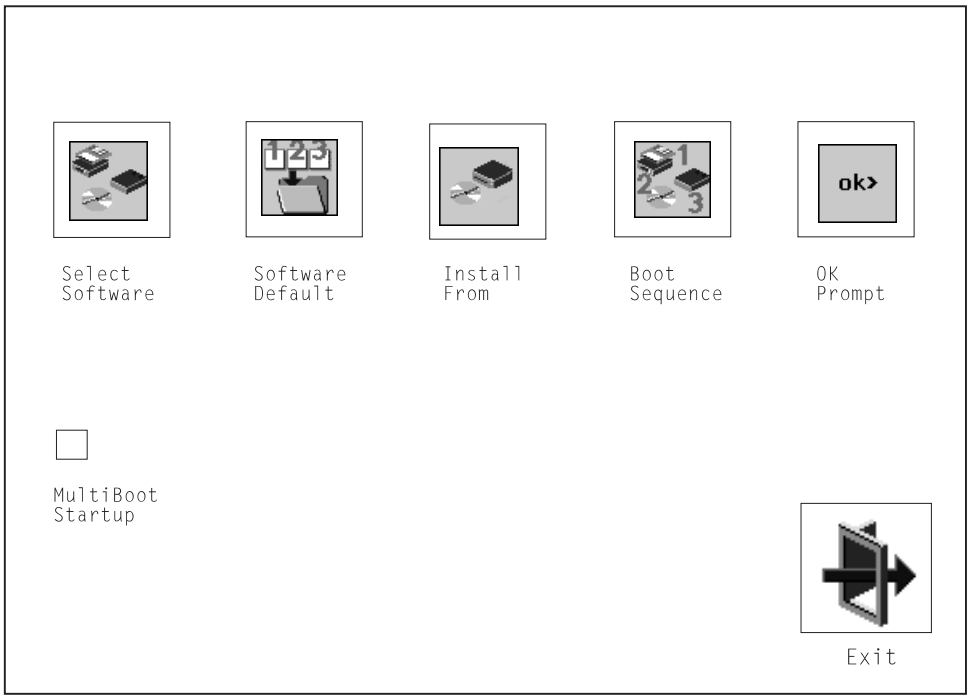


MultiBoot (Model 150 only)



The options available from this screen allow you to view and set various options regarding the operating system and boot sequence.

Note: The SMS software on the Model 140 and Model 240 do not have this menu option. On these systems, this menu is replaced by the **Boot** menu. See “Boot (Model 140 and Model 240)” on page 7-9 for details.



The following describes the choices available on this screen.



Select Software: The Select Software option, if supported by the operating system, allows you to choose which operating system to use. This option is supported by AIX. Not all operating systems support this option.

If you receive an informational message saying that no operating system is installed, then the system information in non-volatile storage may have been lost. This can happen if the battery has been removed. To correct this situation, refer to the **bootlist** reference in your AIX operating system documentation.



Software Default: This option, if supported by the operating system, enables you to select an operating system as the default operating system for your system unit.



Install From: Enables you to select a media drive from which to install an operating system.



Boot Sequence: Enables you to view and change the custom boot list (the sequence in which devices are searched for operating system code). You may choose from 1 to 5 devices for the custom boot list.

The default boot sequence is:

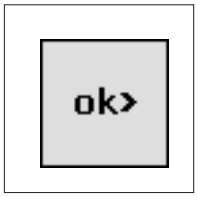
Note:

1. The primary diskette drive.
2. The CD-ROM drive.
3. Tape drive.
4. Hard disk drive.
5. Network device.

To change the custom boot list, enter a new order in the **New** column, then click on the **Save** icon. The list of boot devices is updated to reflect the new order.

Attention:

To change the custom boot list back to the default values, click on **Default**. 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.



OK Prompt: Enables you to go directly to the Open Firmware command prompt. The Open Firmware command prompt is used for debugging and device driver development. For more information about the operation of the Open Firmware command prompt, refer to IEEE Standard 1275.

Multiboot Start: Clicking on this button toggles whether the Multiboot menu appears automatically at startup.

Boot (Model 140 and Model 240)



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.

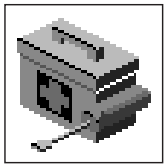
- Diskette drive
- CD-ROM drive
- Hard disk drive
- Network device.

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.

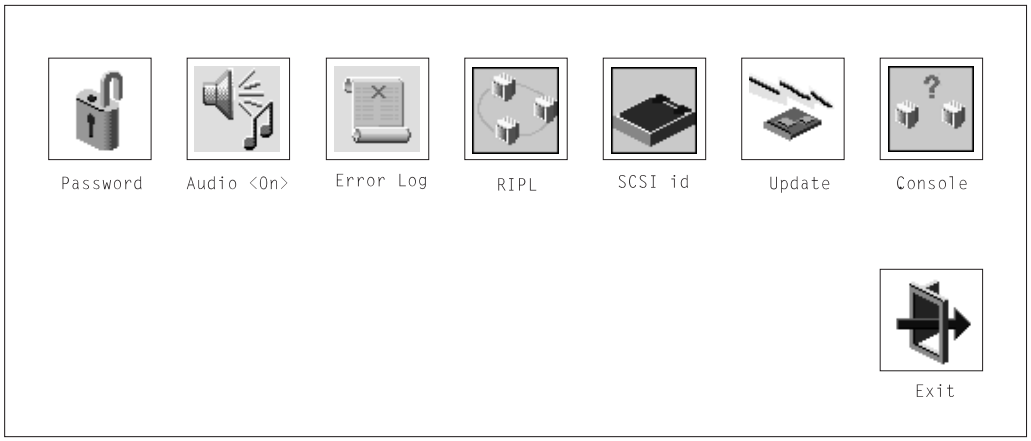
You can choose 1 to 4 devices for the custom boot list. To change the boot sequence back to the default values, select **Default**. (The default sequence is automatically saved.)

Attention: If no user-defined boot-list exists, and the privileged-access password has been enabled, you are asked for the privileged-access password at startup every time you boot up your system. See “Privileged-Access Password” on page 7-15 for more information on the privileged-access password.

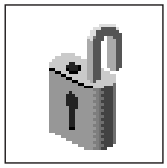
Utilities



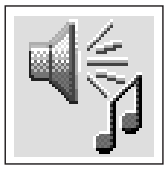
Selecting this icon enables you to perform various tasks and view additional information about your system unit.



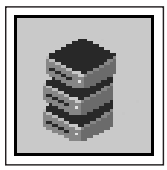
The following describes the choices available on this screen.



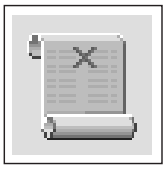
Password: Enables you to set password protection for turning on the system unit and for using system administration tools.



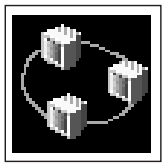
Audio (Model 140 and Model 240 only): Enables you to turn on or off the system tones heard when the system is turned on.



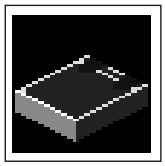
Hard Disk Spin Up Delay (Model 150 only): Enables you to change the spin up delay for SCSI hard disk drives attached to your system.



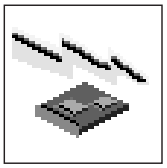
Error Log: Enables you to view and clear the firmware error log information for your system unit.



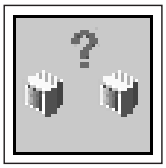
RIPL (Remote Initial Program Load): Allows you to select a remote system from which to load programs via a network adapter when your system unit is first turned on. This option also allows you to configure network adapters which require setup.



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

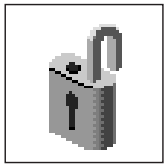


Update: Allows you to update the system firmware program.

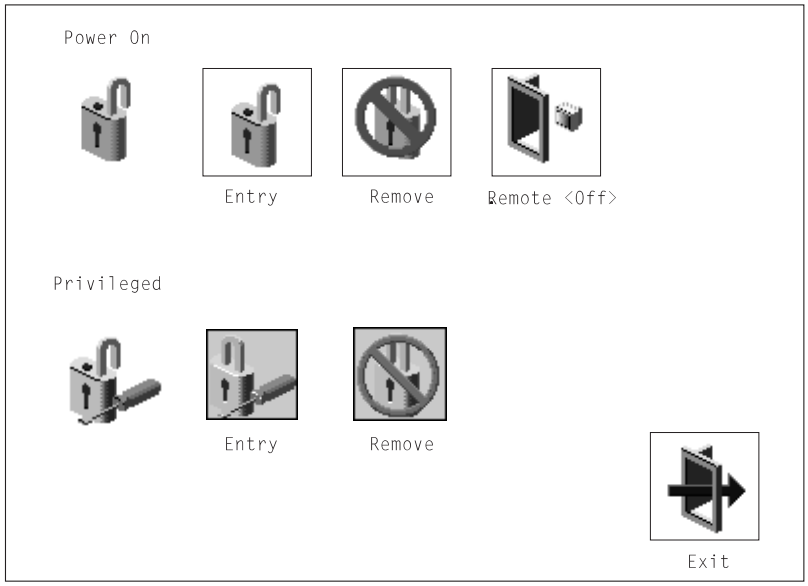


Console: If you have more than one keyboard and display attached to your system unit, or if you have an ASCII terminal attached to your system unit in addition to a keyboard and display, this tool allows you to define which one is active.

Password



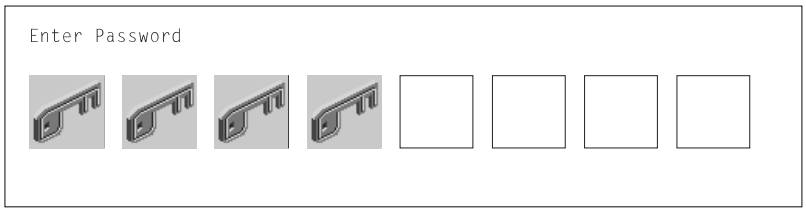
When you select this icon, the following screen is displayed.



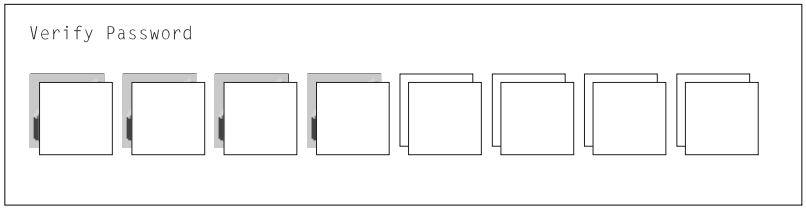
Power-On Password

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.



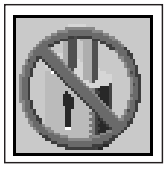
Press **Enter** when you are finished; you must type the password again for verification.



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.

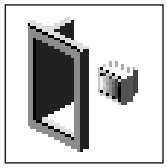
If you previously had set a power-on password and want to remove it, select the Remove icon.



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 the section beginning on 1-1. Moving the jumper back to the default position re-enables 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 8-36 for details.
3. The system unit power cable **must** be disconnected before removing the battery.

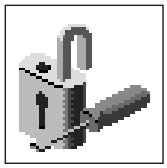
A password becomes effective only after the system is turned off and back on again.



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).

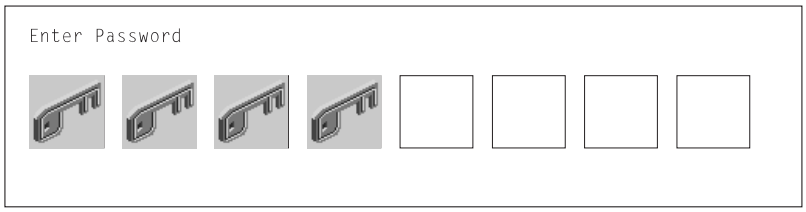


Privileged-Access Password

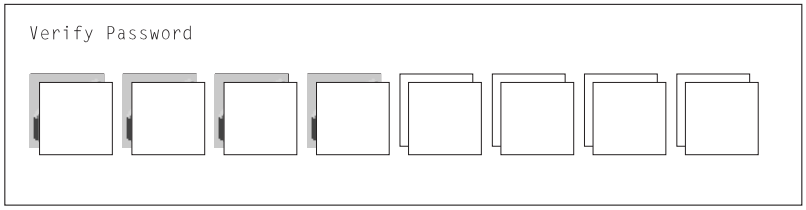
The privileged-access password protects against the unauthorized starting of the system programs. To set the privileged-access password, you must first change a jumper on the system board. See “Front View without Covers” on page 1-3 to locate and change the password-enabling jumper, then return here.

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.

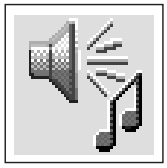
Attention: Once the password-enabling jumper has been changed and the privileged-access password has been set, great care must be taken to preserve the privileged-access password. *If you set the privileged-access password and later misplace it, your system must be returned for service.*

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 are asked for the privileged-access password at startup every time you boot up your system.

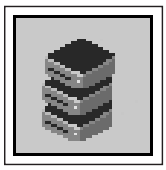
Moving the password-enabling jumper back to the default position does **not** disable or erase the privileged-access password. Removing the jumper or moving the jumper back to the default position only prohibits changing or disabling this password with the System Management Services.

Audio (Model 140 and Model 240 only)

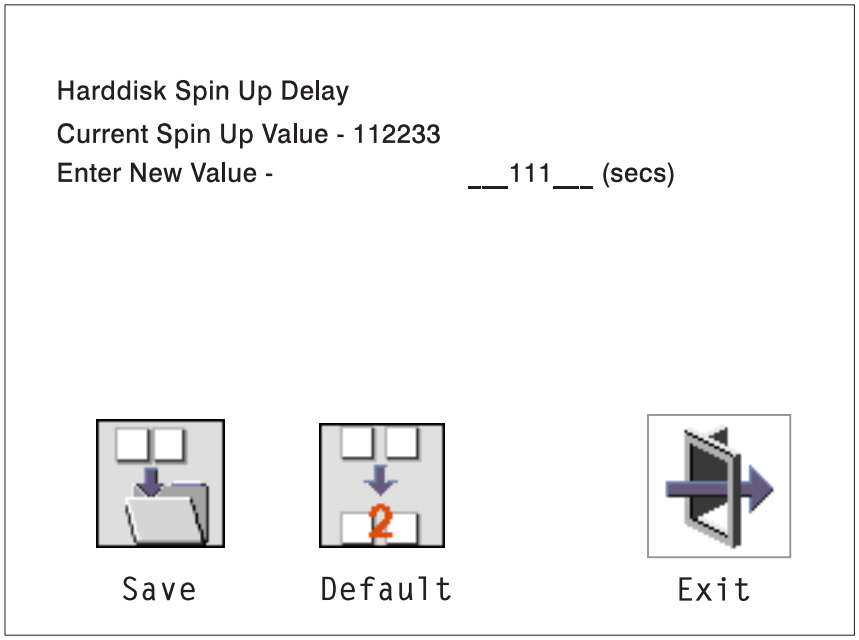


This icon enables you to turn on or off the system tones heard at power-on time. To change the audio status, use the arrow keys or mouse to highlight the audio icon, then press the Enter key.

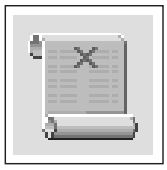
Hard Disk Spin Up Delay (Model 150 only)



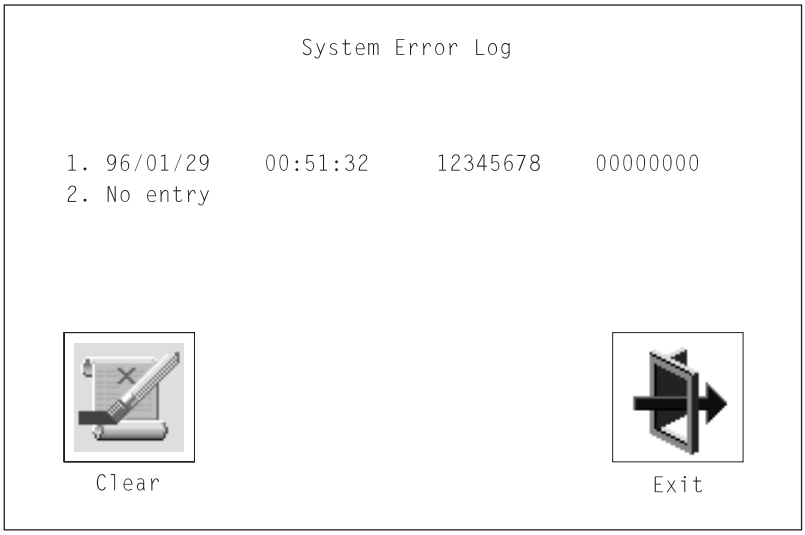
This selection allows you to change the spin up delay for SCSI hard disk drives attached to your system. Spin up delay values can be entered manually or a default setting can be used. All values are measured in seconds. The default is two seconds. After you have entered the new Spin up delay values, use the arrow keys to highlight the **Save** icon and press the Enter key.



Error Log

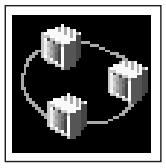


Selecting this icon displays the log of errors your system unit has encountered during operations.

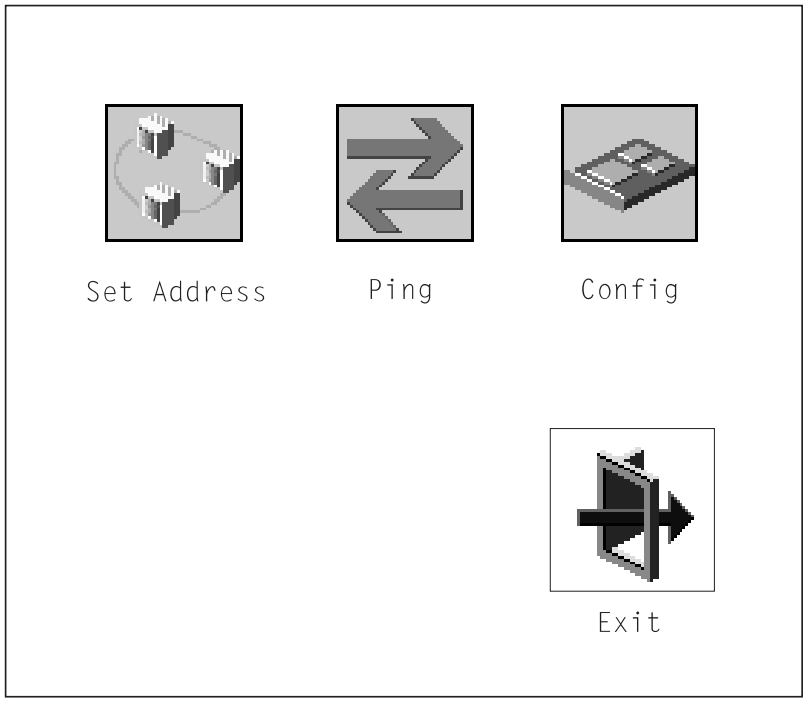


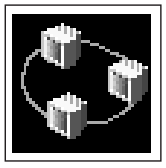
Selecting the Clear icon erases the entries in this log.

RIPL

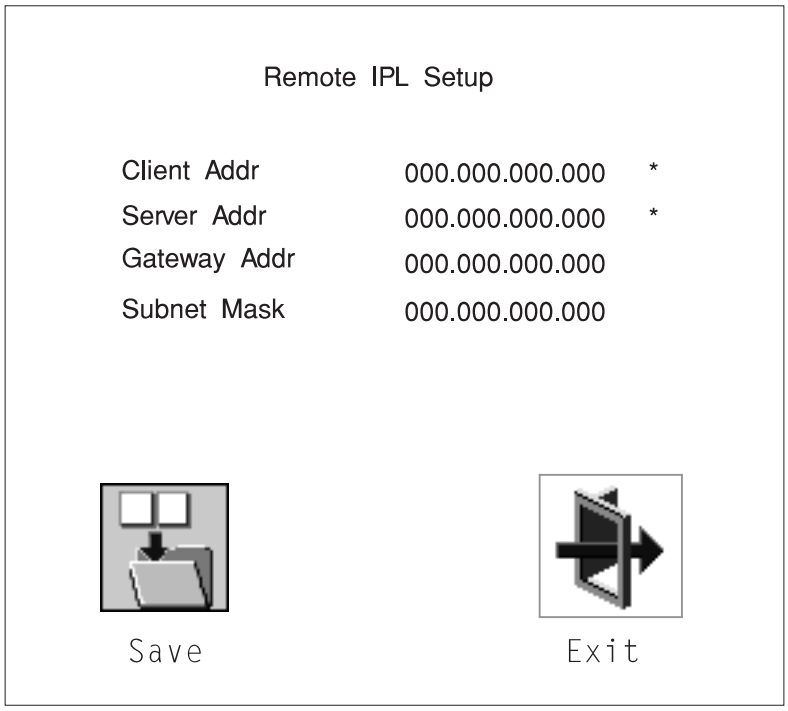


Selecting the Remote Initial Program Load (RIPL) icon above gives you access to the following selections.

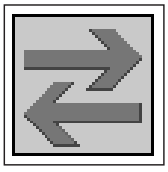




The Set Address icon allows you to define addresses from which your system unit can receive RIPL code.

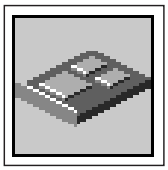


If any of the addresses is incomplete or contains a number other than 0 to 255, an error message is displayed when you select the Save icon. To clear this error, change the improper address and select Save again.

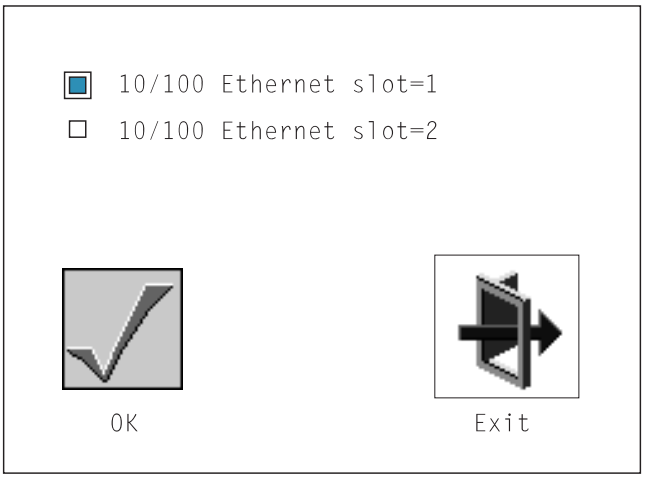


The Ping icon allows you to confirm that a specified address is valid by sending a test transmission to that address.

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



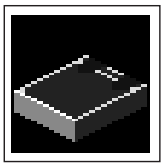
The Config icon allows you to configure network adapters which require setup. Selecting the Config icon presents a list of the adapters requiring configuration. Use the arrow keys or mouse to highlight an adapter, press the spacebar to select the adapter, then highlight the OK icon and press the Enter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

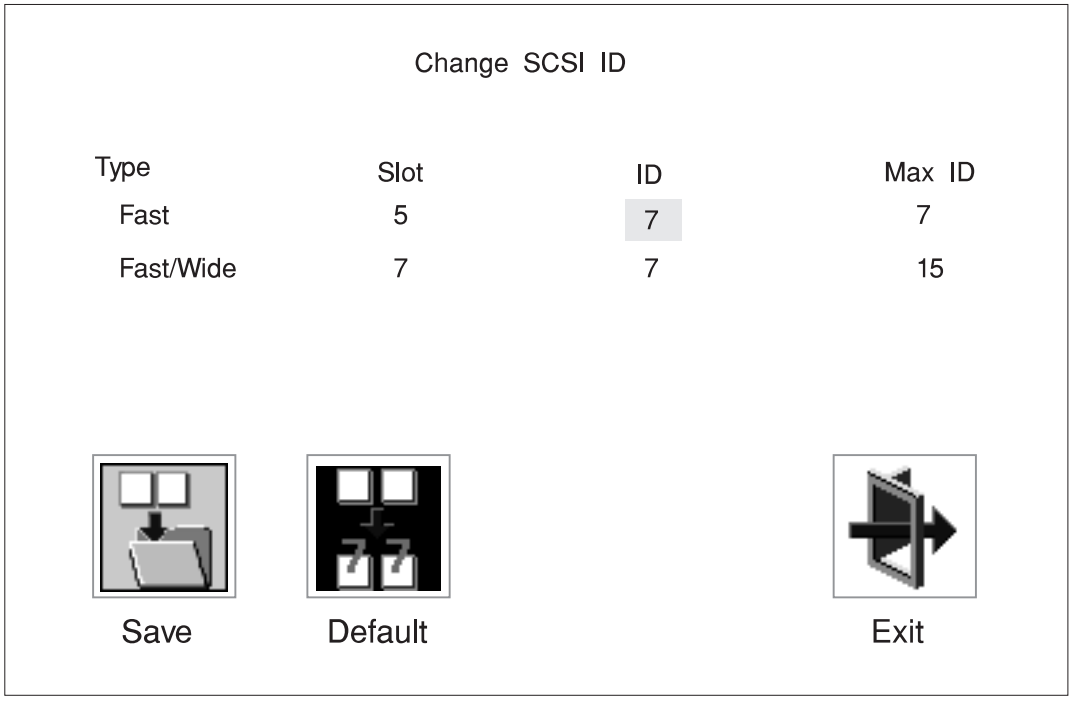
After choosing the adapter to configure, you can select the communications mode of the chosen adapter (or allow the system to select the communications mode automatically). As on the previous screen, use the arrow keys or mouse to highlight, then press the spacebar to select. When you have selected the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

SCSI ID

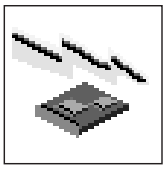


This selection allows you to view and change the addresses (IDs) of the SCSI controllers attached to your system unit. To change an ID, highlight the entry by moving the arrow keys, then enter another number. After you have entered the new address, use the arrow keys or mouse to highlight the Save icon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

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.

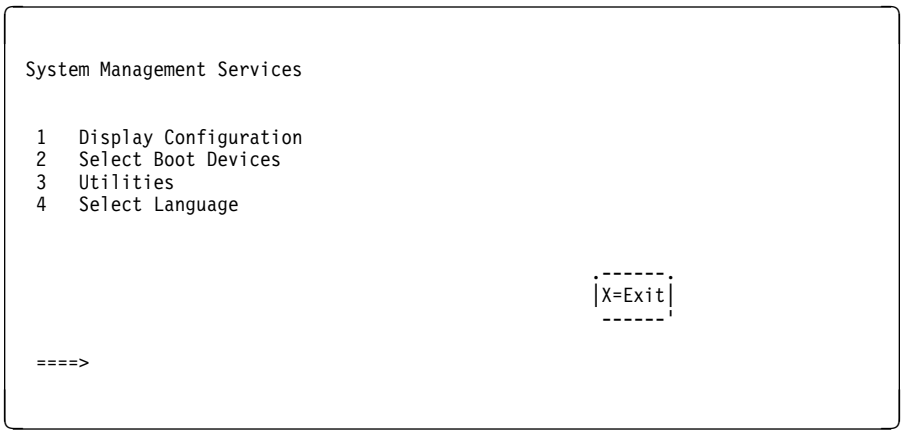


Figure 7-1. Text-based System Management Services - Main Menu (Model 140 and Model 240)

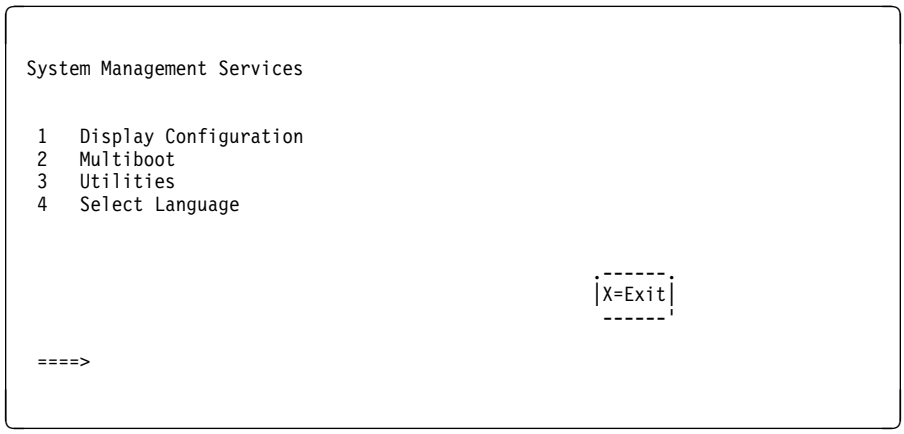


Figure 7-2. Text-based System Management Services - Main Menu (Model 150)

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.

```
<Device Name>

PowerPC 604
L2-Cache, 0512K
Memory
   slotA=8MB
   slotB=8MB
LPT
   addr=3BC
COM
   addr=3F8
COM
   addr=2F8
Audio
Keyboard
Mouse
Diskette
   addr=3F0
Integrated Ethernet
   addr=80005AF67BD
SCSI cntlr id=7


.-----------. .-----------.                          .------.
|P=prev-page| |N=next-page|                          |x=Exit|
 -----------'  -----------'                           ------'
```

Figure 7-3. Text-based System Management Services - Config Screen

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

MultiBoot Menu (Model 150)

The options available from this screen allow you to view and set various options regarding the operating system and boot sequence.

Note: The SMS software on the Model 140 and Model 240 do not have this menu option. On these systems, this menu is replaced by the **Boot** menu. See "Select Boot Devices" on page 7-30 for details.

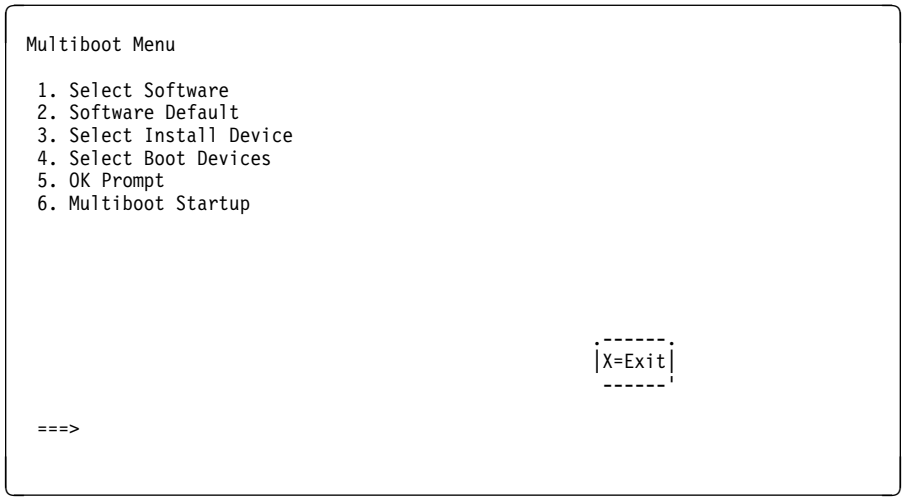


Figure 7-4. Text-based System Management Services - Multiboot Menu

Select Software: If supported by the operating system, this option shows the names of the operating system installed. This option may not be supported by all operating systems.

In the case of AIX this is a supported option, if you receive a message saying that:

```
No Operating System Installed
```

this would mean that information in non-volatile storage could have been lost, as would happen if the battery had been removed. In order to recreate this value, issue the `bootlist` command under AIX with the appropriate parameters as to the location of the operating system in a particular hard disk. Please see the explanation of the bootlist command in your AIX documentation.

Software Default: If supported by the operating system, lets you select the default operating system to start the system. This option may not be supported by all operating systems.

Select Install Device: Produces a list of devices, for example the CD-ROM, where the operating system is installed from. You select one of the devices and the system searches the device for an operating system to install and if supported by the operating system in that device, the name of the operating system displays.

Select Boot Device: Provides a list of devices that can be selected to be stored on the boot list. Up to 5 devices are supported.

OK Prompt: Provides access to the Open Firmware command prompt.

Multiboot Start Option: Toggles between OFF and ON and selects if the Multiboot menu invokes automatically on startup or not.

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.

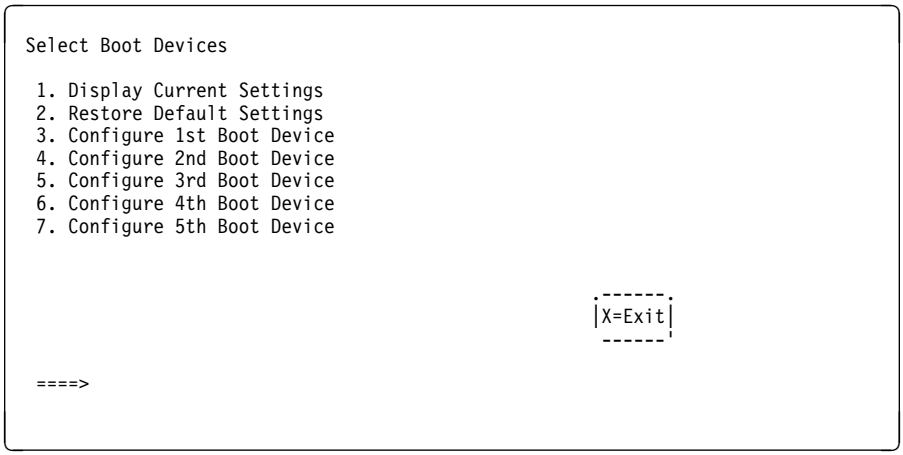


Figure 7-5. Text-based System Management Services - Select Boot Devices Menu

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

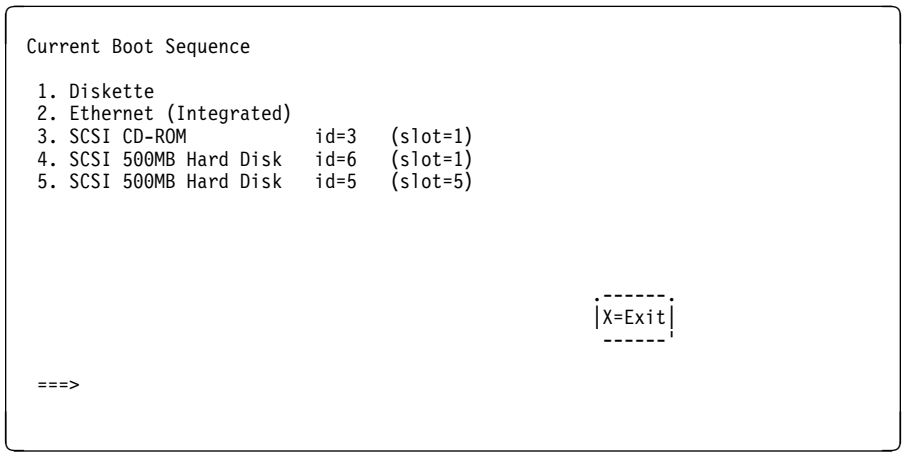


Figure 7-6. Text-based System Management Services - Boot Sequence Screen

Restore Default Settings: Restores the boot list to the default sequence of:

- The primary diskette drive
- CD-ROM drive
- Tape id=5
- Hard disk drive id=6
- Network device.

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

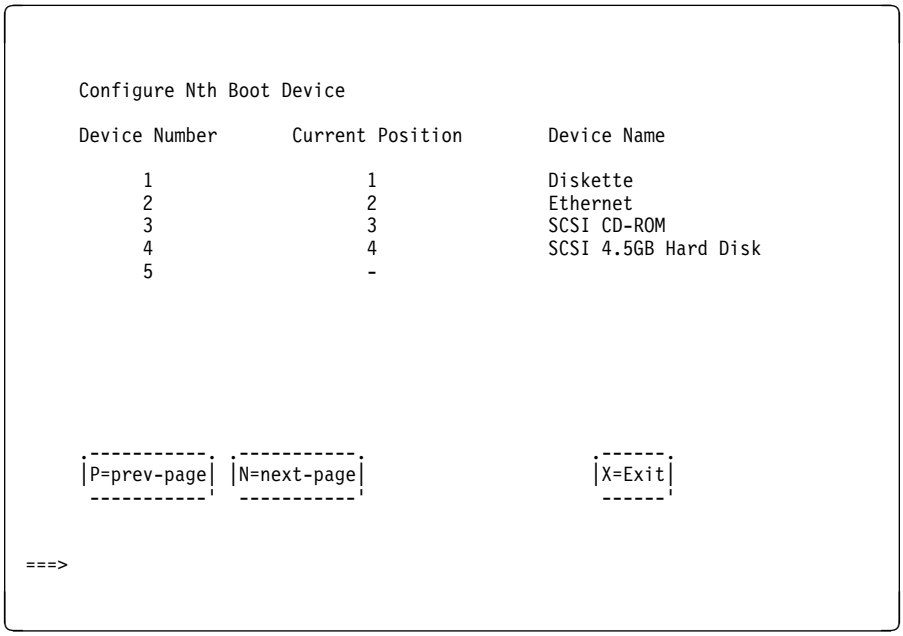


Figure 7-7. Text-based System Management Services - Configure Boot Device Screen

Attention: If no user-defined boot-list exists, and the privileged-access password has been enabled, you are asked for the privileged-access password at startup every time you boot up your system. See “Set Privileged-Access Password” on page 7-35 for more information on the privileged-access password.

Utilities

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

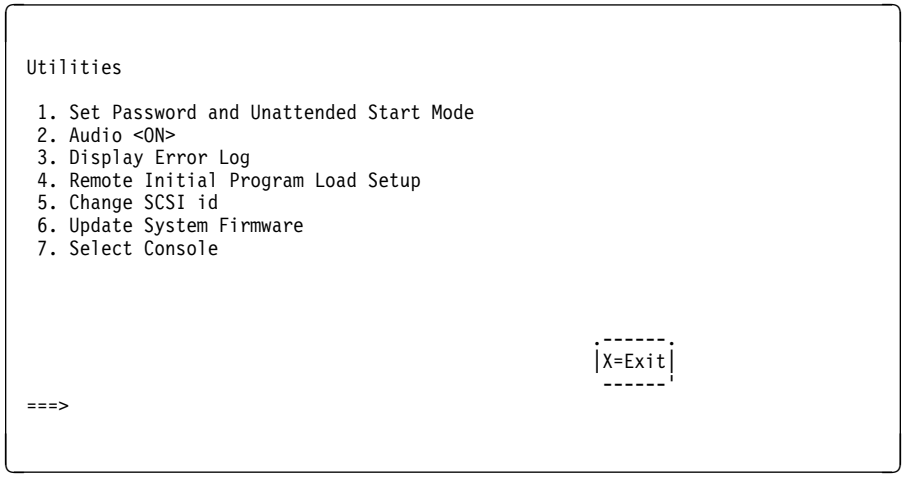


Figure 7-8. Text-based System Management Services - Utilities Menu (Model 140 & Model 240)

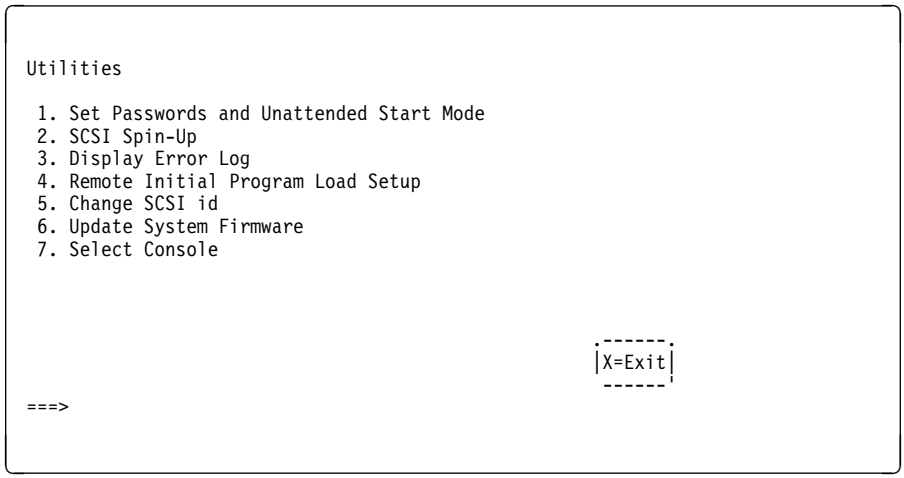


Figure 7-9. Text-based System Management Services - Utilities Menu (Model 150)

Set Password and Unattended Start Mode

Entering this selection permits access to the following options.

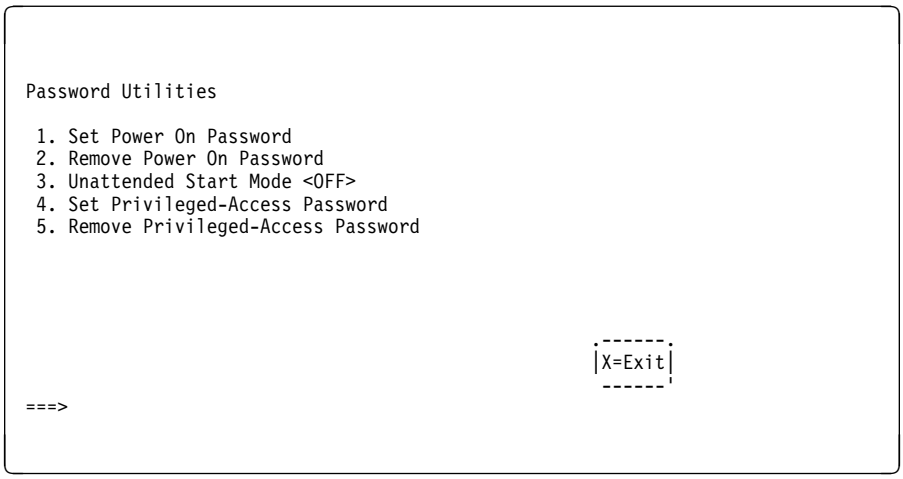


Figure 7-10. Text-based System Management Services - Password Menu

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 re-enables 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 8-36 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 are 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. 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 Privileged-Access Password**.

Audio (Model 140 and Model 240 only)

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

Hard Disk Spin-Up Delay (Model 150 only)

Selecting this utility allows you to adjust the hard disk spin-up delay in your system unit.

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.

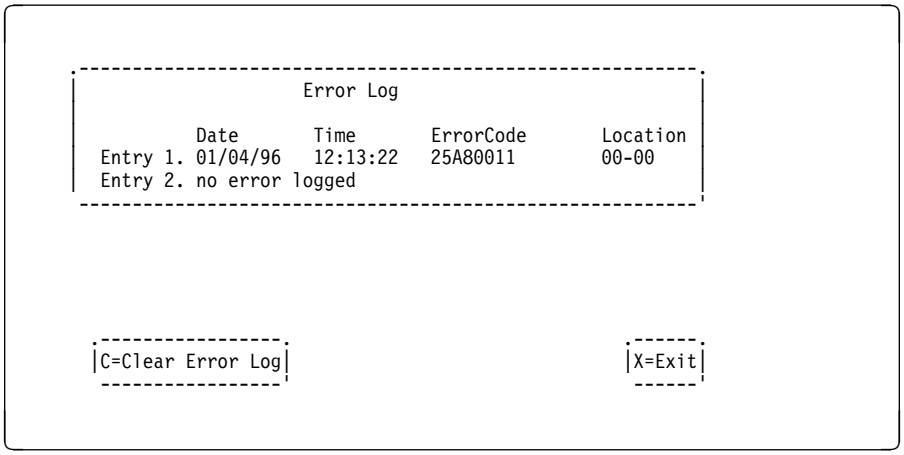


Figure 7-11. Text-based System Management Services - Error Log

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.

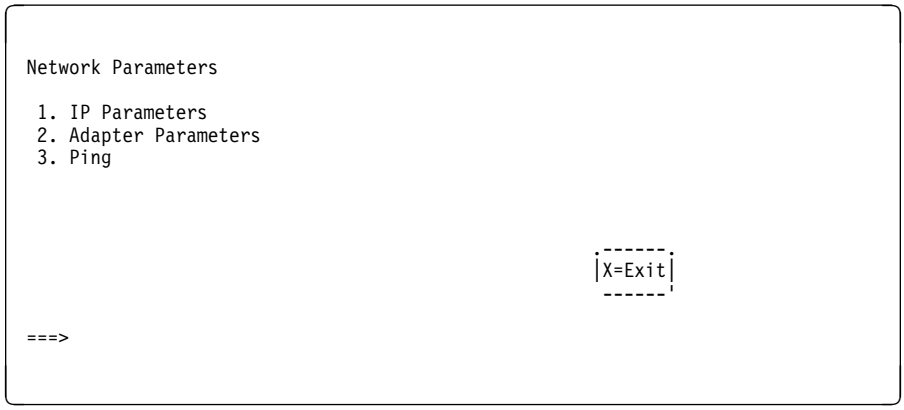


Figure 7-12. Text-based System Management Services - RIPL Setup Menu

Selecting the IP Parameters option displays the following screen.

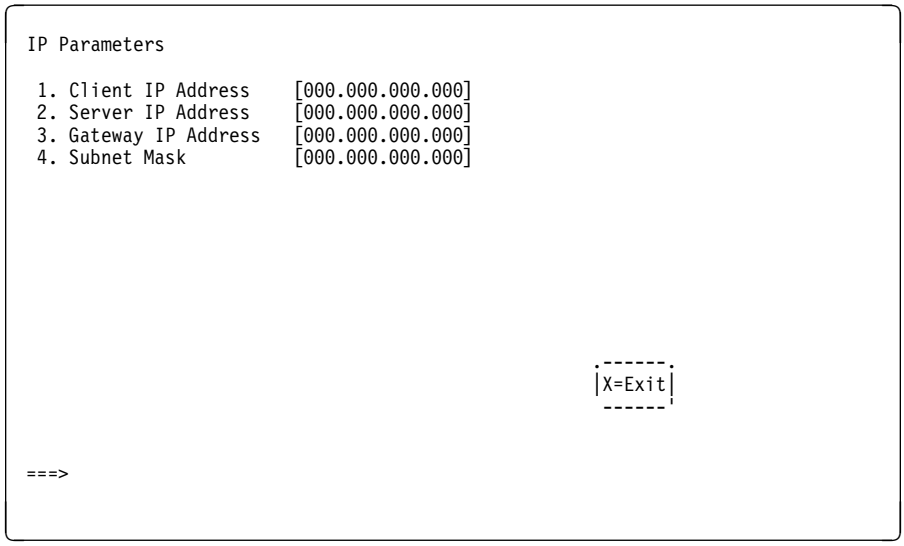


Figure 7-13. Text-based System Management Services - IP Parameters Menu

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

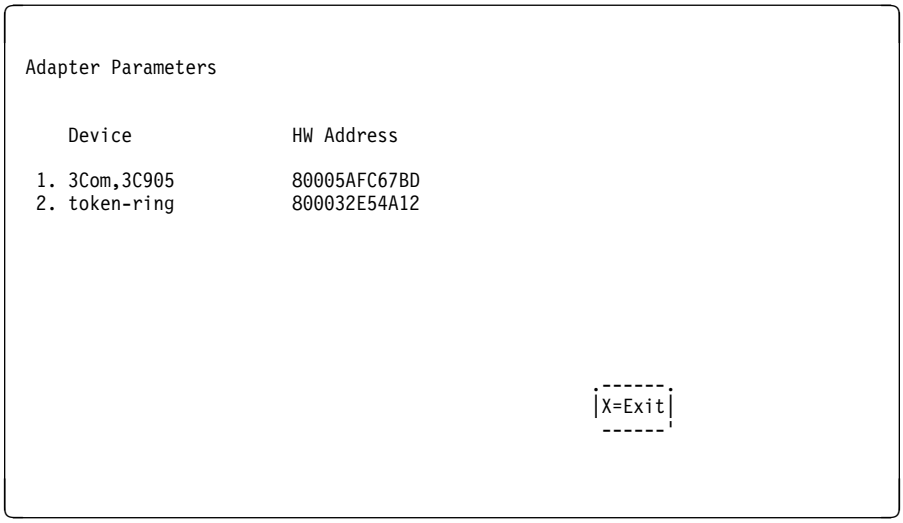
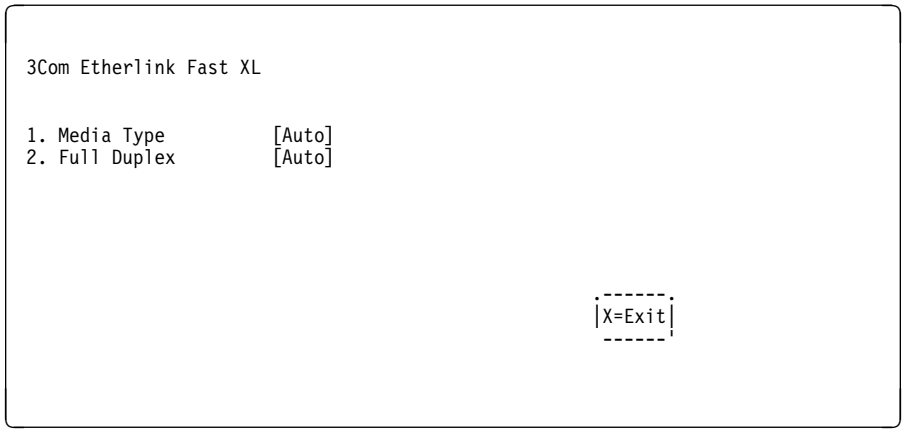
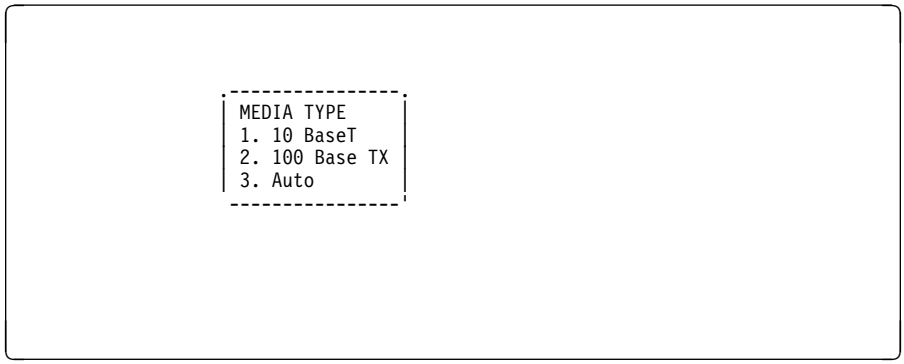


Figure 7-14. Text-based System Management Services - Adapter Parameters Menu

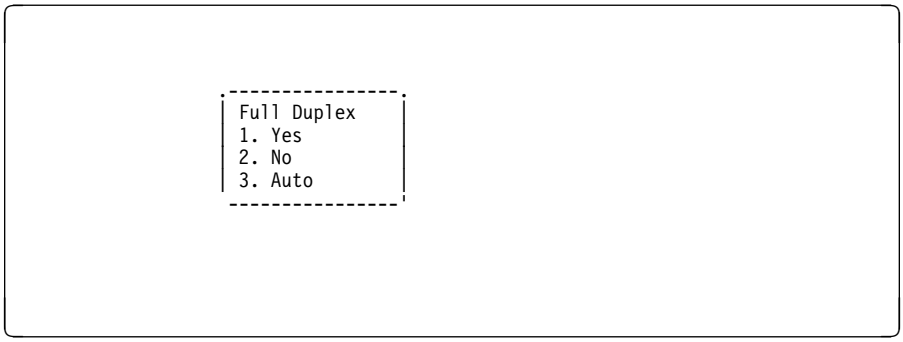
Selecting option 1 (3Com,3C905) displays the following 100Mb Ethernet configuration menus:



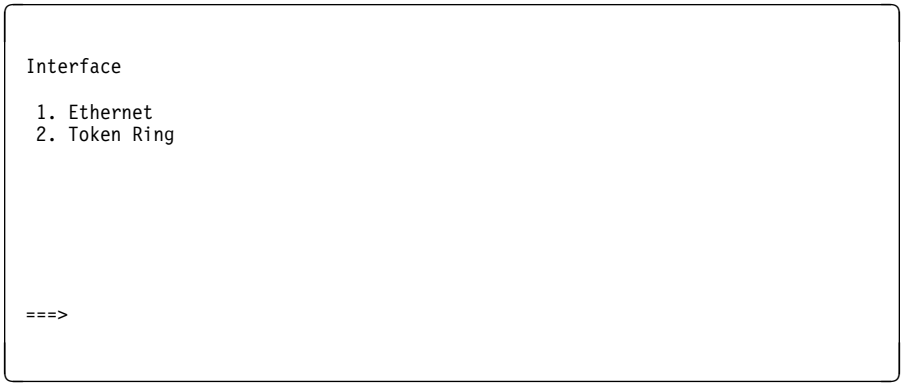
Selecting the Media Type option allows you the change the media employed by the Ethernet adapter:



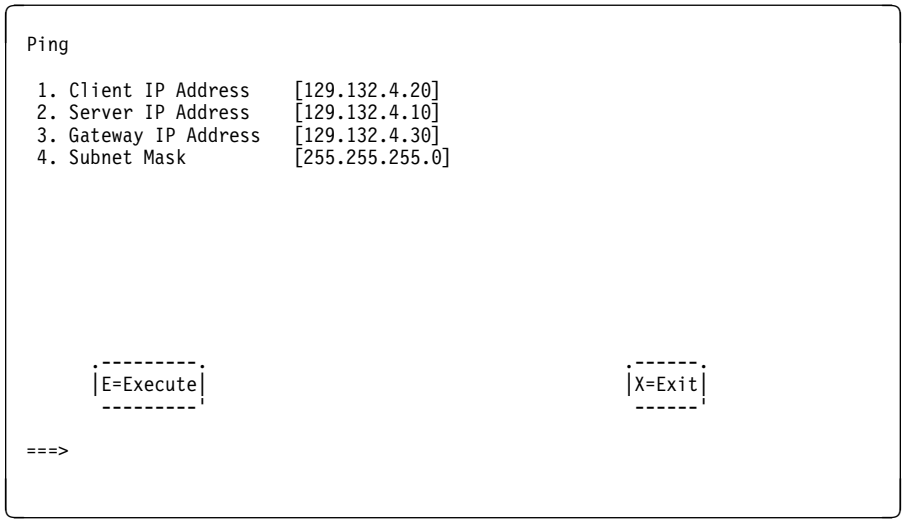
Selecting the Full Duplex option allows you to change how the Ethernet adapter communicates with the network:



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.

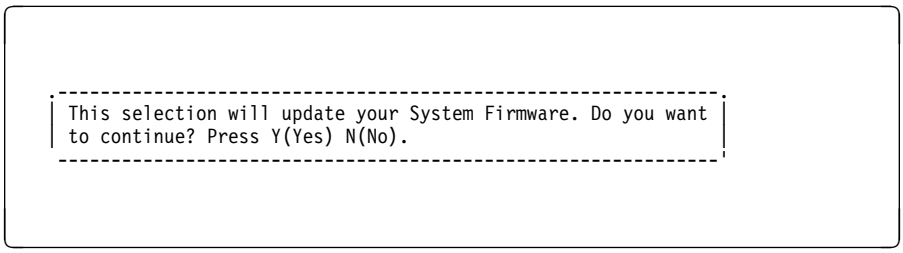
Update System Firmware

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.

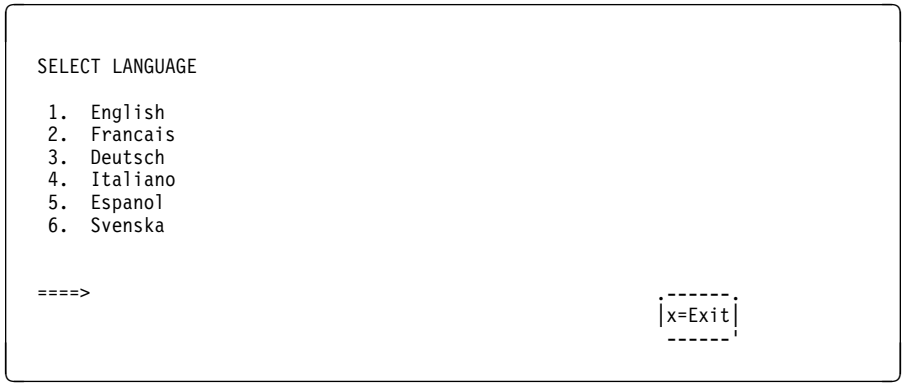
To perform a firmware recovery, do the following:

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.

Open Firmware Command Line

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.

Chapter 8. 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.

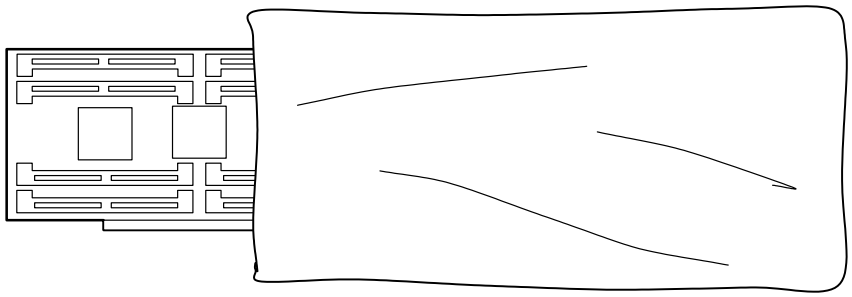
CAUTION:
This product is equipped with a 3-wire power cable and plug for the user's safety. Use this power cable in conjunction with a properly grounded electrical outlet to avoid electrical shock.

Handling Static–Sensitive Devices

ATTENTION: 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:

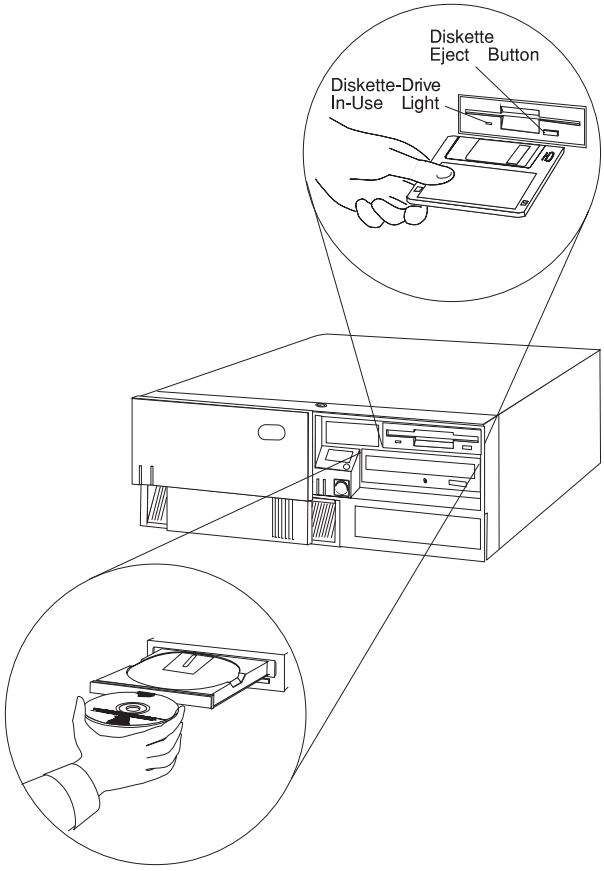
- If you have an antistatic wrist strap available, use it while handling the device.
- Do not remove the device from the antistatic bag until you are ready to install the device in the system unit.
- With the device still in its antistatic bag, touch it to a metal frame of the system.
- Grasp cards and 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

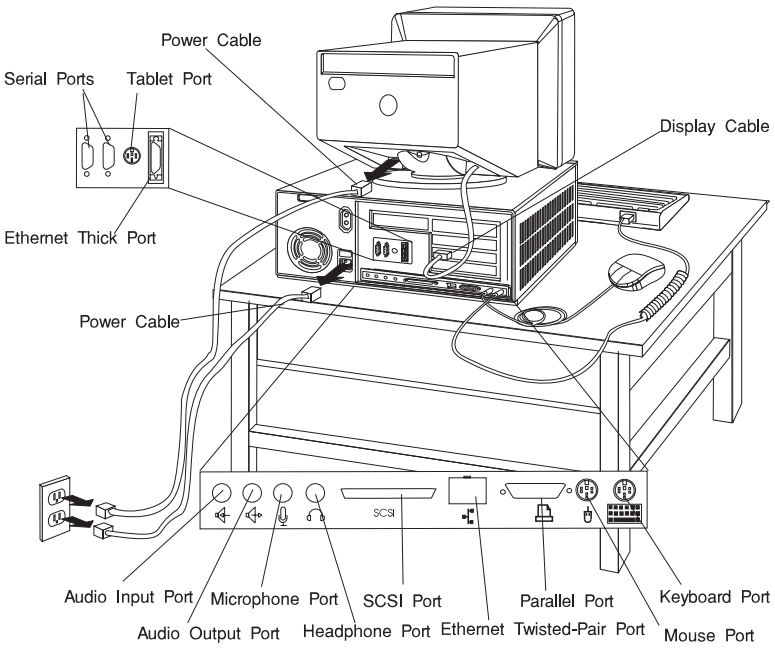
Removal

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.

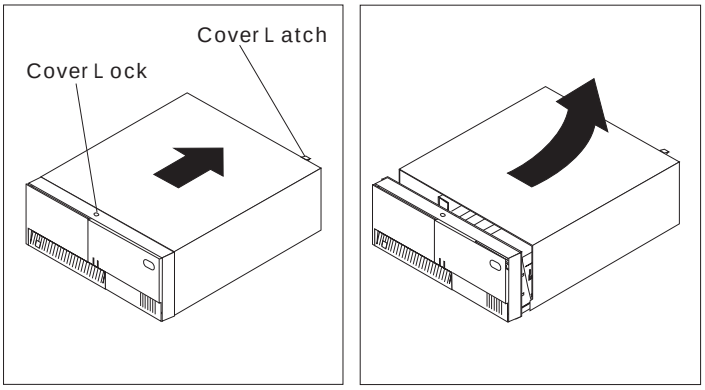


3. Turn off all attached devices and the system unit.
4. If you have a modem or fax machine attached to the system unit, disconnect the telephone line from the wall outlet and the system unit.
5. Unplug all power cords (cables) from electrical outlets.

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

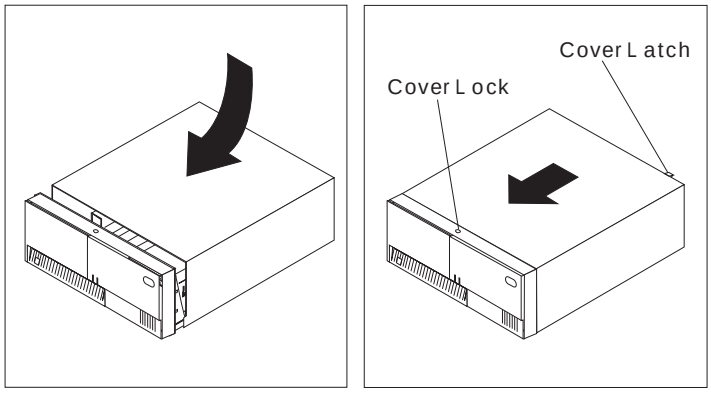


7. If you have not already done so, remove the display from the top of the system unit.
8. Unlock the cover. Then, while holding down the cover latch at the rear of the system unit, slide the cover to the rear approximately 1 inch. Grasp the cover on both sides and lift it away from the system unit.

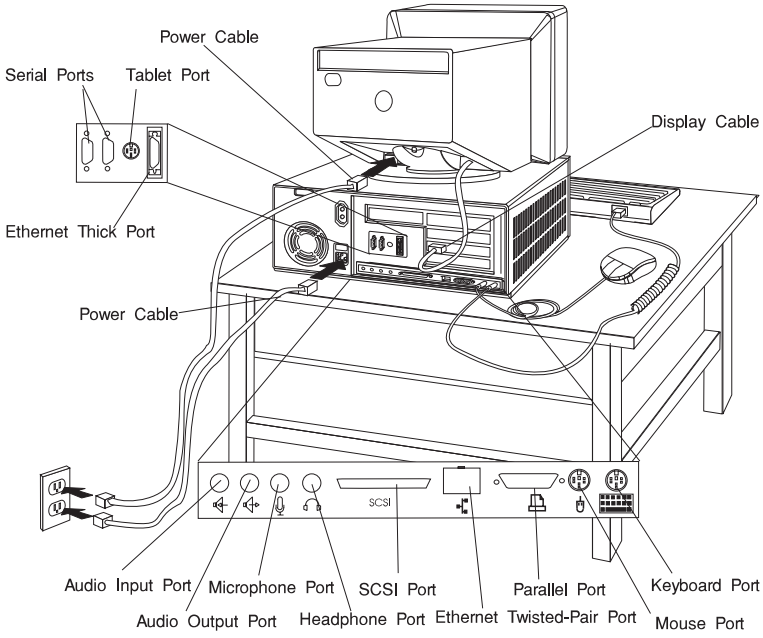


Replacement

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 system unit, reconnect the telephone line to the system unit and the wall outlet.

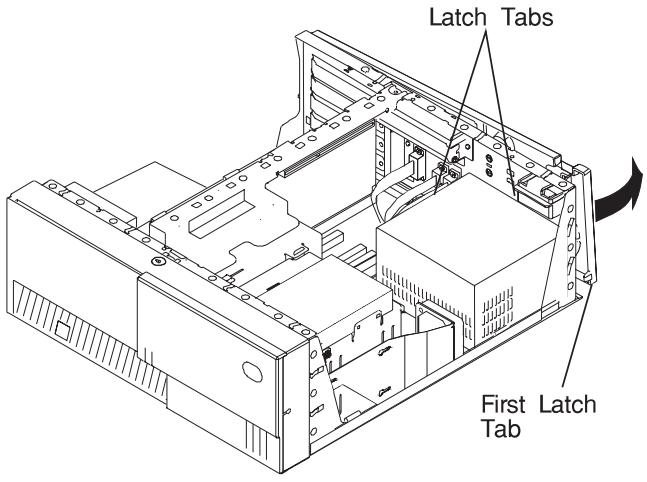
Power Supply

DANGER

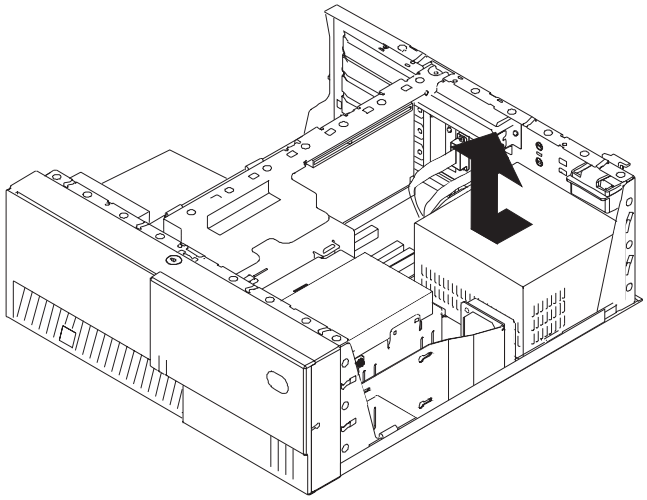
> **Do not attempt to open the covers of the power supply. Power supplies are not servicable and are to be replaced as a unit.**

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 8-3.
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.



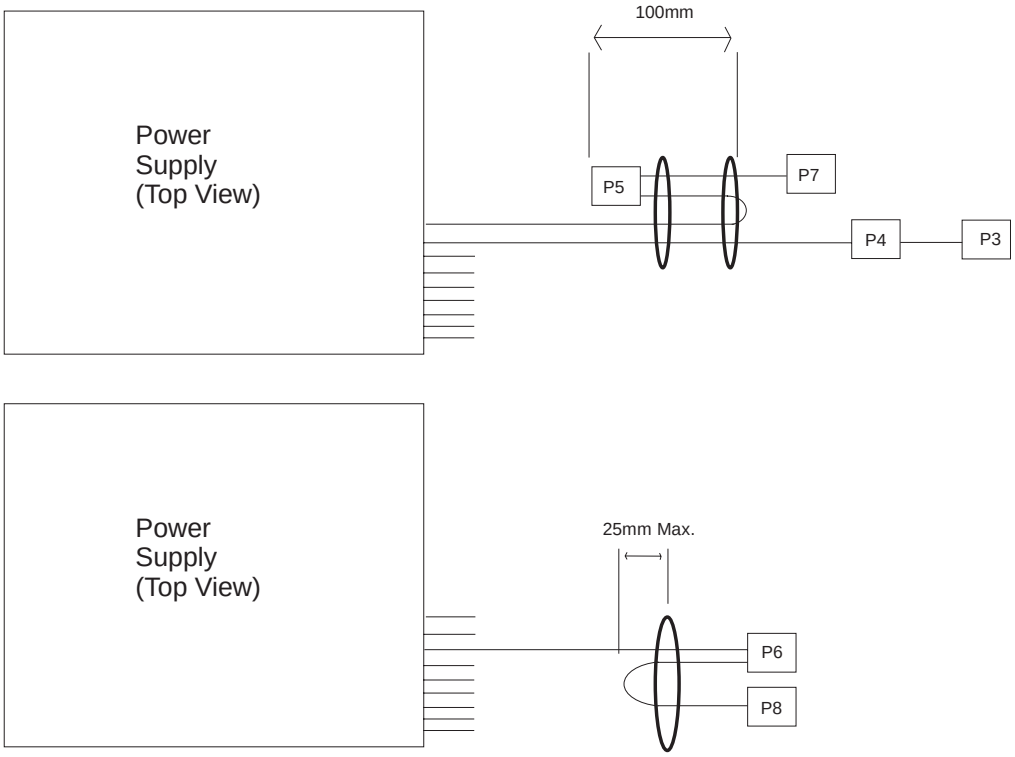
Replacement

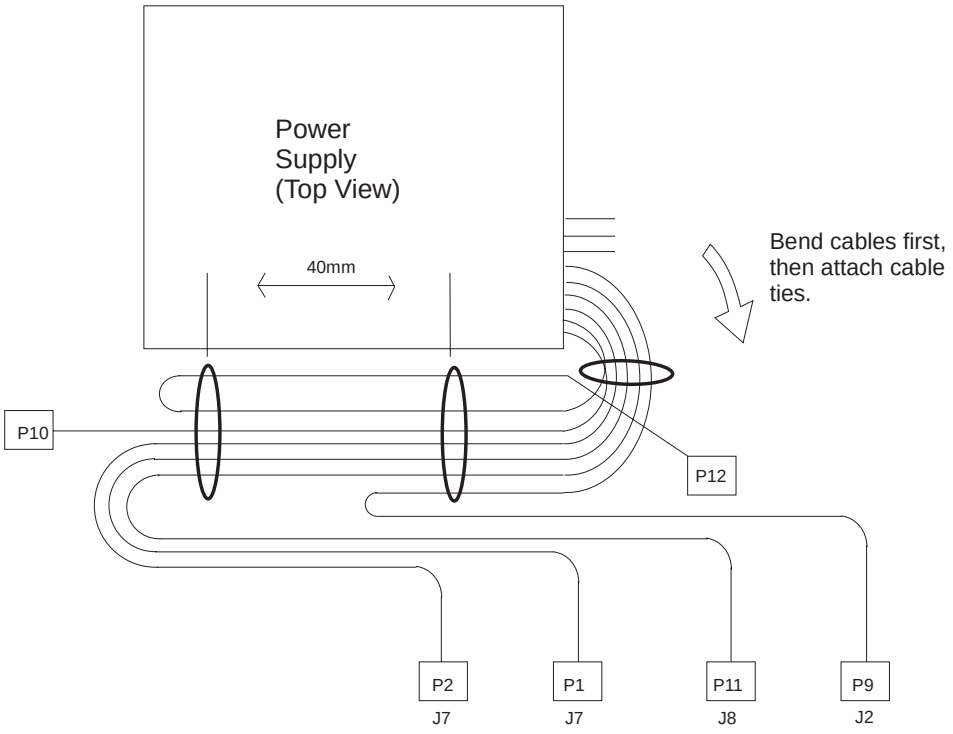
Replace in reverse order, noting the following power supply cable attachments.

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

Cable Ties

After replacing the power supply, ensure you attach cable ties at the areas designated in the following diagrams:

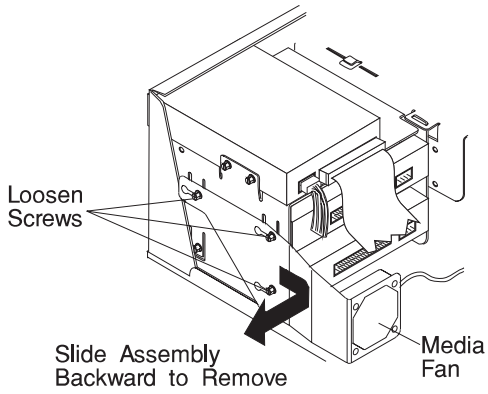



Power
Supply
(Top View)
40mm
Bend cables first,
then attach cable
ties.
P10
P12
P2
J7
P1
J7
P11
J8
P9
J2

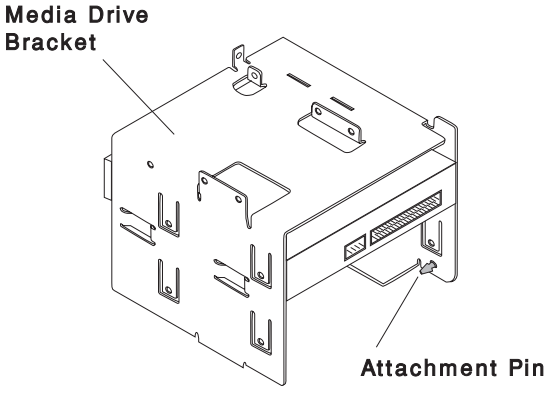
Front Bezel and Power Switch

Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 8-3.
2. Do the removal procedure under “Fan and Speaker Assembly” on page 8-34.
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.

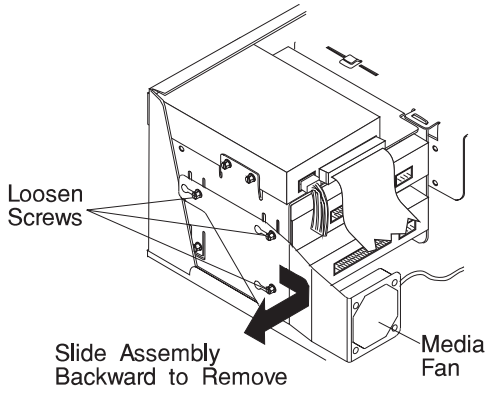
Replacement

1. Connect the power switch cable to the system board.
2. Fasten the power switch to the chassis with the two mounting screws.
3. Slide the front bezel onto the front of the chassis until the latches are securely mounted.
4. Slide the media drive bracket assembly towards the front of the chassis and into position.
5. Secure the media drive bracket assembly to the side of the chassis with the mounting screw.
6. Connect the media fan cable to the system board.
7. Install the media fan assembly.
8. Install the front fan and speaker assembly as described on “Fan and Speaker Assembly” on page 8-34
9. Replace the system unit covers as described in “Cover” on page 8-3.

Media Fan

Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 8-3.
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

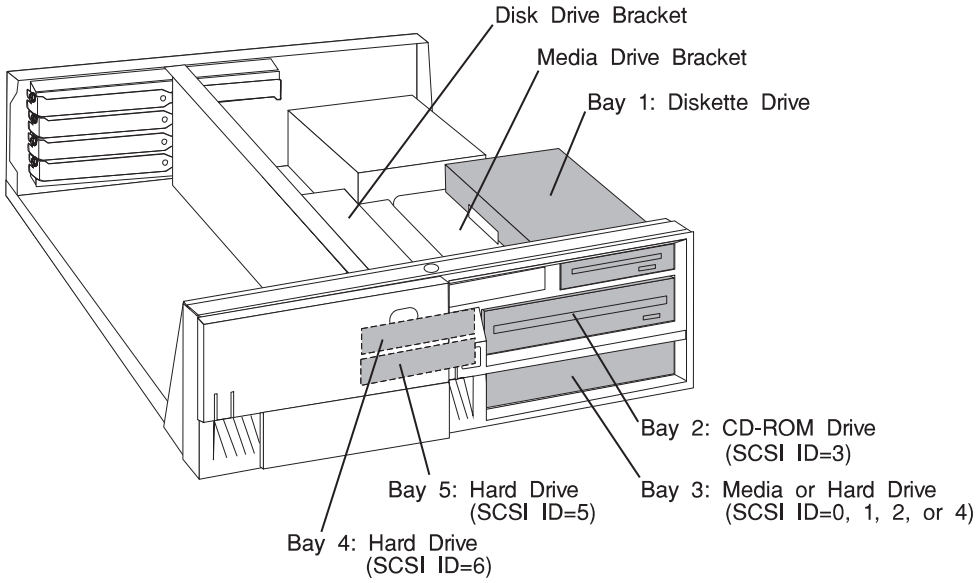
1. Place the media fan assembly into position.
2. Secure the media fan assembly to the side of the media drive bracket with the three screws removed earlier.
3. Connect the media fan power cable to the system board.

Internal Media Drives

Notes:

1. If you have not already done so, disconnect the power cord and remove the covers as described in “Cover” on page 8-3.
2. 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.



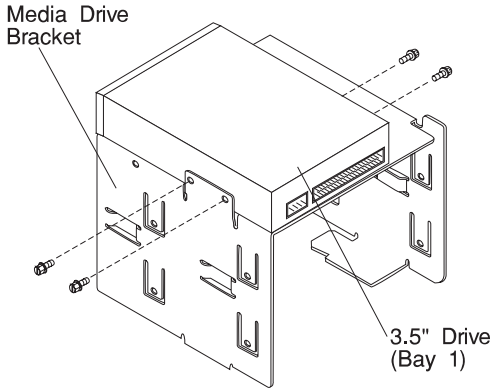
Use the following SCSI cable routing table to ensure all cables are reattached correctly.

SCSI Cable	System Location	Cable Notes
Connector 1	System Board, J4	Between Connectors 1 and 2, route over power supply, not under CD-ROM.
Connector 2	Bay 2, CD-ROM	
Connector 3	Bay 3, Lower Media	If empty, route extra cable through clamp above power supply.
Connector 4	Bay 4, Uppser DASD	
Connector 5	Bay 5, Lower DASD	If empty, route extra cable through clamp above power supply.
Connector 6	System Board, J33	

Diskette Drive

Removal

1. Unplug the diskette power and signal cables from the back of the drive.
2. Remove the screws which secure the diskette drive to the media drive bracket.

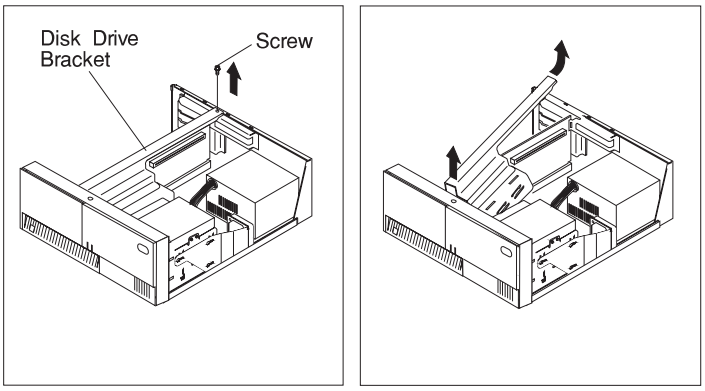


Replacement: Replace in reverse order.

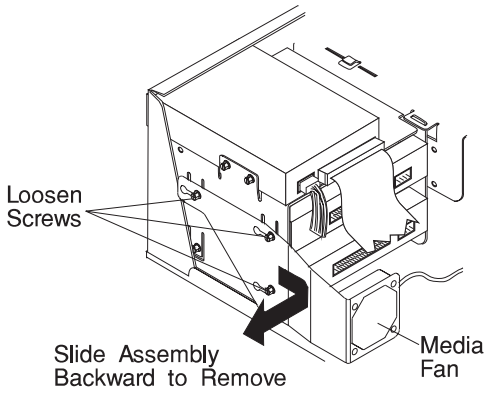
Media Drive in Bay 2 or 3

Removal

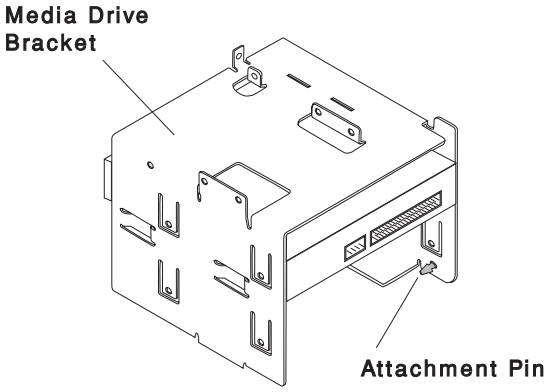
1. Remove the disk drive bracket assembly from the system unit and carefully place it on top of the power supply.



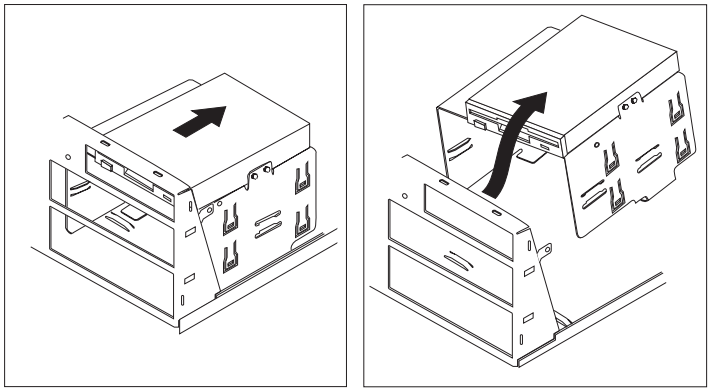
2. Remove the media fan assembly and disconnect the media fan cable.



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



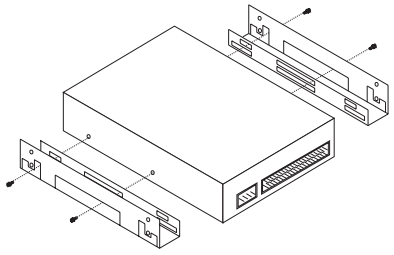
4. Remove the screw which secures the media drive bracket to the side of the chassis, then remove the media drive bracket assembly.



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

6. 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 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.

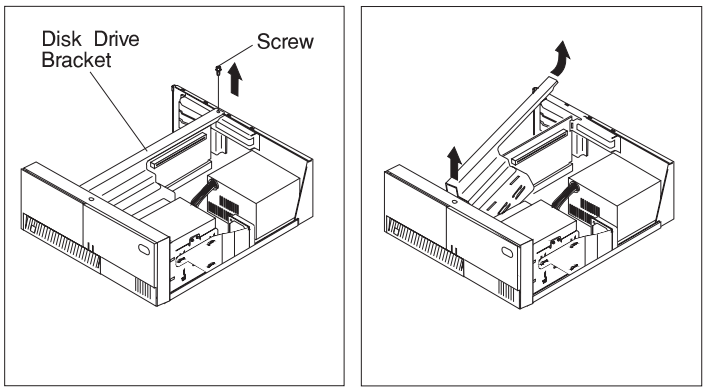


Replacement: To replace, perform the removal steps in the reverse order. Be sure to match the SCSI addresses of the replacement disk drives with those of the removed disk drives. Recommended SCSI addresses are shown in the illustration on page 8-13

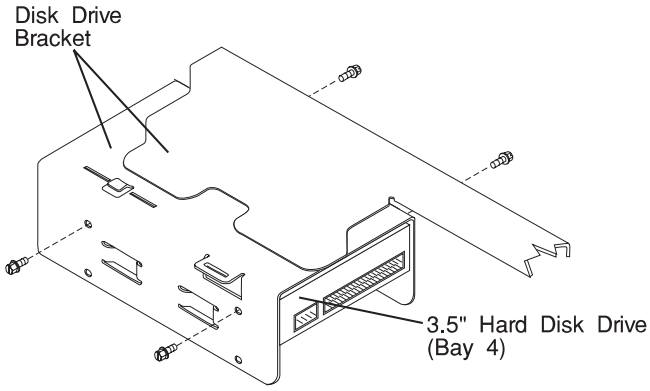
Media Drive in Bay 4 or 5

Removal

1. Remove the disk drive bracket assembly from the system unit.



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

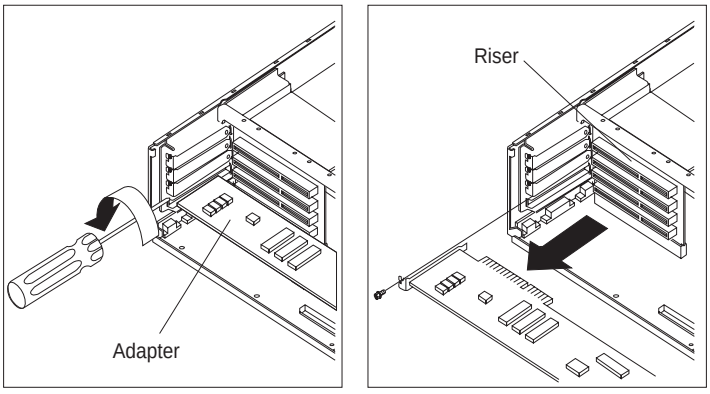


Replacement: To replace, perform the removal steps in the reverse order. Be sure to match the SCSI addresses of the replacement disk drives with those of the removed disk drives. Recommended SCSI addresses are shown in the illustration on page 8-13

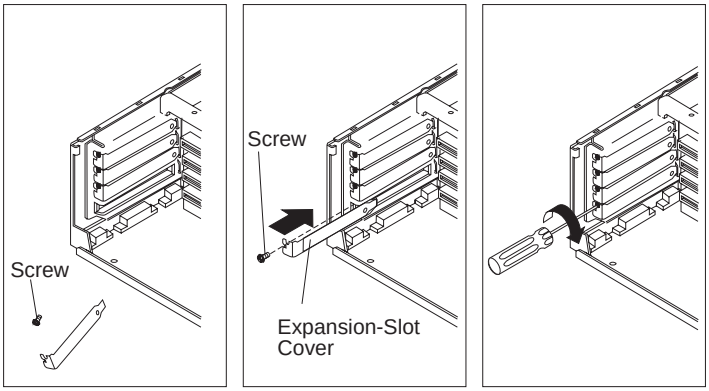
Adapter

Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 8-3.
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

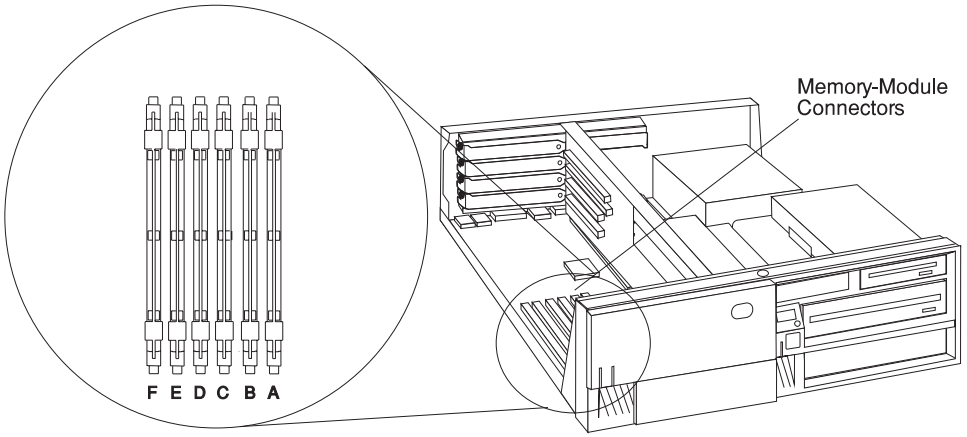
Replace in reverse order.

Memory Modules

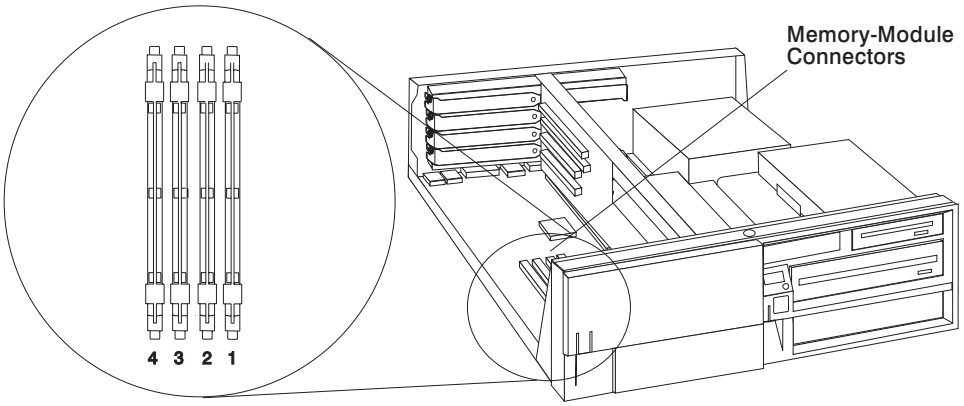
Removal

1. Locate the memory-module connectors.

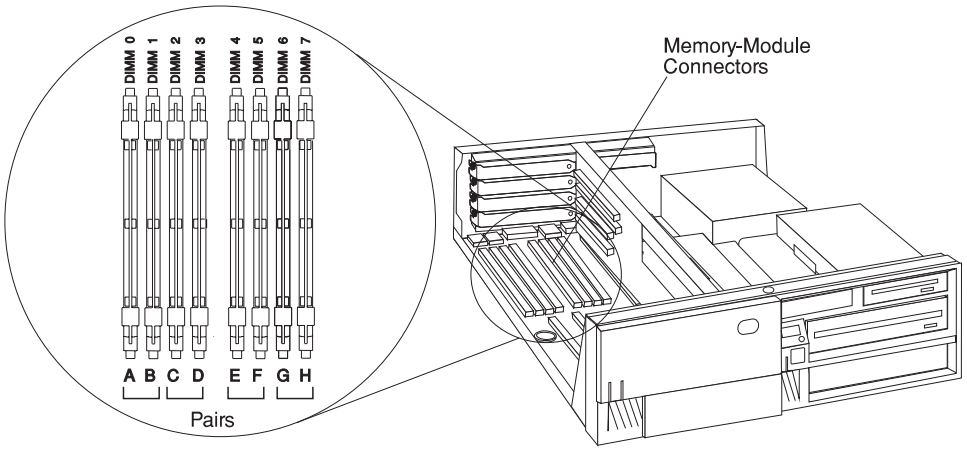
   To locate the six memory-module slots in the Model 140, use the following figure.



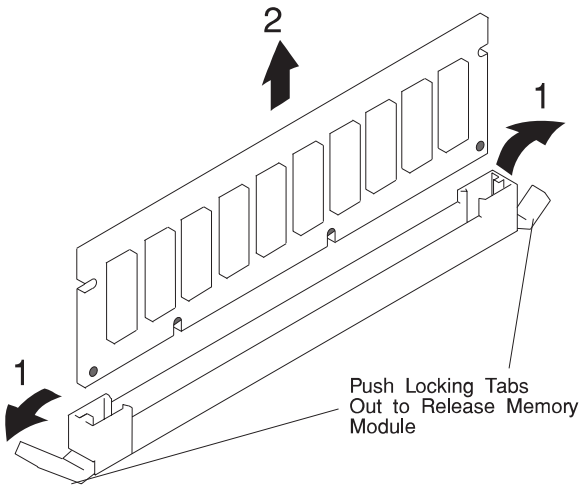
   To locate the four memory-module slots in the Model 150, use the following figure.



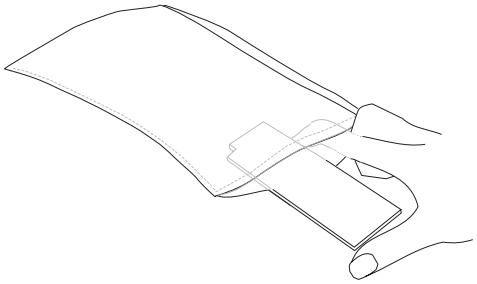
The following figure shows the location of the eight memory-module slots in the Model 240.



2. Remove any adapters that are blocking the memory-module connectors (see “Adapter” on page 8-19)
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.

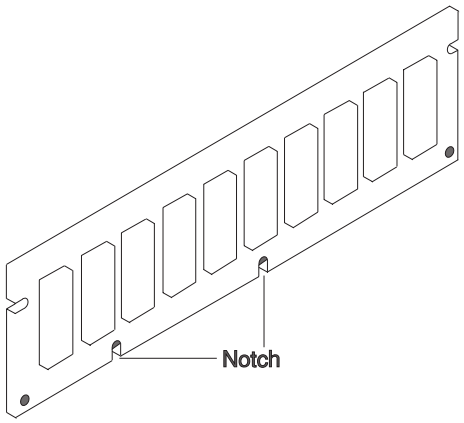


5. Install any adapters you removed into their original connectors. If you need further information on installing adapters, see “Adapter” on page 8-19

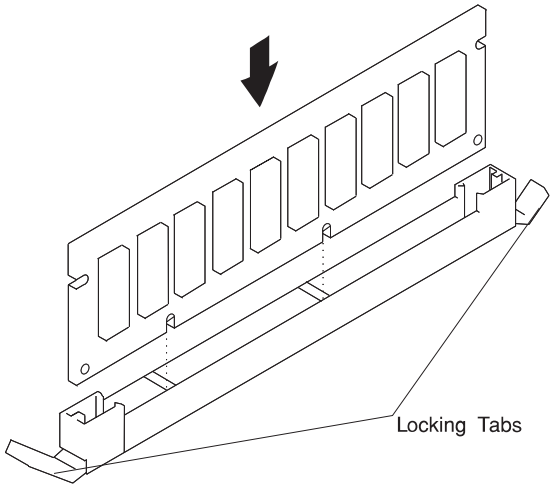
Replacement

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 lock automatically when you have fully inserted the memory module.)



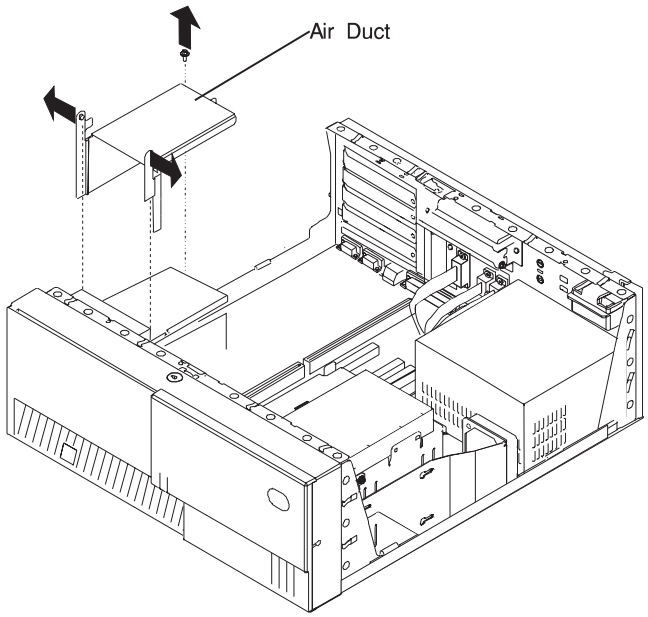
Attention: Inserting the memory module at an angle may cause damage.

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 8-19).

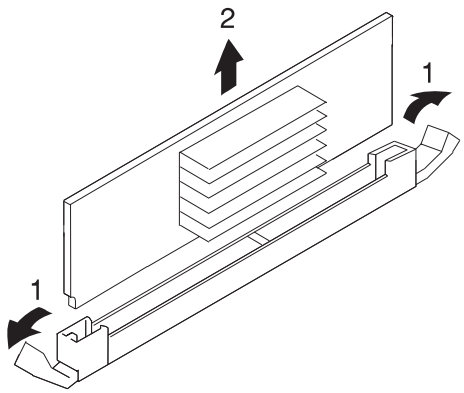
Processor Card (for the Model 240)

Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 8-3.
2. Do the removal procedure under “Adapter” on page 8-19 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.

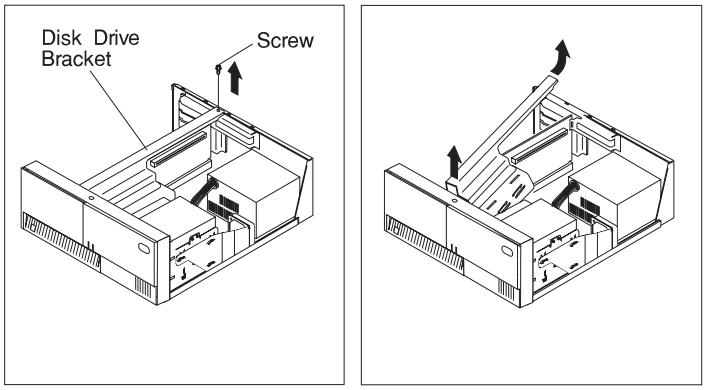
Notes:

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.

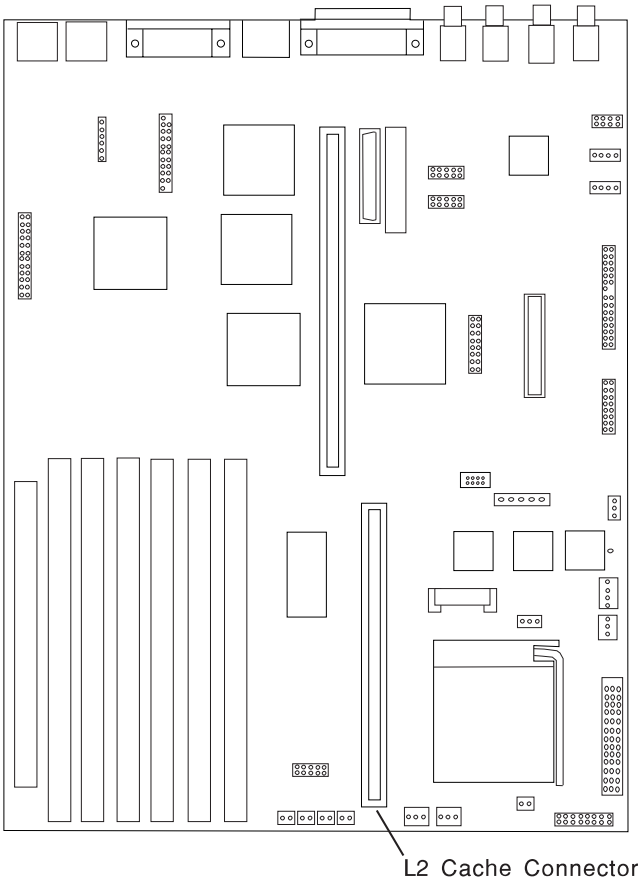
L2 Cache Card (for Model 140 Only)

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.

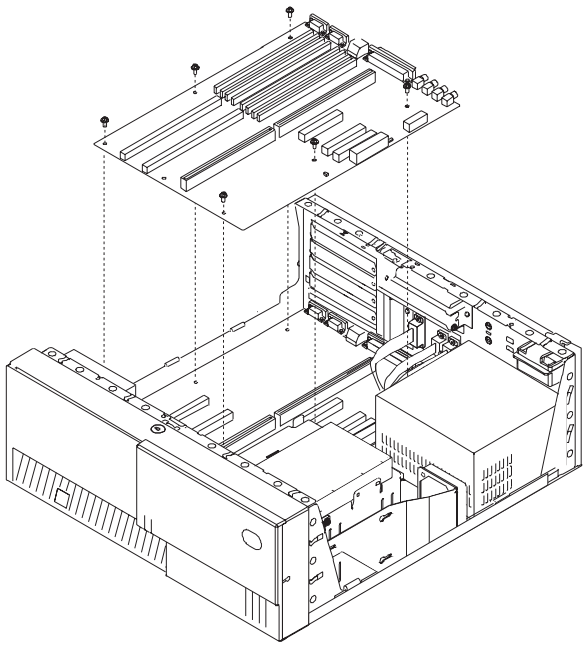
Replacement

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 8-3.
2. Do the removal procedure under “Adapter” on page 8-19.
3. Do the removal procedure under “Riser Card” on page 8-31.
4. Disconnect all cables from the system board.
5. Do the removal procedure under “Memory Modules” on page 8-20.
6. Do the removal procedure under “Processor Card (for the Model 240)” on page 8-24.
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 150, note the following cables must be reattached.

Location	Description
J7, J8	System Board Power Supply
J16	Diskette Drive Signal Cable
J5, J6	CD-ROM Audio
J33, J4	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

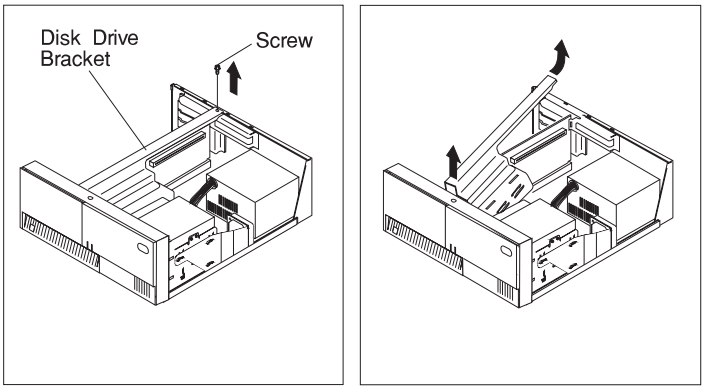
For the Model 240, note the following cables must be reattached.

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

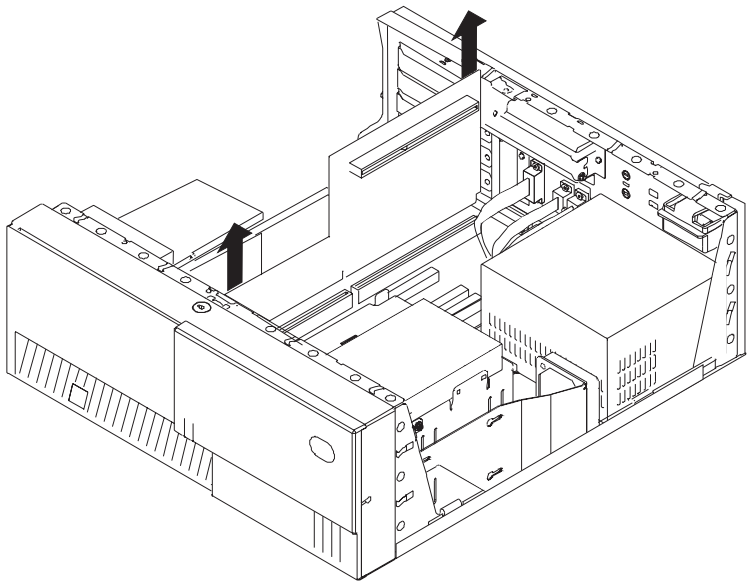
Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 8-3.
2. Remove all adapters; see “Adapter” on page 8-19.
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.)



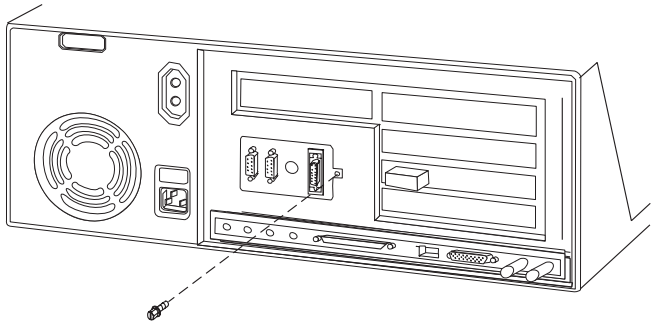
Replacement

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 8-3.
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

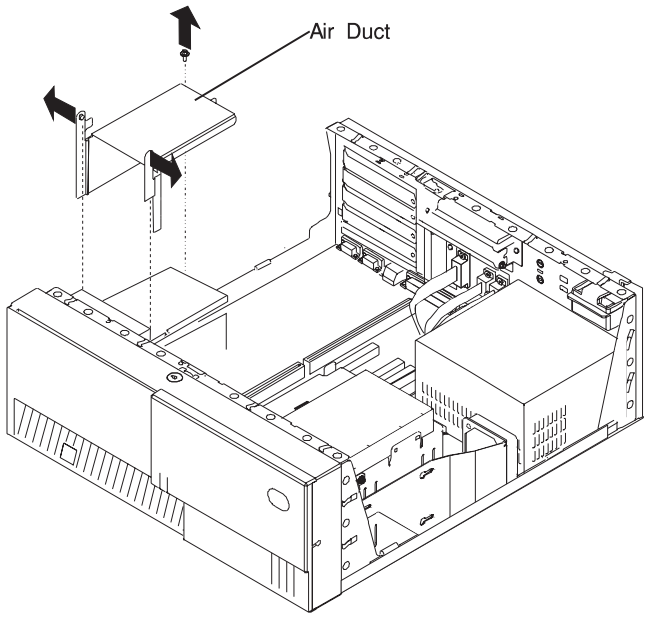
Replace in the reverse order.

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

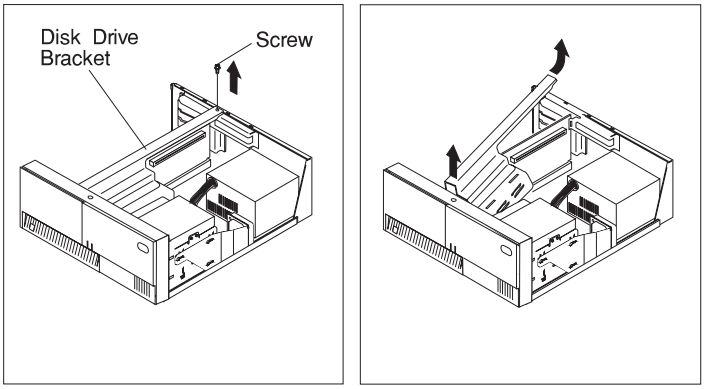
Removal

1. Do the cover removal procedure in “Cover” on page 8-3.
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.

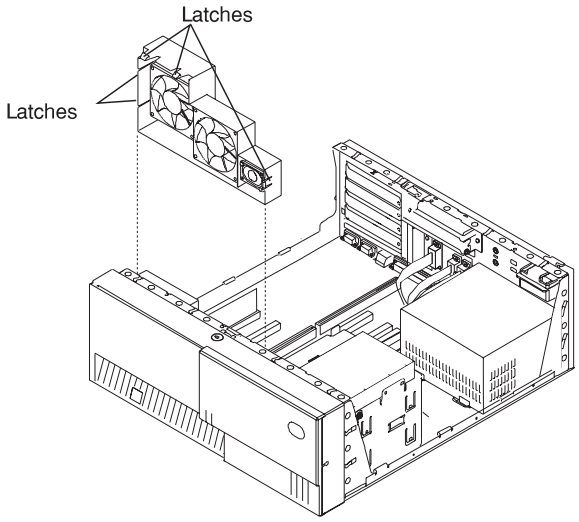


3. Do the removal procedure under “Adapter” on page 8-19 if any installed adapters are long enough to interfere with the fan and speaker assembly.

4. For the Model 240, do the procedure in “Processor Card (for the Model 240)” on page 8-24.
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

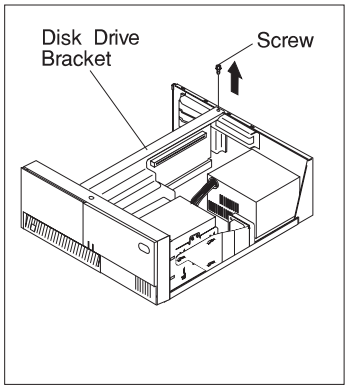
CAUTION:
A lithium battery can cause fire, explosion, or a severe burn. Do not recharge, disassemble, heat above 100°C (212°F), solder directly to the cell, incinerate, or expose cell contents to water. Keep away from children. Replace only with the part number specified for your system. Use of another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

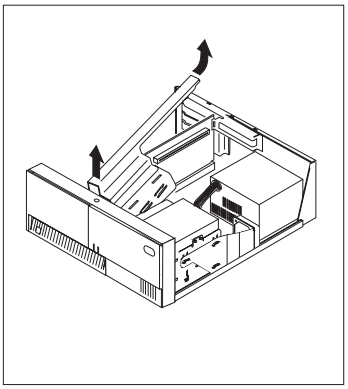
The battery connector is polarized; do not attempt to reverse the polarity.

Dispose of the battery according to local regulations.

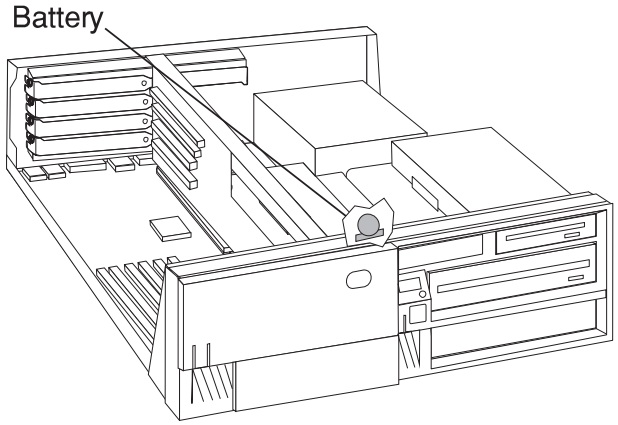
Removal

1. If you have not already done so, remove the covers as described in “Cover” on page 8-3.
2. For the Model 140 and Model 150:
   a. Remove the disk drive bracket assembly from the system unit and carefully place it on top of the power supply.

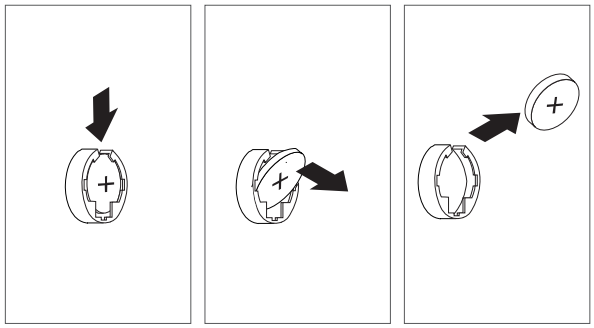




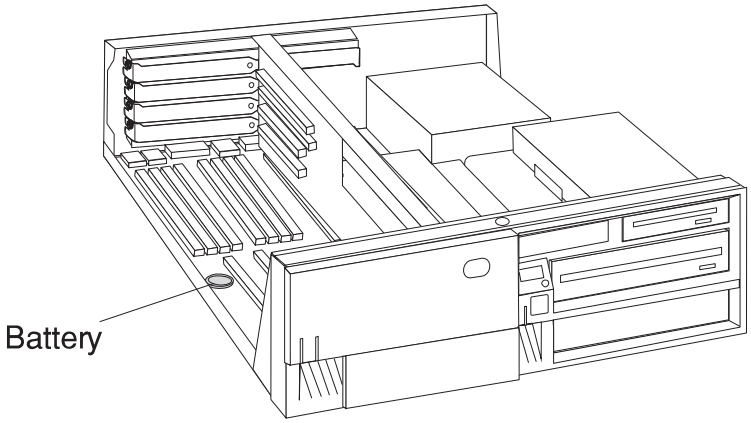
b. The following figure shows the location of the battery in the Model 140 and Model 150.



c. Remove the battery as shown.

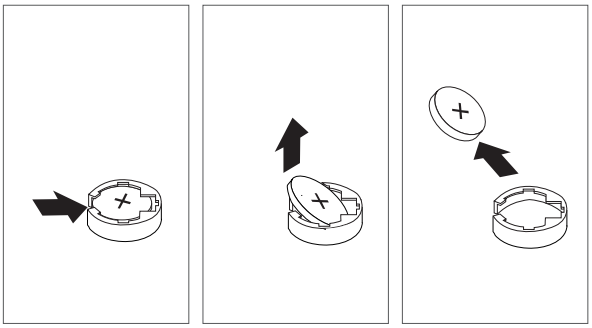


3. For the Model 240.



a. If adapters must be removed in order to reach the battery, refer to “Adapter” on page 8-19.

b. Remove the battery as shown.



Replacement

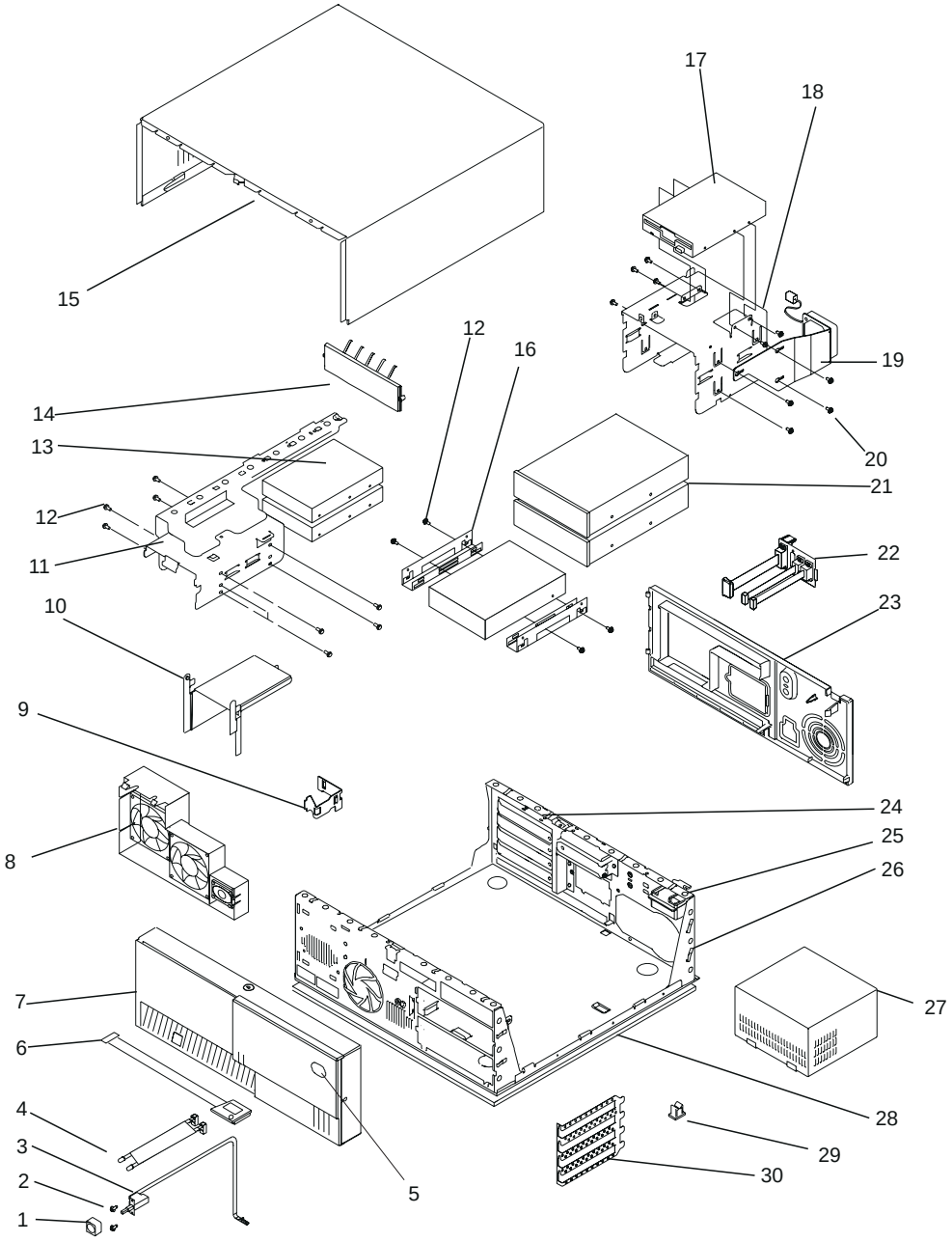
Install the new battery in the reverse order.

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 9. Parts Information

System Unit

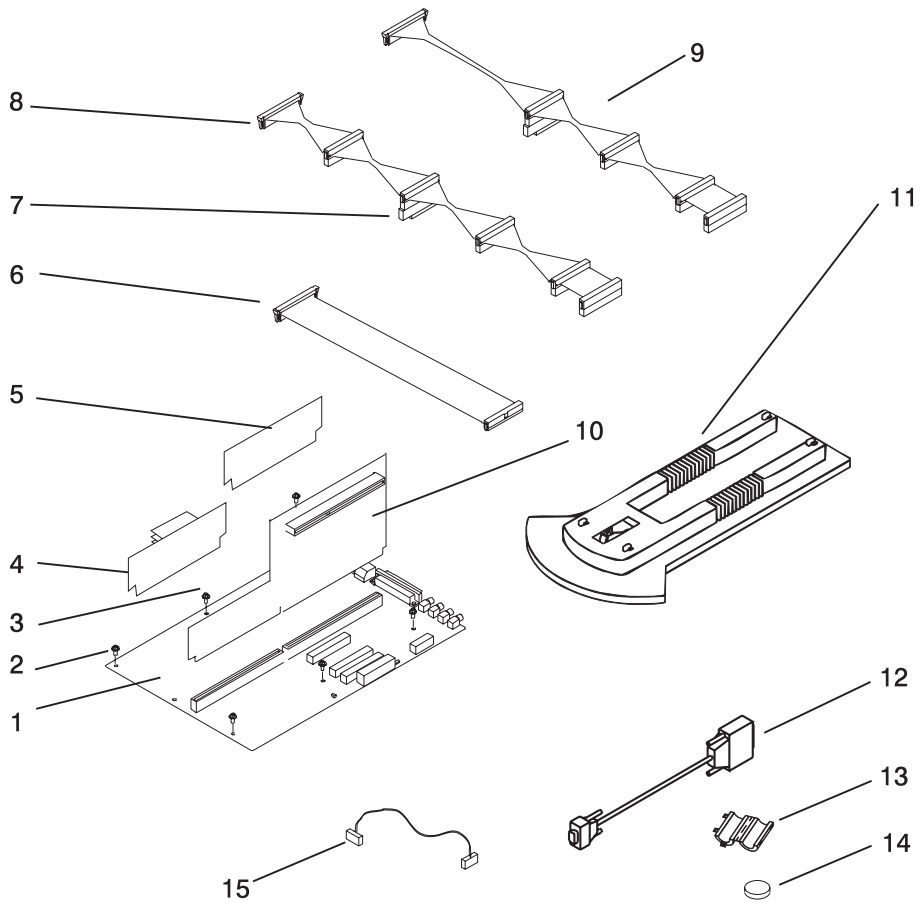

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Index Number	Model 140	Model 150	Model 240	Units Per Assy	Description
1	11H6764	11H6764	11H6764	1	Power Button
2	33G3907	33G3907	33G3907	14	Screw
3	73H0438	73H0438	73H0438	1	Power Switch Assembly
4	73H0437	73H0437	73H0437	1	Power-On LED and Cable
	73H0436	73H0436	73H0436	1	Disk Activity LED and Cable
5	94H0550	08L0033	94H0550	1	Logo
6	88G2411	n/a	88G2411	1	Operator Panel Circuit Assembly
7	07L6776	07L9108	07L6776	1	Front Bezel, Keylock, Keys
8	40H7584	40H7584	93H1820	1	Fan and Speaker Assembly
9	93H1819	93H1819	93H1819	1	Operator Panel Bracket
10	n/a	n/a	11H9747	1	Air flow baffle
11	**Note 1**	**Note 1**	**Note 1**	1	Disk Drive Bracket
12	27F4212	27F4212	27F4212	25-48	Screw, M35 (Disk Drive)
13	**Note 2**	**Note 2**	**Note 2**	1-2	Disk Drive
14	12H0649	07L9112	12H0649	1	EMC Shield
15	**Note 1**	07L9094; **Note 1**	**Note 1**	1	Top Cover Assembly
16	88G2216	88G2216	88G2216	1	3.5-inch Disk Drive Mounting Brackets
17	93F2361	76H4091	93F2361	1	Diskette Drive
18	**Note 1**	**Note 1**	**Note 1**	1	Media Drive Bracket
19	93H1817	93H1817	93H1817	1	Media Fan Assembly
20	40H5180	n/a	n/a	1	Fansink for 166MHz, 200MHz, and 233Mhz CPUs
	93H9648	93H9648	n/a	1	Fansink for 332MHz and 375MHz CPUs only
21	**Note 2**	**Note 2**	**Note 2**	1-2	Disk Drives or removable-media drives
22	93H5982	07L9085	73H3765	1	Cable and Bracket Assembly
23	06H8488	07L9084	06H8488	1	Rear Panel
24	**Note 1**	**Note 1**	**Note 1**	1	PCI/ISA Bulkhead
25	06H6706	07L9097	06H6706	1	Top Cover Latch
26	**Note 1**	**Note 1**	**Note 1**	1	Chassis
27	40H7563	n/a	40H7563	1	Power Supply without Power Factor Correction
	40H7566	40H7566	40H7566	1	Power Supply with Power Factor Correction (Japan)
28	**Note 1**	07L9096; **Note 1**	**Note 1**	1	Bottom Panel
29	93H4574	93H4574	93H4574	5	Cable Tie (Adhesive Base)
30	**Note 1**	**Note 1**	**Note 1**	1	4-slot EMC shield

Note:

1. This part is included in the Cover Assembly FRU 07L6923 for the Model 140, Cover Assembly FRU 07L9078 for the Model 150, or Cover Assembly FRU 93H7799 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)
	93H6023	1	System Board 233-MHz (Model 140)
	93H9334	1	System Board 332-MHz (Model 140)
	07L8446	1	System Board (Model 150)
	11H7516	1	System Board (Model 240)
2	27F4212	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
	19L1808	1-4 (Model 150)	64MB DIMM (Model 150)
	93H6823	1-6 (Model 140)	128MB DIMM (Model 140)
	19L1809	1-4 (Model 150)	128MB DIMM (Model 150)
	93H6822	2-8 (Model 240)	128MB DIMM (Model 240)
	29L3302	1-4 (Model 150)	256MB DIMM (Model 150)
6	93H1821	1	Diskette Cable Assembly
7	92F2565	1	Interposer
8	73H0435	1	SCSI Cable Assembly (Model 140 and Model 150)
	40H7572	1	SCSI Cable Assembly (Model 240)
9	93H6151	1	Ultra SCSI Cable Assembly (Optional)
10	73H4532	1	Riser Card (Model 140)
	08L1417	1	Riser Card (Model 150)
	73H3712	1	Riser Card (Model 240)
11	12H0619	1	Vertical Stand (Model 140 and Model 240)
	07L9115	1	Vertical Stand (Model 150)
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



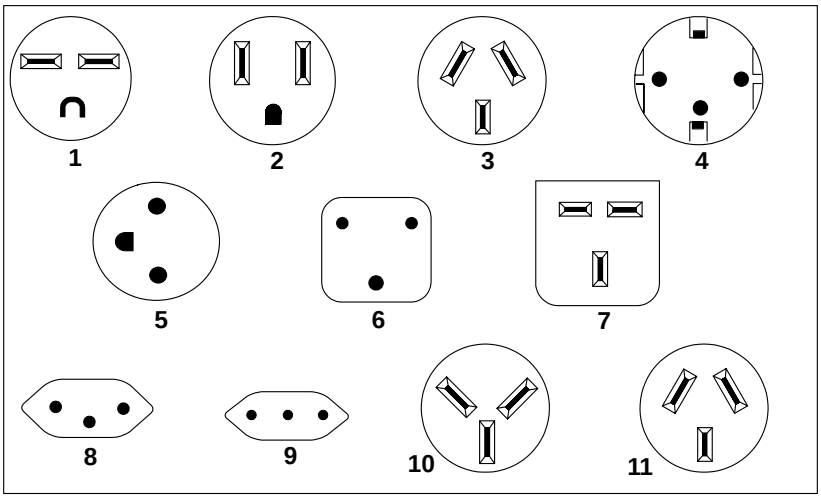
Index Number	FRU Number (Model 140 & Model 240)	FRU Number (Black)	Units Per Assy	Description
1	8131596	07L9451	1	Keyboard, Arabic
	1391414	07L9453	1	Keyboard, Belgian Dutch
	1391526	07L9452	1	Keyboard, Belgian French
	64F7707	07L9450	1	Keyboard, Brazilian Portuguese
	1399583	07L9454	1	Keyboard, Bulgarian
	82G3280	07L9447	1	Keyboard, Canadian French
		07L9448	1	Keyboard, Canadian French
	82G2383	07L9481	1	Keyboard, Chinese Traditional
	1399570	07L9455	1	Keyboard, Czechoslovakian
	1391407	07L9456	1	Keyboard, Danish
	1391511	07L9457	1	Keyboard, Dutch
	1391402	07L9458	1	Keyboard, French
	1391403	07L9459	1	Keyboard, German/Austrian
	1399046	07L9460	1	Keyboard, Greek
	1391408	07L9461	1	Keyboard, Hebrew
	1399581	07L9462	1	Keyboard, Hungarian
	1391407	07L9463	1	Keyboard, Icelandic
	1393395	07L9464	1	Keyboard, Italian
	66G0507	07L9480	2	Keyboard, Japanese
	52G9658	07L9482	1	Keyboard, Korean
	82G3292	07L9449	1	Keyboard, Latin American Spanish
	1391409	07L9465	1	Keyboard, Norwegian
	1399580	07L9466	1	Keyboard, Polish
	1391410	07L9467	1	Keyboard, Portuguese
	1399582	07L9468	1	Keyboard, Romanian
	1399579	07L9469	1	Keyboard, Russian
		07L9470	1	Keyboard, Serbian
	1399571	07L9471	1	Keyboard, Slovak
	1391405	07L9472	1	Keyboard, Spanish
	1391411	07L9473	1	Keyboard, Swedish/Finnish
	1391412	07L9474	1	Keyboard, Swiss
		07L9483	1	Keyboard, Thailand
	1393286	07L9475	1	Keyboard, Turkish, #179
	8125409	07L9476	1	Keyboard, Turkish, #440
	1391406	07L9477	1	Keyboard, UK English, #166
	82G3278	07L9478	1	Keyboard, US English, #103P
	93H8153	07L9479	1	Keyboard, US English, ISO9995, #103P (EMEA)
	93H8152	07L9478	1	Keyboard, Yugoslavian (Latin)
2	93H9113	08L0362	1	Three-button Mouse

Keyboards and Mouse - All Models



Index Number	FRU Part Number	Units Per Assy	Description
1	93H8120	1	Keyboard, 101 United States English (ID 103P)
	93H8121	1	Keyboard, 102 Canada French (ID 058)
	93H8122	1	Keyboard, 102 Canada French (ID 445)
	93H8123	1	Keyboard, 102 Spanish (ID 171)
	93H8124	1	Keyboard, 104 Brazil Portuguese (ID 275)
	93H8125	1	Keyboard, 102 Arabic (ID 238)
	93H8126	1	Keyboard, 102 Belgium French (ID 120)
	93H8127	1	Keyboard, 102 Belgium (ID 120)
	93H8128	1	Keyboard, 102 Bulgarian (ID 442)
	93H8129	1	Keyboard, 102 Czech (ID 243)
	93H8130	1	Keyboard, 102 Danish (ID 159)
	93H8131	1	Keyboard, 102 Dutch (ID 143)
	93H8132	1	Keyboard, 102 French (ID 189)
	93H8133	1	Keyboard, 102 German (ID 129)
	93H8134	1	Keyboard, 102 Greek (ID 319)
	93H8135	1	Keyboard, 101 Hebrew (ID 212)
	93H8136	1	Keyboard, 102 Hungarian (ID 208)
	93H8137	1	Keyboard, 102 Iceland (ID 197)
	93H8138	1	Keyboard, 102 Italy (ID 142)
	93H8139	1	Keyboard, 102 Norwegian (ID 155)
	93H8140	1	Keyboard, 102 Polish (ID 214)
	93H8141	1	Keyboard, 102 Portuguese (ID 163)
	93H8142	1	Keyboard, 102 Romanian (ID 446)
	93H8143	1	Keyboard, 101 Russian (ID 443)
	93H8144	1	Keyboard, 102 Serbian (ID 118)
	93H8145	1	Keyboard, 102 Slovak (ID 245)
	93H8146	1	Keyboard, 102 Spanish (ID 172)
	93H8147	1	Keyboard, 102 Sweden/Finland (ID 153)
	93H8148	1	Keyboard, 105 Swiss F/G (ID 150)
	93H8149	1	Keyboard, 102 Turkish (ID 179)
	93H8150	1	Keyboard, 102 Turkish (ID 440)
	93H8151	1	Keyboard, 102 UK English (ID 166)
	93H8152	1	Keyboard, 102 Latvia (ID 234)
	93H8153	1	Keyboard, US English ISO9995 (ID 103P)
	93H8154	1	Keyboard, 106 Japan (ID 194)
	93H8155	1	Keyboard, 101 Chinese/US (ID 467)
	93H8156	1	Keyboard, 103 Korea (ID 413)
	93H8157	1	Keyboard, 101 Thailand (ID 191)
2	76H5084	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	62X1045	Chicago, U.S.A., stackable
3	13F9940	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, Poland, Portugal, Romania, Saudi Arabia, Spain, Sudan, Sweden, Turkey, Yugoslavia
5	13F9997	Denmark
6	14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka

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

Appendix A. Interpreting Firmware Error Codes

The error code is an 8-character (4-byte) hexadecimal code produced by firmware to identify the potential failing function or FRU in a system. It consists of 5 source code characters and 3 reason code characters. Individual characters within the error code have specific field definitions, as defined in the following tables. Table A-1 and Table A-2.

Table A-1. Service Reference Code Field Layout

Source Code				Reason Code			
Byte 0		Byte 1		Byte 2		Byte 3	
S1	S2	S3	S4	S5	R1	R2	R3

Table A-2 (Page 1 of 2). Service Reference Code Field Descriptions

Field	Description
S1	Maintenance Package Source that produced the error code. **0** Reserved **1** Reserved **2** POST, Firmware **3** BIST **4** Service Processor, base system controller, etc. **5** Reserved **8** Product specific service guide, MAPs **9** Reserved **A-F** Reserved
S2	Base class
S3-S4	Sub-class
S5	Unique version of the device/FRU type for a particular product.
R1	Device/FRU unique failure reason codes. **1-7** Use in combination with R2, R3 for diagnostic test failure when maximum isolation was obtained. **8-9** Use in combination with R2, R3 for diagnostic test failure when maximum isolation was NOT obtained. **A** Log analysis of POST error log **B** Log analysis of machine check or checkstop error log **C** Reserved **D** Diagnostic detected missing resource **E-F** Reserved

Table A-2 (Page 2 of 2). Service Reference Code Field Descriptions	
Field	**Description**
R2 - R3	Device/FRU unique failure reason codes.

Table A-3 (Page 1 of 3). Current PCI 2.1 Class Code Definition		
PCI Base Class (lower nibble) S2	**PCI Sub-Class S3 -S4**	**Description**
0	Devices that were built before the class code field was defined.	
	00	All currently implemented devices except VGA-compatible devices.
	01	VA-compatible devices
1	Mass storage controller	
	00	SCSI bus controller
	01	IDE controller
	02	Floppy disk controller
	03	Intelligent Peripheral Interface (IPI) bus controller
	04	Redundant Array of Independent Disk (RAID) controller
	80	Other mass storage controller
2	Network controller	
	00	Ethernet controller
	01	Token Ring controller
	02	FDDI controller
	03	ATM controller
	80	Other network controller
3	Display controller	
	00	VGA-Compatible controller
	01	Extended Graphics Array (XGA) controller
	80	Other display controller
4	Multimedia device	
	00	Video device
	01	Audio device
	80	Other multimedia device
5	Memory controller	
	00	RAM
	01	Flash
	80	Other memory controller

Table A-3 (Page 2 of 3). Current PCI 2.1 Class Code Definition		
6	Bridge devices	
	00	Host bridge
	01	ISA bridge
	02	EISA bridge
	03	MCA bridge
	04	PCI-to-PCI bridge
	05	PCMCIA bridge
	06	NuBus bridge
	07	Cardbus bridge
	80	Other bridge device
7	Simple communication controllers	
	00	Serial controllers
	01	Parallel port
	80	Other communication controllers
8	Generic system peripherals	
	00	PIC
	01	DMA controller
	02	System timer
	03	Real-Time Clock (RTC) controller
	80	Other system peripherals
9	Input devices	
	00	Keyboard controller
	01	Digitizer (pen)
	02	Mouse controller
	80	Other input controllers
A	Docking stations	
	00	Generic docking station
	80	Other type of docking station
B	Processors	
	00	Reserved
	01	Reserved
	02	Reserved
	10	Reserved
	20	PowerPC
	40	Co-processor

Table A-3 (Page 3 of 3). Current PCI 2.1 Class Code Definition		
C	Serial bus controllers	
	00	FireWire (IEEE 1394)
	01	ACCESS.bus
	02	Serial Storage Architecture (SSA)
	03	Universal Serial Bus (USB)
	04	Fibre channel

Table A-4 (Page 1 of 2). S2-S3-S4 Definition for devices/FRUs not defined in the PCI specification		
Base Class S2	**Sub-Class S3 - S4**	**Description**
0	10	AC Power
	11	DC Power
	20	Temperature Related Problem
	21	Fans
	30-3x	Cables
	40-4x	Terminators
	50	Operator panels
	60-6x	Reserved
	70-7x	Reserved
	90-9x	Reserved
	A0	ROS Heartbeat
	B0	O/S Heartbeat
	D0	Unknown device
	E0	Security

Table A-4 (Page 2 of 2). S2-S3-S4 Definition for devices/FRUs not defined in the PCI specification		
Base Class S2	**Sub-Class S3 - S4**	**Description**
1	A0	SCSI Drivers (generic)
	B0	IDE Drives
	C0	RAID Drives
	D0	SSA Drives
	E0	Tapes SCSI
	E1	Tapes IDE
	ED	SCSI changer
	EE	Other SCSI device
	EF	Diskette drive
	F0	CDROM SCSI
	F1	CDROM IDE
	F2	Read/Write optical SCSI
	F3	Read/Write optical IDE
	F4 - FF	TBD media devices
5	A0	L2 Cache Controller including integrated SRAM
	A1	L2 Cache SRAM
	A8	NVRAM
	A9	CMOS
	AA	Quartz/EEPROM
	B0 - Bx	Memory cards
	Cyy	Memory Dimms (Where C is S2, S3, or S4 and yy identifies the memory size and type).
7	A0	I^2C bus
8	A0	Power Management Functions
9	A0 - Ax	Keyboards
	B0 - Bx	Mouse(s)
	C0 - Cx	Dials
	D0	Tablet
	D1 - Dx	TBD input devices
B	A0	Service processor

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