

IBM

@server

pSeries 610 Model 6C1 and Model 6E1
Service Guide

SA38-0599-01





@server[®]

pSeries 610 Model 6C1 and Model 6E1
Service Guide

SA38-0599-01

Second Edition (February 2002)

Before using this information and the product it supports, read the information in "Safety Notices" on page ix, Appendix A, "Environmental Notices" on page 315, and Appendix B, "Notices" on page 317.

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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:

- x
- 53
- 54
- 251
- 280

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:

- x
- xi
- 53
- 251
- 293

Note: For a translation of these notices, see *System Unit Safety Information*, order number SA23-2652.

Rack Safety Instructions

- Do not install this unit in a rack where the internal rack ambient temperatures will exceed 40 degrees C.
- Do not install this unit in a rack where the air flow is compromised. Any side, front or back of the unit used for air flow through the unit must not be in direct contact with the rack.
- Care should be taken to ensure that a hazardous condition is not created due to uneven mechanical loading when installing this unit in a rack. If the rack has a stabilizer it must be firmly attached before installing or removing this unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to the rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement for the supply circuit.
- An electrical outlet that is not correctly wired could place hazardous voltage on the 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.

Electrical Safety

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

DANGER

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

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 all power cables from the electrical outlet before relocating the system.

Laser Safety Information

CAUTION:

This product may contain a CD-ROM which is a class 1 laser product.

Laser Compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with the IEC 825 (first edition 1984) as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:

All IBM laser modules are designed so that there is never any human access to laser radiation above a class 1 level during normal operation, user maintenance, or prescribed service conditions. Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. Only trained service personnel should perform the inspection or repair of optical fiber cable assemblies and receptacles.

Data Integrity and Verification

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 @server pSeries 610 Model 6C1 and Model 6E1 as well as adapters and attached devices that do not have their own service information. It also contains Maintenance Analysis Procedures (MAPs) that are not common to other systems. In this book, the @server pSeries 610 Model 6C1 and Model 6E1 are hereafter referred to as the "system."

MAPs that are common to all systems are contained in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

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

ISO 9000

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

Related Publications

The following publications provide additional information about your system unit:

- The *@server pSeries 610 Model 6C1 and Model 6E1 Installation Guide*, order number SA38-0597, contains information on how to set up and cable the system, install and remove options, and verify system operation.
- The *@server pSeries 610 Model 6C1 and Model 6E1 User's Guide*, order number SA38-0598, contains information to help users use the system, use the service aids, and solve minor problems.
- The *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, order number SA38-0509, contains diagnostic information, service request numbers (SRNs), and failing function codes (FFCs).
- The *RS/6000 @server pSeries Adapters, Devices, 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 *RS/6000 @server pSeries 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 *System Unit Safety Information*, order number SA23-2652, contains translations of safety information used throughout this book.
- 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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- pSeries
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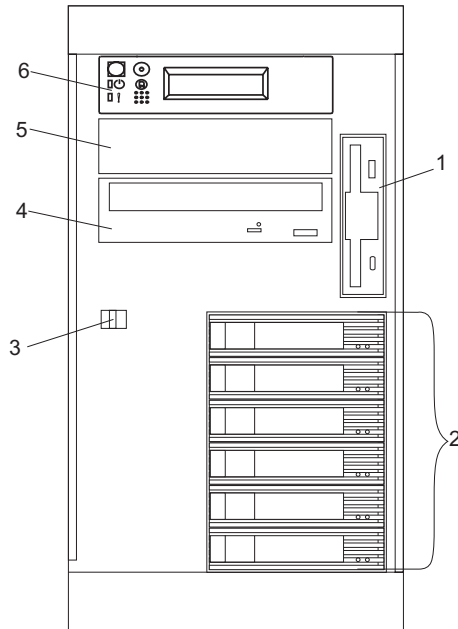
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Chapter 1. Reference Information

System Unit Locations

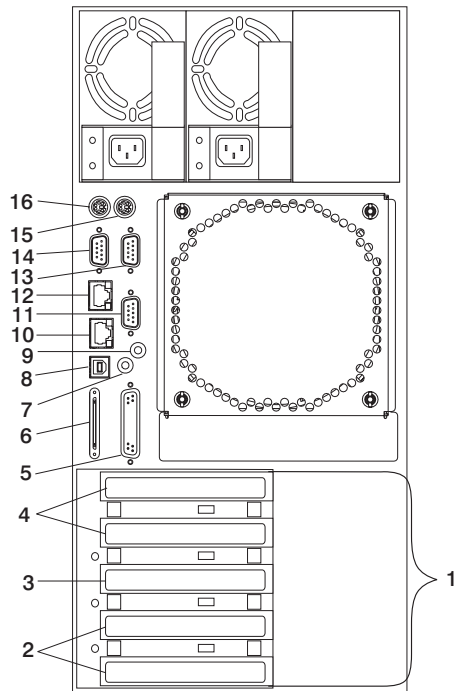
Model 6E1

Front View



- 1 Diskette drive
- 2 Hot-swap disk drives (optional on some systems)
- 3 Cover release lever
- 4 CD-ROM drive
- 5 Media bay
- 6 Operator panel

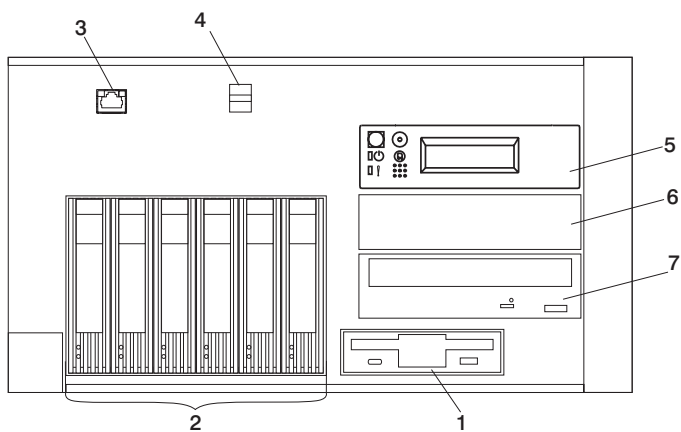
Rear View



- 1 PCI slots
- 2 PCI slots 1-2 (64-Bit/3.3V)
- 3 PCI slot 3 (64-Bit/5V)
- 4 PCI slots 4-5 (32-Bit/5V)
- 5 Parallel connector
- 6 SCSI connector
- 7 Attention LED
- 8 Rack indicator connector
- 9 Power LED
- 10 Ethernet connector 2
- 11 Serial connector 1
- 12 Ethernet connector 1
- 13 Serial connector 3
- 14 Serial connector 2
- 15 Mouse connector
- 16 Keyboard connector

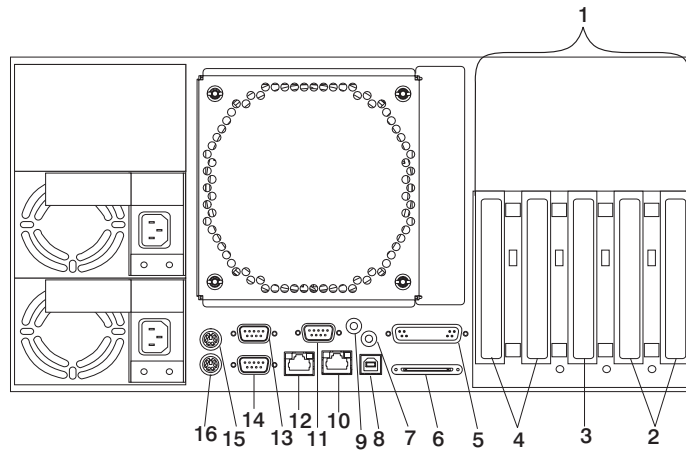
Model 6C1

Front View



- 1 Diskette drive
- 2 Hot-swap disk drives (optional on some systems)
- 3 Serial connector 1 (front)
- 4 Cover release lever
- 5 Operator panel
- 6 Media bay
- 7 CD-ROM drive

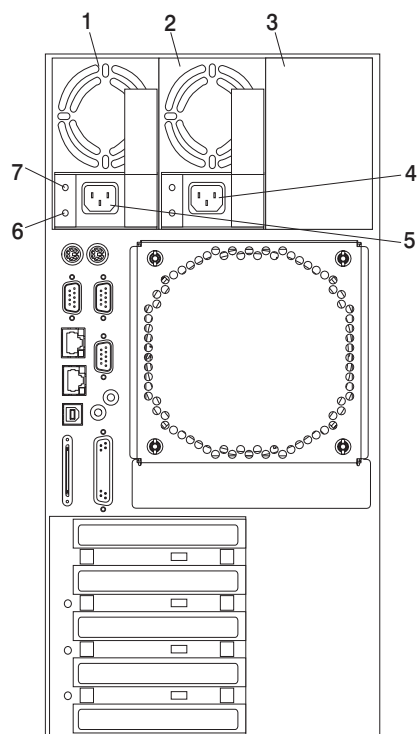
Rear View



- | | |
|----|-----------------------------|
| 1 | PCI slots |
| 2 | PCI slots 1-2 (64-Bit/3.3V) |
| 3 | PCI slot 3 (64-Bit/5V) |
| 4 | PCI slots 4-5 (32-Bit/5V) |
| 5 | Parallel connector |
| 6 | SCSI connector |
| 7 | Attention LED |
| 8 | Rack indicator connector |
| 9 | Power LED |
| 10 | Ethernet connector 2 |
| 11 | Serial connector 1 (rear) |
| 12 | Ethernet connector 1 |
| 13 | Serial connector 3 |
| 14 | Serial connector 2 |
| 15 | Mouse connector |
| 16 | Keyboard connector |

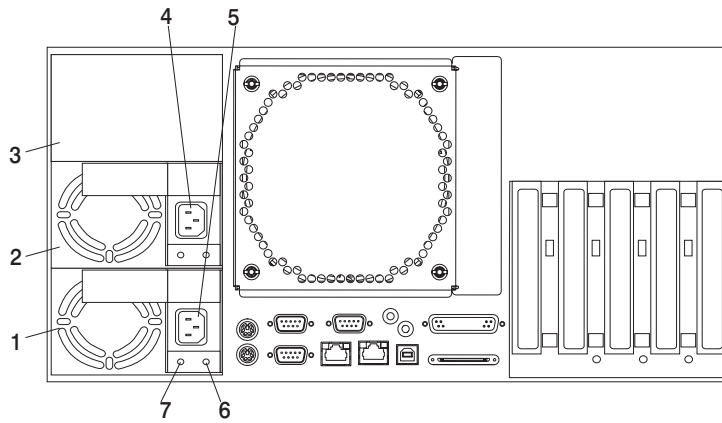
Power Supply Locations

Model 6E1



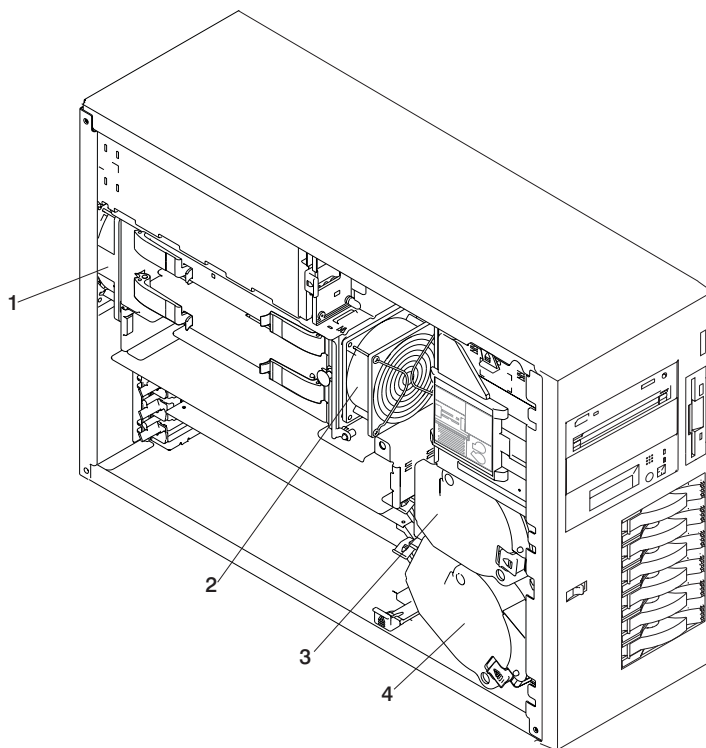
- | | |
|---|--------------------------------|
| 1 | Power supply 1 |
| 2 | Power supply 2 |
| 3 | Filler panel or power supply 3 |
| 4 | Power supply 2 power connector |
| 5 | Power supply 1 power connector |
| 6 | DC power light |
| 7 | AC power light |

Model 6C1



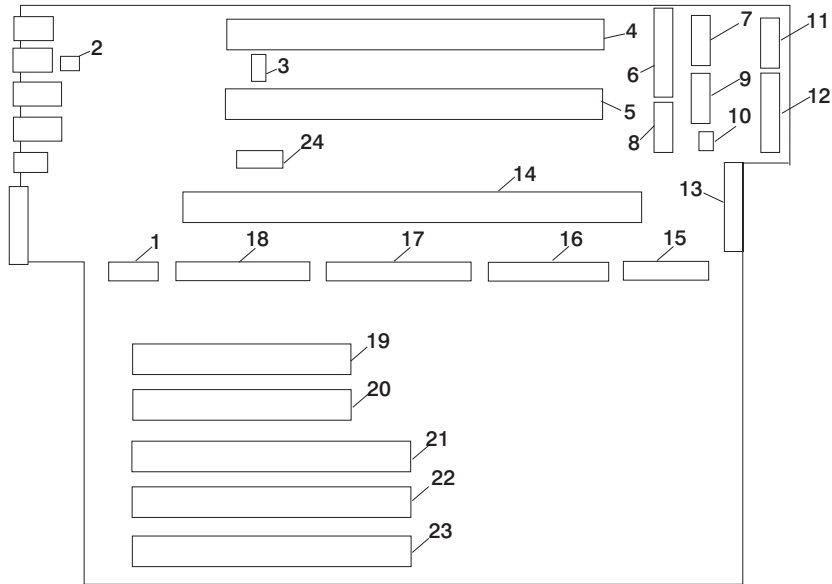
- 1 Power supply 1
- 2 Power supply 2
- 3 Filler panel or power supply 3
- 4 Power supply 2 power connector
- 5 Power supply 1 power connector
- 6 DC power light
- 7 AC power light

Fan Locations



- | | |
|---|--------|
| 1 | Fan #1 |
| 2 | Fan #2 |
| 3 | Fan #3 |
| 4 | Fan #4 |

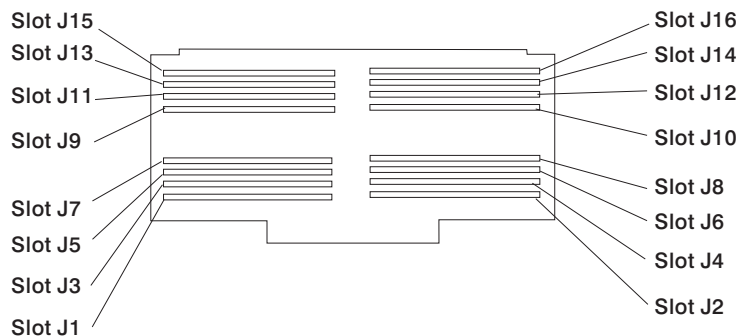
System Board Locations



- | | | | |
|---------|---------------------------------------|----|--|
| 1 | Rear serial port (#1) connector | 2 | Rear power and attention LED connector |
| 3 | Processor power connector | 4 | Processor #2 card connector |
| 5 | Processor #1 card connector | 6 | Power connector |
| 7 | Power connector | 8 | Power connector |
| 9 | Power connector | 10 | Light path card connector |
| 11 | Processor fans | 12 | Blowers |
| 13 | Diskette connector | 14 | Memory card connector |
| 15 | Front serial port connector | 16 | Operator panel connector |
| 17 | CD-ROM IDE connector | 18 | Internal SCSI connector |
| 19 - 20 | 32-bit PCI connectors
(33MHz, 5V) | 21 | 64-bit PCI connector
(33MHz, 5V) |
| 22 - 23 | 64-bit PCI connector
(50MHz, 3.3V) | 24 | Battery connector |

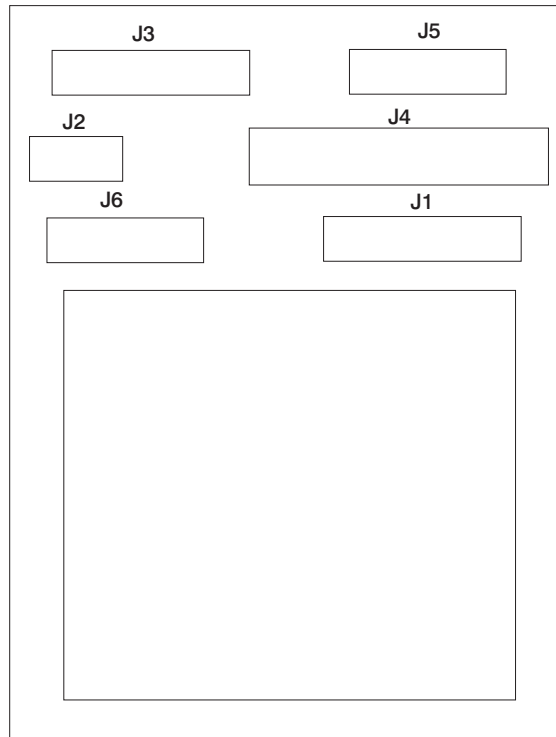
Memory DIMMs Location

Note: Memory DIMMs must be installed and removed in pairs and in the correct slots.
(Slots J1 and J2, J3 and J4, J5 and J6, and so on.)



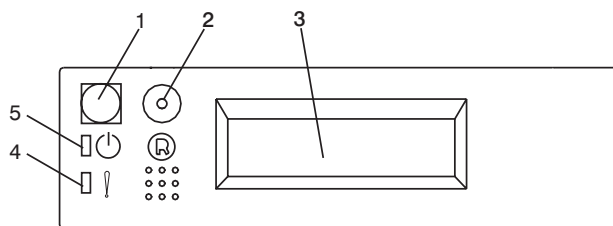
Slot J1	Location P1-M1.1	Slot J2	Location P1-M1.2
Slot J3	Location P1-M1.3	Slot J4	Location P1-M1.4
Slot J5	Location P1-M1.5	Slot J6	Location P1-M1.6
Slot J7	Location P1-M1.7	Slot J8	Location P1-M1.8
Slot J9	Location P1-M1.9	Slot J10	Location P1-M1.10
Slot J11	Location P1-M1.11	Slot J12	Location P1-M1.12
Slot J13	Location P1-M1.13	Slot J14	Location P1-M1.14
Slot J15	Location P1-M1.15	Slot J16	Location P1-M1.16

Power Backplane



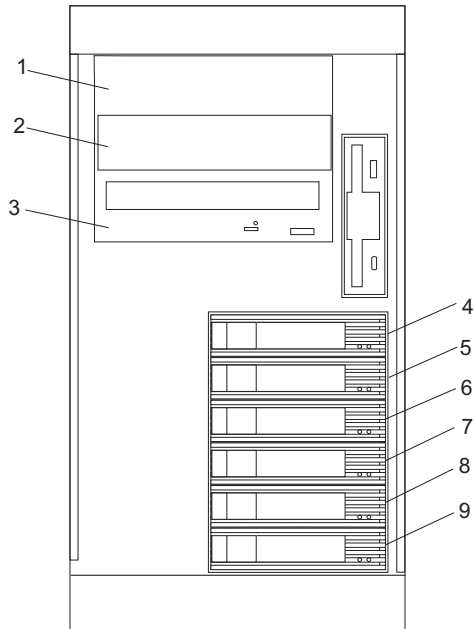
- | | |
|----|----------------------|
| J1 | SCSI backplane power |
| J2 | Media devices power |
| J3 | System board power |
| J4 | System board power |
| J5 | System board power |
| J6 | System board power |

Operator Panel



- 1 Power-On Switch
- 2 Reset Switch
- 3 Display
- 4 Attention LED
- 5 Power-On LED

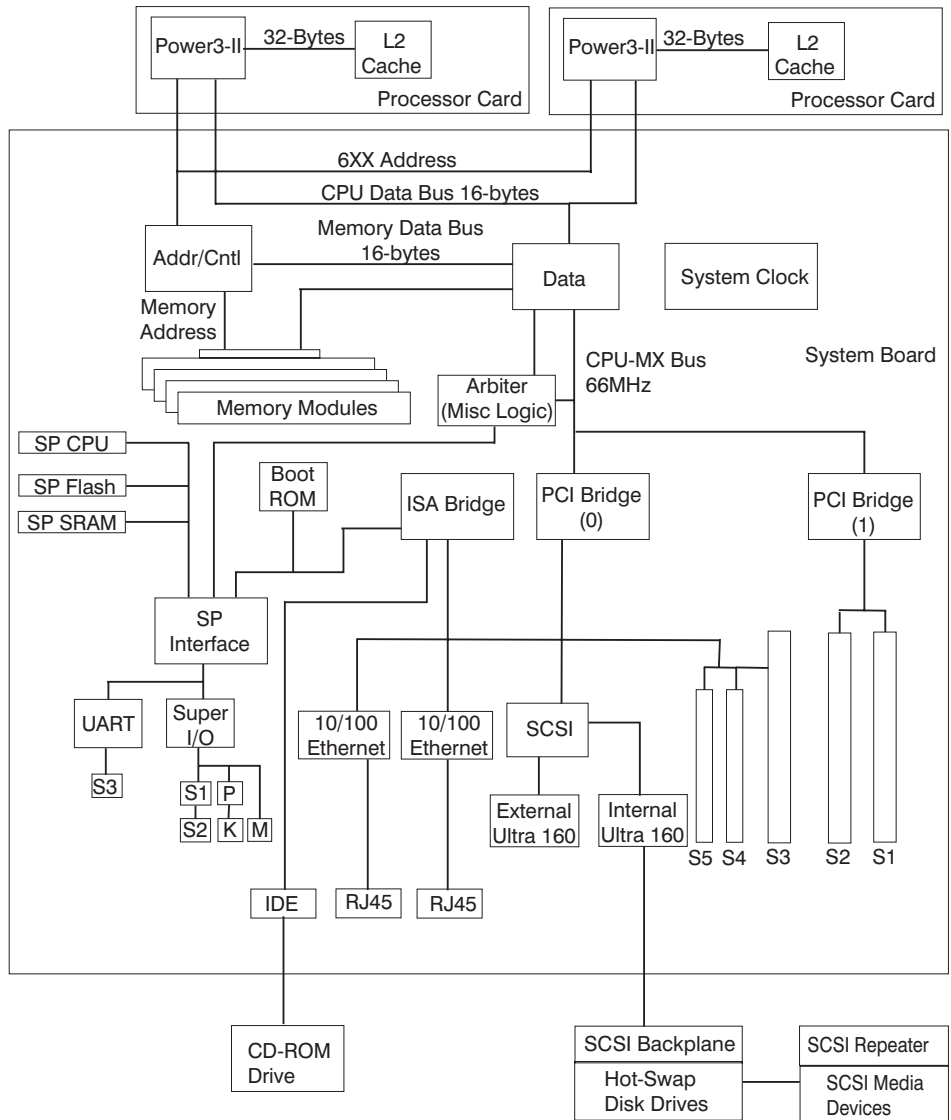
SCSI IDs and Bay Locations



Index	Bay Location	Drive Name	SCSI ID
1	D01	Disk Drive (behind operator panel)	SCSI ID 0
2	D02	Media	SCSI ID 1
3	D03	IDE CD-ROM	IDE (Non-SCSI)
3	D03	SCSI Device	SCSI ID 2
4	D10	Disk Drive	SCSI ID 10
5	D11	Disk Drive	SCSI ID 11
6	D12	Disk Drive	SCSI ID 12
7	D13	Disk Drive	SCSI ID 13
8	D14	Disk Drive	SCSI ID 14
9	D15	Disk Drive	SCSI ID 15

Note: The SCSI bus IDs are the recommended values and indicate how the IDs are set when the system is shipped from the factory. Field installations might not comply with these recommendations.

System Logic Flow Diagram



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 processor 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.

The . (period) identifies sublocations (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.

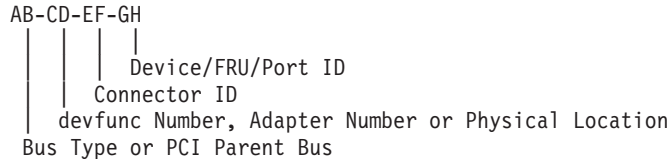
AIX Location Codes

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

Non-SCSI Devices/Drives

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



- The AB value identifies a bus type or PCI parent bus as assigned by the firmware.
- The CD value identifies adapter number, the 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 AB are:

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

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

- For pluggable PCI adapters/cards, CD is the device's devfunc number (PCI device number times 8, plus the function number). The C and D are characters in the range of 0-9, and A-F (hex numbers). Location codes therefore uniquely identify multiple adapters on individual PCI cards.
- For pluggable ISA adapters, CD is equal to the order of the ISA cards defined/configured either by SMIT or the ISA Adapter Configuration Service Aid.
- For an integrated ISA adapters, CD is equal to a unique code identifying the ISA adapter. In most cases, this code is equal to the adapter's physical location code. In cases where a physical location code is not available, CD will be FF.

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

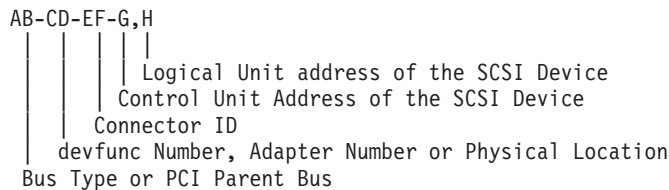
GH is used to identify a port, device, or FRU. For example:

- For async, devices GH defines the port on the fanout box. The values re 00 a 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 an 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.

SCSI Devices/Drives

For SCSI devices, the location code is defined as follows:



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 XXXXXXXX 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 1:

P1-C1

- Second memory card in planar P1:
P1-M2
- Memory DIMM 12 on second memory card plugged into planar P1:
P1-M2.12

Examples of AIX location codes displayed are as follows:

- Integrated PCI adapter:

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

- Pluggable PCI adapters:

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

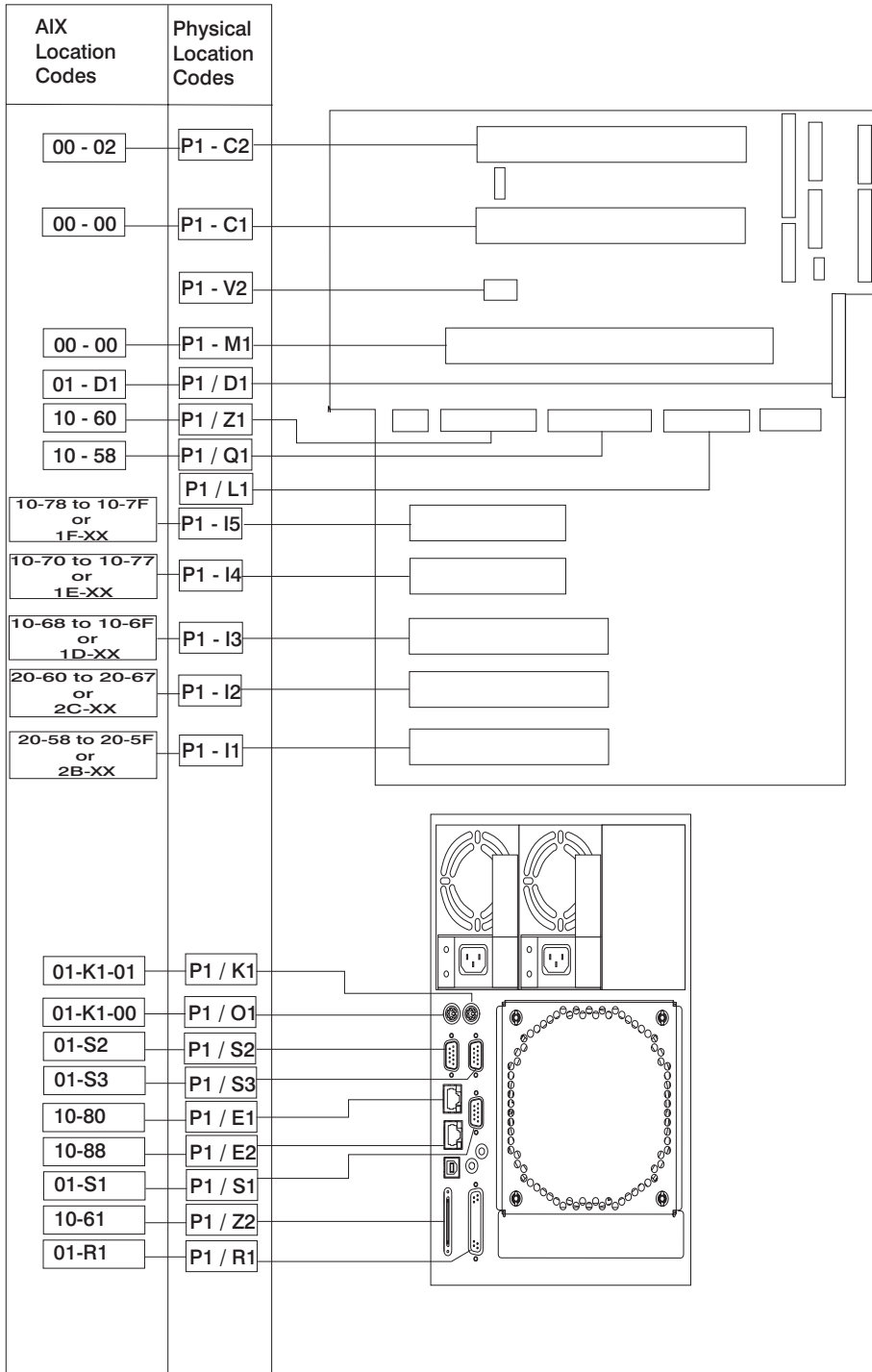
- Integrated ISA adapters:

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

- Device attached to SCSI controller:

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

AIX and Physical Location Code Table

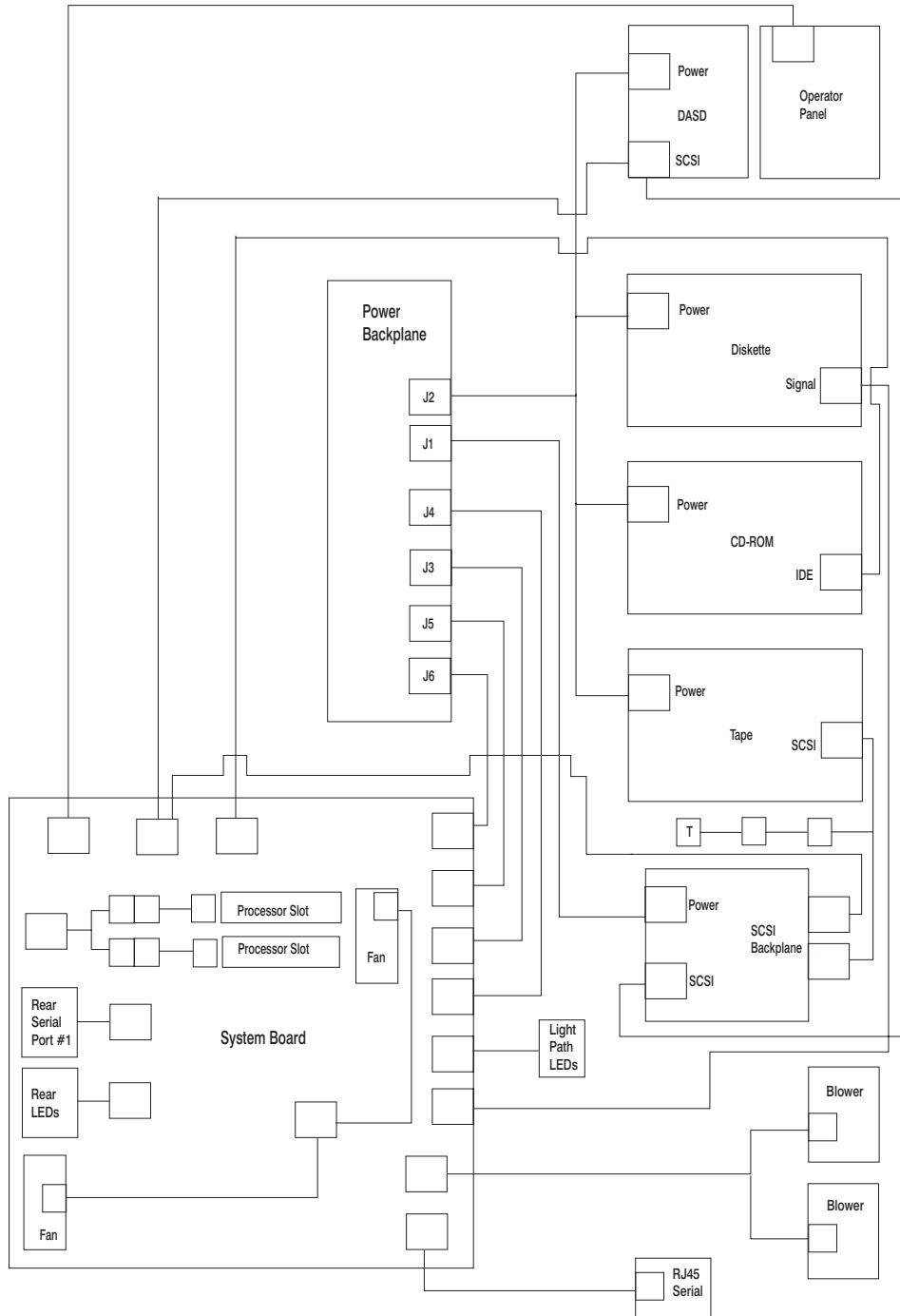


Component Name	AIX Location Code	Physical Location Code	Logical Identification
Central Electronics Complex (CEC)			
System Board	00-00	P1	
Processor Card 1	00-00	P1-C1	Processor 0
Processor Card 2	00-02	P1-C2	Processor 2
Memory Card	00-00	P1-M1	
Memory DIMMs on Memory Card	00-00	P1-M1.1 thru P1-M1.16	Extents: 0H, 0L, 2H, 2L, 4H, 4L, 6H, 6L, 1H, 1L, 3H, 3L, 5H, 5L, 7H, 7L
Integrated Devices			
Diskette Drive	01-D1-00-00	P1-D1	
Keyboard	01-K1-00-00	P1/K1-K1	
Mouse	01-K1-01-00	P1/O1-O1	
Diskette Port	01-D1	P1/D1	
Keyboard Port	01-K1-00	P1/K1	
Mouse Port	01-K1-01	P1/O1	
Serial Port 1	01-S1	P1/S1	
Serial Port 2	01-S2	P1/S2	
Serial Port 3	01-S3	P1/S3	
Parallel Port	01-R1	P1/R1	
Ethernet Port 1	10-80	P1/E1	
Ethernet Port 2	10-88	P1/E2	
Internal SCSI Port	10-60	P1/Z1	
External SCSI Port	10-61	P1/Z2	
IDE Port	10-58	P1/Q1	
Base CD-ROM (IDE) in bay D03	10-59	P1/Q1-A2	
Pluggable Adapters			
PCI Host Bridge 1	00-FEE00000	P1	
Card in PCI Slot 1	20-58 to 20-5F or 2B-xx	P1-I1	
Card in PCI Slot 2	20-60 to 20-67 or 2C-xx	P1-I2	
PCI Host Bridge 0	00-FEF00000	P1	
Card in PCI Slot 3	10-68 to 10-6F or 1D-xx	P1-I3	
Card in PCI Slot 4	10-70 to 10-77 or 1E-xx	P1-I4	

Component Name	AIX Location Code	Physical Location Code	Logical Identification
Card in PCI Slot 5	10-78 to 10-7F or 1F-xx	P1-I5	
SCSI Devices			
SCSI Backplane	N/A	P2	
SCSI Repeater Backplane	N/A	N/A	
SCSI Device in bay D01	10-60-00-0,0	P1/Z1-A0	Internal SCSI Bus ID 0
SCSI Device in bay D02	10-60-00-1,0	P1/Z1-A1	Internal SCSI Bus ID 1
SCSI Device in bay D03	10-60-00-2,0	P1/Z1-A2	Internal SCSI Bus ID 2
SAF-TE Controller	10-60-00-9-0	P1/Z1-A9	SCSI Enclosure Services Controller
Hot-swap DASD bay 1	10-60-00-10,0	P1/Z1-Aa	Primary SCSI Bus ID 10
Hot-swap DASD bay 2	10-60-00-11,0	P1/Z1-Ab	Primary SCSI Bus ID 11
Hot-swap DASD bay 3	10-60-00-12,0	P1/Z1-Ac	Primary SCSI Bus ID 12
Hot-swap DASD bay 4	10-60-00-13,0	P1/Z1-Ad	Primary SCSI Bus ID 13
Hot-swap DASD bay 5	10-60-00-14,0	P1/Z1-Ae	Primary SCSI Bus ID 14
Hot-swap DASD bay 6	10-60-00-15,0	P1/Z1-Af	Primary SCSI Bus ID 15
Fans			
Fan 1		F1	Fan
Fan 2		F2	Fan
Fan 3		F3	Fan
Fan 4		F4	Fan
Operator Panel			
Operator panel		L1	
Lightpath LED panel		L2	
Power Supply			
Power backplane		P3	
Power supply 1		P3-V1	
Power supply 2		P3-V2	
Power supply 3		P3-V3	

Component Name	AIX Location Code	Physical Location Code	Logical Identification
Battery			
Battery		P1-V2	
System VPD module			
System VPD module		L1-N1	
<p>Notes:</p> <ol style="list-style-type: none"> 1. The physical location code for the PCI slots, when empty, uses the P1/lx notation, where the 'l' identifies an integrated device (in this case the empty slot). A PCI device plugged into the slot uses the P1-lx notation, where the 'l' identifies a plugged device. 2. The SCSI bus IDs are the recommended values. The SCSI IDs shown for media devices indicate how the devices are set when they are shipped from the factory. Field installations may not comply with these recommendations. 			

System Cables



Specifications

Dimensions	Rack (Model 6C1)	Tower (Model 6E1)
Height	215 mm 8.5 in. 5 EIA Units	426 mm (16.8 in.)
Width	426 mm 16.8 in.	215 mm (8.5 in.)
Depth	617 mm 24 in.	617 mm (24 in.)
Weight		
Minimum configuration		35.5 kg 78 lbs.
Maximum configuration		43.1 kg 94.8 lbs.
Electrical		
Power source loading (maximum in kVA)		0.46
Power source loading (typical in kVA)		0.31
Voltage range (V ac)	100 to 127 or 200 to 240 (autoranging)	
Frequency (hertz)	50 / 60	
Voltage range (V dc)	Not supported	
Thermal output (maximum)	1536 Btu/hr	
Thermal output (typical)	1024 Btu/hr	
Power requirements (maximum)	450 watts	
Power requirements (typical)	300 watts	
Power factor - US, World Trade, Japan	0.98	
Inrush current ²	70 amps	
Maximum altitude ^{3,4}	2135 m (7000 ft.)	
Temperature Requirements³	Operating 10 to 40°C (50 to 104°F)	Non-Operating 10 to 52°C (50 to 126°F)
Humidity Requirements⁴ (Noncondensing)	Operating 8 to 80%	Non-Operating 8 to 80%
Wet Bulb	27°C (80°F)	27°C (80°F)
Model 6E1 Noise Emissions^{1,5}	Operating	Idle
L _{WAd}	6.1 bels	6.1 bels
<L _{pA} > _m	42 dBA	41 dBA
Model 6C1 Noise Emissions^{1,5}	Operating	Idle
L _{WAd}	6.4 bels	6.1 bels
<L _{pA} > _m	44 dBA	41 dBA
Install/Air Flow	Maintenance of proper service clearance should allow proper air flow.	

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 137 m (450 ft.) above 915 m (3000 ft.).
3. The upper limit of the wet bulb temperature must be derated 1 degree C per 274 m (900 ft.) above 305 m (1000 ft.).
4. 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.

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 301 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.
2. Check the covers for proper fit to the system. They should be in place and secure.
3. Gently rock the system from side to side to determine if it is steady.
4. Set the power switch of the system 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.
9. Check the voltage label on the back of the system 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, check for 0.1 ohm or less resistance between the ground lug on the external power cable plug and the metal frame.
12. Perform the following checks on each device that has its own power cables:
 - a. Check for damage to the power cord.
 - b. Check for the correctly 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 plug and the metal frame of the device.
13. Install the covers.

Chapter 2. Diagnostic Overview

The system uses an integrated set of software diagnostic procedures to facilitate isolation of failing components and system maintenance. This book, along with the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, is the basis of the diagnostic procedures for the system. In particular, Chapter 4, “Checkpoints” on page 85, Chapter 5, “Error Code to FRU Index” on page 113, Chapter 6, “Loading the System Diagnostics” on page 179, and Chapter 10, “Parts Information” on page 301, 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 4 GB of memory or greater have access to a 4-mm or 8-mm 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 system. These MAPs are the entry point for all isolation and error recovery procedures. The MAPs are consistent with existing procedures and methods. The system uses a set of integrated procedures, mentioned earlier, 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 *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* and *PCI Adapter Placement Reference*.

The Quick Entry MAP is a subset of the Entry MAP and helps to save 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 to diagnose a power problem. Power problems can be related to powering on and powering off the system, or power failures that occur after power is turned on.

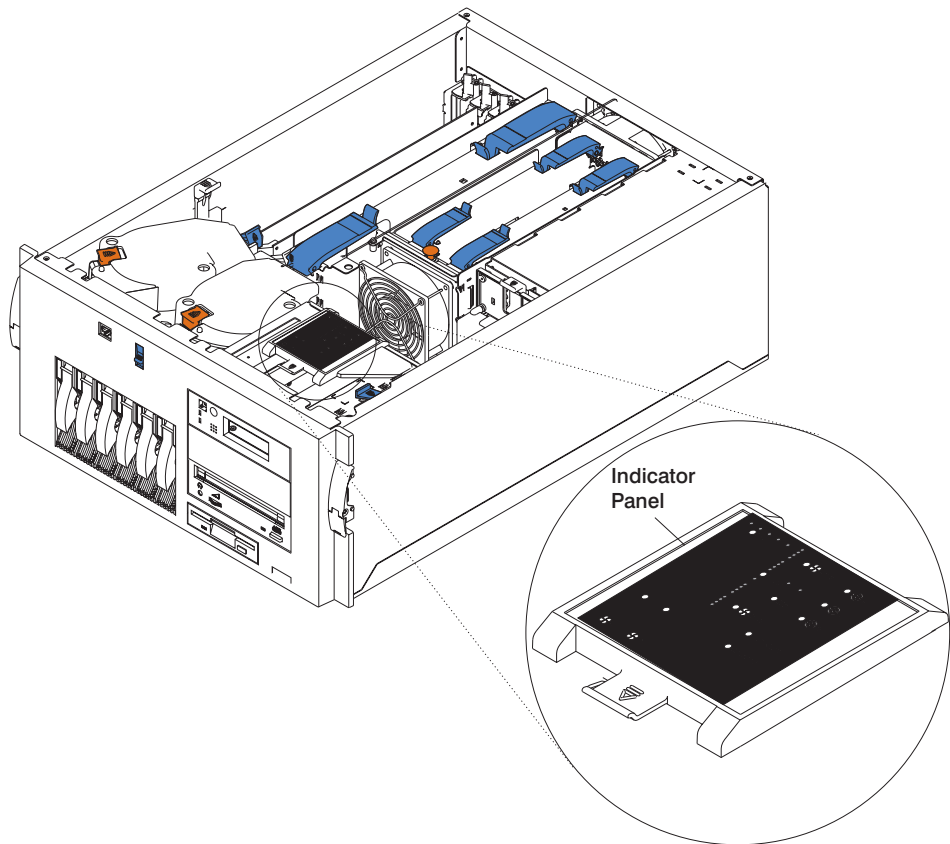
The Minimum Configuration MAP is used to locate defective components not found by normal diagnostics or error-isolation methods. This MAP provides a systematic method of isolation to the failing item or items.

Attention LED and Lightpath LEDs

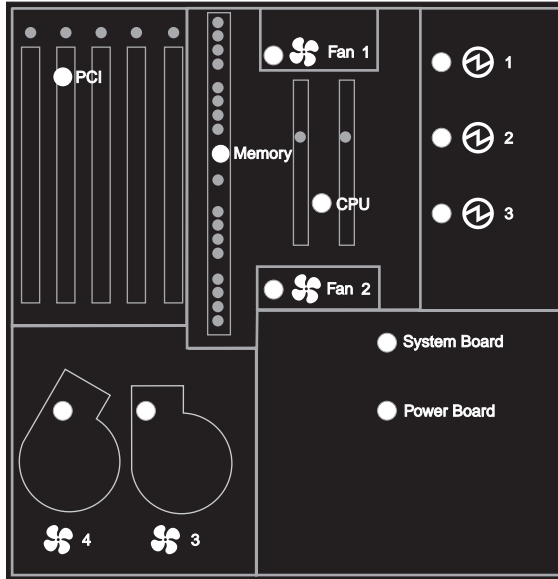
The Attention and Lightpath LEDs provide a means to identify failing components in your server. When a failing component is detected in your server, the Attention LED is turned on. To further help you identify the failing component, go to the indicator panel (see "Indicator Panel") inside the server and check which LEDs are on.

Indicator Panel

The panel provides enough information to identify the area that needs attention. The panel contains a group of amber LEDs that indicate which functional area of the system is experiencing the fault (such as power, CPUs, memory, fans). If one of these LEDs is on, the user or service representative is directed to the physical area of the server where an additional LED on will be on, indicating the component that is responsible for the current fault.



The following illustration shows the LEDs on the indicator panel, located inside the server.



Component LEDs

In addition to the indicator panel or display, individual LEDs are located on or near the failing components. The LEDs are either on the component itself or on the carrier of the component (memory card, fan, memory module, CPU).

The LEDs are amber, except for the power supplies. For the power supplies, two green LEDs (ac power good and dc power good) indicate the fault condition for the power supply.

Resetting the LEDs

To reset the LEDs:

1. Replace the failing component with the new component.
2. Log in as root user.
3. At the command line, type `diag`.
4. Select **Task Selection**.
5. Select **Log Repair Action**.
6. Select the device that was repaired. (If the device is not listed, select `sysplanar0`.)

Checkpoints

The system uses various types of checkpoints, error codes, and SRNs, which are referred to throughout this book (primarily in Chapter 4, “Checkpoints” on page 85, Chapter 5, “Error Code to FRU Index” on page 113, Chapter 6, “Loading the System Diagnostics” on page 179, and Chapter 10, “Parts Information” on page 301). These codes may appear in the service processor boot progress log, the AIX error log, and the operator panel display. Understanding the definition and relationships of these codes is important to the service personnel who are installing or maintaining the system.

Codes that can appear on the operator panel or in error logs are as follows:

Checkpoints

Checkpoints display in the operator panel from the time ac 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 ac 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 on is initiated, the service processor starts built-in self-test (BIST) on the central electronics complex (CEC). VPD data is 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 and 2xxx

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 was presented.

For a list of checkpoints, see Chapter 4, “Checkpoints” on page 85. 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*.

FRU Isolation

For a list of error codes and recommended actions for each code, see Chapter 5, “Error Code to FRU Index” on page 113. These actions can refer to Chapter 10, “Parts Information” on page 301, Chapter 3, “Maintenance Analysis Procedures (MAPs)” on page 35, 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 locations codes, see “Location Codes” on page 14.

To look up part numbers and view component diagrams, see Chapter 10, “Parts Information” on page 301. The beginning of that 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 that make up the system.

Electronic Service Agent for the RS/6000

Service support for the system can be enhanced through the use of the application program, Electronic Service Agent for the RS/6000. This application provides a number of advantages for the customer, including automatic error reporting and analysis without customer intervention. The Electronic Service Agent kit ships with the system and includes the following:

- Electronic Service Agent for the RS/6000 program on CD-ROM
- The manual *Electronic Service Agent for the RS/6000 User's Guide*.

If the manual is not included, it can be downloaded from the following Web site:
<ftp://ftp.software.ibm.com/aix/>.

Using the Service Processor and Electronic Service Agent Features

The service processor and Electronic 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 can 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 Electronic Service Agent application.

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

Prior to installing the Electronic Service Agent feature, ensure that you have the latest level of system firmware. You also need a properly configured modem. For more information on configuring a modem, see Appendix D, "Modem Configurations" on page 323.

Electronic Service Agent

The Electronic Service Agent is a software extension to the AIX operating system that monitors the system while the AIX operating system is running. The Electronic 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 Electronic 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 Electronic Service Agent application. If the Electronic Service Agent application on a remote client decides a service request needs to be placed, the client forwards the information to the Electronic Service Agent server, which 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.

When used in a Scalable Parallel (SP) environment, a client/server type implementation is configured. The Electronic Service Agent client code runs on each of the SP nodes. The server component runs on the control workstation. In the event of any system failures, the relevant information is transmitted to the control workstation through the integrated Ethernet. Once alerted to the system failure, the control workstation initiates actions to prepare and send the service request.

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 Electronic Service Agent package. Refer to Appendix D, "Modem Configurations" on page 323 for more information on configuring your modem.

Chapter 3. Maintenance Analysis Procedures (MAPs)

This chapter contains Maintenance Analysis Procedures (MAPs) for the system.

Notes:

1. If you replace a FRU, go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* to verify correct system operation.
2. 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 that has been captured in nonvolatile random access memory (NVRAM) is available for your use in fixing the problem. The AIX error log and SMIT are only available when diagnostics are run from the hard drive.
3. 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 14.
4. Licensed programs frequently rely on system information stored on the vital product data (VPD) on the operator panel control assembly. If the MAPs indicate that the operator panel should be replaced, update the VPD as described in "System Vital Product Data (VPD) Update Procedure" on page 286.
5. If a network adapter or the system board is replaced, the network administrator must be notified so that the client IP addresses used by the server can be changed. In addition, the operating system configuration of the network controller 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.
6. If you are not able to isolate the problem, try loading standalone diagnostics from the CD-ROM or NIM.

Quick Entry MAP

Use the following table to determine your starting point.

Quick Entry MAP Table of Contents


Problem Description	Page No.
Service Actions	37
System Stops With an 8-Digit Number Displayed	37
System Stops With a 4-Digit Number Displayed	37
OK Does Not Appear in the Operator Panel Display Before Pressing the Power On Button	37
System Stops or Hangs With Alternating Numbers Displayed in the Operator Display Panel.	38
There Appears to be a Display Problem (Distortion, Blurring,Etc.)	38
Power and Cooling Problems	38
Flashing 888 in Operator Panel Display	40
Other Symptoms or Problems	40
You Cannot Find the Symptom in this Table	43

Symptom	Action
Service Actions	
You have parts to exchange or a corrective action to perform.	<ol style="list-style-type: none"> 1. Go to Chapter 9, "Removal and Replacement Procedures" on page 251. 2. Go to "MAP 0410: Repair Checkout" in the <i>RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems</i>.
You need to verify that a part exchange or corrective action corrected the problem.	Go to "MAP 0410: Repair Checkout" in the <i>RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems</i> .
You need to verify correct system operation.	Go to "MAP 0410: Repair Checkout" in the <i>RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems</i> .
System Stops With An 8-Digit Number Displayed	
The system stops with an 8-digit error code displayed in the operator panel display or on the console.	Record the error code. Go to Chapter 5, "Error Code to FRU Index" on page 113.
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 86.</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 92.</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>RS/6000 @server pSeries 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>
OK does not appear in the operator panel display before pressing the power on button	

Symptom	Action
<p>A bouncing or scrolling ball remains on the operator panel display, or the operator panel display is filled with dashes or blocks.</p>	<p>If an ASCII terminal IS available, connect it to the system through serial port 1.</p> <ol style="list-style-type: none"> 1. If the service processor menu is displayed: <ol style="list-style-type: none"> a. Replace the operator panel assembly. Refer to "Operator Panel" on page 285. b. Replace the system board. Location: P1 (See note 3 on page 113.) 2. If the service processor menu is not displayed, replace the system board. Location: P1 (See note 3 on page 113.) <p>If an ASCII terminal is NOT available, replace the following, one at a time.</p> <ol style="list-style-type: none"> 1. Operator panel assembly. Refer to "Operator Panel" on page 285. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
System Stops or Hangs With Alternating Numbers Displayed in the Operator Display Panel	
<p>The operator panel display alternates between the code "E1FD" and another "Exxx" code.</p>	<p>Record both codes. Go to "E1FD" in "Firmware Checkpoints" on page 92.</p>
<p>The operator panel display alternates between the codes "E1DE" and "E1AD".</p>	<p>Record both codes. Go to "E1DE" in "Firmware Checkpoints" on page 92.</p>
Display Problem (Blank, Distortion, Blurring, Etc.).	
<p>All display problems.</p>	<ul style="list-style-type: none"> • If using a graphics display: <ol style="list-style-type: none"> 1. Go to the Problem Determination Procedures for the display. 2. If you do not find a problem, replace the display adapter, then go to "MAP 0410: Repair Checkout" in the <i>RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems</i>. 3. If you do not find a problem, suspect the system board. Go to "MAP 1540: Minimum Configuration" on page 63. • 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 Problem Determination Procedures for the terminal. 3. If you do not find a problem, suspect the system board. Go to "MAP 1540: Minimum Configuration" on page 63.
Power and Cooling Problems	

Symptom	Action
<p>The power LEDs on the operator panel and power supplies do not start blinking within 30 seconds of ac power application and the operator panel display is blank.</p>	<p>Go to "MAP 1520: Power", "Step 1520-2" on page 55.</p>
<p>The power LEDs on the operator panel and power supplies are blinking and the operator panel display is blank.</p>	<p>Go to "MAP 1520: Power", "Step 1520-3" on page 55</p>
<p>The power LED on the operator panel is on solid, the power LEDs on the power supplies are blinking and the operator panel display is blank.</p> <p>When the power on switch on the operator panel is pressed, there is no indication of activity. The power LED on the power supply does not change from blinking to solid and none of the fans, including the fan in the power supplies, start to turn.</p>	<p>Go to "MAP 1520: Power", "Step 1520-3" on page 55</p>
<p>The power LEDs on the operator panel and power supplies are blinking and OK, STBY or DIAG STBY is displayed on the operator panel display.</p> <p>When the power on switch on the operator panel is pressed, there is no indication of activity. None of the power LEDs change from blinking to solid and none of the fans, including the fan in the power supplies, start to turn.</p>	<p>Go to "MAP 1520: Power", "Step 1520-3" on page 55</p>
<p>The power LEDs on the operator panel and power supplies are blinking and OK, STBY or DIAG STBY is displayed on the operator panel display.</p> <p>When the power on switch on the operator panel is pressed, the power LEDs change from blinking to solid and the system begins to power on, but the power LEDs on the operator panel and power supplies do not stay on and the system powers off.</p>	<p>Go to "MAP 1520: Power", "Step 1520-3" on page 55</p>

Symptom	Action
<p>The power LED on the operator panel is on solid, the power LED on the power supply is blinking and OK, STBY or DIAG STBY is displayed on the operator panel display.</p> <p>When the power on switch on the operator panel is pressed, there is no indication of activity. The power LED on the power supply does not change from blinking to solid and none of the fans, including the fans in the power supplies, start to turn.</p>	<p>Go to "MAP 1520: Power", "Step 1520-3" on page 55</p>
<p>The power LEDs on the operator panel and power supplies are blinking and OK, STBY or DIAG STBY is displayed on the operator panel display.</p> <p>When the power on switch on the operator panel is pressed, the power LEDs change from blinking to solid, the fans come on and stay on, but the system does not power on.</p>	<p>Go to "MAP 1520: Power", "Step 1520-3" on page 55</p>
<p>The power LED on the operator panel is on solid, the power LED on the power supplies are blinking and OK, STBY or DIAG STBY is displayed on the operator panel display.</p> <p>When the power on switch on the operator panel is pressed, the power LED on the operator panel changes from blinking to solid, the fans come on and stay on, but the system does not power on.</p>	<p>Go to "MAP 1520: Power", "Step 1520-3" on page 55</p>
Flashing 888 in Operator Panel Display	
<p>888 is displayed in the operator panel.</p>	<p>Go to the "Fast Path MAP" in the <i>RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems</i>.</p>
Other Symptoms or Problems	
<p>You have OK displayed. Fans and blowers are off.</p>	<p>The service processor is ready. The system is waiting for power-on.</p>

Symptom	Action
You have STBY displayed.	The service processor is ready. The operating system has been terminated; the system is still powered on. This usually indicates an operating system crash. The service processor menus are available. Look for error codes related to the operating system crash in the service processor error log.
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/Concerns" on page 110.
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 63 to isolate the problem.
The system stops and the message "STARTING SOFTWARE PLEASE WAIT..." is displayed on the ASCII terminal, or the boot indicator is displayed on a graphics terminal. 	Go to "Boot Problems/Concerns" on page 110.
The system does not respond to the password being entered, or the system login prompt is displayed when booting in service mode.	<p>Verify that the password is being entered from the ASCII terminal or keyboard defined as the firmware 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 that is attached to the system, replace the keyboard. If replacing the keyboard does not fix the problem, replace the system board. Location: P1 (See notes on page 35.) • If entering the password from a keyboard that 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 system board if these procedures do not reveal a problem. • If the problem is fixed, go to "MAP 0410: Repair Checkout" in the <i>RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems</i>. If the problem persists, go to "MAP 1540: Minimum Configuration" on page 63 to isolate the problem.

Symptom	Action
<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. Location: L1 See 4 on page 35. 2. System board (See notes on page 35.) If the problem is fixed, go to "MAP 0410: Repair Checkout" in the <i>RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems</i>. If the problem persists, go to "MAP 1540: Minimum Configuration" on page 63 to isolate the problem.
<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 system board if connected to one of the two integrated SCSI controllers on the system board). (See notes on page 35 if the system 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 5, "Error Code to FRU Index" on page 113 and perform the listed action. e. If no recent error is logged in the error log, continue to the next step below. 2. Go to "Boot Problems/Concerns" on page 110. 3. Go to "MAP 1540: Minimum Configuration" on page 63.
<p>You have a problem that does not prevent the system from booting.</p>	<p>Go to the "Fast Path MAP" in the <i>RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems</i>.</p>

Symptom	Action
You have an SRN.	Go to the "Fast Path MAP" in the <i>RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems</i> .
You suspect a cable problem.	See the <i>RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems</i> .
You do not have a symptom.	Go to "MAP 0020: Problem Determination Procedure" in the <i>RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems</i> .
You have not determined a symptom.	Go to "MAP 1020: Problem Determination" on page 44.
You Cannot Find the Symptom in this Table	
All other problems.	Go to "MAP 1020: Problem Determination" on page 44.

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 *RS/6000 @server pSeries 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 “System Information Menu” on page 194).

Be prepared to record code numbers and use those numbers in the course of analyzing a problem.

The service processor may have been set by the user to monitor server operations and to attempt recoveries. You may wish to disable these actions while you diagnose and service the system. If the system was set up according to the recommendations of the User's Guide, all the settings of the service processor (except language) were saved by using the SAVE/RESTORE HARDWARE MAINTENANCE POLICIES service aid. You 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 might want to disconnect the modem to prevent incoming signals that could cause the system to power on.

The following service processor settings may be of interest to you. The service processor menus are described in “Service Processor Menus” on page 182.

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: 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: Before doing the following procedure be aware that:

- You are asked questions regarding the operator panel display.
 - You are also asked to perform certain actions based on displayed POST indicators.
1. Insert the diagnostic CD-ROM into the CD-ROM drive.
 2. Turn off the power.
 3. Turn on the power.
 4. When the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard icon on a graphical display), press the F5 key on the directly attached keyboard or the number 5 key on an ASCII terminal.
 5. Enter a password, if requested.
 6. Wait until the diagnostics are loaded or the system appears to stop.
 7. Find your symptom in the following table. Then follow the instructions given in the Action column.

Symptom	Action
The diskette LED is blinking rapidly, or EIEA or EIEB is displayed on the operator panel.	The flash EPROM data is corrupted. Run the recovery procedure for the flash EPROM. See "Firmware Recovery" on page 236.
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: Problem Determination Procedure" in the <i>RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems</i> .
The system login prompt is displayed.	You may not have pressed the correct key or you may not have pressed the key soon enough when initiating a service mode IPL of the diagnostic programs. If this was the case, start over at the beginning of this step. Note: Perform the system shutdown procedure before turning off the system. If you are sure you pressed the correct key in a timely manner, go to "Step 1020-2" on page 47.
The system does not respond when the password is entered.	Go to "Step 1020-2" on page 47.

Symptom	Action
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 M0MEM002. • Keyboard, record error code M0KBD000. • SCSI, record error code M0CON000. • Network, record error code M0NET000. • Speaker (audio), record error code M0BT0000. <p>Go to "Step 1020-3" on page 47.</p>
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 86. If the number is in the range of "E1xx-EFFF" then go to "Firmware Checkpoints" on page 92.</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>RS/6000 @server pSeries 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 48.
All other symptoms.	If you were directed here from the Entry MAP, go to "MAP 1540: Minimum Configuration" on page 63. Otherwise, find the symptom in the "Quick Entry MAP" on page 36.

Step 1020-2

There is a problem with the keyboard.

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

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

Step 1020-3

Take the following actions:

1. Find the 8-digit error code in Chapter 5, "Error Code to FRU Index" on page 113.

Note: If the 8-digit error code is not listed in Chapter 5, "Error Code to FRU Index" on page 113, 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 *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

2. Perform the action listed.

Step 1020-4

1. Turn off, then turn on the system unit.
2. When the keyboard indicator appears, press the F1 key on a directly attached keyboard or the 1 key on an ASCII terminal.
3. When the System Management Services menu appears, check the error log for any errors.
 - Choose Error Log from the utilities menu
 - If an error is logged, check the time stamp.
 - If the error was logged during the current boot attempt, record it.
 - Look up the error in the Chapter 5, "Error Code to FRU Index" on page 113 and perform the listed action.
 - If no recent error is logged in the error log, go to "MAP 1540: Minimum Configuration" on page 63.

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. You may also have been sent here by an 8-digit error code.

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/or a 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 63.
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). If you find an obvious problem, fix the problem; then go to “MAP 0410: Repair Checkout” in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
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 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 cables before removing or installing the memory DIMMs to avoid damage to them.

Memory DIMMs must be installed in matched (size and speed) pairs. Refer to “Memory Card and Memory DIMMs” on page 264 for labeling of the memory card and instructions on DIMM removal and installation. (Do not, however, replace the covers as directed while troubleshooting this problem.) A single memory DIMM pair may be installed in module slots J1 and J2 (not slots J1 and J3). A second memory DIMM pair could be installed in module slots J5 and J6 (slots J3 and J4 do not have to be populated first). Along these same lines, there is no requirement that memory DIMM slots J1 and J2 be populated before another slot pair.

Step 1240-1

1. Turn off the power.
2. Remove all installed memory DIMMs from the memory card. Record the positions of the memory DIMMs so that when instructed to reinstall them they can be installed in their original positions.
3. Install one pair of memory DIMMs.
4. Turn on the power.

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

NO If there are no more memory DIMMs to be installed, reseating the DIMMs on the memory card has corrected the problem.

If there was more than one pair of memory DIMMs on the memory card, go to “Step 1240-2” on page 51.

YES Go to “Step 1240-3” on page 51.

Step 1240-2

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

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

NO Repeat this step until all the memory DIMMs are installed and tested.

If all the memory DIMMs have been installed, reseating the memory DIMMs on the memory card has corrected the problem.

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

YES Go to "Step 1240-3".

Step 1240-3

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

1. Turn off the power.
2. Exchange the last memory DIMM pair installed with another pair removed in "Step 1240-1" on page 50 (or any other available pair).
3. Turn on the power.

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

NO Go to "Step 1240-5" on page 52.

YES Go to "Step 1240-4" on page 52.

Step 1240-4

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

1. Turn off the power.
2. Replace the following FRUs (one at a time) in the order listed.
 - Memory card
 - System board
 - Processor card, processor #1, then processor #2
3. Turn on the power.

Note: Replacing any of the above listed FRUs may result in missing and new resources.

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

NO Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries 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 FRUs have been exchanged, go to "MAP 1540: Minimum Configuration" on page 63.

Step 1240-5

The memory DIMM(s) (may be both) 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 DIMMs you exchanged in the previous step.
3. Turn on the power.

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

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

Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

YES Replace the memory DIMM.

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

If the symptom did not change and both memory DIMMs have been exchanged, go to "Step 1240-4".

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 another MAP, an SRN in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, or an error code.
2. The @server pSeries 610 Model 6C1 and Model 6E1 can accommodate three power supplies installed with separate power receptacles on the rear of the system.

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

Observe the following safety notice during service procedures.

DANGER

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

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

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

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

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

CAUTION:

This product is equipped with a 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 all power cables from the electrical outlet before relocating the system.

Step 1520-1

Check the power supply ac LEDs, the green LED on the rear of the system unit and the power LED on the operator panel.

Note: If the condition exists that three power supplies are present, but only two are working, you can verify this situation through the service processor and a warning-level EPOW.

You might have been directed to this MAP for several reasons:

- The ac LEDs on the power supplies are not on, the green LED on the rear of the system unit is not flashing and the operator panel is blank.
Go to “Step 1520-2” on page 55.
- The ac LEDs on the power supplies are on, the green LED on the rear of the system unit is not flashing and the operator panel is blank.
Go to “Step 1520-7” on page 57.
- The ac LEDs on the power supplies are on, the green LED on the rear of the system unit is flashing and OK, STBY or DIAG STBY is displayed on the operator panel.
When the power button on the operator panel is pressed:
 - There is no indication of activity
 - The power LED on the operator panel does not come on
 - The green LED on the rear of the system unit does not come on
 - The dc LEDs on the power supplies are not on
 - None of the fans start to turn.Go to “Step 1520-7” on page 57.
- The ac LEDs on the power supplies are on, the green LED on the rear of the system unit is 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
 - The green LED on the rear of the system unit comes on
 - The dc LEDs on the power supplies are on
 - All of the fans start to turn but the power LED on the operator panel, the green LED on the rear of the system unit, the dc LEDs on the power supplies and the fans do not stay on.Go to “Step 1520-7” on page 57.
- An SRN in *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* listed “MAP 1520: Power” on page 53 in the “Action/Description” column for a voltage sensor out of range.

Step 1520-2

1. Turn off the power.
2. Unplug the power cables from the power outlet.
3. Unplug the power cables from the system.
4. Check that the power cables have continuity.
5. Check that the power 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 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Step 1520-3

1. Find all the cables connecting the power backplane to the system. Unplug these cables from the system, but leave them attached to the power backplane.
2. Connect the power cables from the system unit to the power outlets.

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

NO Go to "Step 1520-4".

YES Go to "Step 1520-7" on page 57.

Step 1520-4

1. Unplug the power cord from the system unit.
2. Unplug all the cables from the power backplane.
3. Connect the power cables to the system unit.

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

NO Go to "Step 1520-6" on page 56.

YES Go to "Step 1520-5" on page 56.

Step 1520-5

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

1. Unplug the power cables from the system.
2. Reconnect one of the cables to the power backplane.
3. Connect the power cables to the system.

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

NO Replace the last cable that you connected to the power backplane.

Repeat this step until all the cables have been reconnected.

Replace the faulty cooling fan. Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries 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 backplane may be defective.

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

- Power supply 1.
 - Power supply 2.
 - Power supply 3 (if installed).
 - Power backplane.
1. Turn off the power.
 2. Unplug the power cables from the system.
 3. Exchange one of the FRUs in the list.
 4. Connect the power cables to the system.

Do the ac LEDs on the power supplies come on 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 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Step 1520-7

1. Unplug the power cables from the system.
2. Exchange the operator panel electronics assembly.
3. Plug the power cables into the system 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 1520-8".
- YES** Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Step 1520-8

1. Turn off the power.
2. Unplug the power cables from the system.
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.
5. Remove the second processor card (if installed).
6. Unplug the power cable from the 6-pack backplane.
7. Unplug the disk drives from the 6-pack backplane.
8. Unplug the power cables from all devices in the media bay.
9. Remove or unplug all the fans.
10. Plug the power cables into the system.
11. 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 58.
- YES** Go to "Step 1520-10" on page 59.

Step 1520-9

Note: Either the processor card, 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:

- Power supply 1.
 - Power supply 2.
 - Power supply 3 (if installed).
 - Power backplane.
 - Processor board
1. Turn off the power.
 2. Unplug the power cables from the system.
 3. Exchange one of the FRUs in the list.
 4. Connect the power cables to the system.
 5. Turn on the power.

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

NO Repeat these steps until all the parts have been installed or connected.

If the symptom did not change and all the parts have been installed or connected, call 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 1520-1" on page 54 in this MAP and follow the instructions for the new symptom.

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

Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries 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.
3. PCI adapters, lowest slot to highest slot.
4. Fans.

Turn the power on 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.
3. Install or connect one of the parts in the list.
4. Plug the power cable into the system.
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 the memory card was just installed, remove all of the memory DIMMs. If the system does not come up, replace the memory card.

Reinstall the memory DIMMs, one pair at a time, until the problem recurs. Replace the memory DIMM pair that was just installed.

Note: The memory DIMM pair must be installed in slots that are next to each other. Refer to “Memory Card and Memory DIMMs” on page 264.

Repeat these steps until all the parts have been installed.

Go to “Step 1520-11”.

YES Go to “MAP 0410: Repair Checkout” in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Step 1520-11

Does the system contain three power supplies?

NO Go to “Step 1520-12” on page 60.

YES Go to “Step 1520-14” on page 61.

Step 1520-12

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

Exchange the following FRUs in the order listed:

1. Power supply.
2. Power cables to system board.
3. System board.
4. Power backplane.

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 0410: Repair Checkout" in the *RS/6000 @server pSeries 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 has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to "Step 1520-1" on page 54 in this MAP, and follow the instructions for the new symptom.

Step 1520-13

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

Did you find a problem?

NO Go to "Step 1540-1" on page 64.

YES Correct the problem. Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Step 1520-14

Because the @server pSeries 610 Model 6C1 and Model 6E1 accommodate redundant power supplies, it is not necessary to power off the system when replacing a power supply.

The power supplies are symmetrical, so replacement starts with power supply 1 (the unit closest to the bottom in a Model 6C1 or to the top left in a Model 6E1). Refer to “Power Supply” on page 280 for instructions on replacing a power supply.

Notes:

1. Always service first the power supply whose green LED, located on top of the power supplies, 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 order:

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 0410: Repair Checkout” in the *RS/6000 @server pSeries 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 60.

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

Step 1520-15

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

Shut down the system and remove the power cable from the system.

Exchange the following FRUs in order:

1. Power cables to system board.
2. System board.
3. Power backplane.

Restart the system and 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 0410: Repair Checkout" in the *RS/6000 @server pSeries 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 60.

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

MAP 1540: Minimum Configuration

Notes:

1. Be sure to unplug the power cords before removing or installing processor card(s), the memory card, or the system board to avoid damage to it.
2. This MAP assumes that a CD-ROM drive is installed and connected to the integrated SCSI or IDE adapter, and a diagnostic CD-ROM is available.
3. If a power-on password or privileged-access password is installed, you are prompted to enter the password before the diagnostic CD-ROM can load.
4. The term "POST indicators" refers to the icons (graphic 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 "System Information Menu" on page 194).
6. The service processor might have been set by the user to monitor server 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 Mode	From the 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: a. Number of reboot attempts to 0 (zero) b. Use OS-Defined restart policy to No c. 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.

When directed to exchange a FRU that is common to a FRU removed to create a minimum configuration system, use one of the removed FRUs instead of a new FRU. For example, if the system contains 16 memory modules and you are directed to remove 14 of them to create a minimum configuration system, then use one of the removed memory modules when exchanging the FRU. Once the failing FRU is isolated, replace it with a new one.

Step 1540-1

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

Note: If you cannot insert the diagnostic CD-ROM, go to "Step 1540-2" on page 65.

2. Ensure that the diagnostics and the operating system are shut down.
3. Turn off the power.
4. Turn on the power.
5. When the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard icon on a graphical display), press the F5 key on the directly attached keyboard or the number 5 key on an ASCII terminal.
6. Enter the appropriate password if you are prompted to do so.

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

NO Go to "Step 1540-2" on page 65.

YES Go to "Step 1540-18" on page 79.

Step 1540-2

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 63. Then return here and continue.
3. Exit the service processor menus and remove the power cords.
4. Disconnect all external cables (parallel, serial port 1, serial port 2, serial port 3, keyboard, mouse, Ethernet, SCSI, and so on).
5. Remove the service access cover (Model 6E1) or place the drawer (Model 6C1) into the service position and remove the service access cover.
6. Record the slot numbers of the PCI adapters. Label and record the locations of any cables attached to the adapters. Disconnect any cables attached to the adapters and remove all the adapters.
7. Remove the second processor (if installed). If the second processor is removed, ensure the first processor is installed.
8. Record the slot numbers of the memory DIMMs. Remove all memory DIMMs except for one pair from the memory card.

Notes:

- a. Place the memory DIMM locking tabs in the locked (upright) position to prevent damage to the tabs.
 - b. Memory DIMMs must be installed in pairs and in the correct connectors. For example, install the pair in connectors J1 and J2.
9. Disconnect the SCSI cable from the SCSI connector on the system board.
 10. Disconnect the IDE cable from the IDE connector on the system board.
 11. If installed, disconnect the signal and power connectors from the disk drive cage backplane.
 12. If installed, remove the disk drive(s) from the disk drive cage.
 13. Disconnect the signal and power connectors from all the SCSI devices.
 14. Disconnect the signal and power connectors from all the IDE devices.
 15. Disconnect the diskette drive cable from the diskette drive connector on the system board.
 16. Plug in the power cords and wait for the OK on the operator panel display.
 17. Turn on the power.

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

NO Go to "Step 1540-3" on page 66.

YES If a second processor card was removed, go to "Step 1540-4" on page 67.

If the system has only one processor card, go to "Step 1540-5" on page 67.

Step 1540-3

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

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

1. Turn off the power, remove the power cords, and exchange the following FRUs in the order listed:
 - a. Processor card
 - b. Memory DIMM in odd-numbered slot (J1, J3, J5)
 - c. Memory DIMM in even-numbered slot (J2, J4, J6)
 - d. Memory card
 - e. System board (see notes on page 35)
 - f. Power supplies.
2. Plug in the power cords and wait for the OK on the operator panel display.
3. 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 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 64 in this MAP and follow the instructions for the new symptom.

YES Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Step 1540-4

No failure was detected with this configuration.

1. Turn off the power and remove the power cords.
2. Reinstall the second processor card.
3. Plug in the power cords and wait for the 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 (see notes on page 35)

Repeat this step until the 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 64 and follow the instructions for the new symptom.

YES Go to "Step 1540-5".

Step 1540-5

No failure was detected with this configuration.

1. Turn off the power and remove the power cords.
2. Install a pair of memory DIMMs.

Note: Ensure that the new memory DIMMs are the same size and speed as the original memory DIMMs.

3. Plug in the power cords and wait for the 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 1540-6" on page 68.

YES Repeat this step until all the memory DIMMs are installed and tested.
Go to "Step 1540-9" on page 70.

Step 1540-6

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

1. Turn off the power and remove the power cords.
2. Exchange the last memory DIMM pair installed.
3. Plug in the power cords and wait for the 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 69.

YES Go to "Step 1540-7".

Step 1540-7

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

1. Turn off the power and remove the power cords.
2. Reinstall one of the memory DIMMs you exchanged in the previous step.
3. Plug in the power cords and wait for the 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 DIMM.

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

If the symptom did not change and both memory DIMMs have been exchanged, go to "Step 1540-8" on page 69.

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

If both memory DIMMs have been tested, go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Step 1540-8

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

1. Turn off the power and remove the power cords.
2. Exchange the following FRUs in the order listed.
 - a. Memory card
 - b. System board (see notes on page 35)
 - c. Power supply
3. Plug in the power cords and wait for the 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 of 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, return to "Step 1540-1" on page 64 in this MAP, and follow the instructions for the new symptom.

YES Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Step 1540-9

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

Notes:

- a. If an ASCII terminal has been defined as the firmware console, attach the ASCII terminal cable to the S1 connector on the rear of the system unit.
 - b. If a display attached to a display adapter has been defined as the firmware console, install the display adapter and connect the display to the adapter. Plug the keyboard into the keyboard connector on the rear of the system unit
3. Turn on the power.
 4. If the ASCII terminal or graphics display (including display adapter) is connected differently than it was before, the Console Selection screen appears and requires that a new console be selected.
 5. When the keyboard indicator is displayed, press the F1 key on the directly attached keyboard or the number 1 key on an ASCII terminal.
 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 the S1 serial port or the display attached to the graphics adapter, and test that device. If a problem is found, follow the procedures to correct the problem on that device.
2. Graphics adapter
3. Cable (async or graphics)
4. System board (see notes on page 35)

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 changed, check for loose cards, cables, and obvious problems. If you do not find a problem, return to "Step 1540-1" on page 64 and follow the instructions for the new symptom.

YES Go to "Step 1540-10" on page 71.

Step 1540-10

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn off the power and remove the power cords.
3. Plug the IDE cable into the IDE connector on the system board.
4. Plug in the power cords and wait for the OK on the operator panel display.
5. Turn on the power.
6. After the keyboard indicator is displayed, press the F5 key on the directly attached keyboard or the number 5 key on an ASCII terminal keyboard.
7. Enter the appropriate password if 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. IDE cable
2. CD-ROM drive
3. System board (see notes on page 35)
4. Processor card
5. Power supply.

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

If the symptom did not change and all the FRUs have been exchanged, call 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 64 in this MAP and follow the instructions for the new symptom.

YES Go to "Step 1540-11" on page 72.

Step 1540-11

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

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn off the power and remove the power cords.
3. Plug the SCSI cable into the SCSI connector on the system board.
4. Plug in the power cords and wait for OK on the operator panel display.
5. Turn on the power.
6. After the keyboard indicator is displayed, press the F5 key on the directly attached keyboard or the number 5 key on an ASCII terminal keyboard.
7. Enter the appropriate password if 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. SCSI cable
2. Last SCSI device connected (disk drive, tape drive)
3. System board (see notes on page 35)
4. Power supply.

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

If the symptom did not change and all the FRUs have been exchanged, call 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 64 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.

If the SCSI 6-pack is installed, go to "Step 1540-12" on page 73.

If the SCSI 6-pack is not installed, go to "Step 1540-14" on page 75.

Step 1540-12

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

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn off the power and remove the power cords.
3. Connect the signal and power connectors to the backplane.
4. Plug in the power cords and wait for OK on the operator panel display.
5. Turn on the power.
6. If the Console Selection screen is displayed, choose the system console.
7. After the keyboard indicator is displayed, press the F5 key on the directly attached keyboard or the number 5 key on an ASCII terminal keyboard.
8. Enter the appropriate password if 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. SCSI cable
2. Disk drive cage backplane

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

If the symptom did not change and all the FRUs have been exchanged, call 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 64 in this MAP and follow the instructions for the new symptom.

Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

YES Go to "Step 1540-13" on page 74.

Step 1540-13

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

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn off the power and remove the power cords.
3. Install a disk drive in the disk drive cage.
4. Plug in the power cords and wait for OK on the operator panel display.
5. Turn on the power.
6. After the keyboard indicator is displayed, press the F5 key on the directly attached keyboard or the number 5 key on an ASCII terminal keyboard.
7. Enter the appropriate password if 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 64 in this MAP and follow the instructions for the new symptom.

Yes Repeat this step until all drives are installed and tested.

Go to "Step 1540-14" on page 75.

Step 1540-14

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

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn off the power and remove the power cords.
3. Plug the diskette drive cable into the diskette drive connector on the system board.
4. Plug in the power cords and wait for OK on the operator panel display.
5. Turn on the power.
6. After the keyboard indicator displays, press the F5 key on the directly attached keyboard or the number 5 key on an ASCII terminal keyboard.
7. Enter the appropriate password if 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. Diskette drive
2. Diskette drive cable
3. System board (see notes on page 35)
4. Power supply

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

If the symptom did not change and all the FRUs have been exchanged, call 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 64 in this MAP and follow the instructions for the new symptom.

YES Go to "Step 1540-15" on page 76.

Step 1540-15

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

1. Turn off the power and remove the power cords.
2. Attach a system board device (parallel, serial port 1, serial port 2, serial port 3, keyboard, mouse, Ethernet, SCSI, keyboard or mouse) that had been removed.
3. Plug in the power cords 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 displays, press the F5 key on the directly attached keyboard or the number 5 key on an ASCII terminal keyboard.
7. Enter the appropriate password if 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. System board (see notes on page 35).

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

Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

YES Go to "Step 1540-16" on page 77.

Step 1540-16

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

1. Turn off the power and remove the power cords.
2. Install a FRU (adapter) and connect any cables and devices that were attached to the FRU.
3. Plug in the power cords 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 displays, press the F5 key on the directly attached keyboard or the number 5 key on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

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

NO Go to "Step 1540-17" on page 78.

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

Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Step 1540-17

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

1. Make sure the diagnostic CD-ROM is inserted into the CD-ROM drive.
2. Turn off the power and remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cords and wait for OK on the operator panel display.
5. Turn on the power.
6. If the Console Selection screen is displayed, choose the system console.
7. After the keyboard indicator displays, press the F5 key on the directly attached keyboard or the number 5 key on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

NO Repeat this step until the defective device or cable is identified or all 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. System board (see notes on page 35)
3. Power supply

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

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

Exchange the defective device or cable.

Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Step 1540-18

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. Select **Advanced Diagnostics Routines**.
4. If the terminal type has not been defined, you must use the Initialize Terminal option on the FUNCTION SELECTION menu to initialize the AIX diagnostic environment before you can continue with the diagnostics. This is a separate operation from selecting the firmware display.
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, select **System Verification** and press Enter.
7. Select **All Resources** (if you were sent here from “Step 1540-19” select the adapter/device you loaded from the supplemental media) and commit (F7) to start test routines. Follow the instructions on the screen to get test results.

Did you get an SRN?

NO Go to “Step 1540-20” on page 80.

YES Go to “Step 1540-19”.

Step 1540-19

Look at the FRU part numbers associated with the SRN.

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

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

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

If the system board or a network adapter is removed, see notes on page 35.

Go to “MAP 0410: Repair Checkout” in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

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

Step 1540-20

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

NO Go to "Step 1540-21".

YES Go to "Step 1540-22".

Step 1540-21

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

Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

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

Step 1540-22

Select **Task Selection**.

Select **Process Supplemental Media** and follow the onscreen instructions to process the media.

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

Did the system return to the TASKS SELECTION SCREEN after the supplemental media was processed?

NO Go to "Step 1540-23" on page 81.

YES Press F3 to return to the FUNCTION SELECTION screen.

Go to "Step 1540-18" on page 79, substep 4.

Step 1540-23

The adapter or device is probably defective.

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

1. Adapter
2. System board (see notes on page 35)

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

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

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

Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Step 1540-24

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 63 and then return here and continue.
4. Exit the service processor menus and remove the power cords.
5. Remove the service access cover (Model 6E1) or place the drawer (Model 6C1) into the service position and remove the service access cover.
6. Record the slot numbers of the PCI adapters. Label and record the locations of any cables attached to the adapters. Disconnect any cables attached to the adapters and remove all the adapters.
7. Plug in the power cords and wait for OK on the operator panel display.
8. Turn on the power.

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

NO Go to "Step 1540-26" on page 82.

YES Go to "Step 1540-25" on page 82.

Step 1540-25

One of the FRUs remaining in the system unit is defective. Do the following:

1. Turn off the power.
2. Remove the power cords.
3. Replace the system board (see notes on page 35).
4. Plug in the power cable and wait for OK on the operator panel display.
5. Turn on the power.

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

NO Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

YES Reinstall the original FRU.

If the symptom did not change and all the FRUs have been exchanged, return to "Step 1540-2" on page 65 in this MAP.

Step 1540-26

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

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

Does the system stop with the 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 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

YES Go to "Step 1540-27" on page 83.

Step 1540-27

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

1. Turn off the power.
2. Remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cords and wait for OK on the operator panel display.
5. Turn on the power.
6. If the Console Selection screen is displayed, choose the firmware console.
7. Enter the appropriate password if you are prompted to do so.

Does the system stop with the 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 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

YES Repeat this step until the defective device or cable is identified or all of the devices and cables have been disconnected.

If all of 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. System board (see notes on page 35)

Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

If the symptom did not change and all the FRUs have been exchanged, return to "Step 1540-2" on page 65 in this MAP.

Chapter 4. Checkpoints

Checkpoints let users and service personnel know what the server is doing, with some detail, while it initializes. These checkpoints are not intended to be error indicators, but in some cases, a server could hang at one of the checkpoints without displaying an 8-character error code. It is for these hang conditions, only, that any action should be taken regarding 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 “System Information Menu” on page 194. To access the System Information Menu, refer to “Privileged User Menus” on page 185.

Unresolved Checkpoint Problems

Go to “MAP 1540: Minimum Configuration” on page 63 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” on page 86 or “Firmware Checkpoints” on page 92.
- A 4-digit code is displayed and is listed in “Service Processor Checkpoints” on page 86 or “Firmware Checkpoints” on page 92, but there are no repair actions or FRUs listed for the code.
- 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 E010 to E0FF. The message **OK** indicates successful service processor testing and initialization. Firmware checkpoints are listed in “Firmware Checkpoints” on page 92.

If you replace FRUs or perform an action, and the problem is still unresolved, go to “MAP 1540: Minimum Configuration” on page 63 unless otherwise indicated in the tables.

If you replace FRUs or perform an action, and the problem is corrected, go to “MAP 0410: Repair Checkout” in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Table 1. Service Processor Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
DIAG STBY	Service processor is ready. The system unit was shut down in service mode by the operating system; however, the system unit is still powered on.	The service processor is ready. The operating system has been terminated; the system is still powered on. This usually indicates an operating system crash. The service processor menus are available. Look for error codes related to the operating system crash in the service processor error log.
E000	System support controller begins operation. This is an informational checkpoint.	Call support.
E010	Starting service processor self-tests	Replace the system board. Location: P1 (See note 3 on page 113.)
E011	Service processor self-tests completed successfully	Call support.
E012	Begin to set up service processor helps	Replace the system board. Location: P1 (See note 3 on page 113.)
E020	Configuring CMOS	Replace the system board. Location: P1 (See note 3 on page 113.)
E021	Configuring NVRAM	<ol style="list-style-type: none"> 1. Manually drain the NVRAM by removing the battery. Short circuit the battery leads for at least 30 seconds. Use a conductive object such as a coin or a screwdriver for this purpose. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
E022	Accessing system board VPD	Replace the system board. Location: P1 (See note 3 on page 113.)

Table 1. Service Processor Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E023	Accessing memory card VPD	Replace the memory card Location: P1-M1
E025	Service processor accessing VPD.	Replace the system board. Location: P1 (See note 3 on page 113.)
E026	Service processor accessing VPD.	Replace the system board. Location: P1 (See note 3 on page 113.)
E030	Beginning to build I ² C resources	1. Replace the processor card. Location: P1-C1 2. Replace the system board. Location: P1 (See note 3 on page 113.)
E031	Finished building I ² C resources	Replace the system board. Location: P1 (See note 3 on page 113.)
E032	JTAG self-test	Replace the system board. Location: P1 (See note 3 on page 113.)
E040	Starting serial port tests	Replace the system board. Location: P1 (See note 3 on page 113.)
E042	Configuring serial port 1	Replace the system board. Location: P1 (See note 3 on page 113.)
E043	Configuring serial port 2	Replace the system board. Location: P1 (See note 3 on page 113.)
E044	Preparing to set serial port line speed	Replace the system board. Location: P1 (See note 3 on page 113.)
E045	Preparing to disconnect serial port	Replace the system board. Location: P1 (See note 3 on page 113.)
E050	Reading system VPD	Operator panel. Location: L1 (See note 2 on page 113.)

Table 1. Service Processor Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E051	Reading processor card VPD	<p>If one processor is installed:</p> <ul style="list-style-type: none"> • Replace processor card 1 Location P1-C1 • Replace the system board. Location: P1 (See note 3 on page 113.) <p>If two processor cards are installed:</p> <ol style="list-style-type: none"> 1. Remove processor card 2 (P1-C2) and turn on the power. If the system does not hang on E051, replace processor card 2. If removing processor card 2 does not fix the system, continue to the next step. 2. Remove processor card 1 (P1-C1) and install processor card 2 in slot 1 (P1-C1) and turn on the power. If the system does not hang on E051, replace processor card 1. If this swap does not fix the system, continue to the next step. 3. Replace the system board. Location: P1 (See note 3 on page 113.)
E053	Reading system board VPD	<p>Replace the system board. Location: P1 (See note 3 on page 113.)</p>
E054	Reading system board VPD	<p>Replace the system board. Location: P1 (See note 3 on page 113.)</p>
E055	Reading power supply VPD	<p>Power supply Location: P3-V1 Location: P3-V2 Location: P3-V3</p>
E060	Preparing to auto power-on (AC restored)	<ol style="list-style-type: none"> 1. Replace the system board. Location: P1 (See note 3 on page 113.) 2. Replace processor card 1 Location P1-C1 3. Replace processor card 2 Location P1-C2
E061	Preparing to auto power-on (Timer)	<ol style="list-style-type: none"> 1. Replace the system board. Location: P1 (See note 3 on page 113.) 2. Replace processor card 1 Location P1-C1 3. Replace processor card 2 Location P1-C2

Table 1. Service Processor Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E070	Configuring modem	<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 unit. 3. Replace the modem. 4. Replace the system board. Location: P1 (See note 3 on page 113.)
E072	Preparing to call home	<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 unit. 3. Replace the modem. 4. Replace the system board. Location: P1 (See note 3 on page 113.)
E075	Service processor menus are available	<p>This code is posted on the operator panel when the service processor menus are available; the system is in stand-by waiting for user input.</p> <p>If the service processor menus are not displayed on the ASCII terminal:</p> <ol style="list-style-type: none"> 1. Verify that the ASCII terminal is functional. Check the cable between the ASCII terminal and the serial port on the system. 2. Remove, then reapply AC power. The service processor settings (modem speeds and call-out numbers, for example) may have to be reentered. 3. Replace the system board. Location: P1 (See note 3 on page 113.)
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 unit. 3. Replace the modem. 4. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 1. Service Processor Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E080	Entering service processor recovery flash update process.	<ol style="list-style-type: none"> 1. Do the following flash recovery procedure: <ol style="list-style-type: none"> a. Insert a newly formatted DOS diskette loaded with service processor firmware into the diskette drive. The file name must be <i>spflash.img</i>. Note: Insert the diskette after checkpoint E080 is displayed on the operator panel. b. Shut down the system unit and unplug the power cable. c. Plug in the power cable, power-on the system unit. 2. Retry item 1 with a newly formatted DOS diskette. 3. Replace the system board. Location: P1 (See note 3 on page 113.)
E081	Flash update completed - system reboot in progress	<ol style="list-style-type: none"> 1. Unplug the power cable. 2. Plug in the power cable, power-on the system unit. 3. Do the following flash recovery procedure: <ol style="list-style-type: none"> a. Insert a newly formatted DOS diskette loaded with service processor firmware into the diskette drive. The file name must be <i>spflash.img</i>. Note: Insert the diskette after checkpoint E080 is displayed on the operator panel. b. Shut down the system unit and unplug the power cable. c. Plug in the power cable, power-on the system unit. 4. Retry the flash recovery procedure with a newly formatted DOS diskette. 5. Replace the system board. Location: P1 (See note 3 on page 113.)
E0A0	Beginning bring-up phase	See "Error Codes E0A0, E0B0, E0C0, E0E0, E0E1 and 40A00000 Recovery Procedure" on page 175.
E0B0	Starting processor BIST	See "Error Codes E0A0, E0B0, E0C0, E0E0, E0E1 and 40A00000 Recovery Procedure" on page 175.

Table 1. Service Processor Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E0C0	Starting X5 BIST	See "Error Codes E0A0, E0B0, E0C0, E0E0, E0E1 and 40A00000 Recovery Procedure" on page 175.
E0D0	Creating JTAG scanlog (This procedure could take several minutes.)	Call support
E0E0	Pulling processor card out of the reset state.	See "Error Codes E0A0, E0B0, E0C0, E0E0, E0E1 and 40A00000 Recovery Procedure" on page 175.
E0E1	Pull processor card out of reset: okay	See "Error Codes E0A0, E0B0, E0C0, E0E0, E0E1 and 40A00000 Recovery Procedure" on page 175.
OK	Service Processor Ready. Waiting for power-on normal operation	Press the system unit's power button to power-on the system unit.
STBY	Service processor is ready. The operating system has been terminated; the system is still powered on.	This usually indicates an operating system crash. The service processor menus are available. Look for error codes related to the operating system crash in the service processor error log.

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 86.

If you replace FRUs or perform an action, and the problem is still unresolved, go to “MAP 1540: Minimum Configuration” on page 63 unless otherwise indicated in the tables.

If you replace FRUs or perform an action, and the problem is corrected, go to “MAP 0410: Repair Checkout” in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Table 2. Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E100	Reserved/Unused	See “Unresolved Checkpoint Problems” on page 85.
E101	Video enabled, extended memory test	See “Unresolved Checkpoint Problems” on page 85.
E102	Firmware restart	See “Unresolved Checkpoint Problems” on page 85.
E103	Set memory refresh (composite image)	See “Unresolved Checkpoint Problems” on page 85.
E104	Set memory refresh (recovery block)	See “Unresolved Checkpoint Problems” on page 85.
E105	Transfer control to operating system (normal boot).	See “Boot Problems/Concerns” on page 110.
E108	Run recovery block base memory (test 2K), set stack	See “Unresolved Checkpoint Problems” on page 85.
E109	Copy CRC verification code to RAM	See “Unresolved Checkpoint Problems” on page 85.
E10A	Turn on cache	See “Unresolved Checkpoint Problems” on page 85.
E10B	Flush cache	See “Unresolved Checkpoint Problems” on page 85.
E10C	Jump to CRC verification code in RAM	See “Unresolved Checkpoint Problems” on page 85.
E10D	Compute composite image CRC	See “Unresolved Checkpoint Problems” on page 85.
E10E	Jump back to ROM	See “Unresolved Checkpoint Problems” on page 85.
E10F	Transfer control to open firmware	See “Unresolved Checkpoint Problems” on page 85.
E110	Turn off cache, check if composite image CRC is valid	See “Unresolved Checkpoint Problems” on page 85.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E111	Good CRC - jump to composite image	See "Unresolved Checkpoint Problems" on page 85.
E112	Bad CRC - initialize base memory, stack	See "Unresolved Checkpoint Problems" on page 85.
E113	Bad CRC - copy uncompressed recovery block code to RAM	See "Unresolved Checkpoint Problems" on page 85.
E114	Bad CRC - jump to code in RAM	See "Unresolved Checkpoint Problems" on page 85.
E115	Bad CRC - turn on cache	See "Unresolved Checkpoint Problems" on page 85.
E116	Bad CRC - copy recovery block data section to RAM	See "Unresolved Checkpoint Problems" on page 85.
E117	Bad CRC - Invalidate and flush cache, set TOC	See "Unresolved Checkpoint Problems" on page 85.
E118	Bad CRC - branch to high level recovery control routine.	See "Unresolved Checkpoint Problems" on page 85.
E119	Initialize base memory, stack	See "Unresolved Checkpoint Problems" on page 85.
E11A	Copy uncompressed recovery block code to RAM	See "Unresolved Checkpoint Problems" on page 85.
E11B	Jump to code in RAM	See "Unresolved Checkpoint Problems" on page 85.
E11C	Turn on cache	See "Unresolved Checkpoint Problems" on page 85.
E11D	Copy recovery block data section to RAM	See "Unresolved Checkpoint Problems" on page 85.
E11E	Invalidate and flush cache, set TOC	See "Unresolved Checkpoint Problems" on page 85.
E11F	Branch to high level control routine.	See "Unresolved Checkpoint Problems" on page 85.
E120	Initialize I/O and early memory block	See "Unresolved Checkpoint Problems" on page 85.
E121	Initialize service processor	See "Unresolved Checkpoint Problems" on page 85.
E122	No memory detected (system lockup) Note: Disk drive light is on continuously.	Go to "MAP 1240: Memory Problem Resolution" on page 49.
E123	No memory DIMM found in socket.	See "Unresolved Checkpoint Problems" on page 85.
E124	Disable defective memory bank	See "Unresolved Checkpoint Problems" on page 85.
E125	Clear PCI devices command	See "Unresolved Checkpoint Problems" on page 85.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E126	Check valid image - start	See "Unresolved Checkpoint Problems" on page 85.
E127	Check valid image - successful	See "Unresolved Checkpoint Problems" on page 85.
E128	Disable interrupts, set initial vectors for open firmware.	See "Unresolved Checkpoint Problems" on page 85.
E129	Validate target RAM address	See "Unresolved Checkpoint Problems" on page 85.
E12A	Copy ROM to RAM, flush cache	See "Unresolved Checkpoint Problems" on page 85.
E12B	Set MP operational parameters	See "Unresolved Checkpoint Problems" on page 85.
E12C	Set MP CPU node characteristics	See "Unresolved Checkpoint Problems" on page 85.
E12D	Park secondary processors in parking lot	See "Unresolved Checkpoint Problems" on page 85.
E12E	Primary processor sync	See "Unresolved Checkpoint Problems" on page 85.
E12F	Unexpected return from open firmware (system lockup)	See "Unresolved Checkpoint Problems" on page 85.
E130	Build device tree	See "Unresolved Checkpoint Problems" on page 85.
E131	Create root node	See "Unresolved Checkpoint Problems" on page 85.
E132	Create CPUs node	See "Unresolved Checkpoint Problems" on page 85.
E133	Create L2 cache node	See "Unresolved Checkpoint Problems" on page 85.
E134	Create memory node	See "Unresolved Checkpoint Problems" on page 85.
E135	Create memory DIMM node	See "Unresolved Checkpoint Problems" on page 85.
E136	Test memory	See "Unresolved Checkpoint Problems" on page 85.
E137	Create openprom node	See "Unresolved Checkpoint Problems" on page 85.
E138	Create options node	See "Unresolved Checkpoint Problems" on page 85.
E139	Create aliases node and system aliases	See "Unresolved Checkpoint Problems" on page 85.
E13A	Create packages node	See "Unresolved Checkpoint Problems" on page 85.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E140	Loading boot image	See “Unresolved Checkpoint Problems” on page 85.
E149	Create boot manager node	See “Unresolved Checkpoint Problems” on page 85.
E14C	Create terminal-emulator node	See “Unresolved Checkpoint Problems” on page 85.
E14D	Initiate boot image loading	See “Boot Problems/Concerns” on page 110.
E14E	Create client interface node/directory	See “Unresolved Checkpoint Problems” on page 85.
E14F	NVRAM validation, configure variable token generation	See “Unresolved Checkpoint Problems” on page 85.
E150	Create host (primary) PCI controller node	See “Unresolved Checkpoint Problems” on page 85.
E151	Probing PCI bus	<ol style="list-style-type: none"> 1. If a location code is associated with the checkpoint: <ul style="list-style-type: none"> • Replace the FRU identified by the location code • Replace, one at a time, the other PCI adapter cards on the same PCI bus. See “Bus SRN to FRU Reference Table” on page 176. • Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81. 2. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E152	Probing for the adapter FCODE; evaluate if present.	<ol style="list-style-type: none"> 1. If a location code is associated with the checkpoint: <ul style="list-style-type: none"> • Replace the FRU identified by the location code • Replace, one at a time, the other PCI adapter cards on the same PCI bus. See “Bus SRN to FRU Reference Table” on page 176. • Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81. 2. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E153	End adapter FCODE probe/evaluation	<ol style="list-style-type: none"> 1. If a location code is associated with the checkpoint: <ul style="list-style-type: none"> • Replace the FRU identified by the location code • Replace, one at a time, the other PCI adapter cards on the same PCI bus. See “Bus SRN to FRU Reference Table” on page 176. • Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81. 2. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E154	Create PCI bridge node	<ol style="list-style-type: none"> 1. If a location code is associated with the checkpoint: <ul style="list-style-type: none"> • Replace the FRU identified by the location code • Replace, one at a time, the other PCI adapter cards on the same PCI bus. See “Bus SRN to FRU Reference Table” on page 176. • Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81. 2. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E155	Probing PCI bridge secondary bus	<ol style="list-style-type: none"> 1. If a location code is associated with the checkpoint: <ul style="list-style-type: none"> • Replace the FRU identified by the location code • Replace, one at a time, the other PCI adapter cards on the same PCI bus. See “Bus SRN to FRU Reference Table” on page 176. • Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81. 2. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E156	Create PCI Ethernet node	<ol style="list-style-type: none"> If a location code is associated with the checkpoint: <ul style="list-style-type: none"> Replace the FRU identified by the location code Replace, one at a time, the other PCI adapter cards on the same PCI bus. See "Bus SRN to FRU Reference Table" on page 176. Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E15A	Create 64-bit host (primary) PCI controller node	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E15B	Transferring control to operating system (service mode boot)	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E15C	Probe primary 64-bit PCI bus	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E15D	Create host PCI controller node	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E15E	Create MPIC node	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E15F	Adapter VPD probe	<ol style="list-style-type: none"> If a location code is associated with the checkpoint: <ul style="list-style-type: none"> Replace the FRU identified by the location code Replace, one at a time, the other PCI adapter cards on the same PCI bus. See "Bus SRN to FRU Reference Table" on page 176. Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E160	CPU node VPD creation	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E161	Root node VPD creation	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E162	Service processor node VPD creation	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E164	Create PCI graphics node (P9)	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E168	Create PCI graphics node (S3)	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E170	Start of PCI bus probe	<ol style="list-style-type: none"> If a location code is associated with the checkpoint: <ul style="list-style-type: none"> Replace the FRU identified by the location code Replace, one at a time, the other PCI adapter cards on the same PCI bus. See "Bus SRN to FRU Reference Table" on page 176. Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E171	Executing PCI-Delay function	<ol style="list-style-type: none"> If a location code is associated with the checkpoint: <ul style="list-style-type: none"> Replace the FRU identified by the location code Replace, one at a time, the other PCI adapter cards on the same PCI bus. See "Bus SRN to FRU Reference Table" on page 176. Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E172	First pass PCI device probe	<ol style="list-style-type: none"> 1. If a location code is associated with the checkpoint: <ul style="list-style-type: none"> • Replace the FRU identified by the location code • Replace, one at a time, the other PCI adapter cards on the same PCI bus. See “Bus SRN to FRU Reference Table” on page 176. • Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81. 2. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E174	Establish host connection	Refer to “Boot Problems/Concerns” on page 110 for general considerations.
E175	BootP request	<p>Refer to “Boot Problems/Concerns” on page 110 for general considerations.</p> <ol style="list-style-type: none"> 1. Turn off, then on, and retry the boot operation. 2. Verify boot list by using the firmware SMS Multiboot menus. 3. Verify the network connection (network could be down). 4. Have network administrator verify the server configuration for this client.
E176	TFTP file transfer	<p>Refer to “Boot Problems/Concerns” on page 110 for general considerations.</p> <ol style="list-style-type: none"> 1. Turn off, then on, and retry the boot operation. 2. Verify boot list by using the firmware SMS Multiboot menus. 3. Verify the network connection (network could be down). 4. Have network administrator verify the server configuration for this client.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E177	Transfer failure due to TFTP error condition	Refer to “Boot Problems/Concerns” on page 110 for general considerations. <ol style="list-style-type: none"> 1. Turn off, then on, and retry the boot operation. 2. Verify boot list by using the firmware SMS Multiboot menus. 3. Verify the network connection (network could be down). 4. Have network administrator verify the server configuration for this client.
E178	Create PCI token ring node	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E17B	Processor frequency measurement	<ol style="list-style-type: none"> 1. Replace battery, restore NVRAM data (passwords, startup data) 2. Replace the system board. Location: P1 See note 3 on page 113.
E180	Service processor command setup	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E183	Service Processor POST	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E190	Create ISA node	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E193	Initialize Super I/O.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E196	Probe ISA bus.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E19B	Create service processor node.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E19C	Create tablet node.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E19D	Create NVRAM node.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E19E	Real time clock (RTC) creation and initialization.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E19F	Create EEPROM node.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1AD	Alternating pattern of E1AD and E1DE is used to indicate a default catch condition before the firmware "checkpoint" word is available	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1B0	Create LPT node.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1B1	Create serial node.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1B2	Create audio node.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1B3	Create 8042 node.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1B6	Probe for (ISA) keyboard.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1BA	Enable L2 cache.	See "Unresolved Checkpoint Problems" on page 85.
E1BB	Set cache parameters for burst.	See "Unresolved Checkpoint Problems" on page 85.
E1BC	Set cache parameters for 512KB.	See "Unresolved Checkpoint Problems" on page 85.
E1BD	Probe for (ISA) mouse.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1BE	Create operator panel node.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1BF	Create power management node.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1C5	Create ISA interrupt controller (PIC) node.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1C6	Create DMA node.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E1D0	Create PCI SCSI node.	<ol style="list-style-type: none"> If a location code is associated with the checkpoint: <ul style="list-style-type: none"> Replace the FRU identified by the location code Replace, one at a time, the other PCI adapter cards on the same PCI bus. See “Bus SRN to FRU Reference Table” on page 176. Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E1D3	Create SCSI block device node.	<ol style="list-style-type: none"> If a location code is associated with the checkpoint: <ul style="list-style-type: none"> Replace the FRU identified by the location code Replace, one at a time, the other PCI adapter cards on the same PCI bus. See “Bus SRN to FRU Reference Table” on page 176. Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E1D4	Create SCSI byte device node (ST).	<ol style="list-style-type: none"> If a location code is associated with the checkpoint: <ul style="list-style-type: none"> Replace the FRU identified by the location code Replace, one at a time, the other PCI adapter cards on the same PCI bus. See “Bus SRN to FRU Reference Table” on page 176. Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81. If no location code is associated with the checkpoint, go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E1DB	Create a (floppy) diskette controller (FDC) node.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
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 system board. Location: P1 (See notes on page 113.) 2. If selecting the console with an ASCII terminal, suspect the ASCII terminal. Use the problem determination procedures for the terminal. If these procedures do not reveal a problem, replace the system board. Location: P1 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	See "Unresolved Checkpoint Problems" on page 85.
E1DE	Alternating pattern of E1DE and E1AD is used to indicate a default catch condition before the firmware "checkpoint" word is available.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1DF	Create diskette drive (disk) node	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1E0	Program flash	See "Unresolved Checkpoint Problems" on page 85.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E1E1	Flash update complete	See "Unresolved Checkpoint Problems" on page 85.
E1E2	Initialize system I/O	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1E3	PReP boot image initialization.	See "Unresolved Checkpoint Problems" on page 85.
E1E4	Initialize Super I/O with default values.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E1E5	XCOFF boot image initialization.	See "Unresolved Checkpoint Problems" on page 85.
E1E6	Set up early memory allocation heap.	See "Unresolved Checkpoint Problems" on page 85.
E1E7	PE boot image initialization.	See "Unresolved Checkpoint Problems" on page 85.
E1E8	Initialize primary diskette drive (polled mode).	See "Unresolved Checkpoint Problems" on page 85.
E1E9	ELF boot image initialization.	See "Unresolved Checkpoint Problems" on page 85.
E1EA	Corrupted firmware image detected while loading from diskette.	<ol style="list-style-type: none"> 1. Ensure that the diskette installed contains recovery image appropriate for this system unit. Refer to "Checking the Current Firmware Levels" on page 349. 2. If the diskette is installed with the correct recovery image, then suspect: <ol style="list-style-type: none"> a. Diskette b. Diskette drive c. Diskette cable d. Replace the system board. Location: P1 (See notes on page 113.) 3. See "Unresolved Checkpoint Problems" on page 85.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E1EB	Verify flash EPROM recovery image.	<ol style="list-style-type: none"> 1. Ensure that the diskette installed contains recovery image appropriate for this system unit. Refer to "Checking the Current Firmware Levels" on page 349. 2. If the diskette is installed with the correct recovery image, then suspect: <ol style="list-style-type: none"> a. Diskette b. Diskette drive c. Diskette cable d. Replace the system board. Location: P1 (See notes on page 113.) 3. See "Unresolved Checkpoint Problems" on page 85.
E1EC	Get recovery image entry point	See "Unresolved Checkpoint Problems" on page 85.
E1ED	Invalidate instruction cache	See "Unresolved Checkpoint Problems" on page 85.
E1EE	Jump to composite image	See "Unresolved Checkpoint Problems" on page 85.
E1EF	Erase flash	See "Unresolved Checkpoint Problems" on page 85.
E1F0	Start OBE	See "Unresolved Checkpoint Problems" on page 85.
E1F1	Begin self-test sequence on boot device(s)	See "Unresolved Checkpoint Problems" on page 85.
E1F2	Power-on password prompt.	<p>Prompt should be visible on the firmware console.</p> <p>If a console is attached but nothing is displayed on it, go to the "Quick Entry MAP" on page 36 with the symptom "All display problems."</p>
E1F3	Privileged-access password prompt.	<p>Prompt should be visible on the firmware console.</p> <p>If a console is attached but nothing is displayed on it, go to the "Quick Entry MAP" on page 36 with the symptom "All display problems."</p>
E1F5	Build boot device list.	See "Unresolved Checkpoint Problems" on page 85.
E1F6	Determine boot device sequence.	See "Unresolved Checkpoint Problems" on page 85.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E1F7	No boot image located.	Use the System Management Services menus to modify the boot sequence (also known as <i>boot list</i>) 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.
E1FB	Scan SCSI bus for attached devices.	See “Unresolved Checkpoint Problems” on page 85.
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 63.
E201	Setup PHB BARC addresses.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E202	Initialize PHB registers and PHB’s PCI configuration registers.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E203	Look for PCI to ISA bridge.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E204	Setup ISA bridge, PCI config. registers, and initialize	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E206	Check for 50 MHz device on PCI bus in slot 1P or 2P.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E207	Setup data gather mode and 64/32-bit mode on PCG.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E208	Assign bus number on PCG.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E209	Assign PCI I/O addresses on PCI.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.
E20A	Assign PCI I/O addresses on PCG.	Go to MAP 1540: Minimum Configuration, “Step 1540-24” on page 81.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E20B	Check MCERs stuck at fault.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E20C	Testing L2 cache.	<ol style="list-style-type: none"> 1. Replace the processor card. Location: P1-C1 Location: P1-C2 (See notes on page 113.) 2. See "Unresolved Checkpoint Problems" on page 85.
E210	Processors L1 data cache array test fails. System hangs.	See "Unresolved Checkpoint Problems" on page 85.
E211	IPL ROS CRC checking.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E212	Processor POST.	<ol style="list-style-type: none"> 1. Replace the processor card. Location: P1-C1 Location: P1-C2 (See notes on page 113.) 2. See "Unresolved Checkpoint Problems" on page 85.
E213	Initial memory configuration.	Go to "MAP 1240: Memory Problem Resolution" on page 49.
E214	Memory test.	Go to "MAP 1240: Memory Problem Resolution" on page 49.
E216	Copy ROS into RAM. Setup translation and C environment.	<ol style="list-style-type: none"> 1. Go to "MAP 1240: Memory Problem Resolution" on page 49. 2. See "Unresolved Checkpoint Problems" on page 85.
E218	Memory test.	Go to "MAP 1240: Memory Problem Resolution" on page 49.
E21A	System has good memory	See "Unresolved Checkpoint Problems" on page 85.
E220	Final memory configuration.	Go to "MAP 1240: Memory Problem Resolution" on page 49.
E240	Setup Winbond ISA bridge.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E241	Reset PCI Bus.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E242	Initialize ISA DMA channel.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E243	Setup configuration registers.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E244	Enable system speaker and send a beep.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E246	System firmware corrupted, take recovery path.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E247	Capture memory module SPDs into NVRAM.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E249	Enter recover path's main code.	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
E297	Start firmware softload path execution.	See "Unresolved Checkpoint Problems" on page 85.
E298	Start firmware recovery path execution.	See "Unresolved Checkpoint Problems" on page 85.
E299	Start C code execution.	See "Unresolved Checkpoint Problems" on page 85.
E3xx	Memory test	See "MAP 1240: Memory Problem Resolution" on page 49.
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. Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
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. Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
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. Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.

Table 2. Firmware Checkpoints. (continued)

Checkpoint	Description	Action/ Possible Failing FRU
E443	Generate NVRAM configuration variable dictionary words.	Suspect a system firmware problem if this problem persists. Verify that the system firmware is at the current release level, update as necessary. See "Unresolved Checkpoint Problems" on page 85.
E600	SSA PCI adapter open firmware has run successfully.	1. Replace the SSA adapter. 2. See "Unresolved Checkpoint Problems" on page 85.
E601	SSA PCI adapter BIST has been started but failed to complete after 4 seconds.	1. Replace the SSA adapter. 2. See "Unresolved Checkpoint Problems" on page 85.
E602	SSA PCI adapter open firmware has started.	1. Replace the SSA adapter. 2. See "Unresolved Checkpoint Problems" on page 85.
E603	SSA PCI adapter BIST has completed with an error.	1. Replace the SSA adapter. 2. See "Unresolved Checkpoint Problems" on page 85.
E604	SSA PCI adapter BIST and subsequent POSTs have completed successfully	1. Replace the SSA adapter. 2. See "Unresolved Checkpoint Problems" on page 85.
E605	SSA PCI adapter BIST has completed successfully, but the subsequent POSTs have failed.	1. Replace the SSA adapter. 2. See "Unresolved Checkpoint Problems" on page 85.
E60E	SSA PCI adapter open firmware about to exit (no stack corruption).	1. Replace the SSA adapter. 2. See "Unresolved Checkpoint Problems" on page 85.
E60F	SSA PCI adapter open firmware has run unsuccessfully.	1. Replace the SSA adapter. 2. See "Unresolved Checkpoint Problems" on page 85.
E6FF	SSA PCI adapter open firmware about to exit (with stack corruption)	1. Replace the SSA adapter. 2. See "Unresolved Checkpoint Problems" on page 85.

Boot Problems/Concerns

Depending on the boot device, a checkpoint may be displayed on the operator panel for an extended period of time while the boot image is retrieved from the device. This is particularly true 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 a CD-ROM drive is connected to the internal IDE connector and a diagnostic CD-ROM is available. Booting from CD-ROM or NIM on the diagnostics image is referred to as Standalone Diagnostics.

Step 1

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

1. Check to see if the intended boot device is correctly specified in the boot list. If it is in the boot list:
 - a. Remove all removable media from devices in the boot list from which you do not want to boot.
 - b. If attempting to boot from the network, go to "Step 2".
 - c. If attempting to boot from a disk drive or CD-ROM, go to "Step 3" on page 111.
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 device can be added to the boot sequence, reboot the system. If the intended boot device cannot be added to the boot list, go to "Step 3" on page 111.

Step 2

If attempting to boot from the network:

1. Verify that IP parameters are correct.
2. Attempt to "ping" the target server using the SMS Ping utility. If the ping is not successful, have the network administrator verify the server configuration for this client.
3. Check with the network administrator to ensure that the network is up.
4. Check the network cabling to the adapter.
5. Turn the power off, then on and retry the boot operation.

Step 3

Try to boot and run standalone diagnostics against the system, particularly against the intended boot device. If an SRN is generated, go to the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* manual.

If diagnostics boot successfully and "No Trouble Found" was the result when diagnostics were run against the intended boot device, go to substep 4. If the diagnostics boot successfully, but the intended boot device was not present in the resource list:

1. If you booted from IDE CD-ROM Standalone Diagnostics, follow these steps:
 - a. Check the SCSI cables
 - b. Remove all hot-swap disk drives except the intended boot device if it's a hot-swap drive.
 - c. Disconnect all other internal SCSI devices.
 - d. Replace the SCSI cables
 - e. Replace the repeater card
 - f. Replace the SCSI backplane
 - g. Replace the intended boot device.
 - h. Replace the system board.
2. Go to the Task Selection Menu and select **Task, Display Configuration and Resource List**. If the intended boot device is not listed, go to "MAP 0290: Missing Resource Problem Resolution" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* manual.
3. If an SRN, not an 8-digit error code, is reported, go to the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* manual.
4. If the diagnostics are successful, and no other devices have been disconnected, it may be necessary to perform an operating system-specific recovery process, or reinstall the operating system.
5. If you replaced the indicated FRUs and the problem is not corrected, or the above descriptions did not address your particular situation, go to "MAP 1540: Minimum Configuration" on page 63.

If the problem has been corrected, go to "MAP 0410: Repair Checkout" in *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

If diagnostics do not boot successfully, and a SCSI boot failure is also occurring, go to "MAP 1540: Minimum Configuration" on page 63.

If diagnostics do not boot successfully, and a SCSI boot failure is not occurring:

1. Check IDE cabling to boot device.
2. Check device configuration jumpers.

If no problem is found with the cabling or the jumpers, continue to "Step 4" on page 112.

Step 4

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 5".
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 primary I/O drawer backplane can also cause the device or adapter to fail.) Go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Step 5

The CD-ROM drive, IDE cable, graphics adapter (if installed), or the system board is most likely defective. A TTY terminal attached to the serial port also can be used to determine if the graphics adapter is causing the problem. This is done by removing the graphics adapter, attaching a TTY to the serial port, and retrying standalone diagnostics. If the standalone diagnostics load, replace the graphics adapter.

1. Replace the CD-ROM drive.
2. Replace the IDE cable.
3. Replace the system board.
4. 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 63.
5. Go to "MAP 0410: Repair Checkout" in *RS/6000 @server pSeries 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 this index to help you decide which FRUs to replace when you are servicing the system.

Performing Slow Boot

To fully analyze all of the available information, perform the following steps before continuing or doing a hardware repair or replacement, especially if the error is related to the CPU or memory:

1. Record the 8-character error code (and location code if present) displayed 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. If a new error code is not reported, continue with the old error code.

Considerations for Using the Error Code to FRU Index

If you replace FRUs or perform an action and the problem is still not corrected, go to "MAP 1540: Minimum Configuration" on page 63, unless otherwise indicated in the tables.

If you replace FRUs or perform an action and the problem is corrected, go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

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 48 to display the System Management Services error log and obtain a location code. Location code descriptions can be found under "Location Codes" on page 14.

After you have obtained the location code, see Chapter 10, "Parts Information" on page 301 for the part number.

Notes:

1. If more than eight digits are displayed in the operator panel, use only the first eight digits to find the error in the tables. The digits that display beyond the first eight digits are location codes that can assist you in diagnosing the problem. See "Location Codes" on page 14.
2. Licensed programs frequently rely on system information stored on the VPD on the operator panel control assembly. If the MAPs indicate that the operator panel control

assembly should be replaced, swap the VPD from the old operator panel to the new one. If the 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.

3. If a network adapter or the system board is replaced, the network administrator must be notified so that the client IP addresses used by the server can be changed. In addition, the operating system configuration of the network controller 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.
4. For service processor menus, see Chapter 7, "Using the Service Processor" on page 181.

Firmware/POST Error Codes

If you replace FRUs or perform an action and the problem is still unresolved, go to "MAP 1540: Minimum Configuration" on page 63 unless otherwise indicated in the tables.

If you replace FRUs or perform an action, and the problem has been resolved, go to "MAP 0410: Repair Checkout" in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, unless otherwise indicated in the tables.

The error codes listed in Table 3 identify the failing device/FRU, in most cases. A physical location code may be displayed with the error code. If so, use the physical location code to identify the suspected FRU.

Table 3. Firmware Error Codes.

Error Code	Description	Action / Possible Failing FRU
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 92 table using code E174 .
20A80003	Cannot get server hardware address.	Refer to "Firmware Checkpoints" on page 92 table using code E174 .
20A80004	Bootp failed.	Refer to "Firmware Checkpoints" on page 92 table using code E175 .
20A80005	File transmission (TFTP) failed.	Check network connection, try again.
20A80006	Image too large. Ran out of available firmware memory resources loading boot image.	<ol style="list-style-type: none"> 1. Verify boot server configuration. 2. Contact your service support representative for assistance.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
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 48) 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.
20D00011	Instantiate RTAS failed.	Contact your service support person for assistance.
20E00000	Power-on password entry error.	The password has been entered incorrectly. Re-enter the password.
20E00001	Privileged-access password entry error.	The password has been entered incorrectly. Re-enter 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. Location: P1-V2 2. Replace the system board. Location: P1 (See notes on page 113.)
20E00008	CMOS corrupted or tampering evident, CMOS initialized.	1. Replace battery, restore NVRAM data (passwords, startup data). Location: P1-V2 2. Replace the system board. Location: P1 (See notes on page 113.)
20E00009	Invalid password entered - system locked.	The password has been entered incorrectly 3 times. Turn off, then turn on the system unit, then enter the password correctly.
20E0000C	Failed to open RTC device tree node.	1. Turn off, turn on system unit. 2. Replace the system board. Location: P1 (See notes on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
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
20EE0006	No SCSI controllers present	The system board should always have at least 2 integrated PCI SCSI controllers; one internal and one external. Replace the system board. Location: P1 (See notes on page 113.)
20EE0007	Keyboard not found	1. Plug in keyboard. 2. Replace the system board. Location: P1 (See notes on page 113.)
20EE0008	No configurable adapters found in the system by the remote IPL menu in the SMS utilities.	This warning occurs when the remote IPL menu in the SMS utilities cannot locate any LAN adapters that are supported by the remote IPL function. If a supported device is installed: 1. Replace the adapter. 2. Replace the system board. Location: P1 (See notes on page 113.)
20EE0009	Unable to communicate with service processor	Replace the system board. Location: P1 (See notes on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
20EE000A	Pointer to the operating system found in nonvolatile storage.	<p>Values normally found in nonvolatile storage that point to the location of an operating system were not found. This can happen for either of two reasons:</p> <ul style="list-style-type: none"> • Your installed operating system does not support storing the values. • Some event occurred that caused the system to lose nonvolatile 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 off the system and power it back on 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 unable to find an operating system on the device list that was attempted.	Go to "Boot Problems/Concerns" on page 110.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
21A00xxx	SCSI DASD device errors	<p>Notes:</p> <ol style="list-style-type: none"> Before replacing any system components, ensure that the: <ol style="list-style-type: none"> Controller and each device on the SCSI bus is assigned a unique SCSI ID. SCSI bus is properly terminated. SCSI signal and power cables are securely connected and not damaged. The location code information is required to identify the ID of SCSI device failures, as well as to indicate the location of the controller to which the device is attached. Check below for the xxx value. The xxx can stand for anything like 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"> Replace the SCSI device. Replace the SCSI cable. 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"> Replace the media (in removable media devices). Replace the SCSI device.
21A00003	Send diagnostic failed.	Refer to the notes in error code 21A00xxx. Replace the SCSI device.
21A00004	Send diagnostic failed - DevOfI command.	Refer to the notes in error code 21A00xxx. Replace the SCSI device.
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.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
21F20xxx	SCSI read/write optical.	Refer to 21A00xxx for a description and repair action for the xxx value.
22000001	Internal wrap test failed.	Replace adapter.
22001001	Internal wrap test failed.	Replace adapter.
22002001	Adapter failed to complete hardware initialization.	Replace adapter.
22010001	Adapter failed to complete hardware initialization.	Replace adapter.
22011001	Adapter failed to complete hardware initialization.	Replace adapter.
25000000	Memory controller failed.	Replace the system board.
25010xxx	Flash Update Problem	
25010000	No diskette in drive.	Insert diskette containing firmware image.
25010001	Diskette seek error.	<ol style="list-style-type: none"> 1. Retry function. 2. Replace diskette drive. 3. Replace diskette cable. 4. Replace the system board. Location: P1 (See notes on page 113.)
25010002	Diskette in drive does not contain an *.IMG file.	Insert diskette with firmware update file.
25010003	Cannot open OPENPROM package.	Replace the system board. Location: P1 (See notes on page 113.)
25010004	Cannot find OPENPROM node.	Replace the system board. Location: P1 (See notes on page 113.)
25010006	System ID does not match image system ID.	Make sure correct firmware update diskette is being used with this system.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
25010007	Image has bad CRC.	<ol style="list-style-type: none"> 1. Power-on the system unit. 2. Do the following flash recovery procedure: <ol style="list-style-type: none"> a. Insert a newly formatted DOS diskette loaded with service processor firmware into the diskette drive. The file name must be <i>spflash.img</i>. b. Shut down the system unit and unplug the power cable. c. Plug in the power cable, power-on the system unit. 3. Retry item 2 with a newly formatted DOS diskette. 4. Go to "MAP 1540: Minimum Configuration" on page 63.
25010008	Flash is write-protected, update cancelled.	<ol style="list-style-type: none"> 1. Turn off, turn on system unit and retry. 2. Replace the system board. Location: P1 (See notes on page 113.)
25010009	Flash module is unsupported or not recognized.	Make sure correct firmware update diskette is being used with this system.
2501000A	Flash write-protected.	<ol style="list-style-type: none"> 1. Turn off, turn on system unit, retry. 2. Replace the system board. Location: P1 (See notes on page 113.)
2501000C	Failed write to flash memory	<ol style="list-style-type: none"> 1. Turn off, turn on system unit, retry. 2. Replace the system board. Location: P1 (See notes on page 113.)
25A0xxx0	L2 cache controller problem.	<ol style="list-style-type: none"> 1. Replace the processor card. Location: P1-C1 Location: P1-C2 Replace the system board. Location: P1 (See notes on page 113.) <p>See error code 2B2xxx22 for xxx definitions.</p>

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
25A0xxx1	L2 cache controller problem.	<ol style="list-style-type: none"> 1. Replace the processor card. Location: P1-C1 Location: P1-C2 2. Replace the system board. Location: P1 (See notes on page 113.) <p>See error code 2B2xxx22 for xxx definitions.</p>
25A1xxx1	L2 SRAM failure	<p>Replace the processor card. Location: P1-C1 Location: P1-C2 See error code 2B2xxx22 for xxx definitions.</p>
25A80xxx	NVRAM problems	<p>NVRAM problem resolution:</p> <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, and the system might need to be reconfigured. 2. If the error is persistent, replace the battery. Location: P1-V2 3. If the error is persistent after battery replacement, or the error code is 25A80000, replace the system board. Location: P1 (See notes on page 113.)
25A80000	Initialization failed, device test failed.	Refer to NVRAM error notes on page 121.
25A80001	Init-NVRAM invoked, all of NVRAM initialized.	Refer to NVRAM error notes on page 121.
25A80002	Init-NVRAM invoked, some data partitions may have been preserved.	Refer to NVRAM error notes on page 121.
25A80011	Data corruption detected, all of NVRAM initialized.	Refer to NVRAM error notes on page 121.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
25A80012	Data corruption detected, some data partitions may have been preserved.	Refer to NVRAM error notes on page 121.
25A80100	NVRAM data validation check failed.	Turn off, turn on system unit and retry the operation before replacing any system component. Refer to NVRAM error notes on page 121.
25A80201	Unable to expand target partition while saving configuration variable.	Refer to NVRAM error notes on page 121.
25A80202	Unable to expand target partition while writing error log entry.	Refer to NVRAM error notes on page 121.
25A80203	Unable to expand target partition while writing VPD data.	Refer to NVRAM error notes on page 121.
25A80210	Setenv/\$Setenv parameter error - name contains a null character.	Refer to NVRAM error notes on page 121.
25A80211	Setenv/\$Setenv parameter error - value contains a null character.	Refer to NVRAM error notes on page 121.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
25A80998	NVRAMRC script evaluation error - command line execution error	<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 (through the open firmware script editing command nvedit). It may not be possible to resolve the problem without a detailed analysis of the NVRAM script, the current system configuration, and device tree contents.</p> <ol style="list-style-type: none"> 1. The problem can be caused by a SCSI controller/adaptor, whose SCSI bus ID has been changed from the default setting, no longer appearing in the system. This can be caused either by removing a SCSI controller/adaptor, or a problem with a SCSI controller/adaptor. <ul style="list-style-type: none"> • Select the SCSI ID utility from the SMS menus. <ol style="list-style-type: none"> a. Verify the list of SCSI controllers/adapters. If the list is not correct, suspect a problem with the controller/adaptor that is installed but not listed. b. Select the option to save the configuration information. c. Restart the system. • If the problem persists, boot the operating system and verify the SCSI bus IDs of any installed/available SCSI controllers/adapters (change as necessary), and restart the system. 2. 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. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
Memory Error Notes		
Use the location code obtained from the SMS Error Log utility (described in “Step 1020-4” on page 48) to identify which memory DIMM (or memory DIMM pair) the error is reported against.		
Memory error codes are in the form 25Cyyxxx where yy indicates memory DIMM present detect-bits (PD-bits) and xxx indicates the last 3 digits of the error code.		
See Table 4 on page 174 for information on how to interpret PD bits.		
25B00001	No memory DIMMs detected.	Go to “MAP 1240: Memory Problem Resolution” on page 49.
25B00002	Multiple memory DIMMs failed a memory test.	Go to “MAP 1240: Memory Problem Resolution” on page 49.
25Cyy001	Memory DIMM is not supported.	<p>Replace unsupported memory DIMM.</p> <p>Note:</p> <p>Memory DIMM must be replaced with a supported type of memory DIMM. If an unsupported memory DIMM is replaced with the same unsupported type, the error persists.</p> <p>There might be two memory module-related memory errors reported to indicate a memory DIMM pair. One of the two indicated memory DIMMs may be good. When replacing memory replace one memory DIMM at a time, not both.</p> <p>See Memory Error Notes on page 124 for more information.</p>
25Cyy002	Memory DIMM fails memory test.	Go to “MAP 1240: Memory Problem Resolution” on page 49.
25Cyy003	PD bits are mismatched or missing one memory DIMM.	<ol style="list-style-type: none"> 1. Make sure both memory DIMMs in the pair are present and are the same type. 2. Go to “MAP 1240: Memory Problem Resolution” on page 49.
25Cyy004	Memory DIMMs are disabled.	<ol style="list-style-type: none"> 1. Use the memory config/deconfig menu in the Service Processor System Information Menu to check the status of the memory DIMMs. 2. Go to “MAP 1240: Memory Problem Resolution” on page 49.
25Cyy005	Memory DIMM failed address test.	Go to “MAP 1240: Memory Problem Resolution” on page 49.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
25Cyy006	Memory DIMM failed inter-extent test.	<ol style="list-style-type: none"> 1. Replace the memory card. Location: P1-M1 2. Replace the processor card. Location: P1-C1 Location: P1-C2 <p>See Memory Error Notes on page 124 for more information.</p>
25Cyy007	Memory DIMM failed extent access test.	<ol style="list-style-type: none"> 1. Replace the memory card. Location: P1-M1 2. Replace the processor card. Location: P1-C1 Location: P1-C2 <p>See Memory Error Notes on page 124 for more information.</p>
25Cyy008	Memory DIMM has been deconfigured.	<ol style="list-style-type: none"> 1. Use the memory config/deconfig menu in the Service Processor System Information Menu to check the status of the memory DIMMs. 2. Go to "MAP 1240: Memory Problem Resolution" on page 49.
26020001	Invalid PCI adapter vendor ID.	<ol style="list-style-type: none"> 1. Move adapter to another slot (behind another 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 system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
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 system board. Location: P1 (See note 3 on page 113.)
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 system board. Location: P1 (See note 3 on page 113.)
26020007	Unable to allocate bus resources to PCI adapter. (Partial allocation may have succeeded)	<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 system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
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 system board. Location: P1 (See note 3 on page 113.) <p>If the location code shown does not identify a card slot, or if there is no location code, replace the system board. Location: P1 (See note 3 on page 113.)</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 to online diagnostics 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 failure. Otherwise, continue. 2. Refer to the "Bus SRN to FRU Reference Table" on page 176 using PCI bus "xx" for isolation of the failing device.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
28030xxx	RTC errors	<p>RTC Error Notes</p> <ol style="list-style-type: none"> 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. <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. If the error is persistent, replace the battery on the system board. Location: P1-V2 If the error is persistent after battery replacement, replace the system board. Location: P1 (See note 3 on page 113.)
28030001	RTC initialization required. RTC not updating, corrected.	<ol style="list-style-type: none"> Set the time and date. Refer to error code 28030xxx on page 128.
28030002	Bad time/date values	<ol style="list-style-type: none"> Set the time and date. Refer to error code 28030xxx on page 128.
28030003	RTC initialization required. RTC not updating, corrected	Replace system board. Location: P1 (See note 3 on page 113.)
28030004	Operating mode parameters changed (for example data format).	<ol style="list-style-type: none"> Set the time and date. Refer to error code 28030xxx on page 128.
28030005	Battery error	<ol style="list-style-type: none"> Replace the battery. Location: P1-V2 Note: Password, time and date need to be set. Refer to error code 28030xxx on page 128 if the problem persists.

Table 3. Firmware Error Codes. (continued)

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 Location: P1-C1 Location: P1-C2 3. Replace system board. Location: P1 (See note 3 on page 113.) Replacing the battery does not correct this error condition.
28A00040	Power supply/fan errors	<p>Check the following:</p> <ul style="list-style-type: none"> • Ensure the I/O and media fans are properly connected to the system board. • Ensure the processor fan is properly connected to the processor card. • Reseat all suspected fans connectors. • Look for obstructions that may prevent the fans from normal operations. (For example, a cable caught in the fan, preventing it from spinning.) • Replace any suspected fans that may cause this error. • If after replacing the suspected fans, the problem still exists: <ul style="list-style-type: none"> – Replace the processor card for a failing processor fan. – Replace the system board Location: P1 (See note 3 on page 113.)
28A00050	Power supply failure	<ol style="list-style-type: none"> 1. Replace the power supply specified by the location code. 2. Replace the power backplane. Location: P3
29000002	Keyboard/mouse controller failed self-test.	<p>Replace the system board. Location: P1 (See note 3 on page 113.)</p>
29A00003	Keyboard not present/detected.	<ol style="list-style-type: none"> 1. Keyboard 2. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
29A00004	Keyboard stuck key test failed.	<ol style="list-style-type: none"> Keyboard Replace the system board. Location: P1 (See note 3 on page 113.)
29B00004	Mouse not present/detected.	<ol style="list-style-type: none"> Mouse Replace the system board. Location: P1 (See note 3 on page 113.)
2B2xxx11	Processor is manually disabled	Use service processor menus to re-enable the processor, then reboot the system. (See error code 2B2xxx22 on page 130 for xxx definition.)
2B2xxx22	Processor disabled.	Replace processor card. Location: P1-C1 Location: P1-C2 Note: Where xxx indicates the processor type as follows: 711 333Mhz processor with 1 MB of L2 cache. 7D4 400Mhz processor with 4 MB of L2 cache. 758 450 MHz processor with 8 MB of L2 cache
2B2xxx31	Processor failed.	Replace processor card. Location: P1-C1 Location: P1-C2 See error code 2B2xxx22 on page 130 for xxx definition.
2B2xxx42	Unsupported processor type.	Replace processor card. Location: P1-C1 Location: P1-C2 See error code 2B2xxx22 on page 130 for xxx definition.
2BA00000	Service processor POST failure.	<ol style="list-style-type: none"> Unplug the system power cable and wait until the system power indicator remains off and the operator panel is blank. Plug in the system power cable and retry the operation. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
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 system board. Location: P1 (See note 3 on page 113.)
2BA00013	Service processor reports bad NVRAM CRC.	<ol style="list-style-type: none"> 1. If problem persists, replace battery. Location: P1-V2 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00014	Service processor reports bad service processor firmware.	Use service processor firmware diskette to reprogram firmware.
2BA00017	Service processor reports bad or low battery.	<ol style="list-style-type: none"> 1. Replace the battery. Location: P1-V2 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00018	EPOW test failure.	Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00019	IRQ13 test failure.	Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00024	Service processor reports bad power controller firmware.	Use the system firmware diskette to reprogram the system firmware.
2BA00040	Service processor reports service processor VPD module not present.	<ol style="list-style-type: none"> 1. Use the service processor firmware diskette to reprogram the service processor firmware. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00041	Service processor VPD is corrupted.	<ol style="list-style-type: none"> 1. Use the service processor firmware diskette to reprogram the service processor firmware. 2. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
2BA00050	Service processor reports system operator panel VPD module not present or not recognizable.	Replace the operator panel. Location: L1 (See note 2 on page 113.) Note: Swap the old VPD module from the old operator panel control assembly to the new one.
2BA00051	System operator panel VPD data corrupted.	Replace the operator panel control assembly. (See note 2 on page 113.) Note: Swap the old VPD module from the old operator panel control assembly to the new one.
2BA00060	Service processor reports system board VPD module not present.	Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00061	Service processor reports system board VPD data corrupted.	Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00062	Service processor reports system board VPD module not present.	Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00063	Service processor reports system board VPD data corrupted.	Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00070	Service processor reports processor card VPD module not present.	Replace the processor card. Location: P1-C1 Location: P1-C2
2BA00071	VPD data corrupted for processor card.	Replace the processor card. Location: P1-C1 Location: P1-C2
2BA00073	VPD data corrupted for processor card.	Replace the processor card. Location: P1-C1 Location: P1-C2
2BA00080	Service processor reports memory card VPD module not present	Replace the memory card, location: P1-M1.
2BA00081	VPD data corrupted on memory card	Replace the memory card, location: P1-M1.
2BA00100	Service processor firmware recovery information could not be written to diskette.	1. Check diskette media write-protect tab. 2. Replace the diskette drive.
2BA00102	No service processor update diskette in drive.	Insert the diskette.
2BA00103	Service processor firmware update file is corrupted, update cancelled.	1. Obtain new service processor firmware diskette. 2. Retry operation.

Table 3. Firmware Error Codes. (continued)

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	<p>Service processor firmware update error occurred, update not completed.</p> <p>Error occurred during service processor flash write operation.</p>	<p>Service processor firmware update error recovery procedure:</p> <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. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00201	<p>Service processor firmware update error occurred, update not completed.</p> <p>Error occurred while reading service processor CRC.</p>	See error code 2BA00200 for recovery procedure.
2BA00202	<p>Service processor firmware update error occurred, update not completed.</p> <p>Error occurred while verifying service processor firmware CRC.</p>	See error code 2BA00200 for recovery procedure.
2BA00203	<p>Service processor firmware update error occurred, update not completed.</p> <p>Error occurred while reading new service processor firmware CRC after updating service processor firmware.</p>	See error code 2BA00200 for recovery procedure.
2BA00204	<p>Service processor firmware update error occurred, update not completed.</p> <p>Error occurred while calculating firmware CRC.</p>	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. Location: F1 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00301	Service processor reports slow fan number 2.	<ol style="list-style-type: none"> 1. Replace fan 2. Location: F2 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00302	Service processor reports slow fan number 3.	<ol style="list-style-type: none"> 1. Replace fan 3. Location: F3 2. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

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. Location: F4 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00309	Service processor reports generic cooling alert.	<ol style="list-style-type: none"> 1. Check for cool-airflow obstructions to the system. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00310	Service processor reports processor card over temperature alert.	<ol style="list-style-type: none"> 1. Check for cool-airflow obstructions to the system. 2. If the problem persists, replace processor card. Location: P1-C1 Location: P1-C2
2BA00311	Service processor reports system board over temperature alert.	<ol style="list-style-type: none"> 1. Check for cool-airflow obstructions to the system. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00312	Service processor reports memory over temperature alert.	<ol style="list-style-type: none"> 1. Check for cool-airflow obstructions to the system. 2. Replace the memory card. Location: P1-M1
2BA00313	Service processor reports generic power alert.	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the power backplane. Location: P3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00314	Service processor reports 5 V over voltage alert.	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the power backplane. Location: P3 3. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
2BA00315	Service processor reports 5 V under voltage alert.	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the power backplane. Location: P3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00316	Service processor reports 3.3V over voltage alert.	<ol style="list-style-type: none"> 1. Check, and reseat if necessary, power connectors P1 and P2. 2. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00317	Service processor reports 3.3V under voltage alert.	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the power backplane. Location: P3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00318	Service processor reports 2.5 V over voltage alert.	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the power backplane. Location: P3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00319	Service processor reports 2.5 V under voltage alert.	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the power backplane. Location: P3 3. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
2BA00324	Service processor reports 5 V standby over voltage alert.	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the power backplane. Location: P3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00325	Service processor reports 5 V standby under voltage alert.	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the power backplane. Location: P3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00334	Service processor reports generic slow shutdown request.	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the power backplane. Location: P3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00335	Service processor reports processor card critical over temperature slow shutdown request.	<ol style="list-style-type: none"> 1. Check for cool-airflow obstructions to the system. 2. Check fans for obstructions that prevent them from normal operation (for example: a cable caught in the fan, preventing it from spinning). 3. If problem persists, replace the processor card. Location: P1-C1 Location: P1-C2
2BA00336	Service processor reports I/O critical over temperature slow shutdown request.	<ol style="list-style-type: none"> 1. Check for cool-airflow 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 the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
2BA00337	Service processor reports memory critical over temperature slow shutdown request.	<ol style="list-style-type: none"> 1. Check for cool-airflow 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 the memory card. Location: P1-M1
2BA00338	Service processor reports generic fast shutdown request.	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00340	Service processor reports locked fan - fast shutdown request fan number 1.	<ol style="list-style-type: none"> 1. Replace fan 1. Location: F1 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00341	Service processor reports locked fan - fast shutdown request fan number 2.	<ol style="list-style-type: none"> 1. Replace fan 2. Location: F2 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00342	Service processor reports locked fan - fast shutdown request fan number 3.	<ol style="list-style-type: none"> 1. Replace fan 3. Location: F3 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00343	Service processor reports locked fan - fast shutdown request fan number 4.	<ol style="list-style-type: none"> 1. Replace fan 4. Location: F4 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00350	Service processor reports generic immediate shutdown request.	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
2BA00351	Service processor reports generic AC power loss EPOW.	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00352	Service processor reports loss of AC power (outlet).	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00353	Service processor reports loss of AC power (power button).	<ol style="list-style-type: none"> 1. Replace the power supply. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the system board. Location: P1 (See note 3 on page 113.)
2BA00356	Service processor reports fan failure in a power supply	<ol style="list-style-type: none"> 1. Replace the power supply specified by the location code. 2. Replace the power backplane. Location: P3.
2BA00357	Service processor reports over-temperature condition in a power supply	<ol style="list-style-type: none"> 1. Replace the power supply specified by the location code. 2. Replace the power backplane. Location: P3.
2BA00358	Service processor reports redundant power supply failure	<ol style="list-style-type: none"> 1. Replace the power supply specified by the location code. 2. Replace the power backplane. Location: P3.
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 system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40100005	Loss of system power detected.	<ol style="list-style-type: none"> 1. Possible temporary AC power loss. Turn on the power. If the system boots, use the AIX Service Aids to reset the System Attention indicator and the Lightpath indicators. On your next shutdown and prior to reboot, use the service processor menus to reset the error log. 2. If AC power is available to system, replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
40100006	Loss of ac power to system detected.	<ol style="list-style-type: none"> 1. Possible temporary AC power loss. Turn on the power. If the system boots, use the AIX Service Aids to reset the System Attention indicator and the Lightpath indicators. On your next shutdown and prior to reboot, use the service processor menus to reset the error log. 2. If AC power is available to system, replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
40100007	Immediate shutdown due to loss of AC to system.	<ol style="list-style-type: none"> 1. Possible temporary AC power loss. Turn on the power. If the system boots, use the AIX Service Aids to reset the System Attention indicator and the Lightpath indicators. On your next shutdown and prior to reboot, use the service processor menus to reset the error log. 2. If AC power is available to system, replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40110000	Loss of a redundant power supply was detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
40110001	Power supply failed	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 5. Replace the system board Location: P1 (See note 3 on page 113.)
40110002	Missing voltage on both processor cards	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
40110003	Missing voltage on one processor card	<p>If AIX is running, check the AIX error log to find out which processor card is failing. If AIX is not available, check the service processor error log. Replace the failing processor. Location: P1-C1 or P1-C2.</p>

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40110004	Low voltage detected in power supply main enclosure.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
40110005	Fan warning detected in power supply main enclosure.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
40110006	Fan failure detected in power supply main enclosure.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
40110007	Thermal warning detected in power supply main enclosure.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40110008	Thermal failure detected in power supply main enclosure.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
40110009	Overvoltage detected on 5 volt line in power supply main enclosure	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
4011000A	Overvoltage detected on 5 volt line in power supply main enclosure	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
4011000B	Overvoltage detected on 5 volt line in power supply main enclosure	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
4011000C	Overvoltage detected on 5 volt line in power supply main enclosure	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
4011000D	Overvoltage detected on 3.3 volt line in power supply main enclosure	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
4011000E	Overvoltage detected on +12 volt line in power supply main enclosure	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
4011000F	Overvoltage detected on -12 volt line in power supply main enclosure	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40110010	Current sharing fault detected in power supply main enclosure	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Reseat the power supplies 3. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
40110011	DC_GOOD fault detected in main power supply enclosure	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Reseat the power supplies 3. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
40110013	Only one power supply is present; two are required	Install an additional power supply. Two power supplies are required.
40110014	Overcurrent detected on 5 volt line in power supply main enclosure	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Look at the service processor error log for more error information. 3. Reseat the power supplies 4. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3
40111002	Unknown power problem detected.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40111022	Overvoltage detected on 5.0 volt line	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40111032	Overvoltage detected on the 3.3 volt line.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40111033	Overvoltage detected on the 2.5 volt line	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40111052	Overvoltage detected on the +12 volt line	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40111062	Overvoltage detected on the -12 volt line	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40111072	A high +5 V standby voltage reading detected.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40111082	A low 5.0 V reading detected.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40111092	A low 3.3 V reading detected.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. If a location code is displayed with this error code, replace the part at that location 3. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 4. Replace the system board. Location: P1 (See note 3 on page 113.)
40111093	A low 2.5 V reading detected.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the processor cards. Location: P1-C1 Location: P1-C2
401110B2	A low +12 V reading detected.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
401110C2	A low -12 V reading detected.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
401110D2	A low +5 standby V reading detected.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40111101	Power good signal low on either processor card 1 or processor card 2.	<p>If AIX is running, check the AIX error log to find out which processor card is failing. If AIX is not available, check the service processor error log. Replace the failing processor. Location: P1-C1 or P1-C2.</p>
40111102	Wrong processor card plugged into the system.	<ol style="list-style-type: none"> 1. Remove processor cards. 2. Verify FRU number of new processor card is correct before installation.
40111122	High PCI +5.0 voltage reading detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40111132	A high PCI 3.3 voltage was detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40111152	A high PCI +12 voltage was detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40111162	A high PCI -12 voltage was detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40111182	A low PCI +5 voltage was detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40111192	A low PCI +3.3 voltage was detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
401111B2	A low PCI +12 voltage was detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
401111C2	A low PCI -12 voltage was detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40112022	High 5.0 voltage reading detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the processor cards. Location: P1-C1 Location: P1-C2

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40112023	High 1.8 V reading detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the processor cards. Location: P1-C1 Location: P1-C2
40112032	High 3.3 V reading detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40112033	High 2.5 V reading detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the processor cards. Location: P1-C1 Location: P1-C2
4011 2052	A high +12 voltage was detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
4011 2061	A high -12 voltage was detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40112062	Low 1.8 V reading detected.	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the processor cards. Location: P1-C1 Location: P1-C2
40112063	Critically low 1.8 V reading detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the processor cards. Location: P1-C1 Location: P1-C2
40112064	Critically high 1.8 V reading detected	<ol style="list-style-type: none"> 1. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the processor cards. Location: P1-C1 Location: P1-C2

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40112065	Critically low 2.5 V reading detected	<ol style="list-style-type: none"> 1. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the processor cards. Location: P1-C1 Location: P1-C2
40112066	Critically high 2.5 V reading detected	<ol style="list-style-type: none"> 1. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the processor cards. Location: P1-C1 Location: P1-C2
40112082	Low 5.0 voltage reading detected	<ol style="list-style-type: none"> 1. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the processor cards. Location: P1-C1 Location: P1-C2
40112092	Low 3.3 V reading detected	<ol style="list-style-type: none"> 1. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the system board. Location: P1 (See note 3 on page 113.)
40112093	Low 2.5 V reading detected	<ol style="list-style-type: none"> 1. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 2. Replace the processor cards. Location: P1-C1 Location: P1-C2

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
401120B2	A low +12 voltage was detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
401120C2	A low -12 voltage was detected	<ol style="list-style-type: none"> 1. If a location code is displayed with this error code, replace the part at that location. 2. Replace the power supplies one-at-a-time. Location: P3-V1 Location: P3-V2 Location: P3-V3 3. Replace the system board. Location: P1 (See note 3 on page 113.)
40200001	An unknown cooling problem detected.	<ol style="list-style-type: none"> 1. Check system unit fans. Locations: F1, F2, F3, F4 2. Replace the processor cards. Location: P1-C1 Location: P1-C2
40200021	A processor card temperature warning detected.	<ol style="list-style-type: none"> 1. Check system unit fans. Locations: F1, F2, F3, F4 2. Replace the processor cards. Location: P1-C1 Location: P1-C2
40200023	A critical processor card temperature condition detected.	<ol style="list-style-type: none"> 1. Check system unit fans. Locations: F1, F2, F3, F4 2. Replace the processor cards. Location: P1-C1 Location: P1-C2
40200031	A system board temperature warning detected.	<ol style="list-style-type: none"> 1. Check system unit fans. Locations: F1, F2, F3, F4 2. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40200033	A critical system board temperature condition detected.	<ol style="list-style-type: none"> 1. Check system unit fans. Locations: F1, F2, F3, F4 2. Replace the system board. Location: P1 (See note 3 on page 113.)
40200051	An inlet temperature warning detected. (High temperature sensed at the air flow inlet.)	<ol style="list-style-type: none"> 1. Check system unit fans. Locations: F1, F2, F3, F4 2. Replace the system board. Location: P1 (See note 3 on page 113.)
40200053	An inlet memory temperature condition detected. (Critically high temperature sensed at the air flow inlet.)	<ol style="list-style-type: none"> 1. Check system unit fans. Locations: F1, F2, F3, F4 2. Replace the system board. Location: P1 (See note 3 on page 113.)
40210011	A slow fan detected.	<p>Check:</p> <ol style="list-style-type: none"> 1. Room operating temperature. 2. Check system unit fans. Locations: F1, F2, F3, F4
40210014	A stopped fan detected.	Replace the failing fan.
40A00000	The system firmware surveillance interval was exceeded (System firmware surveillance time-out).	<ol style="list-style-type: none"> 1. Check for system firmware updates 2. Go to the service processor main menu and select System Information Menu, then select Read Progress Indicators from Last System Boot. Begin your repair action with the error code or checkpoint immediately preceding 40A0 0000. If a location code appears with the error code or checkpoint, replace the part at that location. 3. If the problem is not resolved, call service support.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40B00000	The operating system surveillance interval exceeded (operating system surveillance time-out).	<ol style="list-style-type: none"> 1. This error code indicates that the operating system terminated early (which usually implies an operating system crash). This error code may appear in the service processor error log by itself. However, in the AIX error log, there should be another error which points to the cause of the operating system crash. Use the other error as the starting point for your service action. 2. Call service support.
40D00003	An unknown slow shutdown commanded.	Insure the ambient temperature is in the proper range.
40D00004	An unknown fast shutdown occurred.	Insure the ambient temperature is in the proper range.
40D00101	BIST on the system board failed.	Replace the system board. (See note 3 on page 113.)
40D00102	BIST on the system board failed.	Replace system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
40D00200	Processor initialization failed.	Location code will point to failing FRU.
40D00201	JTAG chip ID mismatch.	Replace the failing FRU pointed to by the location code.
40D00202	Hot-swap SCSI backplane failure	Replace the hot-swap backplane. Location: P2
40D00203	SCSI ID conflict on hot-swap disk drives	<ol style="list-style-type: none"> 1. Verify that there are no SCSI ID jumpers on the hot-swap disk drives. (The SCSI IDs are set automatically by the hot-swap backplane.) 2. Isolate the failing hot-swap drive by removing all of the drives, then reinstalling them one at a time until the error occurs. The last one that was reinstalled is the failing drive. 3. Replace the hot-swap backplane. Location: P2
450000C0	Uncorrectable memory error. (checkstop)	Go to "MAP 1240: Memory Problem Resolution" on page 49.
450000C1	Memory ECC correctable error (checkstop)	Go to "MAP 1240: Memory Problem Resolution" on page 49.
450000C2	Memory ECC correctable error threshold exceeded (checkstop)	Go to "MAP 1240: Memory Problem Resolution" on page 49.
450000C3	Memory controller subsystem internal error (checkstop)	Go to "MAP 1240: Memory Problem Resolution" on page 49.
450000C4	Memory address error (invalid address or access attempt) (checkstop)	Go to "MAP 1240: Memory Problem Resolution" on page 49.
450000C5	Memory data error (bad data going to memory) (checkstop)	Go to "MAP 1240: Memory Problem Resolution" on page 49.
450000C6	Memory bus/switch internal error (checkstop)	Go to "MAP 1240: Memory Problem Resolution" on page 49.
450000C7	Memory time-out error (checkstop)	Go to "MAP 1240: Memory Problem Resolution" on page 49.
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.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
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.
450000D7	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.
450000DA	The processor was found deconfigured. The service processor reconfigured the available processor.	<ol style="list-style-type: none"> 1. Note that this error code indicates that the corresponding FRU has been reconfigured. Check the processor config/deconfig menu in the service processor system information menu before replacing parts. 2. Replace the processor card. Location: P1-C1 Location: P1-C2
450000DB	All memory DIMM pairs were found deconfigured. The service processor reconfigured the best available pair.	<ol style="list-style-type: none"> 1. Note that this error code indicates that the corresponding FRU has been reconfigured. Check the processor config/deconfig menu in the service processor system information menu before replacing parts. 2. Replace all memory DIMM pairs.
45800000	Memory controller checkstop	Go to "MAP 1540: Minimum Configuration" on page 63.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
45C00000	Memory checkstop. (Uncorrectable memory error.)	<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 boot from the CD-ROM. If the reboot is successful, run diagnostics in problem determination mode to determine the cause of the failure. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
460000C0	I/O bus address parity error (checkstop)	<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 1540-24" on page 81.
460000C1	I/O bus data parity error (checkstop)	<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 1540-24" on page 81.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
460000C2	I/O bus time-out, access or other error (checkstop)	<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 1540-24" on page 81.
460000C3	I/O bridge/device internal error (checkstop)	<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 1540-24" on page 81.
460000C4	Error from a PCI to non-PCI bridge chip, indicating an error on the secondary bus. (checkstop)	<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 1540-24" on page 81.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
460000C5	Mezzanine/system bus address 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.
460000C6	Mezzanine/system bus data 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.
460000C7	Mezzanine/system bus time-out, transfer or protocol 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.
460000D4	I/O expansion bus data parity or CRC 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.
460000D5	I/O expansion bus data time-out, access or other 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.
460000D6	I/O expansion bus connection failure. (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.
460000D7	I/O expansion bus unit is not in an operating state (power down, off-line). (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. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
460000D8	A generic memory controller detected-checkstop has occurred.	<ol style="list-style-type: none"> 1. Try to reboot the system into online diagnostics service mode to preserve the AIX error log. Run 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. Try to boot AIX diagnostics from CD-ROM. <ol style="list-style-type: none"> a. 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 63. b. 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 63.

Table 3. Firmware Error Codes. (continued)

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 into online diagnostics to preserve the AIX error log. Run 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. Try to boot AIX diagnostics from CD-ROM. <ol style="list-style-type: none"> a. 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 63. b. 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 63.
48800909	System VPD error.	<ol style="list-style-type: none"> 1. Check cable to operator panel. 2. Replace the operator panel control assembly. (See note 2 on page 113.) Note: Swap the old VPD module from the old operator panel control assembly to the new one. 3. Replace the system board. Location: P1 (See note 3 on page 113.) 4. Go to "MAP 1540: Minimum Configuration" on page 63.
4880090A	System board VPD read failed.	Replace the system board. Location: P1 (See note 3 on page 113.)
4880090B	Error identifying system type using VPD. (Possible I ² C bus error.)	<ol style="list-style-type: none"> 1. Check the power supply cable connections 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. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
4B20000A	The processor has been deconfigured.	<ol style="list-style-type: none"> 1. Replace the processor card. Location: P1-C1 Location: P1-C2 2. Replace the system board. Location: P1 (See note 3 on page 113.)
4B200043	Service processor reports JTAG fail	<ol style="list-style-type: none"> 1. Remove the processor card in slot 2 (P1-C2), if installed, and see if the problem is resolved. If resolved, replace the processor card in P1-C2. If not, proceed to step 2. 2. Exchange the processor card in slot 1 (P1-C1) with the card removed from slot 2 in step 1. (Replace the card in slot 1 with a new FRU if there is only one processor card in the system.) See if the problem is resolved. If not, proceed to step 3. 3. Replace the system board. Location: P1 (See note 3 on page 113.) 4. Call service support.
4B200055	No processor found.	<ol style="list-style-type: none"> 1. If only one processor is installed, it must be in slot 1 (P1-C1). 2. If two processor cards are installed, replace the card in slot 1 (P1-C1).
4B200056	No processor card.	<ol style="list-style-type: none"> 1. If only one processor is installed, it must be in slot 1 (P1-C1). 2. If two processor cards are installed, replace the card in slot 1 (P1-C1).
4B200057	The processor cards are not compatible with each other.	Remove the processor cards. Verify that the FRU numbers are valid. Replace if necessary.
4B200058	Compatibility test on processor card in slot 1 failed.	Remove the processor cards. Verify that the FRU numbers are valid. Replace if necessary.
4B200059	Compatibility test on processor card in slot 2 failed.	Remove the processor cards. Verify that the FRU numbers are valid. Replace if necessary.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
4B200060	The processor cards are not properly seated	<ol style="list-style-type: none"> 1. Reseat the processor cards. Location: P1-C1 Location: P1-C2. 2. Remove the power cord from the system. If both processor cards are installed, remove the second card and reapply power. If the problem is fixed, replace the second card. If the problem is not fixed, replace the first processor card with the second processor card that was just removed and reapply power. If the problem is fixed, replace the processor card that was in the first slot. 3. Replace the system board. Location: P1
4B201010	A machine check has occurred.	<ol style="list-style-type: none"> 1. Attempt to reboot the system into online diagnostics. If the reboot fails, attempt to boot from a CD-ROM. If the reboot is successful, run diagnostics in problem determination mode to determine the cause of the problem. 2. Go to "MAP 1540: Minimum Configuration" on page 63.
4B201020	TEA Error	Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
4B276851	Processor BIST failed	Replace the processor card. Location: P1-C1. Location: P1-C2

Table 3. Firmware Error Codes. (continued)

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 "Service Processor Menus" on page 182 for assistance. If the code is <i>E105</i>, <i>E14D</i>, <i>E15B</i>, <i>E174</i>, <i>E175</i> or <i>0xxx</i>, where xxx is any three digits, continue to step 4 instead of the listed action. Otherwise, find the code in the "Service Processor Checkpoints" on page 86 or "Firmware Checkpoints" on page 92 and perform the action indicated. 4. Attempt to reboot the system into online diagnostics to preserve the AIX error log. If the reboot fails, attempt to boot 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. Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
4B2xxx01	Checkstop-slot 1 failure	<ol style="list-style-type: none"> 1. Attempt to reboot the system into online diagnostics to preserve the AIX error log. If the reboot fails, attempt to boot 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. Replace the processor card in slot 1. Location: P1-C1 3. Replace the system board. Location: P1 (See note 3 on page 113.)

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
4B2xxx02	Checkstop-slot 2 failure	<ol style="list-style-type: none"> 1. Attempt to reboot the system into online diagnostics to preserve the AIX error log. If the reboot fails, attempt to boot 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. Replace the processor card in slot 2. Location: P1-C2 3. Replace the system board. Location: P1 (See note 3 on page 113.)
4B2xxx10	Machine check - 0	<ol style="list-style-type: none"> 1. Attempt to reboot the system into online diagnostics to preserve the AIX error log. If the reboot fails, attempt to boot 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. Go to MAP 1540: Minimum Configuration, "Step 1540-24" on page 81.
4B2xxx11	Machine check - 1 (stuck active)	<ol style="list-style-type: none"> 1. Remove the processor card in slot 2 (P1-C2), if installed, and see if the problem is resolved. If resolved, replace the processor card in P1-C2. If not, proceed to step 2. 2. Exchange the processor card in slot 1 (P1-C1) with the card removed from slot 2 in step 1. (Replace the card in slot 1 with a new FRU if there is only one processor card in the system.) See if the problem is resolved. If not, proceed to step 3. 3. Replace the system board. Location: P1 (See note 3 on page 113.) 4. Call service support.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
4B2xxx41	ABIST fail	<ol style="list-style-type: none"> 1. Replace the processor card indicated by the location code in the operator panel. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
4B2xxx42	ABIST fail	<ol style="list-style-type: none"> 1. Replace the processor card indicated by the location code in the operator panel. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
4B2xxx51	LBIST fail	<ol style="list-style-type: none"> 1. Replace the processor card indicated by the location code in the operator panel. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
4B2xxx52	LBIST fail	<ol style="list-style-type: none"> 1. Replace the processor card indicated by the location code in the operator panel. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
4B2xxxC0	Processor card 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 any possible additional FRUs.
4B2xxxC1	Processor card internal cache controller 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 any possible additional FRUs.
4B2xxxC2	External cache parity or multi-bit ECC 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 any possible additional FRUs.
4B2xxxC3	External cache ECC single-bit ECC 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 any possible additional FRUs.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
4B2xxxC4	System bus time-out error (checkstop)	<ol style="list-style-type: none"> 1. If this error occurs while the system is running, replace the FRU indicated by the physical location code displayed on the operator panel. 2. If this error occurs while booting, go to "MAP 1540 Minimum Configuration", "Step 1540-24" on page 81. Otherwise, go to the next step. 3. Check the service processor error log for any possible additional FRUs.
4B2xxxC5	System bus time-out error, waiting for I/O (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 any possible additional FRUs.
4B2xxxC6	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 any possible additional FRUs.
4B2xxxC7	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 FRU with probability

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
4B2xxxC8	A generic processor-detected checkstop has occurred.	<ol style="list-style-type: none"> 1. Try to reboot the system into online diagnostic to preserve the AIX error log. Run 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. Try to boot AIX diagnostics from CD-ROM. <ol style="list-style-type: none"> a. 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 63. b. 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 63.
4BA00000	The system support controller detects the service processor, but cannot establish communication. The system halts.	<ol style="list-style-type: none"> 1. Power off the system unit: <ol style="list-style-type: none"> a. Unplug the power cord. b. Plug in the power cord and power on the system unit. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
4BA00001	The system support controller cannot detect the service processor.	Replace the system board. Location: P1 (See note 3 on page 113.)
4BA0000A	Processor card deconfigured	<ol style="list-style-type: none"> 1. Possible BIST failure: <ol style="list-style-type: none"> a. Power off the system unit. b. Unplug the power cord. c. Plug in the power cord and power on the system unit. 2. Replace the processor card. Location: P1-C1 Location: P1-C2

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
4BA00800	Unknown error.	<ol style="list-style-type: none"> 1. Check level of service processor firmware. If not the latest, apply update. 2. Call service support.
4BA00826	Service processor cannot call home.	<ol style="list-style-type: none"> 1. Check the modem configuration in the service processor menus. 2. Check the modem physical connection to the system unit. 3. Verify (with a conventional telephone) that the telephone line is an active analog line. 4. Replace the modem. 5. Replace the system board. Location: P1 (See note 3 on page 113.)
4BA00827	Flash update diskette fail.	<ol style="list-style-type: none"> 1. Copy the flash update image onto a new, formatted diskette and retry. 2. Verify that the flash update image is correct for this system unit. 3. Replace the diskette drive.
4BA00828	Flash update (CRC) checksum fail.	Copy the flash update image onto a newly formatted diskette and retry.
4BA00829	Bad system firmware.	Replace the system board. Location: P1 (See note 3 on page 113.)
4BA00830	Boot fail.	Go to "Boot Problems/Concerns" on page 110.
4BA00831	Bad service processor firmware image.	<ol style="list-style-type: none"> 1. Unplug the power cable, wait a few minutes, plug in the power cable and reboot the system unit. Check for progress codes in the operator panel. If there are any progress codes, refer to their description. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
4BA00832	Error while doing flash update.	<ol style="list-style-type: none"> 1. Power off the system, then power on the system; retry the flash programming a few times. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
4BA10001	SSC SRAM fail	Go to "MAP 1540: Minimum Configuration" on page 63.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
4BA10002	SSC SRAM fail	Go to "MAP 1540: Minimum Configuration" on page 63.
4BA10003	The service processor hardware self-test failed.	Replace the system board. Location: P1 (See note 3 on page 113.)
4BA10004	The service processor firmware failed.	1. Restore or update the service processor firmware. 2. Replace the system board. Location: P1 (See note 3 on page 113.)
4BA10005	I ² C path fail.	1. Replace the system board. Location: P1 (See note 3 on page 113.) 2. Replace the processor card. Location: P1-C1. Location: P1-C2
4BA10832	Error while attempting a flash update.	1. Power-off, then power-on the system unit. 2. Do the following flash recovery procedure: a. Insert a newly formatted DOS diskette loaded with service processor firmware into the diskette drive. The file name must be <i>spflash.img</i> . b. Shut down the system unit and unplug the power cable. c. Plug in the power cable, power-on the system unit. 3. Retry item 2 with a newly formatted DOS diskette. 4. Replace the system board. Location: P1 (See note 3 on page 113.)
4BA11111	Problem with system board.	Replace the system board. Location: P1 (See note 3 on page 113.)
4BA80013	NVRAM access failure.	1. Remove, then reapply AC power. The service processor settings (modem speeds and call-out numbers, for example) may have to be reentered 2. Call service support.

Table 3. Firmware Error Codes. (continued)

Error Code	Description	Action / Possible Failing FRU
4BA80014	NVRAM (CRC) checksum fail.	<p>This is a recoverable temporary condition, unless followed by 4BA80015. If the system hangs at this error code:</p> <ol style="list-style-type: none"> 1. Remove, then reapply AC power. The service processor settings (modem speeds and call-out numbers, for example) may have to be reentered 2. Call service support.
4BA80015	NVRAM reinitialization fail.	<ol style="list-style-type: none"> 1. Remove, then reapply AC power. The service processor settings (modem speeds and call-out numbers, for example) may have to be reentered 2. Replace the system board. Location: P1 (See note 3 on page 113.) The service processor settings (modem speeds and call-out numbers, for example) will have to be reentered.

Memory DIMM Present Detect Bits (PD-Bits)

The following table expands on the Memory Error Notes found on page 124, 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 or perform an action, and the problem is still not corrected, go to “MAP 1540: Minimum Configuration” on page 63 unless otherwise indicated in the tables.

Table 4. Memory DIMM PD bits

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

Note: Memory DIMMs must be installed in pairs.

Error Codes E0A0, E0B0, E0C0, E0E0, E0E1 and 40A00000 Recovery Procedure

If checkpoint E0A0, E0B0, E0C0, E0E0, E0E1 or error code 40A00000 is displayed on the operator panel, do the following:

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 63 and then return here and continue.
4. Exit the service processor menus and remove the power cable.
5. Remove the side cover.
6. Record the slot numbers of the PCI adapters. Label and record the location of any cables attached to the adapters. Disconnect any cables attached to the adapters and remove all the adapters.
7. Plug in the power cable and wait for OK on the operator panel display.
8. Turn on the power.

Does the system stop with checkpoint E0A0, E0B0, E0C0, E0E0, E0E1 or 40A00000 displayed on the operator panel?

NO One of the PCI cards has failed and is preventing startup.

1. Remove all of the PCI cards.
2. Reinstall one of the PCI cards.
3. Power on the system unit.
4. If the system unit powers on, continue to add PCI cards one at a time until the faulty card is found.
5. Replace the failing FRU, then go to "MAP 0410: Repair Checkout" in *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.

Note: Always power off the system unit before adding an additional card.

YES If one processor card is installed:

- Replace the processor card, location: P1-C1.
- Replace the system board, location: P1.

If two processor cards are installed:

1. Remove processor card 2 (P1-C2) and turn on the power. If the system does not hang on a checkpoint, or display an error code, replace processor card 2. If removing processor card 2 does not fix the system, continue to the next step.
2. Remove processor card 1 (P1-C1) and install processor card 2 in slot 1 (P1-C1) and turn on the power. If the system does not hang on a checkpoint, or display an error code, replace processor card 1. If this swap does not fix the system, continue to the next step.
3. Replace the system board (P1).

Bus SRN to FRU Reference Table

This table is used to locate defective FRUs within the system board PCI and ISA buses. The table indicates which devices should be tested for each SRN. For this procedure, if possible, diagnostics are run on the system 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 system 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 technical service support 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)	System board. (See notes on page 113.)
		Internal/external SCSI port (10-61)	System board. (See notes on page 113.)
		Internal Ethernet port (10-80)	System board. (See notes on page 113.)
		Device installed in I/O slot 3 (10-68 to 10-6F)	Adapter
		Device installed in I/O slot 4 (10-70 to 10-77)	Adapter
		Device installed in I/O slot 5 (10-78 to 10-7F)	Adapter
9CC-101	PCI Bus 40	Device installed in I/O slot 1 (20-58 to 20-5F)	Adapter
		Device installed in I/O slot 2 (20-60 to 20-67)	Adapter
651-730	ISA Bus	Diskette drive port/device (01-D1-00-00)	System board. (See notes on page 113.)
		Parallel port/device (01-R1)	System board. (See notes on page 113.)
		Serial ports (1, 2, 3)/device (01-S1, 01-S2, 01-S3)	System board. (See notes on page 113.)
		Mouse port/device (01-K1-01-00)	System board. (See notes on page 113.)
		Keyboard port/device (01-K1-00-00)	System board. (See notes on page 113.)

Table 5. Bus SRN to FRU Reference Table (continued)

SRN	Bus Identification	Possible Failing Device and AIX Location Code	Associated FRU
		Audio port/device (01-Q2)	System board. (See notes on page 113.)

Typical Boot Sequence for @server pSeries 610 Model 6C1 and Model 6E1

After the ac power is turned on, the system support controller (SSC) startup begins, and releases reset to the service processor. If the SSC cannot communicate with the service processor, the LCD displays 4BA00000. If the service processor is not present, the LCD displays 4BA00001.

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 the Enter key on an ASCII terminal connected to serial port 1.
3. Built-In Self-Test (BIST)
 - The service processor initiates built-in self-test (BIST) on the central electronics complex (CEC) when the power button is pressed.
 - The VPD data are read and the CRC is checked.
 - The processor compatibility test is run.
 - LCD code range is E0A0 - E0E1.
4. System Initialization
 - System firmware begins to execute and initializes system registers after LCD code E0E1.
 - LCD code range is E1XX - E2XX.
5. Memory Test
 - The system firmware tests the system memory and identifies failing memory DIMM 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 System 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 (hard disk).
7. IPL Boot Code
- The system firmware attempts to boot from the devices listed in the boot list.
 - LCD code range is E1XX.
8. Boot Image Execution
- After a boot image is located on a device in the boot list, the system firmware code passes control to AIX, indicated by either of the following AIX boot codes:
 - LCD code E105 for normal boot
 - LCD code E15B for service mode boot.
 - The AIX boot code displays LCD progress codes in the format 0xxx or 2xxx.
9. AIX Boot Complete
- The AIX login prompt displays on the AIX console.

Chapter 6. Loading the System Diagnostics

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

Performing Slow Boot

To fully analyze all of the available information, perform the following steps before doing a hardware repair or replacement, especially if the error is related to the CPU or memory:

1. Record the 8-character error code (and location code if present) displayed 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.

Loading Standalone Diagnostics

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

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

Loading Online Diagnostics

Online Diagnostics can be loaded by booting 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 the following:

1. Verify with the system administrator and users that all programs may be stopped, then do so.

2. Turn off the system.
3. Wait 30 seconds, and turn on the system.
4. After the keyboard indicator appears during startup, and before the tone sounds, press the F6 key on a directly attached keyboard (or the number 6 key on an ASCII terminal).
5. Enter any requested passwords.

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

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

Default Boot List and Service Mode Boot List

The default boot list is:

1. Diskette drive
2. CD-ROM drive
3. Tape drive
4. Disk drive
5. 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** provided that a diagnostic CD is present in the CD-ROM drive.

Pressing the F6 key on a directly attached keyboard (or number 6 key on an ASCII terminal) loads **Online Diagnostics** using the service mode boot list. No diagnostic CD should be in the CD-ROM drive because **Online Diagnostics** are typically run from a hard disk. 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 contains five entries, and for each matching device type found in the system unit, the system makes an entry in the service mode boot list.)
- If no service mode boot list is present, the system uses the default boot list.

Chapter 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 surveillance failure).

During the first power-on (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 off, service processor menus become available after 15 seconds.

Service Processor Menus

The service processor menus are divided into the following groups:

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

This section describes these menus, how to access them, and the functions associated with each option within the menus.

When the system is powered off, 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

Service processor menus can be accessed locally by connecting an ASCII terminal to either serial port 1 (S1) or serial port 2 (S2). The service processor menus cannot be accessed on serial port 3 (S3). 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 displays on the operator panel, the service processor prompts you for a password (if set), and when verified, displays the service processor menus.

Accessing Service Processor Menus Remotely

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 system, 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 system.

Notes:

1. If your modem has not been configured, go to “Call-In/Call-Out Setup Menu” on page 198. With a terminal or terminal emulator, call the system’s modem.
2. The service processor prompts you for a password (if set), and when verified, displays the service processor menus.

Saving and Restoring Service Processor Settings

All the settings you make (except language) from the service processor menus can be backed up either for recovering from a fault that may corrupt these settings, or for replicating these settings to other servers that include a service processor.

The AIX service aid, Save or Restore Hardware Management Policies, can be used to save your settings after initial setup or whenever the settings must be changed for system operation purposes.

It is strongly recommended that you use this AIX service aid for backing up service processor settings to protect the usefulness of the service processor and the availability of the server. Refer to “Save or Restore Hardware Management Policies,” in the “Introducing Tasks and Service Aids” section of the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, SA38-0509.

General User Menu

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 Menu

1>
```

Note: The service processor prompt displays either 1> or 2> to indicate which serial port on the system 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 from top (latest) to bottom (oldest). The dashed line represents the point where the latest boot started.

If the <-- arrow occurs, use the 4-digit checkpoint or 8-digit error code being pointed to as the starting 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 (UTC), 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 “Service Processor Error Log” on page 210 for an example of the error log.

- **Read System POST Errors**

This option should only be used by service personnel to display additional error log information.

- **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 system during setup (optional)

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

System Name, an optional field, is the name that your system 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 system. 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: ct010717
Copyright 2001, 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 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. Reprogram Service Processor Flash EPROM
8. Serial Port Snoop Setup Menu
98. Return to Previous Menu
99. Exit from Menus

1>
```

Note: Unless otherwise stated in the 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 system) or remotely (through a modem). The error threshold is three attempts.

If the error threshold is reached by someone entering passwords at the system, the service processor exits the menus. This action is taken based on the assumption that the system 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 table 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.
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 system.

- **Enable/Disable Console Mirroring**

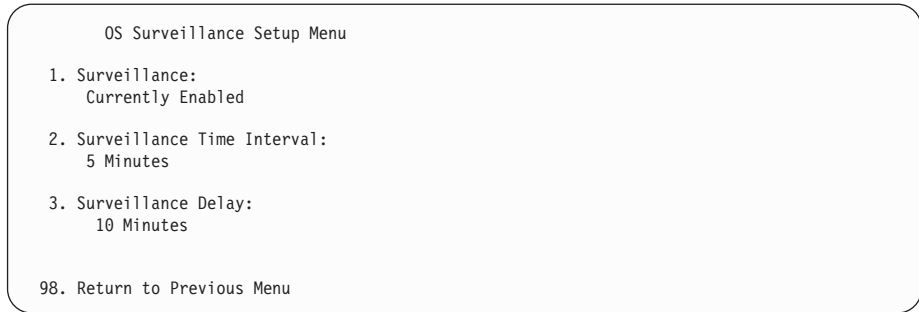
When console mirroring is enabled, the service processor sends information to both serial ports. This capability, which can be enabled by local or remote users, provides local users with the capability to monitor remote sessions. Console mirroring can be enabled for the current session only. For more information, see “Console Mirroring” on page 209.

- **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 can be used to set up operating system (OS) 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 of 10 minutes is the recommended minimum.

Surveillance Time Interval and Surveillance Delay can only be changed after surveillance is enabled. Refer to “Service Processor System Monitoring - Surveillance” on page 207 for more information about surveillance.

- **Reset Service Processor**

Allows the user to reinitialize the service processor.

- **Reprogram Service Processor Flash EPROM**

Attention: Only the service processor firmware can be updated from the service processor menus; the system firmware cannot be updated from the service processor menus. A service processor firmware update always requires a companion system firmware update, which must be applied first. For this reason, updating only the service processor firmware using the service processor menus is not recommended. See the Web site at <http://www.rs6000.ibm.com/support/micro> to download the latest firmware levels and update instructions.

The service processor firmware update image must be written onto a DOS-formatted diskette. The update image can be obtained from the Web site at <http://www.rs6000.ibm.com/support/micro>.

After the update diskette has been made, from the service processor main menu, select **Service Processor Setup**. Then select **Reprogram Service Processor Flash EPROM**. The program requests the update diskette(s) as they are needed. The service processor will automatically reboot after the firmware update is complete.

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 Menu, 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 is booted to AIX, whenever the reset string is typed on the main console, the system uses the service processor reboot policy to restart. This action causes an early power off warning (EPOW) 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 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 be used on systems that require automatic power-on after a power failure. Unattended start mode can also be set using SMS menus.

- **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 system is powered on at the predetermined number of rings. If the system is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the system is powered on. The **Ring Indicate Power-On Menu** and defaults are as follows:

```
Ring Indicate Power-On Menu

1. Ring indicate power-on:
   Currently Disabled

2. Number of rings:
   Currently 6

98. Return to Previous Menu
```

The number of rings can be set to any number greater than zero. The default value is six 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 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 system 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** lets the service processor react in 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 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 default value is yes.
- **Enable supplemental restart policy** - The default setting is no. If set to yes, the service processor restarts the system when the system loses control as detected by the service processor surveillance, and either:
 - 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 205.
- **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 AfterCrash Setting	Service Processor to Use OS-Defined Restart Policy?	Service Processor Enable Supplemental Restart Policy?	System Response
None	No	No ¹	
None	No	Yes	Restarts
None	Yes ¹	No ¹	
None	Yes ¹	Yes	Restarts
False ²	No	No ¹	
False ²	No	Yes	Restarts
False ²	Yes ¹	No ¹	
False ²	Yes ¹	Yes	
True	No	No ¹	
True	No	Yes	Restarts
True	Yes ¹	No ¹	Restarts
True	Yes ¹	Yes	Restarts

¹ Service processor default

² AIX default

- **Power-On System**

Allows immediate power-on of the system. For other power-on methods, see “System Power-On Methods” on page 204.

- **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 stop at the System Management Services menu during the boot process. Enabling this option is equivalent to pressing 1 on the attached ASCII terminal (or F1 on a graphics terminal) while the system initialization indicators display on screen.

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

This selection causes the system to perform a service mode boot using the service mode boot list saved in NVRAM. If the system boots AIX from the disk drive and AIX diagnostics are loaded on the disk drive, AIX boots in service mode to the diagnostics menu.

Using this option to boot the system is the preferred way to run online diagnostics.

- **Enabling the Service Mode Boot from Default List option**

This selection is similar to “Service Mode Boot from Saved List”, except the system boots using the default boot list that is stored in the system firmware. This is normally used to try to boot customer diagnostics from the CD-ROM drive.

Using this option to boot the system is the preferred way to run standalone diagnostics.

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

Causes the system to automatically enter open firmware prompt (also called the OK prompt). This option should only be used by service personnel to obtain additional debug information.

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 discards 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 the 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 enters the open firmware prompt and disregards the settings in the Boot Mode Menu.

System Information Menu

Use this menu to view the processor 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 Repeat Gard
    Currently Enabled

11. Enable/Disable MEM Repeat 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 preceding the one that produced the current sessions.

The progress indicator codes are listed from 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 of 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 (UTC), 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 “Service Processor Error Log” on page 210 for an example of the error log.

- **Read System POST Errors**

This option should only be used by service personnel to display additional error log information.

- **Read NVRAM**

Displays 320 bytes of nonvolatile random access memory (NVRAM) contents.

- **Read Service Processor Configuration**

Displays all service processor settings that can be changed 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 the processor configuration.

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

```
Processor Configuration/Deconfiguration Menu

Processor number
0. Configured by system (0x0)
2. Configured by system (0x0)

98. Return to Previous Menu

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

The processor can be in one of the following states:

- **Configured by system:** The system processor is present, and has not exceeded the failure threshold.
- **Deconfigured by system:** The system processor has been taken offline by the service processor due to an unrecoverable error, or recoverable errors exceeding the failure threshold.

Note: A status of (0x0) indicates that the processor card has not had any errors logged against it by the service processor.

Attention: If the system processor in slot 1 (P1-C1) has been deconfigured by the system, the service processor will prevent the system from booting.

- **Memory Configuration/Deconfiguration Menu:**

Use this menu to view and modify the dual inline memory module (DIMM) configuration. If it is necessary to take one of the memory DIMMs offline, this menu allows you to deconfigure a DIMM and then reconfigure the DIMM at a later time.

The configuration process takes place during system power-on. Therefore, the configuration displayed by this menu in standby mode reflects the configuration during the last boot.

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

```
Memory Configuration/Deconfiguration Menu

DIMMs on memory card number 0:

1. Configured by system (0x0)      2. Configured by system (0x0)
3. Configured by system (0x0)      4. Configured by system (0x0)

98. Return to Previous Menu

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

In this system, the memory card number is 0 by default.

When the user selects a DIMM, its state toggles between configured and deconfigured. Memory DIMMs that are not present are not shown.

Each memory DIMM can be in one of following states:

- **Configured by system:** The memory DIMM is present, and has not exceeded the failure threshold. It has been 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 this menu.
- **Manually deconfigured:** The memory DIMM is present, but unavailable. It has been deconfigured by the user through this menu.

Note: A status of (0x0) indicates that the memory DIMM has not had any errors logged against it by the service processor.

- **Enable/Disable CPU Repeat Gard Menu**

Use this option to enable or disable CPU repeat gard.

- **Enable/Disable Memory Repeat Gard Menu**

Use this option to enable or disable memory repeat gard.

- **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. Make the rack/system indicator blink/reset the state
2. Clear all lightpath LEDs
98. Return to Previous Menu

1>>
```

If option 1 is chosen, the rack indicator/system attention LED can be set or reset (turned on or off).

If option 2 is chosen, the LEDs on the lightpath LED panel can be cleared (turned off).

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 different languages. This menu allows selecting languages in which service processor and system firmware menus and messages display.

```
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 correctly display languages other than English.

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**, see “Modem Configuration Menu” on page 199.
- **Serial Port Selection Menu**, see “Serial Port Selection Menu” on page 199.
- **Serial Port Speed Setup Menu**, see “Serial Port Selection Menu” on page 199.
- **Telephone Number Setup Menu**, see “Telephone Number Setup Menu” on page 200.
- **Call-Out Policy Setup Menu**, see “Call-Out Policy Setup Menu” on page 202.
- **Customer Account Setup Menu**, see “Customer Account Setup Menu” on page 203.
- **Call-out Test**, see “Call-Out Policy Setup Menu” on page 202.
- **Ring Indicate Power-On Menu**, see page 190.

Modem Configuration Menu

Entries at the top of the Modem Configuration Menu display the status of the current selections. Selections are made in the 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 323 and “Transfer of a Modem Session” on page 328.

```
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 as follows:

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

Telephone Number Setup Menu

Use this 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 service center computer. The service center usually includes a computer that takes calls from systems 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 systems. 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 system. 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.

Notes:

1. At least one of the preceding three telephone numbers must be assigned in order for the call-out test to execute successfully.
2. 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 system. 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 system's modem is connected. The service or administration center representatives need this number to make direct contact with your system 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**

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:

- Service center
- Customer administration center
- 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 values are as follows:

Remote timeout 120 seconds

Remote latency 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.

Customer Account Setup Menu

This menu allows users to enter information that is specific to their account.

```
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.

System Power-On Methods

This section discusses the following system power-on methods:

- Power-on switch
- Remote power-on by 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 by 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 205 for more information.

- Unattended start mode - refer to **Enable/Disable Unattended Start Mode** on page 190.

The service processor can be enabled to recover from the loss of ac power (see Enable/Disable Unattended Power-On Mode in the "System Power Control Menu" on page 190). When ac power is restored, the system returns to the power state at the time ac loss occurred. For example, if the system was powered-on when ac loss occurred, it reboots/restarts when power is restored. If the system was powered-off when ac loss occurred, it remains off when power is restored.

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

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

Note: If an ac power loss is in progress when the timed power-on attempt occurs, the server cannot power on when ac 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 190.

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 system board has failed or has been removed), it maintains server security by disabling the call-in capability to both 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 to 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 “Serial Port Selection Menu” on page 199.

Service Processor Reboot/Restart Recovery

Reboot describes bringing the system hardware back up; 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 is reinitialized. Restart must follow a successful reboot.

Boot (IPL) Speed

When the server enters reboot recovery, slow IPL is automatically started, which gives the 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 entered 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” on page 186). 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 setup menu.

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.

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 error indications. The firmware uses the error signatures in the hardware to analyze and isolate the error to a specific processor.

The processors that are deconfigured remain offline for 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 menu. The user can also enable or disable this function through the service processor.

Memory Boot-Time Deconfiguration (Memory Repeat Gard)

Memory boot-time deconfiguration allows for the removal of a memory segment or 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 resource(s) to be removed are the ones that experienced the following failures:

- A boot-time test failure
- Run-time recoverable errors over the error 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 the specific memory segment or DIMM.

The memory segment or DIMM that is deconfigured remains offline during 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 startup (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, and the surveillance interval and surveillance delay cannot be changed by the user.

If the service processor detects no heartbeats during system boot (for a set period of time), 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

The 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 service processor menus and AIX service aid 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

The maximum time (in minutes) the service processor will wait between heartbeats from the operating system before reporting a surveillance failure.

- Surveillance delay

The maximum time (in minutes) for the service processor will wait for the first heartbeat from the operating system after the operating system has been started, before reporting a surveillance failure.

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 within the surveillance delay period, 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 up the following using the service processor menus or diagnostic service aids:
 - Enable call out for the serial port where the modem is connected.
 - Set 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:
 1. Remote session already in progress.
 2. Remote user uses the service processor menus to enable console mirroring, allowing both consoles to be active.
- Local session first, then remote session added:
 1. Local session is already in progress.
 2. The service processor receives a call from the remote user.
 3. The local user selects the option to enable console mirroring. The service processor immediately begins mirroring service processor menus.

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

Service Processor Firmware Updates

Attention: Only the service processor firmware can be updated from the service processor menus; the system firmware cannot be updated from the service processor menus. A service processor firmware update always requires a companion system firmware update, which must be applied first. For this reason, updating only the service processor firmware using the service processor menus is not recommended. See the Web site at <http://www.rs6000.ibm.com/support/micro> to download the latest firmware levels and update instructions.

The service processor firmware update image must be written onto a DOS-formatted diskette. The update image can be obtained from the following Web site:
<http://www.rs6000.ibm.com/support/micro>.

After the update diskette has been made, from the service processor main menu, select **Service Processor Setup**. Then select **Reprogram Service Processor Flash EPROM**. The program requests the update diskette(s) as they are needed. The service processor will automatically reboot after the firmware update is complete.

Service Processor Error Log

The service processor error log contains information about errors reported by the service processor.

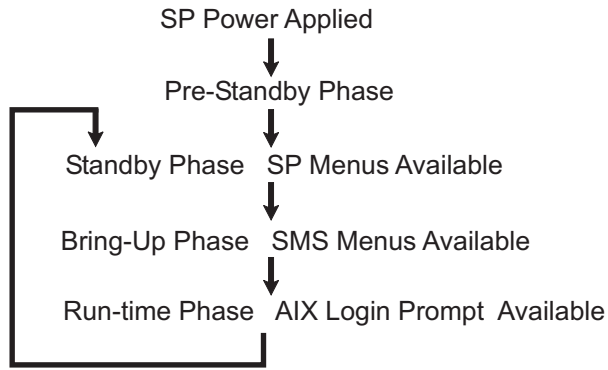
```
                                Error Log
19991118165344 1. 4B276851 CPU BIST fail detected
FRUs to replace: P1-C1

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

The time stamp in this error log is coordinated universal time (UTC), also known as Greenwich mean time (GMT). AIX error logs have more information available and are able to time stamp with local time.

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:

- Service processor initialization - Performs any necessary hardware and software initializations.
- 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 command, 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 handles 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 indicated and any other available error information.

- Update Operator Panel

The service processor displays operator panel data on the ASCII terminal if a terminal 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. Using 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 237.

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; processor upgrades may require a specific version of firmware to be installed in your system unit. (**Update System Firmware** is an option under the Utilities menu in the System Management Services.)

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

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

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

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

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



You can also press F8 here to enter the open firmware **OK>** prompt. This should only be done by service personnel to obtain additional debug information.

The System Management Services screen contains the following choices.



Config: Enables you to view your system configuration. Go to “Config” on page 218.



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 219.



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, view or clear the firmware error log, and update your system unit’s firmware. Go to “Utilities” on page 222.



Exit: Returns you to the previous screen.

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

Config



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=512MB
Memory Card slot 1, Module Slot =2 size=512MB
Memory Card slot 1, Module Slot =3 size=512MB
Memory Card slot 1, Module Slot =4 size=512MB


Service Processor
Tablet Port
LPT addr=3F8
Com addr=3F8
Com addr=2F8

Keyboard
Mouse

Integrated Ethernet
addr=9999FF111R

SCSI controller id= 7





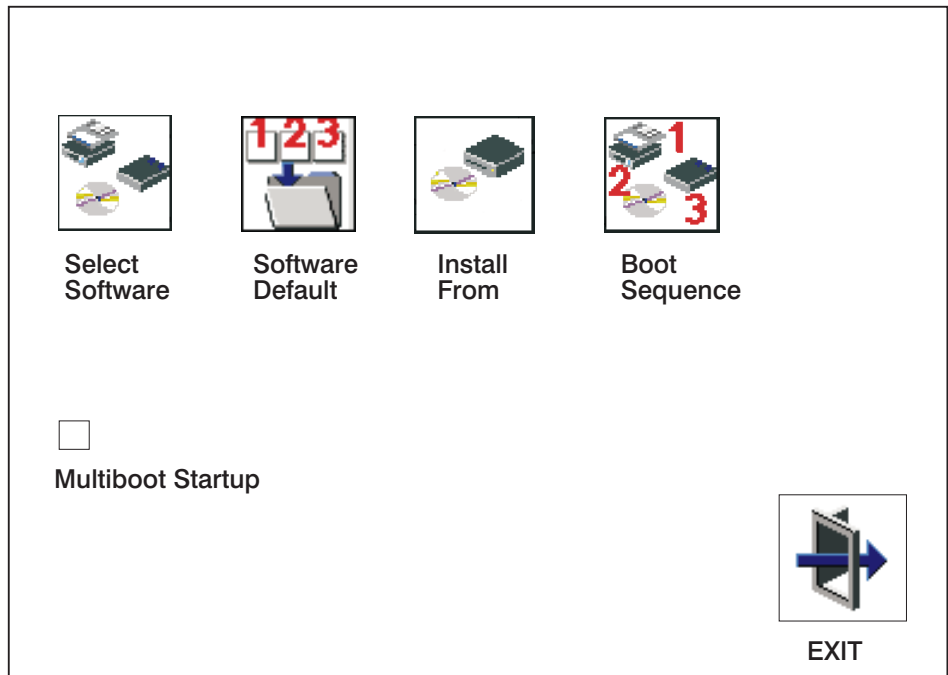
Exit

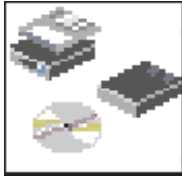
If more than one screen of information is available, a blue arrow displays in the top right corner of the screen. Use the page up and page down keys to scroll through the pages.

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 is used when more than one operating system is installed on the same disk drive. AIX does not support multiple operating systems on a single disk drive. Multiple AIX images can be installed on separate disk drives; the desired disk drive can be selected for booting using the **Select Boot Device** function in System Management Services or the AIX diagnostic service aid **Display or Change Bootlist**.

If **Select Software** is chosen from this menu, a line similar to the following is displayed:

```
-> 1    AIX 5.1.0 <-
```

This indicates the current version of AIX that is installed on the system. If a **1** is entered, the system will boot AIX.

If you receive an informational message saying that no operating system is installed, then the system information in nonvolatile storage may have been lost. This situation can occur if the battery has been removed. To correct this situation, refer to the **boot sequence** option on this menu.

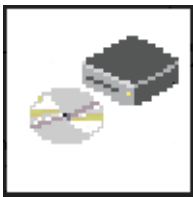


Software Default: This option is used when more than one operating system is installed on the same disk drive. AIX does not support multiple operating systems on a single disk drive. Multiple AIX images can be installed on separate disk drives; the desired disk drive can be selected for booting using the **Select Boot Device** function in System Management Services or the AIX diagnostic service aid **Display or Change Bootlist**.

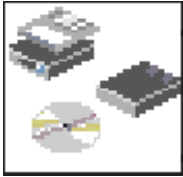
If **Software Default** is chosen from this menu, a line similar to the following is displayed:

```
-> 1    AIX 5.1.0 <-
```

This indicates the current version of AIX that is installed on the system. .



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. Diskette drive
2. CD-ROM drive
3. Tape drive
4. Hard disk drive
5. 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.

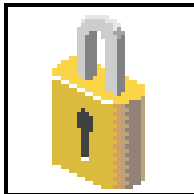
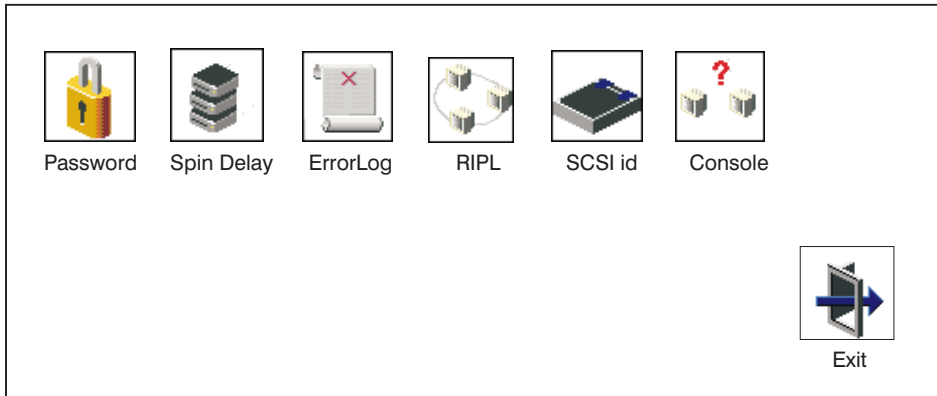
Multiboot Startup: Clicking on this button toggles whether the Multiboot menu displays automatically at startup.

Utilities

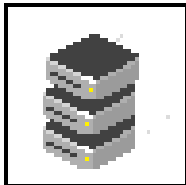


Selecting this icon enables you to perform various tasks and view additional information about your system unit.

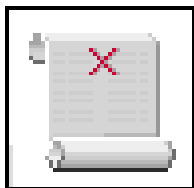
The following describes the choices available on this screen.



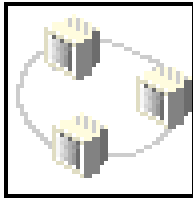
Password: Enables you to set password protection for turning on the system unit and for using system administration tools. Go to “Password” on page 224.



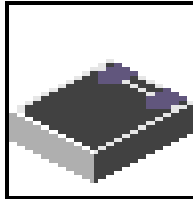
Spin Delay: Enables you to change the spin-up delay for SCSI hard disk drives attached to your system. Go to “Spin Delay” on page 228.



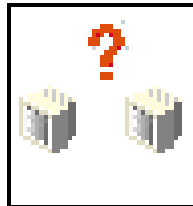
Error Log: Enables you to view and clear the firmware error log for your system unit. Go to “Error Log” on page 229.



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 230.



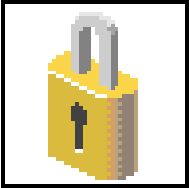
SCSI ID: Allows you to view and change the addresses (IDs) of the SCSI controllers attached to your system unit. Go to “SCSI ID” on page 235.



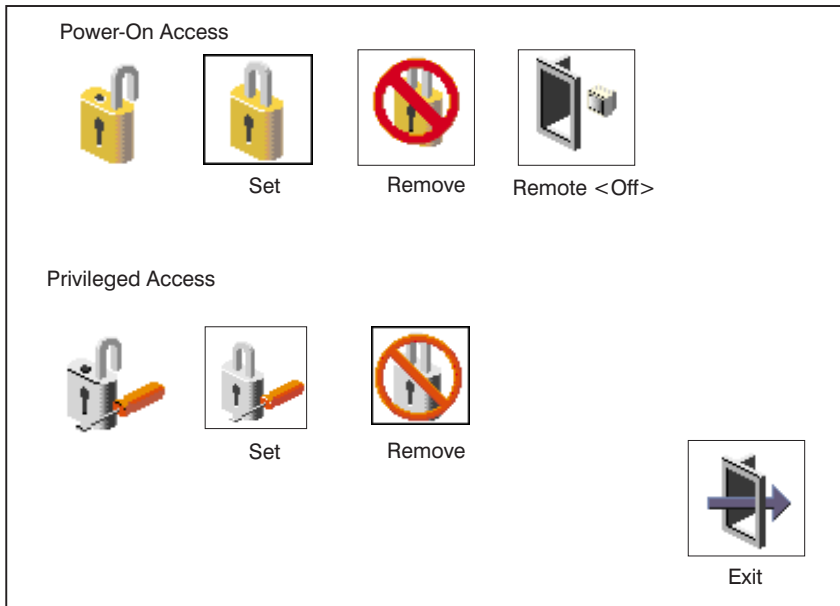
Console: Allows the user to select which console to use to display the SMS menus. This selection is only for the SMS menus. It does not affect the display used by the AIX operating system.

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

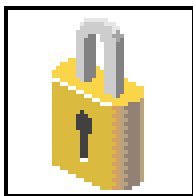
Password



Select this icon to perform password-related tasks.







Power-On Access Password



Setting a **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 preceding screen).

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.

Verify Password

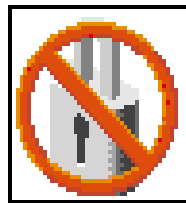
--	--	--	--	--	--	--	--

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

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

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.



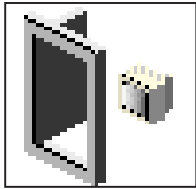
After you have selected the remove icon, the power-on-access status icon flashes and changes to the unlocked position to indicate that the power-on-access password is not set.

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.

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

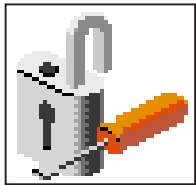
Remote Mode



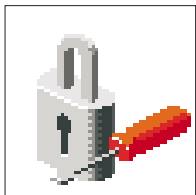
Remote Mode: The remote mode, when enabled, allows the system to start from the defined boot device. This mode is ideal for network servers and other system units that operate unattended. When the remote mode is set, the icon label changes to **Remote <On>**

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 190 for instructions on enabling the unattended start mode, which allows the system unit to turn on whenever ac power is applied to the system (instead of having the system unit wait for the power button to be pushed).

Privileged-Access Password







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



When you select the **Set** icon, a screen with 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.

Verify Password

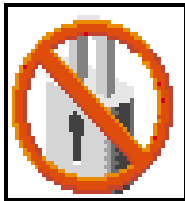
□ □ □ □ □ □ □ □

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 the 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 now requires the password you just entered before running system programs.

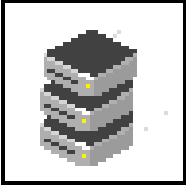
If you previously had set a privileged-access password and want to remove it, select the **Remove** icon.



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

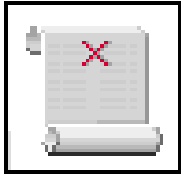


Select this icon to change the spin-up delay for SCSI hard disk drives attached to your system. Spin-up delay values can be entered manually or you can use a default setting. All values are measured in seconds. The default is two seconds. After you have entered the new spin-up delay values, use the arrow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



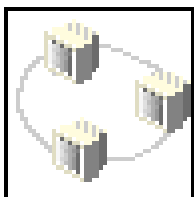
Exit

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

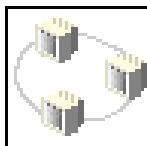
This error log only shows the first and last errors.

Note: The time stamp in this error log is coordinated universal time (UTC), 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.

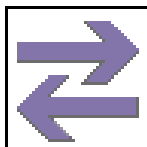
RIPL



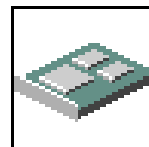
Selecting the **Remote Initial Program Load (RIPL)** icon gives you access to the following selections.



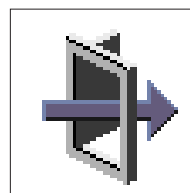
Set Address



Ping

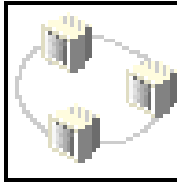


Config



Exit

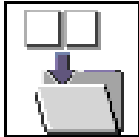
Set Address




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



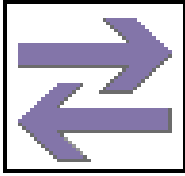
Exit

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 type the new address.

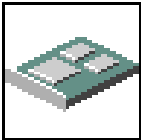
Ping




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



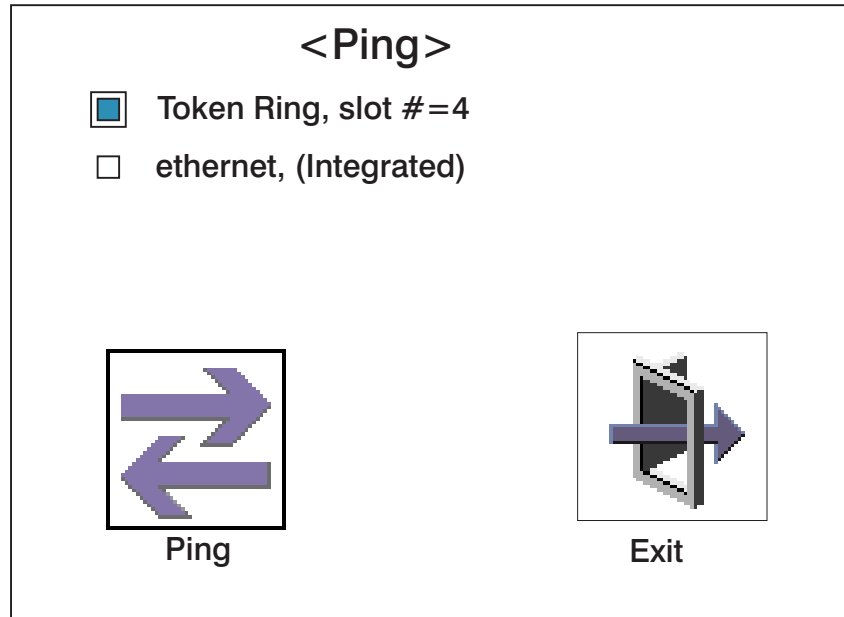
Adapter



Exit

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

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



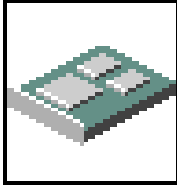
To use this screen, do the following:

1. Use the arrow keys or mouse to highlight 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 select the adapter.
3. Highlight the **Ping** icon and press Enter to send the test transmission.

Config

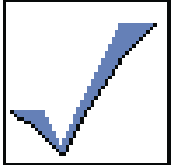
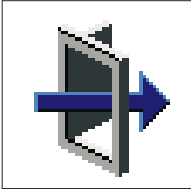


The **Config** icon allows you to configure network adapters that require setup.

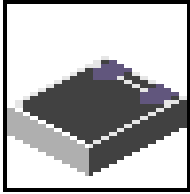
Selecting the **Config** icon causes a list of the adapters requiring configuration to display.

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. Highlight the **OK** icon and press Enter.

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.

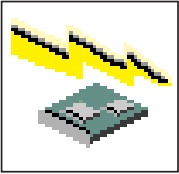
Change SCSI ID

Type	Slot	Id	Max Id
Ultra	0	7	15
Fast/Wide	0	7	15

Save **Default** **Exit**

Firmware Update



Attention: The SMS firmware update utility does not support the combined image update process. It is recommended only for those systems that cannot boot AIX. Detailed instructions on using the SMS utilities to update system and service processor firmware can be obtained from the following Web site:

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

If you are not able to obtain firmware update images or instructions from this Web site, contact your service representative.

If the firmware update image is available on your network from another system, see Appendix E, "Firmware Updates" on page 349 for instructions on updating the system and service processor firmware using a combined image from the AIX command line.

Firmware Recovery

If a troubleshooting procedure has indicated that the system firmware unit has been damaged, it may be possible to recover it. For example, if the system hangs during startup with E1EA displayed on the operator panel, the system firmware has been damaged but may be recovered.

To recover damaged system firmware, do the following:

1. Create a firmware recovery diskette. This must be a 3.5" high-density (1.44 MB) diskette that has been formatted for DOS.
2. Obtain the system firmware update image file from one of the following sources:
 - a. From the Web address: <http://www.rs6000.ibm.com/support/micro>
 - b. From a service representative if you cannot access the Web address.
3. Copy the system firmware update image file to the recovery diskette, naming it PRECOVER.IMG. The file must be written in DOS format.
4. When the system stops booting, for example at E1EA, insert the recovery diskette. If the diskette drive LED does not light up, power the system unit off, then back on again.
5. If the recovery procedure is successful, the system will continue starting and will display checkpoints of the form E1XX.
6. Enter the System Management Services menu. When the keyboard indicator displays, press the 1 key if the system console is an ASCII terminal. If the system console is a graphics display and directly attached keyboard, press the F1 key.
7. When the main menu displays, choose Utilities, then perform an update of the system firmware by following the prompts that are displayed.

Attention: A companion service processor firmware update may be required. See the Web site at <http://www.rs6000.ibm.com/support/micro> to get additional information on companion levels and detailed update instructions.

Text-Based System Management Services

The text-based System Management Services are available if an ASCII terminal is attached to your system. The text-based System Management Services makes it possible for you to view information about your system 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 after the word "keyboard" appears and before the word "speaker" appears. After the text-based System Management Services starts, the following screen displays.

Note: The version of firmware currently installed in your system is displayed at the top of each screen in the text-based System Management Services. Note the version number. Processor and other device upgrades may require a specific version of firmware to be installed in your system. Update System Firmware is an option under the Main Menu.

On all menus except the Main Menu, there are several navigator keys:

M Return to the main menu.

ESC Return to the previous menu.

X Exit the System Management Services and start the operating system.

If X is entered, you are asked to confirm your choice to exit the SMS menus and start the operating system.

When there is more than one page of information to display, there are two additional navigator keys:

N Display the next page of the list.

P Display the previous page of the list.

Note: The lower-case navigator key has the same effect as the upper-case key that is shown on the screen. For example, "n" or "N" takes you back to the main menu.

On each menu screen, you are given the option of choosing a menu item and pressing enter (if applicable), or selecting a navigator key.

Main Menu

- 1 Select Language
- 2 Change Password Options
- 3 View Error Log
- 4 Setup Remote IPL (Initial Program Load)
- 5 Change SCSI Settings
- 6 Select Console
- 7 Select Boot Options
- 8 View System Configuration Components
- 9 System/Service Processor Firmware Update

Navigator keys:

X = eXit System Management Services

Type the number of the menu item and press Enter or Select a Navigator key: _

Select Language

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

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

Navigator keys:

M = return to main menu

ESC key = return to previous screen

X = eXit System Management Services

Type the number of the menu item and press Enter or Select a Navigator key: _

Change Password Options

The Change Password Options screen enables you to select from password utilities.

Password Utilities

- 1 Set Privileged-Access Password
- 2 Remove Privileged-Access Password
- 3 Unattended Start Mode <OFF>

Navigator keys:

M = return to main menu

ESC key = return to previous screen

X = eXit System Management Services

Type the number of the menu item and press Enter or Select a Navigator key: _

Set Privileged-Access Password

The privileged-access password protects against the unauthorized starting of the system programs.

Attention: If 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**.

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 enabled or disabled using service processor menus. Unattended start mode can be used on servers 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.

View Error Log

Use this option to view or clear your system'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

1. Clear error log

-----
Navigator keys:
M = return to main menu
ESC key = return to previous screen                X = eXit System Management Services
-----
Type the number of the menu item and press Enter or Select a Navigator key: _
```

Note: The time stamp in his error log is coordinated universal time (UTC), 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.

Setup Remote IPL (Initial Program Load)

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

Navigator keys:

M = return to main menu

ESC key = return to previous screen

X = eXit System Management Services

Type the number of the menu item and press Enter or Select a Navigator key: _

Selecting the IP (Internet Protocol) 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]

Navigator keys:

M = return to main menu

ESC key = return to previous screen

X = eXit System Management Services

Type the number of the menu item and press Enter or Select a Navigator key: _

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

Navigator keys:
M = return to main menu
ESC key = return to previous screen
X = eXit System Management Services

Type the number of the menu item and press Enter or Select a Navigator key: _

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

10/100 Ethernet TP PCI Adapter	
1. Data Rate	(Currently Auto)
2. Full Duplex	(Currently Yes)

Navigator keys:
M = return to main menu
ESC key = return to previous screen
X = eXit System Management Services

Type the number of the menu item and press Enter or Select a Navigator key: _

Selecting the **Data Rate** option allows you the change the media employed by the Ethernet adapter:

```
Select Data Rate

 1. 10 Mbps
 2. 100 Mbps
 3. Auto

-----

Navigator keys:
M = return to main menu
ESC key = return to previous screen                X = eXit System Management Services
-----

Type the number of the menu item and press Enter or Select a Navigator key: _
```

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

```
Select Full Duplex Mode

 1. Yes
 2. No
 3. Auto

-----

Navigator keys:
M = return to main menu
ESC key = return to previous screen                X = eXit System Management Services
-----

Type the number of the menu item and press Enter or Select a Navigator key: _
```

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.

```
Adapter Parameters

Device                Slot                Hardware Address
-----
 1. 100/10 Ethernet   5:P1-I5/E1         0060940d5151
 2. fddi              4:P1-I4/Q1         00005a4263cd
 3. 100/10 Ethernet   Integrated: P1/E1   000000000000

-----

Navigator keys:
M = return to main menu
ESC key = return to previous screen                X = eXit System Management Services
-----

Type the number of the menu item and press Enter or Select a Navigator key: _
```

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]
5. Execute Ping

Navigator keys:

M = return to main menu

ESC key = return to previous screen

X = eXit System Management Services

Type the number of the menu item and press Enter or Select a Navigator key: _

Change SCSI Settings

This option allow you to view and change the addresses of the SCSI controllers attached to your system.

SCSI Utilities

1. Change Hardware Spin Up Delay
2. Change SCSI Id

Navigator keys:

M = return to main menu

ESC key = return to previous screen

X = eXit System Management Services

Type the number of the menu item and press Enter or Select a Navigator key: _

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.

Follow the instructions that display on the screen. To return to the SMS menu, press the number **1** key after the word **keyboard** displays and before the tone sounds.

Select Boot Options

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 Device
5 Multiboot Startup <currently OFF>

-----
Navigator keys:
M = return to main menu
ESC key = return to previous screen
X = eXit System Management Services
-----
Type the number of the menu item and press Enter or Select a Navigator key: _
```

Select Software: This option is used when more than one operating system is installed on the same disk drive. AIX does not support multiple operating systems on a single disk drive. Multiple AIX images can be installed on separate disk drives; the desired disk drive can be selected for booting using the **Select Boot Device** function in System Management Services or the AIX diagnostic service aid **Display or Change Bootlist**.

If **Select Software** is chosen from this menu, a line similar to the following is displayed:

```
-> 1      AIX 5.1.0 <-
```

This indicates the current version of AIX that is installed on the system. If a **1** is entered, the system will boot AIX.

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

```
No Operating System Installed
```

this indicates 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 **Select Boot Device** option on this menu.

The AIX Documentation library is available at the following Web address: <http://www.ibm.com/servers/aix/library/techpubs.html>. AIX documentation is also contained on the AIX Documentation CD. The documentation is made accessible by loading the documentation CD onto the hard disk or by mounting the CD in the CD-ROM drive.

Software Default: This option is used when more than one operating system is installed on the same disk drive. AIX does not support multiple operating systems on a single disk drive. Multiple AIX images can be installed on separate disk drives; the desired disk drive can be selected for booting using the **Select Boot Device** function in System Management Services or the AIX diagnostic service aid **Display or Change Bootlist**.

If **Software Default** is chosen from this menu, a line similar to the following is displayed:

```
-> 1      AIX 5.1.0 <-
```

This indicates the current version of AIX that is installed on the system.

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

```
No Operating System Installed
```

this indicates 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 **Select Boot Device** option on this menu.

Select Install Device: Produces a list of devices, for example the CD-ROM, from which the operating system is 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. This option should only be used by service personnel to obtain additional debug information.

Multiboot Startup: Toggles between OFF and ON and selects whether the Multiboot menu invokes 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.

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

Navigator keys:

M = return to main menu

ESC key = return to previous screen

X = eXit System Management Services

Type the number of the menu item and press Enter or Select a Navigator key: _

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 9100 MB Harddisk (loc = P1-I6/Z1-A8)
2. SCSI CD-ROM (loc = P1/Z1-A1)
3. SCSI Tape (loc = P1/Z1-A0)
4. Ethernet (loc = P1-I5/E10)
5. None

Navigator keys:

M = return to main menu

ESC key = return to previous screen

X = eXit System Management Services

Type the number of the menu item and press Enter or Select a Navigator key: _

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

1. Primary diskette drive
2. CD-ROM drive
3. Tape drive (if installed)
4. Hard disk drive
5. 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.

Options display a screen similar to the following:

```
Configure Nth Boot Device

Device      Current      Device
Number      Position     Name
-----
1           1           Diskette
2           2           Port E2 - 100/10 Ethernet Adapter (Integrated)
3           3           Port E1 - 100/10 Ethernet Adapter Integrated)
4           4           IDE CD-ROM
5           5           SCSI 36.4 MB Hard Disk id=@0,0 (Integrated)
6           6           -

-----
Navigator keys:
M = return to main menu
ESC key = return to previous screen                X = eXit System Management Services
-----
Type the number of the menu item and press Enter or Select a Navigator key: _
```

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 thus selecting the SCSI CD-ROM device to be the 2nd (**Nth**) device in the boot sequence.

View System Configuration Components

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

```
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=512MB
  Memory card slot=1, module slot=2 size=512MB
  Memory card slot=1, module slot=3 size=512MB
  Memory card slot=1, module slot=4 size=512MB

Service Processor
Tablet Port

LPT   addr=378

COM   addr=3F8

COM   addr=2F8

Keyboard
Mouse
Diskette addr=3F0

SCSI controller id=7 (P1/Z1)

-----
Navigator keys:
M = return to main menu           N = next page of list           P = previous page of list
ESC key = return to previous screen X = eXit System Management Services
-----
Type the number of the menu item and press Enter or Select a Navigator key: _
```

System/Service Processor Firmware Update

Firmware Update Menu

1. System Firmware
2. Service Processor Firmware

Navigator keys:

M = return to main menu

ESC key = return to previous screen

X = eXit System Management Services

Type the number of the menu item and press Enter or Select a Navigator key: _

Attention: The SMS firmware update utility does not support the combined image update process. It is recommended only for those systems that cannot boot AIX. Detailed instructions on using the SMS utilities to update system and service processor firmware can be obtained from the following Web site:

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

If you are not able to obtain firmware update images or instructions from this Web site, contact your service representative.

If the firmware update image is available on your network from another system, see Appendix E, "Firmware Updates" on page 349 for instructions on updating the system and service processor firmware using a combined image from the AIX command line.

Firmware Recovery

For instructions on firmware recovery, go to "Firmware Recovery" on page 236.

Chapter 9. Removal and Replacement Procedures

Servicing of this system can be performed with the system either in the vertical or horizontal position.

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

DANGER

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

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

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

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

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

CAUTION:

This product is equipped with a 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.

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:

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

Stopping the System

Attention: When shutting down your system to install options, shut down all applications first and then shut down the operating system. The system power turns off and the system goes into standby mode when the operating system is shut down. Before removing power from the system, ensure that the shutdown 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. Log in to the system as root user.
2. Stop any applications that are running on the system.
3. At a command line, type shutdown to stop the operating system.
4. After you shut down the operating system, set the power switches of any attached devices to Off.

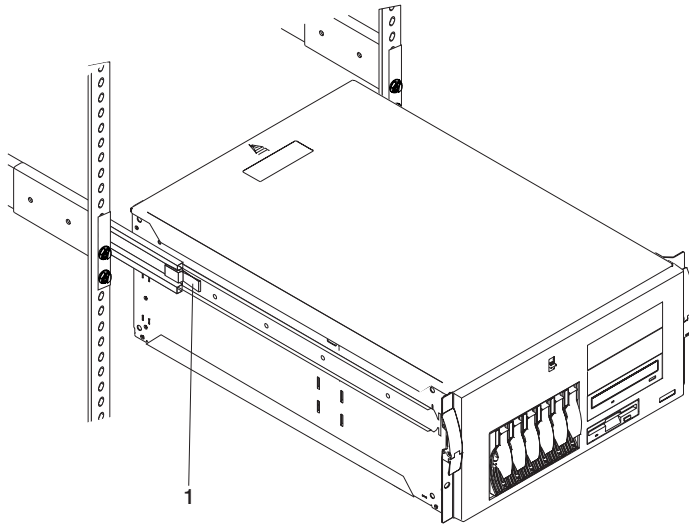
Placing the Model 6C1 in the Service Position

Attention: Care should be taken to ensure that a hazardous condition is not created due to uneven mechanical loading when placing the system in the service position. If the rack has a stabilizer, it must be firmly attached before placing the system in the service position.

Before doing any actions inside the Model 6C1, you must put the system in the service position. To place the system in the service position:

1. Release the left and right side latches
2. Pull the system toward the front until it is fully extended.

When the system is fully extended, safety latches on the slide rails lock into place. This prevents the system from being accidentally pulled out too far and dropped.



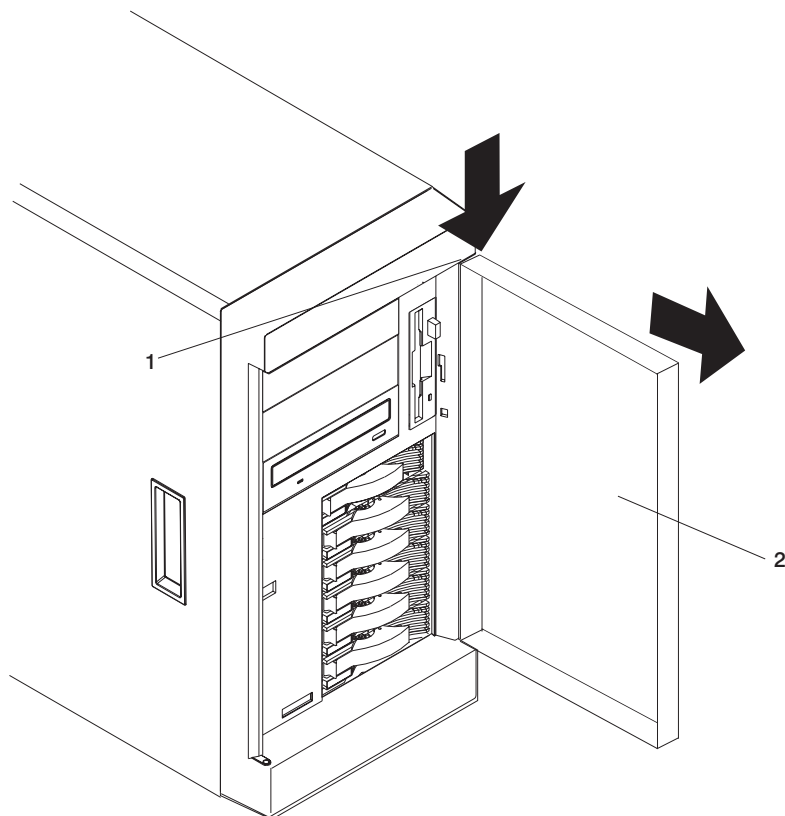
After completing actions, return the system to the normal position by pressing in on the safety latches (1).

Front Door (Model 6E1)

The following procedures cover removal and replacement of the front door on the Model 6E1.

Removal

Refer to the following illustration while you perform the steps in this procedure.

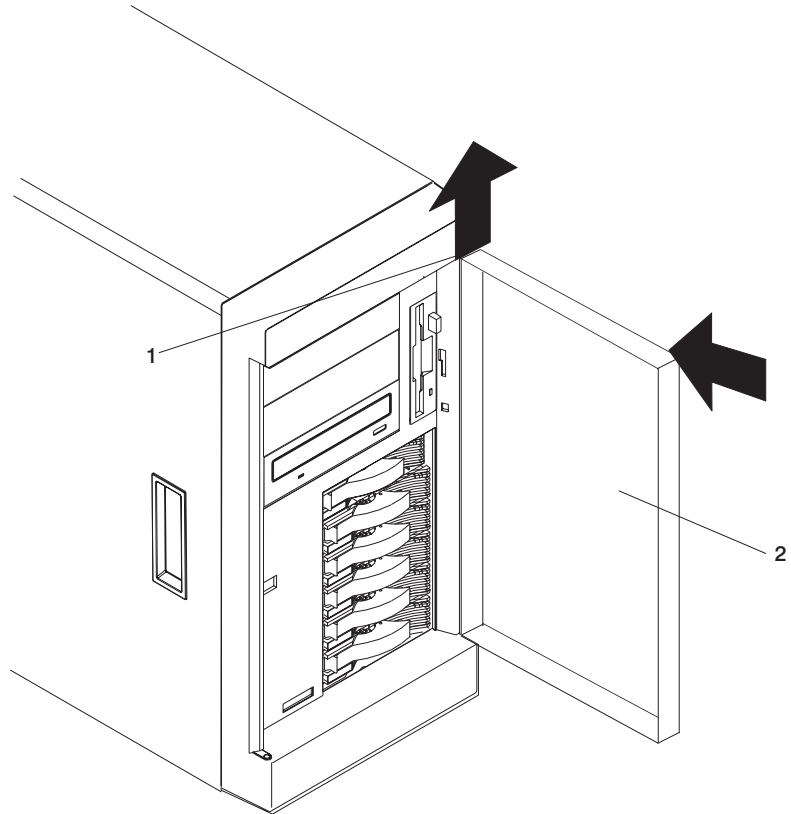


- | | |
|---|------------|
| 1 | Flange |
| 2 | Front door |

1. Unlock and open the system door (2).
2. Locate the flange (1) on the top edge of the door.
3. Press down on the flange while pressing out on the door; then lift the system door up and off the hinge. Set the door aside in a safe place.

Replacement

Refer to the following illustration while you perform the steps in this procedure.



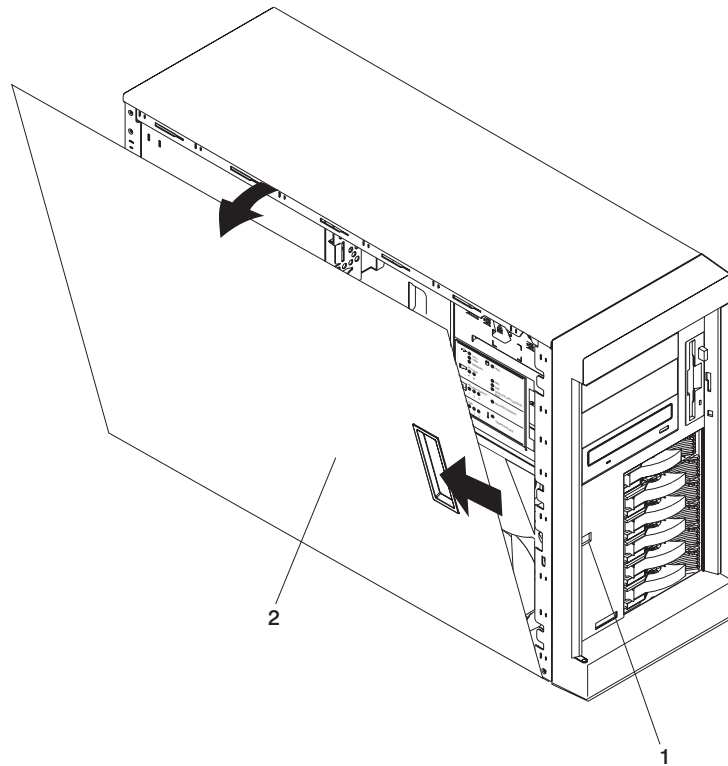
- | | |
|---|------------|
| 1 | Flange |
| 2 | Front door |

1. Set the door (2) on the bottom hinge.
2. Press the flange (1) downward while pressing the top of the door toward the system, until the flange connects with the top hinge. Release the flange.
3. Close and lock the system door.

Covers

The following procedures cover removal and replacement of the service access cover.

Service Access Cover (Model 6E1)



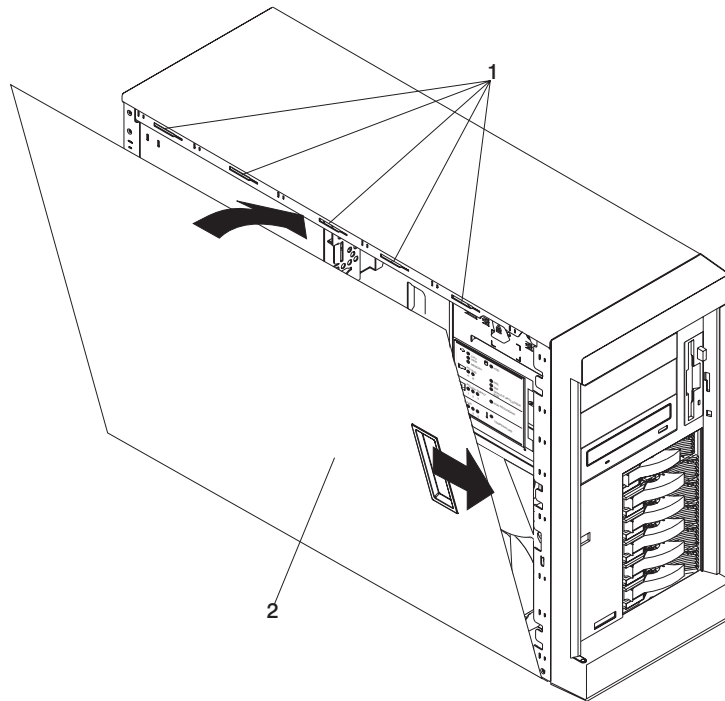
- | | |
|---|---------------------|
| 1 | Cover-release latch |
| 2 | Cover |

Removal

1. If you are planning to install or remove any part other than a hot-swap hard disk drive, hot-swap power supply, or hot-swap fan, turn off the system and all attached devices and disconnect all external cables and power cords.
2. Slide the cover-release lever (1) on the front of the system to release the cover, and slide the cover (2) toward the rear of the system about 25 mm (1 inch). Move the top edge of the cover out from the system, then lift the cover off the system. Set the cover aside.

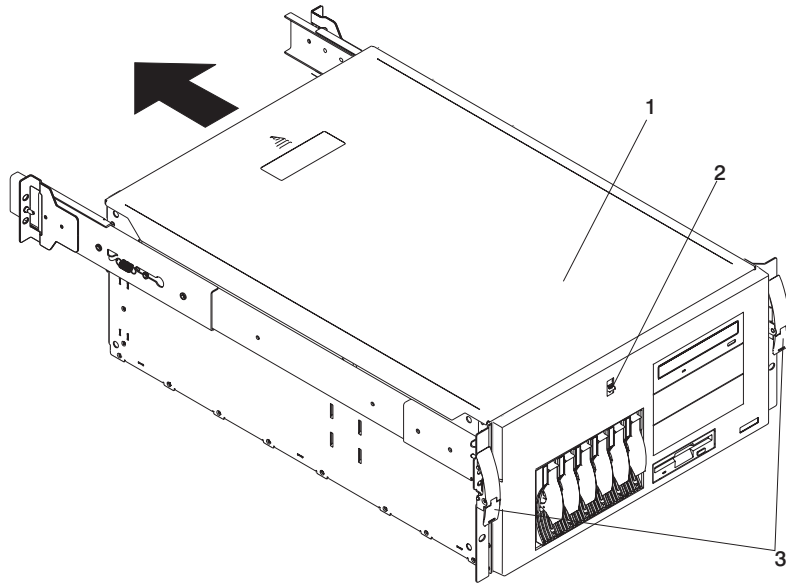
Attention: For proper cooling and airflow, replace the cover before turning on the system. Operating the system for extended periods of time (over 30 minutes) with the cover removed might damage system components.

Replacement



1. Align the service access cover (2) with the left side of the system, about 25 mm (1 inch) from the front of the system; place the bottom of the left-side cover on the bottom rail of the left side of the chassis.
2. Insert the tabs at the top of the cover into the slots (1) at the top of the system side.
3. Hold the cover against the system, and slide the cover toward the front of the system until the cover clicks into place.

Service Access Cover (Model 6C1)



- | | |
|---|---------------------|
| 1 | Top cover |
| 2 | Cover-release latch |
| 3 | Side latches |

Removal

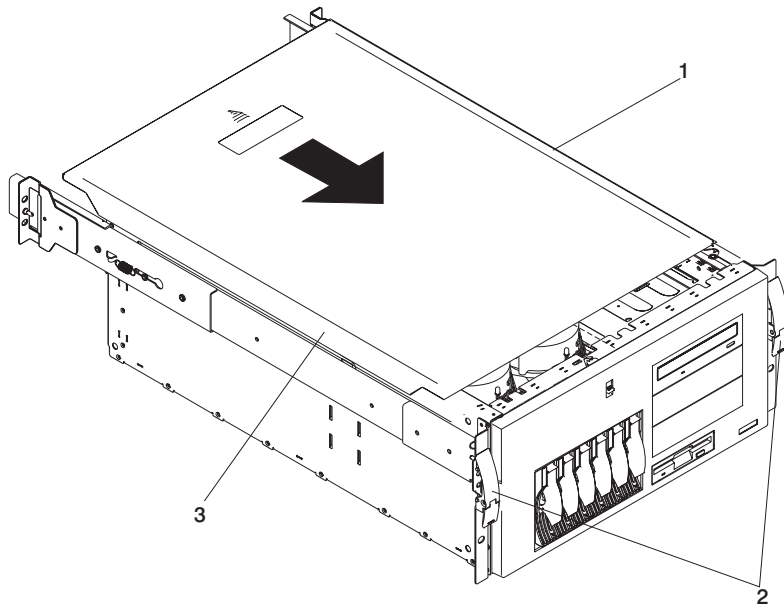
1. If you are planning to install or remove any part other than a hot-swap hard disk drive, hot-swap power supply, or hot-swap fan, turn off the system and all attached devices and disconnect all external cables and power cords.
2. Release the left and right side latches (3), and pull the system out of the rack enclosure until both slide rails lock.

Note: When the system is in the locked position, you can easily reach the cables on the back of the system.

3. Move the cover-release latch (2) down while sliding the top cover (1) toward the rear of the system about 25 mm (1 inch). Lift the cover off the system, and set the cover aside.

Attention: For proper cooling and airflow, replace the cover before turning on the system. Operating the system for extended periods of time (over 30 minutes) with the cover removed might damage system components.

Replacement



- | | |
|---|--------------|
| 1 | Top cover |
| 2 | Side latches |
| 3 | Flanges |

1. Align the top cover (1) with the top of the system, about 25 mm (1 inch) from the front of the system. The flanges on the left and right sides of the cover should be on the outside of the system chassis.
2. Hold the cover against the system, and slide the cover toward the front of the system until the cover clicks into place.

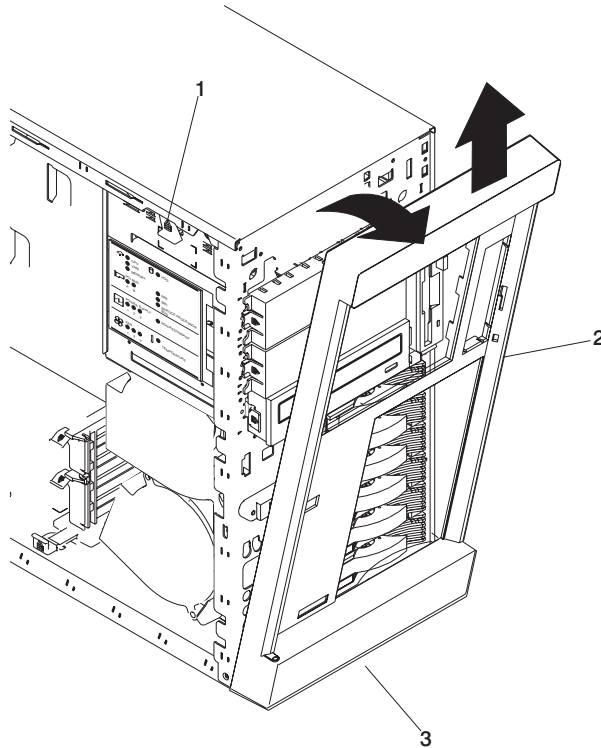
Bezels

The following procedures cover removal and replacement of the bezel.

Model 6E1

Removal

Refer to the following illustrations while you perform the steps in this procedure.



- | | |
|---|--------------------------------|
| 1 | Bezel-release lever |
| 2 | Bezel |
| 3 | Side with bezel tabs and slots |

To remove the bezel:

1. Remove the service access cover as described in “Covers” on page 256.
2. Move the blue bezel-release lever (1), following the curve of the lever opening.
3. Lift the bezel tabs out of the slots (3), and pull the bezel (2) away from the system front. Store the bezel in a safe place.

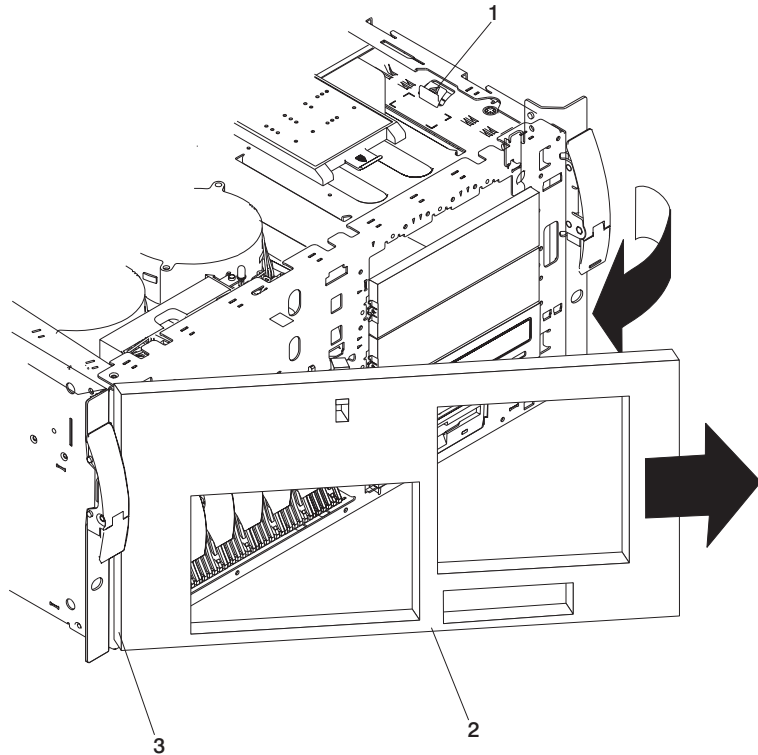
Replacement

Replace in reverse order.

Model 6C1

Removal

Refer to the following illustrations while you perform the steps in this procedure.



- | | |
|---|--------------------------------|
| 1 | Bezel-release lever |
| 2 | Bezel |
| 3 | Side with bezel tabs and slots |

To remove the bezel:

1. Remove the service access cover as described in “Covers” on page 256.
2. Move the blue bezel-release lever (1), following the curve of the lever opening.
3. Lift the bezel tabs out of the slots (3), and pull the bezel (2) away from the system front. Store the bezel in a safe place.

Replacement

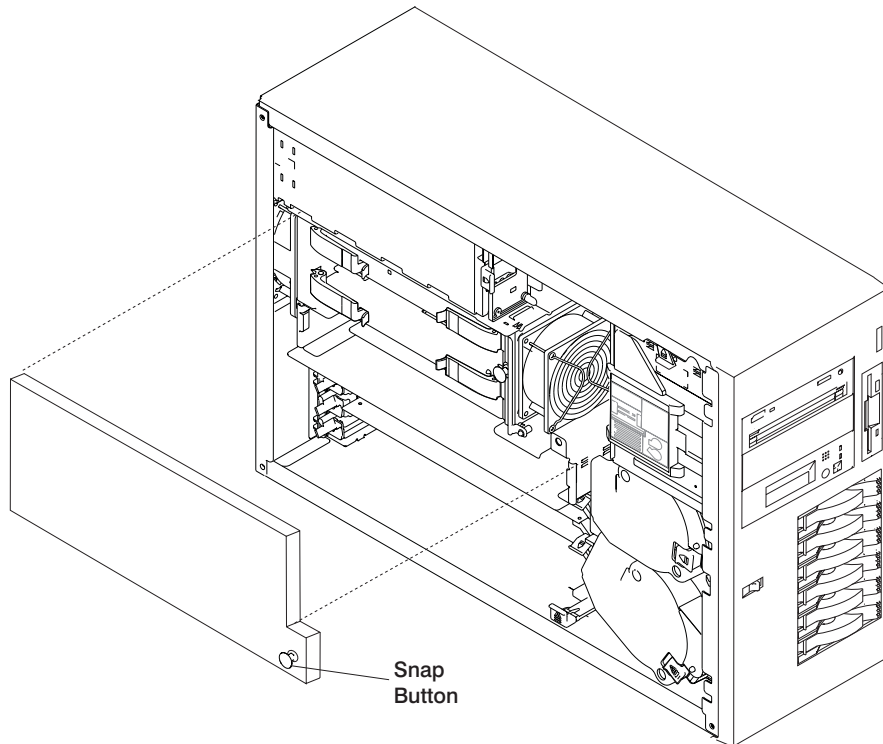
Replace in reverse order.

Processor and Memory Card Cover

The following procedures cover removal and replacement of the processor and memory card cover.

Removal

1. If you have not already done so, shut down the system as described in “Stopping the System” on page 252.
2. If your system is a Model 6C1 (rack mount), place the system in the service position as described in “Placing the Model 6C1 in the Service Position” on page 253.
3. If you have not already done so, remove the service access cover as described in “Covers” on page 256.
4. Record any memory card or processor LEDs that are on.
5. Pull out on the snap button, and remove the processor and memory card cover.



Replacement

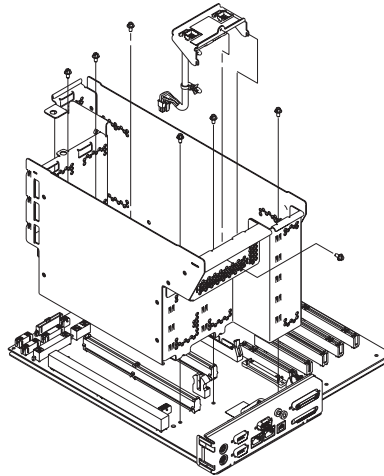
Replace in reverse order.

CEC Cage

The following procedures cover removal and replacement of the CEC cage.

Removal

1. If you have not already done so, shut down the system as described in “Stopping the System” on page 252.
2. If you have not already done so, unplug the system power cables from the electrical outlets.
3. If your system is a Model 6C1 (rack mount), place the system in the service position as described in “Placing the Model 6C1 in the Service Position” on page 253.
4. If you have not already done so, remove the service access cover as described in “Covers” on page 256.
5. Remove the processor and memory card cover as described in “Processor and Memory Card Cover” on page 262.
6. Remove the processor cards as described in “Processor Card” on page 271.
7. Remove the memory card as described in “Memory Card and Memory DIMMs” on page 264.
8. Remove the screws (6) and remove the CEC cage from the system board.



Replacement

Replace in reverse order.

Memory Card and Memory DIMMs

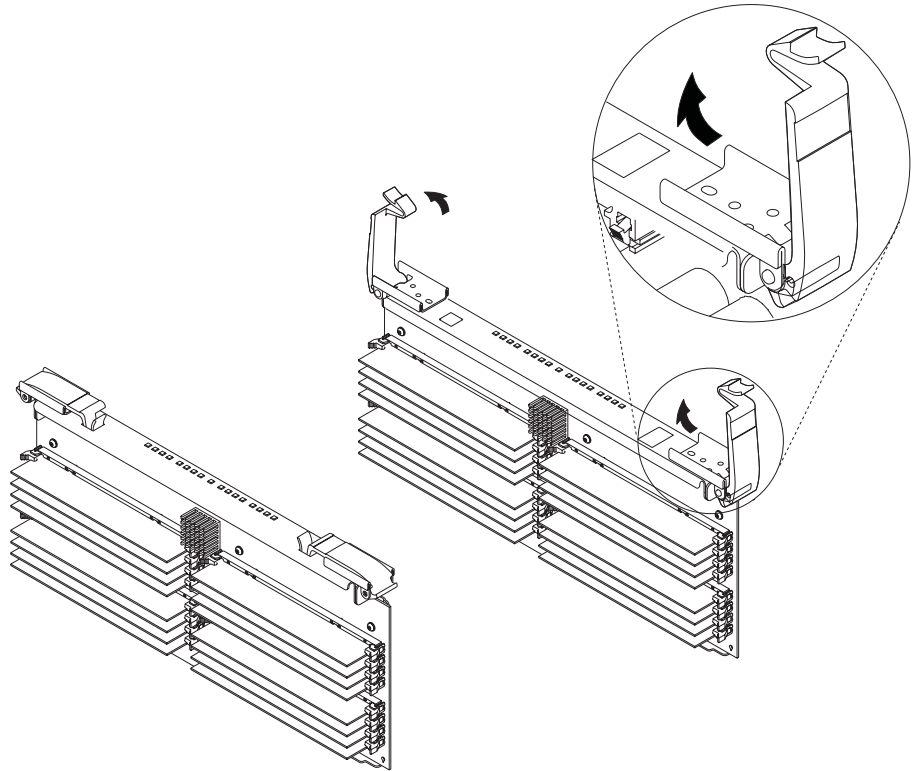
The following procedures cover removal and replacement of the memory card and memory DIMMs.

Before performing these procedures, read “Handling Static-Sensitive Devices” on page 252.

Memory Card Removal

1. If you have not already done so, shut down the system as described in “Stopping the System” on page 252.
2. If you have not already done so, unplug the system power cables from the electrical outlet.
3. If your system is a Model 6C1 (rack mount), place the system in the service position as described in “Placing the Model 6C1 in the Service Position” on page 253.
4. If you have not already done so, remove the service access cover as described in “Covers” on page 256.
5. Remove the processor and memory card cover as described in “Processor and Memory Card Cover” on page 262.
6. The memory card is secured in place with retention latches, one on each end of the card. Open the retention latches.

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

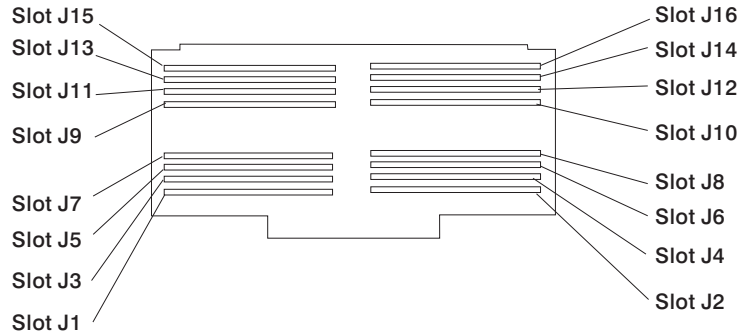


7. Remove the card from the connector.

Memory DIMM Removal

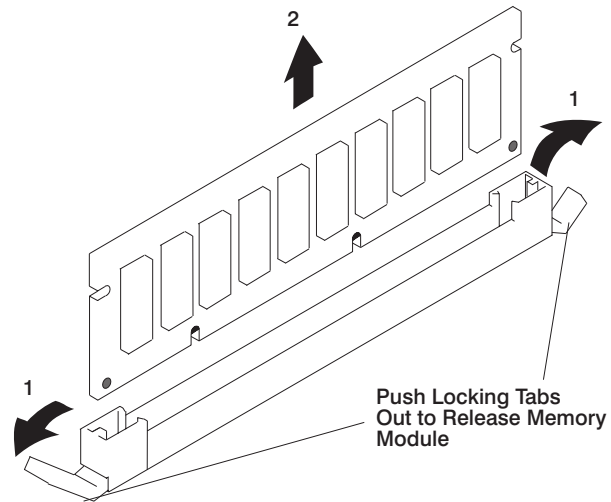
1. If you have not already done so, remove the memory card as described in “Memory Card Removal” on page 264
2. Locate the memory DIMM connectors, and determine which DIMM you want to remove.

Note: Memory DIMMs must be removed in pairs from the correct slots. (Slots J1 and J2, J3 and J4, J5 and J6, and so on.)



Slot J1	Location P1-M1.1	Slot J2	Location P1-M1.2
Slot J3	Location P1-M1.3	Slot J4	Location P1-M1.4
Slot J5	Location P1-M1.5	Slot J6	Location P1-M1.6
Slot J7	Location P1-M1.7	Slot J8	Location P1-M1.8
Slot J9	Location P1-M1.9	Slot J10	Location P1-M1.10
Slot J11	Location P1-M1.11	Slot J12	Location P1-M1.12
Slot J13	Location P1-M1.13	Slot J14	Location P1-M1.14
Slot J15	Location P1-M1.15	Slot J16	Location P1-M1.16

3. Remove the memory DIMM by pushing the tabs out on the memory connectors.

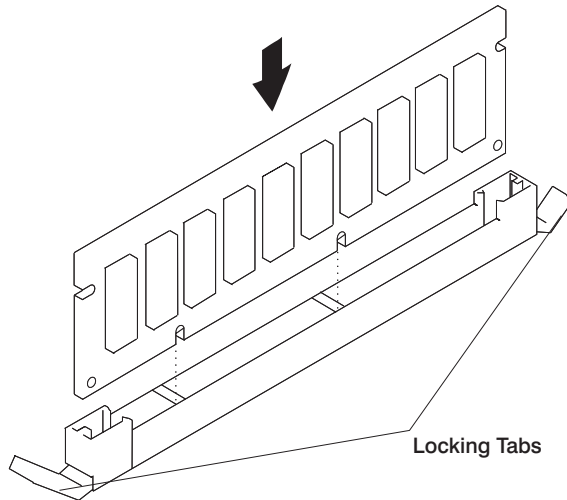


Memory DIMM Replacement

1. With one hand, touch any metal surface of the chassis to minimize static electrical charges, and then pick up the memory DIMM.
2. Locate the memory DIMM connector on the memory card.

Note: Memory DIMMs must be installed in pairs in the correct slots. (Slots J1 and J2, J3 and J4, J5 and J6, and so on.)

3. Insert the memory DIMM firmly into the connector.

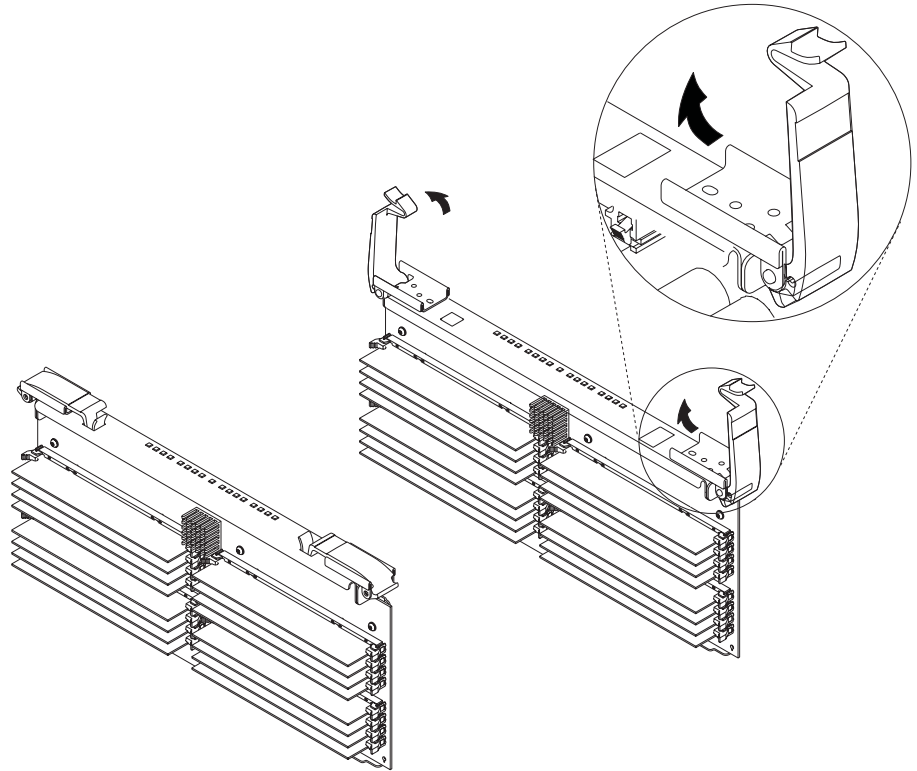


4. Secure the memory DIMM with the locking tabs located at each end of the connector.
5. Replace the memory card into the system.

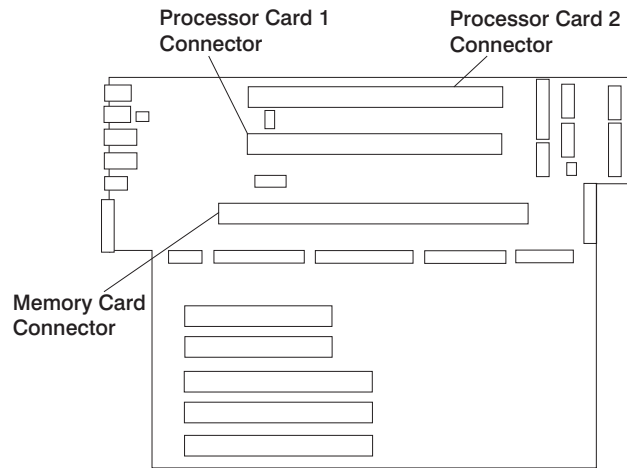
Memory Card Replacement

1. Open the retention latches. *Both* latches should be in an upright position. See the following illustration.

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



2. Align the card with the card guides and card connector.



3. Close the retention latches, securing the card into the connector.
4. Replace the covers as described in "Covers" on page 256.

Processor Card

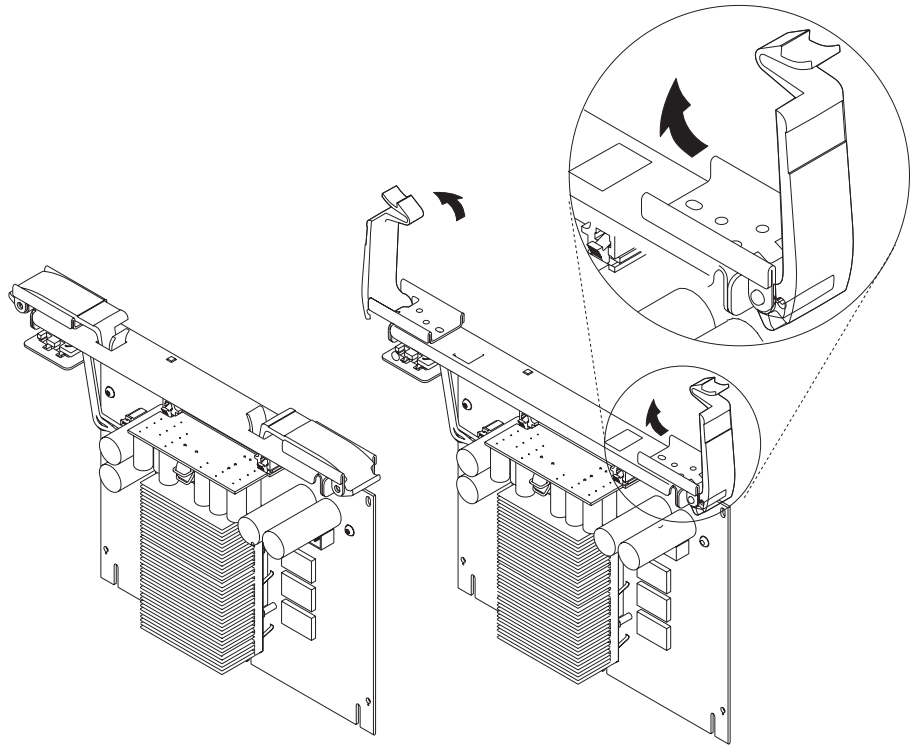
The following procedures cover removal and replacement of the processor card.

Before performing these procedures, read “Handling Static-Sensitive Devices” on page 252.

Removal

1. If you have not already done so, shut down the system as described in “Stopping the System” on page 252.
2. If you have not already done so, unplug the system power cable from the electrical outlet.
3. If your system is a Model 6C1 (rack mount), place the system in the service position as described in “Placing the Model 6C1 in the Service Position” on page 253.
4. If you have not already done so, remove the service access cover as described in “Covers” on page 256.
5. Remove the processor and memory card cover as described in “Processor and Memory Card Cover” on page 262.
6. The processor card is secured in place with retention latches, one on each end of the card. Open the retention latches.

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

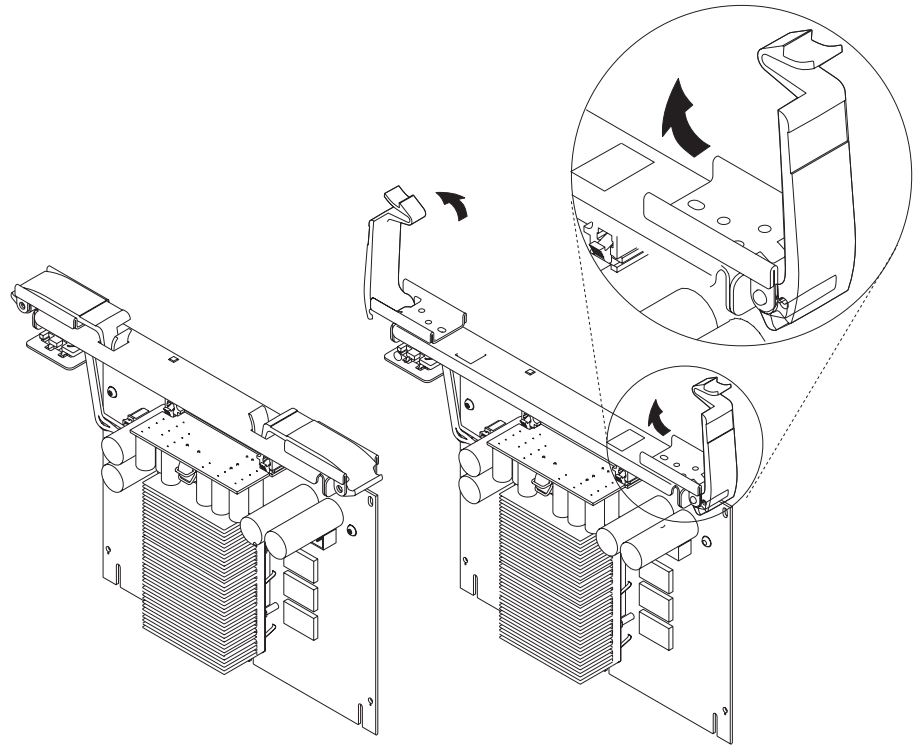


7. Remove the card from the connector.

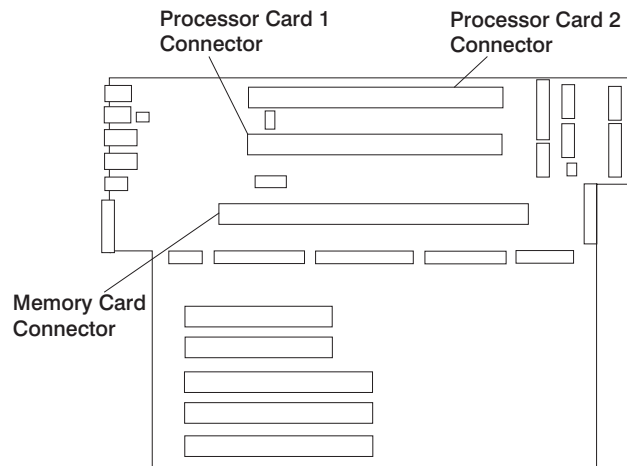
Replacement

1. Open the retention latches. *Both* retention latches should be in an upright position. See the following illustration.

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



2. Align the card with the card guides and card connector.



3. Close the retention latches, securing the card into the connector.
4. Replace the covers as described in "Covers" on page 256.

Adapters

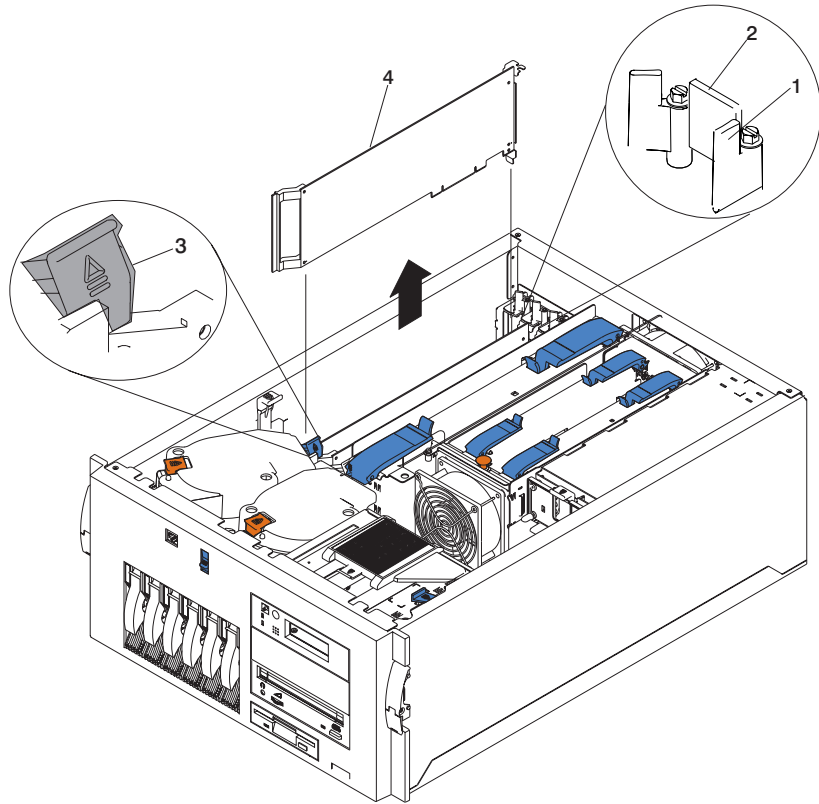
The following procedures cover removal and replacement of the adapters.

Before performing these procedures, read “Handling Static-Sensitive Devices” on page 252.

Note: This system does not support hot-plugging of PCI adapters.

Removal

1. If you have not already done so, shut down the system as described in “Stopping the System” on page 252.
2. If you have not already done so, unplug the system power cables from the electrical outlets.
3. If your system is a Model 6C1 (rack mount), place the system in the service position as described in “Placing the Model 6C1 in the Service Position” on page 253.
4. If you have not already done so, remove the service access cover as described in “Covers” on page 256.
5. Determine which adapter you are removing.
6. Disconnect any cables attached to the adapter.



- | | |
|---|-------------------------|
| 1 | Adapter retainer flap |
| 2 | Tab |
| 3 | Adapter retention latch |
| 4 | Adapter |

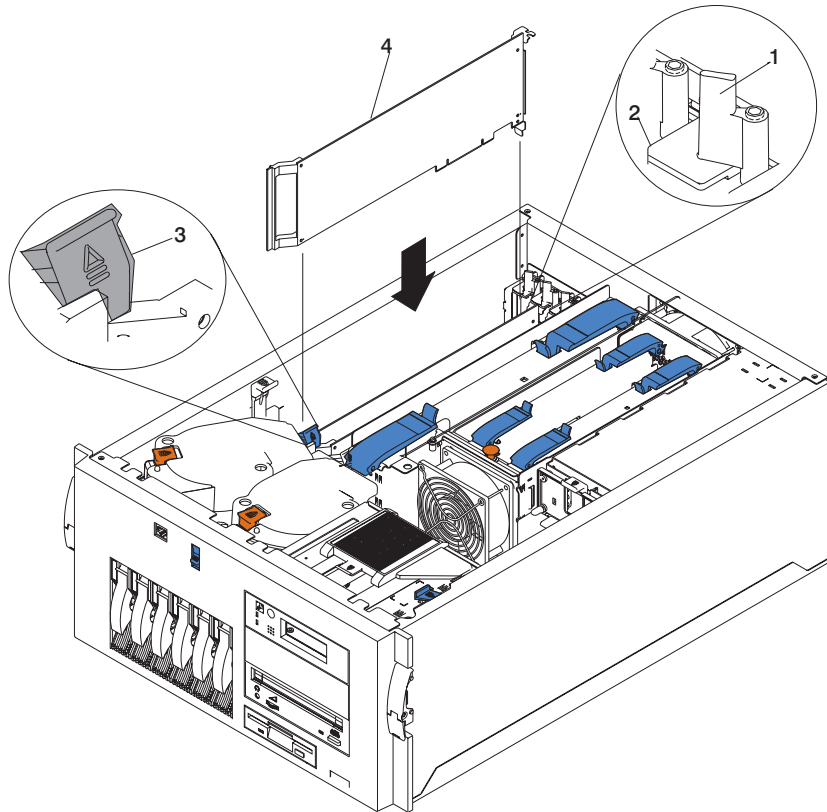
7. If you are removing a long adapter, press on the touchpoint on the adapter retainer flap (1) at the end of the slot nearest the front of the system, and rotate the adapter retainer flap upward.
8. Rotate the adapter retention latch (3) counterclockwise.
9. Raise the tab (2) on the adapter guide over the tab on the top corner of the adapter.
10. Carefully grasp the adapter (4) by its top edge or upper corners, and remove it from the system board.

Replacement

1. Remove the adapter from the antistatic package.

Attention: Avoid touching the components and gold-edge connectors on the adapter.

2. Place the adapter, component-side up, on a flat, static-protective surface.
3. Set any jumpers or switches as described by the adapter manufacturer.
4. Install the adapter.



- | | |
|---|-------------------------|
| 1 | Tab |
| 2 | Adapter retention latch |
| 3 | Adapter retainer flap |
| 4 | Adapter |

- a. Carefully grasp the adapter (5) by its top edge or upper corners, and align it with the expansion slot on the system board.
- b. Press the adapter *firmly* into the expansion slot.

Attention: When you install an adapter in the system, be sure that it is completely and correctly seated in the system-board connector. Incomplete insertion might cause damage to the system board or the adapter.

- c. Lower the tab (2) on the adapter guide over the tab on the top corner of adapter. Rotate the adapter retention latch (3) clockwise until it snaps into place.

Attention: Power cannot be restored to the adapter slot if the tab is not lowered into place.

- d. If opened previously, close the adapter retainer flap (4).
5. Connect any needed external cables to the adapter and route through the cable management arm.

Attention: Route any internal cables so that the flow of air from the fans is not blocked.

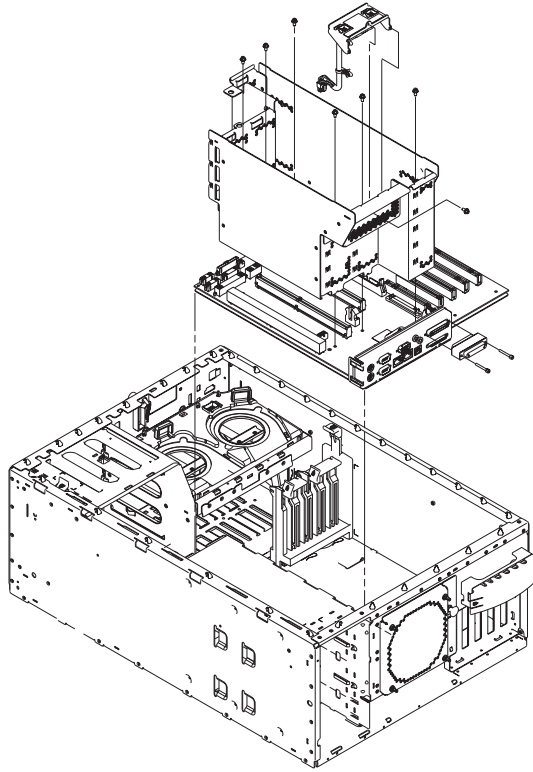
6. Replace the covers as described in “Covers” on page 256.

System Board

The following procedures cover removal and replacement of the system board.

Removal

1. If you have not already done so, shut down the system as described in “Stopping the System” on page 252.
2. If you have not already done so, unplug the system power cable from the electrical outlet.
3. If your system is a Model 6C1 (rack mount), place the system in the service position as described in “Placing the Model 6C1 in the Service Position” on page 253.
4. If you have not already done so, remove the service access cover as described in “Covers” on page 256.
5. Remove the processor and memory card cover as described in “Processor and Memory Card Cover” on page 262.
6. Remove the adapters as described in “Adapters” on page 274.
7. Remove the adapter retainer flap assembly.
8. Remove the memory card as described in “Memory Card and Memory DIMMs” on page 264.
9. Remove the processor card(s) as described in “Processor Card” on page 271.
10. Pull the media devices out the front of the system but do not remove completely.
11. Remove fan assembly 2 as described in “Hot-Swap Fan Assembly” on page 299.
12. Remove the CEC cage as described in “CEC Cage” on page 263.
13. Remove all cables from the system board.
14. Remove fan assembly 1 as described in “Hot-Swap Fan Assembly” on page 299.
15. Pull on the release lever to cam the system board out of the system.



Replacement

Replace in reverse order.

Power Supply

The following procedures cover removal and replacement of the power supplies.

DANGER

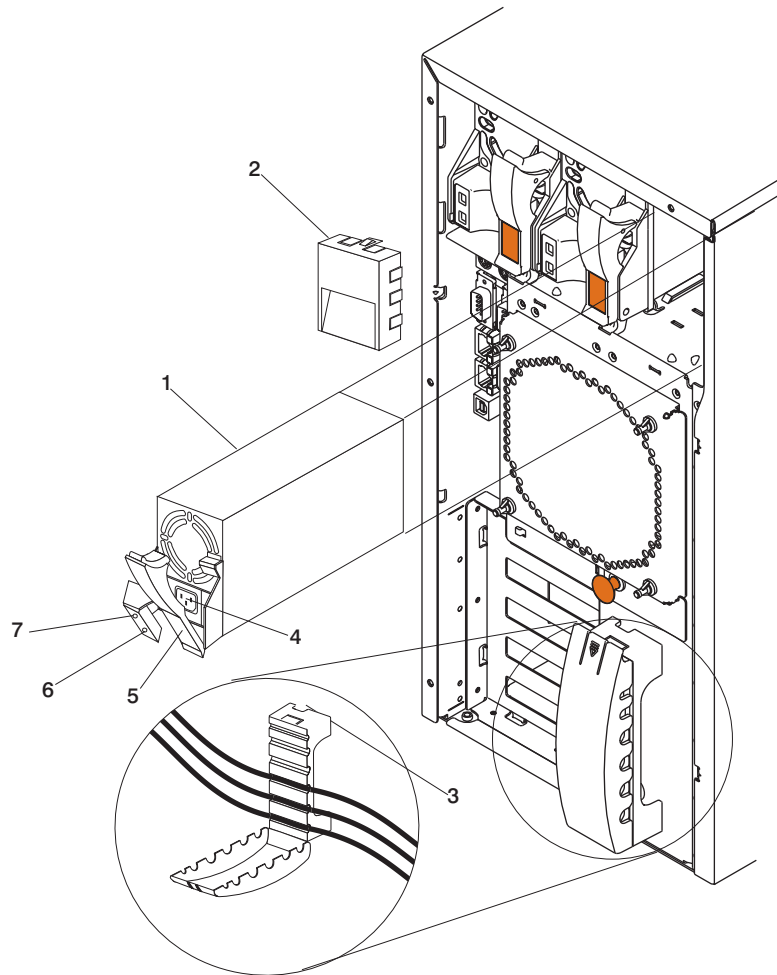
Do not attempt to open the covers of the power supply. Power supplies are not serviceable and are to be replaced as a unit.

Removal

Your system comes with two power supplies. You can add a third power supply to provide redundant power. After you install a power supply, check the power supply status indicators to verify that the power supply is operating properly.

Note: You do not need to turn off the power to the system to install hot-swap power supplies.

Refer to the following illustration while performing the steps in this procedure.



- | | |
|---|---|
| 1 | Power supply |
| 2 | Filler panel |
| 3 | Cable-restraint bracket |
| 4 | Power cord connector |
| 5 | Handle on power supply (in open position) |
| 6 | AC power light |
| 7 | DC power light |

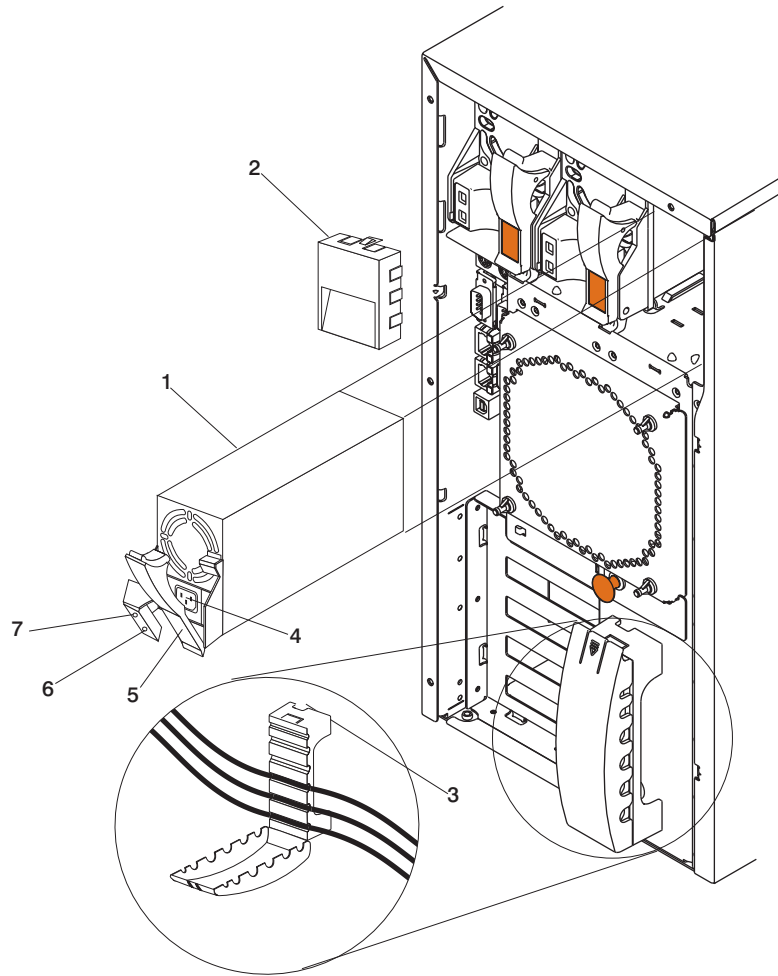
Note: You do not need to turn off the power to the system to install hot-swappable power supplies if your system has a redundant (third) power supply installed.

1. If your system does not have a redundant (third) power supply installed, turn off the power to the system and peripheral devices. Otherwise, go to the next step.
2. To remove the power supply (1):
 - a. Unplug the power cord connector from the power supply.
Attention: Be careful when you remove the hot-swap power supply; the power supply might be too hot to handle comfortably.
 - b. Remove the defective power supply by placing the handle (5) on the power supply in the open position (perpendicular to the power supply) and pulling the power supply from the bay.
3. If you are not replacing the power supply:
 - a. Install a power-supply filler panel (2).
Note: During normal operation, each power-supply bay must have either a power supply or filler panel installed for proper cooling.
 - b. Open the cable-restraint bracket (3) and remove the power cord from the cable-restraint bracket. Close the cable-restraint bracket.
 - c. Unplug the power cord from the electrical outlet.

Replacement

Note: If a power supply is being replaced for a redundant failure, after the service repair action is completed, ask the customer to check the **crontab** file for any power/cooling warning messages. When a power or cooling error is encountered, AIX adds an entry to the **crontab** file to "wall" a warning message every 12 hours, alerting/reminding the customer of the problem. Replacing the faulty part does not clear this **crontab** entry, so unless the crontab file is edited to remove this entry, the customer will continue to be reminded of the failure despite it's having been repaired. The AIX command **crontab -l** reads the **crontab** file to determine if an entry exists. The **crontab -e** command edits the file.

Refer to the following illustration while performing the steps in this procedure.



- | | |
|---|---|
| 1 | Power supply |
| 2 | Filler panel |
| 3 | Cable-restraint bracket |
| 4 | Power cord connector |
| 5 | Handle on power supply (in open position) |
| 6 | AC power light |
| 7 | DC power light |

Note: You do not need to turn off the power to the system to install hot-swap power supplies if your system has a redundant (third) power supply installed.

1. If installed, remove the filler panel from the bay.

2. Install the power supply (1) in the bay:
 - a. Place the handle (5) on the power supply in the open position (that is, perpendicular to the power supply) and slide the power supply into the chassis.
 - b. Gently close the handle to seat the power supply in the bay.
3. Plug the power cord for the added power supply into the power cord connector (4).
4. Route the power cord through the cable-restraint bracket (3) and the cable management arm.
5. Plug the power cord into a properly grounded electrical outlet.
6. Verify that the dc power light (7) and ac power light (6) on the power supply are lit, indicating that the power supply is operating correctly.

Operator Panel

The following procedures cover removal and replacement of the operator panel.

Removal

1. If you have not already done so, shut down the system as described in “Stopping the System” on page 252.
2. If you have not already done so, unplug the system power cables from the electrical outlets.
3. If your system is a Model 6C1 (rack mount), place the system in the service position as described in “Placing the Model 6C1 in the Service Position” on page 253.
4. Remove the service access cover. See “Covers” on page 256.
5. Remove the bezel as described in “Bezels” on page 260.
6. Remove the operator panel by grasping the release levers and pulling the operator panel tray from the system.
7. If installed, remove the cables from the disk drive.
8. Disconnect the cables from the operator panel and remove the operator panel.

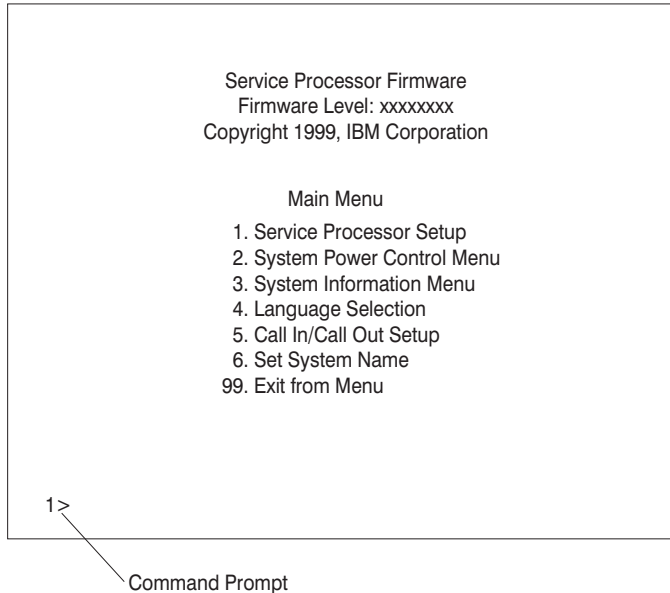
Replacement

1. To replace, perform removal steps in reverse order.
2. Complete the VPD update procedure as described in “System Vital Product Data (VPD) Update Procedure” on page 286.

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.

This menu is for IBM Authorized use only. If you have not been authorized to use this menu, please discontinue use immediately.

Press Return to continue, or X to return to menu 1.

4. Press Return to continue.

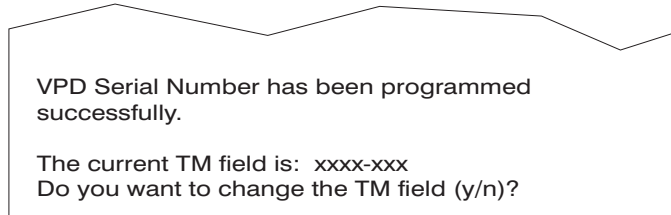
VPD Serial Number is not programmed.

Enter the VPD Serial Number (7 ASCII digits): xxxxxxx

5. Type the VPD serial number.

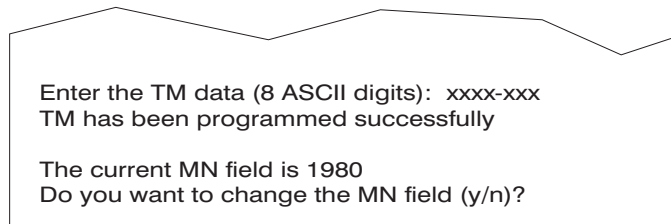
Note: The serial number *must* be entered correctly. Enter the last seven digits only. Do not include the dash (-) in the serial number as a digit. If the serial number is not entered correctly, a new operator panel must be ordered and

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)?

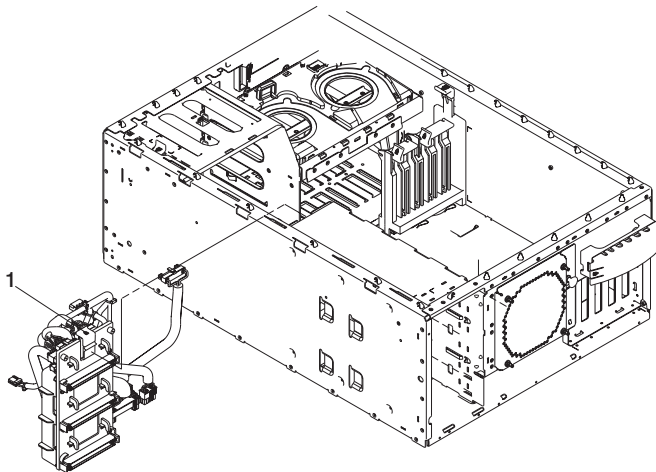
8. The **MN** field is for manufacturing use only. Enter **n** (no) in this field.
9. Enter 99 at the command line of the Main Menu to exit.

Power Backplane

The following procedures cover removal and replacement of the power backplane.

Removal

1. If you have not already done so, shut down the system as described in “Stopping the System” on page 252.
2. If you have not already done so, unplug the system power cables from the electrical outlet.
3. If your system is a Model 6C1 (rack mount), place the system in the service position as described in “Placing the Model 6C1 in the Service Position” on page 253.
4. If you have not already done so, remove the service access cover as described in “Covers” on page 256.
5. Remove the power supplies as described in “Power Supply” on page 280.
6. Disconnect the cables from the power backplane.
7. Push down on the release lever **(1)** and remove the power backplane.



Replacement

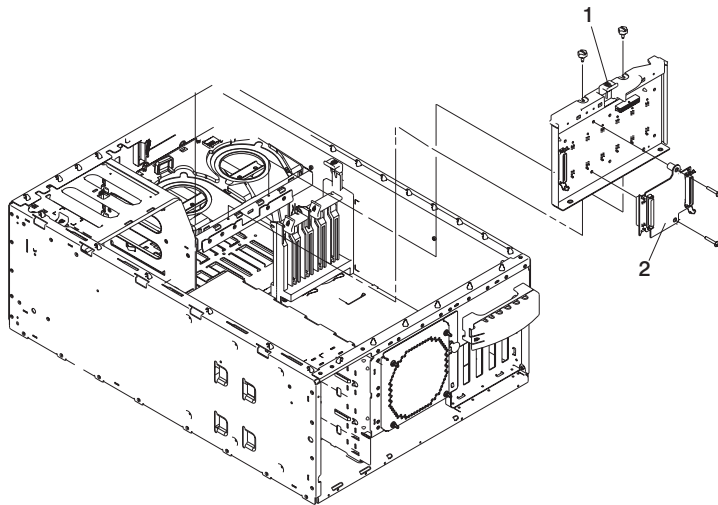
1. Replace in reverse order.

SCSI Backplane

The following procedures cover removal and replacement of the SCSI backplane.

Removal

1. If you have not already done so, shut down the system as described in “Stopping the System” on page 252.
2. If you have not already done so, unplug the system power cables from the electrical outlet.
3. If your system is a Model 6C1 (rack mount), place the system in the service position as described in “Placing the Model 6C1 in the Service Position” on page 253.
4. If you have not already done so, remove the service access cover as described in “Covers” on page 256.
5. Remove the hot-swap drives as described in “Hot-Swap Disk Drives” on page 295.
6. Remove the fan assemblies 3 and 4 as described in “Hot-Swap Fan Assembly” on page 299.
7. Remove the processor and memory card cover as described in “Processor and Memory Card Cover” on page 262.
8. Remove the CEC cage as described in “CEC Cage” on page 263.
9. Remove all cables from the backplane.
10. Remove the screws and remove the SCSI repeater card **(2)** from the backplane.
11. Remove the screws from the SCSI backplane.
12. Pull the release lever **(1)** and remove the backplane.



Replacement

1. Attach the SCSI repeater card removed earlier to the new backplane.
2. Replace in reverse order.

Media Devices (CD-ROM, Tape, or Disk Drive)

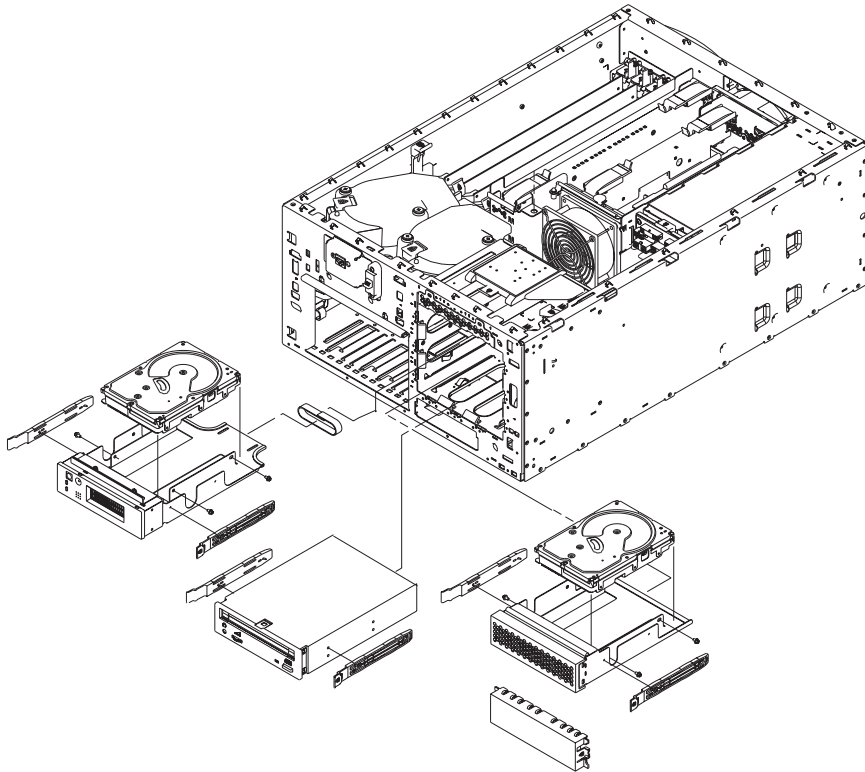
The following procedures cover removal and replacement of the media devices.

Before performing these procedures, read “Handling Static-Sensitive Devices” on page 252.

Removal

1. Remove the service access cover. See “Covers” on page 256.
2. Remove the bezel. See “Bezels” on page 260.
3. If you are removing the disk drive, you must remove the operator panel. See “Operator Panel” on page 285.
4. To gain better access, slide the media devices out of the bays located above the device you are removing.
5. Disconnect the signal and power cables.
6. Remove the device.
7. If you are removing a media device other than a disk drive, remove the blue slides from the sides of the device.

Replacement



1. Touch the static-protective bag containing the drive to any unpainted metal surface on the system, then, remove the drive from the bag and place it on a static-protective surface.
2. Set any jumpers or switches on the device according to the documentation provided with the drive. Refer to “SCSI IDs and Bay Locations” on page 12 for SCSI id information.
3. Install any blue slides removed previously.
4. Place the device so that the slide rails engage in the bay guide rails. Do not push the device all the way into the bay.
5. Connect the signal and power cables.
6. Push the device into the bay until it clicks into place.
7. Install any media devices removed earlier.
8. Replace the bezel as described in “Bezels” on page 260.
9. Replace the covers as described in “Covers” on page 256.

Battery

The following procedures cover removal and replacement of the battery.

CAUTION:

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

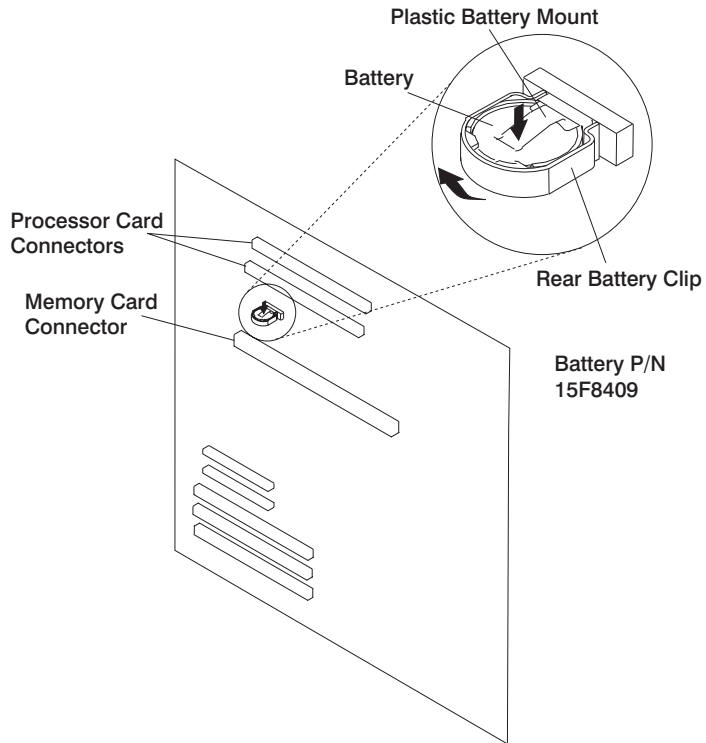
The battery connector is polarized; do not attempt to reverse polarity.

Dispose of the battery according to local regulations.

Removal

1. If you have not already done so, shut down the system as described in “Stopping the System” on page 252.
2. If you have not already done so, unplug the system power cables from the electrical outlets.
3. If your system is a Model 6C1 (rack mount), place the system in the service position as described in “Placing the Model 6C1 in the Service Position” on page 253.
4. If you have not already done so, remove the service access cover as described in “Covers” on page 256.
5. If you have not already done so, remove the processor and memory card cover as described in “Processor and Memory Card Cover” on page 262.
6. Remove the processor cards as described in “Processor Card” on page 271.
7. Remove the memory card as described in “Memory Card and Memory DIMMs” on page 264.

8. Locate the battery on the system board.



9. Pry the battery out of its mount using your fingernail. After the top of the battery has cleared the plastic mount, pull it up and out of the system board.

Replacement

1. Ensure that the battery polarity is correct. (Plus (+) side away from plastic battery mount.)
2. Using your thumb, gently press the battery into the battery mount. Use your index finger to support the back of the battery mount during this operation.
3. Replace any removed processors or memory cards.
4. Replace the processor and memory card cover as described in "Processor and Memory Card Cover" on page 262.
5. Replace the covers as described in "Covers" on page 256.

Hot-Swap Disk Drives

The following procedures cover removal and replacement of the hot-swap disk drives.

Note: You do not have to power off the system to remove a hot-swap disk drive from the system. Before you perform these procedures, ensure that the customer has taken appropriate actions to back up the data for the drive you are removing, and that the drive has been removed from the configuration. Physically removing a hot-swap drive from the system before it has been removed from the system configuration can cause unrecoverable data corruption.

Deconfiguring (Removing) or Configuring a Disk Drive

Use this procedure if you are removing or installing a drive while the system power is turned on.

Deconfiguring (Removing)

1. Back up the information from the disk drive to another drive.
2. Log in as root user.
3. At the command line, type `smitty`.
4. Select **System Storage Management (Physical and Logical Storage)** and press Enter.
5. Select **Logical Volume Manager** and press Enter.
6. Select **Volume Groups** and press Enter.
7. Select **Set Characteristics of a Volume Group** and press Enter.
8. Select **Remove a Physical Volume from a Volume Group**.
9. Press F4 to list the available volume groups, then select the volume group name and press Enter.
10. Press F4 to select a physical volume, and follow the instructions on the screen to select the physical volume. Then press Enter.
11. Press F3s, Cancel, to go back to the first menu and select **System Storage Management (Physical and Logical Storage)**.
12. Select **Removable Disk Management**.
13. Select **Remove a Disk**.
14. Select the desired disk from the list on the screen and press Enter.
15. Follow the instructions on the screen to remove the drive.
16. When you are asked "Are you sure?," press Enter. The power LED above the drive that you selected will remain on.
17. Remove the disk drive by pulling the disk drive lever toward you until it is completely open. Then remove the disk drive from the slot. The LED on the top of the slot will turn off when the disk drive is removed.
18. Press F10 to exit `smitty`.

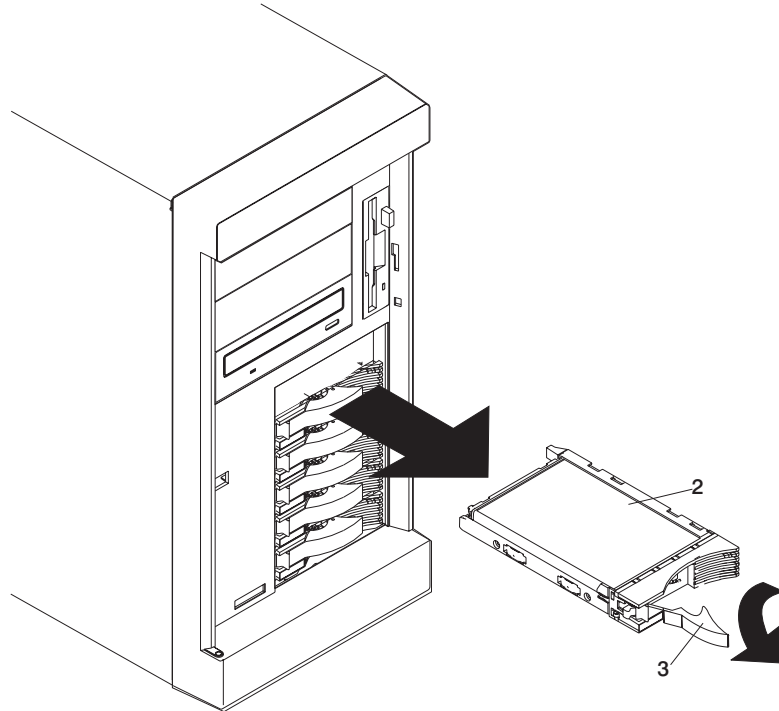
Configuring (Replacing)

1. Remove the disk drive from its protective packaging, and open the drive latch handle.
2. Install the disk drive in 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 drive bay. The drive should be in far enough for the latch handle to engage the latch. Push the disk drive lever up and to the rear to lock the disk drive. The LED above the slot will turn on.
3. Log in as root user.
4. At the command line, type `smitty`.
5. Select **Devices**.
6. Select **Install/Configure Devices Added After IPL** and press Enter. Successful configuration is indicated by the OK message displayed next to the Command field at the top of the screen
7. Press F3s, Cancel, to go back to the first menu and select **System Storage Management (Physical and Logical Storage)** and press Enter.
8. Select **Logical Volume Manager** and press Enter.
9. Select **Volume Groups** and press Enter.
10. Select **Set Characteristics of a Volume Group** and press Enter.
11. Select **Add a Physical Volume to a Volume Group**.
12. Fill in the fields for the drive you are adding to the system. Press F4 for a list of selections.
13. See the *AIX System Management Guide: Operating System and Devices* to finish the drive configuration. This publication is available at the following Web address: <http://www.ibm.com/systems/aix/library/>. Select **Technical Publications**. This publication is also contained on the *AIX Documentation* CD. The documentation is made accessible by loading the documentation CD files onto the hard disk or by mounting the CD in the CD-ROM drive.
14. Press F10 to exit `smitty`.

Removal

1. If the system is a Model 6E1, unlock and open the system door.

Attention: To maintain proper system cooling, do not operate the system for more than two minutes without either a drive or a filler panel installed for each bay.



2. Remove the disk drive (1) by placing the handle (2) on the drive to the open position (perpendicular to the drive) and pulling the hot-swap tray from the bay.

Note: Do not remove the drive from the tray assembly.

Replacement

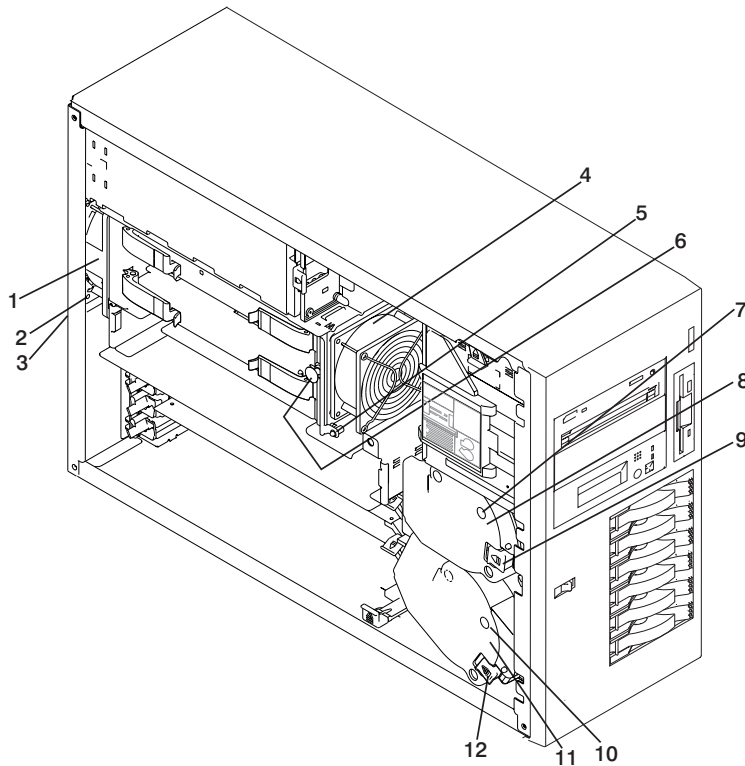
1. Install the hard disk drive in the hot-swap bay:
 - a. Ensure the tray handle is open (perpendicular to the drive).
 - b. Align the drive/tray assembly so that it engages the guide rails in the bay.
 - c. Push the drive assembly into the bay until the tray handle engages the lock mechanism.
 - d. Push the tray handle to the right until it locks.
2. Check the disk drive status indicators to verify that the hard disk drive is installed properly.
3. If the system is a Model 6E1, close and lock the system door.

Hot-Swap Fan Assembly

The following procedures cover removal and replacement of the hot-swap fan assemblies.

Note: You do not need to turn off the power to the system to replace a hot-swap fan assembly.

The following illustration shows the replacement of a hot-swap fan assembly. Refer to this illustration while performing the steps in this procedure.



1	Hot-swap fan assembly 1	2	Fan assembly 1 LED
3	Fan 1 release button	4	Hot-swap fan assembly 2
5	Fan assembly 2 LED	6	Fan 2 release button
7	Fan assembly 3 LED	8	Hot-swap fan assembly 3
9	Fan 3 release latch	10	Fan assembly 4 LED
11	Hot-swap fan assembly 4	12	Fan 4 release latch

Removal

1. If your system is a Model 6C1 (rack mount), place the system in the service position as described in "Placing the Model 6C1 in the Service Position" on page 253.

2. For fan assemblies 2, 3, and 4, you must remove the service access cover. See “Covers” on page 256.

Attention: To ensure proper system cooling, do not remove the service access cover for more than 30 minutes during this procedure.

3. Determine which of the following fan assemblies to replace by checking the fan LEDs on the diagnostic LED panel (see “Attention LED and Lightpath LEDs” on page 28) and the LEDs located on the fan assemblies.
 - Fan assembly 1 (1)
 - Fan assembly 2 (4)
 - Fan assembly 3 (9)
 - Fan assembly 4 (12)
4. If you are removing fan assembly 2, you must remove the processor and memory card cover. See “Processor and Memory Card Cover” on page 262.
5. If you are removing fan assembly 1 or fan assembly 2, pull out the snap button and remove the fan.

If you are removing fan assembly 3 or fan assembly 4, press the orange release latch (9), or (12) for the fan and pull the fan away from the system.

Replacement

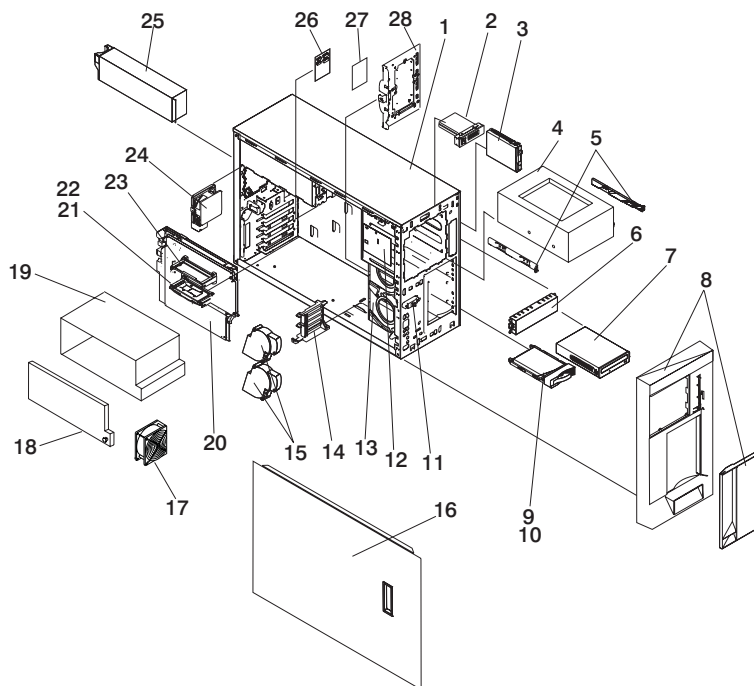
Note: If a fan assembly is being replaced for a redundant failure, after the service repair action is completed, ask the customer to check the **crontab** file for any power/cooling warning messages. When a power or cooling error is encountered, AIX adds an entry to the **crontab** file to “wall” a warning message every 12 hours, alerting/reminding the customer of the problem. Replacing the faulty part does not clear this **crontab** entry, so unless the crontab file is edited to remove this entry, the customer will continue to be reminded of the failure despite it’s having been repaired. The AIX command **crontab -l** reads the **crontab** file to determine if an entry exists. The **crontab -e** command edits the file.

1. Slide the replacement fan assembly into the system until it clicks into place.
2. Replace the service access cover. See “Covers” on page 256.

Chapter 10. Parts Information

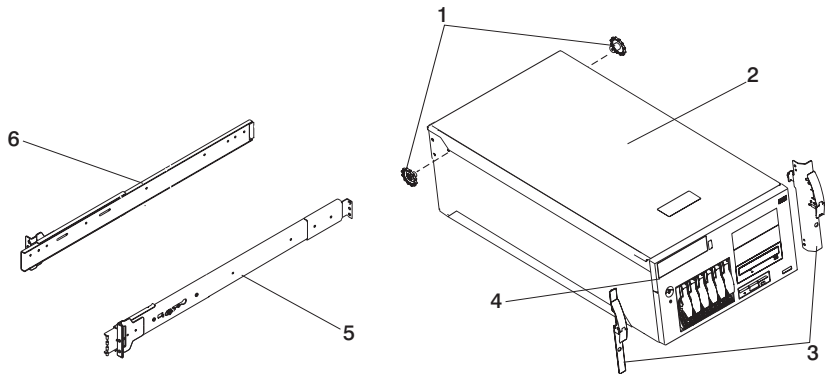
This chapter contains parts information for the @server pSeries 610 Model 6C1 and Model 6E1.

System Parts



Index Number	FRU Part Number	Units Per Assembly	Description
1	21P6989	1	Chassis (tower)
	21P6990	1	Chassis (rack)
2	21P7166	1	Operator panel
3	See note	1	Diskette drive
4	See note	Up to 2	Media device
5	00N6453	Up to 2	Slide
6	00N6451	Up to 2	Media filler
7	See note	1	CD-ROM drive
8	21P6569	1	Cover Assembly (IBM) includes door and keylock
	21P7174	1	Cover Assembly (OEM) includes door and keylock
9	See note	Up to 6	Hot-swap DASD
10	21P6581	Up to 6	Hot-swap DASD filler
	53P2297	1	Hot-swap DASD filler (6-pack)
11	00N6603	1	Cover release
12	21P6652	1	Lightpath assembly
13	00N6408	1	Blower housing
14	03K8992	1	I/O bracket
15	09N7515	2	Blower assembly
16	00N6400	1	Access cover (tower)
17	21P6798	1	Processor fan
18	21P6796	1	CEC cage cover
19	21P6670	1	CEC cage
20	09P2420	1	System board
21	09P2890	1	Memory card
22	09P0550	Up to 16	256 MB DIMM
	09P0491	Up to 16	512 MB DIMM
	44H8167	Up to 14	Memory DIMM filler
23	09P5495	Up to 2	Processor card 333 MHz
	09P3666	Up to 2	Processor card 375 MHz
	09P3669	Up to 2	Processor card 450 MHz
	21P6779	1	Processor card filler
24	21P6811	1	Rear fan assy
25	24P6867	Up to 3	Power supply (250 watt)
	00N6405	1	Power supply filler
26	21P7485	1	Power backplane
27	09P4183	1	SCSI repeater card
28	21P7165	1	SCSI backplane

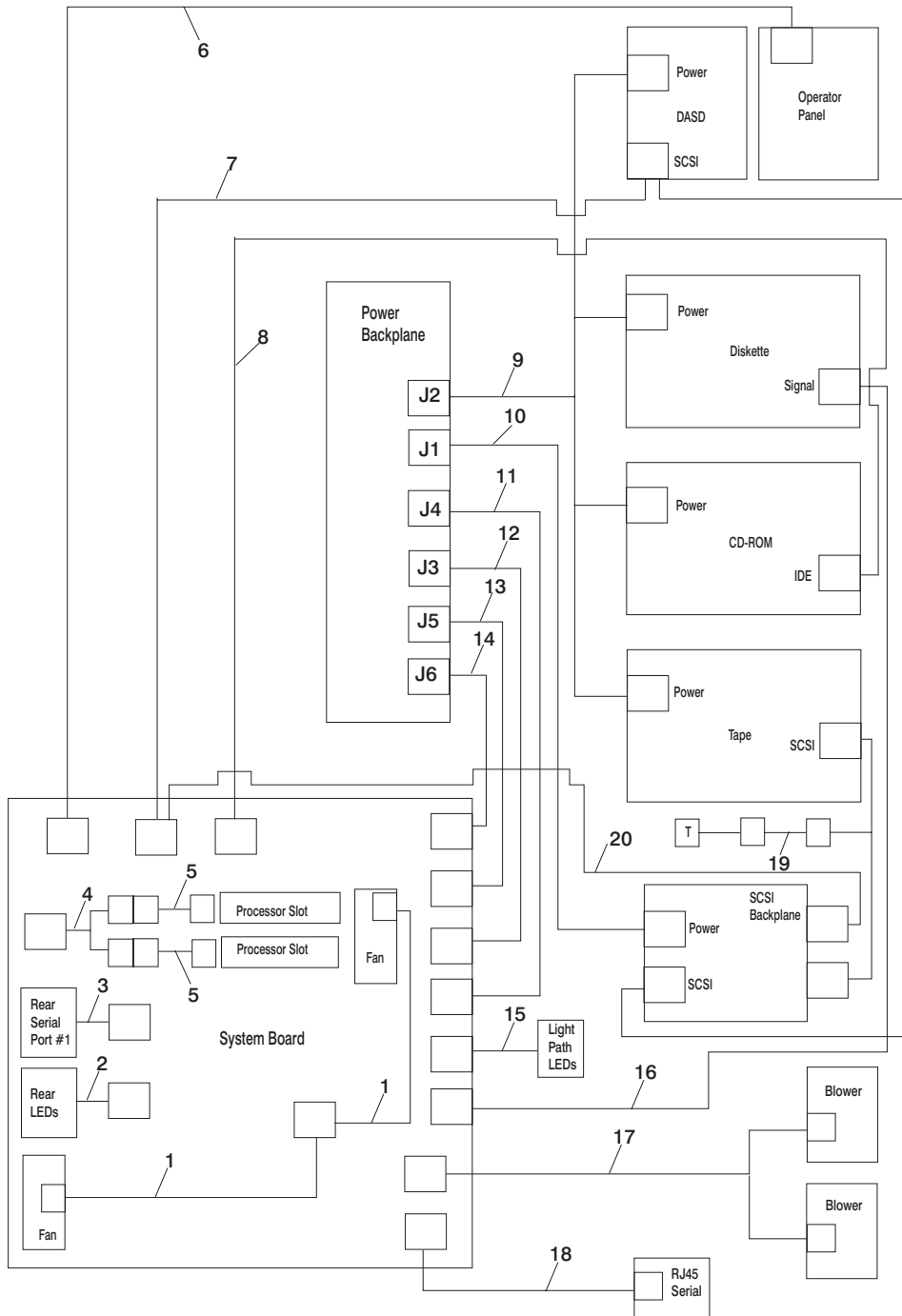
Note: See *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* for part numbers.



Index Number	FRU Part Number	Units Per Assembly	Description
1	09N7997	2	Rail roller support (rack)
2	21P6829	1	Access cover (rack)
3	21P6813	1	Drawer left latch (rack)
	21P6815	1	Drawer right latch (rack)
4	21P6579	1	Front cover (IBM rack)
	53P0069	1	Front cover (OEM rack)
5	00N6457	1	Slide (right hand)
6	00N6455	1	Slide (left hand)

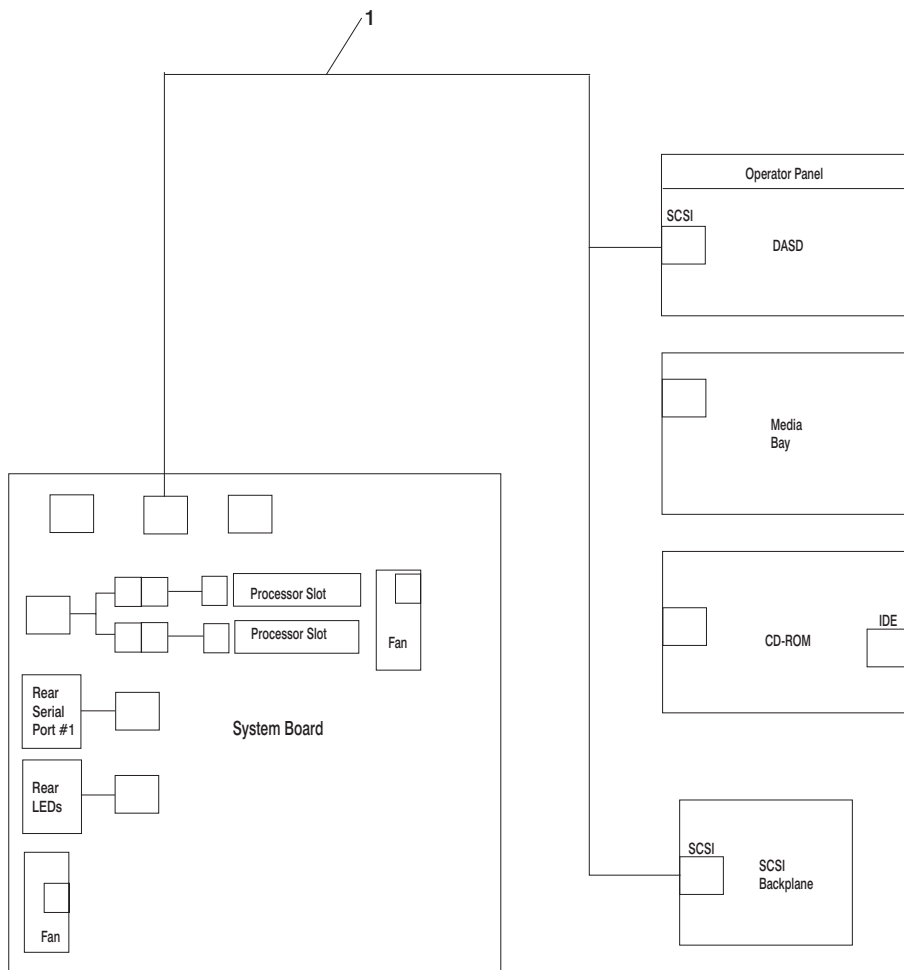
Note: See *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* for part numbers.

System Internal Cables

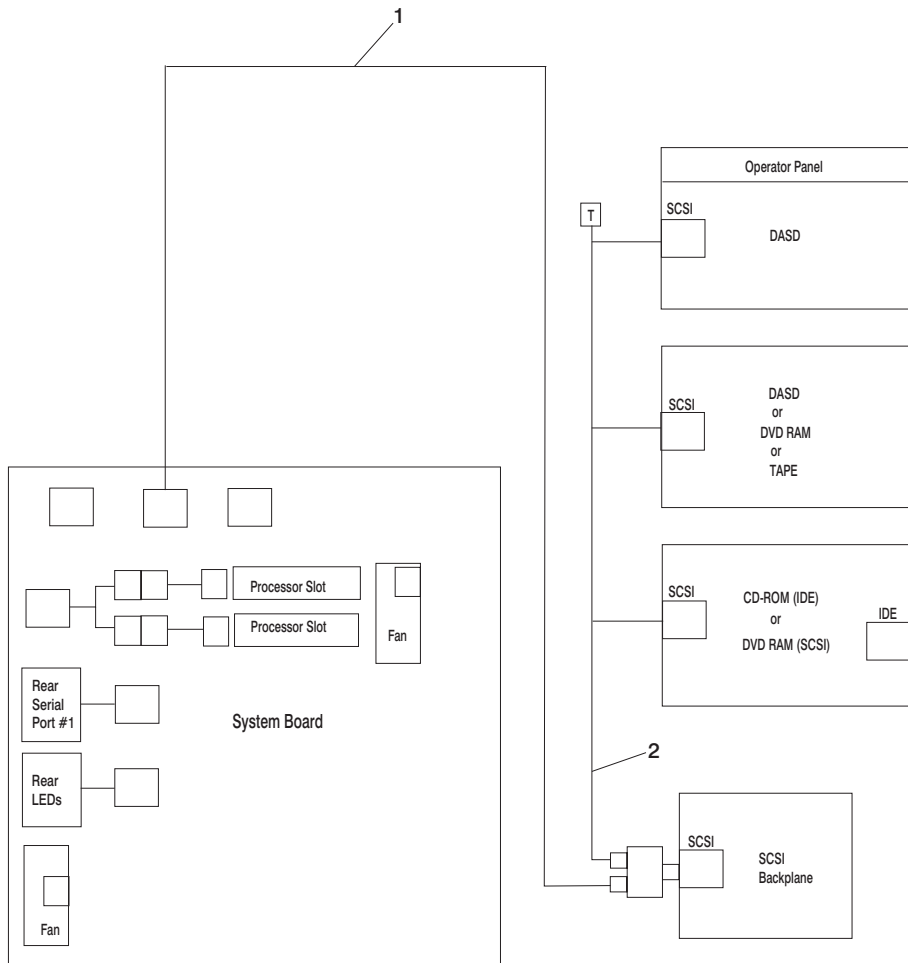


Index Number	FRU Part Number	Units Per Assembly	Description
1	21P6647	1	Fan power cable
2	21P6653	1	Rear LED cable
3	21P6657	1	Rear serial port #1 cable
4	21P6648	1	Processor power cable
5	21P6649	Up to 2	Processor power cable
6	21P6650	1	Operator panel cable
7	21P6655	1	SCSI cable
8	53P1466	1	CD-ROM signal cable
9	00N6573	1	Media power cable
10	00N6549	1	DASD backplane power cable
11	21P7399	1	System board power cable
12	00N6572	1	System board power cable
13	00N6551	1	System board power cable
14	00N6550	1	System board power cable
15	21P6652	1	Lightpath LED cable
16	21P6651	1	Diskette signal cable
17	37L6062	1	Blower cable
18	21P8070	1	Front RJ45 serial cable
19	53P0457	1	Tape signal cable
20	21P6923	1	Backplane SCSI cable (not used when 21P6655 is installed)

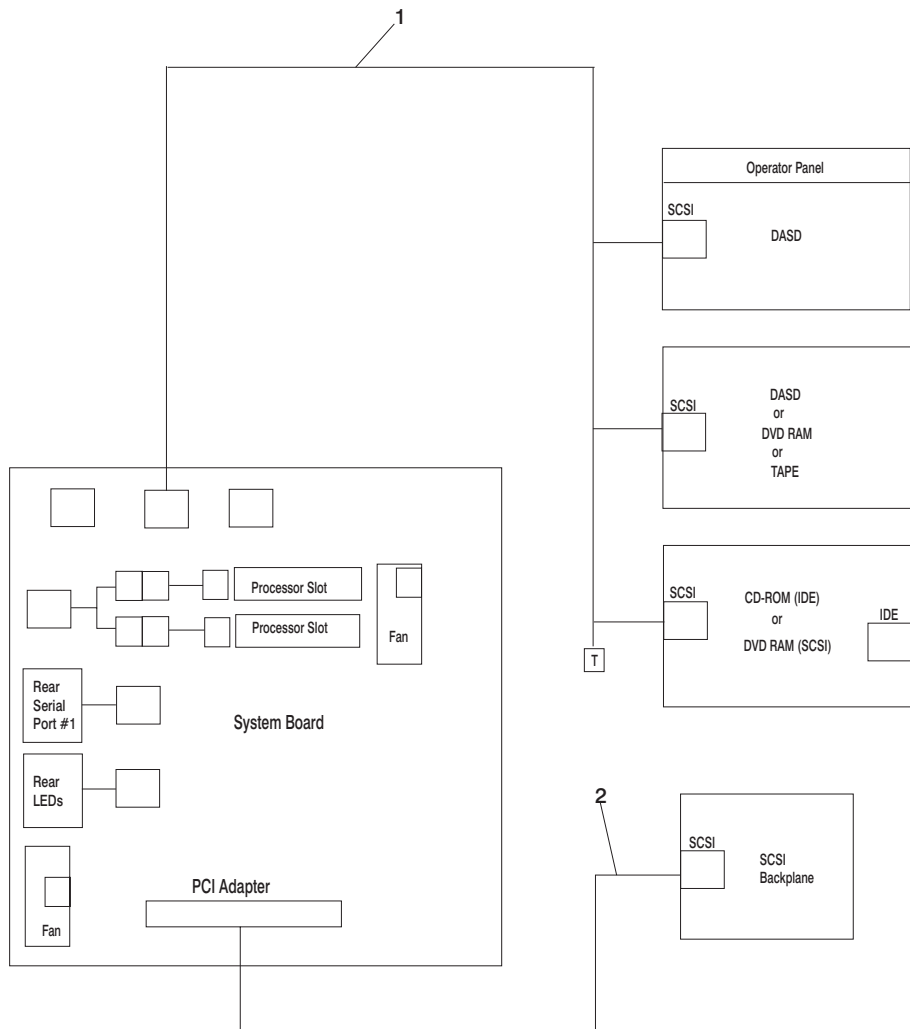
SCSI Cables



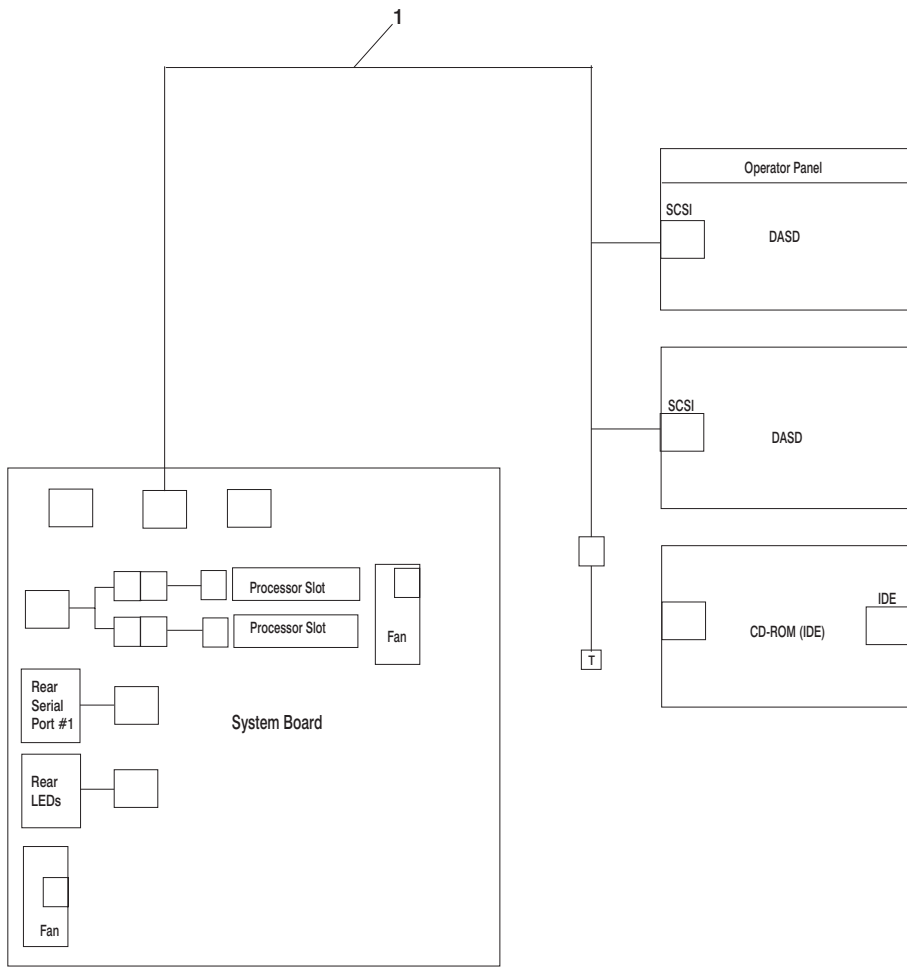
1 SCSI Cable 21P6655



- 1 SCSI Cable 21P6923
- 2 SCSI Cable 53P0457



- 1 SCSI Cable 53P1673
- 2 SCSI Cable 53P1674



1 SCSI Cable 09P6025

Keyboards and Mouse (White)



Index Number	FRU Part Number	Units Per Assembly	Description
1	93H8120	1	Keyboard, 101 United States English (ID 103P)
	93H8123	1	Keyboard, 102 Spanish (ID 171)
	93H8125	1	Keyboard, 102 Arabic (ID 238)
	08L0904	1	Keyboard, 102 Belgium French (ID 120)
	08L0905	1	Keyboard, 102 Belgium (ID 120)
	08L0906	1	Keyboard, 102 Danish (ID 159)
	08L0908	1	Keyboard, 102 French (ID 189)
	08L0909	1	Keyboard, 102 German (ID 129)
	93H8134	1	Keyboard, 102 Greek (ID 319)
	93H8135	1	Keyboard, 101 Hebrew (ID 212)
	08L0911	1	Keyboard, 102 Italy (ID 142)
	08L0912	1	Keyboard, 102 Norwegian (ID 155)
	93H8143	1	Keyboard, 101 Russian (ID 443)
	08L0914	1	Keyboard, 102 Spanish (ID 172)
	08L0915	1	Keyboard, 102 Sweden/Finland (ID 153)
	08L0916	1	Keyboard, 105 Swiss F/G (ID 150)
	08L0917	1	Keyboard, 102 UK English (ID 166)
	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)

Keyboards and Mouse (Black)



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

Index Number	FRU Part Number	Units Per Assembly	Description
	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)
	09P4455	1	Three Button Mouse (Black)

Appendix A. Environmental Notices

Product Recycling and Disposal

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets and connectors which may contain lead and copper/beryllium alloys 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. IBM offers product return programs in several countries, for country specific instructions please refer to the following web site:
<http://www.ibm.com/ibm/environment/products/prp.phtml>

This product may contain a sealed lead acid battery(s) or nickel-cadmium battery(s). 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 batteries in this product, please contact IBM at 1-800-426-4333. For information on disposal of sealed lead acid or nickel cadmium batteries outside the United States, contact your local waste disposal or recycling 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 1 ozone-depleting chemicals in the manufacturing process and reductions in manufacturing wastes. For more information, contact an IBM account representative.

Acoustical Noise Emissions

The equivalent continuous A-weighted sound pressure level at workstations (emission sound pressure level at the 1-meter bystander positions) does not exceed 70 dB(A).

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

Declared Acoustical Noise Emissions

Product Configuration	Declared A-Weighted Sound Power Level, <i>LWAd</i> (B)		Declared A-Weighted Sound Pressure Level, <LpAm>(dB) at 1 meter Bystander Position	
	Operating	Idling	Operating	Idling
Model 6E1	6.1	6.1	44	43
Model 6C1	6.2	5.9	46	44

Notes:

1. L_{WA}^d is the declared (upper limit) sound power level for a random sample of machines. (1B = 10dB)
2. L_{pA}^m is the mean value of the A-weighted sound pressure level at the 1-meter bystander positions for a random sample of machines.
3. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296.
4. System Configurations
 - Model 6E1: 1 processor, 2 hard files
 - Model 6C1: 2 processors, 7 hard files, 3 power supplies

Appendix B. Notices

This information was developed for products and services offered in the U.S.A.

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Information concerning products made by other than the manufacturer was obtained from the suppliers of those products, their published announcements, or other publicly available sources. The manufacturer has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to products made by other than the manufacturer. Questions on the capabilities of products made by other than the manufacturer should be addressed to the suppliers of those products.

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 system and power on the local terminal.
Attention: Make sure that system power remains off.
4. Start the service processor menus. See “Service Processor Menus” on page 182.
5. Set the system name. See “Privileged User Menus” on page 185.
6. Enable surveillance. See OS Surveillance Setup Menu on page 188.
7. Configure Call-In/Call-Out. See “Call-In/Call-Out Setup Menu” on page 198.
8. Exit the service processor menus.
9. Unplug the power cord from the system.
10. Attach modems (if needed). See “Accessing Service Processor Menus Locally” on page 182.
11. Plug in the system.
Attention: Make sure that the system power remains off.
12. Test both of the following:
 - Call-In, see “Testing Call-In” on page 320
 - Call-Out, see “Testing Call-Out” on page 320
13. Use the “Save or Restore Hardware Management Policies,” in the “Introduction to Tasks and Service Aids” section of the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems* to back up the service processor settings.

Note: This step 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 that 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 321.

The server should be powered off as a result of the “Service Processor Setup Checklist” on page 319.

Testing Call-In

1. At your remote terminal, 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 “Transfer of a Modem Session” on page 328 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` 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 201) and customer voice (on page 201). 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. Your computer is trying to page you.

If this test is successful, call-out is working correctly.

Return to the “Telephone Number Setup Menu” on page 200 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 service processor 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 325.

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 327 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 325.

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.

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 325.

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 326 for more information. Go to step 7 on page 325.

If No, go to step 6.

6. Does your modem respond to:

- AT&F reset command

or

- AT&F n 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.

Note: 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.

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. 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 emulation. 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 occur 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 for configuring your server's serial ports.

To set up a remote terminal session, dial into the service processor and start the system. After the operating system is loaded and initialized, the connection will be dropped. At this point, 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 328 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.
#
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#
#
# 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
DefaultTO 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.
# %R = paging number
expect "0\r" timeout 60 # Confirm successful command.
delay 2 # Wait before hanging up.
send "ATH0\r" # Hang up.
expect "0\r" timeout 2 # Confirm successful command.
done

ripo: 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
DefaultTO 10
CallDelay 120
#
# %N Call-Out phone number %R Return phone number
#
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

connect: 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*Q2S8=6\r" # Trellis modulation disabled
# Retrain with adaptive rate
# Set ,=6second
expect "0\r" or "OK\r\n" timeout 2 # Confirm commands successful
send "ATV0X0S0=0\r" # Numeric response code
# AT compatible messages
# Auto-Answer disabled
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 "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
# Confirm commands successful.

expect "0\r" timeout 2
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

ribo: 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
# Confirm commands successful.
#

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 "ATZ00T\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 "ATZ00T\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

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 "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

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 "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
DefaultTO 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 (").

conduit: 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&FQ0T\r"                   # Reset to factory defaults.
ignore "0\r" or "OK\r\n" timeout 2          # Ignore modem response.
send "ATE0T\r"                               # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2          # Enable responses (Numeric),
send "ATQ0V0X0T\r"                         # Limit response codes.
expect "0\r" timeout 2                     # Confirm commands successful.
send "ATS0=2\r"                             # Set AutoAnswer ON
expect "0\r" timeout 2                     # Confirm command successful.
send "AT&C1&D2\r"                          # Detect carrier and DTR.
expect "0\r" timeout 2                     # Confirm command successful.
done
waitcall: ignore "2\r" timeout 1             # Ignore first ring.
          expect "2\r" timeout 10           # Pick up second ring
                                                # or timeout.
          # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
timeout 60
done
page:     send "ATDT%N,,,,%R;\r"            # %N = pager call center number
                                                # Add enough commas to wait for
                                                # time to enter paging number.
                                                # %R = paging number
                                                # Confirm successful command.
          expect "0\r" timeout 60
          delay 2                             # Wait before hanging up.
          send "ATH0T\r"                     # Hang up.
          expect "0\r" timeout 2             # Confirm successful command.
          done
ripo:     send "AT&FQ0T\r"                   # Reset to factory defaults.
ignore "0\r" or "OK\r\n" timeout 2          # Ignore modem response.
send "ATE0T\r"                               # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2          # Enable responses (Numeric),
send "ATQ0V0X0T\r"                         # Limit response codes.
expect "0\r" timeout 2                     # Confirm commands successful.
send "ATS0=0\r"                             # Set AutoAnswer OFF
expect "0\r" timeout 2                     # Confirm command successful.
send "AT&C1&D2\r"                          # Detect carrier and DTR.
expect "0\r" timeout 2                     # Confirm command successful.
done                                          # RI Power On enabled.
error:    # Handle unexpected modem

```

```
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"  
delay 2  
done
```

Sample File modem_f0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F0
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F0 reset command to choose the factory defaults.
# This set up is preferred for modems with extended (&) commands. For early
# vintage modems, setup Z or Z0 is recommended. If your modem responds to
# the extended (&) commands and to factory default choices (&Fn), but doesn't
# work properly with this setup file, setup F1 is recommended.
#
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultT0 10
CallDelay 120
# AT Attention Code , Inserts delay in dialing commands
# &F0 Reset. Restore profile 0 Q0 Turn on responses
# E0 Turn echo off Q1 Turn off responses
# V0 Use numeric responses S0=0 Automatic answer inhibit
# +++ Escape to command mode S0=2 Answer on second ring
# H0 Hang-up X0=0 Limit modem response codes
#
# T = Tone mode. When used as T\r, it is a
# no op to maintain program synchronization
# when modem may/will echo the commands.
#
# &C1 Detect CD &D2 Respond to DTR (often the default)
# &R1 Ignore RTS (CTS)
#
# %N Call-Out phone number %P Paging phone number
# %S Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses. Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

connect: send "AT&F0Q0T\r" # Reset modem. Select profile 0
          ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
          send "ATE0T\r" # Initialize modem: Echo OFF,
          expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
          send "ATQ0V0X0T\r" # Limit response codes.
          expect "0\r" timeout 2 # Confirm commands successful.
          send "ATS0=0\r" # Set AutoAnswer OFF
          expect "0\r" timeout 2 # Confirm command successful.
          send "AT&C1&D2&R1\r" # Detect carrier and DTR,
          # Ignore RTS.
          expect "0\r" timeout 2 # Confirm command successful.
          done

connect: send "ATDT%N\r" # Tone dialing command.
          # %N from Call Home setup.

          # Expect a connection response.
```



```

expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

retry:      send "A/"                                # Repeat the previous command.

                                                    # Expect a connection response.
expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
timeout 60
done

disconnect:
delay 2      # Separate from previous data.
send "+++"  # Assure command mode.
delay 2      # Allow mode switching delay.
send "ATH0T\r" # Set modem switch-hook down
                                                    # (i.e., hang up).
ignore "0\r" or "OK\r" timeout 2 # Ignore modem response.
send "ATE0Q1\r" # Initialize modem: Echo OFF,
                                                    # Disable responses.

ignore "0\r" timeout 1
done

condin:     send "AT&F0Q0T\r" # Reset modem. Select profile 0
ignore "0\r" or "OK\r\n" timeout 2 # Ignore modem response.
send "ATE0T\r" # Initialize modem: Echo OFF,
expect "0\r" or "OK\r\n" timeout 2 # Enable responses (Numeric),
send "ATQ0V0X0T\r" # Limit response codes.
expect "0\r" timeout 2 # Confirm commands successful.
send "ATS0=2\r" # Set AutoAnswer ON
expect "0\r" timeout 2 # Confirm command successful.
send "AT&C1&D2&R1\r" # Detect carrier and DTR,
                                                    # Ignore RTS.
                                                    # Confirm command successful.

expect "0\r" timeout 2
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

ripos:     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.
                                                    # Confirm command successful.

expect "0\r" timeout 2

```

```
done                                # RI Power On enabled.
error:                               # Handle unexpected modem
                                     # responses.
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done
```

Sample File modem_f1.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F1
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
# This example uses the AT&F1 reset command to choose the factory defaults.
# This set up is for modems with extended (&) commands and which do not work
# properly with setup F0. For early vintage modems, setup Z or Z0 is
# recommended.
#
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#
#
# 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 (").

conduit: 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

conadin:  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. 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.

Checking the Current Firmware Levels

To check the current levels that are installed on the system, do the following:

1. Log in as root user.
2. Enter the following command:
lscfg -vp | grep alterable
3. Press enter. A report will be produced similar to the following:
ROM Level.(alterable).....ct010507 <=== service processor F/W level
ROM Level.(alterable).....CLT01198 <=== system F/W level

Notes:

1. In the preceding example, if the current version of service processor firmware is ct010507, the last six characters of the ROM level represent a date in a yymmdd format, where yy is the last two digits of the year, mm is the month and dd is the day of the firmware (Julian date).
2. Also in the preceding example, if the current version of system firmware is CLT01198, 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 Gregorian 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 than) 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 than) the service processor firmware shown on the Web site, consider downloading and applying the update.

Updating System Firmware

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 server. 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 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/cc*.img
```

The update file name will have the format *ccyyddd.img*. The *cc* indicates that this is a combined image for the 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/ccyyddd.img
```

Notes:

- a. *ccyyddd.img* is the file you identified in the previous step.
- b. Make sure that you include the periods (.) in the commands shown above.
- c. 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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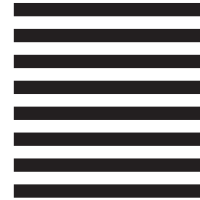
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