

pSeries 640 Model B80



Service Guide

Second Edition (September 2001)

Before using this information and the product it supports, read the information in "Safety Notices" on page xiii, Appendix A, "Environmental Notices" on page 363, and Appendix B, "Notices" on page 365.

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Safety Notices

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

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

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For a translation of the safety notices contained in this book, see the *System Unit Safety Information*, order number SA23-2652.

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.

CAUTION:

This unit has more than one power cord. To reduce the risk of electrical shock, disconnect two power supply cords before servicing.

DANGER

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

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.

Data Integrity and Verification

— Notice —

IBM computer systems contain mechanisms designed to reduce the possibility of undetected data corruption or loss. This risk, however, cannot be eliminated. Users who experience unplanned outages, system failures, power fluctuations or outages, or component failures must verify the accuracy of operations performed and data saved or transmitted by the system at or near the time of the outage or failure. In addition, users must establish procedures to ensure that there is independent data verification before relying on such data in sensitive or critical operations. Users should periodically check the IBM support websites for updated information and fixes applicable to the system and related software.

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 *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 previous training on the pSeries 640 Model B80.

ISO 9000

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

Online Publications

RS/6000 and pSeries publications are available online. To access the online books, visit our Web site at: http://www.rs6000.ibm.com/resource/hardware_docs/

Related Publications

The following publications provide additional information about your system unit:

- The *System Unit Safety Information*, order number SA23-2652, contains translations of safety information used throughout this book.
- The *pSeries 640 Model B80 Installation Guide*, order number SA38-0579, contains information on how to set up and cable the system, install and remove options, and verify system operation.
- The *pSeries 640 Model B80 User's Guide*, order number SA38-0580, contains information on how to use the system, use diagnostics, use service aids, and verify system operations.
- The *Diagnostic Information for Multiple Bus Systems*, order number SA38-0509, contains diagnostic information, service request numbers (SRNs), and failing function codes (FFCs).
- The *Adapter, Device, and Cable Information for Multiple Bus Systems*, order number SA38-0516, contains information about adapters, devices, and cables for

your system. This manual is intended to supplement the service information found in the *Diagnostic Information for Multiple Bus Systems*.

- The *Site and Hardware Planning Guide*, order number SA38-0508, contains information to help you plan your installation.
- The *Network Installation Management Guide and Reference*, order number SC23-4113, contains information describing the installation of the AIX operating system, version 4.3, and optional software on one or more diskless, dataless, and standalone machines from a central server.
- The *PCI Adapter Placement Reference*, order number SA38-0538, contains information regarding slot restrictions for adapters that can be used in this system.

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- IBM
- pSeries 640 Model B80
- RS/6000
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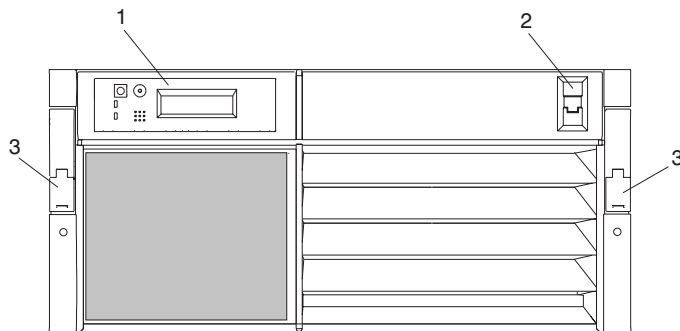
Chapter 1. Reference Information

The 7026 Model B80 is a rack-mounted system. The system unit can be configured as a 1 to 4-way system symmetric multi-processing (SMP) system. The system unit supports the following:

- Two processor cards (maximum) (choice of a 375 Mhz or 450 Mhz card speed)
- Two memory cards
- 16 pairs (32) memory modules
- Five PCI adapters
- Four hot swap disk drives (Ultra2 SCSI)
- One 5 1/4 inch media bay

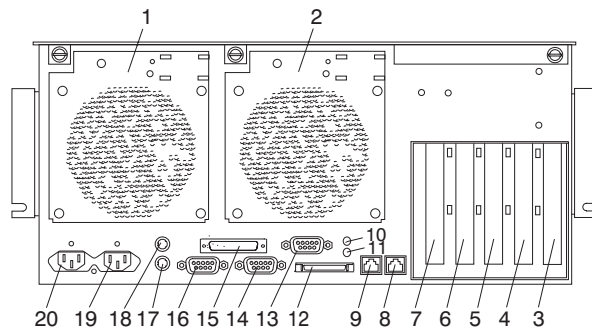
System Unit Component Locations

Front View



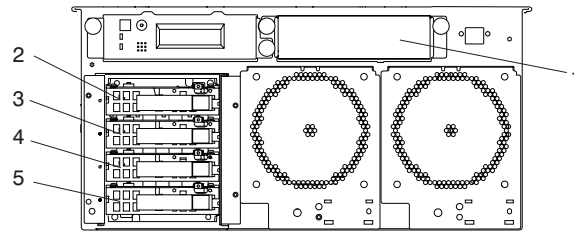
Number	Component Description
1	Operator Panel
2	Serial Port 1 (RJ-45 Connector)
3	System Unit Rack Lock Release

Rear View



Number	Component Description
1	System Fan #3
2	System Fan #4
3	PCI Adapter Slot 1 (64-Bit)
4	PCI Adapter Slot 2 (64-Bit)
5	PCI Adapter Slot 3 (64-Bit)
6	PCI Adapter Slot 4 (64-Bit)
7	PCI Adapter Slot 5 (32-Bit)
8	RJ45 Ethernet Connector 1
9	RJ45 Ethernet Connector 2
10	Power LED (Green)
11	Attention/Fault LED (amber)
12	External SCSI Connector
13	Serial Port 3 Connector
14	Serial Port 2 Connector
15	Parallel Port Connector
16	Serial Port 1 Connector (Rear)
17	Keyboard Connector
18	Mouse Connector
19	Power Supply #2 Receptacle (ac connector shown)
20	Power Supply #1 Receptacle (ac connector shown)

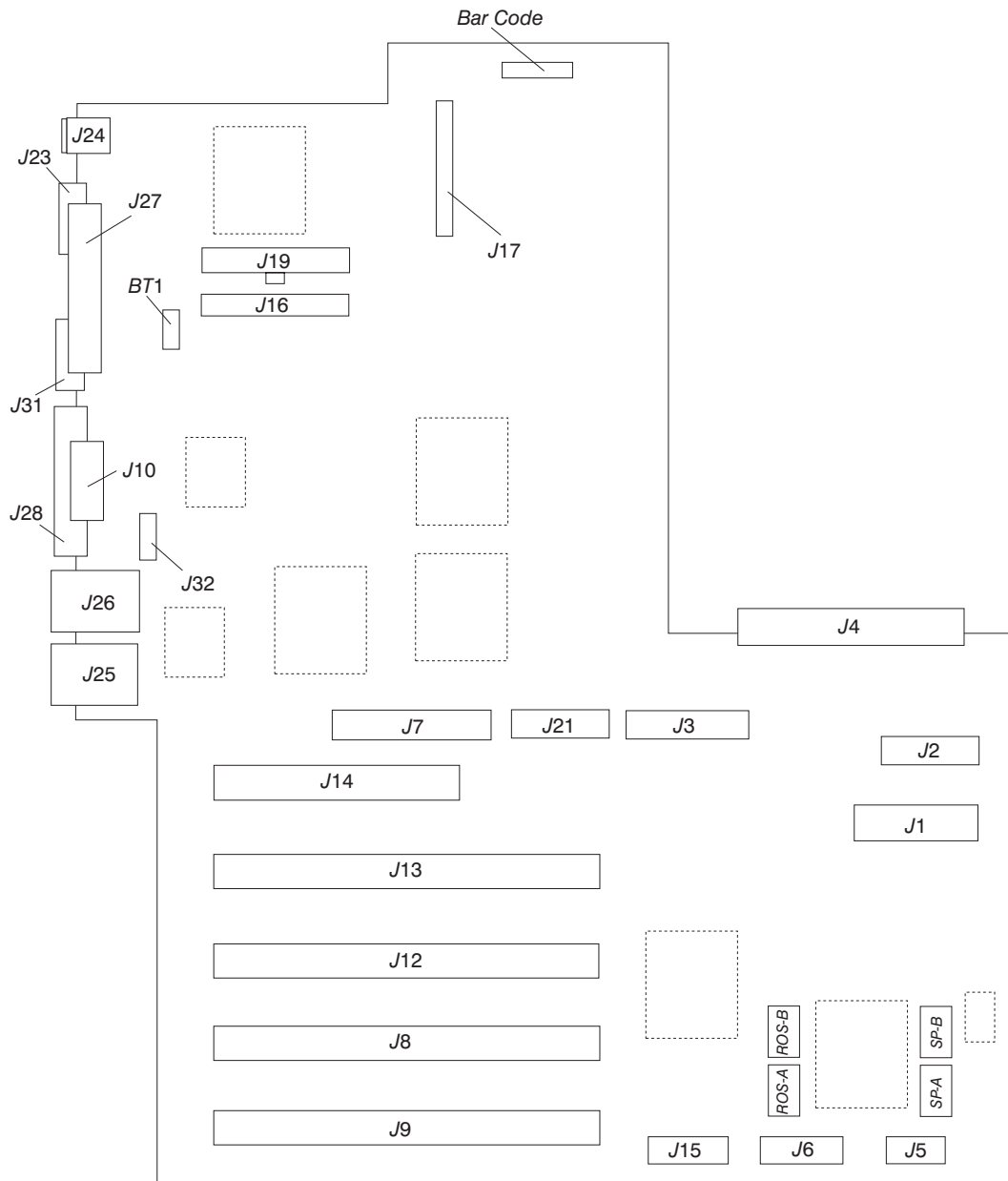
SCSI IDs and Bay Locations



Number	Bay Location	Description	SCSI ID
1	Bay D01	Media Bay	SCSI ID 0
2	Bay D02	Disk Drive	SCSI ID 8
3	Bay D03	Disk Drive	SCSI ID 9
4	Bay D04	Disk Drive	SCSI ID 10
5	Bay D05	Disk Drive	SCSI ID 11

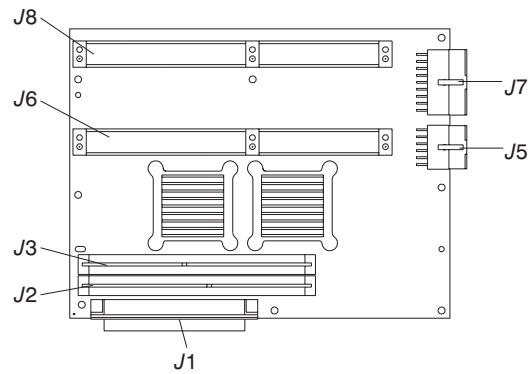
Note: The SCSI bus IDs listed are the recommended values. The SCSI IDs shown for media devices indicate how the devices are set when shipped from the factory. Field installations might not comply with these recommendations.

I/O Board Component Locations



Number	Component Description
BT1	Battery Socket Connector
J1	Operator Panel Connector
J2	SCSI I ² C Disk Drive Connector
J3	I/O Fan Connector
J4	I/O Board Connector to System Board
J5	VPD Module Connector
J6	ESP External Connector
J7	Internal SCSI Connector
J8	64-bit PCI Connector (3.3V Keyed)
J9	64-bit PCI Connector (3.3V Keyed)
J10	Serial Port 3 Connector
J12	64-bit PCI Connector (5.0V Keyed)
J13	64-bit PCI Connector (5.0V Keyed)
J14	32-bit PCI Connector (5.0V Keyed)
J15	Service Processor External Connector
J16	Power Supply Controller Connector
J17	Manufacturing Test Connector (Manufacturing Use Only)
J19	Power Supply Connector
J21	Serial Port 1 I/O Board Connector
J23	Serial Port 1 Connector (Rear)
J24	Keyboard Connector (Bottom Connector) Mouse (Top Connector)
J25	RJ45 Ethernet Connector
J26	RJ45 Ethernet Connector
J27	Parallel Port Connector
J28	External SCSI Connector
J31	Serial Port 2 Connector
J32	LEDs Connector
ROS-A	I/O Board EEPROM
ROS-B	I/O Board EEPROM
SP-A	I/O Board EEPROM
SP-B	I/O Board EEPROM

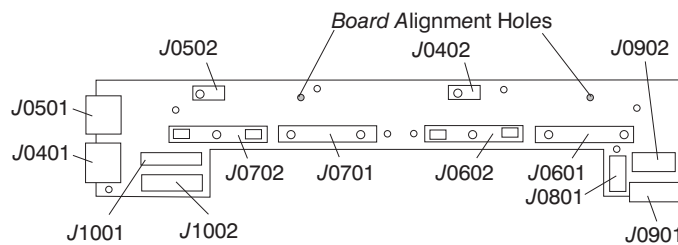
System Board Locations



Number	Component Description
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 #1 (Primary)
J7	Power supply connector
J8	Processor card connector #2

Power Distribution Board Component Locations

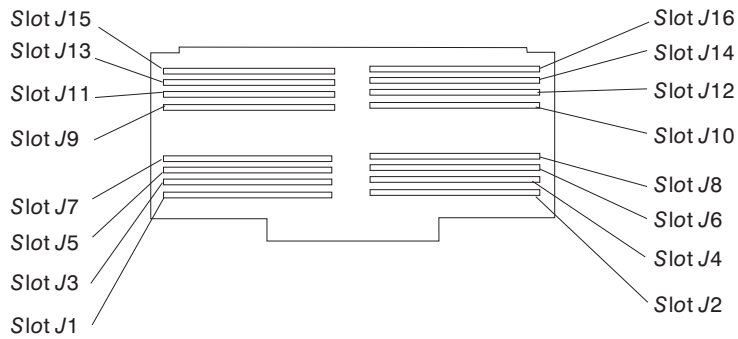
The following illustration shows the power distribution board for both ac and dc power.



The following table contains the component J number and description for both the ac and dc power distribution boards.

Number	Component Description
J0401	Power Supply #2 Input Receptacle
J0402	Power Supply #2 Connector
J0501	Power Supply #1 Input Receptacle
J0502	Power Supply #1 Connector
J0601	Power Supply #2 Connector
J0602	Power Supply #2 Connector
J0701	Power Supply #1 Connector
J0702	Power Supply #1 Connector
J0901	Power Connector to System Board
J0902	Power Connector to System Board
J0801	Power Connector to Media Device and Disk Drives
J1001	Power Connector to I/O Board
J1002	Power Connector to I/O Board

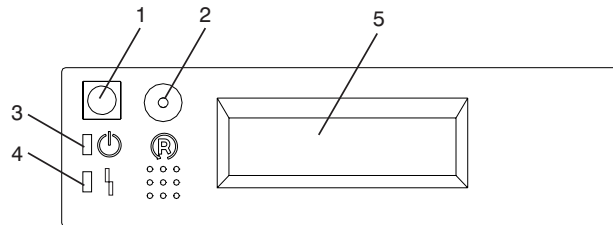
Memory Card Locations



Note: Memory modules must be installed in pairs and in the correct slot configuration. For example, slots J1 and J2, J3 and J4, J5 and J6, and so on are considered slot pairs. However, you can skip paired slots; for example, if slots J1 and J2 are populated, you can populate slots J5 and J6 without first populating slots J3 and J4.

Reading the Operator Panel Display and System LEDs

The following illustration shows the component location on the operator panel.

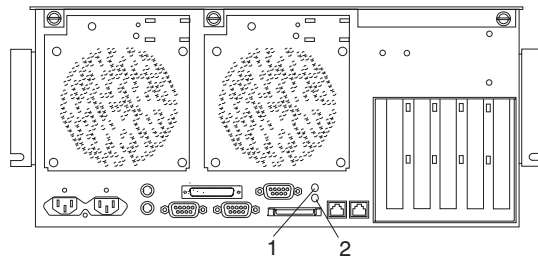


Number	Component Description
1	Power-On Switch
2	Reset Switch
3	Power-On LED(green)
4	Attention/Fault LED and System Identify LED (amber)
5	Operator Panel Display

The following table describes the function of the operator panel components. The numbers in the number column correspond to the numbers in the above illustration.

Number	Component Name	Component Description
1	Power-On Switch	Turns the system drawer's power on and off.
2	Reset Switch	Its function depends upon the operating system.
3	Power-On LED	Glows green when the system drawer is powered on.
4	Attention/Fault and System Identify	An LED that glows amber when the system is in the following states: <ul style="list-style-type: none"> • Normal State - LED is off • Fault State - LED is on solid • Identify State - LED is blinking
5	Operator Panel Display	Displays current status of system drawer startup, or diagnostic information in the event of a hardware problem.

The Model B80 also has LEDs located on the rear of the chassis. The following illustrations shows the location of the LEDs.



The following table describes the function of each LED.

Number	Component Name	Component Description
1	Power-On LED	Green LED that glows when the system drawer is powered on.
2	Attention/Fault and System Identify	Amber LED that glows when the system is in the following states: <ul style="list-style-type: none"> • Normal State - LED is off • Fault State - LED is on solid • Identify State - LED is blinking

Resetting the Attention/Fault Indicator (Amber LED)

The Attention/Fault Indicator is turned off when a Log Repair Action is performed. If the serviceable event was not a result of an error log entry, use the Log Repair Action task to turn off the attention/fault indicator.

Use the following example to run this task directly from the AIX command line:

```
/usr/lpp/diagnostics/bin/usysfault [-s normal]
```

Flag Description

-s Normal, sets the Attention/Fault Indicator to the normal state.

When this command is used without the -s flag, the current state of the indicator is displayed.

System Identify Indicator (Amber LED)

The System Identify Indicator is used to help physically identify the system in a large equipment room.

Use the following example to run this task directly from the AIX command line:

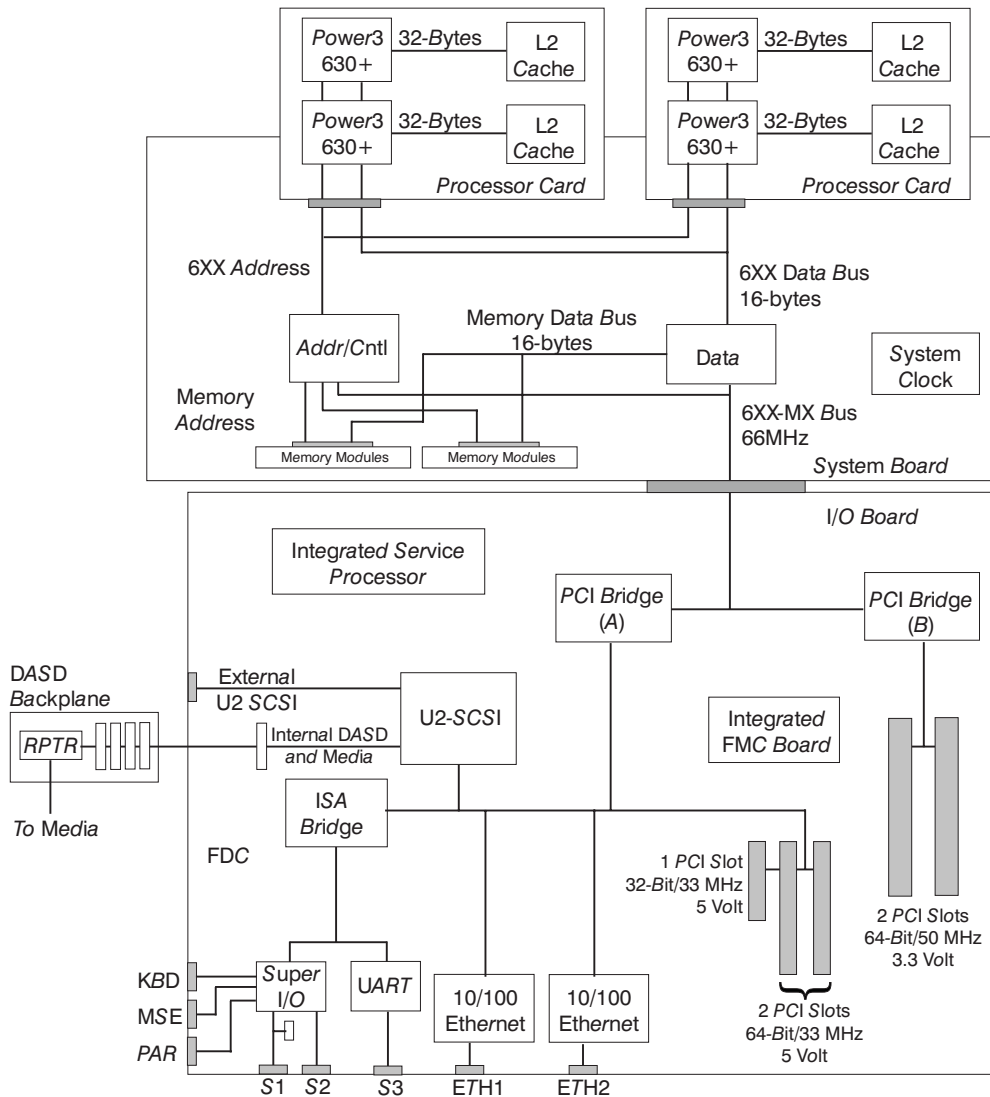
```
/usr/lpp/diagnostics/bin/usysident [-s {normal | identify}]
```

Flag	Description
-s {normal identify}	Sets the state of the System Identify Indicator to either normal or identify.

When this command is used without the -s flag, the current state of the indicator displays.

For more information refer to the *Introduction to Task and Service Aids* chapter in the *Diagnostic Information for Multiple Bus Systems*.

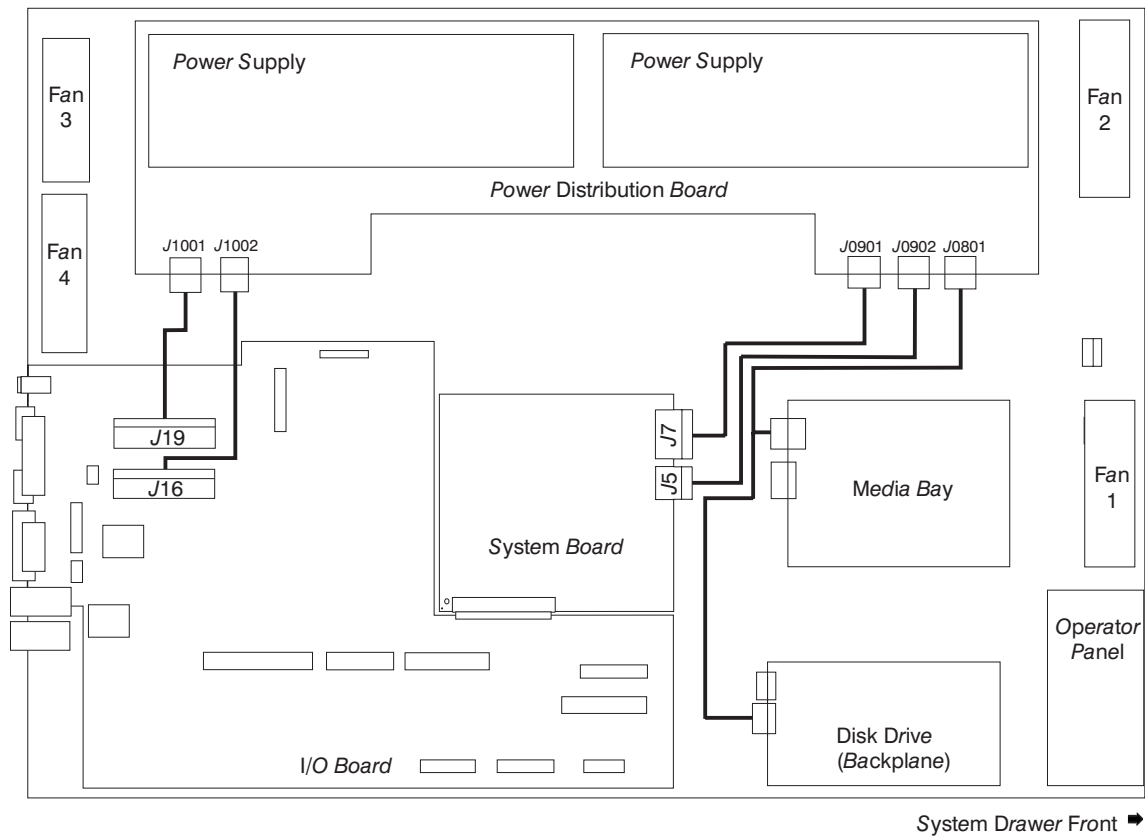
System Logic Flow Diagram



System Cables

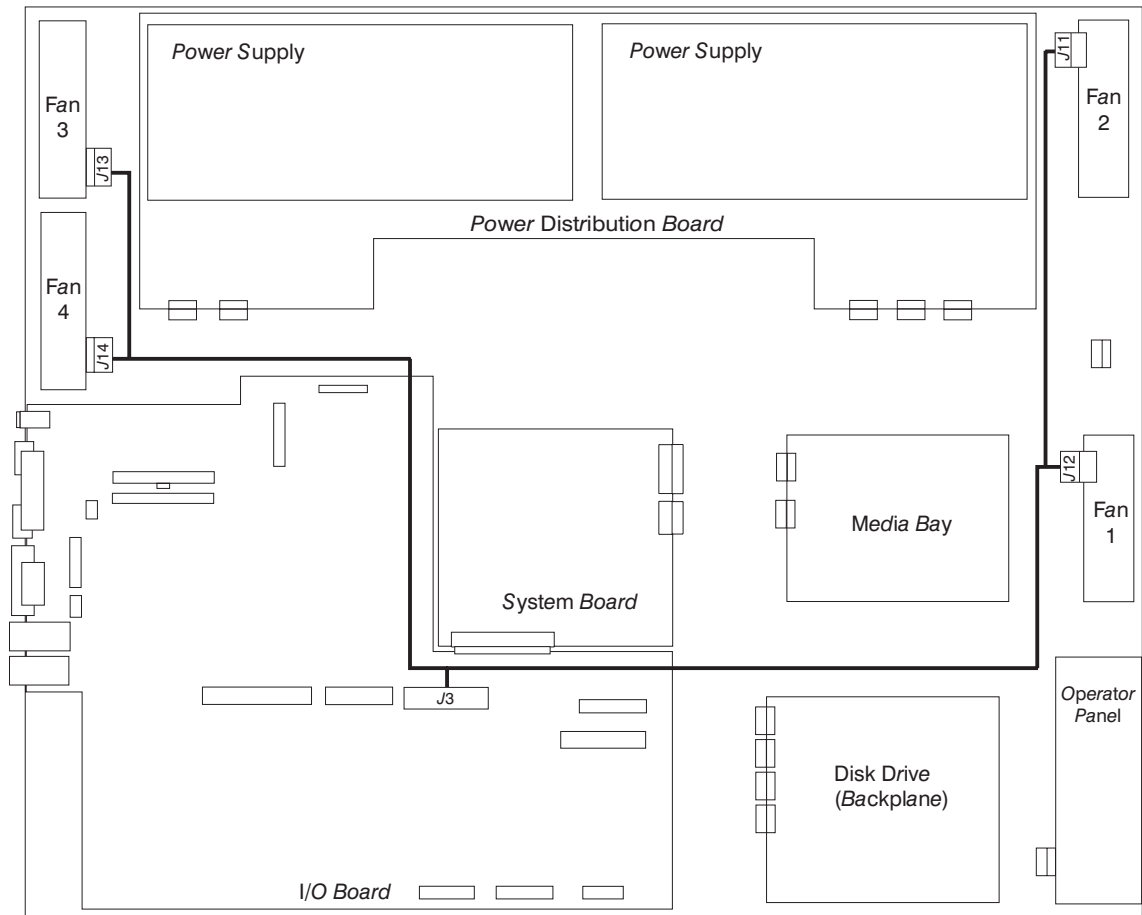
The following are cable routing diagrams. The diagrams are broken out into three categories in order to simplify the tracking of each cable beginning and ending connections.

Power Cable Routing Diagram



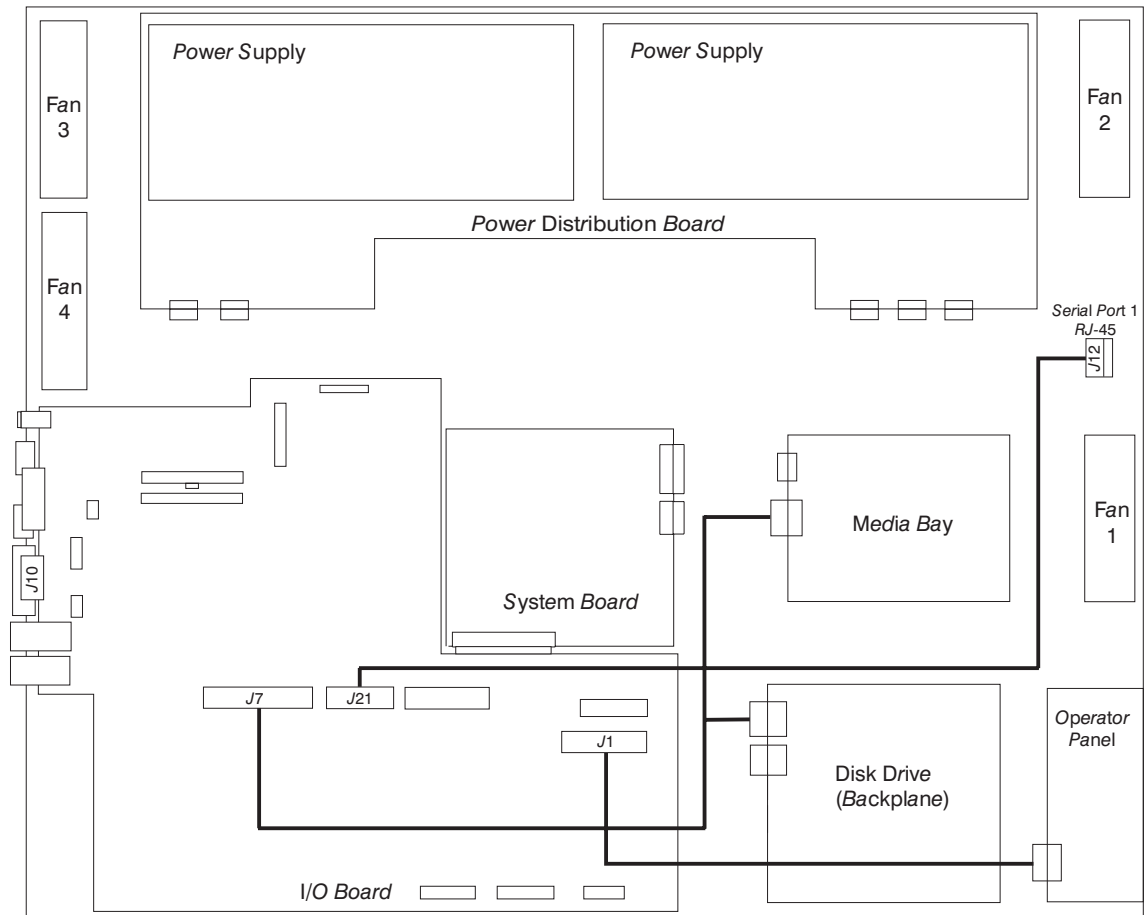
Power Distribution Board Connector Number	Destination Board Connector Number
J1001	I/O Board Connector J19
J1002	I/O Board Connector J16
J0901	System Board Connector J7
J0902	System Board Connector J5
J0801	4-Pack Backplane Connector

Fan Cable Routing Diagram



I/O Board Connector	Fan Number and Connector Number
I/O Board Connector J3	Fan 1, Connector J12
I/O Board Connector J3	Fan 2, Connector J11
I/O Board Connector J3	Fan 3, Connector J13
I/O Board Connector J3	Fan 4, Connector J14

Signal Cable Routing Diagram



I/O Board Connector	Destination Board Connector Number
J7	4-pack Backplane and Media Bay
J1	Operator Panel
J21	Serial Port 1 (Front J12)

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 location code is an alphanumeric string of variable length, consisting of a series of location identifiers, separated by a dash (-), or slash (/), or a pound sign (#) character. The series is hierarchical; that is, each location identifier in the string is a physical or logical 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.
- The # (pound sign) separator character indicates a cable connection between a connector and parent.

The following are examples:

- P1-C1 identifies processor card C1 plugged into planar P1.

- P1-M1 identifies memory card M1 plugged into planar P1.
- P2/S1 identifies serial port 1 controller on I/O board P2 or the connector for serial port 1.
- P1-K1 identifies a keyboard attached to connector K1 on planar P1.
- P2/Z1 identifies an integrated SCSI port controller on planar P2 which drives connector Z1.
- P2-Z1-... points to the actual SCSI bus and devices attached to Z1.
- P1-I2#E3 identifies; the cable attached to Ethernet controller 3 plugged into slot 2 (I2) on planar P1.

The . (period) identifies sub locations (DIMMs on a memory card or SCSI addresses). The following are examples:

- P1-M1.4 identifies memory DIMM 4 on memory card 1 plugged into planar P1.
- P1-C1.1 identifies processor 1 on processor card 1 plugged into planar P1.
- P2-Z1-A3.1 identifies a SCSI device with SCSI address of LUN 1 at SCSI ID 3 attached to SCSI bus 1, which is integrated on planar P2.
- P2.1 identifies a riser card plugged into planar P2.
- P1-I2#E3.2 identifies the second in a series of cables attached to Ethernet controller 3 plugged into slot 2 (I2) on planar P1.

Depending on the AIX and firmware levels, AIX diagnostics may include the extended location information when identifying a planar or card. The extended location information or cable information is always included when identifying a cable or connector. Location codes with extended location information that are displayed without a description identifying the devices always identify the cable attached to the port.

AIX Location Codes

The basic formats of the AIX location codes are as follows:

- 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 follows:

```
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 only with AB-CD.

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). The location codes therefore uniquely identify multiple adapters on individual PCI cards.

EF is the connector ID, used to identify the adapter's connector to which a resource is attached.

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 identifies either 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 devices, the location code is defined as follows:

```

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

```

Where:

- AB-CD-EF are the same as non-SCSI devices.
- G defines the control unit address of the device. Values of 0 to 15 are valid.
- H defines the logical unit address of the device. Values of 0 to 255 are valid.

A bus location code is also generated as '00-XXXXXXXX', where XXXXXXXXX is equivalent to the node's unit address.

Examples of physical location codes displayed by AIX are as follows:

- First processor card plugged into planar P1:

P1-C1

- Second memory card plugged into planar P1:

P1-M2

- Memory module 12 on second memory card plugged into planar P1.

P1-M2.12

Examples of AIX location codes displayed are:

- Integrated PCI adapter:

10-60	Ethernet
10-80	Ethernet
10-88	Integrated SCSI Port 1 (internal)
10-89	Integrated SCSI Port 2 (external)

- Pluggable PCI adapters:

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

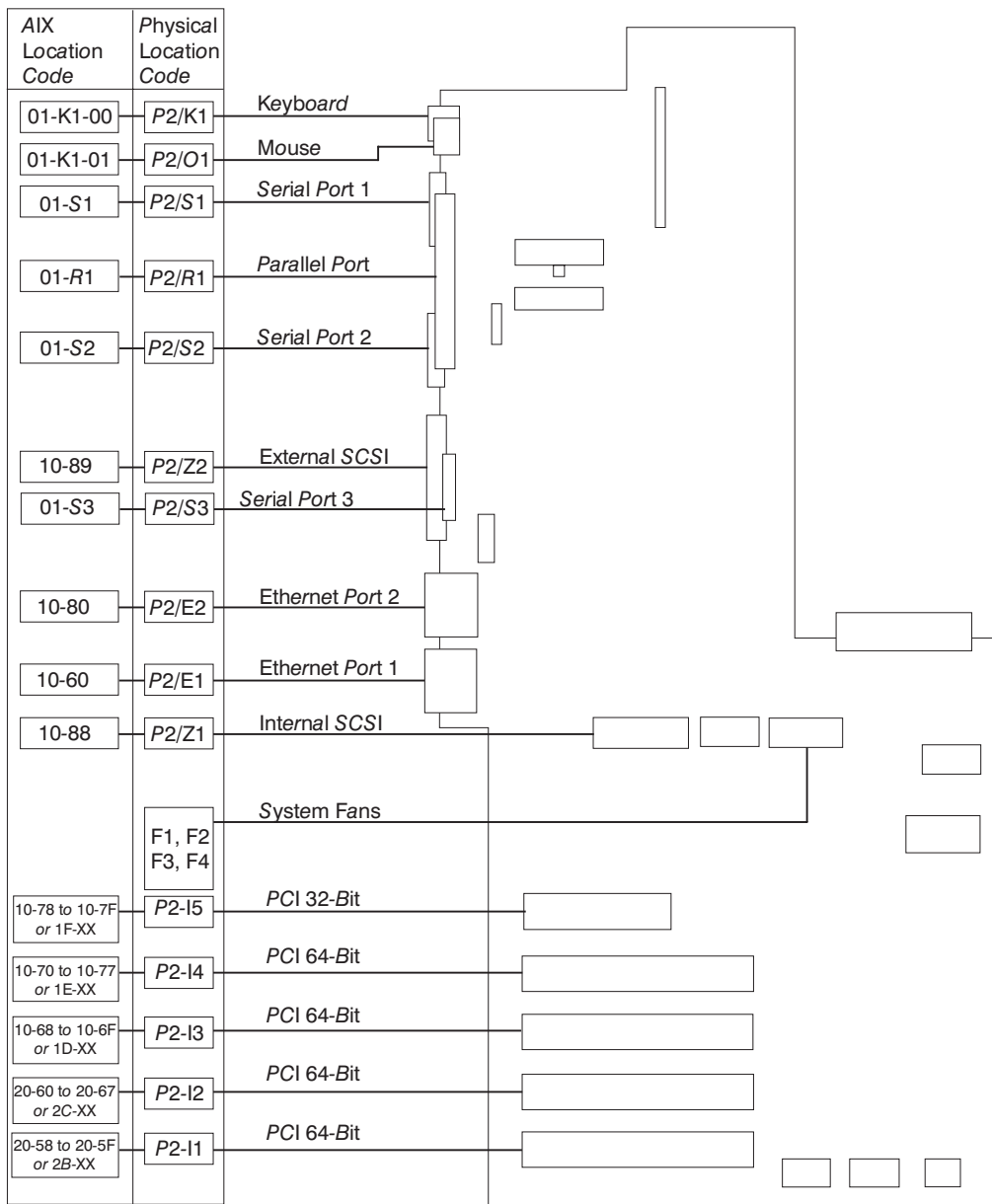
- Integrated ISA adapters:

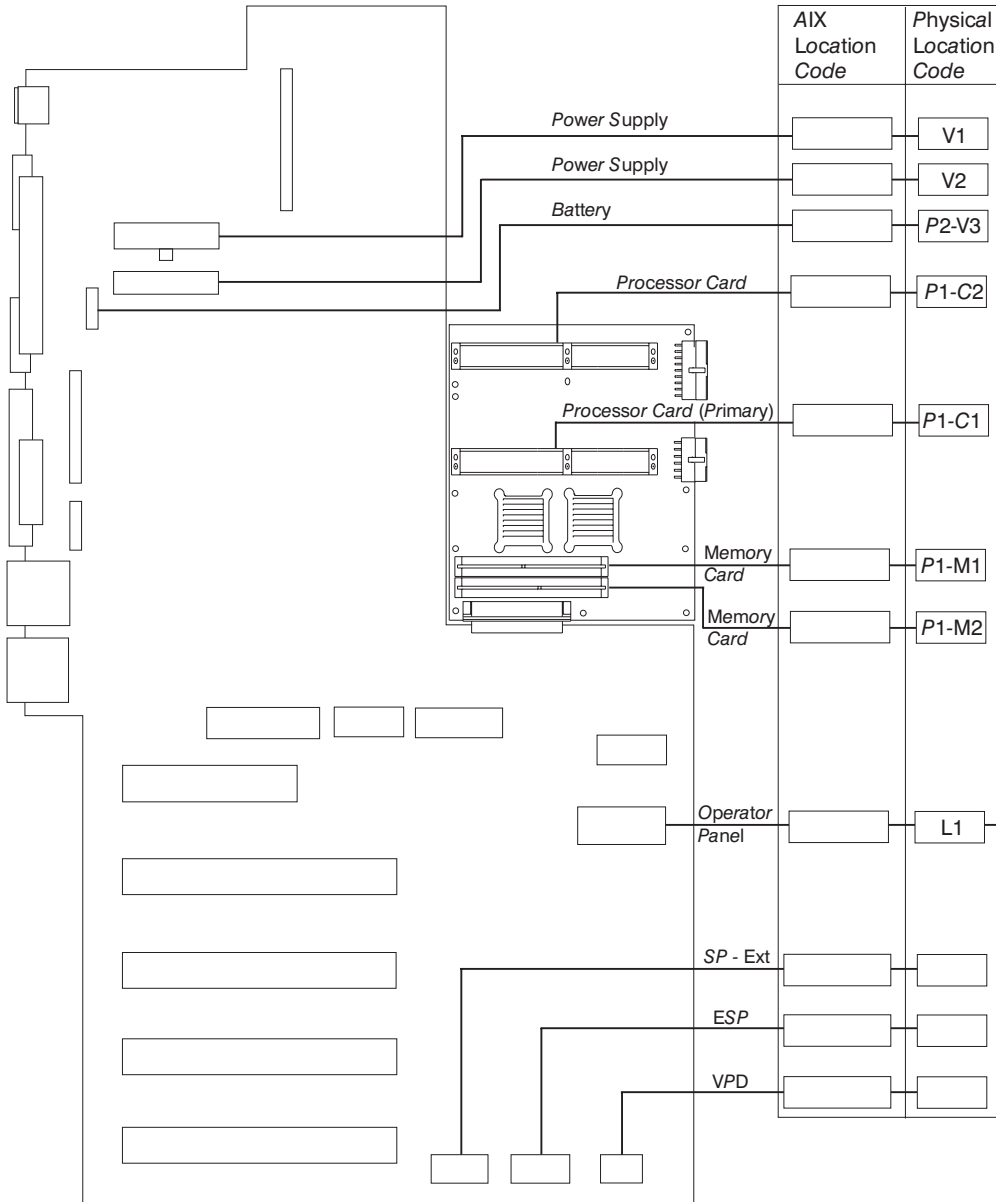
01/R1	Parallel port adapter
01/S1	Serial port 1 adapter
01/S2	Serial port 2 adapter
01/S3	Serial port 3 adapter
01/K1	Keyboard adapter

- Device attached to SCSI controller:

10-88-00-4,0	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 (primary) (L2 Cache)	00-00 and 00-01 (2-way card)	P1-C1	Processor connector J6	CPU ID proc0 and proc1 (2-way card)
Processor card 2 L2 Cache	00-02 and 00-03(2-way card)	P1-C2	Processor connector J8	CPU ID proc2 and proc3 (2-way card)
Memory card 1	00-00	P1-M1	Memory card connector J3	
Memory card 1 memory modules 1 through 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 memory modules 1 through 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				
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
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
Serial Port 1	01-S1	P2/S1	I/O board connector J23	0x0318

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
Serial Port 2	01-S2	P2/S2	I/O board connector J31	0x0218
Serial Port 3	01-S3	P2/S3	I/O board connector J10	
Parallel Port	01-R1	P2/R1	I/O board connector J27	0x0378
Ethernet Port 1	10-60	P2/E1	I/O board connector J26	Host Bridge ID00, Device 06
Ethernet Port 2	10-80	P2/E2	I/O board connector J25	Host Bridge ID00, Device 06
Internal SCSI	10-88	P2/Z1	I/O board connector J7	Host Bridge ID00, Device 02
External SCSI	10-89	P2/Z2	I/O board connector J28	Host Bridge ID00, Device 07
Pluggable Adapters				
Card in PCI Slot 1P	20-58 to 20-5F or 2B-XX	P2-I1	I/O board connector J8	Host Bridge ID01, Device 01
Card in PCI Slot 2P	20-60 to 20-67 or 2C-XX	P2-I2	I/O board connector J9	Host Bridge ID01, Device 02
Card in PCI Slot 3P	10-68 to 10-6F or 1D-XX	P2-I3	I/O board connector J12	Host Bridge ID00, Device 03
Card in PCI Slot 4P	10-70 to 10-77 or 1E-XX	P2-I4	I/O board connector J13	Host Bridge ID00, Device 04
Card in PCI Slot 5P	10-78 to 10-7F or 1F-XX	P2-I5	I/O board connector J14	Host Bridge ID00, Device 05
SCSI Devices				
Optional Media Bay (Bay D01)	10-88-00-0, 0	P2-Z1-A0		Primary SCSI Bus ID 0
Disk Drive (Bay D02)	10-88-00-8, 0	P2-Z1-A8		Primary SCSI Bus ID 8
Disk Drive in Bay D03	10-88-00-9, 0	P2-Z1-A9		Primary SCSI Bus ID 9
Disk Drive in Bay D04	10-88-00-10, 0	P2-Z1-A10		Primary SCSI Bus ID 10
Disk Drive in Bay D05	10-88-00-11, 0	P2-Z1-A11		Primary SCSI Bus ID 11
Fans				
Fan 1 (Front Fan)		F1	Fan connector J3 at I/O Board	

FRU Name	AIX Location Code	Physical Location Code	Physical Connection	Logical Identification
Fan 2 (Front Fan)		F2	Fan connector J3 at I/O Board	
Fan 3 (Rear Fan)		F3	Fan connector J3 at I/O Board	
Fan 4 (Rear Fan)		F4	Fan connector J3 at I/O 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		
Power supply		V2		
Battery				
Battery		P2-V3	I/O board connector BT1	
Vital Product Data (VPD)				
System VPD Module		L1-N1	Operator Panel Socket	
Notes:				
<ol style="list-style-type: none"> The physical location code for the PCI slots, when empty, uses the P1/ notation, where the '/' identifies an integrated device (in this case the empty slot). A PCI device plugged into the slot uses the P1-lx notation; the '-' identifies a plugged device. The SCSI bus IDs are the recommended values. The SCSI IDs shown for devices indicate how the devices are set when they are shipped from the factory. Field installations may not comply with these recommendations. 				

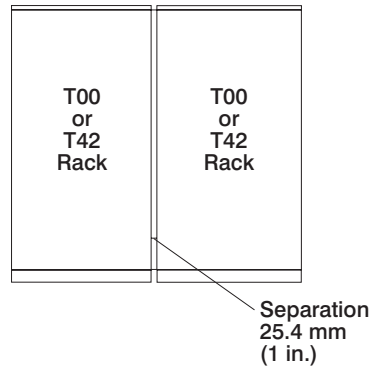
Model B80 Specifications

Dimensions				
Height		217 mm	8.6 in.	
Width		482 mm	19 in.	
Depth		617 mm	24.3 in.	
Weight				
Minimum configuration		36.5 kg	80.3 lbs.	
Maximum configuration		45.0 kg	99.3 lbs.	
Electrical				
Power source loading (max. in kVA)			0.46	
Power source loading (typ. in kVA)			0.29	
Voltage range (V ac)		100 to 127 or 200 to 240 (autoranging)		
Frequency (hertz)			50 / 60	
Voltage range (V dc)			-48	
Thermal output (maximum)			1536 BTU/hr	
Thermal output (typical)			1024 BTU/hr	
Power requirements (maximum)			450 watts	
Power requirements (typical)			300 watts	
Power factor			0.98	
Inrush current ¹			30 amps	
Maximum altitude		2135 m (7000 ft.)		
Temperature Requirements²		Operating	Non-Operating	
		10 to 40°C	10 to 52°C	
		(50 to 104°F)	(50 to 126°F)	
Humidity Requirements (Noncondensing)		Operating	Non-Operating	
		8 to 80%	8 to 80%	
Wet Bulb³		27°C (80°F)	27°C (80°F)	
Noise Emissions^{4,5}		Operating	Idle	
	$L_{WA,d}$	6.1 bels	5.9 bels	
	$L_{pA,m}$	N/A	N/A	
	$<L_{pA}>_m$	46 dBA	44 dBA	
Clearances	Front	Back	Left	Right
Install/Air Flow	Maintenance of a proper service clearance should allow proper air flow.			
Service	See service clearances in "T00 and T42 Service Clearances and Caster Location" on page 28.			
<ol style="list-style-type: none"> 1. Inrush currents occur only at initial application of power, no inrush occurs during normal power off-on cycle. 2. The upper limit of the dry bulb temperature must be derated 1 degree C per 137m (450 ft.) above 915m (3000 ft.). 3. The upper limit of the wet bulb temperature must be derated 1 degree C per 274m (900 ft.) above 305m (1000 ft.). 4. See "Noise Emission Notes" on page 27 for definitions of noise emissions positions. 5. Levels are for a single system installed in a T00 32 EIA rack with the center of the unit approximately 1500 mm (59 in.) off the floor. 				

Noise Emission Notes

1. L_{WA_d} is the declared sound power emission level for a production series of machines.
2. L_{pA_m} is the mean value of the sound pressure emission levels at the operator position (if any) for a production series of machines.
3. $\langle L_{pA} \rangle_m$ is the mean value of the space-averaged sound pressure emission levels at the one-meter positions for a production series of machines.
4. N/A = Not Applicable (no operator position).
5. All measurements are made in accordance with ISO 7779 and reported in conformance with ISO 9296.

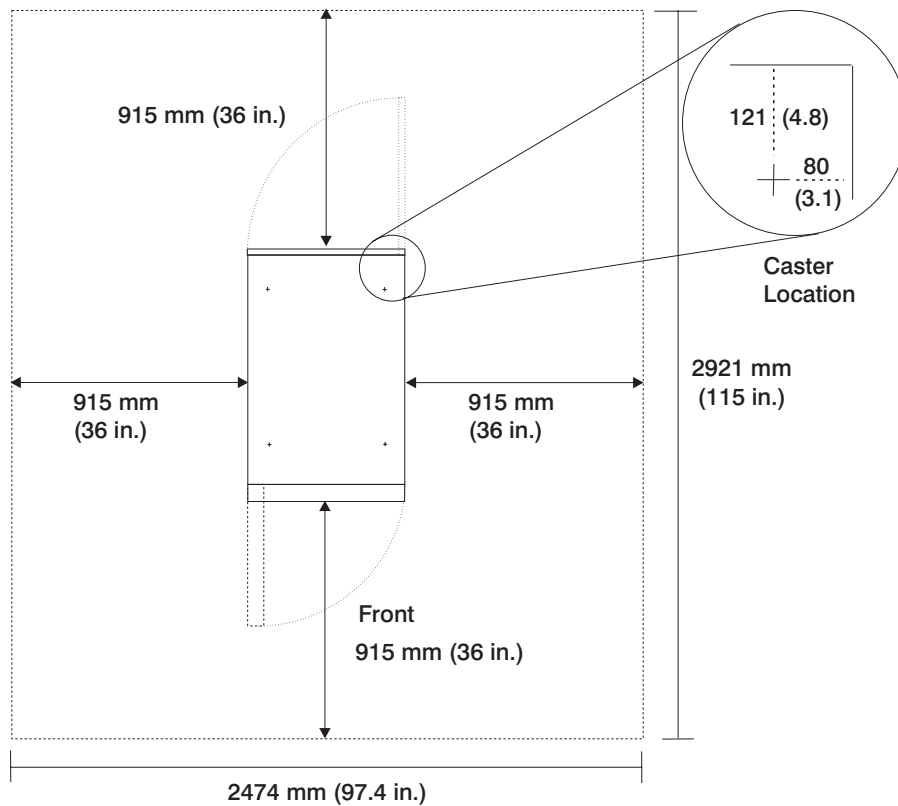
T00 and T42 Racks Multiple Attachment



T00 racks or T42 racks can be bolted together in a multiple rack arrangement as shown above. A kit is available including the bolts, spacers, and decorative trim pieces to cover the 25.4mm (1 in.) space. For service clearances use the service clearances as shown in the table in “T00 and T42 Service Clearances and Caster Location” on page 28.

T00 and T42 Service Clearances and Caster Location

The service clearances and caster locations are shown in the following illustration:



Note:

1. Rack units are large and heavy and are not easily moved. Because maintenance activities require access at both the front and back, extra room needs to be allowed. The footprint shows the radius of the swinging doors on the I/O rack. The illustration shows the minimum space required.
2. The amount of space needed by the unit during service operation is indicated by the lines on the footprint. For multiple racks placed side by side, the left and right clearances apply only to the leftmost and rightmost rack.

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 the following:

- 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 10, "Parts Information" on page 353 to find the power cables that are available.

Service Inspection Guide

Perform a service inspection on the system when:

- The system is inspected for a maintenance agreement.
- Service is requested and service has not recently been performed.

- An alterations and attachments review is performed.
- Changes have been made to the equipment that may affect the safe operation of the equipment.
- External devices with 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 owner of the system is responsible to correct any unsafe conditions.

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 cable.
 - 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.

Chapter 2. Diagnostics Overview

The Model B80 system uses an integrated set of software diagnostic procedures to facilitate system maintenance. This book, and the *Diagnostics Information for Multiple Bus Systems*, are the basis of the diagnostic procedures for Model B80 systems. In particular, chapters 3, 4, 5, and 10 in this book are important for the trained service representative to understand and use when isolating a failure on the system.

The manufacturer recommends that systems configured with 4GB of memory or greater have access to a 4mm or 8mm tape drive for submission of system dump information if required. This function can be accomplished through locally attached or network-attached devices, as appropriate.

Maintenance Analysis Procedures (MAPs)

Maintenance Analysis Procedures (MAPs) guide the trained service person through the complex Model B80 system. These MAPs are the entry point for all isolation and error recovery procedures. Model B80 systems use a set of integrated procedures, to which the MAPs are the primary entry point.

The MAPs are as follows:

- Entry MAP
- Quick Entry MAP
- Problem Determination MAP
- Power MAP
- Minimum Configuration MAP

The Entry Map is the starting point for problem determination. The purpose of this MAP is to quickly point to the appropriate MAP or service reference information either in this book, or in the common book set, which includes the *Diagnostic Information for Multiple Bus Systems* and the *PCI Adapter Placement Reference*.

The Quick Entry MAP is a subset of the Entry MAP and saves time for some types of problems.

The Problem Determination MAP provides a structured analysis method to get an error code if one is not provided by the customer, or if diagnostics cannot be loaded.

The Power MAP deals with isolation of components and cables to diagnose a power problem. Power problems can be related to powering up and down the system, or power failures that occur after power is turned on.

The Minimum Configuration MAP is used to locate defective components not found by normal diagnostics or error-isolation methods. This MAP provides a systematic method of isolation to the failing item or items.

Checkpoints

This system uses various types of checkpoints, error codes, and SRNs which are referred to throughout this book (primarily in Chapters 3, 4, and 5). Codes that may appear in the service processor boot progress log, the AIX error log, and the operator panel display as checkpoints.

Checkpoints display in the operator panel from the time the power is connected to the system until the AIX login prompt is displayed after a successful operating system boot. These checkpoints have the following forms:

E000 - E075 These checkpoints display from the time the power is connected to the system until the OK prompt displays on the operator panel display. During this time, the service processor performs self-test and NVRAM initialization.

E0A0 - E0E1 When power up is initiated, the service processor starts built-in self-test (BIST) on the central electronics complex (CEC). VPD data are read.

E0E2 - E2xx This range indicates that the system processor is in control and is initializing system resources.

E3xx These codes indicate that the system processor is running memory tests.

E1xx The system firmware attempts to boot from devices in the boot list. Control is passed to AIX when E105 (normal mode boot) or E15B (service mode boot) displays on the operator panel display.

0xxx 0xxx codes are AIX checkpoints and configuration codes. Location codes may also be shown on the operator panel display during this time.

Error Codes If a fault is detected, an 8-digit error code is displayed in the operator panel display. A location code may be displayed at the same time on the second line of the display.

Checkpoints can become error codes if the system fails to advance past the point at which the code is presented. A list of the checkpoints may be found in Chapter 4, "Checkpoints" on page 101. Each entry provides a description of the event and the recommended action if the system fails to advance.

SRNs Service request numbers, in the form xxx-xxx, may also be displayed on the operator panel display and be noted in the AIX error log.

SRNs are listed in the *Diagnostic Information for Multiple Bus Systems*, order number SA38-0509.

FRU Isolation

For a list of error codes and recommended actions for each code, see Chapter 5, “Error Code to FRU Index” on page 127. These actions can refer to Chapter 10, “Parts Information” on page 353, Chapter 3, “Maintenance Analysis Procedures (MAPs)” on page 37, or provide informational message and directions. If a replacement part is indicated, direct reference is made to the part name. The respective AIX and physical location codes are listed for each occurrence as required. For a list of location codes, see “AIX and Physical Location Code Reference Table” on page 21.

To look up part numbers and view component diagrams, see Chapter 10, “Parts Information” on page 353. The beginning of the chapter provides a parts index with the predominant field replaceable units (FRUs) listed by name. The remainder of the chapter provides illustrations of the various assemblies and components which make up Model B80 systems.

Service Agent

Service support for the Model B80 can be enhanced through the use of the application program, Service Agent. This application provides a number of advantages for the Model B80 customer, including automatic error reporting and analysis without customer intervention. The Service Agent kit is shipped with the Model B80 system and includes the following:

- Service Agent program on diskette
- *Service Agent CE Information Guide*,

Using the Service Processor and Service Agent Features

The service processor and Service Agent features protect users against unnecessary system downtime by advising support personnel (both internal and external) of any unexpected changes in the system environment. In combination, the two features provide a flexible solution to automated system maintenance.

Service Processor

The service processor runs on its own power boundary and continually monitors hardware attributes, the AIX operating system, and the environmental conditions within the system. Any system failure which prevents the system from coming back to an operational state (a fully functional AIX operating system) is reported by the service processor. The service processor is controlled by firmware and does not require the AIX operating system to be operational to perform its tasks. If any system failures are detected, the service processor has the ability to take predetermined corrective actions. The methods of corrective actions are:

- Surveillance
- Call home
- AIX operating system monitoring

Surveillance is a function in which the service processor monitors the system through heartbeat communication with the system firmware. The *heartbeat* is a periodic signal that the firmware can monitor. During system startup, the firmware surveillance monitor is automatically enabled to check for heartbeats from the firmware. If a heartbeat is not detected within a default period, the service processor cycles the system power and attempts to restart until the system either restarts successfully, or a predetermined retry threshold is reached. In the event the service processor is unsuccessful in bringing the system online (or in the event that the user asked to be alerted to any service processor-assisted restarts), the system can call home to report the error.

The call home function can be initialized to call either a service center telephone number, a customer administration center, or a digital pager telephone number. The service processor can be configured to stop at the first successful call to any of the numbers listed, or can be configured to call every number provided. If connected to the service center, the service processor transmits the relevant system information (the system's serial number and model type) and service request number (SRN). If connected to a digital pager service, the service processor inputs a customer voice telephone number defined by the customer. An established sequence of digits or the telephone number to a phone near the failed system could be used to signal a system administrator to a potential system failure.

During normal operations, the service processor can also be configured to monitor the AIX operating system. If AIX does not respond to the service processor heartbeat, the service processor assumes the operating system is hung. The service processor can automatically initiate a restart and, if enabled, initiate the call home function to alert the appropriate people to the system hang. Enabling operating system surveillance also enables AIX to detect any service processor failures and report those failures to the Service Agent application.

Unlike the Service Agent, the service processor cannot be configured in a client/server environment where one system can be used to manage all dial-out functions for a set of systems.

Prior to installing the Service Agent feature, ensure that you have the latest level of system and service processor firmware. You also need a properly configured modem. For more information on configuring a modem, see Appendix D, "Modem Configurations" on page 371.

Service Agent

The Service Agent is a software extension to the AIX operating system that monitors the system while the AIX operating system is running. The Service Agent monitors and analyzes all recoverable system failures, and, if needed, can automatically place a service call to a service center (without user intervention).

The service center receives the machine type/serial number, host name, SRN, and a problem description. The service center analyzes the problem report and, if warranted, dispatches a service person to the customer site. The service center also determines if any hardware components need to be ordered prior to the service person's arrival.

The Service Agent code also gives the user the option to establish a single system as the problem reporting server. A single system, accessible over the user network, can be used as the central server for all the other systems on the local area network (LAN) that are running the Service Agent application. If the Service Director application on a remote client decides a service request needs to be placed, the client forwards the information to the Service Agent server, which then dials the service center telephone number from its locally attached modem. In this scenario, the user only needs to maintain a single analog line for providing call-out capabilities for a large set of servers.

A modem is required for enabling automated problem reporting to the IBM service center. Configuration files for several types of modems are included as part of the Service Agent package. Refer to Appendix D, "Modem Configurations" on page 371 for more information on configuring your modem.

Chapter 3. Maintenance Analysis Procedures (MAPs)

This chapter contains Maintenance Analysis Procedures (MAPs).

1. When possible, run online diagnostics in service mode. Online diagnostics perform additional functions, compared to standalone diagnostics. This ensures that the error state of the system is captured in NVRAM (non-volatile random access memory) for your use in fixing the problem. The AIX error log and SMIT are only available when diagnostics are run from the hard drive.
2. 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 “Location Codes” on page 16.
3. Licensed programs frequently rely on network configuration and system information stored on the VPD (vital product data) module on the operator panel control assembly. If the MAPs indicate that the operator panel control assembly should be replaced, swap the VPD module from the old operator panel to the new one. If the existing VPD module must 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.
4. 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 might 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	39
System Stops With a 8-Digit Number Displayed	39
System Stops With a 4-Digit Number Displayed	39
System Stops With a 3-Digit Number Displayed	39
System Stops or Hangs With Alternating Numbers Displayed in the Operator Display Panel.	40
Display Problem (Distortion, Blurring, Etc.)	40
Power and Cooling Problems	40
Flashing 888 in Operator Panel Display	40
Other Symptoms or Problems	41
You Cannot Find the Symptom in this Table	44

Note:

- If you replace FRUs or perform an action and the problem is still not corrected, go to "MAP 1540: Minimum Configuration" on page 72, unless otherwise indicated in the tables.
- If you replace FRUs and the problem is corrected, go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*

Symptom	Action
Service Actions	
You have parts to exchange or a corrective action to perform.	<ol style="list-style-type: none"> Go the Chapter 9, "Removal and Replacement Procedures" on page 265. Go to "MAP 410: Repair Checkout" in the <i>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>Diagnostic Information for Multiple Bus Systems</i> .
You need to verify correct system operation.	Go to "MAP 410: Repair Checkout" in the <i>Diagnostic Information for Multiple Bus Systems</i> .
System Stops With A 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 5, "Error Code to FRU Index" on page 127.
System Stops With A 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 has the format "E0xx" then go to "Service Processor Checkpoints" on page 101.</p> <p>If the number displayed is in the range "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 (for example P2-I3), replace the card in the indicated slot. If this does not correct the problem, then go to "Firmware Checkpoints" on page 106.</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>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 A 3-Digit Number Displayed	
The system stops and a 3-digit number displayed in the operator panel display or on the console.	Record SRN 101-xxx, where xxx is the three digit number displayed in the operator panel, then go to the Fast Path MAP in the <i>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 106.
The operator panel display alternates between the codes "E1DE" and "E1AD".	Record both codes. Go to "E1DE" in "Firmware Checkpoints" on page 106.
Display Problem (Blank, Distortion, Blurring, Etc.).	
All display problems.	<ul style="list-style-type: none"> • If using a graphics display: <ol style="list-style-type: none"> 1. Go to the <i>problem determination procedures</i> for the display. 2. If you do not find a problem, replace the display adapter. 3. If you do not find a problem, suspect the I/O board. Go to "MAP 1540: Minimum Configuration" on page 72. • If the problem is with the ASCII terminal: <ol style="list-style-type: none"> 1. Make sure that the ASCII terminal is connected to S1. 2. If problems persist, go to the <i>problem determination procedures</i> for the terminal. 3. If you do not find a problem, suspect the I/O board. Go to "MAP 1540: Minimum Configuration" on page 72.
Power and Cooling Problems	
The power LEDs on the power supplies do not start flashing within 30 seconds of AC or DC power application.	Go to "MAP 1520: Power" on page 60.
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 60.
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 60.
The cooling fan(s) do not come on or come on but do not stay on.	Go to "MAP 1520: Power" on page 60.
Flashing 888 in Operator Panel Display	
888 is displayed in the operator panel.	Go to the Fast Path MAP in the <i>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>Diagnostic Information for Multiple Bus Systems</i> .
You have STBY displayed.	The service processor is ready. The system was shut down by the operating system and is still powered on. This condition can be requested by a privileged system user with no faults. See the service processor 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" refers to the icons (graphic display) or device mnemonics (ASCII terminal) that appear during the power-on self-test (POST).	Go to "Boot Problems or Concerns" on page 118.
The system stops and POST indicators are displayed on the system console. The term "POST indicators" refers 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 72 to isolate the problem.
<p>The system stops and the message "STARTING SOFTWARE PLEASE WAIT..." is displayed on ASCII terminal, or the boot indicator, illustrated below, is displayed on a graphics terminal.</p> 	Go to Chapter 4, "Checkpoints" on page 101.

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> <ul style="list-style-type: none"> • 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 the notes on page 37.) • If entering the password from a keyboard which is attached to an 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. • If the problem is fixed, go to "MAP 410: Repair Checkout" in the <i>Diagnostic Information for Multiple Bus Systems</i>. If the problem persists, go to "MAP 1540: Minimum Configuration" on page 72 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 the notes on page 37.) <p>If the problem is fixed, go to "MAP 410: Repair Checkout" in the <i>Diagnostic Information for Multiple Bus Systems</i>. If the problem persists, go to "MAP 1540: Minimum Configuration" on page 72 to isolate the problem.</p>

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 the integrated SCSI controller on the I/O board). (See the notes on page 37 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 from the utilities menu. b. If an error is logged, check the time stamp. c. If the error was logged during the current boot attempt, record it. d. Look up the error in Chapter 4, "Checkpoints" on page 101 and perform 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 72.
<p>You have a problem that does not prevent the system from booting.</p>	<p>Go to the Fast Path MAP in the <i>Diagnostic Information for Multiple Bus Systems</i>.</p>

Symptom	Action
You have an SRN.	Go to the Fast Path MAP in the <i>Diagnostic Information for Multiple Bus Systems</i> .
You suspect a cable problem.	See the <i>Adapter, Device, and Cable Information for Multiple Bus Systems</i> .
You do not have a symptom.	Go to MAP 0020 in the <i>Diagnostic Information for Multiple Bus Systems</i> .
You have not determined a symptom.	Go to "MAP 1020: Problem Determination" on page 45.
You Cannot Find the Symptom in this Table	
All other problems.	Go to "MAP 1020: Problem Determination" on page 45.

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 *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 47.

The service processor may have been set by the user to monitor server operations and to attempt recoveries. You can disable these actions while you diagnose and service the system. If the system was set up according to recommendations from the installation guide, all the settings of the service processor (except language) were saved by using the **SAVE/RESTORE HARDWARE MAINTENANCE POLICIES Service Aid**. You can use that same service aid to restore the settings at the end of your service action.

In case the service processor settings were not saved by the user, if you disable them, make notes of their current settings so that you can restore them before you leave.

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

Following are the service processor settings. The service processor menus are described in Chapter 7, "Using the Service Processor" on page 187.

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.

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.

Refer to “Running Standalone Diagnostics from a CD-ROM” on page 179 or “Running Standalone Diagnostics from a Network Installation Management (NIM) Server” on page 180.

Wait until the diagnostics are loaded or the system appears to stop.

Find your symptom in the following table. Then follow the instructions given in the Action column.

Symptom	Action
E1EA or E1EB is displayed on the operator panel.	The flash EPROM data is corrupted. Replace the EPROMs on the I/O board.
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>Diagnostic Information for Multiple Bus Systems</i> .

Symptom	Action
The system login prompt is displayed.	<p>Note: Perform the system shut down procedure before turning off the system.</p> <ul style="list-style-type: none"> • If you are loading diagnostics from the CD-ROM 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. • If you are sure you pressed the correct key in a timely manner, go to “Step 1020-2” on page 50. • If you are loading diagnostics from a NIM server, check the following: <ul style="list-style-type: none"> – The bootlist on the client may be incorrect. – Cstate on the NIM server may be incorrect. – There may be network problems preventing you from connecting to the NIM server. <p>Verify the settings and the status of the network. If you continue to have problems refer to “Boot Problems or Concerns” on page 118 and follow the steps for network boot problems.</p>
The system does not respond when the password is entered.	Go to “Step 1020-2” on page 50.
The system stopped and a POST indicator is displayed on the system console and an 8-digit error code is not displayed.	<p>If the POST indicator represents:</p> <ul style="list-style-type: none"> • Memory, record error code MOMEM002. • 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 50.</p>

Symptom	Action
The system stops and a 4-digit number is displayed in the operator panel display.	<p>If the number displayed has the format "E0xx" then go to "Service Processor Checkpoints" on page 101. If the number is in the range of "E1xx-EFFF" then go to "Firmware Checkpoints" on page 106.</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>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 51.
All other symptoms.	If you were directed here from the Entry MAP, go to "MAP 1540: Minimum Configuration" on page 72. Otherwise, find the symptom in the "Quick Entry MAP" on page 38.

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 World Trade (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 8-digit error code in Chapter 5, "Error Code to FRU Index" on page 127.

Note: If the 8-digit error code is not listed in Chapter 5, "Error Code to FRU Index," look for it in the following:

- Any supplemental service manual for the device
- The diagnostic problem report screen
- The Service Hints service aid
- The CERADME 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 number 1 key on the keyboard.
3. When the System Management Services appear, check the error log for any errors.
 - a. Display **Error log** under Utilities.
 - 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 the Chapter 5, "Error Code to FRU Index" on page 127 and perform the listed action.
 - e. If no recent error is logged in the error log, go to "MAP 1540: Minimum Configuration" on page 72.

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 troubleshoot 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 you are 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 72.
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 might want to disable these actions while you diagnose and service the system. If you disable them, make notes of their current settings so that you can restore them before you leave. The following settings may be of interest to you.

Surveillance	From the Service Processor Setup Menu, go to the OS 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 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 acceptable to have 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 usable.

Note: Memory modules must be installed in pairs and in the correct slot configuration. For example, slots J1 and J2, J3 and J4, J5 and J6, and so on are considered slot pairs. However, you can skip paired slots; for example if slots J1 and J2 are populated, you can populate slots J5 and J6 without first populating slots J3 and J4.

Step 1240-1

1. Ensure that the diagnostics and the operating system are shut down.
2. Turn off the power.
3. Remove and reinstall any installed memory card.
4. Turn on the power.

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

- NO** Reseating the memory card has corrected the problem.
Go to "Map 0410: Repair Checkout" in the *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 57.
If there are two memory cards installed, go to "Step 1240-2."

Step 1240-2

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

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

- NO** Go to "Step 1240-4" on page 55.
- YES** Go to "Step 1240-3" on page 55.

Step 1240-3

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

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

NO Tag the memory card you removed from slot J2 as "suspect bad" and go to "Step 1240-7" on page 57.

YES Go to "Step 1240-6" on page 56.

Step 1240-4

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

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

NO Go to "Step 1240-5" on page 56.

YES Tag the memory card in slot J3 "suspect bad" and go to "Step 1240-7" on page 57.

Step 1240-5

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

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

- NO** Re-seating the memory card has corrected the problem.
Go to "Map 0410: Repair Checkout" in the *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 off the power.
2. Exchange the following FRUs in the order listed:
 - a. System board
 - b. Processor card(s)
3. Turn on the power.

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

- NO** Go to "Map 0410: Repair Checkout" in the *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 72.

Step 1240-7

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

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 58.

Step 1240-8

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

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 *Diagnostic Information for Multiple Bus Systems*.
- YES** Go to "Step 1240-9" on page 58.

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

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

NO Go to "Step 1240-11" on page 59.

YES Go to "Step 1240-10."

Step 1240-10

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

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

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

NO Go to "Map 0410: Repair Checkout" in the *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 72.

Step 1240-11

One or both of the memory modules that you exchanged in the previous step may be defective. To isolate the failing memory module, do the following:

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

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 *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 58.

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 this book or the *Diagnostic Information for Multiple Bus Systems*.
2. 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.
3. The Model B80 can accommodate two power supplies installed with separate power receptacles, PS1 and PS2, located on the rear of the system unit. The PS1 receptacle is the power source for the rear power supply bay. The PS2 receptacle is the power source for the front power supply bay.
4. Observe the following safety notices 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 an electrical shock.

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

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

Use one hand, when possible, to connect or disconnect signal cables. This prevents possible shock from the touching of two surfaces with different electrical potentials.

During an electrical storm, do not connect cables that are used as communication lines. These cables include, display stations, printers, telephones, or station protectors cables.

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.

CAUTION:

This system may have two power supplies installed. To reduce the risk of electrical shock, disconnect both power cables from the system unit and Power Distribution Unit/Power Distribution Bus before servicing.

Step 1520-1

1. Place the drawer into the service position, as described in “Front Service Position” on page 270.
2. Remove the power supply chassis cover, as described in “Power Supply Chassis Cover Removal” on page 281.
3. Check the power supply LEDs.

Note: The condition of "two power supplies present, but only one working" can be determined by the service processor and a warning-level EPOW.

You may be directed to this MAP for several reasons:

- The LEDs on the power supplies are not flashing and the operator panel is blank. Go to “Step 1520-2” on page 62.
- The LEDs on the power supplies are flashing and the operator panel is blank. Go to “Step 1520-5” on page 63.
- The LEDs on the power supplies are flashing and OK, STBY or DIAG STBY is displayed on the operator panel. There is no indication of activity when the power button on the operator panel is pressed. The power LED on the operator panel does not come on and none of the fans start to turn. Go to “Step 1520-5” on page 63.
- The LEDs on the power supplies are flashing and OK, STBY or DIAG STBY is displayed on the operator panel. When the power button on the operator panel is pressed, the power LED on the operator panel comes on and all the fans start to turn, but the power LED on the operator panel and the fans do not stay on. Go to “Step 1520-5” on page 63.
- An SRN referred to in the *Diagnostic Information for Multiple Bus Systems* listed MAP 1520 in the *Actions/Descriptions* column for a voltage sensor out of range. Go to “Step 1520-9” on page 66.

Step 1520-2

1. Turn off the power.
2. Unplug the power distribution unit (PDU)/power distribution bus (PDB) power cable from the wall outlet.
3. Unplug the power cables from the PDU/PDB and the system unit.
4. Check that the power cable from the wall outlet to the PDU/PDB has continuity.
5. Check that the power cables from the PDU/PDB to the system unit have continuity.
6. Check the circuit breakers on the PDU/PDB.
7. Check that the wall outlet has been wired correctly with the correct voltage.

Did you find a problem?

NO Go to "Step 1520-3".

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

Step 1520-3

1. Find all the cables connecting the power distribution board to the system. Unplug these cables from the system, but leave them attached to the power distribution board.
2. Connect the power cables from the PDU/PDB to the system unit.
3. Connect the power cable from the PDU/PDB to the wall outlet.

Do the LEDs on the power supplies start flashing within 30 seconds after applying ac power?

NO Go to "Step 1520-4" on page 63.

YES Go to "Step 1520-7" on page 65.

Step 1520-4

1. Unplug the power cables from the PDU/PDB and the system unit.
2. Unplug all the cables from the power distribution board.
3. Connect the power cables from the PDU/PDB to the system unit.

Do the LEDs on the power supplies start flashing within 30 seconds after applying ac power?

NO Go to "Step 1520-6" on page 64.

YES Go to "Step 1520-5."

Step 1520-5

One of the cables you unplugged from the power distribution board may be defective.

1. Unplug the power cables from the PDU/PDB and the system unit.
2. Reconnect one of the cables to the power distribution board.
3. Connect the power cables from the PDU/PDB to the system unit.

Do the LEDs on the power supplies start flashing within 30 seconds after applying ac power?

NO Replace the last cable that you connected to the Power Distribution Board. Go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

YES Repeat this step until the defective cable is identified or all the cables have been reconnected.

Step 1520-6

Either the power supplies or the power distribution board may be defective.

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

1. Power distribution board.
2. Front power supply.
3. Rear power supply (if installed).

Do the following procedure each time a FRU is exchanged from the above list.

1. Turn off the power.
2. Unplug the power cables from the system unit.
3. Exchange one of the FRUs in the list.
4. Connect the power cables to the system unit.

Do the LEDs on the power supplies start flashing within 30 seconds after applying ac power?

- 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.
- YES** Go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Step 1520-7

1. Unplug the power cables from the system unit.
2. Exchange the operator panel electronics assembly.
3. Plug the power cables into the system unit and wait for OK, STBY or DIAG STBY on the operator panel display.
4. Turn on the power.

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 64.
- YES** Go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Step 1520-8

1. Turn off the power.
2. Unplug the power cables from the system unit.
3. Record the slot numbers of all the 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.
4. Remove the memory card(s).
5. Remove the processor card(s).
6. Unplug the power cable from the 4-pack backplane.
7. Unplug the power cable from any device in the media bay.
8. Remove all the fans.
9. Plug the power cables into the system unit.
10. Turn on the power.

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

- NO** Go to "Step 1520-9" on page 66.
- YES** Go to "Step 1520-10" on page 67.

Step 1520-9

Note: The I/O board, system board or the power supplies may be defective.

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

1. Processor card
2. I/O board
3. System board
4. Rear power supply
5. Front power supply (if installed)

Note: A system unit equipped with a single power supply can have that power supply reside in either the front or rear power supply bay.

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

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.

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

Step 1520-10

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

1. Second processor card (If removed)
2. Memory card(s) (one at a time)
3. 4-Pack backplane power cable
4. SCSI removable media device power cable
5. PCI adapters (lowest slot to highest slot)
6. Fans

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

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

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

NO Replace the last part installed. If a memory card was just installed, remove all of the memory modules. If the system does not come up, replace the memory card. Reinstall the memory modules, one pair at a time, until the problem recurs. Replace the memory module pair that was just installed.

Note: Memory modules must be installed in pairs and in the correct slot configuration. For example, slots J1 and J2, J3 and J4, J5 and J6, and so on, are considered slot pairs. However, you can skip paired slots; for example, if slots J1 and J2 are populated, you can populate slots J5 and J6 without first populating slots J3 and J4.

Repeat these steps until all the parts have been installed. 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 61 and follow the instructions for the new symptom.

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

Step 1520-11

Does the system contain two power supplies?

NO Go to "Step 1520-12" on page 69.

YES Go to "Step 1520-14" on page 70.

Step 1520-12

Shut down the system, and remove all power cables from the rear of the system drawer.

Exchange the following FRUs in the order listed. If the I/O board is to be replaced, first refer to Chapter 3, "Maintenance Analysis Procedures (MAPs)" on page 37 note 4.

1. Power supply
2. Power cables to the I/O and system board
3. I/O board
4. System board
5. Power distribution board

Restart the system and perform error log analysis.

Do you get an SRN indicating a voltage sensor is out of range?

- NO** The last FRU exchanged is defective. Go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.
- YES** Reinstall the original FRU. Repeat the FRU replacement steps until a defective FRU is identified or all the FRUs have been exchanged. If the symptom did not change and all FRUs have been exchanged, go to "Step 1520-13." If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to "Step 1540-1" on page 73 and follow the instructions for the new symptom.

Step 1520-13

Check that the wall outlet is properly wired and is providing the correct voltage.

Did you find a problem?

- NO** Go to "Step 1540-1" on page 73.
- YES** Correct the problem. Go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*

Step 1520-14

Since the Model B80 accommodates redundant power supplies; it is not necessary to power down the system when replacing a power supply.

The power supplies are symmetrical, so replacement starts with the unit closest to the rear of the system drawer (power supply 1). Refer to "Hot-Plug Power Supplies" on page 333 for instructions on replacing a power supply.

Notes:

1. Always service first the power supply whose green LED, located on top of the power supply, is either blinking or out.
2. Before removing a power supply, be sure the redundant power supply is operational by observing the green LED. The green LED must be steady and not blinking or out.

Replace the following FRUs in the order listed:

1. Power supply 1
2. Power supply 2

Perform error log analysis.

Do you receive an SRN indicating a voltage sensor out of range?

- NO** The last FRU exchanged is defective. Go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.
- YES** Reinstall the original FRU. Repeat the FRU replacement steps until a defective FRU is identified or all the FRUs have been exchanged. If the symptom did not change and all FRUs have been exchanged, go to "Step 1520-15" on page 71. If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to "Step 1540-1" on page 73 and follow the instructions for the new symptom.

Step 1520-15

The problem lies within the system unit hardware or with the line voltage or wiring.

Shut down the system, and remove the power cables from the rear of the system unit.

Exchange the following FRUs in the order listed. If the I/O board is to be replaced, first refer to Chapter 3, " Maintenance Analysis Procedures (MAPs)" on page 37, note 4.

1. Power cables to I/O or system board
2. I/O board
3. System board
4. Power distribution board

Restart the system and perform error log analysis.

Do you get an SRN indicating a voltage sensor is out of range?

NO The last FRU exchanged is defective. Go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

YES Reinstall the original FRU. Repeat the FRU replacement steps until a defective FRU is identified or all the FRUs have been exchanged. If the symptom did not change and all FRUs have been exchanged, go to "Step 1520-13" on page 69. If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to "Step 1540-1" on page 73 and follow the instructions for the new symptom.

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 or the system can be IPL'd in standalone diagnostics mode from a network server.
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* refers to the icons (graphical display) or device mnemonics (ASCII terminal) that appear during the power-on self-test (POST).
5. The service processor might 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 might have been set by the user to monitor server operations and to attempt recoveries. You can disable these actions while you diagnose and service the system. If you disable them, make notes of their current settings so that you can restore them before you leave. The following lists the settings.

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

Were you directed to this MAP because the system stopped with a 4-digit number in the range of 0000 to 9FFF displayed on the operator display panel?

- NO** If the system has a CD-ROM drive, go to "Step 1540-2."
 If the system does not have a CD-ROM drive, go to "Step 1540-3" on page 74.
- YES** Go to "Step 1540-27" on page 97.
-

Step 1540-2

1. Ensure that the diagnostics and the operating system are shut down and the *OK* prompt is displayed on the operator panel.
2. Turn on the power.
3. Insert the diagnostic CD-ROM into the CD-ROM drive.
Note: If you cannot insert the diagnostic CD-ROM, go to "Step 1540-4" on page 74.
4. When the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard icon on a graphical display), press the numeric 5 key on the keyboard.
5. Enter the appropriate password if you are prompted to do so.

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

- NO** Go to "Step 1540-4" on page 74.
- YES** Go to "Step 1540-21" on page 93.

Step 1540-3

Refer to "Running Standalone Diagnostics from a Network Installation Management (NIM) Server" on page 180 and "Client Configuration and Booting Standalone Diagnostics from the NIM Server" on page 181. Load system diagnostics in the standalone diagnostics mode from the network.

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

NO Go to "Step 1540-4."

YES Go to "Step 1540-21" on page 93.

Step 1540-4

1. Turn off the power.
2. If you have not already done so, configure the service processor with the instructions in note 6 on page 72 and then return here and continue.
3. Exit service processor menus and remove the power cable.
4. Disconnect all external cables (parallel, serial port 1, serial port 2, serial port 3, Ethernet, SCSI, keyboard or mouse) from the rear of the system drawer.
Note: If an ASCII terminal is attached to serial port 1, record whether it is attached to the front or rear serial port 1.
5. Place the drawer into the service position as described in "Front Service Position" on page 270.
6. Remove the top cover as described in "Main Chassis Cover Removal" on page 279.
7. Remove the CEC cover as described in "Central Electronics Complex (CEC) Cover" on page 288.
8. 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.
9. If the system has two processor cards, remove the second processor card from connector J8.
10. Remove the memory card from connector J3. Record the slot numbers of the memory modules. Remove all the installed memory modules from the memory card except for one pair. Reinstall the memory card into connector J3.

Note: Memory modules must be installed in pairs and in the correct slot configuration. For example, slots J1 and J2, J3 and J4, J5 and J6, and so on, are considered slot pairs. However, you can skip paired slots; for example, if slots J1 and J2 are populated, you can populate slots J5 and J6 without first populating slots J3 and J4.

11. Remove the second memory card from connector J2, if present.
12. Disconnect the SCSI cable from the SCSI connector (J7) on the I/O board.
13. Disconnect the power connector from the power distribution board connector labelled J0801.
14. Remove the disk drive(s) from the 4-pack.
15. Plug in the power cable and wait for OK on the operator panel display.
16. Turn on the power.

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

NO Go to "Step 1540-5" on page 76.

YES If a second processor card was removed, go to "Step 1540-6" on page 77.

 If the system has only one processor card, go to "Step 1540-7" on page 78.

Step 1540-5

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

1. Processor card
2. Memory module in odd numbered slot (J1, J3, J5, and so on)
3. Memory module in even numbered slot (J2, J4, J6, and so on)
4. Memory card
5. System board
6. I/O board (See the notes on page 37.)

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

Turn on the power.

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 73 in this MAP and follow the instructions for a new symptom.

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

Step 1540-6

No failure was detected with this configuration.

1. Turn off the power 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 on the power.

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 the notes on page 37.)

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 73 and follow the instructions for the new symptom.

YES Go to "Step 1540-7" on page 78.

Step 1540-7

No failure was detected with this configuration.

1. Turn off the power 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 on the power.

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

NO Go to "Step 1540-8" on page 79.

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 on the second memory card. Remove all of the memory modules from the second memory card except one pair. Repeat this step with the second memory card (if previously installed).

Go to "Step 1540-11" on page 82.

Step 1540-8

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 off the power and remove the power cable.
2. Exchange the last memory module pair installed.
3. Plug in the power cable and wait for OK on the operator panel display.
4. Turn on the power.

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

NO Go to "Step 1540-10" on page 81.

YES Go to "Step 1540-9" on page 80.

Step 1540-9

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

1. Turn off the power and remove the power cable.
2. Reinstall one of the memory modules you exchanged in the previous step.
3. Plug in the power cable and wait for OK on the operator panel display.
4. Turn on the power.

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 1540-10" on page 81.

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 *Diagnostic Information for Multiple Bus Systems*.

Step 1540-10

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

1. Turn off the power and remove the power cable.
2. Exchange the following FRUs in the order listed:
 - a. Memory card
 - b. System board
 - c. I/O board (see the notes on page 37.)
3. Plug in the power cable and wait for OK on the operator panel display.
4. Turn on the power.

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 73 in this MAP, and follow the instructions for the new symptom.

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

Step 1540-11

1. Turn off the power.
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 serial port 1 connector from which you disconnected it.
 - 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 and mouse into the connectors on the rear of the system unit.
3. Turn on the power.
 4. If the ASCII terminal or graphical display (including display adapter) is 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 1 key on the keyboard to start System Management Services.
 6. Enter the appropriate password if you are 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 serial port 1 or the display attached to the graphics adapter, and test that device. 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 the notes on page 37.)

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 73 and follow the instructions for the new symptom.

YES If the system has a CD-ROM drive, go to "Step 1540-12" on page 84.

If the system does not have a CD-ROM drive, go to "Step 1540-14" on page 86.

Step 1540-12

1. Turn off the power and remove the power cable.
2. Plug the SCSI cable into the SCSI connector (J7) on the I/O board.
3. Connect the power connector to the power distribution board.
4. Plug in the power cable and wait for OK on the operator panel display.
5. Turn on the power.
6. Insert the diagnostics CD-ROM in the CD-ROM drive.
7. After the keyboard indicator is displayed, press the 5 key on the keyboard.
8. Enter the appropriate password if you are 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. CD-ROM drive
 2. Disk drive cage backplane
 3. SCSI cables
 4. I/O board (See the notes on page 37.)
- 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 service support 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 73 in this MAP and follow the instructions for the new symptom.
- YES** Go to "Step 1540-13" on page 85.

Step 1540-13

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

1. Turn off the power and remove the power cable.
2. Install a disk drive in the disk drive cage.
3. Plug in the power cable and wait for OK on the operator panel display.
4. Turn on the power.
5. Insert the diagnostic CD-ROM in the CD-ROM drive.
6. After the keyboard indicator is displayed, press the 5 key on the directly attached keyboard.
7. Enter the appropriate password if you are 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 service support 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 73 in this MAP, and follow the instructions for the new symptom.

YES Repeat this step until all the disk drives are installed.

Go to "Step 1540-18" on page 90.

Step 1540-14

1. Turn off the power and remove the power cable.
2. If the system uses the integrated Ethernet adapter for the network connection, connect the network cable to it. If it uses a network adapter plugged into the I/O board, install the adapter and connect the network cable to it.
3. Connect the power connector to the power distribution board.
4. Plug in the power cable and wait for OK on the operator panel display.
5. Refer to "Running Standalone Diagnostics from a Network Installation Management (NIM) Server" on page 180 and "Client Configuration and Booting Standalone Diagnostics from the NIM Server" on page 181. Load system diagnostics to boot the system in the standalone diagnostics mode from the network.
6. Enter the appropriate password if you are 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. Network adapter (if not using the integrated Ethernet for the network connection)
2. I/O board (See the notes on page 37.)

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 service support 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 73 in this MAP and follow the instructions for the new symptom.

YES If the system has a tape drive, go to "Step 1540-15" on page 87.

If the system does not have a tape drive, go to "Step 1540-16" on page 88.

Step 1540-15

1. Turn off the power and remove the power cable.
2. Plug the SCSI cable into the SCSI connector (J7) on the I/O board.
3. Connect the power connector to the power distribution board.
4. Plug in the power cable and wait for OK on the operator panel display.
5. Refer to "Running Standalone Diagnostics from a Network Installation Management (NIM) Server" on page 180 and "Client Configuration and Booting Standalone Diagnostics from the NIM Server" on page 181. Load system diagnostics to boot the system in the standalone diagnostics mode from the network.
6. Enter the appropriate password if you are 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. Tape drive
2. Disk drive backplane
3. SCSI cables
4. I/O board (See the notes on page 37.)

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 service support 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 73 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 1540-17" on page 89.

Step 1540-16

1. Turn off the power and remove the power cable.
2. Plug the SCSI cable into the SCSI connector (J7) on the I/O board.
3. Connect the power connector to the power distribution board.
4. Plug in the power cable and wait for OK on the operator panel display.
5. Refer to "Running Standalone Diagnostics from a Network Installation Management (NIM) Server" on page 180 and "Client Configuration and Booting Standalone Diagnostics from the NIM Server" on page 181. Load system diagnostics to boot the system in the standalone diagnostics mode from the network.
6. Enter the appropriate password if you are 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. Disk drive backplane
 2. SCSI cable
 3. I/O board (See the notes on page 37.)
- 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 service support 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 73 in this MAP and follow the instructions for the new symptom.
- YES** Go to "Step 1540-17" on page 89.

Step 1540-17

The system is working correctly with this configuration. One of the disk drive(s) that you removed from the disk drive backplane may be defective.

1. Turn off the power and remove the power cable.
2. Install a disk drive in the disk drive backplane.
3. Plug in the power cable and wait for OK on the operator panel display.
4. Refer to "Running Standalone Diagnostics from a Network Installation Management (NIM) Server" on page 180 and "Client Configuration and Booting Standalone Diagnostics from the NIM Server" on page 181. Load system diagnostics to boot the system in the standalone diagnostics mode from the network.
5. After the keyboard indicator is displayed, press the 5 key on the keyboard.
6. Enter the appropriate password if you are 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 backplane

Repeat this step until the defective FRU is identified or all the FRU 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 73 in this MAP and follow the instructions for a new symptom.

YES Repeat this step until all the disk drives are installed.

Go to "Step 1540-18" on page 90.

Step 1540-18

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 off the power and remove the power cable.
2. Attach an I/O board device cable (parallel, serial port 1, serial port 2, serial port 3, Ethernet, SCSI, keyboard or mouse) that had been removed.
3. Plug in the power cable and wait for OK on the operator panel display.
4. Turn on the power.
5. If the Console Selection screen is displayed, choose the system console.
6. After the keyboard indicator is displayed, press the 5 key on the keyboard.
7. Enter the appropriate password if you are 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 the notes on page 37.)

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 73 in this MAP and follow the instructions for the new symptom.

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

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

Go to "Step 1540-19" on page 91.

Step 1540-19

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

1. Turn off the power and remove the power cable.
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 on the power.
5. If the Console Selection screen is displayed, choose the system console.
6. After the keyboard indicator is displayed, press the 5 key on the keyboard.
7. Enter the appropriate password if you are prompted to do so.

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

NO Go to "Step 1540-20" on page 92.

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

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

Step 1540-20

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

1. Turn off the power and remove the power cable.
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 on the power.
5. If the Console Selection screen is displayed, select the system console.
6. After the keyboard indicator displays, press the 5 key on the keyboard.
7. Enter the appropriate password if you are 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 the notes on page 37.)

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 73 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 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Step 1540-21

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 Initialize 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 operation from selecting the console display.
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 supplemental media, select option 1.

6. When the DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select **All Resources** (if you were sent here from “Step 1540-25” on page 95, select the adapter/device you loaded from the supplemental media).

Did you get an SRN?

NO Go to “Step 1540-23” on page 94.

YES Go to “Step 1540-22” on page 94.

Step 1540-22

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 exchanged.
- 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 the notes on page 37.
- Go to "MAP 410: Repair Checkout" in the *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 1540-23

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

- NO** Go to "Step 1540-24."
- YES** Go to "Step 1540-25" on page 95.

Step 1540-24

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 *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 1540-25

Select **Task Selection**.

Select **Process Supplemental Media** and follow the on-screen instruction 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 1540-26" on page 96.

YES Press F3 to return to the FUNCTION SELECTION screen.
 Go to "Step 1540-21" on page 93 substep 4.

Step 1540-26

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 the notes on page 37.)

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 73 in this MAP and follow the instructions for the new symptom.

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

Step 1540-27

1. Ensure that the diagnostics and the operating system are shut down.
2. Turn off the power.
3. If you have not already done so, configure the service processor with the instructions in note 6 on page 72 and then return here and continue.
4. Exit service processor menus and remove the power cable.
5. Place the drawer into the service position as described in “Front Service Position” on page 270.
6. Remove the chassis top cover as described in “Main Chassis Cover Removal” on page 279.
7. Remove the CEC cover as described in “CEC Box Cover Removal” on page 288.
8. 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.
9. Plug in the power cable and wait for OK on the operator panel display.
10. Turn on the power.

Does the system stop with same error code displayed on the operator panel that directed you to this MAP step?

NO Go to “Step 1540-29” on page 99.

YES Go to “Step 1540-28” on page 98.

Step 1540-28

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

1. Turn off the power, remove the power cable, and exchange the following FRUs in order:
 - a. System board
 - b. I/O board (See the notes on page 37.)

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

Turn on the power.

Does the system stop with same error code displayed on the operator panel that directed you to this MAP step?

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

YES Reinstall the original FRU.

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

If the symptom did not change and all the FRUs have been exchanged, return to "Step 1540-4" on page 74 in this MAP.

Step 1540-29

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

1. Turn off the power 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 on the power.
5. If the Console Selection screen is displayed, select the system console.
6. Enter the appropriate password if you are prompted to do so.

Does the system stop with same error code displayed on the operator panel that directed you to this MAP step?

- NO** Repeat this step until all of the FRUs (adapters) are installed, then go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.
- YES** Go to "Step 1540-30" on page 100.

Step 1540-30

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

1. Turn off the power 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 on the power.
5. If the Console Selection screen is displayed, select the system console.
6. Enter the appropriate password if you are prompted to do so.

Does the system stop with same error code displayed on the operator panel that directed you to this MAP step?

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 *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 unit is defective.

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

1. Adapter (last one installed)
2. I/O board (See the notes on page 37.)

If the symptom did not change and all the FRUs have been exchanged, return to "Step 1540-1" on page 73 in this MAP.

Chapter 4. Checkpoints

Checkpoints provide users and service personnel with detailed information about what the system is doing as it initializes. These checkpoints are not intended to be error indicators, but in some cases, the system 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 more appropriate symptoms in the service processor error log. See the service processor System Information Menu.

Unresolved Checkpoint Problems

Go to “MAP 1540: Minimum Configuration” on page 72 for any of the following problems:

- A 4-digit code in the range of E000 through EFFF is displayed on the operator panel display but is not listed in “Service Processor Checkpoints” or “Firmware Checkpoints” on page 106.
- A 4-digit code is displayed and is listed in “Service Processor Checkpoints” or “Firmware Checkpoints” on page 106, but there are no repair actions or FRUs listed for the code.
- You have performed an action, or all of the FRUs listed in the repair actions have been replaced, and the problem has not been resolved.

Service Processor Checkpoints

Service processor checkpoints are in the range E001 to E0FF. The message 0K indicates successful service processor testing and initialization.

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.
- You have performed an action, or all of the FRUs listed in the repair action have been replaced, and the problem has not been corrected.

If you replace FRUs or perform an action and the problem is corrected, go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

The following table provides you with a list of checkpoints, a description of each checkpoint and what actions to take if your system should stop while displaying a checkpoint in the operator panel.

Checkpoint	Description	Action/ Possible Failing FRU
E000	System support controller begins operation. This is an informational checkpoint.	Call for support
E010	Starting service processor self-tests	Replace I/O board. (See notes on page 127.)
E011	Service processor self-tests completed successfully	NA
E012	Begin to set up service processor helps	Replace I/O board. (See notes on page 127.)
E01F	Bad self-test; cannot continue	Replace I/O board. (See notes on page 127.)
E020	Configuring CMOS	Replace I/O board. (See notes on page 127.)
E021	Configuring NVRAM	<ol style="list-style-type: none"> 1. Manually drain the NVRAM by removing the battery and short circuiting the battery leads for 30 seconds with a conductive object (the battery will work for this purpose). 2. Replace I/O board. (See notes on page 127.)
E022	Accessing system backplane VPD	Replace the system board.
E023	Accessing memory card 1 VPD	Replace memory card 1 (J3).
E024	Accessing memory card 2 VPD	Replace memory card 2 (J2).
E025	Service processor accessing VPD on memory card 1	Replace I/O board. (See notes on page 127.)
E026	Service processing accessing VPD on memory card 2	Replace I/O board. (See notes on page 127.)
E030	Beginning to build I2C resources	<ol style="list-style-type: none"> 1. Replace processor card(s) 2. Replace I/O board. (See notes on page 127.)

<i>Table 1 (Page 2 of 4). Service Processor Checkpoints.</i>		
Checkpoint	Description	Action/ Possible Failing FRU
E031	Finished building resources	1. Replace processor card(s) 2. Replace I/O board. (See notes on page 127.)
E032	JTAG self-test	Replace I/O board (See notes on page 127.)
E040	Starting serial port tests	Replace I/O board (See notes on page 127.)
E042	Configuring serial port 1	Replace I/O board (See notes on page 127.)
E043	Configuring serial port 2	Replace I/O board. (See notes on page 127.)
E044	Preparing to set serial port line speed	Replace I/O board. (See notes on page 127.)
E045	Preparing to initialize serial port.	Replace I/O board. (See notes on page 127.)
E050	Reading system VPD.	Replace operator panel (See notes on page 127.)
E051	Reading processor VPD.	Replace processor card(s)
E052	Reading memory card and DIMM VPD.	Replace memory card(s) and/or DIMMs.
E053	Reading system board VPD.	Replace system board.
E055	Reading power supply VPD.	Replace power supply.
E060	Preparing to auto power-on (ac restored)	1. I/O board. (See notes on page 127.) 2. Processor card.
E061	Preparing to auto power-on (timer)	1. I/O board. (See notes on page 127.) 2. Processor card.
E070	Configuring modem	1. Try another modem configuration from the service processor menus. 2. Check the cabling between the modem and the system. 3. Replace modem. 4. Replace I/O board. (See notes on page 127.)
E072	Preparing to call home	1. Try another modem configuration from the service processor menus. 2. Check the cabling between the modem and the system. 3. Replace modem. 4. Replace I/O board. (See notes on page 127.)

Table 1 (Page 3 of 4). Service Processor Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E075	Entering service processor menus	<ol style="list-style-type: none"> 1. Verify that the cabling connecting the terminal to the system serial port is correct. 2. Cycle ac power to the system. 3. Clear NVRAM, then recycle ac power to the system. 4. Verify that the terminal being used is functional. 5. Try above repair actions using an alternate terminal. 6. Replace I/O board. (See notes on page 127.)
E076	Leaving service processor menus; attempting to disconnect modems	<ol style="list-style-type: none"> 1. Try another modem configuration from the service processor menus. 2. Check the cabling between the modem and the system. 3. Replace modem. 4. Replace I/O board. (See notes on page 127.)
E080	Service processor firmware corrupted	<ol style="list-style-type: none"> 1. Replace EEPROMs on I/O board. 2. Replace I/O board. (See notes on page 127.)
E081	Flash update completed - system reboot in progress.	<ol style="list-style-type: none"> 1. Cycle ac power and attempt a reboot. 2. Replace EEPROMs on I/O board. 3. Replace I/O board. (See notes on page 127.)
E0A0	Beginning bring-up phase	<ol style="list-style-type: none"> 1. Replace processor card(s). 2. Replace I/O board. (See notes on page 127.)
E0B0	Starting processor BIST	<ol style="list-style-type: none"> 1. Consult the service processor error logs for potential failing FRUs. 2. Replace processor card(s) 3. Replace I/O board. (See notes on page 127.)
E0C0	Starting X5 BIST	<ol style="list-style-type: none"> 1. Replace processor card(s) 2. Replace I/O board. (See notes on page 127.)
E0D0	Creating JTAG scanlog (failure diagnostic information).	
E0E0	Begin pulling processor card out of reset state.	<ol style="list-style-type: none"> 1. Replace processor card(s). 2. Replace I/O board. (See notes on page 127.)

Table 1 (Page 4 of 4). Service Processor Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E0E1	Processor card successfully pulled out of reset.	<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(s). 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(s). If not, continue. 3. Go to MAP 1540: Minimum Configuration "Step 1540-27" on page 97.
DIAG STBY	Service processor ready. The system unit was shut down in service mode by the operating system; however, the system unit 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.
OK	Service processor ready; waiting for power-on	None. Normal operation.
STBY	Service processor ready. System was shut down 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 can be useful in diagnosing certain problems. Service processor checkpoints are listed in "Service Processor Checkpoints" on page 101.

If you replace FRUs and the problem is still not corrected, go to "MAP 1540: Minimum Configuration" on page 72 unless otherwise indicated in the tables.

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

Checkpoint	Description	Action/ Possible Failing FRU
E100	Reserved	See the note on page 101.
E101	Video enabled, extended memory test	See the note on page 101.
E102	Firmware restart	See the note on page 101.
E103	Set memory refresh (composite img)	See the note on page 101.
E104	Set memory refresh (recovery block)	See the note on page 101.
E105	Transfer control to operating system (normal boot).	Go to "Boot Problems or Concerns" on page 118.
E108	Run recovery block base memory (test 2K), set stack	See the note on page 101.
E109	Copy CRC verification code to RAM	See the note on page 101.
E10A	Turn on cache	See the note on page 101.
E10B	Flush cache	See the note on page 101.
E10C	Jump to CRC verification code in RAM	See the note on page 101.
E10D	Compute composite image CRC	See the note on page 101.
E10E	Jump back to ROM	See the note on page 101.
E10F	Transfer control to open firmware	See the note on page 101.
E110	Turn off cache; check if composite image CRC is valid	See the note on page 101.
E111	Good CRC - jump to composite image	See the note on page 101.
E112	Bad CRC - initialize base memory, stack	See the note on page 101.
E113	Bad CRC - copy uncompressed recovery block code to RAM	See the note on page 101.
E114	Bad CRC - jump to code in RAM	See the note on page 101.
E115	Bad CRC - turn on cache	See the note on page 101.

<i>Table 2 (Page 2 of 12). Firmware Checkpoints.</i>		
Checkpoint	Description	Action/ Possible Failing FRU
E116	Bad CRC - copy recovery block data section to RAM	See the note on page 101.
E117	Bad CRC - Invalidate and flush cache, set TOC	See the note on page 101.
E118	Bad CRC - branch to high level recovery control routine.	See the note on page 101.
E119	Initialize base memory, stack	See the note on page 101.
E11A	Copy uncompressed recovery block code to RAM	See the note on page 101.
E11B	Jump to code in RAM	See the note on page 101.
E11C	Turn on cache	See the note on page 101.
E11D	Copy recovery block data section to RAM	See the note on page 101.
E11E	Invalidate and flush cache, set TOC	See the note on page 101.
E11F	Branch to high level control routine.	See the note on page 101.
E120	Initialize I/O and early memory block	See the note on page 101.
E121	Initialize service processor	See the note on page 101.
E122	No memory detected (system lockup) Note: Disk drive light is on continuously.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
E123	No memory module found in socket.	See the note on page 101.
E124	Disable defective memory bank	See the note on page 101.
E125	Clear PCI devices command reg, go forth	See the note on page 101.
E126	Check valid image - start	See the note on page 101.
E127	Check valid image - successful	See the note on page 101.
E128	Disable interrupts, set int vectors for open firmware.	See the note on page 101.
E129	Validate target RAM address	See the note on page 101.
E12A	Copy ROM to RAM, flush cache	See the note on page 101.
E12B	Set multi-processor operational parameters	See the note on page 101.
E12C	Set multi-processor CPU node characteristics	See the note on page 101.
E12D	Park secondary processors in parking lot	See the note on page 101.
E12E	Primary processor sync	See the note on page 101.

Checkpoint	Description	Action/ Possible Failing FRU
E12F	Unexpected return from open firmware (system lockup)	See the note on page 101.
E130	Build device tree	See the note on page 101.
E131	Create root node	See the note on page 101.
E132	Create CPU's node	See the note on page 101.
E133	Create L2 cache node	See the note on page 101.
E134	Create memory node	See the note on page 101.
E135	Create memory module node	See the note on page 101.
E136	Test memory	See the note on page 101.
E137	Create openprom node	See the note on page 101.
E138	Create options node	See the note on page 101.
E139	Create aliases node and system aliases	See the note on page 101.
E13A	Create packages node	See the note on page 101.
E140	PRReP style load	See the note on page 101.
E149	Create boot mgr node	See the note on page 101.
E14C	Create terminal-emulator node	See the note on page 101.
E14D	Load boot image	Go to "Boot Problems or Concerns" on page 118.
E14E	Create client interface node/directory	See the note on page 101.
E14F	NVRAM validation, config variable token generation	See the note on page 101.
E150	Create host (primary) PCI controller node	See the notes on page 101.
E151	Probing primary PCI bus	Go to Map 1540: Minimum Configuration, "Step 1540-27" on page 97. If a network adapter or I/O board is replaced, see notes on page 127.
E152	Probe for adapter FCODE; evaluate if present	Go to Map 1540: Minimum Configuration, "Step 1540-27" on page 97. If a network adapter or I/O board is replaced, see notes on page 127.

<i>Table 2 (Page 4 of 12). Firmware Checkpoints.</i>		
Checkpoint	Description	Action/ Possible Failing FRU
E153	End adapter FCODE probe/evaluation	Go to Map 1540: Minimum Configuration, "Step 1540-27" on page 97. If a network adapter or I/O board is replaced, see notes on page 127.
E154	Create PCI bridge node	Go to Map 1540: Minimum Configuration, "Step 1540-27" on page 97. If a network adapter or I/O board is replaced, see notes on page 127.
E155	Probe PCI bridge secondary bus	Go to Map 1540: Minimum Configuration, "Step 1540-27" on page 97. If a network adapter or I/O board is replaced, see notes on page 127.
E156	Create PCI Ethernet node	See the note on page 101.
E15A	Create 64 bit host (primary) PCI controller node	See the note on page 101.
E15B	Transferring control to operating system (service mode boot)	Go to "Boot Problems or Concerns" on page 118.
E15C	Probe primary 64 bit PCI bus	See the note on page 101.
E15D	Create host PCI controller node	See the note on page 101.
E15E	Create MPIC node	See the note on page 101.
E15F	Adapter VPD probe	See the note on page 101.
E160	CPU node VPD creation	See the note on page 101.
E161	Root node VPD creation	See the note on page 101.
E162	SP node VPD creation	See the note on page 101.
E164	Create PCI graphics node (P9)	See the note on page 101.
E168	Create PCI graphics node (S3)	See the note on page 101.
E170	Start of PCI bus probe	See the note on page 101.
E171	Executing PCI-delay function	See the note on page 101.
E172	First pass PCI device probe	See the note on page 101.
E174	Establish a host connection.	Go to "Boot Problems or Concerns" on page 118.

Table 2 (Page 5 of 12). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E175	BootP request	Go to "Boot Problems or Concerns" on page 118. <ol style="list-style-type: none"> 1. Turn system 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	Refer to "Boot Problems or Concerns" on page 118 for general considerations. <ol style="list-style-type: none"> 1. Turn system 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.
E177	Transfer failure due to TFTP error condition	Refer to "Boot Problems or Concerns" on page 118 for general considerations. <ol style="list-style-type: none"> 1. Turn system 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.
E178	Create PCI token ring node	See the note on page 101.
E17B	Processor frequency measurement	<ol style="list-style-type: none"> 1. Replace battery, restore NVRAM data (passwords, startup data) 2. Replace I/O board. (See notes on page 127.)
E180	Service processor command setup	See the note on page 101.
E183	Service processor POST	See the note on page 101.
E190	Create ISA node	See the note on page 101.
E193	Initialize Super I/O.	See the note on page 101.
E196	Probe ISA bus.	See the note on page 101.
E19B	Create service processor node.	See the note on page 101.
E19C	Create tablet node.	See the note on page 101.
E19D	Create NVRAM node.	See the note on page 101.

<i>Table 2 (Page 6 of 12). Firmware Checkpoints.</i>		
Checkpoint	Description	Action/ Possible Failing FRU
E19E	Real time clock (RTC) creation and initialization.	Refer to error code 28030xxx in "Firmware/POST Error Codes" on page 129.
E19F	Create EEPROM node.	See the note on page 101.
E21A	System has some good memory	See the note on page 101.
E1AD	See description of checkpoint E1DE.	See the note on page 101.
E1B0	Create lpt node.	1. I/O board (See notes on page 127.) 2. See the note on page 101.
E1B1	Create serial node.	See the note on page 101.
E1B2	Create audio node.	1. I/O board (See notes on page 127.) 2. See the note on page 101.
E1B3	Create 8042 node.	1. I/O board (See notes on page 127.) 2. See the note on page 101.
E1B6	Probe for (ISA) keyboard.	1. I/O board (See notes on page 127.) 2. See the note on page 101.
E1BA	Enable L2 cache.	See the note on page 101.
E1BB	Set cache parms for burst.	See the note on page 101.
E1BC	Set cache parms for 512 KB.	See the note on page 101.
E1BD	Probe for (ISA) mouse.	1. I/O board (See notes on page 127.) 2. See the note on page 101.
E1BE	Create operator panel node.	See the note on page 101.
E1BF	Create pwr-mgmt node.	See the note on page 101.
E1C5	Create ISA interrupt controller (pic) node.	1. I/O board (See notes on page 127.) 2. See the note on page 101.
E1C6	Create DMA node.	1. I/O board (See notes on page 127.) 2. See the note on page 101.
E1D0	Create PCI SCSI node.	See the note on page 101.
E1D3	Create SCSI block device node (SD).	See the note on page 101.
E1D4	Create SCSI byte device node (ST).	See the note on page 101.

Table 2 (Page 7 of 12). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E1DB	Create floppy controller (FDC) node.	<ol style="list-style-type: none"> 1. I/O board (See notes on page 127.) 2. See the note on page 101.
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 page 127.) 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	<ol style="list-style-type: none"> 1. I/O board (See notes on page 127.) 2. See the note on page 101.
E1DE	Alternating pattern of E1DE and E1AD is used to indicate a default catch condition before the firmware "checkpoint" word is available.	<ol style="list-style-type: none"> 1. I/O board (See notes on page 127.) 2. See the note on page 101.
E1E0	Program flash	See the note on page 101.
E1E1	Flash update complete	See the note on page 101.
E1E2	Initialize System I/O	See the note on page 101.
E1E3	PReP boot image initialization.	See the note on page 101.

<i>Table 2 (Page 8 of 12). Firmware Checkpoints.</i>		
Checkpoint	Description	Action/ Possible Failing FRU
E1E4	Initialize Super I/O with default values.	See the note on page 101.
E1E5	XCOFF boot image initialization.	See the note on page 101.
E1E6	Set up early memory allocation heap.	See the note on page 101.
E1E7	PE boot image initialization.	See the note on page 101.
E1E9	ELF boot image initialization.	See the note on page 101.
E1EA	Firmware flash corrupted.	Replace the EEPROMs on the I/O board.
E1EB	Verify flash EEPROM recovery image.	Replace the EEPROMs on the I/O board.
E1EC	Get recovery image entry point	See the note on page 101.
E1ED	Invalidate instruction cache	See the note on page 101.
E1EE	Jump to composite image	See the note on page 101.
E1EF	Erase flash	See the note on page 101.
E1F0	Start O.B.E.	See the note on page 101.
E1F1	Begin self-test sequence on boot device(s)	See the note on page 101.
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 38 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 38 with the symptom "All display problems."
E1F5	Build boot device list.	See the note on page 101.
E1F6	Determine boot device sequence.	See the note on page 101.
E1F7	No boot image located.	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.

Table 2 (Page 9 of 12). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E1FB	Scan SCSI bus for attached devices.	See the note on page 101.
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 72.
E201	Setup PHB BARC addresses.	<ol style="list-style-type: none"> 1. I/O board (See notes on page 127.) 2. See the note on page 101.
E202	Initialize PHB registers and PHB's PCI configuration registers.	<ol style="list-style-type: none"> 1. I/O board (See notes on page 127.) 2. See the note on page 101.
E203	Look for PCI to ISA bridge.	<ol style="list-style-type: none"> 1. I/O board (See notes on page 127.) 2. See the note on page 101.
E204	Setup ISA bridge, PCI config. registers and initialize	<ol style="list-style-type: none"> 1. I/O board (See notes on page 127.) 2. See the note on page 101.
E206	Check for 50MHz device on PCI bus in slots 1P and 2P.	<ol style="list-style-type: none"> 1. Replace the I/O board (See notes on page 127.) 2. I/O adapter in PCI slot 1P or 2P. 3. See the note on page 101.
E207	Setup data gather mode and 64/32-bit mode on PCG.	<ol style="list-style-type: none"> 1. I/O board (See notes on page 127.) 2. See the note on page 101.
E208	Assign bus number on PCG.	<ol style="list-style-type: none"> 1. I/O board (See notes on page 127.) 2. See the note on page 101.
E209	Assign PCI I/O addresses on PCI.	<ol style="list-style-type: none"> 1. I/O board (See notes on page 127.) 2. See the note on page 101.
E20A	Assign PCI I/O addresses on PCG.	<ol style="list-style-type: none"> 1. I/O board (See notes on page 127.) 2. See the note on page 101.
E20B	Check MCERs stuck at fault.	<ol style="list-style-type: none"> 1. Replace the system board. 2. If the problem persists, go to "MAP 1540: Minimum Configuration" on page 72.

<i>Table 2 (Page 10 of 12). Firmware Checkpoints.</i>		
Checkpoint	Description	Action/ Possible Failing FRU
E20C	Testing L2 cache.	1. I/O board (See notes on page 127.) 2. See the note on page 101.
E210	Processors L1 data cache array test fails. System hangs.	1. I/O board (See notes on page 127.) 2. See the note on page 101.
E211	IPL ROS CRC checking.	1. I/O board (See notes on page 127.) 2. See the note on page 101.
E212	Processor POST.	1. I/O board (See notes on page 127.) 2. See the note on page 101.
E213	Initial memory configuration.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
E214, E218	Memory test.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
E216	Copy ROS into RAM. Setup translation and C environment.	1. I/O board (See notes on page 127.) 2. See the note on page 101.
E21A	System has good memory	See the note on page 101.
E220	Final memory configuration.	Go to "MAP 1240: Memory Problem Resolution" on page 52.
E240	Setup Winbond ISA bridge.	Replace I/O board. (See the notes on page 128.)
E241	Reset PCI Bus.	Replace I/O board. (See the notes on page 128.)
E242	Initialize ISA DMA channel.	Replace I/O board. (See the notes on page 128.)
E243	Setup Grackle configuration registers.	Replace I/O board. (See the notes on page 128.)
E244	Enable system speaker and send a beep.	Replace I/O board. (See the notes on page 128.)
E246	System firmware corrupted, take recovery path.	Replace I/O board. (See the notes on page 128.)
E247	Capture DIMM SPD's into NVRAM.	Replace I/O board. (See the notes on page 128.)
E249	Enter recovery path's main code.	Replace I/O board. (See the notes on page 128.)

<i>Table 2 (Page 11 of 12). Firmware Checkpoints.</i>		
Checkpoint	Description	Action/ Possible Failing FRU
E24C	L2 cache array test fails. System hangs.	Replace I/O board. (See the notes on page 128.)
E24D	L2 cache array test fails. System hangs.	Replace I/O board. (See the notes on page 128.)
E297	Start firmware softload path execution.	See the note on page 101.
E298	Start firmware recovery path execution.	See the note on page 101.
E299	Start C code execution.	See the note on page 101.
E3xx	Memory test	See "MAP 1240: Memory Problem Resolution" on page 52.
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 I/O board (See the notes on page 127.) 3. See the note on page 101.
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 I/O board (See the notes on page 127.) 3. See the note on page 101.
E442	Validate NVRAM partitions.	<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 I/O board (See the notes on page 127.) 3. See the note on page 101.
E443	Generate NVRAM configuration variable dictionary words.	<ol style="list-style-type: none"> 1. Suspect a system firmware problem if this problem persists. Verify that the system firmware is at the current release level; update as necessary. 2. See the note on page 101.
E600	SSA PCI adapter open firmware has run successfully.	<ol style="list-style-type: none"> 1. Replace the adapter. 2. See the note on page 101.
E601	SSA PCI adapter BIST has been started but failed to complete after 4 secs.	<ol style="list-style-type: none"> 1. Replace the adapter. 2. See the note on page 101.
E602	SSA PCI adapter open firmware has started.	<ol style="list-style-type: none"> 1. Replace the adapter. 2. See the note on page 101.

Table 2 (Page 12 of 12). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E603	SSA PCI adapter BIST has completed with an error.	1. Replace the adapter. 2. See the note on page 101.
E604	SSA PCI adapter BIST and subsequent POSTs have completed successfully	1. Replace the adapter. 2. See the note on page 101.
E605	SSA PCI adapter BIST has completed successfully, but the subsequent POSTs have failed.	1. Replace the adapter. 2. See the note on page 101.
E60E	SSA PCI adapter open firmware about to exit (no stack corruption).	1. Replace the adapter. 2. See the note on page 101.
E60F	SSA PCI adapter open firmware has run unsuccessfully.	1. Replace the adapter. 2. See the note on page 101.
E6FF	SSA PCI adapter open firmware about to exit (with stack corruption)	1. Replace the adapter. 2. See the note on page 101.

Boot Problems or 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 for tape and network boot attempts. If booting from CD-ROM or tape, watch for activity on the drive's LED indicator. A blinking LED indicates 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 might 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. Because time-out durations are necessarily long to accommodate retries, the system may appear to be hung.

This procedure assumes that if a CD-ROM drive is installed, it is connected to internal SCSI connector J7 and a diagnostics CD-ROM is available.

Note: If the system does not have a CD-ROM drive installed, a NIM server is required as the source for booting the system in standalone diagnostics mode.

Step 1

Restart the system and access the firmware SMS Main Menu. Select **Multiboot**.

1. Check if the intended boot device is correctly specified in the boot sequence.
2. 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 2."
3. Remove all removable media from devices in the boot list from which you do not want to boot.
4. If attempting to boot from the network, go to "Network Boot" on page 122.
5. If attempting to boot from a disk drive or CD-ROM, go to "Step 2."

Step 2

Try to boot and run standalone diagnostics against the system, particularly against the intended boot device.

1. If the intended boot device is not listed in the "NEW RESOURCE" list, go to "MAP 0290: Missing Resource Problem Resolution" in the *Diagnostic Information for Multiple Bus Systems*.

2. If an SRN, not an 8-digit error code, is reported, go to the *Diagnostic Information for Multiple Bus Systems* manual.
3. If the diagnostics are successful, it may be necessary to perform an operating system-specific recovery process, or reinstall the operating system.
4. If unable to load standalone diagnostics, do the following:
 - a. Verify proper SCSI bus termination
 - b. Check SCSI cabling
 - c. It is possible that another attached SCSI device is causing the problem. Do the following:
 1. Disconnect the signal and power cables from the disk drive cage backplane.
 2. Disconnect the disk drive(s) in the disk drive cage from the backplane.
 3. Disconnect the signal and power cables from any other SCSI devices attached to the SCSI adapter that the CD-ROM drive is attached to.
 4. Try to boot the standalone diagnostics again.
 5. If you are still unable to load standalone diagnostics go to "Step 3."
 6. If standalone diagnostics load, one of the disconnected devices 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 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Step 3

It is possible that another installed adapter is causing the problem. Do the following:

1. Remove all installed adapters except the one the CD-ROM drive is attached to and the one used for the console.
2. Try to boot the standalone diagnostics again.
3. If unable to load standalone diagnostics go to "Step 4" on page 120.
4. If standalone diagnostics load, reinstall 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. (The system board can also cause the device or adapter to fail.) Go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Step 4

The CD-ROM drive, SCSI cable, SCSI adapter, graphics adapter, or the system board is most likely defective. An ASCII terminal attached to the serial port also can be used to determine if the graphics adapter is causing the problem. This is done by removing the graphics adapter, attaching an ASCII terminal to the serial port, and retrying standalone diagnostics. If the standalone diagnostics load, replace the graphics adapter.

If the graphics adapter is not causing the problem:

1. Replace the CD-ROM drive.
2. Replace the SCSI cable.
3. If the CD-ROM drive is attached to a SCSI adapter rather than the integrated SCSI on the system board, replace the SCSI adapter.
4. Replace the system board.
5. If you replaced the indicated FRUs and the problem is still not corrected, or the above descriptions did not address your particular situation, go to "MAP 1540: Minimum Configuration" on page 72.
6. If replace a FRU or perform an action and the problem is corrected, go to "MAP 410: Repair Checkout" in *Diagnostic Information for Multiple Bus Systems*.

Typical Boot Sequence

After the power is turned on, the system support controller (SSC) 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.

A typical boot sequence is as follows:

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 Enter 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 are read and the cyclic redundancy check (CRC) is calculated.
 - 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 which 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 pressing 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 standalone diagnostics (CD).
 - 6 or F6 to start the online diagnostics (disk drive).

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

- After a boot image is located on a device in the boot list, the system firmware code passes control to one of the following AIX boot codes:
 - E105 for normal boot
 - E15B for service mode boot
- The AIX boot code displays LCD progress codes in the range from 02XX to 0DXX.

9. AIX Boot Complete

- The AIX login prompt displays on the main console.

Network Boot

Return to the SMS Main Menu. Select **Utilities**, then depending on your terminal type, select **RIPL** or **Remote Initial Program Load Setup**.

1. Do the following to verify the IP parameters, the server configuration for the client, and the network status:
 - a. Select **Set Address** or **IP Parameters**.
 - b. Verify the IP parameters are correct.
 - c. Return to the Network Parameters screen.
 - d. Attempt to ping the target server using the SMS Ping utility. If the ping is unsuccessful, have the network administrator verify the server configuration for this client.

Note: The **Cstate** flag for the system you are trying to boot must be set to *diagnostic boot has been enabled* on the server.
 - e. Check with the network administrator to ensure that the network is up.
 - f. Turn off the power to the system.
 - g. Check the network cabling to the adapter.
 - h. Turn on the power to the system and retry the boot operation. If the system boots, you are finished. If the system does not boot, continue on to the next step.

- i. To boot the system from the network, refer to “Running Standalone Diagnostics from a Network Installation Management (NIM) Server” on page 180.
 - j. Try to boot and load standalone diagnostics from the network.
 - k. If the network diagnostics load, go to step 2.
 - l. If you are unable to boot and load diagnostics from the network, go to step 3.
2. Run standalone diagnostics against the system, and 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 *Diagnostic Information for Multiple Bus Systems*.
 - If an SRN, not an 8-digit error code, is reported, go to the *Diagnostic Information for Multiple Bus Systems*.
 - If the diagnostics are successful, it may be necessary for the customer to perform a specific recovery procedure or reinstall the operating system. Refer to your operating system documentation for instructions.
3. An installed adapter or device may be causing the problem.
 - a. Remove all adapters except the network adapter you are trying to boot from and the one used for the console.
 - b. Disconnect the signal and power cables from the 4-pack backplane.
 - c. Remove all disk drives from the 4-pack.
 - d. Disconnect the signal and power cables from any other attached SCSI devices.
 - e. Boot the system from the network. Refer to “Running Standalone Diagnostics from a Network Installation Management (NIM) Server” on page 180.
 - f. If you are unable to boot and load diagnostics from the network, go to step 4.
 - g. If network diagnostics load, one of the adapters or devices that you removed or disconnected may be causing the problem. Reinstall or reconnect the adapter and devices one at a time, retrying the boot operation with each installation of an adapter or device. Continue with the reinstallation until the problem recurs.
 - If the problem appears to be one of the disk drives, suspect the disk drive or the 4-pack backplane.
 - If the problem appears to be an adapter, suspect the adapter or the I/O board.
 - h. Replace the suspect component.

- i. If the problem has been corrected, go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.
4. If you suspect the network adapter, the graphics adapter, or the I/O board to be defective, do the following:
 - a. To determine if the graphics adapter is causing the problems, do the following:
 1. Attach an ASCII terminal to serial port 1.
 2. Remove the graphics adapter, and retry booting the system.
 3. If the standalone diagnostics load, replace the graphics adapter.If you are unable to load standalone diagnostics, continue with the next step.
 - b. If you are attempting to boot from an integrated network adapter on the I/O board, replace the I/O board and retry booting the system.
 - c. If you are attempting to boot from a network adapter plugged into the I/O board, do the following:
 1. Replace the network adapter and retry booting the system.
 2. Replace the I/O board and retry booting the system.
 - d. If you replaced the indicated FRUs and the problem still persists, or the above description did not address your particular situation, go to "MAP 1540: Minimum Configuration" on page 72.
 - e. After you have completed the repair, go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Disk Drive or CD-ROM Drive Boot

1. If you suspect a corrupted boot record, damaged removable media, cabling, or SCSI device may be causing the problem, do the following:
 - a. Verify the correct SCSI bus termination.
 - b. Check the SCSI power and signal cabling.
 - c. Check for SCSI ID conflicts.
 - d. Check for a possibly defective CD-ROM disc. Replace the CD-ROM disc if necessary.
 - e. Try to boot and run standalone diagnostics against the system, particularly against the intended boot device. If the system does not boot, check the *NEW RESOURCE* list.
 - f. If the intended boot device is not listed in the *NEW RESOURCE* list, go to "MAP 0290: Missing Resource Problem Resolution" in the *Diagnostic Information for Multiple Bus Systems*.

- g. If an SRN, not an 8-digit error code, is reported, go to the *Diagnostic Information for Multiple Bus Systems*.
 - h. If the diagnostics are successful, it may be necessary to perform a specific recovery procedure or reinstall the operating system. Refer to your operating system documentation for instructions.
 - i. If unable to load standalone diagnostics, go to step 2.
- 2. If you suspect another attached SCSI device may be causing the problem, do the following:
 - a. Remove all disk drives from the 4-pack.
 - b. Try booting standalone diagnostics again.
 - c. If standalone diagnostics load, one of the removed disk drives may be causing the problem. Reinstall all disk drives one at a time and retry the boot operation until the problem recurs. Replace the disk drive that caused the problem.

Note: If the disk drives appears to be the problem, suspect also the 4-pack backplane.
 - d. If you are unable to load standalone diagnostics, replace the 4-pack backplane and try to boot standalone diagnostics again.
 - e. If standalone diagnostics load, go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.
 - f. If you are unable to load standalone diagnostics, go to step 3.
- 3. If you suspect another installed adapter may be causing the problem, do the following:
 - a. Remove all installed adapters except the one the CD-ROM drive is attached to and the one used for the console.
 - b. Try to boot the standalone diagnostics again.
 - c. If you are unable to load standalone diagnostics, go to step 4.
 - d. If the standalone diagnostics load, reinstall the adapters and devices, one at a time, retrying the boot operation with each installed adapter or device until the problem recurs. Replace the adapter or device that caused the problem.

Note: The I/O board can also cause the device or adapter to fail.
 - e. After you have completed the repair, go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.
- 4. If you suspect the CD-ROM drive, SCSI adapter, the graphics adapter, or the I/O board is most likely defective, do the following:
 - a. To determine if the graphics adapter is causing the problem, do the following:

1. Attach an ASCII terminal to serial port 1.
2. Remove the graphics adapter, and retry booting the system.
3. If the standalone diagnostics load, replace the graphics adapter.

If you are unable to load standalone diagnostics, continue with the next step.

- b. Replace the CD-ROM drive and retry booting the system. If you are unable to load standalone diagnostics, continue with the next step.
- c. If the CD-ROM drive is attached to an integrated SCSI adapter replace the I/O board and retry booting the system.
- d. If the CD-ROM drive is attached to a SCSI adapter plugged into the I/O board, do the following:
 1. Replace the SCSI adapter and retry booting the system.
 2. Replace the I/O board and retry booting the system.
- e. If a system problem still exists after following one or more of the above procedures, go to "MAP 1540: Minimum Configuration" on page 72.
- f. If you have completed the repair, go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Chapter 5. 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 the 8-digit error code and the location code if given to determine the failing FRU.

If the codes in the following tables indicate a device that 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 51 to display the System Management Services error log and obtain a location code. Location code descriptions can be found under “Location Codes” on page 16.

Once you have the location code, see Chapter 10, “Parts Information” on page 353 for the part number.

Performing Slow Boot

To fully analyze all of the available information, perform the following steps before doing a hardware repair or replacement:

1. Record the 8-character error code (and location code if present) in the operator panel or that was reported by the customer.
2. Do a slow-mode boot in service mode. This can be specified using the System Power Control Menu on the service processor main menu. (A fast-mode boot skips much of the built-in diagnostic testing.) A slow mode boot may yield a new 8-character error code on the operator panel and new errors in the service processor error log. If a new error code is reported, use it in subsequent steps to continue problem analysis.

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 "Location Codes" on page 16.
2. Licensed programs frequently rely on system information stored on the VPD. The VPD is stored in the operator panel. If the MAPs indicate that the operator panel assembly should be replaced, swap the VPD module 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 might 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.

Firmware/POST Error Codes

Note:

- If you replace FRUs or perform an action and the problem is still not corrected, go to "MAP 1540: Minimum Configuration" on page 72, unless otherwise indicated in the tables.
- If you replace FRUs and the problem is corrected, go to "MAP 410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Error Code	Description	Action / Possible Failing FRU
20A80xxx		Check the following 20A80... error codes for the xxx value. The xxx stands for any alpha-numeric digit, for example 20A80001, 20A80002, or 20A80003 and so on. If a problem still persists after performing the tasks mentioned in the <i>Action / Possible Failing FRU</i> column, then go to "Boot Problems or Concerns", "Network Boot" on page 122 for additional instructions.
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 106 using code E174 .
20A80003	Cannot get server hardware address.	Refer to "Firmware Checkpoints" on page 106 using code E174 .
20A80004	Bootp failed.	<ol style="list-style-type: none"> 1. Turn the system off, then on, and retry the boot operation. 2. Go to "Boot Problems or Concerns" on page 118.
20A80005	File transmission (FTP) failed.	Check network connection; try again.
20A80006	Image too big. Ran out of available firmware memory resources loading boot image.	Verify boot server configuration.
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 51) 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, cannot locate package.	Contact your service support representative for assistance.

Table 3 (Page 2 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
20D00011	Instantiate RTAS failed.	Contact your service support representative for assistance.
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 page 127.)
20E00005	EEPROM locked	1. Power down, power up the system. 2. Replace the I/O board. (See notes on page 127.)
20E00008	CMOS reinitialized due to corruption.	1. Replace battery, restore NVRAM data (passwords, startup data). 2. Replace I/O board. (See notes on page 127.)
20E00009	Invalid password entered - system locked.	The password has been entered incorrectly three times. Turn off, then turn on the system unit, then enter the password correctly.
20E0000C	Failed to open RTC device tree node	1. Turn the system off, then on. 2. Replace I/O board. (See notes on page 127.)
20E00017	Cold boot needed for password entry.	Turn off, turn on system unit.
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

Table 3 (Page 3 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
20EE0006	No SCSI controllers present	The I/O board should always have (at least) 2 integrated SCSI controllers; replace the I/O board. (See notes on page 127.)
20EE0007	Keyboard not found	<ol style="list-style-type: none"> 1. Plug in keyboard. 2. Replace I/O board. (See notes on page 127.)
20EE0008	No configurable adapters found in the system.	<p>This warning occurs when the selected SMS function cannot locate any devices/adapters supported by the function. If a supported device is installed:</p> <ol style="list-style-type: none"> 1. Replace the device or adapter. 2. Replace I/O board. (See notes on page 127.)
20EE0009	Unable to communicate with service processor	<ol style="list-style-type: none"> 1. Replace the I/O board. 2. Replace the system board.

Table 3 (Page 4 of 47). 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 either of two reasons:</p> <ol style="list-style-type: none"> 1. Your installed operating system does not support storing the values. 2. Some event occurred that caused the system to lose non-volatile storage information (drainage or replacement of the battery). <p>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. Refer to your AIX documentation for the exact syntax and usage of the bootlist command.</p> <p>To boot the operating system so that the above-mentioned values can be reconstructed, power-down the system 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, use the System Management Services menus to modify the boot sequence (also known as boot list) to include devices that are known to contain a copy of the operating system. 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.	Go to "Boot Problems or Concerns" on page 118.

Table 3 (Page 5 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
21000001	Unsupported SCSI bus mode	<p>Before replacing any system components, refer to the notes in error code 21A00xxx.</p> <ol style="list-style-type: none"> 1. Disconnect the SCSI cable from the SCSI controller the location code identifies and reboot the system. 2. If the error code persists, replace the SCSI controller (or the I/O board if the SCSI controller is integrated). 3. Reconnect the SCSI cable disconnected in step 1, and remove all the SCSI devices attached to the cable and reboot the system. 4. If the error code persists, replace the SCSI cable. 5. Reconnect, one at a time, all SCSI devices disconnected in step 3. If the error code returns, replace the last reconnected SCSI device. <p>If all SCSI devices have been reconnected and the error code has not returned, there may have been a bad connection. Go to "MAP 410: Repair Checkout" in the <i>Diagnostic Information for Multiple Bus Systems</i>.</p>

Table 3 (Page 6 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
21000002	Unsupported SCSI bus mode - high voltage differential	<p>Before replacing any system components, refer to the notes in error code 21A000xxx.</p> <ol style="list-style-type: none"> 1. Disconnect the SCSI cable from the SCSI controller the location code identifies and reboot the system. 2. If the error code persists, replace the SCSI controller (or the I/O board if the SCSI controller is integrated). 3. Reconnect the SCSI cable disconnected in step 1, and remove all the SCSI devices attached to the cable and reboot the system. 4. If the error code persists, replace the SCSI cable. 5. Reconnect, one at a time, all SCSI devices disconnected in step 3. If the error code returns, replace the last reconnected SCSI device. <p>If all SCSI devices have been reconnected and the error code has not returned, there may have been a bad connection. Go to "MAP 410: Repair Checkout" in the <i>Diagnostic Information for Multiple Bus Systems</i>.</p>

Table 3 (Page 7 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
21000004	Cannot determine the SCSI bus mode	<p>Before replacing any system components, refer to the notes in error code 21A000xxx.</p> <ol style="list-style-type: none"> 1. Disconnect the SCSI cable from the SCSI controller the location code identifies and reboot the system. 2. If the error code persists, replace the SCSI controller (or the I/O board if the SCSI controller is integrated). 3. Reconnect the SCSI cable disconnected in step 1, and remove all the SCSI devices attached to the cable and reboot the system. 4. If the error code persists, replace the SCSI cable. 5. Reconnect, one at a time, all SCSI devices disconnected in step 3. If the error code returns, replace the last reconnected SCSI device. <p>If all SCSI devices have been reconnected and the error code has not returned, there may have been a bad connection. Go to "MAP 410: Repair Checkout" in the <i>Diagnostic Information for Multiple Bus Systems</i>.</p>

Table 3 (Page 8 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
21A00xxx	SCSI DASD device errors	<p>If a boot problem still exists after you have completed the tasks mentioned in the following note list, then go to "Boot Problems or Concerns" on page 118.</p> <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. Location code information required to identify the ID of SCSI device failures and to indicate the location of the controller to which the device is attached is located on the second line of the operator panel display. 3. Check below for the xxx value, the xxx can stand for anything such as 001, 002, 003 and so on. Ensure that all components associated with the suspected SCSI device are thoroughly checked.
21A00001	Test unit ready failed - hardware error.	<p>Refer to the notes in error code 21A00xxx.</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 21A00xxx.</p> <ol style="list-style-type: none"> 1. Replace the media in removable media devices. 2. Replace the SCSI device.
21A00003	Send diagnostic failed.	<p>Refer to the notes in error code 21A00xxx. Replace the SCSI device.</p>
21A00004	Send diagnostic failed - DevOfI cmd.	<p>Refer to the notes in error code 21A00xxx. Replace the SCSI device.</p>

<i>Table 3 (Page 9 of 47). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
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 the failing FRU.
22001001	Internal wrap test failed.	Replace the failing FRU.
22002001	Adapter failed to complete hardware initialization.	Replace the failing FRU.
22010001	Adapter failed to complete hardware initialization.	Replace the failing FRU.
22011001	Adapter failed to complete hardware initialization.	Replace the failing FRU.
25000000	Memory controller failed.	Replace the system board.
25010xxx	Flash Update Problem	
25010003	Cannot open OPENPROM package.	Replace I/O board. (See notes on page 127.)
25010004	Cannot find OPENPROM node.	Replace I/O board. (See notes on page 127.)
25A0xxx0	L2 cache controller problem.	1. Replace the processor card. 2. Replace the system board. See error code 2B2xxx22 for xxx definitions.
25A0xxx1	L2 cache controller problem.	1. Replace the processor card. 2. Replace the system board. See error code 2B2xxx22 for xxx definitions.
25A1xxx1 through 25A1xxxB	L2 SRAM failure	Replace the processor card. See error code 2B2xxx22 for xxx definitions.

Table 3 (Page 10 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
25A80xxx	NVRAM problems	<ol style="list-style-type: none"> 1. Errors reported against NVRAM can be caused by low battery voltage and (more rarely) power outages that occur during normal system usage. With the exception of the 25A80000 error, these errors are 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 (for example boot device list) information has been lost; the system may need to be reconfigured. 2. If the error is persistent, replace the battery. 3. If the error is persistent after battery replacement, or the error code is 25A80000, replace the I/O board. (See notes on page 127.)
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.
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.

<i>Table 3 (Page 11 of 47). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
25A80211	Setenv/\$Setenv parameter error - value contains a null character.	Refer to Action under error code 25A80xxx.
25A80998	NVRAMRC script evaluation error - command	<p>Execution of a command line within the NVRAM configuration variable "NVRAMRC" (script) resulted in a "throw" being executed. This script can be modified by the system firmware SMS utilities, the operating system, PCI adapter ROM code or utility, or an operator (via the open firmware script editing command nvedit). It may not be possible to resolve the problem without a detailed analysis of the NVRAM script, current system configuration, and device tree contents.</p> <ol style="list-style-type: none"> The problem can be caused by a SCSI adapter, whose SCSI bus ID has been changed from the default setting, no longer appearing in the system. This can be caused either by removing the adapter, or a problem with a SCSI adapter. <ul style="list-style-type: none"> Select the SCSI ID utility from the SMS menu(s). <ol style="list-style-type: none"> Verify the list of SCSI controllers/adapters. If the list is not correct, suspect a problem with the adapter(s) installed but not listed. Select the option to SAVE the configuration information. Restart the system. If the problem persists, boot the operating system and verify the SCSI bus IDs of any installed/available SCSI controllers (change as necessary), and restart the system. Contact your service support representative for further assistance.
25A80999	NVRAMRC script evaluation error - stack unbalanced on completion.	This is a firmware debug environment error. There is no user action or FRU replacement.

Table 3 (Page 12 of 47). 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 51) 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 Module PD-bits and xxx indicates the last 3 digits of the error code.</p> <p>See "Memory Problem Determination Bits" on page 176 for information on how to interpret PD bits.</p>		
25B00001	No memory DIMMs detected	<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 and retry. 3. Replace memory card(s). 4. Replace system board.
25B00002	Multiple memory modules failed memory test.	<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 and retry. 3. Replace memory card(s). 4. Replace system board.
25Cyy001	Memory module is not supported.	<p>Replace unsupported memory module.</p> <p>Note:</p> <p>A memory module must be replaced with a supported type of memory module. If an unsupported memory module is replaced by the same unsupported type, the error remains.</p> <p>There may be two memory module-related memory errors reported to indicate a memory module pair. One of the two indicated memory modules may be good. When replacing memory, replace one memory module at a time, not both.</p> <p>See "Memory Problem Determination Bits" on page 176 for definition of "yy".</p>

Table 3 (Page 13 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
25Cyy002	Memory module fails memory test.	<ol style="list-style-type: none"> 1. Access the following service processor menus: <ul style="list-style-type: none"> • Privileged User Menu • System Information Menu. • Memory Configuration/Deconfiguration Menu 2. If the Memory Configuration/Deconfiguration Menu indicates: <ul style="list-style-type: none"> • Fewer than four memory modules deconfigured, go to step 3 • Four memory modules are deconfigured, go to step 4 • More than four memory modules are deconfigured, go to step 5. 3. Replace the deconfigured memory modules. 4. Replace the memory card. <p>Note: Before replacing the system board perform steps 3 and 4.</p> <ol style="list-style-type: none"> 5. Replace the system board. <p>See "Memory Problem Determination Bits" on page 176 for the definition of "yy".</p>
25Cyy003	PD bits are mismatched 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 Problem Determination Bits" on page 176 for definition of "yy".</p>
25Cyy004	Memory modules are disabled.	<p>Remove this unused memory module.</p> <p>See "Memory Problem Determination Bits" on page 176 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 Problem Determination Bits" on page 176 for definition of "yy".</p>

Table 3 (Page 14 of 47). Firmware Error Codes.

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 Problem Determination Bits" on page 176 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 Problem Determination Bits" on page 176 for definition of "yy".</p>
25Cyy008	Memory module has been deconfigured.	<ol style="list-style-type: none"> 1. Access the following service processor menus: <ul style="list-style-type: none"> • Privileged User Menu • System Information Menu. • Memory Configuration/Deconfiguration Menu 2. If the Memory Configuration/Deconfiguration Menu indicates: <ul style="list-style-type: none"> • Fewer than four memory modules deconfigured, go to step 3 • Four memory modules are deconfigured, go to step 4 • More than four memory modules are deconfigured, go to step 5. 3. Replace the deconfigured memory modules. 4. Replace the memory card. <p>Note: Before replacing the system board perform steps 3 and 4.</p> 5. Replace the system board. <p>See "Memory Problem Determination Bits" on page 176 for the definition of "yy".</p>

<i>Table 3 (Page 15 of 47). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
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 page 127.)
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 page 127.)
26020003	Invalid or unrecognized 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 page 127.)

<i>Table 3 (Page 16 of 47). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
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 page 127.)
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 page 127.) <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 page 127.)</p>
26800Dxx	Machine check occurred, unable to isolate to single device	<p>"xx" indicates the PCI bus number with the error</p> <ol style="list-style-type: none"> 1. Attempt to reboot the system in service mode, this preserves the AIX error log. If the reboot is successful, run diagnostics in problem determination mode to determine the cause of failure. Otherwise continue. 2. Refer to the "Bus SRN to FRU Reference Table" page 123, using PCI Bus "xx" for isolation of the failing device.

Table 3 (Page 17 of 47). 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 page 127.)</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.
28030003	RTC initialization required - RTC not updating, not corrected.	Replace I/O board. (See notes on page 127.)
28030004	RTC operating mode parameters changed (such as data format)	<ol style="list-style-type: none"> 1. Set/Restore the time and date 2. Refer to RTC problem resolution above if problem persists.
28030005	RTC battery error	<ol style="list-style-type: none"> 1. Replace the battery 2. Refer to RTC problem resolution above if problem persists. <p>Password, time, and date must be reset.</p>

Error Code	Description	Action / Possible Failing FRU
28030006	Processor frequency measurement error	<ol style="list-style-type: none"> 1. Verify that the current level of the system firmware is installed. 2. Replace the processor card 3. Replace I/O board (See notes on page 127.) <p>Replacing the battery does not correct this error condition.</p>
29000002	Keyboard/mouse controller failed self-test.	Replace the I/O board. (See notes on page 127.)
29A00003	Keyboard not present/detected.	<ol style="list-style-type: none"> 1. Keyboard 2. Replace the I/O board. (See notes on page 127.)
29A00004	Keyboard stuck key test failed.	<ol style="list-style-type: none"> 1. Keyboard 2. Replace the I/O board. (See notes on page 127.)
29B00004	Mouse not present/detected.	<ol style="list-style-type: none"> 1. Mouse 2. Replace the I/O board. (See notes on page 127.)
2B2xxx11	Processor is manually disabled.	Use service processor menus to reenable the processor and reboot the system. See error code 2B2xxx22 for xxx definitions.
2B2xxx22	Processor disabled.	Processor card, where xxx indicates the processor type as follows: <ul style="list-style-type: none"> 651 200 Mhz processor card with 1 Mb of L2 cache. 654 200 Mhz processor card with 4 Mb of L2 cache. 754 375 Mhz one way processor card with 4 Mb of L2 cache. 764 375 Mhz two way processor card with 4 Mb of L2 cache. 768 375 Mhz two way processor card with 8 Mb of L2 cache. 7A8 450 Mhz two way processor card with 8 Mb 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.
2BA00xxx	Service processor	

Error Code	Description	Action / Possible Failing FRU
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 page 127.)
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 page 127.)
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 page 127.)
2BA00014	Service processor reports bad service processor firmware.	Replace EEPROM modules on the I/O board.
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 page 127.)
2BA00018	EPOW test failure.	Replace the I/O board. (See notes on page 127.)
2BA00019	IRQ13 test failure.	Replace the I/O board. (See notes on page 127.)
2BA00024	Service processor reports bad power controller firmware.	Replace EEPROM modules on the I/O board.
2BA00040	Service processor reports service processor VPD module not present.	<ol style="list-style-type: none"> 1. Replace EEPROM modules on the I/O board. 2. Replace the I/O board. (See notes on page 127.)
2BA00041	Service processor VPD is corrupted.	<ol style="list-style-type: none"> 1. Replace EEPROM modules on the I/O board. 2. Replace the I/O board. (See notes on page 127.)
2BA00050	Service processor reports system operator panel VPD module not present or not recognizable.	<p>Replace the operator panel control assembly.</p> <p>Note: Swap the old VPD module from the old operator panel control assembly to the new one.</p>

Table 3 (Page 20 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
2BA00051	System operator panel VPD data corrupted.	Replace the operator panel control assembly. Note: Swap the old VPD module from the old operator panel control assembly to the new one.
2BA00052	Service processor reports node supervisor VPD data corrupted	Replace the node supervisor card.
2BA00053	Service processor reports node supervisor VPD module not present.	Replace the node supervisor card.
2BA00060	Service processor reports I/O board VPD module not present.	Replace the I/O board. (See notes on page 127.)
2BA00061	Service processor reports I/O board VPD data corrupted.	Replace the I/O board. (See notes on page 127.)
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.
2BA00064	Service processor reports PCI riser card VPD module not present.	Replace the PCI riser card.
2BA00065	Service processor reports PCI riser card VPD data corrupted.	Replace the PCI riser card.
2BA00066	Service processor reports PCI expansion card VPD module not present.	Replace the PCI expansion card.
2BA00067	Service processor reports PCI expansion card VPD data corrupted.	Replace the PCI expansion card.
2BA00070	Service processor reports processor card VPD module not present.	Replace the processor card(s).
2BA00071	VPD data corrupted for processor card in slot 1 (J6).	Replace the processor card in slot 1.
2BA00073	VPD data corrupted for processor card in slot 2 (J8).	Replace the processor card in slot 2.
2BA00080	Service processor reports memory card VPD module not present.	Replace the memory card(s).
2BA00081	VPD data corrupted for memory card in slot 1 (J3).	Replace the memory card in slot 1.
2BA00083	VPD data corrupted for memory card in slot 2 (J2).	Replace the memory card in slot 2.
2BA00101	Service processor is NOT installed, update cancelled.	Replace the I/O board. (See notes on page 127.)

<i>Table 3 (Page 21 of 47). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
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.	Service processor firmware update error recovery procedure: <ol style="list-style-type: none"> 1. Turn off the system. 2. Unplug power cable and then plug power cable back in. 3. Turn on the system. 4. Retry operation. If the problem persists, replace the I/O board. (See notes on page 127.)
2BA00201	Service processor firmware update error occurred; update not completed. Error occurred while reading service processor firmware CRC.	See error code 2BA00200 for recovery procedure.
2BA00202	Service processor firmware update error occurred; update not completed. Error occurred while verifying service processor firmware 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 firmware CRC after updating the service processor firmware.	See error code 2BA00200 for recovery procedure.
2BA00204	Service processor firmware update error occurred; update not completed. Error occurred while calculating CRC.	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 I/O board. (See notes on page 127.)
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 I/O board. (See notes on page 127.)
2BA00302	Service processor reports slow fan number 3.	<ol style="list-style-type: none"> 1. Replace fan 3. 2. If problem persists, replace power supply. 3. Replace I/O board (See notes on page 127.)

Table 3 (Page 22 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
2BA00303	Service processor reports slow fan number 4.	<ol style="list-style-type: none"> 1. Replace fan 4. 2. If problem persists, replace power supply. 3. Replace the I/O board. (See notes on page 127.)
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 I/O board. (See notes on page 127.)
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 I/O over temperature alert.	<ol style="list-style-type: none"> 1. Check for cool air flow obstructions to the system. 2. Replace I/O board. (See notes on page 127.)
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 I/O board. (See notes on page 127.)
2BA00314	Service processor reports 5V over voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00315	Service processor reports 5V under voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00316	Service processor reports 3.3V over voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00317	Service processor reports 3.3V under voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00318	Service processor reports 2.5V over voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00319	Service processor reports 2.5V under voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00320	Service processor reports +12V over voltage alert.	<ol style="list-style-type: none"> 1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)

<i>Table 3 (Page 23 of 47). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
2BA00321	Service processor reports +12V under voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00322	Service processor reports -12V over voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00323	Service processor reports -12V under voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00324	Service processor reports 5V standby over voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00325	Service processor reports 5V standby under voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00326	Service processor reports PCI expansion card 5V over voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00327	Service processor reports PCI expansion card 5V under voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00328	Service processor reports PCI expansion card 3.3V over voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00329	Service processor reports PCI expansion card 3.3V under voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00330	Service processor reports PCI expansion card +12V over voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00331	Service processor reports PCI expansion card +12V under voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00332	Service processor reports PCI expansion card -12V over voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00333	Service processor reports PCI expansion card -12V under voltage alert.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
2BA00334	Service processor reports generic slow shutdown request.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)

Table 3 (Page 24 of 47). 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 a problem persists, replace the processor card.
2BA00336	Service processor reports I/O 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 a problem persists, replace the I/O board. (See notes on page 127.)
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 I/O board. (See notes on page 127.)
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 I/O board. (See notes on page 127.)
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 I/O board. (See notes on page 127.)
2BA00342	Service processor reports locked fan - fast shutdown request fan number 3.	<ol style="list-style-type: none"> 1. Replace fan 3. 2. If a problem persists, replace the power supply. 3. Replace I/O board (See notes on page 127.)

<i>Table 3 (Page 25 of 47). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
2BA00343	Service processor reports locked fan - fast shutdown request fan number 4.	<ol style="list-style-type: none"> 1. Replace fan 4. 2. If a problem persists, replace the power supply. 3. Replace the I/O board. (See notes on page 127.)
2BA00350	Service processor reports generic immediate shutdown request.	<ol style="list-style-type: none"> 1. Replace the power supply. 2. Replace the I/O board. (See notes on page 127.)
2BA00351	Service processor reports generic power loss EPOW.	<ol style="list-style-type: none"> 1. Replace the power supply. 2. Replace the I/O board. (See notes on page 127.)
2BA00352	Service processor reports loss of power (outlet).	<ol style="list-style-type: none"> 1. Replace the power supply. 2. Replace the I/O board. (See notes on page 127.)
2BA00353	Service processor reports loss of power (power button).	<ol style="list-style-type: none"> 1. Replace the power supply. 2. Replace the I/O board (See notes on page 127.)
2BA00399	Service processor reports unsupported value in EPOW.	<ol style="list-style-type: none"> 1. Check EPOW cabling on SCSI or SSA backplanes. 2. Replace the I/O board. (See notes on page 127.)
40100005	Loss of system power detected.	Possible main power loss. If not, replace the power supply.
40100007	Immediate shutdown.	Possible main power loss. If not, replace power supply.
40110000	Loss of the redundant power supply.	<ol style="list-style-type: none"> 1. Check voltage input to the power supplies. 2. Replace the power supply indicated by the location code in the operator panel.
40110001	Power supply failed.	<ol style="list-style-type: none"> 1. Look at the service processor error log for more error information. 2. Check the power cable to connector on the system board. 3. Replace the power supply. 4. Replace the I/O board. (See note 3 on page 127.)
40110002	Voltage not detected on the processor card.	<ol style="list-style-type: none"> 1. Check all power cables and their connections between the power distribution board and the power connectors located on both the system board and the I/O board. 2. Power supply

Table 3 (Page 26 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
40110003	Voltage not detected on the processor card.	Processor card. If the system is running, check the AIX error log to determine which processor is failing. If the system is not running, check the service processor error log.
40110004	Low voltage detected in power supply main enclosure.	<ol style="list-style-type: none"> 1. Check all power cables and their connections between the power distribution board and the power connectors located on both the system board and the I/O board. 2. Power supply
40110005	Fan warning detected in power supply main enclosure.	<ol style="list-style-type: none"> 1. Check all power cables and their connections between the power distribution board and the power connectors located on both the system board and the I/O board. 2. Power supply
40110006	Fan failure detected in power supply main enclosure.	<ol style="list-style-type: none"> 1. Check all power cables and their connections between the power distribution board and the power connectors located on both the system board and the I/O board. 2. Power supply
40110007	Thermal warning detected in power supply main enclosure.	<ol style="list-style-type: none"> 1. Check all power cables and their connections between the power distribution board and the power connectors located on both the system board and the I/O board. 2. Power supply
40110008	Thermal failure detected in power supply main enclosure.	<ol style="list-style-type: none"> 1. Check all power cables and their connections between the power distribution board and the power connectors located on both the system board and the I/O board. 2. Power supply
40110009	Over-current on the main 5.0 V was detected by the power supply.	<ol style="list-style-type: none"> 1. Possible PCI card or disk drive problem. 2. Go to "MAP 1520: Power "Step 1520-3" on page 62. 3. I/O board 4. Power supply
4011000A	Over-current on the processor card 5.0 V output was detected by the power supply.	<ol style="list-style-type: none"> 1. Possible processor card problem. 2. Go to "MAP 1520: Power "Step 1520-3" on page 62. 3. Processor card 4. Power supply

<i>Table 3 (Page 27 of 47). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
4011000B	High 5.0 RA volt detected in power supply main enclosure.	<ol style="list-style-type: none"> 1. Check connector on the I/O board. 2. Replace power supply.
4011000C	High 3.3 M volt detected in power supply main enclosure.	<ol style="list-style-type: none"> 1. Check connector on the I/O board. 2. Replace power supply.
4011000D	Over-current on the 3.3 V output was detected by the power supply.	<ol style="list-style-type: none"> 1. Possible PCI card or memory module problem. 2. Go to "MAP 1520: Power "Step 1520-3" on page 62. 3. System board 4. Power supply
4011000E	Over-current on the +12.0 V output was detected by the power supply.	<ol style="list-style-type: none"> 1. Possible processor card, PCI card, or disk drive problem. 2. Go to "MAP 1520: Power "Step 1520-3" on page 62. 3. I/O board 4. Power supply
4011000F	Over-current on the -12.0 V output was detected by the power supply.	<ol style="list-style-type: none"> 1. Possible PCI card problem. 2. Go to "MAP 1520: Power "Step 1520-3" on page 62. 3. I/O board 4. Power supply
40110012	Voltage not found on I/O expansion board.	<ol style="list-style-type: none"> 1. Check power interlock tab on I/O expansion power FRU. 2. Check power cable at I/O expansion board for proper seating. 3. Check interposer signal cable. 4. Check I/O expansion control cable. 5. Replace power supply. 6. Replace I/O expansion board. 7. Replace I/O expansion control cable, I/O expansion power cable and interposer signal cable assemblies. 8. Replace interposer card.
40111002	Unknown power problem detected.	Power supply.
40111022	A high 5.0 V reading detected.	<ol style="list-style-type: none"> 1. Power supply. 2. Replace the I/O board. (See notes on page 127.)
40111032	A high 3.3 V reading detected.	<ol style="list-style-type: none"> 1. Replace the I/O board. (See notes on page 127.) 2. Power supply
40111033	A high 2.5 voltage reading detected.	<ol style="list-style-type: none"> 1. Power supply 2. Processor card
40111052	A high +12 voltage reading detected.	<ol style="list-style-type: none"> 1. Power supply. 2. I/O board. (See notes on page 127.)

Error Code	Description	Action / Possible Failing FRU
40111062	A high -12 voltage reading detected.	1. Power supply. 2. I/O board. (See notes on page 127.)
40111072	A high +5 V standby voltage reading detected.	1. Replace the I/O board. (See notes on page 127.) 2. Power supply.
40111082	A low 5.0 V reading detected.	1. Power supply. 2. I/O board (See notes on page 127.)
40111092	A low 3.3 V reading detected.	1. Replace the I/O board. (See notes on page 127.) 2. Power supply.
40111093	A low 2.5 voltage reading detected.	1. Power supply. 2. Processor card.
401110B2	A low +12 voltage reading detected.	1. Power supply. 2. I/O board. (See notes on page 127.)
401110C2	A low -12 voltage reading detected.	1. Power supply. 2. I/O board. (See notes on page 127.)
401110D2	A low +5 standby V reading detected.	1. Replace the I/O board. (See notes on page 127.) 2. Power supply
40111101	Power good signal low on the processor card.	Replace the processor card. (If the system is running, refer to the AIX error log to see which processor card is failing. If the system is not running, refer to the service processor error log.)
40111102	Wrong processor card plugged into the system.	1. Remove processor card 2. Verify part number 3. Install valid card
40111103	Real CPU 5 V fail.	1. Remove card 2. Verify part number 3. Install valid card
40112022	A high 5.0 voltage reading detected.	1. Replace power supply. 2. Replace processor card.
40112023	A high 1.8 voltage reading detected.	1. Replace power supply. 2. Replace processor card.
40112032	A high 3.3 voltage reading detected.	1. Replace power supply. 2. Replace I/O board. (See notes on page 127.)
40112033	A high 2.5 voltage reading detected.	1. Replace power supply. 2. Replace processor card.

<i>Table 3 (Page 29 of 47). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
40112052	A high +12 voltage reading detected.	1. Replace power supply. 2. I/O board. (See notes on page 127.)
40112061	A high -12 voltage reading detected.	1. Replace power supply. 2. I/O board. (See notes on page 127.)
40112062	A low 1.8 voltage reading detected.	1. Replace power supply. 2. Replace processor card.
40112063	A critically low 1.8 voltage reading detected.	1. Replace power supply. 2. Replace processor card.
40112064	A critically high 1.8 voltage reading detected.	1. Replace power supply. 2. Replace processor card.
40112065	A critically low 2.5 voltage reading detected.	1. Replace power supply. 2. Replace processor card.
40112066	A critically high 2.5 voltage reading detected.	1. Replace power supply. 2. Replace processor card.
40112082	A low 5.0 voltage reading detected.	1. Replace power supply. 2. Replace processor card.
40112092	A low 3.3 voltage reading detected.	1. Replace power supply. 2. I/O board. (See notes on page 127.)
40112093	A low 5.0 voltage reading detected.	1. Replace power supply. 2. Replace processor card.
401120B2	A low +12 voltage reading detected.	1. Replace power supply. 2. I/O board. (See notes on page 127.)
401120C2	A low -12 voltage reading detected.	1. Replace power supply. 2. I/O board. (See notes on page 127.)
40200001	An unknown cooling problem detected.	Check/replace system fans.
40200021	A processor card temperature warning detected.	1. Check system fans. 2. Replace processor card(s).
40200023	A critical processor card temperature condition detected.	1. Check system fans. 2. Replace processor card(s).
40200031	An I/O board temperature warning detected.	1. Check system fans. 2. I/O board. (See notes on page 127.)
40200033	A critical I/O board temperature condition detected.	1. Check system fans. 2. I/O board. (See notes on page 127.)
40200051	A inlet temperature warning detected. (High temperature sensed at the air flow inlet.)	1. Check/replace system fans. 2. I/O board. (See notes on page 127.)

Table 3 (Page 30 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
40200053	A inlet memory temperature condition detected. (Critically high temperature sensed at the air flow inlet.)	<ol style="list-style-type: none"> 1. Check/replace system fans. 2. I/O board. (See notes on page 127.)
40210011	A slow fan detected.	<ol style="list-style-type: none"> 1. Check fan connector 2. Replace failing fan.
40210014	A stopped fan detected.	<ol style="list-style-type: none"> 1. Check fan connector 2. Replace failing fan.
40A00000	System firmware IPL failure.	<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 do the action indicated for the posted code identified by the arrow. If no arrow is present, do the action indicated for the 8-digit code that appears immediately below 40A00000. If there is no 8-digit code, note the 4-digit code immediately below 40A00000 and attempt to reboot the system. If an 8-digit code other than 40A00000 appears during the reboot, do the action indicated; otherwise, do the action indicated by the 4-digit error code. <p>Note: Refer to "Service processor checkpoints" or "Firmware checkpoints" for help.</p>
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. Replace the I/O board. (See notes on page 127.) 5. If the problem persists, call the support center for assistance.
40D00003	An unknown slow shutdown occurred.	Critical cooling problem. Check to ensure the temperature is in the ambient range.

<i>Table 3 (Page 31 of 47). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
40D00004	An unknown fast shutdown occurred.	Critical cooling problem. Make sure all fans are operating normally.
40D00101	BIST on I/O board failed.	Replace I/O board. (See notes on page 127.)
40D00102	BIST on system board failed.	Replace system board.
40D00200	Processor array initialization failed.	Location code will point to failing FRU.
40D00201	JTAG chip ID mismatch.	Location code will point to failing FRU.
450000C0	Uncorrectable memory error.	<ol style="list-style-type: none"> 1. Note the FRU indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log and note any additional FRUs. 3. Attempt to boot the system. If the system fails to boot, perform the repair action for the new error code. If the system boots, run diagnostics to determine if there were any additional errors logged during the boot. If diagnostics reports error code 25Cyy002, then follow the action for that error code. If not, replace the FRUs noted in step 1 and step 2.
450000C1	Memory ECC correctable error (Checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
450000C2	Memory ECC correctable error threshold exceeded(checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
450000C3	Memory controller subsystem internal error (checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
450000C4	Memory address error (invalid address or access attempt) (checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.

Table 3 (Page 32 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
450000C5	Memory data error (bad data going to memory) (checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
450000C6	Memory bus/switch internal error(checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
450000C7	Memory time-out error(checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
450000D0	System bus time-out error(checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
450000D1	System bus parity error(checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
450000D2	System bus protocol/transfer error(checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
450000D3	I/O host bridge time-out error (checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
450000D4	I/O host bridge address/data bus parity error(checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
450000D6	System support function error(checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.

Table 3 (Page 33 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
45000D7	System bus internal hardware/switch error (checkstop).	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
45000DA	All processor were found deconfigured. The service processor reconfigured the best processor that was available	This SRN just indicates that the corresponding FRU has been reconfigured, but it is not a warning or an error that this FRU is defective. If problem persists with the reconfigured processor even after power-on, replace the defective FRUs as indicated in service processor error log.
45000DB	All DIMM pairs were found deconfigured. The service processor reconfigured the best DIMM pair that was available.	<ol style="list-style-type: none"> 1. This SRN just indicates that the corresponding FRU has been reconfigured, but it is not a warning or an error that this FRU is defective. 2. Replace all DIMM pairs. 3. Replace the memory card(s).
45800000	Memory controller checkstop.	<ol style="list-style-type: none"> 1. Go to "MAP 1540: Minimum Configuration" on page 72. 2. If problem is not resolved, replace system board. 3. If problem is not resolved, replace I/O board. (See notes on page 127.)
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.

Table 3 (Page 34 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
460000C0	I/O bus address parity error	<ol style="list-style-type: none"> 1. If a physical location code is displayed in the operator panel or by AIX diagnostics, replace the FRU as indicated by the location code. If a physical location code is not available, continue 2. In the service processor menus, go to "Read Progress Indicators from last System Boot". If an arrow is pointing to a location code, replace the FRU at that location code. If there is no arrow pointing to a location code, continue. 3. Go to MAP 1540: Minimum Configuration, "Step 1540-21" on page 93.
460000C1	I/O bus data parity error	<ol style="list-style-type: none"> 1. If a physical location code is displayed in the operator panel or by AIX diagnostics, replace the FRU as indicated by the location code. If a physical location code is not available, continue 2. In the service processor menus, go to "Read Progress Indicators from last System Boot". If an arrow is pointing to a location code, replace the FRU at that location code. If there is no arrow pointing to a location code, continue. 3. Go to MAP 1540: Minimum Configuration, "Step 1540-27" on page 97.
460000C2	I/O bus time-out, access or other error	<ol style="list-style-type: none"> 1. If a physical location code is displayed in the operator panel or by AIX diagnostics, replace the FRU as indicated by the location code. If a physical location code is not available, continue 2. In the service processor menus, go to "Read Progress Indicators from last System Boot". If an arrow is pointing to a location code, replace the FRU at that location code. If there is no arrow pointing to a location code, continue. 3. Go to MAP 1540: Minimum Configuration, "Step 1540-27" on page 97.

Table 3 (Page 35 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
460000C3	I/O bridge/device internal error	<ol style="list-style-type: none"> 1. If a physical location code is displayed in the operator panel or by AIX diagnostics, replace the FRU as indicated by the location code. If a physical location code is not available, continue 2. In the service processor menus, go to "Read Progress Indicators from last System Boot". If an arrow is pointing to a location code, replace the FRU at that location code. If there is no arrow pointing to a location code, continue. 3. Go to MAP 1540: Minimum Configuration, "Step 1540-27" on page 97.
460000C4	Error from a PCI to non-PCI bridge chip, indicating an error on the secondary bus	<ol style="list-style-type: none"> 1. If a physical location code is displayed in the operator panel or by AIX diagnostics, replace the FRU as indicated by the location code. If a physical location code is not available, continue 2. In the service processor menus, go to "Read Progress Indicators from last System Boot". If an arrow is pointing to a location code, replace the FRU at that location code. If there is no arrow pointing to a location code, continue. 3. Go to MAP 1540: Minimum Configuration, "Step 1540-27" on page 97.
460000C5	Mezzanine/system bus address parity error	<ol style="list-style-type: none"> 1. If a physical location code is displayed in the operator panel or by AIX diagnostics, replace the FRU as indicated by the location code. If a physical location code is not available, continue 2. In the service processor menus, go to "Read Progress Indicators from last System Boot". If an arrow is pointing to a location code, replace the FRU at that location code. If there is no arrow pointing to a location code, continue. 3. Go to MAP 1540: Minimum Configuration, "Step 1540-27" on page 97.

Table 3 (Page 36 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
460000C6	Mezzanine/system bus data parity error	<ol style="list-style-type: none"> 1. If a physical location code is displayed in the operator panel or by AIX diagnostics, replace the FRU as indicated by the location code. If a physical location code is not available, continue 2. In the service processor menus, go to "Read Progress Indicators from last System Boot". If an arrow is pointing to a location code, replace the FRU at that location code. If there is no arrow pointing to a location code, continue. 3. Go to MAP 1540: Minimum Configuration, "Step 1540-27" on page 97.
460000C7	Mezzanine/System bus time-out, transfer or protocol error	<ol style="list-style-type: none"> 1. If a physical location code is displayed in the operator panel or by AIX diagnostics, replace the FRU as indicated by the location code. If a physical location code is not available, continue 2. In the service processor menus, go to "Read Progress Indicators from last System Boot". If an arrow is pointing to a location code, replace the FRU at that location code. If there is no arrow pointing to a location code, continue. 3. Go to MAP 1540: Minimum Configuration, "Step 1540-27" on page 97.
460000D4	I/O expansion bus data parity or CRC error protocol error	<ol style="list-style-type: none"> 1. If a physical location code is displayed in the operator panel or by AIX diagnostics, replace the FRU as indicated by the location code. If a physical location code is not available, continue 2. In the service processor menus, go to "Read Progress Indicators from last System Boot". If an arrow is pointing to a location code, replace the FRU at that location code. If there is no arrow pointing to a location code, continue. 3. Go to MAP 1540: Minimum Configuration, "Step 1540-27" on page 97.

<i>Table 3 (Page 37 of 47). Firmware Error Codes.</i>		
Error Code	Description	Action / Possible Failing FRU
460000D5	I/O expansion bus data time-out, access or other error	<ol style="list-style-type: none"> 1. If a physical location code is displayed in the operator panel or by AIX diagnostics, replace the FRU as indicated by the location code. If a physical location code is not available, continue 2. In the service processor menus, go to "Read Progress Indicators from last System Boot". If an arrow is pointing to a location code, replace the FRU at that location code. If there is no arrow pointing to a location code, continue. 3. Go to MAP 1540: Minimum Configuration, "Step 1540-27" on page 97.
460000D6	I/O expansion bus connection failure	<ol style="list-style-type: none"> 1. If a physical location code is displayed in the operator panel or by AIX diagnostics, replace the FRU as indicated by the location code. If a physical location code is not available, continue 2. In the service processor menus, go to "Read Progress Indicators from last System Boot". If an arrow is pointing to a location code, replace the FRU at that location code. If there is no arrow pointing to a location code, continue. 3. Go to MAP 1540: Minimum Configuration, "Step 1540-27" on page 97.
460000D7	I/O expansion bus unit not in an operating state (power down, off-line)	<ol style="list-style-type: none"> 1. If a physical location code is displayed in the operator panel or by AIX diagnostics, replace the FRU as indicated by the location code. If a physical location code is not available, continue 2. In the service processor menus, go to "Read Progress Indicators from last System Boot". If an arrow is pointing to a location code, replace the FRU at that location code. If there is no arrow pointing to a location code, continue. 3. Go to MAP 1540: Minimum Configuration, "Step 1540-27" on page 97.

Table 3 (Page 38 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
460000D8	A generic memory controller-detected checkstop has occurred.	<ol style="list-style-type: none"> <li data-bbox="769 625 1138 835">1. Try to reboot the system in service mode to preserve the AIX error log. Run AIX online diagnostics in problem determination mode to determine the cause of the failure. If a new SRN or error code is generated, follow the actions for that code. <li data-bbox="769 852 1138 1157">2. If your system has a CD-ROM drive installed, try running AIX standalone diagnostics from a CD-ROM. If the boot is successful, run advanced diagnostics and follow the actions for any SRN or error code that is generated. If the same error code is generated, go to "MAP 1540: Minimum Configuration" on page 72. <li data-bbox="769 1173 1138 1474">3. If your system does not have a CD-ROM drive installed, try booting AIX standalone diagnostics from a NIM server. If AIX standalone diagnostics do not boot, follow the actions for any new SRN or error code that is generated. If the same error code is generated, go to "MAP 1540: Minimum Configuration" on page 72.

Table 3 (Page 39 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
460000D9	A generic I/O memory controller-detected checkstop has occurred.	<ol style="list-style-type: none"> 1. Try to reboot the system in service mode to preserve the AIX error log. Run AIX online diagnostics in problem determination mode to determine the cause of the failure. If a new SRN or error code is generated, follow the actions for that code. 2. If your system has a CD-ROM drive installed, try running AIX standalone diagnostics from a CD-ROM. If the boot is successful, run advanced diagnostics and follow the actions for any SRN or error code that is generated. If the same error code is generated, go to "MAP 1540: Minimum Configuration" on page 72. 3. If your system does not have a CD-ROM drive installed, try booting AIX standalone diagnostics from a NIM server. If AIX standalone diagnostics do not boot, follow the actions for any new SRN or error code that is generated. If the same error code is generated, go to "MAP 1540: Minimum Configuration" on page 72.
48800909	System VPD error.	<ol style="list-style-type: none"> 1. Check cable to operator panel. 2. Replace operator panel. (See notes on page 127.) 3. Go to "MAP 1540: Minimum Configuration" on page 72.
4880090A	System board VPD read fail.	<ol style="list-style-type: none"> 1. Replace the system board. 2. Replace I/O board. (See notes on page 127.)
4880090B	Error identifying system type using VPD.	<ol style="list-style-type: none"> 1. Check power supply cables. 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 (Page 40 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
4B2xxx00	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 Chapter 7, "Using the Service Processor" on page 187 if you need help. If the code is "E105",E14D, E15B, E174, E175, or "0xxx", where xxx is any 3 digits, continue to step 4 instead of the listed action. Otherwise, find the code in the "Service Processor Checkpoints" on page 101 or "Firmware Checkpoints" on page 106 and perform the action shown there. 4. Attempt to reboot the system in service mode, to preserve 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 (J8), 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 (J6) with processor card removed from slot 2 (J8) 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 1540-2" on page 73.

Table 3 (Page 41 of 47). 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, to preserve 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 (J6) 3. System board 4. I/O board (See notes on page 127.)
4B2xx02	Checkstop - slot 2 fail	<ol style="list-style-type: none"> 1. Attempt to reboot the system in service mode, to preserve 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(J8) 3. System board 4. I/O board (See notes on page 127.)

Table 3 (Page 42 of 47). 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 (J8), 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 (J6) with processor card removed from slot 2 (J8) in step 1 (replace processor card if only one processor card 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 1540-1" on page 73.
4B2xxx11	Machine check - 1 (stuck active)	<ol style="list-style-type: none"> 1. Remove processor card in slot 2 (J8), 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 (J6) with processor card removed from slot 2 (J8) in step 1 (replace processor card if only one processor card 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	ABIST fail on first processor in slot identified by location code displayed on operator panel.
4B2xxx42	ABIST fail	ABIST fail on second processor in slot identified by location code displayed on operator panel.

Table 3 (Page 43 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
4B2xxx51	LBIST fail	LBIST fail on first processor in slot identified by location code displayed on operator panel.
4B2xxx52	LBIST failed	LBIST failed on second processor in slot identified by location code displayed on operator panel.
4B2xxxC0	CPU internal error	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
4B2xxxC1	CPU internal cache or cache controller error	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
4B2xxxC2	External cache parity or multi-bit ECC error	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
4B2xxxC3	External cache ECC single-bit ECC error	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
4B2xxxC4	System bus time-out error	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel and reboot the system. 2. If the system fails to boot, reinstall the card removed in step 1. 3. If the card replaced in step 1 was a processor card, and a second processor card is present, replace the second processor card. Reboot the system. 4. If the system boots, the processor card pulled in step 3 is at fault. 5. If system still fails to boot, replace system board.
4B2xxxC5	System bus time-out error, waiting for I/O	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.

Table 3 (Page 44 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
4B2xxxC6	System bus parity error	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
4B2xxxC7	System bus protocol/transfer error	<ol style="list-style-type: none"> 1. Replace the FRU as indicated by the physical location code displayed on the operator panel. 2. Check the service processor error log for additional FRUs.
4B2xxxC8	A generic processor-detected checkstop has occurred.	<ol style="list-style-type: none"> 1. Try to reboot the system in service mode to preserve the AIX error log. Run AIX online diagnostics in problem determination mode to determine the cause of the failure. If a new SRN or error code is generated, follow the actions for that code. 2. If your system has a CD-ROM drive installed, try running AIX standalone diagnostics from a CD-ROM. If the boot is successful, run advanced diagnostics and follow the actions for any SRN or error code that is generated. If the same error code is generated, go to "MAP 1540: Minimum Configuration" on page 72. 3. If your system does not have a CD-ROM drive installed, try booting AIX standalone diagnostics from a NIM server. If AIX standalone diagnostics do not boot, follow the actions for any new SRN or error code that is generated. If the same error code is generated, go to "MAP 1540: Minimum Configuration" on page 72.

Error Code	Description	Action / Possible Failing FRU
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 page 127.)
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.
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 1 failed.	<ol style="list-style-type: none"> 1. Remove cards 2. Verify part numbers 3. Install valid cards.
4B200059	Compatibility test on processor card 2 failed.	<ol style="list-style-type: none"> 1. Remove cards 2. Verify part numbers 3. Install valid cards.
4B20000A	All processors got deconfigured.	<ol style="list-style-type: none"> 1. Replace processor card 2. Replace system board
4BA00000	The system support controller detects the service processor, but cannot establish communication. The system halts.	<ol style="list-style-type: none"> 1. Power down the system unit: <ol style="list-style-type: none"> a. Unplug the power cord. b. Plug in the power cord and power up the system unit. 2. Replace the I/O board. (See note 3 on page 127.)
4BA00001	The system support controller cannot detect the service processor.	Replace the I/O board. (See notes on page 127.)
4BA00800	Unknown error.	Check level of service processor firmware; update if necessary. If the problem persists, call for support.

Table 3 (Page 46 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
4BA00826	Service processor cannot call home.	<ol style="list-style-type: none"> 1. Check modem configuration in service processor menus. 2. Check modem connections. 3. Replace the I/O board. (See notes on page 127.)
4BA00829	Bad system firmware.	Replace the I/O board. (See notes on page 127.)
4BA00830	Boot fail.	Go to "Boot Problems or Concerns" on page 118.
4BA00831	Bad service processor firmware image.	<ol style="list-style-type: none"> 1. Unplug the system from it's power source, wait a few moments, and attempt to reboot. Pay close attention to the progress code the machine hangs on (if it does hang on one) and refer to description of that progress code. 2. Replace the I/O board.
4BA00832	Error while doing flash update.	<ol style="list-style-type: none"> 1. Re-power the system; retry the flash programming a few times. 2. Replace IO board. (See notes on page 127.)
4BA10001	SSC SRAM fail	<ol style="list-style-type: none"> 1. Go to MAP 1540: Minimum Configuration, "MAP 1540: Minimum Configuration" on page 72. 2. Replace I/O board. (See notes on page 127.)
4BA10002	SSC SRAM fail.	<ol style="list-style-type: none"> 1. Go to "MAP 1540: Minimum Configuration" on page 72. 2. Replace I/O board. (See notes on page 127.)
4BA10003	Service processor hardware fail.	Replace I/O board. (See notes on page 127.)
4BA10004	Service processor firmware fail.	<ol style="list-style-type: none"> 1. Replace the EEPROMs on the I/O board. 2. Replace I/O board. (See notes on page 127.)
4BA10005	I ² path fail	<ol style="list-style-type: none"> 1. Replace I/O board. (See notes on page 127.) 2. Replace processor card. 3. Replace system board.

Table 3 (Page 47 of 47). Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
4BA80013	NVRAM access failure	<ol style="list-style-type: none"> 1. Unplug the system unit. Manually clear NVRAM. Remove the battery and use it to short the battery leads for at least 30 seconds. Power-up the system unit. 2. Go to "MAP 1540: Minimum Configuration" on page 72.
4BA80014	NVRAM checksum (CRC) checksum failed.	<ol style="list-style-type: none"> 1. Recoverable temporary condition, unless followed by 4BA80015. 2. Replace I/O board.
4BA80015	NVRAM reinitialization fail.	<ol style="list-style-type: none"> 1. Unplug the system unit. Manually clear NVRAM. Remove the battery and use it to short the battery leads for at least 30 seconds. Power-up the system unit. 2. Go to "Step 1540-21" on page 93.

Memory Problem Determination Bits

The following table expands the firmware error code **25Cyyxxx** on page 139, where **yy** is the PD value 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 72 unless otherwise indicated in the tables.

Table 4. Memory Module PD bits

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, run diagnostics on the I/O board bus devices with all adapters removed from the failing bus. If a failure is detected on this system with all adapters removed from the failing bus, the I/O board is the isolated FRU. If a failure is not detected, the adapters are added back one at a time to their original slot location, and the configuration is tested until a failure is detected. The failure is then isolated to the failing FRU.

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

Table 5. Bus SRN to FRU Reference Table

SRN	Bus Identification	Possible Failing Device and AIX Location Code	Associated FRU
9CC-100	PCI Bus 00	Internal SCSI port (10-60)	I/O board. (See notes on page 127.)
		External SCSI port (10-88)	I/O board. (See notes on page 127.)
		Internal Ethernet port (10-80)	I/O board. (See notes on page 127.)
		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 40	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	Parallel port/device (01-R1)	I/O board. (See notes on page 127.)
		Serial ports (1-2)/device (01-S1 to 01-S2)	I/O board. (See notes on page 127.)
		Mouse port/device (01-K1-01-00)	I/O board. (See notes on page 127.)
		Keyboard port/device (01-K1-00-00)	I/O board. (See notes on page 127.)

Chapter 6. Loading System Diagnostics

Sources for the Diagnostic Programs

The diagnostics consist of standalone diagnostics and online diagnostics.

For additional information about standalone diagnostics and online diagnostics refer to "Using Standalone Diagnostics and Online Diagnostics in the *Diagnostic Information for Multiple Bus Systems*.

Performing Slow Boot

To fully analyze all of the available information, perform the following steps before doing a hardware repair or replacement:

1. Record the 8-character error code (and location code if present) in the operator panel or that was reported by the customer.
2. Do a slow-mode boot in service mode. This can be specified using the System Power Control Menu on the service processor main menu. (A fast-mode boot skips much of the built-in diagnostic testing.) A slow mode boot may yield a new 8-character error code on the operator panel and new errors in the service processor error log. If a new error code is reported, use it in subsequent steps to continue problem analysis.

Standalone Diagnostics

- Are resident on CD-ROM or a network installation management (NIM) server.
- Provide a method to test the system when the online diagnostics are not installed or cannot be loaded from the disk drive.
- Allow testing of the disk drives and other resources that can not be tested by the online diagnostics.
- Do not have access to the AIX configuration data.
- Do not have access to the AIX error log so error log analysis cannot be run.

Running Standalone Diagnostics from a CD-ROM

Note: When running standalone diagnostics from a CD-ROM, the CD-ROM drive and the SCSI controller that controls the drive cannot be tested.

To run standalone diagnostics from a CD-ROM, take the following steps:

1. Remove any removable media (tape or CD-ROM disc).

2. Stop all programs including the AIX operating system (get help if needed).
3. Ensure the system unit's power is turned off.
4. Turn the system unit's power on.
5. Insert the diagnostic CD-ROM into the drive.
6. When the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard icon on a graphical display), press the number 5 key on the keyboard.
7. Enter any requested passwords.
8. Follow any instruction to select the console.

After the diagnostic controller loads, DIAGNOSTIC OPERATING INSTRUCTIONS appear on the console display. Follow the displayed instructions to check out the desired resources.

When testing is complete, use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS. Press the F10 key and follow the displayed instructions to eject the CD-ROM.

Running Standalone Diagnostics from a Network Installation Management (NIM) Server

A client system connected to a network with a network installation management (NIM) server is capable of booting standalone diagnostics from the NIM server if the client system is registered on the NIM server and the NIM boot settings on both the server and client are correct.

Notes:

1. All operations to configure the NIM server require root access.
2. If you replace the network adapter in the client, the network adapter hardware address for the client needs to be updated on the NIM server.
3. The **Control State (Cstate)** for standalone clients on the NIM server should be kept in the *diagnostic boot has been enabled* state.
4. On the client system, the NIM server network adapter should be put in the bootlist after the boot hardfile. This allows the system to boot in standalone diagnostics from the NIM server, if there is a problem booting from the hardfile. Refer to the **Multiboot** section under SMS in the client system's service guide for information on setting the bootlist.

NIM Server Configuration

Refer to the "Advanced NIM Configuration Tasks" chapter of the *Network Installation Management Guide and Reference* for information on doing the following:

- Register a client on the NIM server.
- Enable a client to run diagnostics from the NIM server.

To verify that the client system is registered on the NIM server and diagnostic boot is enabled. From the command line on the NIM server, run the command **lsnim -a Cstate -Z ClientName** from the command line on the NIM server. Refer to the following table for system responses.

Note: The *ClientName* is the name of the system you want to run standalone diagnostics on.

System Response	Client Status
#name:Cstate: ClientName: diagnostic boot has been enabled:	The client system is registered on the NIM server and enabled to run diagnostics from the NIM server.
#name:Cstate: ClientName:ready for a NIM operation: or #name:Cstate: ClientName:BOS installation has been enabled:	The client system is registered on the NIM server but not enabled to run diagnostics from the NIM server. Note: If the client system is registered on the NIM server but Cstate has not been set, no data will be returned.
0042-053 lsnim: there is no NIM object named "ClientName"	The client is not registered on the NIM server.

Client Configuration and Booting Standalone Diagnostics from the NIM Server

To run standalone diagnostics on a client from the NIM server, do the following:

1. Remove any removable media (tape or CD-ROM).
2. Stop all programs including the AIX operating system (get help if needed).
3. Ensure that the system power is off.
4. Turn the system unit's power back on.
5. When the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard icon on a graphical display), press the number 1 key on the keyboard to display the SMS menu.
6. Enter any requested passwords.
7. Select **Utilities**.

8. Depending on the console type, select **RIPL** or **Remote Initial Program Load Setup**.
9. Enter the client address, server address, gateway address (if applicable) and subnet mask. Click Save if you are using a graphical interface. Exit to the SMS Utilities screen.
10. If the NIM server is set up to allow pinging from the client system, use the **ping** utility in the RIPL utility to verify that the client system can ping the NIM server. Under the **ping** utility, choose the network adapter that provides the attachment to the NIM server to do the ping operation. If the ping comes back with an OK message, the client is prepared to boot from the NIM server. If ping returns with a FAILED prompt, the client does not proceed with the NIM boot.

Note: If the ping fails, refer to “Boot Problems or Concerns” on page 118 and follow the steps for network boot problems.

Use the following procedure to temporarily change the system bootlist so that the network adapter attached to the NIM server network is first in the bootlist.

1. Exit to the SMS main screen.
2. Depending on the console type, select **Multiboot** or **Select Boot Devices**.
3. Depending on the console type, select **Boot Sequence** or **Select Boot Devices**.
4. Record the current bootlist settings. (You will have to set the bootlist back to the original settings after running diagnostics from the NIM server.)
5. Change the bootlist so the network adapter attached to the NIM server is first in the bootlist.
6. Exit completely from SMS.

The system should start loading packets while doing a **bootp** from the network.

Follow the instructions on the screen to select the system console.

If Diagnostics Operating Instructions Version x.x.x is displayed, standalone diagnostics has loaded successfully.

If the AIX login prompt is displayed, standalone diagnostics did not load. Check the following items:

- The bootlist on the client may be incorrect.
- Cstate on the NIM server may be incorrect.
- There maybe network problems preventing you from connecting to the NIM server.

Verify the settings and the status of the network. If you continue to have problems refer to “Boot Problems or Concerns” on page 118 and follow the steps for network boot problems.

After running diagnostics, reboot the system and use SMS to change the bootlist sequence back to its original setting.

Service Mode Diagnostics

To run online diagnostics in service mode, take the following steps:

1. Remove any removable media (tape or CD-ROM disc).
2. Stop all programs including the AIX operating system (get help if needed).
3. Ensure that the system unit power is turned off.
4. Turn the system unit power on.
5. When the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard icon on a graphical display), press the number 5 key on the keyboard.
6. Enter the appropriate password if prompted to do so.
7. Follow any instruction to select the console.

After the diagnostic controller loads, the DIAGNOSTIC OPERATING INSTRUCTIONS appear on the console display. Follow the displayed instructions to check out the desired resources.

When testing is complete use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS. Press the F3 key (from a defined terminal) to shut down the diagnostics before turning off the system unit.

Note: Pressing the F3 key (from a defined terminal) produces a Confirm Exit popup menu which offers two options: continuing with the shutdown by pressing F3, or returning to diagnostics by pressing Enter.

For undefined terminals, pressing 99 produces a full screen menu which offers two options: continuing with the shutdown by pressing 99 and then Enter, or returning to diagnostics by pressing Enter.

Online Diagnostics

Online diagnostics can be loaded using the customized 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 as follows:

1. Verify with the system administrator and users that all programs can 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 password.

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 type of devices in the boot list have been polled without finding a bootable image, the system restarts, giving the user the opportunity to start the system management services (by pressing the F1 key on a directly attached keyboard or the number 1 key on an ASCII terminal) before the system attempts to boot again.

Note: Concurrent mode and maintenance mode requires root access.

Online diagnostics:

- When installed, are resident with AIX on the system's disk drive or, in the case of a diskless client, on the network server.
- Can be run concurrently (called concurrent mode) with other applications.
- Can be run in single user mode (called service mode).
- Can be run in maintenance mode (called maintenance mode).
- Have access to the AIX configuration data.
- Have access to the AIX error log so error log analysis can be run.

Concurrent Mode Diagnostics

To run online diagnostics in concurrent mode, take the following steps:

1. Log onto the AIX operating system as **root** or use **CE login**.
2. Enter the **diag** command.
3. When the DIAGNOSTIC OPERATING INSTRUCTIONS are displayed, follow the instructions to check out the desired resources.
4. When testing is complete, use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS. Press the F3 key again to return to the AIX operating system prompt. Be sure to vary on any resource you had varied off.
5. Press the CTRL-D key sequence to log off from **root** or **CE login**.

Maintenance Mode Diagnostics

To run the online diagnostics in maintenance mode you must be logged on to the AIX operating system as **root** or **superuser** and use the **shutdown -m** and **diag** commands. Use the following steps to run the online diagnostics in maintenance mode:

Attention: Running the **shutdown -m** command terminates all of the customer's network connections, user logins (other than root), GUI console, and all other processes. Ensure the customer is informed of this before running this command.

1. Log onto the AIX operating system as **root** or **superuser**.
2. Stop all programs including the AIX operating system (get help if needed).
3. Enter the **shutdown -m** command.
4. When a message indicates the system is in maintenance mode, enter the **diag** command.
Note: It may be necessary to set **TERM** again.
5. When the DIAGNOSTIC OPERATING INSTRUCTIONS are displayed, follow the instructions to check out the desired resources.
6. When testing is complete, use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS. Press the F3 key again to return to the AIX operating system prompt.
7. Enter the **shutdown -F** command.

Default Boot List

The default boot list is as follows:

1. Tape or CD-ROM drive (if installed)
2. Disk drive
3. Network adapter
 - 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 when a diagnostic CD is present in a CD-ROM drive.

Pressing the F6 key on a directly attached keyboard (or the number 6 key on an ASCII terminal) loads online diagnostics using the service mode boot list. No diagnostic CD should be in the CD-ROM drive because online diagnostic is typically run from a hard disk, which is in the service mode boot list defined by 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 and 6 keys work like the F5 and 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 may contain up to 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 7. Using the Service Processor

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 turned 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 (that is, the 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 following table.

Service Processor Functions	Service Processor Menus (ASCII terminals)	AIX Service Aids (ASCII or graphics terminals)	SMS (ASCII or graphics terminals)
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	
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 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 can 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 five minutes of inactivity. Return to the menus by pressing any key on the local or remote terminal.

Accessing Service Processor Menus Locally

The service processor menus can be accessed locally by connecting an ASCII terminal to either serial port 1 (on the front or rear of the system) or serial port 2. 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, after OK appears in the operator panel display. The service processor then prompts you for a password (if set), and when verified, displays the service processor menus.

Accessing Service Processor Menus Remotely

The service processor menus can be accessed remotely by connecting a modem to serial port 1 or serial port 2, as follows:

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

Note: If your modem has not been configured, go to “Call-In/Call-Out Setup Menu” on page 207. 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, if set, 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 Menus

1>
```

Note: The service processor prompt displays 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 manufacturer vital product data, such as serial numbers, part numbers, and so on, that were stored from the system boot prior to the one in progress now.

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

Displays the boot progress indicators (checkpoints), up to a maximum of 100, from the system boot prior to the one in progress. This historical information can 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 indicator codes are listed top (latest) to bottom (oldest).

If the **<===** arrow occurs, use the 4-digit checkpoint or 8-character error code being pointed to as the beginning point for your service actions.

- **Read Service Processor Error Logs**

Displays the service processor error logs.

The time stamp in this error log is Coordinated Universal Time (CUT), also known as Greenwich Mean Time (GMT). AIX error logs have additional information available and are able to time stamp the errors with local time. See page “Service Processor Error Log” on page 222 for an example of the error log.

- **Read System POST Errors**

Select this item to 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 are sufficient working system resources. If POST errors occur during startup, this error log, when used with the diagnostics, helps to isolate faults. See “System POST Errors” on page 223 for an example of the POST error screen.

- **View System Environmental Conditions**

With this menu option, the service processor reads all environmental sensors and reports the results to the user. This option can be useful when surveillance fails, because it allows the user to determine the environmental conditions that may be related to the failure.

Privileged User Menus

The following menus are available to privileged users only. The user must know the privileged-access password, if set, 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 (optional)

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 that 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 following Main Menu illustration is example information only.

```
Service Processor Firmware
Firmware Level: sh991029
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

The Service Processor Setup menu shown below is accessed from the main 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. Serial Port Snoop Setup Menu
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 eight alphanumeric characters. You can enter longer passwords, but the entries are truncated to include only the first eight characters. Passwords can be set from the service processor menu or from the System Management Services 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 (through a modem). The error threshold is three attempts.

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 displays
None	Set	MAIN MENU displays
Set	None	Users with password see the MAIN MENU. Other 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**

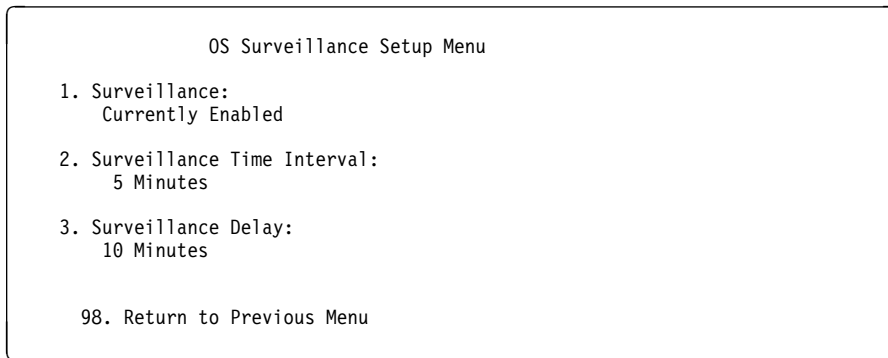
When console mirroring is enabled, the service processor sends information to both serial ports. This capability, which can be enabled by local or remote users, provides local users the capability to monitor remote sessions. Console mirroring can be enabled for the current session only. For more information, see “Console Mirroring” on page 221.

- **Start Talk Mode**

In a console mirroring session, it is useful for those who 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.

- **OS Surveillance Setup Menu**

This menu is used to set up operating system surveillance.



- **Surveillance**

Can be set to enabled or disabled.

- **Surveillance Time Interval**

Can be set to any number from 1 to 255 minutes. The default value is 5 minutes.

- **Surveillance Delay**

Can be set to any number from 0 to 255 minutes. The default value is 10 minutes.

The surveillance time interval and surveillance delay can only be changed after surveillance is enabled.

Refer to “Service Processor System Monitoring - Surveillance” on page 218 for more information about surveillance.

- **Reset Service Processor**

Allows the user to reinitialize the service processor.

- **Serial Port Snoop Setup Menu**

This menu can be used to set up serial port snooping, in which the user can configure serial port 1 as a "catch-all" reset device.

From the main service processor menu, select option 1, Service Processor Setup, then select option 8 (Serial Port Snoop Setup menu).

```
SERIAL PORT SNOOP SETUP MENU

1. System reset string:
   Currently Unassigned

2. Snoop Serial Port:
   Currently Unassigned

98. Return to Previous Menu

1>
```

Use the **system reset string** option to enter the system reset string, which resets the machine when it is detected on the main console on serial port 1.

Use the **snoop serial port** option to select the serial port to snoop.

Note: Only serial port 1 is supported.

After serial port snooping is correctly configured, at any point after the system unit is booted to AIX, whenever the reset string is typed on the main console, the system unit uses the service processor reboot policy to restart. This action causes an EPOW (early power off warning) to be logged, and also an AIX dump to be created if the machine is at an AIX prompt, with AIX in such a state that it can respond. If AIX cannot respond, the EPOW record is created, rather than the AIX dump.

Pressing Enter after the reset string is not required, so make sure that the string is not common or trivial. A mixed-case string is recommended.

System Power Control Menu

The following System Power Control Menu is used to set power control options:

```
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
7. Boot Mode Menu
98. Return to Previous Menu
99. Exit from Menus

1>
```

- **Enable/Disable Unattended Start Mode**

Use this option to instruct the service processor to immediately power on the server after a power failure, bypassing power-on password verification. Unattended start mode can also be set using SMS menus. Unattended start mode can be used on systems that require automatic power-on after a power failure.

- **Ring Indicate 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 and 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 is powered on. The ring indicate power-on menu and defaults are shown below:

```
Ring Indicate 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 can be enabled or disabled. The number of rings can be set to any number greater than zero. The default value is 6 rings.

- **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 reboot process ends when control passes to the operating system loading (or initialization) process.

Restart describes activating the operating system after the system hardware has been 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. Values equal to or greater than 0 are valid. Only successive failed reboot attempts count, not reboots that occur after a restart attempt. At restart, the counter is set to 0.
- **Use OS-Defined restart policy** The default setting is yes. It lets the service processor react or not react the same way 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 and level. If the operating system's automatic restart setting is defined, then it can 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 system automatic restarts.

- The **Use OS-Defined restart policy** is set to No,
OR
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 214.

- **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:

- The **Use OS-Defined restart policy** is set to No,
OR
- 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 214.

- **Call-Out before restart** If a restart is necessary due to a system fault, you can enable the service processor to call out and report the event. This option can be valuable if the number of these events becomes excessive, signalling a bigger problem.

The following table describes the relationship among the operating system 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

¹Service processor default

² AIX default

- **Power-On System**

Allows immediate power-on of the system. For other power-on methods, see “System Power-On Methods” on page 213.

- **Power-Off System**

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

- **Enable/Disable Fast System Boot**

Allows the user to select a fast system boot.

Attention: Enabling fast system boot results in several diagnostic tests being skipped and a shorter memory test being run.

- **Boot Mode Menu**

Allows users to set the system to automatically start a specific function on the next system start. This setting applies to the next boot only and is reset to the default state of being disabled following a successful boot attempt.

```
BOOT MODE MENU
1. Boot to SMS Menu:
   Currently Disabled
2. Service Mode Boot from Saved List:
   Currently Disabled
3. Service Mode Boot from Default List:
   Currently Disabled
4. Boot to Open Firmware Prompt:
   Currently Disabled
98. Return to Previous Menu
1>
```

- **Enabling the Boot to SMS Menu option**

Causes the system to automatically enter the System Management Services menu during the boot process. Enabling this option is equivalent to pressing the 1 key while the system initialization indicators display on screen.

– **Enabling the Service Mode Boot from Saved list option**

Causes the system to automatically enter the stand-alone diagnostics (see “Online Diagnostics” on page 184 for more information on stand-alone diagnostics). Enabling this option is equivalent to pressing the 5 key while the system initialization indicators display on screen.

– **Enabling the Service Mode Boot from Default list option**

Causes the system to automatically enter the online diagnostics in service mode (see “Standalone Diagnostics” on page 179 for more information on online diagnostics). Enabling this option is equivalent to pressing the 6 key while the system initialization indicators display on screen.

– **Enabling the Boot to Open Firmware Prompt option**

Causes the system to automatically enter open firmware prompt (also called the OK prompt). Enabling this option is equivalent to pressing the 8 key while the system initialization indicators display on screen (see “Open Firmware” on page 263 for more information about open firmware prompt).

If more than one option is enabled, the system recognizes only the option corresponding to the smallest menu number. For example, If options 4 and 2 were enabled, the system recognizes only Option 2: Service Mode Boot from Saved List. After a boot attempt, all enabled options are disabled. In effect, the system throws away any menu options that are enabled after the option with the highest priority (the option with the smallest menu number) is executed.

The user can also override the choices in the boot mode menu while the system initialization indicators display on screen. For example, if the user had enabled the system to enter the SMS menus (option 1) but pressed the 8 key while the system initialization indicators displayed on the screen, the system would enter the open firmware prompt and disregard the settings in the boot mode menu.

Note: After the logo or banner screen displays, the initialization indicators appear across the bottom of the screen. The system initialization indicators are described in “Open Firmware” on page 263.

System Information Menu

This menu provides access to system configuration information, error logs, system resources, and processor configuration.

```
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
10. Enable/Disable CPU Gard
    Currently Enabled

11. Enable/Disable MEM Gard
    Currently Enabled

12. Query/Modify Attention Indicator

98. Return to Previous Menu
99. Exit from Menus

1>
```

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

Displays manufacturer's vital product data (VPD), such as serial numbers, part numbers, and so on, that were stored from the system boot prior to the one in progress now.

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

Displays the boot progress indicators (checkpoints), up to a maximum of 100, from the system boot prior to the one in progress. This historical information can help to 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 proceeding the one that produced the current sessions.

The progress indicator codes are listed top (latest) to bottom (oldest). If the <=== arrow occurs, use the 4-digit checkpoint or 8-character error code being pointed to as the beginning point for your service actions.

- **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), also known as Greenwich Mean Time (GMT). AIX error logs have additional information available and are able to time stamp the errors with the local time. See page “Service Processor Error Log” on page 222 for an example of the error log.

- **Read System POST Errors**

Select this item to 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 are sufficient working system resources. If POST errors occur during startup, this error log, when used with the diagnostics, helps to isolate faults. See “System POST Errors” on page 223 for an example of the POST error screen.

- **Read NVRAM**

Displays nonvolatile random-access memory (NVRAM) contents.

- **Read Service Processor Configuration**

Displays all service processor settings that are changeable by the user.

- **View System Environmental Conditions**

The service processor reads all environmental sensors and reports the results to the user. Use this option when surveillance fails, because it allows the user to determine the environmental conditions that may be related to the failure.

- **Processor Configuration/Deconfiguration Menu**

Use this option to view 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 (0x0)
1. Configured by system (0x0)
2. Configured by system (0x0)
3. Configured by system (0x0)
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 starts. 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 failure threshold. It has been configured by the system and is available.
- **Deconfigured by system:** The processor is present, but has exceeded the failure threshold. It is deconfigured by the system and is currently unavailable.
- **Manually configured:** The processor is present and available. It has been 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**

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

```
Memory Configuration/Deconfiguration Menu

Memory DIMMs on memory card number 0:

Memory DIMMs on memory card number 1:
 1. Configured by system (0x0)
 2. Configured by system (0x0)

98. Return to Previous Menu

Enter card number and memory DIMM number separated by a space
1>
```

The user can manually configure or deconfigure any memory DIMM (dual inline memory module), 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 starts. 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 failure threshold. It is configured by the system and is available.
 - **Deconfigured by system:** The memory DIMM is present, but has exceeded the failure threshold. It has been deconfigured by the system and is currently unavailable.
 - **Manually configured:** The memory DIMM is present and available. It has been 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.
- **Enable/Disable CPU Gard:** Use this option to enable or disable CPU Gard. Selecting this option causes the state to switch between enabled and disabled.
 - **Enable/Disable MEM Gard:** Use this option to enable or disable MEM Gard. Selecting this option causes the state to switch between enabled and disabled.
 - **Query/Modify Attention Indicator:** (amber colored LED located on the operator panel) This option allows the user to query and modify the system fault/system identify LED. This LED displays the state of the attention indicator sensors.

If this option is chosen, the following screen is displayed:

```
Do you wish to:
1. Query the attention indicator sensors?
2. Modify the attention indicator sensor?
98. Return to Previous Menu

1>
```

If option 1 is chosen, the states of the indicator sensors are displayed.

If option 2 is chosen, you can reset the fault indicator if it is set. (The fault indicator cannot be set from this menu.) You are also given the option to set or reset the identify indicator.

Note: The system fault/system identify LED can also be set and reset using tasks in the AIX service aids.

Language Selection Menu

The service processor menus and messages are available in various languages. This menu allows selecting languages into which service processor and system firmware menus are displayed.

```
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 to properly display languages other than English.

This menu allows selecting languages in which service processor and system firmware menus and messages are displayed.

Call-In/Call-Out Setup Menu

This menu is used to configure a modem for the service processor to use to support the system.

```
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** Two entries at the top of the Modem Configuration Menu display the status of the current selections. Selections are made in the two sections 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. 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 371 and “Transfer of a Modem Session” on page 377.

```
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. none          9. modem_m0_sp
4. modem_f_sp   10. modem_m1_sp
5. modem_f0_sp
6. modem_f1_sp
7. modem_z_sp
8. modem_z0_sp
30. Save configuration to NVRAM and Configure modem
98. Return to Previous Menu
```

- **Serial Port Selection Menu** This menu allows you to enable and/or disable the call-in functions of each serial port in any combination.

```

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

```

- **Serial Port Speed Setup Menu** This menu allows you to set serial port speed to enhance terminal performance or to accommodate modem capabilities.

```

Serial Port Speed Setup Menu

1. Serial port 1 speed:
   Currently 9600

2. Serial port 2 speed:
   Currently 9600

98. Return to Previous Menu

```

A speed of 9600 baud or higher is recommended. Valid serial port speeds are shown below:

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

- **Telephone Number Setup Menu** Use the menu to set or change the telephone numbers for reporting a system failure.

```
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 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 the service processor conforms. Contact your service provider for the correct service center telephone number to enter here. For more information about the format and catcher computers, refer to the README file in the AIX /usr/samples/syscatch directory.
- **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.
- **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, use a test number, which you can change later.

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 shown in the following example:

18001234567,, ,87654

The commas create pauses for the voice response system, and the 87654 represents the PIN. The length of these pauses is set in modem register S8. The default is usually 1 or 2 seconds each.

- **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, use a test number, which you can change later.
- **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** This menu allows you to set call-out policy.

```
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**

Call-out policy can 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 administration center
3. Pager

If call-out policy is set to 'All', the service processor attempts a call out to the following numbers in the order listed:

1. Service center
2. Customer administration center
3. Pager

- **Remote timeout** and **remote latency** are functions of your service provider's catcher computer. Either use the defaults or contact your service provider for recommended settings. The default value for remote timeout is 120 seconds; the default value for remote latency is 2 seconds.
- **Number of retries** is the number of times you want the server to retry calls that resulted in busy signals or in other error messages. The default value for the number of retries is 2.

- **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. 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.

- **Call-Out Test**

The call-out test verifies if the call-out function is working properly. Before the test, call-out must be enabled and the system configured properly for call-out.

During the setup, the user should have entered the phone numbers for the digital pager and customer voice for test purposes. These numbers are used to determine whether call-out is working during the call-out test.

The call-out test should cause the user's phone to ring. If the test is successful, call-out is working properly. The user should now change the test digital pager and customers voice number to the correct numbers.

- **Ring Indicate Power-On Menu** See page 197.

System Power-On Methods

This section discusses the following system power-on methods:

- Power-on switch
- Remote power-on via ring-indicate signal

The server automatically powers on when it detects a "ring indicate" signal from a modem attached to one of the integrated serial ports.

A remote user can call the server to activate ring detection by the modem. Listen for a few more rings than the threshold number for starting the system and then hang up. The default threshold is six rings.

Wait 5 minutes for the server to initialize and then call again using an ASCII terminal. The server responds by requesting a password, if set, or presenting the service processor menus. The remote user now has control of the server.

Note: For security, if the system is powered on by the remote power-on via ring indicate signal and the service processor detects a battery failure, the service processor causes the system to power off. See "Service Processor Call-In Security" on page 214 for more information.

- Unattended start mode - refer to **Enable/Disable Unattended Start Mode** on page 197.

The service processor can be enabled to recover from the loss of power (see Enable/Disable Unattended Power-On Mode in the System Power Control Menu). When power is restored, the system returns to the power state at the time power loss occurred. For example, if the system was powered-on when power loss occurred, it reboots/restarts when power is restored. If the system was powered-off when power 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 AIX **shutdown -t** command for details on setting the timer.

Note: If a power loss is in progress when the timed power-on attempt occurs, the server will not be able to power on when power is restored.

- Follow-up to a failed boot attempt

The service processor initiates a power-on sequence if a failed boot attempt is detected (due to a hardware or software failure).

- **Fast/Slow Boot (IPL) Capabilities**

Using the service processor menus, you can select the IPL type, mode, and speed of your system. For more information, refer to “System Power Control Menu” on page 197.

Attention: Selecting fast IPL results in several diagnostic tests being skipped and a shorter memory test being run.

Service Processor Call-In Security

If the service processor detects bad battery-powered storage (indicating that the battery on the I/O board has failed or has been removed), it maintains server security by disabling the call-in capability to all serial ports.

When call-in is disabled, the system can still be powered on by using the ring-indicator signal, but the service processor then causes the system to power down, preventing access to any system facilities or AIX.

After battery power is restored, the password(s) must be reset and the call-in function(s) enabled. Both of these operations can be performed from service processor menus. See “Service Processor Setup Menu” on page 193 and “Call-In/Call-Out Setup Menu” on page 207.

Service Processor Reboot/Restart Recovery

Reboot describes bringing the system hardware back up from a system reset or power-on. The reboot process ends when control passes to the operating system loading (or initialization) process.

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

Boot (IPL) Speed

When the server enters reboot recovery, slow IPL is automatically invoked. This is to give the power-on self test (POST) an opportunity to locate and report any problems.

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. 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 the number of retries selected in 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 Set Surveillance Parameters option in the Service Processor Setup Menu). If OS activity stops due to a hardware- or software-induced failure, 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 the operating system documentation).

If you are using the AIX operating system, the menu item under SMIT for setting the restart policy is Automatically Reboot After Crash (True/False). 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 hardware or surveillance failure.

Service Processor Reboot/Restart Policy Controls

The operating system's automatic restart policy (see operating system documentation) defines the operating system's response to a system crash. The service processor can be instructed to refer to that policy by the "Use OS-Defined Restart Policy" selection on the Reboot/Restart Policy Setup Menu on page 198.

Processor Boot-Time Deconfiguration (CPU Repeat-Gard)

Processor boot-time deconfiguration allows for the removal of processors from the system configuration at boot time. The objective is to minimize system failure or data integrity exposure due to a faulty processor.

The hardware resources that get removed are the ones that experienced the following failures:

- A boot-time test failure.
- Run-time recoverable errors exceeding the failure threshold prior to the current boot phase.
- Run-time irrecoverable errors prior to the current boot phase.

This function uses processor hardware built-in self-test (BIST) and firmware power-on self-test (POST) to discover and isolate processor hardware failures during boot time. It also uses the hardware error detection logic in the processor to capture run-time recoverable and irrecoverable errors. The firmware uses the error signatures in the hardware to analyze and isolate the errors to a specific processor.

The processors that are deconfigured remain offline during subsequent reboots until the faulty processor hardware is replaced.

This function allows users to manually deconfigure or re-enable a previously deconfigured processor through the service processor menus. The user can also enable or disable this function through the service processor.

Processor Run-Time Deconfiguration (CPU-Gard)

Processor run-time deconfiguration allows for the dynamic removal of CPUs from the system configuration. The objective is to minimize system failures or data integrity exposures due to a faulty processor. If a processor exceeds a predefined threshold of recoverable internal errors, it is removed from the system configuration.

The function uses the hardware error detection logic in the processor to capture run-time recoverable errors. The firmware uses the error signatures in the hardware to analyze and isolate the error to a specific CPU. The firmware also maintains error threshold information.

When an internal recoverable error for a processor reaches a predefined threshold, the firmware notifies the AIX operating system. The AIX operating system migrates all software processes and interrupts to another processor and takes the faulty processor offline.

CPUs that are deconfigured at run time remain offline during subsequent reboots, through the CPU boot time deconfiguration function, until the faulty CPU hardware is replaced. The user can also enable or disable this function, through the AIX system management function.

Memory Boot-Time Deconfiguration (Memory Repeat-Gard)

Memory boot-time deconfiguration allows for the removal of a memory segment or memory DIMM from the system configuration at boot time. The objective is to minimize system failures or data integrity exposure due to faulty memory hardware.

The hardware resources that get removed are the ones that experienced the following failures:

- A boot-time test failure.
- Run-time recoverable errors exceeding the failure threshold prior to the current boot phase.
- Run-time irrecoverable errors prior to the current boot phase.

This function uses firmware power-on self-test (POST) to discover and isolate memory hardware failures during boot time. It also uses the hardware error detection logic in the memory controller to capture run-time recoverable and irrecoverable errors. The firmware uses the error signatures in the hardware to analyze and isolate the error to specific memory segment or memory DIMM.

The memory segment or DIMM that is deconfigured remains offline for subsequent reboots until the faulty memory hardware is replaced.

The function allows users to manually deconfigure or re-enable a previously deconfigured memory segment/DIMM through the service processor menu. The user can also enable or disable this function through the service processor menu.

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:

- System firmware bring-up (automatic)
- Operating system run time (optional)

System Firmware Surveillance

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 by the user.

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 failure condition repeats, the service processor leaves the machine powered on, logs an error, and displays 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

Operating system surveillance provides the service processor with a means to detect hang conditions, as well as hardware or software failures, while the operating system is running. It also provides the operating system with a means to detect service processor failure caused by the lack of a return heartbeat.

Operating system surveillance is enabled by default, allowing the user to run operating systems that do not support this service processor option.

You can also use the service processor menus and AIX service aids to enable or disable operating system surveillance.

For operating system surveillance to work correctly, you must set the following parameters:

- Surveillance enable/disable
- Surveillance interval

This is the maximum time (in minutes) the service processor should wait for a heartbeat from the operating system before timeout.

- 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 the parameters are set 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

The service processor can call out when it detects one of the following conditions:

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

To enable the call-out feature, do the following:

1. Have a modem connected to serial port 1 or 2.
2. Set the following using the service processor menus or diagnostic service aids:
 - Enable call-out for the serial port where the modem is connected.
 - Set the serial port line speed.

- Enter the modem configuration filename.
- Set up site-specific parameters (such as phone numbers for call-in and call-out policy).
- 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 user 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 for Console Mirroring

The following describes the system configuration for console mirroring:

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

Remote console mirroring can be invoked in two ways:

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

Note: To disconnect quickly, press Ctrl+D on either console, and both sessions exit the service processor menus.

Service Processor Error Log

The service processor error logs contain information about errors reported by the service processor.

```
                Error Log
19991118165344 1. 4B276851 CPU BIST fail detected
FRUs to replace: P1-C1

Press "C" to clear error log. Press "Enter" to continue. >
```

The time stamp in this error log is Coordinated Universal Time (CUT), also known as 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 startup, this error log helps isolate faults when used with the diagnostics. The following is an example of the screen:

```
Read System POST Errors

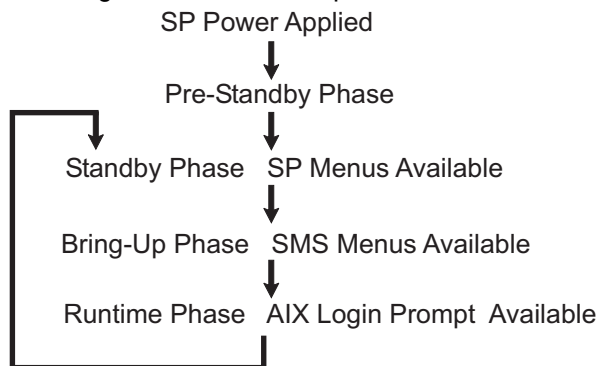
Version : 0
Severity : 0
Disposition : 0
Initiator : 0
Event being reported : 0

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.



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 (POST) and configuration tasks are completed.

The pre-standby phase components are as follows:

- Service processor initialization - Performs hardware and software initialization.
- Service processor POST - Conducts power-on self-tests on its various work and code areas.
- Service processor unattended start mode checks - To assist fault recovery. If unattended start mode is set, the service processor automatically reboots the server. The service processor does not wait for user input or power-on commands, but moves through the phase and into the bring-up phase. Access SMS menus or service processor menus to reset the unattended start mode.

Standby Phase

The standby phase can be reached in either of two ways:

- With the server off and power connected (the normal path), recognized by OK in the LCD display.
OR
- 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 service processor takes care of some automatic duties and is available for menu operation. The service processor remains in the standby phase until a power-on request is detected.

The standby phase components are as follows:

- Modem configuration

The service processor configures the modem (if installed) so that incoming calls can be received or outgoing calls can 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 service processor menus are password-protected. Before you can access them, you need either the general-access password (GAP) or privileged-access password (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 service processor checks to see if the previous boot attempt failed. If two consecutive failures are detected, the service processor displays an error code and places an outgoing call to notify an external party if the user has enabled this option.

- **Dial Out**

The service processor can dial a preprogrammed telephone number in the event of an IPL failure. The service processor issues an error report with the last reported IPL status and any other available error information.

- **Update Operator Panel**

The service processor displays operator panel data on the ASCII terminal if it is connected either locally or remotely.

- **Environmental Monitoring**

The service processor provides expanded error recording and reporting.

- **System Firmware Surveillance (Heartbeat Monitoring)**

The service processor monitors and times the interval between system firmware heartbeats.

- **Responding to System Processor Commands**

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

Run-Time Phase

This phase includes the tasks that the service processor performs during steady-state execution of the operating system.

- Environmental Monitoring

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

- Responding to System Processor Commands

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

- Run-Time Surveillance (Heartbeat Monitoring)

If the device driver is installed and surveillance enabled, the service processor monitors the system heartbeat. If the heartbeat times out, the service processor places an outgoing call. This is different from the bring-up 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 to the customer settings.

Chapter 8. System Management Services

Use the System Management Services menus 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 250.

Graphical System Management Services

To start the graphical System Management Services, turn on or restart the computer.

The firmware version installed in your system unit is displayed at the bottom right corner of the initial logo screen. Note the version number; some device upgrades may require a specified version of firmware to be installed in your system unit. Refer to Appendix F, “Firmware Updates” on page 405 for information on checking device firmware levels.

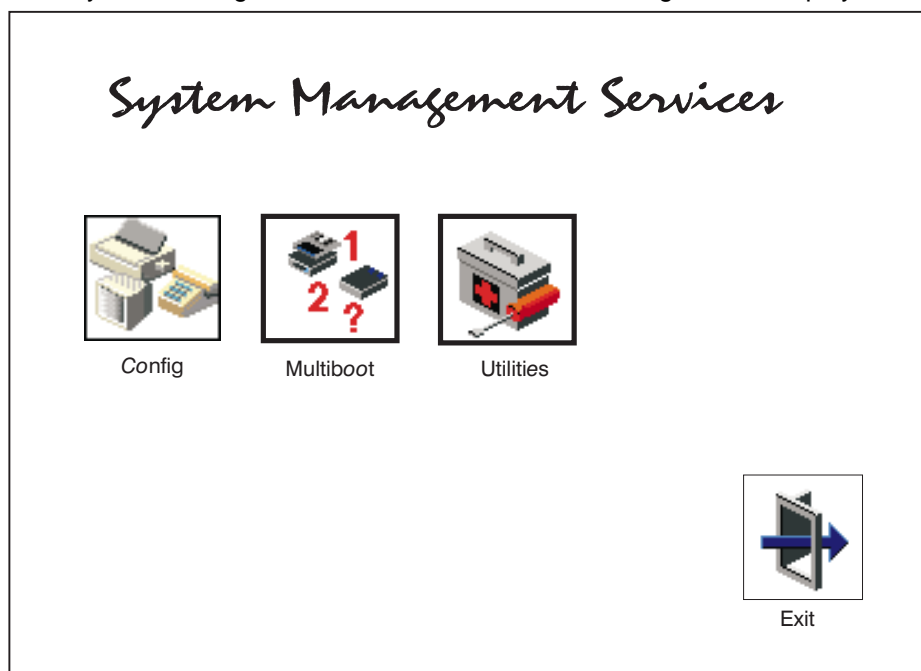
After the logo is displayed, initialization icons display across the bottom of the screen.

To enter the graphical System Management Services, you must press the number **1** key *after the keyboard icon displays* during startup and before the tone.

If you have pressed the number **1** key, the System Management Services menu displays after the initialization and power-on self-test (POST) is complete.

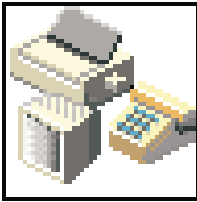
Note: If you have installed a privileged-access password, you are prompted for this password before you gain access to the System Management Services menu.

After the System Management Services starts, the following screen displays:

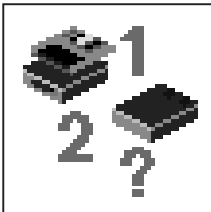


You can also press the number 8 key here to enter the open firmware **OK>** prompt.

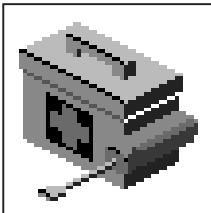
The System Management Services screen contains the following choices.



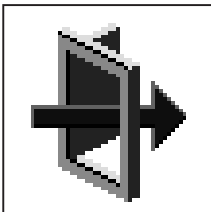
Config: Enables you to view your system setup. Go to “Config” on page 232.



Multiboot: Enables you to set and view the default operating system, modify the boot sequence, access the Open Firmware command prompt, and work with other options. Go to “Multiboot” on page 233.



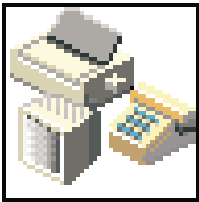
Utilities: Enables you to set and remove passwords, enable the unattended start mode, set and view the addresses of your system's SCSI controllers, select the active console, and view or clear the firmware error log. Go to “Utilities” on page 235.



Exit: Selecting the exit icon on this screen causes the firmware to start booting the operating system. On every other screen, selecting the exit icon takes you back 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



By selecting this icon, you can 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, POWER3 375 MHz
L2-Cache, 4096K

PowerPC, POWER3 375 MHz
L2-Cache, 4096K

Memory
 Memory Card slot 1, Module Slot =1 size=128MB
 Memory Card slot 1, Module Slot =2 size=128MB

Service Processor

Tablet Port

LPT addr=378

Com addr=3F8

Com addr=2F8



Audio

Keyboard

Mouse

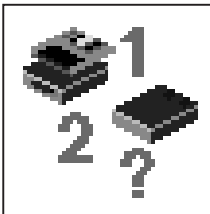
Integrated Ethernet
 addr=9999FF111R

SCSI controller id= 7

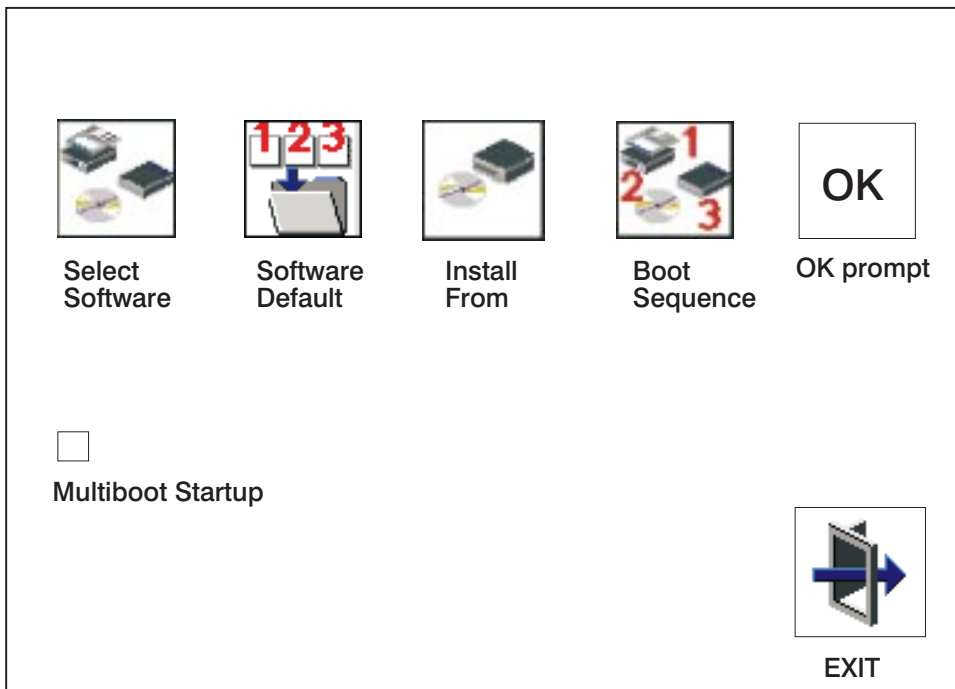


Exit

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

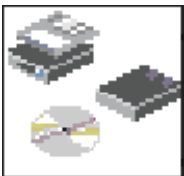
Multiboot



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



The following describes the choices available on this screen.

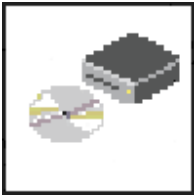


Select Software: This option, if supported by the operating system, allows you to choose which operating system to use. Choosing an operating system causes the system to start. This option is supported by AIX. However, not all operating systems support this option.

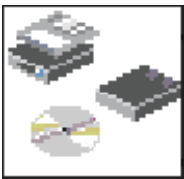
If you receive an informational message saying that no operating system is installed, then the system information in non-volatile storage may have been lost. This situation can occur if the battery has been removed. To correct this situation, refer to the **bootlist** reference in your AIX operating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



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



Install From: Enables you to select a media drive from which to install an operating system. Selection of a device is done using the spacebar.



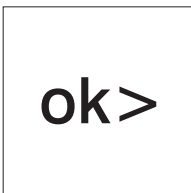
Boot Sequence: Enables you to view and change the custom boot list (the sequence in which devices are searched for operating system code). You may choose from 1 to 5 devices for the custom boot list.

The default boot sequence is:

1. The CD-ROM drive (if installed) or tape drive (if installed)
2. Hard disk drive
3. Network adapter

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.

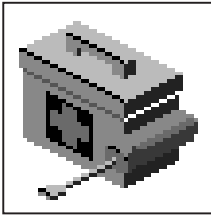


OK Prompt: Enables you to go directly to the open firmware command prompt. The open firmware command prompt is used for debugging and device driver development. For more information about the operation of the open firmware command prompt, refer to IEEE Standard 1275.

The **open firmware** command line can also 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. Do not invoke this feature if you are not familiar with Open Firmware. To exit from the command prompt, restart your system.

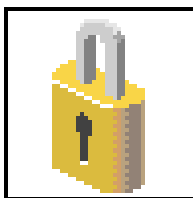
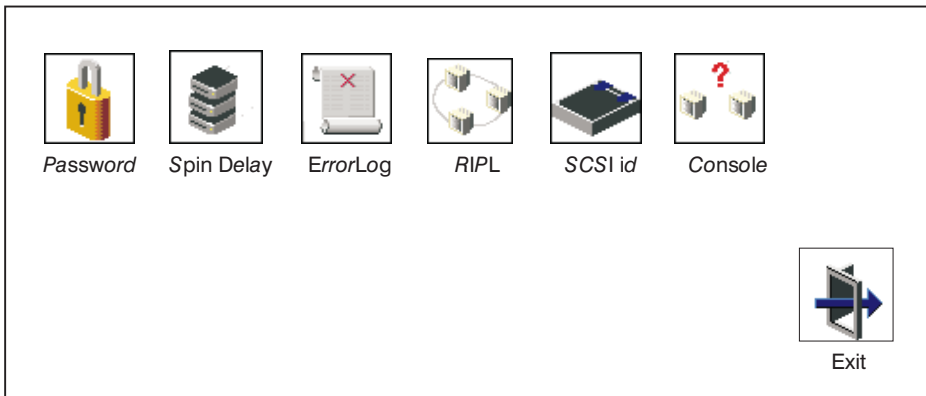
Multiboot Startup: Clicking on this button toggles whether the Multiboot menu displays automatically at startup.

Utilities

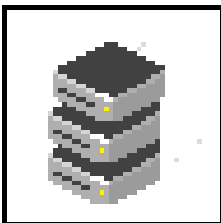


Selecting this icon enables you to perform various tasks and view additional information about your system unit.

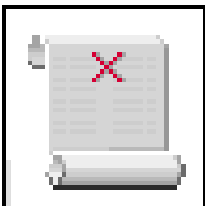
The following describes the choices available on this screen.



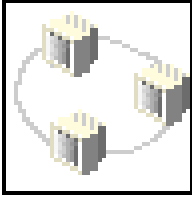
Password: Enables you to set password protection for turning on the system unit and for using system administration tools. Go to “Password” on page 237.



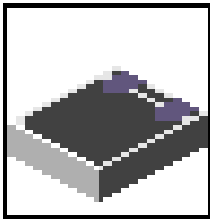
Spin Delay: Enables you to change the spin-up delay for SCSI hard disk drives attached to your system. Go to “Spin Delay” on page 241.



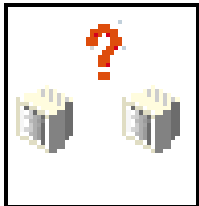
ErrorLog: Enables you to view and clear the firmware error log for your system unit. Go to “Error Log” on page 242.



RIPL (Remote Initial Program Load): Enables you to select a remote system from which to load programs through a network adapter when your system unit is first turned on. This option also allows you to configure network adapters, which is required for RIPL. Go to “RIPL” on page 243.



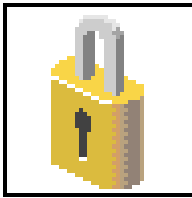
SCSI ID: Allows you to view and change the addresses (IDs) of the SCSI controllers attached to your system unit. Go to “SCSI ID” on page 249.



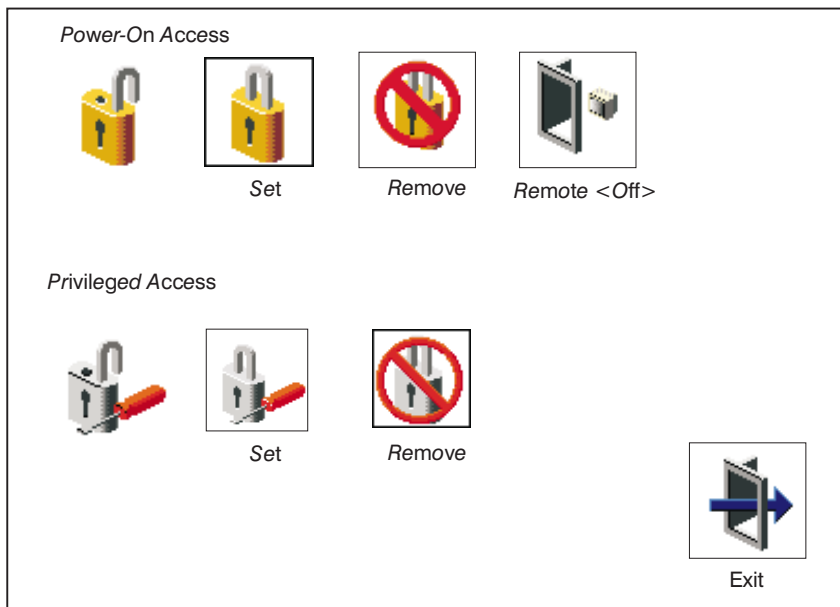
Console: Allows the user to select which console to use to display the SMS menus. This selection is only for the SMS menus. It does not affect the display used by the AIX operating system.

Follow the instructions that display on the screen. Pressing the number 1 key after the keyboard icon appears and before the tone sounds returns you to SMS.

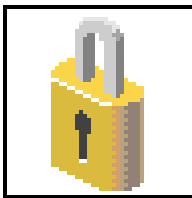
Password



Select this icon to perform password-related tasks.

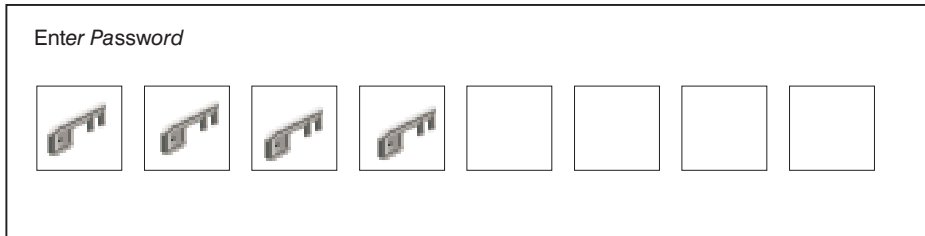


Power-On Access Password

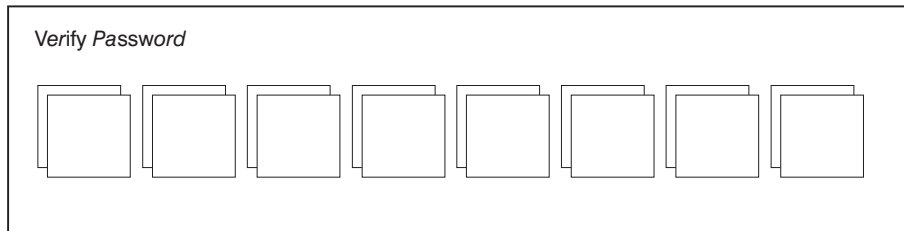


Power-On Access password helps protect information stored in your system unit. If a power-on access password is set for your system unit, the power-on access status icon is shown in the locked position. If a power-on access password is not set, then the power-on access status icon is shown in the unlocked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

When you select the **Set** icon, a screen with eight empty boxes displays. 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.



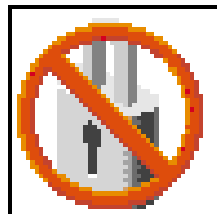
Press Enter when you are finished; you must type the password again for verification.



If you type the password incorrectly, press the Esc key and start again.

Note: After you have entered and verified the password, the power-on access password icon flashes and changes to the locked position to indicate that your system unit now requires the password you just entered during the power on process.

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



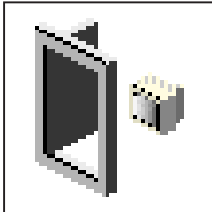
After you have selected the remove icon. The power-on-access status icon flashes and changes to the unlocked position to indicate that the power-on-access password is not set.

If the two password entries do not match, an error icon appears with an error code: 20E00000.

Note: If you *forget* the power-on access password, you can erase the password by shutting down the system unit and removing the battery for at least 30 seconds. 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.

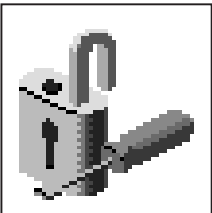
Remote Mode



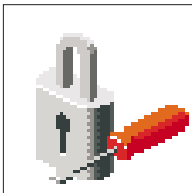
Remote Mode: The remote mode, when enabled, allows the system to start from the defined boot device. This mode is ideal for network servers and other system units that operate unattended. When the remote mode is set, the icon label changes to **Remote <On>**

Note: 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 197 for instructions on enabling the unattended start mode, which allows the system unit to turn on whenever 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.

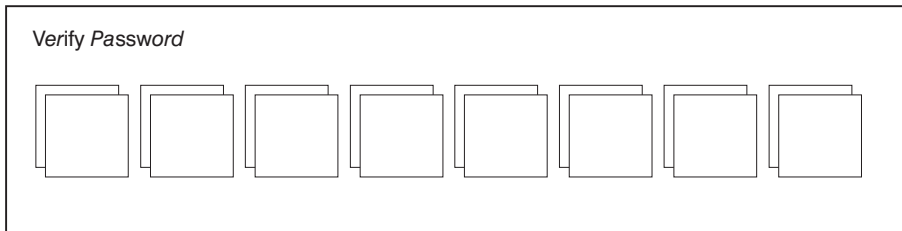


When you select the **Set** icon, a screen with eight empty boxes displays. Type your password in these boxes. You can use any combination of up to eight characters (A-Z, a-z, and 0-9) for your password. As you type a character, a key displays in the box.

Enter Password

							
---	---	---	---	--	--	--	--

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

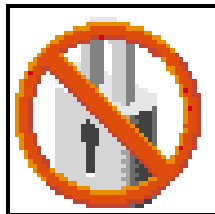


If you type the password incorrectly, press the Esc key and start again.

If the two password entries do not match, an error icon displays with an error code: 20E00001.

Note: 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.

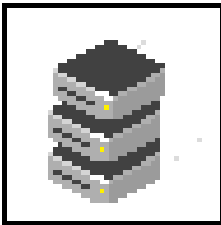
If you previously had set a privileged-access password and want to remove it, select the **Remove** icon.



After you have selected the **Remove** icon, the privileged-access status icon flashes and changes to the unlocked position to indicate that the privileged-access password is not set.




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

Spin Delay

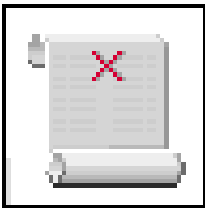


Select this icon to change the spin-up delay for SCSI hard disk drives attached to your system. Spin-up delay values can be entered manually or you can use a default setting. All values are measured in seconds. The default is two seconds. After you have entered the new spin-up delay values, use the arrow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

<Hard Disk Spinup Delay>
Current Spin Up Value - 2
Enter New Value (>1) (SEC)

		
Save	Default	Exit


Error Log




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

System Error Log

Date	Time	Error Code	Location
1. 00/04/13	00:51:32	25C38005	P1-M1.10
2. No entry			



Clear



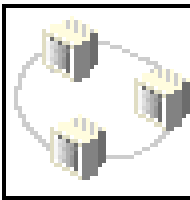
Exit

Selecting the **Clear** icon erases the entries in this log.

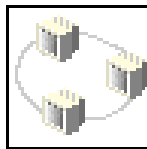
This error log only shows the first and last errors.

Note: The time stamp in this error log is Coordinated Universal Time (CUT), which is also referred to as Greenwich Mean Time (GMT). AIX error logs have more information available and can time stamp with your local time.

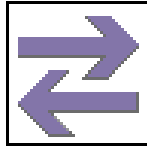
RIPL



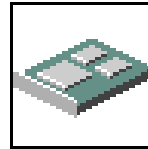
Selecting the **remote initial program load (RIPL)** icon gives you access to the following selections.



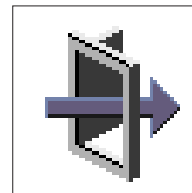
Set Address



Ping

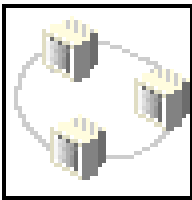


Config



Exit

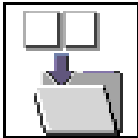
Set Address




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	255.255.255.000



Save



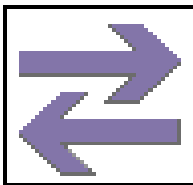
Exit

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

Attention: If the client system and the server are on the same subnet, set the gateway IP address to [0.0.0.0].

To change an address, press the backspace key on the highlighted address until the old address is completely deleted. Then enter the new address.

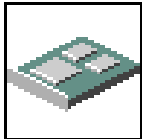
Ping




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

Ping Setup

Client Addr	000.000.000.000
Server Addr	000.000.000.000
Gateway Addr	000.000.000.000
Subnet Mask	255.255.255.000



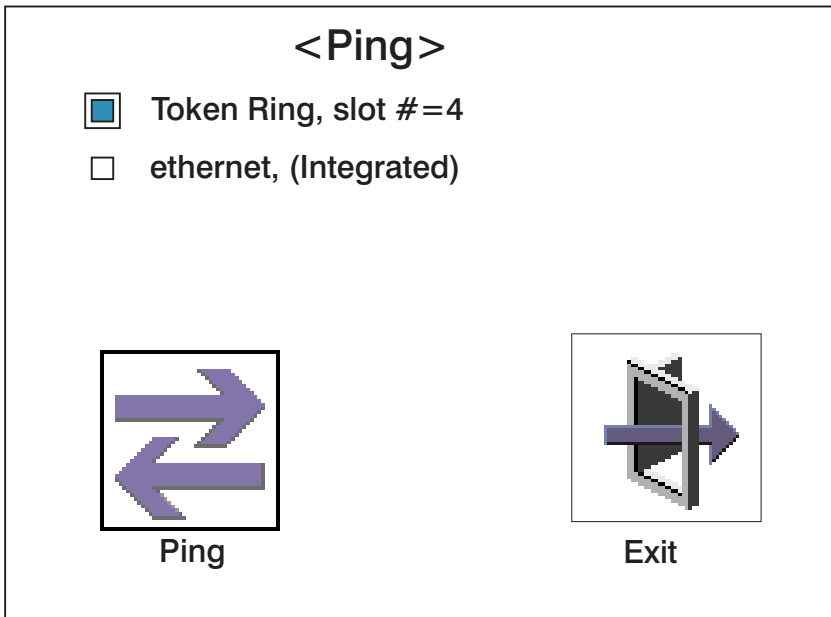
Adapter



Exit

To change an address, press the backspace key on the highlighted address until the old address is completely deleted. Then enter the new address.

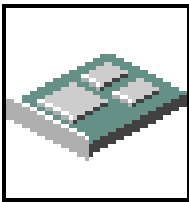
Selecting the **Adapter** icon displays a screen in which you select the communications (token-ring or ethernet) used to send test transmissions.



To send the test, do the following:

1. Use the arrow keys or mouse to select an adapter to configure.
Note: Clicking with the mouse sends the ping. If you use the arrow keys you must press the space bar, then use the ping icon.
2. Press the spacebar to highlight the buttons.
3. Select the **Ping** icon and press Enter to send the test transmission.

Config

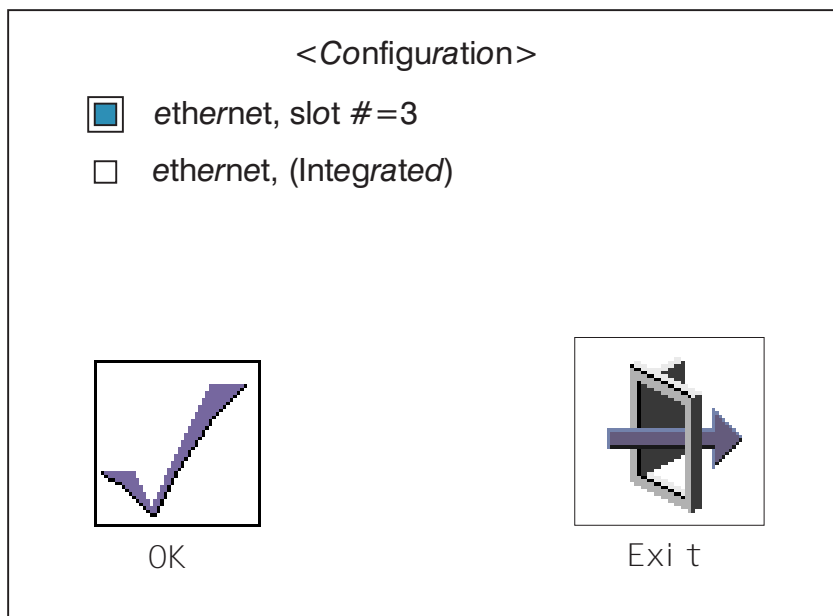


The **Config** icon allows you to configure network adapters which require setup.

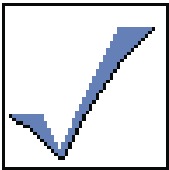
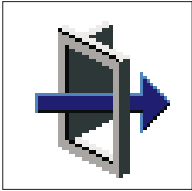
Selecting the **Config** icon causes a list of the adapters requiring configuration to display.

To use this screen, do the following:

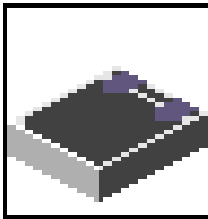
1. Use the arrow keys or mouse to highlight an adapter to configure.
2. Press the spacebar to select the adapter.
3. Select the **OK** icon and press Enter.



The following screen is a configuration window for an ethernet adapter. This screen only appears when you need to configure ethernet adapter specific information.

Data Rate		
<input checked="" type="checkbox"/> 10 Mbps	<input type="checkbox"/> 100 Mbps	<input type="checkbox"/> Auto
Full Duplex		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Auto
		
Save	Exit	

SCSI ID




Select this icon to view and change the addresses (IDs) of the SCSI controllers attached to your system unit.

To change a SCSI controller ID, highlight the entry by moving the up or down arrow keys, then use the spacebar to scroll through available IDs. After you have entered the new address, use the left or right arrow keys or mouse to highlight the **Save** icon and press Enter.


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
Ultra	0	7	15
Fast/Wide	0	7	15



Save



Default



Exit

Text-Based System Management Services

The text-based System Management Services are available if an ASCII terminal is attached to your system unit. The System Management Services make it possible for you to view information about your system unit and to perform such tasks as setting passwords and changing device configurations.

To start the text-based System Management Services, press the number **1** key on the ASCII terminal keyboard when the keyboard text symbol appears but before the tone sounds during startup. After the text-based System Management Services starts, the following screen displays.

Note: The level of firmware installed in your system is displayed at the top of each menu in the text-based System Management Services.

```
System Management Services

1  Display Configuration
2  Multiboot
3  Utilities
4  Select Language

                                |X=Exit|
                                -----

===>
```

Pressing the number next to the options provides capabilities described in this section.

After you have finished using the text-based System Management Services, type **x** (for exit) to start your system unit. On all other SMS screens, typing **x** takes you back to the prior screen.

Display Configuration

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

```
Device Name

Power PC, POWER3  375 MHz
L2-Cache 4096K
Power PC, Power3  375 MHz
L2-Cache 4096K

Memory
  Memory card slot=1, module slot=1 size=128MB
  Memory card slot=1, module slot=2 size=128MB
Service Processor
Tablet Port
LPT
  addr=378
COM
  addr=3F8
COM
  addr=2F8
Audio
Keyboard
Mouse
SCSI controller id=7

[P=prev-page] [N=next-page] [X=Exit]
```

Multiboot Menu

Use this screen to view and set various options regarding the operating system and boot sequence.

```
Multiboot Menu

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

                                     |X=Exit|
                                     -----

====>
```

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

If you are running on AIX and you receive the following message:

```
No Operating System Installed
```

this means that information in nonvolatile storage could have been lost, as would happen if the battery had been removed. To re-create this value, run the **bootlist** command under AIX with the appropriate parameters as to the location of the operating system on a particular hard disk. See 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, from which the operating system may be installed. Select a device 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 in the boot list. Up to five devices are supported.

OK Prompt: Provides access to the open firmware command prompt.

Multiboot Startup: Toggles between OFF and ON and selects whether the Multiboot menu is invoked automatically on startup.

Select Boot Device

Select this option 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 Device

1. SCSI CD-ROM          id=3      (slot=1)
2. SCSI 4.5 GB Hard Disk id=6      (slot=1)
3. SCSI 4.5 GB Hard Disk id=5      (slot=5)
4. Ethernet (Integrated)

                                |X=Exit|
```

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

- CD-ROM drive (if installed) or tape drive (if installed)
- Hard disk drive
- Network adapter

Attention: To change the custom boot list back to the default values, select the **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.

Configure Nth Boot Device

In the description below, **Nth** can be **1st, 2nd, 3rd**, and so on, depending on your choice on the previous menu.

This option displays a screen similar to the following:

```
Configure Nth Boot Device

Device      Current      Device
Number      Position     Name

  1          3          SCSI CD-ROM id=0 (Integrated)
  2          -          SCSI 9100 MB Hardisk id=8 (Integrated)
  3          -          Port E2 - 100/10 Ethernet Adapter (Integrated)
  4          -          Port E1 - 100/10 Ethernet Adapter (Integrated)
  5          -          High Speed Token-ring (slot=2)
  6          -          none

                                     |X=Exit|
                                     -----

===>
```

Type the device number of the device name that you want to select as the **Nth** boot device. For example, if you entered this menu by selecting 4 on the previous menu (Configure 2nd Boot Device), then enter the number 3 based on the list shown above, you are selecting the SCSI CD-ROM device to be the 2nd (**Nth**) device in the boot sequence.

Utilities

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

```
Utilities
1 Set Passwords and Unattended Start Mode
2 SCSI Spin up
3 Display Error Log
4 Remote Initial Program Load Setup
5 Change SCSI id
6 Select Console

====>

[X=Exit]
```

Set Password and Unattended Start Mode

Entering this selection permits access to the following options.

```
Password Utilities
1 Set Power-On Access Password
2 Remove Power-On Access Password
3 Unattended Start Mode <OFF>
4 Set Privileged-Access Password
5 Remove Privileged-Access Password

====>

[X=Exit]
```

Set Power-On Access Password

Setting a power-on access 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. Passwords are not case-sensitive upon entry.

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

Note: If you forget the power-on access password, the battery must be removed for longer than 30 seconds to reset the NVRAM. 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.

Unattended Start Mode

Use this option to instruct the service processor to immediately power on the server after a power failure, bypassing power-on password verification. Unattended start mode can also be set using the service processor menus. Unattended start mode can be used on systems that require automatic power on after a power failure.

Note: Unlike other systems, unattended start mode is not automatically disabled when the power-on access password is removed.

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 your system.

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

SCSI Spin Up

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

Display Error Log

Use this option to view or clear your system unit's error log. A screen similar to the following displays when you select this option.

```

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

[C=Clear Error Log]           [X=Exit]
```

Note: The time stamp in this error log is Coordinated Universal Time (CUT), which is also referred to as Greenwich Mean Time (GMT). AIX error logs have more information available and can time stamp with your local time.

Remote Initial Program Load Setup

This option allows you to enable and set up the remote startup capability of your system unit. You must first 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        [255.255.255.000]

                                     [X=Exit]

===>
```

To change IP Parameters, type the number of the parameters for which you want to change the value.

Attention: If the client system and the server are on the same subnet, set the gateway IP address to [0.0.0.0].

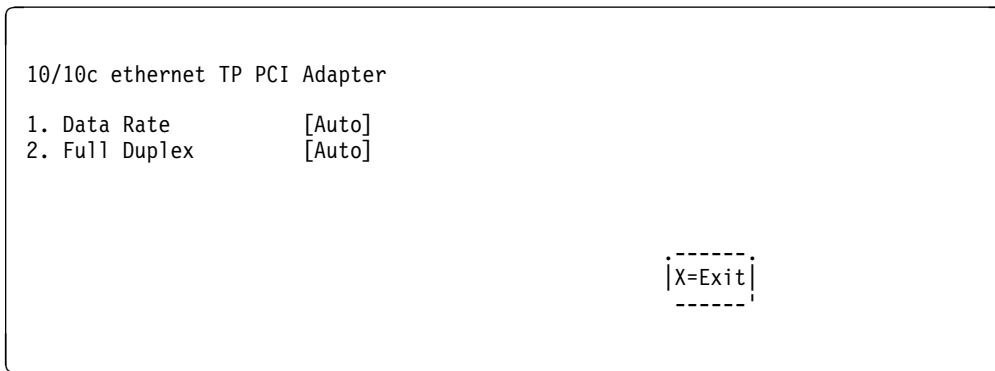
Selecting the **Adapter Parameters** option allows you to view an adapter's hardware address, as well as configure network adapters that require setup. A screen similar to the following displays.

```
Device                Slot          Hardware Address
1. ethernet           3            0004AC5E08D2
2. token-ring         5            0020357A0530
3. ethernet           Integrated   0004ACE4020B

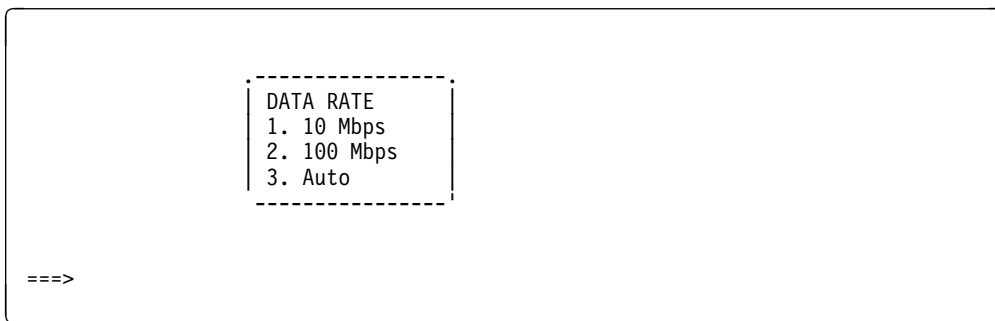
                                     [X=Exit]

(Press enter after making selection)          ===>
```

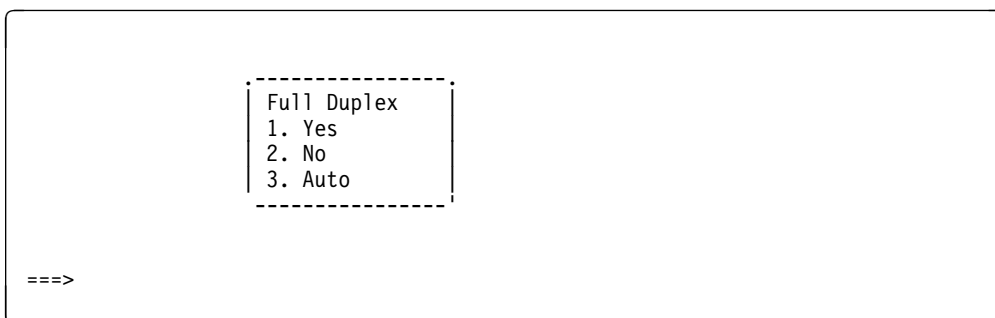
Selecting an adapter on this screen displays configuration menus for that adapter:



Selecting the **Data Rate** 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:



Select **Ping**, from the Network Parameters Menu, to test a connection to a remote system unit. After selecting the **Ping** option, you must choose which adapter communicates with the remote system.

Device	Slot	Hardware Address
1. ethernet	3	0004AC5E08D2
2. token-ring	5	0020357A0530
3. ethernet Integrated		0004ACE4020B

|X=Exit|

(Press enter after making selection) ====>

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

Ping IP Address

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 system unit.

Select Console

The Select Console utility allows the user to select which console the user would like to use to display the SMS menus. This selection is only for the SMS Menus and does not affect the display used by the AIX operating system.

Following the instructions that display on the screen.

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 ASCII must support the ISO-8859 character set to properly display languages other than English.

Open Firmware

To enter the open firmware command line, 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.

Note: If you have installed a privileged-access password, you are prompted for this password before you gain access to the open firmware command line.

Chapter 9. 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 unit or the devices that attach to the system unit. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electric shock.

Before installing or removing signal cables, ensure that the power cables for the system drawer and all non-hot-plug 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 unit 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 system drawer uses 3-wire power cables and plugs for the user's safety. Use these power cables with properly grounded electrical outlets to avoid electrical shock.

CAUTION:

This unit has more than one power cord. To reduce the risk of electrical shock, disconnect two power supply cords before servicing.

Model B80 Hot-Plug FRUs

Note: You do not have to power down the system to remove hot-plug FRUs.

The following FRUs are hot-pluggable:

- Hot-plug power supplies (if the drawer has two power supplies and only one needs to be removed)
- Hot-plug disk drive units (DASD)
- Hot-plug fans

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 to prevent this damage.

Take the following precautions:

- Use your electrostatic discharge strap while working with any electronic components.
- 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 drawer.
- 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 to prevent permanent damage.

Procedure List

The following table contains an alphabetic listing of the removal and replacement procedures found in this chapter.

FRU Description	Procedure Title and Page Number
Adapters	"Adapters" on page 306
Air Flow Baffle	"Memory and Processor Air Flow Baffle" on page 290
Battery	"Battery Replacement" on page 286
Front Bezel	"Front Bezel" on page 283
Bezel Door	"Bezel Door" on page 285
Cable Management Arm	"Cable Management Arm" on page 277
CD-ROM Drive (optional)	"Optional CD-ROM and Tape Drive" on page 329
CEC Box	"Central Electronics Complex (CEC) Box" on page 303
CEC Box Cover	"Central Electronics Complex (CEC) Cover" on page 288
Cover, Power Supply Chassis	"Power Supply Chassis Cover Removal" on page 281
Cover, Main	"Main Chassis Cover Removal" on page 279
Disk Drives	"Disk Drives" on page 313
Disk Drive Backplane	"Disk Drive Backplane" on page 321
Disk Drive Cage	"Disk Drive Cage" on page 319
Disk Drive Preinstall	"Checklist for Handling Drives" on page 312
EEPROM Removal/Replacement	"EEPROMs" on page 309
Fans, System Drawer	"Fans" on page 341
I/O Board	"Input/Output (I/O) Board" on page 348
Internal Drive Overview	"Internal Drive Overview" on page 312
Memory Cards	"Memory Cards" on page 293
Memory Modules	"Memory Modules" on page 296
Operator Panel	"Operator Panel" on page 323
Optional Media Bay	"Optional Media Bay Tray Preparation" on page 327
Power Distribution Board	"Power Distribution Board" on page 336
Power Supplies	"Power Supplies" on page 331
Processor Card	"Processor Card" on page 298
Servicing Position Procedure	"Front Service Position" on page 270
Static	"Handling Static-Sensitive Devices" on page 266
Stopping/Starting System	"Stopping and Starting System" on page 269
System Board	"System Board" on page 344

FRU Description	Procedure Title and Page Number
System Drawer Removal/Installation	"Model B80 Removal and Installation" on page 272
System VPD Update	"System Vital Product Data (VPD) Update Procedure" on page 325
Tape Drive (optional)	"Optional CD-ROM and Tape Drive" on page 329

Stopping and Starting System

This section provides a procedure for stopping and starting the Model B80.

Stopping the System Unit

Attention: When shutting down the system to install options, shut down all applications first and then shutdown the operating system. The system power turns off and the system goes into standby mode when the operating system is powered down. Before removing power from the system unit, ensure that the shut down process is complete. Failure to do so can result in the loss of data. Some option-installation procedures do not require the system to be stopped for installation. If necessary, the option-installation procedures in this section will direct you here if stopping the system is required.

1. Open the front rack door.
2. Log in to the system as root user.
3. Stop any applications that are running on the system.
4. At a command line, type `shutdown` to stop the operating system.
5. After you shut down the operating system, set the power switches of any attached devices to Off.
6. The shutdown procedure stops the operating system, removes power from parts of the system, and puts the system into standby mode.

The OK prompt displays on the operator panel.

Starting the System Unit

Perform the following steps to power on the system.

1. Open the front rack door. Look for OK in the operator panel display, which shows that the system is in standby mode.
2. Press the power button on the operator panel.

The power LED on the operator panel starts blinking at a fast rate. Exxx checkpoints appear in the operator panel display.

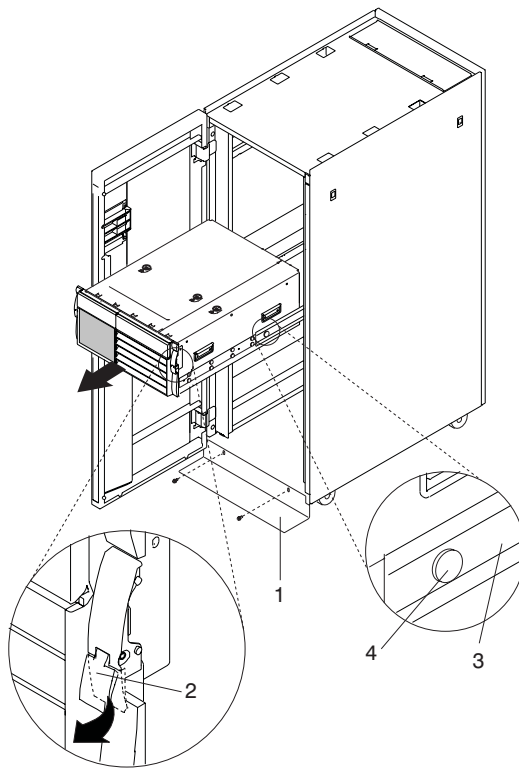
When the power-up sequence is complete, the power LED on the operator panel stops blinking and stays on.

Front Service Position

Attention: Before placing the drawer in the service position, ensure that the rack is either bolted to the floor or a stabilizer bar is correctly attached to the front base of the rack unit. Do not place a system drawer into a nonstabilized rack.

To place the system drawer into the front service position, do the following:

1. Open the front rack door.
2. Lift the lower section of the release latches, which are located on each side of the system drawer. The release latch clicks as it is put into the release position. See the following illustration.



- 1 Stabilizing Bar
- 2 Release Latch in the Release Position
- 3 Outer Rail
- 4 Release Button in Locking Hole

3. Grasp the top section of both latches and pull the drawer out until the rails are fully extended.

Note: The rails are fully extended and in the locked position when the two spring-loaded release buttons, located on each of the rails, click into the button locking hole. The button locking hole is located on the outer most portion of the rail assembly.

Returning the System Drawer to the Operating Position

To place the system drawer back into the operating position, do the following:

1. Press in both spring-loaded release buttons. The buttons are located on the slide rails, which are mounted to each side of the system drawer. See the illustration on page 270.
2. Ensure the release latches are in the open position.
3. Push the drawer straight back into the rack until both front latches have locked into position.
4. Close the front rack door.

Model B80 Removal and Installation

Before performing these procedures, read “Safety Notices” on page xiii.

System Drawer Removal

CAUTION:

This unit weighs between 32 kg (70.5 pounds) and 55 kg (121.2 pounds). Three persons are required to safely move it. Using fewer than three persons to move it can result in injury.

CAUTION:

- Removing the system drawer requires three people.
- *Do not* place more than one drawer in the service position at one time.
- Ensure that the system cables are not tangled and will not bind when placing the system drawer into the service or operating positions.

To remove the system drawer from the rack, do the following:

1. If you have not already done so, shut down the system as described in “Stopping and Starting System” on page 269.
 2. Open the front and rear rack doors.
 3. Disconnect all cables from the rear of the system drawer.
 4. Disconnect the cable management arm by pulling out the two captive snap buttons from the rear of the system drawer. See the illustration on page 277.
 5. From the front of the system drawer, lift the lower section of the release latches, which are located on each side of the system drawer. The release latch clicks as it is put into the release position. See the illustration on page 270.
 6. Grasp the top section of both latches and slowly pull the system drawer out into the service position. See the illustration on page 270.
 - The system should glide out of the rack without binding. If the system binds, assume that the rail wheels are misaligned and immediately grasp the handles located on each side of the system drawer, then continue pulling the system drawer out into its service position.
- Attention:** The system drawer could break away from the rails and drop to the floor. Proceed with caution.
- If you suspect the rail wheels are misaligned the system drawer **MUST** be completely removed from its rails.

- The rails on the rack and on the system drawer must then be inspected for damage.
7. To remove the system drawer completely from the rack, press in both release buttons and continue pulling the system drawer. Maintain a firm grip on the system drawer handles. See the illustration on page 270.
 8. After the system drawer has been removed from the rack, place it in a safe place.
 9. Unlock and retract the extended rack rails back into the rack. To unlock the extended outer rail, do the following:
 - a. Locate the spring-loaded locking latch at the back of the extended rails. The spring-loaded latch is mounted to the fixed portion (attached to the rack) of the rail. The right rail has the latch mounted to the top edge of the rail. The left rail has the latch mounted to the bottom edge of the rail.
 - b. Depending on which rail you are retracting either raise the latch up or lower the latch down and out of the way of the extended rail.
 - c. Push the extended rail carefully back past the latch and into the rack.
 - d. Close the front and rear rack doors.

Installing the System Drawer

This procedure assumes that the rails have already been installed into the racks and that this service call is not a new install. If this is a new install or the rails have not been installed, refer to "Install the Rails and Rack-Mount Brackets" in the pSeries 640 Model B80 Installation Guide.

Assuming the rails have been installed, do the following:

1. Open the front and rear rack doors.
2. Adjust the 8 screws which secure the rails to be finger-tight.

Note: Ensure that the 8 screws that secure the rails to the rack are only finger-tight. If the screws have been tightened before the system drawer has been loaded onto the rails binding and possible bearing problems will occur.
3. Pull out the telescoping section of each rail until it locks into position. The rails only pull out toward the front of the rack and make a clicking sound when put into the locked position.

You are now ready to mount the system drawer.

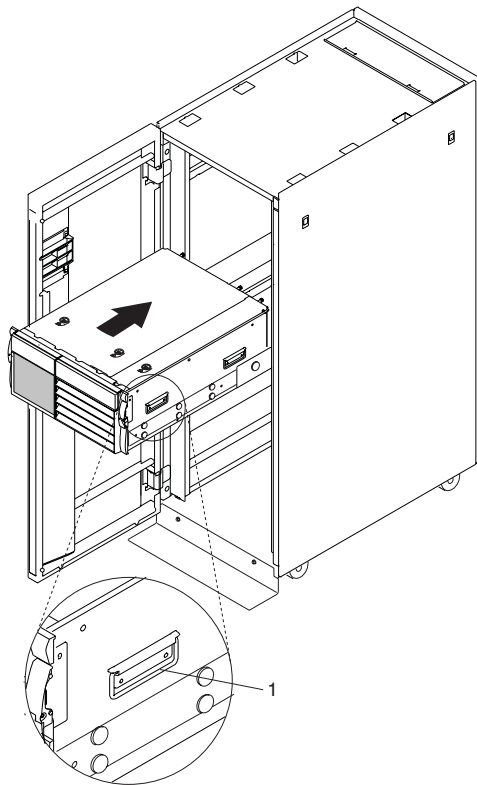
CAUTION:

The stabilizer must be firmly attached to the bottom front of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the stabilizer is not attached to the rack.

CAUTION:

This unit weighs between 32 kg (70.5 pounds) and 55 kg (121.2 pounds). Three persons are required to safely move it. Using fewer than three persons to move it can result in injury.

4. Remove the front bezel from the system. Refer to “Front Bezel Replacement” on page 284.
5. Lift the system drawer by grasping the handles located on each side. See the following illustration for handle locations.



1 System Drawer Lifting Handle

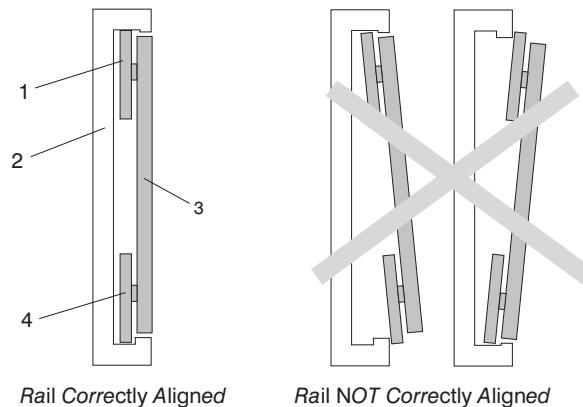
6. Insert the system drawer wheels into the rail tracks and slide the system drawer slowly into the rails. Ensure that the system drawer wheels are correctly aligned in the rails before releasing the system drawer. The system drawer should easily

slide back into the rack. As you slowly slide the system drawer back into the rack watch for any binding. This may indicate that the rollers are not seated correctly into the rails.

Notes:

- a. If one or more of the wheels is not correctly mounted into the rail do not attempt to make any adjustments without first removing the system drawer completely from each rail.
 - b. The 8 screws which secure the rails MUST only be finger-tight when installing or reinstalling a system drawer.
7. To remove the system drawer from the rails, firmly grasp the side handles, then slowly slide the system drawer out to the service position.
- If the system drawer seems to stick or if any part of the rails appear to be broken or deformed, replace the rack rails.
 - Inspect the wheel bearings located on the rails which are attached to the system drawer.

See the following illustration for correct rail wheel alignment.



- 1 Top Rail Wheel
- 2 Outer Rail (Mounted in Rack)
- 3 Inner Rail (Mounted on System Drawer)
- 4 Bottom Rail Wheel

8. Continue sliding the system into the rack. Release buttons, located on each of the inner rails, will hit the front edge of the telescoped outer rail, stopping the system from going any further.
9. Holding the front handle of the system, use your other hand to depress the release button.

10. Continue sliding the system into the rack until the release buttons click in their locking holes.
11. Depress both release buttons and continue sliding the drawer into the rack until the plastic release latches, located on both sides of the system drawer, have engaged the locking tabs located on the rack. The plastic latches make a clicking sound when they lock into position. This action secures the system drawer to the rack.
12. Tighten the 8 rail screws that secure the rails to the rack.
13. If removed, replace the front bezel. Refer to “Front Bezel Replacement” on page 284.
14. Install the cable management arm as described in “Cable Management Arm Installation” on page 278.
15. Reconnect all removed cables.
16. Close the front rack doors.

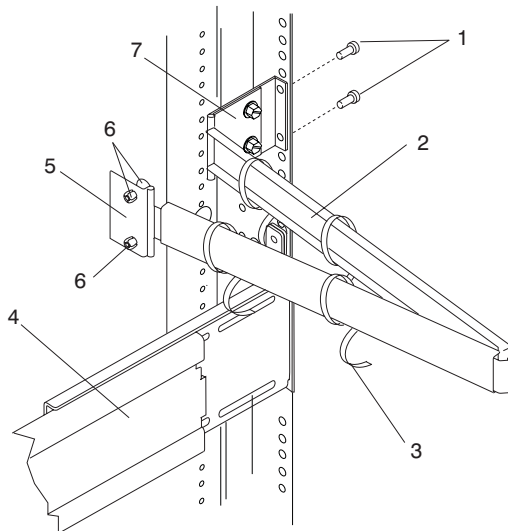
Cable Management Arm

Before performing these procedures, read "Safety Notices" on page xiii.

Cable Management Arm Removal

To remove the cable management arm, do the following:

1. Open the rear rack door.
2. Disconnect all cables from their velcro cable ties.
3. Disconnect the cable management arm snap buttons from the rear of the system. See the illustration on page 277.
4. Remove the two screws that secure the cable management arm to the rack. See the illustration on page 277.
5. Remove the cable management arm.
6. Close the rear rack door.



- 1 Cable Management Arm Mounting Screws (quantity 2)
- 2 System Drawer Cable Management Arm
- 3 Velcro Cable Ties
- 4 Installed Rack Rail
- 5 Cable Management Arm to System Mounting Plate
- 6 Captive Snap Buttons
- 7 Cable Management Arm to Rack Mounting Plate

Cable Management Arm Installation

To install the Model B80 cable management arm, refer to the illustration on page 277, then do the following:

1. Open the front and rear rack doors.
2. Place the system drawer in the operating position as described in “Returning the System Drawer to the Operating Position” on page 271.
3. Place the two captive snap buttons, located on the cable management arm, into the unlocked (pulled out) position.
4. Align and insert the two captive snap buttons into the holes located on the back of the system drawer. Pushing on the head of the snap buttons locks them into position. See the illustration on page 277.
5. Open the cable management arm so that the hinged mounting plate lies flat against the rack-mounting surface.
6. Align the threaded holes, located on the cable management arm mounting plate, with the holes in the rack-mounting surface.

Note: To avoid any binding of the cable management arm, ensure that the cable management arm is level.

7. Use two screws to secure the cable management arm mounting plate to the rack-mounting surface.
8. Install any cables already connected to the system drawer into the velcro ties, located on the cable management arm.

Note: The system drawer should be in the service position and the cable management arm fully extended when securing the velcro ties around the cables.

9. Close the front and rear rack doors.

Covers

Before performing these procedures, read “Safety Notices” on page xiii.

Main Chassis Cover Removal

To remove the main chassis cover, do the following:

1. If you have not already done so, shut down the system as described in “Stopping and Starting System” on page 269.
2. Unplug all system drawer power cables from rear of the system.
3. Open the front rack door.
4. Place the system drawer into the service position as described in “Front Service Position” on page 270.
5. Loosen the two captive thumbscrews located on the rear of the cover. See the illustration on page 280 for the thumbscrew locations.
6. Use the two thumb rings on the cover to slide the cover toward the rear of the system unit. The movement releases both the front and rear edges of the main chassis cover.
7. Push the cover to the left about one-half inch to release the left edge of the cover from the chassis.
8. Lift the cover from the system drawer after the cover's front, rear, and left edges have cleared the chassis.

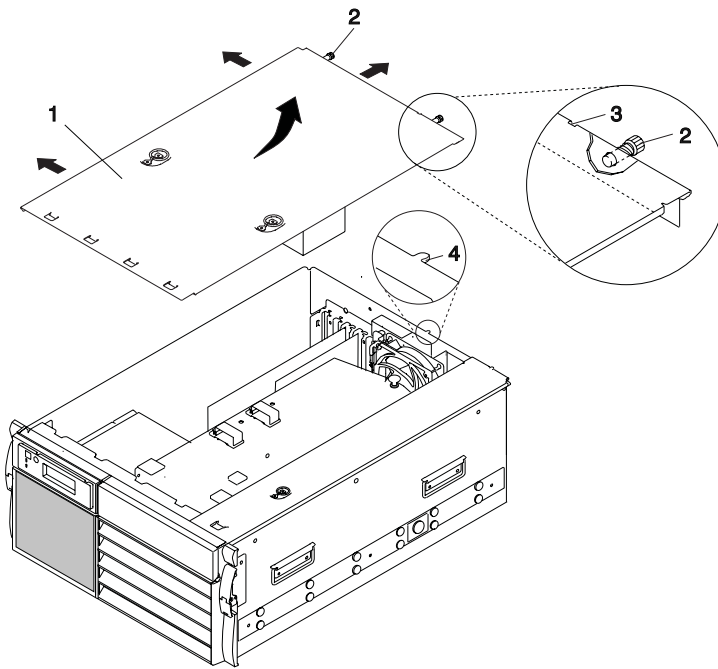
Note: The cover must be lifted straight up to clear the foam insulator blocks which are attached to the underside of the cover.

Main Chassis Cover Replacement

To replace the main chassis cover, do the following:

1. Carefully align the main chassis cover on top of the system drawer.
 - a. Push the left edge of the main chassis cover onto the left edge of the chassis.
 - b. Place the overhang on the right side, inside the chassis, while the back edge containing the thumbscrews remains outside and seats against the rear chassis wall.
2. Slide the cover toward the front of the chassis, ensuring that the cover lays flat against the chassis. The tabs located on the front edge of the cover slide under the top front edge of the chassis and the rear alignment tab slides into the rear alignment tab slot.

3. Align the two captive thumbscrews with the screw holes on back of the chassis and tighten the thumbscrews.
4. Place the system drawer back in the operating position as described in "Returning the System Drawer to the Operating Position" on page 271.
5. Close the front rack door.



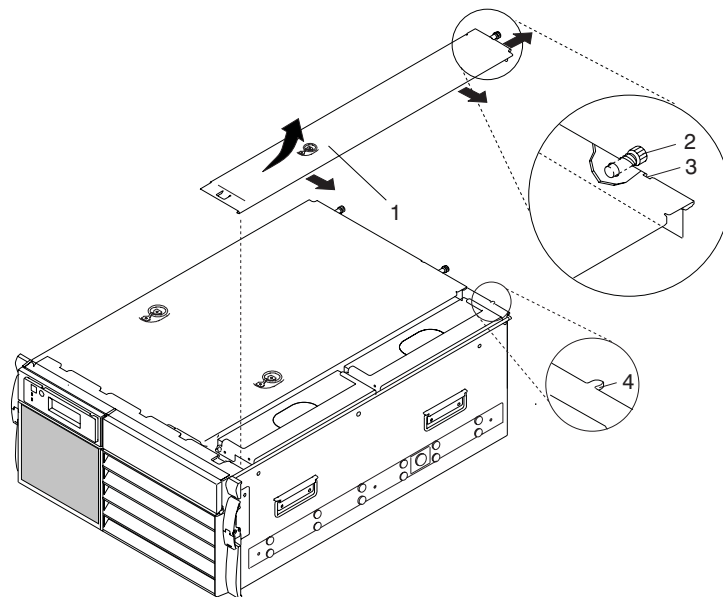
- 1 Main Chassis Cover
- 2 Captive Thumbscrew
- 3 Rear Alignment Slot
- 4 Rear Alignment Tab

Power Supply Chassis Cover Removal

Before performing these procedures, read “Safety Notices” on page xiii.

To remove the power supply chassis cover, do the following:

1. Open the front rack door.
2. Place the system drawer into the service position as described in “Front Service Position” on page 270.
3. Loosen the captive thumbscrew located on the rear of the cover. See the illustration on page 281 for the thumbscrew location.
4. Use the thumb ring on the cover to slide the cover toward the rear of the system unit. The movement releases both the front and rear edges of the power supply chassis cover.
5. Push the cover to the right about one-half inch to release the right edge of the cover from the chassis.
6. Lift the cover from the system drawer after the cover's front and right edges have cleared the chassis.



- | | |
|---|----------------------------|
| 1 | Power Supply Chassis Cover |
| 2 | Captive Thumbscrew |
| 3 | Rear Alignment Slot |
| 4 | Rear Alignment Tab |

Power Supply Chassis Cover Replacement

To replace the power supply chassis cover, do the following:

1. Carefully align the cover on top of the system drawer.
 - a. Push the right edge of the power supply chassis cover onto the right edge of the chassis.
 - b. Place the overhang on the left side of the cover, inside the chassis, while the back edge containing the thumbscrew remains outside, seated against the rear chassis wall.
2. Slide the cover toward the front of the chassis, ensuring that the cover lays flat against the chassis. The tab located on the front edge of the cover should slide under the top front edge of the chassis and the rear alignment tab slides into the rear alignment tab slot.
3. Align the captive thumbscrew with the screw hole on the back of the chassis and tighten the thumbscrew.
4. Place the system drawer back into the operating position, as described in "Returning the System Drawer to the Operating Position" on page 271.
5. Close the front rack door.

Front Bezel

Note: Removing the front bezel is necessary only when installing or servicing any of the following:

- Disk drives
- Optional CD-ROM or tape drive
- Operator panel
- Front fans

Front Bezel Removal

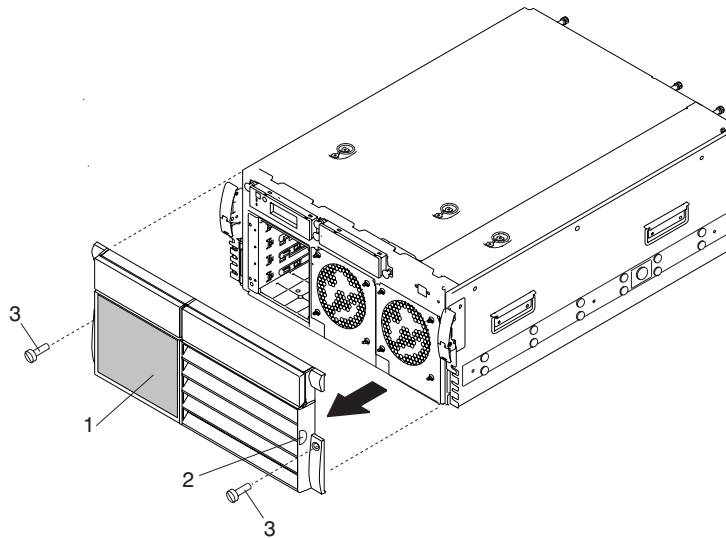
To remove the front bezel, do the following:

1. Open the front rack door.
2. If installed, remove the two bezel retaining thumbscrews. See the illustration on page 284 for the thumbscrew locations.

Note: The thumbscrews are typically used in earthquake prone areas or when the rack mounted system is being moved to another location. It is not necessary to use the thumbscrews to retain the bezel during normal operations and working conditions.

3. Grasp the front bezel on each side and carefully pull it toward you. Use the finger detents, located on each side of the bezel to aid you in pulling the bezel away from the chassis. The detents are designed to keep your hands from slipping away from the bezel as you remove it. See the illustration on page 284 for detent locations.
4. Store the bezel in a safe place.

Note: The front bezel helps suppress EMC emissions and *must* be placed back onto the system drawer after servicing.



- 1 Front Bezel
- 2 Finger Detent
- 3 Bezel Retaining Thumbscrews

Front Bezel Replacement

To replace the front bezel, do the following:

1. Align the studs located on each end of the bezel cover with the holes located on each side of the front of the chassis.
2. Push the cover in until it is seated against the chassis.
3. Replace the two bezel retaining thumbscrews.

Note: The thumbscrews are typically used in earthquake prone areas or when the rack mounted system is being moved to another location. It is not necessary to use the thumbscrews to retain the bezel during normal operations and working conditions.

4. Close the front rack door.

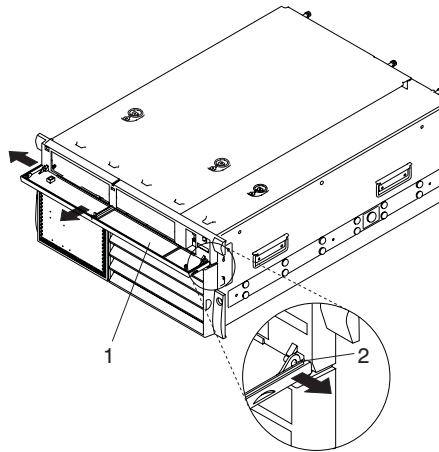
Bezel Door

Opening the bezel door gives you access to the operator panel and media bay. When performing other service procedures the door should remain closed. Many of the procedures in this section have you remove the front bezel, you can remove the front bezel without opening the bezel door.

Bezel Door Removal

To remove the front door, do the following:

1. Open the front rack door.
2. Open the bezel door. See the following illustration for bezel door location.
3. Carefully force out one of the two edges close to the hinge until the hinge peg is exposed.



- 1 Bezel Door (Open Position)
2 Bezel Door Hinge

4. After the hinge peg is totally exposed, pull the door out and then to the side opposite of the exposed hinge peg. This releases the second hinge peg.
5. Remove the cover and put it in a safe place.

Bezel Door Replacement

To replace the bezel door, do the removal steps in reverse order.

Battery Replacement

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.

Before performing these procedures, read “Safety Notices” on page xiii.

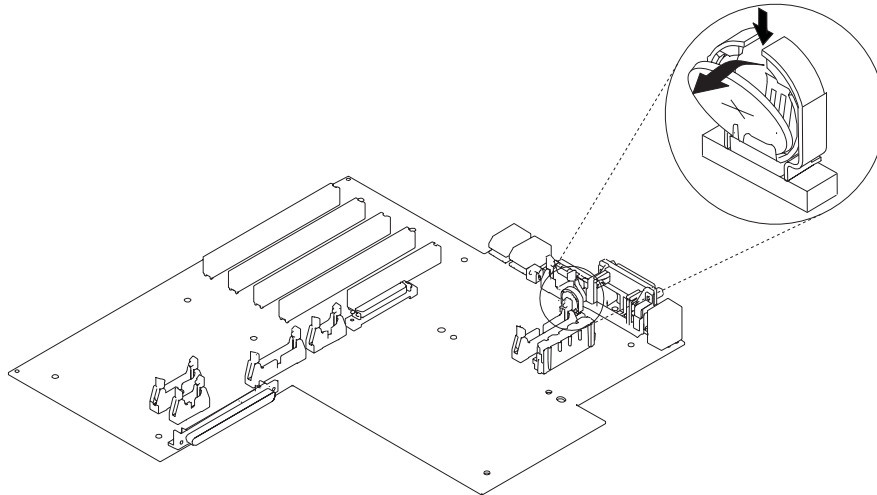
To replace the system's battery, do the following:

1. Open the rear rack door.
2. Shut down the system drawer as described in “Stopping and Starting System” on page 269.
3. Unplug all power cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
4. Release the cable management arm from the system and swing it out of the way.

Note: Do not remove the cables from the cable management arm.

5. With the system drawer in the operating position, remove fan #4 from the rear of the system as described in “Front and Rear Fan Removal” on page 341. If you are not sure which fan is fan #4 refer to “Fan Cable Routing Diagram” on page 14.
6. Locate the battery on the I/O board, as shown in the illustration on page 287
7. To remove the battery from its plastic mount, press down and toward the front of the system drawer.

Note: Do not wiggle the plastic mount from side to side or try to separate the plastic battery mount from the I/O board. The plastic mount connections are soldered to the I/O board. Permanent damage can result to the I/O board if the battery mount is damaged or removed.



8. Replace the battery with (FRU) part number 15F8409 or equivalent.
9. When installing the new battery, ensure that the battery polarity is correct. For this system, the positive (+) side of the battery should be facing the front of the system drawer.
10. Gently insert the battery into the battery mount. Support the battery mount with your fingers while seating the battery.
11. Replace rear fan #4 as described in “Front and Rear Fan Replacement” on page 343.
12. Secure the cable management to the rear of the system as described in “Cable Management Arm Installation” on page 278.
13. Reconnect all of the system drawer power cables.
14. Close the rear rack door.
15. Turn on the power.
16. Reset the time and date.
17. If you are running AIX, you might need to run the **bootlist** command while you are logged in as root user. This restores the custom bootlist and allows the option of *Select Software* under multiboot to start the operating system. Internet Protocol (IP) parameters may also need to be reentered. If your system cannot boot to AIX, go to the System Management Services to reset the boot list.

Central Electronics Complex (CEC) Cover

Before performing these procedures, read "Safety Notices" on page xiii.

CEC Box Cover Removal

To remove the CEC box cover, do the following:

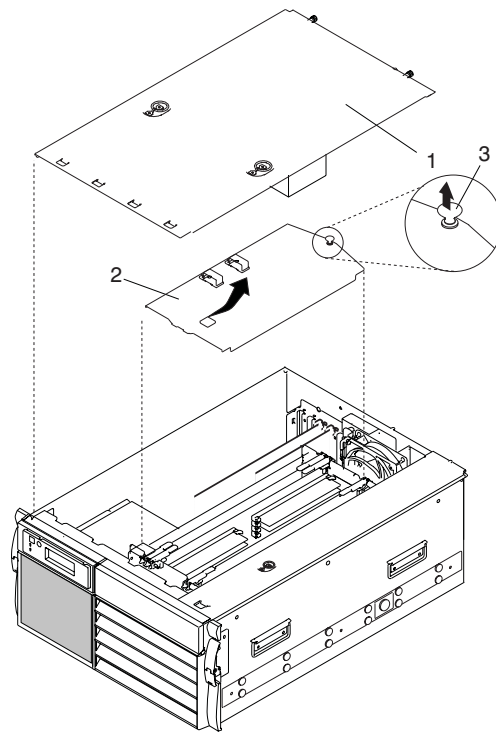
1. Open the front rack door.
2. Remove the front bezel as described in "Front Bezel Removal" on page 283.
3. Remove the main chassis cover as described in "Main Chassis Cover Removal" on page 279.
4. Remove the media bay tray, CD-ROM drive or tape drive, as described in "Optional Media Bay Tray Preparation" on page 327. This step is system configuration dependent.
5. Remove the cables from the cable clips on top of the CEC box cover.
6. Retract the captive snap button, located on the back of the CEC box cover. See the illustration on page 289 for snap button location.
7. Slide the cover back to release the front tabs from the CEC box.
8. Lift the cover from the system drawer.
9. Return to the procedure that sent you here.

CEC Box Cover Replacement

To replace the CEC box cover, do the following:

1. Place the CEC box cover on top of the CEC box.
2. Ensure the snap button located on the back of the cover is in the retracted (unlocked) position.
3. Slide the cover forward, inserting the cover tabs into the slots located on the CEC box.
4. Push in the snap button, securing the cover.
5. Replace the media bay tray, CD-ROM drive or tape drive as described in "Optional CD-ROM and Tape Drive" on page 329. This step is system configuration-dependent.

6. Place the cables in the cable clips on top of the CEC box cover.
7. Replace the main chassis cover as described in “Main Chassis Cover Replacement” on page 279.
8. Replace the front bezel.
9. Close the front rack door.



- 1 Main Chassis Cover
- 2 CEC Box Cover
- 3 Snap Button

Memory and Processor Air Flow Baffle

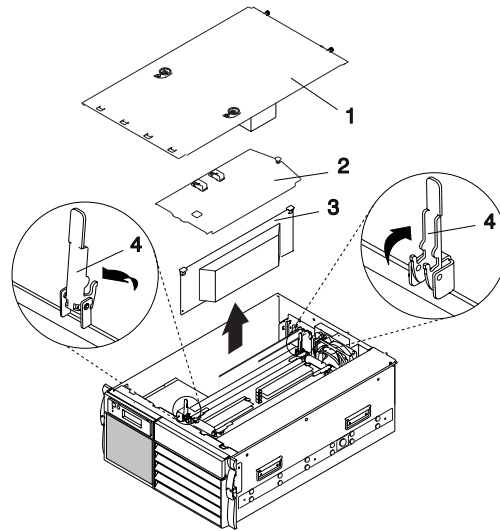
The air flow baffle is used to help direct circulating air in and around the memory and processor cards when the system board is not fully populated.

Air Flow Baffle Removal

Note: Remove the air flow baffle only if you plan to add a new processor or memory card.

To remove an air flow baffle, do the following:

1. Shut down the system as described in “Stopping and Starting System” on page 269.
2. Unplug the system power cables from the electrical outlets.
3. Open the front and rear rack doors.
4. Unplug all power cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
5. Place the system drawer into the service position as described in “Front Service Position” on page 270.
6. Remove the main chassis cover as described in “Main Chassis Cover Removal” on page 279.
7. Remove the front bezel as described in “Front Bezel Removal” on page 283.
8. Remove the media bay tray, CD-ROM drive or tape drive from the media bay as described in “Optional CD-ROM and Tape Drive” on page 329. This step is system configuration-dependent.
9. Remove the CEC box cover as described in “CEC Box Cover Removal” on page 288.
10. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 266.
11. The air flow baffle is secured in place with camming levers, located at each top corner of the air flow baffle. See the illustration on page 291 for the camming lever locations.
12. Open the camming levers and remove the air flow baffle. The illustration on page 291 shows the camming levers releasing the air flow baffle.
Attention: Open both camming levers at the same time.
13. Carefully remove the air flow baffle.



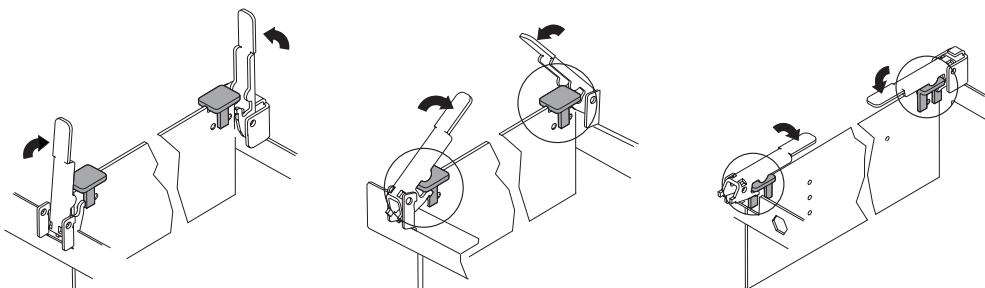
- 1 Main Chassis Cover
- 2 CEC Box Cover
- 3 Air Flow Baffle
- 4 Camming Latch

Air Flow Baffle Replacement

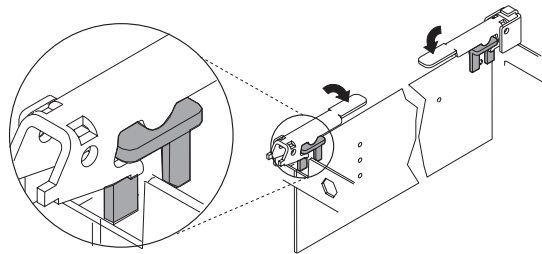
Note: Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 266.

To replace an air flow baffle, do the following:

1. Ensure that the camming levers are standing straight in an upright position. See the following illustrations.
2. Align the air flow baffle in the slot.
3. Close the camming levers, securing the card in the slot.



4. Make sure that the tabs on the new air flow baffle are captured by the levers as shown in the following illustration.



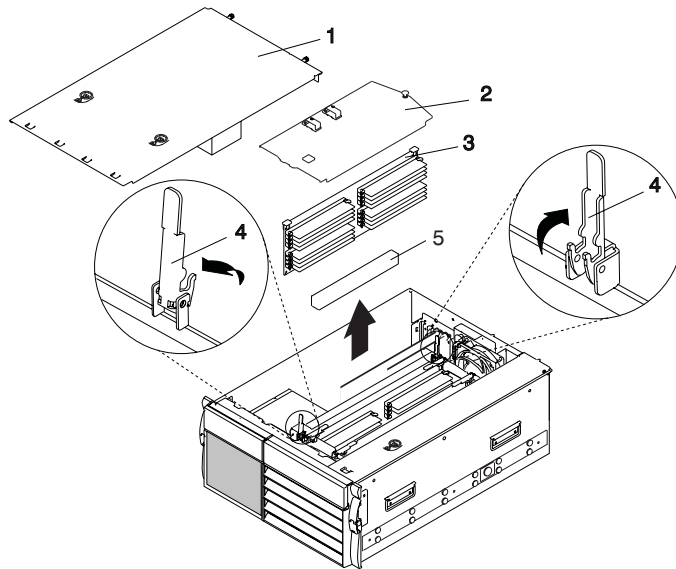
5. Replace the CEC box cover as described in “CEC Box Replacement” on page 305.
6. Replace the media bay tray, CD-ROM drive or tape drive as described in “Optional CD-ROM and Tape Drive” on page 329. This step is system configuration-dependent.
7. Replace the main chassis cover as described in “Main Chassis Cover Replacement” on page 279.
8. Replace the front bezel as described in “Front Bezel Replacement” on page 284.
9. Push the system drawer back into the operating position as described in “Returning the System Drawer to the Operating Position” on page 271.
10. Reconnect all of the system drawer power cables.
11. Turn on the power.
12. Close the front and rear rack doors.

Memory Cards

Memory Card Removal

To remove a memory card, do the following:

1. Shut down the system as described in “Stopping and Starting System” on page 269.
2. Open the front and rear rack doors.
3. Unplug all power cables from the rear of the system. Read the caution statement on page 61 before going to the next step in this procedure.
4. Place the system drawer into the service position as described in “Front Service Position” on page 270.
5. Remove the main chassis cover as described in “Main Chassis Cover Removal” on page 279.
6. Remove the front bezel as described in “Front Bezel Removal” on page 283.
7. Remove the media bay tray, CD-ROM drive or tape drive as described in “Optional CD-ROM and Tape Drive” on page 329. This step is system configuration-dependent.
8. Remove the CEC box cover as described in “CEC Box Cover Removal” on page 288.
9. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 266.
10. The card is secured in place with camming levers located at the top corners of the memory card.
Attention: To prevent damage to the card and to the card connectors, open both camming levers at the same time.
11. Open the card camming levers and remove the card. When the camming levers are fully unlocked and placed in a position as shown in the illustration on page 294, the card automatically is unseated from its connector.
12. Carefully remove the memory card and place it in a safe location.



- 1 Main Chassis Cover
- 2 CEC Box Cover
- 3 System Memory Card
- 4 Camming Latch
- 5 Connector Dust Cover

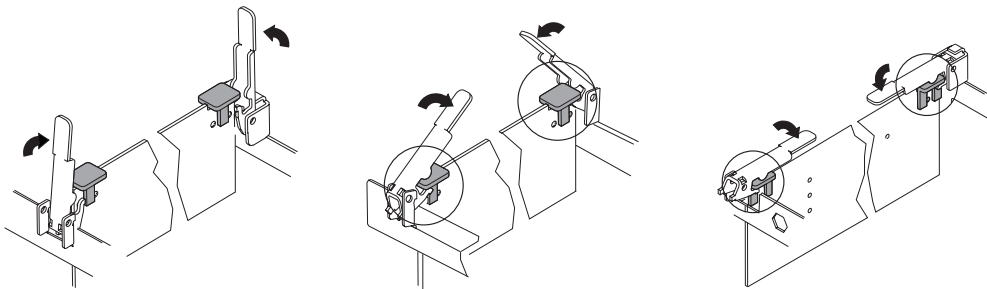
Memory Card Replacement

Notes:

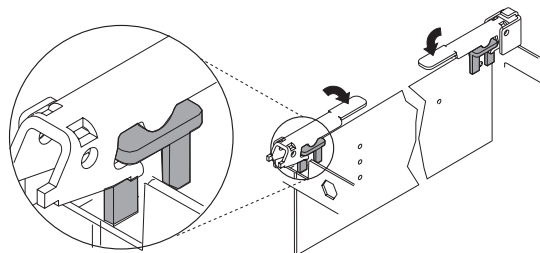
1. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 266.
2. If only one memory card is used in the system drawer, install it into primary slot J3 located on the system board.
3. If a second memory card is used in the system drawer, install it into secondary slot J2 located on the system board. See “System Board Locations” on page 6 for the location of slot J2.
4. The system comes with a dust cover over connector J2 if only one memory card was installed by the manufacturer. Before installing a memory card into connector J2, ensure that the dust cover has been removed.

To replace a memory card, do the following:

1. Align the card with the connector.
2. Close the camming levers, securing the card into the connector.



3. Make sure that the tabs on the new card are captured by the levers as shown in the following illustration.



Note: After you have locked the camming levers, push the card in with your thumbs to ensure the card is properly seated.

4. Replace the CEC box cover as described in “CEC Box Replacement” on page 305.
5. Replace the media bay tray, CD-ROM drive or tape drive as described in “Optional CD-ROM and Tape Drive” on page 329. This step is system configuration-dependent.
6. Replace the main chassis cover as described in “Main Chassis Cover Replacement” on page 279.
7. Replace the front bezel as described in “Front Bezel Replacement” on page 284.
8. Push the system drawer back into the operating position as described in “Returning the System Drawer to the Operating Position” on page 271.
9. Reconnect all of the system drawer power cables.
10. Turn on the power.
11. Close the front and rear rack doors.

Memory Modules

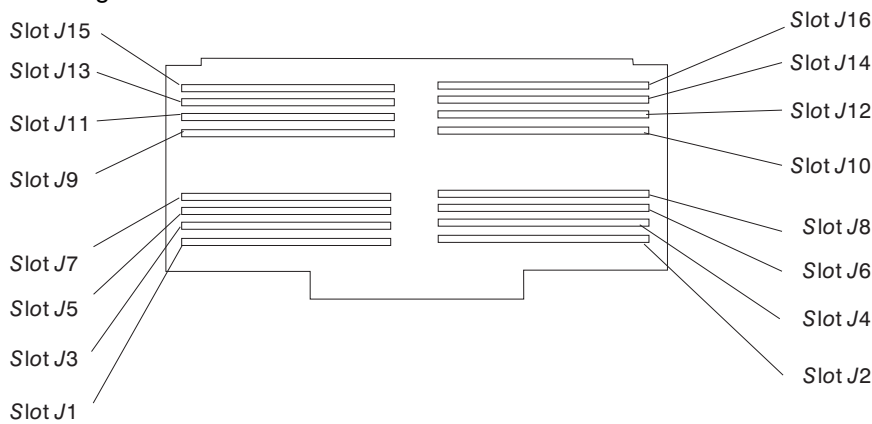
Before performing these procedures, read “Safety Notices” on page xiii.

Memory Module Removal

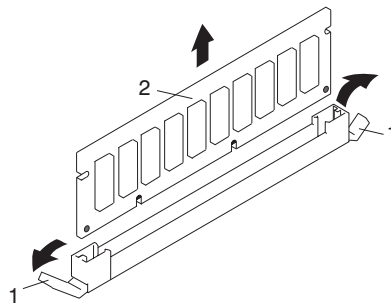
Note: Memory modules are located on the memory boards. The memory modules must be removed in pairs. See the following illustration on page 296.

To remove a memory module, do the following:

1. Remove the memory card as described in “Memory Card Removal” on page 293.
2. Use the following illustration to locate and determine which memory module you are removing.



3. Remove the memory module by pushing the tabs out and then down. The tabs camming action forces the memory module out of the connector.



- 1 Connector Tabs (unlocked position)
- 2 Memory Module

4. Pull the memory module out of the connector.

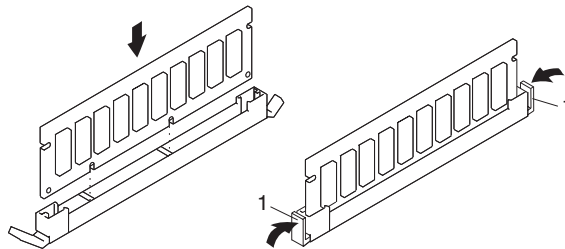
Memory Module Replacement

Notes:

1. Memory modules must be installed in pairs and in the correct slot configuration. For example, slots J1 and J2, J3 and J4, J5 and J6, and so on, are considered slot pairs. However, you can skip paired slots; for example if slots J1 and J2 are populated, you can populate slots J5 and J6 without first populating slots J3 and J4.
2. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 266.

To replace memory modules, do the following:

1. Locate the memory module connector on the memory card.
2. Ensure that the connector locking tabs are pushed out in the unlocked position before installing a new memory module, as shown in the following illustration.
3. Insert the memory module firmly into the connector. The locking tabs located on each end of the memory module connector should have moved back into the locked (upright) position.



1 Locking Tabs (locked position)

4. Ensure that the locking tabs are in the locked position.
5. Complete this procedure by following “Memory Card Replacement” on page 294.

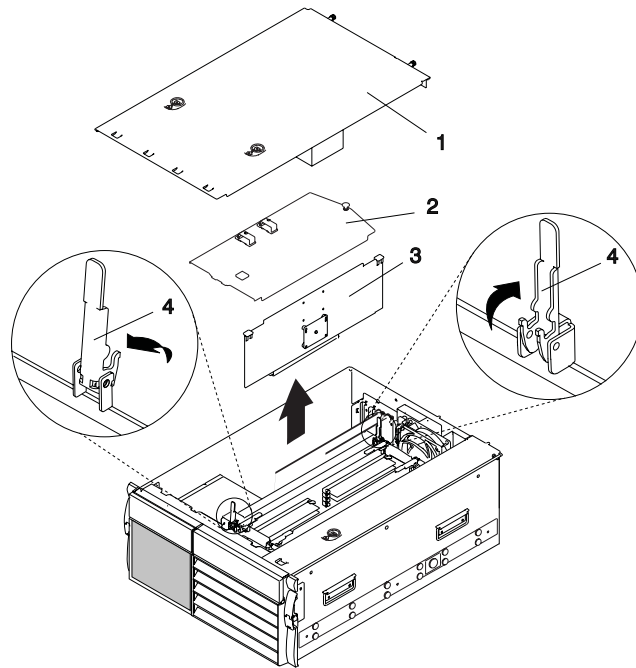
Processor Card

Before performing these procedures, read "Safety Notices" on page xiii.

Processor Card Removal

To remove a processor card do the following:

1. Open the front and rear rack doors.
2. Shut down the system as described in "Stopping and Starting System" on page 269.
3. Unplug all power cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
4. Place the system drawer into the service position as described in "Front Service Position" on page 270.
5. Remove the main chassis cover as described in "Main Chassis Cover Removal" on page 279.
6. Remove the front bezel as described in "Front Bezel Removal" on page 283.
7. Remove the media bay tray, CD-ROM drive or tape drive as described in "Optional CD-ROM and Tape Drive" on page 329. This step is system configuration-dependent.
8. Remove the CEC box cover as described in "CEC Box Cover Removal" on page 288.
9. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to "Handling Static-Sensitive Devices" on page 266.
10. Open the processor card camming levers. The camming levers are located at each of the top corners of the card. When the camming levers are fully unlocked and placed in a position as shown in illustration on page 299, the card automatically is unseated from its connector.
Attention: To prevent damage to the card and to the card connectors, open both camming levers at the same time.
11. Carefully remove the processor card.



- 1 Main Chassis Cover
- 2 CEC Box Cover
- 3 System Processor Card
- 4 Camming Latch

Processor Card Replacement

Notes:

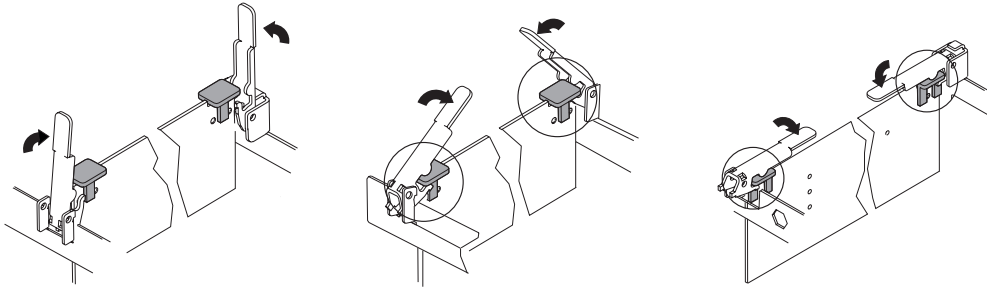
1. Installing a new processor card into your system unit may require updating the firmware.
2. You have a choice of installing a 375 Mhz or 450 Mhz speed processor.
3. Do not mix processor card speeds, for example, you can not use one 375 Mhz speed processor with a 450 Mhz speed processor in the same system.
4. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to "Handling Static-Sensitive Devices" on page 266.
5. Camming levers are in the correct position to receive a processor card when *both* levers are standing straight in an upright position. See the following illustration.

6. If one processor card is used in the system drawer, it *must* be installed into primary slot J6 located on the system board. See “System Board Locations” on page 6 for the location of slot J6.

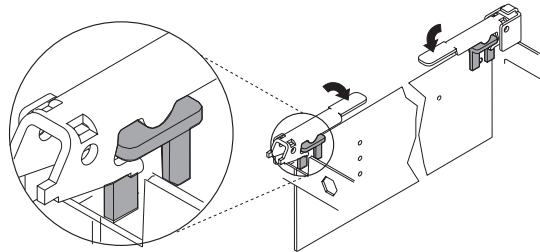
7. If a second processor card is used in the system drawer, install it into secondary slot J8 located on the system board. See “System Board Locations” on page 6 for the location of slot J8

To replace a processor card, do the following:

1. Align the card with the connector.
2. Close the camming levers securing the card into the connector.



3. Ensure the tabs on the new card are captured by the levers as shown in the following illustration.



Note: After you have locked the camming levers, push the card in with your thumbs to ensure the card is properly seated.

4. Replace the CEC box cover as described in “CEC Box Cover Replacement” on page 288.
5. Replace the media bay tray, CD-ROM drive or tape drive as described in “Optional CD-ROM and Tape Drive” on page 329. This step is system configuration-dependent.
6. Replace the front bezel as described in “Front Bezel Replacement” on page 284.
7. Replace the main chassis cover as described in “Main Chassis Cover Replacement” on page 279.
8. Push the system drawer back into the operating position as described in “Returning the System Drawer to the Operating Position” on page 271.
9. Reconnect all of the system drawer power cables.
10. Turn on the power.
11. Close the front and rear rack doors.

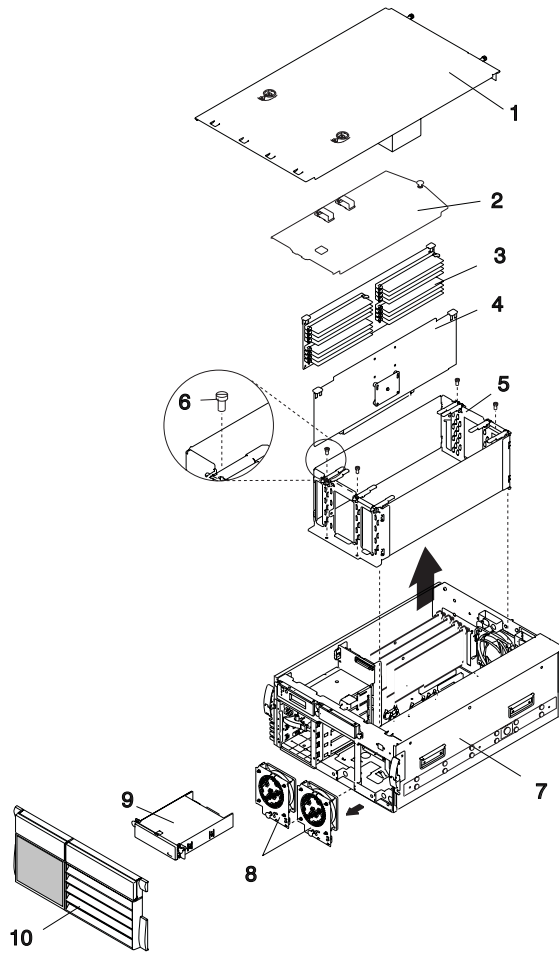
Central Electronics Complex (CEC) Box

Before performing these procedures, read “Safety Notices” on page xiii.

CEC Box Removal

To remove the CEC box, do the following:

1. Open the front and rear rack doors.
2. Shut down the system as described in “Stopping and Starting System” on page 269.
3. Unplug all power cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
4. Remove the front bezel as described in “Front Bezel Removal” on page 283.
5. Remove the media bay tray, CD-ROM drive or tape drive as described in “Optional CD-ROM and Tape Drive” on page 329. This step is system configuration-dependent.
6. Remove the front fans as described in “Front and Rear Fan Removal” on page 341.
7. Place the system drawer into the service position as described in “Front Service Position” on page 270.
8. Remove the main chassis cover as described in “Main Chassis Cover Removal” on page 279.
9. Remove the CEC box cover as described in “CEC Box Cover Removal” on page 288.
Note: Before removing, record the position of all installed memory cards, processor cards and air flow baffles.
10. Remove the processor cards as described in “Processor Card Removal” on page 298.
11. Remove the memory cards as described in “Memory Card Removal” on page 293.
12. If installed, remove the air flow baffles as described in “Air Flow Baffle Removal” on page 290.
13. Remove the four screws which secure the CEC box to the chassis. See the illustration on page 304 for screw locations.
14. Carefully lift the CEC box from the system drawer.



- 1 Main Chassis Cover
- 2 CEC Box Cover
- 3 System Memory Card
- 4 System Processor Card
- 5 CEC Box
- 6 CEC Box Retaining Screw (quantity 4)
- 7 System Drawer
- 8 Front Fans
- 9 Media Device or Tray (configuration-dependent)
- 10 Front Bezel

CEC Box Replacement

To replace the CEC box, do the following:

1. Carefully lower the CEC box into the system drawer.
2. Align the CEC box to the two alignment pins located on the I/O board.
Note: The rear of the CEC box can be identified by the four holes located on the bottom ledge. Two of the four holes are used by the alignment pins.
3. Replace the four screws which secure the CEC box to the chassis. See the illustration on page 304 for screw locations.
4. Replace the processor cards as described in "Processor Card Replacement" on page 299.
5. Replace the memory cards as described in "Memory Card Replacement" on page 294.
6. If removed, replace all air flow baffles as described in "Air Flow Baffle Replacement" on page 291.
7. Replace the CEC box cover as described in "CEC Box Cover Replacement" on page 288.
8. Replace the media bay tray, CD-ROM drive or tape drive as described in "Optional CD-ROM and Tape Drive" on page 329. This step is system configuration-dependent.
9. Replace the front fans as described in "Front and Rear Fan Replacement" on page 343.
10. Replace the main chassis cover as described in "Main Chassis Cover Replacement" on page 279.
11. Return the system drawer to the operating position as described in "Returning the System Drawer to the Operating Position" on page 271.
12. Replace the front bezel as described in "Front Bezel Replacement" on page 284.
13. Reconnect all of the system drawer power cables.
14. Power on the system as described in "Stopping and Starting System" on page 269.
15. Close the front and rear rack doors.

Adapters

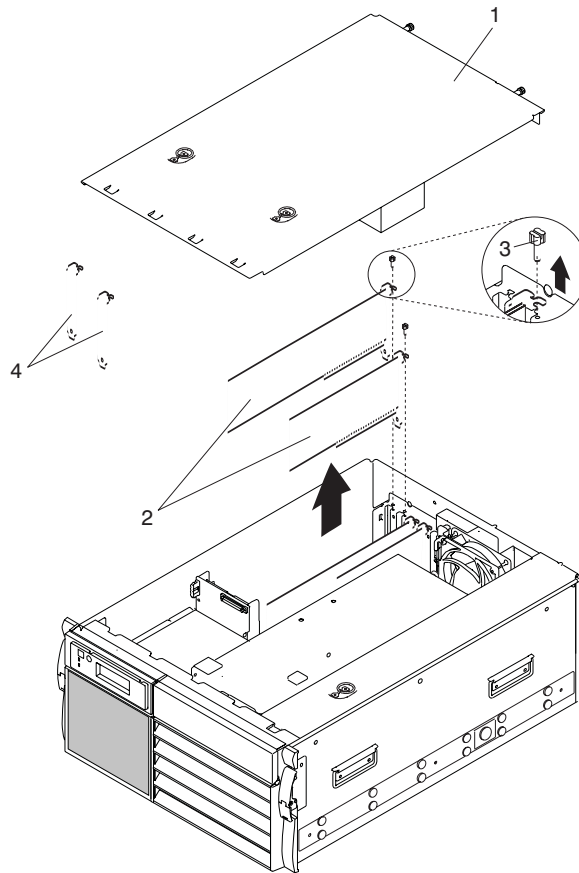
Before performing these procedures, read “Safety Notices” on page xiii.

Adapter Removal

To remove an adapter, do the following:

1. Open the front and rear rack doors.
2. Shut down the system as described in “Stopping and Starting System” on page 269.
3. Unplug all power cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
4. Record the slot number and location of the adapter being removed.
Note: Adapter slots are numbered on the rear of the system drawer, from right to left (one through five).
5. Label and disconnect all cables attached to the adapter being removed.
6. Place the system drawer into the service position as described in “Front Service Position” on page 270.
7. Remove the main chassis cover as described in “Main Chassis Cover Removal” on page 279.
8. Locate the adapter. See the illustration on page 307.
9. Remove the adapter bracket retaining screw. See the illustration on page 307.
10. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 266.
11. Carefully remove the adapter from the system drawer, and store it in a safe place.
12. If you are not installing another adapter into this slot location, replace the expansion-slot cover and thumbscrew (if available). If you are installing another adapter, go to “Adding or Replacing an Adapter” on page 308.
13. If you have other options to install, refer to “Procedure List” on page 267. If you do not have other options to install, continue with the next step.

14. Replace the main chassis cover as described in “Main Chassis Cover Replacement” on page 279.
15. Push the system drawer back to its operating position as described in “Returning the System Drawer to the Operating Position” on page 271.
16. Connect or reconnect all system drawer cables.
17. Route cables through the cable management arm.
18. Turn on the power as described in “Starting the System Unit” on page 269.
19. Close the front and rear rack doors.



- 1 Main Chassis Cover
- 2 Adapter Card (up to 5)
- 3 Adapter Bracket Retaining Screw (1 per adapter)
- 4 Adapter Slot Shields

Adding or Replacing an Adapter

To add or install an adapter, do the following:

1. Open the front and rear rack doors.
2. Shut down the system as described in “Stopping and Starting System” on page 269.
3. Unplug all power cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
4. Place the system drawer into the service position as described in “Front Service Position” on page 270.
5. Remove the main chassis cover as described in “Main Chassis Cover Removal” on page 279.
6. Refer to the *PCI Adapter Placement Reference* for information regarding slot restrictions for adapters that can be used in this system.
7. If necessary, remove the adapter shield thumbscrew and slide out the expansion slot shield. See the illustration on page 307.
8. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 266.
9. Carefully grasp the adapter by the edges and align the adapter with the expansion-slot and connector.
10. Press the adapter firmly into the connector.
11. Use the thumbscrew you removed earlier from the expansion-slot shield or previous adapter to secure the adapter card bracket to the system unit.
12. Replace the main chassis cover as described in “Main Chassis Cover Replacement” on page 279.
13. Push the system drawer back to its operating position as described in “Returning the System Drawer to the Operating Position” on page 271.
14. Connect or reconnect all adapter cables.
15. Reconnect all of the system drawer power cables.
16. Route cables through the cable management arm.
17. Turn on the power as described in “Starting the System Unit” on page 269.
18. Close the front and rear rack doors.

EEPROMs

There are four replaceable EEPROMs located on the I/O board. When ordered you will receive a kit containing four EEPROMs, an extracting tool and instructions. Be sure to replace all of the EEPROMs.

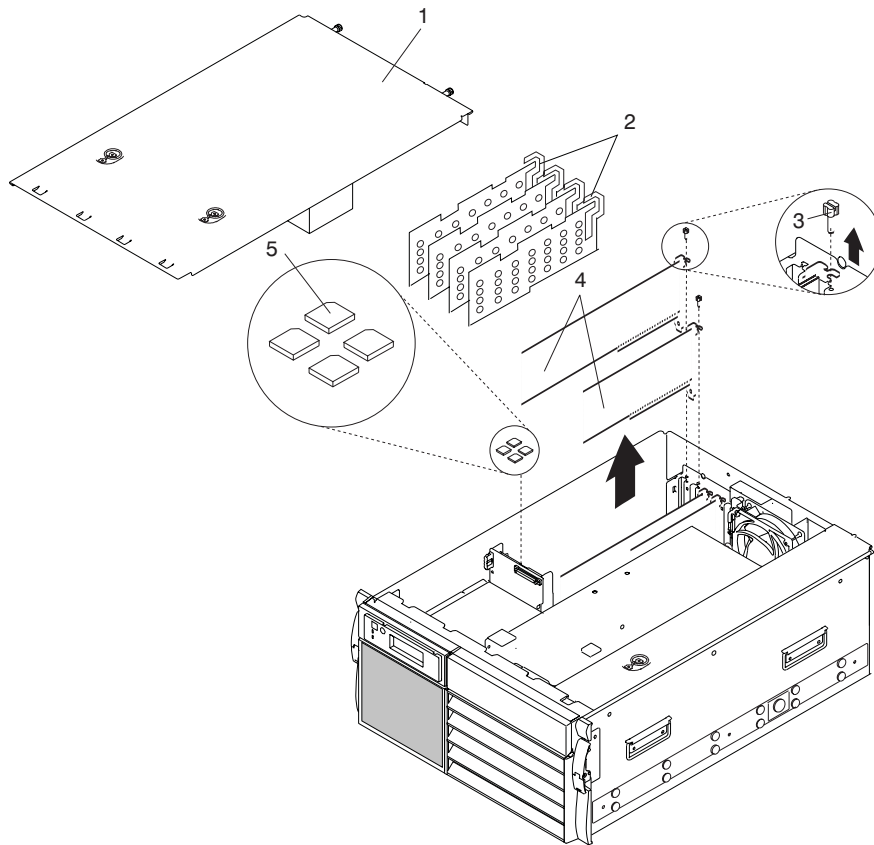
Notes:

1. EEPROMs are labelled and must be replaced with the correct EEPROM. For example, the EEPROM labelled ROS-A must be replaced with a new EEPROM from the kit labelled ROS-A.
2. EEPROM locations are silk screened on the I/O board.
3. Before performing these procedures, read "Safety Notices" on page xiii.

EEPROM Removal

To remove the EEPROMs from their mounts, do the following:

1. Open the front and rear rack doors.
2. Unplug all power cables from the rear of the system drawer.
3. Record the slot number and location of all adapters.
Note: Adapter slots are numbered on the rear of the system drawer, from right to left (one through five).
4. Label and disconnect all of the adapter cables.
5. Place the system drawer into the service position as described in "Front Service Position" on page 270.
6. Remove the main chassis cover as described in "Main Chassis Cover Removal" on page 279.
7. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to "Handling Static-Sensitive Devices" on page 266.
8. Locate and remove all adapters and plastic separator cards.
9. Locate the EEPROMs on the I/O board and note the orientation of each. See the illustration on page 311.
10. Using the extractor tool, remove each EEPROM.



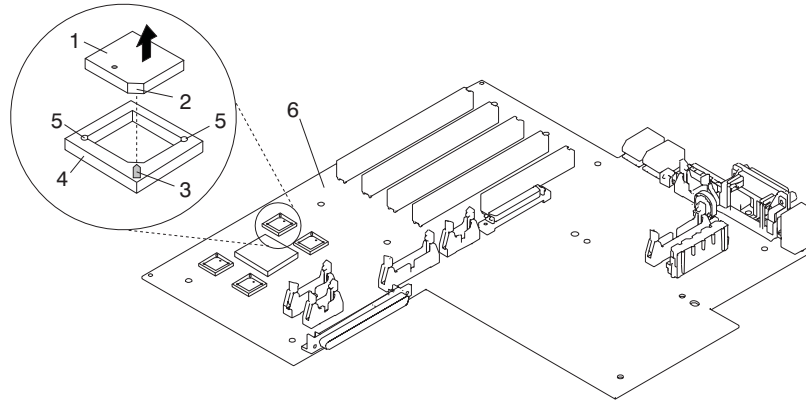
- 1 Main Chassis Cover
- 2 Adapter Separator Cards
- 3 Adapter Retaining Thumbscrew
- 4 Adapter Cards (up to 5)
- 5 EEPROMs (quantity 4)

EEPROM Replacement

To replace EEPROMs, do the following:

1. Before handling any EEPROM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 266.
2. Correctly align each EEPROM to its mount.

Note: The beveled (notched) corner of each EEPROM must align with the arrow located on the top edge of the EEPROM mount. See the following illustration.



- 1 Removed EEPROM Chip
- 2 Beveled (Notched) EEPROM Corner
- 3 Mount Alignment Arrow
- 4 EEPROM Mount
- 5 EEPROM Extractor Tool Access Hole
- 6 I/O Board

3. After all of the EEPROMs have been replaced, install the plastic adapter dividers.
4. Replace each removed adapter into its recorded slot, pressing it firmly into the connector.
5. Use the thumbscrew you removed earlier to secure the adapter card.
6. Replace the main chassis cover as described in "Main Chassis Cover Replacement" on page 279.
7. Push the system drawer back to its operating position as described in "Returning the System Drawer to the Operating Position" on page 271.
8. Reconnect all labelled adapter cables.
9. Reconnect all of the system drawer power cables.
10. Route cables through the cable management arm.
11. Turn on the power as described in "Starting the System Unit" on page 269.
12. Close the front and rear rack doors.

Internal Drive Overview

The Model B80 has five drive bays, as shown in the next illustration.

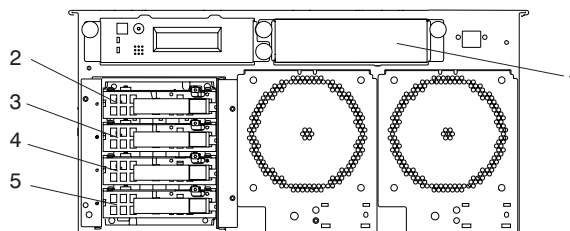
- One 5.25 inch media bay, used to mount an optional CD-ROM or tape drive
- Four 1 inch disk drive bays

Checklist for Handling Drives

Consider the following cautions when installing or removing media drives:

- 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 cause latent failures.
- Media drives are particularly sensitive to electrostatic discharge. Before handling any drive, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 266.
- Refer to the documentation provided 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.
- SCSI devices mounted in the optional media bay must have their SCSI address set to zero. Refer to the documentation provided with your device for more information on setting the SCSI address. Refer to “SCSI IDs and Bay Locations” on page 3 for more information on SCSI addresses in your system drawer.

The following illustration shows the locations of the internal drives.



- 1 Media Bay - SCSI ID=0
- 2 Disk Drive - SCSI ID=8
- 3 Disk Drive - SCSI ID=9
- 4 Disk Drive - SCSI ID=10
- 5 Disk Drive - SCSI ID=11

Note: The disk drive SCSI IDs are preset by manufacturer.

Disk Drives

Your system can have up to four disk drives installed. The disk drives are mounted in special carriers that allow the disk drives to plug into the slot bays while the system is in operation. To install or remove a disk drive, use the procedures in this section.

Note: To avoid complications, keep your default boot disk drive in the top disk drive slot.

Before performing the following procedures, read "Safety Notices" on page xiii.

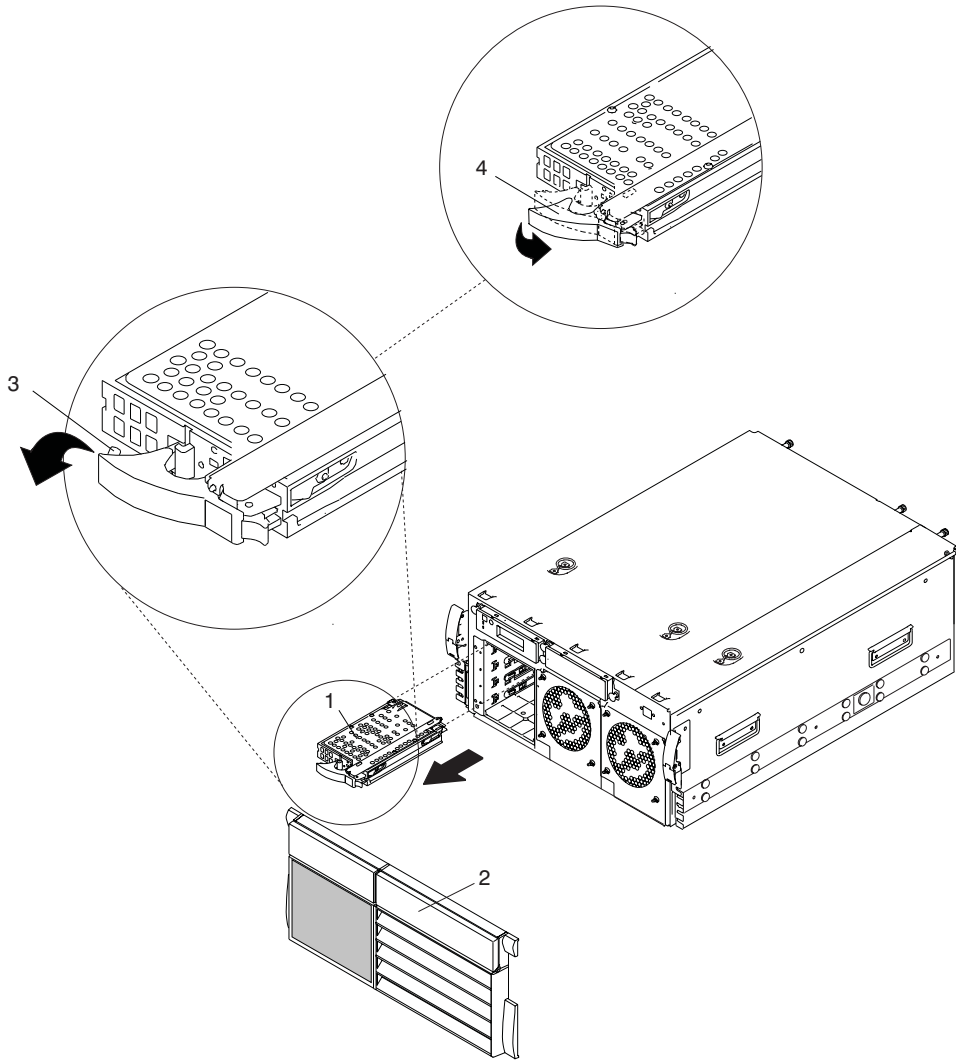
Removing a Hot-Plug Disk Drive

Note: It is the customer's responsibility to perform the following procedure until the exit **smitty** step has been performed.

To remove a hot-plug disk drive, do the following:

1. Open the front rack door.
2. Log in as root user.
3. Enter the **smitty** command.
4. Select **Devices** and press Enter.
5. Select **Fixed Disk** and press Enter.
6. Select **List All Defined Disks** and press Enter.
From the listing determine which hard drives you will be removing and record their name and address.
7. Press F3 until you have been returned to the System Management Screen.
8. Select **System Storage Management (Physical and Logical Storage)** and press Enter.
9. Select **Logical Volume Manager** and press Enter.
10. Select **Physical Volumes** and press Enter.
11. Select **List Contents of a Physical Volume** and press Enter.
12. Press F4 and select the hard disk that you recorded in step 5 and press Enter.
13. Under **List Options** select "status" and press Enter.
14. Confirm and record the volume group name, then press F3 until you are returned to the Logical Volume Manager screen.
15. Select **Volume Groups** and press Enter.

16. Select **Deactivate a Volume Group** and press Enter.
17. Press F4 and select the volume group which you previously recorded in step 13 and press Enter.
18. Press enter again. You should see an OK message at the top of your screen.
19. Press F3 until you are returned to the Volume Group screen.
20. Select **Export a Volume Group** and press Enter.
21. Press F4 and select the volume group which you previously recorded in step 13 and press Enter.
22. Press Enter again. You should see an OK message at the top of your screen.
23. Press F3 until you are returned to the System Storage Management (Physical and Logical Storage) screen.
24. Select **Removable Disk Management** and press Enter.
25. Select **Remove a Disk** and press Enter
26. Select the identified disk drive you want to remove from the system, (recorded in step 5) and press Enter.
27. Select **No** and press Enter.
28. After the *Are You Sure* screen appears, press Enter.
29. You should see an OK message at the top of your screen.
30. Press F10 to exit **smitty**.
31. Open the front rack door.
32. Remove the front bezel as described in "Front Bezel Removal" on page 283.
33. Grasp and pull the blue trigger located on the back of the disk drive release handle. Continue pulling on the handle until it is fully extended and the disk drive is removed from the system drawer.
34. If you are replacing a disk drive, go to "Hot-Plug Disk Drive Installation or Replacement" on page 316. If you are not replacing a disk drive go to the next step.
35. Replace the front bezel as described in "Front Bezel Replacement" on page 284.
Note: The front bezel helps suppress EMC emissions and *must* be placed back on the system drawer after servicing.
36. Close the front rack door.



- 1 Disk Drive
- 2 Front Bezel
- 3 Disk Drive Locking Latch
- 4 Disk Drive Release Handle

Hot-Plug Disk Drive Installation or Replacement

To install a hot-plug disk drive, do the following:

1. Open the front rack door.
2. Remove the front bezel as described in "Front Bezel Removal" on page 283.
3. Locate the disk drive bay. See the following illustration for bay location.
4. Before handling any disk drive, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to "Handling Static-Sensitive Devices" on page 266.
5. Open the release handle on the disk drive carrier.
6. Install the disk drive into the drive slot. Align the disk drive with the drive slot rails, and slide the disk drive into the slot until it contacts the backplane at the rear of the disk drive cage. The drive should now be in far enough for the latch handle to engage the latch.
7. Ensure that the disk drive is fully seated by pushing the release handle into the secured position. This engages the disk drive's locking latch.
8. Repeat this process for all the disk drives you are installing.
9. Replace the front bezel as described in "Front Bezel Replacement" on page 284.
Note: The front bezel *must* be installed on the system drawer before system operation continues.
10. Have the customer's system administrator log in as root user and complete the rest of this procedure.
11. At the command line, type **smitty**.
12. Select **Devices**.
13. Select **Install/Configure Devices Added After IPL** and press Enter. Follow the instructions on the screen. Successful configuration is indicated by the
OK
message displayed next to the **Command** field at the top of the screen.
14. Press F10 to exit **smitty** if you are not going to configure your disk drive. If you are going to configure your disk drive at this time press F3 until you have been returned to the **System Management Screen**, then go to step 3 under "Configuring Hot-Plug Disk Drives" on page 317.

15. Configure the new disk drive. See “Configuring Hot-Plug Disk Drives” for instructions on configuring the drive for use with your operating system.
16. If you have other options to install, refer to “Procedure List” on page 267. If you do not have other options to install, continue with the next step.
17. Close the front rack door.

Configuring Hot-Plug Disk Drives

Notes:

1. Configuring SCSI hot-plug disk drives is a **customer system-administration** function.
2. Improper servicing could cause the loss of customer data.

To configure a disk drive, do the following:

1. Log in as root user.
2. Enter the **smitty** command.
3. Select **System Storage Management (Physical and Logical Storage)** and press Enter.
4. Select **Logical Volume Manager** and press Enter.
5. Select **Volume Groups** and press Enter.
6. Select **Set Characteristics of a Volume Group** and press Enter.
7. Select **Add a Physical Volume to a Volume Group**

Note: Do not select **Root Volume Group** if you plan on removing and inserting this disk drive.

8. Fill in the fields for the drive you are adding to the system. Press F4 for a list of selections.

See the *System Management Guide: Operating System and Devices* for further information on the drive configuration. The System Management Guide is located on the Documentation CD. If your system has a CD-ROM drive installed, use it to access this publication. If your system does not have a CD-ROM drive installed, you need to access the System Management Guide either by using your NIM server or downloading it from the documentation web site.

9. Press Enter. After the *Are You Sure* screen appears, press Enter.
10. Press F10 to exit **smitty**.

Unconfiguring Hot-Plug Disk Drives

Notes:

1. Unconfiguring SCSI hot-plug disk drives is a **customer system-administration** function.
2. Improper servicing could cause the loss of customer data.

To unconfigure a disk drive, do the following:

1. Log in as root user.
2. Enter the **smitty** command.
3. Select **System Storage Manager (Physical and Logical Storage)** and press Enter.
4. Select **Logical Volume Manager** and press Enter.
5. Select **Volume Groups** and press Enter.
6. Select **Set Characteristics of a Volume Group.** and press Enter.
7. Select **Remove a Physical Volume from a Volume Group.**
8. Press F4 to list the available volume groups then select the volume group name and press Enter.
9. Press F4 to select a physical volume and follow the on-screen instructions to select the physical volume. Then press Enter.
10. Return to the procedure that directed you here.

Disk Drive Cage

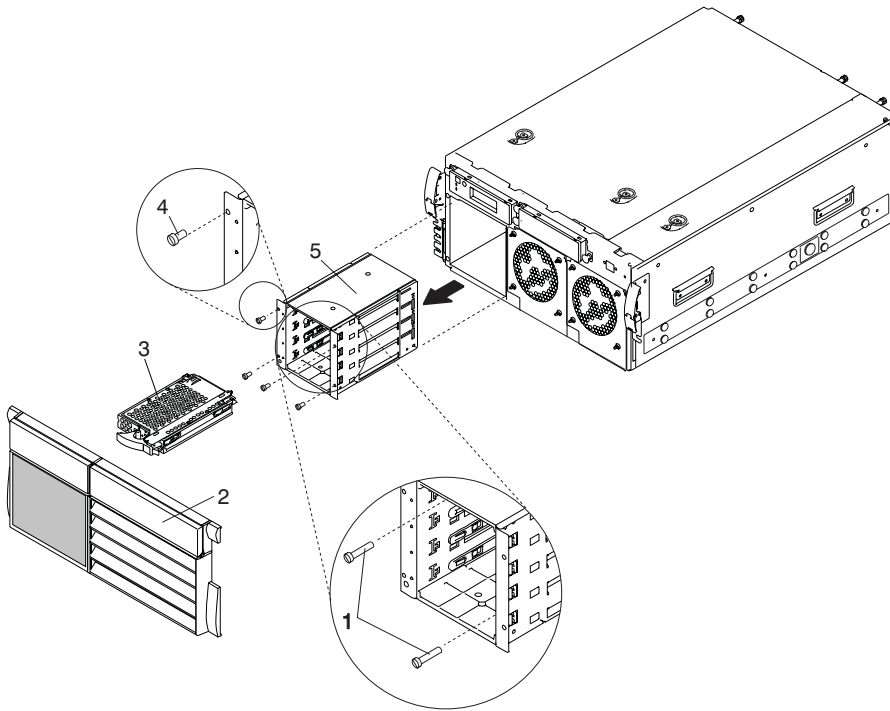
Disk Drive Cage Removal

To remove the disk drive cage, do the following:

1. Open the front and rear rack doors.
2. Shut down the system as described in “Stopping and Starting System” on page 269.
3. Unplug all power cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
4. Remove the front bezel as described in “Front Bezel Removal” on page 283.
5. Remove all disk drives as described in “Removing a Hot-Plug Disk Drive” on page 313.
6. Remove the four retaining screws that secure the disk drive cage to the chassis. See the following illustration.
7. Remove the two screws that secure the disk drive cage to the disk drive backplane. These screws are located on the inside of the disk drive cage in the upper left and lower right corners.
Note: The screw located in the upper left corner is a long machine screw. The screw located in the lower right corner is a short self-tapping screw.
8. Carefully pull the disk drive cage out of the system drawer.

Disk Drive Cage Replacement

Perform the removal steps in the reverse order.



- 1 Cage to Backplane Retaining Screws (quantity 2)
- 2 Front Bezel
- 3 Disk Drive (up to 4)
- 4 Disk Drive Cage Retaining Screw (quantity 4)
- 5 Disk Drive Cage

Disk Drive Backplane

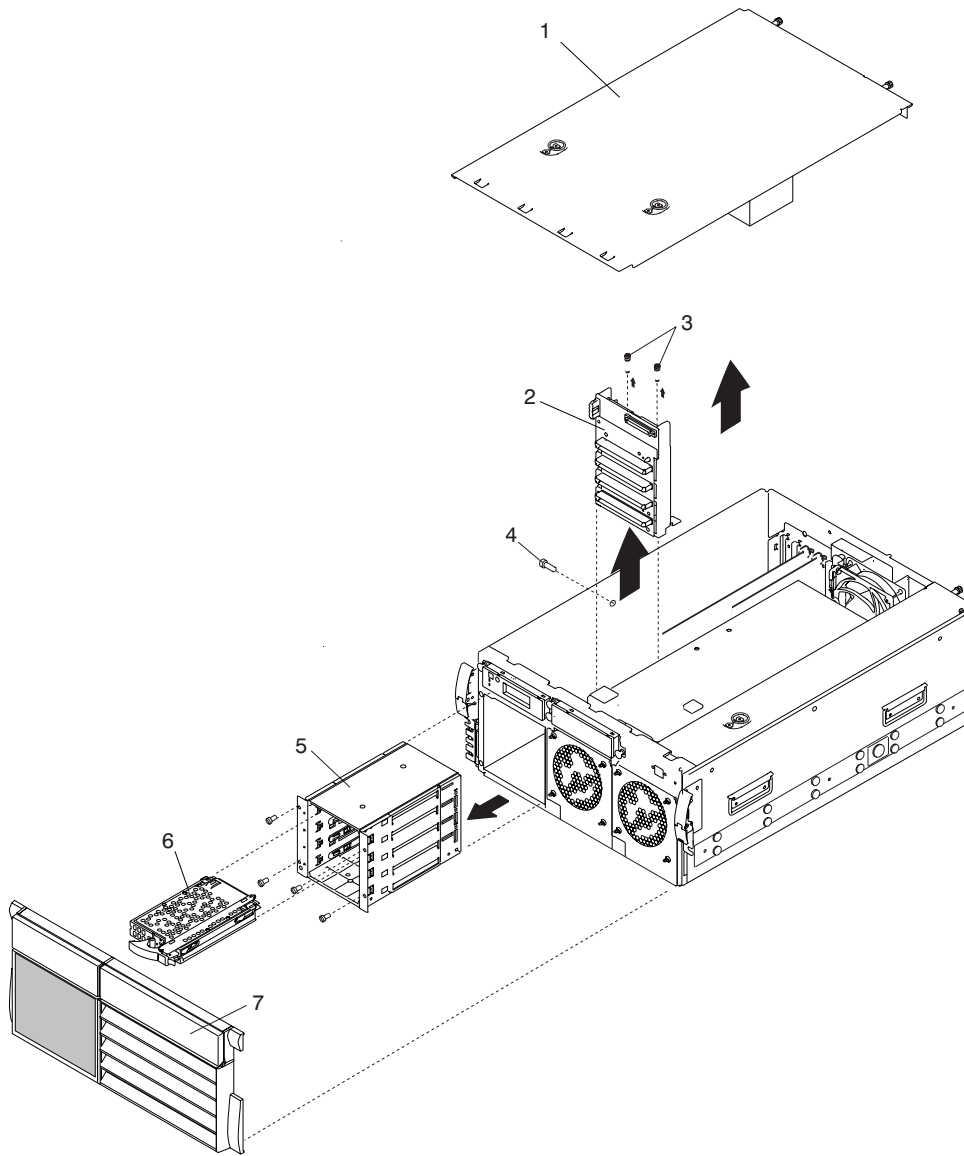
Disk Drive Backplane Removal

To remove the disk drive backplane, do the following:

1. Open the front and rear rack doors.
2. Shut down the system as described in “Stopping and Starting System” on page 269.
3. Unplug all power cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
4. Remove the front bezel as described in “Front Bezel Removal” on page 283.
5. Remove all disk drives as described in “Removing a Hot-Plug Disk Drive” on page 313.
6. Place the system drawer into the service position as described in “Front Service Position” on page 270.
7. Remove the main chassis cover as described in “Main Chassis Cover Removal” on page 279.
8. Remove the disk drive cage as described in “Disk Drive Cage Removal” on page 319.
9. Remove all adapter cables and adapter cards as described in “Adapters” on page 306.
10. Unplug all cables attached to the disk drive backplane.
11. Remove the retaining screw from the left side of the chassis. See the following illustration for the screw location.
12. Remove the two retaining screws that secure the disk drive backplane to the chassis base. See the following illustration for the screw locations.
13. Carefully lift the backplane up and out of the system drawer and place it in a safe location.

Disk Drive Backplane Replacement

To replace the disk drive backplane, perform the removal steps in reverse order.



- 1 Main Chassis Cover
- 2 Disk Drive Backplane
- 3 Backplane Base Retaining Screw (quantity 2)
- 4 Backplane Side Retaining Screw (quantity 1)
- 5 Disk Drive Cage
- 6 Disk Drive
- 7 Front Bezel

Operator Panel

Before performing these procedures, read “Safety Notices” on page xiii.

Attention: If you are replacing the operator panel with a new FRU, you *must* write the system VPD information (machine type, model number, and serial number). You *must* contact the support center to obtain instructions and the necessary password to enter the information into the VPD module. If you type an incorrect serial number, the operator panel is rendered inoperable, and a new operator panel must be reordered.

Note: Refer to “System Vital Product Data (VPD) Update Procedure” on page 325 for the correct procedure.

Operator Panel Removal

To remove the operator panel, do the following:

1. Open the front rack door.
2. Shut down the system as described in “Stopping and Starting System” on page 269.
3. Unplug all power cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
4. Remove the front bezel as described in “Front Bezel Removal” on page 283.

Note: The front bezel helps suppress EMC emissions and *must* be placed back onto the system drawer after servicing.

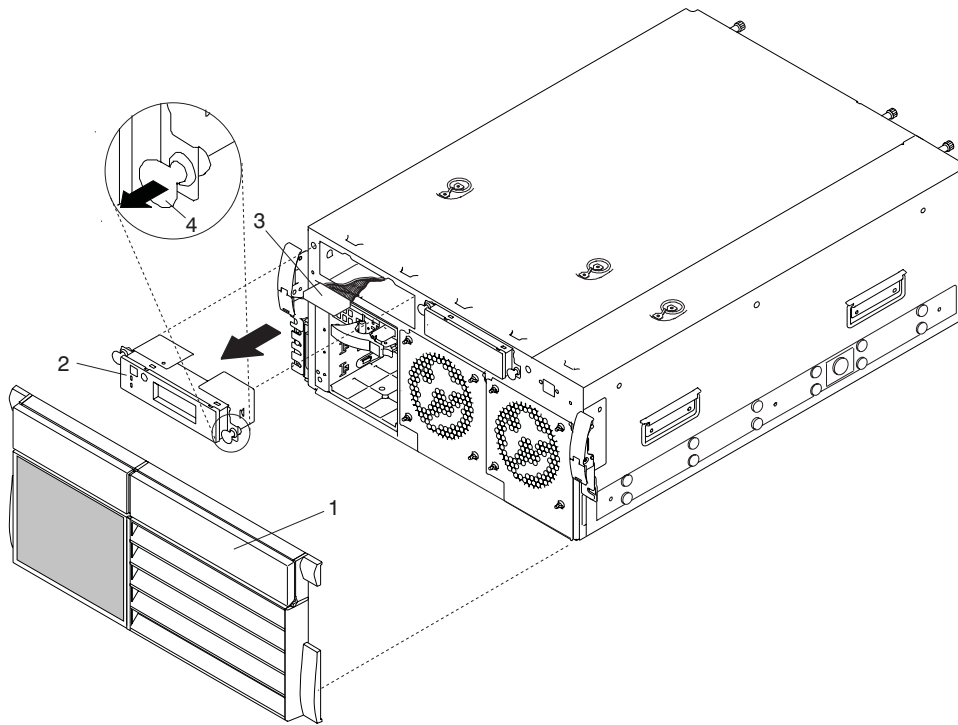
5. Locate the operator panel, as shown in the following illustration.
6. Pull out the two snap buttons located on each side of the operator panel.
Note: Pull out the lower snap button on the right side of the operator panel. The top snap button is one of the snap buttons used to secure the media bay tray.
7. Grasp the operator panel and slowly pull it out of the system drawer.
8. Disconnect the operator panel signal and power cables located on the back of the operator panel.

Operator Panel Replacement

To replace the operator panel, do the following:

1. Connect the signal and power cables to the new operator panel.
2. Carefully slide the operator panel back into the system drawer.
3. Ensure that the snap buttons are retracted before seating the operator panel.

4. Secure the operator panel to the system chassis by pushing in and locking the snap buttons.
5. Reconnect all of the system drawer power cables.
6. Complete the VPD update procedure as described in “System Vital Product Data (VPD) Update Procedure” on page 325, then return here.
7. Replace the front bezel as described in “Front Bezel Replacement” on page 284.
8. Power on the system drawer.
9. Close the front rack door.

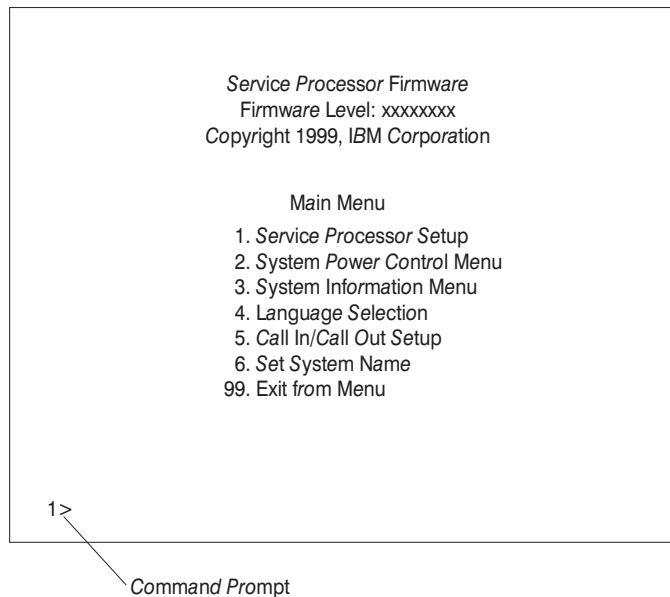


- 1 Front Bezel
- 2 Operator Panel
- 3 Operator Panel Cable
- 4 Operator Panel Snap Button

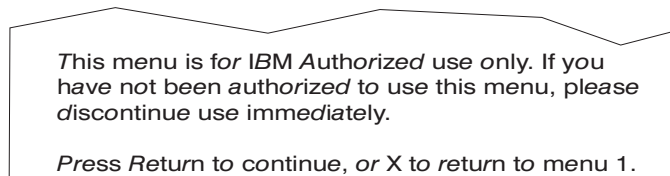
System Vital Product Data (VPD) Update Procedure

If you replaced the operator panel with a new FRU, perform the following procedure to ensure that the VPD is correct.

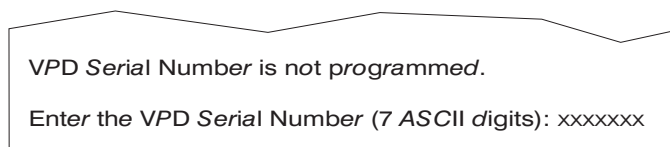
1. After you install the new operator panel, wait for the OK message to display in the operator panel display.
2. Start the **Service Processor Firmware** menu.



3. At the command prompt, type the code which accesses the hidden menus. If necessary, call your local support center to obtain the code.



4. Press Return to continue.



5. Type the VPD serial number.

Note: The serial number *must* be entered correctly. Enter the last seven digits only. Do not include the dash (-) in the serial number as a digit. If the serial number is not entered correctly, a new operator panel must be ordered and installed.

VPD Serial Number has been programmed successfully.

*The current TM field is: xxxx-xxx
Do you want to change the TM field (y/n)?*

6. Type **y** (yes) if the system unit's type/model (TM) you are working on is different from the one listed on the screen.
7. Type the machine type and model number of the system unit.

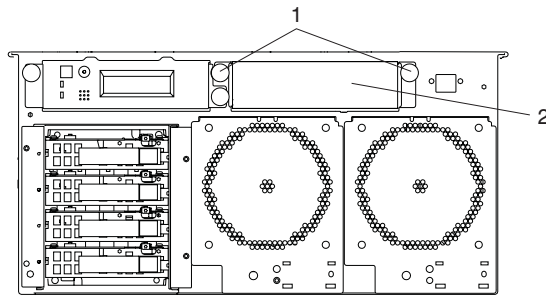
*Enter the TM data (8 ASCII digits): xxxx-xxx
TM has been programmed successfully*

*The current MN field is 1980
Do you want to change the MN field (y/n)?*

8. The **MN** field is for manufacturing use only. Enter **n**(no) in this field.
9. Enter 99 at the command line of the Main Menu to exit.

Optional Media Bay Tray Preparation

Note: The optional media bay can be used to house a CD-ROM or tape drive. The following illustration shows the location of the optional media bay on the system drawer.



- 1 Media Bay Tray Snap Buttons
- 2 Optional Media Drive Bay

Before performing these procedures, read the following:

- “Safety Notices” on page xiii
- “Laser Safety Information” on page xv

To prepare the optional media bay and media bay tray to house either a CD-ROM or tape drive, do the following:

1. Open the front and rear rack doors.
2. Shut down the system unit as described in “Stopping and Starting System” on page 269.
3. Unplug all power cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
4. Remove the front bezel as described in “Front Bezel Removal” on page 283.

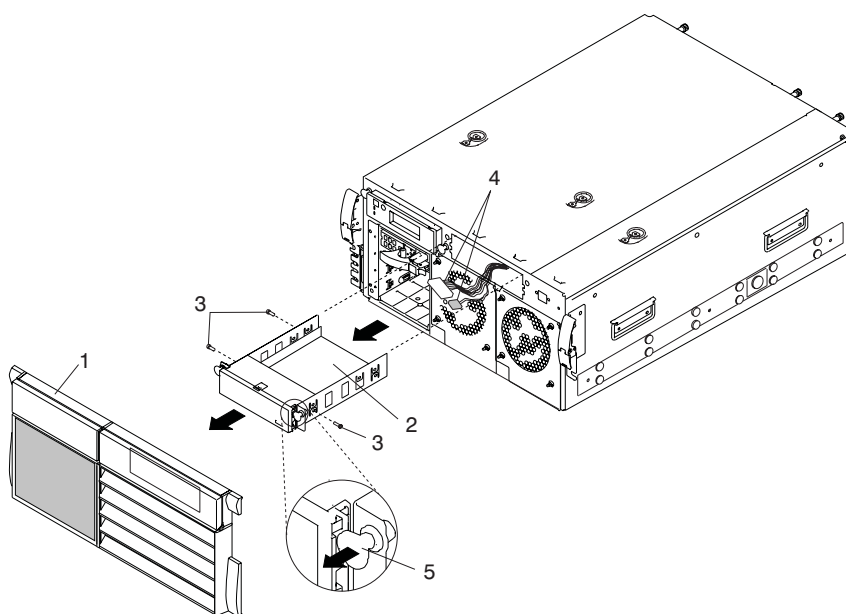
Note: The front bezel helps suppress EMC emissions and *must* be placed back onto the system drawer after servicing.

5. Locate the media bay. See the previous illustration for the media bay location.
6. Locate the two captured snap buttons located on each side of the media bay tray. Pull the snap buttons back to release the media bay tray from the chassis.
7. Carefully pull the tray out of the system drawer.

Note: The SCSI and power cables are attached to the media bay tray.

8. Detach the SCSI and power cables from the tray.

9. Remove the screws located on each side of the media bay tray. This releases the media bezel assembly from the media bay tray. See the illustration on page 328 for screw locations.
10. The media bay tray is now ready to receive the media drive.



- 1 Front Bezel
- 2 Media Drive Tray Assembly
- 3 Media Drive Tray Screws (3 to 4)
- 4 Media Drive SCSI and Power Cable
- 5 Media Drive Snap Button

Optional CD-ROM and Tape Drive

Note: The optional media bay and cables are designed to be serviced from the front of the system unit.

To remove a CD-ROM or tape drive, do the following:

1. Open the front rack door.
2. Shut down the system as described in “Stopping and Starting System” on page 269.
3. Remove the front bezel as described in “Front Bezel Removal” on page 283.

Note: The front bezel helps suppress EMC emissions and *must* be placed back onto the system drawer after servicing.

4. Locate the media drive bay. See the illustration on 327.
5. If you are replacing a media drive:
 - a. Pull out the two snap buttons located on each side of the media drive.
 - b. Grasp the media drive and slowly pull it out of the system drawer.
 - c. Disconnect the SCSI and power cables located on the back of the media drive.
 - d. Remove the screws located on each side of the media bay tray. This releases the media drive from the media bay tray. See the illustration on page 328 for screw locations.
 - e. Place the media drive in a safe place.
6. If you are adding a media drive to the system drawer for the first time, refer to “Optional Media Bay Tray Preparation” on page 327.

To replace a CD-ROM or tape drive, do the following:

1. Using the screws previously removed from the media bay tray, secure the new media device to the media bay tray.
2. Connect the SCSI and power cables to their respective connectors.

Note: The connectors are located on the back of the media drive.

3. Ensure the snap buttons are in the retracted (unlocked) position.
4. Carefully slide the drive into the system drawer until the drive is seated against the front of the chassis.

Note: Be careful not to damage or unplug the media device cables while performing this procedure.

5. Push in the captured snap buttons to lock the drive in place.
6. Replace the front bezel as described in “Front Bezel Replacement” on page 284.

7. If the system drawer is in the service position, return it to the operating position as described in “Returning the System Drawer to the Operating Position” on page 271.
8. Reconnect all of the system drawer power cables.
9. Power on the system drawer as described in “Starting the System Unit” on page 269.
10. Close the front rack door.

Power Supplies

i1.power supply removal/installation **DANGER**

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

This system drawer has power supplies that have hot-plug capabilities. To use this feature, you *must* have two power supplies in place.

Non-Hot-Plug Power Supply Removal

If you are servicing a system that has only one power supply installed, it should be handled as a non-hot-pluggable power supply. To replace a non-hot-plug power supply, do the following:

Before performing these procedures, read the following “Safety Notices” on page xiii.

1. Open the front and rear rack doors.
2. Shut down the system as described in “Stopping and Starting System” on page 269.
3. Unplug the power cable from the rear of the system drawer. Read the caution statement on page 61.
4. Place the system drawer in the service position as described in “Front Service Position” on page 270.
5. Remove the power supply chassis cover as described in “Power Supply Chassis Cover Removal” on page 281.
6. Grasp the handle, located on top of the power supply. Pivot the handle upward to 90 degrees. See the illustration on page 334.

Note: The handle acts as a locking cam. The handle must be in the straight up position before you can remove or install the power supply.

7. Pull the power supply straight-up and out of the system drawer.

Non-Hot-Plug Power Supply Replacement

To replace a non-hot-plug power supply, do the following:

1. Grasp the handle located on top of the new power supply. Pivot the handle upward to 90 degrees. See the illustration on page 334.
2. Carefully insert the power supply into the same power supply bay that the faulty power supply was just removed. Align the guide pins into the slots on each end of the power supply bay.
3. Lightly press the power supply into the connector, then lower the power supply handle until it snaps into place. The power supply handle acts as a cam. When lowered, the handle seats and locks the power supply in the correct position.
4. Plug the power cable into the electrical outlet. The green LED located on top of the power supply comes on solid.
5. Replace the power supply chassis cover as described in “Power Supply Chassis Cover Replacement” on page 282.
6. Return the system to the operating position as described in “Returning the System Drawer to the Operating Position” on page 271.
7. Power on the system drawer as described in “Starting the System Unit” on page 269.
8. Close the front and rear rack doors.

Hot-Plug Power Supplies

If you are servicing a system that has two power supplies installed, you can replace each power supply without shutting down the system drawer.

Before performing these procedures, read the following “Safety Notices” on page xiii.

Attention: Do not perform the hot-plug procedure for a power supply if the ambient temperature is greater than 32°C (90°F). Loss of data or data corruption could result.

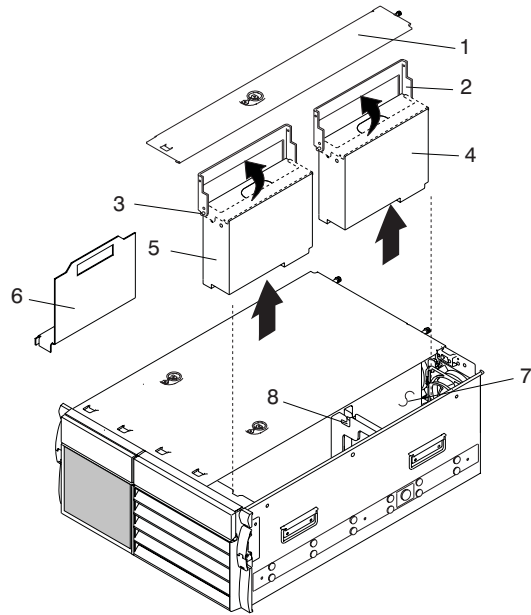
Hot-Plug Power Supply Removal

To remove a hot-plug power supply, do the following:

1. Open the front rack door.
2. Place the system drawer in the service position as described in “Front Service Position” on page 270.
3. Remove the power supply chassis cover as described in “Power Supply Chassis Cover Removal” on page 281.
4. Grasp the handle, located on top of the power supply you are removing. Pivot the handle upward to 90 degrees.

Note: The handle acts as a locking cam. The handle must be in the straight up position before you can remove or install the power supply.

5. Pull the power supply straight-up and out of the system drawer.
6. If you are replacing the power supply, go to step 6 in “Hot-Plug Power Supply Replacement” on page 334. If you are not replacing the power supply continue on to the next step.
7. Replace the power supply chassis cover as described in “Power Supply Chassis Cover Replacement” on page 282.
8. Place the system drawer back into the operating position, as described in “Returning the System Drawer to the Operating Position” on page 271.
9. Close the front and rear rack doors.



- 1 Power Supply Chassis Cover
- 2 Power Supply Handle (Service Position)
- 3 Power Supply Guide Pin
- 4 Primary Power Supply
- 5 Redundant Power Supply
- 6 Power Supply Dust Cover
- 7 Primary Power Supply Bay
- 8 Power Supply Guide Pin Slot

Hot-Plug Power Supply Replacement

To replace or add a new hot-plug power supply, do the following:

1. Place the system drawer in the service position as described in “Front Service Position” on page 270.
2. Remove the power supply chassis cover as described in “Power Supply Chassis Cover Removal” on page 281.

3. Remove the power supply dust cover (if installed). See the illustration on page 334.
4. Grasp the handle located on top of the new power supply. Pivot the handle upward to 90 degrees. See the illustration on page 334.
5. Carefully insert the power supply into the power supply bay, and align the guide pins into the slots on each end of the power supply bay.
6. Lightly press the power supply into the connector, then lower the power supply handle until it snaps into place. The power supply handle acts as a cam. When lowered, the handle seats and locks the power supply in the correct position.
7. Plug-in both ends of the power cable (system connector and wall outlet). The green LED located on top of the power supply comes on solid.
8. Replace the power supply chassis cover as described in “Power Supply Chassis Cover Replacement” on page 282.
9. Place the system drawer back into the operating position, as described in “Returning the System Drawer to the Operating Position” on page 271.
10. Close the front and rear rack doors.

Power Distribution Board

Before performing these procedures, read “Safety Notices” on page xiii.

Note: The Model B80 can be set up to use either ac or dc power. If the power distribution board is being replaced, you must order the correct board for the type of current the system is using.

Power Distribution Board Removal

To remove the power distribution board, do the following:

1. Open the front and rear rack doors.
2. Shut down the system drawer as described in “Stopping and Starting System” on page 269.
3. Unplug all power cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
4. Remove the rear fans as described in “Front and Rear Fan Removal” on page 341.
5. Remove the three screws that secure the rear EMC plate to the rear of the chassis. See the illustration on page 339 for screw location and EMC plate identity.
6. Remove the front bezel as described in “Front Bezel Removal” on page 283.
7. Remove the media bay tray, CD-ROM drive or tape drive as described in “Optional CD-ROM and Tape Drive” on page 329. This step is system configuration-dependent.
8. Remove the front fans as described in “Front and Rear Fan Removal” on page 341.
9. Disconnect the front fan #2 power connector from its chassis mount and move out of the way.
10. Place the system drawer in the service position as described in “Front Service Position” on page 270.
11. Remove the main chassis cover as described in “Main Chassis Cover Removal” on page 279.
12. Remove the power supply chassis cover as described in “Power Supply Chassis Cover Removal” on page 281.
13. Remove the power supplies as described in “Hot-Plug Power Supply Removal” on page 333.

14. Remove the CEC box cover as described in “CEC Box Cover Removal” on page 288.
15. With one hand, touch any metal surface of the chassis to minimize static electric discharge. Refer to “Handling Static-Sensitive Devices” on page 266.
16. If present, remove all air flow baffles from the CEC box as described in “Air Flow Baffle Removal” on page 290.
17. Remove all memory cards from the CEC box as described in “Memory Card Removal” on page 293.
18. Remove all processor cards from the CEC box as described in “Processor Card Removal” on page 298.
19. Remove the CEC box as described in “CEC Box Removal” on page 303.
20. Disconnect the five cables connected to the power distribution board.
21. Remove the eight screws that secure the power distribution board to the base of the chassis.
22. Raise the power distribution board above the two alignment pins.
23. Slowly pivot the board up, then out of the system drawer.
Note: Visually check the plastic insulating gasket, which is located below the power distribution card. Replace the gasket if it is damaged.

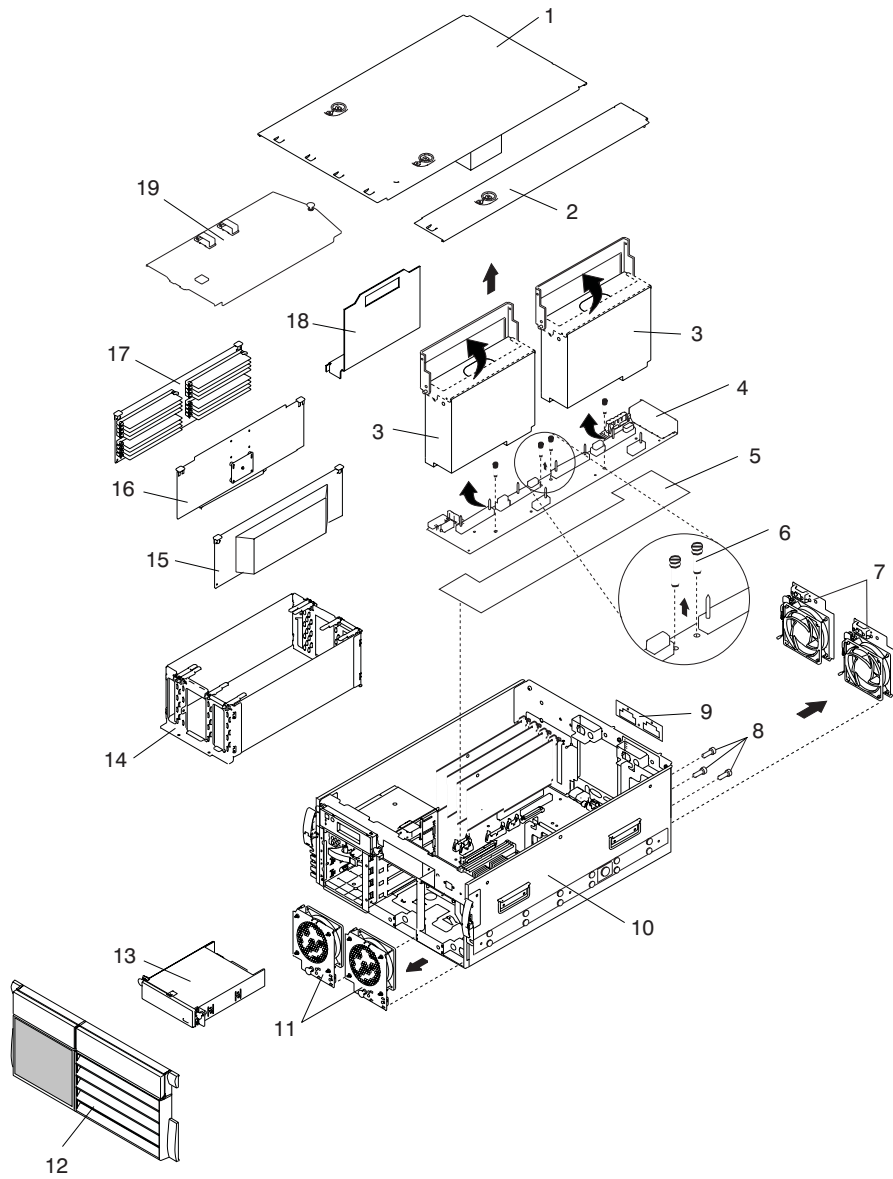
Power Distribution Board Replacement

To replace the power distribution board, do the following:

Note: Before placing the new board in the system drawer, ensure the plastic insulating gasket is correctly aligned with the alignment pins.

1. Before removing the new board from its protective packaging, with one hand, touch any metal surface of the chassis to minimize static electric discharge. Refer to “Handling Static-Sensitive Devices” on page 266.
2. Place the rear EMC plate over the power receptacles located at the rear of the board.
3. Slowly pivot the new board down into the system drawer.
4. Align the power distribution board with the two alignment pins located on the chassis base. Refer to the illustration on page 7 to see the alignment hole locations on the power distribution board.
5. Ensure all screw holes are aligned and start all screws. *Do not* tighten the screws until the board has been correctly aligned and all screws have been started in their respective holes.

6. Align screw holes of the EMC plate to the chassis and replace the screws.
7. Replace the system rear fans as described in “Front and Rear Fan Replacement” on page 343.
8. Replace all of the power distribution board cables.
Note: Do not attach the power cables to the rear of the system at this time.
9. Replace the CEC box as described in “CEC Box Replacement” on page 305.
10. Replace all of the processor cards as described in “Processor Card Replacement” on page 299.
11. Replace all of the memory cards as described in “Memory Card Replacement” on page 294.
12. If removed, replace all air flow baffles as described in “Air Flow Baffle Replacement” on page 291.
13. Replace the CEC box cover as described in “CEC Box Cover Replacement” on page 288.
14. Replace the power supplies as described in “Hot-Plug Power Supply Replacement” on page 334.
15. Replace the power supply chassis cover as described in “Power Supply Chassis Cover Replacement” on page 282.
16. Replace the main chassis cover as described in “Main Chassis Cover Replacement” on page 279.
17. Place the system drawer back into the operating position, as described in “Returning the System Drawer to the Operating Position” on page 271.
18. Reinstall the front fan #2 power connector to its chassis mount.
19. Replace the front fans as described in “Front and Rear Fan Replacement” on page 343.
20. Replace the media bay tray, CD-ROM drive or tape drive as described in “Optional CD-ROM and Tape Drive” on page 329. This step is system configuration-dependent.
21. Replace the front bezel as described in “Front Bezel Replacement” on page 284.
22. Replace the power cables to the power receptacles at the rear of the system drawer.
23. Turn on the power.
24. Close the front and rear rack doors.



- 1 Main Chassis Cover
- 2 Power Supply Chassis Cover
- 3 Power Supply (2 maximum)
- 4 Power Distribution Board
- 5 Power Distribution Board Insulating Gasket
- 6 Power Distribution Board Retaining Screw (quantity 8)
- 7 System Rear Fans (#4 and #3)
- 8 EMC Rear Plate Retaining Screws (quantity 3)
- 9 EMC Rear Plate
- 10 System Drawer
- 11 System Front Fans (#1 and #2)
- 12 Front Bezel
- 13 Media Bay Tray or Media Device
- 14 CEC Box
- 15 Air Flow Baffle (2 maximum)
- 16 Processor Card (2 maximum)
- 17 Memory Card (2 maximum)
- 18 Power Connector Dust Cover (configuration-dependent)
- 19 CEC Box Cover

Fans

Before performing these procedures, read “Safety Notices” on page xiii.

Front and Rear Fan Removal

Notes:

1. All fans in the Model B80 are hot-pluggable, meaning they can be removed and replaced without shutting down the system. However, service only one fan at a time.
2. The front and rear fans can be serviced without putting the system drawer into the service position.
3. Front and rear fans cannot be interchanged. You can distinguish the front fans from rear fans by the color of the air flow mounting panel. The front fans have black mounting panels. The rear fans have silver mounting panels.
4. The LED on the failing fan will be off.

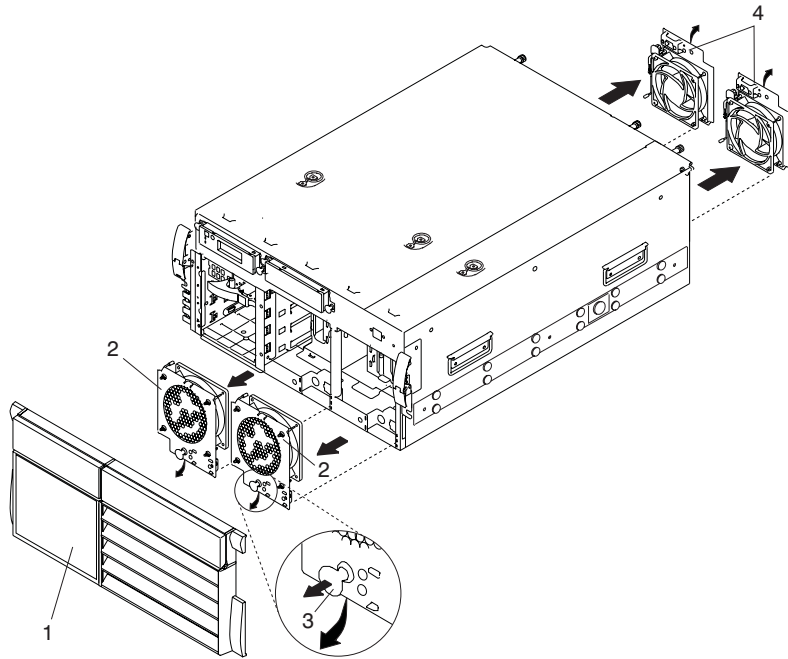
To remove system fans, do the following:

1. Depending on which fans you are removing, open the front or rear rack door.
2. **Front Fan Removal**
 - a. Remove the front bezel as described in “Front Bezel Removal” on page 283.
 - b. Pull out the snap button of the suspect fan. On the front fans, the snap button is located on the bottom of the front fan plate.
 - c. Gently pull the fan out then down, releasing the top edge of the front fan.
 - d. Remove the fan from the system drawer.

Note: All the fans used on the Model B80 have docking connectors that are automatically disconnected as the fan is being removed from the chassis.

3. **Rear Fan Removal**
 - a. Push the system drawer slightly forward to clear the cable management arm.
 - b. Pull out the snap button, located on the top of the rear fan plate.
 - c. Gently pull the top of the fan out then up, releasing the bottom edge of the rear fan.
 - d. Remove the fan from the system drawer.

Note: All the fans used on the Model B80 have docking connectors that are automatically disconnected as the fan is being removed from the chassis.



- 1 Front Bezel
- 2 Hot-Plug Front Fans
- 3 Fan Snap Button
- 4 Hot-Plug Rear Fans

Front and Rear Fan Replacement

To replace the front or rear fans, do the following:

1. Ensure the snap button is retracted in the unlocked position before mounting any of the fans onto the chassis.
2. Align the fan with the chassis housing.

3. Front Fan Replacement

- a. Insert the top edge of the fan plate into the chassis housing.
- b. Pivot the fan down until the bottom edge rests against the chassis.
- c. Push the snap button into the locked position.

Note: The docking connector automatically connects the fan to the power source. If the fan was replaced while the system was still in operation, the fan should have powered on.

4. Replace the front bezel as described in “Front Bezel Replacement” on page 284.

5. Rear Fan Replacement

- a. Push the system drawer slightly forward to clear the cable management arm.
- b. Insert the bottom edge of the fan plate into the chassis housing.
- c. Pivot the fan up until the top edge rests against the chassis.
- d. Push the snap button into the locked position.

Note: The docking connector automatically connects the fan to the power source. If the fan was replaced while the system was still in operation, the fan should have powered on.

6. Close all opened rack doors.

System Board

Before performing these procedures, read "Safety Notices" on page xiii.

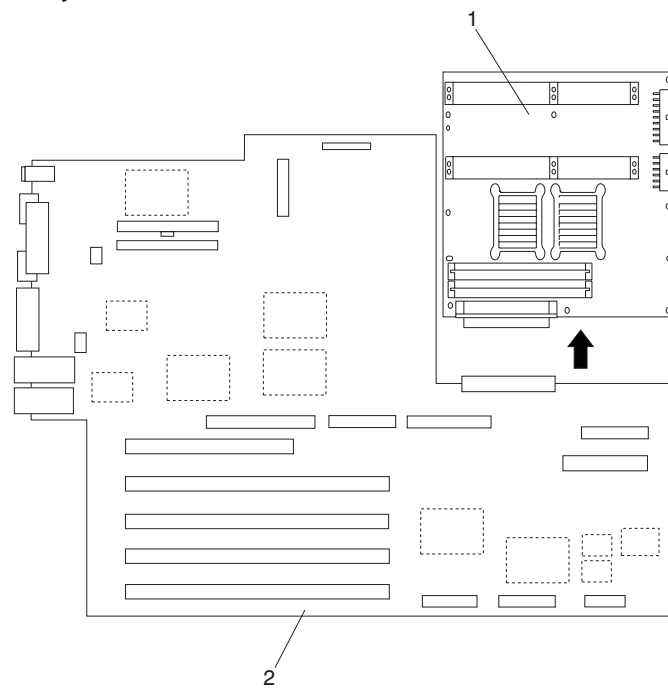
System Board Removal

Attention: Record the location of all components before you remove or disconnect them. Record the settings of any jumpers on the board before removing the board from the system unit.

To remove the system board, do the following:

1. Open the front and rear rack doors.
2. Shut down the system drawer as described in "Stopping and Starting System" on page 269.
3. Unplug all power cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
4. Place the system drawer in the service position as described in "Front Service Position" on page 270.
5. Remove the main chassis cover as described in "Main Chassis Cover Removal" on page 279.
6. Remove the media bay tray, CD-ROM drive or tape drive as described in "Optional CD-ROM and Tape Drive" on page 329. This step is system configuration-dependent.
7. Remove the CEC box cover as described in "CEC Box Cover Removal" on page 288.
8. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to "Handling Static-Sensitive Devices" on page 266.
Note: Before removing, record the position of all installed memory cards, processor cards and air flow baffles.
9. If installed, remove all air flow baffles as described in "Air Flow Baffle Removal" on page 290.
10. Remove all processor cards as described in "Processor Card Removal" on page 298.
11. Remove all memory cards as described in "Memory Card Removal" on page 293.
12. Remove the CEC box as described in "CEC Box Removal" on page 303.

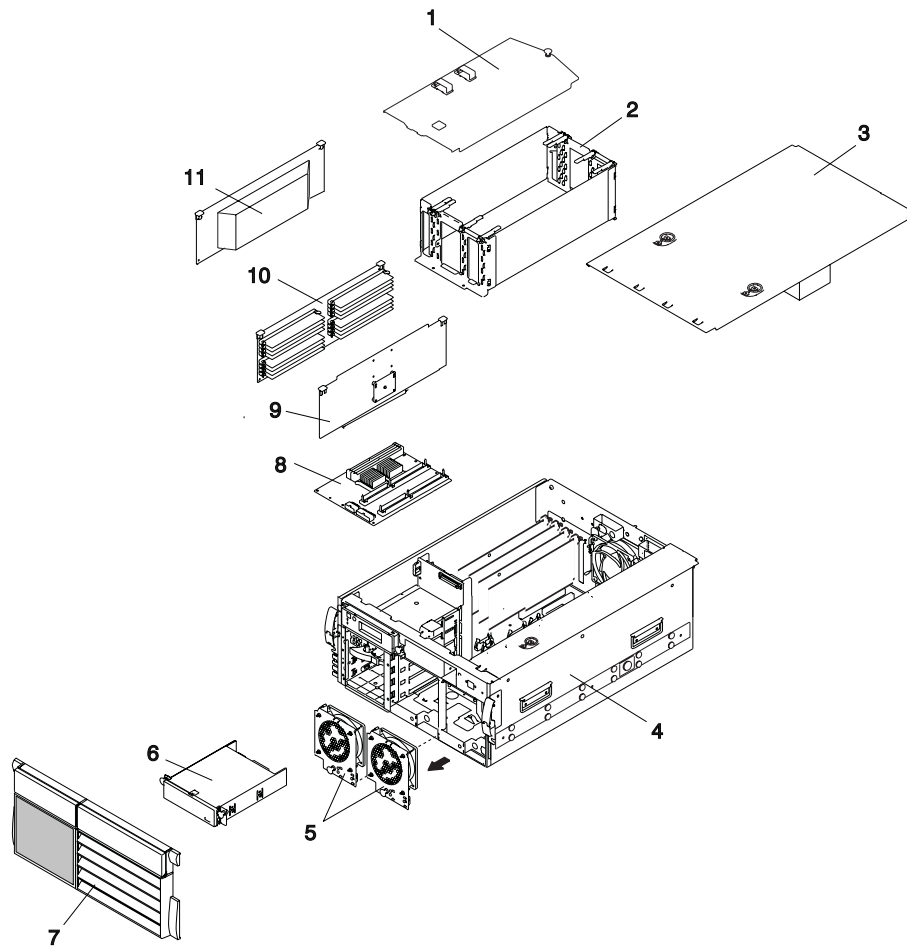
13. Disconnect all power cables connected to the system board.
14. Remove the remaining screws that are securing the system board to the chassis.
15. Disconnect the system board from the I/O board.



- 1 System Board
- 2 I/O Board

Attention: When separating the system board from the I/O board, you must lift the system board up slightly to avoid possible damage to the underside by the screw standoffs.

16. Slowly lift the system board out of the system drawer and place it in a safe location.



- 1 CEC Box Cover
- 2 CEC Box
- 3 Main Chassis Cover
- 4 System Drawer
- 5 System Front Fans
- 6 Media Device or Tray (configuration-dependent)
- 7 Front Bezel
- 8 System Board
- 9 Processor Card (up to 2)
- 10 Memory Card (up to 2)
- 11 Air Flow Baffle (up to 2)

System Board Replacement

To replace the system board, do the following:

1. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to "Handling Static-Sensitive Devices" on page 266.
2. Carefully lower the system board into the system drawer.
3. Align and connect the system board to the I/O board.
4. Align all screw holes, and start all screws. *Do not* tighten the screws until the system board has been correctly aligned and all screws have been started in their respective holes.
5. Reconnect all of the power cables to the system board.
6. Replace the CEC box as described in "CEC Box Replacement" on page 305.
7. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to "Handling Static-Sensitive Devices" on page 266.
8. Replace all memory cards into their original locations as described in "Memory Card Replacement" on page 294.
9. Replace all processor cards into their original locations as described in "Processor Card Replacement" on page 299.
10. If previously installed, replace all air flow baffles into their original locations as described in "Air Flow Baffle Replacement" on page 291.
11. Replace the CEC box cover as described in "CEC Box Cover Replacement" on page 288.
12. Replace the media bay tray, CD-ROM drive or tape drive as described in "Optional CD-ROM and Tape Drive" on page 329. This step is system configuration-dependent.
13. Replace the main chassis cover as described in "Main Chassis Cover Replacement" on page 279.
14. Return the system drawer back to the operating position as described in "Returning the System Drawer to the Operating Position" on page 271.
15. Reconnect all of the system drawer power cables.
16. Power on the system drawer as described in "Starting the System Unit" on page 269.
17. Close the front and rear rack doors.

Input/Output (I/O) Board

Before performing these procedures, read "Safety Notices" on page xiii.

I/O Board Removal

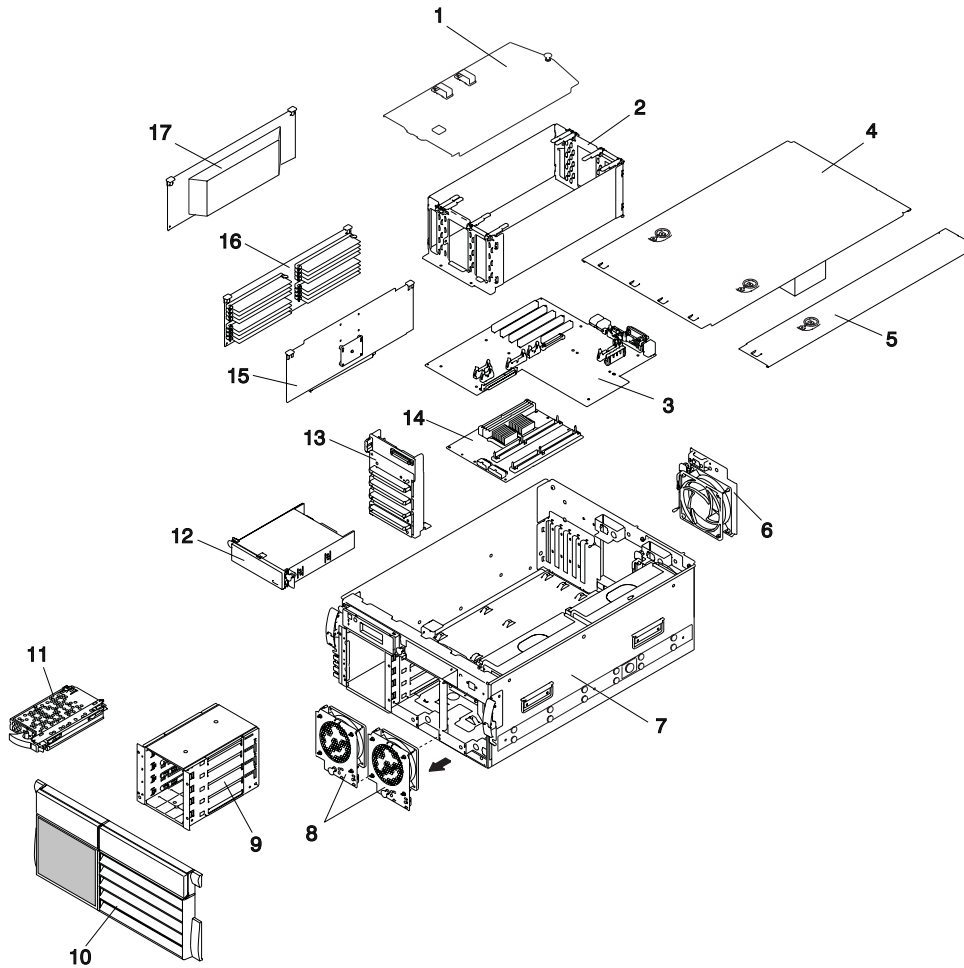
Attention: Record the location of all components before you remove or disconnect them. Record the settings of any jumpers on the board before removing the board from the system unit.

To remove the I/O board, do the following:

1. Open the front and rear rack doors.
2. Shut down the system drawer as described in "Stopping and Starting System" on page 269.
3. Unplug all power cables, then label and disconnect all other cables from the rear of the system drawer. Read the caution statement on page 61 before going to the next step in this procedure.
4. Remove the rear fans as described in "Front and Rear Fan Removal" on page 341.
5. Remove the front bezel as described in "Front Bezel Removal" on page 283.
6. Remove all disk drives as described in "Removing a Hot-Plug Disk Drive" on page 313.
7. Remove the media bay tray, CD-ROM drive or tape drive as described in "Optional CD-ROM and Tape Drive" on page 329. This step is system configuration-dependent.
8. Remove the front fans as described in "Front and Rear Fan Removal" on page 341.
9. Place the system drawer in the service position as described in "Front Service Position" on page 270.
10. Remove the main chassis cover as described in "Main Chassis Cover Removal" on page 279.
11. Remove the CEC box cover as described in "CEC Box Cover Removal" on page 288.
12. With one hand, touch any metal surface of the chassis to minimize static electric discharge. Refer to "Handling Static-Sensitive Devices" on page 266.
13. Before handling any card, board, or memory module, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to "Handling Static-Sensitive Devices" on page 266.

Note: Before removing, record the position of all installed memory cards, processor cards and air flow baffles.

14. If installed, remove all air flow baffles as described in “Air Flow Baffle Removal” on page 290.
15. Remove all processor cards as described in “Processor Card Removal” on page 298.
16. Remove all memory cards as described in “Memory Card Removal” on page 293.
17. Remove the CEC box as described in “CEC Box Removal” on page 303.
18. Remove all adapters as describes in “Adapter Removal” on page 306.
19. Remove all power, signal and SCSI cables from the I/O board.
20. Disconnect all power cables from the **system board**.
21. Remove all screws that secure the **system board** to the chassis.
22. Remove the system board as described in “System Board Removal” on page 344.
23. Remove the disk drive backplane as described in “Disk Drive Backplane Removal” on page 321.
24. Remove all screws that secure the I/O board to the chassis.
25. Slowly lift the I/O board out of the system drawer and place it in a safe place.



- 1 CEC Box Cover
- 2 CEC Box
- 3 System I/O Board
- 4 Main Chassis Cover
- 5 Power Supply Chassis Cover
- 6 Hot-Plug Rear Fan #4
- 7 System Drawer
- 8 Front Fans
- 9 Disk Drive Cage
- 10 Front Bezel
- 11 Disk Drive (up to 4)
- 12 Media Drive (optional)
- 13 Disk Drive Backplane
- 14 System Board
- 15 Processor Card (up to 2)
- 16 Memory Card (up to 2)
- 17 Air Flow Baffle (up to 2)

I/O Board Replacement

To replace the I/O board, do the following:

1. With one hand, touch any metal surface of the chassis to minimize static electric discharge. Refer to “Handling Static-Sensitive Devices” on page 266.
2. Carefully align the I/O board to the alignment pins located on the chassis base.
3. Replace the screws that secure the I/O board to the chassis.
Note: *Do not* replace the screws that secure the CEC box and the disk drive backplane to the system drawer at this time.
4. Replace the system board as described in “System Board Replacement” on page 347.
5. Reconnect the power, signal and SCSI cables previously disconnected from the power distribution board to the I/O board.
6. Replace the disk drive backplane as described in “Disk Drive Backplane Replacement” on page 321.
7. Replace the CEC box as described in “CEC Box Replacement” on page 305.
8. Replace all adapters as described in “Adding or Replacing an Adapter” on page 308.
9. Replace all memory cards into their original locations as described in “Memory Card Replacement” on page 294.
10. Replace all processor cards into their original locations as described in “Processor Card Replacement” on page 299.
11. If previously installed, replace all air flow baffles into their original locations as described in “Air Flow Baffle Replacement” on page 291.
12. Replace the CEC box cover as described in “CEC Box Cover Replacement” on page 288.
13. Replace the main chassis cover as described in “Main Chassis Cover Replacement” on page 279.
14. Return the system drawer back to the operating position as described in “Returning the System Drawer to the Operating Position” on page 271.

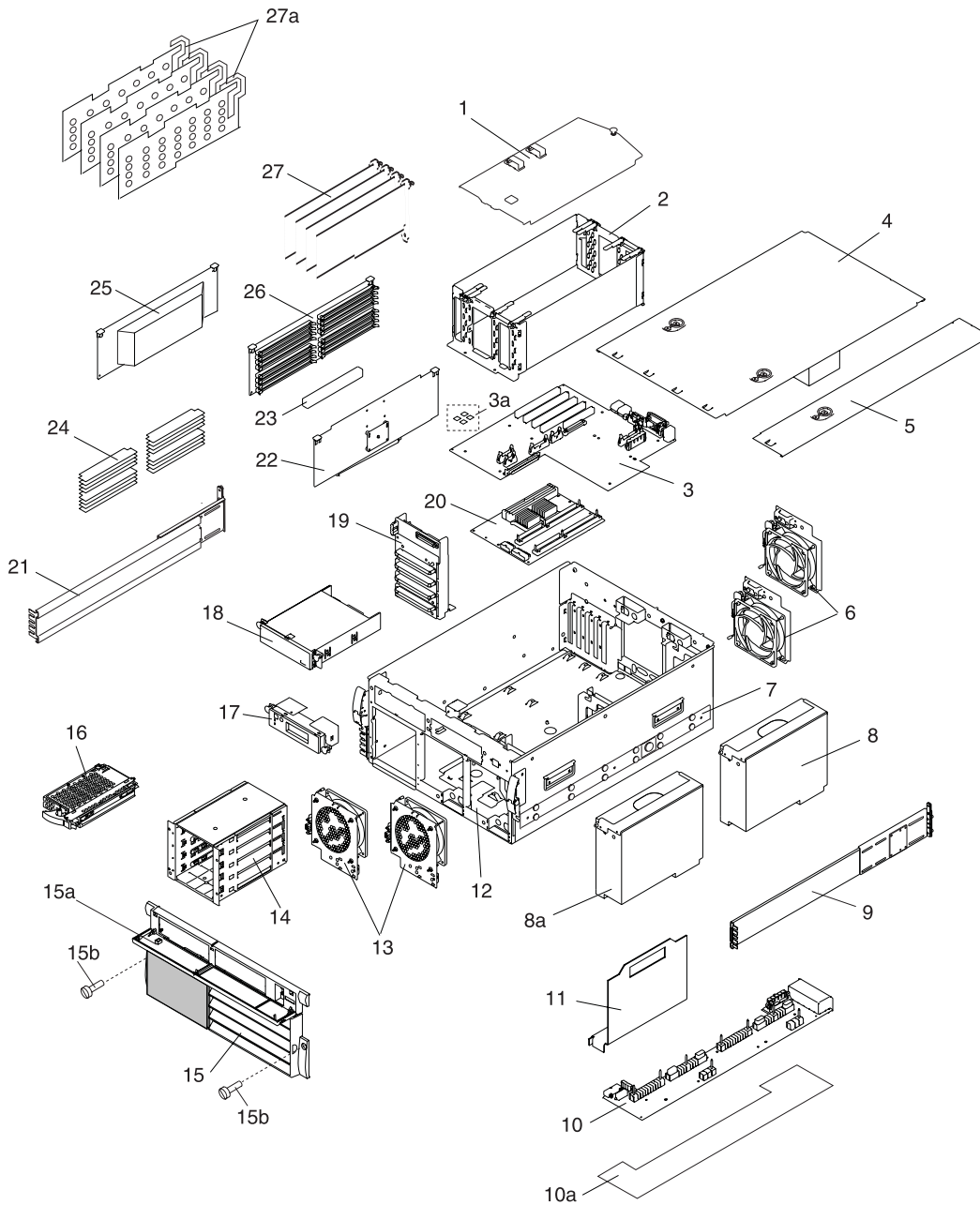
15. Replace the media bay tray, CD-ROM drive or tape drive as described in “Optional CD-ROM and Tape Drive” on page 329. This step is system configuration-dependent.
16. Replace all disk drives as described in “Hot-Plug Disk Drive Installation or Replacement” on page 316.
17. Replace the front bezel as described in “Front Bezel Replacement” on page 284.
18. Reconnect the power and adapter cables located from the rear of the system drawer.
19. Reconnect all labeled cables to their appropriate I/O board connectors from the rear of the system drawer
20. Power on the system drawer as described in “Starting the System Unit” on page 269.
21. Close the front and rear rack doors.

Chapter 10. Parts Information

This chapter contains parts information for the 7026 Model B80.

Part-Name to Part Number Index

The following tables identify each part by name and provide you with the replacement part order number.

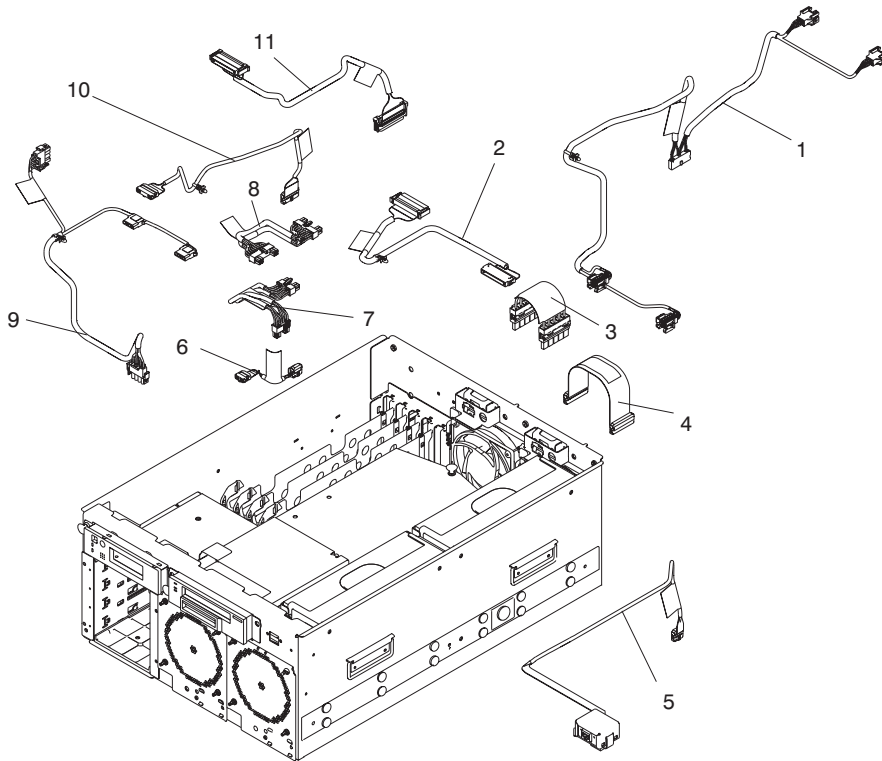


Index	Part Number	Units Per Assy.	Description
1	04N5116	1	CEC Box Cover
2	04N5130	1	CEC Box
3	00P1859	1	I/O Board
3a	09P2221	1	I/O Board EEPROM Kit (extractor tool included)
4	04N5118	1	Top Cover
5	04N5119	1	Power Supply Chassis Cover
6	04N5121	2	Rear Fan
7	21P4314	2	Inner Slide Rail
8	00P2342	1	AC Power Supply
	00P2344		DC Power Supply
8a	00P2342	1	Redundant AC Power Supply
	00P2344		Redundant DC Power Supply
9	21P4315	1	Right Rack Rail
10	04N5406	1	AC Power Distribution Board
	04N5225		DC Power Distribution Board
10a	21P3701	1	Power Distribution Board Insulator Pad
11	21P4419	1	Power Connector Dust Cover
12	04N5144	1	System Drawer
13	04N5124	2	Front Fan
14	04N4281	1	Disk Drive Cage
15	21P4377	1	Front Bezel Cover
15a	04N6302	1	Front Bezel Door
15b	04N6587	1	Blue Bezel Retaining Thumbscrew
16	See Note (below)	Up to 4	Disk Drive
17	04N6150	1	Operator Panel
18	See Note (below)	1	Media Drive
19	04N5209	1	Disk Drive Backplane
20	09P2053	1	System Board
21	21P4316	1	Left Rack Rail
22	09P0399	Up to 2	Processor Card (1-Way 375 MHz, 4MB cache)
	09P0406		Processor Card (2-Way, 375 MHz, 4MB cache)
	09P0143		Processor Card (2-Way 375 Mhz, 8MB cache)
	09P4478		Processor Card (2-Way 450 Mhz, 8MB cache)
23	03N4219	1	Memory Card Connector Dust Cover
24	93H4702	Up to 32	128 MB Memory Module
	09P0550	Up to 32	256 MB Memory Module
	09P0491	Up to 32	512 MB Memory Module
25	97H9431	2 (maximum)	Air Flow Baffle
26	00P1967	1 or 2	Memory Card
27	See Note (below)		Adapter Cards
27a	44L0041	4	Plastic Adapter Separator Card
	15F8409	1	Battery (located on the system board)

Note: See *Diagnostic Information for Multiple Bus Systems* for part numbers.

System Cabling

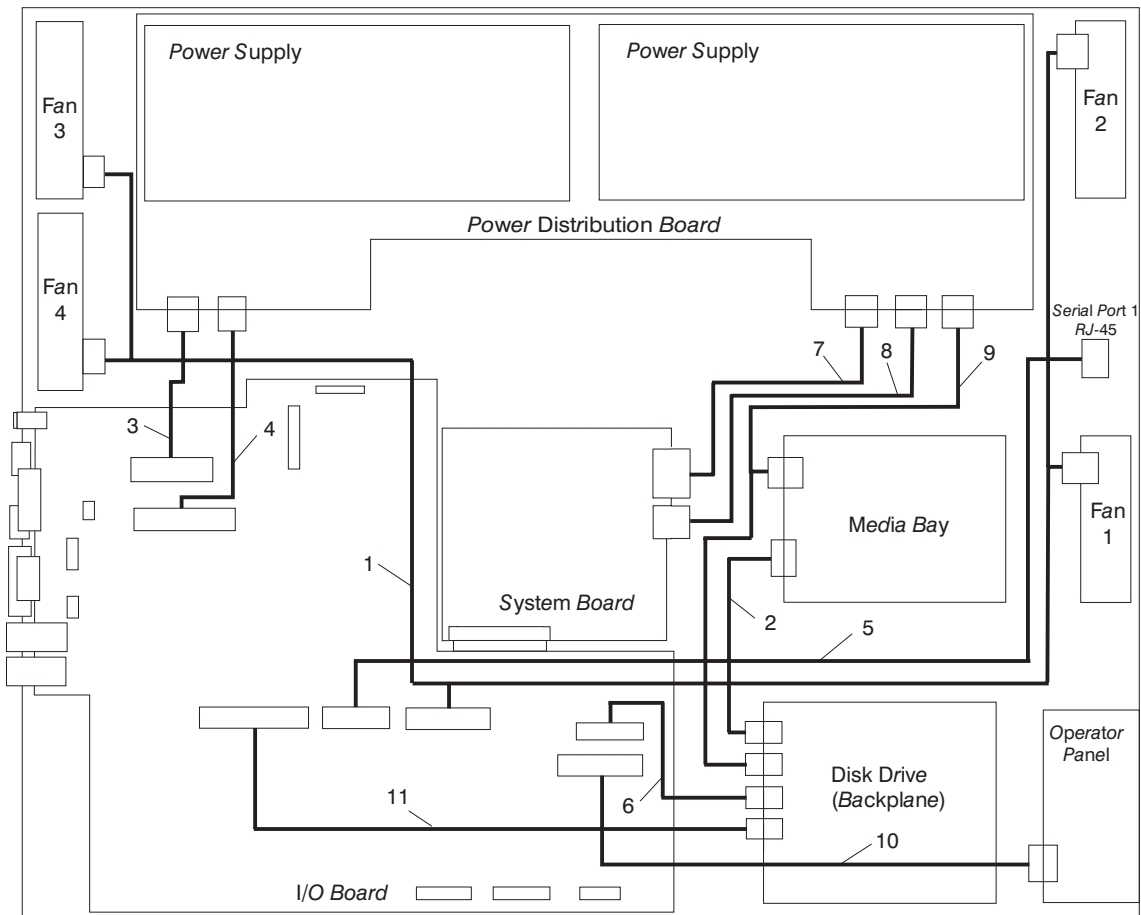
The following illustration identifies each cable and gives you an idea of what each cable looks like. The cable illustration that follows the table is a wiring map that shows the connecting points for each cable.



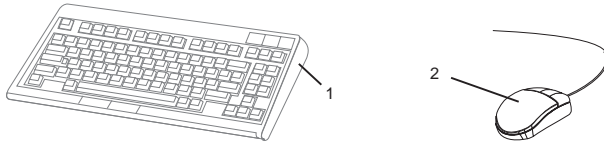
Index	Part Number	Description
1	04N5101	I/O Board to Fan Cable Harness
2	21P3951	Backplane to Media Bay Signal Cable
3	04N5099	Power Distribution Board (PDB) to I/O Board Power Cable
4	04N5100	PDB to I/O Board Signal Cable
5	04N5545	RJ45 to I/O Serial Port 1 Cable
6	04N5107	I/O to Backplane Signal Cable
7	04N5102	System Board to PDB Power Cable
8	04N5103	System Board to PDB Power Cable
9	04N5104	PDB to Media Bay to Backplane Power Cable
10	04N5108	I/O Board to Operator Panel Cable
11	04N5105	I/O Board to Backplane Power/Signal Cable

Cable Mapping Diagram

The following illustration shows where each cable is connected in the Model B80. Use the previous illustration and table to help identify the cable name and part number.

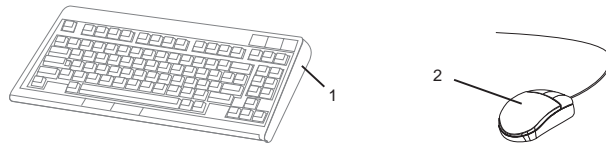


Keyboards and Mouse (White)



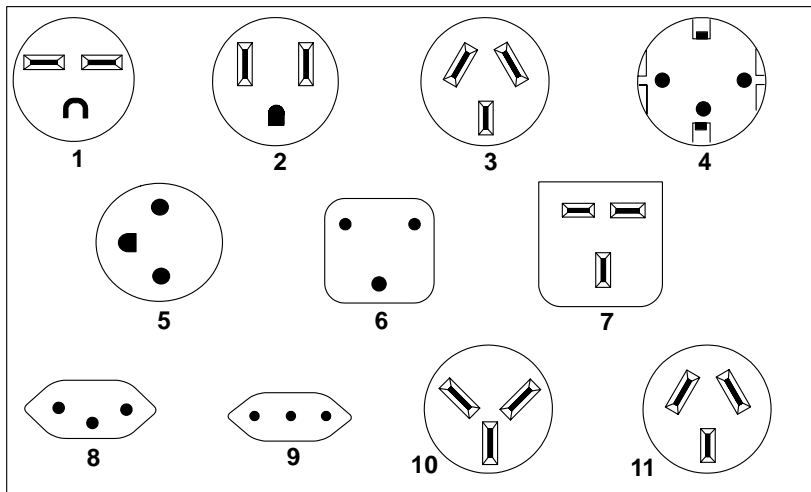
Index Number	FRU Part Number	Units Per Assy	Description
1	93H8120	1	Keyboard, 101 United States English (ID 103P)
	93H8121	1	Keyboard, 102 Canada French (ID 058)
	93H8122	1	Keyboard, 102 Canada French (ID 445)
	93H8123	1	Keyboard, 102 Spanish (ID 171)
	93H8124	1	Keyboard, 104 Brazil Portuguese (ID 275)
	93H8125	1	Keyboard, 102 Arabic (ID 238)
	93H8126	1	Keyboard, 102 Belgium French (ID 120)
	93H8127	1	Keyboard, 102 Belgium (ID 120)
	93H8128	1	Keyboard, 102 Bulgarian (ID 442)
	93H8129	1	Keyboard, 102 Czech (ID 243)
	93H8130	1	Keyboard, 102 Danish (ID 159)
	93H8131	1	Keyboard, 102 Dutch (ID 143)
	93H8132	1	Keyboard, 102 French (ID 189)
	93H8133	1	Keyboard, 102 German (ID 129)
	93H8134	1	Keyboard, 102 Greek (ID 319)
	93H8135	1	Keyboard, 101 Hebrew (ID 212)
	93H8136	1	Keyboard, 102 Hungarian (ID 208)
	93H8137	1	Keyboard, 102 Iceland (ID 197)
	93H8138	1	Keyboard, 102 Italy (ID 142)
	93H8139	1	Keyboard, 102 Norwegian (ID 155)
	93H8140	1	Keyboard, 102 Polish (ID 214)
	93H8141	1	Keyboard, 102 Portuguese (ID 163)
	93H8142	1	Keyboard, 102 Romanian (ID 446)
	93H8143	1	Keyboard, 101 Russian (ID 443)
	93H8144	1	Keyboard, 102 Serbian (ID 118)
	93H8145	1	Keyboard, 102 Slovak (ID 245)
	93H8146	1	Keyboard, 102 Spanish (ID 172)
	93H8147	1	Keyboard, 102 Sweden/Finland (ID 153)
	93H8148	1	Keyboard, 105 Swiss F/G (ID 150)
	93H8149	1	Keyboard, 102 Turkish (ID 179)
	93H8150	1	Keyboard, 102 Turkish (ID 440)
	93H8151	1	Keyboard, 102 UK English (ID 166)
	93H8152	1	Keyboard, 102 Latvia (ID 234)
93H8153	1	Keyboard, US English ISO9995 (ID 103P)	
93H8154	1	Keyboard, 106 Japan (ID 194)	
93H8155	1	Keyboard, 101 Chinese/US (ID 467)	
93H8156	1	Keyboard, 103 Korea (ID 413)	
93H8157	1	Keyboard, 101 Thailand (ID 191)	
2	76H5084	1	Three Button Mouse

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 Romanian (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	1838572	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	87G3880	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	87G3880	Chicago, U.S.A.
2	36L8861	AC drawer to rack Power Distribution Bus (standard)
3	13F9941	Argentina, Australia, New Zealand
4	13F9980	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	13F9998	Denmark
6	14F0016	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka

Index	Part Number	Country
7	14F0034	Bahrain, Bermuda, Brunei, Channel Islands, Cyprus, Ghana, Hong Kong, India, Iraq, Ireland, Jordan, Kenya, Kuwait, Malawi, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Arab Emirates (Dubai), United Kingdom, Zambia
8	14F0052	Liechtenstein, Switzerland
9	14F0070	Chile, Ethiopia, Italy
10	14F0088	Israel
11	6952291	Paraguay, Colombia, Uruguay

Appendix A. Environmental Notices

Product Recycling and Disposal

This unit contains materials such as circuit boards and connectors with lead that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. This manual contains specific information on batteries where applicable. This product may contain nickel-cadmium and/or lithium batteries. The battery(s) must be recycled or disposed of properly. Recycling facilities may not be available in your area. In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used sealed lead acid, nickel cadmium and nickel metal hydride batteries and battery packs from IBM equipment. For information on proper disposal of the nickel cadmium batteries in this product, please contact IBM at 1-800-426-4333. 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 signify 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.

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).

Appendix B. Notices

This information was developed for products and services offered in the U.S.A.

The manufacturer may not offer the products, services, or features discussed in this document in other countries. Consult the manufacturer's representative for information on the products and services currently available in your area. Any reference to the manufacturer's product, program, or service is not intended to state or imply that only that product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any intellectual property right of the manufacturer may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any product, program, or service.

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Appendix C. Service Processor Setup and Test

For your convenience, an example of a basic service processor setup checklist is included here. Your setup may include more or fewer of the available features, so you can adjust this checklist for your own application so that it is helpful to you.

Service Processor Setup Checklist

1. Unplug the power cord from the server.
2. Attach a local terminal for this setup procedure.
3. Plug in the server and power on the local terminal.
Attention: Make sure that server power remains off.
4. Bring up the service processor menus. See Chapter 7, “Using the Service Processor” on page 187.
5. Set the system name. See “Privileged User Menus” on page 192.
6. Enable Surveillance. See page “Service Processor Setup Menu” on page 193.
7. Configure Call-In/Call-Out. See “Call-In/Call-Out Setup Menu” on page 207.
8. Exit the Service Processor menus.
9. Unplug the power cord from the server.
10. Attach modems (if needed). See page “Call-In/Call-Out Setup Menu” on page 207.
11. Plug in the server.
Attention: Make sure that server power remains off.
12. Test both of the following:
 - Call-In, page 368
 - Call-Out, page 369
13. Use the “Save or Restore Hardware Management Policies,” in the “Introduction to Tasks and Service Aids” section of the *Diagnostic Information for Multiple Bus Systems* to back up the service processor settings.
Note: This is strongly recommended to protect the usefulness of the service processor and the availability of the server.

Your service processor is now ready for use.

Testing the Setup

This section contains sample testing procedures to help ensure your setup is working.

These tests include communicating with the server operating system. Before you start, ensure that the necessary serial port(s) is configured. If you need assistance, refer to “Serial Port Configuration” on page 370.

The server should be powered off as a result of the “Service Processor Setup Checklist” on page 367.

Testing Call-In

1. Go to your remote terminal and call in to your server. Your server answers and offers you the service processor main menu after requesting your privileged access password.
2. Select **System Power Control**.
3. Select **Power-On System**.

When you are asked if you wish to continue powering on the system, type **Y**.

4. After the system firmware and operating system have initialized the server, the login prompt displays at your remote terminal if you set up Seamless Modem Transfer (refer to page 377 for more information). This may take several minutes. When the login prompt displays, you have successfully called the Service Processor.
5. Type **logout** to disconnect from the operating system. The message No Carrier displays on your remote terminal.
6. Call your server again. The operating system answers and offers you the login prompt. If these tests are successful, call-in is working.
7. Log in and type **shutdown -F** to shut down your server.
8. The message No Carrier displays on your remote terminal.

Testing Call-Out

During the setup, you entered your phone numbers for the pager (on page 209) and customer voice (on page 210). These numbers are used for this test.

1. Your remote terminal is disconnected as a result of the Call-In test.
2. Call your server again.
3. At the Service Processor Main Menu, select **Call-In/Call-Out Setup** menu, then select **Call-Out** test. This action causes a simulated error condition for the purposes of this test.
4. After a few moments, a message displays, regarding an illegal entry. Press Enter to clear the message and return to the main menu.
5. When your telephone rings, answer the call. You should hear the sound of a telephone being dialed. This is your computer trying to page you.

If this test is successful, call-out is working correctly.

Return to the 209 to enter the actual telephone numbers your server will use for reporting problems.

Serial Port Configuration

To configure the serial port on an AIX system, run the following from an AIX console:

1. Log in as root user.
2. To determine if you have any serial ports already configured, type:

```
lsdev -Cc tty
```

If no serial ports are configured, none are listed. If you want to configure serial ports that are not listed, continue with the remaining steps.
3. Identify the serial port(s) with the modem(s).
4. Type **smit tty**
5. Select **add tty**
6. Select **RS232**
7. Select **Baud rate 9600** or higher.
8. Select **login enable** and set the flow control to RTS.
9. Commit the selections and set up any other needed serial ports.
10. Exit SMIT.

Appendix D. Modem Configurations

The Service Processor is designed to place little demand on an attached modem, thereby increasing the setup and connection success rates.

Sample Modem Configuration Files

This appendix contains information about several sample modem configuration files that either work directly with your modem or provide a good starting point for a custom setup.

The sample modem configuration files are located in your 7026 Model B80 firmware in the **/usr/share/modems** subdirectory (if your server is using AIX) with the following names. A listing of each specific file is included in this appendix.

Generic Modem Configuration Files

AIX 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

Specific Modem Configuration Files

AIX File Name	Service Processor Firmware File Name
modem_m0.cfg	modem_m0_sp
modem_m1.cfg	modem_m1_sp

Use the following selection procedures and your modem manual to determine which of the configuration files is suitable for your use.

Configuration File Selection

Use the following steps to select a configuration file:

1. Is your modem an IBM 7852-400?

If Yes, use modem configuration file **modem_m0.cfg** and go to step 7 on page 373.

Note: The IBM 7852-400 modem has DIP switches on the right side of the unit. See "IBM 7852-400 DIP Switch Settings" on page 375 for the correct switch settings.

If No, continue with step 2.

2. Is your modem an IBM 7857-017?

If Yes, use modem configuration file **modem_m1.cfg** and go to step 7 on page 373.

Note: The IBM 7857-017 modem has two telephone line connections on the back of the unit. One is marked **LL** (for Leased Line), and the other is marked **PTSN** (for Public Telephone Switched Network). The service processor expects to use the modem on the public network, so the telephone line should attach to the PTSN connector.

If No, continue with step 3.

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

If Yes, go to step 5 on page 373.

If No, continue with step 4.

4. Does your modem respond to:

- ATZ reset command
 - or
 - ATZ n reset commands, where n can be 0, 1, and so on?
- If ATZ, configuration file **modem_z.cfg** is recommended.
If ATZ n , configuration file **modem_z0.cfg** is recommended.

Go to step 7 on page 373.

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

If Yes, disable this test. You can use sample configuration files **/usr/share/modem_m0.cfg** or **/usr/share/modem_m1.cfg** as models to help you create a file for your particular modem. See "Customizing the Modem Configuration Files" on page 374 for more information. Go to step 7.

If No, go to step 6.

6. Does your modem respond to:

- AT&F reset command
- or
- AT&Fn reset commands, where *n* can be 0, 1, and so on?

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.

7. You have completed selection of the configuration file.

If your modem configuration selection is not available in the Service Processor Modem Configuration Menu, you must access it through the Configure Remote Maintenance Policy Service Aid.

If you find it necessary to adjust any of these configuration files, use the manual provided with your modem to accomplish that task. It is recommended you select settings that enable hardware flow control and respond to DTR.

Note: Some older modems do not respond to the **X0** or **&R1** commands. Edit out these commands from the modem configuration file if yours is such a modem. See your modem manual for more information.

Some modems, such as the 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.

Examples for Using the Generic Sample Modem Configuration Files

The following table contains information to help you determine which modem configuration file to use with various modems.

Modem	Setup Z	Setup Z0 (Rare)	Setup F	Setup F0	Setup F1
AT&T DataPort 2001 (Ring interrupt only on first ring)				X	
Bocamodem 1440E			X		
Hayes Smart Modem 300	X				
IBM 5841	X				
IBM 5843	X				
IBM 7851				X	
IBM 7852-10				X	
IBM 7855					X
USRobotics 36.6K Sportster					X
Zoom V.32			X		

Customizing the Modem Configuration Files

You can create your own modem configuration files or modify the samples provided. After you customize your modem configuration files, you *must* access them through the Configure Remote Maintenance Policy Service Aid rather than from the service processor menus.

Notes:

1. If you have already set up your serial ports, line speeds, authorizations, and telephone numbers from the service processor menus, use the service aid to specify your customized modem configuration files.
2. If you have not already set up your serial ports, line speeds, authorizations, and telephone numbers from the service processor menus, use the service aids to set them 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 that you can modify, as follows:

1. Find the necessary command in your modem manual.

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

Change the third line of each of the following stanzas:

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

4. Save the changes.

IBM 7852-400 DIP Switch Settings

If you are using a 7852-400 modem to enable service processor communications, for proper operation, the dual inline package (DIP) switches must be set according to the following table:

Switch	Position	Function
1	Up	Force DTR
2	Up	Flow Control &E4
3	Down	Result Codes Enabled
4	Down	Modem Emulation Disabled
5	Up	Auto Answer Enabled
6	Up	Maximum Throughput Enabled
7	Up	RTS Normal Functions
8	Down	Enable Command Mode
9	Down	Remote Digital Loopback Test Enabled
10	Up	Dial-Up Line Enabled
11	*Up	AT Responses Enabled (Extended Responses Disabled)
12	*Down	Asynchronous Operation
13	UP	28.8KB Line Speed
14	Up	
15	Up	CD and DSR Normal Functions
16	Up	2-Wire Leased Line Enabled

* Only switches 11 and 12 are changed from the factory default settings.

Xon/Xoff Modems

Some early modems 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 accept these extra characters. If your configuration includes such a modem, your functional results may be unpredictable.

The sample modem configuration files included in this appendix do not support these modems, so custom configuration files are necessary. Anchor Automation 2400E is an example of such a modem.

If you experience unexplainable performance problems that may be due to Xon/Xoff characters, it is recommended that you upgrade your modem.

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 that they receive. The 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 can choose to start ring indicate power-on on any ring count.

Terminal Emulators

The service processor is compatible with simple ASCII terminals, and therefore compatible with most emulators. When a remote session is handed off from the service processor to the operating system, agreement between terminal emulators becomes important.

The server's operating system will have some built-in terminal emulators. You may also have a commercially available terminal emulator. It is important that the local and host computers select the same or compatible terminal emulators so that the key assignments and responses match, ensuring successful communications and control.

For best formatting, choose line wrap in your terminal emulator setup.

Recovery Procedures

Situations such as line noises and power surges 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 occurs after your modem has been initialized, it might be necessary to recover your modem to a known state.

If your modem communicates correctly 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 ensure it has been initialized recently.

If your system is particularly difficult to access physically, another strategy is to protect it with an uninterruptible power source (UPS) and a phone-line surge protector.

In case recovery becomes necessary, shut down your system using established procedures. Disconnect the power cable and press the power button to drain capacitance while power is disconnected. Disconnect and reconnect modem power, and then reconnect system power to completely reinitialize your system.

Transfer of a Modem Session

Because many modem command variations exist, the sample modem configuration files located at the end of this appendix 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. Using this mechanism, the server hangs up on a connection under normal conditions.

Consult your modem manual for its specific response scheme for the **&Dn** command.

Two strategies are available for dealing with the modem's response to DTR:

- Recovery
- Prevention

Before you use one of these strategies, determine if your server's modem is set up correctly 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. Will the modem drop the connection after the System initialization complete message displays at the remote terminal?

If yes, 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 files, as follows:

2. Will the server's modem disconnect when the power drops? You can make this observation at the remote terminal by commanding your server to shut down and

power off. (Use the AIX command **shutdown -F**.) 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 files. 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.

Recovery Strategy

The recovery strategy consists of making two calls to establish a remote session. This solution is the easiest to implement and allows more freedom to configure 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, call the server back and the operating system will answer and offer you the login prompt.

Prevention Strategy

The disconnect is caused by the operating system when it initializes the primary console. The tests listed in "Transfer of a Modem Session" on page 377 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 will no longer experience 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 will be 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 Sample Files

Sample File modem_m0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP: modem_m0
#
# FUNCTIONS: Modem configuration file specifically for IBM 7852-400
# modem with Auto-Reliable feature. This feature must be turned off
# for Catcher calls. This example uses the AT&F reset command to
# choose the factory defaults.
#
# (C) COPYRIGHT International Business Machines Corp. 1996
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#
# US Government Users Restricted Rights - Use, duplication or
# disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
#
#
# The modem has configuration switches. They should be set to the
# factory default settings, except switches 11 and 12. These must be
# to UP ("AT" responses) and DOWN (Asynchronous operation), respectively.

ICDelay 1
DefaultT0 10
CallDelay 120
#
# %N Call-Out phone number    %R Return phone number
#
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:    send "AT&F&E2E0T\r"                # Reset to factory defaults
                                                    # Reliable mode
                                                    # Echo off
            ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
            send "AT&E12&E14\r"                # Disable pacing
                                                    # Disable data compression
            expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful.
            send "AT&SF1&S0S9=1\r"            # DSR independent of CD
                                                    # Force DSR on.
                                                    # CD respond time=100ms
            expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful.
            send "ATV0S0=0\r"                # Numeric response code
                                                    # Auto-Answer off
            expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful.
            done

connect:    send "ATDT%N\r"                    # Tone dialing command.
                                                    # %N from Call Home setup.
```



```

                                # Expect a connection response.
                                expect "33\r" or "31\r" or "28\r" or "26\r" or "24\r" or "21\r" or
"19\r" or "13\r" or "12\r" or "1\r" busy "7\r"
                                timeout 60
                                done

retry:    send "A/"                # Repeat the previous command.
                                # Expect a connection response.
                                expect "33\r" or "31\r" or "28\r" or "26\r" or "24\r" or "21\r" or
"19\r" or "13\r" or "12\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&F&E2E0T\r"      # Reset to factory defaults.
                                # Reliable mode
                                # Echo off
    ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
    send "AT&E12&E14\r"           # Disable pacing
                                # Disable data compression
    expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful
    send "AT&SF1&S0S9=1\r"        # DSR independent of CD.
                                # Force DSR on.
                                # CD respond time=100ms
    expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful.
    send "ATV0S0=2\r"            # Numeric response code
                                # Answer on 2nd ring
    expect "0\r" timeout 2        # Confirm commands successful.
    done

waitcall: ignore "2\r" timeout 1    # Ignore first ring.
    expect "2\r" timeout 10        # Pickup 2nd ring or timeout
                                # Expect a connection response.
    expect "33\r" or "31\r" or "28\r" or "26\r" or "24\r" or "21\r" or
"19\r" or "13\r" or "12\r" or "1\r" busy "7\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.

```

```

    expect "0\r" timeout 60      # %R = paging number
    delay 2                      # Confirm successful command.
    send "ATH0\r"               # Wait before hanging up.
    expect "0\r" timeout 2      # Hang up.
    done                         # Confirm successful command.

ribo:    send "AT&F&E2E0T\r"    # Reset to factory defaults.
        # Reliable mode
        # Echo off

    ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
    send "AT&E12&E14\r"          # Disable pacing
        # Disable data compression

    expect "0\r" or "OK\r\n" timeout 2 # Confirm successful command.
    send "AT&SF1&S0S9=1\r"        # DSR independent of CD.
        # Force DSR on.
        # CD respond time=100ms

    expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful.
    send "ATV0S0=0\r"           # Numeric response code
        # Auto Answer OFF

    expect "0\r" timeout 2      # Confirm commands successful.
    done                         #

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_m1.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP modem_m1
#
# FUNCTIONS: Modem configuration file specifically for IBM 7857-017 modem with
# Auto-Reliable feature. This feature must be turned off for Catcher calls.
# This example uses the AT&F reset command to choose the factory defaults.
#
# To allow dial commands for digital pagers, it is necessary to reduce
# the number of characters in the dial command. Each comma (delay) has
# been set to 6 seconds (S8=6) for that reason.
#
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#

ICDelay 1
DefaultT0 10
CallDelay 120
#
# %N Call-Out phone number %R Return phone number
#
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout: send "AT&F*E0E0\r" # Reset to factory defaults.
# *E0=data compression disabled
# E0=echo disabled
ignore "\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "AT#F0*Q2S8=6\r" # Trellis modulation disabled
# Retrain with adaptive rate
# Set ,=6second
expect "\r" or "OK\r\n" timeout 2 # Confirm commands successful
send "ATV0X0S0=0\r" # Numeric response code
# AT compatible messages
# Auto-Answer disabled
expect "\r" or "OK\r\n" timeout 2 # Confirm commands successful.
done

connect: send "ATDT%N\r" # Tone dialing command.
# %N from Call Home setup.
expect "1\r" busy "7\r" timeout 60 # Expect a connection response.
done

retry: send "A/" # Repeat the previous command.
expect "1\r" busy "7\r" timeout 60 # Expect a connection response.
```

```

done

disconnect:
delay 2 # Separate from previous data.
send "+++" # Assure command mode.
delay 2 # Allow mode switching delay.
send "ATH0\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&F*E0E0\r" # Reset to factory defaults.
# *E0=data compression disabled
# E0=echo disabled

ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "AT#F0*Q2\r" # Trellis modulation disabled
# Retrain with adaptive rate

expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful
send "ATV0X0S0=2\r" # Numeric response code
# AT compatible messages
# Answer on 2nd ring

expect "0\r" timeout 2 # Confirm commands 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 "1\r" timeout 60
done

page: send "ATD%N,%R\r" # %N = pager call center number
# commas=6sec wait time to
# enter paging number.
# %R = return number

expect "0\r" or "3\r" timeout 30 # Confirm successful command.
delay 2 # Wait before hanging up.
send "+++" # Assure command mode.
delay 2 # Allow mode switching delay.
send "ATH0\r" # Hang up.
expect "0\r" timeout 2 # Confirm successful command.
done

ripo: send "AT&F*E0E0\r" # Reset to factory defaults.
# *E0=data compression disabled
# E0=echo disabled

ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "AT#F0*Q2\r" # Trellis modulation disabled
# Retrain with adaptive rate

```

```
expect "0\r" or "OK\r\n" timeout 2 # Confirm successful command.
send "ATV0X0S0=0\r"                # Numeric response code
                                     # AT compatible messages
                                     # Auto-Answer disabled
expect "0\r" timeout 2              # Confirm commands successful.
done                                 #

error:                                # Handle unexpected modem
                                     # responses.
expect "8\r" or "7\r" or "4\r" or "3\r"
delay 2
done
```

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
DefaultT0 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 "ATE0Q1\r"       # Initialize modem: Echo OFF,
                                                # Disable responses.

ignore "0\r" timeout 1
done

condin:   send "AT&F00T\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&F00T\r"           # Reset to factory defaults.
           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.
           send "AT&C1&D2\r"         # Detect carrier and DTR.
           expect "\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

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
DefaultTO 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 "\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.
          send "AT&C1&D2&R1\r"      # Detect carrier and DTR,
          # Ignore RTS.
          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" timeout 2 # Ignore modem response.
send "ATEQ1\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

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 E. 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. The code consists of five source code characters and three reason code characters. Individual characters within the error code have specific field definitions, as defined in the following tables.

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 <i>not</i> 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
R2 - R3	Device/FRU unique failure reason codes.

Table 8 (Page 1 of 3). Current PCI 2.1 Class Code Definition

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

<i>Table 8 (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	Power PC
	40	Co-processor

Table 8 (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	Fiber channel

Table 9 (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 9 (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	CD-ROM SCSI
	F1	CD-ROM 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

Appendix F. Firmware Updates

This section provides information and instruction for updating firmware. You may need to perform these steps if you are installing an option or if your support representative has instructed you to update your firmware.

Check the Current System Firmware and Service Processor Firmware Levels

To verify the current levels that are installed on the system, use the following steps:

1. Log in as root user.
2. Type the following at the command line:

```
lscfg -vp | grep -p alterable
```

3. Press Enter. This command produces a report similar to the following:

```
ROM Level . (alterable) . . . . .sc000811 <===service processor F/W level
ROM Level . (alterable) . . . . .NAN00210 <===system firmware level
```

Note:

In the example above, if the current version of service processor firmware is sc000811, the last six characters of the ROM level represent a date in a *yyymmdd* format, where *yy* is the last two digits of the year, *mm* is the month and *dd* is the day of the firmware (Gregorian date).

Also in the example above, if the current version of system firmware is NAN00210, the last five characters of the ROM level represent a date in a *yyddd* format, where *yy* is the last two digits of the year and *ddd* is the Julian date of the firmware.

Check the web site at <http://www.rs6000.ibm.com/support/micro> for the latest level of downloadable firmware. If the version of system firmware installed on your system is older than (has an earlier date) the system firmware shown on the web site, you should consider downloading and applying the update. If the version of service processor firmware installed on your system is older than (has an earlier date) the service processor firmware shown on the web site, you should consider downloading and applying the update.

Firmware Updating After EEPROM or I/O Board Replacement

If the firmware has to be updated due to the replacement of the EEPROMs or the I/O board, there are two methods of obtaining the update image:

1. Ask the customer to download the update image and instructions from the RS/6000 support web site at <http://www.rs6000.ibm.com/support/micro>, and follow the instructions for updating the firmware.
2. If access to the support web site is not provided, obtain the firmware update diskettes from CORE. Provide these diskettes to the customer so that the customer can load the update image onto an intermediate AIX system (one that has a diskette drive). The intermediate system must be on the same network that the Model B80 being serviced is on.

Proceed to "Loading the Firmware Update Image From Diskette". You may need to provide these instructions to the customer.

Loading the Firmware Update Image From Diskette

On an intermediate AIX system with a diskette drive, enter the commands:

mkdir /tmp/fwupdate.

Note: If the directory /tmp/fwupdate already exists, make sure it is empty before proceeding.

cd /tmp/fwupdate

Then enter:

restore

You will be prompted to mount volume 1 on /dev/rfd0.

In the drive of the target server, put the AIX backup diskette labeled:

Volume 1: AIX backup: combined system and svp F/W for 7026 Model B80

When prompted for volume 2, in the drive of the target server, put the AIX backup diskette labeled:

Volume 2: AIX backup: combined system and svp F/W for 7026 Model B80

The file is now located in the /tmp/fwupdate subdirectory on the intermediate AIX system.

7026 Model B80 Firmware Updates

To update the system firmware, perform the following steps:

1. Log in as root user.
2. If the directory **/tmp/fwupdate** does not exist, create it by issuing the following command:

```
mkdir /tmp/fwupdate
```
3. The firmware update file must be written into the **/tmp/fwupdate** directory on the Model B80. This can be done by using the **ftp** command to get the image from an ftp server, NFS-mounting the directory on the host server, or downloading it from the web site at <http://www.rs6000.ibm.com/support/micro>.

After the firmware update file has been written into the **/tmp/fwupdate** directory, verify its existence by entering the following command:

```
ls /tmp/fwupdate/sx*.img
```

The update file name will have the format *sxyydd.img*. The *sx* indicates that this is a combined image for a Model B80 server, *yy* is the last two digits of the year, and *ddd* is the Julian date of the update file.

4. After the update file has been written to the **/tmp/fwupdate** directory, enter the following commands:

```
cd /usr/lpp/diagnostics/bin  
then  
/update_flash -f /tmp/fwupdate/sxyydd.img
```

Where *sxyydd.img* is the name of the firmware update file in the **/tmp/fwupdate** directory.

Notes:

- a. Make sure that you include the periods (.) in the commands shown above.
- b. AIX commands are case-sensitive. Type them exactly as shown.

You are asked by the system for confirmation to proceed with the firmware update and the required reboot. If you confirm, the system applies the new

firmware, reboots, and returns to the AIX prompt. This may take up to ten minutes, depending on the configuration of the system.

Attention: On some systems, the message *Wait for rebooting before stopping* may appear on the system display. *Do not* turn off the system unit until the system has fully rebooted to the AIX login prompt. If a shutdown is necessary at that time, log in as root user and issue the **shutdown** command. While the update is in progress, you will see *Rebooting...* on the display for as long as three minutes.

The firmware update is complete.

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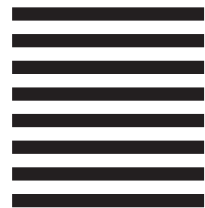
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