

RS/6000 7043 Model 260



Service Guide

First 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 7043 Model 260 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 Règlement 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.

A *caution* notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury.

Electrical Safety

Observe the following safety instructions any time you are connecting or disconnecting devices attached to the workstation.

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. If possible, 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.

DANGER

To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

Unit Emissions

The unit-related emission value is equal to or lower than 70dB(A).

Der Geräuschpegel der Einheit ist kleiner oder gleich 70 db(A).

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 30 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 maintenance information that is specific to the system unit, adapters, and attached devices that do not have their own service information. This book also contains Maintenance Analysis Procedures (MAPs) that are not common with other systems. MAPs that are common to all systems are contained in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

This book is used by a service technician to diagnose and repair system failures. This book assumes that the service technician has had previous training on the 7043 Model 260.

ISO 9000

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

Related Publications

The following publications provide additional information about your system unit:

- The *7043 Model 260 User's Guide* contains information to help users set up their system unit, install, configure, and modify options, and solve minor problems.
- The *IBM RS/6000 Diagnostic Information for Multiple Bus Systems* contains diagnostic information, service request numbers (SRNs), and failing function codes (FFCs).
- The *IBM RS/6000 Adapter, Device, and Cable Information for Multiple Bus Systems* contains information about adapters, devices, and cables for your system. This manual is intended to supplement the service information found in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.
- The *Site and Hardware Planning Guide* contains information to help you plan your installation.

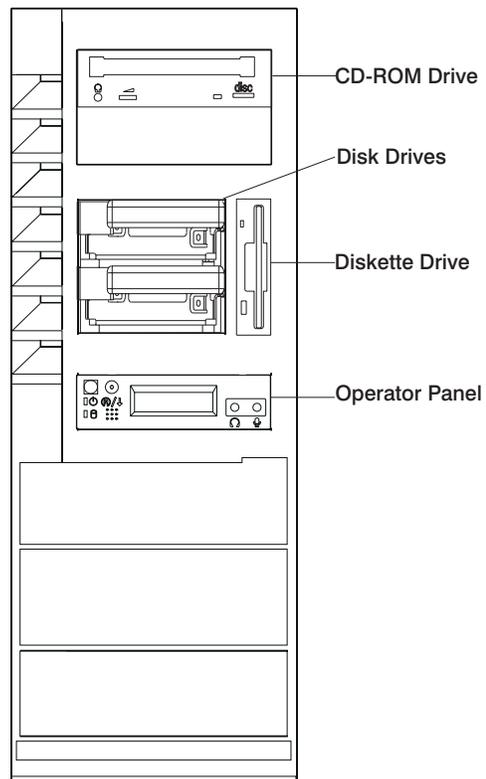
Trademarks

- AIX is a registered trademark of the International Business Machines Corporation.
- PowerPC is a trademark of the International Business Machines Corporation.

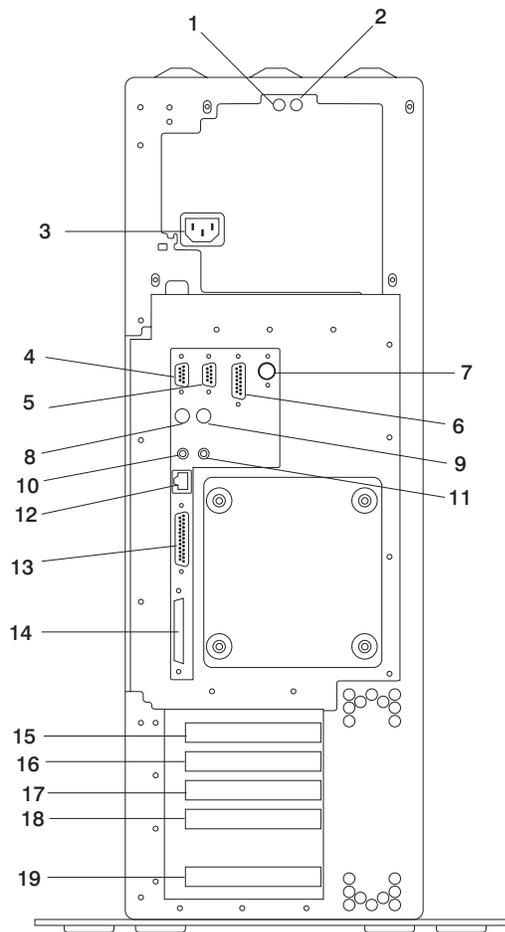
Chapter 1. Reference Information

System Unit Locations

Front View with Media Door Off

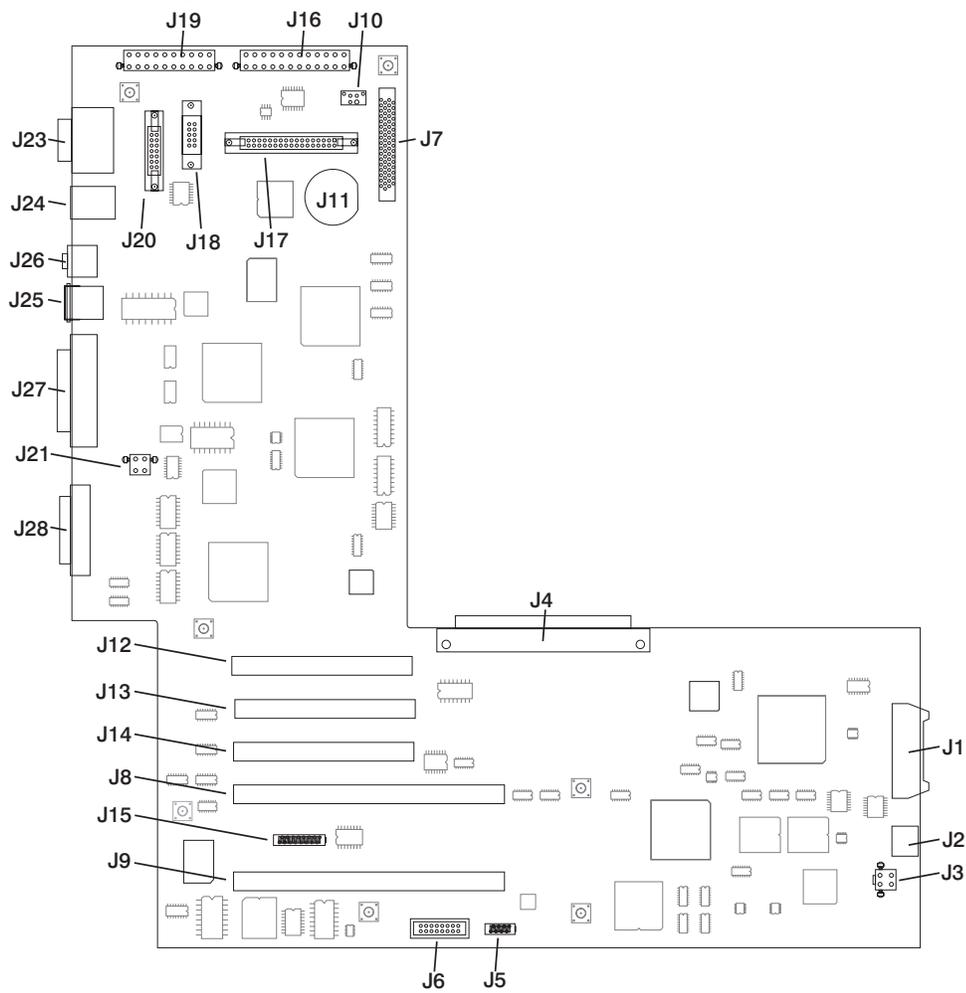


Rear View



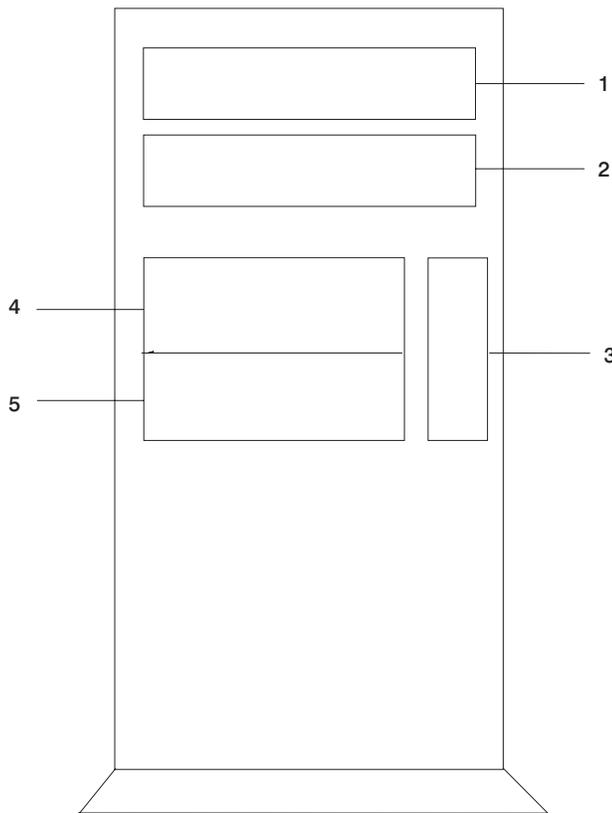
1	Power Supply LED
2	Power Supply Test Switch
3	Power Connector
4	Serial Connector S1
5	Serial Connector S2
6	AUI Ethernet Connector
7	Tablet Connector
8	Keyboard Connector
9	Mouse Connector
10	Audio Line Out
11	Audio Line In
12	RJ45 Ethernet Connector
13	Parallel Connector
14	External SCSI Connector
15	PCI Slot 5 (32-bit)
16	PCI Slot 4 (32-bit)
17	PCI Slot 3 (32-bit)
18	PCI Slot 2 (64-bit)
19	PCI Slot 1 (64-bit)

I/O Board Component Locations



J1	Operator panel power connector
J2	Operator panel audio connector
J3	PCI fan connector
J4	I/O board connector to system board
J5	VPD module connector
J6	ESP external connector
J7	Internal SCSI connector
J8, J9	64-bit PCI connectors
J10	CD ROM Audio
J11	Battery connector
J12, J13, J14	32-bit PCI connectors
J15	Service processor external connector
J16	Power connector
J17	Diskette drive connector
J18	Tablet connector
J19	Power connector
J20	AUI Ethernet connector
J21	Cec fan connector
J23	Serial port connector
J24	Keyboard/Mouse connector
J25	RJ45 Ethernet connector
J26	Audio in/out
J27	Parallel port connector
J28	External SCSI connector

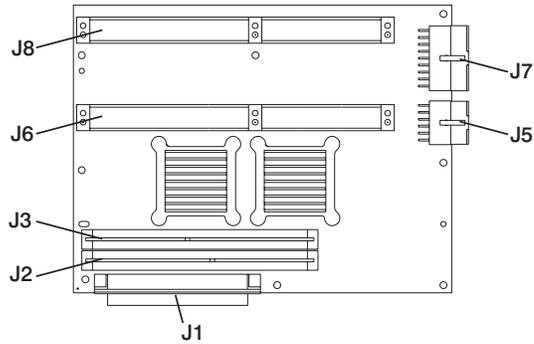
SCSI IDs and Bay Locations



1	Bay D2	CD-ROM	SCSI ID 1
2	Bay D3	Media device	SCSI ID 0
3	Bay D1	Diskette drive	Non-SCSI
4	Bay D4	Disk drive	SCSI ID 9
5	Bay D5	Disk drive	SCSI ID 8

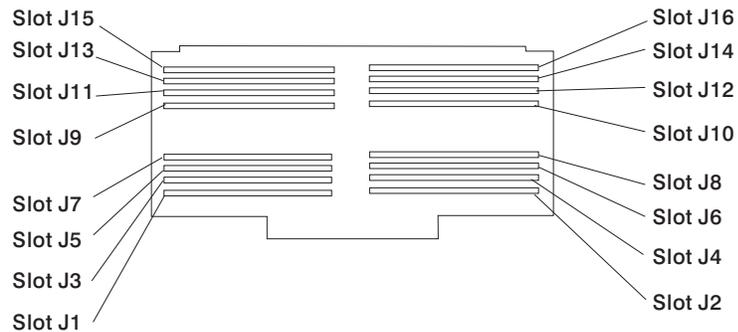
Note: The SCSI bus ID's are the recommended values. Features installed at the manufacturing site correspond to these IDs. Field installations may not comply with these recommendations.

System Board Locations



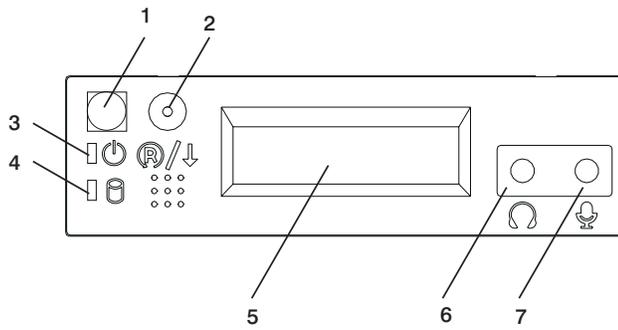
J1	System board connector to I/O board
J2	Memory card 2 connector
J3	Memory card 1 connector
J5	Power supply connector
J6	Processor card connector #2
J7	Power supply connector
J8	Processor card connector #1

Memory Card Locations



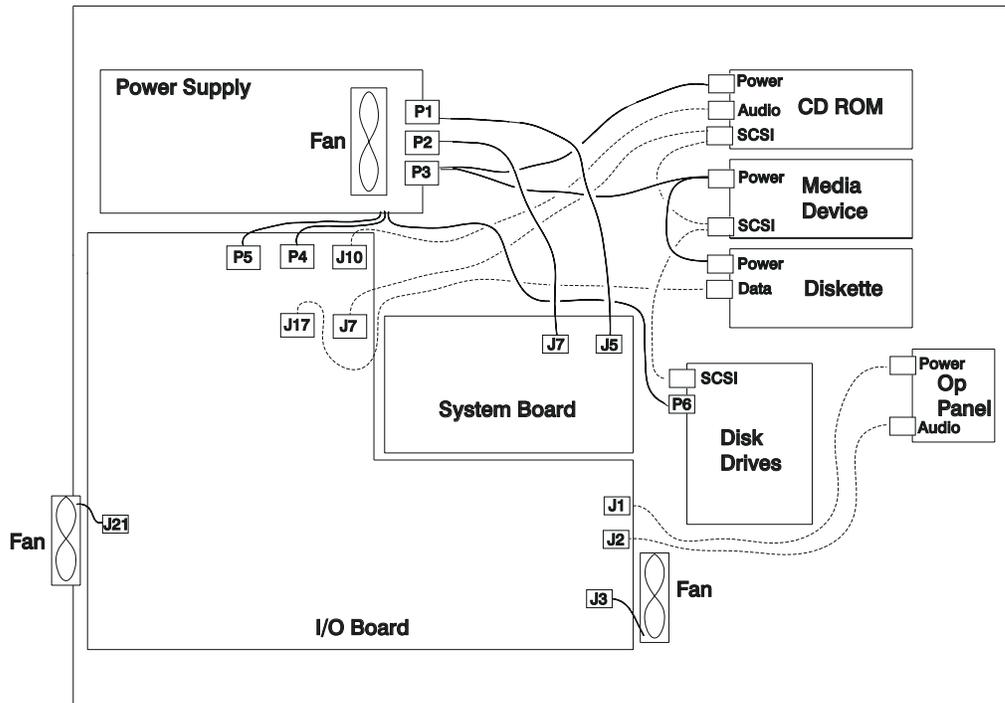
Note: Memory modules must be installed in pairs and in the correct slot configuration. (Slots J1 and J2, J3 and J4, J5 and J6, etc.)

Operator Panel



1	Power On Switch
2	Reset Switch
3	Power On LED
4	Disk Drive Activity LED
5	Display
6	Headset Receptacle
7	Microphone Receptacle

System Cables



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 their own power cables have those cables 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. Remove the covers.
6. Check for alterations or attachments. If there are any, check for obvious safety hazards such as broken wires, sharp edges, or broken insulation.
7. Check the internal cables for damage.
8. Check for dirt, water, and any other contamination within the system unit.
9. Check the voltage label on the back of the system unit to ensure that it matches the voltage at the outlet.
10. Check the external power cable for damage.
11. 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.
12. 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.
13. Install the covers.

Specifications

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

Dimensions

- With pedestal:
 - Height - 615 mm (24.2 inches)
 - Depth - 681 mm (26.8 inches)
 - Width - 340 mm (13.4 inches)
- Without pedestal:
 - Height - 610 mm (24.0 inches)
 - Depth - 681 mm (26.8 inches)
 - Width - 221 mm (8.7 inches)

Weight

Configuration dependent

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

Typical EMC Configuration - 0.3 kVA

Maximum - 0.5 kVA

Power Requirements

Typical - 275 watts

Maximum - 640 watts

Power Factor

0.89 - 0.98

Operating Voltage

100 to 127V ac; 50 to 60 Hz

200 to 240V ac; 50 to 60 Hz

Heat Output (Maximum)

Typical - 400 BTU/hr

Maximum - 794 BTU/hr

Acoustics

6.0 Bels operating

5.5 Bels idle

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 8, "Parts Information" on page 8-1 to find the power cables that are available.

Chapter 2. Maintenance Analysis Procedures (MAPs)

Note: 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.

Notes:

1. If more than eight digits are displayed in the operator panel, use only the first eight digits to find the error in the tables. The digits that display beyond the first eight digits are location codes that can assist you in diagnosing the problem. See Chapter 4, "Location Codes" on page 4-1.
2. Licensed programs frequently rely on network configuration, and system information stored on the VPD on the operator panel control assembly. If the MAPs indicate that the Operator Panel Control Assembly should be replaced, swap the VPD from the old operator panel to the new one. If the old VPD module has to be replaced call technical support for recovery instructions. If recovery is not possible, notify the system owner that new keys for licensed programs may be required.
3. 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.

Quick Entry MAP

Use the following table to determine your starting point.

Quick Entry MAP Table of Contents

Problem Description	Page No.
Service Actions	2-3
System Stops With an 8-Digit Number Displayed	2-3
System Stops With a 4-Digit Number Displayed	2-3
System Stops With a 3-Digit Number Displayed	2-3
System Stops or Hangs With Alternating Numbers Displayed in the Operator Display Panel.	2-4
There Appears to be a Display Problem (Distortion, Blurring,Etc.)	2-4
Power and Cooling Problems	2-4
Flashing 888 in Operator Panel Display	2-4
Other Symptoms or Problems	2-5
You Cannot Find the Symptom in this Table	2-8

Symptom	Action
Service Actions	
You have parts to exchange or a corrective action to perform.	<ol style="list-style-type: none"> 1. Go to the <i>Removal and Replacement Procedures</i>. 2. Go to "MAP 410: Repair Checkout" in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i>.
You need to verify that a part exchange or corrective action corrected the problem.	Go to "MAP 410: Repair Checkout" in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i> .
You need to verify correct system operation.	Go to "MAP 410: Repair Checkout" in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i> .
System Stops With An 8-Digit Number Displayed	
The system stops with an 8-digit error code displayed in the operator panel display or on the console.	Record the error code. Go to Chapter 3, "Error Code to FRU Index" on page 3-1.
System Stops With An 4-Digit Number Displayed	
The system stops and a 4-digit number is displayed in the operator panel display or on the console.	<p>If the number displayed begins with the character "E0xx" then go to "SP Checkpoints" on page 3-33.</p> <p>If the number displayed begins with the characters "E1xx-EFFF", make note of any location code that is displayed on the second line of the operator panel. If the location code indicates a card slot (eg. P2-I3), replace the card in the indicated slot. If this does not correct the problem, then go to "Firmware Checkpoints" on page 3-36.</p> <p>For all other numbers record SRN 101-xxx, where xxx is the last three digits of the four-digit number displayed in the operator panel, then go to the Fast Path MAP in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i>.</p> <p>Note: If the operator panel displays 2 sets of numbers, use the bottom set of numbers as the error code.</p>
System Stops With An 3-Digit Number Displayed	
The system stops with an 3-digit number displayed in the operator panel display or on the console.	Record SRN 101-xxx, where xxx is the last three digits of the four-digit number displayed in the operator panel, then go to the Fast Path MAP in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i> .

Symptom	Action
System Stops or Hangs With Alternating Numbers Displayed in the Operator Display Panel	
The operator panel display alternates between the code "E1FD" and another "Exxx" code.	Record both codes. Go to "E1FD" in "Firmware Checkpoints" on page 3-36.
The operator panel display alternates between the codes "E1DE" and "E1AD".	Record both codes. Go to "E1DE" in "Firmware Checkpoints" on page 3-36.
Display Problem (Blank, Distortion, Blurring, Etc.).	
All display problems.	<ol style="list-style-type: none"> 1. If using a graphics display: <ol style="list-style-type: none"> a. Go to the <i>Problem Determination Procedures</i> for the display. b. If you do not find a problem, replace the display adapter. c. If you do not find a problem, suspect the I/O board. Go to "MAP 1540: Minimum Configuration" on page 2-31. 2. If the problem is with the ASCII terminal: <ol style="list-style-type: none"> a. Make sure that the ASCII terminal is connected to S1. b. If problems persist, go to the <i>Problem Determination Procedures</i> for the terminal. c. If you do not find a problem, replace the service processor. d. If you do not find a problem, suspect the I/O board. Go to "MAP 1540: Minimum Configuration" on page 2-31.
Power and Cooling Problems	
The power LEDs on the operator panel and the power supply do not start flashing within 30 seconds of AC power application.	Go to "MAP 1520: Power" on page 2-23.
The power LEDs on the operator panel and the power supply do not come on or stay on.	Go to "MAP 1520: Power" on page 2-23.
The power LEDs on the operator panel and the power supply come on and stay on but the system does not power on.	Go to "MAP 1520: Power" on page 2-23.
The cooling fan(s) do not come on or come on but do not stay on.	Go to "MAP 1520: Power" on page 2-23.
Flashing 888 in Operator Panel Display	
888 is displayed is displayed in the operator panel.	Go to the Fast Path MAP in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i> .

Symptom	Action
Other Symptoms or Problems	
You have OK displayed.	The service processor is ready. Go to "MAP 0020: Problem Determination Procedure" in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i> .
You have STBY displayed.	The Service Processor is ready. The system was shutdown by the operating system and is still powered on. This condition can be requested by a privileged system user with no faults. See SP error log for possible operating system fault indications.
The system POST indicators are displayed on the system console, the system pauses and then restarts. The term "POST indicators" refer to the icons (graphic display) or device mnemonics (ASCII terminal) that appear during the power-on self-test (POST).	Go to "Boot Problems/Concerns" on page 3-47.
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 2-31 to isolate the problem.
<p>The system stops and the message "STARTING SOFTWARE PLEASE WAIT..." is displayed on</p> <p>ASCII terminal, the boot indicator () is displayed on a graphics terminal.</p>	Go to "Checkpoints" on page 3-33.

Symptom	Action
<p>The system does not respond to the password being entered or the system login prompt is displayed when booting in service mode.</p>	<p>Verify that the password is being entered from the ASCII terminal or keyboard defined as the system console. If so, then the keyboard or its controller may be faulty.</p> <ol style="list-style-type: none"> 1. If entering the password from the keyboard which is attached to the system, replace the keyboard. If replacing the keyboard does not fix the problem, replace the I/O board. (See notes on 2-1.) 2. If entering the password from a keyboard which is attached to a ASCII terminal, use the Problem Determination Procedures for the ASCII terminal. Make sure the ASCII terminal is connected to S1. Replace the I/O board if these procedures do not reveal a problem. 3. If the problem is fixed, go to "MAP 410: Repair Checkout" in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i>. If the problem persists, go to "MAP 1540: Minimum Configuration" on page 2-31 to isolate the problem.
<p>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.</p>	<p>Reseat the operator panel cable. If the problem is not resolved, replace these parts in the following order:</p> <ol style="list-style-type: none"> 1. Operator panel assembly. Update the VPD information in the new operator panel. 2. I/O board (See notes on 2-1.) 3. If the problem is fixed, go to "MAP 410: Repair Checkout" in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i>. If the problem persists, go to "MAP 1540: Minimum Configuration" on page 2-31 to isolate the problem.

Symptom	Action
<p>The SMS configuration list or Boot sequence selection menu shows more SCSI devices attached to a controller/adaptor than are actually attached.</p>	<p>A device may be set to use the same SCSI bus ID as the control adaptor. Note the ID being used by the controller/adaptor (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.</p> <p>If settings do not appear to be in conflict:</p> <ol style="list-style-type: none"> 1. Replace the SCSI cable. 2. Replace the device. 3. Replace the SCSI adaptor (or I/O board if connected to one of the two integrated SCSI controllers on the I/O board). (See notes on 2-1 if the I/O board is replaced.) <p>Note: In a "Twin-tailed" configuration where there is more than one initiator device (normally another system) attached to the SCSI bus, it may be necessary to change the ID of the SCSI controller or adaptor with the System Management Services.</p>
<p>The System Management Services menu is displayed.</p>	<p>The device or media you are attempting to boot from may be faulty.</p> <ol style="list-style-type: none"> 1. Check the SMS error log for any errors. To check the error log: <ol style="list-style-type: none"> 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 "Checkpoints" on page 3-33 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 2-31.
<p>You have a problem that does not prevent the system from booting.</p>	<p>Go to the Fast Path MAP in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i>.</p>
<p>You have an SRN.</p>	<p>Go to the Fast Path MAP in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i>.</p>

Symptom	Action
You suspect a cable problem.	See the <i>IBM RS/6000 Adapter, Device, and Cable Information for Multiple Bus Systems</i> .
You do not have a symptom.	Go to MAP 0020 in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i> .
You do not have a determined symptom.	Go to "MAP 1020: Problem Determination" on page 2-9.
You Cannot Find the Symptom in this Table	
All other problems.	Go to "MAP 1020: Problem Determination" on page 2-9.

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 *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

The Service Processor may have recorded one or more symptoms in its error log. It is a good idea to examine that error log before proceeding (see Service Processor System Information Menu).

Be prepared to record code numbers and use those numbers in the course of analyzing a problem. Go to "Step 1020-1" on page 2-11.

The Service Processor may have been set by the user to monitor server operations and to attempt recoveries. You may wish to disable these actions while you diagnose and service the system. If the system was set up according to the recommendations of the User's Guide, all the settings of the Service Processor (except Language) were saved by using the SAVE/RESTORE HARDWARE MAINTENANCE POLICIES Service Aid. You may use that same Service Aid to restore the settings at the end of your service action.

Just in case the Service Processor settings were not saved by the user, if you disable them, you should make notes of their current settings for restoration before you leave.

In addition to the parameters in the table below, you may wish to disconnect the modem to prevent incoming signals that could cause the system to power on.

Following are the Service Processor settings of your interest. The Service Processor menus are described in "Service Processor Menus" on page A-3.

Surveillance	From the Service Processor Setup Menu, go to the Surveillance Setup Menu and disable surveillance.
Unattended Start	From the Service Processor System Power Control Menu, disable unattended start mode.
Reboot Policy	From the System Power Control Menu, go to the Reboot/Restart Policy Setup Menu and set: <ol style="list-style-type: none"> 1. Number of reboot attempts to 0 (zero) 2. Use OS-Defined restart policy to No 3. Enable supplemental restart policy to No.
Call Out	From the Call-In/Call-Out Setup Menu, go to the Serial Port Selection Menu and disable call-out on both serial ports.

Another feature that could disrupt a service action by powering the system on is an AIX function called "Timed Power-On". If you think it should be turned off during your service action, refer to the "System Power-On Methods" in the System User's Guide: Operating System and Devices (order number SC23-4126).

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 into the CD-ROM drive.
2. Turn the power off.
3. Turn the power on.
4. When the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard 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 a password, if requested.
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 diskette LED is blinking rapidly, or EIEA or EIEB 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 6-22.
The system stops with a prompt to enter a password.	Enter the password. You are not 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 diagnostic operating instructions are displayed.	Go to MAP 0020 in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i> .
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 2-13.

Symptom	Action
The system does not respond when the password is entered.	Go to "Step 1020-2" on page 2-13.
The system stopped and a POST indicator is displayed on the system console and an eight-digit error code is not displayed.	<p>If the POST indicator represents:</p> <ul style="list-style-type: none"> • 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. <p>Go to "Step 1020-3" on page 2-13.</p>
The system stops and a 4-digit number is displayed in the operator panel display.	<p>If the number displayed begins with the character "E0xx" then go to "SP Checkpoints" on page 3-33. or "E1xx-EFFF" then go to "Firmware Checkpoints" on page 3-36.</p> <p>For all other numbers record SRN 101-xxx, where xxx is the last three digits of the four-digit number displayed in the operator panel, then go to the Fast Path MAP in the <i>IBM RS/6000 Diagnostic Information for Multiple Bus Systems</i>.</p> <p>Note: If the operator panel displays 2 sets of numbers, use the bottom set of numbers as the error code.</p>
The System Management Services is displayed.	Go to "Step 1020-4" on page 2-14.
All other symptoms.	If you were directed here from the Entry MAP, go to "MAP 1540: Minimum Configuration" on page 2-31. Otherwise, find the symptom in the "Quick Entry MAP" on page 2-2.

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 MOKBD001; 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 MOKBD002; then go to "Step 1020-3."
Type 106 keyboard. (Identify by the Japanese characters.)	Record error code MOKBD003; then go to "Step 1020-3."
ASCII terminal keyboard	Go to the documentation for this type of ASCII terminal and continue problem determination.

Step 1020-3

Take the following actions:

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

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

- Any supplemental service manual for the device
- The diagnostic problem report screen for additional information
- The Service Hints service aid
- The CEReadme file (by using the Service Hints service aid). Note: Service aids can be found in Diagnostic 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 Error Log
 - If an error is logged, check the time stamp.
 - If the error was logged during the current boot attempt, record it.
 - Look up the error in the Chapter 3, “Error Code to FRU Index” on page 3-1 and do the listed action.
 - If no recent error is logged in the error log, go to “MAP 1540: Minimum Configuration” on page 2-31.

MAP 1240: Memory Problem Resolution

Note:

The firmware checkpoint that sent you here could be one of the following: E122, E213, E214, E218, E220 or E3xx.

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

Purpose of This MAP

This MAP is used 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 operator panel.

Notes:

1. If the symptom changes while using this MAP, check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 1540: Minimum Configuration" on page 2-31
2. The Service Processor may have recorded one or more symptoms in its error log. It is a good idea to examine that error log before proceeding (see Service Processor System Information Menu).
3. The Service Processor may have been set by the user to monitor service operations and to attempt recoveries. You may wish to disable these actions while you diagnose and service the system. If you disable them, you should make notes of their current settings for restoration before you leave. Following are the settings of your interest.

Surveillance	From the Service Processor Setup Menu, go to the Surveillance Setup Menu and disable surveillance.
Unattended Start	From the Service Processor System Power Control Menu, disable unattended start mode.
Reboot Policy	From the System Power Control Menu, go to the Reboot/Restart Policy Setup Menu and set: <ol style="list-style-type: none">1. Number of reboot attempts to 0 (zero)2. Use OS-Defined restart policy to No3. Enable supplemental restart policy to No.
Call Out	From the Call-In/Call-Out Setup Menu, go to the Serial Port Selection Menu and disable call-out on both serial ports.

General Memory Information

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

Memory cards can be installed in either slot (or both) on the system board, there is no requirement that one be installed before the other.

It is perfectly acceptable for there to be two partially populated memory cards in the system, the first memory card does not have to be fully populated before memory on the second memory card is useable.

Memory modules, on the other hand, must be installed in matched (size and speed) pairs. Refer to "Memory Modules" on page 7-14 for labeling of the memory card and instructions on module removal and installation (do not, however, replace the covers as directed while troubleshooting this problem). A single memory module pair may be installed in module slots J1 and J2 (not slots J1 and J3). A second memory module pair could be installed in module slots J5 and J6 (slots J3 and J4 do not have to be populated first). Along these same lines, there is no requirement that memory module slots J1 and J2 be populated before another slot pair.

Step 1240-1

1. Ensure that the diagnostics and the operating system are shut down.
2. Turn the power off.
3. Remove and re-install any installed memory card(s)
4. Turn the power on.

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

- NO** Re-seating the memory card(s) has corrected the problem.
Go to "Map 0410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.
- YES** If there is only one memory card installed tag it as "suspect bad" and go to "Step 1240-7" on page 2-20.
If there are two memory cards installed go to "Step 1240-2."

Step 1240-2

1. Turn the power off.
2. Remove the memory card from slot J3.
3. Turn the power on.

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

- NO** Go to "Step 1240-4" on page 2-18.
- YES** Go to "Step 1240-3" on page 2-18.

Step 1240-3

1. Turn the power off.
2. Remove the memory card from slot J2.
3. Install the memory card removed from slot J3 in it's original location.
4. Turn the power on.

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

NO Tag the memory card you removed from slot J2 "suspect bad" and go to "Step 1240-7" on page 2-20.

YES Go to "Step 1240-6" on page 2-19.

Step 1240-4

1. Turn the power off.
2. Remove the memory card from slot J2.
3. Install the memory card removed from slot J3 in it's original location.
4. Turn the power on.

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

NO Go to "Step 1240-5" on page 2-19.

YES Tag the memory card in slot J3 "suspect bad" and go to "Step 1240-7" on page 2-20.

Step 1240-5

1. Turn the power off.
2. Install the memory card removed from slot J2 in it's original location.
3. Turn the power on.

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

- NO** Re-seating the memory card(s) has corrected the problem.
Go to "Map 0410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.
- YES** Go to "Step 1240-6."

Step 1240-6

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

1. Turn the power off.
2. Exchange the following FRUs in the order listed.
 - a. System board
 - b. Processor card(s)
3. Turn the power on.

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

- NO** Go to "Map 0410: Repair Checkout" in the *IBM RS/6000 Diagnostic 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 2-31.

Step 1240-7

1. Turn the power off.
2. Remove all installed memory modules from the memory card you tagged "suspect bad". Record the position of the memory modules removed so that when instructed to re-install them they can be installed in their original position.
3. Install one pair of memory modules.
4. Turn the power on.

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

- NO** If there are no more memory modules to be installed reseating the memory modules on the memory card has corrected the problem.
- If there was more than one pair of memory modules on the memory card go to "Step 1240-8."
- YES** Go to "Step 1240-9" on page 2-21.

Step 1240-8

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

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

- NO** Repeat this step until all the memory modules are installed and tested.
- If all the memory modules have been installed reseating the memory modules on the memory card has corrected the problem.
- Go to "Map 0410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.
- YES** Go to "Step 1240-9" on page 2-21.

Step 1240-9

The failure may be caused by the last pair of memory modules installed or the memory card. 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 system stop with a memory checkpoint displayed on the operator panel?

NO Go to "Step 1240-11" on page 2-22.

YES Go to "Step 1240-10."

Step 1240-10

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

1. Turn the power off.
2. Exchange the following FRUs in the order listed.
 - a. Memory card
 - b. System board
 - c. Processor card(s)
3. Turn the power on.

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

NO Go to "Map 0410: Repair Checkout" in the *IBM RS/6000 Diagnostic 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 2-31.

Step 1240-11

The memory module(s) (may be both) you exchanged in the previous step may be defective. To isolate the failing memory module, do the following:

1. Turn the power off.
2. Re-install one of the memory modules you exchanged in the previous step.
3. Turn the power on.

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

NO Repeat this step with the second memory module you exchanged in the previous step.

If both memory modules have been tested go to "Map 0410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

YES Replace the memory module.

If you have not tested both memory modules repeat this step with the second memory module you exchanged in the previous step.

If the symptom did not change and both memory modules have been exchanged, go to "Step 1240-10" 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 *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.
2. The 7043 Model 260 has power LEDs located on the operator panel and the power supply. When the system is powered off both LEDs should be blinking. When the system is powered on both LEDs 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. If possible, 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.

DANGER

To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

Step 1520-1

You may be directed to this MAP for several reasons:

1. There is no indication of activity when the start/stop switch on the operator panel is pressed. None of the power 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 start/stop switch on the operator panel is pressed, the system begins to power on, but the operator panel power LED and/or the power supply LED do not stay on."

Step 1520-2

1. Unplug the power cord from the system unit and the power outlet.
2. Check that the external power cord to the system unit has continuity.
3. Check that the power outlet has been wired correctly with the correct voltage.
4. Plug the power cord into the system unit and the power outlet.

Did you find a problem?

NO Go to "Step 1520-3" on page 2-25.

YES Correct the problem. Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1520-3

1. Unplug the power cord from the system unit.
2. If you have not already done so, remove the covers as described in "Covers" on page 7-5.
3. Press and hold the start/stop switch on the operator panel for a few seconds to discharge the power supply.
4. Unplug the power connectors (P1, P2, P3, P4, P5 and P6) from the power supply.
5. Plug the power cord into the system unit.
6. There is a small dark-colored switch on the back of the power supply, near the back of the system. It is a normally off momentary switch. Press and hold this switch for a few seconds while observing the fan in the power supply and the power LED on the power supply.

Does the fan in the power supply turn on and the power LED on the power supply change from blinking to solid while you hold the switch? (When you let go of the switch, the system will power down.)

- NO** Replace the power supply. Go to "Map 0410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.
- YES** Go to go to "Step 1520-4" on page 2-26.

Step 1520-4

The power supply is working normally.

1. Unplug the power cord from the system unit.
2. Press and hold the start/stop switch on the operator panel for a few seconds to discharge the power supply.
3. Plug the power connectors (P1, P2, P3, P4, P5 and P6) into the power supply.
4. Plug the power cord into the system unit.

If a cooling fan won't turn, the system will try to power up and then off when the start/stop switch on the operator panel is pressed (but not when the switch on the power supply is pressed and held).

While holding the power supply switch do all the cooling fans turn?

- NO** Replace the faulty cooling fan. Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.
- YES** Exchange the operator panel electronics assembly. Go to "Step 1520-5" on page 2-27.

Step 1520-5

Press the start/stop switch on the operator panel to turn the power on.

Does the power LED on the operator panel come on and stay on?

- NO** Reinstall the original operator panel electronics assembly. Go to "Step 1520-6" on page 2-28.
- YES** Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1520-6

1. Unplug the power cord from the system unit.
2. Record the location of all the adapters. Label and record the location of any cables attached to the adapters. Remove all the adapters.
3. Remove all the memory cards.
4. If two processor cards are installed remove the lower one.
5. Unplug the power cable from the SCSI backplane.
6. Unplug the power cables from all the SCSI devices.
7. Unplug the front and rear cooling fan power connectors.
8. Plug the power cord into the system unit.
9. Press the start/stop switch on the operator panel to turn the power on.

Does the power LED on the operator panel come on and stay on?

NO Go to "Step 1520-7" on page 2-29.

YES Go to "Step 1520-8" on page 2-30.

Step 1520-7

Either the processor card, system board, I/O board or power supply is defective.

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

1. Processor card
2. System board
3. I/O board
4. Power supply.

Press the start/stop switch on the operator panel to turn the power on after each FRU is exchanged. If the power stays on, the most recently exchanged FRU was causing the failure.

1. Unplug the power cord from the system unit.
2. Exchange one of the FRUs in the list.
3. Plug the power cord into the system unit.
4. Press the start/stop switch on the operator panel to turn the power on.

Does the power LED on the operator panel come on and stay on?

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 1520-1" on page 2-24 in this MAP and follow the instructions for the new symptom.

YES Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1520-8

One of the parts that you removed or disconnected is probably defective. Install or connect the parts one at a time in the following order to identify the failing part.

1. Processor card
2. Memory card(s)
3. Front cooling fan
4. Rear cooling fan
5. SCSI backplane power cable.
6. SCSI power cable(s), lowest bay to highest bay.
7. Adapter cards, lowest slot to highest slot.

Press the start/stop switch on the operator panel to 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 power cord from the system unit.
3. Install or connect one of the parts in the list.
4. Plug the power cord into the system unit.
5. Press the start/stop switch on the operator panel to turn the power on.

Does the power LED on the operator panel come on and stay on?

NO

Replace the last part you installed.

Repeat these steps until all the parts have been installed or connected.

If the symptom did not change and all the parts have been installed or connected 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 2-24 in this MAP and follow the instructions for the new symptom.

YES

Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

MAP 1540: Minimum Configuration

Notes:

1. Be sure to unplug the power cable before removing or installing processor card(s), memory card(s), system board or I/O board to avoid damage to them.
2. This MAP assumes that a CD-ROM drive is installed and connected to the integrated SCSI adapter, and a Diagnostics CD-ROM is available.
3. If a power-on password or privileged-access password is installed, you are prompted to enter the password before the diagnostic CD-ROM can load.
4. The term "POST indicators" refer to the icons (graphic display) or device mnemonics (ASCII terminal) that appear during the power-on self-test (POST).
5. The Service Processor may have recorded one or more symptoms in its error log. It is a good idea to examine that error log before proceeding (see Service Processor System Information Menu).
6. The Service Processor may have been set by the user to monitor server operations and to attempt recoveries. You may wish to disable these actions while you diagnose and service the system. If you disable them, you should make notes of their current settings for restoration before you leave. Following are the settings of your interest.

Surveillance	From the Service Processor Setup Menu, go to the Surveillance Setup Menu and disable surveillance.
Unattended Start	From the Service Processor System Power Control Menu disable unattended start mode.
Reboot Policy	From the System Power Control Menu go to the Reboot/Restart Policy Setup Menu and set: <ol style="list-style-type: none">1. Number of reboot attempts to 0 (zero)2. Use OS-Defined restart policy to No3. Enable supplemental restart policy to No.
Call Out	From the Call-In/Call-Out Setup Menu, go to the Serial Port Selection Menu and disable call-out on both serial ports.

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.

Step 1540-1

1. Insert the diagnostic CD-ROM into the CD-ROM drive.

Note: If you cannot insert the diagnostic CD-ROM, go to "Step 1540-2" on page 2-33.

2. Ensure that the diagnostics and the operating system are shut down.
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. Enter the appropriate password if prompted to do so.

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

- NO** Go to "Step 1540-2" on page 2-33.
- YES** Go to "Step 1540-18" on page 2-52.

Step 1540-2

1. Turn the power off.
2. If you have not already done so, configure the Service Processor with the instructions in note 6 on page 2-31 and then return here and continue.
3. Exit Service Processor Menus and remove the power cable.
4. Disconnect all external cables (parallel, serial 1, serial 2, keyboard, mouse, tablet, ethernet, SCSI, etc.).
5. Remove the side cover.
6. Record the slot numbers of the PCI adapters. Label and record the location of any cables attached to the adapters. Disconnect any cables attached to the adapters and remove all the adapters.
7. Remove the second processor card from slot J6 (if present). (If second processor card removed, ensure first processor card is installed.).
8. Record the slot numbers of the memory modules. Remove all installed memory modules except for one pair from the first memory card.
Note: Memory modules must be installed in pairs and in the correct slots. For example, install the pair in J1 and J2.
9. Remove the second memory card from slot J3, if present.
10. Disconnect the SCSI cable from the SCSI connector (J7) on the I/O board.
11. Disconnect the signal and power connectors from the disk drive cage backplane.
12. Remove the disk drive(s) from the disk drive cage.
13. Disconnect the signal and power connectors from all the SCSI devices except the CD-ROM drive.
14. Disconnect the diskette drive cable from the diskette drive connector (J17) on the I/O board.
15. Plug in the power cable (and wait for OK on the operator panel display).
16. Turn the power on.

Does the system stop with code E1F2, E1F3, STBY or 4BA00830 displayed on the operator panel?

NO Go to “Step 1540-3” on page 2-35.

YES If a second processor card was removed, go to “Step 1540-4” on page 2-36.

If the system has only one processor card, go to “Step 1540-5” on page 2-37.

Step 1540-3

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

If a memory module is exchanged, ensure that the new module is the same size and speed as the original module.

Turn the power off, remove the power cable, and exchange the following FRUs in order:

1. Processor card
2. Memory modules in odd numbered slot (J1, J3, J5, etc.)
3. Memory modules in even numbered slot (J2, J4, J6, etc.)
4. Memory card
5. System board
6. I/O board (see notes on page 2-1.)
7. Power supply.

Plug in the power cable (and wait for OK on the operator panel display).

Turn the power on.

Does the system stop with code E1F2, E1F3, STBY or 4BA00830 displayed on the operator panel?

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 1540-1" on page 2-32 in this MAP and follow the instructions for the new symptom.

YES Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1540-4

No failure was detected with this configuration.

1. Turn the power off and remove the power cable.
2. Reinstall the second processor card.
3. Plug in the power cable (and wait for OK on the operator panel display).
4. Turn the power on.

Does the system stop with code E1F2, E1F3, STBY or 4BA00830 displayed on the operator panel?

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. Processor card (last one installed)
2. System board
3. I/O 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 1540-1" on page 2-32 and follow the instructions for the new symptom.

YES Go to "Step 1540-5" on page 2-37.

Step 1540-5

No failure was detected with this configuration.

1. Turn the power off and remove the power cable.
2. Install a pair of memory modules.
3. Plug in the power cable (and wait for OK on the operator panel display).
4. Turn the power on.

Does the system stop with code E1F2, E1F3, STBY or 4BA00830 displayed on the operator panel?

NO Go to "Step 1540-6" on page 2-38.

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

After all the memory modules are installed and tested, record the positions of the memory modules in the second memory card. Remove all of the memory modules from the second memory card except 1 pair. Repeat this step with the second memory card (if previously installed).

Go to "Step 1540-9" on page 2-41.

Step 1540-6

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

1. Turn the power off and remove the power cable.
2. Exchange the last memory module pair installed.
3. Reinstall the power cable.
4. Turn the power on.

Does the system stop with code E1F2, E1F3, STBY or 4BA00830 displayed on the operator panel?

NO Go to "Step 1540-8" on page 2-40.

YES Go to "Step 1540-7" on page 2-39.

Step 1540-7

The memory module(s) (may be both) you exchanged in the previous step may be defective. To isolate the failing memory module, do the following:

1. Turn the power off and remove the power cable.
2. Re-install one of the memory modules you installed in the previous step.
3. Plug in the power cable (and wait for OK on the operator panel display).
4. Turn the power on.

Does the system stop with code E1F2, E1F3, STBY or 4BA00830 displayed on the operator panel?

NO Replace the memory module.

If you have not tested both memory modules, repeat this step with the second memory module you exchanged in the previous step.

If the symptom did not change and both memory modules have been exchanged, go to "Step 1540-8" on page 2-40.

YES Repeat this step with the second memory module you exchanged in the previous step.

If both memory modules have been tested, go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1540-8

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

1. Turn the power off and remove the power cable.
2. Exchange the following FRUs the order listed.
 - a. Memory card
 - b. System board
 - c. I/O board (See notes on 2-1.)
 - d. Power supply.
3. Plug in the power cable (and wait for OK on the operator panel display).
4. Turn the power on.

Does the system stop with code E1F2, E1F3, STBY or 4BA00830 displayed on the operator panel?

- 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 1540-1" on page 2-32 in this MAP, and follow the instructions for the new symptom.
- YES** Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1540-9

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

Notes:

- a. If an ASCII terminal has been defined as the system console, attach the ASCII terminal cable to the to the S1 connector on the rear of the system unit.
 - 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 if prompted to do so.

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).
4. I/O 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 1540-1" on page 2-32 and follow the instructions for the new symptom.

YES Go to "Step 1540-10" on page 2-43.

Step 1540-10

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn the power off and remove the power cable.
3. Plug the SCSI cable into the SCSI connector (J7) on the I/O board.
4. Plug in the power cable (and wait for OK on the operator panel display)/
5. Turn the power on.
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 if 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. CD-ROM drive
3. I/O board (see notes on page 2-1.)
4. Processor card
5. 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 1540-1" on page 2-32 in this MAP and follow the instructions for the new symptom.

YES Go to "Step 1540-11" on page 2-44.

Step 1540-11

The system is working correctly with this configuration. One of the SCSI devices that you disconnected may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn the power off and remove the power cable.
3. Connect the signal and power connectors to one of the SCSI devices (CD-ROM drive, tape drive, disk drive, etc.). Do not connect the signal and power connectors to the backplane at this time.
4. Plug in the power cable (and wait for OK on the operator panel display).
5. Turn the power on.
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 if 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. I/O board (see notes on page 2-1).
4. Processor card
5. 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 1540-1" on page 2-32 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, except the backplane, are connected and tested.

Go to "Step 1540-12" on page 2-46.

Step 1540-12

The system is working correctly with this configuration. The backplane may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn the power off and remove the power cable.
3. Connect the signal and power connectors to the backplane.
4. Plug in the power cable (and wait for OK on the operator panel display)
5. Turn the power on.
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 if 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. Disk drive cage backplane
- 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 1540-1" on page 2-32 in this MAP and follow the instructions for the new symptom.
- YES** Go to "Step 1540-13" on page 2-47.

Step 1540-13

The system is working correctly with this configuration. One of the disk drives that you removed from the disk cage may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn the power off and remove the power cable.
3. Install a disk drive in the disk drive cage.
4. Plug in the power cable (and wait for OK on the operator panel display)
5. Turn the power on.
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 if prompted to do so.

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

NO In the following order, exchange the FRUs that have not been exchanged.

1. Last disk drive installed
2. Disk drive cage backplane

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 1540-1" on page 2-32 in this MAP and follow the instructions for the new symptom.

YES Repeat this step with the second disk drive (if it was installed).

Go to "Step 1540-14" on page 2-48.

Step 1540-14

The system is working correctly with this configuration. The diskette drive may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn the power off and remove the power cable.
3. Plug the diskette drive cable into the diskette drive connector (J17) on the I/O board.
4. Plug in the power cable (and wait for OK on the operator panel display)
5. Turn the power on.
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 if 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. I/O 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 1540-1" on page 2-32 in this MAP and follow the instructions for the new symptom.

YES Go to "Step 1540-15" on page 2-49.

Step 1540-15

The system is working correctly with this configuration. One of the devices that you disconnected from the I/O board may be defective.

1. Turn the power off and remove the power cable.
2. Attach an I/O board device (parallel, serial1, serial2, AUI/RJ45 Ethernet, Ultra-2 SCSI, tablet, keyboard or mouse) that had been removed.

Note: If the FRU you installed requires supplemental media use the Process Supplemental Media task to load the supplemental media first.

3. Plug in the power cable (and wait for OK on the operator panel display)
4. Turn the power on.
5. If the Console Selection screen displays, 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 if prompted to do so.

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

NO The last device or cable that you attached is defective.

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

1. Device and cable (last one attached)
2. I/O board (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.

If the symptom has changed check for loose cards, cables, and obvious problems. If you do not find a problem return to "Step 1540-1" on page 2-32 in this MAP and follow the instructions for the new symptom.

Go to "Map 0410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

YES Repeat this step until all of the devices are attached.

Go to "Step 1540-16" on page 2-50.

Step 1540-16

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

1. Turn the power off and remove the power cable.
2. Install a FRU (adapter) and connect any cables and devices that were attached to it.

Note: If the FRU you installed requires supplemental media use the Process Supplemental Media task to load the supplemental media first.

3. Plug in the power cable (and wait for OK on the operator panel display)
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 if prompted to do so.

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

NO Go to "Step 1540-17" on page 2-51.

YES Repeat this step until all of the FRUs (adapters) are installed.

Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1540-17

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 and remove the power cable.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cable (and wait for OK on the operator panel display)
5. Turn the power on.
6. If the Console Selection screen is displayed, choose the system console.
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 if 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. I/O board (see notes on page 2-1).
3. 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 1540-1" on page 2-32 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 *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1540-18

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.
4. Select Advanced 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 displays, press Enter.
7. Select All Resources (if you were sent here from "Step 1540-22" on page 2-54, select the Adapter/Device you loaded from the supplemental media).

Did you get an SRN?

NO Go to "Step 1540-20" on page 2-54.

YES Go to "Step 1540-19" on page 2-53.

Step 1540-19

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 I/O board or a network adapter is replaced, see notes on page 2-1.
- Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic 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 1540-20

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

NO Go to "Step 1540-21."

YES Go to "Step 1540-22."

Step 1540-21

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

Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic 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 1540-22

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 TASKS SELECTION SCREEN after the supplemental media was processed?

NO Go to "Step 1540-23" on page 2-55.

YES Press F3 to return to the FUNCTION SELECTION screen.

Go to "Step 1540-18" substep 4 on page 2-52.

Step 1540-23

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. I/O board (see notes on page 2-1).

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 1540-1" on page 2-32 for the new symptom.

Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

Step 1540-24

1. Ensure that the diagnostics and the operating system are shut down.
2. Turn the power off.
3. If you have not already done so, configure the Service Processor with the instructions from note six in "MAP 1540: Minimum Configuration" on page 2-31 and then return here and continue.
4. Exit Service Processor Menus and remove the power cable.
5. Remove the side cover.
6. Record the slot numbers of the PCI adapters. Label and record the location of any cables attached to the adapters. Disconnect any cables attached to the adapters and remove all the adapters.
7. Plug the power cable into a power outlet (and wait for OK on the operator panel display).
8. Turn the power on.

Does the system stop with code 4B2xxx00 or 4B2xxx10 displayed on the operator panel?

NO Go to "Step 1540-26" on page 2-58.

YES Go to "Step 1540-25" on page 2-57.

Step 1540-25

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

1. Turn the power off, remove the power cable, and exchange the FRUs in the following order.
 - a. System board
 - b. I/O board (see notes on page 2-1).
2. Plug in the power cable (and wait for OK on the operator panel display).
3. Turn the power on.

Does the system stop with code 4B2xxx00 or 4B2xxx10 displayed on the operator panel?

NO Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

YES Re-install 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, go to "Step 1540-2" on page 2-33.

Step 1540-26

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

1. Turn the power off and remove the power cable from the power outlet.
2. Install a FRU (adapter) and connect any cables and devices that were attached to it.
3. Plug in the power cable (and wait for OK on the operator panel display).
4. Turn the power on.
5. If the Console Selection screen displays, choose the system console.
6. Enter the appropriate password if prompted to do so.

Does the system stop with code 4B2xxx00 or 4B2xxx10 displayed on the operator panel?

- NO** Repeat this step until all of the FRUs (adapters) are installed, then go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.
- YES** Go to "Step 1540-27" on page 2-59.

Step 1540-27

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

1. Turn the power off and remove the power cable from the power outlet.
2. Starting with the last installed adapter, disconnect one attached device and cable.
3. Plug in the power cable (and wait for OK on the operator panel display).
4. Turn the power on.
5. If the Console Selection screen displays, choose the system console.
6. Enter the appropriate password if prompted to do so.

Does the system stop with code 4B2xxx00 or 4B2xxx10 displayed on the operator panel?

NO The last device or cable that you disconnected is defective.

Exchange the defective device or cable.

Go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

YES 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 is defective.

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

1. Adapter (last on installed)
2. I/O board (see notes on page 2-1).

If the symptom did not change and all the FRUs have been exchanged, go to "Step 1540-2" on page 2-33.

Chapter 3. Error Code to FRU Index

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

If the codes in the following tables indicate a device which is present more than once in the system unit, a location code is needed to specify which device generated the error. Go to "Step 1020-4" on page 2-14 to display the System Management Services error log and obtain a location code. Location code descriptions can be found under Chapter 4, "Location Codes" on page 4-1.

Once you have the location code, see Chapter 8, "Parts Information" on page 8-1 for the part number.

Notes:

1. If more than eight digits are displayed in the operator panel, use only the first eight digits to find the error in the tables. The digits that display beyond the first eight digits are location codes that can assist you in diagnosing the problem. See Chapter 4, "Location Codes" on page 4-1.
2. Licensed programs frequently rely on network configuration, and system information stored on the VPD on the operator panel. If the MAPs indicate that the operator panel should be replaced, swap the VPD from the old operator panel to the new one. If the old VPD module has to be replaced call technical support for recovery instructions. If recovery is not possible, notify the system owner that new keys for licensed programs may be required.
3. 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.

If you replace FRUs and the problem is still not corrected, go to "MAP 1540: Minimum Configuration" on page 2-31. unless otherwise indicated in the tables.

If you replace FRUs and the problem is corrected, go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*

Firmware/POST Error Codes

If you replace FRUs and the problem is still not corrected, go to "MAP 1540: Minimum Configuration" on page 2-31

If you replace FRUs and the problem is corrected, go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*

Table 3-1 (Page 1 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
20A80xxx	Remote initial program load (RIPL) error.	
20A80000	Insufficient information to boot.	Verify the IP address.
20A80001	Client IP address is already in use by other network device.	Change IP address.
20A80002	Cannot get gateway IP address.	Refer to "Firmware Checkpoints" on page 3-36 table using code E174 .
20A80003	Cannot get server hardware address.	Refer to "Firmware Checkpoints" on page 3-36 table using code E174 .
20A80004	Bootp failed.	<ol style="list-style-type: none"> 1. Refer to "Boot Problems/Concerns" on page 3-47 for general considerations. 2. Turn off then on, and retry the boot operation. 3. Verify Boot List by using the Firmware SMS Multiboot menus. 4. Verify the network connection (network could be down). 5. Have network administrator verify the server configuration for this client.
20A80005	File transmission (TFTP) failed.	Check network connection, try again.
20A80006	Image too big. Ran out of available firmware memory resources loading boot image.	Verify boot server configuration.
20D00xxx	Unknown/Unrecognized device	
20D0000F	Self-test failed on device, no error/location code information available.	Check the System Management Services error log entry (described in "Step 1020-4" on page 2-14) for this error code. The location code (if present) in the error log entry should identify the location of the failing device.
20D00010	Self-test failed on device, can't locate package.	Contact your service support representative for assistance.

Table 3-1 (Page 2 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
20D00011	Cannot determine machine model.	The machine model is part of the System Vital Product Data. Perform corrective actions listed for errors 2BA00050, 2BA00051.
20E00xxx	Security	
20E00000	Power on Password entry error.	The password has been entered incorrectly. Retry installing the password.
20E00001	Privileged-access password entry error.	The password has been entered incorrectly. Retry installing the password.
20E00002	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.
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 I/O board. (See notes on 3-1.)
20E00005	EEPROM locked.	1. Turn off, then turn on system unit. 2. Replace the I/O board. (See notes on 3-1.)
20E00008	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 I/O board. (See notes on 3-1.)
20E00009	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.

Table 3-1 (Page 3 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
20E0000A	EEPROM lock problem.	If for privileged-access password install, is jumper in correct position? Consult the system's User's Guide for jumper location and position. <ol style="list-style-type: none">1. Turn off, turn on system unit.2. Replace I/O board. (See notes on 3-1.)
20E0000B	EEPROM write problem	<ol style="list-style-type: none">1. Turn off, turn on system unit.2. Replace I/O board. (See notes on 3-1.)
20E0000C	EEPROM read problem.	<ol style="list-style-type: none">1. Turn off, turn on system unit.2. Replace I/O board. (See notes on 3-1.)
20E00017	Cold boot needed for password entry.	Turn off, turn on system unit.
20EE0xxx	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: 255.192.002.000
20EE0006	No SCSI controllers present	The I/O board should always have (at least) 2 integrated PCI SCSI controllers; replace the I/O board. (See notes on 3-1.)
20EE0007	Keyboard not found	<ol style="list-style-type: none">1. Plug in keyboard.2. Replace I/O board. (See notes on 3-1.)
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: <ol style="list-style-type: none">1. Replace the device or adapter.2. Replace I/O board. (See notes on 3-1.)
20EE0009	Unable to communicate with the service processor.	<ol style="list-style-type: none">1. Replace I/O board. (See notes on 3-1.)2. Replace system board.

Table 3-1 (Page 4 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
20EE000A	Pointer to the operating system found in non-volatile storage.	<p>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.</p> <p>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.</p>
20EE000B	The system was not able to find an operating system on the device list that was attempted.	<p>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.</p>

Table 3-1 (Page 5 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
21A000xxx	SCSI device errors	<p>Notes:</p> <ol style="list-style-type: none"> 1. Before replacing any system components: <ol style="list-style-type: none"> 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.
21A00001	Test Unit Ready Failed - hardware error.	<p>Refer to the notes in error code 21A000xxx.</p> <ol style="list-style-type: none"> 1. Replace the SCSI device. 2. Replace the SCSI cable. 3. Replace the SCSI controller.
21A00002	Test Unit Ready Failed - sense data available.	<p>Refer to the notes in error code 21A000xxx.</p> <ol style="list-style-type: none"> 1. Replace the media (Removable media devices). 2. Replace the SCSI device.
21A00003	Send diagnostic failed.	<p>Refer to the notes in error code 21A000xxx. Replace the SCSI device.</p>
21A00004	Send diagnostic failed - DevOfI cmd.	<p>Refer to the notes in error code 21A000xxx. Replace the SCSI device.</p>
21E00xxx	SCSI tape	Refer to 21A00xxx for a description and repair action for the xxx value.
21ED0xxx	SCSI changer.	Refer to 21A00xxx for a description and repair action for the xxx value.
21EE0xxx	Other SCSI device type.	Refer to 21A00xxx for a description and repair action for the xxx value.
21F00xxx	SCSI CD-ROM.	Refer to 21A00xxx for a description and repair action for the xxx value.
21F20xxx	SCSI Read/Write Optical.	Refer to 21A00xxx for a description and repair action for the xxx value.
22000001	Internal wrap test failed.	Replace adapter.

<i>Table 3-1 (Page 6 of 27). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
22001001	Internal wrap test failed.	Replace adapter.
22002001	Adapter failed to complete hardware initialization.	Replace adapter.
22010001	Adapter failed to complete hardware initialization.	Replace adapter.
22011001	Adapter failed to complete hardware initialization.	Replace adapter.
25000000	Memory controller failed.	Replace the system board.
25010xxx	Flash Update Problem	
25010000	No diskette in drive.	Insert diskette containing firmware image.
25010001	Diskette seek error.	<ol style="list-style-type: none"> 1. Retry function. 2. Replace diskette drive. 3. Replace diskette cable. 4. Replace I/O board. (See notes on 3-1.)
25010002	Diskette in drive does not contain an *.IMG file.	Insert diskette with firmware update file.
25010003	Cannot open OPENPROM package.	Replace I/O board. (See notes on 3-1.)
25010004	Cannot find OPENPROM node.	Replace I/O board. (See notes on 3-1.)
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.	Replace firmware updated diskette.
25010008	Flash is write protected, update cancelled.	<ol style="list-style-type: none"> 1. Turn off, turn on system unit and retry. 2. Replace I/O board. (See notes on 3-1.)
25010009	Flash module is unsupported or not recognized.	Make sure correct firmware update diskette is being used with this system.
2501000A	Flash write protected.	<ol style="list-style-type: none"> 1. Turn off, turn on system unit, retry. 2. Replace I/O board. (See notes on 3-1.)
25A0xxx0	L2 Cache controller problem.	<ol style="list-style-type: none"> 1. Replace the processor card. 2. Replace the system board. See error code 2B2xxx22 for xxx definitions.
25A0xxx1	L2 Cache controller problem.	<ol style="list-style-type: none"> 1. Replace the processor card. 2. Replace the system board. See error code 2B2xxx22 for xxx definitions.

Table 3-1 (Page 7 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
25A1xxx1	L2 SRAM failure	Replace the processor card. See error code 2B2xxx22 for xxx definitions.
25A80xxx	NVRAM problems	<p>NVRAM problem resolution:</p> <ol style="list-style-type: none"> 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 re-configured. If the error is persistent, replace the battery. If the error is persistent after battery replacement, or the error code is 25A80000, replace the I/O board. (See notes on 3-1.)
25A80000	Initialization failed, device test failed.	Refer to Action under error code 25A80xxx.
25A80001	Init-nvram invoked, ALL of NVRAM initialized.	Refer to Action under error code 25A80xxx.
25A80002	Init-nvram invoked, some data partitions may have been preserved.	Refer to Action under error code 25A80xxx.
25A80011	Data corruption detected, ALL of NVRAM initialized.	Refer to Action under error code 25A80xxx.
25A80012	Data corruption detected, some data partitions may have been preserved.	Refer to Action under error code 25A80xxx.
25A80100	NVRAM data validation check failed.	Turn off, turn on system unit and retry the operation before replacing any system component. Refer to Action under error code 25A80xxx.
25A80201	Unable to expand target partition while saving configuration variable.	Refer to Action under error code 25A80xxx.
25A80202	Unable to expand target partition while writing error log entry.	Refer to Action under error code 25A80xxx.

Table 3-1 (Page 8 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
25A80203	Unable to expand target partition while writing VPD data.	Refer to Action under error code 25A80xxx.
25A80210	Setenv/\$Setenv parameter error - name contains a null character.	Refer to Action under error code 25A80xxx.
25A80211	Setenv/\$Setenv parameter error - value contains a null character.	Refer to Action under error code 25A80xxx.
25AA0xxx	EEPROM problems.	EEPROM problem resolution: <ol style="list-style-type: none"> 1. Ensure that the EEPROM Security jumper is in the correct position if doing a privileged-access password install. 2. Retry the operation. 3. If retries do not solve the problem, replace the I/O board. (See notes on 3-1.)
25AA0000	Unable to unlock EEPROM.	Refer to Action under error code 25AA0xxx.
25AA0001	Read-Recv error.	Refer to Action under error code 25AA0xxx.
25AA0002	Read-Trans error.	Refer to Action under error code 25AA0xxx.
25AA0003	Write-enable error.	Refer to Action under error code 25AA0xxx.
25AA0004	Write-recv error.	Refer to Action under error code 25AA0xxx.
25AA0005	Write-disable error.	Refer to Action under error code 25AA0xxx.
25AA0006	Write-Trans error.	Refer to Action under error code 25AA0xxx.
25AA0007	Unable to lock EEPROM.	Refer to Action under error code 25AA0xxx.
25B00001	No memory modules detected in either memory card 1 or 2.	<ol style="list-style-type: none"> 1. Reseat any installed memory card(s) and retry. 2. Reseat any installed memory modules on the installed memory cards. 3. Replace Memory Card(s).

Table 3-1 (Page 9 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
<p>Memory Errors</p> <p>Use the location code obtained from the SMS Error Log utility (described in "Step 1020-4" on page 2-14) to identify which memory module (or memory module pair) the error is reported against.</p> <p>Memory error codes are in the form 25Cyyxxx where yy indicates Memory & memdimm. PD-bits and xxx indicates the last 3 digits of the error code.</p> <p>See "Memory PD Bits" on page 3-29 for information on how to interpret PD bits.</p>		
25Cyy001	Memory module is not supported.	<p>Replace unsupported memory module.</p> <p>Note:</p> <p>Memory module must be replaced with a supported type memory module. If an unsupported memory module is replaced the same unsupported type, the error does not go away.</p> <p>There may be 2 memory module related memory errors reported to indicate a memory module pair. One of the 2 indicated memory modules may be good, when replacing memory replace 1 memory module at a time, not both.</p> <p>See "Memory PD Bits" on page 3-29 for definition of "yy".</p>
25Cyy002	Memory module fails memory test.	<ol style="list-style-type: none"> 1. Replace memory module. 2. Replace memory card. 3. Replace the system board. <p>See "Memory PD Bits" on page 3-29 for definition of "yy".</p>
25Cyy003	PD bits are mis-matched or missing one memory module.	<ol style="list-style-type: none"> 1. Make sure both memory modules in the pair are the same type. 2. Replace system board. <p>See "Memory PD Bits" on page 3-29 for definition of "yy".</p>
25Cyy004	Memory modules are disabled.	<p>Remove this unused memory module.</p> <p>See "Memory PD Bits" on page 3-29 for definition of "yy".</p>
25Cyy005	Memory module failed address test.	<ol style="list-style-type: none"> 1. Replace memory module. 2. Replace memory card. 3. Replace system board. 4. Replace processor card. <p>See "Memory PD Bits" on page 3-29 for definition of "yy".</p>

<i>Table 3-1 (Page 10 of 27). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
25Cyy006	Memory module failed inter-extent test.	<ol style="list-style-type: none"> 1. Replace system board. 2. Replace processor card. <p>See "Memory PD Bits" on page 3-29 for definition of "yy".</p>
25Cyy007	Memory module failed extent access test.	<ol style="list-style-type: none"> 1. Replace system board. 2. Replace processor card. <p>See "Memory PD Bits" on page 3-29 for definition of "yy".</p>
25Cyy008	Memory module has been deconfigured.	<ol style="list-style-type: none"> 1. Replace memory module. <p>See "Memory PD Bits" on page 3-29 for definition of "yy".</p>
26020001	Invalid PCI adapter vendor ID.	<ol style="list-style-type: none"> 1. Move adapter to another slot (behind a different PCI bridge). 2. Check for available firmware updates for adapter. Apply update if available. 3. Run AIX diagnostics on adapter. Replace if indicated. 4. Replace adapter. 5. Check for system firmware updates. Apply if update available. 6. Replace power supply. 7. Replace I/O board. (See notes on 3-1.)
26020002	Invalid PCI adapter device ID.	<ol style="list-style-type: none"> 1. Move adapter to another slot (behind a different PCI bridge). 2. Check for available firmware updates for adapter. Apply update if available. 3. Run AIX diagnostics on adapter. Replace if indicated. 4. Replace adapter. 5. Check for system firmware updates. Apply if update available. 6. Replace power supply. 7. Replace I/O board. (See notes on 3-1.)

Table 3-1 (Page 11 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
26020003	Invalid PCI adapter class code.	<ol style="list-style-type: none"> 1. Move adapter to another slot (behind a different PCI bridge). 2. Check for available firmware updates for adapter. Apply update if available. 3. Run AIX diagnostics on adapter. Replace if indicated. 4. Replace adapter. 5. Check for system firmware updates. Apply if update available. 6. Replace power supply. 7. Replace I/O board. (See notes on 3-1.)
26020007	Failed to allocate bus resources to PCI adapter.	<ol style="list-style-type: none"> 1. Move adapter to another slot (behind a different PCI bridge). 2. Check for available firmware updates for adapter. Apply update if available. 3. Run AIX diagnostics on adapter. Replace if indicated. 4. Replace adapter. 5. Check for system firmware updates. Apply if update available. 6. Replace power supply. 7. Replace I/O board. (See notes on 3-1.)
26800Cxx	Machine Check occurred.	<p>If the location code shown on the operator panel identifies a card slot:</p> <ol style="list-style-type: none"> 1. Replace the adapter in the slot identified. 2. Replace the I/O board (See notes on 3-1.) <p>If the location code shown does not identify a card slot, or if there is no location code, replace the I/O board. (See notes on 3-1.)</p>

Table 3-1 (Page 12 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
28030xxx	RTC errors	<p>1. Errors reported against the Real Time Clock (RTC) can be caused by low battery voltage and (more rarely) power outages that occur during normal system usage. These errors are warnings that the RTC 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 been lost.</p> <ul style="list-style-type: none"> • To set/restore a Power On Password, use the SMS utility. • To set/restore the Time and Date, use the Operating System facility. <p>2. If the error is persistent, replace the battery.</p> <p>3. If the error is persistent after battery replacement, replace the I/O board. (See notes on 3-1.)</p>
28030001	RTC initialization required- RTC not updating, corrected.	Refer to Action under error code 28030xxx.
28030002	Bad time/date values	<ol style="list-style-type: none"> 1. Set the time and date. 2. Refer to Action under error code 28030xxx.
29000002	Keyboard/Mouse controller failed self-test.	Replace the I/O board. (See notes on 3-1.)
29A00003	Keyboard not present/detected.	<ol style="list-style-type: none"> 1. Keyboard 2. Replace the I/O board. (See notes on 3-1.)
29A00004	Keyboard stuck key test failed.	<ol style="list-style-type: none"> 1. Keyboard 2. Replace the I/O board. (See notes on 3-1.)
29B00004	Mouse not present/detected.	<ol style="list-style-type: none"> 1. Mouse 2. Replace the I/O board. (See notes on 3-1.)

Table 3-1 (Page 13 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
2B2xxx22	Processor disabled.	Processor card. Where xxx indicates the processor type as follows: 651 200 Mhz Processor with 1MB of L2 cache. 654 200 Mhz Processor with 4MB of L2 cache.
2B2xxx31	Processor failed.	Processor card. See error code 2B2xxx22 for xxx definitions.
2B2xxx42	Unsupported processor type.	Processor card. See error code 2B2xxx22 for xxx definitions.
2B200402	Unsupported processor.	Processor card.
2BA00xxx	Service processor	
2BA00000	Service processor POST failure.	<ol style="list-style-type: none"> 1. Unplug the system power cable and wait until the system power indicator remains off and the operator panel is blank. 2. Plug the system power cable back in and retry the operation. 3. Replace the I/O board. (See notes on 3-1.)
2BA00012	Service processor reports self-test failure.	<ol style="list-style-type: none"> 1. Unplug the system power cable and wait until the system power indicator remains off and the operator panel is blank. 2. Plug the system power cable back in and retry the operation. 3. Replace the I/O board. (See notes on 3-1.)
2BA00013	Service processor reports bad NVRAM CRC.	<ol style="list-style-type: none"> 1. If problem persists, replace battery. 2. Replace the I/O board. (See notes on 3-1.)
2BA00014	Service processor reports bad service processor firmware.	Use service processor firmware diskette to re-program firmware.
2BA00017	Service processor reports bad or low battery.	<ol style="list-style-type: none"> 1. Replace the battery. 2. Replace the I/O board. (See notes on 3-1.)
2BA00018	EPOW test failure.	1. Replace the I/O board. (See notes on 3-1.)
2BA00019	IRQ13 test failure.	Replace the I/O board. (See notes on 3-1.)

<i>Table 3-1 (Page 14 of 27). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
2BA00024	Service processor reports bad power controller firmware.	Use the system firmware diskette to re-program the system firmware.
2BA00040	Service processor reports service processor VPD module not present.	<ol style="list-style-type: none"> 1. Use the service processor firmware diskette to re-program the service processor firmware. 2. Replace the I/O board. (See notes on 3-1.)
2BA00041	Service processor VPD is corrupted.	<ol style="list-style-type: none"> 1. Use the service processor firmware diskette to re-program the service processor firmware. 2. Replace the I/O board. (See notes on 3-1.)
2BA00050	Service processor reports system operator panel VPD module not present or not recognizable.	<p>Replace the operator panel control assembly. (See notes on 3-1.)</p> <p>Note: Swap the old VPD module from the old operator panel control assembly to the new one.</p>
2BA00051	System operator panel VPD data corrupted.	<p>Replace the operator panel control assembly. (See notes on 3-1.)</p> <p>Note: Swap the old VPD module from the old operator panel control assembly to the new one.</p>
2BA00060	Service processor reports I/O board VPD module not present.	Replace the I/O board. (See notes on 3-1.)
2BA00061	Service processor reports I/O board VPD data corrupted.	Replace the I/O board. (See notes on 3-1.)
2BA00062	Service processor reports system board VPD module not present.	Replace the system board.
2BA00063	Service processor reports system board VPD data corrupted.	Replace the system board.
2BA00070	Service processor reports processor card VPD module not present.	Replace the processor card(s).
2BA00071	VPD data corrupted for processor card in slot 0.	Replace the processor card in slot 0.
2BA00073	VPD data corrupted for processor card in slot 1.	Replace the processor card in slot 1.
2BA00100	Service processor firmware recovery information could not be written to diskette.	<ol style="list-style-type: none"> 1. Check diskette media write protect tab. 2. Replace the diskette drive.
2BA00102	No service processor update diskette in drive.	Insert the diskette.

Table 3-1 (Page 15 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
2BA00103	Service processor firmware update file is corrupted, update cancelled.	<ol style="list-style-type: none"> 1. Obtain new service processor firmware diskette. 2. Retry operation.
2BA00104	Service processor firmware update file is the same level as the service processor firmware, update cancelled.	<ol style="list-style-type: none"> 1. Obtain new level of service processor firmware. 2. Retry operation.
2BA00200	Service processor firmware update error occurred, update not completed. Error occurred during service processor flash write operation.	<p>Service processor firmware update error recovery procedure:</p> <ol style="list-style-type: none"> 1. Turn the system Off. 2. Unplug power cable and then plug power cable back in. 3. Turn the system On. 4. Retry operation. If problem persists, replace service processor.
2BA00201	Service processor firmware update error occurred, update not completed. Error occurred while reading service processor CRC.	See error code 2BA00200 for recovery procedure.
2BA00202	Service processor firmware update error occurred, update not completed. Error occurred while verifying service processor CRC.	See error code 2BA00200 for recovery procedure.
2BA00203	Service processor firmware update error occurred, update not completed. Error occurred while reading new service processor CRC after updating service processor firmware.	See error code 2BA00200 for recovery procedure.
2BA00204	Service processor firmware update error occurred, update not completed. Error occurred while calculate CRC write.	See error code 2BA00200 for recovery procedure.
2BA00300	Service processor reports slow fan number 1.	<ol style="list-style-type: none"> 1. Replace fan 1. 2. If problem persists, replace power supply. 3. Replace system board. (See notes on 3-1.)
2BA00301	Service processor reports slow fan number 2.	<ol style="list-style-type: none"> 1. Replace fan 2. 2. If problem persists, replace power supply. 3. Replace system board. (See notes on 3-1.)

<i>Table 3-1 (Page 16 of 27). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
2BA00309	Service processor reports generic cooling alert.	<ol style="list-style-type: none"> 1. Check for cool air flow obstructions to the system. 2. Replace system board. (See notes on 3-1.)
2BA00310	Service processor reports processor card over temperature alert.	<ol style="list-style-type: none"> 1. Check for cool air flow obstructions to the system. 2. If the problem persists, replace processor card.
2BA00311	Service processor reports IO over temperature alert.	<ol style="list-style-type: none"> 1. Check for cool air flow obstructions to the system. 2. Replace system board. (See notes on 3-1.)
2BA00312	Service processor reports memory over temperature alert.	<ol style="list-style-type: none"> 1. Check for cool air flow obstructions to the system. 2. Replace memory card.
2BA00313	Service processor reports generic power alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00314	Service processor reports 5V over voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00315	Service processor reports 5V under voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00316	Service processor reports 3.3V over voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00317	Service processor reports 3.3V under voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00318	Service processor reports 2.5V over voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00319	Service processor reports 2.5V under voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00320	Service processor reports +12V over voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00321	Service processor reports +12V under voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace system board. (See notes on 3-1.)

Table 3-1 (Page 17 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
2BA00322	Service processor reports -12V over voltage alert.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00323	Service processor reports -12V under voltage alert.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00324	Service processor reports 5V standby over voltage alert.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00325	Service processor reports 5V standby under voltage alert.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00326	Service processor reports PCI expansion card 5V over voltage alert.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00327	Service processor reports PCI expansion card 5V under voltage alert.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00328	Service processor reports PCI expansion card 3.3V over voltage alert.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00329	Service processor reports PCI expansion card 3.3V under voltage alert.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00330	Service processor reports PCI expansion card +12V over voltage alert.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00331	Service processor reports PCI expansion card +12V under voltage alert.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00332	Service processor reports PCI expansion card -12V over voltage alert.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00333	Service processor reports PCI expansion card -12V under voltage alert.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00334	Service processor reports generic slow shutdown request.	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)

Table 3-1 (Page 18 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
2BA00335	Service processor reports processor card critical over temperature slow shutdown request.	<ol style="list-style-type: none"> 1. Check for cool air flow obstructions to the system. 2. Check fans for obstructions that prevent them from normal operation (example: a cable caught in the fan preventing it from spinning). 3. If problem persists, replace I/O board.
2BA00336	Service processor reports IO critical over temperature slow shutdown request.	<ol style="list-style-type: none"> 1. Check for cool air flow obstructions to the system. 2. Check fans for obstructions that prevent them from normal operation (example: a cable caught in the fan preventing it from spinning). 3. If problem persists, replace system board. (See notes on 3-1.)
2BA00337	Service processor reports memory critical over temperature slow shutdown request.	<ol style="list-style-type: none"> 1. Check for cool air flow obstructions to the system. 2. Check fans for obstructions that prevent them from normal operation (example: a cable caught in the fan preventing it from spinning) 3. If problem persists, replace memory card.
2BA00338	Service processor reports generic fast shutdown request.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00340	Service processor reports locked fan - fast shutdown request fan number 1.	<ol style="list-style-type: none"> 1. Replace fan 1. 2. If problem persists, replace power supply. 3. Replace system board. (See notes on 3-1.)
2BA00341	Service processor reports locked fan - fast shutdown request fan number 2.	<ol style="list-style-type: none"> 1. Replace fan 2. 2. If problem persists, replace power supply. 3. Replace system board. (See notes on 3-1.)
2BA00350	Service processor reports generic immediate shutdown request.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00351	Service processor reports generic AC power loss EPOW.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace system board. (See notes on 3-1.)

Table 3-1 (Page 19 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
2BA00352	Service processor reports loss of AC power (outlet).	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00353	Service processor reports loss of AC power (power button).	1. Replace power supply. 2. Replace system board. (See notes on 3-1.)
2BA00399	Service processor reports unsupported value in EPOW.	1. Check EPOW cabling on SCSI or SSA Backplanes. 2. Replace system board. (See notes on 3-1.)
40100005	A loss of system power detected.	Possible main power loss. If not, replace power supply.
40100007	Immediate shutdown.	Possible main power loss. If not, replace power supply.
40110001	Power supply failed.	1. Check power cable to connector on I/O Board. 2. Power supply. 3. I/O board. (See notes on 3-1.)
40110002	Voltage not detected on either processor card.	Replace power supply.
40110003	Voltage not detected on one processor card. (If the system is running, refer to the AIX error log to find out which processor card is failing. If the system is not running, refer to the service processor error log.)	Replace processor card.
40110004	Low voltage detected in power supply main enclosure.	1. Check I ² C cable to connector on I/O board. 2. Power supply.
40110005	Fan warning detected in power supply main enclosure.	1. Check I ² C cable to connector on I/O board. 2. Power supply.
40110006	Fan failure detected in power supply main enclosure.	1. Check I ² C cable to connector on I/O board. 2. Power supply.
40110007	Thermal warning detected in power supply main enclosure.	1. Check I ² C cable to connector on I/O board. 2. Power supply.
40110008	Thermal failure detected in power supply main enclosure.	1. Check I ² C cable to connector on I/O board. 2. Power supply.
40110009	High 5.0 volt detected in power supply main enclosure.	1. Check I ² C cable to connector on I/O board. 2. Power supply.

<i>Table 3-1 (Page 20 of 27). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
4011000A	High 5.0 RA volt detected in power supply main enclosure.	1. Check I ² C cable to connector on I/O board. 2. Power supply.
4011000B	High 5.0 RB volt detected in power supply main enclosure.	1. Check I ² C cable to connector on I/O board. 2. Power supply.
4011000C	High 3.3 M volt detected in power supply main enclosure.	1. Check I ² C cable to connector on I/O board. 2. Power supply.
4011000D	High 3.3 volt detected in power supply main enclosure.	1. Check I ² C cable to connector on I/O board. 2. Power supply.
4011000E	High +12.0 volt detected in power supply main enclosure.	1. Check I ² C cable to connector on I/O board. 2. Power supply.
4011000F	High -12.0 volt detected in power supply main enclosure.	1. Check I ² C cable to connector on I/O board. 2. Power supply.
40111002	An unknown power problem detected.	Power supply.
40111022	A high 5.0 voltage reading detected.	1. Power supply. 2. Processor card.
40111032	A high 3.3 voltage reading detected.	1. Processor card. 2. Power supply.
40111052	A high +12 voltage reading detected.	1. Power supply. 2. I/O board. (See notes on 3-1.)
40111062	A high -12 voltage reading detected.	1. Power supply. 2. I/O board. (See notes on 3-1.)
40111072	A high +5 standby voltage reading detected.	1. Processor card. 2. Power supply.
40111082	A low 5.0 voltage reading detected.	1. Power supply. 2. I/O board. (See notes on 3-1.)
40111092	A low 3.3 voltage reading detected.	1. Processor card. 2. Power supply.
401110B2	A low +12 voltage reading detected.	1. Power supply. 2. I/O board. (See notes on 3-1.)
401110C2	A low -12 voltage reading detected.	1. Power supply. 2. I/O board. (See notes on 3-1.)
401110D2	A low +5 standby voltage reading detected.	1. Processor card. 2. Power supply.

Table 3-1 (Page 21 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
40111101	Power good signal low on either processor card 1 or processor card 2. (If the system is running, refer to the AIX error log to find out which processor card is failing. If the system is not running, refer to the service processor error log.)	Replace failing processor card
40111102	Wrong processor cards plugged into the system.	<ol style="list-style-type: none"> 1. Remove cards 2. Verify part numbers 3. Install valid cards
40111103	Real cpu 5 volt fail.	<ol style="list-style-type: none"> 1. Remove cards 2. Verify part numbers 3. Install valid cards
40200001	An unknown cooling problem detected.	Cooling problem; check system fans.
40200021	A processor card temperature warning detected.	Over temperature on processor card.
40200023	A critical processor card temperature condition detected.	Critical temperature on processor card.
40200031	An I/O board temperature warning detected.	Over temperature on I/O board.
40200033	A critical I/O board temperature condition detected.	Critical temperature on I/O board.
40200051	A inlet temperature warning detected.	Over temperature on the Air Flow Inlet.
40200053	A inlet memory temperature condition detected.	Critical temperature on the Air Flow Inlet.
40210011	A slow fan detected.	Check: <ol style="list-style-type: none"> 1. Room operating temperature. 2. System fans.
40210014	<ol style="list-style-type: none"> 1. A stopped fan detected. 2. Fan connector unplugged. 3. Fan sensor defective. 	<ol style="list-style-type: none"> 1. Check connector 2. Replace failing fan.
40A00000	System firmware IPL failure.	<ol style="list-style-type: none"> 1. Surveillance mode control is from the Service Processor Menus. 2. Verify that the system firmware supports service processor surveillance. 3. Processor card. 4. I/O board. (See notes on 3-1.) 5. If the problem persists, call the support center for assistance.

<i>Table 3-1 (Page 22 of 27). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
40B00000	The operating system surveillance interval exceeded.	<ol style="list-style-type: none"> 1. Surveillance mode control is from the Service Processor Menus. 2. Verify that the Operating System (OS) Heartbeat Utility is installed and has been activated. 3. Check for errors or unusual conditions that might prevent the OS from reporting Heartbeat messages; such as system dump, machine check or checkstop error. Review the error log. 4. I/O board. (See notes on 3-1.) 5. If the problem persists, call the support center for assistance.
40D00003	An unknown slow shutdown commanded.	Critical cooling problem. Check to ensure the temperature is in the ambient range.
40D00004	An unknown fast shutdown commanded.	Locked fan failure detected. Make sure all fans are operating normally.
40D00101	Bist on I/O board failed.	Replace I/O board. (See notes on 3-1.)
40D00102	BIST on system board fail.	Replace system board.
45800000	Memory controller checkstop.	<ol style="list-style-type: none"> 1. Replace system board. 2. If problem is not resolved, go to MAP 1540: Minimum Configuration, "Step 1540-22" on page 2-54.
45C00000	Memory checkstop. (Uncorrectable memory error.)	<ol style="list-style-type: none"> 1. Attempt to reboot the system in Service mode, this preserves the AIX error log. If the reboot fails, attempt to reboot from the CD-ROM. If the reboot is successful, run Diagnostics in Problem Determination mode to determine the cause of the failure. 2. Replace system board.
48800909	System vpd error.	<ol style="list-style-type: none"> 1. Check cable to op-panel. 2. Replace op-panel. 3. Replace I/O board. (See notes on 3-1.)
4880090A	Generic vpd error.	Go to "Step 1540-22" on page 2-54.
4880090B	Error identifying system type using vpd.	<ol style="list-style-type: none"> 1. I²C bus error. 2. Call for support.
4880090C	Jtag unable to confirm system type using system vpd.	<ol style="list-style-type: none"> 1. Remove cards. 2. Verify part numbers. 3. Install valid cards. 4. Call for support.

Table 3-1 (Page 23 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
4B2xx00	Checkstop	<ol style="list-style-type: none"> 1. Press enter on an attached ASCII terminal keyboard to go into the Service Processor menus. 2. Select System Information Menu. 3. Select "Read Progress Indicators from Last System Boot" and use the posted code indicated by the arrow. Refer to "Service Processor Menus" on page A-3 if you need help. If the code is "E105" or "Oxxx", where xxx is any 3 digits , continue to step 4 instead of the listed action. Otherwise, find the code in the "SP Checkpoints" on page 3-33 or "Firmware Checkpoints" on page 3-36 and perform the action shown there. 4. Attempt to reboot the system in Service Mode, this preserves the AIX error log. If the reboot fails, attempt to reboot from the CD-ROM. If the reboot is successful, run Diagnostics in Problem Determination mode to determine the cause of the failure. Otherwise continue. 5. Remove processor card in slot 2 (if installed) and see if the problem is resolved. If problem is resolved replace processor card. If not, continue. 6. Exchange processor card in slot 1 with processor card removed from slot 2 in step 1 (replace processor card if only one processor card is exists) and see if the problem is resolved. If problem is resolved replace processor card. If not, continue. 7. Go to MAP 1540: Minimum Configuration, "Step 1540-22" on page 2-54.

Table 3-1 (Page 24 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
4B2xx01	Checkstop - Slot 1 Fail	<ol style="list-style-type: none"> 1. Attempt to reboot the system in Service Mode, this preserves the AIX error log. If the reboot fails, attempt to reboot from the CD-ROM. If the reboot is successful, run Diagnostics in Problem Determination mode to determine the cause of the failure. Otherwise continue. 2. Processor card in Slot 1 3. System board 4. I/O board (See notes on 3-1.)
4B2xx02	Checkstop - Slot 2 Fail	<ol style="list-style-type: none"> 1. Attempt to reboot the system in Service Mode, this preserves the AIX error log. If the reboot fails, attempt to reboot from the CD-ROM. If the reboot is successful, run Diagnostics in Problem Determination mode to determine the cause of the failure. Otherwise continue. 2. Processor card in Slot 2 3. System board 4. I/O board (See notes on 3-1.)

Table 3-1 (Page 25 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
4B2xxx10	Machine Check - 0	<ol style="list-style-type: none"> 1. Attempt to reboot the system in Service Mode, this preserves the AIX error log. If the reboot fails, attempt to reboot from the CD-ROM. If the reboot is successful, run Diagnostics in Problem Determination mode to determine the cause of the failure. Otherwise continue. 2. Remove processor card in slot 2 (if installed) and see if the problem is resolved. If problem is resolved replace processor card. If not, continue. 3. Exchange processor card in slot 1 with processor card removed from slot 2 in step 1 (replace processor card if only one processor card is exists) and see if the problem is resolved. If problem is resolved replace processor card. If not, continue. 4. Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 2-56.
4B2xxx11	Machine Check - 1 (Stuck Active)	<ol style="list-style-type: none"> 1. Remove processor card in slot 2 (if installed) and see if the problem is resolved. If problem is resolved replace processor card. If not, continue. 2. Exchange processor card in slot 1 with processor card removed from slot 2 in step 1 (replace processor card if only one processor card is exists) and see if the problem is resolved. If problem is resolved replace processor card. If not, continue. 3. Replace system board.
4B2xxx41	ABIST fail	<ol style="list-style-type: none"> 1. Processor card in Slot 1. 2. I/O board. (See notes on 3-1.)
4B2xxx42	ABIST fail	<ol style="list-style-type: none"> 1. Processor card in Slot 2. 2. I/O board. (See notes on 3-1.)
4B2xxx51	LBIST fail	<ol style="list-style-type: none"> 1. Processor card in Slot 1. 2. I/O board. (See notes on 3-1.)

<i>Table 3-1 (Page 26 of 27). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
4B2xxx52	LBIST fail	<ol style="list-style-type: none"> 1. Processor card in Slot 2. 2. I/O board. (See notes on 3-1.)
4B200043	Service processor reports JTAG fail	<ol style="list-style-type: none"> 1. Remove processor card in slot 2 (if installed) and see if the problem is resolved. If not, proceed to step 2. 2. Exchange processor card in slot 1 with processor card removed from slot 2 in step 1 (replace processor card if only one processor card exists) and see if the problem is resolved. If not, proceed to step 3. 3. Replace system board. 4. Replace I/O board. (See notes on 3-1.)
4B200055	No processor found.	<ol style="list-style-type: none"> 1. If only one processor card is used, it must be in slot #1. 2. If two processor cards are being used, replace the card in slot #1.
4B200056	No processor card in first slot.	<ol style="list-style-type: none"> 1. If only one processor card is used, it must be in slot #1. 2. If two processor cards are being used, replace the card in slot #1.
4B200057	The processor cards are not compatible with each other.	<ol style="list-style-type: none"> 1. Remove cards 2. Verify part numbers 3. Install valid cards.
4B200058	Compatibility test on processor card 0 failed.	<ol style="list-style-type: none"> 1. Remove cards 2. Verify part numbers 3. Install valid cards.
4B200059	Compatibility test on processor card 1 failed.	<ol style="list-style-type: none"> 1. Remove cards 2. Verify part numbers 3. Install valid cards.
4B201020	TEA Error	Go to MAP 1540: Minimum Configuration, "Step 1540-22" on page 2-54.
4BA00000	The system support controller detects the service processor, but cannot establish communication. The system halts.	Replace the I/O board. (See notes on 3-1.)
4BA00001	The system support controller cannot detect the service processor.	Replace the I/O board. (See notes on 3-1.)

Table 3-1 (Page 27 of 27). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
4BA00800	Unknown error.	Check level of Service Processor, if not the latest and problem persists, call for support.
4BA00826	Service processor cannot call home.	Replace the I/O board. (See notes on 3-1.)
4BA00827	Flash update diskette fail.	Replace the diskette drive.
4BA00828	Flash update (crc) checksum fail.	Replace the flash image.
4BA00829	Bad system firmware.	Replace the I/O board. (See notes on 3-1.)
4BA00830	Boot fail.	Go to "Boot Problems/Concerns" on page 3-47.
4BA10001	SSC sram fail	Go to MAP 1540: Minimum Configuration, "Step 1540-22" on page 2-54.
4BA10002	SSC sram fail	Update firmware.
4BA10003	Service processor fail.	Replace I/O board. (See notes on 3-1.)
4BA10004	Service processor firmware fail.	Restore or update the service processor Flash EPROM.
4BA10005	I ² C Path Fail.	<ol style="list-style-type: none"> 1. I/O board. (See notes on 3-1.) 2. Processor card. 3. System board.
4BA80013	NVRAM	Go to MAP 1540: Minimum Configuration, "Step 1540-22" on page 2-54.
4BA80014	NVRAM (crc) checksum fail.	Recoverable temporary condition, unless succeeded by 4BA80015.
4BA80015	NVRAM reinitialization fail.	Replace NVRAM module.

Memory PD Bits

The following table expands the firmware error code **25Cyyxxx** on page 3-9, where **yy** is the PD values in the table below and xxx are the last three digits of the error code. 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 1540: Minimum Configuration” on page 2-31 unless otherwise indicated in the tables.

PD value	Size	Clock Cycle (nsecs)	Parity/ECC
28	512MB	10	ECC
2A	512MB	8	ECC
38	128MB	10	ECC
3A	128MB	8	ECC
48	64MB	10	ECC
4A	64MB	8	ECC
58	32MB	10	ECC
5A	32MB	8	ECC
68	256MB	10	ECC
6A	256MB	8	ECC

Note: Memory modules must be installed in pairs.

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.

<i>Table 3-3. Bus SRN to FRU Reference Table</i>			
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 notes on 3-1.)
		Internal/External SCSI port 2 (30-58)	I/O board. (See notes on 3-1.)
		Internal Ethernet port (10-80)	I/O board. (See notes on 3-1.)
		Device installed in I/O Slot 3P (10-68 to 10-6F)	Adapter
		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 notes on 3-1.)
		Parallel port/device (01-R1)	I/O board. (See notes on 3-1.)
		Serial ports (1-2)/device (01-S1 to 01-S2)	I/O board. (See notes on 3-1.)
		Mouse port/device (01-K1-01-00)	I/O board. (See notes on 3-1.)
		Keyboard port/device (01-K1-00-00)	I/O board. (See notes on 3-1.)
		Audio port/device (01-FF)	I/O board. (See notes on 3-1.)
		Tablet port/device (01-FF)	I/O board. (See notes on 3-1.)

Typical Boot Sequence for 7043 Model 260

After the A/C power is turned on, the System Support Controller (SSC) startup begins, and releases reset to the service processor. If the SSC cannot communicate with the service processor, the LCD displays 4BA00000. If the service processor is not present, the LCD displays 4BA00001.

1. Service processor self test

- Service processor card performs self test and NVRAM initialization.
- LCD Code range is E000 - E07F.
- LCD code is "OK" when complete.

2. Service processor in standby mode

- You can enter the service processor menus whenever the LCD code is "OK", "STBY", or has an eight digit error code on the LCD display by pressing the enter key on an ASCII terminal connected to serial port 1.

3. Built-In-Self-Test (BIST)

- The service processor initiates Built-In-Self-Test (BIST) on the Central Electronics Complex (CEC) chips when the POWER Button is pressed.
- The VPD data is read and the CRC is checked.
- The processor compatibility test is run.
- LCD Code range is E0A0 - E0E1.

4. System Initialization

- System firmware begins to execute and initializes system registers after LCD code E0E1.
- LCD Code range is E1XX - E2XX.

5. Memory Test

- The system firmware tests the system memory and identifies failing memory cards and memory module locations.
- LCD Code range is E3XX.

6. Device Configuration and Test

- System firmware checks to see what devices are in the system and performs a simple test on them.
- The system firmware displays the device name or device icon being tested. After the keyboard name or icon appears, the user can enter the Systems Management Services menu by hitting the "1" key (if ASCII terminal) or the "F1" key (if Graphics terminal).
- The user can also enter one of the following:
 - "5" or "F5" to start the Stand-alone Diagnostics (CD).
 - "6" or "F6" to start the On-line Diagnostics (hard disk).

7. IPL Boot Code

- The system firmware attempts to boot from the devices listed in the Boot List.
- LCD Code range is E1XX.

8. Boot Image Execution

- Once a boot image is located on a device in the Boot List, the system firmware code hands off control to the AIX Boot code.
 - LCD Code E105 for Normal Boot or
 - E15B for Service Mode Boot.
- The AIX Boot code indicates LCD progress codes in the range from 05XX to 09XX.

9. AIX Boot Complete

- The AIX login prompt appears on the main console.

Checkpoints

Checkpoints are intended to let users and service personal know what the server is doing, with some detail, as it initializes. These checkpoints are not intended to be error indicators, but in some cases a server could hang at one of the checkpoints without displaying an 8-character error code. It is for these hang conditions, only, that any action should be taken with respect to checkpoints. The most appropriate action is included with each checkpoint.

Before taking actions listed with a checkpoint, it is a good idea to look for better symptoms in the service processor error log. See Service Processor System Information Menu.

SP Checkpoints

Service processor checkpoints are in the range E010 to E0FF. The message **OK** indicates successful service processor testing and initialization. Firmware checkpoints are listed in "Firmware Checkpoints" on page 3-36.

Note: Go to MAP 1540 for any of the following conditions:

- A four-digit code in the range of E001 through EFFF displays on the operator panel but is not listed in the checkpoint table.
- A four-digit code displays in the checkpoint table, but does not contain a repair action or FRU listing.
- All of the FRUs listed in the repair action have been replaced and the problem has not been corrected.

If you replace FRUs and the problem is corrected, go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*

Checkpoint	Description	Action/ Possible Failing FRU
E000	System support controller begins operation. This is an informational checkpoint.	See the note on 3-33.
E010	Starting service processor self-tests	I/O board. (See notes on 3-1.)
E011	Service processor self-tests completed successfully	NA
E012	Begin to set up service processor helps	I/O board. (See notes on 3-1.)
E01F	Bad self-test; cannot continue	
E020	Configuring CMOS	I/O board. (See notes on 3-1.)

Table 3-4 (Page 2 of 3). Service Processor Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E021	Configuring NVRAM	I/O board. (See notes on 3-1.)
E025	Service Processor accessing VPD on memory card 1	I/O board. (See notes on 3-1.)
E026	Service Processing accessing VPD on memory card 2	I/O board. (See notes on 3-1.)
E030	Beginning to build I2C resources	1. Processor card. 2. I/O board. (See notes on 3-1.)
E031	Finished building I2C resources	1. Processor card. 2. I/O board. (See notes on 3-1.)
E032	JTAG self-test	
E040	Starting serial port tests	1. I/O board. (See notes on 3-1.) 2. Processor card.
E042	Configuring serial port 1	1. I/O board. (See notes on 3-1.) 2. Processor card.
E043	Configuring serial port 2	1. I/O board. (See notes on 3-1.) 2. Processor card.
E044	Preparing to set serial port line speed	1. I/O board. (See notes on 3-1.) 2. Processor card.
E045	Preparing to initialize serial port	1. I/O board. (See notes on 3-1.) 2. Processor card.
E05x	Reserved	Call for support
E060	Preparing to auto power-on (AC restored)	1. I/O board. (See notes on 3-1.) 2. Processor card.
E061	Preparing to auto power-on (Timer)	1. I/O board. (See notes on 3-1.) 2. Processor card.
E070	Configuring modem	1. Modem. 2. I/O board. (See notes on 3-1.) 3. Processor card.
E072	Preparing to call home	1. Modem. 2. I/O board. (See notes on 3-1.) 3. Processor card.
E075	Entering SP menus	1. I/O board. (See notes on 3-1.) 2. Processor card.
E076	Leaving SP menus; attempting to disconnect modems	1. I/O board. (See notes on 3-1.) 2. Processor card.
E0A0	Beginning Bring-Up Phase	1. Processor card. 2. I/O board. (See notes on 3-1.)
E0B0	Starting processor BIST	1. Processor card. 2. I/O board. (See notes on 3-1.)

Table 3-4 (Page 3 of 3). Service Processor Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E0C0	Starting X5 BIST	1. Processor card. 2. I/O board. (See notes on 3-1.)
E0D0	Creating scanlog (takes a while)	
E0E0	Pulling processor card out of reset	1. Processor card 1 2. I/O board. (See notes on 3-1.)
E0E1	Pull processor card out of reset: okay	1. Remove processor card in slot 2 (if installed) and see if the problem is resolved. If problem is resolved replace processor card. If not continue. 2. Exchange processor card in slot 1 with the processor card removed in step 1 (or replace processor card if only one processor card exists) and see if problem is resolved. If problem is resolved replace processor card. If not continue. 3. Go to Map 1540: Minimum Configuration, "Step 1540-24" on page 2-56.
OK	SP Ready Waiting for Power-On	None. Normal operation.
STBY	SP Ready. System was shutdown by the operating system and is still powered on.	This condition can be requested by a privileged system user with no faults. See service processor error log for possible operating system fault indications.

Firmware Checkpoints

Firmware uses progress codes (checkpoints) in the range of E1xx to EFFF. These checkpoints occur during system startup and maybe be useful in diagnosing certain problems. Service processor checkpoints are listed in "SP Checkpoints" on page 3-33.

If you replace FRUs and the problem is still not corrected, go to "MAP 1540: Minimum Configuration" on page 2-31 unless otherwise indicated in the tables.

If you replace FRUs and the problem is corrected, go to "MAP 410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*

Table 3-5 (Page 1 of 11). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E100	Reserved	See the note on 3-33.
E101	Video enabled, extended memory test	See the note on 3-33.
E102	Firmware restart	See the note on 3-33.
E103	Set memory refresh (composite img)	See the note on 3-33.
E104	Set memory refresh (recovery block)	See the note on 3-33.
E105	Transfer control to Operating System (normal boot).	See "Boot Problems/Concerns" on page 3-47.
E108	Run recovery block base memory (test 2K), set stack	See the note on 3-33.
E109	Copy CRC verification code to RAM	See the note on 3-33.
E10A	Turn on cache	See the note on 3-33.
E10B	Flush cache	See the note on 3-33.
E10C	Jump to CRC verification code in RAM	See the note on 3-33.
E10D	Compute composite image CRC	See the note on 3-33.
E10E	Jump back to ROM	See the note on 3-33.
E10F	Transfer control to Open Firmware	See the note on 3-33.
E110	Turn off cache, Check if composite image CRC is valid	See the note on 3-33.
E111	GOOD CRC - jump to composite image	See the note on 3-33.
E112	BAD CRC - initialize base memory, stack	See the note on 3-33.
E113	BAD CRC - copy uncompressed recovery block code to RAM	See the note on 3-33.
E114	BAD CRC - jump to code in RAM	See the note on 3-33.
E115	BAD CRC - turn on cache	See the note on 3-33.

Table 3-5 (Page 2 of 11). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E116	BAD CRC - copy recovery block data section to RAM	See the note on 3-33.
E117	BAD CRC - Invalidate and flush cache, set TOC	See the note on 3-33.
E118	BAD CRC - branch to high level recovery control routine.	See the note on 3-33.
E119	Initialize base memory, stack	See the note on 3-33.
E11A	Copy uncompressed recovery block code to RAM	See the note on 3-33.
E11B	Jump to code in RAM	See the note on 3-33.
E11C	Turn on cache	See the note on 3-33.
E11D	Copy recovery block data section to RAM	See the note on 3-33.
E11E	Invalidate and flush cache, set TOC	See the note on 3-33.
E11F	Branch to high level control routine.	See the note on 3-33.
E120	Initialize I/O and early memory block	See the note on 3-33.
E121	Initialize S.P.	See the note on 3-33.
E122	No memory detected (system lockup) Note: Disk drive light is on continuously.	Go to "MAP 1240: Memory Problem Resolution" on page 2-15.
E123	No memory module found in socket.	See the note on 3-33.
E124	Disable defective memory bank	See the note on 3-33.
E125	Clear PCI devices command reg, go forth	See the note on 3-33.
E126	Check valid image - start	See the note on 3-33.
E127	Check valid image - successful	See the note on 3-33.
E128	Disable interrupts, set int vectors for O.F.	See the note on 3-33.
E129	Validate target RAM address	See the note on 3-33.
E12A	Copy ROM to RAM, flush cache	See the note on 3-33.
E12B	Set MP operational parameters	See the note on 3-33.
E12C	Set MP CPU node characteristics	See the note on 3-33.
E12D	Park secondary processors in parking lot	See the note on 3-33.
E12E	Primary processor sync	See the note on 3-33.
E12F	Unexpected return from Open Firmware (system lockup)	See the note on 3-33.

Table 3-5 (Page 3 of 11). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E130	Build device tree	See the note on 3-33.
E131	Create ROOT node	See the note on 3-33.
E132	Create cpus node	See the note on 3-33.
E133	Create L2 Cache node	See the note on 3-33.
E134	Create memory node	See the note on 3-33.
E135	Create memory module node	See the note on 3-33.
E136	Test memory	See the note on 3-33.
E137	Create openprom node	See the note on 3-33.
E138	Create options node	See the note on 3-33.
E139	Create aliases node and system aliases	See the note on 3-33.
E13A	Create packages node	See the note on 3-33.
E140	PReP style load	See the note on 3-33.
E149	Create boot mgr node	See the note on 3-33.
E14C	Create terminal-emulator node	See the note on 3-33.
E14D	Load boot image	See "Boot Problems/Concerns" on page 3-47.
E14E	Create client interface node/directory	See the note on 3-33.
E14F	NVRAM validation, config variable token generation	See the note on 3-33.
E150	Create host (primary) PCI controller node	See the note on 3-33.
E151	Probing primary PCI bus	Go to Map 1540: Minimum Configuration, "Step 1540-22" on page 2-54. If a network adapter or I/O board is replaced, see 3-1.
E152	Probe for adapter FCODE, evaluate if present	Go to Map 1540: Minimum Configuration, "Step 1540-22" on page 2-54. If a network adapter or I/O board is replaced, see 3-1.
E153	End adapter FCODE, probe/evaluation	Go to Map 1540: Minimum Configuration, "Step 1540-22" on page 2-54. If a network adapter or I/O board is replaced, see 3-1.

<i>Table 3-5 (Page 4 of 11). Firmware Checkpoints.</i>		
Checkpoint	Description	Action/ Possible Failing FRU
E154	Create PCI bridge node	Go to Map 1540: Minimum Configuration, "Step 1540-22" on page 2-54. If a network adapter or I/O board is replaced, see 3-1.
E155	Probe PCI bridge secondary bus	Go to Map 1540: Minimum Configuration, "Step 1540-22" on page 2-54. If a network adapter or I/O board is replaced, see 3-1.
E156	Create PCI ethernet node	See the note on 3-33.
E15A	Create 64 bit host (primary) PCI controller node	See the note on 3-33.
E15B	Transferring control to Operating System (service mode boot)	See "Boot Problems/Concerns" on page 3-47.
E15C	Probe primary 64 bit PCI bus	See the note on 3-33.
E15D	Create host PCI controller node	See the note on 3-33.
E15E	Create MPIC node	See the note on 3-33.
E15F	Adapter VPD probe	See the note on 3-33.
E160	CPU node VPD creation	See the note on 3-33.
E161	Root node VPD creation	See the note on 3-33.
E162	SP node VPD creation	See the note on 3-33.
E164	Create PCI graphics node (P9)	See the note on 3-33.
E168	Create PCI graphics node (S3)	See the note on 3-33.
E16C	GTX100P Subsystem Open request.	See the note on 3-33.
E16D	GTX100P Planar not detected or failed diagnostics.	See the note on 3-33.
E16E	GTX100P Subsystem Open successful.	See the note on 3-33.
E16F	GTX100P Close Subsystem.	See the note on 3-33.
E170	Start of PCI Bus Probe	See the note on 3-33.
E171	Executing PCI-Delay function	See the note on 3-33.
E174	Establish host connection	Refer to "Boot Problems/Concerns" on page 3-47 for general considerations.

Table 3-5 (Page 5 of 11). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E175	BootP request	Refer to "Boot Problems/Concerns" on page 3-47 for general considerations. 1. Turn off then on, and retry the boot operation. 2. Verify the network connection (network could be down). 3. Have network administrator verify the server configuration for this client.
E176	TFTP file transfer	See the note on 3-33.
E177	Transfer failure due to TFTP error condition	See the note on 3-33.
E178	Create PCI token ring node	See the note on 3-33.
E180	Service Processor Command setup	See the note on 3-33.
E183	Service Processor Post	See the note on 3-33.
E190	Create ISA node	See the note on 3-33.
E193	Initialize Super I/O.	See the note on 3-33.
E196	Probe ISA bus.	See the note on 3-33.
E19B	Create service processor node.	See the note on 3-33.
E19C	Create tablet node.	See the note on 3-33.
E19D	Create nvram node.	See the note on 3-33.
E19E	Real time clock (RTC) creation and initialization.	Refer to error code 28030xxx in "Firmware/POST Error Codes" on page 3-2.
E19F	Create eeprom node.	See the note on 3-33.
E1AD	See description of checkpoint E1DE. See the note on 3-33.	
E1B0	Create lpt node.	I/O board (See notes on 3-1.) See the note on 3-33.
E1B1	Create serial node.	See the note on 3-33.
E1B2	Create audio node.	I/O board (See notes on 3-1.) See the note on 3-33.
E1B3	Create 8042 node.	I/O board (See notes on 3-1.) See the note on 3-33.
E1B6	Probe for (ISA) keyboard.	I/O board (See notes on 3-1.) See the note on 3-33.
E1BA	Enable L2 cache.	See the note on 3-33.

Table 3-5 (Page 6 of 11). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E1BB	Set cache parms for burst.	See the note on 3-33.
E1BC	Set cache parms for 512KB.	See the note on 3-33.
E1BD	Probe for (ISA) mouse.	I/O board (See notes on 3-1.) See the note on 3-33.
E1BE	Create op-panel node.	See the note on 3-33.
E1BF	Create pwr-mgmt node.	See the note on 3-33.
E1C0	Create ISA ethernet node.	See the note on 3-33.
E1C5	Create ISA interrupt controller (pic) node.	I/O board (See notes on 3-1.) See the note on 3-33.
E1C6	Create dma node.	See the note on 3-33.
E1D0	Create PCI SCSI node.	See the note on 3-33.
E1D3	Create (* wildcard *) SCSI block device node (SD).	See the note on 3-33.
E1D4	Create (* wildcard *) SCSI byte device node (ST).	See the note on 3-33.
E1DB	Create floppy controller (FDC) node.	I/O board (See notes on 3-1.) See the note on 3-33.

Table 3-5 (Page 7 of 11). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E1DC	Dynamic console selection.	<p>If a console is attached but nothing is displayed on it, follow the steps associated with "All display problems" in the Entry MAP tables.</p> <p>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 60 seconds, but there is no response to the keystroke:</p> <ol style="list-style-type: none"> 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 I/O board. (See notes on 3-1.) 2. If selecting the console with an ASCII terminal, suspect the ASCII terminal. Use the Problem Determination Procedures for the terminal. Replace the I/O board if these procedures do not reveal a problem. Note: Terminal settings should be set to: <ul style="list-style-type: none"> • 9600 Baud • No Parity • 8 Data bits • 1 Stop bit
E1DD	Early processor exception	I/O board (See notes on 3-1.) See the note on 3-33.
E1DE	Alternating pattern of E1DE and E1AD is used to indicate a Default Catch condition before the firmware "checkpoint" word is available.	1. I/O board (See notes on 3-1.) See the note on 3-33.
E1DF	Create diskette drive (disk) node	See the note on 3-33.
E1E0	Program flash	See the note on 3-33.
E1E1	Flash update complete	See the note on 3-33.
E1E2	Initialize System I/O	See the note on 3-33.
E1E3	PReP boot image initialization.	See the note on 3-33.
E1E4	Initialize Super I/O with default values.	See the note on 3-33.
E1E5	XCOFF boot image initialization.	See the note on 3-33.

<i>Table 3-5 (Page 8 of 11). Firmware Checkpoints.</i>		
Checkpoint	Description	Action/ Possible Failing FRU
E1E6	Set up early memory allocation heap.	See the note on 3-33.
E1E7	PE boot image initialization.	See the note on 3-33.
E1E8	Initialize primary diskette drive (polled mode).	See the note on 3-33.
E1E9	ELF boot image initialization.	See the note on 3-33.
E1EA	Firmware flash corrupted, load from diskette.	<p>Ensure that the diskette installed contains recovery image appropriate for this system unit.</p> <p>The System Management Services recovery procedure for the flash EEPROM should be executed. See "Firmware Update" on page 6-21.</p> <p>If the diskette is installed with the correct recovery image, then suspect:</p> <ol style="list-style-type: none"> 1. Diskette 2. Diskette drive 3. Diskette cable 4. I/O board (See notes on 3-1.) <p>See the note on 3-33.</p>
E1EB	Verify flash EPROM recovery image.	<p>Ensure that the diskette installed contains recovery image appropriate for this system unit.</p> <p>The System Management Services recovery procedure for the flash EEPROM should be executed. See "Firmware Update" on page 6-21.</p> <p>If the diskette is installed with the correct recovery image, then suspect:</p> <ol style="list-style-type: none"> 1. Diskette 2. Diskette drive 3. Diskette cable 4. I/O board (See notes on 3-1.) <p>See the note on 3-33.</p>
E1EC	Get recovery image entry point	See the note on 3-33.
E1ED	Invalidate instruction cache	See the note on 3-33.
E1EE	Jump to composite image	See the note on 3-33.
E1EF	Erase flash	See the note on 3-33.
E1F0	Start O.B.E.	See the note on 3-33.
E1F1	Begin self-test sequence on boot device(s)	See the note on 3-33.

Table 3-5 (Page 9 of 11). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E1F2	Power-On Password prompt.	Prompt should be visible on the system console. If a console is attached but nothing is displayed on it, go to the "Quick Entry MAP" on page 2-2 with the symptom "All display problems."
E1F3	Privileged-Access Password prompt.	Prompt should be visible on the system console. If a console is attached but nothing is displayed on it, go to the "Quick Entry MAP" on page 2-2 with the symptom "All display problems."
E1F5	Build boot device list.	See the note on 3-33.
E1F6	Determine boot device sequence.	See the note on 3-33.
E1F7	No boot image located.	See the note on 3-33.
E1FB	Scan SCSI bus for attached devices.	See the note on 3-33.
E1FD	Default Catch	The operator panel will alternate between the code E1FD and another Exxx code, where Exxx is the point at which the error occurred. If the Exxx is not listed in this table, go to "MAP 1540: Minimum Configuration" on page 2-31.
E201	Setup PHB BARC addresses.	Replace the I/O board (See notes on 3-1.) See the note on 3-33.
E202	Initialize PHB registers and PHB's PCI configuration registers.	Replace the I/O board (See notes on 3-1.) See the note on 3-33.
E203	Look for PCI to ISA bridge.	Replace the I/O board (See notes on 3-1.) See the note on 3-33.
E204	Setup ISA bridge. PCI config. registers and initialize	Replace the I/O board (See notes on 3-1.) See the note on 3-33.
E206	Check for 50MHz device on PCI Bus in Slots 1P or 2P.	1. Replace the I/O board (See notes on 3-1.) 2. I/O Adapters in PCI slots 1P or 2P. 3. See the note on 3-33.
E207	Setup Data gather mode and 64/32-bit mode on PCG.	Replace the I/O board (See notes on 3-1.) See the note on 3-33.
E208	Assign bus number on PCG.	Replace the I/O board (See notes on 3-1.) See the note on 3-33.
E209	Assign PCI I/O addresses on PCI.	Replace the I/O board (See notes on 3-1.) See the note on 3-33.

<i>Table 3-5 (Page 10 of 11). Firmware Checkpoints.</i>		
Checkpoint	Description	Action/ Possible Failing FRU
E20A	Assign PCI I/O addresses on PCG	Replace the I/O board. (See notes on 3-1.) See the note on 3-33.
E20B	Check MCERs stuck at fault.	<ol style="list-style-type: none"> 1. Replace the system board. See the note on 3-33. 2. If the problem persists, go to "MAP 1540: Minimum Configuration" on page 2-31.
E20C	Testing L2 cache.	Replace the processor card (See notes on 3-1.) See the note on 3-33.
E211	IPL ROS CRC checking.	Replace the I/O board (See notes on 3-1.) See the note on 3-33.
E212	Processor POST.	Replace the processor card (See notes on 3-1.) See the note on 3-33.
E213	Initial memory configuration.	Go to "MAP 1240: Memory Problem Resolution" on page 2-15.
E214, E218	Memory test.	Go to "MAP 1240: Memory Problem Resolution" on page 2-15.
E216	Copy ROS into RAM. Setup Translation and C environment.	Replace the memory card (See notes on 3-1.) See the note on 3-33.
E220	Final memory configuration.	Go to "MAP 1240: Memory Problem Resolution" on page 2-15.
E297	Start firmware softload path execution.	See the note on 3-33.
E298	Start firmware recovery path execution.	See the note on 3-33.
E299	Start C code execution.	See the note on 3-33.
E3xx	Memory test	See "MAP 1240: Memory Problem Resolution" on page 2-15.
E440	Validate NVRAM, initialize partitions as needed.	<ol style="list-style-type: none"> 1. Verify that the system and service processor firmware levels are at the current release levels, update as necessary. 2. Replace the memory card (See notes on 3-1.) See the note on 3-33.
E441	Generate /options node NVRAM configuration variable properties.	<ol style="list-style-type: none"> 1. Verify that the system and service processor firmware levels are at the current release levels, update as necessary. 2. Replace the memory card (See notes on 3-1.) See the note on 3-33.

Table 3-5 (Page 11 of 11). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E442	Validate NVRAM partitions.	<ol style="list-style-type: none"><li data-bbox="769 657 1127 762">1. Verify that the system and service processor firmware levels are at the current release levels, update as necessary.<li data-bbox="769 762 1127 846">2. Replace the memory card (See notes on 3-1.) See the note on 3-33.
E443	Generate NVRAM configuration variable dictionary words.	Suspect a system firmware problem if this problem persists. Verify that the system firmware is at the current release level, update as necessary. See the note on 3-33.

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 progress. 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 will still attempt 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 *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.
 - If a SRN, not an 8-digit error code, is reported, go to the *IBM RS/6000 Diagnostic 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 the disk drive cage backplane.
 - Disconnect the disk drive(s) in the disk drive cage from the backplane.
 - 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 disk drives in the disk drive cage be aware it could be either the disk drive or the backplane). Go to "MAP 0410: Repair Checkout" in the *IBM RS/6000 Diagnostic 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 (I/O board can also cause the device or adapter to fail). Go to "MAP 0410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

5. Either the CD-ROM drive, SCSI adapter, the graphics adapter, or the I/O board is most likely defective. A tty terminal attached to the serial port also can be used to 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 I/O board.
 - Replace SCSI adapter.
 - Replace I/O 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 2-31.
 - Go to "MAP 0410: Repair Checkout" in the *IBM RS/6000 Diagnostic Information for Multiple Bus Systems*.

Chapter 4. Location Codes

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).

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 will be FF.

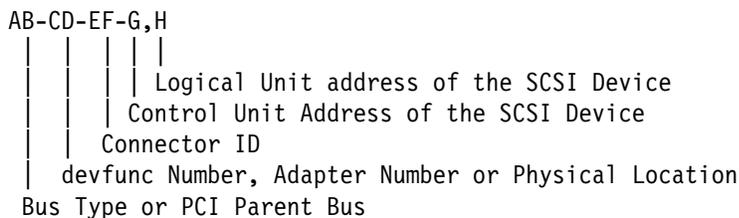
EF is the connector ID. It is used to identify the adapter's connector that a resource is attached to.

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:



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.

Examples of physical location codes displayed by AIX are:

Processor Card in slot 1 of planar 1

P1-C1

Memory module in system planar slot 2

P1-M2

Memory module 12 in card in slot 2 of system planar

U1-P1-M2.12

Examples of AIX location codes displayed are:

Integrated PCI adapter

10-80	Ethernet
10-60	Integrated SCSI Port 1
10-88	Integrated SCSI Port 2

Pluggable PCI adapters

20-58 to 20-5F	Any PCI card in slot 1
20-60 to 20-67	Any PCI card in slot 2
10-68 to 10-6F	Any PCI card in slot 3
10-70 to 10-77	Any PCI card in slot 4
10-78 to 10-7F	Any PCI card in slot 5

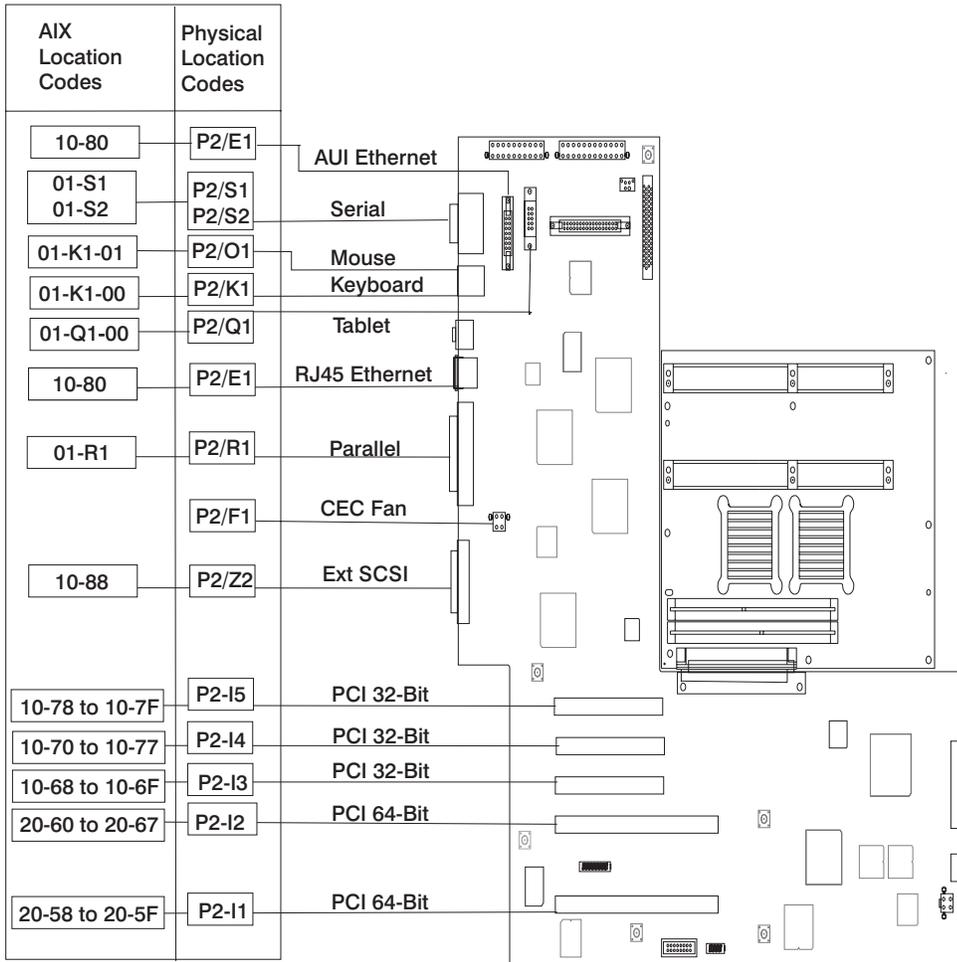
Integrated ISA adapters

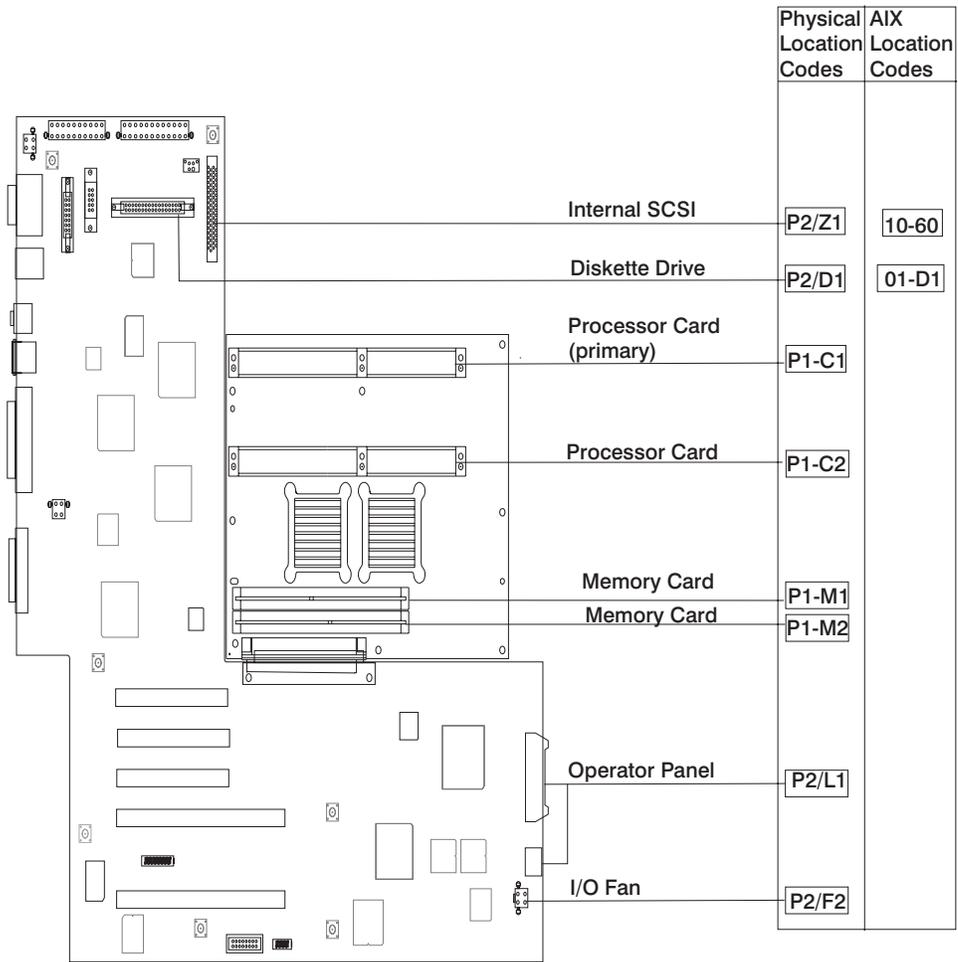
01-D1	Diskette adapter
01-R1	Parallel port adapter
01-S1	Serial port 1 adapter
01-S2	Serial port 2 adapter
01-S3	Serial port 3 adapter
01-K1	Keyboard adapter

Device attached to SCSI controller

10-60-00-4,0	Device attached to Integrated SCSI Port 1
--------------	---

AIX and Physical Location Code Reference Table





FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
Central Electronics Complex (CEC)				
System board	00-00	P1		
Processor card 1	00-00	P1-C1	Processor connectors J8	CPU ID 0x00 and 0x01 (if 2-way card)
Processor card 2	00-02	P1-C2	Processor connector J6	CPU ID 0x04 and 0x05 (if 2-way card)
Memory card 1	00-00	P1-M1	Memory card connector J3	
Memory Card 1 modules 1 thru 16	00-00	P1-M1.1 through P1-M1.16	Memory card sockets J1,J2,J3,J4, J5,J6,J7,J8 J9,J10,J11,J12, J13,J14,J15,J16	Extents: 8L,8H,10L,10H, 12L,12H,14L,14H 9L,9H,11L,11H, 13L,13H,15L,15H
Memory card 2	00-00	P1-M2	Memory card connector J2	
Memory card 2 modules 1 thru 16	00-00	P1-M2.1 through P1-M2.16	Memory card sockets J1,J2,J3,J4, J5,J6,J7,J8 J9,J10,J11,J12, J13,J14,J15,J16	Extents: 8L,8H,10L,10H, 12L,12H,14L,14H 9L,9H,11L,11H, 13L,13H,15L,15H
I/O board	00-00	P2		
Integrated Devices				
Diskette Drive	01-D1-00-00	P2-D1	I/O board Connector J13	Base Address 0x0310
Keyboard	01-K1-00-00	P2-K1	I/O board connector J24	Base Address 0x0060
Mouse	01-K1-01-00	P2-O1	I/O board connector J24	0x0060
Diskette Port	01-D1	P2/D1	I/O board connector J17	0x03f0
Keyboard Port	01-K1-00	P2/K1	I/O board connector J24	0x0060
Mouse Port	01-K1-01	P2/O1	I/O board connector J24	0x0060
Tablet Port	01-Q1-01-00	P2-Q1	I/O board connector J18	0x0060

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
Serial Port 1	01-S1	P2/S1	I/O board connector J23	0x0318
Serial Port 2	01-S2	P2/S2	I/O board connector J23	0x0218
Parallel Port	01-R1	P2/R1	I/O board connector J27	0x0378
AUI Ethernet Port	10-80	P2/E1	I/O board connector J20	Host Bridge ID00, Device 06
RJ45 Ethernet Port	10-80	P2/E1	I/O board connector J25	Host Bridge ID00, Device 06
Internal SCSI Port	10-60	P2/Z1	I/O board connector J7	Host Bridge ID00, Device 02
External SCSI Port	10-88	P2/Z2	I/O board connector J28	Host Bridge ID00, Device 07
Pluggable Adapters				
Card in PCI Slot 1P	20-58 to 20-5F	P2-I1	I/O board connector J9	Host Bridge ID01, Device 01
Card in PCI Slot 2P	20-60 to 20-67	P2-I2	I/O board connector J8	Host Bridge ID01, Device 02
Card in PCI Slot 3P	10-68 to 10-6F	P2-I3	I/O board connector J14	Host Bridge ID00, Device 03
Card in PCI Slot 4P	10-70 to 10-77	P2-I4	I/O board connector J13	Host Bridge ID00, Device 04
Card in PCI Slot 5P	10-78 to 10-7F	P2-I5	I/O board connector J12	Host Bridge ID00, Device 05
SCSI Devices				
Base CD-ROM (Bay D1)	10-60-00-1, 0	P2-Z1-A1		Primary SCSI Bus ID 1 (refer to the note at the end of this table)
Media Device in Bay D2	10-60-00-0, 0	P2-Z1-A0		Primary SCSI Bus ID 0 (refer to the note at the end of this table)
DASD in Bay D4	10-60-00-9, 0	P2-Z1-A9		Primary SCSI Bus ID 9
DASD in Bay D5	10-60-00-8, 0	P2-Z1-A8		Secondary SCSI Bus ID 8

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
Fans				
I/O fan		F2	Fan connector J3 at system board	
CEC fan		F1	Fan connector J21 at system board	
I/O fan connector		P2/F2	Fan connector J3 at system board	
CEC fan connector		P2/F1	Fan connector J21 at system board	
Operator Panel				
Operator panel		L1	I/O board connector J1	
Operator panel Connector		P2/L1	I/O board connector J1	
Power Supply				
Power supply		V1		I2C Ad 92, Ch2; RTAS=9002-0
Battery				
Battery		V2	I/O board connector J11	
Note: The SCSI bus ID's are the recommended values. Features installed at the manufacturing site will correspond to these IDs. Field installations may not comply with these recommendations.				

Chapter 5. Loading the System Diagnostics

The system diagnostics can be booted either from the default boot list or from the service mode boot list. (The service mode boot list can be modified using the system diagnostics "Display or Change Bootlist" service aid. The service mode boot list cannot be modified under the System Management Services.)

To load **Standalone Diagnostics** from the default boot list, perform the following procedure:

1. Verify with the system administrator and users that all programs may be stopped, then do so.
2. Turn off the system.
3. Wait 30 seconds, and turn on the system.
4. Immediately insert the diagnostic CD-ROM into the CD-ROM drive.
5. When or after the keyboard indicator appears during startup, press the F5 key on a directly-attached keyboard (or the number 5 key on an ASCII terminal).
6. Enter any requested passwords.

Online Diagnostics can be loaded by booting from the service mode boot list by pressing the F6 key (on a directly-attached keyboard) or the number 6 key on an ASCII terminal.

The procedure for booting from the devices listed in the service mode boot list (**Online Diagnostics**) is the following:

1. Verify with the system administrator and users that all programs may be stopped, then do so.
2. Turn off the system.
3. Wait 30 seconds, and turn on the system.
4. When or after the keyboard indicator appears during startup, press the F6 key on a directly-attached keyboard (or the number 6 key on an ASCII terminal).
5. Enter any requested passwords.

After any requested passwords have been entered, the system attempts to boot from the first device of each type found on the list. If no bootable image is found on the first device of each type on the list, the system does not search through the other devices of that type for a bootable image; instead, it polls the first device of the next type.

If all types of devices in the boot list have been polled without finding a bootable image, the system restarts, this gives the user the opportunity to start the System Management Services (by pressing the F1 key on a directly attached keyboard or the number 1 on an ASCII terminal) before the system attempts to boot again.

Default Boot List and Service Mode Boot List

The default boot list is:

1. Diskette drive
2. CD-ROM drive
3. Tapedrive
4. Disk drive
5. Network device
 - Token-Ring
 - Ethernet

Pressing the F5 key on a directly-attached keyboard (or the number 5 key on an ASCII terminal) causes the system to load **Standalone Diagnostics** given that a Diagnostic CD is present in the CD-ROM drive.

Pressing the F6 key on a directly-attached keyboard (or number 6 key on an ASCII terminal) loads **Online Diagnostics** from the service mode boot list, no Diagnostic CD should be in the CD-ROM drive since **Online Diagnostics** is typically run from a hard disk, which is in the service mode boot list defined using the system diagnostics "Display or Change Bootlist" service aid. Like the default boot list, the service mode boot list can contain five entries. The F6 or 6 keys work like the F5 or 5 keys, with the following exceptions:

- The system searches for a boot record according to the service mode boot list.
- If the service mode boot list is discovered by a cyclical redundancy check to be corrupted, the system rebuilds the service mode boot list according to the default boot list. (The default boot list contains five entries, and for each matching device type found in the system unit, the system makes an entry in the service mode boot list.)
- If no service mode boot list is present, the system uses the default boot list.

Chapter 6. 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 6-23.

Graphical System Management Services

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

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

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

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

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

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

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

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

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

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

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



You may also press F8 here to enter the **OK>** prompt.

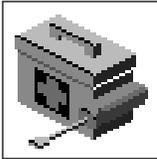
The System Management Services screen contains the following choices.



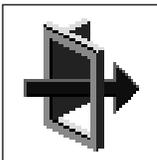
Config: Enables you to view your system setup.



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



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



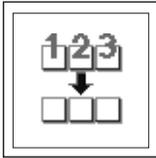
Selecting this icon makes it possible for you to view information about the setup of your system unit. A list similar to the following appears when you select the **Config** icon.

```
<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



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



The following describes the choices available on this screen.

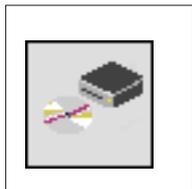


Select Software: The Select Software option, if supported by the operating system, allows you to choose which operating system to use. This option is supported by AIX. Not all operating systems support this option.

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:

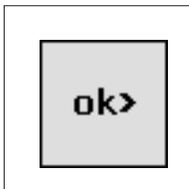
Note:

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:

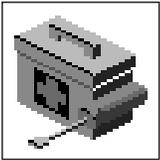
To change the custom boot list back to the default values, click on **Default**. If you change your startup sequence, you must be extremely careful when performing *write* operations (for example, copying, saving, or formatting). You can accidentally overwrite data or programs if you select the wrong 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 will appear automatically at startup.

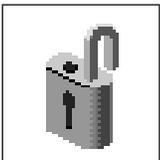
Utilities



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



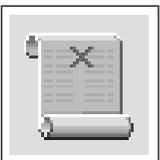
The following describes the choices available on this screen.



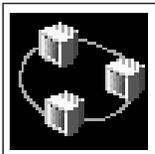
Password: Enables you to set password protection for turning on the system unit and for using system administration tools.



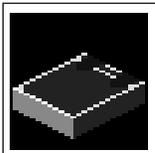
Hard Disk Spin Up Delay: Enables you to change the spin up delay for SCSI hard disk drives attached to your system.



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



RIPL (Remote Initial Program Load): Enables 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.

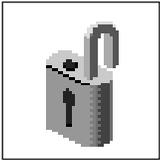


Update: Allows you to update the system firmware program.

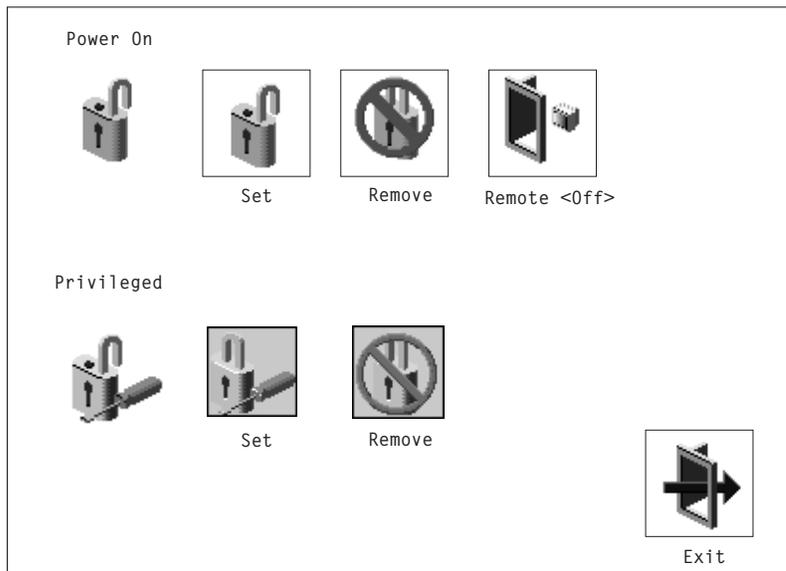


Console: If you have more than one keyboard and display attached to your system unit, or if you have an ASCII terminal attached to your system unit in addition to a keyboard and display, this tool allows you to define which one is active.

Password



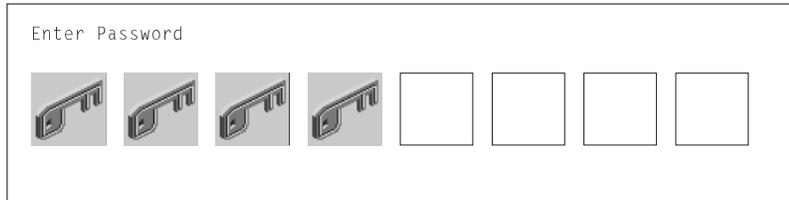
When you select this icon, the following screen is displayed.



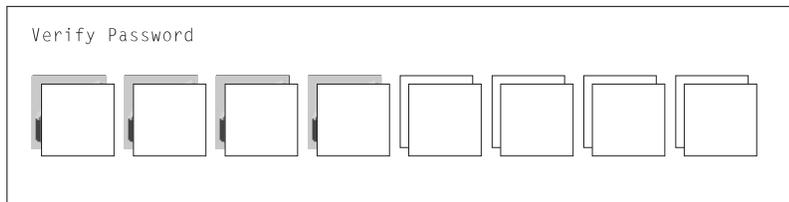
Power-On Password

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 Set 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.

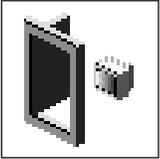
After you have entered and verified the password, the power-on password status icon flashes and changes to the locked position to indicate that the power-on password is installed.

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



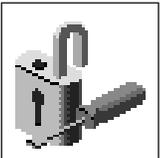
Note: The system unit power cable **must** be disconnected before removing the battery.

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. When the remote mode is set, the icon changes to **Remote <On>**.

Note: In order to use the remote mode feature for booting unattended devices, you must enable the unattended start mode. See the “SYSTEM POWER CONTROL MENU” on page A-12 for instructions on enabling the unattended start mode, 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

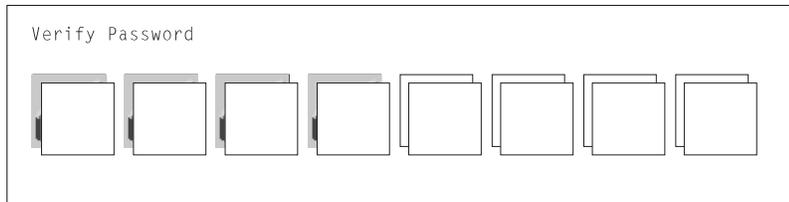
The privileged-access password protects against the unauthorized starting of the system programs. Select the Set icon to set and verify the privileged-access password.

When you select the Set 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.

Enter Password

				<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
---	---	---	---	----------------------	----------------------	----------------------	----------------------

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 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.

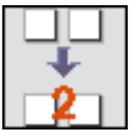
Attention: If no user-defined boot-list exists, and the privileged-access password has been enabled, you are asked for the privileged-access password at startup every time you boot up your system.

Hard Disk Spin Up Delay

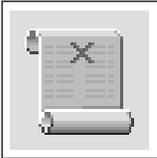


This selection allows you to change the spin up delay for SCSI hard disk drives attached to your system. Spin up delay values can be entered manually or a default setting can be used. All values are measured in seconds. The default is two seconds. After you have entered the new Spin up delay values,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

Harddisk Spin Up Delay
Current Spin Up Value - 112233
Enter New Value - ___111___ (secs)

 Save  Default  Exit

Error Log



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

System Error Log

1.	96/01/29	00:51:32	12345678	00000000
2.	No entry			



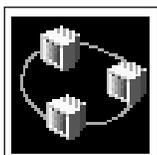
Clear



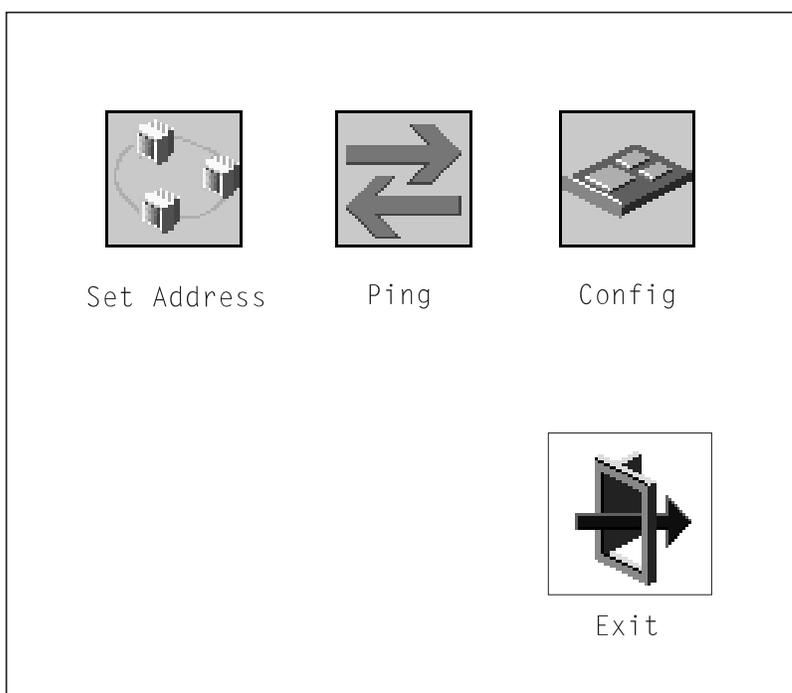
Exit

Selecting the Clear icon erases the entries in this log.

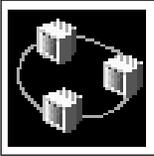
RIPL



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



Set Address



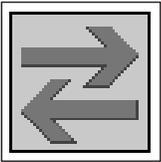
The Set Address icon allows you to define addresses from which your system unit can receive RIPL code.

Remote IPL Setup	
Client Addr	000.000.000.000
Server Addr	000.000.000.000
Gateway Addr	000.000.000.000
Subnet Mask	000.000.000.000

	
Save	Exit

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.

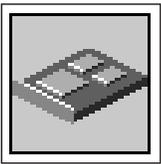
Ping



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

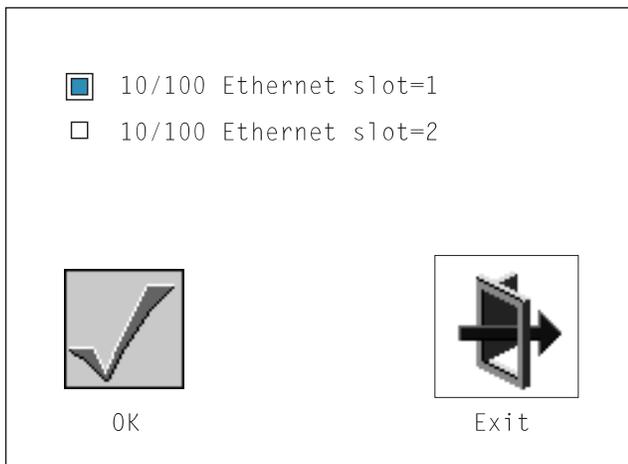
After choosing the Ping option, you are asked to indicate which communications adapter (Token Ring or Ethernet) should be used to send the test transmission.

Config



The Config icon allows you to configure network adapters which require setup.

1. Selecting the Config icon causes a list of the adapters requiring configuration to appear.
 - a. Use the arrow keys or mouse to highlight an adapter to configure.
 - b. Press the spacebar to select the adapter.
 - c. Highlight the OK icon and press the Enter key.

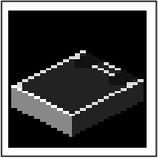


2. The next screen allows you to select the type of adapter you have just chosen (or allow the system to select the type automatically).
 - a. Use the arrow keys or mouse to highlight an adapter to configure.
 - b. Press the spacebar to select the adapter.
 - c. Highlight the OK icon and press the Enter 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).

- a. Use the arrow keys or mouse to highlight an adapter to configure.
- b. Press the spacebar to select the adapter.
- c. 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 a SCSI controllers ID, highlight the entry by moving the arrow keys, then use the space bar to scroll through available IDs. After you have entered the new address, use the arrow keys or mouse to highlight the Save icon and press the Enter key.

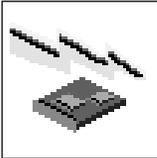
At any time in this process, you can select the Default icon to change the SCSI IDs to the default value of 7.

Change SCSI ID

Type	Slot	ID	Max ID
Fast	5	7	7
Fast/Wide	7	7	15

		
Save	Default	Exit

Firmware Update



This selection allows you to update the system or service processor 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 authorized reseller or marketing representative.

Firmware Recovery

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

To perform a firmware recovery, do the following:

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

Text-Based System Management Services

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

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

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

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

To start the text-based System Management Services instead of the Open Firmware command line, press the number **1** key 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.

```
System Management Services

1  Display Configuration
2  Multiboot
3  Utilities
4  Select Language

                                [X=Exit]

====>
```

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, POWER3
L2-Cache, 1M/4M
Memory
  Memory card slot=1, module slot=1 size=32MB
  Memory card slot=1, module slot=2 size=32MB
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|
```

MultiBoot Menu

```
Multiboot Menu

1. Select Software
2. Software Default
3. Select Install Device
4. Select Boot Devices
5. OK Prompt
6. Multiboot Startup

                                     |X=Exit|

===>
```

Select Software: If supported by the operating system, 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.

```
Select Boot Devices

1. Display Current Settings
2. Restore Default Settings
3. Configure 1st Boot Device
4. Configure 2nd Boot Device
5. Configure 3rd Boot Device
6. Configure 4th Boot Device
7. Configure 5th Boot Device

                                     |X=Exit|

====>
```

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

```
Current Boot Sequence

1. Diskette
2. Ethernet (Integrated)
3. SCSI CD-ROM      id=3   (slot=1)
4. SCSI 500MB Hard Disk id=6   (slot=1)
5. SCSI 500MB Hard Disk id=5   (slot=5)

                                     |X=Exit|

====>
```

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

- The primary diskette drive
- CD-ROM drive
- Tape id=5 (slot=1)
- Hard disk drive id=6 (Slot=1)
- Network device.

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

```
Configure Nth Boot Device

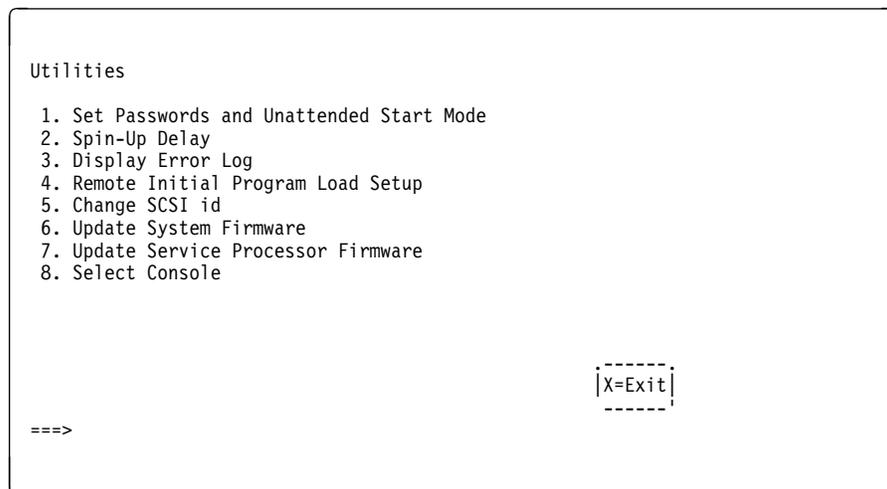
Device Number      Current Position      Device Name
-----
1                  1                    Diskette
2                  2                    Ethernet
3                  3                    SCSI CD-ROM
4                  4                    SCSI 4.5GB Hard Disk
5                  -

|P=prev-page| |N=next-page| |X=Exit|

====>
```

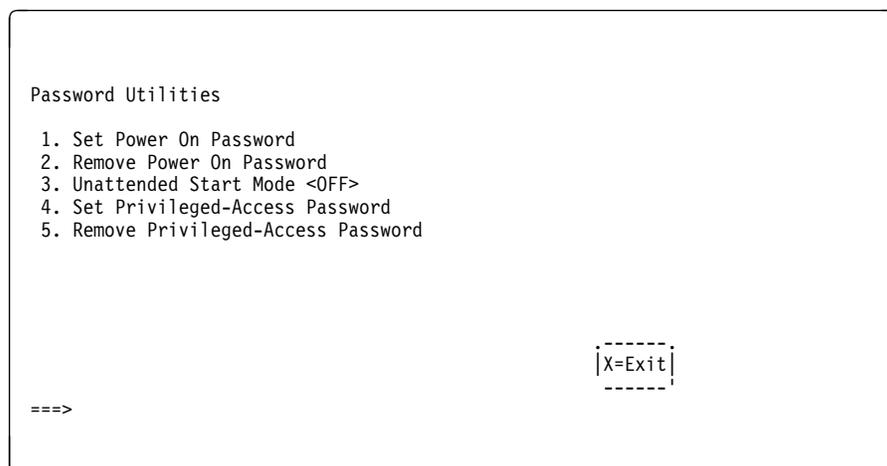
Utilities

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



Set Password and Unattended Start Mode

Entering this selection permits access to the following options.



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

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

Note: 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.

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

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.

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

Hard Disk Spin-Up Delay

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 system unit's error log.

```

      Error Log
-----
Date      Time      ErrorCode  Location
Entry 1. 01/04/96 12:13:22  25A80011  00-00
Entry 2. no error logged

|C=Clear Error Log|      |X=Exit|
-----
```

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.

```
Network Parameters
1. IP Parameters
2. Adapter Parameters
3. Ping

                                     |X=Exit|
                                     -----

===>
```

Selecting the IP Parameters option displays the following screen.

```
IP Parameters
1. Client IP Address [000.000.000.000]
2. Server IP Address [000.000.000.000]
3. Gateway IP Address [000.000.000.000]
4. Subnet Mask [000.000.000.000]

                                     |X=Exit|

====>
```

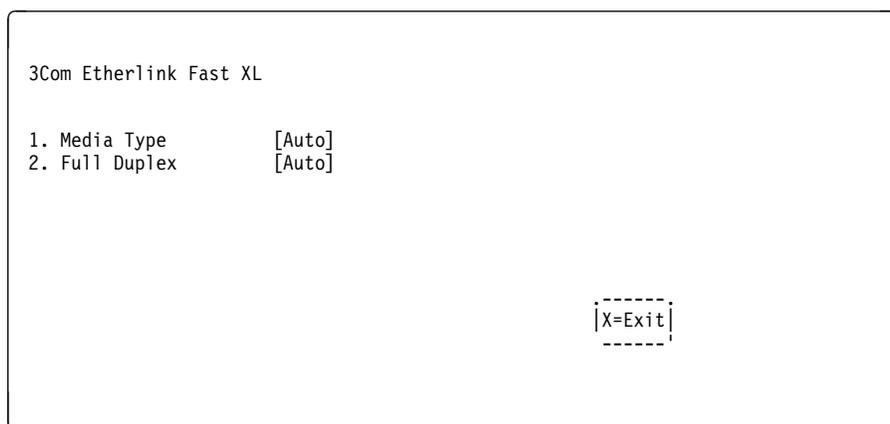
Selecting the Adapter Parameters option allows you to view an adapter's hardware address, as well as configure network adapters that require setup.

```
Adapter Parameters

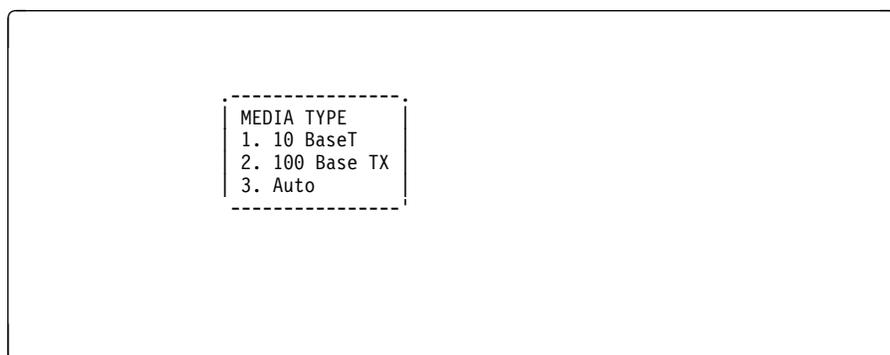
Device          HW Address
1. 3Com,3C905   80005AFC67BD
2. token-ring   800032E54A12

                                     |X=Exit|
```

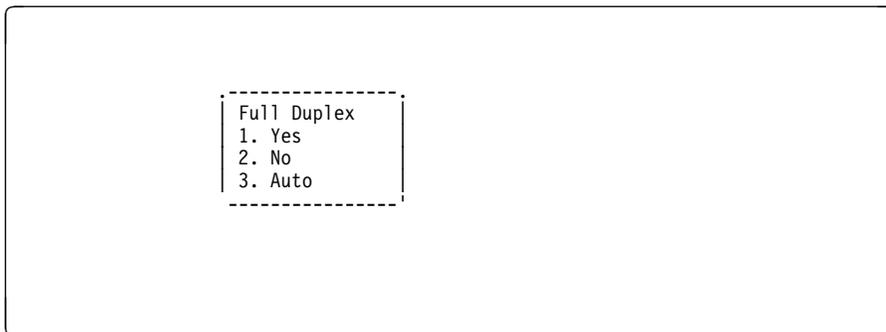
Selecting an adapter on this screen displays configuration menus for that adapter:



Selecting the Media Type option allows you to 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.

```
Ping
1. Client IP Address [129.132.4.20]
2. Server IP Address [129.132.4.10]
3. Gateway IP Address [129.132.4.30]
4. Subnet Mask [255.255.255.0]

|E=Execute|           |X=Exit|

===>
```

Change SCSI ID

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

Update System or Service Processor Firmware

These options allow you to update your system or service processor 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.

This selection will update your System Firmware. Do you want to continue? Press Y(Yes) N(No).

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 number **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.

```
SELECT LANGUAGE
1. English
2. Francais
3. Deutsch
4. Italiano
5. Espanol
6. Svenska

====>                                |x=Exit|
```

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

Chapter 7. 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. If possible, 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 communications lines.

CAUTION:

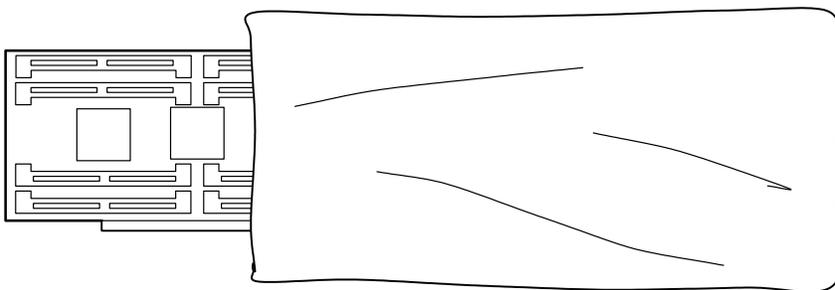
This product is equipped with a 3-wire power cable and plug for the user's safety. Use this power cable in conjunction with a properly grounded electrical outlet to avoid electrical shock.

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.



Procedure List

Which removal and replacement procedure are you going to perform?

- Covers: Go to “Covers” on page 7-5.
- Processor and Memory Card Cover: Go to “Removal of Processor and Memory Card Cover” on page 7-10.
- Memory Cards: Go to “Memory Cards” on page 7-11.
- Memory Modules: Go to “Memory Modules” on page 7-14.
- Processor Card: Go to “Processor Card” on page 7-17.
- Adapters: Go to “Adapters” on page 7-20.
- Internal Drives: Go to “Internal Drives” on page 7-22.
- Disk Drives: Go to “Disk Drives” on page 7-23.
- Configuration or Deconfiguration of Media Drives: Go to “Configuration or Deconfiguration of Media Drives” on page 7-26.
- Battery: Go to “Battery” on page 7-27.
- System Board: Go to “System Board” on page 7-30.
- I/O Board: Go to “I/O Board” on page 7-33.
- Power Supply: Go to “Power Supply” on page 7-35.
- Operator Panel: Go to “Operator Panel” on page 7-37.
- CEC Fan: Go to “CEC Fan” on page 7-38.
- I/O Fan: Go to “I/O Fan” on page 7-39.
- Disk Drive Cage: Go to “Disk Drive Cage” on page 7-40.
- CD-ROM, Tape Drive, Diskette Drive: Go to “CD-ROM Drive, Tape Drive, Diskette Drive” on page 7-42.

Stopping the System Unit

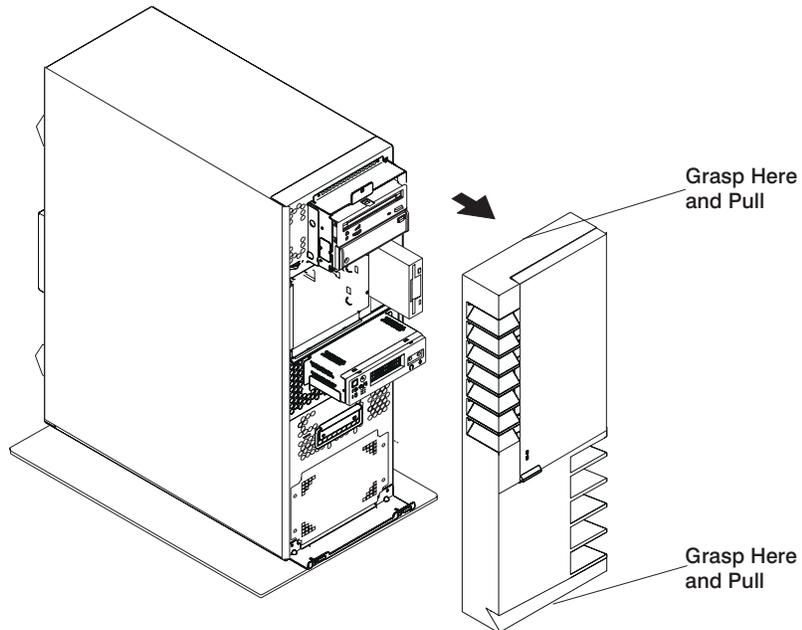
Attention: When using the shutdown procedure for your system, follow the correct shutdown procedure before you stop the system unit. Failure to do so may result in the loss of data.

1. At a command line, enter **shutdown -F** to stop the operating system.
2. After you shut down the operating system, set the power switches of any attached devices to Off.
3. The system unit is powered down by the shut down procedure.

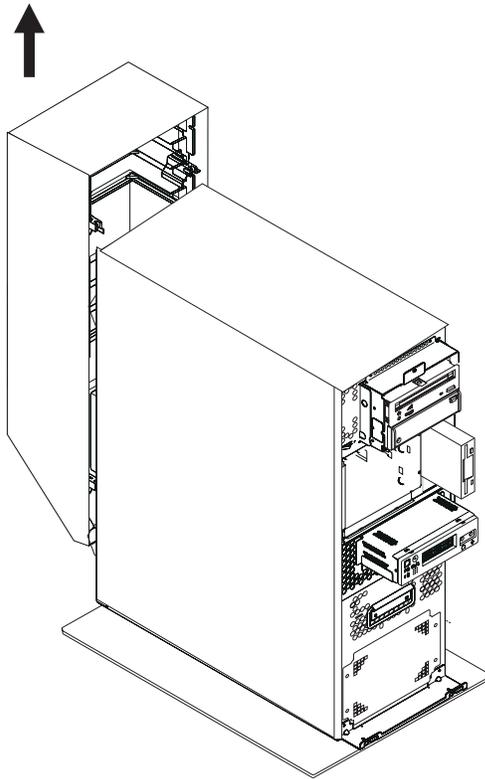
Covers

Removal of Covers

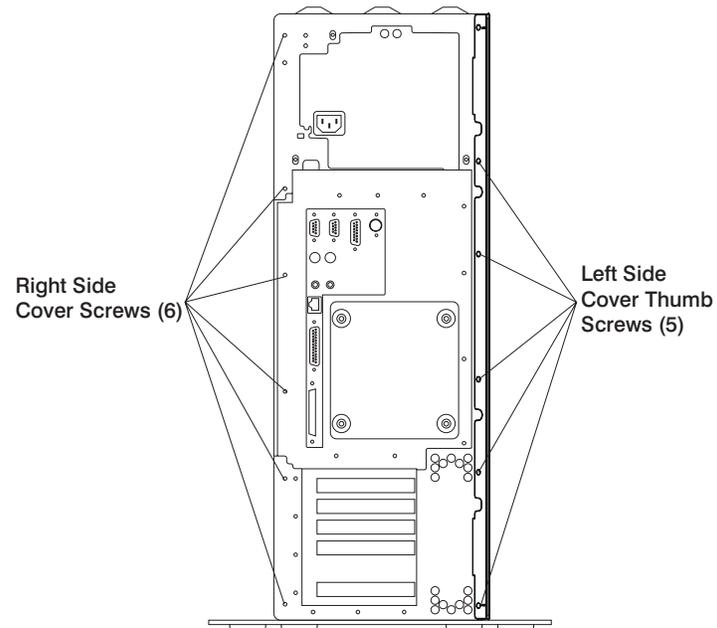
1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. To remove the front cover, grasp the front cover at the top and bottom as shown. Pull the cover out at the bottom first to ease removal.



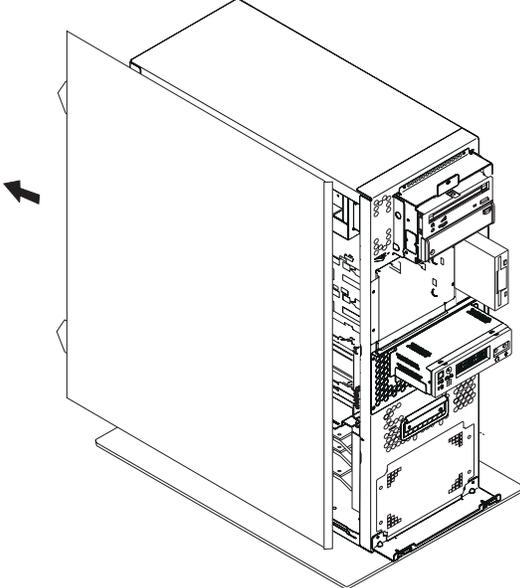
3. To remove the rear cover, lift the cover up and away from the system.



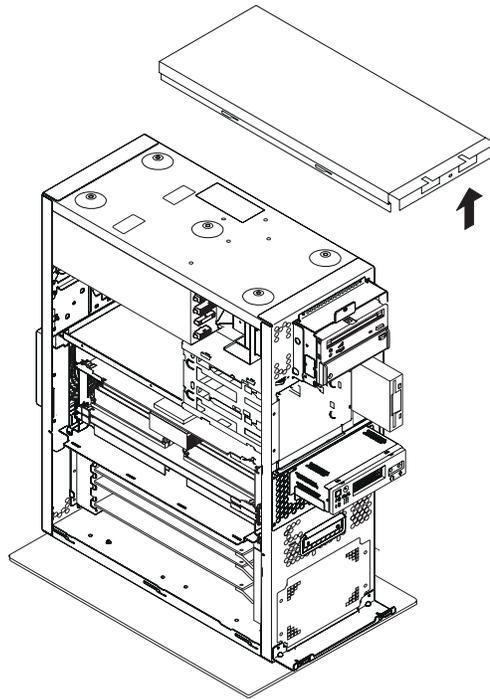
4. To remove the side covers,
 - a. Remove the screws that hold the side covers to the rear frame.



b. Slide the covers to the rear and remove.



5. To remove the top cover, remove the screw at the front and the two screws at the rear and lift the cover off. (The side covers must have been removed previously).



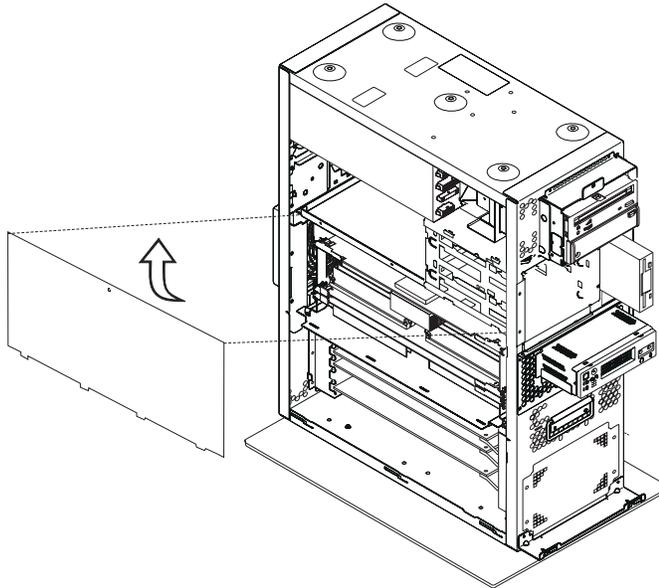
Replacement of Covers

1. To replace the top cover, place the cover on top of the system and secure with the screws removed earlier.
2. To replace the side covers:
 - a. Insert the tabs on the side covers into the slots on the enclosure.
 - b. Slide the covers toward the front of the enclosure until it latches into place.
 - c. Secure the rear of the covers with the screws removed earlier.
3. To replace the front cover, align the tabs on the front cover with the slots on the system unit enclosure. Insert the front cover until it is secure.
4. To replace the rear cover, align the tabs on the side covers with the slots on the rear cover and slide the cover down until it latches into place.

Processor and Memory Card Cover

Removal of Processor and Memory Card Cover

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the front, rear, and left side covers as described in “Removal of Covers” on page 7-5.
4. Remove the thumb screw securing the processor and memory card cover and remove the cover.



Replacement of Processor and Memory Card Cover

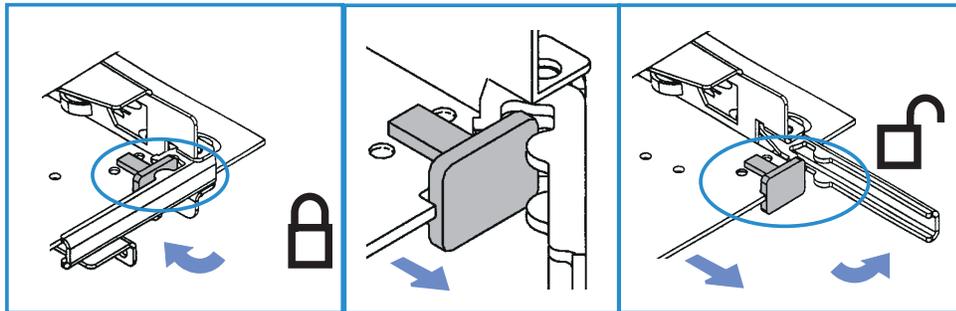
To replace the processor and memory card cover, perform the removal steps in the reverse order.

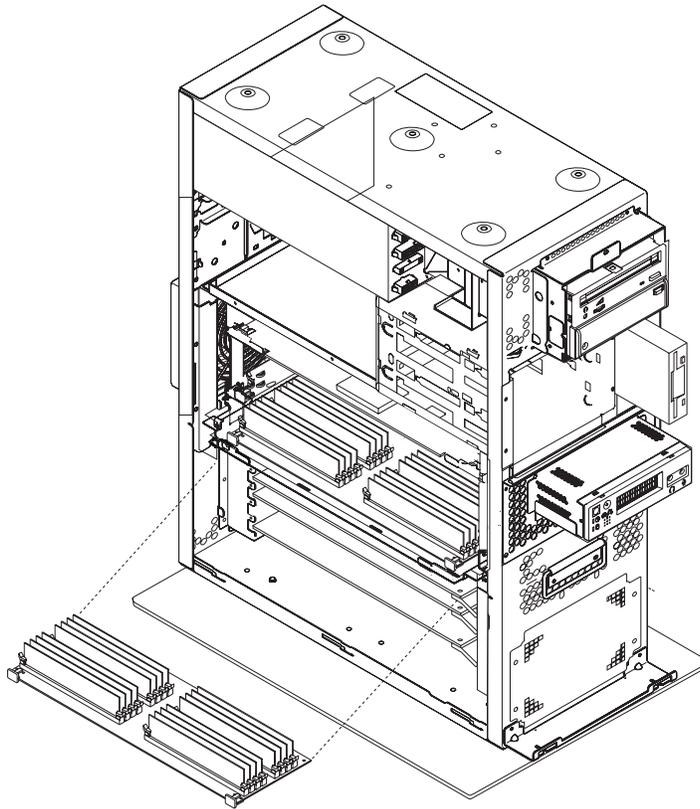
Memory Cards

Removal of Memory Cards

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the front, rear, and left side covers as described in “Removal of Covers” on page 7-5.
4. Remove the processor and memory card cover as described in “Removal of Processor and Memory Card Cover” on page 7-10.
5. Remove the memory card shield from in between the two memory cards.
6. The card is secured in place with latches at each end of its connection to the system board. Open the card latches and remove the card.

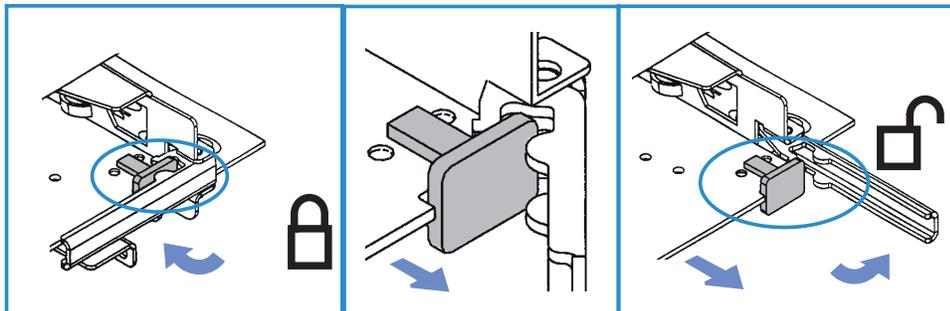
Attention: To prevent damage to the card and to the card connectors, open and close the latches at the same time.





Replacement of Memory Cards

1. With one hand, touch any metal surface of the chassis to minimize static electrical charges, and then pick up the memory card.
2. Open the retainer latches.



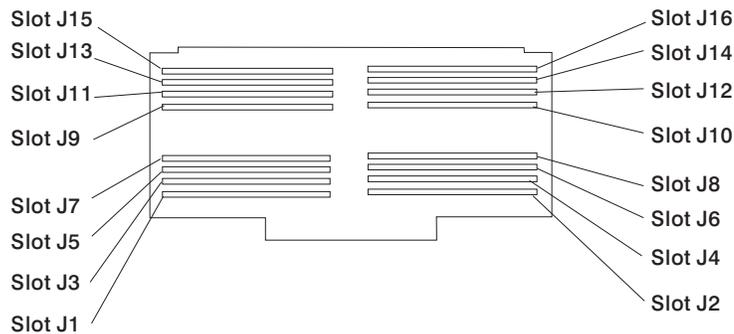
3. If only one memory card is installed, it should be installed in the primary slot (J2).
4. Place the memory card into the card guide rails.

5. Make sure that the black tabs on the new card are captured by the latches.
6. Align the card with the connector.
7. Firmly insert the card into the connector.
8. Close the retainer latches to secure the card into the connector.
Attention: To prevent damage to the card and to the card connectors, open and close the retainer latches at the same time.
9. Install the memory card shield between the two memory cards.
10. Replace the processor and memory card cover “Replacement of Processor and Memory Card Cover” on page 7-10.
11. Replace the system unit covers as described in “Replacement of Covers” on page 7-9.

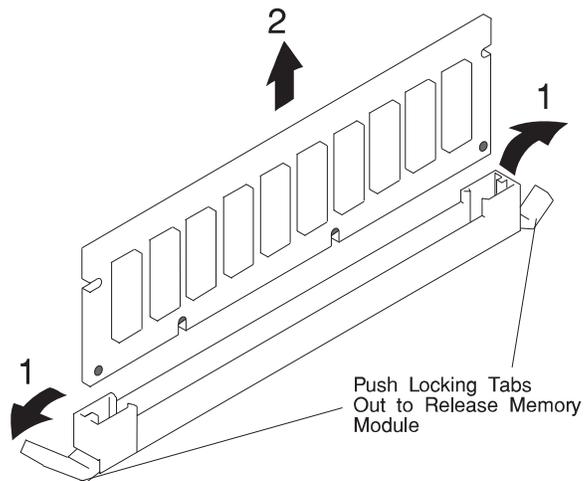
Memory Modules

Removal of Memory Modules

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the front, rear and left side covers as described in “Removal of Covers” on page 7-5.
4. If you have not already done so, remove the processor and memory card cover as described in “Removal of Processor and Memory Card Cover” on page 7-10.
5. If you have not already done so, remove the memory card as described in “Removal of Memory Cards” on page 7-11.
6. Locate the memory module connectors and determine which module you want to remove.

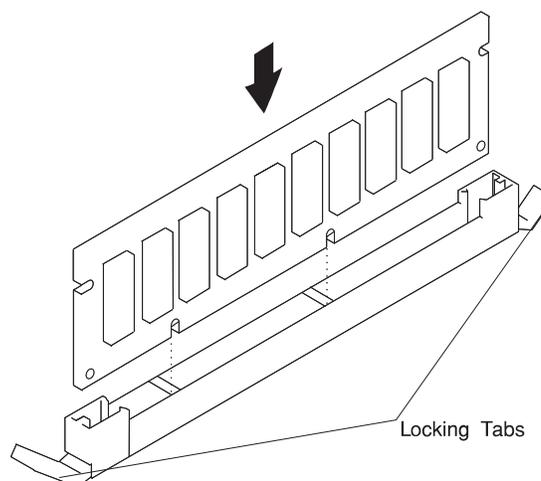


7. Remove the memory module by pushing the tabs out on the memory connectors.



Replacement of Memory Modules

1. With one hand, touch any metal surface of the chassis to minimize static electrical charges, and then pick up the memory module.
2. Locate the memory module connector on the memory card.
Note: Memory modules must be installed in pairs and in the correct slot configuration. (Slots J1 and J2, J3 and J4, J5 and J6, etc.)
3. Insert the memory module firmly into the connector.



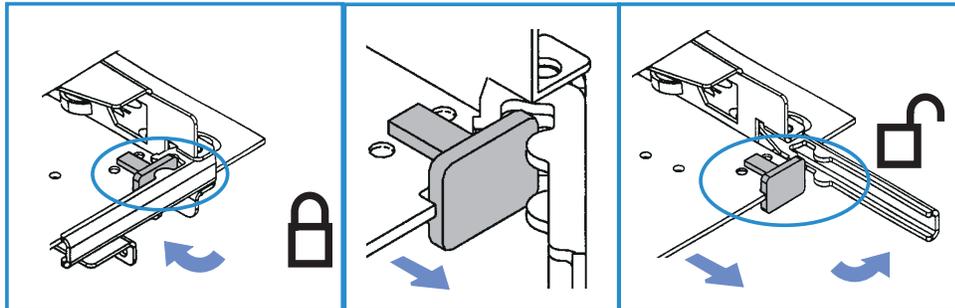
4. Secure the memory module with the locking tabs located at each end of the connector.
5. Replace the memory card into the system unit. See “Replacement of Memory Cards” on page 7-12 for more information.
6. Replace the processor and memory card cover as described in “Replacement of Processor and Memory Card Cover” on page 7-10.
7. Replace the system unit covers as described in “Replacement of Covers” on page 7-9.

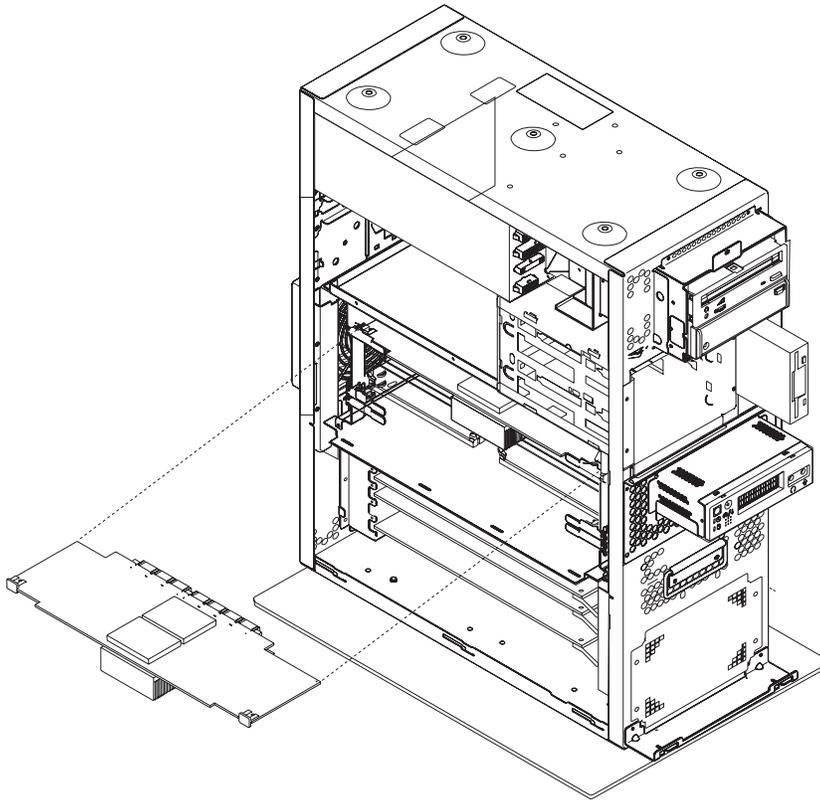
Processor Card

Removal of Processor Card

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the front, rear, and left side covers described in “Removal of Covers” on page 7-5.
4. Remove the processor and memory card cover as described in “Removal of Processor and Memory Card Cover” on page 7-10.
5. The processor card is secured in place with card retainer latches, one on each end of the card. Open the card retainer latches and remove the card from the connector.

Attention: To prevent damage to the card and the card connectors, open and close the retainer latches at the same time.



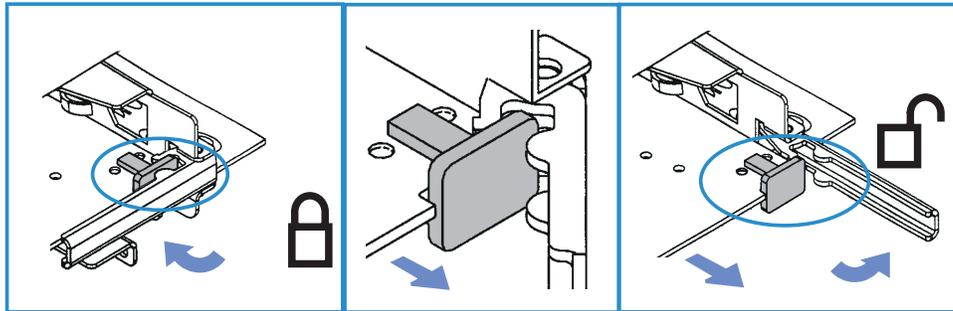


Replacement of Processor Card

Installing a processor card into your system unit may require updating the firmware. A diskette or CD-ROM is included with your new processor card if that is required.

Attention: If your system unit has two processor cards, both processor cards must be of the same clock speed.

1. If you have not already done so, open the card retainer latches on both ends of the card connector.



2. Place the processor card in the processor card guide rails.
3. Carefully align the processor card with the card connector.
4. Firmly insert the processor card into the card connector.
5. Close the retainer latches to secure the processor card. Ensure that the processor card is fully seated.

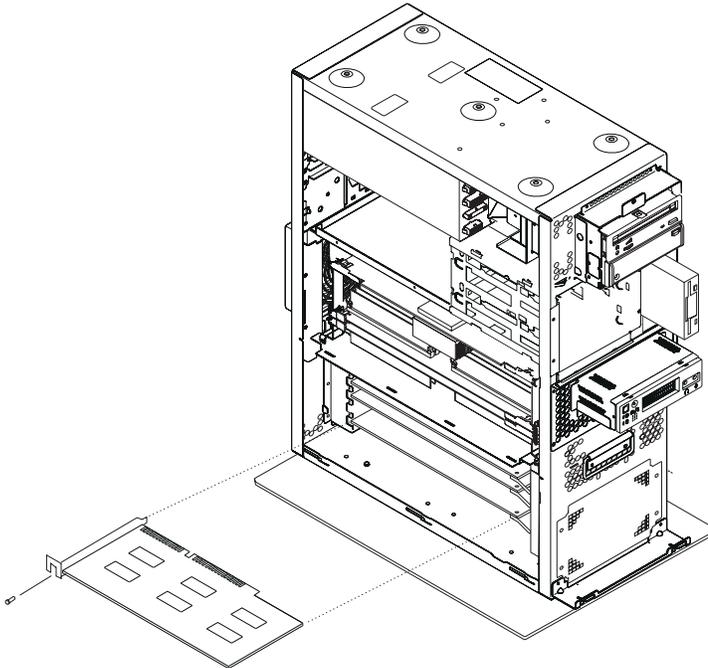
Attention: To prevent damage to the card and to the card connectors, open and close the retainer latches at the same time.

6. Replace the processor and memory card cover as described in “Replacement of Processor and Memory Card Cover” on page 7-10.
7. Replace the system unit covers as described in “Replacement of Covers” on page 7-9.

Adapters

Removal of Adapters

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the front, rear, and left side covers as described in “Removal of Covers” on page 7-5.
4. Record the slot number and location of the adapter being removed.
5. Label any cables attached to the adapter being removed.
6. Disconnect any cables that are connected to the adapter being removed.
7. Remove the screw that holds the adapter bracket to the system unit.
8. Remove the adapter from the system unit.



Replacement of Adapters

1. If you are not installing another adapter in this slot location, replace the expansion slot cover. Slide the cover over the expansion slot and tighten the screw on the top of the expansion slot cover.
2. Carefully grasp the adapter by the edges and align the adapter with the expansion-slot connector.
3. Press the adapter firmly into the expansion-slot connector.
4. Use the screw you removed earlier from the expansion-slot cover to secure the adapter card bracket to the system unit.
5. Connect any cables you removed earlier to the adapter.
6. Replace the system unit covers as described in "Replacement of Covers" on page 7-9.

Internal Drives

The 7043 Model 260 has 5 internal media bays.

- One 3.5 inch diskette bay
- Two 5.25 inch media bays, for CD-ROM drives, tape drives, or disk drives.
- Two 3.5 inch disk drive bays.

A diskette drive and CD-ROM drive come preinstalled in all systems.

Pre-installation Steps

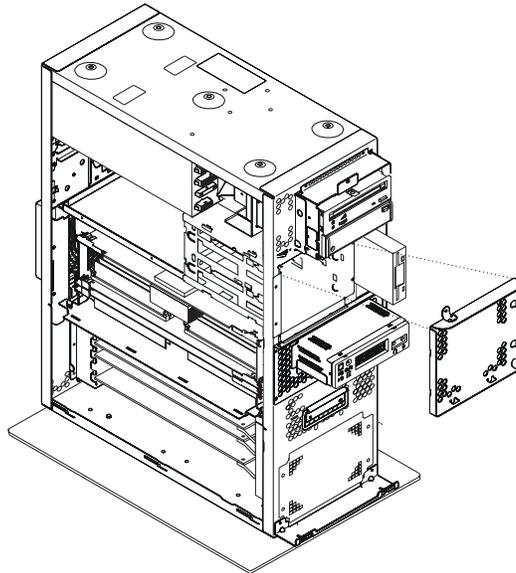
Consider the following cautions when installing or removing media drives into your system unit.

- Use caution when handling all disk drives. Disk drives are more likely to be damaged during installation and service than at any other time. A fall of as little as .25 inch, bumping, or rough handling can all cause latent failures.
- Media drives are particularly sensitive to electrostatic discharge. Follow the electro-static handling procedures prior to handling the media drive.
- Refer to the documentation that came with your drive to determine if any drive-specific procedures must be followed, such as setting switches or jumpers, or attaching the drive to a carrier tray.
- Media SCSI drives must have their SCSI address set manually. Refer to the documentation that came with your drive for more information on setting the SCSI address. Refer to "SCSI IDs and Bay Locations" on page 1-6 for more information on SCSI addresses in your system unit.

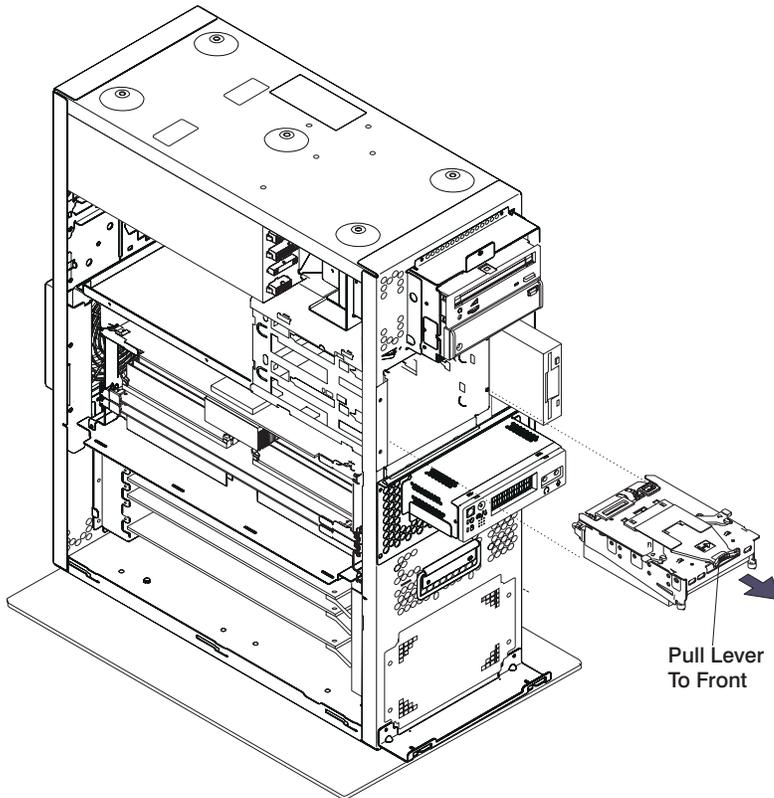
Disk Drives

Removal of Disk Drives

1. Deconfigure the drive you wish to remove. See “Deconfiguration of Media Drives” on page 7-26 for instructions.
2. If you have not already done so, remove the front cover as described in “Covers” on page 7-5.
3. If the system has a padlock or cable securing the disk drive cage, remove the padlock or cable.
4. Loosen the retaining screw that secures the disk drive cage cover to the disk drive cage and remove the cover.



5. Locate the drive you wish to remove.
6. Pull the disk drive lever toward you and remove the drive unit from the system unit .



Replacement of Disk Drives

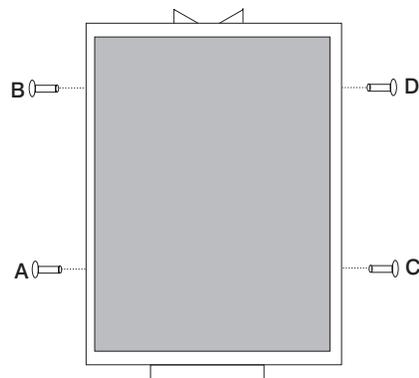
1. Align the drive with the disk drive cage rails.
2. Slide the drive into the system unit until it connects with the backplane at the rear of the drive bay.
3. Configure the drive using **smit**. Then wait five minutes for the drive to warmup. See "Configuration of Media Drives" on page 7-26 for instructions on configuring the drive.

Removal of Disk Drives from Carrier

1. If you have not already done so, remove the drive and carrier from the system unit. See "Removal of Disk Drives" on page 7-23 for instructions.
2. Loosen and remove screws **A** and **B** first.
3. Loosen and remove screws C and D.
4. Remove the drive from the carrier.

Installation of Disk Drives into Carrier

1. Align the drive with the carrier so that ...
2. Insert the unit into the carrier.
3. Insert and tighten the screws in the following order:
 - A
 - B
 - C
 - D



Configuration or Deconfiguration of Media Drives

Configuration of Media Drives

If you need to configure a disk drive, use the following procedure:

1. Login as root.
2. Enter the **smit** command.
3. Select **Devices**.
4. Determine the type of disk drive you want to configure. Select that type of drive from the menu.
5. Select **Add a drive type**, where *drive type* is the type of drive you are configuring.
6. A list will appear listing various models of the drive type you selected. Select the specific type of drive you are adding.

Deconfiguration of Media Drives

1. Login as root.
2. Enter the **smit** command.
3. Select **Devices**.
4. Determine the type of disk drive you want to remove or deconfigure. Select that type of drive from the menu.
5. When you get to the Keep Definition option, select **Yes**. This selection retains the details of the drive in the device configuration database.
6. A list will appear listing various models of the drive type you selected. Select the specific type of drive you are removing.
7. Select the **Do** option to unconfigure the drive.

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.

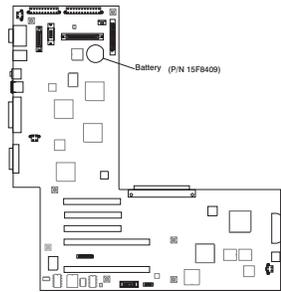
The battery connector is polarized; do not attempt to reverse polarity.

Dispose of the battery according to local regulations.

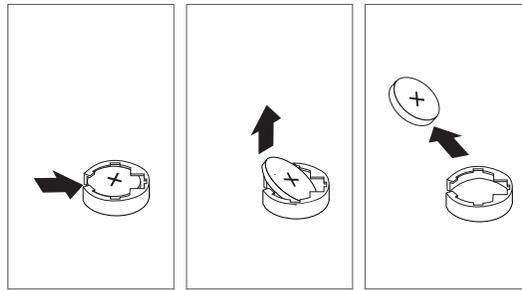
Removal of Battery

1. If you have not already done so, remove the front, rear, and left side covers as described in “Removal of Covers” on page 7-5.
2. Remove the processor and memory card cover as described in “Processor and Memory Card Cover” on page 7-10.

3. Locate the battery on the I/O board.

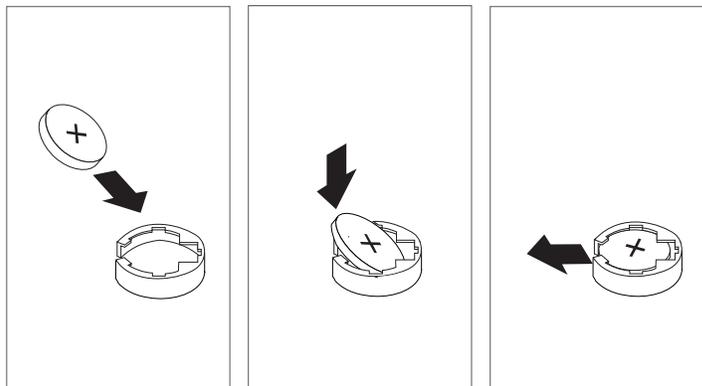


4. Use one finger to slightly slide the battery toward the front of the server. (The spring mechanism behind the battery pushes it out toward you as you slide it forward.) Use your thumb and index finger to hold the battery as it pushes out of the socket.



Replacement of Battery

1. Tilt the battery so that you can insert it into the front of the socket. As you slide the battery toward the front of the server, push it down into the socket.



Note: Be sure to tell the customer that the time and date need to be reset.

If running AIX the bootlist command may have to be run from AIX while logged in as root, this would restore the custom boot list and allow the option of Select Software under multiboot to start the operating system. Other parameters that may have to be rebuilt are the IP parameters.

Ensure that the battery polarity is correct; place the battery in the holder with the positive side facing up.

2. Replace the processor and memory card cover.
3. Replace the system unit covers as described in “Replacement of Covers” on page 7-9.

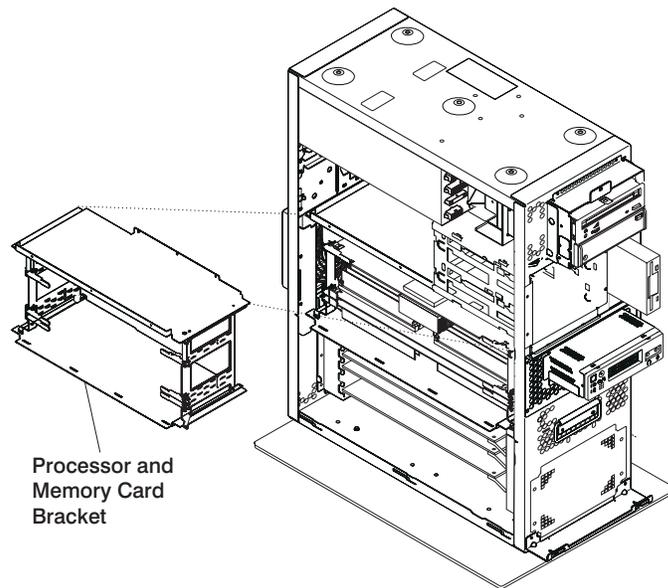
System Board

Removal of System Board

Attention: Be certain to record the location of any component prior to removal or disconnection. Record the settings of any jumpers on the board prior to removing it from the system unit.

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the front, rear and left side covers as described in “Removal of Covers” on page 7-5.
4. If you have not already done so, remove the processor and memory card cover as described in “Removal of Covers” on page 7-5.
5. If you have not already done so, remove the disk drive cage as described in “Disk Drive Cage” on page 7-40.
6. Remove the processor cards from the system unit. Refer to “Removal of Processor Card” on page 7-17 for more information.
7. Remove the memory cards from the system unit. Refer to “Removal of Memory Cards” on page 7-11 for more information.

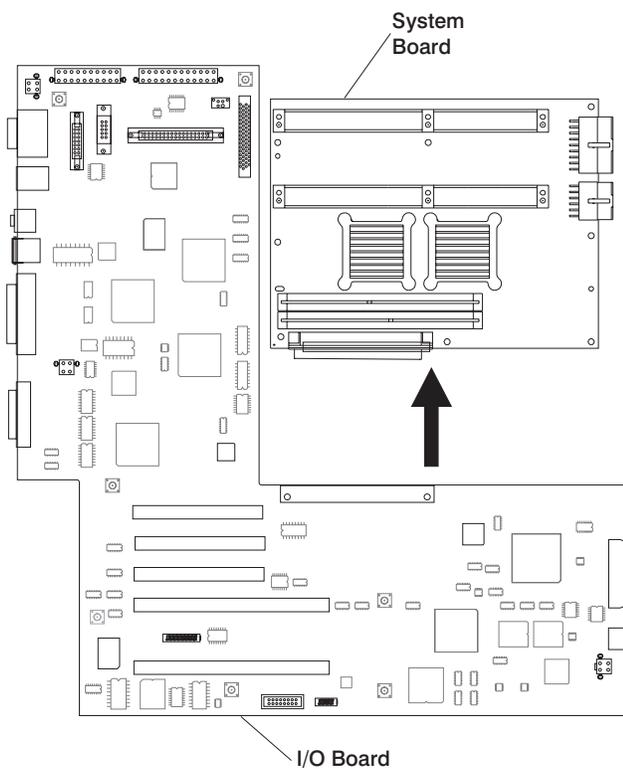
8. Remove the retaining screws that secure the processor and memory card bracket to the system unit.



9. Remove the processor and memory card bracket by sliding it straight out away from the system.
10. Disconnect the power cables from the system board connectors (J5 and J7).
11. Remove the screws that secure the system board to the system unit.

12. Slide the system board up to disconnect it from the I/O board

Attention: Take great care not to bend the connector between the system board and the I/O board.



13. Carefully remove the system board from the system unit.

Replacement of System Board

To replace the system board, perform the removal steps in the reverse order. Carefully connect the system board and I/O board. Hold the system board in place while inserting holding screws.

I/O Board

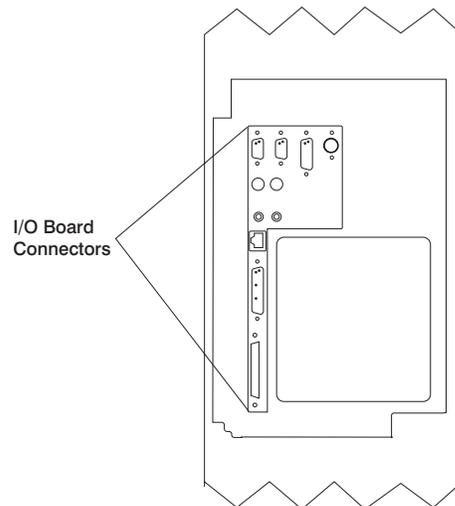
Removal of I/O Board

Attention: Be certain to record the location of any component prior to removal or disconnection.

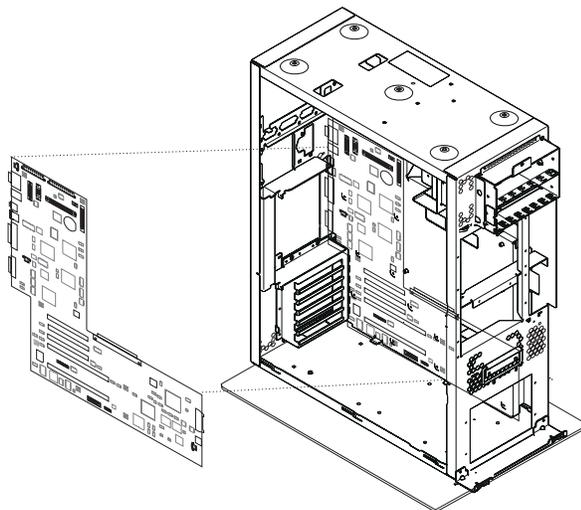
Attention: Record the settings of any jumpers on the board prior to removing it from the system unit.

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the front, rear, and left side covers as described in “Removal of Covers” on page 7-5.
4. If you have not already done so, remove the system board as described in “Removal of System Board” on page 7-30.
5. Remove the I/O fan as described in “I/O Fan” on page 7-39.
6. Record the location of all cables at the rear of the system unit.
7. Disconnect all cables from the rear of the system unit.
8. Record the location of all adapter cards and remove the adapters from the system unit. Refer to “Removal of Adapters” on page 7-20 for more information.
9. Disconnect all cables from the connectors on the I/O board.

10. Remove the screws that secure the I/O board connectors to the rear of the system unit.



11. Remove the screws that secure the I/O board to the system unit.
12. Remove the I/O board from the system unit by carefully sliding it out away from the system unit. Ensure that all of the rear connectors on the I/O board clear the system unit frame.



Replacement of I/O Board

To replace the I/O board, perform the removal steps in the reverse order.

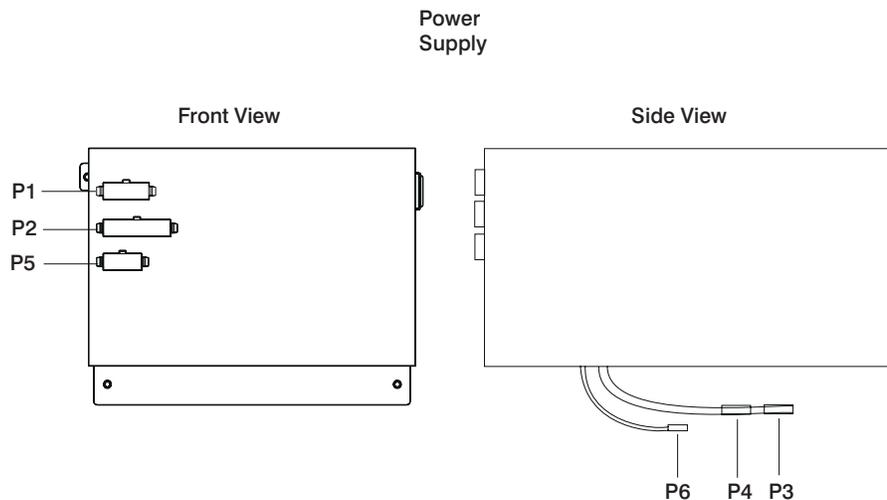
Power Supply

DANGER

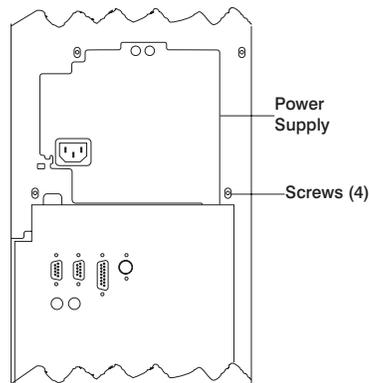
Do not attempt to open the covers of the power supply. Power supplies are not serviceable and are to be replaced as a unit.

Removal of Power Supply

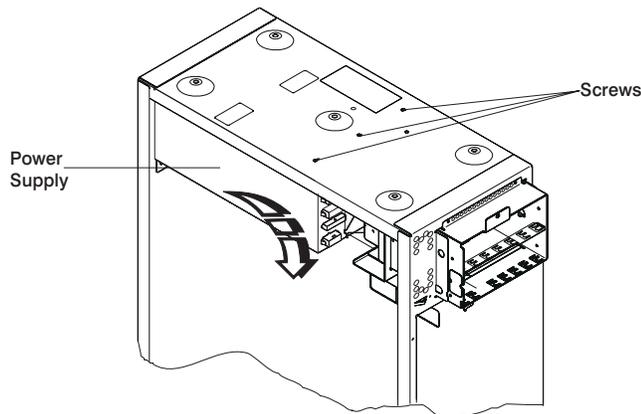
1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove all of the covers as described in “Removal of Covers” on page 7-5.
4. Remove the media devices as described in “CD-ROM Drive, Tape Drive, Diskette Drive” on page 7-42.
5. Remove the disk drives as described in “Disk Drives” on page 7-23
6. Remove the screws that secure the disk drive cage as described in “Removal of Disk Drive Cage” on page 7-40. Do not disconnect the cables from the backplane. Slide the disk drive cage forward enough that the power supply can be removed.
7. Disconnect the six power cables from the power supply connectors in the following order (P3, P4, P6, P5, P2, and P1). Ensure that the cables allow clearance for power supply removal.



8. Remove the power cables from the I/O board connectors (J16 and J19).
9. Remove the retaining screws that secure the power supply to the rear of the system unit.



10. Remove the retaining screws that secure the power supply to the top of the system unit.



Attention: When removing the power supply ensure that the power supply does not drop down and damage the I/O board components or connectors.

11. Slide the power supply slightly toward the front of the system unit to disengage the power supply retainer from the top and right side of the system frame.
12. Carefully remove the power supply from the system unit.

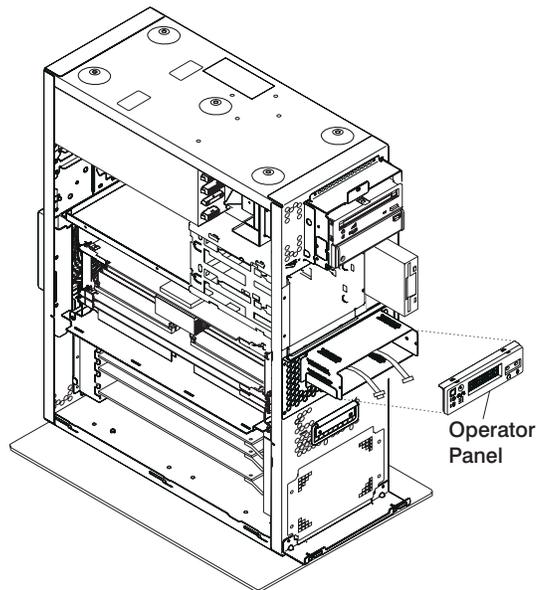
Replacement of Power Supply

To replace the power supply, perform the removal steps in the reverse order. Ensure that the power supply retainer engages with the top and right side of the system frame. This assists in proper alignment of the power supply screws.

Operator Panel

Removal of Operator Panel

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the front cover as described in “Removal of Covers” on page 7-5.
4. Remove the retaining screws (4) that secure the operator panel to the front of the system unit.



5. Slide the operator panel out from the system unit.
6. Remove the screw that secures the audio cable to the operator panel.
7. Disconnect the cables from the rear of the operator panel.

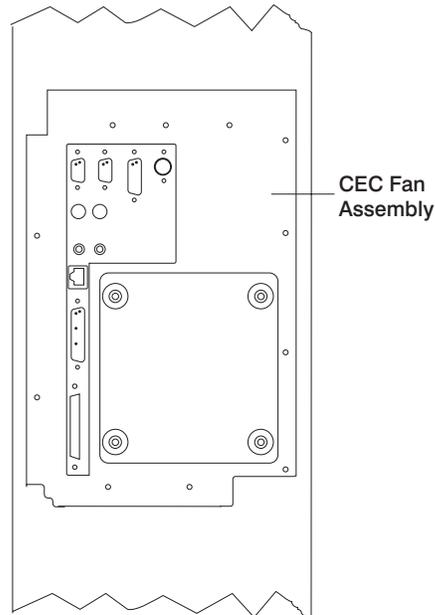
Replacement of Operator Panel

Perform the removal steps in the reverse order.

CEC Fan

Removal of CEC Fan

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the front, back and right side covers as described in “Removal of Covers” on page 7-5.
4. Remove the retaining screws (11) that secure the rear fan assembly to the system unit.



5. Disconnect the fan from the connector in the cable.
6. Pull the rear fan assembly out from the system unit.

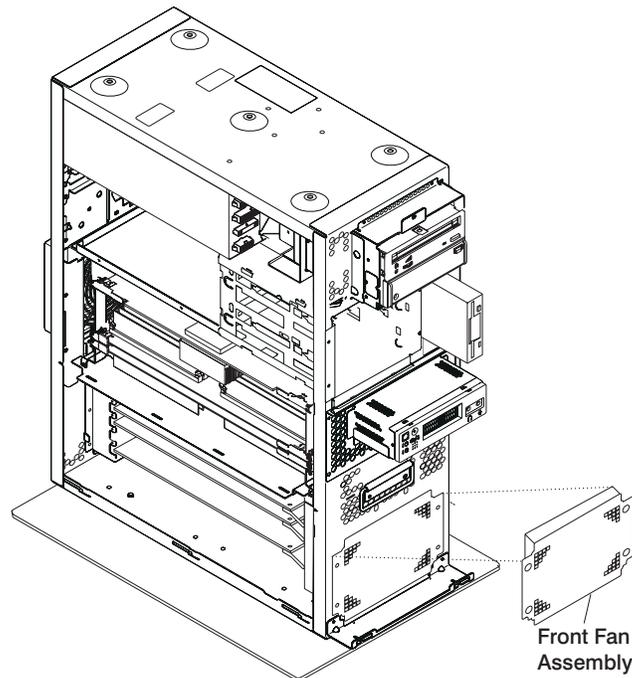
Replacement of CEC Fan

When replacing the fan assembly, insert the left side first to ensure proper seal. Perform the removal steps in the reverse order.

I/O Fan

Removal of I/O Fan

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the front cover as described in “Removal of Covers” on page 7-5.
4. Remove the retaining screws that secure the front fan assembly to the system unit.



5. Slide the front fan assembly out of the system unit.
6. Disconnect the fan connector (J3) from the I/O board.

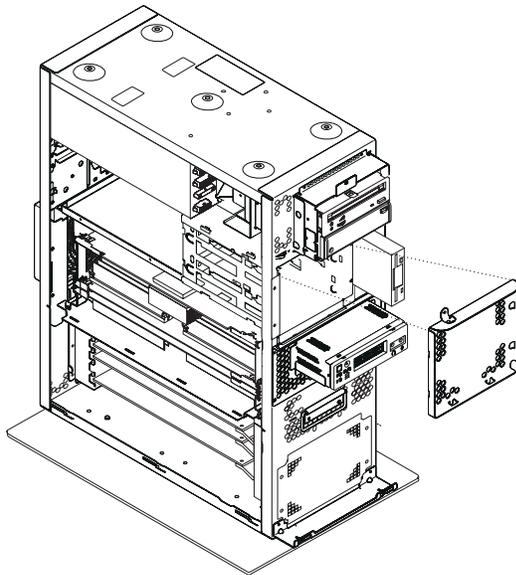
Replacement of I/O Fan

Perform the removal steps in the reverse order.

Disk Drive Cage

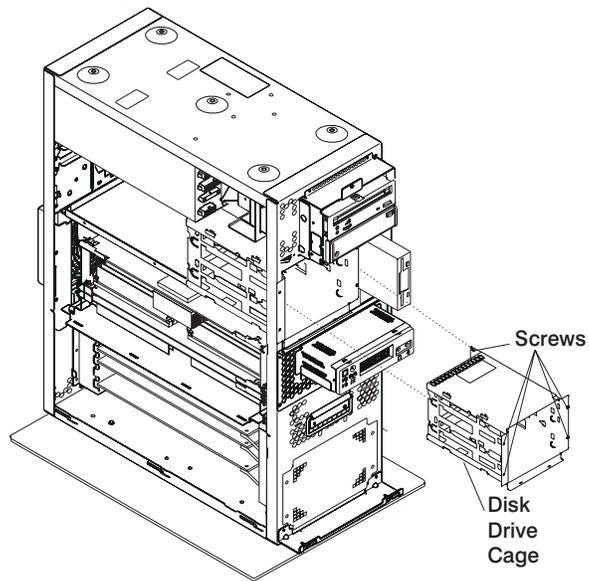
Removal of Disk Drive Cage

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the front, rear and side cover as described in “Removal of Covers” on page 7-5.
4. If the system has a padlock or cable securing the disk drive cage, remove the padlock or cable.
5. Loosen the retaining screw that secures the disk drive cage cover to the disk drive cage and remove the cover.



6. If you have not already done so, remove the disk drives as described in “Disk Drives” on page 7-23.
7. Remove the retaining screws that secure the disk drive cage to the front of the system unit.
8. Record the cable locations and disconnect the cables from the backplane connectors.
9. Remove the retaining screws that secure the back of the disk drive cage assembly to the system unit.

10. Remove the disk drive cage from the system unit.



Replacement of Disk Drive Cage

Perform the removal steps in the reverse order.

CD-ROM Drive, Tape Drive, Diskette Drive

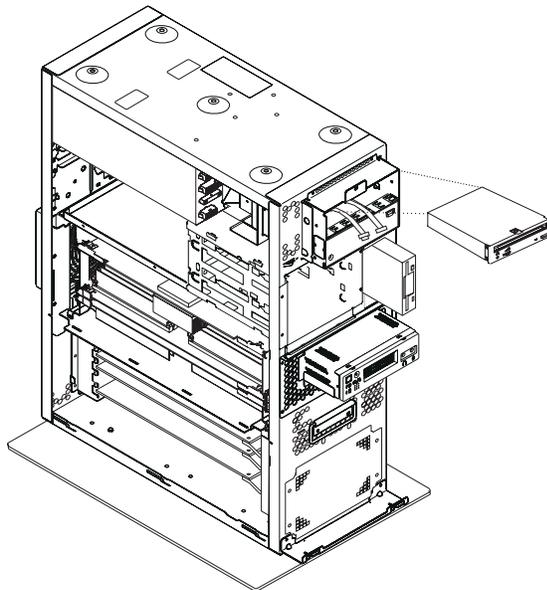


CAUTION:

Do not open the drive; no user adjustments or serviceable parts are inside.

Removal of Media Drives

1. If you have not already done so, shutdown the system as described in “Stopping the System Unit” on page 7-4.
2. If you have not already done so, unplug the system unit power cable from the electrical outlet.
3. If you have not already done so, remove the front, rear, and left side covers as described in “Removal of Covers” on page 7-5. It may help removal if you remove the right cover but it is not necessary at this time.
4. Remove the screws that secure the media drive to the system unit.
5. Slide the drive forward toward the front of the system unit.

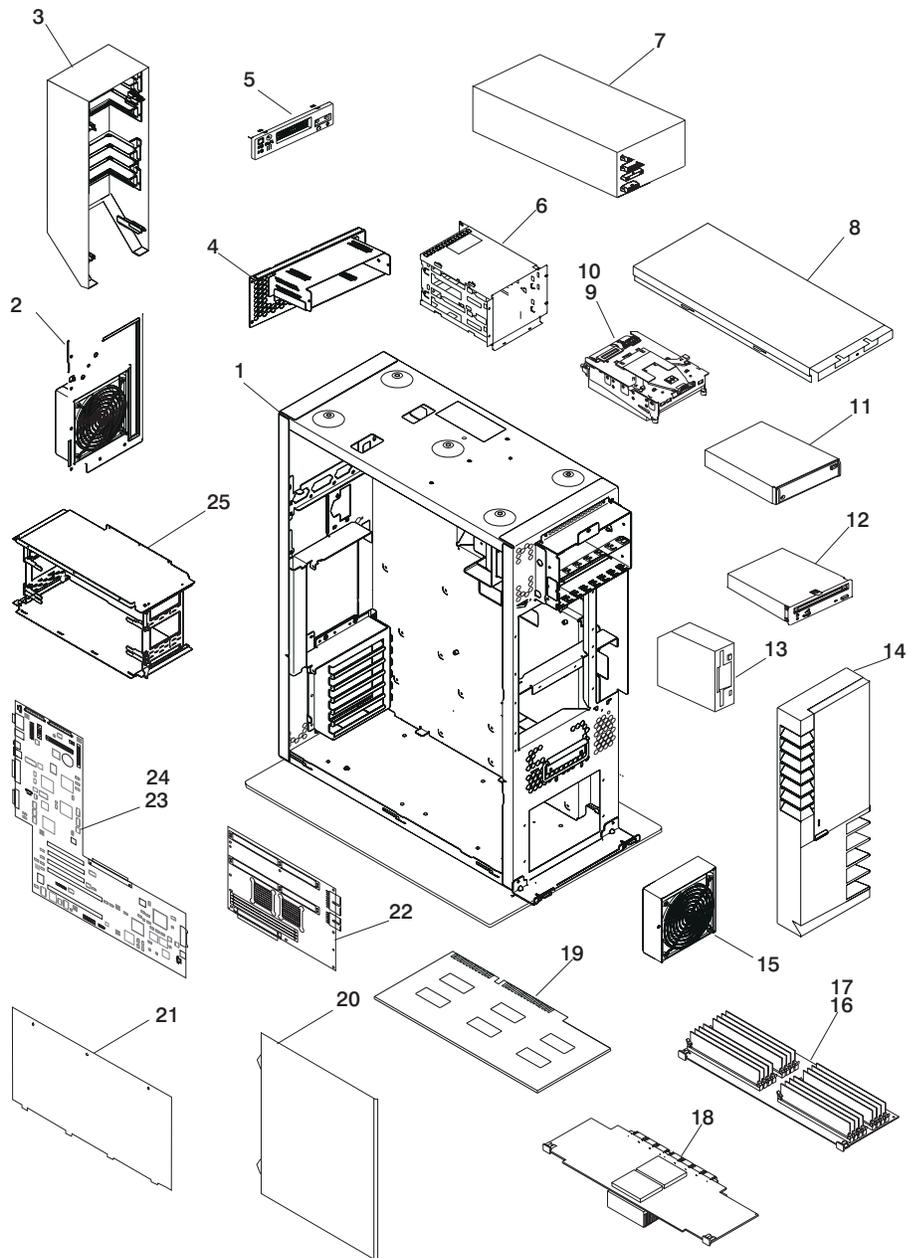


6. Disconnect the power and data cables from the drive you are removing.
7. If you are removing a CD-ROM drive, disconnect the audio cable from the rear of the CD-ROM drive.

Replacement of Media Drives

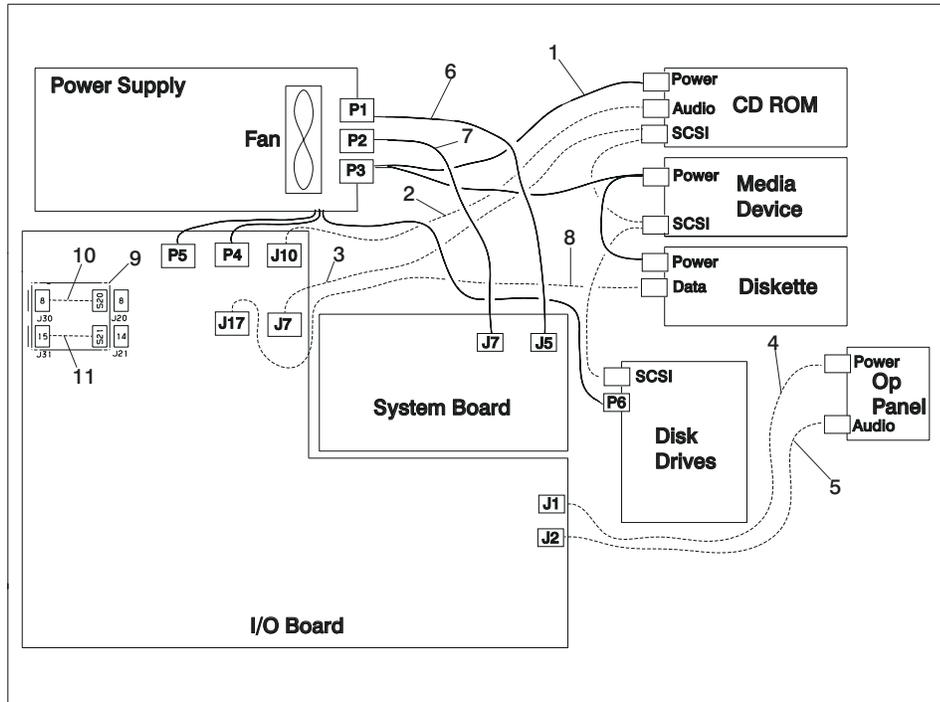
1. Align the drive with the guides at the edge of the bay.
2. Slide the drive into the system unit until it stops.
3. The diskette drive requires a 16-Bit to 8-Bit adapter to be installed between the connector at the rear of the drive and the data cable. Install this adapter at this time.
4. Connect the cables from the front of the system.
 - a. Locate the appropriate data cable for the drive. Connect the cable to the connector at the rear of the drive.
 - b. If you are installing a CD-ROM drive, connect the audio cable from the I/O board to the audio connector at the rear of the drive.
 - c. If you are installing a SCSI drive, set the SCSI address jumpers at the rear of the drive to the correct address. Refer to the documentation that came with your drive for details on setting the SCSI address.
 - d. The two media bays share a common power cable. Connect an available connector on the power cable to the 4-pin connector at the rear of the drive.
5. Secure the media drive to the system unit with the retaining screws.
6. Replace the system unit covers as described in "Replacement of Covers" on page 7-9.

Chapter 8. Parts Information



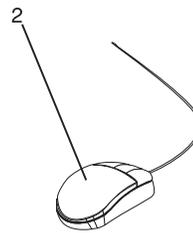
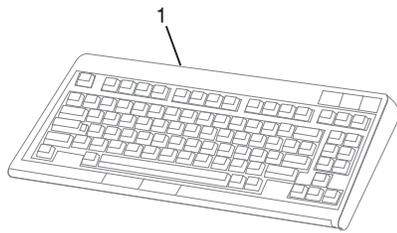
Index	Part Number	Units Per	Description
1	74G6355	1	Chassis assembly
	24L1910	1	Chassis assembly (OEM)
2	74G6361	1	Fan assembly (CEC)
3	97H9415	1	Rear cover
	24L1903	1	Rear cover (OEM)
4	74G6349	1	Operator Panel Bracket
5	07L7234	1	Operator panel
6	97H9302	1	Disk drive cage (includes backplane)
7	97H9337	1	Power supply
8	97H5936	1	Top cover
9	See note	2	Disk drive
10	97H9336	2	Disk drive carrier
11	See note	1	Media device
12	07H7608	1	CD-ROM drive
13	76H4091	1	Diskette drive
14	97H9404	1	Front cover
	24L1900	1	Front cover (OEM)
15	97H9425	1	Fan assembly (PCI)
16	84H3427	1 or 2	Memory card
17	42H2773	Up to 32	32 MB Memory module
	42H2775	Up to 32	128 MB Memory module
18	08L1013	1 or 2	Processor card(200 Mhz)
19	See note	Up to 5	Adapter
20	97H5937	2	Side cover
21	97H9432	A/R	PCI air duct
22	08L1303	1	System board
23	08L0633	1	I/O board
24	15F8409	1	Battery
25	97H9424	1	Processor and memory card cage

Note: See *IBM RS/6000 Diagnostic Information for Multiple Bus Systems* for part numbers.



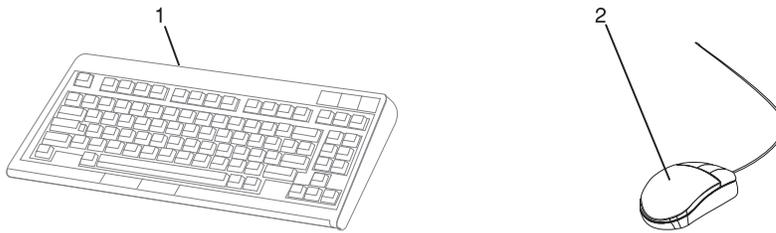
Index	Part Number	Units Per	Description
1	24L1909	1	Cable (Media devices power)
2	97H9321	1	Cable (CD-ROM audio)
3	97H9322	1	Cable (Media and disk drive SCSI)
4	93H9328	1	Cable (Operator panel power)
5	97H9442	1	Cable (Operator panel audio)
6	97H9315	1	Cable (Power, system board)
7	97H9316	1	Cable (Power, system board)
8	97H9320	1	Cable (Diskette signal)
9	97H9327	1	Cable (Includes both Tablet and Ethernet cables)
10	97H9323	1	Cable (Tablet signal)
11	97H9324	1	Cable (AUI Ethernet signal)
	76H0518	1	Cable (SCSI converter)

Keyboards and Mouse



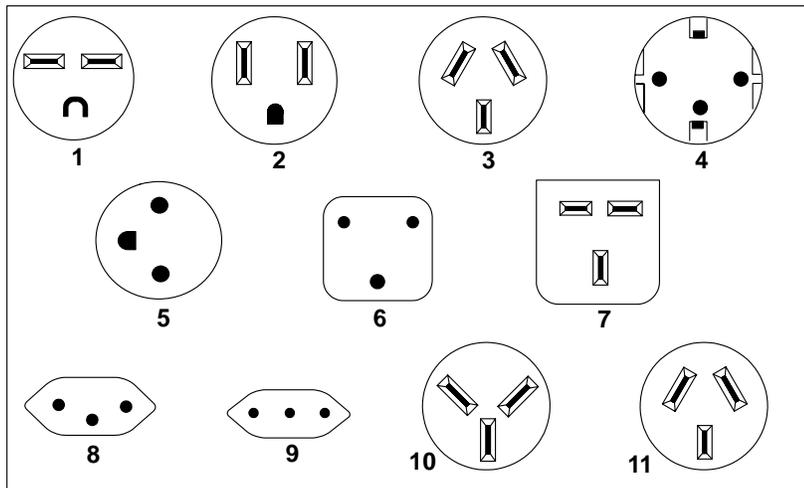
Index Number	FRU Part Number	Units Per Assy	Description
1	93H8120	1	Keyboard, 101 United States English (ID 103P)
	93H8121	1	Keyboard, 102 Canada French (ID 058)
	93H8122	1	Keyboard, 102 Canada French (ID 445)
	93H8123	1	Keyboard, 102 Spanish (ID 171)
	93H8124	1	Keyboard, 104 Brazil Portuguese (ID 275)
	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 Romainian (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

Keyboards and Mouse (Black)



Index Number	FRU Part Number	Units Per Assy	Description
1	07L9446	1	Keyboard, 101 United States English (ID 103P)
	07L9447	1	Keyboard, 102 Canada French (ID 058)
	07L9448	1	Keyboard, 102 Canada French (ID 445)
	07L9449	1	Keyboard, 102 Spanish (ID 171)
	07L9450	1	Keyboard, 104 Brazil Portuguese (ID 275)
	07L9451	1	Keyboard, 102 Arabic (ID 238)
	07L9452	1	Keyboard, 102 Belgium French (ID 120)
	07L9453	1	Keyboard, 102 Belgium (ID 120)
	07L9454	1	Keyboard, 102 Bulgarian (ID 442)
	07L9455	1	Keyboard, 102 Czech (ID 243)
	07L9456	1	Keyboard, 102 Danish (ID 159)
	07L9457	1	Keyboard, 102 Dutch (ID 143)
	07L9458	1	Keyboard, 102 French (ID 189)
	07L9459	1	Keyboard, 102 German (ID 129)
	07L9460	1	Keyboard, 102 Greek (ID 319)
	07L9461	1	Keyboard, 101 Hebrew (ID 212)
	07L9462	1	Keyboard, 102 Hungarian (ID 208)
	07L9463	1	Keyboard, 102 Iceland (ID 197)
	07L9464	1	Keyboard, 102 Italy (ID 142)
	07L9465	1	Keyboard, 102 Norwegian (ID 155)
	07L9466	1	Keyboard, 102 Polish (ID 214)
	07L9467	1	Keyboard, 102 Portuguese (ID 163)
	07L9468	1	Keyboard, 102 Romainian (ID 446)
	07L9469	1	Keyboard, 101 Russian (ID 443)
	07L9470	1	Keyboard, 102 Serbian (ID 118)
	07L9471	1	Keyboard, 102 Slovak (ID 245)
	07L9472	1	Keyboard, 102 Spanish (ID 172)
	07L9473	1	Keyboard, 102 Sweden/Finland (ID 153)
	07L9474	1	Keyboard, 105 Swiss F/G (ID 150)
	07L9475	1	Keyboard, 102 Turkish (ID 179)
	07L9476	1	Keyboard, 102 Turkish (ID 440)
07L9477	1	Keyboard, 102 UK English (ID 166)	
07L9478	1	Keyboard, 102 Latvia (ID 234)	
07L9479	1	Keyboard, US English ISO9995 (ID 103P)	
07L9480	1	Keyboard, 106 Japan (ID 194)	
07L9481	1	Keyboard, 101 Chinese/US (ID 467)	
07L9482	1	Keyboard, 103 Korea (ID 413)	
07L9483	1	Keyboard, 101 Thailand (ID 191)	
2	08L0362	1	Three Button Mouse (Black)

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.
3	6952311	Argentina, Australia, New Zealand
4	13F9979	Abu Dhabi, Austria, Belgium, Bulgaria, Botswana, Egypt, Finland, France, Germany, Greece, Iceland, Indonesia, Korea (South), Lebanon, Luxembourg, Macau, Netherlands, Norway, Portugal, Saudi Arabia, Spain, Sudan, Sweden, Turkey, Yugoslavia
5	13F9997	Denmark
6	14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka
7	14F0033	Bahrain, Bermuda, Brunei, Channel Islands, Cyprus, Ghana, Hong Kong, India, Iraq, Ireland, Jordan, Kenya, Kuwait, Malawi, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Arab Emirates (Dubai), United Kingdom, Zambia

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

Appendix A. Service Processor Information

The Service Processor menus enable you to configure Service Processor options and to enable and disable functions.

Service Processor menus are available using an ASCII terminal when the server is powered off and the Service Processor is operating with standby power. Service Processor menus are also available when server power is on and the Service Processor has detected a server problem (such as loss of surveillance).

During the first power up (i.e. power cord is plugged into the outlet), Service Processor menus are not available for 45 seconds while the Service Processor is running self-tests and initializing the server. If the server powers down, Service Processor menus become available after 15 seconds.

For a summary of the Service Processor functions and the methods for invoking them, see the table on page A-2.

Service Processor Functions	Service Processor Menus (ASCII terminals)	Service Processor Service Aids (ASCII or graphics terminals)	SMS (ASCII or graphics terminals)
Read VPD	Y ³		Y ³
View System Environmental Conditions	Y ³		
Read System POST Errors	Y ³		
Read Service Processor Error Logs	Y ³		
View Progress Indicators from last Boot	Y ³		
Power-on System	Y ³		
Power-off System	Y ²		
Read NVRAM	Y ²		
Reset Service Processor	Y ²		
Setup Reboot/Restart Policy	Y ²		
Start Talk Mode	Y ²		
Enable/Disable Console Mirroring	Y ²	Y ¹	
Select Modem Line Speed	Y ²	Y ¹	
Enable/Disable Modem	Y ²	Y ¹	
Setup Modem Configuration	Y ²	Y ¹	
Setup Ring Indicate Power-On	Y ²	Y ¹	
Setup Dial-out Phone Numbers	Y ²	Y ¹	
Setup Surveillance	Y ²	Y ¹	
Update Service Processor Flash EPROM	Y ²	Y ¹	Y ²
Change General Access Password	Y ²		Y ²
Change Privileged Access Password	Y ²		Y ²
Select Language	Y ²		Y ²
Enable/Disable Unattended Start Mode	Y ²		Y ²

¹ Operating system root password

² Privileged access password

³ General access (power-on) password

Service Processor Menus

The Service Processor menus are divided into two groups:

- General user menus - the user must know the general access password.
- Privileged user menus - the user must know the privileged access password.

The following section describes these two groups of menus, how to access them, and the functions associated with each option.

When the server is powered down, the Service Processor menus may be accessed locally or remotely.

Service Processor Menu Inactivity

To prevent loss of control in unstable power environments, the Service Processor leaves the menu mode after 5 minutes of inactivity. Menus may be resumed by pressing any key on the terminal, local or remote.

How to access Service Processor menus locally

Service Processor menus may be accessed locally by connecting an ASCII terminal to either serial port. Because the presence of the ASCII terminal cannot be confirmed by the Service Processor, you must press a key on the ASCII terminal to confirm its presence. Next the Service Processor prompts you for a password (if set), and when verified, displays the Service Processor menus.

How to access Service Processor menus remotely

Service Processor menus may be accessed remotely by connecting a modem to serial port 1 or serial port 2.

- Power off the server, unplug the power cord, and press the power button to drain capacitance while power is disconnected.
- Connect the modem to the appropriate serial port and turn the modem on.
- Plug in the server.

Note: If your modem has not been configured, go to “CALL-IN/CALL-OUT SETUP MENU” on page A-19.

With a terminal or terminal emulator, call the server's modem. The Service Processor prompts you for a password (if set), and when verified, displays the Service Processor menus.

General User Menus

The menu options presented to the General user are a subset of the options available to the Privileged user. The user must know the General Access Password in order to access these menus.

```
GENERAL USER MENU

1. Power-On System
2. Read VPD Image from Last System Boot
3. Read Progress Indicators from Last System Boot
4. Read Service Processor Error Logs
5. Read System POST Errors
6. View System Environmental Conditions
99. Exit from Menu

1>
```

Note: The Service Processor prompt reads either **1>** or **2>** to indicate which serial port on the system unit is being used to communicate with the Service Processor.

- **Power-On System**

Allows the user to power-on the system.

- **Read VPD Image from Last System Boot**

Displays the VPD information that was in effect after the last system boot. This information is usually identical with the results from the menu selection "Read VPD," but in the case of configuration updates or certain faults, this historical comparison can be useful to System Administrators and service personnel.

- **Read Progress Indicators from last Boot**

Displays the boot progress indicators (check points), up to a maximum of 100, from the system boot prior to the one in progress now. This historical information may be useful to help diagnose system faults.

The progress indicators are displayed in two sections. Above the dashed line are the progress indicators (latest) from the boot that produced the current sessions. Below the dashed line are progress indicators (oldest) from the boot preceding the one that produced the current sessions.

The progress indication codes are listed top (latest) to bottom (oldest). The dashed line merely represents the point where the latest boot started.

Use the posted code indicated by the <-- arrow.

- **Read Service Processor Error Logs**

Displays the Service Processor error logs.

The time stamp in this error log is Coordinated Universal Time (CUT), a.k.a. Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time. See page A-37 for an example of the error log.

- **Read System POST Errors**

Selecting this item lets you review the results of the POST (Power-On Self Test). Your server may be able to start in the presence of POST errors if there is sufficient working system resources. If POST errors occur during start-up, this error log when used with the diagnostics helps to isolate faults. See page A-38 for an example of the POST error screen.

- **View System Environmental Conditions**

On selection of this menu, the Service Processor reads all environmental sensors and reports the results to the user. This option maybe useful when surveillance fails, as it allows the user to determine the environmental conditions that may be related to the failure. See page A-15 for an example of the System Environmental Conditions screen.

Privileged User Menus

The following menus are available to privileged users only. The user must know the Privileged Access Password in order to access these menus.

MAIN MENU

At the top of the MAIN Menu is a listing containing:

- Your Service Processor's current firmware version
- The firmware copyright notice
- The System Name given to your server during setup

You need the firmware version for reference when you either update or repair the functions of your service processor.

The System Name, an optional field, is the name your server reports in problem messages. This name helps your support team, (for example, your system administrator, network administrator, or service representative) to more quickly identify the location, configuration, and history of your server. The System Name is set from the Main Menu using option 6.

Note: The information under the Service Processor Firmware heading in the Main Menu example that follows is example information only.

```
Service Processor Firmware
EPROM: 19970915
FLASH: 19970512
Copyright 1997, IBM Corporation
  SYSTEM NAME
```

MAIN MENU

1. Service Processor Setup Menu
2. System Power Control Menu
3. System Information Menu
4. Language Selection Menu
5. Call-In/Call-Out Setup Menu
6. Set System Name
99. Exit from Menus

1>

Service Processor SETUP MENU

Service Processor SETUP MENU

1. Change Privileged Access Password
2. Change General Access Password
3. Enable/Disable Console Mirroring:
 Currently Disabled
4. Start Talk Mode
5. OS Surveillance Setup Menu
6. Reset Service Processor
7. Reprogram Service Processor Flash EPROM
98. Return to Previous Menu
99. Exit from Menus

1>

Note

Unless otherwise stated in menu responses settings become effective when a menu is exited using option 98 or 99.

Passwords

Passwords can be any combination of up to 8 alphanumeric characters. You can enter longer passwords, but the entries are truncated to include only the first 8 characters. Passwords can be set from the Service Processor menu or from the SMS menus.

For security purposes, the Service Processor counts the number of attempts to enter correct passwords. The results of not recognizing a correct password within this error threshold are different, depending on whether the attempts are being made locally (at the server) or remotely (via a modem). The error threshold is 3.

If the error threshold is reached by someone entering passwords at the server, the Service Processor exits the menus. This action is taken based on the assumption that the server is in an adequately secure location with only authorized users having access. Such users must still successfully enter a login password to access AIX.

If the error threshold is reached by someone entering passwords remotely, the Service Processor disconnects the modem to prevent potential security attacks on the server by unauthorized remote users.

The following illustrates what you can access with the Privileged Access Password and the General Access Password.

Privileged Access Password	General Access Password	Resulting Menu
None	None	MAIN MENU displayed
None	Set	MAIN MENU displayed
Set	None	User's with password see the MAIN MENU Others users see the GENERAL USER MENU
Set	Set	Users see menus associated with the entered password

- **Change Privileged Access Password**

Set or change the Privileged Access Password. It provides the user with the capability to access all Service Processor functions. This password is usually used by the system administrator or **root** user.

- **Change General Access Password**

Set or change the General Access Password. It provides limited access to Service Processor menus, and is usually available to all users who are allowed to power-on the server.

- **Enable/Disable Console Mirroring**

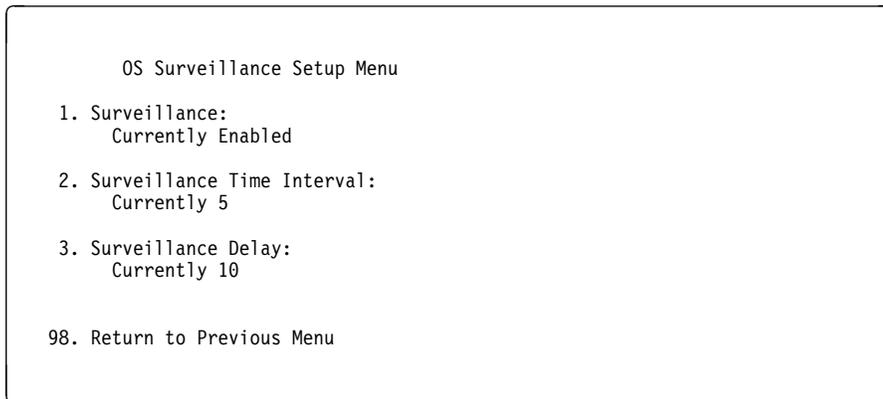
When Console Mirroring is enabled, the Service Processor sends information to both serial ports. This capability may be enabled by local or remote users. This provides local users the capability to monitor remote sessions. Console mirroring may be enabled for the current session only. For more information, see “Console Mirroring” on page A-34.

- **Start Talk Mode**

In a console mirroring session, it is useful for those that are monitoring the session to be able to communicate with each other. Selecting this menu item activates the keyboards and displays for such communications while console mirroring is established. This is a full duplex link, so message interference is possible. Alternating messages between users works best.

- **Surveillance Setup Menu**

This option may be used to setup operating system surveillance.



- **Surveillance**

- May be set to Enabled or Disabled.

- **Surveillance Time Interval:**

- May be set to any number from 2 to 255 minutes.

- **Surveillance Delay:**

- May be set to any number from 0 to 255 minutes.

Refer to “Service Processor System Monitoring - Surveillance” on page A-31 for more information about surveillance.

- **Reset Service Processor** - Allows the user to reinitialize the Service Processor.

- **Reprogram Service Processor Flash EPROM** - This is an automatic process.

An update diskette can be acquired from the RS/6000 Support page on the Internet or from your service team. The Internet address is:

<http://www.rs6000.ibm.com/support/micro>

The update files must be downloaded to a DOS-formatted diskette. You should format the diskette just prior to receiving the download, to be sure it is clean. Reformatting is worth the time and effort. When this process is selected, you are prompted to place the diskette into the drive and to indicate to the system that the diskette is available and the automatic process starts. If the system has other needs, you are prompted. See “Service Processor Firmware Updates” on page A-35 for additional information and update methods.

SYSTEM POWER CONTROL MENU

```
SYSTEM POWER CONTROL MENU

1. Enable/Disable Unattended Start Mode:
   Currently Disabled
2. Ring Indicate Power-On Menu
3. Reboot/Restart Policy Setup Menu
4. Power-On System
5. Power-Off System
6. Enable/Disable Fast System Boot:
   Currently Disabled
98. Return to Previous Menu
99. Exit from Menus

1>
```

- **Enable/Disable Unattended Start Mode**

This option may be used to instruct Service Processor to immediately power-on the server after a power failure, bypassing power-on password verification. Unattended Start Mode can also be set via SMS Menus. It is intended to be used on servers that require automatic power-on after a power failure.

- **Ring Indicator Power-On Menu**

Ring Indicate Power-On is an alternate method of dialing in, without establishing a Service Processor session. If the system is powered off, Ring Indicate Power-On is enabled, the server is powered on at the predetermined number of rings, If the server is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the server powered-on. The **Ring Indicator Power-On Menu** and defaults are shown below:

```
Ring Indicator Power-On Menu

1. Ring Indicate Power-On :
   Currently Disabled
2. Number of Rings :
   Currently 6

98. Return to Previous Menu
```

- Ring Indicate Power-On may be set to 'Enabled' or 'Disabled'.
- Number of Rings may be set to any number from 1 to 255.

- **Reboot/Restart Policy Setup Menu**, see “Reboot/Restart Policy Setup Menu” on page A-25.

- **Power-on System**

Lets you power-on the system immediately. For other power-on methods see “System Power-On Methods” on page A-28.

- **Power-off System**

Allows the user to power-off the server following a surveillance failure.

SYSTEM INFORMATION MENU

```
SYSTEM INFORMATION MENU

1. Read VPD Image from Last System Boot
2. Read Progress Indicators from Last System Boot
3. Read Service Processor Error Logs
4. Read System POST Errors
5. Read NVRAM
6. Read Service Processor Configuration
7. View System Environmental Conditions
8. Processor configuration/deconfiguration Menu
9. Memory configuration/deconfiguration Menu
98. Return to Previous Menu
99. Exit from Menus

1>
```

- **Read VPD Image from Last System Boot**

Displays the VPD information that was in effect after the last system boot. This information is usually identical with the results from the menu selection "Read VPD," but in the case of configuration updates or certain faults, this historical comparison can be useful to System Administrators and service personnel.

- **Read Progress Indicators from Last System Boot**

Displays the boot progress indicators (check points), up to a maximum of 100, from the system boot prior to the one in progress now. This historical information may be useful to help diagnose system faults.

The progress indicators are displayed in two sections. Above the dashed line are the progress indicators (latest) from the boot that produced the current sessions. Below the dashed line are progress indicators (oldest) from the boot preceding the one that produced the current sessions.

The progress indication codes are listed top (latest) to bottom (oldest). The dashed line merely represents the point where the latest boot started.

Use the posted code indicated by the <-- arrow.

- **Read Service Processor Error Logs**

Displays error conditions detected by the Service Processor.

The time stamp in this error log is Coordinated Universal Time (CUT), a.k.a. Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp the errors with the local time. See A-37 for an example of the error log.

- **Read System POST Errors**

Selecting this item lets you review the results of the POST (Power-On Self Test). Your system unit may be able to start in the presence of POST errors if there is sufficient working system resources. If POST errors occur during start-up, this error log when used with the diagnostics. See page A-38 for an example of the POST error screen.

- **Read NVRAM**

Displays non-volatile random access memory (NVRAM) contents.

- **View System Environmental Conditions**

The Service Processor reads all environmental sensors and reports the results to the user. This option is most useful when surveillance fails, as it allows the user to determine the environmental conditions that may be related to the failure.

The following is an example of the system environmental conditions screen:

```
System Environmental Conditions
(System Power is currently off.)

Fan 0: A stopped fan detected
Fan 1: A stopped fan detected
Fan 2: A stopped fan detected
Fan 3: A stopped fan detected
MEM Temperature is operating within normal tolerances
I/O Temperature is operating within normal tolerances
CPU Temperature is operating within normal tolerances
5.0 Volts: A low 5.0 Voltage reading detected
3.3 Volts: A low 3.3 Voltage reading detected
5.0 Standby Volts: is operating within normal tolerance
+12.0 Volts: A low +12.0 voltage reading detected
-12.0 Volts: A high -12.0 voltage reading detected
(Press Return to Continue)
```

- **Processor Configuration/Deconfiguration Menu**

This option allows the user to see and modify processor configuration.

The following is an example of the Processor Configuration/Deconfiguration Menu:

```
PROCESSOR CONFIGURATION/DECONFIGURATION MENU

Processor Number

0. Configured by system (0x11)
2. Configured by system (0x11)

98. Return to Previous Menu

To change the configuration, select the processor number
1>
```

The user can manually configure or deconfigure any processor, regardless of failure status, through this Service Processor menu. The configuration process takes place during the system power-up. Therefore, the configuration displayed in STANDBY mode reflects the configuration during the last boot. To view the current configuration, access the Service Processor menu after the system boots up. When the user selects a processor, its state toggles between configured and deconfigured. Processors that are not present are not listed. A processor can be in any of the following four states:

- **Configured by System:** The processor is present, and has not exceeded the number of failure threshold. It is configured by the system and is available.
- **Deconfigured by System:** The processor is present, but has exceeded the number of failure threshold. It is deconfigured by the system and is currently unavailable.
- **Manually configured:** The processor is present and available. It is configured by the user through the Service Processor menus.
- **Manually deconfigured:** The processor is present, but unavailable. It has been deconfigured by the user through the Service Processor menus.

- **Memory Configuration/Deconfiguration Menu**

This option allows the user to see and modify memory configuration.

The following is an example of the Processor Configuration/Deconfiguration Menu:

```
MEMORY CONFIGURATION/DECONFIGURATION MENU

DIMMs on Memory Card #0:

DIMMs on Memory Card #1:
  1. Configured by system (0x0)

98. Return to Previous Menu

Enter card number _AND_ DIMM number separated by a space.
1>
```

The user can manually configure or deconfigure any memory DIMM, regardless of failure status, through this Service Processor menu. The configuration process takes place during the system power-up. Therefore, the configuration displayed in STANDBY mode reflects the configuration during the last boot. To view the current configuration, access the Service Processor menu after the system boots up. When the user selects a memory DIMM, its state will toggle between configured and deconfigured. Memory DIMMs that are not present are not listed. A memory DIMM can be in any of the following four states:

- **Configured by System:** The memory DIMM is present, and has not exceeded the number of failure threshold. It is configured by the system and is available.
- **Deconfigured by System:** The memory DIMM is present, but has exceeded the number of failure threshold. It is deconfigured by the system and is currently unavailable.
- **Manually configured:** The memory DIMM is present and available. It is configured by the user through the Service Processor menus.
- **Manually deconfigured:** The memory DIMM is present, but unavailable. It has been deconfigured by the user through the Service Processor menus.

LANGUAGE SELECTION MENU

```
LANGUAGE SELECTION MENU

1. English
2. Francais
3. Deutsch
4. Italiano
5. Espanol
6. Svenska
98. Return to Previous Menu
99. Exit from Menus

1>
```

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

This menu allows selecting languages into which Service Processor and system firmware menus and messages are displayed.

CALL-IN/CALL-OUT SETUP MENU

```
CALL-IN/CALL-OUT SETUP MENU

1. Modem Configuration Menu
2. Serial Port Selection Menu
3. Serial Port Speed Setup Menu
4. Telephone Number Setup Menu
5. Call-Out Policy Setup Menu
6. Customer Account Setup Menu
7. Call-Out Test
8. Ring Indicate Power-On Menu
98. Return to Previous Menu
99. Exit from Menus

1>
```

- **Modem Configuration Menu**, see “Modem Configuration Menu.”
- **Serial Port Selection Menu**, see “Serial Port Selection Menu” on page A-20.
- **Telephone Number Setup Menu**, see “Telephone Number Setup Menu” on page A-21.
- **Call-Out Policy Setup Menu**, see “Call-Out Policy Setup Menu” on page A-23.
- **Customer Account Setup Menu**, see “Customer Account Setup Menu” on page A-24.
- **Ring Indicate Power-On Menu**, see on page A-13.

Modem Configuration Menu

The first two lines of the Modem Configuration Menu are status lines showing the current selections. Selections are made in the two section labeled Modem Ports and Modem Configuration File Name. Select the serial port that you want to activate and then select the modem configuration file for the modem on the port. If you wish to set up both serial ports with modems, make your selections one port at a time.

For information on choosing a modem configuration file, see “Sample Modem Configuration Files” on page A-42 and “Seamless Transfer of a Modem Session” on page A-47.

Modem Configuration Menu

Port 1 Modem Configuration File Name:

Port 2 Modem Configuration File Name:

To make changes, First select the port and then the configuration file name

Modem Ports:

1. Serial port 1
2. Serial port 2

Modem Configuration File Name:

3. modem_f_sp
4. modem_f0_sp
5. modem_f1_sp
6. modem_z_sp
7. modem_z0_sp
8. none

9. Save configuration to NVRAM and Configure modem

98. Return to Previous Menu

Serial Port Selection Menu

Serial Port Selection Menu

1. Serial Port 1 Call-Out:
Currently Disabled

2. Serial Port 2 Call-Out:
Currently Disabled

3. Serial Port 1 Call-In:
Currently Disabled

4. Serial Port 2 Call-In:
Currently Disabled

98. Return to Previous Menu

You may enable and/or disable the call-in and call-out functions of each serial port in any combination.

Serial Port Speed Setup Menu

Serial Port Speed Setup Menu

1. Serial Port 1 Speed:
Currently 9600
2. Serial Port 2 Speed:
Currently 9600
98. Return to Previous Menu

Serial port speed can be set for terminal performance or to accommodate modem capabilities. A speed of 9600 baud or higher is recommended. Valid serial port speeds are shown below:

50	600	4800
75	1200	7200
110	1800	9600
134	2000	19200
150	2400	38000
300	3600	57600
		115200

Telephone Number Setup Menu

This menu may be used to set or change the telephone numbers for reporting a system failure. The Service Processor allows setting or changing telephone numbers for:

- Service Center Telephone Number - The telephone number of the maintenance provider's computer.
- Customer Administration Center Telephone Number - The telephone number of the local system support provider's computer.
- Digital Pager Telephone Number - The number for a pager carried by someone who will respond to problem calls from your server.
- Customer Voice Telephone Number - The telephone number service personnel will use to reach the system user.
- Customer System Telephone Number - The telephone number to which the server's modem is connected.

Telephone Number Setup Menu

1. Service Center Telephone Number:
Currently Unassigned
2. Customer Administration Center Telephone Number:
Currently Unassigned
3. Digital Pager Telephone Number:
Currently Unassigned
4. Customer Voice Telephone Number:
Currently Unassigned
5. Customer System Telephone Number:
Currently Unassigned
98. Return to Previous Menu

1>

- **Service Center Telephone Number** is the number of the service center computer. The service center usually includes a computer that takes calls from servers with call-out capability. This computer is referred to as "the catcher." The catcher expects messages in a specific format to which Service Processor conforms. For more information about the format and catcher computers, refer to the README file in the AIX /usr/samples/syscatch directory. Contact your service provider for the correct telephone number to enter here. Until you have that number, leave this field blank.
 - **Customer Administration Center Telephone Number** is the number of the System Administration Center computer (catcher) that receives problem calls from servers. Contact your system administrator for the correct telephone number to enter here. Until you have that number, leave this field blank.
 - **Digital Pager Telephone Number** is the number for a pager carried by someone who responds to problem calls from your server. Contact your administration center representative for the correct telephone number to enter here. For test purposes, enter your telephone number here. You can change it later when testing is complete.
- Note:** Some modems, such as IBM 7857-017, are not designed for the paging function. Although they can be used for paging, they return an error message when they do not get the expected response from another modem. Therefore, even though the paging was successful, the error message causes the Service Processor to retry, continuing to place pager calls for the number of retries specified in the Call-Out policy Setup Menu. These retries result in redundant pages.

For digital pagers that require a personal Identification Number (PIN) for access, include the PIN in this field as in the following example:

```
1 800 123 4567,,,,87654
```

where the commas create pauses¹ for the voice response system, and the 87654 represents the PIN.

- **Customer Voice Telephone Number** is the telephone number of a phone near the server or answered by someone responsible for the server. This is the telephone number left on the pager for callback. For test purposes, enter your telephone number here. You can change it after testing is completed.

Customer System Telephone Number is the telephone number to which your server's modem is connected. The service or administration center representatives need this number to make direct contact with your server for problem investigation. This is also referred to as the **call-in** phone number.

Call-Out Policy Setup Menu

```
CALL-OUT POLICY SETUP MENU

1. Call-Out policy (First/All):
   Currently First
2. Remote timeout, (in seconds):
   Currently 120
3. Remote latency, (in seconds):
   Currently 2
4. Number of retries:
   Currently 2
98. Return to Previous Menu

1>
```

- **Call Out policy** may be set to 'first' or 'all'. If call out policy is set to 'first', the Service Processor stops at the **first successful** call out to one of the following numbers in the order listed:
 1. Service Center
 2. Customer Admin Center
 3. Pager

¹ The length of these pauses is set in modem register S8. The default is usually 1 or 2 seconds each.

If call out policy is set to 'all', the Service Processor attempts a call out to **all** the following numbers in the order listed:

1. Service Center
2. Customer Admin Center
3. Pager

Remote timeout and **Remote latency** are functions of your service provider's catcher computer. You should take the defaults or contact your service provider for recommended settings.

Number of retries is the number of times you want the server to retry calls that resulted in busy signals or other error messages.

Customer Account Setup Menu

Customer Account Setup Menu

1. Customer Account Number:
Currently Unassigned
2. Customer RETAIN Login UserID:
Currently Unassigned
3. Customer RETAIN Login Password:
Currently Unassigned
98. Return to Previous Menu

1>

- **Customer Account Number** is assigned by your service provider for record keeping and billing. If you have an account number, enter it here. Otherwise, leave this field blank.
- **Customer RETAIN Login UserID** and **Customer RETAIN Login Password** apply to a service function to which your service provider may or may not have access. Leave these fields blank if your service provider does not use RETAIN.

Reboot/Restart Policy Setup Menu

Reboot describes bringing the system hardware back up from scratch, for example, from a system reset or power on. The boot process ends when control passes to the operating system process.

Restart describes activating the operating system after the system hardware reinitialized. Restart must follow a successful reboot.

```
Reboot/Restart Policy Setup Menu

1. Number of reboot attempts:
   Currently 3
2. Use OS-Defined restart policy?
   Currently Yes
3. Enable supplemental restart policy?
   Currently No
4. Call-Out before restart:
   Currently Disabled
98. Return to Previous Menu

1>
```

- **Number of reboot attempts** if the server fails to successfully complete the boot process, it attempts to reboot the number of times specified. Entry values equal to or greater than 0 are valid. Only successive failed reboots attempts count, not reboots that occur after a restart attempt. At restart, the counter is set to 0.
- **Use OS-Defined restart policy** lets the Service Processor react or not react the same as the operating system to major system faults, by reading the setting of the operating system parameter **Automatically Restart/Reboot After a System Crash**. This parameter may, or may not be defined depending on the operating system or its version/level. If the operating system automatic restart setting is defined, then it may be set to respond to a major fault by restarting or by not restarting. See your operating system documentation for details on setting up operating systems automatic restarts. The default value is YES.

- **Enable supplemental restart policy** - The default setting is NO. If set to YES, the Service Processor restarts the system when the system loses control as detected by the Service Processor surveillance, and either:

1. The **Use OS-Defined restart policy** is set to NO

OR

2. The **Use OS-Defined restart policy** is set to YES and the operating system has NO automatic restart policy.

Refer to “Service Processor Reboot/Restart Recovery” on page A-29.

- **Call-Out before restart (Enabled/Disabled)** If a restart is necessary due to a system fault, you can enable the Service Processor to call out and report the event. This item is valuable if the number of these events becomes excessive, signalling a bigger problem.

Service Processor Functions and Features

The following section discusses some of the Service Processor functions and features more fully.

The 7043 Model 260 supports the following functions:

Built-in Functions	Initialization and Test	Service Processor Basic Instructions Test (BIST)
		JTAG System Chip Initialization
	Error Data Collection	BIST/POST errors and status
		Checkstop FIR data logout
		Machine check logout
	Configuration	CPU Complex validation
		VPD Collection
	System Management	Reset and Reboot on System Firmware fail
		Reboot on system failure

Local User Function	User Interface	Local async console
		Text based menus with NLS
		Operator Panel messages
	Power and Miscellaneous	Power On/Off
		Configurable Reboot Policy
	Status and Data Access	VPD
		Error data (Service Processor)
		Error data (system)
		Environmental data
	Service Processor Setup Utilities	Passwords
		Phone numbers
		Language (NLS) selection
		Call In/Call Out enable/disable
		Flash (Gold/Recovery block) Update
		Flash (Composite block) Update
		System Name
Modem Configuration		
Remote User Functions	Call Out (Call Home) Reporting	Boot failure
		OS Termination
		Surveillance failure
		Critical EPOW reporting
		Checkstop
		Machine check
	Identify system by name	Call In
		Power-on via ring-indicate
		Password/security check
		Console mirroring/Quick disconnect
Application Interface Functions	Monitor/Sense	Thermal/Voltage/fan speed
		Service Processor Flash Update(Recovery and Composite)

System Power-On Methods

- Power-on Switch - see “Operator Panel” on page 1-8.
- Service Processor Menu power-on request

You can request a power-on via the Service Processor menus from either a local or remote terminal.

If a remote terminal is to be used, the modem must be connected to serial port 1, and the operating system set up to enable a TTY login session on that port.

Refer to “Seamless Transfer of a Modem Session” on page A-47 for information on transferring modem sessions from Service Processor to the operating system.

- Unattended start mode - refer to **Enable/Disable Unattended Start Mode** on page A-12.

The Service Processor can be enabled to recover from the loss of AC power (see Enable/Disable Unattended Power-On Mode in the SYSTEM POWER CONTROL MENU). When AC power is restored, the system returns to the then current power state at the time AC loss occurred. For example, if the system was powered-on when AC loss occurred, it reboots/restarts when power is restored. If the system was powered-off when AC loss occurred, it remains off when power is restored.

- Timed power-on - refer to the shutdown `-t` command on servers using AIX.

Working in conjunction with AIX, the Service Processor in your server can operate a timer, much like the wake-up timer on your clock radio. You can set the timer so that your server powers on at a certain time after shutting down. The timer is battery operated, so power interruptions occurring while the server is off do not affect its accuracy. Refer to the shutdown `-t` command of AIX for details on setting the timer.

Because of the potential for AC power loss, the Timed Power-On function of AIX can only be assured when Unattended Power-On Mode is enabled. If a Timed Power-On event occurs during an AC power loss, and if Unattended Power-On Mode is enabled, the system starts when AC power is restored.

If Unattended Start Mode is disabled (the default), the system power state remains off when AC power is restored, regardless of the power state of the system when AC loss occurred.

- Ring Indicate Power-On

Enabling ring indicate power-on disables remote call-in. If ring indicate power-on is enabled, the server powers on at a predetermined number of rings. If the server is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the server powered on.

- Follow-up to a Failed Boot Attempt

The Service Processor initiates a power-on sequence upon detection of a failed boot attempt.

Service Processor Reboot/Restart Recovery

Reboot describes bringing the system hardware back up from scratch, for example, from a system reset or power on. The boot process ends when control passes to the operating system process.

Restart describes activating the operating system after the system hardware reinitialized. Restart must follow a successful reboot.

Failure During Boot Process: During the boot process, either initially after system power-on or upon reboot after a system failure, the Service Processor monitors the boot progress (via surveillance). If progress stops, the Service Processor can reinitiate the boot process (reboot) if enabled to do so. The Service Processor can re-attempt this process according to an entry on the Reboot/Restart Policy Setup Menu.

Failure During Normal System Operation: When the boot process completes and control transfers to the operating system (OS), the Service Processor can monitor operating system activity (see the SERVICE PROCESSOR SETUP MENU item Set Surveillance Parameters). If OS activity stops, the Service Processor can initiate a reboot/restart process based on the settings in the Service Processor Reboot/Restart Policy Setup Menu and the OS automatic restart settings (see OS documentation).

If the operating system is AIX, the menu item under SMIT for setting the restart policy is Automatically Reboot After Crash (True/False), and the default is False. When the setting is True, and if the Service Processor parameter, Use OS-Defined Restart Policy, is Yes (the default), the Service Processor takes over for AIX to reboot/restart after a Check Stop or Surveillance failure.

Service Processor Reboot/Restart Policy Controls: The operating system's automatic restart policy (see operating system documentation) indicates the OS response to a system crash. The Service Processor can be instructed to refer to that policy, or not, by the Use OS-Defined Restart Policy menu item.

If the operating system has no automatic restart policy, or if it is disabled, then the Service Processor restart policy can be controlled from the Service Processor Menus by using the Enable Supplemental Restart Policy selection.

Use OS-Defined restart policy?: The **Use OS-Defined restart policy** default setting is YES. This causes the Service Processor to refer to the OS Automatic Restart Policy setting and take action, the same action the OS would take if it could have responded to the problem causing the restart.

When this setting is NO, or if the OS did not set a policy, the Service Processor refers to Enable supplemental restart policy for its action.

Enable Supplemental Restart Policy?: The default setting is NO. If set to YES, the Service Processor restarts the system when the system loses control as detected by the Service Processor surveillance, and either:

1. The **Use OS-Defined restart policy** is set to NO

OR

2. The **Use OS-Defined restart policy** is set to YES and the operating system has NO automatic restart policy.

Refer to “Service Processor Reboot/Restart Recovery” on page A-29.

The following provides a more thorough understanding of the relations among the OS and Service Processor restart controls:

OS Automatic reboot/restart after crash setting	Service Processor to use OS-Defined restart policy?	Service Processor Enable supplemental restart policy?	System response
None	No	No ¹	
None	No	Yes	Restarts
None	Yes ¹	No ¹	
None	Yes ¹	Yes	Restarts
False ²	No	No ¹	
False ²	No	Yes	Restarts
False ²	Yes ¹	No ¹	
False ²	Yes ¹	Yes	
True	No	No ¹	
True	No	Yes	Restarts
True	Yes ¹	No ¹	Restarts
True	Yes ¹	Yes	Restarts

¹ Service Processor default

² AIX default

Service Processor System Monitoring - Surveillance

Surveillance is a function in which the Service Processor monitors the system, and the system monitors the Service Processor. This monitoring is accomplished by periodic samplings called heartbeats.

Surveillance is available during two phases:

1. System firmware bringup (automatic) and
2. Operating system runtime (optional).

System Firmware Surveillance: Provides the Service Processor with a means to detect boot failures while the system firmware is running.

System firmware surveillance is automatically enabled during system power-on. It cannot be disabled via a user selectable option.

If the Service Processor detects no heartbeats during system boot (for 7 minutes), it cycles the system power to attempt a reboot. The maximum number of retries is set from the Service Processor menus. If the fail condition repeats, the Service Processor leaves the machine powered on, logs an error and offers menus to the user. If Call-out is enabled, the Service Processor calls to report the failure and displays the operating system surveillance failure code on the operator panel.

Operating System Surveillance: Provides the Service Processor with a means to detect hang conditions, hardware or software failures while the operating system is running. It also provides the operating system with a means to detect the Service Processor failure by the lack of a return heartbeat.

Operating system surveillance is enabled by default. This is to allow the user to run operating systems that do not support this Service Processor option.

Operating system surveillance can be enabled and disabled via:

- Service Processor Menus
- Service Processor Service Aids

Three parameters must be set for operating system surveillance:

1. Surveillance enable/disable
2. Surveillance interval

This is the maximum time in minutes the Service Processor should wait for a heartbeat from the operating system before timeout.

3. Surveillance delay

This is the length of time in minutes for the Service Processor to wait from when the operating system is started to when the first heartbeat is expected.

Surveillance takes effect immediately after setting the parameters from the Service Processor menus.

If operating system surveillance is enabled (and system firmware has passed control to the operating system), and the Service Processor does not detect any heartbeats from the operating system, the Service Processor assumes the system is hung. The machine is left powered on and the Service Processor enters standby phase, displaying the operating system surveillance failure code on the operator panel. If Call-out is enabled, the Service Processor calls to report the failure.

Call Out (Call-Home)

The Service Processor can call out (Call-Home) when it detects one of the following conditions:

- System firmware surveillance failure.
- Operating system surveillance failure (if supported by Operating System).
- Critical environmental failures.
- Restarts

To enable the call out feature, you need to do the following:

- Have a modem connected to serial port 1 or 2.
- Set up the following using the Service Processor Menus or Diagnostic Service Aids:
 - Enable call out for the serial port where the modem is connected.
 - Set up serial port line speed.
 - Enter the modem configuration filename.
 - Set up site specific parameters (i.e. phone numbers for call out, call out policy, etc).
- To call out before restart, set “Call-Out before restart” to ENABLED from the Reboot/Restart Policy Setup menu.

Note: Some modems, such as IBM 7857-017, are not designed for the paging function. Although they can be used for paging, they return an error message when they do not get the expected response from another modem. Therefore, even though the paging was successful, the error message causes the Service Processor to retry, continuing to place pager calls for the number of retries specified in the Call-Out policy Setup Menu. These retries result in redundant pages.

Console Mirroring

Console mirroring allows a person on a local ASCII terminal to monitor the Service Processor activities of a remote user. Console mirroring ends when the Service Processor releases control of the serial ports to the system firmware.

System Configuration:

- Service Processor
- Modem connected to one serial port and enabled for incoming calls
- Local ASCII terminal connected to the other serial port. This local terminal may be connected directly to your server or connected through another modem.

There are two scenarios in which console mirroring can be invoked:

1. Remote session first, then local session added
 - a. Remote session already in progress.
 - b. Remote user uses the Service Processor menus to enable console mirroring, allowing both consoles to be active.
2. Local session first, then remote session added
 - a. Local session is already in progress.
 - b. The Service Processor receives a call from the remote user.
 - c. The local user selects the option to enable console mirroring. The Service Processor immediately begins mirroring Service Processor menus.

Note: A quick disconnect is accomplished by hitting the key sequence Ctrl+D on either console. Both sessions exit the Service Processor menus.

Service Processor Firmware Updates

The Service Processor EPROM may need to be updated for two different reasons:

1. The UPDATE (composite) portion of the EPROM has become corrupted.
2. The Service Processor firmware upgrades, without any corruption present.

The use of a Flash EPROM allows updates to occur without physically replacing the memory.

The firmware in your server can be updated using one of four available initiation processes:

1. Service Processor initiation
2. SMS Utilities initiation
3. Service Aids initiation
4. AIX initiation.

Each initiation method is described below. In each case, the process prompts you for your authority and shows the contents of the update media. Verify the file with which to perform the update, and follow any other instructions that may appear. After initiation, the processes are identical and automatic.

There are two areas in each firmware module that may need updating:

1. The gold code or base code or EPROM area.
2. The custom or main program or FLASH area.

Each update file contains matching gold and custom firmware, so it is not possible to update to a conflicting set.

Before the update process begins, the versions of each of the two areas of the target firmware module are compared to the versions on the update diskette. Only the area(s) that need updating are updated. In most cases, only the custom area is updated.

An update diskette can be acquired from the RS/6000 Support page on the Internet or from your service team. The Internet address is:

<http://www.rs6000.ibm.com/support/micro>

The update files must be downloaded to a DOS-formatted diskette. You should format the diskette just prior to receiving the download, to be sure it is clean. Reformatting is worth the time and effort.

Refer to the downloaded update instructions, or to the System Management Services “Config” on page 6-4 or “Display Configuration” on page 6-25 or Service Processor menus on page A-7, to determine the level of the system unit or service processor flash.

Updating Firmware from the Service Processor Menus: The Service Processor Menus are available while the server is powered off. From the Service Processor Main Menu, select Service Processor Setup to bring up a menu containing the item, Reprogram Service Processor Flash EPROM. Selecting that item starts the update process. The process requests the update diskette(s) as needed. After inserting the first diskette and informing the system, the process continues automatically. If the process requires user assistance, it is requested.

Updating Firmware from the SMS Utilities: From a powered down or reset condition, bring up the SMS Utilities and select the menu item for updating firmware. The process requests the update diskette(s) as needed. After inserting the first diskette and informing the system, the process continues automatically. If the process requires user assistance, it is requested.

Updating Firmware from the Service Aids

Note: This service aid is only supported for Online Diagnostics.: This service aid allows you to update the system or service processor flash.

Additional update and recovery instructions may be provided; also you need to know the fully qualified path and file name of the flash update image file. If the flash update image file is on a diskette, you need the AIX DOS utilities package to process the diskette. You can use the `dosdir` command to find out the name of the update image file. This service aid uses the `dosread` command to put the file into the **/var** file system.

Using this service aid to update the system or service processor flash does not save the current contents of the flash.

The flash image file will be copied in the **/var** file system. If there is not enough space in the **/var** file system for the flash update image file, an error is reported. If this occurs, exit the service aid, increase the size of the **/var** file system and retry the service aid. After the file is copied, a warning screen asks for confirmation to continue the flash update. Continuing the flash update eventually causes the system to reboot and return to the AIX login prompt. After the system unit reboots, the file **/var/update_flash_image** can be removed to conserve space in the **/var** file system.

Updating Firmware from AIX

You must delete the file `/var/update_flash_image` before proceeding.

The flash update image file must have already been placed in the `/var` file system. This could have been done with a file transfer from another server or with the `dosread` command of the AIX DOS Utilities, for example. With the flash update image in place, issuing the following AIX command

```
shutdown -u /var/*filename*.img
```

initiates the update process. Where `*filename*` is the name of the flash update image. During the process, the server powers down and reboots. You know the process is complete when the login prompt reappears.

Service Processor Logs

Service Processor Error Log: The Service Processor error logs contain error conditions detected by the Service Processor.

```
                                Error Log
19970626223337  0. Loss of Redundant Fan #5
                  40210091

Press "C" to clear error log, any other key to continue. >
```

The time stamp in this error log is Coordinated Universal Time (CUT), a.k.a. Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time.

System POST Errors: If POST (Power-On Self Test) errors occur during start-up, this error log help isolate faults when used with the diagnostics.

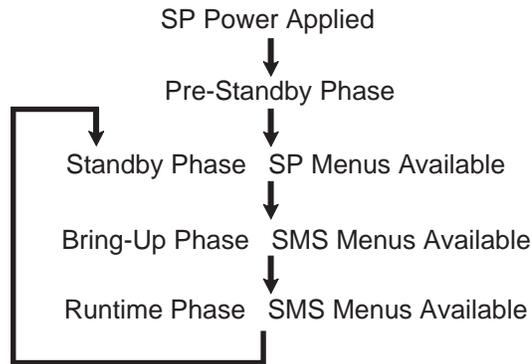
Read System POST Errors

```
Version : 0
Severity : 0
Disposition : 0
Initiator : 0
Event being reported : 0
Extended Error Log Data:
0xC2 0x00 0x84 0x09 0x00 0x00 0x00 0x00
0x20 0x00 0x00 0x00 0x00 0x00 0x72 0x74
0x63 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x28 0x03 0x00 0x05 0x00 0x01
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x49 0x42 0x4D 0x00 0x55 0x30 0x2E 0x31
0x2D 0x50 0x31 0x2D 0x58 0x31 0x00
```

(Press Return to Continue)

Service Processor Operational Phases

This section provides a high-level flow of the phases of the Service Processor (SP).



Pre-Standby Phase: This phase is entered when the server is connected to a power source. The server may or may not be fully powered on. This phase is exited when the Power-On Self Tests (POSTS) and configurations tasks are completed.

The Pre-Standby phase components are:

- SP Initialization
SP performs any necessary hardware and software initializations.
- SP POST
SP conducts Power-On Self Tests on its various work and code areas.
- SP Unattended Start Mode Checks
To assist fault recovery. If unattended start mode is set, the SP automatically reboots the server. SP does not wait for a user-input or power-on command, but moves straight through the phase and into the Bringup Phase. The unattended start mode can be reset by accessing SMS menus, or SP menus.

Standby Phase: The standby phase can be reached in two ways:

1. With the server OFF and power connected (the normal path), recognized by 0K in the LCD display.
2. With the server ON after an operating system fault, recognized by STBY or an 8-digit code in the LCD display.

In the Standby phase, the SP takes care of some automatic duties and is available for menus operation. The SP remains in the standby phase until a power-on request is detected.

The Standby phase components are:

- Modem Configuration
SP will configure the modem (if installed) so that incoming calls may be received, or outgoing calls may be placed.
- Dial In
Monitor incoming phone line to answer calls, prompt for a password, verify the password and remotely display the standby menu. The remote session can be mirrored on the local ASCII console if the server is so equipped and the user enables this function.
- Menus
The SP menus are password protected. Before you can access them you need to know either General User (Power-On Password or POP) or Privileged User (Privileged Access Password or PAP).

Bring-Up Phase: This phase is entered upon power-on, and exited upon loading of the operating system.

The Bring-up phase components are:

- Retry Request Check
The SP checks to see if the previous boot attempt failed. If two consecutive fails are detected, the SP displays an error code and places an outgoing call to notify an external party if the user has enabled this option.
- Dial Out
The SP can dial a pre-programmed telephone number in the event of an IPL failure. The SP issues an error report with the last reported IPL status indicated and any other available error information.

- Update Operator Panel

The SP displays Operator Panel data on the ASCII terminal if a remote connection is active.

- Environmental Monitoring

Environmental Monitoring is now controlled by the Service Processor instead of the base system, with expanded error recording and reporting.

- System Firmware Surveillance (Heartbeat Monitoring)

The SP monitors and time the interval between system firmware heartbeats.

- Responding to System Processor Commands

The SP responds to any command issued by the system processor.

Runtime Phase: This phase includes the tasks that the SP performs during steady-state execution of the operating system.

- Environmental Monitoring

The SP monitors voltages, temperatures and fan speeds (on some servers).

- Responding to System Processor Commands

The SP responds to any command issued by the system processor.

- Run-Time Surveillance (Heartbeat Monitoring)

If the device driver is installed and surveillance enabled, the SP monitors the system heartbeat. If the heartbeat times out, the SP places an outgoing call.

This is different from the Bringup Phase scenario where two reboot attempts are made before placing an outgoing call.

Service Processor Procedures in Service Mode

When the system is in service mode, the following service processor parameters are suspended.

- Unattended Start Mode
- Reboot/Restart Policy
- Call-Out
- Surveillance

When service mode is exited, the service processor parameters revert back to the customer settings.

Modem Configurations

Sample Modem Configuration Files

With nearly 1000 modems to choose from, and various programming standards, configuring a modem for use with the Service Processor can be challenging. The Service Processor is designed to place little demand on an attached modem, thereby increasing the setup and connection success rates. Several sample modem configurations files are supplied that either work directly with your modem, or provide a good starting point for a custom setup, if required. These files are included on the Sample Modem Configuration Files diskette and in your Service Processor firmware with the following names:

Diskette File Name	Service Processor Firmware File Name
modem_z.cfg	modem_z.sp
modem_z0.cfg	modem_z0.sp
modem_f.cfg	modem_f.sp
modem_f0.cfg	modem_f0.sp
modem_f1.cfg	modem_f1.sp

The sample modem configuration files can be found in the `/usr/share/modems` subdirectory, if your server is using AIX. A listing of each file is included at the end of this appendix.

With the following selection procedures and your modem manual, one of these configuration files should be suitable for your use.

Configuration File Selection

1. Does your modem respond to the extended command set (prefixed with &)?

If yes, go to 3

If not, continue with 2 below.

2. Does your modem respond to:

- a. ATZ reset command, or

- b. ATZn reset commands, where n can be 0, 1, etc.?

If ATZ, configuration file modem_z.cfg is recommended.

If ATZn, configuration file modem_z0.cfg is recommended.

If yes, go to 5 on page A-44

If not, continue with 3 below.

3. Does your modem command set include a test for v.42 error correction at the remote modem (often called "Auto-Reliable Mode")?

If yes, and enabled is the default, this test must be disabled. See "Customizing the Modem Configuration Files" on page A-44 for more information.

If not, continue with Step 4 on page A-44.

4. Does your modem respond to:

- a. AT&F reset command, or
- b. AT&Fn reset commands, where n can be 0, 1, etc.?

If AT&F, configuration file modem_f.cfg is recommended.

If AT&Fn, configuration file modem_f0.cfg or modem_f1.cfg is recommended, depending on which provides the hardware flow control profile.

5. Selection is complete. If you find it necessary to adjust any of these configuration files, do so with reference to the manual that came with your modem.² Choose settings that enable hardware flow control and respond to DTR.

Examples

Modem	Setup Z	Setup Z0 (Rare)	Setup F	Setup F0	Setup F1
AT&T DataPort 2001 *				X	
Bocamodem 1440E			X		
Hayes Smart Modem 300	X				
IBM 5841	X				
IBM 5843	X				
IBM 7851				X	
IBM 7852-010				X	
IBM 7855					X
USRobotics 33.6K Sportster					X
Zoom V.32			X		

*Ring interrupt only on first ring.

Customizing the Modem Configuration Files: You can create your own modem configuration file(s) or modify the samples provided. After you customize your modem configuration files, you **MUST** access them via the Configure Remote Maintenance Policy Service Aid rather than from the Service Processor menus.

² Some older modems do not respond to the commands X0 or &R1. You should edit out these commands from the modem configuration file if yours is such a modem. See your modem manual for more information.

Note: If you have already set up your serial ports, line speeds, authorizations and telephone numbers from the Service Processor menus, specify your customized modem configuration files from the service aid.

If you have not already set up your serial ports, line speeds, authorizations and telephone numbers from the Service Processor menus, you may set them up with the service aids while you specify your customized modem configuration files.

To disable Auto-Reliable Mode testing of the remote modem, use the sample modem configuration file `/usr/share/modems/modem_f.cfg` as a model to modify.

1. Find the necessary command in your modem manual.
2. Copy `/usr/share/modems/modem_f.cfg` to make a new file with the name (for example) **modem_fx.cfg**.
3. In **modem_fx.cfg**, change the line `Send "ATE0T\r"` to `Send "ATcccE0T\r"` where `ccc` is the added command found in your modem manual.

Make this change to the third line of each of the following stanzas:

- `condout`
- `condin`
- `ripo`

4. Save the changes.

Use this new modem configuration file as described at the top of this section.

Xon/Xoff Modems: Some modems of the mid-80's vintage assume software flow control (Xon/Xoff) between the computer and the modem. Modems with this design send extra characters during and after the transmitted data. The Service Processor cannot tolerate these extra characters. If your configuration includes such a modem, your functional results may be unpredictable.

The sample modem configuration files included in this package do not support these modems, so custom configuration files would be necessary. Anchor Automation 2400E is an example of such a modem.

Most newer modems do not use this design. It is recommended you use modems of newer vintage if you experience unexplainable performance problems that may be due to Xon/Xoff characters.

Ring Detection: Most modems produce an interrupt request each time they detect a ring signal. Some modems generate an interrupt only on the first ring signal they receive. AT&T DataPort 2001 is an example of such a modem.

The Service Processor uses the ring interrupt request to count the number of rings when Ring Indicate Power-On (RIPO) is enabled. If your modem produces an

interrupt on only the first ring, set Ring Indicate Power-On to start on the first ring. Otherwise, you may choose to start Ring Indicate Power-On on any ring count that makes your operation convenient.

Terminal Emulators: The Service Processor is compatible with simple ASCII terminals, and therefore compatible with most emulators. It is for the cases when a remote session is handed off from the Service Processor to the operating system that agreeing terminal emulators becomes important.

The server's operating system has some built-in terminal emulators. You may also have a commercially available terminal emulation. It is important that the local and host computers select the same or compatible terminal emulators so the key assignments and responses match. This assures successful communications and control.

For best formatting, choose line wrap in your terminal emulator setup.

Recovery Procedures: Line noises, power surges, etc., can sometimes cause your modem to enter an undefined state. When it is being used for dial in, dial out or Ring Indicate Power-On, your modem is initialized each time one of these actions is expected. If one of these environmental conditions occur after your modem has been initialized, it may be necessary to recover your modem to a known state.

If your modem communicates properly with remote users, it is probably in control. It may be wise to occasionally change some of the functional settings and then change them back, just for the sense of security that the modem is communicating, and to assure it has been initialized recently.

Another strategy, particularly if your system is difficult to access physically, is to protect it with an Uninterruptable Power Source (UPS) and a phone-line surge protector.

In case recovery becomes necessary, your system should be shut down as gracefully as possible. Disconnect the power cable and press the power button to drain capacitance while power is disconnected. Disconnect and reconnect modem power, then reconnect system power to allow complete reinitialization of your system.

Seamless Transfer of a Modem Session

There are about as many modem command variations as there are modems. The sample modem configuration files have been written to capture the largest number of workable modem settings.

The modem command `&Dn` (where 'n' is a number) generally sets the modem response to the Data Terminal Ready (DTR) signal from the server's serial port. The desired response is that the modem will hold a connection while DTR is enabled, and drop the connection when DTR is released. This is the mechanism by which the server "hangs up" on a connection under normal conditions.

Usually the command `&D2` works, but not always. The sample modem configuration files³ take this high percentage position. You should consult your modem's manual for its specific response scheme for the `&Dn` command.

There are two methods for dealing with the modem's response to DTR:

1. Recovery
2. Prevention

Before proceeding with one of these strategies, you need to determine if your server's modem is set up properly to respond to DTR.

With the remote terminal connected to serial port 1 and defined as the **primary** console device, there are two tests you can perform:

1. Does the modem **drop** the connection after the "System initialization complete" message appears at the remote terminal?

If yes, this is the correct response. The modem is set up correctly.

If no, try another &Dn setting for your server's modem. See your modem manual for this information. The &Dn command appears in three places each in three of the sample modem configuration files³.

2. Does the server's modem **disconnect** when the power drops? You can make this observation at the remote terminal by commanding your server to shutdown and power off. (The AIX command `shutdown -F` does this.) Watch for the message `NO CARRIER` on your remote terminal.

If yes, this is the correct response. The modem is set up correctly.

If no, try another &Dn setting for your server's modem. See your model manual for this information. The &Dn command appears in three places each in three of the sample modem configuration files³.

Recovery Strategy: The recovery strategy consists of making **two** calls to establish a remote session. This is the easiest solution to implement, and allows more freedom for configuring your server's serial ports.

To set up a remote terminal session, dial into the Service Processor and start the system. After the operating system is loaded and initialized, the connection will be dropped. At this point, you call the server back and the operating system answers and offer you the login prompt.

³ Only the following sample modem configuration files contain the &Dn command (in three places each):

- modem_f.cfg
- modem_f0.cfg
- modem_f1.cfg

If you are using `modem_z.cfg` or `modem_z0.cfg`, you cannot control DTR response. If your remote terminal does not disconnect after logging off, you must command the remote terminal emulator to hang up. This then breaks the connection.

Prevention Strategy: The disconnect is caused by the operating system when it initializes the **primary** console. The tests listed above are conducted with the remote terminal selected as the primary console to manifest the modem's response to DTR transitions.

If a local ASCII terminal or a graphics console is to be a permanent part of your server, then make one of them the primary console. Your remote terminal no longer experiences the connection loss.

If a local console is not a permanent part of your server, you can still assign either the unused graphics console or the unused serial port as the primary console. This gives you the desired seamless connection at your remote terminal.

If you choose to use the unused serial port as the primary console, some initialization traffic is sent to any serial device attached to that port. As a result, that serial device's connection and function could be affected. These impacts may make that port unattractive for devices other than a temporary local ASCII terminal.

Modem Configuration Samples

Sample File modem_z.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP Z
#
# FUNCTIONS: Modem configuration file for many early Hayes* compatible modems.
# This example uses the ATZ reset command to choose the factory defaults.
# This setup will work for many modems, but it is required for early vintage
# modems which respond to neither the ATZ0 reset command nor the extended (&)
# commands. Refer to your modem manual.
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#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultTO 10
CallDelay 120
# AT Attention Code           , Inserts delay in dialing commands
# Z Reset to factory defaults Q0 Turn on responses
# E0 Turn echo off           Q1 Turn off responses
# V0 Use numeric responses    S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up                 T = Tone mode. When used as T\r, it is a
#                               no op to maintain program synchronization
#                               when modem may/will echo the commands.
#
# %N Call-Out phone number   %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:  send "ATZQ0T\r"           # Reset to factory defaults.
          ignore "\0\r" or "OK\r\n" timeout 2 # Ignore modem response.
          send "ATE0T\r"           # Initialize modem: Echo OFF,
          expect "\0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
          send "ATQ0V0T\r"         # Limit response codes.
          expect "\0\r" timeout 2   # Confirm commands successful.
          send "ATS0=0\r"          # Set AutoAnswer OFF
          expect "\0\r" timeout 2   # Confirm command successful.
          done

connect:  send "ATDT%N\r"          # Tone dialing command.
          # %N from Call Home setup.

          # Expect a connection response.
          expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
          timeout 60
          done

retry:    send "A/"               # Repeat the previous command.
```

```

# Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2 # Separate from previous data.
send "+++" # Assure command mode.
delay 2 # Allow mode switching delay.
send "ATH0T\r" # Set modem switch-hook down
# (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2 # Ignore modem response.
send "ATE0Q1\r" # Initialize modem: Echo OFF,
# Disable responses.

ignore "0\r" timeout 1
done

condin:
send "ATZQ0T\r" # Reset to factory defaults.
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r" # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0T\r" # Limit response codes.
expect "0\r" timeout 2 # Confirm commands successful.
send "ATS0=2\r" # Set AutoAnswer ON
expect "0\r" timeout 2 # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1 # Ignore first ring.
expect "2\r" timeout 10 # Pick up second ring
# or timeout.
# Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:
send "ATDT%N,,,%R;\r" # %N = pager call center number
# Add enough commas to wait for
# time to enter paging number.
# %R = paging number

# Confirm successful command.
expect "0\r" timeout 60
delay 2 # Wait before hanging up.
send "ATH0T\r" # Hang up.
expect "0\r" timeout 2 # Confirm successful command.
done

ripo:
send "ATZQ0T\r" # Reset to factory defaults.
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r" # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0T\r" # Limit response codes.
expect "0\r" timeout 2 # Confirm commands successful.
send "ATS0=0\r" # Set AutoAnswer OFF
expect "0\r" timeout 2 # Confirm command successful.
done # RI Power On enabled.

error: # Handle unexpected modem
# responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done

```

Sample File modem_z0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP Z0
#
# FUNCTIONS: Modem configuration file for some early Hayes* compatible modems.
# This example uses the ATZ0 reset command to choose the factory defaults.
# This setup is recommended for modems that will respond to the ATZ0 command
# and which do not respond to the extended (&) commands. Refer to your modem
# manual.
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code           , Inserts delay in dialing commands
# Z0 Reset. Restore Profile 0 Q0 Turn on responses
# E0 Turn echo off           Q1 Turn off responses
# V0 Use numeric responses    S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up                 X0=0 Limit modem response codes
#                             T = Tone mode. When used as T\r, it is a
#                             no op to maintain program synchronization
#                             when modem may/will echo the commands.
#
#
# %N Call-Out phone number    %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:  send "ATZ0Q0T\r"           # Reset modem. Select profile 0
          ignore "\r" or "OK\r\n" timeout 2 # Ignore modem response.
          send "ATE0T\r"             # Initialize modem: Echo OFF,
          expect "\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
          send "ATQ0V0X0T\r"         # Limit response codes.
          expect "\r" timeout 2       # Confirm commands successful.
          send "ATS0=0\r"            # Set AutoAnswer OFF
          expect "\r" timeout 2       # Confirm command successful.
          done

connect:  send "ATDT%N\r"           # Tone dialing command.
          # %N from Call Home setup.

          # Expect a connection response.
          expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
          timeout 60
          done

retry:    send "A/"                # Repeat the previous command.
          # Expect a connection response.
```

```

expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2 # Separate from previous data.
send "+++" # Assure command mode.
delay 2 # Allow mode switching delay.
send "ATH0T\r" # Set modem switch-hook down
# (i.e., hang up).
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0Q1\r" # Initialize modem: Echo OFF,
# Disable responses.

ignore "0\r" timeout 1
done

condin: send "ATZ0Q0T\r" # Reset modem. Select profile 0
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r" # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r" # Limit response codes.
expect "0\r" timeout 2 # Confirm commands successful.
send "ATS0=2\r" # Set AutoAnswer ON
expect "0\r" timeout 2 # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1 # Ignore first ring.
expect "2\r" timeout 10 # Pick up second ring
# or timeout.
# Expect a connection response.

expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page: send "ATDT%N,,,%R;\r" # %N = pager call center number
# Add enough commas to wait for
# time to enter paging number.
# %R = paging number

# Confirm successful command.

expect "0\r" timeout 60
delay 2 # Wait before hanging up.
send "ATH0T\r" # Hang up.
expect "0\r" timeout 2 # Confirm successful command.
done

ripo: send "ATZ0Q0T\r" # Reset modem. Select profile 0
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r" # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r" # Limit response codes.
expect "0\r" timeout 2 # Confirm commands successful.
send "ATS0=0\r" # Set AutoAnswer OFF
expect "0\r" timeout 2 # Confirm command successful.
done # RI Power On enabled.

error: # Handle unexpected modem
# responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done

```

Sample File modem_f.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F reset command to choose the factory defaults.
# This set up is preferred for modems with extended (&) commands. For early
# vintage modems, setup Z or Z0 is recommended. If your modem responds to
# the extended (&) commands and to factory default choices (&Fn), setup file
# F0 or F1 is recommended.
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code , Inserts delay in dialing commands
# &F Reset to default profile Q0 Turn on responses
# E0 Turn echo off Q1 Turn off responses
# V0 Use numeric responses S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up X0=0 Limit modem response codes
#
# T = Tone mode. When used as T\r, it is a
# no op to maintain program synchronization
# when modem may/will echo the commands.
#
# &C1 Detect CD &D2 Respond to DTR (often the default)
#
# %N Call-Out phone number %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout: send "AT&FQ0T\r" # Reset to factory defaults.
         ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
         send "ATE0T\r" # Initialize modem: Echo OFF,
         expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
         send "ATQ0V0X0T\r" # Limit response codes.
         expect "0\r" timeout 2 # Confirm commands successful.
         send "ATS0=0\r" # Set AutoAnswer OFF
         expect "0\r" timeout 2 # Confirm command successful.
         send "AT&C1&D2\r" # Detect carrier and DTR.
         expect "0\r" timeout 2 # Confirm command successful.
         done

connect: send "ATDT%N\r" # Tone dialing command.
         # %N from Call Home setup.

         # Expect a connection response.
         expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
         timeout 60
```

```

done

retry:    send "A/"                                # Repeat the previous command.

                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2                                        # Separate from previous data.
send "+++"                                    # Assure command mode.
delay 2                                        # Allow mode switching delay.
send "ATH0T\r"                                # Set modem switch-hook down
                                                # (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2             # Ignore modem response.
send "ATEOQ1\r"                              # Initialize modem: Echo OFF,
                                                # Disable responses.

ignore "0\r" timeout 1
done

condin:   send "AT&FQ0T\r"                      # Reset to factory defaults.
ignore "0\r" or "OK\r\n" timeout 2          # Ignore modem response.
send "ATE0T\r"                              # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2          # Enable responses (Numeric),
send "ATQ0V0X0T\r"                          # Limit response codes.
expect "0\r" timeout 2                      # Confirm commands successful.
send "ATS0=2\r"                              # Set AutoAnswer ON
expect "0\r" timeout 2                      # Confirm command successful.
send "AT&C1&D2\r"                            # Detect carrier and DTR.
expect "0\r" timeout 2                      # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1              # Ignore first ring.
expect "2\r" timeout 10                     # Pick up second ring
                                                # or timeout.
                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:     send "ATDT%N,,,%R;\r"              # %N = pager call center number
                                                # Add enough commas to wait for
                                                # time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
expect "0\r" timeout 60
delay 2                                        # Wait before hanging up.
send "ATH0T\r"                                # Hang up.
expect "0\r" timeout 2                      # Confirm successful command.
done

ripo:    send "AT&FQ0T\r"                      # Reset to factory defaults.
ignore "0\r" or "OK\r\n" timeout 2          # Ignore modem response.
send "ATE0T\r"                              # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2          # Enable responses (Numeric),
send "ATQ0V0X0T\r"                          # Limit response codes.
expect "0\r" timeout 2                      # Confirm commands successful.
send "ATS0=0\r"                              # Set AutoAnswer OFF
expect "0\r" timeout 2                      # Confirm command successful.
send "AT&C1&D2\r"                            # Detect carrier and DTR.
expect "0\r" timeout 2                      # Confirm command successful.
done                                          # RI Power On enabled.

error:   # Handle unexpected modem
         # responses.

```

```
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"  
delay 2  
done
```

Sample File modem_f0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F0
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F0 reset command to choose the factory defaults.
# This set up is preferred for modems with extended (&) commands. For early
# vintage modems, setup Z or Z0 is recommended. If your modem responds to
# the extended (&) commands and to factory default choices (&Fn), but doesn't
# work properly with this setup file, setup F1 is recommended.
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code , Inserts delay in dialing commands
# &F0 Reset. Restore profile 0 Q0 Turn on responses
# E0 Turn echo off Q1 Turn off responses
# V0 Use numeric responses S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up X0=0 Limit modem response codes
#
# T = Tone mode. When used as T\r, it is a
# no op to maintain program synchronization
# when modem may/will echo the commands.
#
# &C1 Detect CD &D2 Respond to DTR (often the default)
# &R1 Ignore RTS (CTS)
#
# %N Call-Out phone number %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout: send "AT&F0Q0T\r" # Reset modem. Select profile 0
         ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
         send "ATE0T\r" # Initialize modem: Echo OFF,
         expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
         send "ATQ0V0X0T\r" # Limit response codes.
         expect "0\r" timeout 2 # Confirm commands successful.
         send "ATS0=0\r" # Set AutoAnswer OFF
         expect "0\r" timeout 2 # Confirm command successful.
         send "AT&C1&D2&R1\r" # Detect carrier and DTR,
         # Ignore RTS.
         expect "0\r" timeout 2 # Confirm command successful.
         done

connect: send "ATDT%N\r" # Tone dialing command.
         # %N from Call Home setup.
         # Expect a connection response.
```

```

expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

retry:    send "A/"                      # Repeat the previous command.

                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2                      # Separate from previous data.
send "+++"                  # Assure command mode.
delay 2                      # Allow mode switching delay.
send "ATH0T\r"              # Set modem switch-hook down
                              # (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2 # Ignore modem response.
send "ATE0Q1\r"             # Initialize modem: Echo OFF,
                              # Disable responses.

ignore "0\r" timeout 1
done

condin:  send "AT&F0Q0T\r"        # Reset modem. Select profile 0
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r"                # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r"            # Limit response codes.
expect "0\r" timeout 2        # Confirm commands successful.
send "ATS0=2\r"                # Set AutoAnswer ON
expect "0\r" timeout 2        # Confirm command successful.
send "AT&C1&D2&R1\r"          # Detect carrier and DTR,
                              # Ignore RTS.

expect "0\r" timeout 2        # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1    # Ignore first ring.
expect "2\r" timeout 10           # Pick up second ring
                                  # or timeout.
                                  # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:    send "ATDT%N,,,%R;\r"      # %N = pager call center number
                                                # Add enough commas to wait for
                                                # time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
expect "0\r" timeout 60
delay 2                      # Wait before hanging up.
send "ATH0T\r"                # Hang up.
expect "0\r" timeout 2        # Confirm successful command.
done

ripo:    send "AT&F0Q0T\r"        # Reset modem. Select profile 0
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r"                # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r"            # Limit response codes.
expect "0\r" timeout 2        # Confirm commands successful.
send "ATS0=0\r"                # Set AutoAnswer OFF
expect "0\r" timeout 2        # Confirm command successful.
send "AT&C1&D2&R1\r"          # Detect carrier and DTR,
                              # Ignore RTS.

expect "0\r" timeout 2        # Confirm command successful.

```

```
done                                # RI Power On enabled.
error:                               # Handle unexpected modem
                                     # responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done
```

Sample File modem_f1.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F1
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F1 reset command to choose the factory defaults.
# This set up is for modems with extended (&) commands and which do not work
# properly with setup F0. For early vintage modems, setup Z or Z0 is
# recommended.
#
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# disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code           , Inserts delay in dialing commands
# &F1 Reset. Restore profile 1 Q0 Turn on responses
# E0 Turn echo off           Q1 Turn off responses
# V0 Use numeric responses    S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up                 X0=0 Limit modem response codes
#                             T = Tone mode. When used as T\r, it is a
#                             no op to maintain program synchronization
#                             when modem may/will echo the commands.
#
# &C1 Detect CD               &D2 Respond to DTR (often the default)
# &R1 Ignore RTS (CTS)
#
# %N Call-Out phone number   %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:  send "AT&F1Q0T\r"           # Reset modem. Select profile 1
          ignore "\0\r" or "OK\r\n" timeout 2 # Ignore modem response.
          send "ATE0T\r"             # Initialize modem: Echo OFF,
          expect "\0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
          send "ATQ0V0X0T\r"         # Limit response codes.
          expect "\0\r" timeout 2     # Confirm commands successful.
          send "ATS0=0\r"             # Set AutoAnswer OFF
          expect "\0\r" timeout 2     # Confirm command successful.
          send "AT&C1&D2&R1\r"       # Detect carrier and DTR,
          # Ignore RTS.
          expect "\0\r" timeout 2     # Confirm command successful.
          done

connect:  send "ATDT%N\r"            # Tone dialing command.
          # %N from Call Home setup.

          # Expect a connection response.
          expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
```

```

timeout 60
done

retry:    send "A/"                                # Repeat the previous command.

                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2                                        # Separate from previous data.
send "+++"                                    # Assure command mode.
delay 2                                        # Allow mode switching delay.
send "ATH0T\r"                                # Set modem switch-hook down
                                                # (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2             # Ignore modem response.
send "ATE0Q1\r"                               # Initialize modem: Echo OFF,
                                                # Disable responses.

ignore "0\r" timeout 1
done

condin:   send "AT&F1Q0T\r"                    # Reset modem. Select profile 1
ignore "0\r" or "OK\r\n" timeout 2          # Ignore modem response.
send "ATE0T\r"                                # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2          # Enable responses (Numeric),
send "ATQ0V0X0T\r"                          # Limit response codes.
expect "0\r" timeout 2                      # Confirm commands successful.
send "ATS0=2\r"                              # Set AutoAnswer ON
expect "0\r" timeout 2                      # Confirm command successful.
send "AT&C1&D2&R1\r"                        # Detect carrier and DTR,
                                                # Ignore RTS.
expect "0\r" timeout 2                      # Confirm command successful.
done

waitcall: ignore "2\r" timeout 1              # Ignore first ring.
          expect "2\r" timeout 10            # Pick up second ring
                                                # or timeout.
                                                # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done

page:     send "ATDT%N,,,%R;\r"              # %N = pager call center number
                                                # Add enough commas to wait for
                                                # time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
expect "0\r" timeout 60
delay 2                                        # Wait before hanging up.
send "ATH0T\r"                                # Hang up.
expect "0\r" timeout 2                      # Confirm successful command.
done

ripo:    send "AT&F1Q0T\r"                    # Reset modem. Select profile 1
ignore "0\r" or "OK\r\n" timeout 2          # Ignore modem response.
send "ATE0T\r"                                # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2          # Enable responses (Numeric),
send "ATQ0V0X0T\r"                          # Limit response codes.
expect "0\r" timeout 2                      # Confirm commands successful.
send "ATS0=0\r"                              # Set AutoAnswer OFF
expect "0\r" timeout 2                      # Confirm command successful.
send "AT&C1&D2&R1\r"                        # Detect carrier and DTR,
                                                # Ignore RTS.
expect "0\r" timeout 2                      # Confirm command successful.
done                                          # RI Power On enabled.

```

```
error:                                     # Handle unexpected modem
                                           # responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done
```

Appendix B. 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 B-1 and Table B-2.

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

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

Field	Description
R2 - R3	Device/FRU unique failure reason codes.

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

<i>Table B-3 (Page 2 of 3). Current PCI 2.1 Class Code Definition</i>		
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 B-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 B-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

<i>Table B-4 (Page 2 of 2). S2-S3-S4 Definition for devices/FRUs not defined in the PCI specification</i>		
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 ² C 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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