RS/6000 Enterprise Server S70

Installation and Service Guide

SA38-0548-00

First Edition (October 1997)

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Contents

Communications Statements

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

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

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

European Union (EU) Statement

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

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

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

International Electrotechnical Commission (IEC) Statement

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

United Kingdom Telecommunications Safety Requirements

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

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

Avis de conformité aux normes du ministère des Communications du Canada

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

Canadian Department of Communications Compliance Statement

This Class A digital apparatus meets the requirements of the Canadian Interference–Causing Equipment Regulations.

VCCI Statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

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

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

Radio Protection for Germany

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

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse A. Für diese von Geräten gilt folgende Bestimmung nach dem EMVG:

Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministers für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind.

(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

Hinweis

Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlicht worden.

Safety Notices

A *danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury.

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

Note: For a translation of these notices, see the *System Unit Safety Information* manual.

Electrical Safety

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

DANGER

> **An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.**
>
> **Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.**
>
> **When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.**
>
> **Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.**
>
> **During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communication lines.**

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

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

CAUTION:
Energy hazard, remove power before servicing. Disconnect two power supply cords.

Laser Safety Information

The optical drive in this system unit is a laser product. The optical drive has a label that identifies its classification. The label, located on the drive, is shown below.

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

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

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

Class 1 laser products are not considered to be hazardous. The optical drive contains internally a Class 3B gallium–arsenide laser that is nominally 0.14 milliwatts at 765 to 815 nanometers. The design incorporates a combination of enclosures, electronics, and redundant interlocks such that there is no exposure to laser radiation above a Class 1 level during normal operation, user maintenance, or servicing conditions.

About This Book

This book provides maintenance information that is specific to the system unit, adapters, and devices that do not have their own service information. It also contains Maintenance Analysis Procedures (MAPs) that are not common to other systems.

MAPs that are common to all systems are contained in the *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 are available for purchase:

- The *System Unit Safety Information* manual contains tranlations of safety information used throughout this book.
- The *User's Guide*, contains information to help users set up, install options, configure, modify, and solve minor problems.
- The *Diagnostic Information for Multiple Bus Systems* contains common diagnostic procedures, error codes, service request numbers, and failing function codes. This manual is intended for trained service technicians.
- The *RS/6000 Adapters, Devices, and Cable Information for Multiple Bus Systems* contains information about adapters, external devices, and cabling. This manual is intended to supplement information found in the *Diagnostic Information for Multiple Bus Systems*.
- The *Site and Hardware Planning Information* contains information to help you plan your installation.

Chapter 1. Reference Information

This chapter provides an overview of the S70. This includes a logical description and a physical overview of the system. Additional details pertaining to the S70 are also described. These include:

- Memory overview and ordering rules
- General description of the operator panel
- Cabling rules
- System location rules and descriptions.
- Powering on and off the system
- Power flow
- Data flow

S70 Overview

The S70 systems are exclusively multi-processor, multi-bus systems packaged in two different rack types. The processors and memory are packaged in the System Rack and the DASD and I/O devices are in I/O Drawers. The basic system consists of one System Rack and one I/O Drawer in a separate type of rack. The system is expandable to one System Rack and four I/O drawers in up to four I/O racks. The system is referred to as the RS/6000 Enterprise Server S70. Each I/O Drawer is referred to as I/O Expansion S70. Connection between the System Rack and subsequent I/O Drawers is made through a number of cables which include SPCN (System Power Control Network), RIO (Remote Input Output), JTAG, and Operator Panel cables.

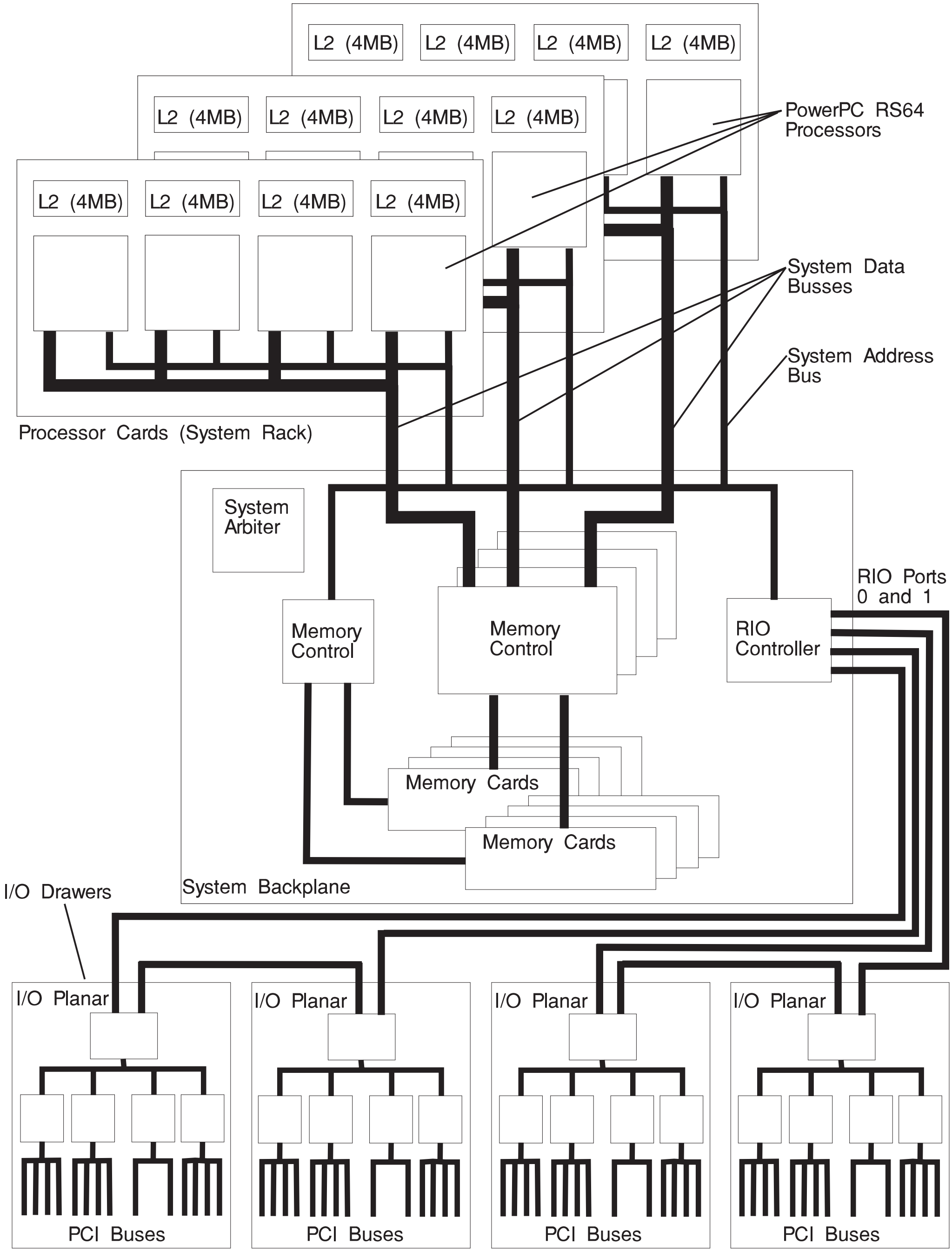
The System Rack is powered independently from the I/O Drawer. The System Rack supports a minimum of one processor card to a maximum of three. Each processor card has four processors with each having its own L2 cache. A maximum of 12 processors may be supported which share a common system memory. The system memory is controlled through a multi-port controller complex and supports up to 20 memory slots. The total memory available to the system user is dependent on the memory feature card installed and the number of memory cards. All system memory exists in the System Rack. Additional major functional units in the System Rack include the operator panel and control circuitry, the SPCN controller, interrupt, and system bus control logic. Power is brought into the System Rack through an AC power cord (200 - 240 V ac), distributed to six bulk supplies and then fed through regulators for both system resources and logic and memory. An alternate -48 V dc power source connection is available.

The Input/output Rack holds the I/O Drawer which provides for up to 14 PCI adapters per drawer. Four succinct Peripheral Component Interface (PCI) buses are present in each I/O Drawer. The primary I/O Drawer, (drawer 0) has PCI slots 2, 8 and 9 reserved for the system media, Service Processor and DASD bays resident in the I/O Drawer. These slots are available in subsequent I/O Drawers 1 through 3 for any supported PCI adapter to use. The PCI bus speed which is supported is 33Mhz with both 32 and 64 bit adapters supported on a slot basis. Slots 1, 5, 9, 10 and 14 support either 32 or 64 bit PCI adapters. The remaining slots are 32 bit only. "S70 Data Flow" on page 1-3 illustrates the system data flow.

The I/O Drawer provides space for up to 4 media devices (tape, CDROM, diskette) and two DASD bays each holding up to six disk drives.

The Input/output Rack may have either 200 - 240 V ac or -48 V dc power.

S70 Data Flow



Powering the System On and Off

The system may be powered on after the following cables are connected:

1. All RIO cables
2. All SPCN cables
3. JTAG Cable
4. Inter-rack Operator Panel Cable
5. All PCI cables to supported drawers

Once the required list of cables is installed, and the power cables are connected, the power button on the system operator panel may be pushed one time to initialize the system (if the button is pushed two times, the system will power off). Progress indicators, also referred to as Checkpoints, are visible on the operator panel display and the green LED to the right of the power button illuminates, indicating the system power is on.

The remote I/O Drawers are powered up through the system power control network (SPCN) controls and interfaces in both the System Rack and I/O Drawers. When power is applied, a light emitting diode (LED) on the I/O Drawer Indicator panel goes from blinking (green) to on continuously, which indicates that power levels are satisfactory in the drawers.

If the system is operating under AIX, enter the **shutdown -F** command to power off the system.

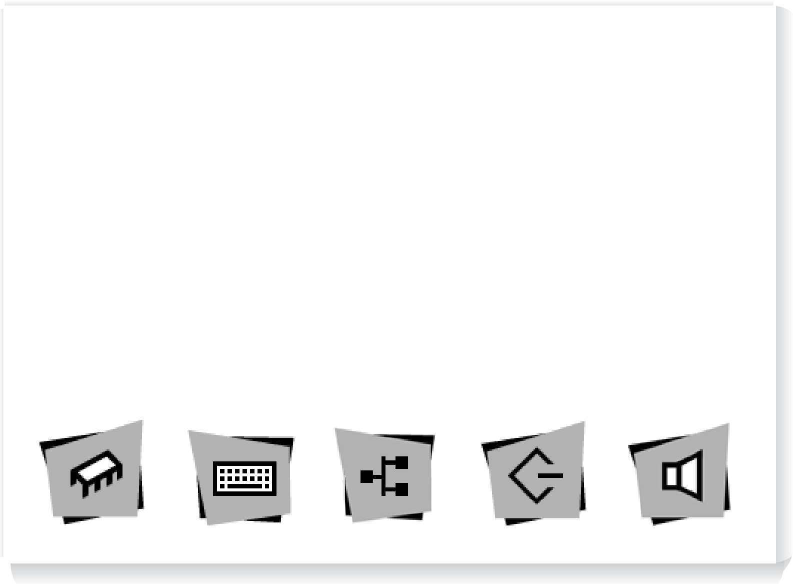
If you cannot use this method, you can power off the system by pressing the operator panel power button two times.

Attention: Using the operator panel Power Pushbutton to power off the system may cause unpredictable results in the data files, and the next IPL will take longer to complete.

For complete details on how to power on and off the system, go to "Powering Off and Powering On the System" on page 9-4 and "System Power-On Methods" on page C-28.

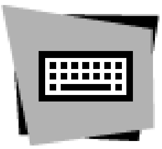
Post Indicators

When the POST is finished, the following screen displays (if using a graphics interface):

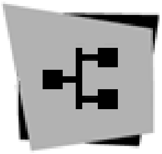


The POST screen displays the following objects.

Memory Module: Memory test.

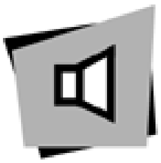


Keyboard: Initialize the keyboard and mouse. The window for pressing the function keys is now open. See “Function Keys” on page 1-7 for more information.



Network: Self-test on network adapters.

SCSI: Adapters are being initialized.



Speaker: Sounds an audible tone at the end of POST.

If using an ASCII terminal, the following text is displayed.

- Memory
- Keyboard
- Network
- SCSI
- Speaker

Function Keys

PF1 Key

- PF1, when operated from a directly attached keyboard, invokes the System Management Services (SMS) GUI interface.
- Numerical **1 key** is the equivalent key on an ASCII terminal.

PF5 Key

- The default boot list, located in firmware, is used.
- Numerical **5 key** is the equivalent key on an ASCII terminal.

This mode attempts to boot from the first device of each type found in the list. It does not search for other bootable devices of that type if the first device is not bootable. Instead, it continues to the next device type in the list. The firmware supports up to five entries in the boot list.

The default boot order is:

1. Diskette
2. CD ROM
3. Hard File
4. Tape Drive
5. Network
   a. Token Ring
   b. Ethernet

PF6 key: PF6 works like PF5 with some exceptions

- Firmware looks for a boot record according to the custom bootlist that was setup by System Management Services.
- Numerical **6 key** is the equivalent key on an ASCII terminal.

PF8 key: To enter the Open Firmware command line, you must press the **F8** key *after the keyboard icon appears* and before the last icon (the speaker icon) appears during startup. After pressing **F8**, the remaining icons display until initialization completes.

When initialization and power-on self test (POST) are complete, the Open Firmware command line (an "OK" prompt) appears.

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

To exit from the Open Firmware command enter `reset-all` or power the system down and reboot.

Console Strategy

If a console has not yet been selected, a previous console selection sequence timed out, or a change in the system configuration affecting the console (keyboard installed/removed, mouse installed/removed, graphics adapter installed/removed or moved to another PCI slot), the firmware invokes a console selection sequence at system boot time. The console selection sequence allows the selection (from the appropriate input device) of any one of all the available console devices. If no console is selected within approximately 60 seconds, serial port 1 (com1) is selected as the console and the selection sequence times out.

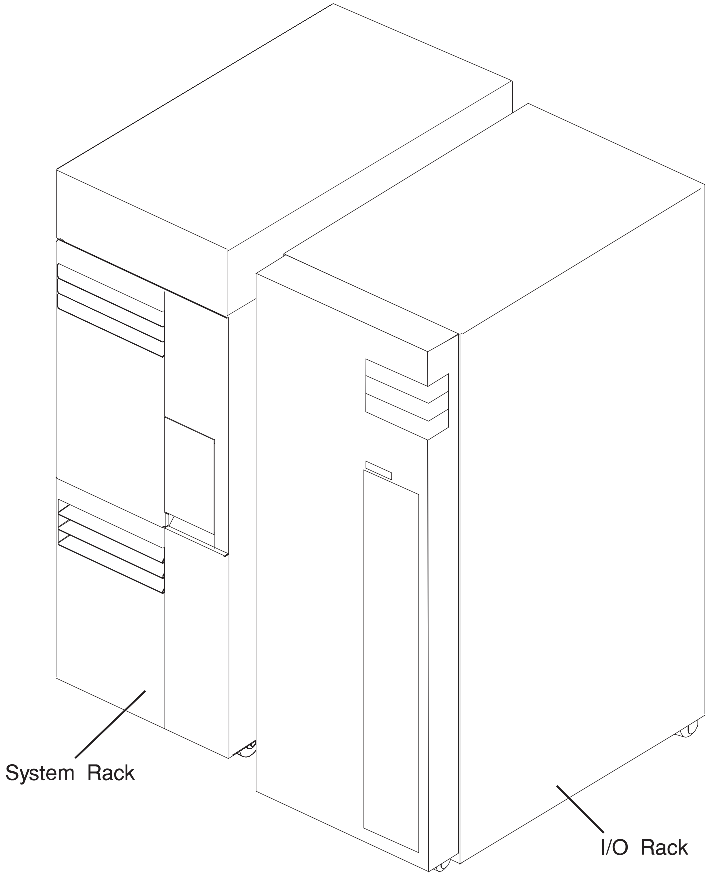
Once a console has been selected, the console selection sequence is only invoked at boot time if there is a change in the system configuration (as described above), or the contents of the system's non-volatile memory (nvram) is lost.

Note: Moving an ASCII terminal from one serial port to another (from com1 to com2) is not detectable by the firmware so it does not constitute a configuration change.

A system console selection sequence can also be initiated from the SMS menus.

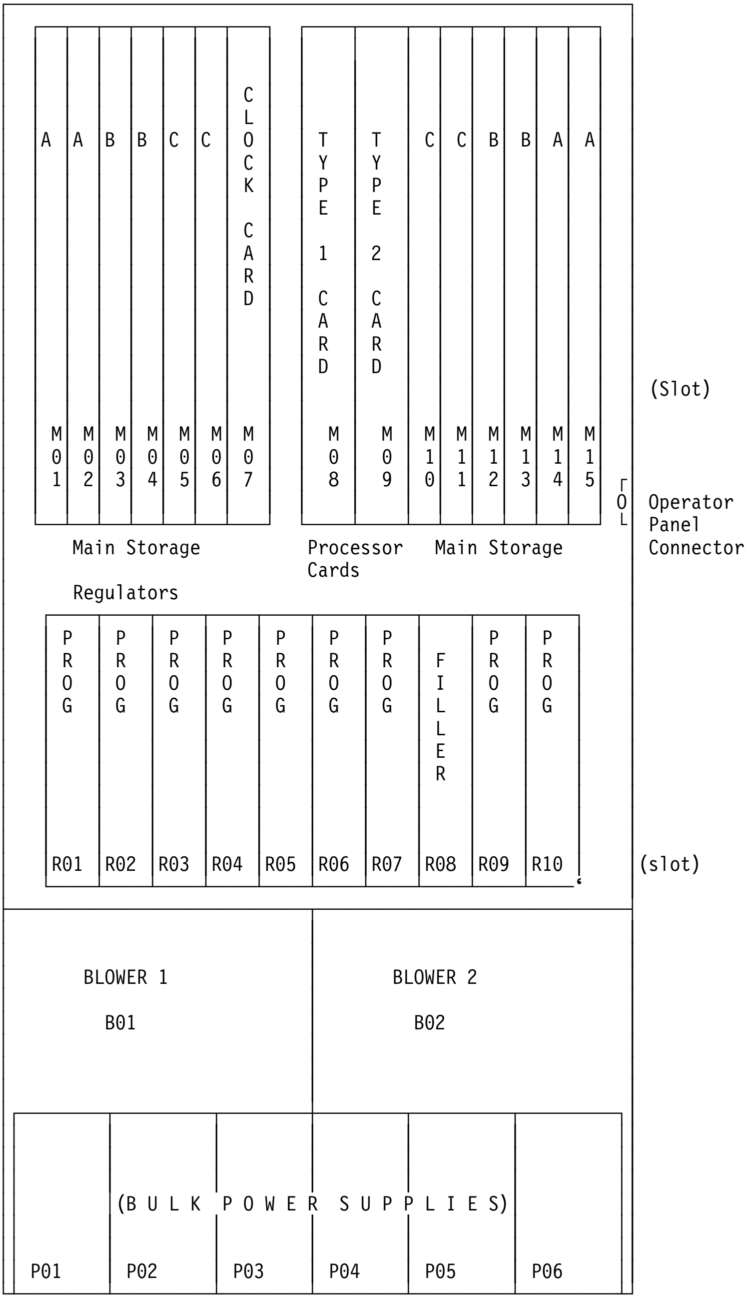
S70 Locations

The S70 consists of a minimum of two racks; the System Rack and the Input/output Rack. These two components are connected by cables that transmit data and control signals. Additional Input/output Racks can be added if further expansion of the system is required. The following figure shows the two units.

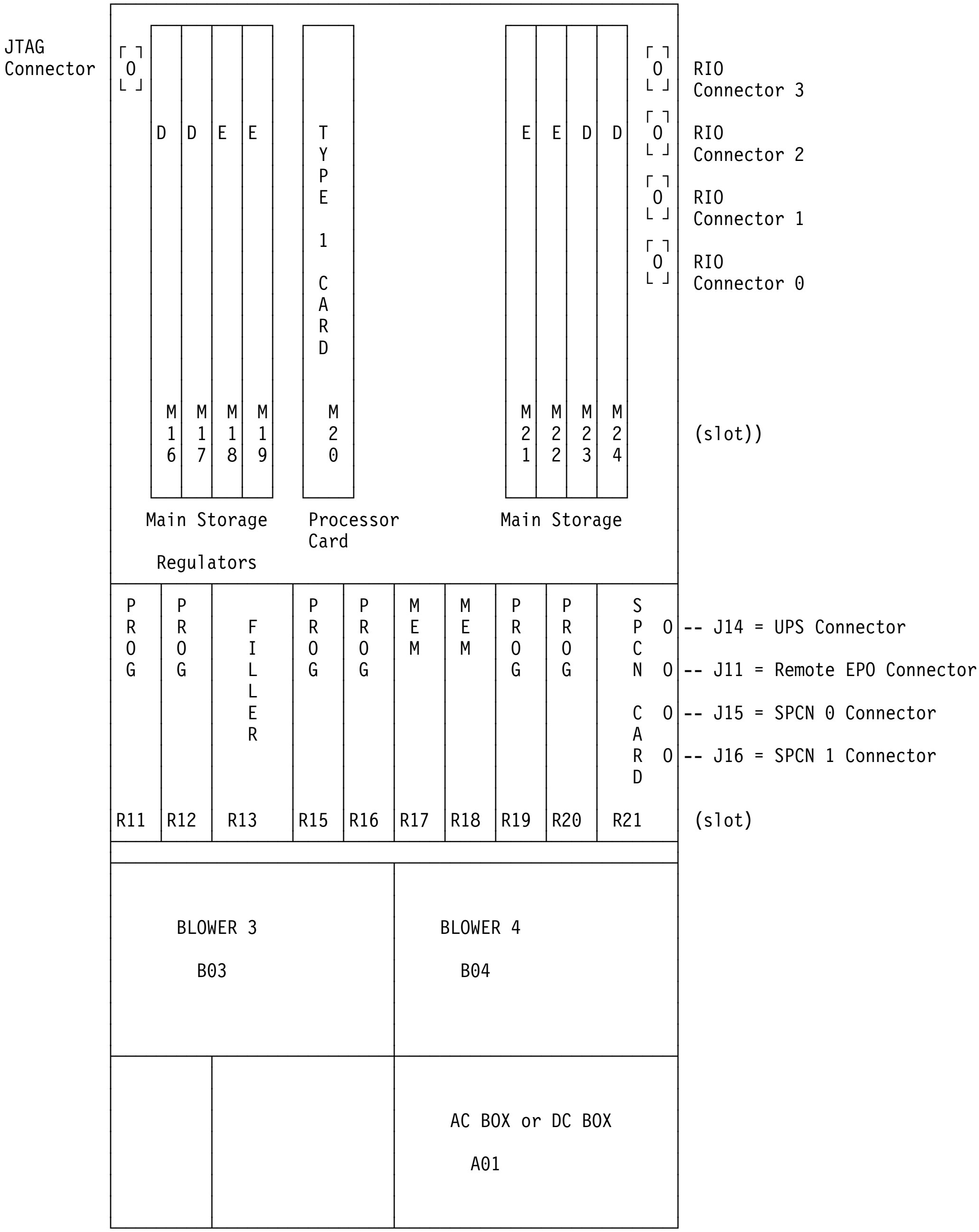


System Rack Locations Front

See the figure below for locations inside the front of the System Rack.

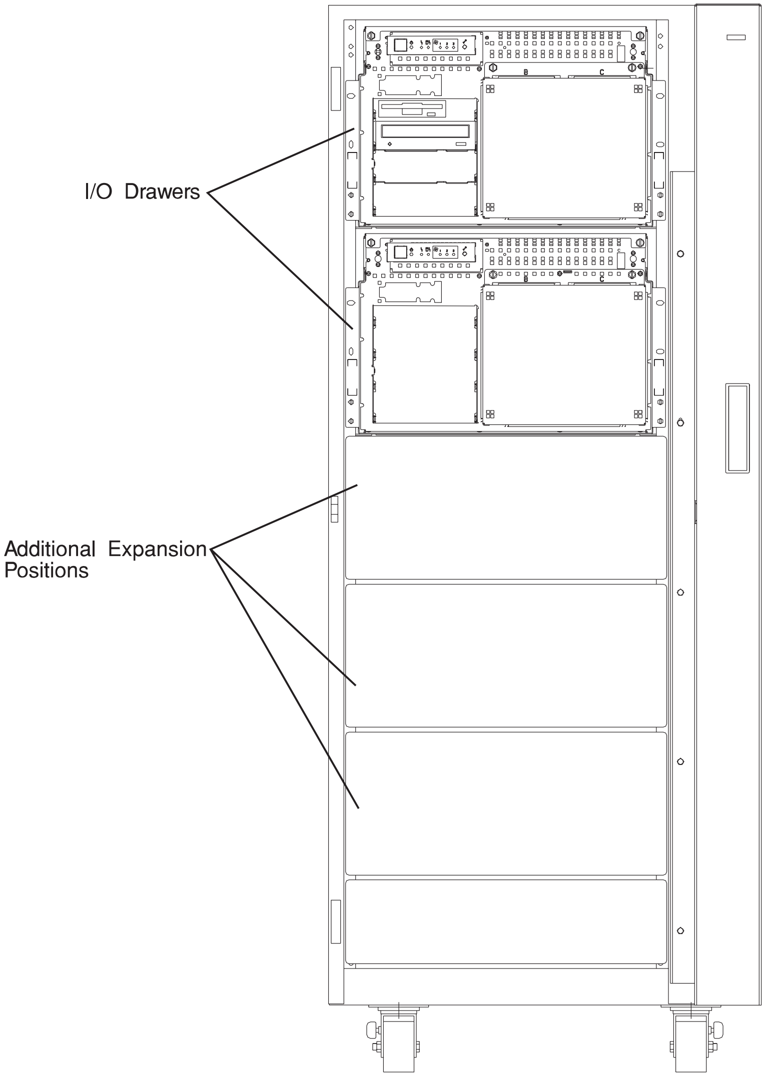


System Rack Locations Rear

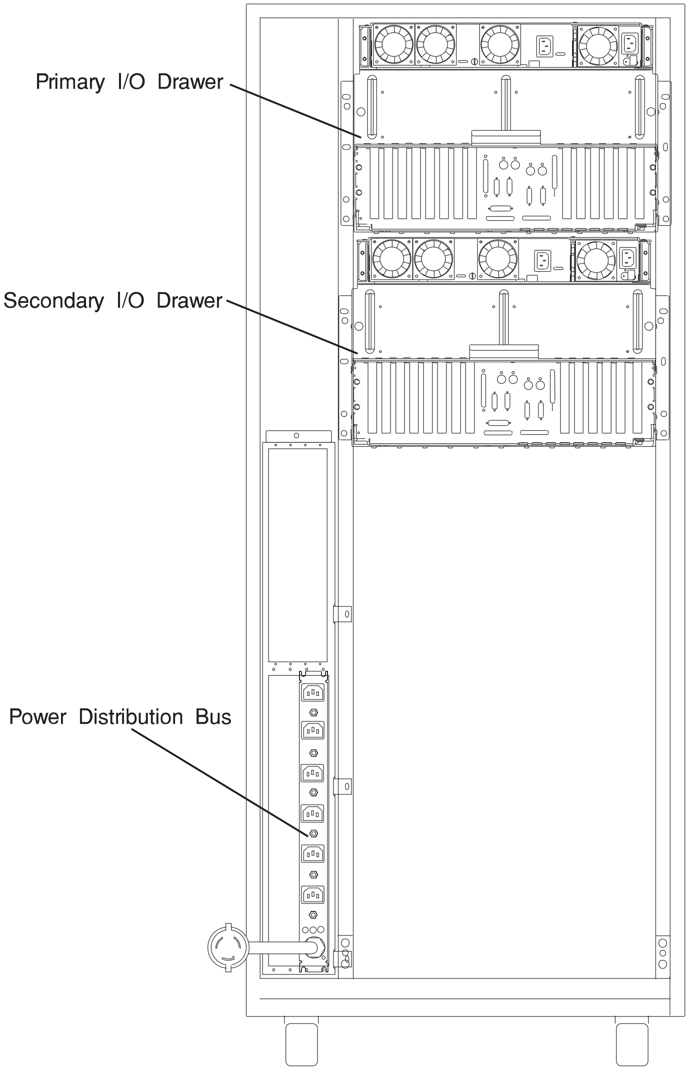


Input/output Rack Front Locations

The figure below shows the front of the Input/output Rack. The bezels are removed from the I/O Drawers so that components of the I/O Drawers can be seen.

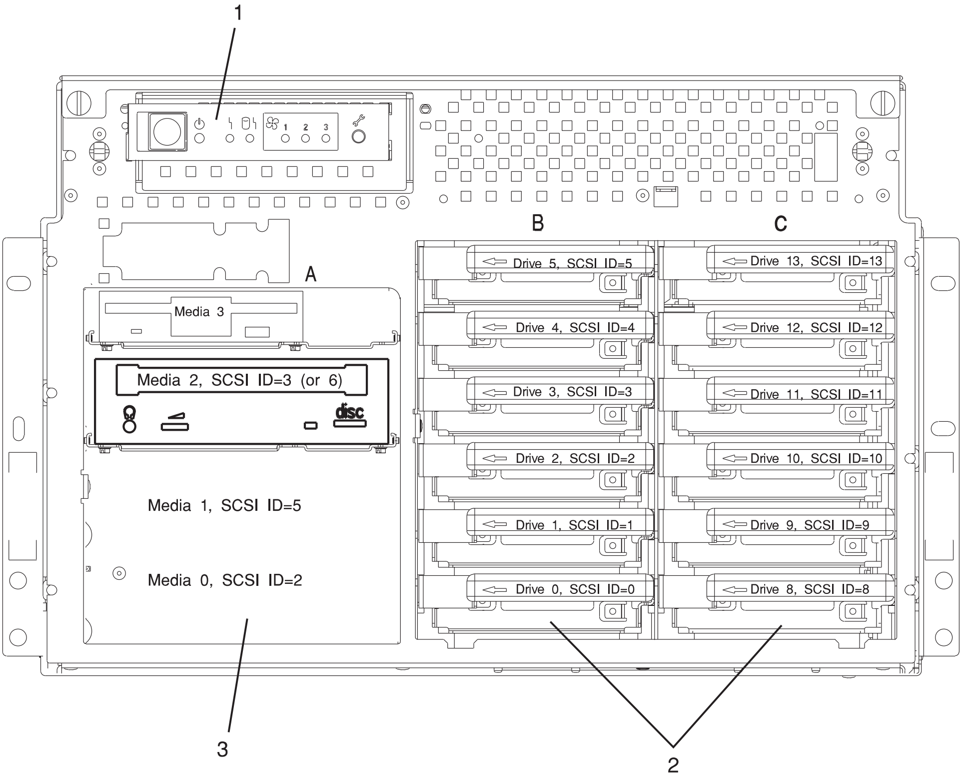


Input/output Rack Rear Locations



I/O Drawer Locations

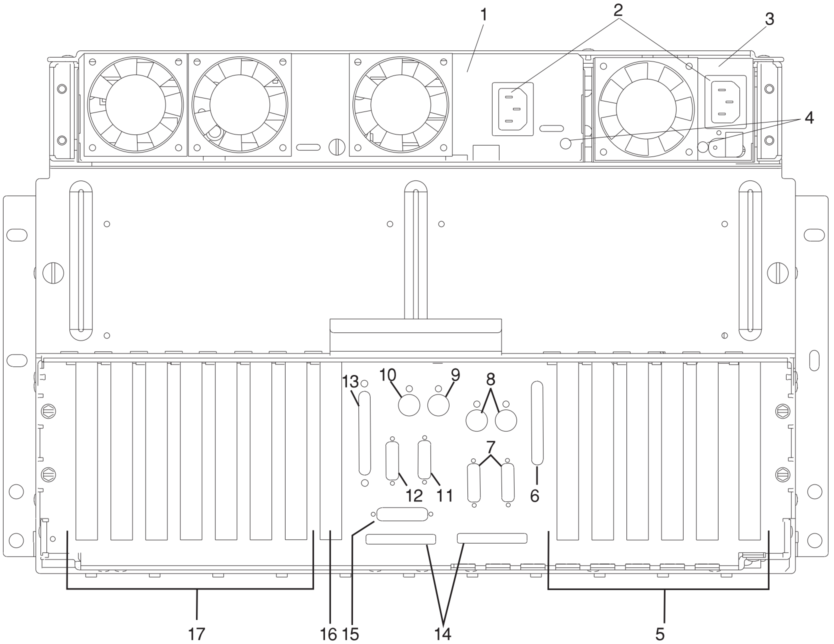
Front View



Note: The SCSI IDs shown for Media Bay A indicate how installed devices will be set when shipped from the factory.

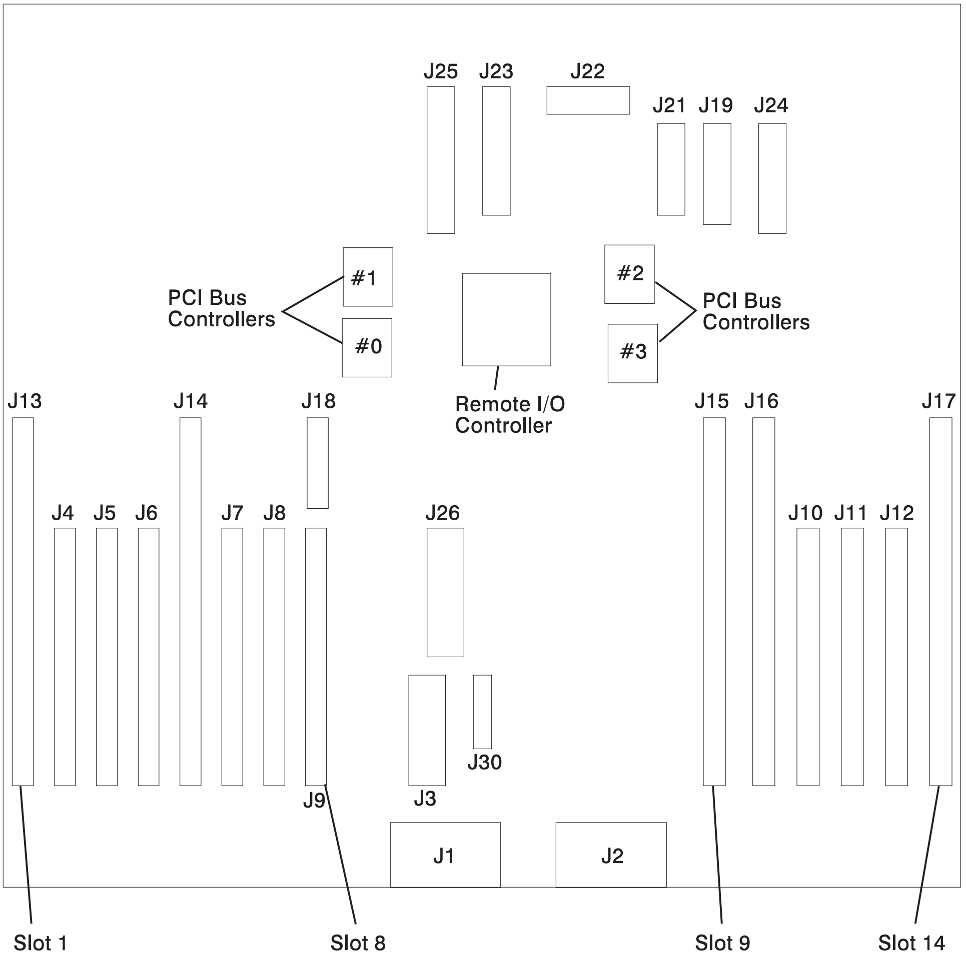
1. Indicator Panel
2. Hot Swap Disk Drive Bays
3. Media Bay

Rear View



1. 3/4 power supply
2. Power cord connectors
3. 1/4 power supply
4. Power good LEDs for the 3/4 and 1/4 power supplies
5. PCI adapter slots (9 - 14)
6. DASD connector for SE/SE SCSI redrive card
7. SPCN 1 (left) SPCN2 (right) connectors
8. Reserved
9. Mouse connector
10. Keyboard Connector
11. Serial Port S2
12. Serial Port S1
13. Parallel Connector
14. RIO 0 and RIO 1
15. Operator panel (OP) connector
16. PCI adapter slot 8, service processor card and JTAG cable in primary I/O Drawer (drawer 0)
17. PCI adapter slots (1 - 7)

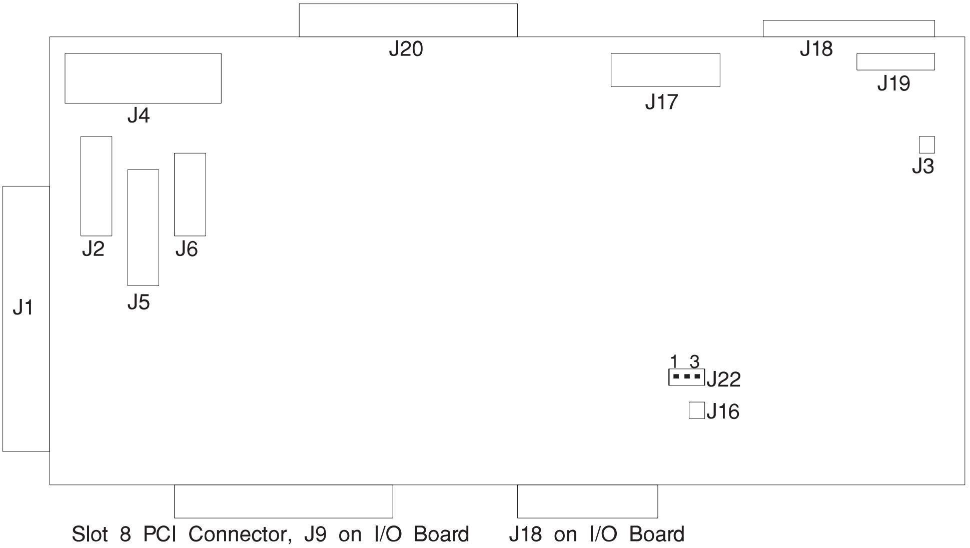
I/O Board Locations



J1	RIO bus
J2	RIO bus
J3	SPCN connector
J4	PCI slot 2, controller 1
J5	PCI slot 3, controller 1
J6	PCI slot 4, controller 1
J7	PCI slot 6, controller 0
J8	PCI slot 7, controller 0
J9	PCI slot 8, controller 0
J10	PCI slot 11, controller 2
J11	PCI slot 12, controller 2
J12	PCI slot 13, controller 2
J13	PCI slot 1, controller 1

J14	PCI slot 5, controller 0
J15	PCI slot 9, controller 3
J16	PCI slot 10, controller 3
J17	PCI slot 14, controller 2
J18	JTAG connector
J19	Miscellaneous power, power supply connector
J20	MX bus test connector
J21	I^2C connector to power supplies
J22	COP card connector
J23	PCI slot (1-8) power connector
J24	PCI slot (9-14) power connector
J25	+12 vdc, –12 vdc, and +3.3 vdc, power supply connector
J26	PCI slot power (1-8) +3.3 vdc, 3/4 power supply
J30	Reserved

Service Processor Card Locations



J1	JTAG connector to system rack
J2	Serial port connector to inside bulkhead card
J3	Speaker connector
J4	Diskette drive connector
J5	Parallel Port connector
J6	Keyboard/mouse connector to inside bulkhead card
J16	Write protect DASD FLASH (if jumper is on pins)
J17	Control panel connector from System Rack.
J18	Test Port 0
J19	Test Port 1
J20	Test Port 2
J22	Write protect boot FLASH (if jumper is set between pins 2 and 3)

System Memory

The S70 server uses a granular approach to system memory. This granularity is provided by having all system main store memory pluggable in reserved slots and by offering several different sizes of memory cards.

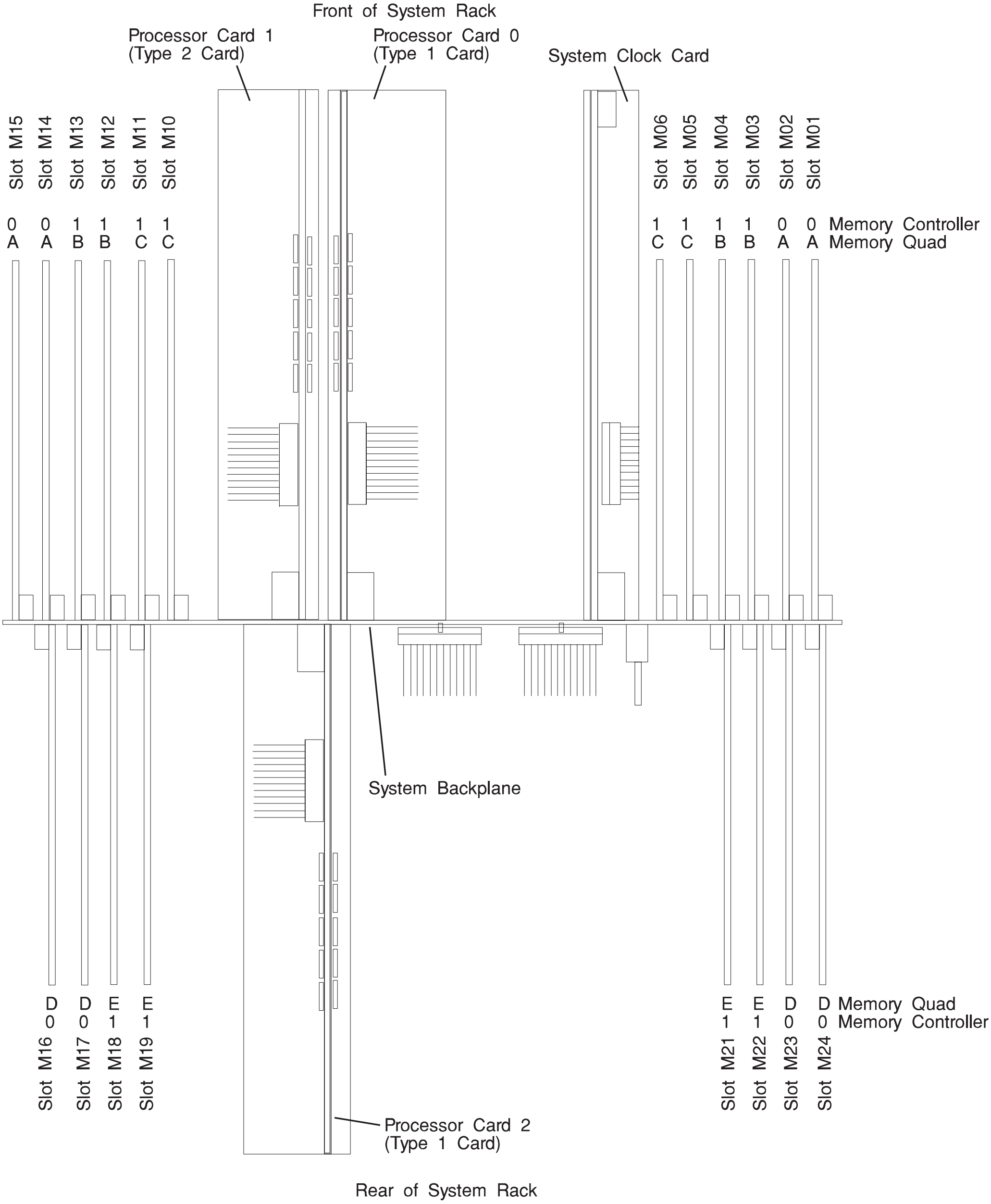
Twenty slots are available for system memory which are located for easy access from the front or rear of the System Rack. These slots are shown in "System Rack Locations Front" on page 1-10 and "System Rack Locations Rear" on page 1-11 which show the relative positions to the System Rack, or the figure in "Memory Locations and Ordering Rules" on page 1-20 which is a top view including the processor and clock cards. The memory cards are M01 through M06 and M10 through M15 on the front of the system, and M16 through M19 and M21 through M24 on the rear of the system.

Two different memory types are provided in the S70. DIMM based memory cards are provided for customers to upgrade from certain previous system units. These DIMM cards accept DIMM modules from prior approved system DIMM memory, and new DIMMs are orderable with the S70 system. Three different sizes of DIMMs are available: 16MB, 32MB, and 64MB. Additionally, 2 different DIMM cards are used in the S70 for supporting the DIMMs. These two cards are distinguished by their orientation of components to fit into the memory packaging arrangement. They are termed right and left hand DIMM cards.

The second type of card used in the S70 is the R1 memory card. R1 memory cards do not employ any DIMM modules and are available in several sizes: 128MB, 256MB, 512MB, and 1024MB.

Memory Locations and Ordering Rules

The figure below is a view of the system memory from the top of the system. This view shows a full configuration of memory cards installed into the system backplane.



R1 Memory Cards are the primary memory cards used in the S70. All S70 memory cards are installed in four card functional units called quads. The quads must be composed of the four cards of the same type. The complete set of four cards must be properly installed in the proper card slots for the newly installed memory to work. See the figure on page 1-20 for the location of the card slots that are in each quad.

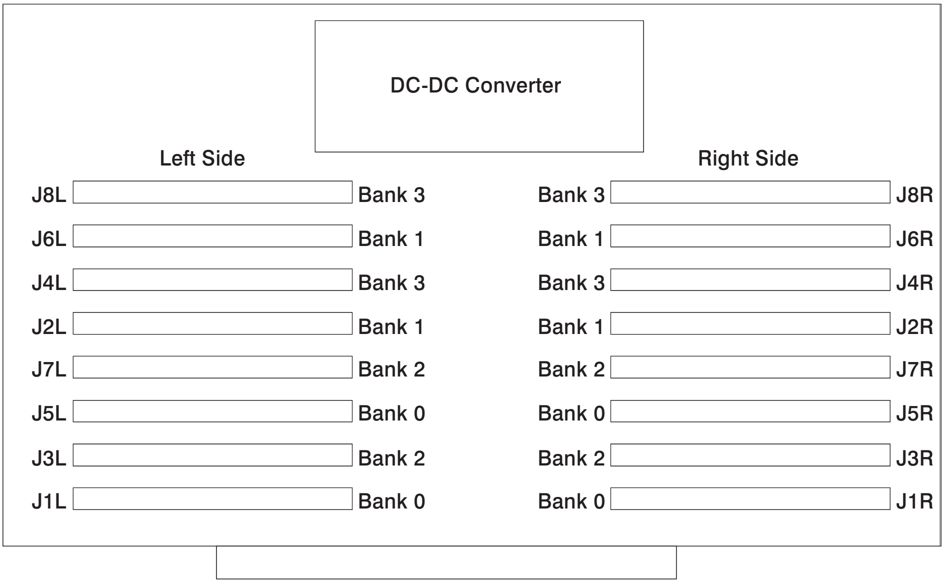
It is important for certain technical applications to have the memory configured for optimal performance. The memory system of the S70 is accessed through two separate ports. Optimization is achieved by equalizing as much as possible the amount of memory on each of the ports. Quads A and D are on one port. Quads B, C, and E are on the other port.

To obtain an upgraded system with good performance, sort all the memory features by size. Sort the memory features by quad size, memory density, from largest to smallest. Install the largest memory feature in Quad A, put the next largest memory feature in Quad B. Continue putting memory quads in the available quads alphabetically with the smaller features following the larger.

DIMM Based Memory Card Memory Card Configuration

The DIMM Based Memory Card has special configuration rules.

The figure below shows the connector locations for the DIMM Based Memory Card memory card.

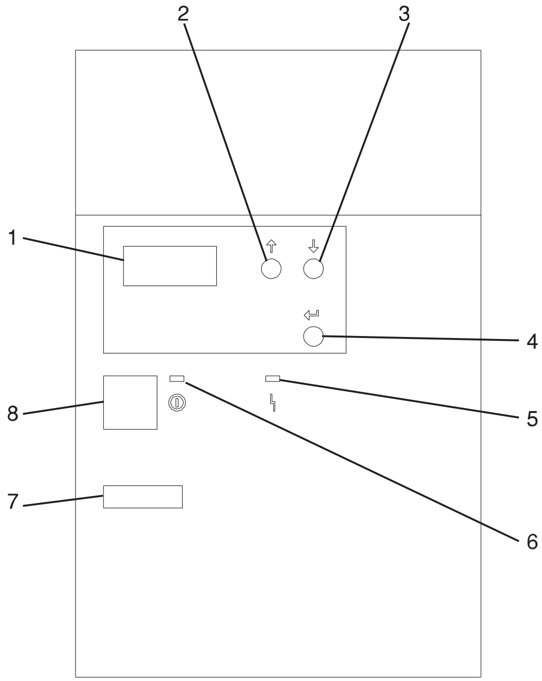


Supported DIMM Types are specifically 16MB 32MB

- DIMM Based Memory cards must be used in a set of four.
- DIMM Based Memory cards may only be placed in Quad E.
- If the DIMM Based Memory cards are used, R1 memory cards must be placed in Quad A.
- If the DIMM Based Memory cards are used, Quads B, C, and D must be empty.
- On the DIMM Based Memory cards sets of DIMMs are installed in banks. A single bank of DIMMs is 16 DIMMs of the same size. The bank spans four cards.
- When populating DIMM Based Memory cards, a minimum of 16 DIMMs must be plugged into a set of four DIMM Based Memory cards. Four DIMMs are installed on each card of the four card set. 16 DIMMs of equal size must be installed in the same bank of the four cards.
- DIMMs must be installed in the cards by fully populating bank 0 first. Then fully populating bank 1, bank 2, and bank 3 in that order.
- The different banks may have different size DIMMs.

System Rack Operator Panel

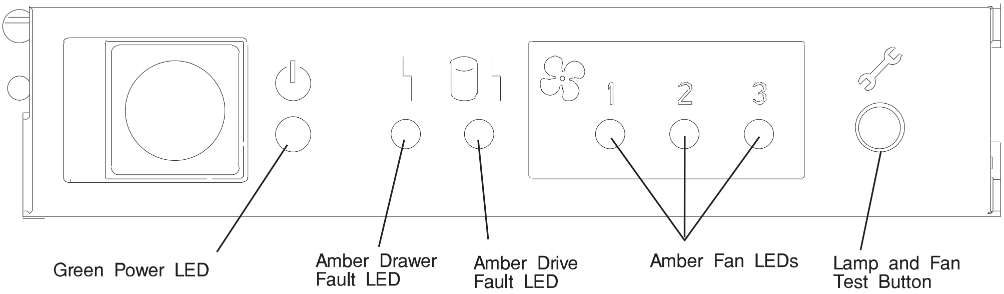
The following diagram shows the locations of the operator panel display and the operator panel. For details about the operator panel functions and descriptions, see Appendix A on page A-1.



1	Operator Panel Display
2	Scroll Up Pushbutton
3	Scroll Down Pushbutton
4	Enter Pushbutton
5	Attention LED
6	Power On LED
7	Serial Number
8	Power Pushbutton

I/O Drawer Indicator Panel

Indicator Panel



External indicators on the front indicator panel indicate status for functions in the I/O Drawer and they are visible with the rack door open. They are:

1. A green POWER LED to indicate that distribution DC voltage is present in the I/O Drawer (Power Good).
   a. ON if power good (power levels are within operating range).
   b. OFF if power bad (power levels are outside of operating range) or off.
   c. Slowly blinking if system is plugged into wall outlet but the power sequence has not been applied.

2. Two amber CHECK LEDs

   a. Drawer Fault

      1. When a Power supply fails (check power good LED on rear of I/O Drawer power supplies).
      2. When a fan fails.

   b. Drive Fault

      OFF No drive fault and no drive is in the identify state.

      ON One or more backplanes have a SCSI reset fault.

      SLOW FLASH One or more backplanes have a power or cooling fault. The drawer fault LED is also on. The LEDs on all drives on any affected backplane are flashing.

      FAST FLASH One or more backplanes are in the identify for remove state (the green LED is flashing on one or more carriers).

3. Three amber FAN LEDs

   All three are off when the fans are operational. The corresponding LED is turned on if a fan fails.

4. Lamp/Fan test button

   If the I/O drawer power is up, pressing this button causes all the LEDs on the indicator panel to light, and the three cooling fans in the I/O Drawer to go to high speed.

Cabling the System Rack and Input/output Rack

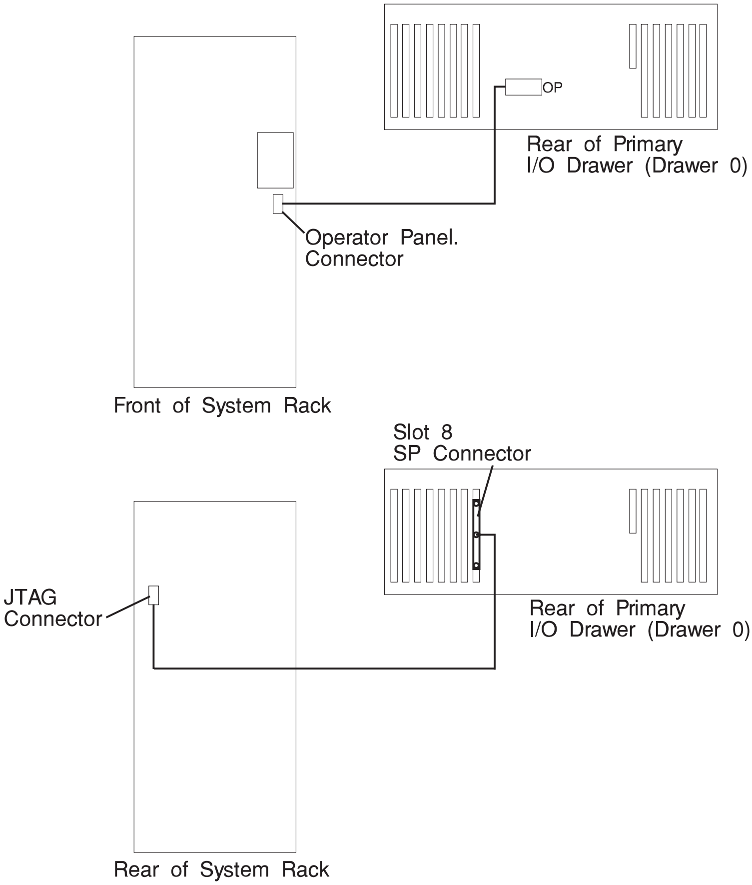
The minimum S70 consists of two racks. The System Rack contains the system processors, memory and supporting hardware. The Input/output Rack contains I/O Drawer(s) with PCI adapters, disk drives, and media drives. The S70 must have one Primary I/O Drawer which contains the service processor. The S70 will support up to four I/O Drawers in different Input/output Rack configurations.

There are two steps to connecting the System Rack to the I/O Drawers in their Input/output Racks.

1. Connecting the cables that only connect between the System Rack and the Primary I/O Drawer such as the JTAG and the Operator Panel cable
2. Connecting the cables that connect the between the System Rack and all the I/O Drawers in a loops, such as the RIO cables and the SPCN cables.

Connecting JTAG and Operator Panel Cables

Use the following figure when you are connecting the JTAG and Operator Panel (OP) cables.



Connecting RIO and SPCN Cables

The RIO and SPCN cables provide two functions in the model S70, remote data bus connection and power control. The following basic rules must be followed when connecting these two types of cables:

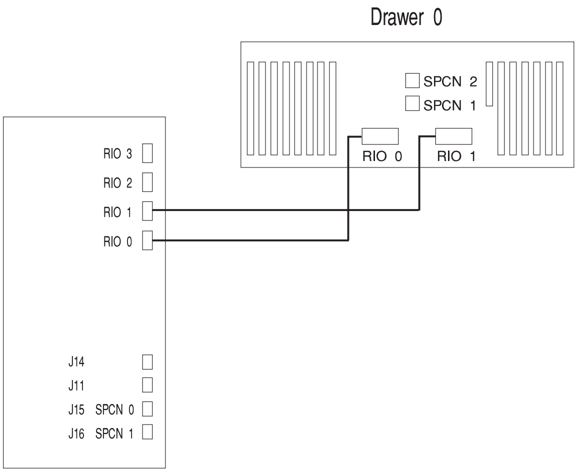
- The I/O Drawers must be connected in a loop fashion for both the RIO cables and the SPCN cables. The loop connection provides redundant paths so that if a failure occurs in part of a cable, the system will continue to operate. If a failure occurs, a warning message is displayed on the system console but the system continues to operate.
- One loop is required for the SPCN cabling. This loop begins and ends at the System Rack.
- Two loops are possible for the RIO cabling depending on the number and desired configuration of I/O Drawers. These loops begin and end at the System Rack.

RIO Cabling

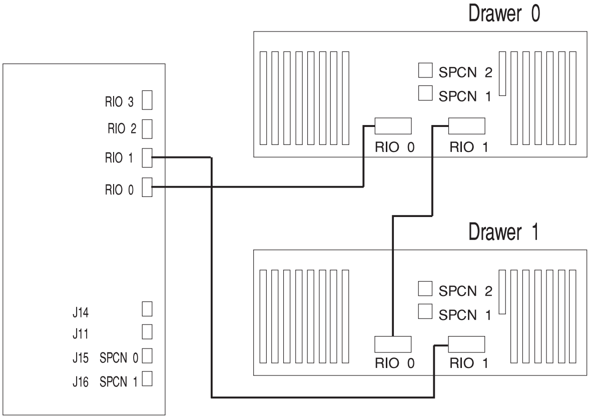
- I/O Drawers 0 and 1 are connected using the first RIO loop which uses RIO ports 0 and 1 on the System Rack.
- I/O Drawers 2 and 3 are connected using the second RIO loop which uses RIO ports 2 and 3 on the System Rack.
- The primary I/O Drawer must be installed and connected to RIO port 0 of the System Rack. The connection must be made from RI0 port 0 of the System Rack to RIO port 0 of the primary I/O Drawer. This connection is required to make the primary drawer the first drawer in the loop which allows the firmware to initialize the system.
- If the loop connection between RIO 2 and RIO 3 is broken, the system is not able to differentiate between I/O Drawer 2 and I/O Drawer 3. The system still configures RIO 0 and RIO 1 ports, but does not configure RIO 2 or RIO 3 ports.

The following figures provide cabling examples for all valid cabling configurations. Match your configuration to the correct figure and connect your RIO cables as shown.

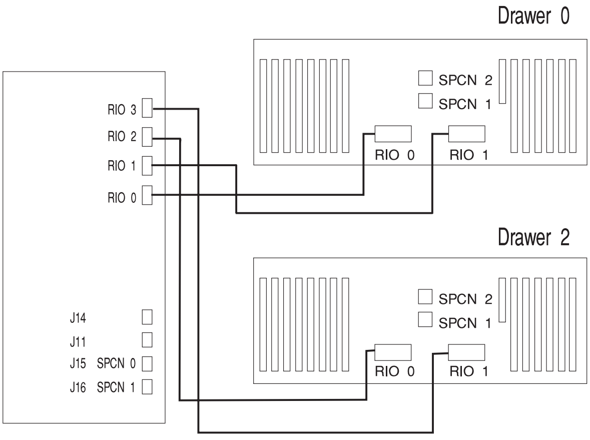
System Rack Attached to one I/O Drawer



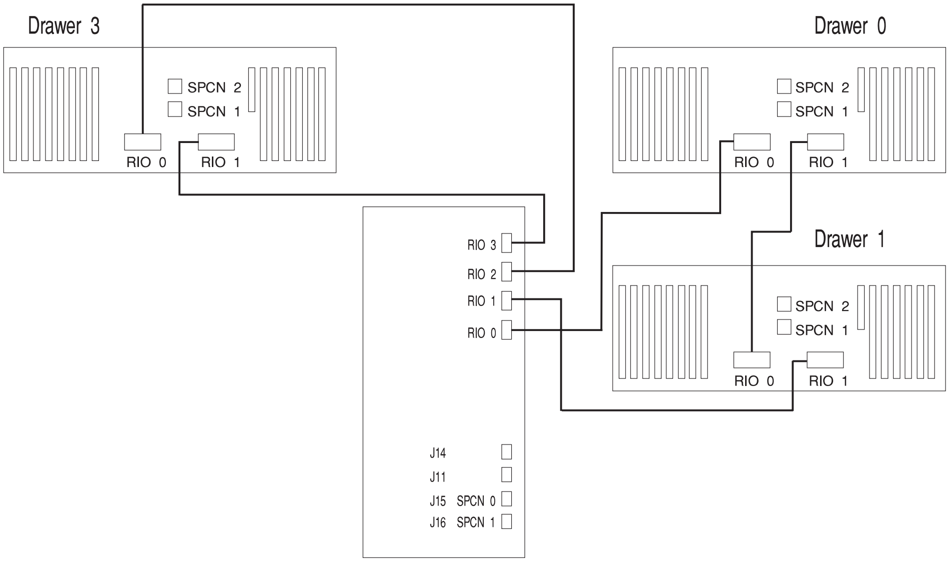
System Rack Attached to two I/O Drawers



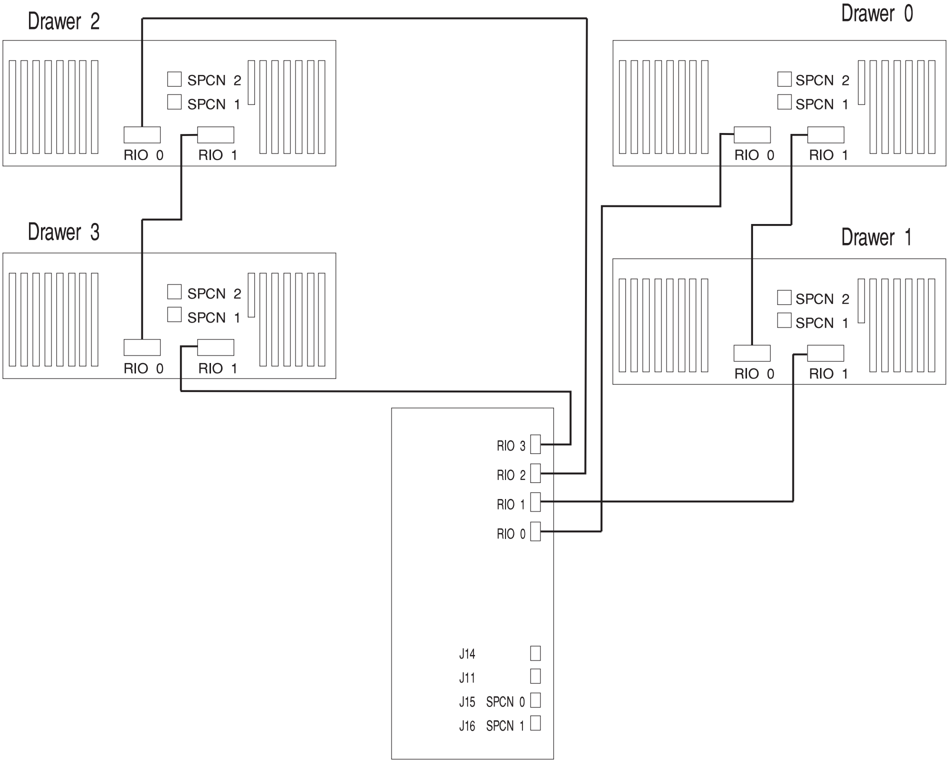
OR



System Rack Attached to three I/O Drawers



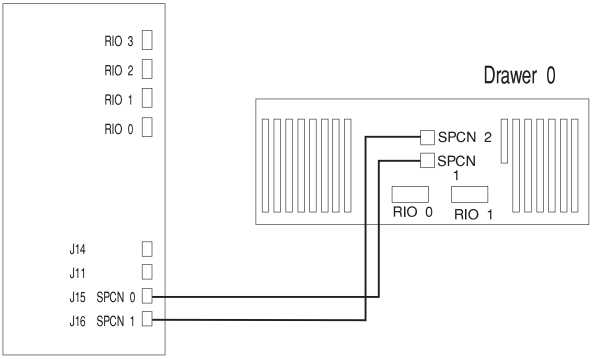
System Rack Attached to Four I/O Drawers



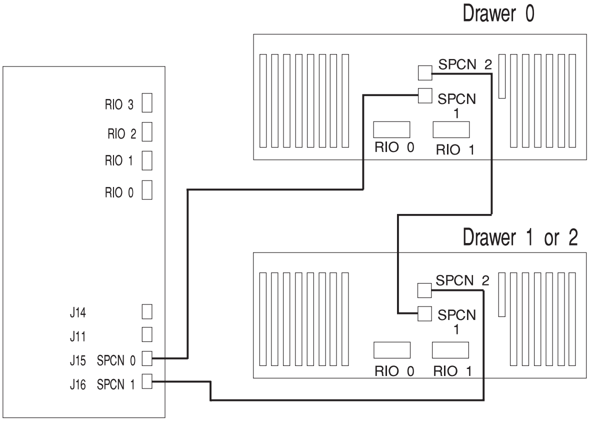
SPCN Cabling

- The following figures provide cabling examples for all valid cabling configurations.
- Match your configuration to the correct figure and connect your SPCN cables as shown.

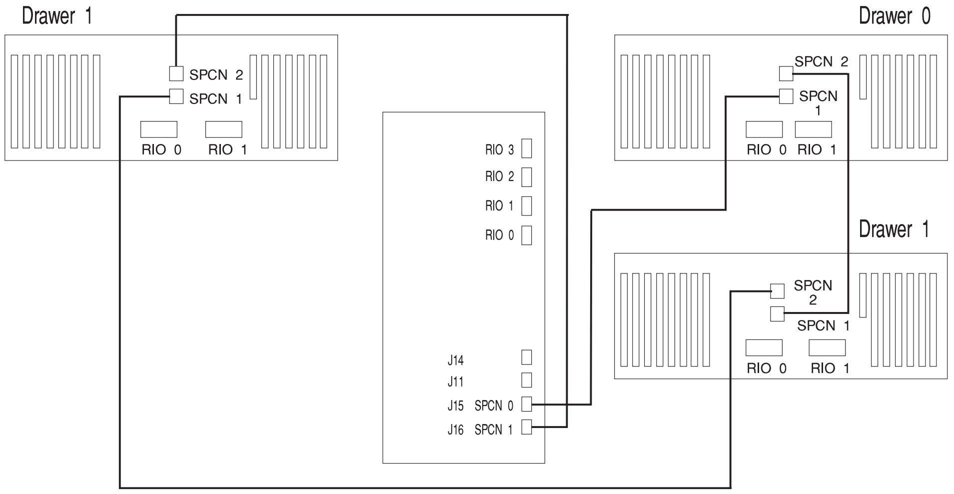
System Rack Attached to One I/O Drawer



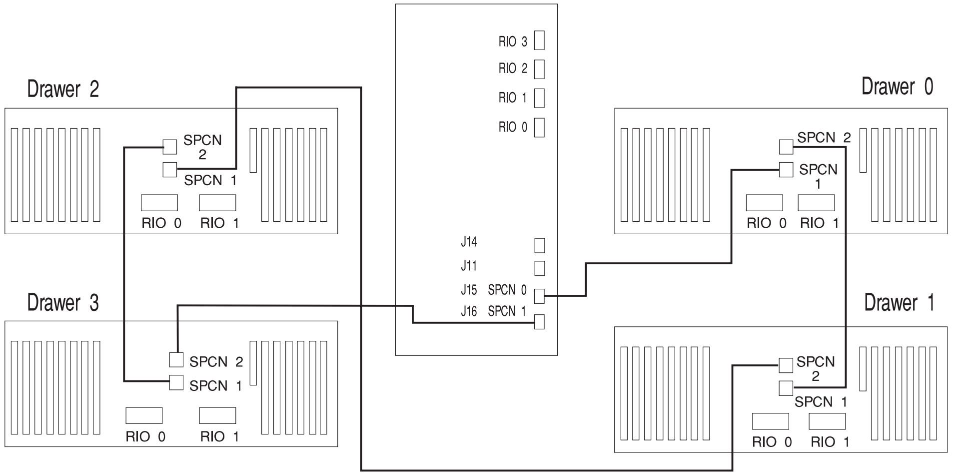
System Rack Attached to Two I/O Drawers



System Rack Attached to Three I/O Drawers



System Rack Attached to Four I/O Drawers



S70 Power Overview

The S70 power is provided to each rack type by independent power supplies and distribution cabling. Both the S70 racks require 200 to 240 V ac connections, or -48 V dc connections. The System Rack and the Input/output Rack have independent power distribution systems.

System Rack Power

The System Rack power distribution network is shown in the figure found under “System Rack Power Cabling” on page 1-39.

The power enters the processor system rack as 200-240 V ac. The line cord enters the AC box which contains 2 components: one is the AC filter and distribution assembly and the other supplies standby power to some system components. Stand-by power is supplied to the system operator panel interface and the System Power Control Network (SPCN).

The filtered 200-240 V ac is then sent to the six system bulk power supplies. The six supplies are coupled together and provide an N+1 level of redundancy for protection. N+1 refers to the fact that since the supplies are coupled to a common distribution bus, if one of the six supplies fails, the system will not fail. The bulk supplies provide a positive 29 volt output which is fed to the system regulator located above the bulk supplies and to the system blowers.

The system blowers are able to maintain the system temperature within the strict guidelines required. The system blowers are not in an N+1 arrangement because blower reliability is very good. The blowers only require +29 V dc.

The system regulators provide 2.5 V dc and 3.3 V dc to the system. The power distribution domains from these regulators is illustrated in the figure under “System Rack Power Cabling” on page 1-39.

System Rack DC Power (-48 V dc)

If the S70 receives power from a -48 V dc source, the AC box and AC bulk power supplies are replaced by the respective DC box and DC bulk power supplies. Also, circuit breaker panels are required, and certain cables and harnesses are substituted. See “System Rack Power Cabling -48 V dc” on page 1-40 for more information.

Input/output Rack Power

The Input/output Rack power distribution network is shown in the figure found under “Input/output Rack Cabling” on page 1-42.

Power enters the Input/output Rack as 200-240 V ac through a power cable assembly and terminates on a Power Distribution Bus (PDB). The PDB has 6 individual AC outlets each capable of eight amps at 200-240 V ac which are overload protected and resettable. Each I/O drawer is supplied from one AC outlet of the PDB through a special “Y” cable. The “Y” cable draws power from a single PDB outlet and provides a standard AC plug to each of the two power supplies utilized in each I/O Drawer. Two I/O Drawers are allowed in each rack but other type drawers may be featured in addition to the two I/O Drawers.

Two power supplies are required for each I/O Drawer Viewed from the rear, the larger supply on the left is called the 3/4 power supply and the smaller one to the right is called the 1/4 power supply. Power distribution is performed on the I/O Drawers without the use of redundant devices and regulators are not used. The 3/4 power supply provides 5 V dc, 3.3 V dc, 12 V dc, and 5 V dc standby. The 1/4 power supply provides 5 V dc, 12 V dc, and 5 V dc standby. The 5 V dc standby power is provided by both power supplies and connected together on the system board directly since the power supplies contain overload protection against one supply shorting the other. +5 V dc standby power is provided to a portion of the I/O planar which is part of the system SPCN logic. This consists of several components including a logic chip, ROM, SRAM, and transceivers. The service processor is not on standby power. +12 V dc is provided to the fans in the drawer from both the 3/4 and the 1/4 power supply to ensure sufficient cooling if one of the power supplies fail. However, the short circuit prevention is on the I/O planar to protect against inadvertent shorts in one line causing the +12 V dc to fail completely.

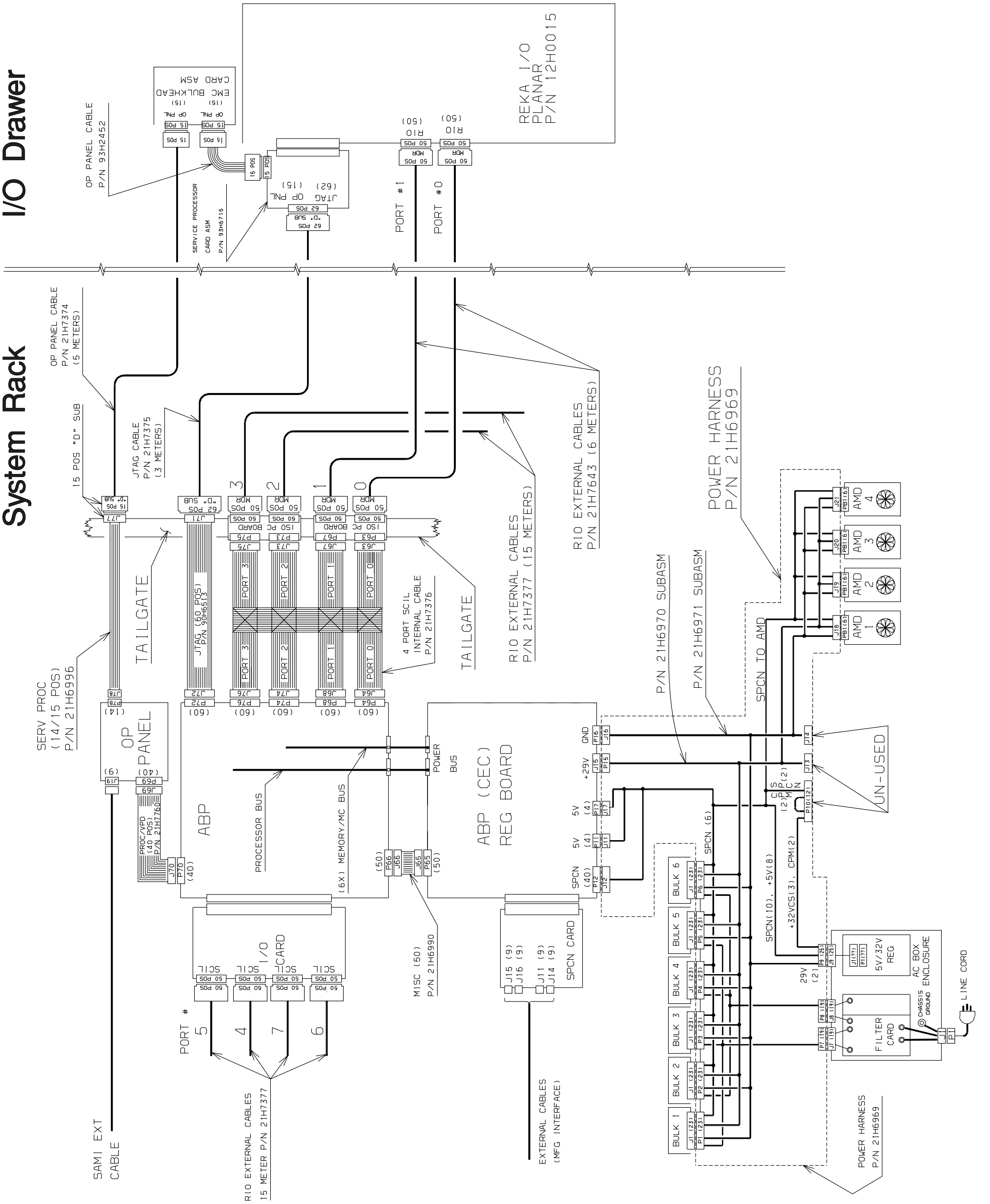
3/4 Power Supply	**1/4 Power Supply**
+ 5 V dc - Media Bays and Logic	+ 5 V dc - Hot-Swap Disk Drive Bays
+ 3.3 V dc - Media Bays and Logic	+ 12 V dc - Hot-Swap Disk Drive Bays
+ 12 V dc - Media Bays and Fans	+ 5 V dc - Standby SPCN and Operator Panel Logic
– 12 V dc - Media Bays and Logic	
+ 5 V dc - Standby SPCN and Operator Panel Logic	

Input/output Rack DC Power (-48 V dc)

If the S70 receives power from a -48 V dc source, the power distribution bus (PDB) is not used. DC versions of the 3/4 and 1/4 power supplies in the I/O Drawers are fed from 20 and 10 amp circuit breakers. "Input/output Rack Cabling -48 V dc" on page 1-43 provides more information about -48 V dc cabling on the Input/output Rack. A 15 amp circuit breaker panel is used to supply power to optional feature drawers that may be installed in the Input/output Rack.

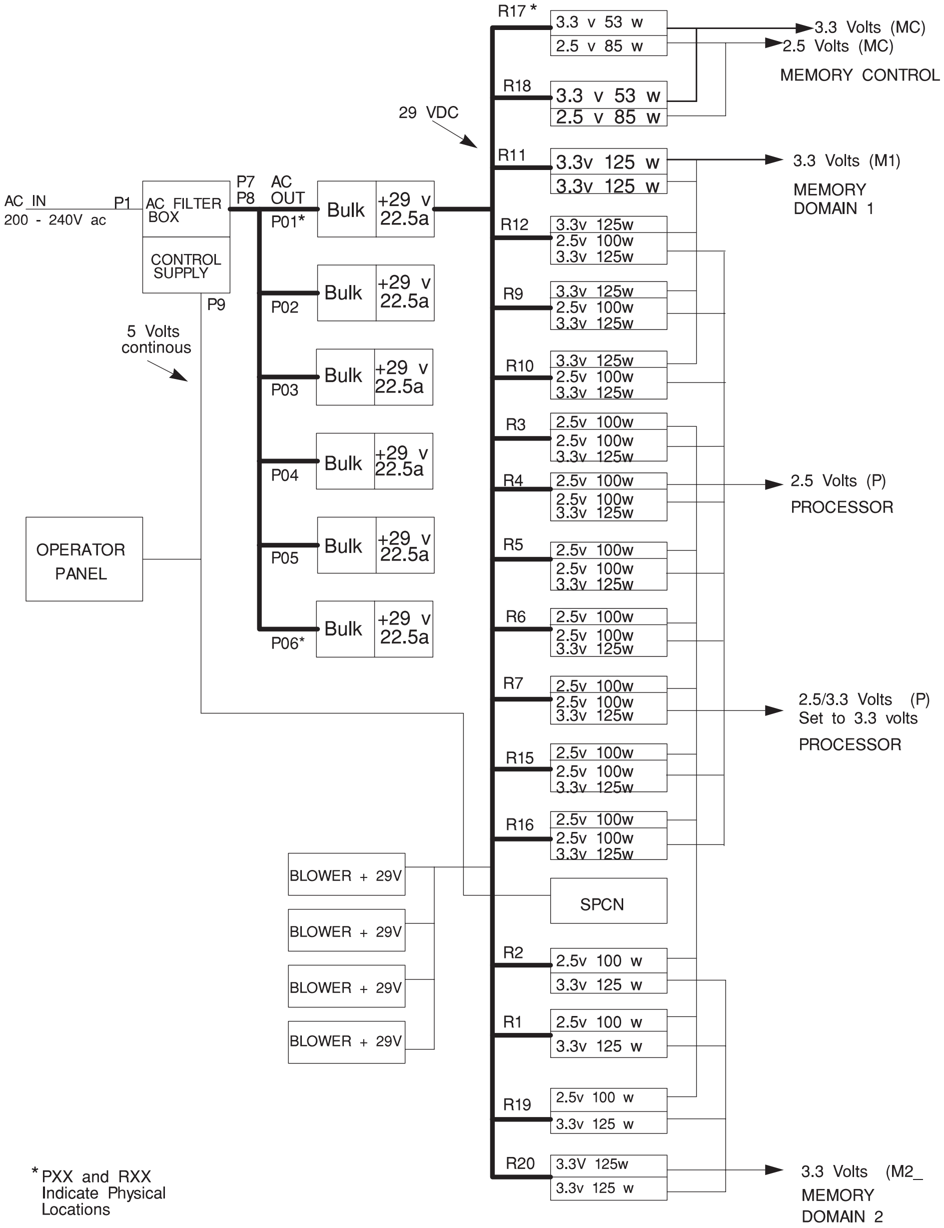
S70 Cabling

The following figure shows the internal cabling for the S70.



System Rack Power Cabling

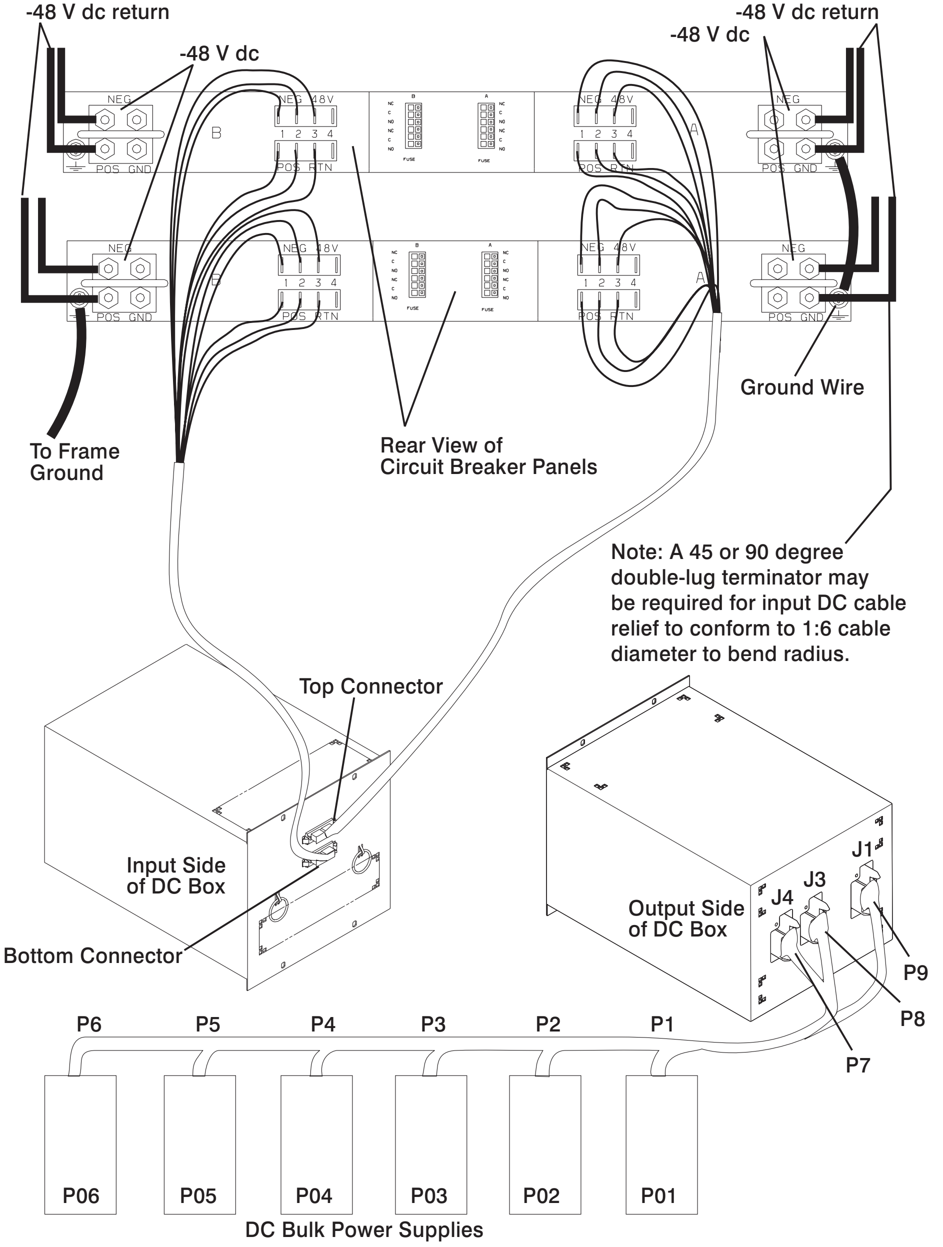
The following figure is a diagram of the power cabling for the System Rack.



*PXX and RXX
Indicate Physical
Locations

System Rack Power Cabling -48 V dc

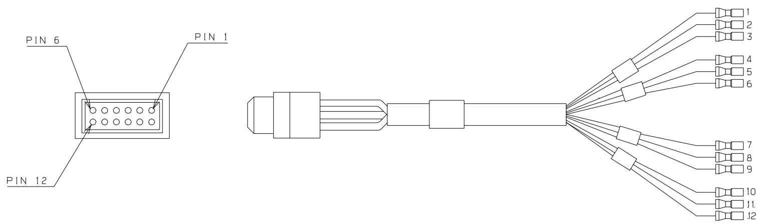
The following figure shows power cabling for a System Rack with -48 V dc power. Power distribution from the bulk power supplies out to rest of the System Rack is the same for the AC powered system as well as the -48 V dc system.



-48 V dc Power Connectivity

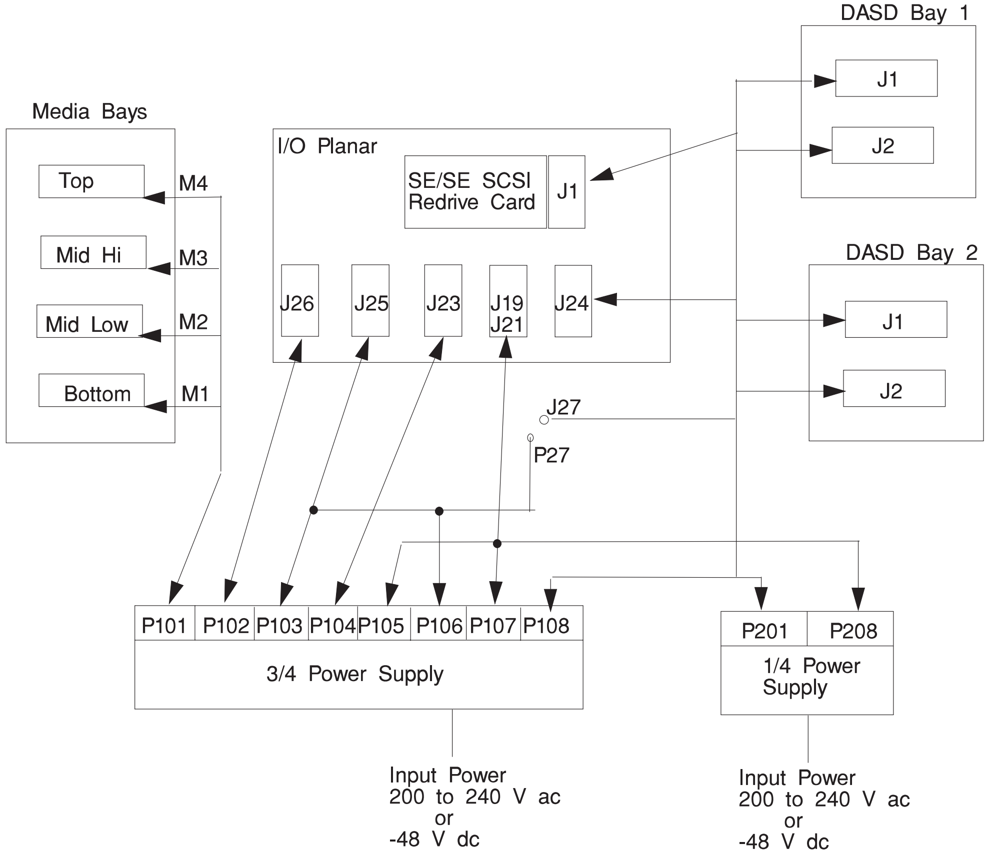
	Circuit Breaker Panel	Cable 93H6158 Wire	Top DC Box Entry Connector	DC Box Exit Connector	Bulk DC Power Supply
48V	A1-Bottom	1	1	J3, Pin 1	P04
	A2-Bottom	2	2	J3, Pin 2	P05
	A3-Bottom	3	3	J3, Pin 3	P06
	A4-Bottom	NC	NC	NC	NC
	A1-Top	4	4	J4, Pin 1	P01
	A2-Top	5	5	J4, Pin 2	P02
	A3-Top	6	6	J4, Pin 3	P03
	A4-Top	NC	NC	NC	NC
48V RETURN	A1-Bottom	7	7	J3, Pin 4	P04
	A2-Bottom	8	8	J3, Pin 5	P05
	A3-Bottom	9	9	J3, Pin 6	P06
	A4-Bottom	NC	NC	NC	NC
	A1-Top	10	10	J4, Pin 4	P01
	A2-Top	11	11	J4, Pin 5	P02
	A3-Top	12	12	J4, Pin 6	P03
	A4-Top	NC	NC	NC	NC

	Bottom Circuit Breaker Panel	Cable 93H6158 Wire	Bottom DC Box Entry Connector	DC Box Exit Connector	Bulk DC Power Supply
48V	B1-Bottom	1	1	J3, Pin 1	P04
	B2-Bottom	2	2	J3, Pin 2	P05
	B3-Bottom	3	3	J3, Pin 3	P06
	B4-Bottom	NC	NC	NC	NC
	B1-Top	4	4	J4, Pin 1	P01
	B2-Top	5	5	J4, Pin2	P02
	B3-Top	6	6	J4, Pin 3	P03
	B4-Top	NC	NC	NC	NC
48V RETURN	B1-Bottom	7	7	J3, Pin 4.	P04
	B2-Bottom	8	8	J3, Pin 5	P05
	B3-Bottom	9	9	J3, Pin 6	P06
	B4-Bottom	NC	NC	NC	NC
	B1-Top	10	10	J4, Pin 4	P01
	B2-Top	11	11	J4, Pin 5	P02
	B3-Top	12	12	J4, Pin 6	P03
	B4-Top	NC	NC	NC	NC



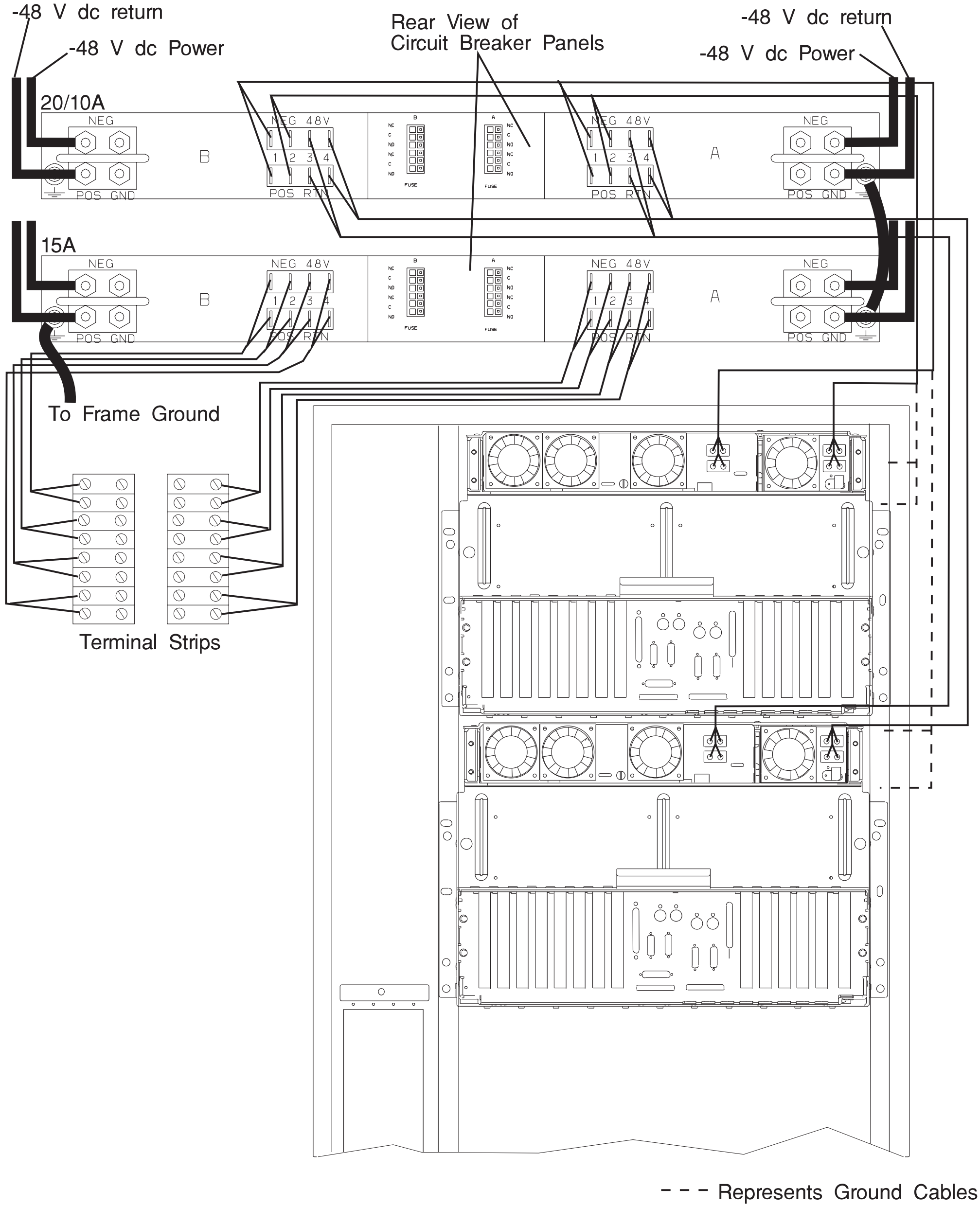
Input/output Rack Cabling

The following figure is a diagram of the power cabling for the Input/output Rack and the I/O Drawer.



Input/output Rack Cabling -48 V dc

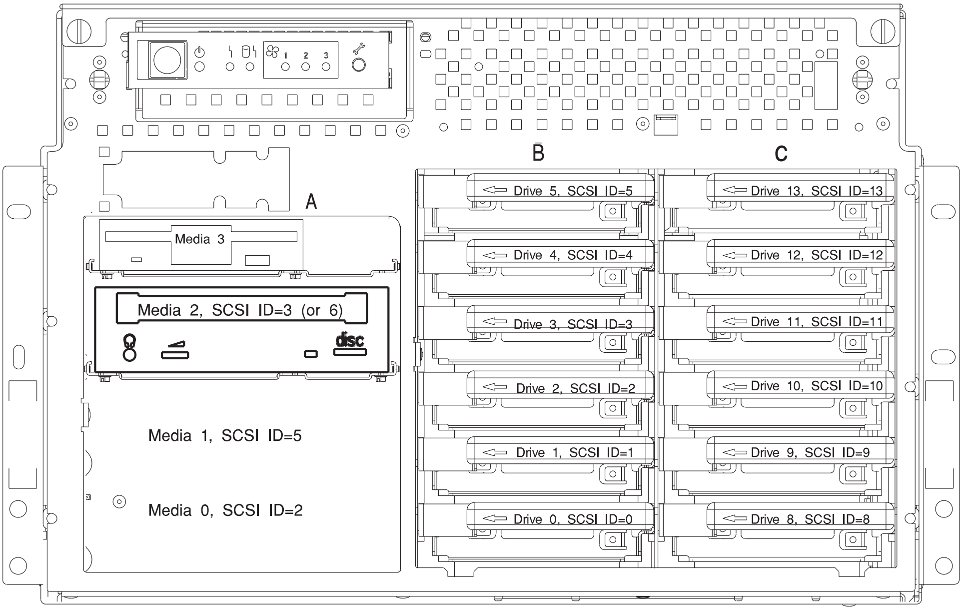
The following figure shows power cabling for a Input/output Rack with -48 V dc power. Power distribution from the 1/4 and 3/4 power supplies to the components in the I/O Drawer is the same for the AC powered I/O Drawer as well as the -48 V dc I/O Drawer.



SCSI IDs and Bay Locations

The figure below shows the SCSI IDs for media and disk drives. The SCSI IDs for media devices installed in bank A at the factory are set using jumpers on the drives when they are installed. The IDs are set as shown in the figure below.

The SCSI IDs for the hot-swap disk drives installed in banks B and C are set when the drive is installed. There are no SCSI jumpers to set, the ID is controlled by the position in which the drive is installed.



Note: The SCSI IDs shown for Media Bay A indicate how installed devices will be set when shipped from the factory.

Logical and Physical Locations

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

Physical Location Codes

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

Location Code Format

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

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

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

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

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

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

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

AIX Location Codes

The basic formats of the AIX location codes are:

- For non-SCSI devices/drives

  AB-CD-EF-GH

- For SCSI devices/drives

  AB-CD-EF-G,H

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

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

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

Adapters and cards are identified with just AB-CD.

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

For pluggable PCI adapters/cards, CD is the device's devfunc number (PCI device number times 8, plus the function number). The C and D are characters in the range of 0-9, and A-F (hex numbers). This allows the location code to uniquely identify multiple adapters on individual PCI cards.

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

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

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

- For all other devices GH is equal to 00.

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

For SCSI the location code is defined as:

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

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

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

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

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

Examples of physical location codes and AIX location codes are:

PCI adapter in drawer 0, Slot 1
Location Code U0.1-P1-I1
AIX location Code 20-58

PCI adapter in drawer 3, Slot 1
Location Code U0.4-P1-I1
AIX location Code E0-58

AIX and Physical Location Code Reference Tables

The following tables contain location codes that are used to identify functional units in the S70 system. Each table below shows the locations for a physical part the system.

System Rack

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
System Rack					
System Rack Drawer		U1	00-00		
System Back-plane		U1.1-P1	00-00		
Memory Con-troller		U1.1-P1	00-00	On System Backplane	
Interrupt Con-troller		U1.1-P1	00-00	On System Backplane	
R1 Memory Card Quad A, Front	M01	U1.1-P1-M1	00-00	System Back-plane	
R1 Memory Card Quad A, Front	M02	U1.1-P1-M2	00-00	System Back-plane	
R1 Memory Card Quad B, Front	M03	U1.1-P1-M3	00-00	System Back-plane	
R1 Memory Card Quad B, Front	M04	U1.1-P1-M4	00-00	System Back-plane	
R1 Memory Card Quad C, Front	M05	U1.1-P1-M5	00-00	System Back-plane	
R1 Memory Card Quad C, Front	M06	U1.1-P1-M6	00-00	System Back-plane	
System Clock Card Front	M07	U1.1-P1-X1	00-00	System Back-plane	
RIO Port 4 Con-nector		U1.1-P1-X1/Q1		System Clock Card	
RIO Port 5 Con-nector		U1.1-P1-X1/Q2		System Clock Card	
RIO Port 6 Con-nector		U1.1-P1-X1/Q3		System Clock Card	
RIO Port 7 Con-nector		U1.1-P1-X1/Q4		System Clock Card	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
Processor Card 0 Type 1, Front	M08	U1.1-P1-C1		System Back-plane	
Processor Card 0 All Cache		U1.1-P1-C1	00-00	On Processor Card 0	
Processor Card 0 Processor 0		U1.1-P1-C1	00-00	On Processor Card 0	
Processor Card 0 Processor 1		U1.1-P1-C1	00-01	On Processor Card 0	
Processor Card 0 Processor 2		U1.1-P1-C1	00-02	On Processor Card 0	
Processor Card 0 Processor 3		U1.1-P1-C1	00-03	On Processor Card 0	
Processor Card 1 Type 2, Front	M09	U1.1-P1-C2		System Back-plane	
Processor Card 1 All Cache		U1.1-P1-C2	00-00	On Processor Card 1	
Processor Card 1 Processor 4		U1.1-P1-C2	00-04	On Processor Card 1	
Processor Card 1 Processor 5		U1.1-P1-C2	00-05	On Processor Card 1	
Processor Card 1 Processor 6		U1.1-P1-C2	00-06	On Processor Card 1	
Processor Card 1 Processor 7		U1.1-P1-C2	00-07	On Processor Card 1	
R1 Memory Card Quad C, Front	M10	U1.1-P1-M7	00-00	System Back-plane	
R1 Memory Card Quad C, Front	M11	U1.1-P1-M8	00-00	System Back-plane	
R1 Memory Card Quad B, Front	M12	U1.1-P1-M9	00-00	System Back-plane	
R1 Memory Card Quad B, Front	M13	U1.1-P1-M10	00-00	System Back-plane	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
R1 Memory Card Quad A, Front	M14	U1.1-P1-M11	00-00	System Back-plane	
R1 Memory Card Quad A, Front	M15	U1.1-P1-M12	00-00	System Back-plane	
Op Panel Front		U1.1-P1-L1		System Back-plane via card	
JTAG Port Rear		U1.1-P1-Q8		System Back-plane via card	
R1 Memory Card Quad D, Rear	M16	U1.1-P1-M13	00-00	System Back-plane	
R1 Memory Card Quad D, Rear	M17	U1.1-P1-M14	00-00	System Back-plane	
R1 Memory Card Quad E, Rear	M18	U1.1-P1-M15	00-00	System Back-plane	
R1 Memory Card Quad E, Rear	M19	U1.1-P1-M16	00-00	System Back-plane	
DIMM Based Memory Card, Quad E Left Hand, Rear	M18	U1.1-P1-M15	00-00	System Back-plane	
DIMM 1	M18-J1L	U1.1-P1-M15.1	00-00	DIMM Memory Card	
DIMM 2	M18-J1R	U1.1-P1-M15.2	00-00	DIMM Memory Card	
DIMM 3	M18-J3L	U1.1-P1-M15.3	00-00	DIMM Memory Card	
DIMM 4	M18-J3R	U1.1-P1-M15.4	00-00	DIMM Memory Card	
DIMM 5	M18-J5L	U1.1-P1-M15.5	00-00	DIMM Memory Card	
DIMM 6	M18-J5R	U1.1-P1-M15.6	00-00	DIMM Memory Card	
DIMM 7	M18-J7L	U1.1-P1-M15.7	00-00	DIMM Memory Card	
DIMM 8	M18-J7R	U1.1-P1-M15.8	00-00	DIMM Memory Card	
DIMM 9	M18-J2L	U1.1-P1-M15.9	00-00	DIMM Memory Card	
DIMM 10	M18-J2R	U1.1-P1-M15.10	00-00	DIMM Memory Card	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
DIMM 11	M18-J4L	U1.1-P1-M15.11	00-00	DIMM Memory Card	
DIMM 12	M18-J4R	U1.1-P1-M15.12	00-00	DIMM Memory Card	
DIMM 13	M18-J6L	U1.1-P1-M15.13	00-00	DIMM Memory Card	
DIMM 14	M18-J6R	U1.1-P1-M15.14	00-00	DIMM Memory Card	
DIMM 15	M18-J8L	U1.1-P1-M15.15	00-00	DIMM Memory Card	
DIMM 16	M18-J8R	U1.1-P1-M15.16	00-00	DIMM Memory Card	
DIMM Based Memory Card Quad E Right Hand	M19	U1.1-P1-M16	00-00	System Back-plane	
DIMM 1	M19-J1L	U1.1-P1-M16.1	00-00	DIMM Memory Card	
DIMM 2	M19-J1R	U1.1-P1-M16.2	00-00	DIMM Memory Card	
DIMM 3	M19-J3L	U1.1-P1-M16.3	00-00	DIMM Memory Card	
DIMM 4	M19-J3R	U1.1-P1-M16.4	00-00	DIMM Memory Card	
DIMM 5	M19-J5L	U1.1-P1-M16.5	00-00	DIMM Memory Card	
DIMM 6	M19-J5R	U1.1-P1-M16.6	00-00	DIMM Memory Card	
DIMM 7	M19-J7L	U1.1-P1-M16.7	00-00	DIMM Memory Card	
DIMM 8	M19-J7R	U1.1-P1-M16.8	00-00	DIMM Memory Card	
DIMM 9	M19-J2L	U1.1-P1-M16.9	00-00	DIMM Memory Card	
DIMM 10	M19-J2R	U1.1-P1-M16.10	00-00	DIMM Memory Card	
DIMM 11	M19-J4L	U1.1-P1-M16.11	00-00	DIMM Memory Card	
DIMM 12	M19-J4R	U1.1-P1-M16.12	00-00	DIMM Memory Card	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
DIMM 13	M19-J6L	U1.1-P1-M16.13	00-00	DIMM Memory Card	
DIMM 14	M19-J6R	U1.1-P1-M16.14	00-00	DIMM Memory Card	
DIMM 15	M19-J8L	U1.1-P1-M16.15	00-00	DIMM Memory Card	
DIMM 16	M19-J8R	U1.1-P1-M16.16	00-00	DIMM Memory Card	
Processor Card 2 Type 1, Rear		U1.1-P1-C3		System Back-plane	
Processor Card 2 All Cache		U1.1-P1-C3	00-00	On Processor Card 2	
Processor Card 2 Processor 8		U1.1-P1-C3	00-08	On Processor Card 2	
Processor Card 2 Processor 9		U1.1-P1-C3	00-09	On Processor Card 2	
Processor Card 2 Processor 10		U1.1-P1-C3	00-10	On Processor Card 2	
Processor Card 2 Processor 11		U1.1-P1-C3	00-11	On Processor Card 2	
DIMM Based Memory Card, Quad E Left Hand	M21	U1.1-P1-M17		System Back-plane	
DIMM 1	M21-J1L	U1.1-P1-M17.1	00-00	DIMM Memory Card	
DIMM 2	M21-J1R	U1.1-P1-M17.2	00-00	DIMM Memory Card	
DIMM 3	M21-J3L	U1.1-P1-M17.3	00-00	DIMM Memory Card	
DIMM 4	M21-J3R	U1.1-P1-M17.4	00-00	DIMM Memory Card	
DIMM 5	M21-J5L	U1.1-P1-M17.5	00-00	DIMM Memory Card	
DIMM 6	M21-J5R	U1.1-P1-M17.6	00-00	DIMM Memory Card	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
DIMM 7	M21-J7L	U1.1-P1-M17.7	00-00	DIMM Memory Card	
DIMM 8	M21-J7R	U1.1-P1-M17.8	00-00	DIMM Memory Card	
DIMM 9	M21-J2L	U1.1-P1-M17.9	00-00	DIMM Memory Card	
DIMM 10	M21-J2R	U1.1-P1-M17.10	00-00	DIMM Memory Card	
DIMM 11	M21-J4L	U1.1-P1-M17.11	00-00	DIMM Memory Card	
DIMM 12	M21-J4R	U1.1-P1-M17.12	00-00	DIMM Memory Card	
DIMM 13	M21-J6L	U1.1-P1-M17.13	00-00	DIMM Memory Card	
DIMM 14	M21-J6R	U1.1-P1-M17.14	00-00	DIMM Memory Card	
DIMM 15	M21-J8L	U1.1-P1-M17.15	00-00	DIMM Memory Card	
DIMM 16	M21-J8R	U1.1-P1-M17.16	00-00	DIMM Memory Card	
DIMM Based Memory Card, Quad E Right Hand	M22	U1.1-P1-M18	00-00	System Back-plane	
DIMM 1	M22-J1L	U1.1-P1-M18.1	00-00	DIMM Memory Card	
DIMM 2	M22-J1R	U1.1-P1-M18.2	00-00	DIMM Memory Card	
DIMM 3	M22-J3L	U1.1-P1-M18.3	00-00	DIMM Memory Card	
DIMM 4	M22-J3R	U1.1-P1-M18.4	00-00	DIMM Memory Card	
DIMM 5	M22-J5L	U1.1-P1-M18.5	00-00	DIMM Memory Card	
DIMM 6	M22-J5R	U1.1-P1-M18.6	00-00	DIMM Memory Card	
DIMM 7	M22-J7L	U1.1-P1-M18.7	00-00	DIMM Memory Card	
DIMM 8	M22-J7R	U1.1-P1-M18.8	00-00	DIMM Memory Card	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
DIMM 9	M22-J2L	U1.1-P1-M18.9	00-00	DIMM Memory Card	
DIMM 10	M22-J2R	U1.1-P1-M18.10	00-00	DIMM Memory Card	
DIMM 11	M22-J4L	U1.1-P1-M18.11	00-00	DIMM Memory Card	
DIMM 12	M22-J4R	U1.1-P1-M18.12	00-00	DIMM Memory Card	
DIMM 13	M22-J6L	U1.1-P1-M18.13	00-00	DIMM Memory Card	
DIMM 14	M22-J6R	U1.1-P1-M18.14	00-00	DIMM Memory Card	
DIMM 15	M22-J8L	U1.1-P1-M18.15	00-00	DIMM Memory Card	
DIMM 16	M22-J8R	U1.1-P1-M18.16	00-00	DIMM Memory Card	
R1 Memory Card Quad E, Rear	M21	U1.1-P1-M17	00-00	System Back-plane	
R1 Memory Card Quad E, Rear	M22	U1.1-P1-M18	00-00	System Back-plane	
R1 Memory Card Quad D, Rear	M23	U1.1-P1-M19	00-00	System Back-plane	
R1 Memory Card Quad D, Rear	M24	U1.1-P1-M20	00-00	System Back-plane	
ISO RIO Extender Card R (Extender)		U1.1-P1.1		System Back-plane	
RIO Port 0 Rear Connector		U1.1-P1.1/Q1		RIO Extender Card	
RIO Port 1 Rear Connector		U1.1-P1.1/Q2		RIO Extender Card	
RIO Port 2 Rear Connector		U1.1-P1.1/Q3		RIO Extender Card	
RIO Port 3 Rear Connector		U1.1-P1.1/Q4		RIO Extender Card	
Power Back-plane Board		U1.1-P2			
Regulator Card Front	R01	U1.1-P2-V1		Power Back-plane	
Regulator Card Front	R02	U1.1-P2-V2		Power Back-plane	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
Regulator Card Front	R03	U1.1-P2-V3		Power Back-plane	
Regulator Card Front	R04	U1.1-P2-V4		Power Back-plane	
Regulator Card Front	R05	U1.1-P2-V5		Power Back-plane	
Regulator Card Front	R06	U1.1-P2-V6		Power Back-plane	
Regulator Card Front	R07	U1.1-P2-V7		Power Back-plane	
Filler Card	R08			Power Back-plane	
Regulator Card Front	R09	U1.1-P2-V8		Power Back-plane	
Regulator Card Front	R10	U1.1-P2-V9		Power Back-plane	
Regulator Card Rear	R11	U1.1-P2-V10		Power Back-plane	
Regulator Card Rear	R12	U1.1-P2-V11		Power Back-plane	
Filler Card	R13 and R14			Power Back-plane	
Regulator Card Rear	R15	U1.1-P2-V12		Power Back-plane	
Regulator Card Rear	R16	U1.1-P2-V13		Power Back-plane	
Regulator Card Mem CTRL Rear	R17	U1.1-P2-V14		Power Back-plane	
Regulator Card Mem CTRL Rear	R18	U1.1-P2-V15		Power Back-plane	
Regulator Card Rear	R19	U1.1-P2-V16		Power Back-plane	
Regulator Card Rear	R20	U1.1-P2-V17		Power Back-plane	
SPCN Card Rear	R21	U1.1-P2-X1		Power Back-plane	
Blower 1 Sense 1		U1.1-P2-X1/F1		On SPCN Card	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
Blower 2 Sense 2		U1.1-P2-X1/F2		On SPCN Card	
Blower 3 Sense 3		U1.1-P2-X1/F3		On SPCN Card	
Blower 4 Sense 4		U1.1-P2-X1/F4		On SPCN Card	
Blower 1 Front		U1.2-F1		Power Harness, J18	
Blower 2 Front		U1.2-F2		Power Harness, J19	
Blower 3 Rear		U1.2-F3		Power Harness, J20	
Blower 4 Rear		U1.2-F4		Power Harness, J21	
Bulk Power 1 Front		U1.2-V2		Power Harness, P1	
Bulk Power 2 Front		U1.2-V3		Power Harness, P2	
Bulk Power 3 Front		U1.2-V4		Power Harness, P3	
Bulk Power 4 Front		U1.2-V5		Power Harness, P4	
Bulk Power 5 Front		U1.2-V6		Power Harness, P5	
Bulk Power 6 Front		U1.2-V7		Power Harness, P6	
AC Power R and 5 v standby AC Box		U1.2-V1		Power Harness, P1, P7, P8, P9	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
I/O Drawer 0 Locations					
I/O Drawer 0 (of 0 to 3)		**U0.1**			
I/O Drawer Planar		U0.1-P1			
RIO Controller 0		U0.1-P1	00-00		
PCI Controller 1		U0.1-P1	00-f850-0000		
PCI slot 1		U0.1-P1-I1	20-58 or 20-58 to 20-5F or 2B-XX	I/O Drawer Planar J13, 64 bit slot	PCI Controller 1
PCI slot 2 SCSI for MEDIA		U0.1-P1-I2	20-60 or 20-60 to 20-67 or 2C-XX	I/O Drawer Planar J4, 32 bit slot	PCI Controller 1
PCI slot 3		U0.1-P1-I3	20-68 or 20-68 to 20-6F or 2D-XX	I/O Drawer Planar J5, 32 bit slot	PCI Controller 1
PCI slot 4		U0.1-P1-I4	20-70 or 20-70 to 20-77 or 2E-XX	I/O Drawer Planar J6, 32 bit slot	PCI Controller 1
PCI Controller 0		U0.1-P1	00-f840-0000		
PCI slot 5		U0.1-P1-I5	10-58 or 10-58 to 10-5F or 1B-XX	I/O Drawer Planar J14, 64 bit slot	PCI Controller 0
PCI slot 6		U0.1-P1-I6	10-60 or 10-60 to 10-67 or 1C-XX	I/O Drawer Planar J7, 32 bit slot	PCI Controller 0
PCI slot 7		U0.1-P1-I7	10-68 or 10-68 to 10-6F or 1D-XX	I/O Drawer Planar J8, 32 bit slot	PCI Controller 0

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
PCI slot 8 Service Processor		U0.1-P1-X1	10-70 or 10-70 to 10-77 or 1E-XX (not used by AIX)	I/O Drawer Planar J9, 32 bit slot	PCI Con-troller 0
TOD		U0.1-P1-X1	Not used by AIX	On Service Processor	
BOOT		U0.1-P1-X1	Not used by AIX	On Service Processor	
JTAG		U0.1-P1-X1	Not used by AIX	On Service Processor	
VDISK		U0.1-P1-X1	Not used by AIX	On Service Processor	
NVRAM		U0.1-P1-X1	Not used by AIX	On Service Processor	
PCI slot 8, Service Processor ISA Bridge		U0.1-P1-X1	10-78 or 10-78 to 10-7f or 1F-XX (not used by AIX)	I/O Drawer Planar J9, 32 bit slot	PCI Con-troller 0
PCI slot 8 Real Time Clock (RTC)		U0.1-P1-X1	Not used by AIX	On Service Processor	I/O ASIC SIO
PCI slot 8 Timer		U0.1-P1-X1	Not used by AIX	On Service Processor	I/O ASIC SIO
Interrupt Con-troller		U0.1-P1-X1	Not used by AIX	On Service Processor	I/O ASIC
DMA Controller		U0.1-P1-X1	Not used by AIX	On Service Processor	I/O ASIC
Diskette Con-troller		U0.1-P1-X1/D1	01-D1	On Service Processor	
Diskette Drive		U0.1-P1-X1/D1	01-D1-00-00	On Service Processor	
Keyboard Mouse Controller		U0.1-P1-X1/K1	01-K1	On Service Processor	
Keyboard		U0.1-P1-X1-K1	01-K1-00-00	On Service Processor	
Mouse Controller		U0.1-P1-X1/K1	01-K1-01	On Service Processor	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
Mouse		U0.1-P1-X1-O1	01-K1-01-00	On Service Processor	
Parallel Port		U0.1-P1-X1/R1	01-R1	On Service Processor	
Serial Port 1		U0.1-P1-X1/S1	01-S1	On Service Processor	
Serial Port 2		U0.1-P1-X1/S2	01-S2	On Service Processor	
System Rack Operator Panel Cable				Service Processor J17	
PCI Controller 3		U0.1-P1	00-f870-0000		
PCI Slot 9 SCSI for disk drive banks B and C		U0.1-P1-I9	40-58 or 40-58 to 40-5f or 4B-XX	I/O Drawer Planar J15, 64 Bit slot	PCI Controller 3
PCI Slot 10		U0.1-P1-I10	40-60 or 40-60 to 40-67 or 4C-XX	I/O Drawer Planar J16, 64 Bit slot	PCI Controller 3
PCI Controller 2		U0.1-P1	00-f860-0000		
PCI Slot 11		U0.1-P1-I11	30-58 or 30-58 to 30-5f or 3B-XX	I/O Drawer Planar J10, 32 Bit slot	PCI Controller 2
PCI Slot 12		U0.1-P1-I12	30-60 or 30-60 to 30-67 or 3C-XX	I/O Drawer Planar J11, 32 Bit slot	PCI Controller 2
PCI Slot 13		U0.1-P1-I13	30-68 or 30-68 to 30-6f or 3D-XX	I/O Drawer Planar J12, 32 Bit slot	PCI Controller 2
PCI Slot 14		U0.1-P1-I14	30-70 or 30-70 to 30-77 or 3E-XX	I/O Drawer Planar J17, 64 Bit slot	PCI Controller 2
Local ASIC Control Chip		U0.1-P1	30-78		
Local ASIC Control Chip		U0.1-P1	30-79		
RIO 0 Connector		U0.1-P1/Q1		I/O Drawer planar, J1	System Rack

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
RIO 1 Connector		U0.1-P1/Q2		I/O Drawer planar J2	System Rack
Speaker		U0.1-P1-X1-Q1		Service Processor J3	
3/4 Power Supply		U0.1-V2		Power cable P101-P108	
1/4 Power Supply		U0.1-V1		Power cable P201, P208	
I/O Drawer Indicator Panel Card (COP)		U0.1-L1		I/O Drawer Planar, J22	Cable to I/O Drawer Planar
I/O Drawer Fans (3)		U0.1-L1-F1		I/O Drawer indicator panel card, J2	
SE/SE SCSI Redrive Card		U0.1-P2		Redrive card connector J1 to power cable	
Interface (Bulkhead) Card		U0.1-P1-Q3		I/O Drawer Planar, J3	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
I/O Drawer 1 Locations					
I/O Drawer 1 (of 0 to 3)		**U0.2**			
I/O Drawer Planar		U0.2-P1			
RIO Controller 1		U0.2-P1	00-00		
PCI Controller 5		U0.2-P1	00-f8D0-0000		
PCI slot 1		U0.2-P1-I1	60-58 or 60-58 to 60-5F or 6B-XX	I/O Drawer Planar J13, 64 bit slot	PCI Controller 5
PCI slot 2 SCSI for MEDIA		U0.2-P1-I2	60-60 or 60-60 to 60-67 or 6C-XX	I/O Drawer Planar J4, 32 bit slot	PCI Controller 5
PCI slot 3		U0.2-P1-I3	60-68 or 60-68 to 60-6F or 6D-XX	I/O Drawer Planar J5, 32 bit slot	PCI Controller 5
PCI slot 4		U0.2-P1-I4	60-70 or 60-70 to 60-7f or 6E-XX	I/O Drawer Planar J6, 32 bit slot	PCI Controller 5
PCI Controller 4		U0.2-P1	00-f8C0-0000		
PCI slot 5		U0.2-P1-I5	50-58 or 50-58 to 50-5F or 5B-XX	I/O Drawer Planar J14, 64 bit slot	PCI Controller 4
PCI slot 6		U0.2-P1-I6	50-60 or 50-60 to 50-67 or 5C-XX	I/O Drawer Planar J7, 32 bit slot	PCI Controller 4
PCI slot 7		U0.2-P1-I7	50-68 or 50-68 to 50-6f or 5D-XX	I/O Drawer Planar J8, 32 bit slot	PCI Controller 4
PCI slot 8		U0.2-P1-I8	50-70 or 50-70 to 50-77 or 5E-XX	I/O Drawer Planar J9, 32 bit slot	PCI Controller 4

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
PCI Controller 7		U0.2-P1	00-f8f0-0000		
PCI Slot 9 SCSI for disk drive banks B and C		U0.2-P1-I9	80-58 or 80-58 to 80-5f or 8B-XX	I/O Drawer Planar J15, 64 Bit slot	PCI Controller 7
PCI Slot 10		U0.2-P1-I10	80-60 or 80-60 to 80-67 or 8C-XX	I/O Drawer Planar J16, 64 Bit slot	PCI Controller 7
PCI Controller 6		U0.2-P1	00-f8e0-0000		
PCI Slot 11		U0.2-P1-I11	70-60 or 70-58 to 70-5f or 7B-XX	I/O Drawer Planar J10, 32 Bit slot	PCI Controller 6
PCI Slot 12		U0.2-P1-I12	70-60 or 70-60 to 70-77 or 7C-XX	I/O Drawer Planar J11, 32 Bit slot	PCI Controller 6
PCI Slot 13		U0.2-P1-I13	70-68 or 70-68 to 70-6f or 7D-XX	I/O Drawer Planar J12, 32 Bit slot	PCI Controller 6
PCI Slot 14		U0.1-P1-I14	70-70 or 70-70 to 70-77 or 7E-XX	I/O Drawer Planar J17, 64 Bit slot	PCI Controller 6
Local ASIC control chip		U0.2-P1	70-78		
Local ASIC control chip		U0.2-P1	70-79		
RIO 0 Connector		U0.2-P1/Q1		I/O Drawer Planar, J1	
RIO 1 Connector		U0.2-P1/Q2		I/O Drawer Planar, J2	
3/4 Power Supply		U0.2-V2		Power cable P101-P108	
1/4 Power Supply		U0.2-V1		Power cable P201, P208	
I/O Drawer Indicator Panel Card (COP)		U0.2-L1		I/O Drawer Planar, J22	Cable to I/O Drawer Planar

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
I/O Drawer Fans (3)		U0.2-L1-F1		I/O Drawer indicator panel card, J2	
SE/SE SCSI Redrive Card		U0.2-P2		Redrive card connector J1 to power cable	
Interface (Bulkhead) Card		U0.2-P1-Q3		I/O Drawer Planar, J3	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
I/O Drawer 2 Locations					
I/O Drawer 2 (of 0 to 3)		**U0.3**			
I/O Drawer Planar		U0.3-P1			
RIO Controller 2		U0.3-P1	00-00		
PCI Controller 9		U0.3-P1	00-f950-0000		
PCI slot 1		U0.3-P1-I1	A0-58 or A0-58 to A0-5F or AB-XX	I/O Drawer Planar J13, 64 bit slot	PCI Controller 9
PCI slot 2 SCSI for MEDIA		U0.3-P1-I2	A0-60 or A0-60 to A0-67 or AC-XX	I/O Drawer Planar J4, 32 bit slot	PCI Controller 9
PCI slot 3		U0.3-P1-I3	A0-68 or A0-68 to A0-6f or AD-XX	I/O Drawer Planar J5, 32 bit slot	PCI Controller 9
PCI slot 4		U0.3-P1-I4	A0-70 or A0-70 to A0-77 or AE-XX	I/O Drawer Planar J6, 32 bit slot	PCI Controller 9
PCI Controller 8		U0.3-P1	00-f940-0000		
PCI slot 5		U0.3-P1-I5	90-58 or 90-58 to 90-5F or 9B-XX	I/O Drawer Planar J14, 64 bit slot	PCI Controller 8
PCI slot 6		U0.3-P1-I6	90-60 or 90-60 to 90-67 or 9C-XX	I/O Drawer Planar J7, 32 bit slot	PCI Controller 8
PCI slot 7		U0.3-P1-I7	90-68 or 90-68 to 90-6f or 9D-XX	I/O Drawer Planar J8, 32 bit slot	PCI Controller 8
PCI slot 8		U0.3-P1-I8	90-70 or 90-70 to 90-77 or 9E-XX	I/O Drawer Planar J9, 32 bit slot	PCI Controller 8

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
PCI Controller 11		U0.3-P1	00-f970-0000		
PCI Slot 9 SCSI for disk drive banks B and C		U0.3-P1-I9	C0-58 or C0-58 to C0-5f or CB-XX	I/O Drawer Planar J15, 64 Bit slot	PCI Controller 9
PCI Slot 10		U0.3-P1-I10	C0-60 or C0-60 to C0-67 or CC-XX	I/O Drawer Planar J16, 64 Bit slot	PCI Controller 9
PCI Controller 10		U0.3-P1	00-f960-0000		
PCI Slot 11		U0.3-P1-I11	B0-58 or B0-58 to B0-5f or BB-XX	I/O Drawer Planar J10, 32 Bit slot	PCI Controller 10
PCI Slot 12		U0.3-P1-I12	B0-60 or B0-60 to B0-67 or BC-XX	I/O Drawer Planar J11, 32 Bit slot	PCI Controller 10
PCI Slot 13		U0.3-P1-I13	B0-68 or B0-68 to B0-6f or BD-XX	I/O Drawer Planar J12, 32 Bit slot	PCI Controller 10
PCI Slot 14		U0.3-P1-I14	B0-70 or B0-70 to B0-77 or BE-XX	I/O Drawer Planar J17, 64 Bit slot	PCI Controller 10
Local ASIC Control Chip		U0.3-P1	B0-78		
Local ASIC Control Chip		U0.3-P1	B0-79		
RIO 0 Connector		U0.3-P1/Q1		I/O Drawer Planar, J1	
RIO 1 Connector		U0.3-P1/Q2		I/O Drawer Planar, J2	
3/4 Power Supply		U0.3-V2		Power Cable P101-P108	
1/4 Power Supply		U0.3-V1		Power Cable P201, P208	
I/O Drawer Indicator Panel Card (COP)		U0.3-L1		I/O Drawer Planar, J22	Cable to I/O Drawer Planar

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
I/O Drawer Fans (3)		U0.3-L1-F1		I/O Drawer indicator panel card, J2	
SE/SE SCSI Redrive Card		U0.3-P2		Redrive card connector J1 to power cable	
Interface (Bulkhead) Card		U0.3-P1-Q3		I/O Drawer Planar, J3	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
I/O Drawer 3 Locations					
I/O Drawer 3 (of 0 to 3)		**U0.4**			
I/O Drawer Planar		U0.4-P1			
RIO Controller 3		U0.4-P1	00-00		
PCI Controller 13		U0.4-P1	00-f9D0-0000		
PCI slot 1		U0.4-P1-I1	E0-58 or E0-58 to E0-5F or EB-XX	I/O Drawer Planar J13, 64 bit slot	PCI Controller 13
PCI slot 2 SCSI for MEDIA		U0.4-P1-I2	E0-60 or E0-60 to E0-67 or EC-XX	I/O Drawer Planar J4, 32 bit slot	PCI Controller 13
PCI slot 3		U0.4-P1-I3	E0-68 or E0-68 to E0-6f or ED-XX	I/O Drawer Planar J5, 32 bit slot	PCI Controller 13
PCI slot 4		U0.4-P1-I4	E0-70 or E0-70 to E0-77 or EE-XX	I/O Drawer Planar J6, 32 bit slot	PCI Controller 13
PCI Controller 12		U0.4-P1	00-f9c0-0000		
PCI slot 5		U0.4-P1-I5	D0-58 or D0-58 to D0-5f or DB-XX	I/O Drawer Planar J14, 64 bit slot	PCI Controller 12
PCI slot 6		U0.4-P1-I6	D0-60 or D0-60 to D0-67 or DC-XX	I/O Drawer Planar J7, 32 bit	PCI Controller 12
PCI slot 7		U0.4-P1-I7	D0-68 or D0-68 to D0-6f or DD-XX	I/O Drawer Planar J8, 32 bit	PCI Controller 12
PCI slot 8		U0.4-P1-I8	D0-70 or D0-70 to D0-77 or DE-XX	I/O Drawer Planar J9, 32 bit	PCI Controller 12

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
PCI Controller 15		U0.4-P1	00-f9f0-0000		
PCI Slot 9 SCSI for disk drive banks B and C		U0.4-P1-I9	G0-58 or G0-58 to G0-5f or GB-XX	I/O Drawer Planar J15, 64 Bit	PCI Controller 15
PCI Slot 10		U0.4-P1-I10	G0-60 or G0-60 to G0-67 or GC-XX	I/O Drawer Planar J16, 64 Bit	PCI Controller 15
PCI Slot 11		U0.4-P1-I11	F0-58 or F0-58 to F0-5f or FB-XX	I/O Drawer Planar J10, 32 Bit	PCI Controller 14
PCI Slot 12		U0.4-P1-I12	F0-60 or F0-60 to F0-67 or FC-XX	I/O Drawer Planar J11, 32 Bit	PCI Controller 14
PCI Slot 13		U0.4-P1-I13	F0-68 or F0-68 to F0-6f or FD-XX	I/O Drawer Planar J12, 32 Bit	PCI Controller 14
PCI Slot 14		U0.4-P1-I14	F0-70 or F0-70 to F0-77 or FE-XX	I/O Drawer Planar J17, 64 Bit	PCI Controller 14
Local ASIC control chip		U0.4-P1	F0-78		PCI Controller 14
Local ASIC control chip		U0.4-P1	F0-79		PCI Controller 14
RIO 0 Connector		U0.4-P1/Q1		I/O Drawer Planar J1	
RIO 1 Connector		U0.4-P1/Q2		I/O Drawer Planar J2	
3/4 Power Supply		U0.4-V2		Power Cable P101-P108	
1/4 Power Supply		U0.4-V1		Power Cable P201, P208	
I/O Drawer Operator Panel Card (COP)		U0.4-L1		I/O Drawer Planar, J22	Cable to I/O Drawer Planar
I/O Drawer Fans (3)		U0.4-L1-F1		I/O Drawer indicator panel card, J2	

FRU Name	Slot Name	Location Code	AIX Location Code	Physical Connection	Logical Connection
SE/SE SCSI Redrive Card		U0.4-P2		Redrive card connector J1 to power cable	
Interface (Bulkhead) Card		U0.4-P1-Q3		I/O Drawer Planar, J3	

Specifications

This section contains specifications for the S70.

S70 System Rack

The mechanical packaging, cooling, power supply, and environmental requirements for the System Rack are shown in the following table:

Dimensions				
Height			1577 mm	62.0 in.
Width			567 mm	22.3 in.
Depth			1041 mm	40.9 in.
Weight				
Minimum (Configuration dependant)			400 kg	880 lbs.
Electrical				
Power source loading (maximum in kVA)			1.887KVA	
Voltage range (V ac)			200 to 240	
Frequency (hertz)			50 - 60	
Voltage range (V dc)			-40 to -60	
Thermal output (Maximum)			5796 BTU/hr	
Power requirements (Maximum)			1698 watts	
Power factor			0.9	
Inrush current[3]			102 amps	
Maximum altitude			2135 m (7000 ft.)	
		Operating		**Non-Operating**
Temperature Range[4]		10 to 37.8°C (50 to 100°F)		1 to 60°C (34 to 140°F)
		Operating		**Non-Operating**
Humidity (Noncondensing)		8 to 80%		8 to 80%
Wet Bulb Requirements[5]		23°C (73°F)		23°C (73°F)
Noise Emissions[1,2]		**Operating**		**Idle**
L_{WAd}		7.0 bels		7.0 bels
L_{pAm}		N/A		N/A
$<L_{pA}>_m$		N/A		N/A
Impulsive or prominent discrete tones		No		No
Clearances	**Front**	**Back**	**Left**	**Right**
Install/Air Flow	Maintenance of a proper service clearance should allow proper air flow.			
Service[6]	915mm(36 in)	915mm(36 in)	915mm(36 in)	915mm(36 in)

1. See “Noise Emission Notes” on page 1-75 for definitions of noise emissions positions.
2. Noise emissions data for S70 System is based on a system with the doors closed.
3. Inrush currents occur only at initial application of power, no inrush occurs during normal power off-on cycle.
4. The upper limit of the dry bulb temperature must be derated 1 degree C per 137M (450 ft.) above 1295M (4250 ft.)
5. The upper limit of the wet bulb temperature must be derated 1 degree C per 274M (882 ft.) elevation above 1370M (4500 ft.)
6. See “System Service Clearances” on page 1-74.

S70 Input/output Rack

Dimensions				
Height			1577 mm	62.0 in.
Width			650 mm	25.5 in.
Depth			1019 mm	40.1 in.
Weight[1] (Base Rack)			159 kg	349 lbs.
Electrical		(see specifications for drawers or enclosures)		
Temperature Range		(see specifications for drawers or enclosures)		
Humidity Requirements		(see specifications for drawers or enclosures)		
Noise Emissions		(see specifications for drawers or enclosures)		
Clearances	**Front**	**Back**	**Left**	**Right**
Install/Air Flow	Maintenance of a proper service clearance should allow proper air flow.			
Service[2]	915mm(36 in)	915mm(36 in)	915mm(36 in)	915mm(36 in)

1. Configuration dependent, base weight plus weight of drawers.
2. See “System Service Clearances” on page 1-74.

S70 I/O Drawer

Dimensions		
Height	306.2 mm	12.1 in.
Width	442.4 mm	17.4 in.
Depth	748.2 mm	29.5 in.
Weight		
Minimum configuration	43 kg	95 lbs.
Maximum configuration	61 kg	135 lbs.

Electrical	**AC**	**DC**
Power source loading typical in kVA	0.4	0.4
Power source loading maximum in kVA	1.0	1.0
Voltage range	200 to 240 V ac	40 to 60 VDC
Frequency (hertz)	50 / 60	N.A
Thermal output (typical)	1228 BTU/hr	1365 BTU/hr
Thermal output (maximum)	3071 BTU/hr	3412 BTU/hr
Power requirements (typical)	360 watts	400 watts
Power requirements (maximum)	900 watts	1000 watts
Power factor	0.9	N/A
Inrush current[3]	120 amps	300 amps
Maximum altitude	2135 m (7000 ft.)	2135 m (7000 ft.)
Temperature Requirements	**Operating**	**Non-Operating**
	10 to 40°C (50 to 104°F)	10 to 52°C (50 to 125.6°F)
Humidity (Noncondensing)	**Operating**	**Non-Operating**
Without tape drive	8 to 80%	8 to 80%
With tape drive	20 to 80%	20 to 80%
Wet Bulb Requirements		
Without tape drive	27°C (80°F)	27°C (80°F)
With tape drive	23°C (73°F)	27°C (80°F)
Noise Emissions[1,2]	**Operating**	**Idle**
L_{WAd}	5.9 bels	5.8 bels
L_{pAm}	NA	NA
$<L_{pA}>_m$	39 dBA	38 dBA
Impulsive or prominent discrete tones	No	No

Clearances	**Front**	**Back**	**Left**	**Right**
Install/Air Flow	Maintenance of a proper service clearance should allow proper air flow.			
Service	(See "System Service Clearances" on page 1-74)			

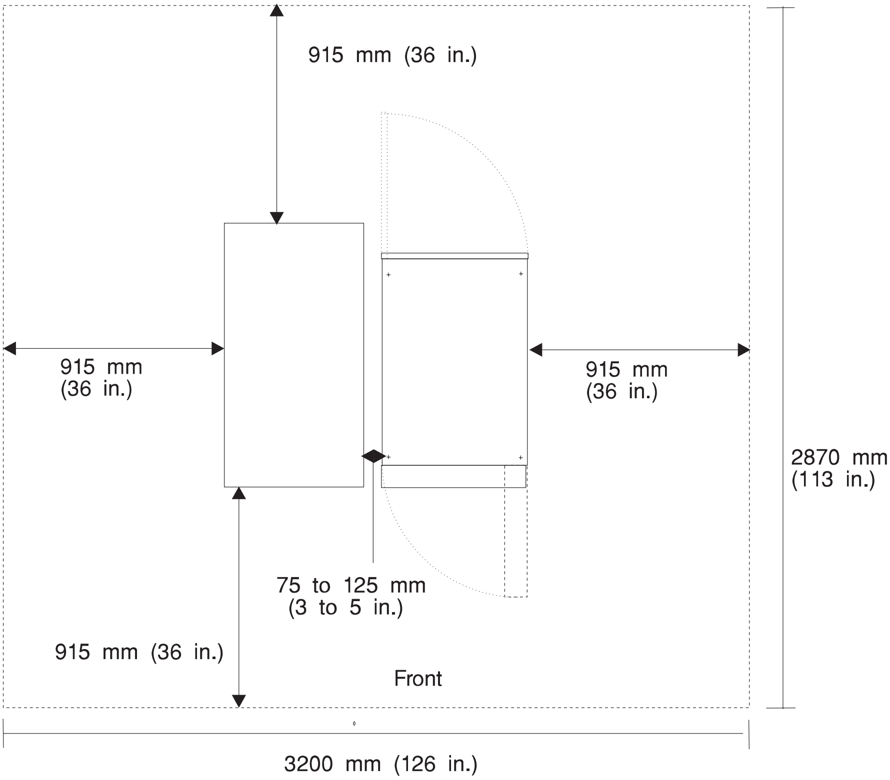
1. See "Noise Emission Notes" on page 1-75 for definitions of noise emissions positions.
2. Noise emissions data for the Model S70 SCSI I/O Drawer are based on the I/O drawer mounted in a rack. See "S70 Input/output Rack" on page 1-72.
3. Inrush currents occur only at initial application of power, no inrush occurs during normal power off-on cycle.

System Service Clearances

The amount of space needed by the units during service is indicated by large box of the footprint.

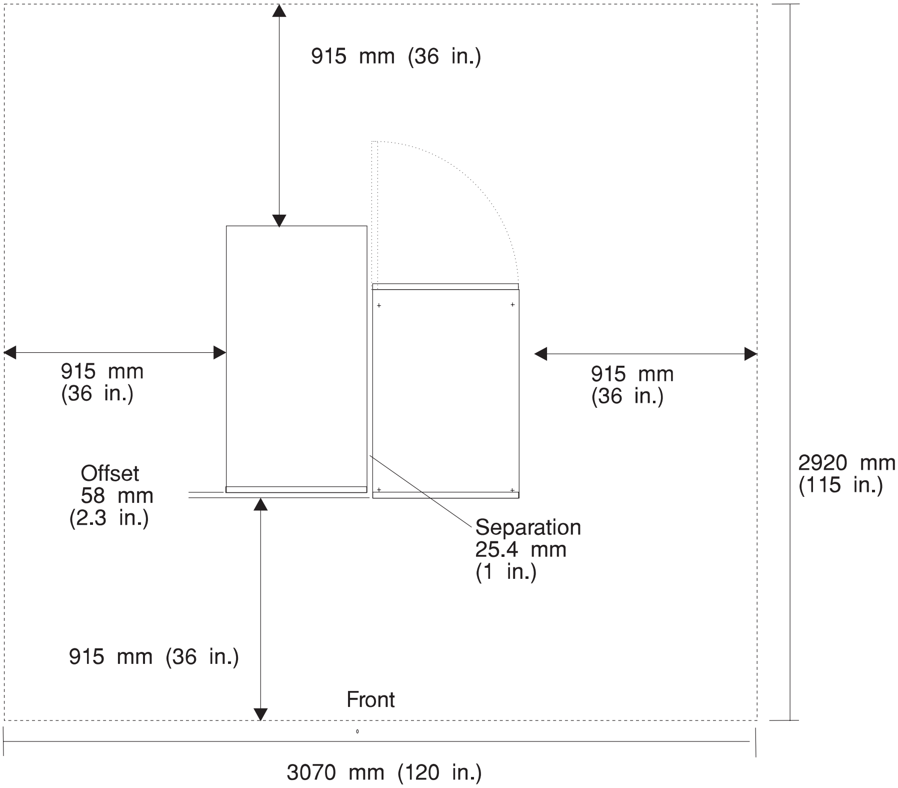
For multiple racks placed side by side, the left and right clearances apply only to the leftmost and rightmost rack.

Rack Configuration (AC Systems)



Note: Rack units are large and heavy and are not easily moved. Because maintenance activities require access at both the front and back, extra room needs to be allowed. The footprint shows the radius of the swinging doors on the I/O rack. The illustrations show the minimum space required.

Rack Configuration (-48 V dc Systems)



Note: Rack units are large and heavy and are not easily moved. Because maintenance activities require access at both the front and back, extra room needs to be allowed. The footprint shows the radius of the swinging doors on the Input/output Rack. The illustrations show the minimum space required.

Noise Emission Notes

1. L_{WAd} is the declared sound power emission level for a production series of machines.
2. L_{pAm} is the mean value of the sound pressure emission levels at the operator position (if any) for a production series of machines.
3. $<L_{pA}>_m$ is the mean value of the space-averaged sound pressure emission levels at the one-meter positions for a production series of machines.
4. N/A = Not Applicable (no operator position).
5. All measurements are made in accordance with ISO DIS 779 and reported in conformance with ISO DIS 7574/4.

External AC Power Cables

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

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

- Electrical cables, type ST
- Attachment plugs complying with National Electrical Manufacturers Association (NEMA) L6-30P
- Appliance couplers complying with International Electrotechnical Commission (IEC) Standard 320, Sheet C13 and C14

Power cables used in other countries consist of the following:

- Electrical cables, Type HD21 or HD22
- Attachment plugs approved by the appropriate testing organization for the specific countries where they are used
- Appliance couplers complying with the International Electrotechnical Commission (IEC) Standard 320, Sheet C13 and C14

Refer to “Power Cords” on page 10-62 for replacement power cable information.

-48 V dc Power Cables

The customer is responsible for providing power cables from the customer's power source to the circuit breaker panel (CBP)

S70 -48 V dc systems must be connected to a -48 V dc supply source which is electrically isolated from its AC power source. In addition, the -48 V dc supply source is to be reliably connected to earth (grounded).

Note: A redundant -48 V dc source may be added. This source must also be electrically isolated from its AC power source and be reliably connect to earth (grounded).

Power cables used in the United States and Canada are listed by Underwriters Laboratories (UL) and certified by the Canadian Standards Association (CSA). These power cables have the following characteristics:

- Power cables and ground cables must be a minimum of 6 AWG stranded copper (or equivalent) for lengths up to 50 feet from the power source.
- All connectors must be the copper crimp type (compression). Connector metal must be compatible with the cable metal.

Service Inspection Guide

Perform a service inspection on the system when:

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

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

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

Perform the following checks:

1. Check the covers for sharp edges and for damage or alterations that expose the internal parts of the system unit.
2. Check the covers for proper fit to the system unit. They should be in place and secure.
3. Ensure that the rack stabilizer is installed and securely attached to the rack.
4. Perform the appropriate power-off procedures.
5. Open the covers.
6. Check for alterations or attachments. If there are any, check for obvious safety hazards such as broken wires, sharp edges, or broken insulation.
7. Check the internal cables for damage.
8. Check for dirt, water, and any other contamination within the system unit.
9. Check the voltage label on the back of the system unit to ensure that it matches the voltage at the outlet.
10. Check the external power cable for damage.
11. With the external power cable connected to the system unit, check for 0.1 ohm or less resistance between the ground lug on the external power cable plug and the metal frame.
12. Perform the following checks on each device that has its own power cables:
    a. Check for damage to the power cord.

b. Check for the correct grounded power cable.

c. With the external power cable connected to the device, check for 0.1 ohm or less resistance between the ground lug on the external power cable the metal frame of the device.

13. Close the doors.

14. Perform the appropriate power-on procedures.

Chapter 2. System Installation Procedure

Follow the procedures in this chapter to install the S70. The estimated installation time for the S70 is:

Install Activity	3.5 Hours
Planning Activity	2.0 Hours
Total Time	5.5 Hours

Step 1. Inventory

__ • The *About Your Machine* listing (in a plastic bag attached to the outside of the carton). Check the listing to verify that you have all the items shipped with the system.

__ • AIX Operating System publications

__ • *RS/6000 Enterprise Server S70 User's Guide*

__ • *RS/6000 Enterprise Server S70 Installation and Service Guide* (this book)

__ • *Diagnostic Information for Multiple Bus Systems*

__ • *RS/6000 Adapters, Devices, and Cable Information for Multiple Bus Systems*

__ • *PCI Adapter Placement Reference*

__ • *System Unit Safety Information*

__ • Support Information and Warranty

Verify with the customer that the following items are available. You will need them to complete this installation.

1. A floor plan, showing where to place each rack.
2. A console, including cables and a power source.
3. A modem for the electronic customer support function (if the customer ordered this function). This includes the correct telephone jack, cables, and a power source.

Step 2. Observe this Safety Notice During Installation

Note: For a translation of this notice, see the *System Unit Safety Information* manual.

DANGER

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

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

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

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

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

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

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

CAUTION:
Energy hazard, remove power before servicing. Disconnect two power supply cords.

Step 3. Check the Customer Environment

1. Verify with your Installation Planning Representative or the customer that any station protector boxes used are correctly installed according to *Site and Hardware Planning Information* manual.

2. Make sure the customer is aware that the recommended temperature for IBM products is 24° C (75° F) and the recommended relative humidity is 45%. The acceptable operating temperature range is 10° C (50° F) to 38° C (100° F) and the acceptable operating humidity range is 8% to 80%

3. Make sure the customer is aware that the front and rear service clearances around the System Rack and Input/output Rack should be 36 inches (900mm). The service clearances are important for proper air circulation, weight distribution, and safety to both the service representative and the customer.

   Refer to "Specifications" on page 1-71 for more planning information.

Step 4. Checking Customer Outlets

Note: For a translation of this notice, see the *System Unit Safety Information* manual.

CAUTION:
Do not touch the receptacle or the receptacle faceplate with anything other than your test probes before you have met the requirements in Step 8 below.

__ 1. Have the customer locate and turn off the branch circuit CB (Circuit Breaker). Attach tag S229-0237, which reads “Do Not Operate.”)

Note: All measurements are made with the receptacle faceplate in the normal installed position.

__ 2. Some receptacles are enclosed in metal housings. On receptacles of this type, perform the following steps:

a. Check for less than 1 volt from the receptacle case to any grounded metal structure in the building, such as a raised-floor metal structure, water pipe, building steel, or similar structure.

b. Check for less than 1 volt from receptacle ground pin to a grounded point in the building.

Note: If the receptacle case or faceplate is painted, be sure the probe tip penetrates the paint and makes good electrical contact with the metal.

__ 3. Check the resistance from the ground pin of the receptacle to the receptacle case. Check resistance from the ground pin to building ground. The reading should be less than 1.0 ohm, which indicates the presence of a continuous grounding conductor.

__ 4. If any of the three checks made in substep 2 are not correct, ask the customer to remove the power from the branch circuit and make the wiring corrections; then check the receptacle again.

Note: Do not use the digital multimeter to measure grounding resistance.

__ 5. Check for infinite resistance between the phase pins. This is a check for a wiring short.

Note: For a translation of this notice, see the *System Unit Safety Information* manual.

CAUTION:
If the reading is other than infinity, do not proceed! Have the customer make necessary wiring corrections before continuing. Do not turn on the branch circuit CB until all the above steps are satisfactorily completed.

__ 6. Have the customer turn on the branch circuit CB. Measure for appropriate voltages between phases. If no voltage is present on the receptacle case or grounded pin, the receptacle is safe to touch.

__ 7. With an appropriate meter, verify that the voltage at the outlet is correct.

__ 8. Verify that the grounding impedance is correct by using the ECOS 1020, 1023, B7106, or an appropriately approved ground impedance tester.

Note: Do not use the 120-volt convenience outlets inside a machine to power the tester.

Step 5. Setting Up the System Racks

Note: For a translation of this notice, see the *System Unit Safety Information*

CAUTION:
The stabilizer must be firmly attached to the bottom of the Input/output Rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the stabilizer is not attached to the rack.

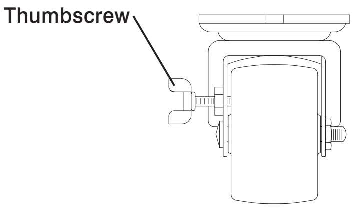
It is the customer's responsibility to unpack the System Rack and Input/output Rack and place them where they are to be installed. If this has not been done, consult the customer and the marketing representative as necessary.

1. Remove all packing and tape, if present, from the System Rack and the Input/output Rack.
2. Position the racks according to the customer floor plan.

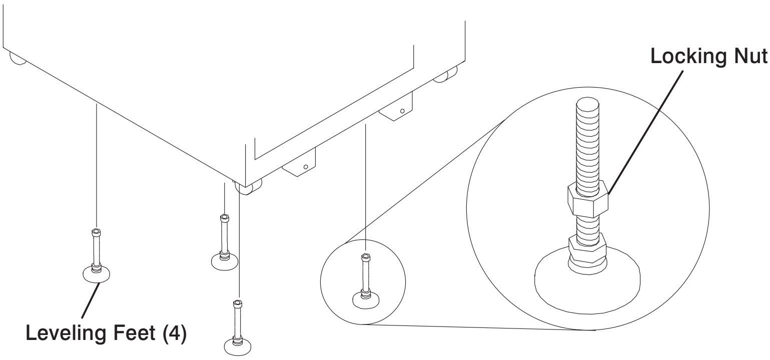
   Note: As viewed from the front, position the primary Input/output Rack (primary I/O rack contains the service processor) to the right side of the System Rack. A clearance of 10 cm (4 inches) between the racks is required to allow access to the Input/output Rack door.

   If you are attaching the racks to a concrete floor or a raised floor, refer to "Step 6A. Attaching the Input/output Rack to a Concrete Floor" on page 2-9, and then return here.

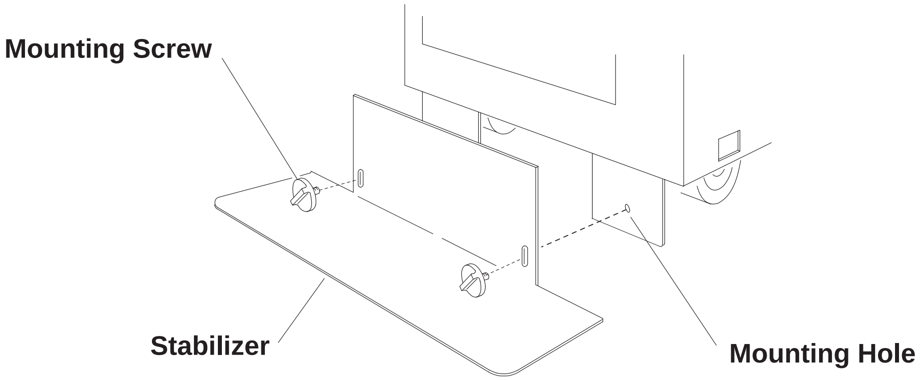
3. On both racks, Lock each caster wheel by tightening the thumbscrew on the caster.



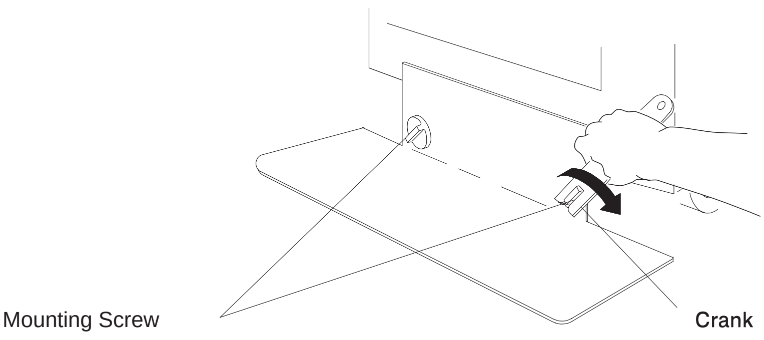
4. Adjust the leveling feet on the Input/output Rack by doing the following:
   a. Loosen the locking nut by turning the locking nut counter-clockwise (away from the bottom of the rack).
   b. Adjust the height of the leveling feet by rotating the leveling feet either upward or downward according to the level of the surface on which the rack is placed. Repeat this for the remaining leveling feet as needed.
   c. When the rack is leveled, tighten the locking nuts on all of the leveling feet.



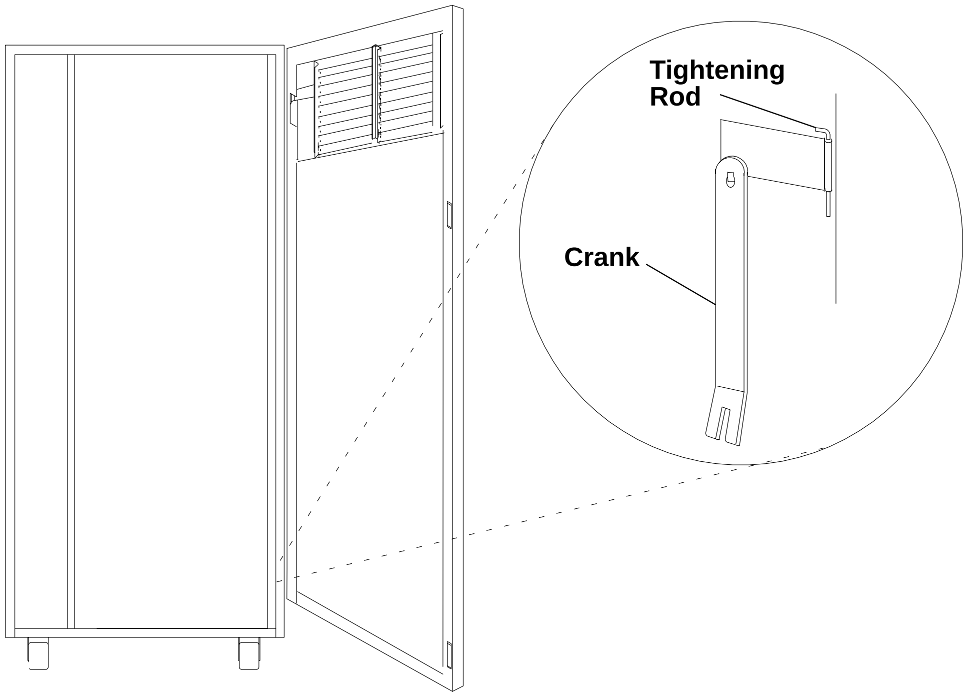
5. Align the slots in the stabilizer with the mounting holes in the bottom front of the Input/output Rack.
6. Ensure that the base of the stabilizer rests firmly on the floor.
7. Install the two mounting screws and hand tighten.



8. Use the crank supplied with the system unit to alternately tighten the mounting screws until they are firmly seated.



9. Hang the crank and tightening rod on the bracket near the bottom of the right wall inside the back of the rack.



10. If head protectors are installed, remove them from diskette drives.

Step 6A. Attaching the Input/output Rack to a Concrete Floor

Perform this step if the Input/output Rack is to be attached to a concrete floor or a raised floor above a concrete floor.

Notes:

1. **Ensure that the primary Input/output Rack (primary I/O rack contains the service processor) is positioned to the right side of the System Rack when viewed from the front. A clearance of 10 cm (4 inches) between the racks is required to allow access to the Input/output Rack door.**
2. If you are attaching a -48 V dc system to a concrete or raised floor, ensure the racks are positioned as shown in "Rack Configuration (-48 V dc Systems)" on page 1-75.
3. If you are attaching the Input/output Rack to a concrete floor, continue with "Attaching the Input/output Rack to a Concrete Floor." If you are attaching the Input/output Rack to a concrete floor below a raised floor, go to "Attaching the Input/output Rack to a Concrete Floor Beneath a Raised Floor" on page 2-12. If you are not attaching the Input/output Rack to a concrete floor, continue with "Step 7. Attach the Front Electrical Outlet" on page 2-22.

Attaching the Input/output Rack to a Concrete Floor

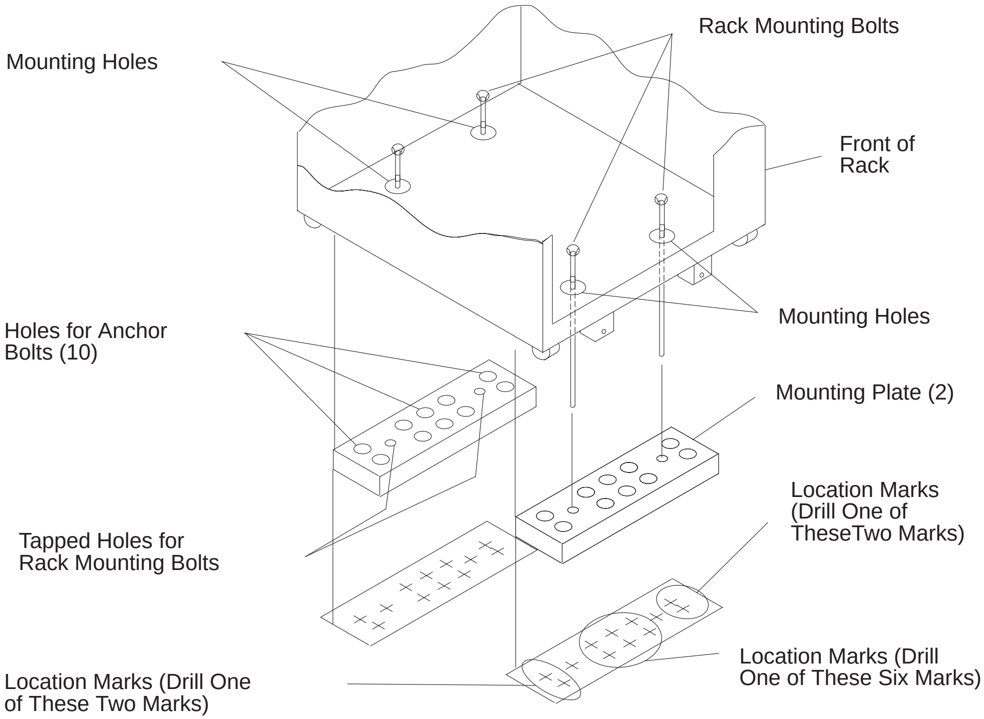
The customer is responsible for attaching the rack mounting plates to the concrete floor.

Note: Because of the long length of the four rack-mounting bolts, the drawer located in the bottom position of the rack must be removed to install the four rack-mounting bolts to the floor.

1. Mark the floor around the edge of each leveling foot.
2. Place the two mounting plates in the approximate mounting locations under the rack.
3. To align the rack over the mounting plates, do the following:
   a. Place the four rack-mounting bolts through the mounting holes at the bottom of the rack.
   b. Position the mounting plates under the four rack-mounting bolts so that the mounting bolts are centered directly over the tapped holes. Insert the rack-mounting bolts three to four rotations into the tapped holes.
4. Mark the floor around the edge of both mounting plates.

5. Remove the mounting bolts from the threaded holes.
6. To access the holes in the mounting plates, raise the four leveling feet, and then move the rack away from the mounting plates.
7. Mark the floor at the center of each hole in the mounting plates (including the tapped holes).
8. Remove the two mounting plates from the marked locations.
9. At the marked location of the tapped mounting holes, drill two holes approximately 1 inch to allow clearance for the ends of the two rack-mounting bolts (the ends of the rack-mounting bolts may protrude past the thickness of the mounting plate).

   Note: A minimum of three anchor bolts for each mounting plate must be used to mount the plates to the concrete floor. Because some of the drilled holes may be aligned with concrete reinforcement rods below the surface of the concrete floor, some of the drilled holes may not be usable. For each mounting plate, select at least three usable holes, two that are on opposite sides and opposite ends of each other, and one hole at the center.

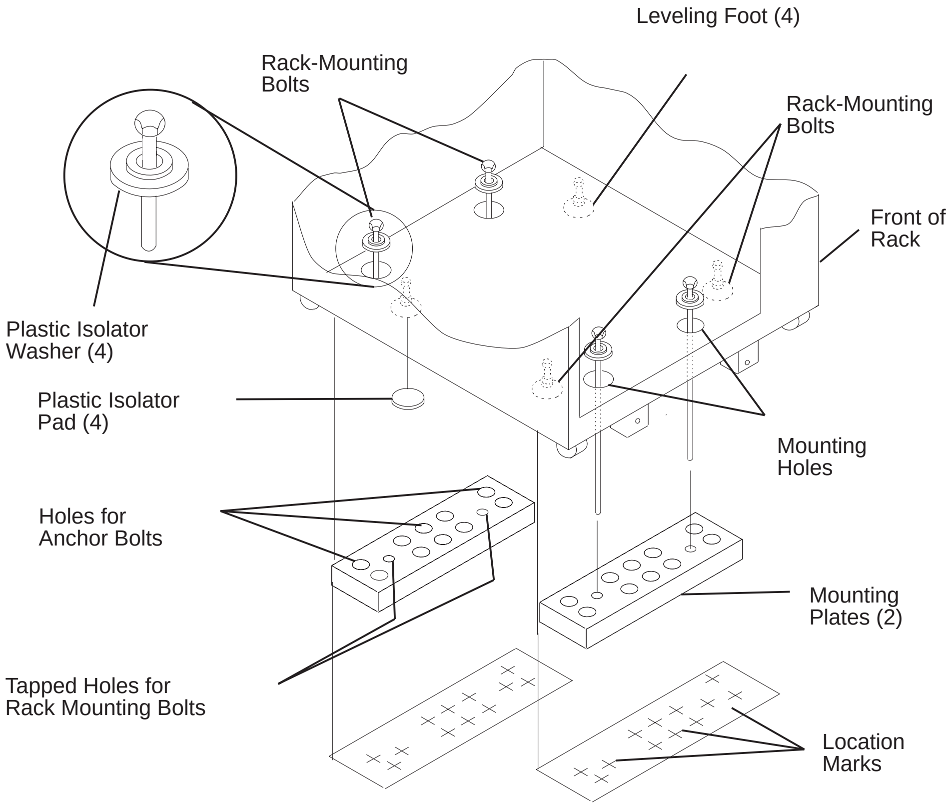


10. Drill one hole in each group of anchor bolt location marks as indicated on the marked floor.

11. Using at least three anchor bolts for each mounting plate, mount the two mounting plates to the concrete floor.
12. Using the location marks for leveling feet as a guide, reposition the rack over the mounting plates.
13. Place the four rack-mounting bolts through the four metal washers, and then through the four plastic isolator washers. The flat side of the plastic isolator washer must be facing upward.
14. To further align the rack over the mounting plates, do the following:
    a. Place the four rack-mounting bolts (with the four plastic isolator washers) through the mounting holes in the bottom of the rack.
    b. Align the four mounting bolts to the location of the four tapped holes in the two mounting plates.
    c. Insert the rack-mounting bolts three to four rotations into the tapped holes.

    Note: The bottom of the four leveling feet must be positioned over the four plastic isolator pads when the rack is leveled.

    If you are installing an AC powered rack, do not use the four plastic isolator pads.
15. Place the four plastic isolator pads under the four leveling feet, and then level the rack using the four adjustable leveling feet.
16. Tighten the locking nuts on the leveling feet.



17. Tighten the four rack-mounting bolts into the two mounting plates.
18. If a drawer was removed from the bottom position of the rack, reinstall it.

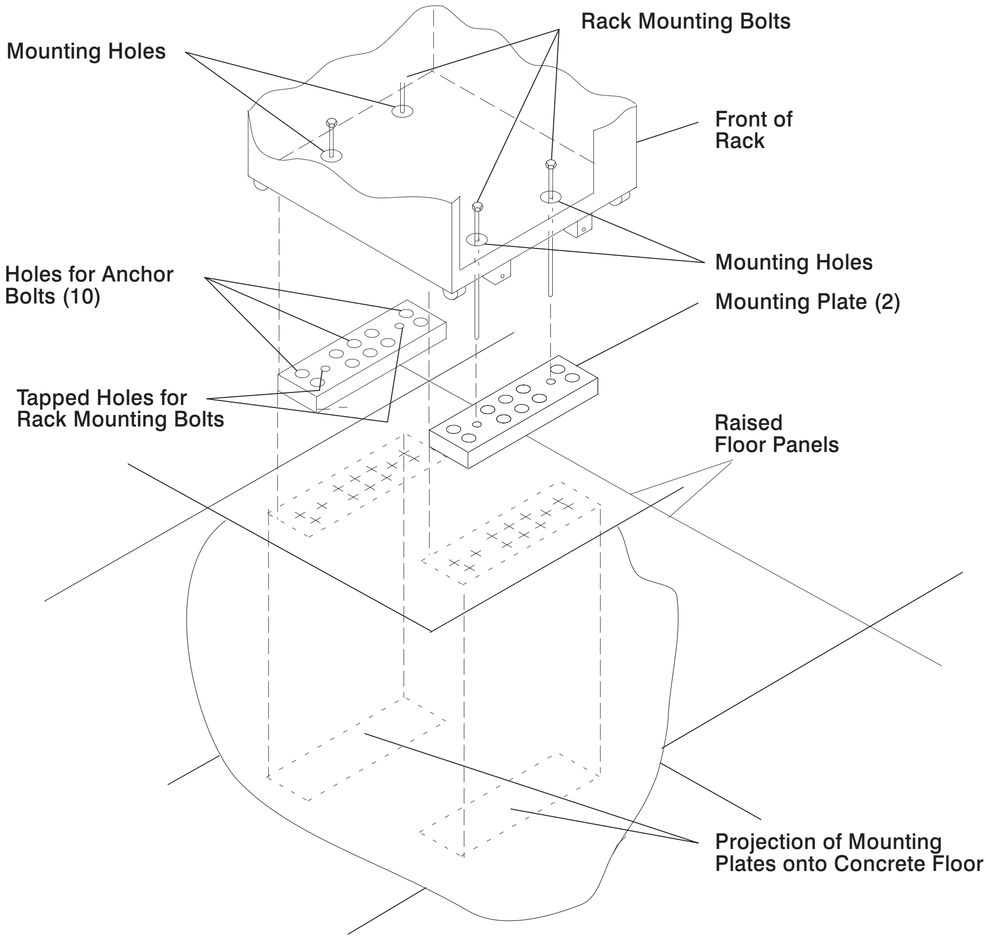
Attaching the Input/output Rack to a Concrete Floor Beneath a Raised Floor

Note: Because of the long length of the four rack-mounting bolts, the drawer located in the bottom position of the rack must be removed to install the four rack-mounting bolts to the floor.

1. Mark the floor around the edge of each leveling foot.
2. Place the two mounting plates in the approximate mounting locations under the rack.
3. To align the rack over the mounting plates, do the following:
   a. Place the four rack-mounting bolts through the mounting holes at the bottom of the rack.

b. Position the mounting plates under the four rack-mounting bolts so that the mounting bolts are centered directly over the tapped holes. Insert the rack-mounting bolts three to four rotations into the tapped holes.

4. Mark the raised-floor panel around the edge of both mounting plates.
5. Remove the mounting bolts from the threaded holes.
6. To access the holes in the mounting plates, raise the four leveling feet, and then move the rack away from the mounting plates.
7. Mark the raised-floor panel at the center of each hole in the mounting plates (including the tapped holes).
8. Remove the two mounting plates from the marked locations.

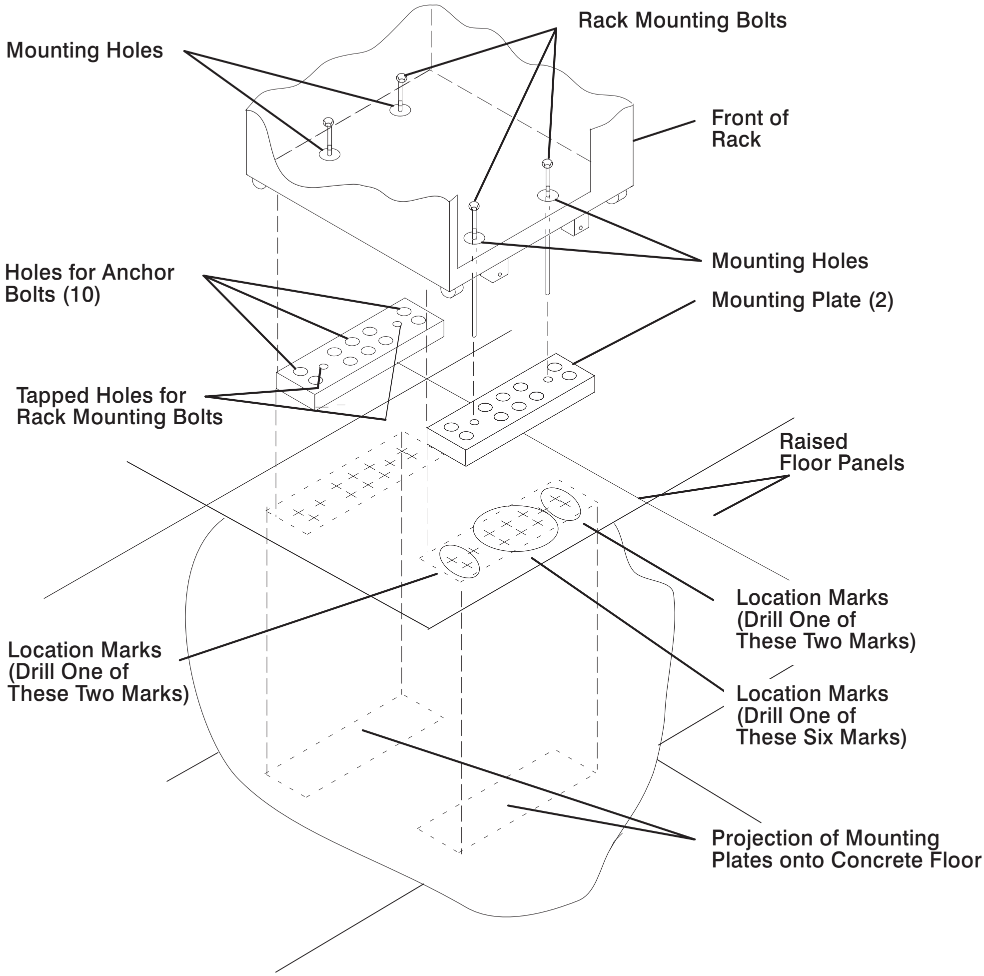


9. At the marked location of the tapped mounting holes, drill two holes approximately 1 inch to allow clearance for the ends of the two rack-mounting bolts (the

ends of the rack-mounting bolts may protrude past the thickness of the mounting plate).

Note: A minimum of three anchor bolts for each mounting plate must be used to mount the plates to the raised-floor panel. For each mounting plate, select at least three usable holes, two that are on opposite sides and opposite ends of each other, and one hole at the center.

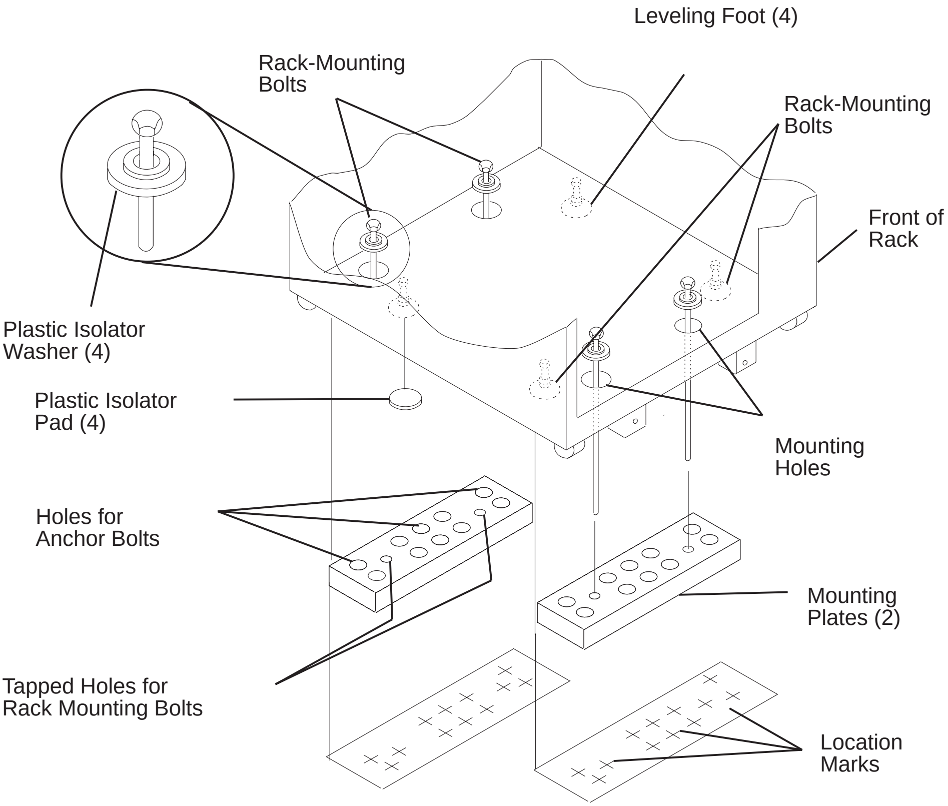
10. Drill one hole in each group of anchor bolt location marks as indicated on the marked raised floor panel.
11. Ensure that the marks for the holes for the anchor bolts in the concrete floor align with the holes in the raised floor panel.
12. Drill the holes in the concrete floor for the anchor bolts.



13. Place the two mounting plates on the locations indicated on the marked raised-floor panel.
14. Using at least three anchor bolts for each mounting plate, mount the two mounting plates through the raised-floor panel to the concrete floor.
15. Using the location marks for leveling feet as a guide, reposition the rack over the mounting plates.
16. Place the four rack-mounting bolts through the four metal washers, and then through the four plastic isolator washers. The flat side of the plastic isolator washer must be facing upward.
17. To further align the rack over the mounting plates, do the following:
    a. Place the four rack-mounting bolts (with the four plastic isolator washers) through the mounting holes in the bottom of the rack.
    b. Align the four mounting bolts to the location of the four tapped holes in the two mounting plates.
    c. Insert the rack-mounting bolts three to four rotations into the tapped holes.

    Note: The bottom of the four leveling feet must be positioned over the four plastic isolator pads when the rack is leveled.

    If you are installing an AC powered rack, do not use the four plastic isolator pads.
18. Place the four plastic isolator pads under the four leveling feet, and then level the rack using the four adjustable leveling feet.
19. Tighten the locking nuts on the leveling feet.



20. Tighten the four rack-mounting bolts into the two mounting plates.
21. If you are attaching an electrical outlet and mounting plate, skip to “Step 7. Attach the Front Electrical Outlet” on page 2-22 or “Step 8. Attach the Rear Electrical Outlet” on page 2-27 as appropriate, then return here.
22. If a drawer was removed from the bottom position of the rack, reinstall it.

Step 6B. Attaching the System Rack to a Concrete Floor

Perform this step if the System Rack is to be attached to a concrete floor or a raised floor above a concrete floor.

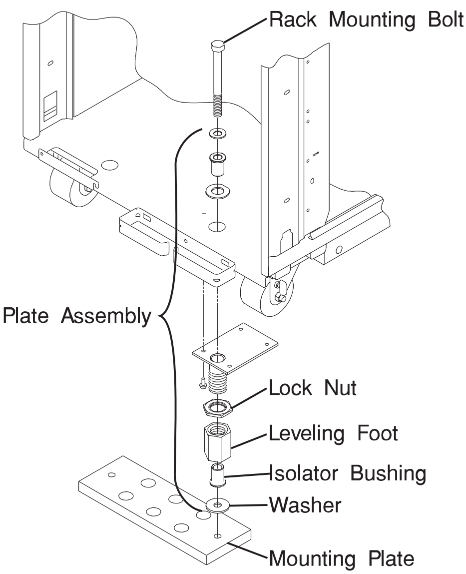
Notes:

1. **Ensure that the primary Input/output Rack (primary I/O rack contains the service processor) is positioned to the right side of the System Rack when viewed from the front. A clearance of 10 cm (4 inches) between the racks is required to allow access to the Input/output Rack door.**
2. If you are attaching a -48 V dc system to a concrete or raised floor, ensure the racks are positioned as shown in “Rack Configuration (-48 V dc Systems)” on page 1-75.
3. If you are attaching the System Rack to a concrete floor, continue with “Attaching the System Rack to a Concrete Floor” on page 2-18. If you are attaching the System Rack to a concrete floor below a raised floor, go to “Attaching the System Rack to a Concrete Floor Beneath a Raised Floor” on page 2-20. If you are not attaching the System Rack to a concrete floor, continue with “Step 7. Attach the Front Electrical Outlet” on page 2-22.

Attaching the System Rack to a Concrete Floor

The customer is responsible for attaching the rack mounting plates to the concrete floor.

1. Install the 4 plate assemblies with the leveling feet, bushings and washers. Make sure that the leveling feet are backed off the floor level to allow space for the mounting plates.



2. Place the mounting plates, front and rear, (note they are different) in the approximate mounting position under the System Rack.
3. To align the System Rack over the mounting plate, do the following:
   a. Place the four rack-mounting bolts through the plate assembly holes at the bottom of the rack (install the bushings and washers to ensure bolt positioning).
   b. Position the mounting plates under the four rack-mounting bolts so that the mounting bolts are centered directly over the tapped holes.
   c. Insert the rack-mounting bolts 3 to 4 rotations into the tapped holes.
4. Mark the floor around the edge of the mounting plates.
5. Remove the mounting bolts from the threaded holes.
6. Move the rack away from the mounting plates.
7. Mark the floor at the center of each hole in the mounting plate (including tapped holes).

8. Remove the mounting plates from the marked locations.
9. At the marked location of the tapped mounting holes, drill two holes approximately 1 inch to allow clearance for the ends of the two rack-mounting bolts (the ends of the rack-mounting plates may protrude past the thickness of the mounting plate).

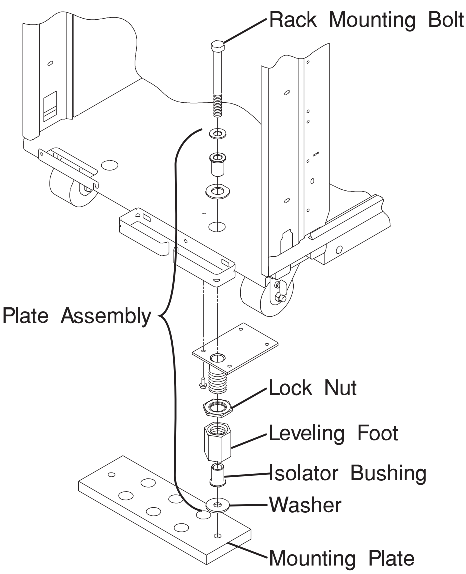
   Note: A minimum of three anchor bolts for each mounting plate must be used to mount the plates to the concrete floor. Because some of the drilled holes may be aligned with concrete reinforcement rods below the surface of the concrete floor, some of the drilled holes may not be usable. For each mounting plate, select at least three usable holes, two that are on opposite sides and opposite ends of each other, and one hole at the center.

   Drill one hole in each group of anchor bolt location marks as indicated on the marked floor.
10. Using at least three bolts for each mounting plate, mount the mounting-plates to the concrete floor.
11. Reposition the System Rack over the mounting plates.
12. Place the four rack-mounting bolts through the plate assemblies with the D-washer positioned so that the straight side of the washer is facing inward toward the System Rack.
13. Place the isolator bushing inside the leveling foot with a washer between the isolator bushing and the floor plate.
14. Insert the rack mounting bolts three or four rotations into the tapped holes.
15. Turn the leveling foot of the plate assembly down until it contacts the mounting plate, and then level the rack using the four leveling feet.
16. Lock the leveling feet by tightening the lock nut.
17. Tighten the four rack-mounting bolts into the mounting plates.

Attaching the System Rack to a Concrete Floor Beneath a Raised Floor

The customer is responsible for attaching the rack mounting plates to the concrete floor.

1. Install the 4 plate assemblies with the levelling feet, bushings and washers. Make sure that the leveling feet are backed off the floor level to allow space for the mounting plates.



2. Place the mounting plates, front and rear, (note they are different) in the approximate mounting position under the System Rack.
3. To align the System Rack over the mounting plate, do the following:
   a. Place the four rack-mounting bolts through the plate assembly holes at the bottom of the rack (install the bushings and washers to ensure bolt positioning).
   b. Position the mounting plates under the four rack-mounting bolts so that the mounting bolts are centered directly over the tapped holes. Insert the rack-mounting bolts 3 to 4 rotations into the tapped holes.
4. Mark the raised-floor panel around the edge of both mounting plates.
5. Remove the mounting bolts from the threaded holes.
6. Move the rack away from the mounting plates.
7. Mark the raised-floor at the center of each hole in the mounting plates (including the tapped holes).
8. Remove the two mounting plates from the marked locations.

9. At the marked location of the tapped mounting holes, drill two holes approximately 1 inch to allow clearance for the ends of the two rack-mounting bolts (the ends of the rack-mounting plates may protrude past the thickness of the mounting plate).

   Note: A minimum of three anchor plates for each mounting plate must be used to mount the plates to the concrete floor. Because some of the drilled holes may be aligned with concrete reinforcement rods below the surface of the concrete floor, some of the drilled holes may not be usable. For each mounting plate, select at least three usable holes, two that are on opposite sides and opposite ends of each other, and one hole at the center.

10. Drill one hole in each group of anchor bolt location marks as indicated on the marked raised-floor panel.
11. Project the holes now in the raised-floor panel down to the concrete floor below. Ensure that the marks for the holes for the anchor bolts in the concrete floor align with the holes in the raised floor panel.
12. Drill the holes in the concrete floor for the anchor bolts.
13. Place the mounting plates on the locations on the marked raised-floor panel.
14. Using the three anchor bolts for each mounting plate, mount the two mounting-plates through the raised-floor panel to the concrete floor.
15. Reposition the System Rack over the mounting plates.
16. Place the four rack-mounting bolts through the plate assemblies with the D-washer positioned so that the straight side of the washer is facing inward toward the System Rack.
17. Place the isolator bushing inside the leveling foot with a washer between the isolator bushing and the floor plate.
18. Insert the rack mounting bolts three or four rotations into the tapped holes.
19. Turn the leveling foot of the plate assembly down until it contacts the mounting plate, and then level the rack using the four leveling feet.
20. Lock the leveling feet by tightening the lock nut.
21. Tighten the 4 rack-mounting bolts into the mounting plates.

Step 7. Attach the Front Electrical Outlet

Attention: Refer to “Safety Notices” on page xv before continuing.

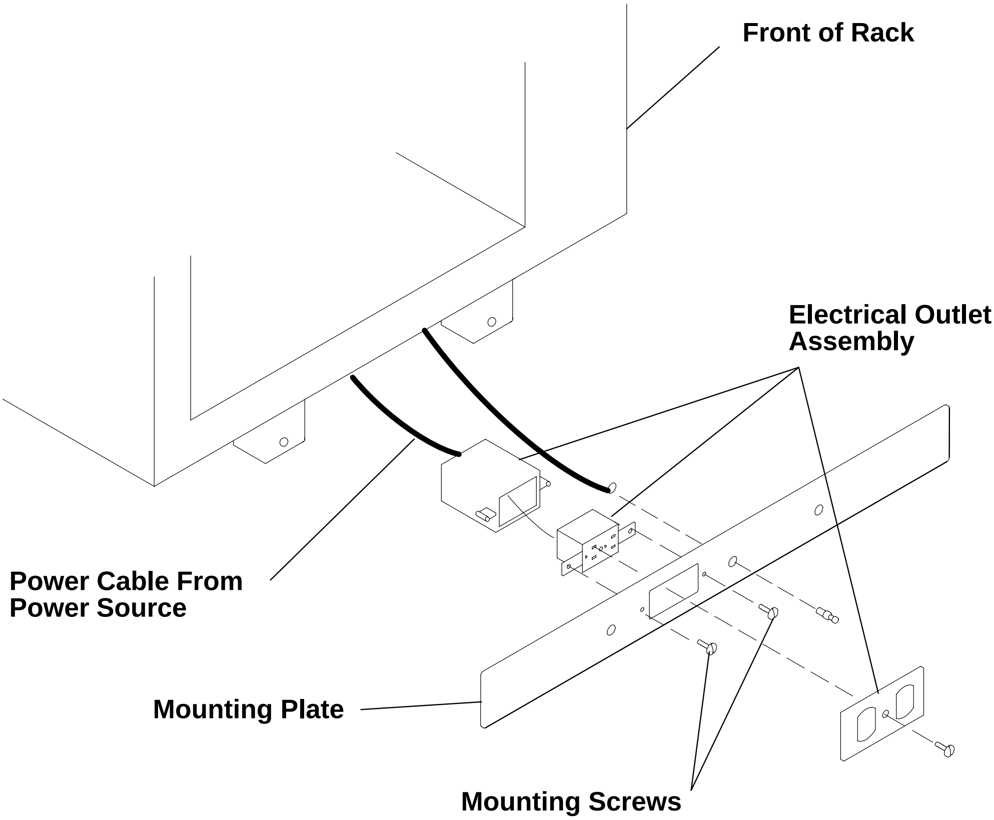
Note: If the rack is on a raised floor without being attached to the concrete floor below the raised floor, a stabilizer must be installed instead of the front-electrical-outlet mounting plate. The front-electrical-outlet mounting plate cannot be installed on the rack when a stabilizer is installed.

Note: If the customer does not want to connect an electrical outlet to the front mounting plate, install the mounting plate without the electrical outlet.

Note: The customer is responsible for providing and connecting the electrical outlet assembly.

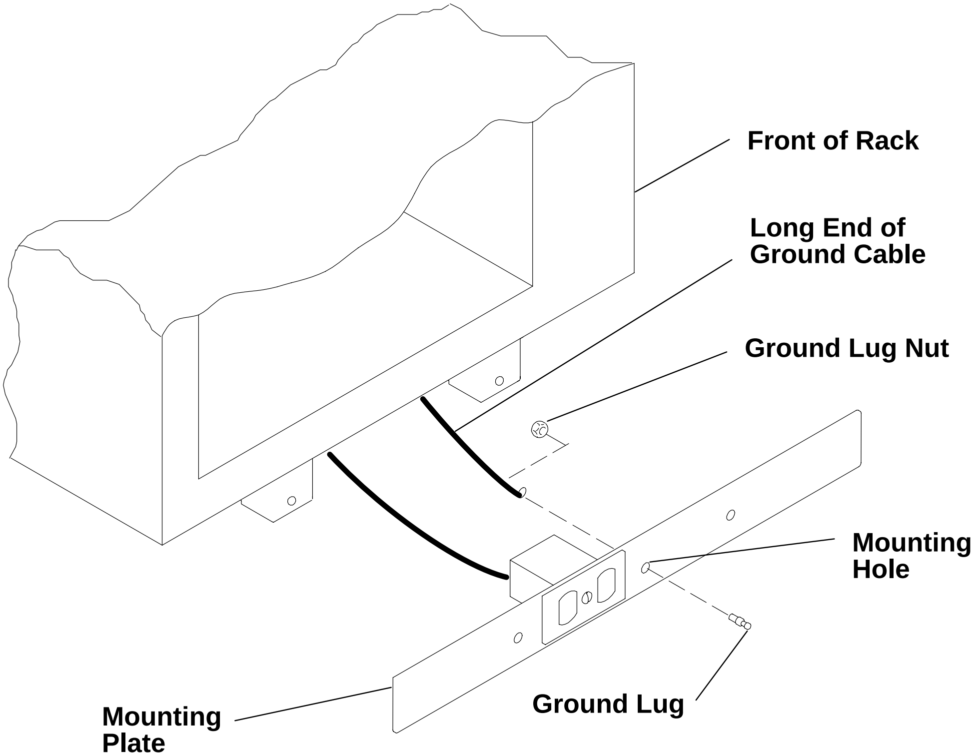
The customer is also responsible for providing and connecting the power cable from the customer power source to the front electrical outlet.

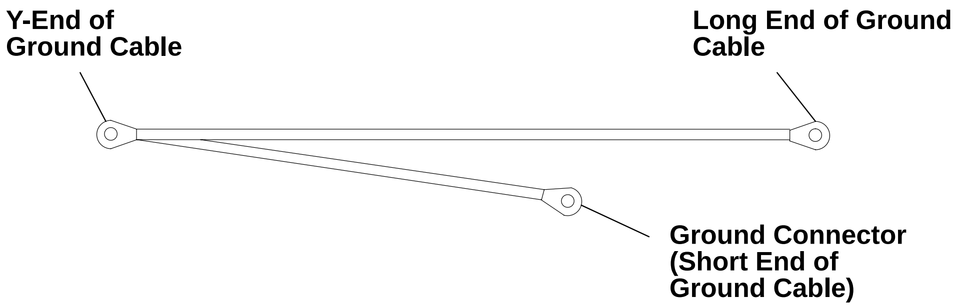
1. After the customer has connected the power cable from the customer power source to the electrical outlet assembly, mount the electrical outlet assembly to the mounting plate using the two mounting screws (provided by the customer).



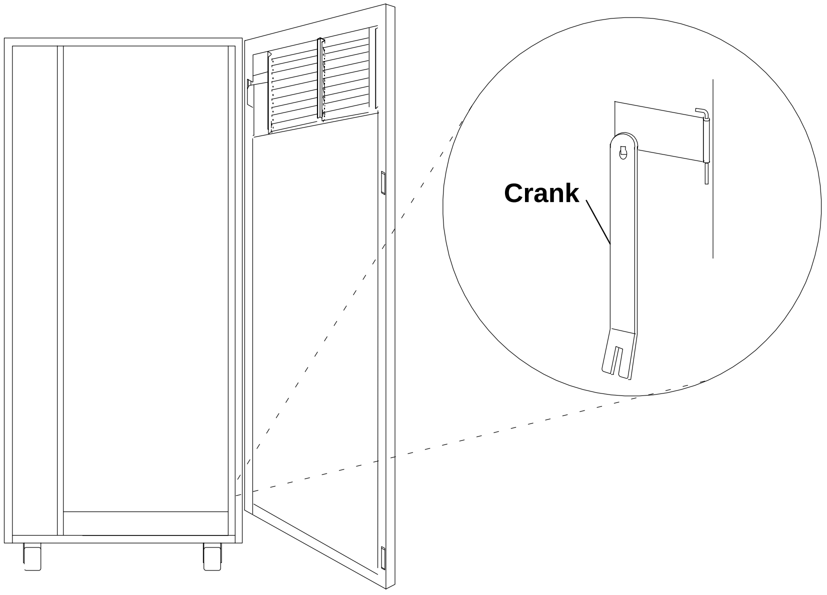
2. Place the ground cable lug through the mounting hole of the mounting plate.
3. Connect the long end of the ground cable to the threaded side of the ground cable lug (inside mounting plate), and then install and tighten the ground lug nut.

   Note: The two remaining connections of the ground cable are done in "Step 8. Attach the Rear Electrical Outlet" on page 2-27

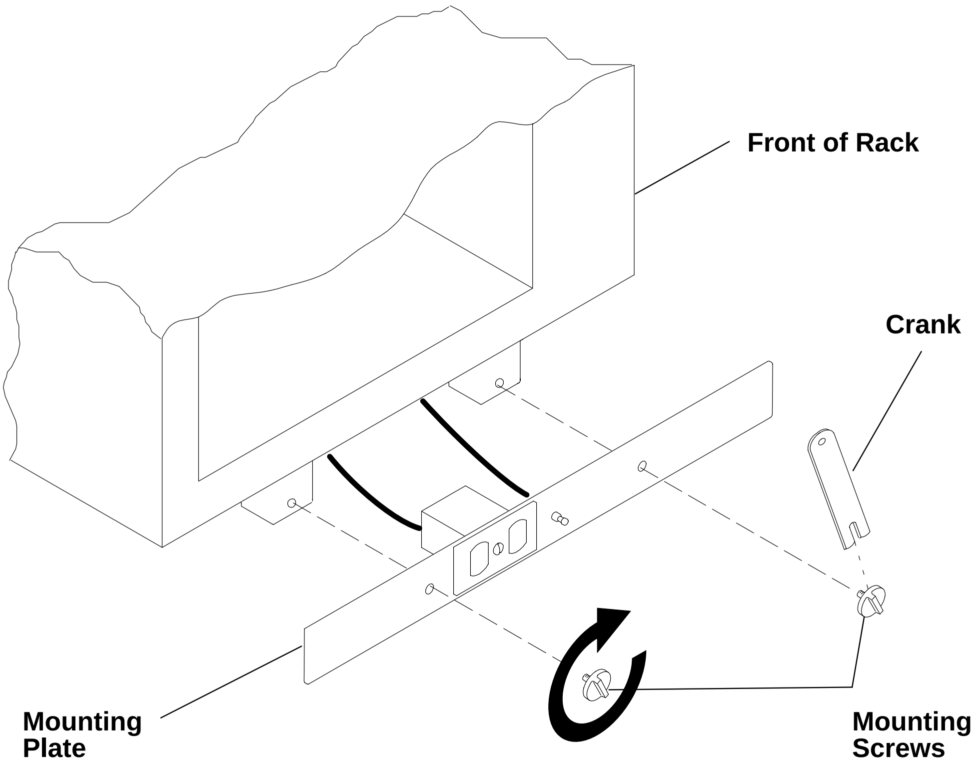




4. Find the crank (for installing the mounting screws) located inside the rear of the rack near the bottom of the right wall.



5. Align the holes of the mounting plate with the holes on the rack, and then install the two mounting screws.
6. Using the crank, tighten the two mounting screws.



7. Store the crank inside the rear of the rack near the bottom of the right wall.

Note: If the customer does not want to connect an electrical outlet to the mounting plate for the rear electrical outlet, install the mounting plate without the electrical outlet.

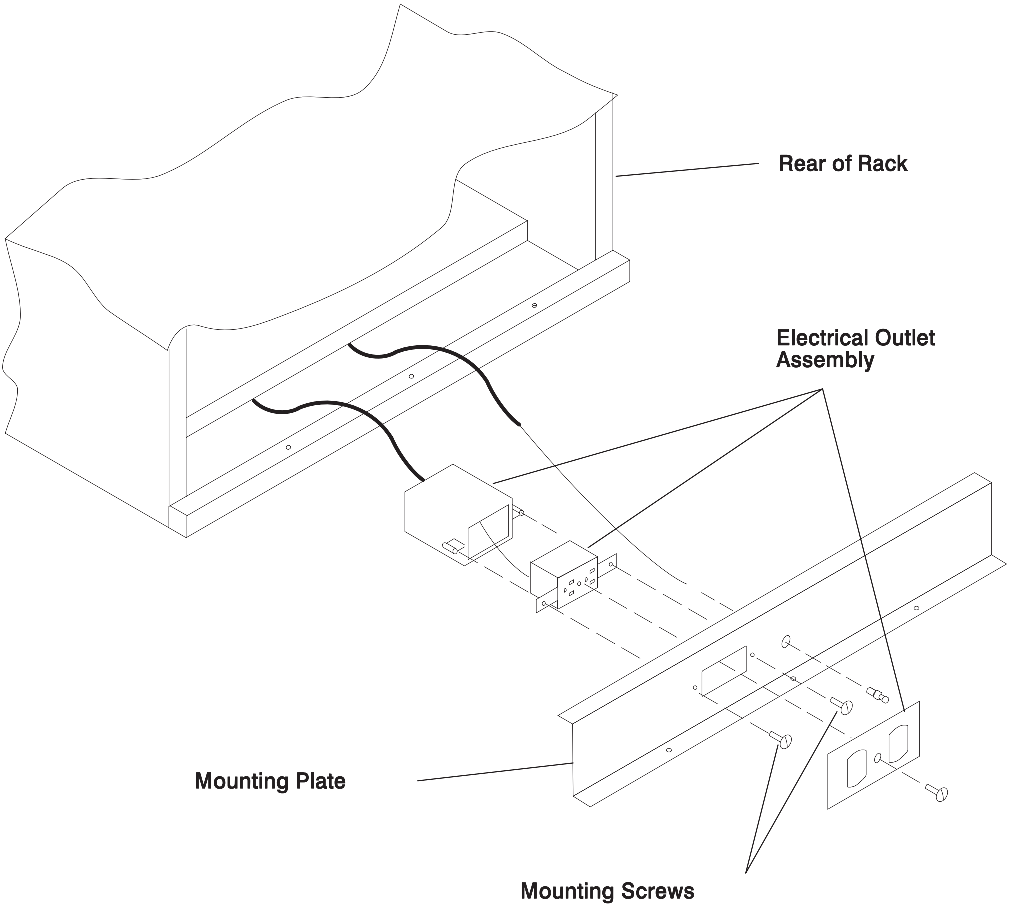
Step 8. Attach the Rear Electrical Outlet

Attention Refer to “Safety Notices” on page xv before continuing.

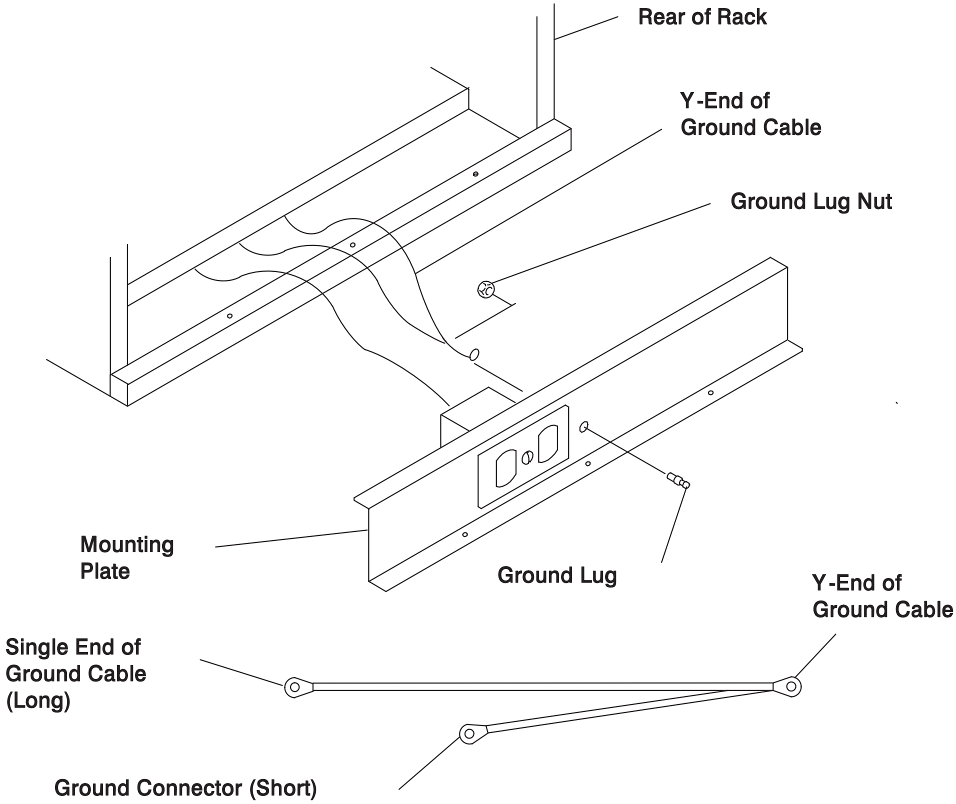
Note: The customer is responsible for providing and connecting the electrical outlet assembly.

The customer is also responsible for providing and connecting the power cable from the customer power source to the rear electrical outlet.

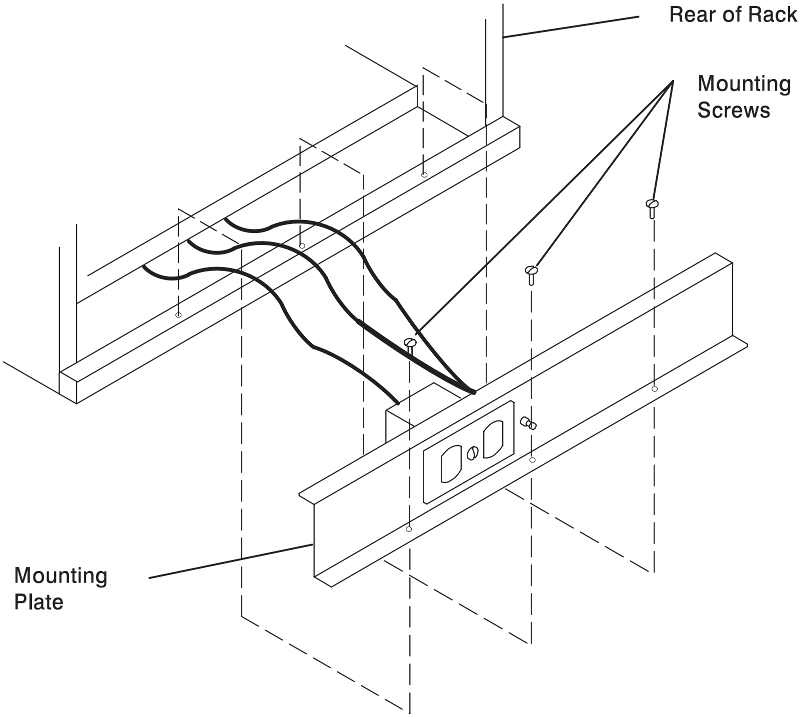
1. Open the rear door of the rack.
2. After the customer has connected the power cable from the customer power source to the electrical outlet assembly, mount the electrical outlet assembly to the mounting plate using the two mounting screws (provided by the customer).



3. Place the ground cable lug through the mounting hole of the mounting plate.
4. Connect the short ground cable to the threaded side of the ground cable lug, and then install and tighten the ground lug nut.

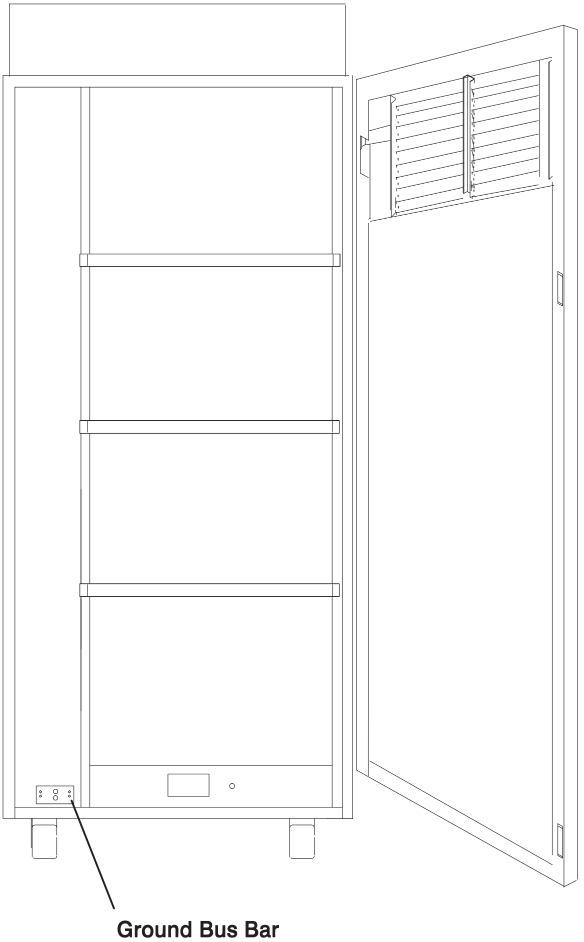


5. Attach the mounting plate to the rack by installing and tightening the three mounting screws.



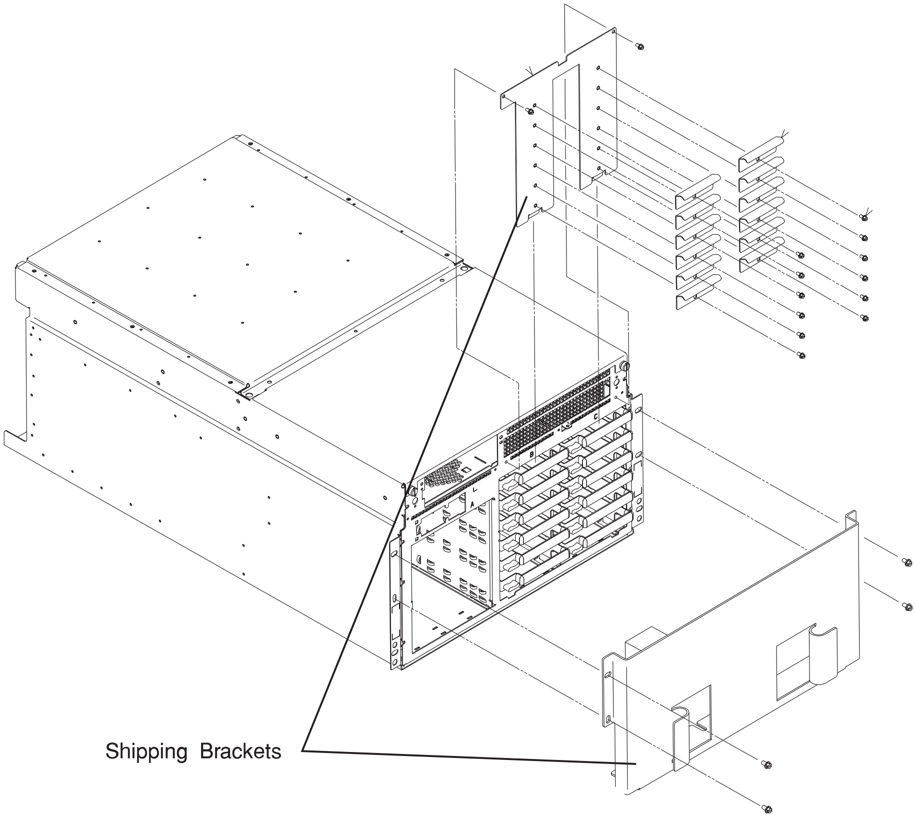
6. Connect the ground connector of the ground cable to the ground bus bar.

7. Reinstall the bottom drawer in the rack if one was removed.
8. Close the rear door of the rack.

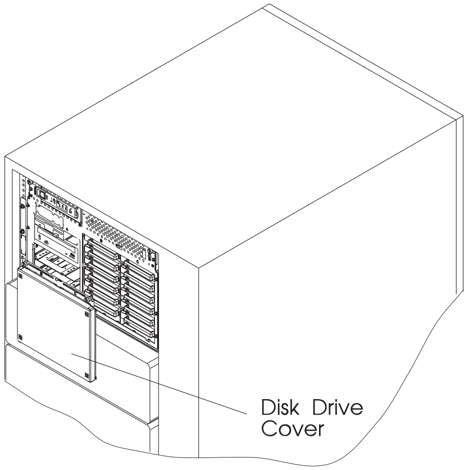


Step 9. Remove the Shipping Brackets and Install Covers

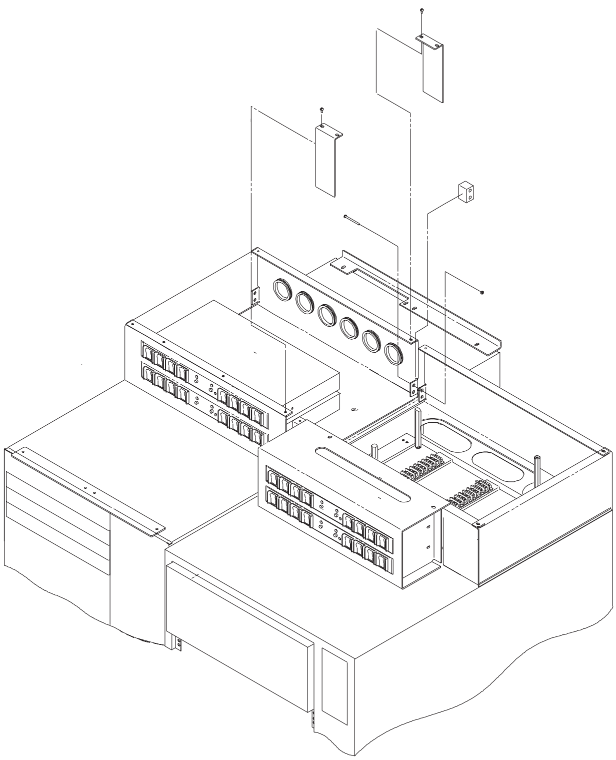
1. Remove the shipping materials from the System Rack.
2. Remove the shipping brackets from the front and rear of the I/O Drawers. A bracket on the rear of the I/O Drawer is located under the 1/4 and 3/4 power supplies. Store the brackets in a safe place for future use.



3. Install any shields and covers that were shipped separately.

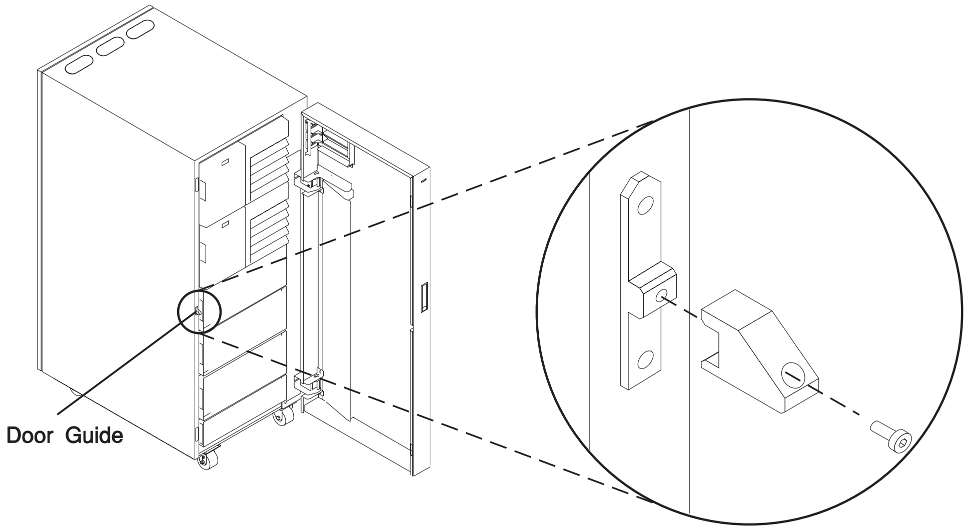


4. If you are installing a -48 V dc powered system, install the spacer and covers between the two power distribution assemblies.



Step 9. Install the Input/output Rack Door Guide

1. Locate the Input/output Rack door guide.
2. Position the door guide as shown.
3. Using a 3mm allen wrench, fasten the door guide to the Input/output Rack as shown.



Step 10. Connecting the Operator Panel Cable and the JTAG Cable Between the Racks

Using the cables provided, connect the cables between the System Rack and the primary I/O Drawer. Refer to "Cabling the System Rack and Input/output Rack" on page 1-26 for connector locations for these cables.

Step 11. Connecting RIO and SPCN Cables Between the Racks

Using the cables provided, connect the RIO and SPCN cables between the System Rack and the I/O Drawers. Refer to "Cabling the System Rack and Input/output Rack" on page 1-26 for valid cabling configurations.

Step 12. Setting Up Attached Devices

Note: During the setup of each device, connect only the device end of the signal cable. *Do not* connect the device signal cables to the Input/output Rack now.

Do the setup procedures in the documentation for each device being attached to the Input/output Rack; then return to "Step 13. Update the Device Records" on page 2-35.

Connect the ASCII terminal to serial port S1. Connect the keyboard, mouse, and graphics display (if available). Refer to "I/O Drawer Locations" on page 1-14 for the locations of the connectors.

Step 13. Update the Device Records

External devices used with the S70 system are connected to connectors on the primary I/O Drawer or to adapters that are installed inside any of the I/O Drawers.

Update the “Device Records” in the *RS/6000 Enterprise Server S70 User's Guide* appendices to reflect the configuration of the system adapters and devices that are installed.

Step 14. Attaching External Devices

External devices used with the S70 system are connected to connectors on the primary I/O Drawer or to adapters that are installed inside any of the I/O Drawers. Refer to “Device Records” in the *RS/6000 Enterprise Server S70 User's Guide* appendices for listings of installed adapters to determine where to attach external devices, attach the external devices now.

Step 15. Connecting the Power

1. Plug the drawer power cords into the power distribution bus (PDB) of the Input/output Rack.
2. Plug the power cords of the external devices into power outlets.
3. Plug the PDB power cord into the customer's electrical outlet.
4. Plug the System Rack power cord into the customer's electrical outlet.

   (If you are installing a -48 V dc system, ensure that the customer's power source is turned off. Connect the -48 V dc power leads to the circuit breaker panels. See “System Rack Power Cabling -48 V dc” on page 1-40 and “Input/output Rack Cabling -48 V dc” on page 1-43 for power cabling information. When the connection is complete, have the customer apply power and set all circuit breakers to the On position.)

Step 16. Powering On and Checking Out the System

1. If your system is a high availability system, make sure all power control interface cables (if installed) are disconnected. High availability systems usually require drawers to remain powered on when the System Rack is powered off. If the power control to certain drawers in your system is different from the factory settings, use your planning information and any documentation supplied for the power control system to understand power control.
2. Press the White Power Button on the Operator Panel. The Operator Panel is located inside the front door of the System Rack.
3. Go to the chapter titled "Installation Checkout Procedure" in the *Diagnostic Information for Multiple Bus Systems* manual and follow the procedures there to check out the system.

Checklist if Problems Occur

If you have a problem when trying to turn the system power on, check:

- The EPO switch is on
- Rack power cables are installed
- PDB Circuit breakers CP1 - CP6 are set correctly (refer to "Input/output Rack Rear Locations" on page 1-13 for locations)
- AC voltage is correct.

If any failures occur, refer to Chapter 4 on page 4-1.

If you have a problem when trying IPL the system, check:

- Check signal cables
- Check signal cable terminating plugs
- Verify device addresses
- Verify console has power
- Verify cable networks.

If any failures occur, refer to Chapter 4 on page 4-1.

Step 17. Service Processor Setup and Test

Refer to Appendix B on page B-1 and perform the steps necessary to setup and test the service processor. Then return here.

Step 18. Finishing the Installation

__ 1. Record the System Identification numbers.

The system has important identification information that you might need if you have it serviced. Record this information in the appendix of the *RS/6000 Enterprise Server S70 User's Guide.*

__ 2. If you decided to delay installing any optional devices, you might want to install these now.

Some options you might install come with a diskette that contains device drivers, configuration files, or test programs. To install these files (after the operating system is installed), follow the instructions that came with the option.

__ 3. To install application programs, follow the instructions supplied with each application program.

If any failures occur, refer to Chapter 4 on page 4-1.

Chapter 3. Introduction to Diagnostics

The S70 system utilizes an integrated set of software diagnostic procedures to facilitate isolation of failing components and system maintenance. This installation and service guide along with the *Diagnostics Information for Multiple Bus Systems* are the basis of the S70 diagnostic procedures for S70 servers. In particular, chapters 4, 5, 6 and 10 in this *Installation and Service Guide* are important for the trained service representative to understand and use when isolating a failure on the system.

Maintenance Analysis Procedures (MAPs)

Chapter 4. Maintenance Analysis Procedures (MAPs) is used to guide the trained service person through the complex multi-rack S70 server systems. These MAPs are the entry point for all isolation and error recovery procedures. The MAPs are consistent with existing procedures and methods. The S70 series of servers utilizes a set of integrated procedures, mentioned earlier, to which the MAPS are the primary entry point.

The S70 MAPS are listed below:

- 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 proper MAP or service reference information either in this book, or in the common book set which includes the *Diagnostic Information for Multiple Bus Systems* and *PCI Adapter Placement Reference Guide.*

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 and cables to diagnose a power problem. The nature of the power problems can be related to powering up and down the system including the I/O racks or power failures that can 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.

Error Codes

S70 servers utilize multiple sets of error codes which are referred to throughout this book, but primarily in chapters 4, 5 and 6. These codes are a blend of traditional error codes and codes generated by newly integrated software used in the S70. Understanding the definition and relationships of these codes is important to the service personnel performing maintenance or installation activities on the S70.

Checkpoints Checkpoints are displayed on the operator panel during the initial program load (IPL) of the system. Checkpoints indicate the progress of the IPL.

Error Codes Error Codes are displayed on the operator panel if the system firmware detects an error during IPL or during normal operation.

SRN Service Request Number is usually a 6 digit number representing a specific failure of a specific item. SRN's are presented through the system operator panel.

SRC A System Reference Code (SRC) is a sequence of codes that are used to identify status, describe a failure which may be hardware, software or firmware. SRCs are presented through the system operator panel. SRCs primarily deal with items pertinent to the System Rack and its associated hardware, software, and firmware. SRCs are new to these diagnostic procedures and are currently unique to S70 servers.

Displaying and Using SRCs

SRCs are displayed on the system operator control panel automatically with control panel “Function 11..” The four leftmost characters displayed describe the reference code identifier. The rightmost four characters are the unit reference code. An SRC can consist of up to 36 bytes of information. Other words of the SRC may be viewed by using the increment or decrement functions on the controls panel. Functions 11 and 13 through 19 are valid SRC data words. The SRC type or reference code identifiers that are valid for the S70 are listed below. The SRC types can be identified by the first digit after the 11-3 in Function 11. For completeness all the valid reference code identifiers for the S70 are listed below.

0000 Hardware reported error. A system problem resulted from a hardware problem.

1XXX Hardware reported error. A system problem resulted from a hardware problem.

A1XX Attention or action required. The system is waiting for a user action.

B006 Machine check or internal problem detected by firmware. A firmware program detected either a software or a hardware error.

B1XX Machine check or internal problem detected by firmware. A firmware program detected either a software or a hardware error.

B4xx Machine check or internal problem detected by firmware. A firmware code program detected either a software or a hardware error.

C1XX IPL status. Status SRC's are displayed to indicate the progression of the IPL.

C3XX IPL status. Status SRC's are displayed to indicate the progression of the IPL.

D1XX General system status. Status SRC's are displayed to indicate the status of system functions when the console is not available.

IPL Checkpoints and Error Codes

The S70 provides error codes and checkpoints to be displayed during system Initial Program Load (IPL). These codes and checkpoints are unique to particular instances and components of the system: hardware, firmware, and software. The architected sets of checkpoints and error codes are listed below.

- Three digit SRN of the form 101-xxx
- Eight digit checkpoint in SRC format of the form C1XX-xxxx
- Eight digit checkpoint in SRC format of the form C3XX-xxxx
- Four digit checkpoints of the form E0XX
- Four digit checkpoints of the form E1XX
- Four digit checkpoints of the form E4XX
- Four digit checkpoints of the form E5XX

Progress codes can turn into error codes if the system fails to advance past the point at which the code is presented. SRN's are listed in the publication “Diagnostic Information for Multiple Bus Systems.” A list of checkpoints can be found in “Chapter 5. Checkpoints”
of this book. Each entry provides a description of the event and the recommended action if the system fails to advance.

FRU Isolation

“Chapter 6. Error Code to FRU Index” provides a listing of the error codes and recommended actions for each code. These actions can refer to “Chapter 10. S70 Parts,” “Chapter 4. MAPs,” 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 per each occurrence as required. Locations codes are listed under “AIX and Physical Location Code Reference Tables” on page 1-49.

“Chapter 10. Parts” is organized to provide the fastest and most direct access possible for part number lookup and component visualization. The front of the chapter provides a parts index with the predominant field replaceable units (FRUs) listed by name. The remainder of the chapter provided illustrations of the various structures and components which make up the S70. The illustrations are ordered with system rack components listed first, I/O rack and then accessories.

Chapter 4. Maintenance Analysis Procedures (MAPs)

Entry MAP

Use the following table to determine your starting point.

When possible, run Online Diagnostics in Service Mode. Online Diagnostics perform additional functions, compared to Standalone Diagnostics. This ensures that the error state of the system is captured in NVRAM for your use in fixing the problem. The AIX error log and SMIT are only available when diagnostics are run from the hard drive.

Notes:

1. When eight digits are displayed in the operator panel, additional information can sometimes be obtained by looking at the system reference codes in function 11 to 19. See Appendix A on page A-1.
2. Licensed programs frequently rely on network configuration, and system information stored on the VPD on the operator panel control assembly. If the MAPs indicate that the Operator Panel Control Assembly should be replaced, 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 is replaced, the network administrator must be notified so that the client IP addresses used by the server can be changed. In addition, the operating system configuration of the network controller may need to be changed in order to enable system startup. Also check to ensure that any client or server that addresses this system is updated.

Symptom	Starting Point
You have a problem that does not prevent the system from booting.	Go to the Fast Path MAP in the *Diagnostic Information for Multiple Bus Systems*.
You do not have a symptom.	Go to MAP 0020 in the *Diagnostic Information for Multiple Bus Systems*
You have an SRN.	Go to the Fast Path MAP in the *Diagnostic Information for Multiple Bus Systems*.
The system stops and a 3-digit number is displayed in the operator panel display.	Record SRN 101-xxx, where xxx is the 3-digit number displayed in the operator panel display, then go to the Fast Path MAP in the *Diagnostic Information for Multiple Bus Systems*.
The system will not boot.	Go to "Quick Entry MAP" on page 4-2.

Quick Entry MAP

Quick Entry MAP Table of Contents

Symptom	Action
Service Actions	
You have parts to exchange or a corrective action to perform.	1. Go to the *Removal and Replacement Procedures*. 2. Go to the *Repair Checkout Procedure* in the *Diagnostic Information for Multiple Bus Systems*.
You need to verify that a part exchange or corrective action corrected the problem.	Go to the *Repair Checkout Procedure* in the *Diagnostic Information for Multiple Bus Systems*.
You need to verify correct system operation.	Go to the *System Checkout Procedure* in the *Diagnostic Information for Multiple Bus Systems*.
8-Digit Error Codes	
You have an 8-digit error code displayed.	Look up the error code in the table in Chapter 6 on page 6-1.
System Stops With an 8-Digit Number Displayed	
The system stops with an 8-digit error code displayed when booting.	Record the error code. Go to Chapter 6 on page 6-1.
System Stops With a 4-Digit Number Displayed	
The system stops with a 4-digit error code and the first digit is "E."	Go to Chapter 5 on page 5-1.
The system stops with a 4-digit error code and the first digit is not "E."	Take the last 3 digits and put 101- on the left to make an SRN. Go to *Diagnostic Information for Multiple Bus Systems*.
There Appears to be a Display Problem (Distortion, Blurring,Etc.)	

<table>
<tr><th>Symptom</th><th>Action</th></tr>
<tr><td>All display problems.</td><td>1. If using a graphics display:
a. Go to the Problem Determination Procedures for the display.
b. If you do not find a problem, replace the display adapter.
c. If you do not find a problem, suspect the I/O planar. Go to “MAP 1540: Minimum Configuration” on page 4-58.
2. If using an ASCII terminal:
a. Make sure that the ASCII terminal is connected to S1.
b. If problems persist, go to the Problem Determination Procedures for the terminal.
c. If you do not find a problem, replace the Service Processor card.
d. If you do not find a problem, suspect the I/O planar. Go to “MAP 1540: Minimum Configuration” on page 4-58.</td></tr>
<tr><td colspan="2">Power and Cooling Problems</td></tr>
<tr><td>You cannot power on the system.</td><td>Go to “MAP 1520: Power” on page 4-13.</td></tr>
<tr><td>The power light does not come on or stay on. (both the operator panel power-on LED and the I/O Drawers indicator panel power LEDs do not come on or stay on).</td><td>Go to “MAP 1520: Power” on page 4-13.</td></tr>
<tr><td>An Input/output Rack or a rack mounted unit will not power on.</td><td>Go to “MAP 1520: Power” on page 4-13.</td></tr>
<tr><td>You have a power problem or there is an SRC in function 5 (05-1xxx-xxxx).</td><td>Go to “MAP 1520: Power” on page 4-13.</td></tr>
<tr><td>The system attention LED on the operator panel is on but there is no SRC displayed in function 11-3 on the control panel.</td><td>Go to “MAP 1520: Power” on page 4-13.</td></tr>
<tr><td colspan="2">Flashing 888 in Operator Panel Display</td></tr>
<tr><td>A flashing 0888 or 888 is displayed in the operator panel display.</td><td>Go to the Fast Path MAP in the Diagnostic Information for Multiple Bus Systems.</td></tr>
<tr><td colspan="2">Other Symptoms or Problems</td></tr>
<tr><td>The operator panel displays only the yellow background light. Fans and blowers are off.</td><td>The Service Processor (SP) is ready. The system is waiting for power on.</td></tr>
</table>

Symptom	Action
All of the system POST indicators are displayed on the system console, the system pauses and then restarts. The term "POST indicators" refer to the icons (graphic display) or device mnemonics (ASCII terminal) that appear during the power-on self-test (POST).	Go to “Boot Problems” on page 5-15.
The system stops and all of the POST indicators are displayed on the system console. The term "POST indicators" refer to the icons (graphic display) or device mnemonics (ASCII terminal) that appear during the power-on self-test (POST).	Go to “MAP 1540: Minimum Configuration” on page 4-58 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 Chapter 5 on page 5-1.
The system does not respond to the password being entered or the system login prompt is displayed when booting in service mode.	1. If the password is being entered from a keyboard attached to the system, then the keyboard or its controller may be faulty. In this case, replace these parts in the following order: a. Keyboard cable b. Keyboard c. Service Processor card 2. If the password is being entered from an ASCII terminal, then use the *Problem Determination Procedures* for the ASCII terminal. Make sure the ASCII terminal is connected to S1. If the problem persists, replace the Service Processor card.
No codes are displayed on the operator panel within a few seconds of turning on the system. The operator panel is blank before the system is powered on.	Reseat the operator panel cable. If problem not resolved, replace in order: 1. Operator Panel Assembly. Update the VPD information in the new operator panel. 2. Service Processor card (See notes on 4-1.)

Symptom	Action
The SMS configuration list or Boot sequence selection menu shows more SCSI devices attached to a controller/adapter than are actually attached.	A device may be set to use the same SCSI bus ID as the control adapter. Note the ID being used by the controller/adapter (this can be checked and/or changed via an SMS utility), and verify that no device attached to the controller is set to use that ID. If settings do not appear to be in conflict: 1. Replace the SCSI cable. 2. Replace the device. 3. Replace the SCSI adapter **Note:** In a "Twin-tailed" configuration where there is more than one initiator device (normally another system) attached to the SCSI bus, it may be necessary to change the ID of the SCSI controller or adapter with the System Management Services.
The System Management Services menu is displayed.	The device or media you are attempting to boot from may be faulty. 1. Check the SMS error log for any errors. To check the error log: • Choose error log • If an error is logged, check the time stamp. • If the error was logged during the current boot attempt, record it. • Look up the error in Chapter 6 and do the listed action. • If no recent error is logged in the error log, continue to the next step below. 2. Try to boot from an alternate boot device connected to the same controller as the original boot device. If the boot succeeds, replace the original boot device (for removable media devices try the media first). 3. Go to “MAP 1540: Minimum Configuration” on page 4-58.
You suspect a cable problem.	Go to the *RS/6000 Adapters, Devices, and Cable Information for Multiple Bus Systems*.
All other problems.	Go to “MAP 1020: Problem Determination” on page 4-7.

MAP 1020: Problem Determination

Purpose of This MAP

Use this MAP to get an error code if you were not provided one by the customer or you are unable to load diagnostics. If you are able to load the diagnostics, go to MAP 0020 in the *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 C-14).

Be prepared to record code numbers and use those numbers in the course of analyzing a problem. Go to "Step 1020-1" on page 4-8.

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 *RS/6000 Enterprise Server S70 User's Guide*, all the settings of the Service Processor (except Language) were saved by using the SAVE/RESTORE HARDWARE MAINTENANCE POLICIES Service Aid. You may use that same Service Aid to restore the settings at the end of your service action.

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

In addition to the parameters in the table below, you may wish to disconnect the modem to prevent incoming signals that could cause the S70 to power on.

Following are the Service Processor settings of your interest. The Service Processor menus are described in Appendix C on page C-1.

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.

Another feature that could disrupt a service action by powering the S70 on is an AIX function called “Timed Power-On.” If you think it should be turned off during your service action, refer to the “System Power-On Methods” in the *System User's Guide: Operating System and Devices* (order number SC23-4121).

Step 1020-1

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

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

1. Power off the system. Refer to “Powering Off the System” on page 9-4.
2. Power on the system. Refer to “Powering On the System” on page 9-5
3. Insert the diagnostic CD-ROM into the CD-ROM drive.
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 system stopped and a code is displayed on the operator panel.	Go to the “Entry MAP” on page 4-1.
The system stops with a prompt to enter a password.	Enter the password. You are not allowed to continue until a correct password has been entered. When you have entered a valid password go to the beginning of this table and wait for one of the other conditions to occur.
The diagnostic operating instructions are displayed.	Go to MAP 0020 in the *Diagnostic Information for Multiple Bus Systems*.
The power good LED does not come on or does not stay on or you have a power problem.	Go to “MAP 1520: Power” on page 4-13.
The system login prompt is displayed.	You may not have pressed the correct key or you may not have pressed the key soon enough when you were to indicate a Service Mode IPL of the diagnostic programs. If this was the case start over at the beginning of this Step. **Note:** Perform the systems shutdown procedure before turning off the system. If you are sure you pressed the correct key in a timely manner, go to “Step 1020-2” on page 4-11.
The system does not respond when the password is entered.	Go to “Step 1020-2” on page 4-11.
The system stopped and a POST indicator is displayed on the system console and an eight-digit error code is not displayed.	If the POST indicator represents: 1. Memory, go to “MAP 1540: Minimum Configuration” on page 4-58. 2. Keyboard a. Replace the keyboard cable. b. Replace the keyboard. c. Replace the Service Processor card. d. Go to “MAP 1540: Minimum Configuration” on page 4-58 3. Network, go to “MAP 1540: Minimum Configuration” on page 4-58. 4. SCSI, go to “MAP 1540: Minimum Configuration” on page 4-58. 5. Speaker a. Replace the speaker. b. Replace the Service Processor card. c. Go to “MAP 1540: Minimum Configuration” on page 4-58

Symptom	Action
The System Management Services menu is displayed	Go to “Step 1020-4” on page 4-12.
All other symptoms.	If you were directed here from the Entry MAP, go to “MAP 1540: Minimum Configuration” on page 4-58. Otherwise, find the symptom in the “Entry MAP” on page 4-1.

Step 1020-2

There is a problem with the keyboard.

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

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

Step 1020-3

Take the following actions:

1. Find the eight-digit error code in Chapter 6 on page 6-1.

   Note: If the eight-digit error code is not listed in Chapter 6, look for it in the following:

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

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

2. Perform the action listed.

Step 1020-4

1. Turn off, then turn on the system unit.
2. When the keyboard indicator appears, press the F1 key on a directly attached keyboard or the 1 key on an ASCII terminal.
3. When the System Management Services appear, check the error log for any errors.
   - Choose Error Log
   - If an error is logged, check the time stamp.
   - If the error was logged during the current boot attempt, record it.
   - Look up the error in the Chapter 6 on page 6-1 and do the listed action.
   - If no recent error is logged in the error log, go to “MAP 1540: Minimum Configuration” on page 4-58.

MAP 1520: Power

This procedure is used to locate power problems in the System Rack or Input/output Rack. If a problem is detected, this procedure helps you isolate the problem to a failing unit.

Observe the following safety notices during service procedures.

DANGER

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

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

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

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

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

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

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

CAUTION:
Energy hazard, remove power before servicing. Disconnect two power supply cords.

Find the symptom in the following table; then follow the instructions given in the Action column.

Symptom	What You Should Do
Power Problems	
The system attention LED on the operator panel is on, there may or may not be an error code displayed on the operator panel.	In addition to function 11, error codes can also appear in function 5. Look at function 5 and record the error code shown. Go to "(1xxx) System Power Control Network (SPCN) Reference Codes" on page 6-30 and find the reference code.
System Rack does not become powered on	Go to "Cannot Power On System Rack (No Error Code)" on page 4-15.
I/O Drawer does not become powered on (Input/output Rack Power light at the power distribution bus is not on).	Go to "Cannot Power On Input/output Rack (No Error Code)" on page 4-23.
Input/output Racks became powered on, but one or more rack-mounted units do not become powered on (no error code).	Go to "Input/output Rack Becomes Powered On, But A Rack Mounted Unit Does Not Become Powered On" on page 4-32
The System Rack, Input/output Rack, or a rack mounted unit does not become powered off.	Go to "System Rack, I/O Rack, or Rack Mounted Unit Cannot Become Powered Off" on page 4-36.
You have been directed here by the SRC tables, the SRC is 1xxx1200.	Go to "The SRC Table Has Directed You Here and the SRC is 1xxx1200" on page 4-38.
You have been directed here by the SRC tables, the SRC is 1xxx120y, where y=1-6.	Go to "The SRC Table Has Directed You Here and the SRC is 1xxx120y or 1xxx140y" on page 4-43.
You have been directed here by the SRC tables, the SRC is 1xxx140y, where y=1-6.	Go to "The SRC Table Has Directed You Here and the SRC is 1xxx120y or 1xxx140y" on page 4-43.
You have been directed here by the SRC tables, the SRC type is 1xxx, and the reference code is 6018, 6118, 6218, 6318, 631A, 633A, 6518, 6618, 6718, 671A, 6A18, 6x38 or CE19.	Go to "Regulator Problem Isolation" on page 4-49.
You have been directed here by the SRC tables, the SRC is 1xxx640x.	Go to "Power Good Problem Isolation" on page 4-52.
You have been directed here by the SRC tables, the SRC type is 1xxx and the reference code is 7201 or 7300.	Go to "AC Box (or DC Box, If -48 V dc System) Problem Isolation" on page 4-54.

Cannot Power On System Rack (No Error Code)

To correct the power-on problem, perform this procedure until the problem is corrected and you can power on the system.

The following steps are for the System Rack, unless other instructions are given.

1. Attempt to power on the system (see “Powering Off and Powering On the System” on page 9-4).

   Does the system power on?

   No **Yes**

   ↓ Go to step 12 of this procedure.

2. **Is the background light for the Data display on the operator panel on?**

   Note: The background light is a dim (yellow) light in the Data area on the control panel.

   No **Yes**

   ↓ Go to step 8 of this procedure.

3.

   Note: Read the Danger and Caution notices under “Safety Notices” on page xv before continuing with this procedure.

   Perform the following:

   a. Disconnect the AC power cable from the customer’s AC power source.

      (For **-48 V dc systems**, disconnect power by setting all circuit breakers to the Off position, then disconnecting the power cables from the top and bottom connectors on the DC box.

      Remove the cover from the power distribution assembly exposing the circuit breaker panels.)

   b. Use a multimeter to measure the AC voltage at the customer’s AC power source.

      (If **-48 V dc system**, using a multimeter, measure the input voltage from the customer supplied power cables. Check between **ALL** -48 V dc supply and return cables for -40 to -60 V dc. See the figure on page 1-40.

      Note: There is one AC power cable for each System Rack or Input/output Rack.

(-48 V dc systems have multiple DC power cables for each rack) Disconnect all the AC power cables and measure the AC voltage at all AC power outlets before answering the following question.

Is the AC voltage from 200 V ac to 240 V ac?
(Is the DC voltage from -40 to -60 V dc?)

Yes **No**

↓ Perform the following:

a. Inform the customer that the AC voltage at the AC power outlet is not correct.

   (If **-48 V dc system**, inform the customer that the DC voltage on the customers -48 V dc supply is not correct.)

b. **-48 V dc systems only:** If the customer voltage is correct with the -48 V dc leads disconnected from the S70, a problem could exist in a circuit breaker panel or in one of the two DC cables supplying power to the DC box.

c. Disconnect all leads (the cables that connect from the circuit breaker panel to the DC box) from the output side of the circuit breaker panel in question.

   Reconnect the -48 V dc leads from the customer's supply to the circuit breaker panel input connectors.

   Measure the input voltage from the customer supplied DC feed.

   Is the voltage between -40 and -60 V dc?

   Yes **No**

   ↓ Replace the circuit breaker panel.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

d. Check for possible faulty breaker operation. Do all breakers turn on and off properly, verify breaker with multimeter voltage reading. Check for possible shorted DC cable.

e. Reconnect the AC power cables to the power source when the AC voltage at the power source is correct.

   (If **-48 V dc system**, set all circuit breakers to the Off position, reconnect any disconnected DC power cables, and reinstall the cover plate on the power distribution assembly. Have the customer apply power and set all the circuit breakers to the On position.)

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Are all circuit breakers reset at the Input/output Rack PDB (or DC circuit breaker panels on the top of the System Rack and Input/output Rack, if -48 V dc system)?

Yes No

↓ Reset the popped circuit breaker.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

4. **Are the AC power cables from the AC box to the customer's AC power outlet connected and seated correctly at both ends?**

   (If -48 V dc system, are the two cables from the circuit breaker panel to the DC box seated correctly? See the figure on 1-40 for DC cabling.)

   Yes No

   ↓ Perform the following:

   a. Connect the AC (or DC, if -48 V dc system) power cables correctly at both ends. Set the circuit breakers to the Off position while disconnecting cables, then back to the On position.

   b. Go to step 1 of this procedure.

5.

   Note: Read the Danger and Caution notices under "Safety Notices" on page xv before continuing with this procedure.

   Perform the following:

   a. Disconnect the AC (or DC, if -48 V dc system) power cables from the AC box (or DC box, if -48 V dc system).

      Note: Set the circuit breakers to the Off position while connecting cables, then back to the On position.

   b. Use a multimeter to measure the AC (or DC, if -48 V dc system) voltage at the AC box (or DC box, if -48 V dc system) end of the power cables.

6. **Is the AC voltage from 200 V ac to 240 V ac**
   (Is the DC voltage -40 to -60 V dc on -48 V dc systems)?

Yes **No**

↓ Perform the following:

a. Exchange the AC power cable

(if you are working on a **-48 V dc** powered system, perform the following:

- Verify that all circuit breakers are in the On position.
- Having verified the breakers were in the correct position, now set all circuit breakers to the Off position and verify that all cables between the circuit breaker panels and the DC box have good continuity.

If you cannot find a problem with the cables or circuit breakers, replace the failing circuit breaker panel.)

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

b. Go to step 1 of this procedure.

7. Perform the following:

   a. Disconnect the AC power cable from the customer's AC power outlet

      (if **-48 V dc system**, disconnect the -48 V dc power by:

      1. Placing all the circuit breakers in the Off position.
      2. Remove the top and bottom DC box input cables, see page 1-40 for cable positions.)

      Note: Disconnect all other AC power cables.

   b. Exchange one of the following FRUs:

      1. System rack operator panel card
      2. SPCN card
      3. System unit operator panel cable
      4. System unit SPCN System Rack to Input/output Rack cable
      5. AC box (or DC box, if -48 V dc system)
      6. System unit backplane

   c. Reconnect the AC power cables to the power source.

      (if **-48 V dc system**, reconnect the top and bottom DC cables to the DC box and set all the circuit breakers to the On position.)

   d. Attempt to power on the system.

   e. If the system powers on, the FRU you exchanged is the failing item.

      If the system does not power on, repeat steps 7a through 7e of this procedure and exchange the next FRU in the list.

   f. If the system does not power on after exchanging all the FRUs in the list, ask your next level of support for assistance.

8. Perform the following:

   a. Power off the system.

   b. Attempt to power on the system.

   Does the system power on?

   Yes **No**

   ↓ Go step 7 of this procedure.

9. Perform the following:

   a. Power off the system.

   b. Display the selected IPL mode on the system unit operator panel.

   Is the selected mode the same mode the customer was using when the power-on failure occurred?

   No **Yes**

   ↓ Go step 14 of this procedure.

10. Perform the following:

    a. Power off the system.

    b. Select the mode on the system unit operator panel the customer was using when the power-on failure occurred.

    c. Attempt to power on the system.

    Does the system power on?

    Yes **No**

    ↓ Go step 14 of this procedure.

11. Exchange system unit operator panel card (see “System Rack Removal and Replacement Procedures” on page 9-6). Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

12. Perform the following:

    a. Power off the system.

    b. Display the selected IPL mode on the system unit control panel.

Table 4-1. Function 01

Function/Data	**Description**
01 _ _ _ _ _ _	Use increment or decrement button and scroll to function 01.
01 _ _ _ A _ _	Press ENTER to enter function 01 Selected IPL Type display. Valid types, which appear in the sixth character position of the Function/Data display, are A, B.

Is the selected mode the same mode the customer was using when the power-on failure occurred?

No **Yes**

↓ Go step 14 of this procedure.

13. Perform the following:

    a. Power off the system.

    b. Select the mode on the system unit operator panel the customer was using when the power-on failure occurred.

    c. Attempt to power on the system.

    Does the system power on?

    Yes **No**

    ↓ Exchange the system unit operator panel card (see “System Rack Removal and Replacement Procedures” on page 9-6).

    This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

14. **Is an eight digit error code displayed on the System Rack operator panel?**

    No **Yes**

    ↓ Go to “Entry MAP” on page 4-1.

15. **Is the Power-On LED (on the operator panel) on continuously?**

    Note: The Power-On LED blinks during a normal power-on sequence. It should not blink for more than 1 minute.

    No **Yes**

    ↓ Go to step 17 of this procedure.

16. Perform the following:

    a. Disconnect the AC power cable from the customer’s power source. (if -48 V dc system, disconnect the -48 V dc power by:

        1. Setting all the circuit breakers to the Off position.

        2. Disconnecting the top and bottom DC box input cables, see 1-40 for cable positions.)

b. Exchange one of the following FRUs:

   1. SPCN card
   2. AC box (or DC box, if -48 V dc system)
   3. System rack operator panel card

c. Reconnect the AC (or DC, if -48 V dc system) power cable to the power source.

d. Attempt to power on the system.

e. If the system powers on, the FRU you exchanged is the failing item.

   If the system does not power on, repeat steps 16a through 16e of this procedure and exchange the next FRU in the list.

f. If the system does not power on after exchanging all the FRUs in the list, ask your next level of support for assistance.

This ends the procedure.

17. **Have all of the racks and units on the system become powered on?**

    Yes **No**

    ↓ Return to “MAP 1520: Power” on page 4-13.

18. Continue the IPL.

    Does the IPL complete successfully?

    No **Yes**

    ↓ **This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

19. Go to “Entry MAP” on page 4-1.

Cannot Power On Input/output Rack (No Error Code)

1. Power off the system (see “Powering Off and Powering On the System” on page 9-4).
2. Starting from J15 or J16 on the system unit (refer to “System Rack Locations Rear” on page 1-11 for location), go to the first Input/output Rack in the Input/output Rack interconnect cable sequence on which the PDB Power On light is off (if a -48 V dc system, the first rack in which power will not come on).
3.

   Note: Read the Danger and Caution notices under “Safety Notices” on page xv before continuing with this procedure.

   Is this a -48 V dc powered system?

   No **Yes**

   ↓ Go to 7 on page 4-24.

   Use a multimeter to measure the AC voltage at the customer’s AC power outlet.

   Is the ac voltage from 200 V ac to 240 V ac?

   Yes **No**

   ↓ Inform the customer that the AC voltage at the power outlet is not correct.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

4. **Is the AC power cable from the Input/output Rack PDB to the customer’s AC power outlet connected and seated correctly at both ends?**

   Yes **No**

   ↓ Connect the AC power cables correctly at both ends.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

5.

Note: Read the Danger and Caution notices under “Safety Notices” on page xv before continuing with this procedure.

Perform the following:

a. Disconnect the AC power cable from the Input/output Rack PDB.

b. Use a multimeter to measure the AC voltage at the Input/output Rack end of the AC power cable.

Is the AC voltage from 200 V ac to 240 V ac?

Yes **No**

↓ Exchange the mainline ac power cable.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

6. Replace the Power Distribution Bus (PDB).

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

7.

a. Switch off power to the system and all devices and drawers in the rack. Refer to the service guides for the devices installed in your rack for more information.

b. Switch off power to all external devices attached to the rack. Refer to the service guide for the external devices attached to your rack for more information.

c. Set the switches for all circuit breaker panels in to the off position.

d. Remove the screws attaching the top cover to the power distribution assembly, and remove the top cover.

8. Using a multimeter, measure for -40 to -60 V dc between the -48 V dc input connectors (upper connectors) and the return ground connectors (lower connectors) for both the A and B power sources on each circuit breaker panel. If both 20A/10A and 15A circuit breaker panels are installed, measure the A and B side of each.

   Is the correct voltage present?

   Yes **No**

   ↓

   a. Check the customer power source for the correct voltage, and check the external power cables (from customer's power source) are correctly installed and operational.

   b. If the customer's power source verified good, go to step 9 of this procedure.

      If the customer's power source is faulty, have the customer fix the faulty power source.

      This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

9.

   a. Set all of the circuit breaker switches on the 20A/10A circuit breaker panel to the On position.

   b. Measure for -40 to -60 V dc between the -48 V dc supply output and positive ground return connections for each of the eight circuit breakers within the 20A/10A circuit breaker panel. Record and note any readings which are out of range.

   Is the voltage between -40 and -60 V dc at each position?

   Yes **No**

   ↓ Go to 11 on page 4-26.

10.

a. Set all of the circuit breaker switches in the 20A/10A circuit breaker panel to the Off position.

b. Set all of the circuit breaker switches in the 15A circuit breaker panel to the On position.

c. Measure for -40 to -60 V dc between the -48 V dc supply output and positive ground return device connectors for each of the eight circuit breakers within the 15A circuit breaker panel. Record and note any readings which are out of range.

Is the voltage between -40 and -60 V dc at each position?

Yes **No**

↓ Go to 15 on page 4-29

Go to 14 on page 4-29

11.

a. Set all circuit breaker switches in **both** circuit breaker panels in your rack to the Off position.

b. Carefully label the device -48 V dc power cables and the DC return cables with device, polarity, and circuit breaker position information.

c. Disconnect all of the device and drawer -48 V dc power cables and positive return ground cables from the 20A/10A circuit breaker panel. Tape the ends of the disconnected cables to insulate them and lay them aside.

d. Set all circuit breakers in the 20A/10A circuit breaker panel to the On position.

e. Measure for -40 to -60 V dc between the negative and positive device connectors for each of the eight circuit breakers in the 20A/10A circuit breaker panel.

Is the voltage between -40 and -60 V dc at each position?

Yes **No**

↓ Replace the 20A/10A circuit breaker panel.

This ends the procedure.

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

12.

a. Set all circuit breaker switches in **both** circuit breaker panels to the Off position.

b. Reconnect all device -48 V dc power cables and return cables to the 20A/10A circuit breaker panel **except** for cables to those positions which were out of range in 9 on page 4-25.

   Note: Visually check for shorts at the terminal lugs.

c. Set all circuit breaker switches on the 20A/10A circuit breaker panel to the On position.

d. Measure for -40 to -60 V dc between the negative and positive device connectors for each of the eight circuit breakers in the 20A/10A circuit breaker panel **including** those positions which were out of range in 9 on page 4-25.

Is the voltage between -40 and -60 V dc at each position?

Yes **No**

↓ An intermittent problem may exist in the power distribution system. Possible causes are:

- 20A/10A circuit breaker panel
- Attached cables

This ends the procedure.

13.

a. Set all circuit breaker switches in the 20A/10A circuit breaker panel to the Off position.

b. Reconnect the device -48 V dc power cables and return ground cables for those circuit breaker positions which were out of range in 9 on page 4-25.

c. Set the circuit breaker panel switches for the positions which were out of range in 9 on page 4-25 to the On position.

d. Measure for -40 to -60 V dc between the -48 V dc supply and ground return device connectors *for the circuit breakers in the 20A/10A circuit breaker panel that were out of range.*

Is the voltage between -40 and -60 V dc at each position?

Yes **No**

↓ The power problem is located in the attached device. Consult the service guide for the failing device for diagnostics.

This ends the procedure.

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

The symptom has changed, there may be an intermittent problem with the circuit breaker panel or an intermittent short at the attached device or cable.

This ends the procedure.

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

14. The circuit breakers are functioning properly. The power problem is probably located in the power supply for the drawer or devices installed in your rack. Refer to the service guide for the drawers or devices installed in your rack.

    This ends the procedure.

15.

    a. Set all of the circuit breaker panel switches in **both** circuit breaker panels to the Off position.

    b. At the terminal strip, disconnect the cables from the terminal strip to the devices or drawers for every circuit breaker panel position that was out of range in 10 on page 4-26. Carefully label each pair, tape the ends to insulate the leads, and set the cables aside.

    c. Set the circuit breaker switches on the 15A circuit breaker panel to the On position.

    d. Measure for -40 to -60 V dc between the -48 V dc supply and ground return device connectors at the circuit breaker panel for the circuit breakers in the 15A circuit breaker panel that were out of range.

    Is the voltage between -40 and -60 V dc at each position?

    Yes **No**

    ↓ Go to 16

    The problem is located in the device or drawer attached to the circuit breaker panel in question. Refer to the service guide for the attached drawer or device for diagnostics.

    This ends the procedure.

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

16.

    a. Set all circuit breaker switches in **both** circuit breaker panels to the Off position.

    b. At the terminal strip, disconnect the cables from the terminal strip to the circuit breaker panel for every circuit breaker position that was out of range in 10 on page 4-26. Carefully label each pair, tape the ends to insulate the leads, and set the cables aside.

    c. Set the 15A circuit breaker switch associated with these cables to the On position.

d. Measure for -40 to -60 V dc between the -48 V dc supply and ground return device connectors at the circuit breaker panel for the circuit breakers in the 15A circuit breaker panel that were out of range.

Is the voltage between -40 and -60 V DC?

Yes **No**

↓ Go to 18 in this procedure.

17.

a. Set all circuit breaker switches on both circuit breaker panels to the Off position.

b. Using an ohmmeter, check the terminal strip to see if it is shorted.

Is the terminal strip shorted?

Yes **No**

↓ Possible intermittent short was made at the the terminal strip. Replace the cables and verify that the proper voltage is present.

If the proper voltage is not present, consult the service guide for the device or drawer attached to this position.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Replace the terminal strip.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

18.

a. Set all circuit breaker switches on both circuit breaker panels to the Off position.

b. At the circuit breaker panel, disconnect both cables (sides A and B) from the connectors for the circuit breakers in question.

c. Set the circuit breaker switches for the 15A circuit breaker panels in question to the On position.

d. Measure for -40 to -60 V dc between the -48 V dc supply and positive ground return for the 15A circuit breaker in question.

Is the voltage between -40 and -60 V dc?

No **Yes**

↓ Replace the cables connecting the circuit breaker panel to the terminal strip.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Replace the 15A circuit breaker panel.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Input/output Rack Becomes Powered On, But A Rack Mounted Unit Does Not Become Powered On

If you have a problem powering on a drawer in an Input/output Rack, examine all the I/O Drawer Indicator Panels to attempt to isolate the problem I/O Drawer. See "I/O Drawer Indicator Panel" on page 1-24 for more information.

1. **Are all circuit breakers reset at the Input/output Rack PDB (If -48 V dc system, are all circuit breakers on the circuit breaker panel reset?)**

   Yes No

   ↓ Reset the popped circuit breaker.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

2. **Are all the AC "Y" cables seated firmly and connected from the Input/output Rack PDB to the I/O Drawer (one end to a PDB outlet, the other two ends of the same AC "Y" cable to the two separate dc power supplies of the same I/O Drawer)?**
   (On -48 V dc systems, check the power cables from the circuit breaker panel on the top of the rack to the I/O Drawers for correct connections. Are all the -48 V dc connections correct and tight?)

   Yes No

   ↓ Fix the connection.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

3.

   Note: Read the Danger and Caution notices under "Safety Notices" on page xv before continuing with this procedure.

   Perform the following:

   a. Disconnect the AC "Y" power cable 1/4 and 3/4 power cables from each power supply on each I/O Drawer that fails to power on.

      (if -48 V dc system, disconnect the power cables for -48 V dc operation to the 1/4 and 3/4 power supplies.)

      Note: Set circuit breakers to the Off position while disconnecting the DC power cables. Then set the circuit breakers to the On position.

   b. Use a multimeter to measure the AC (or DC, if -48 V dc system) voltage at the I/O Drawer end of the AC (or DC, if -48 V dc system) power cables.

Is the ac voltage from 200 V ac to 240 V ac
(Is the DC voltage from -40 to -60 V dc on -48 V dc systems)?

Yes **No**

↓ Exchange the "Y" AC power cable (or the 1/4 and 3/4 DC power cables, on -48 V dc systems)

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

4. **Is a primary I/O Drawer in the I/O rack not powering up?**

   Note: The primary I/O Drawer is the only I/O Drawer with a Service Processor card in Slot 8.

   Yes **No**

   ↓ Go to step 9

5. Replace the following, one at a time, turning off the power before replacement and attempting to power on after replacement:

   a. Service Processor card

   b. 3/4 power supply

   c. 1/4 power supply

   d. I/O Planar

6. **Does the I/O Drawer power up?**

   Yes **No**

   ↓ Go to step 14 on page 4-34.

7. **Are all I/O Drawers powered up (green LEDs are on both supplies in each I/O Drawer)?**

   Yes **No**

   ↓ Go to step 18 on page 4-34.

8. **This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

9. **Are all SPCN cables from and to the secondary I/O Drawer(s) connected properly and firmly seated?**

   Yes **No**

   ↓ Go to step 23 on page 4-34.

10. **Is only one secondary I/O Drawer not powering up?**

Yes **No**

↓ Go to step 24 on page 4-34.

11. Replace the following:
    a. 3/4 power supply
    b. 1/4 power supply
    c. I/O Planar.
12. **Does the I/O Drawer power up?**

    Yes **No**

    ↓ Go to step 16.
13. Go to step 7 on page 4-33.
14. **Have you replaced all parts in the list in step 5 on page 4-33?**

    Yes **No**

    ↓ Go to step 5 on page 4-33 and try the next part in the list.
15. Ask your next level of support for assistance.

    This ends the procedure.
16. **Have you replaced all parts in the list in step 11?**

    Yes **No**

    ↓ Go to step 11 and try the next part in the list.
17. Go to step 15.
18. **Does the I/O Drawer have at least one power supply LED on?**

    Yes **No**

    ↓ Go to step 21.
19. Replace the power supply with the LED off.
20. Go to step 7 on page 4-33.
21. Replace all the SPCN cables connected to the failing I/O Drawer.
22. Go to step 12.
23. Connect all the SPCN cables properly.

    This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.
24. **Are all the SPCN cables from the primary I/O Drawer connected properly and firmly seated?**

Yes **No**

↓ Go to step 23.

25. Replace the SPCN cables from the primary I/O Drawer.
26. Go to 12 on page 4-34.

System Rack, I/O Rack, or Rack Mounted Unit Cannot Become Powered Off

This procedure analyzes a failure of the normal command and operator panel procedures to power off the system or an Input/output Rack

If you have a problem powering off a drawer in and Input/output Rack, examine all I/O Drawer indicator panels to attempt to isolate to the problem I/O Drawer. See “I/O Drawer Indicator Panel” on page 1-24 for more information.

Attention: To prevent loss of data, ask the customer to verify that no interactive jobs are running before you perform this procedure.

1. **Is the power off problem on the System Rack?**

   No **Yes**

   ↓ Go to step 4 of this procedure.

2. Ensure that the SPCN cables that connect the racks are connected and seated correctly at both ends.

   Does the Input/output Rack power off, and is the power-good LED off, on all the power supplies in all the drawers (the power supply power-good LED can be seen from the rear of the I/O Drawer)?

   No **Yes**

   ↓ **This ends the procedure.** Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

3. Go to step 5 of this procedure.

4. Refer to “Powering Off and Powering On the System” on page 9-4 to power off the system, then return here and answer the following question.

   Does the System Rack power off, and is the Power On light off?

   No **Yes**

   ↓ The system is not responding to normal power off procedures, which could indicate a Licensed Internal Code problem.

   Ask your next level of support for assistance.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

5. Disconnect the AC (or DC, if -48 V dc system) power cables.

6. Exchange the following FRUs in the System Rack or the Input/output Rack one at a time (see “System Rack Removal and Replacement Procedures” on page 9-6):

   If the System Rack is failing:

   a. Operator panel
   b. SPCN card
   c. AC module
   d. Operator panel cable

   If an Input/output Rack is failing:

   a. SPCN System Rack to Input/output Rack cable
   b. Service Processor card in Input/output Rack.
   c. I/O planar in primary I/O Drawer.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

The SRC Table Has Directed You Here and the SRC is 1xxx1200

The power system in the System Rack is failing.

Attention: AC (or DC, if -48 V dc system) power cable **must** be disconnected from the System Rack before removing or installing regulators 17 or 18.

Note: To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40).

1. Perform the following:

   a. Power off the system.

   b. Remove regulator assemblies R01 to R16, R19, and R20 from the System Rack. Do not remove R17 or R18.

   c. Power on the system.

   Is SRC 1xxx1200 displayed?

   Yes **No**

   ↓ Go to step 14 on page 4-41

2. Perform the following:

   a. Power off the system.

   b. Remove one of the blowers from the System Rack not previously removed during this procedure.

   c. Power on the system.

   Is SRC 1xxx1200 displayed?

   Yes **No**

   ↓ The blower you removed in this step is failing, replace the blower.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

3. **Have you removed all the blowers one at a time?**

   No **Yes**

   ↓ Install all blowers and go to step 5 on page 4-39.

4. Perform the following:

   a. Power off the system.

   b. Install the blower that was removed in step 2

c. Go to step 2

5. Perform the following:

   a. Power off the system.

   b. Remove all except one of the Bulk Power Supplies from the System Rack.

   c. Power on the system.

   Is SRC 1xxx1200 displayed?

   Yes **No**

   ↓ Go to step 11 on page 4-40.

6. Perform the following:

   a. Power off the system.

   b. Remove the only Bulk Power Supply installed.

   c. Install one of the other Bulk Power Supplies that was removed in step 5.

   d. Power on the system.

   Is SRC 1xxx1200 displayed?

   Yes **No**

   ↓ The Bulk Power Supply that was just removed in this step is failing, replace the Bulk Power Supply.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

7. Perform the following:

   a. Power off the system.

   b. Disconnect the AC (or DC, if -48 V dc system) power cables from the System Rack.

      Note: To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40).

   c. Remove regulator assembly R17.

   d. Reconnect the AC (or DC, if -48 V dc system) power cable to the System Rack.

   e. Power on the system.

   Is SRC 1xxx1200 displayed?

Yes No

↓ Regulator assembly R17 is failing, replace regulator assembly R17.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

8. Perform the following:
   a. Power off the system.
   b. Remove the AC (or DC, if -48 V dc system) power cable from the System Rack.

      Note: To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40).
   c. Remove regulator assembly R18.
   d. Reconnect the AC (or DC, if -48 V dc system) power cable to the System Rack.
   e. Power on the system.

   Is SRC 1xxx1200 displayed?

   Yes No

   ↓ Regulator assembly R18 is failing, replace regulator assembly R18.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

9. Perform the following:
   a. Power off the system.
   b. Exchange the SPCN card.
   c. Power on the system.

   Is SRC 1xxx1200 displayed?

   Yes No

   ↓ The SPCN card that was exchanged in this step is the failing item. Leave the new SPCN in the System Rack.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

10. Replace the system backplane assembly.
11. Perform the following:
    a. Power off the system.

b. Install one of the bulk power supplies that was removed in step 5 on page 4-39.

c. Power on the system.

Is SRC 1xxx1200 displayed?

No **Yes**

↓ The bulk power supply you installed in this step is failing, replace the bulk power supply..

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

12. Have you installed all the bulk power supplies that were removed in step 5 on page 4-39.

Yes **No**

↓ Repeat step 11 on page 4-40.

13. Install all units removed in this procedure.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

14. Perform the following:

a. Power off the system.

b. Install one of the regulator assemblies that was removed in step 1 on page 4-38.

c. Remove all the bus load (processor and memory cards, do not remove the clock card).

d. Power on the system.

Is SRC 1xxx1200 displayed?

No **Yes**

↓ The regulator assembly you just installed is failing, replace the regulator assembly.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

15. **Have you installed all the regulators that were removed in step 1 on page 4-38?**

Yes **No**

↓ Go to step 14 on page 4-41

This ends the procedure.

The SRC Table Has Directed You Here and the SRC is 1xxx120y or 1xxx140y

A power regulator card in the System Rack is failing.

1. Perform the following:

   Attention: AC (or DC, if -48 V dc system) power cable **must** be disconnected from the System Rack before removing or installing regulator assemblies R17 or R18.

   Note: To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40).

   Is SRC 1xxx140x displayed?

   No **Yes**

   ↓ Go to step 27 on page 4-47.

2. **Is SRC 1xxx1201 displayed?**

   No **Yes**

   ↓ Go to step 7 on page 4-44.

3. Perform the following:

   a. Power off the system.

   b. Remove the load cards (memory cards M08, M09, and M20).

   c. Power on the system.

   Does the system power on?

   Yes **No**

   ↓ Go to step 27 on page 4-47.

4. Perform the following:

   a. Power off the system.

   b. Install one of the Mxx load cards that was removed in step 3.

   c. Power on the system.

   Does the system power on?

Yes **No**

↓ The last card that was installed in step 4 of this procedure is failing, replace the failing card.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

5. **Have all the Mxx load cards been installed?**

Yes **No**

↓ Repeat step 4 on page 4-43.

6. **This ends the procedure.**

7. **Is SRC 1xxx1202 displayed?**

Yes **No**

↓ Go to step 12 on page 4-45.

8. Perform the following:

   a. Power off the system.

   b. Remove the load cards M07 and M20.

   c. Power on the system.

Does the system power on?

Yes **No**

↓ Go to step 27 on page 4-47.

9. Perform the following:

   a. Power off the system.

   b. Install one of the Mxx load cards that was removed in step 8.

   c. Power on the system.

Does the system power on?

Yes **No**

↓ The last card that was installed in step 9 is failing, replace the failing card.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

10. **Have all the Mxx load cards been installed?**

Yes **No**

↓ Repeat step 9.

11. **This ends the procedure.**

12. **Is the SRC 1xxx1203?**

Yes **No**

↓ Go to step 15.

13. Perform steps 27 on page 4-47 through 29 on page 4-48 and then return here.

Did performing steps 27 on page 4-47 through 29 on page 4-48 resolve SRC 1xxx1203?

No **Yes**

↓ **This ends the procedure.**

14. Replace the system backplane assembly.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

15. **Is the SRC 1xxx1204?**

Yes **No**

↓ Go to step 17.

16. Perform steps 27 on page 4-47 through 29 on page 4-48 and then return here.

Did performing steps 27 on page 4-47 through 29 on page 4-48 resolve SRC 1xxx1204?

No **Yes**

↓ **This ends the procedure.**

17. **Is the SRC 1xxx1205?**

Yes **No**

↓ Go to step 22 on page 4-46.

18. Perform the following:

  a. Power off the system.
  b. Remove cards M10 and M15.
  c. Power on the system.

Does the system power on?

Yes **No**

↓ Go to step 27 on page 4-47.

19. Perform the following:

    a. Power off the system.

    b. Install one of the Mxx load cards that was removed in step 18 on page 4-45.

    c. Power on the system.

Does the system power on?

Yes **No**

↓ The last card that was installed in step 19 is failing, replace the failing card.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

20. **Have all the Mxx load cards been installed?**

Yes **No**

↓ Repeat step 19

21. **This ends the procedure.**

22. **Is the SRC 1xxx1206?**

Yes **No**

↓ Go to “Entry MAP” on page 4-1.

23. Perform the following:

    a. Power off the system.

    b. Remove cards M1 through M6.

    c. Power on the system.

Does the system power on?

Yes **No**

↓ Go to step 27 on page 4-47.

24. Perform the following:

    a. Power off the system.

    b. Install one of the Mxx load cards that was removed in step 23.

    c. Power on the system.

Does the system power on?

Yes **No**

↓ The last card that was installed in 24 is failing, replace the failing card.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

25. **Have all the Mxx load cards been installed?**

Yes **No**

↓ Repeat step 24 on page 4-46

26. **This ends the procedure.**
27. Perform the following:
    a. Power off the system.
    b. Using the reference code see the table at the end of this procedure to identify the possible failing regulators.
    c. Remove one of the possible failing regulators and install a new regulator card.
    d. Power on the system.

Does the system power on?

No **Yes**

↓ The regulator assembly you removed in this step is the failing, replace the regulator assembly.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

28. **Have you swapped all the regulator card assemblies?**

No **Yes**

↓ **This ends the procedure.**

29. Perform the following:

    a. Power off the system.

    b. Remove the new regulator assembly and install the original regulator assembly.

    c. Go to step 27 on page 4-47 to test another regulator assembly.

Reference Code	The Possible Failing Regulators are:
1201, 1401	R1 - R7, R9, R10, R12, R15, R16 Programmable Regulator Assembly
1202, 1402	R3 - R7, R9, R10, R12, R15, R16 Programmable Regulator Assembly
1203, 1204, 1403, 1404	R17, R18 Memory Regulator Assembly
1205, 1206, 1405, 1406	R9 - R12 Programmable Regulator Assembly

Regulator Problem Isolation

Note: Read the Danger and Caution notices under “Safety Notices” on page xv before continuing with this procedure.

Attention: AC (or DC, if -48 V dc system) power cable **must** be disconnected from the System Rack before removing or installing regulators 17 or 18.

Note: To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40).

1. Power off the system.
2. Perform the following:

   Attention: To prevent overheating problems, do not remove any card completely from the card enclosure unless you install an airflow card in its place.

   Disconnect all cards in the System Rack except the SPCN card, regulator assemblies, and the clock card.

   Note: Disconnect the cards by pulling them out about one inch.
3. Power on the system.

   Does a regulator SRC occur?

   Yes **No**

   ↓ Go to step 8 on page 4-50.
4. Perform the following:
   a. Power off the system.
   b. If the SRC identifies the failing regulator, start with that regulator.
   c. Remove one of the regulators and install a new regulator.
   d. Power on the system.

   Does a regulator SRC occur?

   Yes **No**

   ↓ The regulator assembly that was removed in this step is failing, replace the regulator assembly.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.
5. Perform the following:
   a. Power off the system.

b. Remove the new regulator assembly that you just installed and install the original regulator assembly.

c. Remove a different regulator (not previously removed) and install a new regulator.

d. Power on the system.

Does a regulator SRC occur?

Yes **No**

↓ The regulator assembly that was removed in this step is failing, replace the regulator assembly.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

6. Repeat step 5 on page 4-49 until a new regulator assembly has been installed in all possible positions. Then continue with the next step.

7. Exchange the following FRUs, one at a time, until the problem is corrected:

   a. SPCN card

   b. System backplane assembly.

   If the system has the same SRC after exchanging all the FRUs in this procedure, ask you next level of support for assistance.

   This ends the procedure.

8. **Do you have an SRC other than a regulator SRC?**

   No **Yes**

   ↓ A different SRC or reference code occurred. Use the new SRC or reference code and go to “Entry MAP” on page 4-1.

9. Perform the following:

   a. Power off the system.

   b. Install one of the cards you removed in 2 on page 4-49.

   c. Power on the system.

   Does a regulator SRC occur?

   No **Yes**

   ↓ Power off the system.

   Exchange the last card installed.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

10. Repeat step 9 until all of the cards have been installed.

    If a regulator SRC exists after completing this procedure, ask your next level of support for assistance.

    This ends the procedure.

Power Good Problem Isolation

Attention: AC (or DC, if -48 V dc system) power cable **must** be disconnected from the System Rack before removing or installing regulators 17 or 18.

Note: To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40).

1. Perform the following:

   a. Power off the system.

   b. Exchange the SPCN card.

   c. Power on the system.

   Does SRC 1xxx640x continued to be displayed?

   Yes **No**

   ↓ The SPCN card that was removed is failing, replace the SPCN card.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

2. Perform the following:

   a. Power off the system.

   b. Remove one of the regulators in position R11, R16, R17, or R20 and install a new regulator assembly.

      Note: The regulator in position R17 is not the same part number as the other three regulators.

   c. Power on the system.

   Is SRC 1xxx640x displayed?

   Yes **No**

   ↓ The regulator assembly that was removed in this step is failing, replace the failing regulator assembly.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

3. Perform the following:

   a. Power off the system.

   b. Remove the new regulator that was installed in step 2 and replace it with the original regulator.

c. Remove one of the untested regulators from position R11, R16, R17, or R20 and install a new regulator assembly.

d. Power on the system.

Is SRC 1xxx640x displayed?

Yes **No**

↓ The regulator assembly that was removed in this step is failing, replace the failing regulator assembly.

This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

4. Repeat step 3 on page 4-52 until a new regulator has been installed in positions R11, R16, R17, and R20. Then continue with the next step.

5. Remove the processor cards from the System Rack.

   Attention: To prevent overheating problems, do not remove any card completely from the card enclosure unless you install an airflow card in its place.

6. Power on the system.

   Is SRC 1xxx640x displayed?

   No **Yes**

   ↓ Exchange the system backplane assembly in the System Rack

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

7. Perform the following:

   a. Power off the system.

   b. Install one of the cards you removed in 5.

   c. Power on the system.

   Is SRC 1xxx640x displayed?

   No **Yes**

   ↓ Power off the system.

   Replace the last card installed.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

8. Repeat step 7 until all cards have been reinstalled.

   This ends the procedure.

AC Box (or DC Box, If -48 V dc System) Problem Isolation

A bulk power supply with a blinking or unlit light (LED) is an indication of a failure.

Note: Read the Danger and Caution notices under “Safety Notices” on page xv before continuing with this procedure.

Attention: AC (or DC, if -48 V dc system) power **must** be disconnected from the System Rack before removing or installing regulator assemblies 17 or 18.

Note: To remove DC power, first set all circuit breakers on the circuit breaker panels to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40).

1. Perform the following:
   a. Power off the system.
   b. Disconnect all regulators assemblies by sliding them partially out of the enclosure.
   c. Power on the system.

   Does a power supply reference code occur?

   Yes **No**

   ↓ Go to step 12 on page 4-56 of this procedure.

2. Perform the following:
   a. Power off the system.
   b. Remove one of the blowers from the System Rack that was not previously removed during this procedure.
   c. Power on the system.

   Does a power supply reference code occur?

   Yes **No**

   ↓ The blower you removed in this step is failing, replace the failing blower.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

3. **Have you removed all the blowers one at a time?**

   No **Yes**

   ↓ Install all the blowers and continue with step 5 on page 4-55.

4. Perform the following:
   a. Power off the system.

b. Install the blower that was removed in step 2 in the original location.

c. Go to step 2 on page 4-54

5. Perform the following:

   a. Power off the system.

   b. Remove all except one of the bulk power supplies from the system.

   c. Power on the system.

   Does a power supply reference code occur?

   Yes **No**

   ↓ Go to step 9 on page 4-56.

6. Perform the following:

   a. Power off the system.

   b. Remove the bulk power supply that is installed.

   c. Install one of the other bulk power supplies that was removed in step 5.

   d. Power on the system.

   Does a power supply reference code occur?

   Yes **No**

   ↓ The bulk power supply you just removed in step 6 is failing, replace the bulk power supply.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

7. Perform the following:

   a. Power off the system.

   b. Exchange the SPCN card.

   c. Power on the system.

   Does a power supply reference code occur?

   Yes **No**

   ↓ The SPCN card you exchanged is failing, replace the SPCN card.

   This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

8. Exchange the system backplane assembly.

   This ends the procedure.

9. Perform the following:

    a. Power off the system.

    b. Install one of the bulk power supplies that was removed in step 5 on page 4-55 of this procedure.

    c. Power on the system.

    Does a power supply reference code occur?

    No **Yes**

    ↓ The bulk power supply you installed in this step is failing, replace the bulk power supply.

    This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

10. Have you installed all of the bulk power supplies that were removed in step 5 on page 4-55.

    Yes **No**

    ↓ Go to step 9

11. The problem is no longer present. You may have an intermittent problem.

    This ends the procedure.

12. Perform the following:

    a. Power off the system.

    b. Install one of the regulator assemblies that were removed in step 1 on page 4-54.

    c. Remove all bus load (processor and memory cards) except the clock card and SPCN card.

    d. Power on the system.

    Does a power supply reference code occur?

    No **Yes**

    ↓ The regulator assembly you just installed is failing, replace the regulator assembly.

    This ends the procedure. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

13. Have you installed all the regulator assemblies that were removed in step 1 on page 4-54.

Yes **No**

↓ Go to step 12.

14. **This ends the procedure.**

MAP 1540: Minimum Configuration

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

Notes:

1. Be sure to unplug the power cable from the System Rack and Input/output Rack before removing or installing Service Processor, CPU cards, Memory Cards, or I/O planar to avoid damage.

   Note: To remove the DC power cables and DC power from the -48 V dc system, first set all circuit breakers on both the System Rack and Input/output Rack to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40).

   Remove all DC supply cables from the circuit breakers to the configured drawers in the rack.

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

Surveillance	From the Service Processor Setup Menu, go to the Surveillance Setup Menu and disable surveillance.
Unattended Start	From the Service Processor System Power Control Menu disable unattended start mode.

Reboot Policy	From the System Power Control Menu go to the Reboot/Restart Policy Setup Menu and set: 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 1540-1

1. Ensure that the diagnostics and the operating system are shut down.
2. Insert the diagnostic CD-ROM into the CD-ROM drive.
3. Turn the power off.
4. Turn the power on.
5. When the keyboard indicator is displayed (the word **keyboard** on an ASCII terminal or the keyboard 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 when prompted to do so.

Is the “Please define the System Console” screen displayed?

NO Go to “Step 1540-2.”

YES Go to “Step 1540-3” on page 4-61.

Step 1540-2

The system is unable to boot standalone diagnostics.

The boot attempts that follow will attempt to get the the “Please define system console” prompt on the system console. Ignore any codes that may appear on the operator panel unless stated otherwise.

Go to “Step 1540-4” on page 4-61.

Step 1540-3

The system stopped with the “Please define system console” prompt appearing on the system console.

Standalone diagnostics can be booted. The boot attempts that follow will attempt to get the AIX prompt. Ignore any codes that may appear on the operator panel unless stated otherwise.

Go to “Step 1540-4”

Step 1540-4

Look at the rear of the System Rack and locate the JTAG cable in the top left corner.

Follow the other end of the JTAG cable back to the Service Processor card located in the primary I/O Drawer in the primary I/O rack.

Are there any secondary I/O Drawers attached to the System Rack?

NO Go to “Step 1540-6” on page 4-63.

YES Go to “Step 1540-5” on page 4-62.

Step 1540-5

There is a least one secondary I/O Drawer attached to the System Rack. Isolate the primary I/O drawer by performing the following steps:

Note: Before continuing, check the cabling from the System Rack to I/O Drawer(s) to ensure that the system is cabled correctly. Refer to “Cabling the System Rack and Input/output Rack” on page 1-26 for valid configurations. Record the current cabling configuration and then continue below.

1. Turn the system power off.
2. Verify that primary I/O drawer RIO port 0 is connected to system rack RIO port 0.
3. Connect primary I/O drawer RIO port 1 to system rack RIO port 1.
4. Verify that the primary I/O drawer SPCN port 1 is connected to system rack SPCN port 0.
5. Connect primary I/O drawer SPCN port 2 to system rack SPCN port 1.

   Note: The primary I/O Drawer should be cabled as shown in “Cabling the System Rack and Input/output Rack” on page 1-26 for “System Rack Attached to one I/O Drawer” Be sure to look at both RIO cables and SPCN cables.
6. Disconnect AC (or DC, if -48 V dc system) power from remaining I/O Drawer(s) and Input/output Rack(s).
7. All I/O drawers except the primary I/O Drawer should now be physically disconnected from the System Rack.

Go to “Step 1540-6” on page 4-63.

Step 1540-6

The primary I/O Drawer is the only I/O Drawer connected to the System Rack.

Turn the power on.

If the boot is not successful, the problem is in primary I/O drawer.

Was the boot successful?

NO Go to "Step 1540-7" on page 4-64.

YES Go to "Step 1540-12" on page 4-69.

Step 1540-7

Perform the following to deconfigure the primary I/O drawer:

1. Turn off the power.
2. If you have not already done so, reset the Service Processor settings with the instructions in 6 on page 4-58, then return here and continue.
3. Exit the Service Processor menus and remove the AC (or DC, if -48 V dc system) power cables from the System Rack and the Input/Output Rack.

   Note: To remove the DC power cables and DC power from the -48 V dc system, first set all circuit breakers on both the System Rack and Input/output Rack to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40).

   Remove all dc supply cables from the circuit breakers to the configured drawers in the rack.
4. If a display adapter with keyboard and mouse connected to the primary I/O drawer is being used as the console, locate a standalone serial terminal (possibly a 3151) and connect to the S1 serial port.
5. Remove the keyboard and mouse, if attached to the primary I/O drawer.
6. Leave the remaining external cables (RIO-port0, RIO-port1, SPCN-port0, SPCN-port1, JTAG-SP, and OPPanel) connected.
7. Disconnect the cables attached to adapters in the drawer.

   Note: Label and record the location of any cables attached to the adapters.
8. Remove all of the adapters except the Service Processor in slot 8 and the SCSI adapter that is attached to the boot device.

   Note: Record the slot numbers of the PCI adapters.
9. Disconnect the diskette drive cable from the diskette drive connector on the Service Processor card.
10. Plug in the AC power cables for the System Rack and the Input/Output Rack. (If -48 V dc system, plug in all disconnected cables from step 3, set the circuit breakers to On.) The operator panel should now display a blank yellow back-lighted LED panel.
11. Turn on the power.
12. When TTY screen displays `Enter 0 to select this console` press the 0 key on the TTY terminal's keyboard.

Was the boot successful?

NO Go to "Step 1540-10" on page 4-67.

YES Go to "Step 1540-8" on page 4-66.

Step 1540-8

If the boot was successful, the problem is with one of the adapter cards or devices that was removed or disconnected from the primary I/O Drawer.

1. Turn the power off.
2. Replace one adapter or device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
3. Turn the power on.

Was the boot successful?

NO Go to “Step 1540-9.”

YES Reinstall the next adapter or device and return to the beginning of this step. Continue repeating this process until an adapter or device causes the boot to be unsuccessful.

Step 1540-9

The adapter or device you just installed is causing the boot to be unsuccessful. Replace the adapter or device that is causing the boot to be unsuccessful with a new adapter.

Reinstall all remaining adapters and reconnect all devices. Return the system to its original configuration. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Step 1540-10

If boot is unsuccessful, turn off the power, disconnect the AC power cable (or DC power cables, if -48 V dc system), and replace the remaining parts listed below one at a time. Reconnect the AC power cable (or DC power cables, if -48 V dc system and set the circuit breakers to the On position) turn power on, and check for a successful boot.

Note: To remove the DC power cables and DC power from the -48 V dc system, first set all circuit breakers on both the System Rack and Input/output Rack to the Off position. Then, remove the top and bottom input cables to the DC box (shown on page 1-40).

Remove all dc supply cables from the circuit breakers to the configured drawers in the rack.

1. Boot device SCSI card.
2. Boot device SCSI cable.
3. Service Processor card.
4. I/O planar
5. I/O Drawer 3/4 power supply.
6. I/O Drawer 1/4 power supply.
7. Indicator card.
8. Three fan assembly

Was the boot successful?

NO Reinstall the next part in the list and return to the beginning of this step. Continue repeating this process until a part causes the boot to be successful.

If you have replaced all the items listed above and the boot is not successful, check any external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

YES Go to "Step 1540-11" on page 4-68

Step 1540-11

If the boot is successful:

1. Turn the power off.
2. The item just replaced fixed the problem.
3. If a display adapter with keyboard and mouse were used reinstall the display adapter card, keyboard and mouse.
4. Reconnect the diskette drive cable to the service processor card.
5. Plug in all adapters that were previously removed but not reinstalled.
6. Reconnect the I/O drawer AC (or DC, if -48 V dc system) power cables that were previously disconnected.

   Note: Ensure the Input/output Rack circuit breakers are set to the On position.

Reconfigure the system to its original condition. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Step 1540-12

If boot is successful, the problem is with a remaining secondary I/O drawer.

Is the primary I/O Drawer the only drawer connected at this time?

NO Go to “Step 1540-13” on page 4-70.

YES Reconnect the second I/O Drawer in the configuration that you recorded earlier in this MAP.

Note: The I/O Drawers should be cabled as shown in “Cabling the System Rack and Input/output Rack” on page 1-26 under “System Rack Attached to two I/O Drawers.” Be sure to look at both RIO cables and SPCN cables.

1. Connect AC (or DC, if -48 V dc system) power to this secondary drawer.
2. All I/O drawers except the primary I/O drawer and one secondary I/O drawer should now be physically disconnected from the system rack.

Go to “Step 1540-14” on page 4-70.

Step 1540-13

The last I/O Drawer reconnected was a secondary I/O Drawer. Reconnect the next I/O Drawer in the configuration you recorded earlier in this MAP.

Note: The I/O Drawers should be cabled as shown in "Cabling the System Rack and Input/output Rack" on page 1-26. Be sure to look at both RIO cables and SPCN cables.

Go to "Step 1540-14."

Step 1540-14

Turn on the power.

Is the boot successful?

NO Go to "Step 1540-15" on page 4-71.

YES **Is there another I/O Drawer to connect?**

- **NO** The problem has changed, call your next level of support.
- **YES** Go to "Step 1540-13"

Step 1540-15

The boot is not successful, the problem is in last secondary I/O Drawer that was connected. Do the following steps to deconfigure this secondary I/O Drawer.

1. Turn off the power.
2. Unplug the AC (or DC, if -48 V dc system) power cables for the System Rack and Input/output Rack.

   Note: To remove DC power in the System Rack set all circuit breakers to the Off position. Then, remove the DC input cables to the DC Box, both the top and bottom connectors. To remove DC power in the Input/output Rack, set all circuit breakers to the Off position and disconnect the DC input cables from the 3/4 and 1/4 power supplies.
3. Leave the external cables (RIO-port0, RIO-port1, SPCN-port0, SPCN-port1) connected.
4. Record the slot numbers of the PCI adapters.
5. Label and record the location of any cables attached to the adapters.
6. Remove all of the adapters.
7. Plug in the AC (or DC, if -48 V dc system) power cables for the System Rack and the Input/output Rack.

   Note: If -48 V dc system, reconnect the cables that were disconnected in step 2 and set the circuit breakers to the On position.

   The operator panel should now display a blank yellow backlighted LED panel.
8. Turn on the power.
9. Go to “Step 1540-16” on page 4-72.

Step 1540-16

Is the boot successful?

NO Go to “Step 1540-18” on page 4-74.

YES If the boot was successful, the problem is with one of the adapter cards or devices that was removed or disconnected from the I/O Drawer.

1. Turn the power off.
2. Replace one adapter or device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
3. Turn the power on.

Was the boot successful?

NO Go to “Step 1540-17” on page 4-73.

YES Reinstall the next adapter or device and return to number 1 in this step. Continue repeating this process until an adapter or device causes the boot to be unsuccessful.

Step 1540-17

Replace the adapter or device that is causing the boot to be unsuccessful with a new adapter.

Reinstall all remaining adapters and reconnect all devices. Return the system to its original configuration. Go to "Map 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Step 1540-18

If boot is unsuccessful, turn off the power and replace the remaining parts (listed below) in this drawer, one at a time. Turn power on and check for a successful boot.

1. I/O planar.
2. I/O Drawer 3/4 power supply.
3. I/O Drawer 1/4 power supply.
4. Indicator card
5. Three fan assembly

Was the boot successful?

NO

Reinstall the next part in the list and return to the beginning of this step. Continue repeating this process until a part causes the boot to be successful.

If you have replaced all the items listed above and the boot is not successful, check any external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

YES Go to "Step 1540-19" on page 4-75

Step 1540-19

If the boot is successful:

1. Turn the power off.
2. The item just replaced fixed the problem.
3. Plug in all adapters that were previously removed but not reinstalled.
4. Reconnect the I/O drawer AC (or AC, if -48 V dc system) cables that were previously disconnected. Ensure the circuit breakers are set to the On position.

Reconfigure the system to its original condition. Go to “Map 0410: Repair Checkout” in the *Diagnostic Information for Multiple Bus Systems*.

Chapter 5. Checkpoints

Checkpoints are displayed on the operator panel when the system is going through powering on and the initial program load (IPL). This chapter explains the IPL flow of the system and provides a table that lists checkpoints that you may see as the system IPLs.

IPL Flow S70

The following table outlines the IPL phases from Power-on to the AIX login prompt, matching the phases to corresponding Operator Panel checkpoints for a typical system boot. Also listed are approximate boot times per phase along with their dependencies per phase.

On the S70 system, the boot process is comprised of four phases as defined below:

- **Phase 1: Service Processor Initialization**

  Represents the time from system power-on (8-digit checkpoints on the Operator Panel) to the point that E0xx (4-digit checkpoints on the Operator Panel) checkpoints are displayed.

  Note: SP Menus can be accessed at the end of this phase.

- **Phase 2: Hardware Initialization by Service Processor**

  Represents the time between the first 8-digit checkpoint after phase 1 to the point when the Op Panel is first cleared (displays all blanks).

- **Phase 3: System Firmware initialization**

  Represents the time from the end of Phase 2 to the first appearance of 0000 (4-digit checkpoint on the Op Panel). During this phase 4-digit checkpoints of the form Eyxx are displayed where y is not 0 (zero) and x can be any number in the range 0-F (hexadecimal).

- **Phase 4: AIX Boot**

  Represents the time from the end of phase 3 until the time when the Operator Panel is cleared again. AIX Login prompt follows shortly thereafter.

Note: The table below lists the major checkpoints only!

Phase #	Checkpoints on Operator Panel	Time in phase (minutes)	Major contributors to time in phase
Phase 1	Power-on C1yx 1xxx C1yx 80xx C3yx xxxx E0xx	3 to 4	Number of I/O drawers
Phase 2	C3yx xxxx (blank)	1 to 4 (Fast) 5 to 15+ (Slow)	Fast/Slow boot setting Amount of memory Number of processors
Phase 3	Eyxx 0000	3 to 9+	Number of I/O drawers Number of bootable adapters
Phase 4	0000 (blank)	2 - 30+	Number of SSA drives Number of Adapters Number of Async sessions Number of SCSI devices Amount of memory

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

Before taking actions listed with a checkpoint, check for additional symptoms in the Service Processor error log. See the “System Information Menu” on page C-14 for information on how to access the Service Processor Error Log.

Note: Go to “MAP 1540: Minimum Configuration” on page 4-58 for any of the following checkpoint hang conditions:

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

Checkpoints listed in the following tables have either four blank characters followed by the letter E, or eight characters that begin with C. If your system hangs with a checkpoint displayed that begins with four blank characters and a character other than E, go to the *Diagnostic Information for Multiple Bus Systems*.

Use the table below to determine where to find the checkpoint.

Symptom	Action
You have a code that begins with 4 blank characters followed by the letter E.	This is a checkpoint listed in this section, go to “Service Processor Checkpoints” on page 5-4 or “Firmware Checkpoints” on page 5-7 to find the checkpoint.
You have a code that begins with 4 blanks followed by any character other than E.	Refer to the *Diagnostic Information for Multiple Bus Systems* manual.
You have an 8-character checkpoint that begins with C1xx or C3xx.	Go to “System Processor Checkpoints” on page 5-17

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 5-7.

Table 5-1 (Page 1 of 3). SP Checkpoints.

Checkpoint	**Description**	**Action/ Possible Failing FRU**
E010	Starting SP. self-tests	1. Service Processor Card. Location Code: U0.1-P1-X1 AIX Location Code: 10-70 or 10-70 to 10-77 1E-xx 2. I/O Drawer Planar in primary drawer. Location Code: U0.1-P1
E012	Begin to set up SP heaps	Service Processor Card. Location Code: U0.1-P1-X1
E020	Configuring CMOS	1. I/O Drawer Planar in primary drawer. Location Code: U0.1-P1 2. Service Processor Card. Location Code: U0.1-P1-X1
E021	Configuring NVRAM	1. I/O Drawer Planar in primary drawer. Location Code: U0.1-P1 2. Service Processor Card. Location Code: U0.1-P1-X1
E040	Configuring Service Processor I/O	1. Loose or missing JTAG cable from SP to CEC 2. Service Processor Card. Location Code: U0.1-P1-X1 3. I/O Drawer Planar in primary drawer. Location Code: U0.1-P1
E042	Configuring modem on serial port 1	1. Modem. 2. Service Processor Card. Location Code: U0.1-P1-X1 3. I/O Drawer Planar in primary drawer. Location Code: U0.1-P1 4. Go to the System Entry Map

Table 5-1 (Page 2 of 3). SP Checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E043	Configuring modem on serial port 2	1. Modem. 2. Service Processor Card. Location Code: U0.1-P1-X1 3. I/O Drawer Planar in primary drawer. Location Code: U0.1-P1 4. Go to the System Entry Map
E04F	Modem configuration successful	Re-IPL. Read progress indicators from last system boot to learn which process had requested modem configuration. The Service Processor (now hung) has returned to that process. Check the Service Processor and AIX error logs.
E070	Service Processor is calling the Service Center	Be patient while the call is in progress. If hung at this checkpoint, check the modem, telephone system, and Service Center. Check the Service Processor and AIX error logs.
E071	Service Processor is calling System Administration	Be patient while the call is in progress. If hung at this checkpoint, check the modem, telephone system, and System Administration. Check the Service Processor and AIX error logs.
E072	Service Processor is calling the pager	Be patient while the call is in progress. If hung at this checkpoint, check the modem and the telephone system. Check the Service Processor and AIX error logs.
E075	Entering Service Processor menus	1. Exit SP Menus 2. Service Processor Card. Location Code: U0.1-P1-X1 3. I/O Drawer Planar in primary drawer. Location Code: U0.1-P1 4. Go to the System Entry Map
E07A	Waiting for keystroke from local console	1. Strike a key 2. Wait a few seconds for timeout
E07B	Waiting for keystroke from remote console	1. Strike a key 2. Wait a few seconds for timeout
E07F	Service Processor exiting from session with local or remote terminal.	

Table 5-1 (Page 3 of 3). SP Checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E080	Service Processor flash update in progress	The could take a while. Be patient, if hung at this checkpoint, check the Service Processor and AIX error logs.
E081	Service Processor flash update completed	If hung at this checkpoint, check the Service Processor and AIX error logs.
E082	Service Processor promoting flash from side A to side B.	The could take a while. Be patient, if hung at this checkpoint, check the Service Processor and AIX error logs.
E0EF	End of Service Processor reporting	1. Service Processor Card. Location Code: U0.1-P1-X1

Note: If you receive a four-digit code in the range of E0xx that is not listed in the table above, go to "MAP 1540: Minimum Configuration" on page 4-58.

Firmware Checkpoints

Firmware uses progress codes (checkpoints) in the range of E1xx to EFFF. These checkpoints occur during system startup and maybe be useful in diagnosing certain problems. Service Processor checkpoints are listed in "Service Processor Checkpoints" on page 5-4.

If you replace FRUs and the problem is still not corrected, go to "MAP 1540: Minimum Configuration" on page 4-58 unless otherwise indicated in the tables.

Table 5-2 (Page 1 of 9). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E100	Reserved	See the note on 5-3.
E101	Video enabled, extended memory test	See the note on 5-3.
E102	Firmware restart	See the note on 5-3.
E103	Set memory refresh (composite img)	See the note on 5-3.
E104	Set memory refresh (recovery block)	See the note on 5-3.
E105	Transfer control to Operating System (normal boot).	See "Boot Problems" on page 5-15.
E108	Run recovery block base memory (test 2K), set stack	See the note on 5-3.
E109	Copy CRC verification code to RAM	See the note on 5-3.
E10A	Turn on cache	See the note on 5-3.
E10B	Flush cache	See the note on 5-3.
E10C	Jump to CRC verification code in RAM	See the note on 5-3.
E10D	Compute composite image CRC	See the note on 5-3.
E10E	Jump back to ROM	See the note on 5-3.
E10F	Transfer control to Open Firmware	See the note on 5-3.
E110	Turn off cache, Check if composite image CRC is valid	See the note on 5-3.
E111	GOOD CRC - jump to composite image	See the note on 5-3.
E112	BAD CRC - initialize base memory, stack	See the note on 5-3.
E113	BAD CRC - copy uncompressed recovery block code to RAM	See the note on 5-3.
E114	BAD CRC - jump to code in RAM	See the note on 5-3.
E115	BAD CRC - turn on cache	See the note on 5-3.

Table 5-2 (Page 2 of 9). Firmware Checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E116	BAD CRC - copy recovery block data section to RAM	See the note on 5-3.
E117	BAD CRC - Invalidate and flush cache, set TOC	See the note on 5-3.
E118	BAD CRC - branch to high level recovery control routine.	See the note on 5-3.
E119	Initialize base memory, stack	See the note on 5-3.
E11A	Copy uncompressed recovery block code to RAM	See the note on 5-3.
E11B	Jump to code in RAM	See the note on 5-3.
E11C	Turn on cache	See the note on 5-3.
E11D	Copy recovery block data section to RAM	See the note on 5-3.
E11E	Invalidate and flush cache, set TOC	See the note on 5-3.
E11F	Branch to high level control routine.	See the note on 5-3.
E120	Initialize I/O and early memory block	See the note on 5-3.
E121	Initialize S.P.	See the note on 5-3.
E125	Clear PCI devices command reg, go forth	See the note on 5-3.
E126	Check valid image - start	See the note on 5-3.
E127	Check valid image - successful	See the note on 5-3.
E128	Disable interrupts, set int vectors for O.F.	See the note on 5-3.
E129	Validate target RAM address	See the note on 5-3.
E12A	Copy ROM to RAM, flush cache	See the note on 5-3.
E12B	Set MP operational parameters	See the note on 5-3.
E12C	Set MP cpu node characteristics	See the note on 5-3.
E12D	Park secondary processors in parking lot	See the note on 5-3.
E12E	Primary processor sync	See the note on 5-3.
E12F	Unexpected return from Open Firmware (system lockup)	See the note on 5-3.
E130	Build device tree	See the note on 5-3.
E131	Create ROOT node	See the note on 5-3.
E132	Create cpus node	See the note on 5-3.
E133	Create L2 Cache node	See the note on 5-3.
E134	Create memory node	See the note on 5-3.

Table 5-2 (Page 3 of 9). Firmware Checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E135	Create memory DIMM node	See the note on 5-3.
E136	Test memory	See the note on 5-3.
E137	Create openprom node	See the note on 5-3.
E138	Create options node	See the note on 5-3.
E139	Create aliases node and system aliases	See the note on 5-3.
E13A	Create packages node	See the note on 5-3.
E140	PReP style load	See the note on 5-3.
E149	Create boot mgr node	See the note on 5-3.
E14C	Create terminal-emulator node	See the note on 5-3.
E14D	Loading boot image	See "Boot Problems" on page 5-15.
E14E	Create client interface node/directory	See the note on 5-3.
E14F	NVRAM initialization	See the note on 5-3.
E150	Create host (primary) PCI controller node	See the note on 5-3.
E151	Probing primary PCI bus	1. PCI Adapters If a network adapter is replaced, see 6-1. 2. I/O Drawer Planar See the note on 5-3.
E152	Probing for adapter FCODE, evaluate if present	1. PCI Adapters If a network adapter is replaced, see 6-1. 2. I/O Drawer Planar See the note on 5-3.
E153	End adapter FCODE, probe/evaluate	See the note on 5-3.
E154	Create PCI bridge node	See the note on 5-3.
E155	Probing PCI bridge secondary bus	1. PCI Adapters If a network adapter or I\O planar is replaced, see 6-1. 2. I/O Drawer Planar. See the note on 5-3.
E156	Create PCI ethernet node	See the note on 5-3.
E15A	Create 64 bit host (primary) PCI controller node	See the note on 5-3.

Table 5-2 (Page 4 of 9). Firmware Checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E15B	Transferring control to Operating System (service mode boot)	See “Boot Problems” on page 5-15.
E15C	Probe primary 64 bit PCI bus	See the note on 5-3.
E15D	Create host PCI controller node	See the note on 5-3.
E15E	Create MPIC node	See the note on 5-3.
E15F	Adapter VPD probe	See the note on 5-3.
E160	CPU node VPD creation	See the note on 5-3.
E161	Root node VPD creation	See the note on 5-3.
E162	SP node VPD creation	See the note on 5-3.
E164	Create PCI graphic node (P9)	See the note on 5-3.
E168	Create PCI graphic node (S3)	See the note on 5-3.
E170	Start of PCI Bus Probe	See the note on 5-3.
E171	Executing PCI-Delay function	See the note on 5-3.
E174	Establishing host connection	If the system is not connected to an active network or if the target server is inaccessible (this can also result from incorrect IP parameters being supplied), the system will still attempt to boot and because time-out durations are necessarily long to accommodate retries, the system may appear to be hung. 1. Restart the system and get to the Firmware SMS utilities. In the utilities check: • Is the intended boot device correctly specified in the boot list? • Are the IP parameters correct? • Verify the network connection (network could be down). • Have network administrator verify the server configuration for this client. • Attempt to “Ping” the target server using the SMS “Ping” utility.
E175	BootP request	Refer checkpoint E174.
E176	TFTP file transfer	See the note on 5-3.

Table 5-2 (Page 5 of 9). Firmware Checkpoints.

Checkpoint	Description	Action/ Possible Failing FRU
E177	Transfer failure due to TFTP error condition	See the note on 5-3.
E178	Create PCI token ring node	See the note on 5-3.
E180	SP Command setup	See the note on 5-3.
E183	SP Post	See the note on 5-3.
E190	Create ISA node	See the note on 5-3.
E191	Create ISA reserved node	See the note on 5-3.
E193	Initialize Super I/O	See the note on 5-3.
E196	Probe ISA bus	See the note on 5-3.
E19B	Create Service Processor node	See the note on 5-3.
E19C	Create tablet node	See the note on 5-3.
E19D	Create nvram node	See the note on 5-3.
E19E	Real time clock (RTC) initialization	Refer to error code 28030xxx in “Firmware/POST Error Codes” on page 6-4.
E1AD	See description of checkpoint E1DE	See the note on 5-3.
E1B0	Create lpt node	See the note on 5-3.
E1B1	Create serial node	See the note on 5-3.
E1B2	Create audio node	See the note on 5-3.
E1B3	Create 8042 node	See the note on 5-3.
E1B6	Probe for (ISA) keyboard	See the note on 5-3.
E1BA	Enable L2 cache	See the note on 5-3.
E1BB	Set cache parms for burst	See the note on 5-3.
E1BC	Set cache parms for 512KB	See the note on 5-3.
E1BD	Probe for (ISA) mouse	See the note on 5-3.
E1BE	Create op-panel node	See the note on 5-3.
E1BF	Create pwr-mgmt node	See the note on 5-3.
E1C0	Create ISA ethernet node	See the note on 5-3.
E1C5	Create ISA interrupt controller (pic) node	See the note on 5-3.
E1C6	Create DMA node	See the note on 5-3.
E1D0	Create PCI SCSI node	See the note on 5-3.
E1D3	Create (* wildcard *) SCSI block device node (SD)	See the note on 5-3.
E1D4	Create (* wildcard *) SCSI byte device node (ST)	See the note on 5-3.

Table 5-2 (Page 6 of 9). Firmware Checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E1DB	Create floppy controller (fdc) node	See the note on 5-3.
E1DC	Dynamic console selection.	If a console is attached but nothing is displayed on it, follow the steps associated with "All display problems" in the Entry MAP tables. If selection screen(s) can be seen on the terminals and the appropriate key on the input device associated with the desired display or terminal is pressed, within 60 seconds, but there is no response to the keystroke: 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 Service Processor Card (Location Code: U0.1-P1-X1). 2. If selecting the console with an ASCII terminal, suspect the ASCII terminal. Use the Problem Determination Procedures for the terminal. Replace the Service Processor Card (Location Code: U0.1-P1-X1) if these procedures do not reveal a problem. Note: Terminal settings should be set to: • 9600 Baud • No Parity • 8 Data bits • 1 Stop bit
E1DD	Early processor exception	See the note on 5-3.
E1DE	Alternating pattern of E1DE and E1AD is used to indicate a Default Catch condition before the firmware "checkpoint" word is available.	See the note on 5-3.
E1DF	Create diskette drive (disk) node	See the note on 5-3.
E1E0	Program flash	See the note on 5-3.
E1E1	Flash update complete	See the note on 5-3.
E1E2	Initialize System I/O	See the note on 5-3.
E1E3	PReP boot image initialization.	See the note on 5-3.

Table 5-2 (Page 7 of 9). Firmware Checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E1E4	Initialize Super I/O with default values	See the note on 5-3.
E1E5	XCOFF boot image initialization	See the note on 5-3.
E1E6	Set up early memory allocation heap	See the note on 5-3.
E1E7	PE boot image initialization	See the note on 5-3.
E1E8	Initialize primary diskette drive (polled mode)	See the note on 5-3.
E1E9	ELF boot image initialization	See the note on 5-3.
E1F0	Begin self test sequence on boot device(s). Begin SMS.	See the note on 5-3.
E1F1	Start O.B.E.	See the note on 5-3.
E1F2	Power-On Password prompt.	Prompt should be visible on the system console. If a console is attached but nothing is displayed on it, go to the “Entry MAP” on page 4-1 with the symptom "All display problems."
E1F3	Privileged-Access Password prompt	Prompt should be visible on the system console. If a console is attached but nothing is displayed on it, go to the “Entry MAP” on page 4-1 with the symptom "All display problems."
E1F5	Build boot device list	See the note on 5-3.
E1F6	Determine boot device sequence	See the note on 5-3.
E1F7	No boot image located	See the note on 5-3.
E1FB	Scan SCSI bus for attached devices	See the note on 5-3.
E1FD	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 4-58.
E440	Validate nvram, initialize partitions as needed	1. Verify that the system firmware levels are at the current release levels, update as necessary. 2. Replace Service Processor Card (Location Code: U0.1-P1-X1) if problem persists. See the note on 5-3.

Table 5-2 (Page 8 of 9). Firmware Checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**
E441	Generate /options node nvram configuration variable properties	1. Verify that the system firmware levels are at the current release levels, update as necessary. 2. Replace Service Processor Card (Location Code: U0.1-P1-X1) if problem persists. See the note on 5-3.
E442	Validate nvram partitions	1. Verify that the system firmware levels are at the current release levels, update as necessary. 2. Replace Service Processor Card (Location Code: U0.1-P1-X1) if problem persists. See the note on 5-3.
E443	Generate nvram configuration variable dictionary words	1. Suspect a system firmware problem if problem persists. Verify that the system firmware is at current release level, update downlevel system firmware. See the note on 5-3.
E500	Configure Remote I/O subsystem	1. Configure I/O subsystem 2. The appearance of this code indicates that the I/O subsystem configuration has started or progressed to the point where the code can be displayed. See the note on 5-3.

Table 5-2 (Page 9 of 9). Firmware Checkpoints.		
Checkpoint	**Description**	**Action/ Possible Failing FRU**

E5xy	Configure Remote I/O subsystem components	The E5xy (E511 to E5FF) codes are reserved for activities relating to configuration or testing of the I/O subsystem, or remote I/O sub-system. A hang at one of these codes implies that a severe error occured during the programming of I/O subsystem registers or when interacting with adapters plugged into the system. The last two digits in the checkpoint can be used to help isolate the location of the I/O activity that caused the problem.
		
		"**x**" indicates the I/O drawer number. "**y**" indicates the PCI bus occurance.
		
		If x=_, then the I/O Drawer is:
		
		`X = I/O Drawer`
		`1 = 0`
		`2 = 1`
		`3 = 2`
		`4 = 3`
		
		If y=_, then the PCI Bus is:
		
		`Y = PCI Bus`
		`1 = 0`
		`2 = 1`
		`3 = 2`
		`4 = 3`
		
		See "AIX and Physical Location Code Tables" in Chapter 1, for location codes.

Note: If you receive a four-digit code in the range of E0xx that is not listed in the table above, go to "MAP 1540: Minimum Configuration" on page 4-58.

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

For network boot attempts, refer to checkpoint E174.

If the checkpoint is displayed for an extended time, there may be a problem with the integrity of the boot image.

- Try to boot and run diagnostics against the system, particularly against the intended boot device. If the diagnostics are successful, it may be necessary to perform an operating system specific recovery process, or reinstall the operating system.
- If attempting to boot from a Harddisk, CDROM, or Tape drive:
  1. Try a different CD/Tape (unless booting from Harddisk)
  2. Verify proper SCSI bus termination
  3. Replace SCSI cable
  4. It is possible that another attached SCSI device is causing the problem.

     Disconnect any other SCSI devices attached to the same controller as the one the boot device is attached to and retry the boot operation. If this is successful, one of the devices removed is causing the problem, re-attach devices one by one and retry the boot operation until the problem recurs and replace the device that caused the problem.
  5. Replace SCSI adapter
  6. Replace SCSI drive
  7. It is possible that another installed adapter is causing the problem.

     Remove all installed adapters except the one the boot device is attached to and the one the CDROM drive is attached to. Try to boot the diagnostics from the CDROM drive, and run the diagnostics against the system.

     If this is successful, re-install adapters (and attached devices as applicable) that were removed, one at a time, and run the standalone diagnostics against the system.
  8. Replace I/O Drawer Planar.
- 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".

System Processor Checkpoints

The following table lists checkpoints that are displayed as the system processor IPLs.

Reference Code (IPL SRC)	Description/Function Performed	Action/ Possible Failing FRU
C1yx 1xxx	Service Processor ROS IPL in progress	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 1006	Service processor ROS loading RAM from service processor directed device	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 1007	Service Processor ROS retrying attempt to load RAM from service processor directed device	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 1008	Service Processor ROS attempting to load RAM from non-service processor directed device	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 1009	Service Processor ROS retrying attempt to load RAM from non-service processor directed device	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 1016	Service Processor ROS attempting to load RAM from service processor default device	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 1018	Service Processor ROS attempting to load RAM from non-service processor default device	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 1019	Service Processor ROS retrying attempt to load RAM from non-service processor default device	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 100C	Service processor ROS IPL complete, branch to RAM Loader	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 1030	Loading Service Processor system firmware from service processor device	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 1050	Loading Service Processor system firmware from non-service processor device	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 2001	Service Processor setting up to test and load system processor	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 2002	Service processor testing system processor and main storage	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 2003	Service processor loading system processor	Go to "MAP 1540: Minimum Configuration" on page 4-58
C100 2034	Firmware (system) initialized, control passed to system processor	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 2050	Service Processor waiting for Load Source device	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 2060	Service Processor started a read command from Load Source	Go to "MAP 1540: Minimum Configuration" on page 4-58
C1yx 2090	Service Processor completed a read command from load source	Go to "MAP 1540: Minimum Configuration" on page 4-58

Reference Code (IPL SRC)	Description/Function Performed	Action/ Possible Failing FRU
C1yx 80xx	Service processor/operator panel communication in progress	Go to “MAP 1540: Minimum Configuration” on page 4-58
C1yx 805x	Service Processor loading operator panel firmware	Go to “MAP 1540: Minimum Configuration” on page 4-58
C1yx B1xx	Basic assurance test completed on service processor	Go to “MAP 1540: Minimum Configuration” on page 4-58
C100 D009	Firmware (system) running initialization	Go to “MAP 1540: Minimum Configuration” on page 4-58
C3yx xxxx	System Processor or Main Storage Diagnostic in progress	Go to “MAP 1540: Minimum Configuration” on page 4-58

Chapter 6. Error Code to FRU Index

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

Attention: If you replace FRUs and the problem is still not corrected, go to "MAP 1540: Minimum Configuration" on page 4-58 unless otherwise indicated in the tables.

Notes:

1. These error codes have as their first character the numbers 2, 4, or M. Codes that begin with other characters are listed in "Unit Reference Codes" on page 6-25.
2. Codes that begin with 4 blank characters followed by the letter E are part of the set of checkpoints listed in Chapter 5 on page 5-1. If you have a code that begins with 4 blanks followed by any character other than E, refer to the *Diagnostic Information for Multiple Bus Systems* manual.
3. Licensed programs frequently rely on network configuration, and system information stored on the VPD on the operator panel. If the MAPs indicate that the Operator Panel should be replaced call technical support for recovery instructions. If recovery is not possible, notify the system owner that new keys for licensed programs may be required.
4. If a network adapter is replaced, the network administrator must be notified so that the client IP addresses used by the server can be changed. In addition, the operating system configuration of the network controller may need to be changed in order to enable system startup. Also check to ensure that any client or server that addresses this system is updated.
5. Check the system error logs to determine the location code information associated with the error code that directed you to this note. Find the location code in the "AIX and Physical Location Code Reference Tables" on page 1-49 to determine the location of the failing device.

   Refer to the "Error Log" utility in the System Management Services section to display the error log and obtain the location code. If it is not possible to get to the System Management Services utility, display the error log using the Service Processor menus described in Appendix C on page C-1.

   To determine which I/O Drawer is failing, you may find a status LED on an I/O Drawer is indicating a fault. Check the status lights on the fronts of each installed I/O Drawer to isolate failures to a single drawer. See "I/O Drawer Indicator Panel" on page 1-24 for the location and meaning of the lights (LEDs) on the I/O Drawer indicator panel.

The table below is an index to the checkpoints, error codes, or System Reference Codes (SRC) that you may receive to help diagnose a failure. Locate the code you received and follow the instructions to determine your next step.

Table 6-1 (Page 1 of 2). Checkpoints, Error Codes, and SRC Index

First 4 characters of code	What You Should Do
0000	Operator Panel Reference Codes Go to "(0000) Operator Panel Reference Codes" on page 6-28 and follow the instructions in the SRC table.
1xxx	System Power Control Network (SPCN) Reference Codes Go to "(1xxx) System Power Control Network (SPCN) Reference Codes" on page 6-30 and follow the instructions in the SRC table.
2xxx	Firmware Error Codes Go to "Firmware/POST Error Codes" on page 6-4 and follow the instructions in the Firmware Error Codes tables.
4xxx	Service Processor Error Codes Go to "Firmware/POST Error Codes" on page 6-4 and follow the instructions in the Service Processor Error Codes table.
A1xx	Service Processor Reference Codes Go to "(A1xx, B1xx) Service Processor Reference Codes" on page 6-60 and follow the instructions in the SRC table.
B006	Common Firmware Reference Codes Go to "(B006) Common Firmware Reference Codes" on page 6-62 and follow the instructions in the SRC table.
B1xx	Service Processor Reference Codes Go to "(A1xx, B1xx) Service Processor Reference Codes" on page 6-60 and follow the instructions in the SRC table.
B4xx	System Processor Reference Codes Go to "(B4xx) System Processor Reference Codes" on page 6-64 and follow the instructions in the SRC table.
C1xx	System Processor Checkpoints These codes are checkpoints that display on the operator panel during IPL of the system. You may suspect that the IPL is not advancing correctly when the 6 rightmost characters do not change for 2 minutes. The IPL may take longer with more I/O units and main storage. Go to Chapter 5 on page 5-1 for information about these checkpoints.

Table 6-1 (Page 2 of 2). Checkpoints, Error Codes, and SRC Index	
First 4 characters of code	**What You Should Do**
C3xx	IPL Status Checkpoints These codes are checkpoints that display on the operator panel during IPL of the system. You may suspect that the IPL is not advancing correctly when the 6 rightmost characters do not change for 2 minutes. The IPL may take longer with more I/O units and main storage. Go to Chapter 5 on page 5-1 for information about these checkpoints.
D106 8000	AIX Dump Not Enabled
D182 3080	AIX Dump in Progress
D1xx 8xxx	Power coming down
D1xx xxxx	Service Processor General Status SRCs If you suspect a problem, ask your next level of support for assistance.
Mxxx	Problem Determination Generated Error Codes Go to “Firmware/POST Error Codes” on page 6-4 and follow the instructions in the Firmware Error Codes tables.

Firmware/POST Error Codes

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

Table 6-2 (Page 1 of 14). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU

20110xxy	I/O Drawer Power Supply failure	1. Replace power supply “y” in I/O Drawer “xx.”
		
		If y=_, then the power supply is:
		
		`y = power supply`
		`2 = 3/4 power supply`
		`1 = 1/4 power supply`
		
		If xx=__, then the I/O Drawer is:
		
		`xx = I/O Drawer`
		`1 = 0`
		`2 = 1`
		`3 = 2`
		`4 = 3`
		
		See “AIX and Physical Location Code Tables” in Chapter 1, for location codes.
		2. Check AC power source to I/O Drawer “xx.”
		
		`xx = I/O Drawer`
		`1 = 0`
		`2 = 1`
		`3 = 2`
		`4 = 3`
		
		See “AIX and Physical Location Code Tables” in Chapter 1, for location codes.

Table 6-2 (Page 2 of 14). Firmware Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
203w0xyz	Remote I/O (RIO) configuration warning. This code indicates that an RIO configuration was detected that does not result in complete loops. The system will continue to boot, however performance or recovery capability may be reduced. In some cases, the problem may result in missing I/O. Remote I/O drawers should be connected in loops. Use the letters w, y, and z in the error code to isolate the location of the open loop. RIO cables should be checked for loose connections, and power on the I/O drawers should be verified by the presence of fan motion. The following numbers may be used to help isolate the failing component. • w = loop number, this is either 0 or 1 in a system with 2 RIO loops. • x = Always 0. • y = port number, nearest associated RIO port number on the System Rack. This is either 1, 2, 3, or 4 on a system with 2 loops. • z = B, indicates a missing return line from the I/O drawer to the System Rack. • z = C, indicates a missing link between two I/O drawers. • z = E, indicates an I/O drawer was found connected to RIO port 4 with no return to the System Rack, and no I/O drawer was found connected to RIO port 3. In this case, the I/O connected to RIO port 4 is is removed from the configuration since the cause of the error and the proper location of the I/O cannot be determined.	Go to "MAP 1540: Minimum Configuration" on page 4-58.
20A80000	Insufficient information to boot.	Verify the IP address.
20A80001	Client IP address is already in use by other network device	Change IP address.

Table 6-2 (Page 3 of 14). Firmware Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
20A80002	Cannot get gateway IP address	Refer to Table 5-2 on page 5-7 using code **E174**.
20A80003	Cannot get server hardware address	Refer to Table 5-2 on page 5-7 using code **E174**.
20A80004	Bootp failed	Refer to Table 5-2 on page 5-7 using code **E175**.
20A80005	File transmission (TFTP) failed.	Check network connection, try again.
20D00xxx	Unknown/Unrecognized device	
20D0000F	Selftest failed on device, no error and/or location code information available	Refer to note 5 on page 6-1 to see if a location code is available for the device the error was reported against. 1. Replace device indicated by the location code (if available). 2. Go to “MAP 1540: Minimum Configuration” on page 4-58
20D00010	Selftest failed on device, can't locate package	Contact you service support representative for assistance.
20E00xxx	Security	
20E00001	Privileged-access password entry error.	The password has been entered incorrectly. Retry installing the password.
20E00004	Battery drained or needs replacement	1. Replace System Rack Operator Panel Battery. System Rack Operator Panel Location Code: U1.1-P1-L1. 2. Replace System Rack Operator Panel. (See notes on 6-1.) 3. Replace I/O Drawer Planar in primary drawer Location Code: U0.1-P1-X1.
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.
20EE0xxx	Informational	
20EE0003	IP parameter requires 3 dots "."	Enter valid IP parameter. Example: 000.000.000.000
20EE0004	Invalid IP parameter	Enter valid IP parameter. Example: 000.000.000.000

Table 6-2 (Page 4 of 14). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU
20EE0005	Invalid IP parameter (>255)	Enter valid IP parameter. Example: 255.192.002.000
20EE0006	No recognized SCSI adapter present	This warning occurs when the selected SMS function cannot locate any SCSI adapter supported by the function. If a supported SCSI adapter is installed: 1. Replace SCSI controller(s). 2. Replace the I/O Drawer Planar in drawer(s) containing SCSI controller(s).
20EE0007	Keyboard not found	1. Plug in keyboard. 2. Replace Service Processor Card Location Code: U0.1-P1-X1.
20EE0008	No configurable adapters found in the system	This warning occurs when the selected SMS function cannot locate any devices/adapters supported by the function. If a supported device is installed: 1. Replace the device or adapter. (See notes on 6-1.) 2. Replace the I/O Drawer Planar in the drawer(s) containing the device/adapter.
20EE0009	Unable to communicate with the Service processor	1. Replace the Service Processor Card. Location Code: U0.1-P1-X1. 2. Replace the I/O Drawer Planar in primary drawer Location Code: U0.1-P1.
20EE000B	The system was not able to find an operating system on the device list that was attempted.	Modify the Boot Sequence (also known as boot list) to include devices that are known to contain a copy of the Operating System. This can be accomplished by using the System Management Services Menus. For example, select a hard disk known to have a copy of the Operating System as the first and only device in the boot sequence (boot list) and attempt to boot again.

Error Code	Description	Action/ Possible Failing FRU
20EE000C	Pointer to the operating system found in non-volatile storage.	Values normally found in non-volatile storage that point to the location of an Operating System were not found. This can happen for two reasons, either your installed Operating System doesn't support storing the values or some event occurred that caused the system to lose non-volatile storage information (drainage or replacement of the battery). If you are running AIX, this information can be reconstructed by running the bootlist command specifying the device that the Operating System is installed on. Please refer to your AIX documentation for the exact syntax and usage of the bootlist command. In order to boot the Operating System so that the above mentioned values can be reconstructed,power the system down and power it back up again, this should cause the system to look for the Operating System in the devices contained in the custom boot list or in the default boot list, depending on the condition of the system. If this is not successful, modify the Boot Sequence (also known as boot list) to include devices that are known to contain a copy of the Operating System. This can be accomplished by using the System Management Services Menus. For example, select a hard disk known to have a copy of the Operating System as the first and only device in the boot sequence (boot list) and attempt to boot again.

Table 6-2 (Page 5 of 14). Firmware Error Codes.

Table 6-2 (Page 6 of 14). Firmware Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
21A000xxx	SCSI Device Errors	**Notes:** 1. Before replacing any system components: a. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID. b. Ensure SCSI bus is properly terminated: c. Ensure SCSI signal and power cables are securely connected and not damaged. 2. The location code information is required to identify the ID of SCSI device failures as well as to indicate the location of the controller to which the device is attached. Check the system error logs to determine the location code information associated with the error code.
21A00001	Test Unit Ready Failed - hardware error	Refer to the notes in error code 21A000xxx. 1. Replace the SCSI device. 2. Replace the SCSI cable. 3. Replace the SCSI controller.
21A00002	Test Unit Ready Failed - sense data available	Refer to the notes in error code 21A000xxx. 1. Replace the Media (Removable media devices). 2. Replace the SCSI device.
21A00003	Send Diagnostic Failed	Refer to the notes in error code 21A000xxx. Replace the SCSI device.
21A00004	Send Diagnostic Failed - DevOfl cmd	Refer to the notes in error code 21A000xxx. 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.

Table 6-2 (Page 7 of 14). Firmware Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
21F00xxx	SCSI CD-ROM	Refer to 21A00xxx for a description and repair action for the xxx value.
21F20xxx	SCSI Read/Write Optical	Refer to 21A00xxx for a description and repair action for the xxx value.
22000001	PCI Ethernet BNC/RJ-45 or PCI Ethernet AUI/RJ-45 Adapter Internal Wrap Test failure	Replace the Adapter See note 5 on page 6-1 for location code information related to this error.
22001001	IBM 10/100 Mbps Ethernet PCI Adapter Internal Wrap Test failure	Replace the Adapter See note 5 on page 6-1 for location code information related to this error.
22010001	IBM PCI Auto LANstreamer Token Ring Adapter Adapter failed to complete hardware initialization.	Replace the Adapter See note 5 on page 6-1 for location code information related to this error.
22011001	IBM PCI Token Ring Adapter Adapter failed to complete hardware initialization.	Replace the Adapter See note 5 on page 6-1 for location code information related to this error.
25A00001	Cache L2 controller failure	1. Replace the processor card. See note 5 on page 6-1 for processor card location information. 2. Replace the System Backplane Assembly. Location Code: U1.1-P1.
25A10001	Cache L2 SRAM failure	1. Replace the processor card. See note 5 on page 6-1 for processor card location information.
25A80xxx	NVRAM problems	Errors reported against NVRAM can be caused by low Battery voltage and (more rarely) power outages that occur during normal system usage. With the exception of the 25A80000 error, these errors are warnings that the NVRAM data content had to be re-established and do not require any FRU replacement unless the error is persistent. When one of these errors occurs, any system customization (eg. boot device list) information has been lost, the system may need to be re-configured. If the error is persistent, replace the Service Processor Card (Location Code: U0.1-P1-X1).
25A80000	Initialization failed, device test failed	Refer to Action under error code 25A80xxx.

Error Code	Description	Action/ Possible Failing FRU
25A80001	Init-nvram invoked, ALL of NVRAM initialized	Refer to Action under error code 25A80xxx.
25A80002	Init-nvram invoked, some data partitions may have been preserved.	Refer to Action under error code 25A80xxx.
25A80011	Data corruption detected, ALL of NVRAM initialized	Refer to Action under error code 25A80xxx.
25A80012	Data corruption detected, some data partitions may have been preserved.	Refer to Action under error code 25A80xxx.
25A80100	NVRAM data validation check failed.	Turn off, turn on system unit and retry the operation before replacing any system component. Refer to Action under error code 25A80xxx.
25A80201	Unable to expand target partition - Saving configuration variable.	Refer to Action under error code 25A80xxx.
25A80202	Unable to expand target partition - Writing error log entry.	Refer to Action under error code 25A80xxx.
25A80203	Unable to expand target partition - Writing VPD data.	Refer to Action under error code 25A80xxx.
25A80210	Setenv/$Setenv parameter error - name contains a null character.	Refer to Action under error code 25A80xxx.
25A80211	Setenv/$Setenv parameter error - value contains a null character.	Refer to Action under error code 25A80xxx.

Table 6-2 (Page 8 of 14). Firmware Error Codes.

Table 6-2 (Page 9 of 14). Firmware Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
25A80998	NVRAMRC script evaluation error - command line execution error	Execution of a command line within the nvram configuration variable “nvramrc” (script) resulted in a “throw” being executed. This script can be modified by the system firmware **SMS** utilities, the operating system, PCI adapter rom code or utility, or an operator (via the open firmware script editing command “nvedit”). It may not be possible to resolve the problem without a detailed analysis of the nvram script, the current system configuration, and device tree contents. 1. The problem can be caused by a SCSI adapter,whose SCSI bus ID has been changed from the default setting, no longer appearing in the system. This can be caused either by removing a SCSI adapter, or a problem with a SCSI adapter. a. Select the “SCSI ID” utility from the **SMS** menu(s). 1. Verify the list of SCSI controllers/adapters. If the list is not correct, suspect a problem with the adapter(s) installed but not listed. 2. Select the option to “Save” the configuration information. 3. Restart the system. b. If the problem persists, boot the operating system and verify the SCSI bus IDs of any installed/available SCSI controllers (change as necessary), and restart the system. 2. Contact your service support representative for further assistance.
25A80999	NVRAMRC script evaluation error - stack unbalanced on completion	This is a firmware debug environment error. There is no user action or FRU replacement for this error.
25B00001	Memory card error	1. Replace Memory Card. See note 5 on page 6-1 for Memory Card location code information.

Table 6-2 (Page 10 of 14). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU

26800Cx0	Machine Check occurred	The problem is associated with the I/O Drawer Planar.
		1. Replace I/O Drawer Planar.
		"x" indicates the I/O Drawer number.
		If x=_, then the I/O Drawer is:
		`x = I/O Drawer`
		`1 = 0`
		`2 = 1`
		`3 = 2`
		`4 = 3`
		See "AIX and Physical Location Code Tables" in Chapter 1, for location codes.
		See note 5 on page 6-1 for location code information related to this error.

26800CxF	Machine Check occurred	The problem is associated with the RIO link to an I/O Drawer.
		1. Check Cables
		2. Check Remote I/O
		"x" indicates the I/O Drawer.
		If x=_, then the I/O Drawer is:
		`x = I/O Drawer`
		`1 = 0`
		`2 = 1`
		`3 = 2`
		`4 = 3`
		See "AIX and Physical Location Code Tables" in Chapter 1, for location codes.
		See note 5 on page 6-1 for location code information related to this error.

Table 6-2 (Page 11 of 14). Firmware Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**

26800Cxy	Machine Check occurred	The problem is associated with the adapter in slot “y” in I/O Drawer “x.”
		1. Replace adapter.
		2. Replace I/O Drawer Planar.
		X indicates the I/O Drawer number.
		If x=_, then the I/O Drawer is:
		`x = I/O Drawer`
		`1 = 0`
		`2 = 1`
		`3 = 2`
		`4 = 3`
		See “AIX and Physical Location Code Tables” in Chapter 1, for location codes.
		See note 5 on page 6-1 for location code information related to this error.

28030xxx	RTC errors	
28030001	RTC not updating - RTC initialization required	Errors reported against the Real Time Clock can be caused by low Battery voltage and (more rarely) power outages that occur during normal system usage. These errors are warnings that the Real Time Clock data content needs to be re-established and do not require any FRU replacement unless the error is persistent. When one of these errors occurs, the Time and Date information has been lost. • To set/restore the Time and Date, use the Operating System facility. If the error is persistent: 1. Replace the System Rack Operator Panel Battery. System Rack Operator Panel Location Code: U1.1-P1-L1. 2. Replace the Service Processor Card. Location Code: U0.1-P1-X1. 3. Replace the System Rack Operator Panel. Location Code: U1.1-P1-L1.
28030002	Bad time/date values	1. Set Time and Date. 2. Refer to Action under error code 28030001.

Table 6-2 (Page 12 of 14). Firmware Error Codes.

Error Code	Description	Action/ Possible Failing FRU
28030003	RTC not updating - not correctable	1. Replace the Service Processor Card. Location Code: U0.1-P1-X1.
28030004	RTC operating mode parameters (eg. data mode) changed	1. Set Time and Date. 2. Refer to Action under error code 28030001.
28030005	RTC Battery error	1. Replace the System Rack Operator Panel Battery. **Note:** Password, Time, and Date need to be set. 2. Refer to Action under error code 28030001.
28A00337	Environmental condition, system board over temperature.	1. Check for cool air flow obstructions to the system. 2. Replace I/O Drawer Planar. See note 5 on page 6-1 for location code information related to this error.
28A00340	Fan Fail.	1. Replace I/O Drawer Fans 2. Fan Cable 3. Indicator Card 4. Planar-to-Indicator card cable 5. Replace I/O Drawer Planar. To identify failing I/O Drawer location, see note 5 on page 6-1.
28A00341	1/4 Power Supply EPOW.	1. Replace I/O Drawer 1/4 Power Supply. 2. Replace I/O Drawer Planar. To identify failing I/O Drawer location, see note 5 on page 6-1.
28A00342	3/4 Power Supply EPOW.	1. Replace I/O Drawer 3/4 Power Supply. 2. Replace I/O Drawer Planar. To identify failing I/O Drawer location, see note 5 on page 6-1.
28A00343	System Rack EPOW. This error can be caused by power outages, if the problem is persists, perform the Action/Possible Failing FRU to correct the error.	1. Check SPCN cables from I/O Rack to System Rack. 2. Replace SPCN Card Location code: U1.1-P2-X1 3. Replace System Rack AC Box (or DC Box, if -48 V dc system) Location code: U1.2-V1 If you have replaced all FRUs listed and the problem persists, call your next level of support for assistance

Table 6-2 (Page 13 of 14). Firmware Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
28A00344	EPOW Monitoring Hardware is down-level.	1. Replace I/O Drawer Planar. See note 5 on page 6-1 for location code information related to this error.
29000002	Keyboard/Mouse controller failed self-test	Replace the Service Processor Card. Location Code: U0.1-P1-X1.
29A00003	Keyboard not present/detected	1. Keyboard 2. Keyboard cable 3. Replace the Service Processor Card. Location Code: U0.1-P1-X1.
29A00004	Keyboard stuck key detected	1. Keyboard 2. Replace the Service Processor Card. Location Code: U0.1-P1-X1.
29B00004	Mouse not present/detected	1. Mouse 2. Replace the Service Processor Card. Location Code: U0.1-P1-X1.
2B200031	Processor failure	Processor Card See note 5 on page 6-1 for location code information related to this error.
2BA00000	Service processor POST failure	1. Replace the Service Processor Card. Location Code: U0.1-P1-X1. 2. Replace the I/O Drawer Planar in primary drawer. Location Code: U0.1-P1.
2BA00012	Service processor reports self test failure	1. Replace the Service Processor Card. Location Code: U0.1-P1-X1. 2. Replace the I/O Drawer Planar in primary drawer. Location Code: U0.1-P1.
2BA00013	Service processor reports bad NVRAM CRC	1. If problem persists, replace Service Processor Card. Location Code: U0.1-P1-X1.
2BA00017	Service processor reports bad or low battery.	1. Replace the System Rack Operator Panel Battery. System Rack Operator Panel Location Code: U1.1-P1-L1. 2. Replace the Service Processor Card. Location Code: U0.1-P1-X1.

Table 6-2 (Page 14 of 14). Firmware Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
2BA00041	Service processor VPD is corrupted.	1. Replace the Service Processor Card. Location Code: U0.1-P1-X1.
2BA00071	VPD data corrupted for processor card 0	1. Replace the processor card. See note 5 on page 6-1 for location code information related to this error.
2BA00072	VPD data corrupted for processor card 1	1. Replace the processor card. See note 5 on page 6-1 for location code information related to this error.
2BA00073	VPD data corrupted for processor card 2	1. Replace the processor card. See note 5 on page 6-1 for location code information related to this error.

Table 6-3 (Page 1 of 8). Service Processor Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
40A00000	System firmware IPL surveillance interval exceeded.	1. Surveillance mode control is from the Service Processor (SP) Menus. Verify that the system firmware supports SP surveillance. 2. System Rack fault, go to “Entry MAP” on page 4-1. 3. I/O Drawer Planar in primary drawer. Location Code: U0.1-P1 4. Service Processor Card. Location Code: U0.1-P1-X1 5. If the problem persists, call the support center for assistance.

Table 6-3 (Page 2 of 8). Service Processor Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
40B00000	Operating system surveillance interval exceeded.	1. Surveillance mode control is from the Service Processor(SP) Menus. Verify that the Operating System (OS) Heartbeat Utility is installed and has been activated. 2. Check for errors or unusual conditions that might prevent the OS from reporting Heartbeat messages; such as system dump, machine check or checkstop error. Review the error logs. 3. System Rack fault, go to "Entry MAP" on page 4-1. Location Code: U1 4. I/O Drawer Planar in primary drawer. Location Code: U0.1-P1 5. Service Processor Card. Location Code: U0.1-P1-X1 6. If the problem persists, call the support center for assistance.
4B00F002	AIX terminated with fault information	Review Operator Panel for fault information.
4B00F003	AIX terminated with no fault information	Review Error Logs, beginning with Service Processor.
4B00F004	NVRAM corrupted	Service Processor Card. Location Code: U0.1-P1-X1
4B00F007	System Power Control Network (SPCN) fault	Review Error Logs, beginning with AIX.
4B00F008	Process Runtime Diagnostics (PRD) fault	Review Error Logs, beginning with AIX.
4B00F00A	PCI to ISA bridge fault	1. Service Processor Card. Location Code: U0.1-P1-X1 2. Go to "MAP 1540: Minimum Configuration" on page 4-58.
4B00F00B	Super I/O fault	Service Processor Card. Location Code: U0.1-P1-X1
4B00F00C	PCI to PCI bridge fault	1. Go to "MAP 1540: Minimum Configuration" on page 4-58 2. I/O Drawer Planar in primary drawer. Location Code: U0.1-P1
4B00F00D	Super I/O fault	Service Processor Card. Location Code: U0.1-P1-X1

Table 6-3 (Page 3 of 8). Service Processor Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
4B00F00E	Isolation Processor fault	1. Service Processor Card. Location Code: U0.1-P1-X1 2. I/O Drawer Planar in primary drawer. Location Code: U0.1-P1
4B00F00F	Call Home fault	1. Modem. 2. Service Processor Card. Location Code: U0.1-P1-X1 3. Remote system problem 4. Telephone line problem 5. I/O Drawer Planar in primary drawer. Location Code: U0.1-P1
4B00F010	Service Processor fault	Review Error Logs, beginning with SP, then AIX.
4B00F011	System cannot find boot record	Check boot device selections using SMS utilities. If unable to find the boot device, got to “MAP 1540: Minimum Configuration” on page 4-58.
4B00F100	Service Processor database fault	This message appears only in SP error log. If it persists, re-IPL to clear logs and reset programs.
4B00F101	FLASH update CRC fault	This message appears only in SP error log. If it persists, re-IPL to clear logs and reset programs.
4B00F102	Memory allocation fault	This message appears only in SP error log. If it persists, re-IPL to clear logs and reset programs.
4B00F103	Service Processor initialization fault	This message appears only in SP error log. If it persists, re-IPL to clear logs and reset programs.
4B00F104	System mode switch fault	System Rack fault, go to “Entry MAP” on page 4-1. Location Code: U1
4B00F105	FLASH update fault	This message appears only in SP error log. If it persists, re-IPL to clear logs and reset programs. Other contributors to this condition include: 1. Bad update image. 2. Service Processor Card. Location Code: U0.1-P1-X1

Table 6-3 (Page 4 of 8). Service Processor Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
4B00F106	FLASH update LID replacement fault	This message appears only in SP error log. If it persists, re-IPL to clear logs and reset programs. Other contributors to this condition include: 1. Bad update image. 2. Service Processor Card. Location Code: U0.1-P1-X1
4B00F107	Unsupported FLASH update command	This message appears only in SP error log. If it persists, re-IPL to clear logs and reset programs.
4B00F108	Unsupported FLASH update state	This message appears only in SP error log. If it persists, re-IPL to clear logs and reset programs. If the problem continues, call the support center for assistance.
4B00F109	Modem on serial port 1 failed to configure	1. Check modem power and modem connections 2. Service Processor Card. Location Code: U0.1-P1-X1
4B00F10A	Modem on serial port 2 failed to configure	1. Check modem power and modem connections 2. Service Processor Card. Location Code: U0.1-P1-X1
4B00F10B	System firmware not loaded	This message appears only in SP error log. If it persists, re-IPL to clear logs and reset programs. Additional contributors to this condition include: 1. Loose or missing JTAG cable from SP to CEC 2. CEC (run diagnostics on processors and memory) 3. Service Processor Card. Location Code: U0.1-P1-X1 4. If the problem continues, call the support center for assistance.

Table 6-3 (Page 5 of 8). Service Processor Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
4B00F10C	Internal SP program transfer failed (RSP call)	This message appears only in SP error log. If it persists, re-IPL to clear logs and reset programs. Additional contributors to this condition include: 1. Loose or missing JTAG cable from SP to CEC 2. CEC (run diagnostics on processors and memory) 3. Service Processor Card. Location Code: U0.1-P1-X1 4. If the problem continues, call the support center for assistance.
4B00F10D	PRD buffer in NVRAM full	This message appears only in SP error log. If it persists, re-IPL to clear logs and reset programs. If the problem continues, call the support center for assistance.
4B00F10E	NVRAM access failure	This message appears only in SP error log. If it persists, re-IPL to clear logs and reset programs. Additional contributors to this condition include: 1. Service Processor Card. Location Code: U0.1-P1-X1 2. If the problem continues, call the support center for assistance.
4B00F10F	Modem not detected	1. Check modem power and modem connections 2. Service Processor Card. Location Code: U0.1-P1-X1
4B00F110	Call to Service Center failed	1. Modem. 2. Service Processor Card. Location Code: U0.1-P1-X1 3. Remote system problem 4. Telephone line problem 5. Remote host problem
4B00F111	Call to System Administrator failed	1. Modem. 2. Service Processor Card. Location Code: U0.1-P1-X1 3. Remote system problem 4. Telephone line problem 5. Remote host problem

Table 6-3 (Page 6 of 8). Service Processor Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
4B00F112	Call to Pager failed	1. Modem. 2. Service Processor Card. Location Code: U0.1-P1-X1 3. Remote system problem 4. Telephone line problem
4B00F114	SP TOD failed	Service Processor Card. Location Code: U0.1-P1-X1
4B00F115	SPCN buffer in NVRAM full	If this message persists, re-IPL to clear logs and reset programs. If the problem continues, call the support center for assistance.
4B00F116	Call for SPCN error data failed	1. Check AIX error log 2. Run system diagnostics
4B00F117	Call for SPCN error data failed	1. Check AIX error log 2. Run system diagnostics
4B00F118	Internal SP program transfer failed (Get IPL mode)	If this message persists, re-IPL to clear logs and reset programs. Additional contributors to this condition include: 1. Loose or missing JTAG cable from SP to CEC 2. CEC (run diagnostics on processors and memory) 3. Service Processor Card. Location Code: U0.1-P1-X1 4. If the problem continues, call the support center for assistance.
4B00F119	Internal SP program transfer failed (Switch IPL mode)	If this message persists, re-IPL to clear logs and reset programs. Additional contributors to this condition include: 1. Loose or missing JTAG cable from SP to CEC 2. CEC (run diagnostics on processors and memory) 3. Service Processor Card. Location Code: U0.1-P1-X1 4. If the problem continues, call the support center for assistance.

Table 6-3 (Page 7 of 8). Service Processor Error Codes.		
Error Code	**Description**	**Action/ Possible Failing FRU**
4B00F11A	Internal SP program transfer failed (Copy side B to A)	This message appears only in SP error log. If this message persists, re-IPL to clear logs and reset programs. Additional contributors to this condition include: 1. Loose or missing JTAG cable from SP to CEC 2. CEC (run diagnostics on processors and memory) 3. Service Processor Card. Location Code: U0.1-P1-X1 4. If the problem continues, call the support center for assistance.
4B00F11B	Operator Panel reponse failure	If this message persists, re-IPL to clear logs and reset programs. Additional contributors to this condition include: 1. Service Processor Card. Location Code: U0.1-P1-X1 2. Operator Panel Location Code: U1.1-P1-L1
M0BT0000	The system hung during speaker POST. This error code is generated by the customer performing “Problem Determination” in the *RS/6000 Enterprise Server S70 User's Guide*.	Go to “MAP 1540: Minimum Configuration” on page 4-58.
M0BT0001	The system hung during speaker “Starting Software....” This error code is generated by the customer performing “Problem Determination” in the *RS/6000 Enterprise Server S70 User's Guide*.	Go to “MAP 1540: Minimum Configuration” on page 4-58.
M0KBD000	The system hung during keyboard POST. This error code is generated by the customer performing “Problem Determination” in the *RS/6000 Enterprise Server S70 User's Guide*.	1. Service processor 2. Keyboard
M0KBD001	The system did not respond to a keyboard entry. This error code is generated by the customer performing “Problem Determination” in the *RS/6000 Enterprise Server S70 User's Guide*.	Type 101 keyboard.

Table 6-3 (Page 8 of 8). Service Processor Error Codes.

Error Code	Description	Action/ Possible Failing FRU
M0KBD002	The system did not respond to a keyboard entry. This error code is generated by the customer performing "Problem Determination" in the *RS/6000 Enterprise Server S70 User's Guide*.	Type 102 keyboard.
M0KBD003	The system did not respond to a keyboard entry. This error code is generated by the customer performing "Problem Determination" in the *RS/6000 Enterprise Server S70 User's Guide*.	Kanji-type keyboard.
M0MEM002	The system hung during memory POST. This error code is generated by the customer performing "Problem Determination" in the *RS/6000 Enterprise Server S70 User's Guide*.	Go to "MAP 1540: Minimum Configuration" on page 4-58.
M0NET000	The system hung during network POST. This error code is generated by the customer performing "Problem Determination" in the *RS/6000 Enterprise Server S70 User's Guide*.	Go to "MAP 1540: Minimum Configuration" on page 4-58.
M0PS0000	Power Failure This error code is generated by the customer performing "Problem Determination" in the *RS/6000 Enterprise Server S70 User's Guide*.	Go to "MAP 1520: Power" on page 4-13.
M0SCSI00	Unable to load diagnostics. This error code is generated by the customer performing "Problem Determination" in the *RS/6000 Enterprise Server S70 User's Guide*.	Go to "MAP 1540: Minimum Configuration" on page 4-58.
M0SCSI01	Unable to load diagnostics. This error code is generated by the customer performing "Problem Determination" in the *RS/6000 Enterprise Server S70 User's Guide*.	Go to "MAP 1540: Minimum Configuration" on page 4-58.

Unit Reference Codes

How to Use This Section

This procedure uses an SRC (System Reference Code) that is displayed on the Operator Panel, listed in an error log, or reported by the customer to:

- Identify a list of possible failing items.
- Point to additional isolation procedures (if available).

An SRC reported through a message to the system operator may be used when an error log entry is not available.

The reference code tables in this section support 8-character SRC formats.

Use the procedure below to find an SRC and perform the recommended actions.

1. Use Figure 6-1 to:
   - Determine the unit reference code (URC) from the SRC reported.
   - Determine which SRC table to use.

   Notes:

   a. In the SRC tables, x can be any number 0 through 9 or letter A through F.
   b. Machine check is a condition that is indicated when the System Attention light is on and SRC data for functions 11-3 through 20-3 is displayed on the system operator panel. When the SRC indicates a machine check, the leftmost character in the operator panel display for function 11-3 is 0 through 9, A, B, or F.

      For information about operator panel display functions, see Appendix A on page A-1.

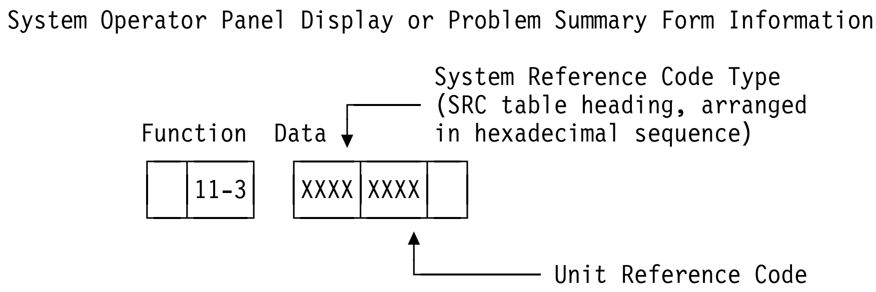


Figure 6-1. Determining the SRC and URC

2. Understand the purpose of Table 6-4 on page 6-27.
   - The 4 leftmost characters of the SRC are listed in Table 6-4 on page 6-27 to tell you which type or SRC you have and direct you to the correct SRC table.

     Follow the instructions in Table 6-4 on page 6-27.
   - You have now determined which SRC table you are going to use and the URC you are going to look for in the SRC table. Do you know how to locate and use the information in the reference code tables?

   No **Yes**

   ↓ Go to step 4 of this procedure
3. This is an information step that explains how to locate and use the information contained in the reference code tables.

   The SRC table name is the same as the SRC type. These tables are arranged in hexadecimal sequence.

   The URCs are arranged in hexadecimal sequence, with numeric characters listed before alphabetic characters. For example, URCs 0001 through 0009 are listed before URCs 000A through 000F.

   Perform the action indicated in the *Description/Action* column of the SRC table to correct the problem. If this does not correct the problem, exchange the failing items or parts in the order that they are listed in the table.

   Notes:

   a. When exchanging the failing items, refer to the “Removal and Replacement Procedures,” in Chapter 9.
   b. The failing item with the highest percent of probable cause should be exchanged first. If exchanging the failing item with the highest percent of probable cause does not correct the problem, reinstall the original item and exchange the failing item with the next highest percent of probable cause. Continue to exchange and reinstall the failing items, one at a time, until the problem is corrected. If exchanging the failing items does not correct the problem, ask your next level of support for assistance.
4. Go to the start of the SRC table for the SRC type.
5. Follow the instructions in the SRC table.

If you cannot find the SRC table for the SRC type, contact your next level of support for assistance.

Table 6-4. SRC reference table

First 4 characters of SRC	What You Should Do
0000	Operator Panel Reference Codes Go to "(0000) Operator Panel Reference Codes" on page 6-28 and follow the instructions in the SRC table.
1xxx	System Power Control Network (SPCN) Reference Codes Go to "(1xxx) System Power Control Network (SPCN) Reference Codes" on page 6-30 and follow the instructions in the SRC table.
A1xx	Service Processor Reference Codes Go to "(A1xx, B1xx) Service Processor Reference Codes" on page 6-60 and follow the instructions in the SRC table.
B006	Common Firmware Reference Codes Go to "(B006) Common Firmware Reference Codes" on page 6-62 and follow the instructions in the SRC table.
B1xx	Service Processor Reference Codes Go to "(A1xx, B1xx) Service Processor Reference Codes" on page 6-60 and follow the instructions in the SRC table.
B4xx	System Processor Reference Codes Go to "(B4xx) System Processor Reference Codes" on page 6-64 and follow the instructions in the SRC table.

(0000) Operator Panel Reference Codes

The operator panel detected a failure.

1. Look at the 4 rightmost characters of the SRC (Data display for function 11-3). These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1110 to 111F	Failure of CEC power supply not identified by SPCN. This reference code can be caused by something holding the system Power On Reset (POR) line active.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. Operator Panel Assm. Location Code: U1.1-P1-L1 3. Service Processor Card Location: U0.1-P1-X1
2222	Service processor failure caused machine check interrupt.	1. Service Processor Card Location: U0.1-P1-X1 2. Operator Panel Assm. Location Code: U1.1-P1-L1
3333	SPCN - operator panel interface error. An attempt to communicate between the SPCN and the operator panel failed.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. Operator Panel Assm. Location Code: U1.1-P1-L1 3. System Backplane Assembly Location: U1.1-P1
4444	Power on request failure A power-on request was not completed successfully. A control panel-detected power-on failure occurred.	1. Operator Panel Assm. Location Code: U1.1-P1-L1 2. SPCN Card Assembly Location: U1.1-P2-X1 3. System Backplane Assembly Location: U1.1-P1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
BBBB	Battery not working correctly A problem was detected with the battery supplying power to the time-of-day clock. The battery is either weak or is not connected securely. **Note:** This is not a critical failure. However, if there is a power failure, the time of day will be lost.	1. Operator Panel Battery 2. Operator Panel Assm. Location Code: U1.1-P1-L1 3. Service Processor Card Location: U0.1-P1-X1 4. System Backplane Assembly Location: U1.1-P1
CCCC	Service processor error to or from operator panel. An attempt to communicate between the service processor and the control panel failed.	1. Service Processor Card Location: U0.1-P1-X1 2. Operator Panel Assm. Location Code: U1.1-P1-L1 3. SPCN Card Assembly Location: U1.1-P2-X1
DDDD	Interface error. A service and manufacturing interface error to or from the control panel occurred. Verify that the external interface device is connected correctly and attempt the power-on operation again.	1. Operator Panel Assm. Location Code: U1.1-P1-L1 2. SPCN Card Assembly Location: U1.1-P2-X1 3. System Backplane Assembly Location: U1.1-P1
EEEE	IPL1 failed in the service processor Go to "MAP 1540: Minimum Configuration" on page 4-58 if the problem is not fixed after replacing all the failing items.	1. Service Processor Card Location: U0.1-P1-X1 2. SPCN Card Assembly Location: U1.1-P2-X1 3. Operator Panel Assm. Location Code: U1.1-P1-L1
FFF0 to FFFF	Control panel self-test failed	1. Operator Panel Assm. Location Code: U1.1-P1-L1 2. SPCN Card Assembly Location: U1.1-P2-X1

(1xxx) System Power Control Network (SPCN) Reference Codes

The system power control network (SPCN) detected a failure.

1. Look at the 4 rightmost characters of the SRC (Data display for function 11-3). These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
00A0	SPCN BATs in process. No action required. This reference code is logged for information only. If this reference code is present for more than 1 minute, go to "MAP 1540: Minimum Configuration" on page 4-58.	
00A1	Regulator 1 has been turned off by system. No action required. This reference code is logged for information only.	
00A2	Regulator 2 has been turned off by system. No action required. This reference code is logged for information only.	
00A3	Regulator 3 has been turned off by system. No action required. This reference code is logged for information only.	
00A4	Regulator 4 has been turned off by system. No action required. This reference code is logged for information only.	
00A5	Regulator 5 has been turned off by system. No action required. This reference code is logged for information only.	
00A6	Regulator 6 has been turned off by system. No action required. This reference code is logged for information only.	
00AA	Download in process. No action required. This reference code is logged for information only.	
00AC	Detected AC (or DC, if -48 V dc system) loss If system powers on normally or stays powered on after AC (or DC, if -48 V dc system) power failure, no replacement of parts may be needed.	1. SPCN Cables 2. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
00EF	Remote EPO Switch is off	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0800	Blower B01 powered off for concurrent maintenance	Location: U1.2-F1
0801	Blower B02 powered off for concurrent maintenance	Location: U1.2-F2
0802	Blower B03 powered off for concurrent maintenance	Location: U1.2-F3
0803	Blower B04 powered off for concurrent maintenance	Location: U1.2-F4
0900	Power Supply P01 powered off for concurrent maintenance	Location: U1.2-V2
0901	Power Supply P02 powered off for concurrent maintenance	Location: U1.2-V3
0902	Power Supply P03 powered off for concurrent maintenance	Location: U1.2-V4
0903	Power Supply P04 powered off for concurrent maintenance	Location: U1.2-V5
0904	Power Supply P05 powered off for concurrent maintenance	Location: U1.2-V6
0905	Power Supply P06 powered off for concurrent maintenance	Location: U1.2-V7
0F0F	AC (or dc, if -48 V dc system) Box Failure. The SPCN node cannot determine the machine type of the box in which it is installed. If not able to fix, go to “MAP 1540: Minimum Configuration” on page 4-58.	1. SPCN Card Location: U1.1-P2-X1 2. System Backplane Assembly Location: U0.1-P1-X1
0F12	Unidentified box ID. EEPROM test failed. The SPCN node cannot determine the machine type of the box in which it is installed. If not able to fix, go to “MAP 1540: Minimum Configuration” on page 4-58.	1. SPCN Card Location: U1.1-P2-X1 2. System Backplane Assembly Location: U0.1-P1-X1
0F13	Unidentified box ID. Code type mismatch. The SPCN node cannot determine the machine type of the box in which it is installed. If not able to fix, go to “MAP 1540: Minimum Configuration” on page 4-58.	1. SPCN Card Location: U1.1-P2-X1 2. System Backplane Assembly Location: U0.1-P1-X1
0F1F	Unidentified box ID. LCD test failed. The SPCN node cannot determine the machine type of the box in which it is installed. If not able to fix, go to “MAP 1540: Minimum Configuration” on page 4-58.	1. SPCN Card Location: U1.1-P2-X1 2. System Backplane Assembly Location: U0.1-P1-X1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
0F2C	Unknown box ID. The SPCN node cannot determine the machine type of the box in which it is installed. If not able to fix, go to "MAP 1540: Minimum Configuration" on page 4-58.	1. SPCN Card Location: U1.1-P2-X1 2. System Backplane Assembly Location: U0.1-P1-X1
0F2D	Unknown box ID. Code level mismatch. The SPCN node cannot determine the machine type of the box in which it is installed. If not able to fix, go to "MAP 1540: Minimum Configuration" on page 4-58.	1. SPCN Card Location: U1.1-P2-X1 2. System Backplane Assembly Location: U0.1-P1-X1
0F2E	SPCN Network Fault. The box ID was not defined. A network communications failure occurred. If not able to fix, go to "MAP 1540: Minimum Configuration" on page 4-58.	1. SPCN Card Location: U1.1-P2-X1 2. System Backplane Assembly Location: U0.1-P1-X1
1100	Power Supply P01 error A fault detection failure occurred for Power Supply P01. If the LED on a bulk power supply is not on or is blinking, it may be the failing item. The LED not on may be the only indication of a failure. Exchange the bulk power supply to correct this problem.	1. Bulk Power Supply, P01 Location: U1.2-V2 2. SPCN Card Assm., R21 Location: U1.1-P2-X1
1101	Power Supply P02 error A fault detection failure occurred for Power Supply P02. If the LED on a bulk power supply is not on or is blinking, it may be the failing item. The LED not on may be the only indication of a failure. Exchange the bulk power supply to correct this problem.	1. Bulk Power Supply, P02 Location: U1.2-V3 2. SPCN Card Assm., R21 Location: U1.1-P2-X1
1102	Power Supply P03 error A fault detection failure occurred for Power Supply P03. If the LED on a bulk power supply is not on or is blinking, it may be the failing item. The LED not on may be the only indication of a failure. Exchange the bulk power supply to correct this problem.	1. Bulk Power Supply, P03 Location: U1.2-V4 2. SPCN Card Assm., R21 Location: U1.1-P2-X1
1103	Power Supply P04 error A fault detection failure occurred for Power Supply P04. If the LED on a bulk power supply is not on or is blinking, it may be the failing item. The LED not on may be the only indication of a failure. Exchange the bulk power supply to correct this problem.	1. Bulk Power Supply, P04 Location: U1.2-V5 2. SPCN Card Assm., R21 Location: U1.1-P2-X1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1104	Power Supply P05 error A fault detection failure occurred for Power Supply P05. If the LED on a bulk power supply is not on or is blinking, it may be the failing item. The LED not on may be the only indication of a failure. Exchange the bulk power supply to correct this problem.	1. Bulk Power Supply, P05 Location: U1.2-V6 2. SPCN Card Assm., R21 Location: U1.1-P2-X1
1105	Power Supply P06 error A fault detection failure occurred for Power Supply P06. If the LED on a bulk power supply is not on or is blinking, it may be the failing item. The LED not on may be the only indication of a failure. Exchange the bulk power supply to correct this problem.	1. Bulk Power Supply, P06 Location: U1.2-V7 2. SPCN Card Assm., R21 Location: U1.1-P2-X1
1108	Regulator R01 error A fault detection failure occurred for Regulator R01.	1. Programmable Regulator Assm., R01 Location: U1.1-P2-V1 2. SPCN Card Location: U1.1-P2-X1
1109	Regulator R02 error A fault detection failure occurred for Regulator R02.	1. Programmable Regulator Assm., R02 Location: U1.1-P2-V2 2. SPCN Card Location: U1.1-P2-X1
110A	Regulator R03 error A fault detection failure occurred for Regulator R03.	1. Programmable Regulator Assm., R03 Location: U1.1-P2-V3 2. SPCN Card Location: U1.1-P2-X1
110B	Regulator R04 error A fault has been detected for Regulator R04.	1. Programmable Regulator Assm., R04 Location: U1.1-P2-V4 2. SPCN Card Location: U1.1-P2-X1
110C	Regulator R05 error A fault detection failure occurred for Regulator R05.	1. Programmable Regulator Assm., R05 Location: U1.1-P2-V5 2. SPCN Card Location: U1.1-P2-X1
110D	Regulator R06 error A fault detection failure occurred for Regulator R06.	1. Programmable Regulator Assm., R06 Location: U1.1-P2-V6 2. SPCN Card Location: U1.1-P2-X1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
110E	Regulator R07 error A fault detection failure occurred for Regulator R07.	1. Programmable Regulator Assm., R07 Location: U1.1-P2-V7 2. SPCN Card Location: U1.1-P2-X1
110F	Regulator R08 error A fault has been detected for a non-existent regulator.	1. SPCN Card Location: U1.1-P2-X1
1110	Regulator R09 error A fault detection failure occurred for regulator R09.	1. Programmable Regulator Assm., R09 Location: U1.1-P2-V8 2. SPCN Card Location: U1.1-P2-X1
1111	Regulator R10 error A fault detection failure occurred for Regulator R10.	1. Programmable Regulator Assm., R10 Location: U1.1-P2-V9 2. SPCN Card Location: U1.1-P2-X1
1112	Regulator R11 error A fault detection failure occurred for Regulator R11.	1. Programmable Regulator Assm., R11 Location: U1.1-P2-V10 2. SPCN Card Location: U1.1-P2-X1
1113	Regulator R12 error A fault detection failure occurred for Regulator R12.	1. Programmable Regulator Assm., R12 Location: U1.1-P2-V11 2. SPCN Card Location: U1.1-P2-X1
1114	Regulator R13 error A fault has been detected for a non-existent regulator.	1. SPCN Card Location: U1.1-P2-X1
1115	Regulator R14 error A fault has been detected for a non-existent regulator.	1. SPCN Card Location: U1.1-P2-X1
1116	Regulator R15 error A fault detection failure occurred for Regulator R15.	1. Programmable Regulator Assm., R15 Location: U1.1-P2-V12 2. SPCN Card Location: U1.1-P2-X1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1117	Regulator R16 error A fault detection failure occurred for Regulator R16.	1. Programmable Regulator Assm., R16 Location: U1.1-P2-V13 2. SPCN Card Location: U1.1-P2-X1
1118	Regulator R17 error A fault detection failure occurred for Regulator R17.	1. Memory Regulator Assm., R17 Location: U1.1-P2-V14 2. SPCN Card Location: U1.1-P2-X1
1119	Regulator R18 error A fault detection failure occurred for Regulator R18.	1. Memory Regulator Assm., R18 Location: U1.1-P2-V15 2. SPCN Card Location: U1.1-P2-X1
111A	Regulator R19 error A fault detection failure occurred for Regulator R19.	1. Programmable Regulator Assm., R19 Location: U1.1-P2-V16 2. SPCN Card Location: U1.1-P2-X1
111B	Regulator R20 error A fault detection failure occurred for Regulator R20.	1. Programmable Regulator Assm., R20 Location: U1.1-P2-V17 2. SPCN Card Location: U1.1-P2-X1
1200	29V Buss Fault A 29V Bus fault has been detected.	Go to “MAP 1520: Power” on page 4-13.
1201	2.5V Processor Regulator Fault A 2.5V Regulator fault has been detected.	Go to “MAP 1520: Power” on page 4-13.
1202	3.3V Processor Regulator Fault A 3.3V Regulator fault has been detected.	Go to “MAP 1520: Power” on page 4-13.
1203	2.5V Memory Control Regulator Fault A 2.5V Memory Control Regulator fault has been detected.	Go to “MAP 1520: Power” on page 4-13.
1204	3.3V Memory Control Regulator Fault A 3.3V Memory Control Regulator fault has been detected.	Go to “MAP 1520: Power” on page 4-13.
1205	3.3V Memory 1 Control Regulator Fault A 3.3V Memory 1 Control Regulator fault has been detected.	Go to “MAP 1520: Power” on page 4-13.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1206	3.3V Memory 2 Control Regulator Fault A 3.3V Memory 2 Control Regulator fault has been detected.	Go to “MAP 1520: Power” on page 4-13.
1300	Power Supply P01 Fault A fault has been detected for Power Supply P01. If the LED on a bulk power supply is not on or is blinking, it may be the failing item. The LED not on may be the only indication of a failure. Exchange the bulk power supply to correct this problem.	Bulk Power Supply, P01 Location: U1.2-V2
1301	Power Supply P02 Fault A fault has been detected for Power Supply P02. If the LED on a bulk power supply is not on or is blinking, it may be the failing item. The LED not on may be the only indication of a failure. Exchange the bulk power supply to correct this problem.	Bulk Power Supply, P02 Location: U1.2-V3
1302	Power Supply P03 Fault A fault has been detected for Power Supply P03. If the LED on a bulk power supply is not on or is blinking, it may be the failing item. The LED not on may be the only indication of a failure. Exchange the bulk power supply to correct this problem.	Bulk Power Supply, P03 Location: U1.2-V4
1303	Power Supply P04 Fault A fault has been detected for Power Supply P04. If the LED on a bulk power supply is not on or is blinking, it may be the failing item. The LED not on may be the only indication of a failure. Exchange the bulk power supply to correct this problem.	Bulk Power Supply, P04 Location: U1.2-V5
1304	Power Supply P05 Fault A fault has been detected for Power Supply P05. If the LED on a bulk power supply is not on or is blinking, it may be the failing item. The LED not on may be the only indication of a failure. Exchange the bulk power supply to correct this problem.	Bulk Power Supply, P05 Location: U1.2-V6
1305	Power Supply P06 Fault A fault has been detected for Power Supply P06. If the LED on a bulk power supply is not on or is blinking, it may be the failing item. The LED not on may be the only indication of a failure. Exchange the bulk power supply to correct this problem.	Bulk Power Supply, P06 Location: U1.2-V7

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1308	Regulator R01 Fault A fault has been detected for Regulator R01.	Programmable Regulator Assm., R01 Location: U1.1-P2-V1
1309	Regulator R02 Fault A fault has been detected for Regulator R02.	Programmable Regulator Assm., R02 Location: U1.1-P2-V2
130A	Regulator R03 Fault A fault has been detected for Regulator R03.	Programmable Regulator Assm., R03 Location: U1.1-P2-V3
130B	Regulator R04 Fault A fault has been detected for Regulator R04.	Programmable Regulator Assm., R04 Location: U1.1-P2-V4
130C	Regulator R05 Fault A fault has been detected for Regulator R05.	Programmable Regulator Assm., R05 Location: U1.1-P2-V5
130D	Regulator R06 Fault A fault has been detected for Regulator R06.	Programmable Regulator Assm., R06 Location: U1.1-P2-V6
130E	Regulator R07 Fault A fault has been detected for Regulator R07.	Programmable Regulator Assm., R07 Location: U1.1-P2-V7
130F	Regulator R08 Fault A fault has been detected for a non-existent regulator.	1. SPCN Card Location: U1.1-P2-X1
1310	Regulator R09 Fault A fault has been detected for Regulator R09.	Programmable Regulator Assm., R09 Location: U1.1-P2-V8
1311	Regulator R10 Fault A fault has been detected for Regulator R10.	Programmable Regulator Assm., R10 Location: U1.1-P2-V9
1312	Regulator R11 Fault A fault has been detected for Regulator R11.	Programmable Regulator Assm., R11 Location: U1.1-P2-V10
1313	Regulator R12 Fault A fault has been detected for Regulator R12.	Programmable Regulator Assm., R12 Location: U1.1-P2-V11
1314	Regulator R13 Fault A fault has been detected for a non-existent regulator.	1. SPCN Card Location: U1.1-P2-X1
1315	Regulator R14 Fault A fault has been detected for a non-existent regulator.	1. SPCN Card Location: U1.1-P2-X1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1316	Regulator R15 Fault A fault has been detected for Regulator R15.	Programmable Regulator Assm., R15 Location: U1.1-P2-V12
1317	Regulator R16 Fault A fault has been detected for Regulator R16.	Programmable Regulator Assm., R16 Location: U1.1-P2-V13
1318	Regulator R17 Fault A fault has been detected for Regulator R17.	Memory Regulator Assm., R17 Location: U1.1-P2-V14
1319	Regulator R18 Fault A fault has been detected for Regulator R18.	Memory Regulator Assm., R18 Location: U1.1-P2-V15
131A	Regulator R19 Fault A fault has been detected for Regulator R19.	Programmable Regulator Assm., R19 Location: U1.1-P2-V16
131B	Regulator R20 Fault A fault has been detected for Regulator R20.	Programmable Regulator Assm., R20 Location: U1.1-P2-V17
1401	2.5V Processor Domain Fault A 2.5V Domain fault has been detected.	Go to "MAP 1520: Power" on page 4-13.
1402	3.3V Processor Domain Fault A 3.3V Domain fault has been detected.	Go to "MAP 1520: Power" on page 4-13.
1403	2.5V Memory Control Domain Fault A 2.5V Memory Control Domain fault has been detected.	Go to "MAP 1520: Power" on page 4-13.
1404	3.3V Memory Control Domain Fault A 3.3V Memory Control Domain fault has been detected.	Go to "MAP 1520: Power" on page 4-13.
1405	3.3V Memory Control 1 Domain Fault A 3.3V Memory 1 Control Domain fault has been detected.	Go to "MAP 1520: Power" on page 4-13.
1406	3.3V Memory Control 2 Domain Fault A 3.3V Memory 2 Control Domain fault has been detected.	Go to "MAP 1520: Power" on page 4-13.
6018	One of the regulators (R01, R02, or R03) has reported a fault. A regulator fault was detected.	1. Programmable Regulator Assm. R01, R02, or R03 Location: U1.1-P2-V1, U1.1-P2-V2, U1.1-P2-V3 2. SPCN Card Location: U1.1-P2-X1 3. Go to "MAP 1520: Power" on page 4-13.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6118	Regulator over current fault. One of the regulators (R01, R02, or R03) detected an over current condition. This may be caused by the regulator or one of the cards powered by the regulator.	1. Programmable Regulator Assm., R01, R02, R03 Location: U1.1-P2-V1, U1.1-P2-V2, U1.1-P2-V3 2. SPCN Card Location: U1.1-P2-X1 3. Go to "MAP 1520: Power" on page 4-13.
6218	Regulator over current fault. Regulator 1 detected an over current condition. This may be caused by the regulator or one of the cards powered by the regulator.	1. Programmable Regulator Assm., R01 Location: U1.1-P2-V1 2. SPCN Card 3. Go to "MAP 1520: Power" on page 4-13. Location: U1.1-P2-X1
6238	Regulator over current fault. Regulator 2 detected an over current condition. This may be caused by the regulator or one of the cards powered by the regulator.	1. Programmable Regulator Assm., R02 Location: U1.1-P2-V2 2. SPCN Card 3. Go to "MAP 1520: Power" on page 4-13. Location: U1.1-P2-X1
6258	Regulator over current fault. Regulator 3 detected an over current condition. This may be caused by the regulator or one of the cards powered by the regulator.	1. Programmable Regulator Assm., R03 Location: U1.1-P2-V3 2. AC box (DC box, if -48 V dc system) Location: U1.2-V1
6318	For SRC 1011, Regulator 1 has reported a fault.	1. Programmable Regulator Assm. 2. Go to "MAP 1520: Power" on page 4-13. Location: U1.1-P2-V1 3. SPCN Card Assembly, R21 Location: U1.1-P2-X1
	For SRC 10xC, the 3/4 power supply in the I/O Drawer that contains the Service Processor Card reported a fault. The system will power off. Visible as a function 11 on the operator panel.	1. 3/4 Power Supply 2. I/O Planar 3. Planar to Indicator Card Cable

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
631A	Regulator Fault Regulator 1 has reported a fault.	1. Programmable Regulator Assm., R01 Location: U1.1-P2-V1 2. Go to "MAP 1520: Power" on page 4-13. 3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
6338	Regulator Fault Regulator 2 has reported a fault.	1. Programmable Regulator Assm., R02 Location: U1.1-P2-V2 2. Go to "MAP 1520: Power" on page 4-13. 3. SPCN Card Location: U1.1-P2-X1
633A	Regulator Fault Regulator 1 has reported a fault.	1. Programmable Regulator Assm., R01 Location: U1.1-P2-V1 2. Go to "MAP 1520: Power" on page 4-13. 3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
6358	Regulator Fault Regulator 3 reported a fault.	1. Programmable Regulator Assm., R03 Location: U1.1-P2-V3 2. AC box (DC box, if -48 V dc system) Location: U1.2-V1
6400	Power Good Fault	Go to "MAP 1520: Power" on page 4-13.
6401	Power Good Fault	Go to "MAP 1520: Power" on page 4-13.
6518	One of the regulators has reported a fault. An over current sensor failure occurred for a regulator. The AC box or one of the regulators can cause this fault.	1. Go to "MAP 1520: Power" on page 4-13. 2. AC box (DC box, if -48 V dc system) Location: U1.2-V1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6618	Regulator over current fault Regulator 1 reported a false over current condition. Fault tolerance may allow continued system use.	1. Programmable Regulator Assm., R01 Location: U1.1-P2-V1 2. Go to “MAP 1520: Power” on page 4-13. 3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
6638	Regulator over current fault Regulator 2 reported a false over current condition. Fault tolerance may allow continued system use.	1. Programmable Regulator Assm., R02 Location: U1.1-P2-V2 2. Go to “MAP 1520: Power” on page 4-13. 3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 Location: U1.2-V1
6658	Regulator over current fault Regulator 3 reported a false over current condition. Fault tolerance may allow continued system use.	1. Programmable Regulator Assm., R03 Location: U1.1-P2-V3 2. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
6718	For SRC 1011, Regulator 1 has reported a fault. Fault tolerance may allow continued system operation.	1. Programmable Regulator Assm., R01 Location: U1.1-P2-V1 2. Go to “MAP 1520: Power” on page 4-13. 3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
	For SRC 10X1, the 3/4 power supply in a drawer that does not contain the Service Processor Card reported a fault. The system remains powered on. Refer to the note at the end of this table to isolate which drawer.	1. 3/4 Power Supply 2. I/O Planar 3. Planar to Indicator Card Cable
671A	Regulator fault Regulator 17 has reported a fault. Fault tolerance may allow continued system use.	1. Memory Regulator Assm., R17 Location: U1.1-P2-V14 2. Go to “MAP 1520: Power” on page 4-13.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6738	For SRC 1011, Regulator 2 has reported a fault. Fault tolerance may allow continued system operation.	1. Programmable Regulator Assm., R02 Location: U1.1-P2-V2 2. Go to "MAP 1520: Power" on page 4-13. 3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
	For SRC 10XC, the 1/4 power supply in the drawer that contains the Service Processor Card reported a fault. The system remains powered on. Visible as function 05 on the operator panel display.	1. 1/4 Power Supply 2. I/O Planar 3. Planar to Indicator Card Cable
	For SRC 10X1, the 1/4 power supply in a drawer that does not contain the Service Processor Card reported a fault. The system remains powered on. Visible as function 05 on the operator panel display. Refer to the note at the end of this table to isolate which drawer.	1. 1/4 Power Supply 2. I/O Planar 3. Planar to Indicator Card Cable
673A	Regulator fault Regulator 18 has reported a fault. Fault tolerance may allow continued system use.	1. Memory Regulator Assm., R18 Location: U1.1-P2-V15 2. Go to "MAP 1520: Power" on page 4-13.
6758	Regulator fault Regulator 3 has reported a fault. Fault tolerance may allow continued system use.	1. Programmable Regulator Assm., R03 Location: U1.1-P2-V3 2. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
6818	For SRC 1011, a fault detection failure occurred for a regulator.	1. Programmable Regulator Assm., R01, R02, R03 Location: U1.1-P2-V1, U1.1-P2-V2, U1.1-P2-V3 2. SPCN Card Location: U1.1-P2-X1
	For SRC 10XC, the 3/4 power supply in the drawer that contains the service processor card has a sensor fault. The dc-good signal is in the wrong state before power is applied. The system remains powered up. Visible as function 05 on the operator panel display.	1. 3/4 Power Supply 2. Indicator Card 3. Planar to Indicator Card Cable

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6918	One of the regulators has reported a fault. An over current fault detection failure occurred for a regulator. The regulator or the SPCN card can cause this failure.	1. Programmable Regulator Assm., R01, R02, R03 Location: U1.1-P2-V1, U1.1-P2-V2, U1.1-P2-V3 2. SPCN Card Location: U1.1-P2-X1
6A18	For SRC 1011, a regulator fault detection failure occurred for regulator 1.	1. Programmable Regulator Assm., R01 Location: U1.1-P2-V1 2. Go to "MAP 1520: Power" on page 4-13. 3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
	For SRC 10X1, the 3/4 power supply in a drawer that does not contain the service processor card has a sensor fault. The dc-good signal is in the wrong state before power is applied. The system remains powered up. Visible as function 05 on the operator panel display. Refer to the note at the end of this table to isolate which drawer.	1. 3/4 Power Supply 2. Indicator Card 3. Planar to Indicator Card Cable
6A38	For SRC 1011, A regulator fault detection failure occurred for regulator 2.	1. Programmable Regulator Assm., R02 Location: U1.1-P2-V2 2. Go to "MAP 1520: Power" on page 4-13. 3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
	For SRC 10XC, the 1/4 power supply in the drawer that contains the Service Processor Card reported a sensor fault. The dc-good signal is in the wrong state before power is applied. The system remains powered on. Visible as function 05 on the operator panel display.	1. 1/4 Power Supply 2. Indicator Card 3. Planar to Indicator Card Cable
	For SRC 10X1, the 1/4 power supply in a drawer that does not contain the Service Processor Card reported a sensor fault. The dc-good signal is in the wrong state before power is applied. The system remains powered up. Visible as function 05 on the operator panel display. Refer to the note at the end of this table to isolate which drawer.	1. 1/4 Power Supply 2. Indicator Card 3. Planar to Indicator Card Cable

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6A58	Regulator Fault A regulator fault detection failure occurred for regulator 3. The regulator or the SPCN card can causes this fault.	1. Programmable Regulator Assm., R03 Location: U1.1-P2-V3 2. SPCN Card Location: U1.1-P2-X1 3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
7000	Air Moving Device 1 Fault A problem was detected with an Air Moving Device which can be caused by an Air Moving Device not being installed or operating at the wrong speed. The SPCN card could be defective. Change the failing items one at a time.	1. Blower 1, B01 Location: U1.2-F1 2. SPCN Card Location: U1.1-P2-X1
7001	Air Moving Device 2 Fault A problem was detected with an Air Moving Device which can be caused by an Air Moving Device not being installed or operating at the wrong speed. The SPCN card could be defective. Change the failing items one at a time.	1. Blower 2, B02 Location: U1.2-F2 2. SPCN Card Location: U1.1-P2-X1
7002	Air Moving Device 3 Fault A problem was detected with an Air Moving Device which can be caused by an Air Moving Device not being installed or operating at the wrong speed. The SPCN card could be defective. Change the failing items one at a time.	1. Blower 3, B03 Location: U1.2-F3 2. SPCN Card Location: U1.1-P2-X1
7003	Air Moving Device 4 Fault A problem was detected with an Air Moving Device which can be caused by an Air Moving Device not being installed or operating at the wrong speed. The SPCN card could be defective. Change the failing items one at a time.	1. Blower 4, B04 Location: U1.2-F4 2. SPCN Card Location: U1.1-P2-X1
7101	Power Supply failure The AC power supply module reported a fault.	1. AC box (DC Box, if -48 V dc system) Location: U1.2-V1
7201	Power Supply Over Current fault The AC box (or DC box) reported an over current condition. This is usually caused by one of the regulators.	Go to “MAP 1520: Power” on page 4-13.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
7300	AC (or DC, if -48 V dc system) Box Over Current fault The AC (or DC, if -48 V dc system) box or one of the feature power supplies reported an over current condition.	Go to “MAP 1520: Power” on page 4-13.
7400	Control Supply fault A control supply fault was reported in the AC box	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 2. SPCN Card, R21 Location: U1.1-P2-X1
7401	Control Supply over current A control supply over current condition was detected in the AC (or DC, if -48 V dc system) box.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 2. SPCN Card, R21 Location: U1.1-P2-X1
7402	Control Supply 5V regulator fault The SPCN detected a fault in the +5 V dc regulator of the control supply in the AC (or DC, if -48 V dc system) box.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 2. SPCN Card, R21 Location: U1.1-P2-X1
7403	Control Supply 12V Regulator fault The SPCN detected a fault in the +12V dc regulator of the control supply in the AC (or DC, if -48 V dc system) box.	1. AC box (DC Box, if -48 V dc system) Location: U1.2-V1
7404	Control Supply 12V Regulator overcurrent An overcurrent condition was detected in the +12 V dc regulator of the control supply in the AC (or DC, if -48 V dc system) box.	1. AC box (DC Box, if -48 V dc system) Location: U1.2-V1
7405	Control Supply 5VSW Regulator Fault The SPCN detected a fault in the 5VSW dc regulator of the control supply in the ac (or dc, if -48 V dc system) box.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 2. Operator Panel Assm. Location: U1.1-P1-L1 3. SPCN Card, R21 Location: U1.1-P2-X1 4. Clock Card Location: U1.1-P1-X1 5. System Backplane Assembly Location: U1.1-P1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
7406	Control Supply 5VSW power off failure This failure must be corrected before removing powered processor or memory cards to avoid damage.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 2. Operator Panel Assm. Location: U1.1-P1-L1 3. SPCN Card, R21 Location: U1.1-P2-X1
7500	Air Moving Device 1 missing error A problem was detected with an Air Moving Device 1 which can be caused by an Air Moving Device not being installed. Install Air Moving Device if missing, replace if already installed. Replace the SPCN card if the replacing Air Moving Device does not fix the problem.	1. Blower 1, B01 Location: U1.2-F1 2. SPCN Card, R21 Location: U1.1-P2-X1
7501	Air Moving Device 2 missing error A problem was detected with an Air Moving Device 2 which can be caused by an Air Moving Device not being installed. Install Air Moving Device if missing, replace if already installed. Replace the SPCN card if the replacing Air Moving Device does not fix the problem.	1. Blower 2, B02 Location: U1.2-F2 2. SPCN Card, R21 Location: U1.1-P2-X1
7502	Air Moving Device 3 missing error A problem was detected with an Air Moving Device 3 which can be caused by an Air Moving Device not being installed. Install Air Moving Device if missing, replace if already installed. Replace the SPCN card if the replacing Air Moving Device does not fix the problem.	1. Blower 3, B03 Location: U1.2-F3 2. SPCN Card, R21 Location: U1.1-P2-X1
7503	Air Moving Device 4 missing error A problem was detected with an Air Moving Device 4 which can be caused by an Air Moving Device not being installed. Install Air Moving Device if missing, replace if already installed. Replace the SPCN card if the replacing Air Moving Device does not fix the problem.	1. Blower 4, B04 Location: U1.2-F4 2. SPCN Card, R21 Location: U1.1-P2-X1
8400	No VPD Found due to Invalid Bypass	SPCN Card, R21 Location: U1.1-P2-X1
8401	Timeout on Panel for Request of VPD	1. Operator Panel Assm. Location: U1.1-P1-L1 2. Clock Card, M07 Location: U1.1-P1-X1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
8402	No VPD Found due to Clock Card Failure	1. Clock Card, M07 Location: U1.1-P1-X1 2. Operator Panel Assm. Location: U1.1-P1-L1
8403	VPD Critical Mismatch	SPCN Card, R21 Location: U1.1-P2-X1
8404	Processor Unit VPD Mismatch	1. Processor 1, M08 Location: U1.1-P1-C1 2. Processor 2, M09 Location: U1.1-P1-C2
8405	Processor Unit VPD Mismatch	1. Processor 3, M20 Location: U1.1-P1-C3 2. Processor 1, M08 Location: U1.1-P1-C1 3. Processor 2, M09 Location: U1.1-P1-C2
8406	Invalid Cache Jumper	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
8407	Cache Voltage Mismatch - The regulator backplane cache jumpers are not correct for the processors installed. Correct the jumper positions.	Cache jumpers J1 and J2 are behind R17. Note if cache jumpers are correct. Exchange R17 or R18 one at a time.
8409	No Processor Installed	1. Processor 3, M20 Location: U1.1-P1-C3 2. Processor 1, M08 Location: U1.1-P1-C1 3. Processor 2, M09 Location: U1.1-P1-C2 If you are testing the system and have all processors removed, disregard this SRC otherwise install or exchange all processors cards.
8413	Invalid Processor VPD	Processor 1, M08 Location: U1.1-P1-C1
8414	Invalid Processor VPD	Processor 2, M09 Location: U1.1-P1-C2
8415	Invalid Processor VPD	Processor 3, M20 Location: U1.1-P1-C3

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
8423	No Processor VPD	1. Clock Card, M07 Location: U1.1-P1-X1 2. Processor 1, M08 Location: U1.1-P1-C1
8424	No Processor VPD	1. Clock Card, M07 Location: U1.1-P1-X1 2. Processor 2, M09 Location: U1.1-P1-C2
8425	No Processor VPD	1. Clock Card, M07 Location: U1.1-P1-X1 2. Processor 3, M20 Location: U1.1-P1-C3
9012	Address not valid. Firmware command had a frame address that was not valid. Exchange the SPCN frame-to-frame cables to the failing frame.	1. Go to "MAP 1520: Power" on page 4-13, assume that you do not have an error code when following the MAP. 2. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
9013	Invalid Node Address. The address in the SPCN command does not match the secondary nodes assigned address. Exchange the failing items for the SPCN node reporting the error.	1. Go to "MAP 1520: Power" on page 4-13, assume that you do not have an error code when following the MAP. 2. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9014	A command has an invalid address mode. A command from the system unit specified a unit address of D or E or had a frame address of 00. Exchange the failing items in the system unit.	1. SPCN code problem. 2. Go to "MAP 1520: Power" on page 4-13, assume that you do not have an error code when following the MAP.
9021	A command to an SPCN node was rejected. No action required. This reference code is logged for information only.	
9022	Addressed Unit not in frame. The addressed unit does not exist in the addressed frame. No action required. This reference code is logged for information only.	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9023	Addressed Unit exists, but the frame is powered off. The addressed unit is in a frame that is powered off. No action required. This reference code is logged for information only.	
9024	SPCN Firmware code not valid. The firmware code in one of the secondary nodes is not valid. The code will be reloaded. No action required. This reference code is logged for error analysis only.	
9025	SPCN Firmware Code is not valid. The Firmware Code in one of the frames is not valid. The code will be reloaded. No action required. This reference code is logged for error analysis only.	
9028	SPCN Firmware Code is not valid. The Firmware Code in the primary node is not valid. The code will be reloaded. No action required. This reference code is logged for error analysis only.	
9029	SPCN VPD Damaged The VPD record in the EEPROM has bad data. Exchange the failing items for the node reporting the failure.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
902D	Addressed frame is not in SPCN configuration table. The addressed frame is not in the SPCN configuration table. No action required. This reference code is logged for information only.	
9031	Frame-to-Frame Communications Failure The SPCN detected a BCC error on a transmission from another frame. The transmission is attempted again. No action required. This reference code is logged for error analysis only.	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9032	SPCN Communications Failure, unit to rack. The frame detected a BCC error on a transmission from a secondary node to the frame. The transmission is attempted again. No action required. This reference code is logged for error analysis only.	
9033	SPCN Communications Failure, rack to unit. A secondary node detected a BCC error on a transmission from the frame. The transmission is attempted again. No action required. This reference code is logged for error analysis only.	
9034	Unsupported Packet Size The receiving node detected a packet exceeding 70 bytes. The frame can also return this code if a secondary node returns more than 10 bytes to a PAS command. No action required. This reference code is logged for error analysis only.	
9035	Secondary SPCN node timeout. A secondary SPCN node did not respond to a command. The command was attempted again and failed. No action required. This reference code is logged for error analysis only.	
9036	Frame Timeout One or more frames did not respond to a command. The command is attempted again. No action required. This reference code is logged for error analysis only.	
903B	Invalid Packet Length for data sent. The number of bytes sent or received does not match the number of bytes specified in the command. No action required. This reference code is logged for error analysis only.	
9041	Invalid Load Type The down load was successful, but the wrong type of Firmware Code was loaded. The operation was attempted again but was not successful. Exchange the failing items for the node reporting the fault.	1. SPCN Code Problem 2. SPCN Card Assembly, R21 Location: U1.1-P2-X1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9042	EEPROM Failure The EEPROM in an SPCN node cannot be written successfully. Exchange the SPCN node reported in the failure.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9043	Download Failure The Firmware Code download to an SPCN node was completed but was not successful. Exchange the failing SPCN node.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9046	QDS Packet Sequence Error The Packet Sequence number is wrong. The download was stopped.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9047	QDS Block Sequence Error The Block Sequence number is wrong. The download was stopped.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9048	The SPCN ROS and EEPROM Firmware Code is not compatible. The firmware levels in the nodes ROS and EEPROM are not compatible. Exchange the failing items for the failing node.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem
9080	Undefined Status Code An SPCN node returned an unknown status code. Exchange the failing SPCN node.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. System Backplane Assembly Location: U1.1-P1
90F0	A frame was dropped from the SPCN configuration. A frame was dropped from the SPCN configuration. This is usually caused by a loss of AC power or a problem with the frame-to-frame cable.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. Go to “MAP 1520: Power” on page 4-13, assume that you do not have an error code when following the MAP.
90F1	A frame was added to the SPCN configuration. No action required. This reference code is logged for information only.	

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9101	Firmware-SPCN Timeout A firmware timeout occurred. The SPCN failed to respond to a firmware command.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 2. Operator panel assembly Location: U1.1-P1-L1
9103	Download Initialize Timeout An SPCN node failed to enter the download state after an Initialize for Download command. Exchange the failing SPCN node.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9104	Download Completion Timeout An SPCN node failed to leave the download state. Exchange the failing SPCN node.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9105	Load Damaged Timeout An SPCN node failed to enter the operational state. Exchange the failing SPCN node.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9106	An SPCN LID was not found. No action required. This reference code is logged for information only.	
9107	An SPCN microcode download is required. No action required. This reference code is logged for error analysis only.	
9108	A status change occurred in one of the SPCN nodes. No action required. This reference code is logged for information only.	
9109	Firmware Code part number is not correct. The AROS part number field was not updated to the correct level after the system attempted to load new Firmware Code.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9111	SPCN is too large for VLIC. There are more nodes in the network than VLIC can service.	1. SPCN Code Problem
9112	Primary SPCN node is reporting load damaged. The Firmware Code for the primary SPCN node is damaged. The reload failed because the code could not be found.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9113	Secondary SPCN node is reporting load damaged. The Firmware Code for the secondary SPCN node is damaged. The reload failed because the code could not be found.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9114	Frame SPCN node is reporting load damaged. The Firmware Code for a SPCN node is damaged. The reload failed because the code could not be found.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9115	SPCN Command rejected by the Service Processor. The service processor rejected an SPCN command from the Firmware Code. No action required. This reference code is logged for information only.	
9116	SPCN - Control Panel interface failure. The SPCN to control panel interface is not working.	
9117	SPCN - Control Panel interface is now working. The SPCN to control panel interface is now working. No action required. This reference code is logged for information only.	
9212	Frame Address field not valid. A Firmware Code command had a frame address that is not valid. Exchange the failing items for the failing node.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9213	Invalid Address status, secondary node. The address in the SPCN command does not match the assigned address of the secondary node. Exchange the failing items for the failing node.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9214	Invalid Address Mode status Invalid Address Mode occurred during Frame Command processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem
9215	Invalid Frame Command status Invalid Frame Command occurred during Frame Command processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
921B	System Unit SPCN Port Fault status. System Unit Port Fault occurred during Command processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem
922B	Address Unassigned status A secondary node has no address assigned during Command processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem
9231	Frame-to-Frame Communications Failure A frame-to-frame communications failure occurred during STF processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. Go to “MAP 1520: Power” on page 4-13, assume that you do not have an error code when following the MAP.
9232	Intrarack Communications Failure An SPCN secondary node to frame communications failure occurred during Command processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. Go to “MAP 1520: Power” on page 4-13, assume that you do not have an error code when following the MAP.
9233	Intrarack Communications Failure An SPCN frame to secondary node communications failure occurred during Command processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. Go to “MAP 1520: Power” on page 4-13, assume that you do not have an error code when following the MAP.
9234	Unsupported Packet Size status Unsupported Packet Size occurred during STF and Secondary Node Command processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. Go to “MAP 1520: Power” on page 4-13, assume that you do not have an error code when following the MAP.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9235	SPCN Secondary Node Timeout status An SPCN Secondary Node Timeout occurred during Command processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem 3. Go to "MAP 1520: Power" on page 4-13, assume that you do not have an error code when following the MAP.
9236	Frame Timeout status An SPCN Frame Node Timeout occurred during Network post processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. Go to "MAP 1520: Power" on page 4-13, assume that you do not have an error code when following the MAP.
9238	Secondary Node Fault An SPCN Secondary Node Fault occurred during Command processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem
9239	Frame Node Fault An internal error in the SPCN frame node prevents the running of a Frame command.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem
923A	ASA Failure The frame address returned by a secondary node does not match the address of the frame.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem
923B	Invalid Packet Length for data sent. An Invalid Packet Length occurred for data exchanged.	1. SPCN Code Problem 2. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9280	Response Stack Overflow Too many responses were received during System Frame command processing.	1. Go to "MAP 1520: Power" on page 4-13, assume that you do not have an error code when following the MAP. 2. SPCN Code Problem 3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9281	Response Overrun Response Overrun occurred during System Frame processing.	1. Go to “MAP 1520: Power” on page 4-13, assume that you do not have an error code when following the MAP. 2. SPCN Code Problem 3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
9282	No Free Entries No free entries were found during System Frame processing.	1. Go to “MAP 1520: Power” on page 4-13, assume that you do not have an error code when following the MAP. 2. SPCN Code Problem 3. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
9283	ARA Failure An Assign Frame Address Failure occurred during ARA Preprocessing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem
9284	Undefined status Undefined Status occurred during Frame or STF processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem
9285	BCC Fault A BCC Error was detected during Network post processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1
9286	Length Check Error. Length Check occurred during SPCN post processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem
9287	Undefined status Undefined Status occurred during Command processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem
9288	Configuration Error A configuration error was detected during System Frame processing.	1. SPCN Card Assembly, R21 Location: U1.1-P2-X1 2. SPCN Code Problem

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
9289	Invalid Packet Length for data sent. Invalid Packet Length occurred for data exchanged.	1. SPCN Code Problem 2. SPCN Card Assembly, R21 Location: U1.1-P2-X1
C512	AC (or dc, if -48 V dc system) Box Failure SPCN serial port communications fault occurred.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
C600	AC (or dc, if -48 V dc system) Box Failure The AC (or DC, if -48 V dc system) box control supply failed to turn off.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
C601	AC (or dc, if -48 V dc system) Box Failure AC box bus voltage control test fault occurred.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
C602	AC (or DC, if -48 V dc system) Box Failure AC (or DC, if -48 V dc system) box fault detection failure occurred.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
C609	Clock Card Failure The clock card in slot 17 is missing or defective.	1. Clock Card, M07 Location: U1.1-P1-X1 2. SPCN Card, R21 Location: U1.1-P2-X1
C62E	SPCN Network Fault An SPCN frame-to-frame communication failure was detected.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 2. Go to “MAP 1520: Power” on page 4-13, assume that you do not have an error code when following the MAP.
C701	AC (or dc, if -48 V dc system) Box Failure An SPCN frame-to-frame communication failure was detected.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 2. Go to “MAP 1520: Power” on page 4-13, assume that you do not have an error code when following the MAP.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
C702	AC (or dc, if -48 V dc system) Box Failure An SPCN frame-to-frame communication failure was detected.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 2. Go to “MAP 1520: Power” on page 4-13, assume that you do not have an error code when following the MAP.
C703	AC (or dc, if -48 V dc system) Box Failure An SPCN frame-to-frame communication failure was detected.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 2. Go to “MAP 1520: Power” on page 4-13, assume that you do not have an error code when following the MAP.
CB00	Unknown box ID The SPCN node cannot determine the machine type of the box in which it is installed.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 2. System Backplane Assembly Location: U1.1-p1
CB05 to CB06	AC (or dc, if -48 V dc system) Box Failure The SPCN ROS and EPROMs test failed.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
CC00	AC (or dc,, if -48 V dc system) Box Failure An unknown fault was detected. The machine failed to power up.	1. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1 2. Go to “MAP 1520: Power” on page 4-13, assume that you do not have an error code when following the MAP. 3. SPCN Card Assembly, R21 Location: U1.1-P2-X1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
CE18	Regulator Not Present No regulators can be found. If the regulators are installed, exchange the failing items.	1. Programmable Regulator Assm. 2. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1
CE19	Regulator Not Present If regulator 3 in slot 16 is installed, exchange the failing items.	1. Go to "MAP 1520: Power" on page 4-13. 2. AC Box (DC Box, if -48 V dc system) Location: U1.2-V1

Note:

If the SPCN network is cabled as specified in "Cabling the System Rack and Input/output Rack" on page 1-26, then the SPCN rack addresses are assigned as 1 to the System Rack, 2 to the primary I/O Drawer (drawer that contains the service processor), 3 to the next I/O Drawer in the chain, etc. This can be read as the third character in the SRC. The fourth character in the SRC is the unit address. The primary I/O Drawer has a unit address of C. All other drawers have a unit address of 1.

(A1xx, B1xx) Service Processor Reference Codes

1. Look at the 4 rightmost characters of the SRC (Data display for function 11-3). These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1933	IPL command rejected; bus 1 load-source unit not ready. Make the load source device ready. If load source device is ready and error still exists, replace the failing item. If the load source device is a tape or CD storage unit use FI00092.	Service Processor Card Location: U0.1-P1-X1
4500	Problem detected with the Service Processor	Service Processor Card Location: U0.1-P1-X1
4501	System processor card failure	1. Processor 1, M08 Location: U1.1-P1-C1 2. Processor 2, M09 Location: U1.1-P1-C2 3. Processor 3, M20 Location: U1.1-P1-C3
4502	Service Processor Follow bus isolation procedures to diagnose the problem.	1. Service Processor Card Location: U0.1-P1-X1 2. RIO Cable 3. Operator Panel Assm.
4503	Any device attached to Bus 1 or the Service Processor	1. Service Processor Card Location: U0.1-P1-X1 2. RIO Cable
4504	IPL command rejected; load-source device failed or not found	SP Card
4505	Problem with load source device media	SP Card
4506	Problem detected with Operator Panel	Operator Panel Assm.
4507	Tape or CD storage unit failure Before replacing any FRU verify the load source device is ready and the correct IPL media is loaded properly.	SP Card
4509	Service Processor Problem Isolation Procedure Please refer to and follow the procedures defined in SP-PIP40.	1. Service Processor Card Location: U0.1-P1-X1 2. Operator Panel Assm.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4511	Service Processor or system processor failure	1. Service Processor Card Location: U0.1-P1-X1 2. Processor 1, M08 Location: U1.1-P1-C1 3. Processor 2, M09 Location: U1.1-P1-C2 4. Processor 3, M20 Location: U1.1-P1-C3
4512	Clock card (in System Rack)	1. Clock Card. M07 Location: U1.1-P1-X1
4998	Operator/User Error	Invalid operation
4999	Service processor firmware problem - call for support	
6010	Service Processor	Service Processor Card Location: U0.1-P1-X1
8FF0	Information only, no service action required Service processor error log entry. If the secondary refcode is 806A, a successful download of control panel code has occurred. If the secondary refcode is 8EEE, one of the following conditions may have occurred. The Time-of-Day (TOD) chip had to be reset due to an invalid power-up state. TOD requests will not work successfully until a write TOD is done. Timed-Power-On request has been acknowledged. Power on sequences must be set for valid months, days, hours, minutes, and seconds, for future times, and for times when the system will be powered off.	
8FF1	System down, condition reported	

(B006) Common Firmware Reference Codes

The common firmware detected a failure.

1. Look at the 4 rightmost characters of the SRC (Data display for function 11-3). These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1301	Service Processor resource not available. An activation or deactivation failed to get a resource controlled by firmware.	1. I/O Adapter Firmware Problem 2. Service Processor Firmware Problem
1302	Not valid condition in Service Processor firmware. An error in an activation or deactivation occurred.	1. I/O Adapter Firmware Problem 2. Service Processor Firmware Problem 3. Service Processor Card Location: U0.1-P1-X1
1303	Service Processor resource not available. A resource needed to perform a requested function is not available in the firmware.	1. I/O Adapter Firmware Problem 2. Service Processor Firmware Problem
1304	Not valid condition in Service Processor firmware. The firmware has recovered from a condition that was not expected.	1. I/O Adapter Firmware Problem 2. Service Processor Firmware Problem 3. Service Processor Card Location: U0.1-P1-X1
1305 to 1306	Service Processor card or firmware error. A microprocessor exception occurred on the I/O adapter.	1. Service Processor Card Location: U0.1-P1-X1 2. Go to "MAP 1540: Minimum Configuration" on page 4-58.
1307	Service Processor resource not available. The firmware could not allocate memory resources on the Service Processor card.	1. I/O Adapter Firmware Problem 2. Service Processor Firmware Problem 3. Service Processor Card Location: U0.1-P1-X1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
1308	Not valid condition in Service Processor firmware. The firmware found a condition that should not have occurred.	1. I/O Adapter Firmware Problem 2. Service Processor Firmware Problem 3. Service Processor Card Location: U0.1-P1-X1
1309	Service Processor was not ready for interrupt that occurred.	1. I/O Adapter Firmware Problem 2. Service Processor Card Location: U0.1-P1-X1 3. Go to "MAP 1540: Minimum Configuration" on page 4-58.
1310	Service Processor resource not available. The Service Processor error log is being filled faster than the errors are being reported to the system. Check other errors reported to the system and correct them.	

(B4xx) System Processor Reference Codes

1. Look at the 4 rightmost characters of the SRC (Data display for function 11-3). These 4 characters are the unit reference code.
2. Find the unit reference code in the following table.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4400	System processor card failure A processor card at the specified location is faulty. Probability is high.	Processor 1, M08 Location Code: U1.1-P1-C1 AIX location: 00-00 00-01 00-02 00-03
4401	System processor card failure A processor card at the specified location is faulty. Probability is high.	Processor 2, M09 Location Code: U1.1-P1-C2 AIX Location: 00-04 00-05 00-06 00-07
4402	System processor card failure A processor card at the specified location is faulty. Probability is high.	Processor 3, M20 Location Code: U1.1-P1-C3 AIX Location: 00-08 00-09 00-10 00-11
4403	System processor card failure A processor card at the specified location is faulty. Probability is high.	Processor 1 Processor 2 Processor 3 Cannot isolate to 1 FRU, See Chapter 1 on page 1-1 and “Logical and Physical Locations” on page 1-45 for processor card locations.
4410	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M01 Location Code: U1.1-P1-M1 AIX Location: 00-00
4411	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M02 Location Code: U1.1-P1-M2 AIX Location: 00-00
4412	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M03 Location Code: U1.1-P1-M3 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4413	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M04 Location Code: U1.1-P1-M4 AIX Location: 00-00
4414	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M05 Location Code: U1.1-P1-M5 AIX Location: 00-00
4415	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M06 Location Code: U1.1-P1-M6 AIX Location: 00-00
4416	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M10 Location Code: U1.1-P1-M7 AIX Location: 00-00
4417	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M11 Location Code: U1.1-P1-M8 AIX Location: 00-00
4418	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M12 Location Code: U1.1-P1-M9 AIX Location: 00-00
4419	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M13 Location Code: U1.1-P1-M10 AIX Location: 00-00
441A	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M14 Location Code: U1.1-P1-M11 AIX Location: 00-00
441B	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M15 Location Code: U1.1-P1-M12 AIX Location: 00-00
441C	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M16 Location Code: U1.1-P1-M13 AIX Location: 00-00
441D	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M17 Location Code: U1.1-P1-M14 AIX Location: 00-00
441E	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M18 Location Code: U1.1-P1-M15 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
441F	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M19 Location Code: U1.1-P1-M16 AIX Location: 00-00
4420	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M21 Location Code: U1.1-P1-M17 AIX Location: 00-00
4421	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M22 Location Code: U1.1-P1-M18 AIX Location: 00-00
4422	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M23 Location Code: U1.1-P1-M19 AIX Location: 00-00
4423	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card, M24 Location Code: U1.1-P1-M20 AIX Location: 00-00
4435	Main storage failure A memory card at the specified location is faulty. Probability is high.	Memory Card Can not isolate to 1 FRU, See Chapter 1 on page 1-1 and “Logical and Physical Locations” on page 1-45 for memory card locations.
4440	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
4441	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
4442	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
4443	I/O adapter failed - I/O Drawer 3 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.4-P1 Problem is in this drawer.
4444	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4445	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
4446	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
4450	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
4451	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
4452	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
4453	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
4454	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
4455	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
4456	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
4457	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
4458	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4459	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
445A	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
445B	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1
4460	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
4461	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
4462	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
4463	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
4464	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
4465	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
4466	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
4467	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4468	I/O adapter failed - I/O Drawer 2 failure	Go to "MAP 1540: Minimum Configuration" on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
4469	I/O adapter failed - I/O Drawer 2 failure	Go to "MAP 1540: Minimum Configuration" on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
446A	I/O adapter failed - I/O Drawer 2 failure	Go to "MAP 1540: Minimum Configuration" on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
446B	I/O adapter failed - I/O Drawer 2 failure	Go to "MAP 1540: Minimum Configuration" on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
4470	JTAG cable or system backplane assembly	JTAG Cable 3M JTAG Cable (Internal) System Backplane Assembly Location Code: U1.1-P1 AIX Location: 00-00
4480	Clock Card Failure	Clock Card, M07 Location Code: U1.1-P1-X1 AIX Location: 00-00
4490	Firmware error	Service Processor Firmware Location Code: U0.1-P1-X1
4491	Firmware error	Service Processor Card and Service Processor Firmware Location Code: U0.1-P1-X1
4492	Firmware error	Service Processor Firmware Location Code: U0.1-P1-X1
4500	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J1L Location Code: U1.1-P1-M18.1 AIX Location: 00-00
4501	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J1R Location Code: U1.1-P1-M18.2 AIX Location: 00-00
4502	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J3L Location Code: U1.1-P1-M18.3 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4503	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J3R Location Code: U1.1-P1-M18.4 AIX Location: 00-00
4504	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J5L Location Code: U1.1-P1-M18.5 AIX Location: 00-00
4505	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J5R Location Code: U1.1-P1-M18.6 AIX Location: 00-00
4506	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J7L Location Code: U1.1-P1-M18.7 AIX Location: 00-00
4507	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J7R Location Code: U1.1-P1-M18.8 AIX Location: 00-00
4508	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J2L Location Code: U1.1-P1-M18.9 AIX Location: 00-00
4509	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J2R Location Code: U1.1-P1-M18.10 AIX Location: 00-00
450A	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J4L Location Code: U1.1-P1-M18.11 AIX Location: 00-00
450B	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J4R Location Code: U1.1-P1-M18.12 AIX Location: 00-00
450C	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J6L Location Code: U1.1-P1-M18.13 AIX Location: 00-00
450D	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J6R Location Code: U1.1-P1-M18.14 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
450E	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J8L Location Code: U1.1-P1-M18.15 AIX Location: 00-00
450F	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-J8R Location Code: U1.1-P1-M18.16 AIX Location: 00-00
4510	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M22-JX Location Code: U1.1-P1-M18 AIX Location: 00-00
4511	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J1L Location Code: U1.1-P1-M17.1 AIX Location: 00-00
4512	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J1R Location Code: U1.1-P1-M17.2 AIX Location: 00-00
4513	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J3L Location Code: U1.1-P1-M17.3 AIX Location: 00-00
4514	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J3R Location Code: U1.1-P1-M17.4 AIX Location: 00-00
4515	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J5L Location Code: U1.1-P1-M17.5 AIX Location: 00-00
4516	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J5R Location Code: U1.1-P1-M17.6 AIX Location: 00-00
4517	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J7L Location Code: U1.1-P1-M17.7 AIX Location: 00-00
4518	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J7R Location Code: U1.1-P1-M17.8 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4519	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J2L Location Code: U1.1-P1-M17.9 AIX Location: 00-00
451A	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J2R Location Code: U1.1-P1-M17.10 AIX Location: 00-00
451B	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J4L Location Code: U1.1-P1-M17.11 AIX Location: 00-00
451C	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J4R Location Code: U1.1-P1-M17.12 AIX Location: 00-00
451D	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J6L Location Code: U1.1-P1-M17.13 AIX Location: 00-00
451E	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J6R Location Code: U1.1-P1-M17.14 AIX Location: 00-00
451F	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J8L Location Code: U1.1-P1-M17.15 AIX Location: 00-00
4520	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-J8R Location Code: U1.1-P1-M17.16 AIX Location: 00-00
4521	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M21-JX Location Code: U1.1-P1-M17 AIX Location: 00-00
4522	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J1L Location Code: U1.1-P1-M15.1 AIX Location: 00-00
4523	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J1R Location Code: U1.1-P1-M15.2 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4524	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J3L Location Code: U1.1-P1-M15.3 AIX Location: 00-00
4525	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J3R Location Code: U1.1-P1-M15.4 AIX Location: 00-00
4526	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J5L Location Code: U1.1-P1-M15.5 AIX Location: 00-00
4527	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J5R Location Code: U1.1-P1-M15.6 AIX Location: 00-00
4528	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J7L Location Code: U1.1-P1-M15.7 AIX Location: 00-00
4529	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J7R Location Code: U1.1-P1-M15.8 AIX Location: 00-00
452A	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J2L Location Code: U1.1-P1-M15.9 AIX Location: 00-00
452B	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J2R Location Code: U1.1-P1-M15.10 AIX Location: 00-00
452C	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J4L Location Code: U1.1-P1-M15.11 AIX Location: 00-00
452D	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J4R Location Code: U1.1-P1-M15.12 AIX Location: 00-00
452E	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J6L Location Code: U1.1-P1-M15.13 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
452F	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J6R Location Code: U1.1-P1-M15.14 AIX Location: 00-00
4530	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J8L Location Code: U1.1-P1-M15.15 AIX Location: 00-00
4531	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-J8R Location Code: U1.1-P1-M15.16 AIX Location: 00-00
4532	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M18-JX Location Code: U1.1-P1-M15 AIX Location: 00-00
4533	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J1L Location Code: U1.1-P1-M16.1 AIX Location: 00-00
4534	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J1R Location Code: U1.1-P1-M16.2 AIX Location: 00-00
4535	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J3L Location Code: U1.1-P1-M16.3 AIX Location: 00-00
4536	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J3R Location Code: U1.1-P1-M16.4 AIX Location: 00-00
4537	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J5L Location Code: U1.1-P1-M16.5 AIX Location: 00-00
4538	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J5R Location Code: U1.1-P1-M16.6 AIX Location: 00-00
4539	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J7L Location Code: U1.1-P1-M16.7 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
453A	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J7R Location Code: U1.1-P1-M16.8 AIX Location: 00-00
453B	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J2L Location Code: U1.1-P1-M16.9 AIX Location: 00-00
453C	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J2R Location Code: U1.1-P1-M16.10 AIX Location: 00-00
453D	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J4L Location Code: U1.1-P1-M16.11 AIX Location: 00-00
453E	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J4R Location Code: U1.1-P1-M16.12 AIX Location: 00-00
453F	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J6L Location Code: U1.1-P1-M16.13 AIX Location: 00-00
4540	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J6R Location Code: U1.1-P1-M16.14 AIX Location: 00-00
4541	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J8L Location Code: U1.1-P1-M16.15 AIX Location: 00-00
4542	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-J8R Location Code: U1.1-P1-M16.16 AIX Location: 00-00
4543	Main storage failure A memory card at the specified location is faulty. Probability is high.	MEMORY, M19-JX Location Code: U1.1-P1-M16 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4544	Main storage failure A memory card at the specified location is faulty. Probability is high. The B0 in the location code is calling out J1L, J1R, J5L, and J5R.	MEMORY, M22B0 M21B0 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 1,2,5, and 6 AIX Location: 00-00
4545	Main storage failure A memory card at the specified location is faulty. Probability is high. The B1 in the location column is calling out J3L, J3R, J7L, and J7R.	MEMORY, M22B1 M21B1 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 3,4,7, and 8 AIX Location: 00-00
4546	Main storage failure A memory card at the specified location is faulty. Probability is high. The B0 in the location column is calling out J1L, J1R, J5L, and J5R.	MEMORY, M22B0 M21B0 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 1,2,5, and 6 AIX Location: 00-00
4547	Main storage failure A memory card at the specified location is faulty. Probability is high. The B1 in the location column is calling out J3L, J3R, J7L, and J7R.	MEMORY, M22B1 M21B1 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 3,4,7, and 8 AIX Location: 00-00
4550	Main storage failure A memory card at the specified location is faulty. Probability is high. The B2 in the location column is calling out J2L, J2R, J6L, and J6R.	MEMORY, M22B2 M21B2 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 9,10,13, and 14 AIX Location: 00-00
4551	Main storage failure A memory card at the specified location is faulty. Probability is high. The B3 in the location column is calling out J4L, J4R, J8L, and J8R.	MEMORY, M22B3 M21B3 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 11,12,15, and 16 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4552	Main storage failure A memory card at the specified location is faulty. Probability is high. The B2 in the location column is calling out J2L, J2R, J6L, and J6R.	MEMORY, M22B2 M21B2 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 9,10,13, and 14 AIX Location: 00-00
4553	Main storage failure A memory card at the specified location is faulty. Probability is high. The B3 in the location column is calling out J4L, J4R, J8L, and J8R.	MEMORY, M22B3 M21B3 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 11,12,15, and 16 AIX Location: 00-00
4554	Main storage failure A memory card at the specified location is faulty. Probability is high. The B4 in the location column is calling out J1L, J1R, J5L, and J5R.	MEMORY, M18B4 M19B4 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 1,2,5, and 6 AIX Location: 00-00
4555	Main storage failure A memory card at the specified location is faulty. Probability is high. The B5 in the location column is calling out J3L, J3R, J7L, and J7R.	MEMORY, M18B5 M19B5 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 3,4,7, and 8 AIX Location: 00-00
4556	Main storage failure A memory card at the specified location is faulty. Probability is high. The B4 in the location column is calling out J1L, J1R, J5L, and J5R.	MEMORY, M18B4 M19B4 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 1,2,5, and 6 AIX Location: 00-00
4557	Main storage failure A memory card at the specified location is faulty. Probability is high. The B5 in the location column is calling out J3L, J3R, J7L, and J7R.	MEMORY, M18B5 M19B5 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 3,4,7, and 8 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
4558	Main storage failure A memory card at the specified location is faulty. Probability is high. The B6 in the location column is calling out J2L, J2R, J6L, and J6R.	MEMORY, M18B6 M19B6 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 9,10,13, and 14 AIX Location: 00-00
4559	Main storage failure A memory card at the specified location is faulty. Probability is high. The B7 in the location column is calling out J4L, J4R, J8L, and J8R.	MEMORY, M18B7 M19B7 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 11,12,15, and 16 AIX Location: 00-00
455A	Main storage failure A memory card at the specified location is faulty. Probability is high. The B6 in the location column is calling out J2L, J2R, J6L, and J6R.	MEMORY, M18B6 M19B6 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 9,10,13, and 14 AIX Location: 00-00
455B	Main storage failure A memory card at the specified location is faulty. Probability is high. The B7 in the location column is calling out J4L, J4R, J8L, and J8R.	MEMORY, M18B7 M19B7 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 11,12,15, and 16 AIX Location: 00-00
4570	I/O adapter hardware error detected	Go to “MAP 1540: Minimum Configuration” on page 4-58.
4571	I/O adapter hardware error detected	Go to “MAP 1540: Minimum Configuration” on page 4-58.
4572	I/O adapter hardware error detected	Go to “MAP 1540: Minimum Configuration” on page 4-58.
4573	I/O adapter hardware error detected	Go to “MAP 1540: Minimum Configuration” on page 4-58
6400	System processor card failure A processor card at the specified location is faulty. Probability is low.	Processor 1, M08 Location Code: U1.1-P1-C1 AIX Location: 00-00 00-01 00-02 00-03

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6401	System processor card failure A processor card at the specified location is faulty. Probability is low.	Processor 2, M09 Location Code: U1.1-P1-C2 AIX Location: 00-04 00-05 00-06 00-07
6402	System processor card failure A processor card at the specified location is faulty. Probability is low.	Processor 3, M20 Location Code: U1.1-P1-C3 AIX Location: 00-08 00-09 00-10 00-11
6403	System processor card failure A processor card at the specified location is faulty. Probability is low.	Processor 1 Processor 2 Processor 3 Cannot isolate to 1 FRU, See Chapter 1 on page 1-1 and "Logical and Physical Locations" on page 1-45 for processor card locations.
6410	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M01 Location Code: U1.1-P1-M1 AIX Location: 00-00
6411	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M02 Location Code: U1.1-P1-M2 AIX Location: 00-00
6412	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M03 Location Code: U1.1-P1-M3 AIX Location: 00-00
6413	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M04 Location Code: U1.1-P1-M4 AIX Location: 00-00
6414	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M05 Location Code: U1.1-P1-M5 AIX Location: 00-00
6415	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M06 Location Code: U1.1-P1-M6 AIX Location: 00-00
6416	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M10 Location Code: U1.1-P1-M7 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6417	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M11 Location Code: U1.1-P1-M8 AIX Location: 00-00
6418	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M12 Location Code: U1.1-P1-M9 AIX Location: 00-00
6419	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M13 Location Code: U1.1-P1-M10 AIX Location: 00-00
641A	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M14 Location Code: U1.1-P1-M11 AIX Location: 00-00
641B	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M15 Location Code: U1.1-P1-M12 AIX Location: 00-00
641C	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M16 Location Code: U1.1-P1-M13 AIX Location: 00-00
641D	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M17 Location Code: U1.1-P1-M14 AIX Location: 00-00
641E	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M18 Location Code: U1.1-P1-M15 AIX Location: 00-00
641F	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M19 Location Code: U1.1-P1-M16 AIX Location: 00-00
6420	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M21 Location Code: U1.1-P1-M17 AIX Location: 00-00
6421	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M22 Location Code: U1.1-P1-M18 AIX Location: 00-00
6422	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M23 Location Code: U1.1-P1-M19 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6423	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card, M24 Location Code: U1.1-P1-M20 AIX Location: 00-00
6435	Main storage failure A memory card at the specified location is faulty. Probability is low.	Memory Card Cannot isolate to 1 FRU, See Chapter 1 on page 1-1 and “Logical and Physical Locations” on page 1-45 for memory card locations.
6440	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
6441	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
6442	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
6443	I/O adapter failed - I/O Drawer 3 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.4-P1 Problem is in this drawer.
6444	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
6445	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
6446	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 . Problem is in this drawer.
6450	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 . Problem is in this drawer.
6451	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6452	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
6453	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
6454	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
6455	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
6456	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
6457	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
6458	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
6459	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
645A	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
645B	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
6460	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6461	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
6462	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
6463	I/O adapter failed - I/O Drawer 0 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.1-P1 Problem is in this drawer.
6464	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
6465	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
6466	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
6467	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.2-P1 Problem is in this drawer.
6468	I/O adapter failed - I/O Drawer 1 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
6469	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
646A	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.
646B	I/O adapter failed - I/O Drawer 2 failure	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1 Problem is in this drawer.

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6470	Card enclosure or system backplane assembly	System Backplane Assembly Location Code: U1.1-P1 AIX Location: 00-00
6480	Clock Card Failure	Clock Card, M07 Location Code: U1.1-P1-X1 AIX Location: 00-00
6490	Firmware error	Service Processor Firmware Location Code: U0.1-P1-X1
6491	Firmware error	Service Processor Card and Service Processor Firmware Location Code: U0.1-P1-X1
6492	Firmware error	Service Processor Firmware Location Code: U0.1-P1-X1
6500	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J1L Location Code: U1.1-P1-M18.1 AIX Location: 00-00
6501	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J1R Location Code: U1.1-P1-M18.2 AIX Location: 00-00
6502	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J3L Location Code: U1.1-P1-M18.3 AIX Location: 00-00
6503	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J3R Location Code: U1.1-P1-M18.4 AIX Location: 00-00
6504	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J5L Location Code: U1.1-P1-M18.5 AIX Location: 00-00
6505	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J5R Location Code: U1.1-P1-M18.6 AIX Location: 00-00
6506	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J7L Location Code: U1.1-P1-M18.7 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6507	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J7R Location Code: U1.1-P1-M18.8 AIX Location: 00-00
6508	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J2L Location Code: U1.1-P1-M18.9 AIX Location: 00-00
6509	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J2R Location Code: U1.1-P1-M18.10 AIX Location: 00-00
650A	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J4L Location Code: U1.1-P1-M18.11 AIX Location: 00-00
650B	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J4R Location Code: U1.1-P1-M18.12 AIX Location: 00-00
650C	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J6L Location Code: U1.1-P1-M18.13 AIX Location: 00-00
650D	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J6R Location Code: U1.1-P1-M18.14 AIX Location: 00-00
650E	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J8L Location Code: U1.1-P1-M18.15 AIX Location: 00-00
650F	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-J8R Location Code: U1.1-P1-M18.16 AIX Location: 00-00
6510	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M22-JX Location Code: U1.1-P1-M18 AIX Location: 00-00
6511	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J1L Location Code: U1.1-P1-M17.1 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6512	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J1R Location Code: U1.1-P1-M17.2 AIX Location: 00-00
6513	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J3L Location Code: U1.1-P1-M17.3 AIX Location: 00-00
6514	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J3R Location Code: U1.1-P1-M17.4 AIX Location: 00-00
6515	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J5L Location Code: U1.1-P1-M17.5 AIX Location: 00-00
6516	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J5R Location Code: U1.1-P1-M17.6 AIX Location: 00-00
6517	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J7L Location Code: U1.1-P1-M17.7 AIX Location: 00-00
6518	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J7R Location Code: U1.1-P1-M17.8 AIX Location: 00-00
6519	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J2L Location Code: U1.1-P1-M17.9 AIX Location: 00-00
651A	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J2R Location Code: U1.1-P1-M17.10 AIX Location: 00-00
651B	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J4L Location Code: U1.1-P1-M17.11 AIX Location: 00-00
651C	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J4R Location Code: U1.1-P1-M17.12 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
651D	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J6L Location Code: U1.1-P1-M17.13 AIX Location: 00-00
651E	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J6R Location Code: U1.1-P1-M17.14 AIX Location: 00-00
651F	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-J8L Location Code: U1.1-P1-M17.15 AIX Location: 00-00
6520	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY M21-J8R Location Code: U1.1-P1-M17.16 AIX Location: 00-00
6521	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M21-JX Location Code: U1.1-P1-M17 AIX Location: 00-00
6522	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J1L Location Code: U1.1-P1-M15.1 AIX Location: 00-00
6523	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J1R Location Code: U1.1-P1-M15.2 AIX Location: 00-00
6524	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J3L Location Code: U1.1-P1-M15.3 AIX Location: 00-00
6525	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J3R Location Code: U1.1-P1-M15.4 AIX Location: 00-00
6526	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J5L Location Code: U1.1-P1-M15.5 AIX Location: 00-00
6527	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J5R Location Code: U1.1-P1-M15.6 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6528	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J7L Location Code: U1.1-P1-M15.7 AIX Location: 00-00
6529	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J7R Location Code: U1.1-P1-M15.8 AIX Location: 00-00
652A	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J2L Location Code: U1.1-P1-M15.9 AIX Location: 00-00
652B	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J2R Location Code: U1.1-P1-M15.10 AIX Location: 00-00
652C	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J4L Location Code: U1.1-P1-M15.11 AIX Location: 00-00
652D	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J4R Location Code: U1.1-P1-M15.12 AIX Location: 00-00
652E	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J6L Location Code: U1.1-P1-M15.13 AIX Location: 00-00
652F	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J6R Location Code: U1.1-P1-M15.14 AIX Location: 00-00
6530	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J8L Location Code: U1.1-P1-M15.15 AIX Location: 00-00
6531	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-J8R Location Code: U1.1-P1-M15.16 AIX Location: 00-00
6532	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M18-JX Location Code: U1.1-P1-M15 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6533	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J1L Location Code: U1.1-P1-M16.1 AIX Location: 00-00
6534	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J1R Location Code: U1.1-P1-M16.2 AIX Location: 00-00
6535	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J3L Location Code: U1.1-P1-M16.3 AIX Location: 00-00
6536	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J3R Location Code: U1.1-P1-M16.4 AIX Location: 00-00
6537	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J5L Location Code: U1.1-P1-M16.5 AIX Location: 00-00
6538	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J5R Location Code: U1.1-P1-M16.6 AIX Location: 00-00
6539	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J7L Location Code: U1.1-P1-M16.7 AIX Location: 00-00
653A	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J7R Location Code: U1.1-P1-M16.8 AIX Location: 00-00
653B	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J2L Location Code: U1.1-P1-M16.9 AIX Location: 00-00
653C	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J2R Location Code: U1.1-P1-M16.10 AIX Location: 00-00
653D	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J4L Location Code: U1.1-P1-M16.11 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
653E	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J4R Location Code: U1.1-P1-M16.12 AIX Location: 00-00
653F	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J6L Location Code: U1.1-P1-M16.13 AIX Location: 00-00
6540	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J6R Location Code: U1.1-P1-M16.14 AIX Location: 00-00
6541	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J8L Location Code: U1.1-P1-M16.15 AIX Location: 00-00
6542	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-J8R Location Code: U1.1-P1-M16.16 AIX Location: 00-00
6543	Main storage failure A memory card at the specified location is faulty. Probability is low.	MEMORY, M19-JX Location Code: U1.1-P1-M16 AIX Location: 00-00
6544	Main storage failure A memory card at the specified location is faulty. Probability is low. The B0 in the location column is calling out J1L, J1R, J5L, and J5R.	MEMORY, M22B0 M21B0 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 1,2,5, and 6 AIX Location: 00-00
6545	Main storage failure A memory card at the specified location is faulty. Probability is low. The B1 in the location column is calling out J3L, J3R, J7L, and J7R.	MEMORY, M22B1 M21B1 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 3,4,7, and 8 AIX Location: 00-00
6546	Main storage failure A memory card at the specified location is faulty. Probability is low. The B0 in the location column is calling out J1L, J1R, J5L, and J5R.	MEMORY, M22B0 M21B0 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 1,2,5, and 6 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6547	Main storage failure A memory card at the specified location is faulty. Probability is low. The B1 in the location column is calling out J3L, J3R, J7L, and J7R.	MEMORY, M22B1 M21B1 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 3,4,7, and 8 AIX Location: 00-00
6550	Main storage failure A memory card at the specified location is faulty. Probability is low. The B2 in the location column is calling out J2L, J2R, J6L, and J6R.	MEMORY, M22B2 M21B2 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 9,10,13, and 14 AIX Location: 00-00
6551	Main storage failure A memory card at the specified location is faulty. Probability is low. The B3 in the location column is calling out J4L, J4R, J8L, and J8R.	MEMORY, M22B3 M21B3 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 11,12,15, and 16 AIX Location: 00-00
6552	Main storage failure A memory card at the specified location is faulty. Probability is low. The B2 in the location column is calling out J2L, J2R, J6L, and J6R.	MEMORY, M22B2 M21B2 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 9,10,13, and 14 AIX Location: 00-00
6553	Main storage failure A memory card at the specified location is faulty. Probability is low. The B3 in the location column is calling out J4L, J4R, J8L, and J8R.	MEMORY, M22B3 M21B3 Location Code: U1.1-P1-M18.**x** U1.1-P1-M17.**x** where **x** is 11,12,15, and 16 AIX Location: 00-00
6554	Main storage failure A memory card at the specified location is faulty. Probability is low. The B4 in the location column is calling out J1L, J1R, J5L, and J5R.	MEMORY, M18B4 M19B4 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 1,2,5, and 6 AIX Location: 00-00
6555	Main storage failure A memory card at the specified location is faulty. Probability is low. The B5 in the location column is calling out J3L, J3R, J7L, and J7R.	MEMORY, M18B5 M19B5 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 3,4,7, and 8 AIX Location: 00-00

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6556	Main storage failure A memory card at the specified location is faulty. Probability is low. The B4 in the location column is calling out J1L, J1R, J5L, and J5R.	MEMORY, M18B4 M19B4 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 1,2,5, and 6 AIX Location: 00-00
6557	Main storage failure A memory card at the specified location is faulty. Probability is low. The B5 in the location column is calling out J3L, J3R, J7L, and J7R.	MEMORY, M18B5 M19B5 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 3,4,7, and 8 AIX Location: 00-00
6558	Main storage failure A memory card at the specified location is faulty. Probability is low. The B6 in the location column is calling out J2L, J2R, J6L, and J6R.	MEMORY, M18B6 M19B6 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 9,10,13, and 14 AIX Location: 00-00
6559	Main storage failure A memory card at the specified location is faulty. Probability is low. The B7 in the location column is calling out J4L, J4R, J8L, and J8R.	MEMORY, M18B7 M19B7 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 11,12,15, and 16 AIX Location: 00-00
655A	Main storage failure A memory card at the specified location is faulty. Probability is low. The B6 in the location column is calling out J2L, J2R, J6L, and J6R.	MEMORY, M18B6 M19B6 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 9,10,13, and 14 AIX Location: 00-00
655B	Main storage failure A memory card at the specified location is faulty. Probability is low. The B7 in the location column is calling out J4L, J4R, J8L, and J8R.	MEMORY, M18B7 M19B7 Location Code: U1.1-P1-M15.**x** U1.1-P1-M16.**x** where **x** is 11,12,15, and 16 AIX Location: 00-00
6570	I/O adapter hardware error detected	Go to "MAP 1540: Minimum Configuration" on page 4-58. Location Code: U0.1-P1
6571	I/O adapter hardware error detected	Go to "MAP 1540: Minimum Configuration" on page 4-58. Location Code: U0.2-P1

Reference Code	Description/Action Perform all actions before exchanging Failing Items	Failing Item
6572	I/O adapter hardware error detected	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.3-P1
6573	I/O adapter hardware error detected	Go to “MAP 1540: Minimum Configuration” on page 4-58. Location Code: U0.4-P1

Chapter 7. Loading the System Diagnostics In Service Mode

For more information about using standalone or online diagnostics, see “Using the Standalone and Online Diagnostics” in the *Diagnostic Information for Multiple Bus Systems*.

The system unit can be booted either from the default boot list or from the custom boot list. (See Chapter 8 on page 8-1 for instructions on defining the custom boot list.)

Online Diagnostics can be loaded by booting from the custom 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 Online Diagnostics from the devices listed in the custom boot list follows:

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

   Note: If AIX is running, enter the **shutdown -F** command.
3. Wait until the Power LED stops flashing and remains off, then press the power button to turn the system on.
4. When or after the keyboard indicator appears during startup, press the F6 key on a directly-attached keyboard (or the number 6 key on an ASCII terminal).
5. Enter any requested passwords.

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

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

   Note: If AIX is running, enter the **shutdown -F** command.
3. Wait until the Power LED stops flashing and remains off, then press the power button to turn the system on.
4. Immediately insert the diagnostic CD-ROM into the CD-ROM drive.
5. When or after the keyboard indicator appears during startup, press the F5 key on a directly-attached keyboard (or the number 5 key on an ASCII terminal).

6. Enter any requested passwords.

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.

Custom Boot List and Default Boot List

The default boot list is:

1. Diskette
2. CD-ROM
3. Tape
4. Hard File
5. Network
    - Token-Ring
    - Ethernet

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

Pressing the F6 key on a directly-attached keyboard (or number 6 key on an ASCII terminal) loads **Online Diagnostics** from the custom boot list, no Diagnostic CD should be in the CD-ROM drive since **Online Diagnostics** is typically run from a hard disk, which is in the boot list defined using the System Management Services described in Chapter 8 on page 8-1. Like the default boot list, the custom boot list can contain five entries. The F6 or 6 keys work like the F5 or 5 keys, with the following exceptions:

- The system searchs for a boot record according to the custom boot list.
- If the custom boot list is discovered by a cyclical redundancy check to be corrupted, the system rebuilds the custom 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 custom boot list.)

- If no custom boot list is present, the system enters "none" in the corresponding location within the custom boot list.

Chapter 8. System Management Services

The System Management Services (SMS) make it possible for you to view information about your system and to perform such tasks as setting the password 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 8-20.

Graphical System Management Services

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

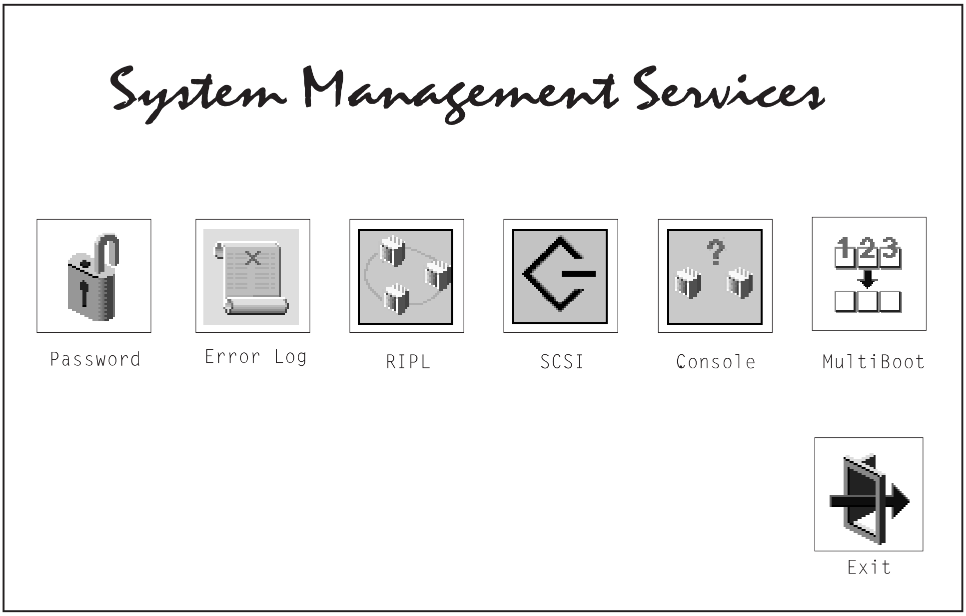
Note: The graphical user interface for System Management Services is only available if a graphics adapter is installed in the system.

After the logo is displayed, initialization icons (post indicators) appear across the bottom of the screen. For more information on these icons, refer to “Post Indicators” on page 1-5.

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

You can use the mouse to select an icon. The left mouse button acts as the Enter key.

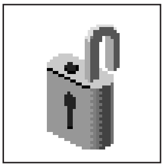
After the System Management Services starts, the following screen appears.



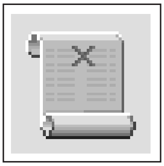
You may also press F8 here to enter the `OK>` prompt.

The System Management Services screen contains the following choices.

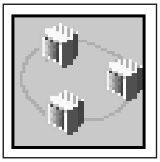
The following describes the choices available on this screen.



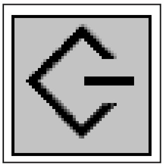
Password: Enables you to set password protection for using system administration tools. This password can be set here or in the Service Processor. Unattended Start Mode can also be set here.



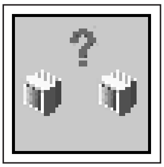
Error Log: Enables you to view and clear system firmware-detected error log information for your system.



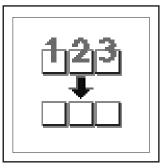
RIPL (Remote Initial Program Load): Allows you to select a remote system from which to load programs via a network adapter when your system unit is first turned on. This option also allows you to configure network adapters which require setup.



SCSI Utilities: Allow you to set SCSI hard disk spin up delay times and to set SCSI IDs for SCSI controllers installed in the S70.



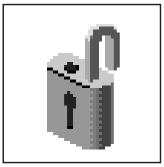
Console: If you have more than one display attached to your system unit, or if you have an ASCII terminal attached to your system unit in addition to a keyboard and display, this tool allows you to define which one is active.



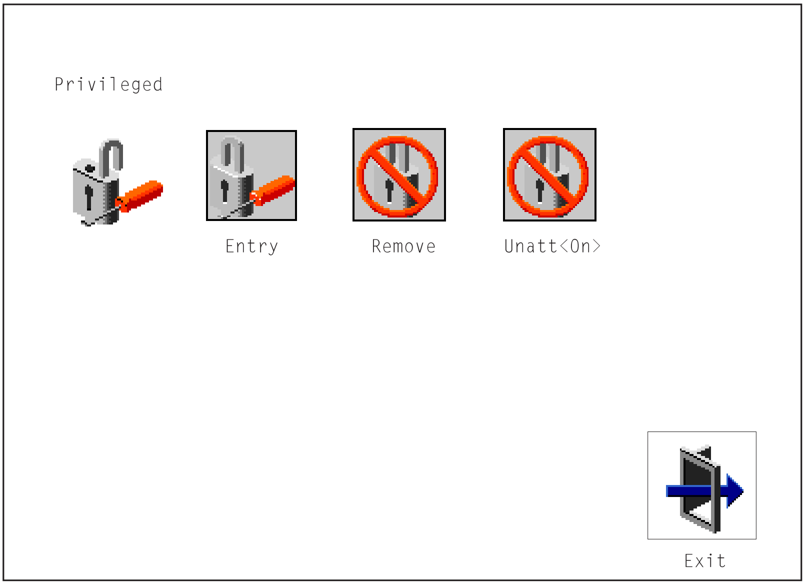
MultiBoot: Invokes the Multiboot menu which provides several functions:

- Which operating system to boot
- Default operating system
- Install from a list of devices
- Select boot sequence
- Go to Command Prompt
- Power up to Multiboot menu.

Password



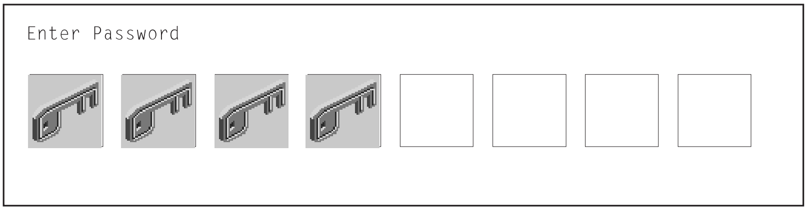
When you select this icon, the following screen is displayed.



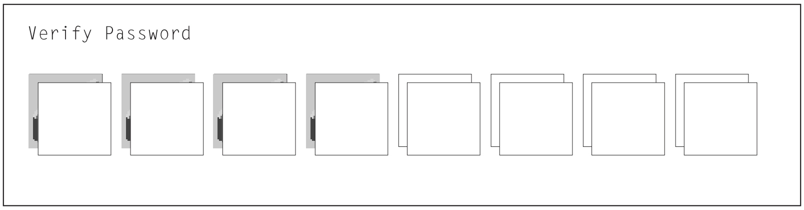
Privileged-Access Password: The privileged–access password protects against the unauthorized starting of the system programs.

Both the Service Processor and System Management Services use this password. If the password is set in System Management Services, the Service Processor automatically uses the same password. The Privileged-Access Password can also be set and removed from the Service Processor menus. See Appendix C on page C-1 for more information.

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



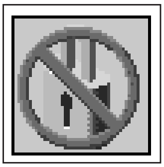
Press **Enter** when you are finished; you are required to type the password again for verification.



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

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

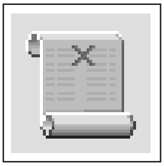
Remove: If you previously had set a privileged-access password and want to remove it, select the **Remove** icon.



Note: If you *forget* the password, you must remove the battery for at least 30 seconds to disable the password. See "Operator Panel Battery" on page 9-15 for details.

Unatt<On>: This icon is used to enable/disable Unattended Start Mode. This option is used to instruct the Service Processor to restore the power-state of the server after a temporary power failure. It is intended to be used on servers that require automatic power-on after a power failure. The default setting is ON.

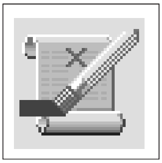
Error Log



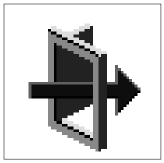
Selecting this icon displays the log of errors your system has encountered during operations.

System Error Log

```
1. 10/04/96    02:15:35     25a80011    00-00
2. No entry
```



Clear

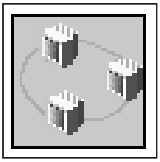


Exit

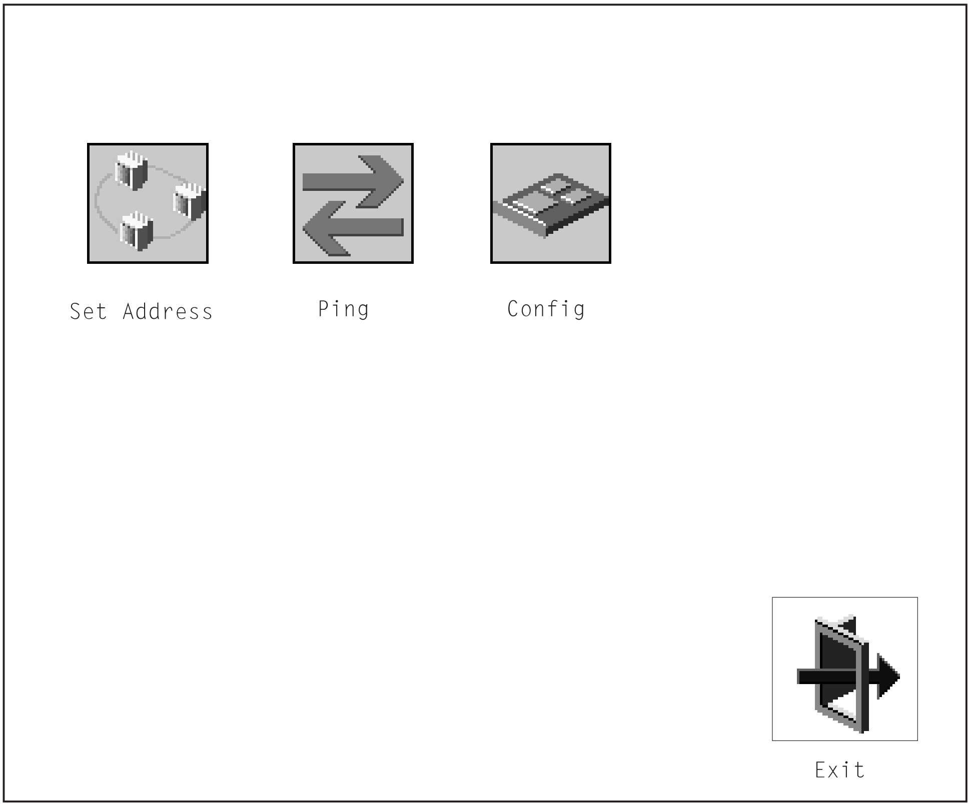
Selecting the **Clear** icon erases the entries in this log.

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

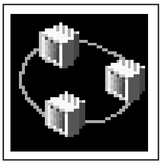
RIPL



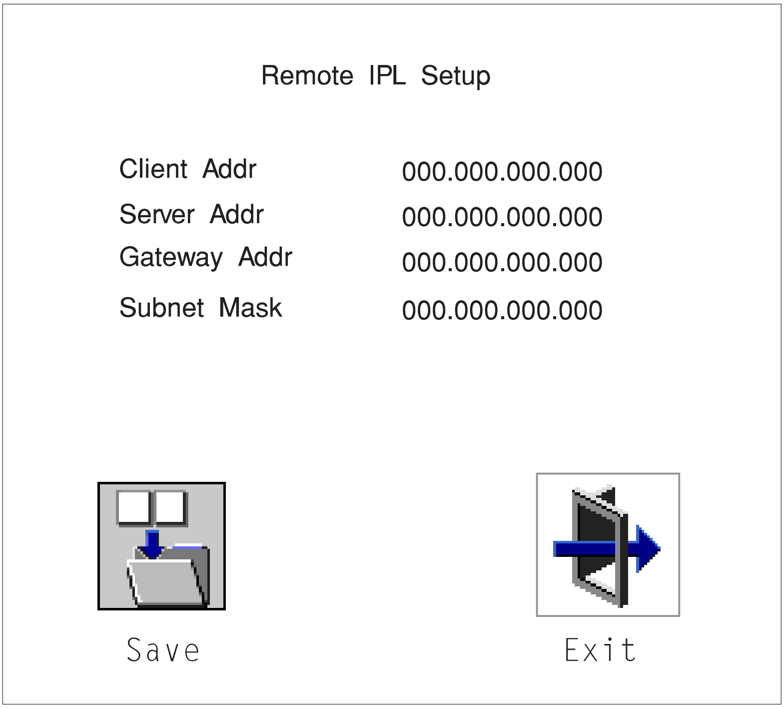
Selecting the **RIPL** (Remote Initial Program Load) icon above gives you access to the following selections.



Set Address



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



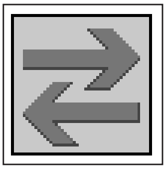
Notes:

1. Some applications may require that IP addresses contain leading zeroes for numbers less than 100. For example, 129.132.4.20 may need to be entered as 123.132.004.020.

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

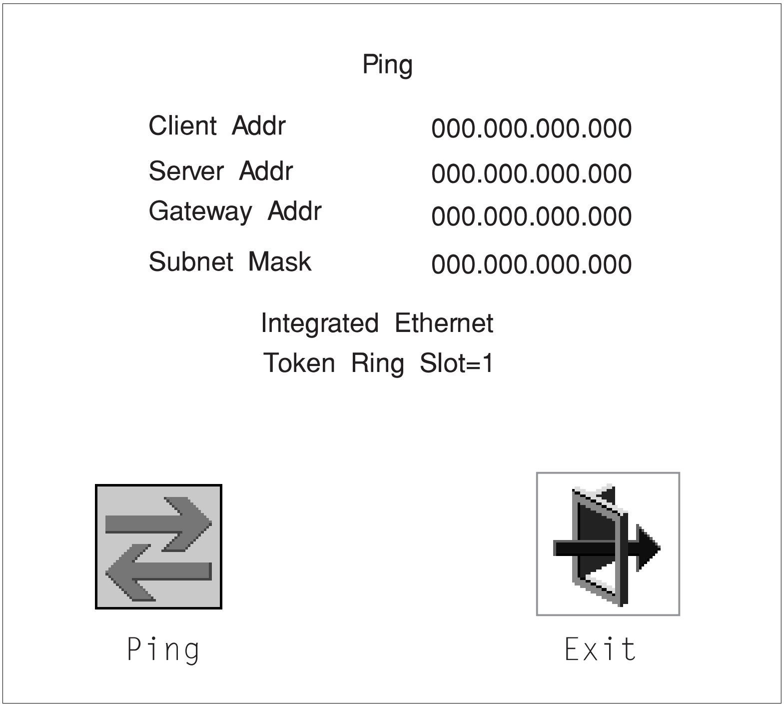
Note: You should save a copy of your changes in case of battery backup failure.

Ping

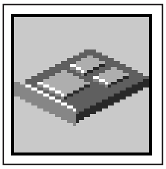


The **Ping** icon allows you to confirm that a specified address is valid by sending a test transmission to that address.

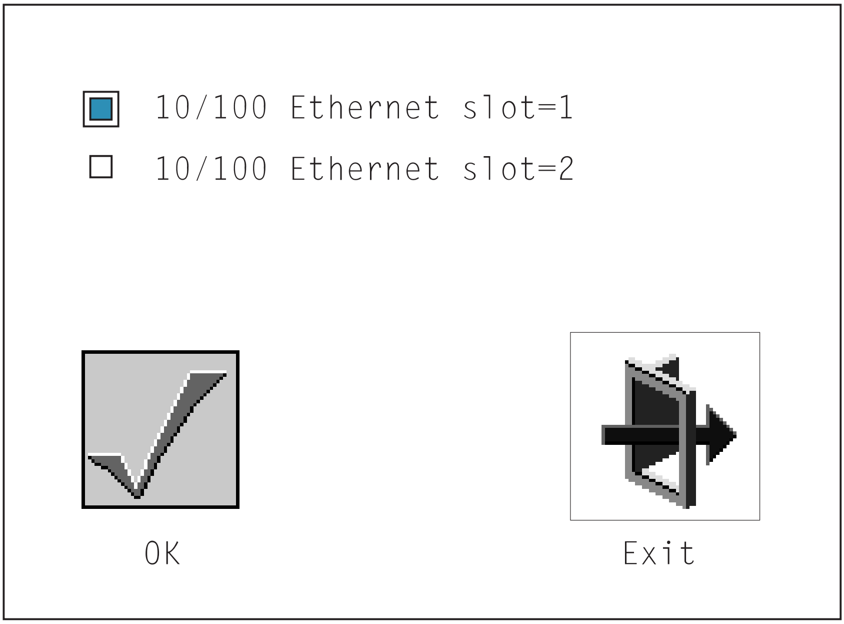
After choosing the Ping option, you may be asked to indicate which communications adapter (Token Ring or Ethernet) should be used to send the test transmission.



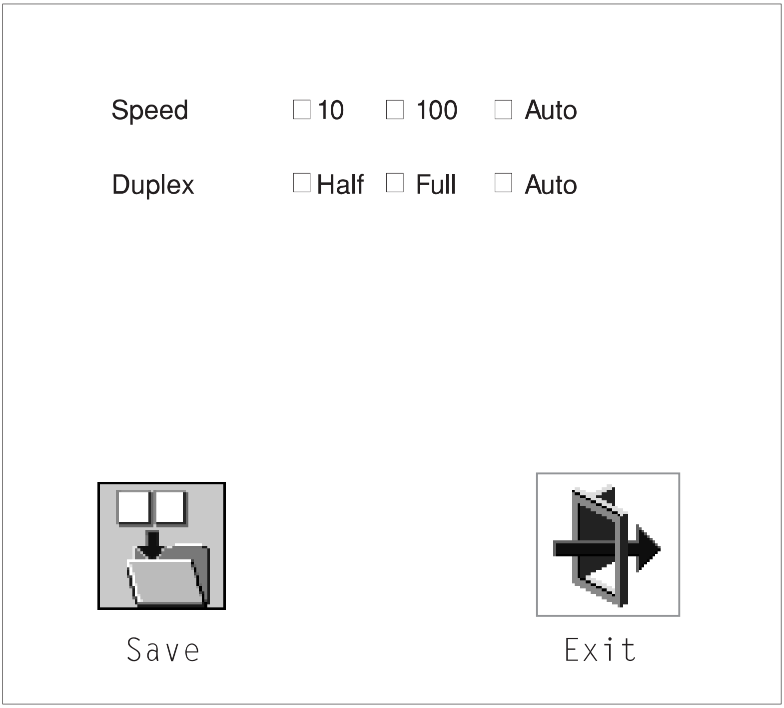
Config



The **Config** icon allows you to configure network adapters which are recognized by the system as requiring setup. Selecting the Config icon presents a list of the adapters requiring configuration. Use the arrow keys to highlight an adapter, press the spacebar to select the adapter, then highlight the **OK** icon and press the Enter key.

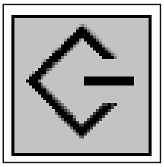


The next screen allows you to select the configuration of the adapter you have just chosen (or allow the system to select the configuration automatically).

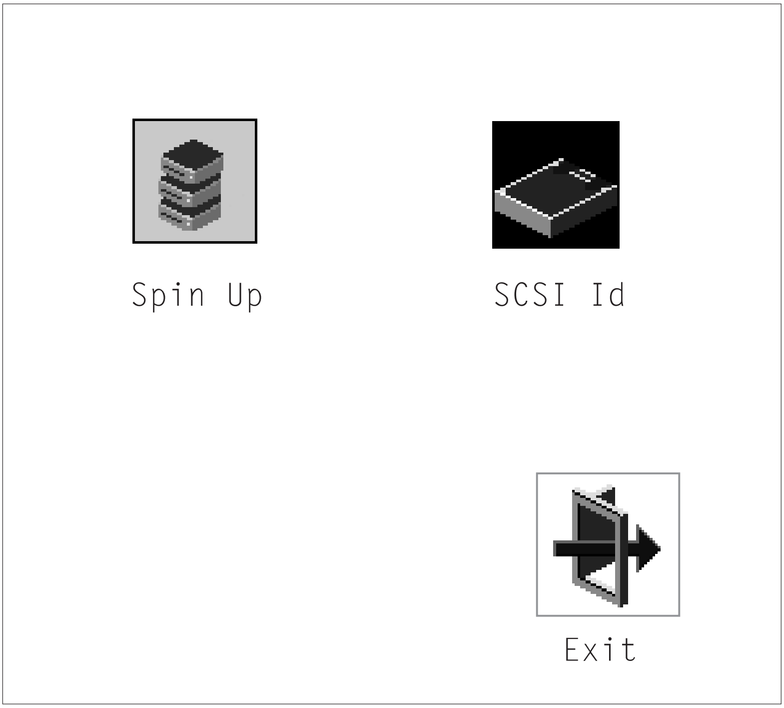


As on the previous screen, use the arrow keys to highlight, press the space bar to select, then highlight the **Save** icon and press enter. The defaults are highlighted the first time you enter this screen.

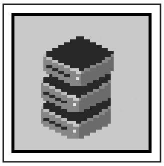
SCSI



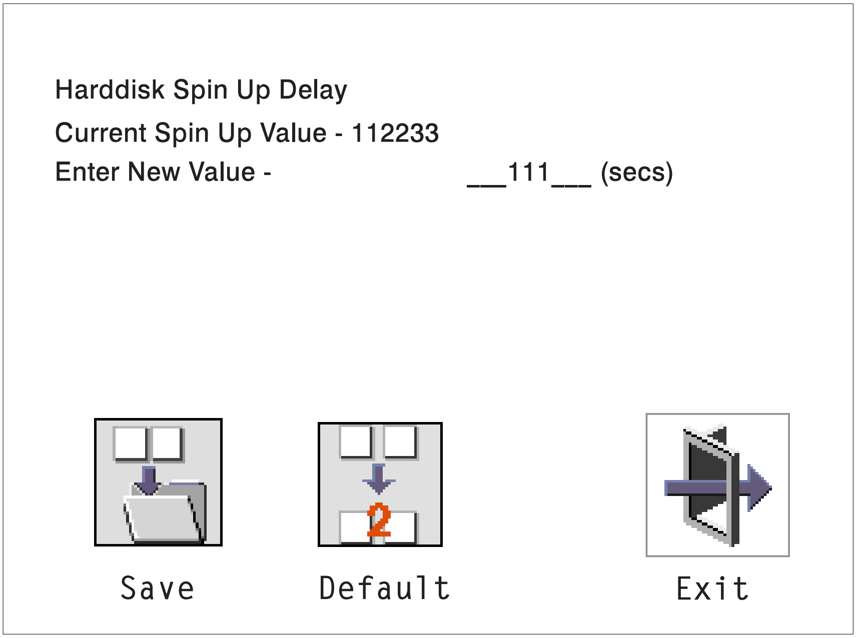
This selection is for available SCSI utilities. The first is the hard disk spin up delay used by the AIX operating system. The second selection changes the SCSI ID for SCSI controllers that are found in the S70.



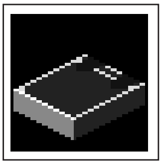
Hard Disk Spin Up Delay



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



SCSI ID

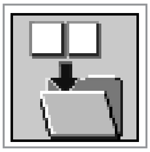


This selection allows you to view and change the addresses (IDs) of the SCSI controllers attached to your system unit. To change an ID, highlight the entry by moving the arrow keys, then use the spacebar to scroll through the available IDs for the controller. After you have entered the new address, use the arrow keys to highlight the **Save** icon and press the Enter key.

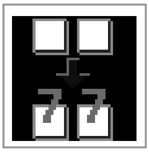
At any time in this process, you can select the **Default** icon to change the SCSI IDs to the default values of 7.

Change SCSI ID

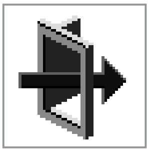
Type	Slot	ID	Max ID
Fast	5	7	7
Fast/Wide	7	7	15



Save

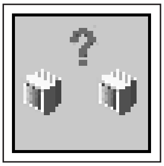


Default

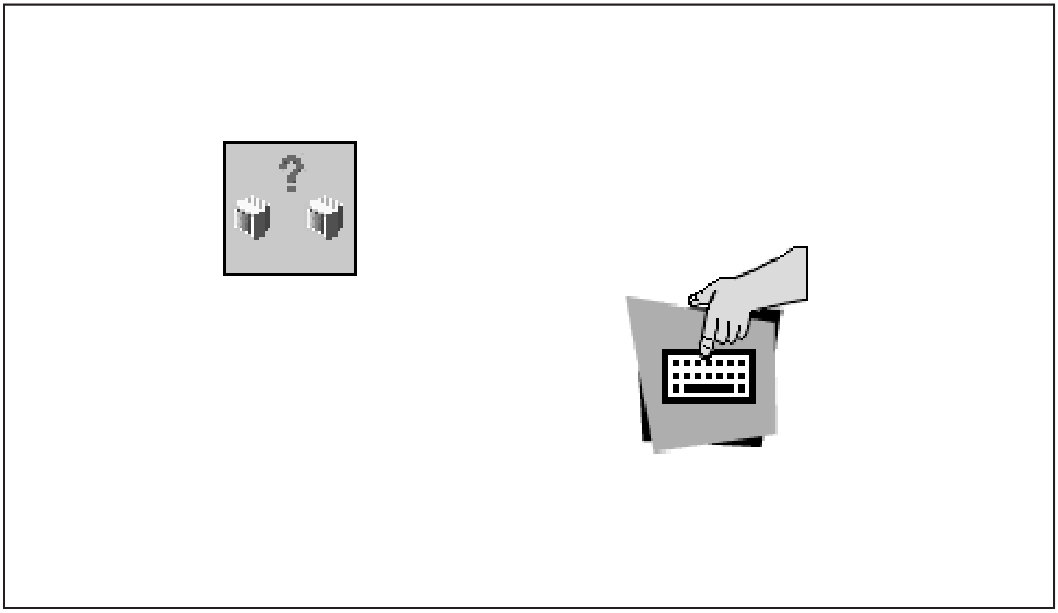


Exit

Console Select

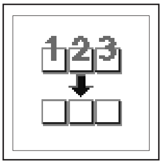


Selecting this icon makes it possible for you select between multiple TTY and graphics consoles. Only one session can exist at a time. Sessions are numbered by the serial ports and then the graphics adapters installed in the system.



A number appears over the **keyboard** icon to represent the consoles installed. To select a console, type the number for the console you wish to use.

MultiBoot

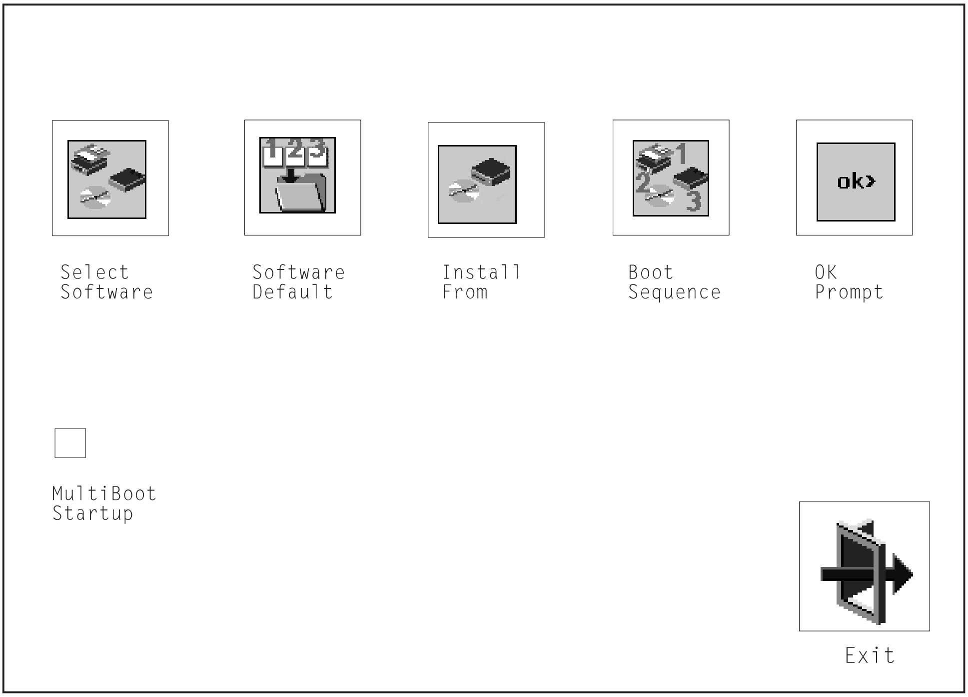


This selection invokes the Multiboot menu which provides several functions:

- To Select a particular operating system to boot.

  In the case of AIX this is a supported option. If you receive an informational icon after making this selection, this would mean that information in non-volatile storage could have been lost, as would happen if the battery had been removed. In order to recreate this value, issue the bootlist command under AIX with the appropriate parameters as to the location of the operating system in a particular hard disk. Please see the explanation of the bootlist command in your AIX documentation.

- To select a particular operating system as the default operating system.
- To install from the list of possible devices.
- To set the sequence in which devices are searched for operating system startup code.
- To go to the Open Firmware command prompt.
- To set the Multiboot menu so that it comes up immediately as the system powers up.



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

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

```
No Operating System Installed
```

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

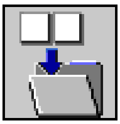
Software Default: If supported by the operating system, lets you select the default operating system to start the system. This option may not be supported by all operating systems.

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

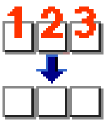
Boot Sequence

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

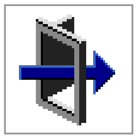
New		List of Boot Devices
-	[1]	Diskette
1	[2]	SCSI CD-ROM id=3 (slot=1)
	[3]	SCSI Tape Drive id=5 (slot=1)
3	[4]	SCSI 4.5 GB Harddisk id=6 (slot=1)
2	[5]	Ethernet (Integrated)



Save



Default



Exit

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

The default boot sequence is:

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

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

You can choose 1 to 5 devices for the custom boot list. To change the boot sequence back to the default values, select **Default**. (The default sequence is automatically saved.)

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

Text-Based System Management Services

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

To start the Text-Based System Management Services, turn on or restart the system. After the logo is displayed, the words "Memory", "Keyboard", "Network", "SCSI" and "Speaker" appear across the bottom of the screen. Press the 1 key after the word "Keyboard" appears and before the last word "Speaker" appears.

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

```
System Management Services


 1.  Privilege Access Password
 2.  Display Error Log
 3.  Remote Initial Program Load Setup
 4.  SCSI Utilities
 5.  Console Select
 6.  MultiBoot
 7.  Select Language


                                                          .------.
                                                          |X=Exit|
                                                           ------'

 ====>
```

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

After you have finished using the text-based System Management Services, entering **x** (for exit) boots your system. You may also press `8` here to enter the `OK>` prompt.

Privileged Access Password: Entering this selection permits access to the following options.

```
Password

Select
 1. Enter Privileged Access Password
 2. Remove Privileged Access Password
 3. Unattended Start Mode <ON>



                                                        .------.
                                                        |X=Exit|
                                                         ------'
===>
```

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

Both the Service Processor and System Management Services use this password. If the password is set in System Management Services, the Service Processor automatically uses the same password.

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

Note: If you *forget* your password, you must unplug the operator panel cable for 60 seconds to disable the password. See “Operator Panel Battery” on page 9-15 for details.

Unatt<On>: This icon is used to enable/disable Unattended Start Mode. This option is used to instruct the Service Processor to restore the power-state of the server after a temporary power failure. It is intended to be used on servers that require automatic power-on after a power failure. The default setting is ON.

Display Error Log: A screen similar to the following is displayed when you select this option. You can view or clear your system's error log.

```
                 System Error Log


             Date     Time    ErrorCode Location
   Entry 1. 10/04/96 02:15:35 25a80011   00-00
   Entry 2. No Entry



  .--------.                               .-----------.
  |C=Clear |                               |X=Exit Log |
   --------'                                -----------'

  =====>
```

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

Remote Initial Program Load Setup: This option allows you to enable and set up the remote startup capability of your system. First, you are asked to specify the network parameters.

```
Network Parameters

 1. Set Address
 2. Ping Remote System
 3. Configure Adapters





                                                     .------.
                                                     |X=Exit|
                                                      ------'

===>
```

Note: Some applications may require that IP addresses contain leading zeroes for numbers less than 100. For example, 129.132.4.20 may need to be entered as 123.132.004.020.

Selecting the Set Address option displays the following screen.

```
IP Parameters

 1. Client IP Address    000.000.000.000
 2. Server IP Address    000.000.000.000
 3. Gateway IP Address   000.000.000.000
 4. Subnet Mask          000.000.000.000






                                                      .------.
                                                      |X=Exit|
                                                       ------'


===>
```

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

```
Interface

 1. Ethernet (Integrated)
 2. Token Ring (Slot=3)






===>
```

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

```
Ping

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







      .---------.                                   .------.
      |E=Execute|                                   |X=Exit|
       ---------'                                    ------'

===>
```

The third option available from the RIPL screen is the Configure adapters option. The following screen appear when you make this selection.

```
Configure Adapters


    1. 10/100 Ethernet Slot=1
    2. 10/100 Ethernet Slot=2







                                                 .------.
                                                 |X=Exit|
                                                  ------'
```

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

```
.-----------------.
| Full Duplex     |
| 1. Yes          |
| 2. No           |
| 3. Auto         |
 -----------------'
```

SCSI Utilities: Allow you to set SCSI hard disk spin up delay times and to set SCSI IDs for SCSI controllers installed in the S70.

```
SCSI Utilities

    1. Harddisk Spin Up Delay
    2. Change SCSI Id

                            .--------.
                            | X=exit |
                             --------'
```

Console Select

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

```
Press 0 to Select This Console
        as the active console
```

MultiBoot Menu

```
Multiboot Menu

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




                                                              .------.
                                                              |X=Exit|
                                                               ------'

 ===>
```

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

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

`No Operating System Installed`

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

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

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

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

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

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

Select Boot Devices

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

```
Select Boot Devices

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


                                                      .------.
                                                      |X=Exit|
                                                       ------'

 ====>
```

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

```
Current Boot Sequence

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


                                                      .------.
                                                      |X=Exit|
                                                       ------'

 ===>
```

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

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

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

```
    Configure Nth Boot Device

    Device Number       Current Position        Device Name

          1                    1                Diskette
          2                    2                Ethernet
          3                    3                SCSI CD-ROM
          4                    4                SCSI 4.5GB Hard Disk
          5                    -






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


===>
```

Select Language

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

```
SELECT LANGUAGE

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


====>                                                      .------.
                                                           |x=Exit|
                                                            ------'
```

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

Chapter 9. Removal and Replacement Procedures

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

DANGER

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

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

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

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

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

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

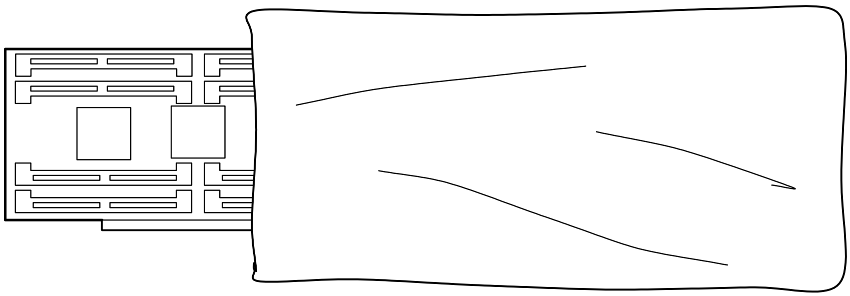
CAUTION:
This unit has more than one power supply cord. To reduce the risk of electrical shock, disconnect two power supply cords before servicing.

Handling Static-Sensitive Devices

Attention: Disk drives, tape drives and CD-ROM drives are sensitive to static electricity discharge. These devices are wrapped in antistatic bags to prevent damage caused by electrostatic discharge.

Take the following precautions:

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



Powering Off and Powering On the System

Powering Off the System

If the system is operating under AIX, enter the **shutdown -F** command to power off the system.

If you cannot use this method, you can power off the system by using the following operator panel power Pushbutton procedure.

Attention: Using the operator panel Power Pushbutton to power off the system may cause unpredictable results in the data files, and the next IPL will take longer to complete.

1. Open the operator panel cover.
2. Press the Power pushbutton (white) on the operator panel.

   The operator panel display shows **O ?** (the international power-off symbol) with the **?** blinking.
3. Press the Power pushbutton (white) on the operator panel again to confirm.

   Note: To cancel the power-off operation, do not press the Power pushbutton a second time. Instead, press any other operator panel pushbutton.
4. The operator panel Power-On light starts blinking as the system powers off. The operator panel light stops blinking and stays off when the power-off operation is complete. The green LED on the I/O Drawer(s) indicator panel goes to a slow blink, indicating that standby power is on.

   Does the system power off successfully?

   No **Yes**

   ↓ **This ends the procedure.**
5. Perform the following:
   a. Press the ↑ or the ↓ pushbutton until function 08 is shown in the operator panel display.
   b. Press the Enter pushbutton.
   c. Error code A100 8008 is shown on the operator panel display.
6. Press the Power pushbutton (white) on the operator panel.

   The operator panel display shows **08** **O ?** (the international power-off symbol) with the **?** blinking.
7. Press the Power pushbutton (white) on the operator panel again.

The system powers off, and the operator panel Power-On light goes off and remains off.

Note: To cancel the power-off operation, do not select function 08. Instead, press any other control panel pushbutton.

This ends the procedure.

Powering On the System

1. Open the door to the operator panel.
2. Press the Power (white) pushbutton on the operator panel.
3. The operator panel Power-On light starts blinking as the system is powered on. The operator panel Power-On light stops blinking and stays on when power on is complete.

   This ends the procedure.

System Rack Removal and Replacement Procedures

This is the starting point for all remove procedures in the System Rack. Perform the following steps.

1. Find the location of the part you are replacing in "S70 Locations" on page 1-9.
2. Find the FRU you are removing in this section and follow the procedures.
3. When you have completed the remove procedure, install the FRU by reversing the remove procedure unless otherwise noted.
4. After exchanging an item, refer to "MAP 0410: Repair Checkout" in the *Diagnostic Information for Multiple Bus Systems*.

Attention: It is not always necessary to power off the system to exchange a field replaceable unit (FRU). You will be directed through a concurrent exchange, if possible, for hot-swap disk drive units.

Fast Power Up

This feature is not recommended except in a service environment as several key system functions are not verified. The fast power up sequence is:

1. Press the system Power pushbutton two times to insure power down.
2. Press the Scroll Up pushbutton one time.
3. Press the Enter pushbutton two times.
4. Press the Scroll Up pushbutton two times.
5. Press the Enter pushbutton one time.
6. Press the system Power pushbutton one time

The system powers up and the system operator panel displays progress.

Covers

Removal: Refer to “Operator Panel, Brackets, and Covers (Front View)” on page 10-10 and “Front, Rear, and Top Covers” on page 10-6 to locate cover parts then perform the following steps:

- To remove the front and rear covers:
  1. Lift up on the cover.
  2. Pull the cover out and off.
- To remove the top cover:
  1. Remove the cover mounting screws.
  2. Slide the cover to the front or rear.
  3. Lift the cover up and off.
- To remove the side cover(s):
  1. Remove the front, rear, and top covers.
  2. Remove the screws from the front and rear of the side cover.
  3. Lift up on the cover.
  4. Pull the cover out and off.

Replacement: Replace in reverse order.

AC Box

Removal

1. Power off the system (see “Powering Off and Powering On the System” on page 9-4).
2. Disconnect the power cord.
3. Remove the rear cover (see “Covers” on page 9-7).

Refer to “AC Module Assembly and Rear Blowers (Rear View)” on page 10-16 for AC Box parts and perform the following steps.

4. Remove the screws that hold the AC Box.
5. Remove the AC Box.

Replacement: Replace in reverse order.

DC Box

Removal

1. Power off the system (see “Powering Off and Powering On the System” on page 9-4).
2. Place all circuit breakers in panel 1 and panel 2 in the off position.
3. Remove the rear cover (see “Covers” on page 9-7).

Refer to “AC Module Assembly and Rear Blowers (Rear View)” on page 10-16 for DC Box parts and perform the following steps.

4. Disconnect the input cables (cables from the circuit breaker panel to the DC Box) from the top and bottom connectors of the input side of the DC Box.
5. Remove the screws that hold the DC Box.
6. Remove the DC Box.

Replacement: Replace in reverse order.

System Rack -48 V dc Circuit Breaker Panel

Removal CAUTION:

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

1. Turn the system power off and turn power off to any other drawers that are connected to the circuit breaker panel.
2. Have the customer switch power off at their power source.

   Note: Once the customer's power source is switched off, ensure that a tag or label is positioned over the switch to indicate that the power source is intended to remain switched off.

3. Refer to “System Rack -48 Volt Power Distribution Assembly (1 of 2)” on page 10-32 for a figure that shows the parts described in this procedure.
4. Remove the five mounting screws from the top cover of the circuit breaker panel chassis.
5. Remove the top cover of the circuit breaker panel chassis.
6. Ensure that the customer completely disconnects both the -48 V dc power cables and the return power cables from both circuit breaker panels.
7. Record and tag each cable that connects to the circuit breaker panel with its location so you can reinstall them correctly later.
8. Disconnect all cables that connect to the circuit breaker panel.

   Note: If you are removing the bottom circuit breaker panel, you may wish to tag and disconnect the cabling from the top circuit. breaker panel to allow easier access.

9. Remove two mounting screws from each side of the circuit breaker panel.
10. Slide the circuit breaker panel out the front panel of the chassis.

Replacement: Replace in reverse order.

Blowers

Removal: **Do not power off the system.**

Note: When you install the new blower, some force is required to insert the blower past the spring-loaded flap.

Front Blowers

1. Remove the front cover (see “Covers” on page 9-7).

Refer to “Bulk Power Supplies and Front Blowers (Front View)” on page 10-14 for blower parts and perform the following steps.

2. Remove the Bulk Power EMC shield.
3. On the operator panel:
   a. Select function 7.
   b. Press the Enter button.
   c. Select function 0702.
   d. Press the Enter button.
   e. Select 07Fx where x is the blower to be powered off (0=Blower 1, 1=Blower 2, 2=Blower 3, 3=Blower 4).
   f. Press the Enter button. The green LED on the blower will turn off.
4. Remove the blower assembly.
5. The new blower will automatically power on when it is installed.

Replacement: Replace in reverse order.

Removal

1. Remove the rear cover (see “Covers” on page 9-7).

Refer to “AC Module Assembly and Rear Blowers (Rear View)” on page 10-16 for blower parts and perform the following steps.

Refer to “AC Module Assembly and Rear Blowers (Rear View)” on page 10-16 and perform the following steps.

2. Remove the Rear Blower EMC shield.
3. On the operator panel:
   a. Select function 7.
   b. Press the Enter button.
   c. Select function 0702.
   d. Press the Enter button.
   e. Select 07Fx where x is the blower to be powered off (0=Blower 1, 1=Blower 2, 2=Blower 3, 3=Blower 4).
   f. Press the Enter button. The green LED on the blower will turn off.
4. Remove the blower assembly.
5. The new blower will automatically power on when it is installed.

Replacement: Replace in reverse order.

Electronic Cards

Removal

Attention: All cards are sensitive to electrostatic discharge (see “Handling Static-Sensitive Devices” on page 9-3).

1. Power off the system (see “Powering Off and Powering On the System” on page 9-4).
2. Disconnect the power cord.
3. Remove the front or rear cover to access the card you are replacing (see “Covers” on page 9-7).
4. Are you replacing a card in the front of the system?

   No **Yes**

   ↓

   a. Refer to “Front Electronics Cage and System Backplane Assembly” on page 10-18 for cards.

   b. Continue with step 6.
5. You are removing a card from the rear of the system, refer to “Electronics Cage (Rear View)” on page 10-20 for cards. Continue with step 6.
6. Remove the EMC shield for the card location that you are accessing.
7. Mark the cables that are attached to the card so you can return them to the correct location during reassembly.
8. Remove the cables attached to the card.
9. Remove the card.

Replacement: Replace in reverse order.

Operator Panel

Removal

Attention: The operator panel card is sensitive to electrostatic discharge (see "Handling Static-Sensitive Devices" on page 9-3).

1. Power off the system (see "Powering Off and Powering On the System" on page 9-4).
2. Disconnect the power cord.
3. Remove the front cover to access the operator panel (see "Covers" on page 9-7).
4. Disconnect the operator panel cables.
5. Remove the operator panel.

Replacement

1. Replace in reverse order.

   Attention. When the operator panel is replaced, the Vital Product Data (VPD) has to be reprogrammed. Perform the procedure in "Programming System Vital Product Data" on page B-4 before you return the system to normal operations.

2. Use "SMIT" to reset the system date and time.
3. Tell the customer to reset their passwords. Passwords can be set using the Service Processor menus, see Appendix C on page C-1 for more information. The Service Processor menus also are used to reset the service processor call-in functions after an operator panel replacement. See Appendix C on page C-1 and "Service Processor Call-In Security" on page C-29 for more information.

Operator Panel Battery

Removal

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.

1. Power off the system (see "Powering Off and Powering On the System" on page 9-4).
2. Disconnect the power cords from both the System Rack and the Input/output Rack
3. Remove the front cover to access the operator panel (see "Covers" on page 9-7).
4. Pivot the operator panel outward from the System Rack by loosening the two retaining screws. Loosen the three retaining screws on the rear of the operator panel and slide the retainer cover to the right.
5. Remove the battery from the back of the operator panel.

Replacement

1. Replace the battery by reversing the steps in the removal procedure.
2. Power on the system (see "Powering Off and Powering On the System" on page 9-4).
3. Use "SMIT" to reset the system date and time.
4. Tell the customer to reset their passwords. Passwords can be set using the Service Processor menus, see Appendix C on page C-1 for more information. The Service Processor menus also are used to reset the service processor call-in functions after a battery replacement. See Appendix C on page C-1 and "Service Processor Call-In Security" on page C-29 for more information.

Operator Panel Cable (Op-panel to SP Cable)

Removal

AttentionIf the operator panel cable is disconnected, settings for passwords and service processor call-in functions will be lost. These settings can be reset once the cable is replaced.

1. Power off the system (see “Powering Off and Powering On the System” on page 9-4).
2. Disconnect the power cords from both the System Rack and the Input/output Rack
3. Remove the front cover to access the operator panel (see “Covers” on page 9-7).
4. Pivot the operator panel outward from the System Rack by loosening the two retaining screws.
5. Loosen the retaining screws on the connector for the operator panel cable and disconnect the cable.
6. Loosen the retaining screws on the connector for the other end of the operator panel cable from the back of the primary I/O Drawer and remove the cable.

Replacement

1. Replace the operator panel cable by reversing the steps in the removal procedure.
2. Power on the system (see “Powering Off and Powering On the System” on page 9-4).
3. Use “SMIT” to reset the system date and time.
4. Tell the customer to reset their passwords. Passwords can be set using the Service Processor menus, see Appendix C on page C-1 for more information. The Service Processor menus also are used to reset the service processor call-in functions after an operator panel cable replacement. See Appendix C on page C-1 and “Service Processor Call-In Security” on page C-29 for more information.

Bulk Power Supply

Removal

Note: Read the Danger and Caution notices under "Safety Notices" on page xv before continuing with this procedure.

Note: Use this procedure for either Bulk Power Supplies in AC powered systems or -48 V dc powered systems.

1. **Do not power off the system.**
2. Remove the front cover (see "Covers" on page 9-7).

Refer to "Bulk Power Supplies and Front Blowers (Front View)" on page 10-14, for bulk power supply parts and continue with the following steps.

3. Remove the Bulk Power EMC shield.
4. On the operator panel:
   a. Select function 7.
   b. Press the Enter button.
   c. Select function 0703.
   d. Press the Enter button.
   e. Select 07Bx where x is the bulk to be powered off (0=Bulk 1, 1=Bulk 2, and so on).
   f. Press the Enter button. The green LED on the bulk will turn off.
5. Remove the bulk power supply.

The new bulk power supply will automatically power on when it is installed.

Replacement: Replace in reverse order.

Bulk Power Subframe

Removal

1. Print out a rack configuration sheet so that you know where all devices and cards are located in the system rack.
2. Power the off system (see “Powering Off and Powering On the System” on page 9-4).
3. Disconnect the power cord (if -48 V dc system, set all circuit breakers to the Off position and disconnect the top and bottom input cables to the DC box).
4. Remove the front and rear system covers (see “Covers” on page 9-7).

Refer to “Bulk Power Supplies and Front Blowers (Front View)” on page 10-14 for bulk power subframe parts and then perform the following steps from the ***** FRONT ***** of the system.

5. Remove the Bulk Power EMC shield covering the blowers and bulk power supplies.
6. Remove the screws from the bulk power supplies and blower assemblies.
7. Slide out the bulk power supplies and blower assemblies far enough so that they are disconnected from their power connectors.

Refer to “Bulk Power Supplies and Front Blowers (Front View)” on page 10-14 for DC bulk power subframe parts and then perform the following steps from the ***** REAR ***** of the system.

8. Remove the AC box (or DC box).
9. Remove the Rear Blower EMC shield.
10. Remove the rear blowers.

Refer to “Power Regulators, Cables, and Air Baffles (Rear View)” on page 10-24 for System Rack regulator EMC shield and then perform the following steps from the ***** REAR ***** of the system.

11. Remove the System Rack Regulator EMC Shield that covers the power regulators.
12. Mark the regulators and their locations so that you can reinstall them in the proper locations.
13. Remove the power regulators and SPCN card.

14. **Carefully remove the top row of screws that are near the alignment pins inside the System Rack Regulator Cage.** Don't allow the screws to be dropped down inside the system.

15. Remove the screws that are near the connectors in the lower left and lower right corners inside the System Rack Regulator Cage.

16. Remove the screws in the Right Cage Retaining Bracket and remove the bracket.

17. Remove the screws in the sides and bottom of the System Rack Regulator Cage that mount the cage into the rack. Slide the Regulator Cage out 15 cm (6 inches).

18. Disconnect the power cables that are connected to the lower right and lower left corners of the system backplane assembly.

Refer to “Power Subframe (Rear View, 1 of 3)” on page 10-26 for power subframe assembly parts, and then perform the following steps from the ***** REAR ***** of the system.

19. Remove the screws from the top and bottom of the Power Subframe Assembly.

20. Remove the Power Subframe Assembly.

Replacement: Replace in reverse order.

Regulator

Removal

Note: The system must be powered off and the power cord disconnected from the source before removing and installing regulators 17 or 18.

1. Power off the system (see “Powering Off and Powering On the System” on page 9-4).
2. Disconnect the AC power cord.
3. Remove the rear cover (see “Covers” on page 9-7).
4. Remove the System Rack Regulator EMC shield.
5. Remove the regulator.

Replacement: Replace in reverse order.

SPCN Card

Removal

1. Power the off system (see “Powering Off and Powering On the System” on page 9-4).
2. Disconnect the power cord.
3. Remove the rear cover (see “Covers” on page 9-7).

Refer to “Power Regulators, Cables, and Air Baffles (Rear View)” on page 10-24 for SPCN parts and then perform the following steps from the ***** REAR ***** of the system.

4. Mark the locations and the cables attached to the SPCN card so that you can reinstall the cables to the proper location.
5. Lift the handles and pull the card out.

Replacement: Replace in reverse order.

Note: An SPCN firmware update is required if other than the original version is on the system. Refer to Appendix D on page D-1 for instructions on obtaining the latest level firmware, downloading and installation. If a BACKUP set of diskettes exists from a prior update, these may be used.

System Backplane Assembly

Removal

1. Print out a rack configuration sheet so that you know where all devices and cards are located in the system rack.
2. Power off the system (see “Powering Off and Powering On the System” on page 9-4).
3. Disconnect the power cord.
4. Remove the front and rear system covers (see “Covers” on page 9-7) .

Refer to “Front Electronics Cage and System Backplane Assembly” on page 10-18 for system backplane assembly parts and perform the following steps from the ***** FRONT ***** of the system.

5. Loosen the two thumbscrews on the operator panel and swing out the operator panel assembly. Contact the system administrator panel.
6. Disconnect the cables from the operator (op) panel assembly.
7. Remove the op panel assembly from the frame.
8. Remove the upper and lower Front Cage EMC shields.
9. Remove the EMC brackets from around the Front Cage in the following order:
   - Top
   - Left and Right
10. Mark the processor, memory, regulator, and filler cards and their locations in the Front Cage so you can return the cards to their proper location during reassembly.
11. Remove the processor, memory, regulator, and filler cards from the Front Cage.

Refer to “Power Regulators, Cables, and Air Baffles (Rear View)” on page 10-24 and perform the following steps from the ***** REAR *****of the system.

12. Remove the upper and lower EMC shields from the rear cage assembly.
13. Remove the EMC brackets from around the rear cage in the following order:
    - Top
    - Left and Right
14. Mark the SPCN card, regulators, memory, and filler cards and their locations in the top and bottom of the rear cage so that you can return the cards to their proper location during reassembly.

15. Remove the SPCN card, regulators, memory, and filler cards from the top and bottom of the rear cage.
16. Remove the mounting screws from the lower part of the rear cage.
17. Remove the two Cable EMC Shields from the rear cage.
18. Remove the Air Baffle in the lower center of the rear cage.
19. Unplug the cables attached to the upper left and upper right corners of the front cage/system backplane assembly.
20. Remove the 6 'starred' screws that mount the rear cage to the front cage/system backplane assembly.

CAUTION:
This unit weighs between 18 kg (39.7 pounds) and 32 kg (70.5 pounds). Two persons are required to safely move it. Using less that two persons to move it can result in injury.

21. Remove the rear cage assembly from the back of the system.
22. Unplug the cables attached to the lower left and right corners of the front cage/system backplane assembly.

Refer to “Front Electronics Cage and System Backplane Assembly” on page 10-18 for front cage/system backplane assembly and perform the following steps from the ***** FRONT *****of the system.

*** IMPORTANT *** The front cage/system backplane assembly is heavier on the rear than it is on the front. The front cage/system backplane assembly may tip to the rear if it is not properly handled.

23. Remove the lower mounting screws from the front cage/system backplane assembly.
24. Use two people to remove front cage/system backplane assembly from the front of the system.

CAUTION:
This unit weighs between 18 kg (39.7 pounds) and 32 kg (70.5 pounds). Two persons are required to safely move it. Using less that two persons to move it can result in injury.

25. Place the front cage/system backplane assembly on the floor in the upright position.
26. Disconnect the op panel cable from system backplane assembly.

27. There are 6 'starred' screws inside the front cage/system backplane assembly that mount the system backplane assembly to the cage. From inside the front cage, remove five of the 'starred' screws.
28. To prevent the system backplane assembly from falling, hold the system backplane assembly to the cage and then remove the last 'starred' screw.
29. Lay the front cage face down on the floor so the system backplane assembly is on top.
30. Remove the system backplane assembly from the front cage.
31. Close all of the connector latches on the new system backplane assembly. The latches need to be closed so they do not interfere with the rear cage when it is installed.
32. To complete the replacement, reverse the previous steps beginning with step 24 on page 9-23.

Replacement: Replace in reverse order.

Rear Cage

Removal: Refer to “Power Regulators, Cables, and Air Baffles (Rear View)” on page 10-24 for rear cage parts and perform the following steps from the ***** REAR *****of the system.

1. Remove the upper and lower EMC shields from the rear cage assembly.
2. Remove the EMC brackets from around the rear cage in the following order:
   - Top
   - Left and Right
3. Mark the SPCN card, regulators, memory, and filler cards and their locations in the top and bottom of the rear cage so that you can return the cards to their proper location during reassembly.
4. Remove the SPCN card, regulators, memory, and filler cards from the top and bottom of the rear cage.
5. Remove the mounting screws from the lower part of the rear cage.
6. Remove the two Cable EMC Shields from the rear cage.
7. Remove the Air Baffle in the lower center of the rear cage.
8. Unplug the cables attached to the upper left and upper right corners of the front cage/system backplane assembly.
9. Remove the 6 'starred' screws that mount the rear cage to the front cage/system backplane assembly .

CAUTION:
This unit weighs between 18 kg (39.7 pounds) and 32 kg (70.5 pounds). Two persons are required to safely move it. Using less that two persons to move it can result in injury.

10. Remove the rear cage assembly from the back of the system.

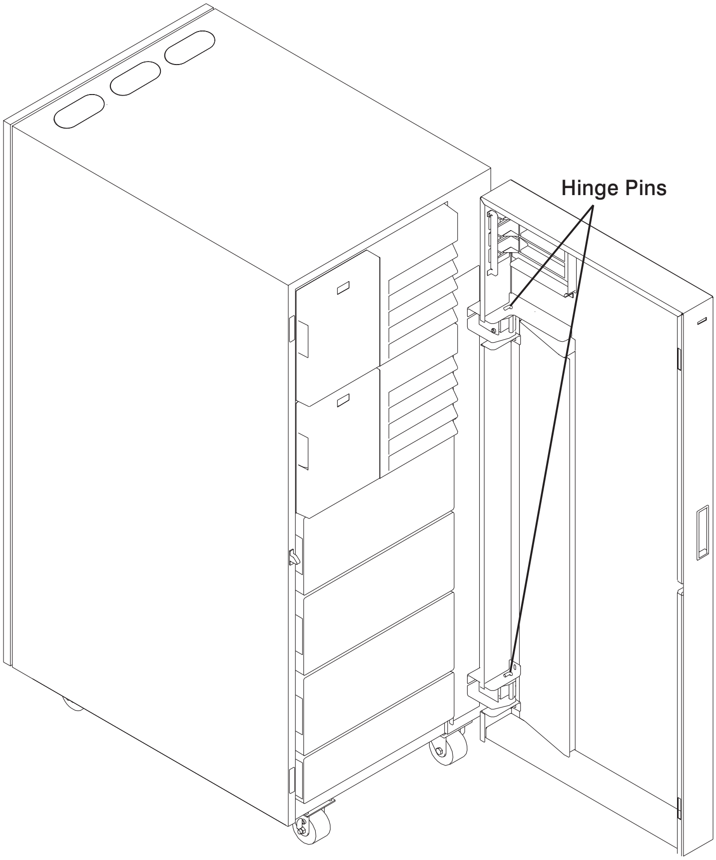
Replacement: Replace in reverse order.

Input/output Rack Removal and Replacement Procedures

Front Door

Removal

1. Open the front door.
2. Remove the C-clip from the bottom of the hinge pins.
3. Remove the pins from the door hinges and lift the front door off the hinges.
4. If required, the hinge assemblies can be removed for better access to the sides of some drawers.



Replacement: Replace in reverse order.

Installing an I/O Drawer Into A Rack Unit

Install the Rails and Mounting Hardware for the I/O Drawer

CAUTION:
The stabilizer must be firmly attached to the bottom front of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the stabilizer is not attached to the rack.

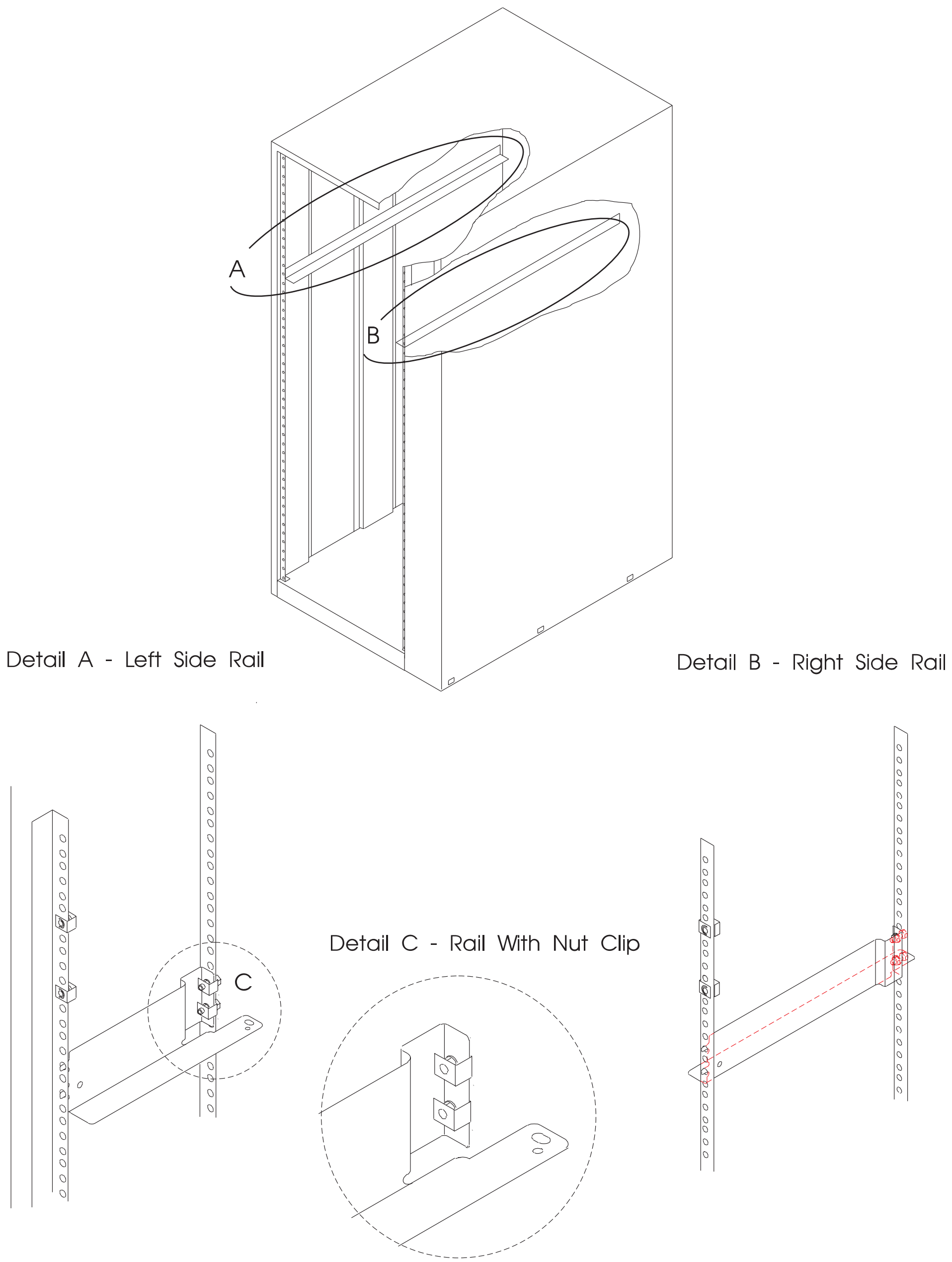
Note: Racks have EIA numbers visible from the rear that go from 1 (at the bottom) to 32 (at the top). The lowest EIA number completely occupied by a drawer is said to be that drawer's EIA position. Therefore, the rail surface that a drawer sets upon is approximately in line with the lower edge of the EIA position for that drawer. An EIA number is also used in identifying cables attached to that drawer.

1. The I/O Drawer occupies 7 EIA units. Install the new rails at the bottom of the EIA number which is 7 EIA units down from the top of the rack, or 7 EIA units down from an existing I/O Drawer if one is installed.
2. Install one (1) nut clip on the fifth hole above the upper guide pins for each rail at the front of the rack.
3. Install one (1) more nut clip on the tenth hole above the upper guide pins for each rail at the front of the rack.
4. At the rear of each rail, install two (2) nut clips.
5. Install the rails to the rack, using four M5x14 hex head screws that are supplied with the unit.

Typical Rail Installation

Note: Rack is shown with front door and hinges removed.

Mounting Hardware for Rack Drawer



Install the I/O Drawer

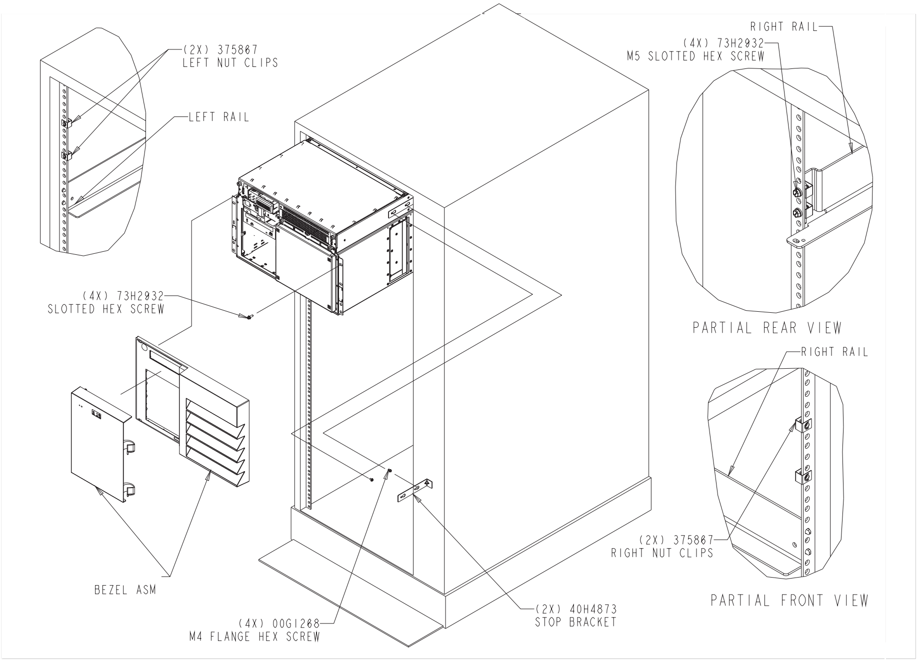
CAUTION:
This unit weighs between 32 kg (70.5 pounds) and 55 kg (121.2 pounds). Three persons are required to safely move it. Using less than three persons to move it can result in injury.

When fully configured:

CAUTION:
This unit weighs more than 55 kg (121.2 pounds). Material handling systems such as levers, slings, or lifts are required to safely move it. When this is not possible, specially trained persons or services (such as riggers or movers) must be used.

1. Slide the shipping box containing the I/O Drawer in front of the rack.
2. Install two M4 hexhead flange screws to each side of the I/O Drawer Do not completely tighten these screws.

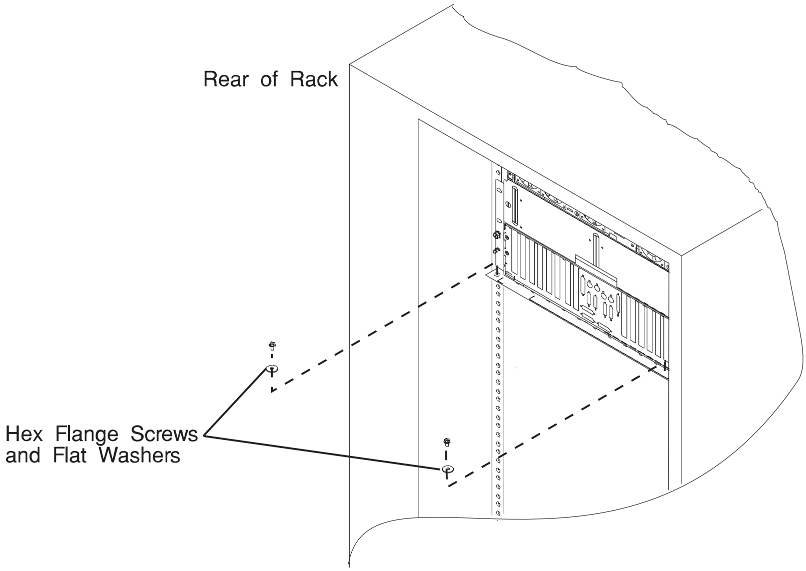
   Note: Rack is shown with front door and hinges removed.



3. Lift the I/O Drawer onto the support rails, and slide it **slowly** into the rack until the first hexhead flange screw. Slip the angled end of each chassis stop bracket behind the rack frame and position the slotted clearance holes over the hexhead flange screws. Tighten the hexhead flange screws securely.
4. Continue sliding the drawer into the rack until the front of the I/O Drawer rests against the nut clips on the rack.

   Attention: Do not lift the disk drive drawer by its bezel.
5. Attach the rear of the I/O Drawer to the rack rails with the two (2) M4 screws and the two (2) M4 washers provided with the I/O Drawer. This secures the drawer to the rack.

   Note: Rack is shown with rear door and hinges removed.



6. Remove the bezel from the drawer by pulling it toward you.
7. Using four (4) M5 x 14 hex head screws supplied with this unit, attach the disk drive drawer to the nut clips in the front of the rack at the sides.
8. Replace the bezel by lining up the velcro hook and loop pads and pushing it toward the drawer.

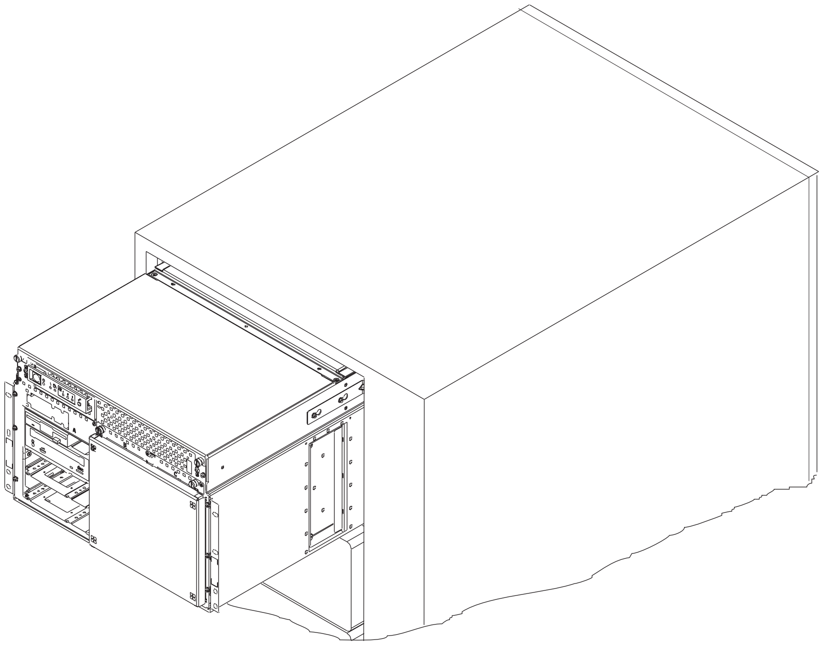
Service Position

CAUTION:
The stabilizer must be firmly attached to the bottom front of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the stabilizer is not attached to the rack.

To gain access to the front of the drawer, follow these steps:

1. Do the steps in the power off procedure, refer to “Powering Off the System” on page 9-4.
2. Open the Input/output Rack doors.
3. Remove the power cords from the rear of the drawer.
4. Remove other cables as required from the rear of the drawer.
5. Remove the bezel by pulling it toward you.
6. Remove the four screws that attach the drawer to the rack.
7. Remove the two screws that attach the drawer to the rear of the rails in the rack.
8. Pull the drawer out until it stops (about 12 inches).
9. Return to the procedure that directed you to place the drawer into the front service position.

Note: Rack is shown with front door and hinges removed.



Operating Position

To place the drawer into the operating position, follow these steps:

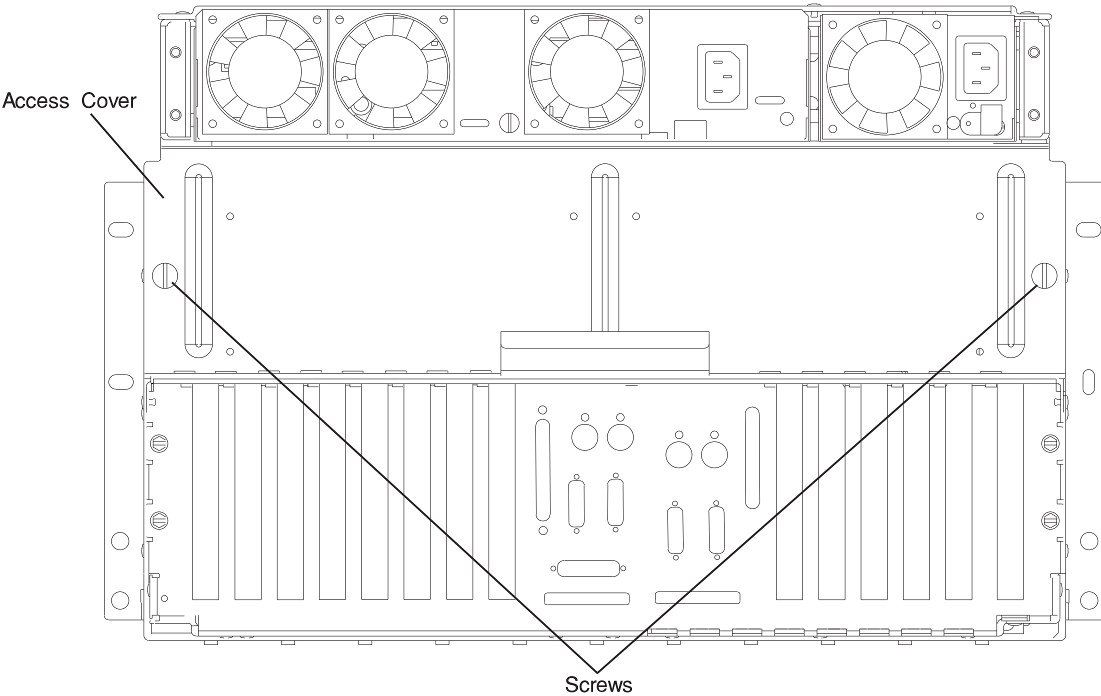
1. Slide the drawer into the rack. If the drawer does not slide all the way in, go to the rear of the rack and realign the drawer, and then slide it in the rest of the way.
2. Replace the two screws that attach the drawer to the rear of the rails in the rack.
3. Replace the four retainer screws to the front of the drawer.
4. Replace the bezel by pushing it toward the machine.
5. Plug the power cords into the rear of the drawer.
6. Do the steps in the power on procedure, refer to "Powering On the System" on page 9-5.

Rear Access Cover

Removal: To gain access to the rear of the drawer, follow these steps:

1. Power off the system, refer to "Powering Off the System" on page 9-4.
2. Open the rear door of the rack unit.
3. Remove the power cords from the rear of the drawer.

4. If you have a modem or fax machine attached to the server, disconnect the telephone line from the wall outlet and the server.
5. Unplug all power cords (cables) from electrical outlets.
6. Note the locations of the following; then, disconnect them from the back of the I/O Drawer:
   - Power cords
   - Display cable
   - Keyboard cable
   - Any other cables and cords
7. Remove the rear access cover by loosening the two retained screws (one on each side).

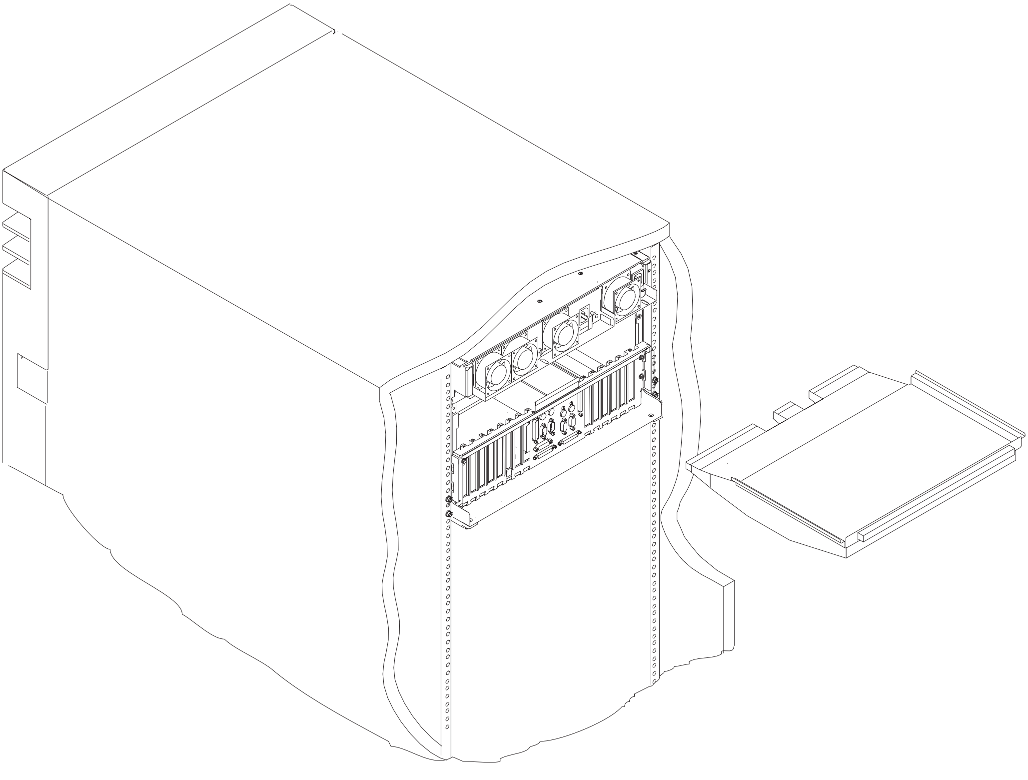


Replacement: Replace in the reverse order.

Acoustic Baffle

Removal

1. Follow the removal steps in “Rear Access Cover” on page 9-32.
2. Slide the acoustic baffle out.
3. If you need more room to reach your hands inside to remove cards or other components, remove the power supplies as described in “Power Supplies” on page 9-38.



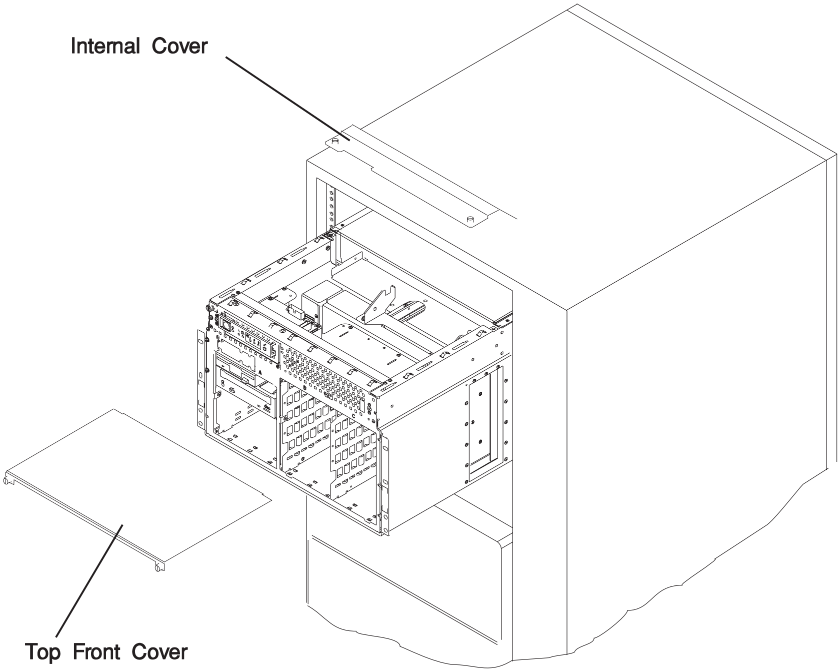
Replacement: Replace in the reverse order.

Front Chassis Cover

Removal

1. Remove all media (CDs, optical discs, or tapes) from drives; then turn the power off to the drawer.
2. Place the drawer in the service position as described in "Service Position" on page 9-31.
3. Remove the cover by loosening the two retained screws at the top front of the drawer. Slide the cover forward and then up to remove it. Store it in a safe place.

   Note: Rack is shown with front door and hinges removed.



4. Remove the internal cover by loosening the two thumbscrews.
5. Return to the procedure that directed you to remove the front, top cover.

Replacement

1. Replace the internal cover by tightening the two thumbscrews.
2. Align the tabs on the bottom edges of the top cover with the slots in the top edges of the drawer and slide the cover back until it stops.
3. Tighten the two retained screws at the front of the cover.
4. Place the drawer in the operating position as described in "Operating Position" on page 9-32.
5. Return to the procedure that directed you to replace the front, top cover.

Input/output Rack -48 V dc Circuit Breaker Panels

Removal **CAUTION:**

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

1. Turn the power off to all I/O Drawers and devices attached to the circuit breaker panel.

   Note: Once the customer's power source is switched off, ensure that a tag or label is positioned over the switch to indicate that the power source is intended to remain switched off.

2. Refer to “Input/output Rack -48 Volt Power Distribution Assembly (1 of 2)” on page 10-54 for a figure that shows the parts described in this procedure.
3. Remove the five mounting screws from the top cover of the circuit breaker panel chassis.
4. Remove the top cover of the circuit breaker panel chassis.
5. Ensure that the customer completely disconnects both the -48 V dc power cables and the return power cables from both circuit breaker panels.
6. Record and tag each cable that connects to the circuit breaker panel with its location so you can reinstall them correctly later.
7. Disconnect all cables that connect to the circuit breaker panel.

   Note: If you are removing the bottom circuit breaker panel, you may wish to tag and disconnect the cabling from the top circuit. breaker panel to allow easier access.

8. Remove two mounting screws from each side of the circuit breaker panel.
9. Slide the circuit breaker panel out the front panel of the chassis.

Replacement

Replace in reverse order.

Power Supplies

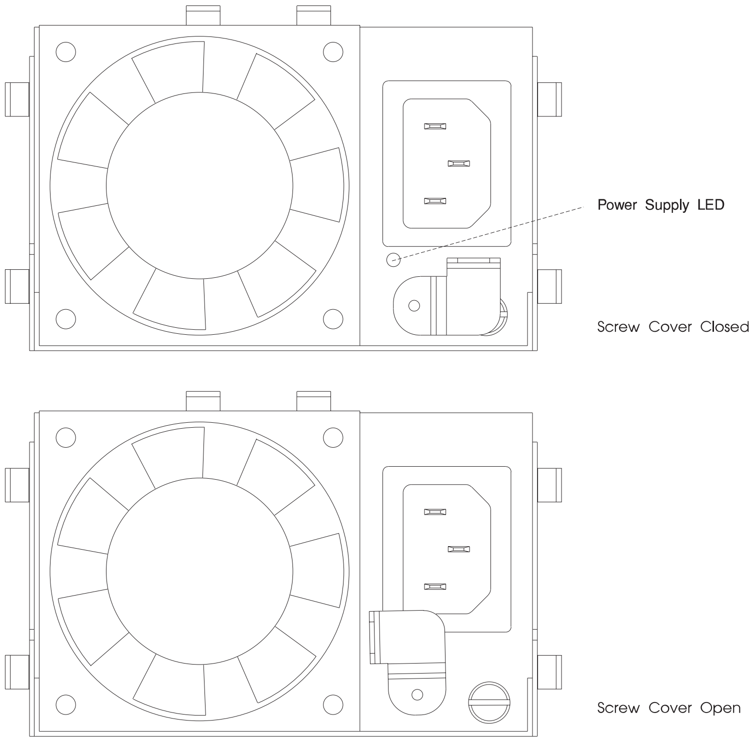
DANGER

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

Note: The I/O Drawer holds two power supplies. You can replace each supply separately.

Removal

1. If you have not already done so, open the rear door of the rack unit and locate the drawer you need to work on.
2. If a power supply needs to be removed, the green LED is off.



3. Unplug the power cord from the PDB and from the power supply.

   Notes:

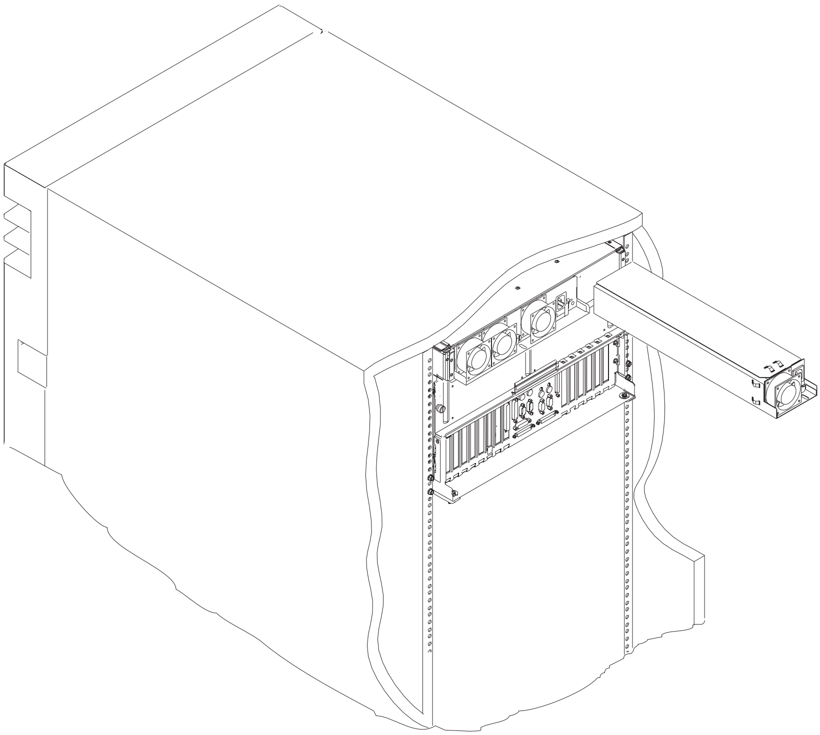
   a. If you are removing the 3/4 power supply go to step 7 on page 9-40.

   b. If you are removing the 1/4 power supply go to step 4.

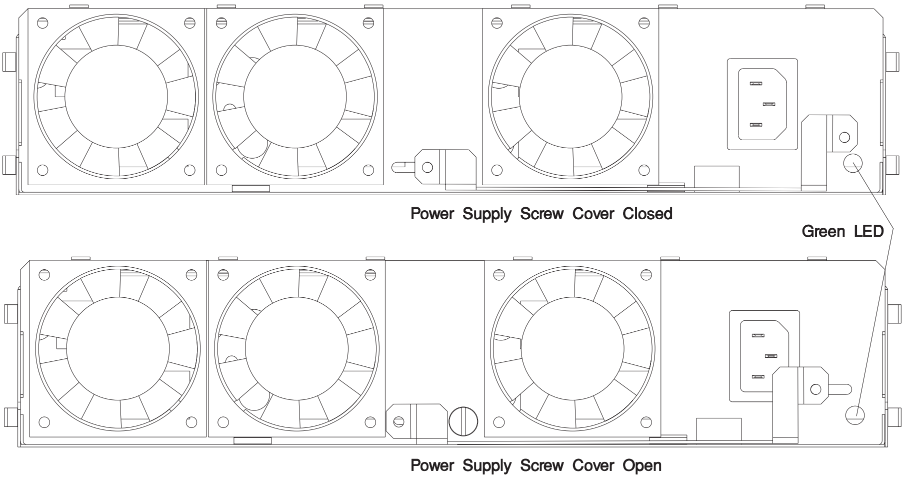
4. Pivot the screw cover counterclockwise to the open position to access the power supply screw.

5. Loosen the screw until the power supply can be pulled out.

6. Slide the power supply out.

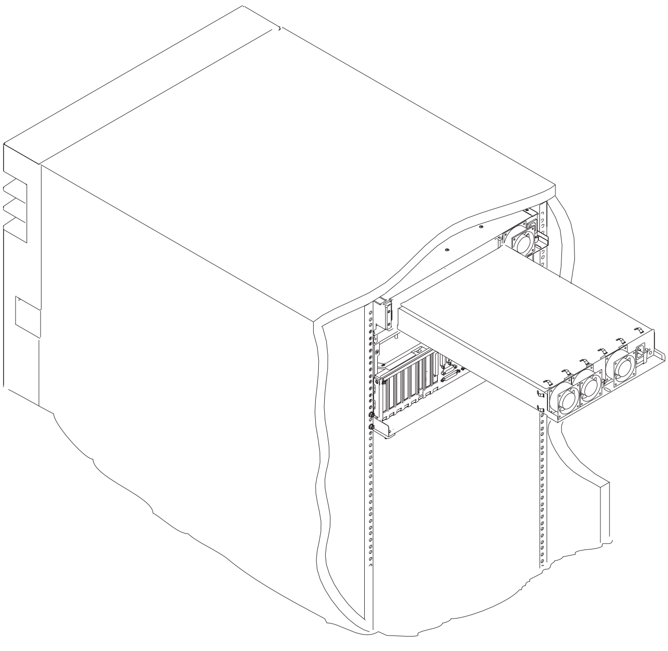


7. To remove the 3/4 power supply, slide the screw cover to the left to the open position to access the power supply screw.



8. Loosen the screw until the power supply can be pulled out.

9. Slide the power supply out.



Replacement

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

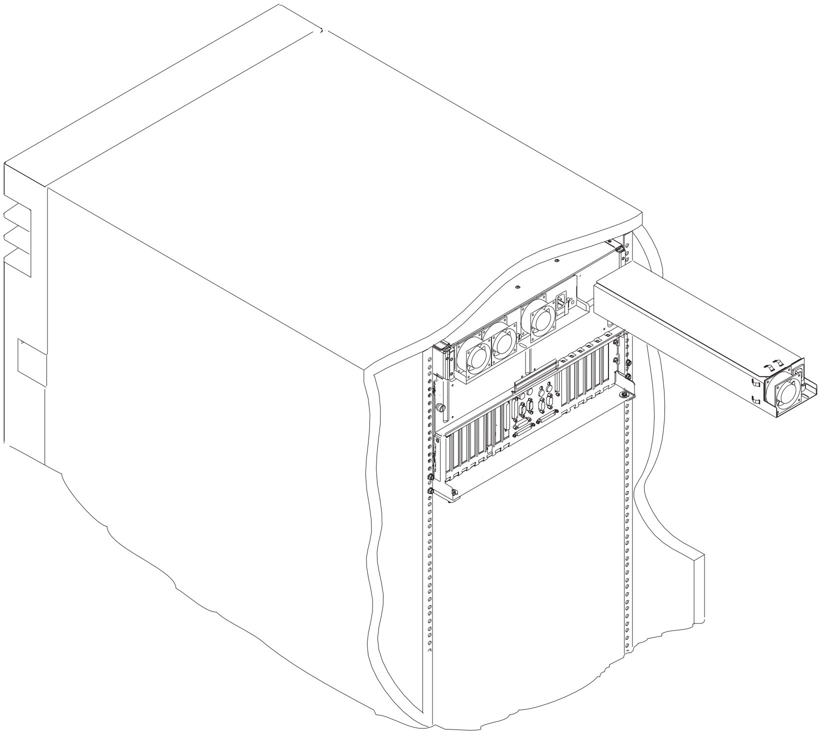
1. If you have not already done so, open the rear door of the rack unit and locate the drawer you need to work on.

   Notes:

   a. If you are replacing the 3/4 power supply, go to step 7 on page 9-44.

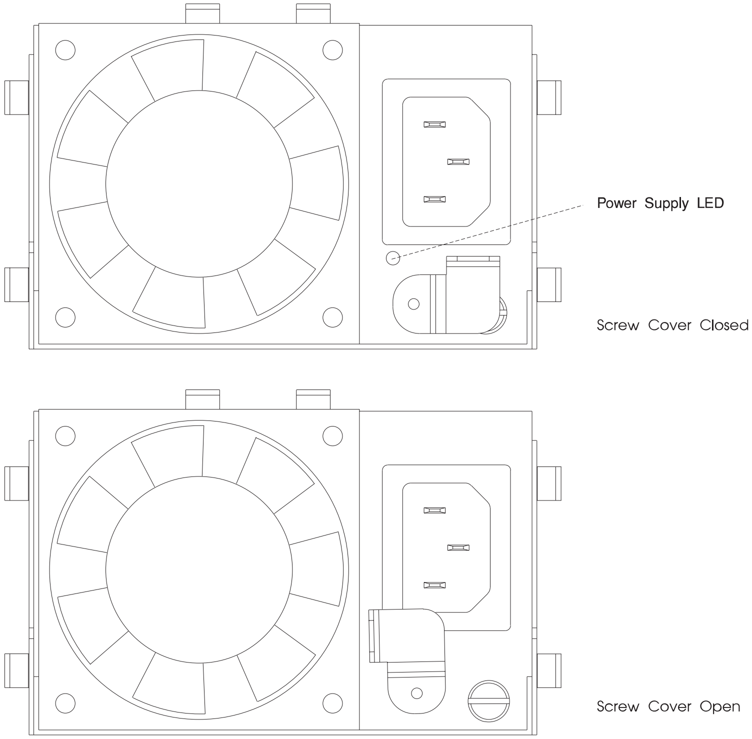
   b. If you are installing the 1/4 power supply, go to step 2 on page 9-42.

2. Slide the 1/4 power supply in.



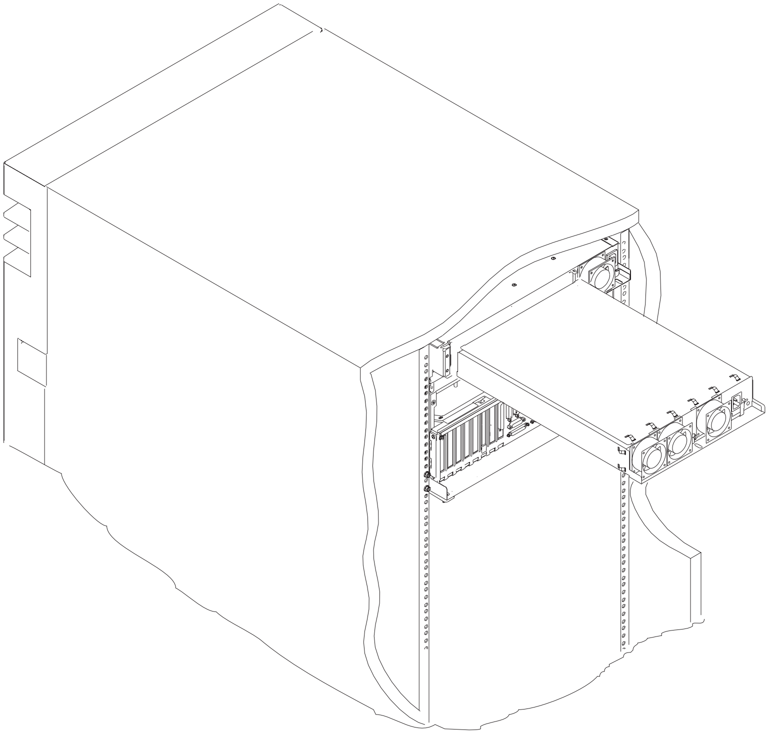
3. Tighten the screw until the power supply is drawn in tight.

4. Pivot the screw cover clockwise over the screw.



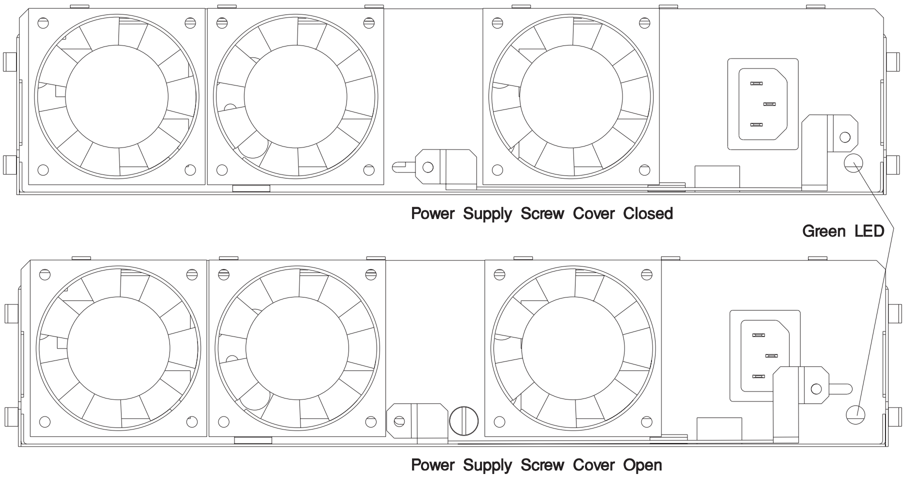
5. Plug the power cord into the power supply.
6. Plug the other end of the power cord into the rack power distribution unit.

7. To install the 3/4 power supply, slide it into position.



8. Tighten the screw until the power supply is drawn in tight.

9. Slide the screw cover to the right to cover the screw.



10. Plug the power cord into the power supply.
11. Plug the other end of the power cord into the rack power distribution unit.
12. Close the door at the rear of the rack unit.

Hot Swap Disk Drives

Unconfiguring or Configuring a Disk Drive: There are three conditions where you need to use these procedures:

- You are removing or installing a drive while the system power is turned on.
- You are installing a new drive.
- You are removing a drive from the system.

Unconfiguring: To unconfigure a disk drive:

1. Login as root.
2. Enter the **smit** command.
3. Select **Devices**.
4. Determine the type of drive you want to unconfigure; then select that type drive. When you get to the Keep Definition option, select **Yes**. This retains the details of the drive in the device configuration database.
5. Select the **Do** option to unconfigure the drive.

Configuring

1. Login as root.
2. Enter the **smit** command.
3. Select **Devices**.
4. Select the type of drive you want to configure.
5. Select **Add** for the type of drive you are configuring, then select the type of drive you are adding.

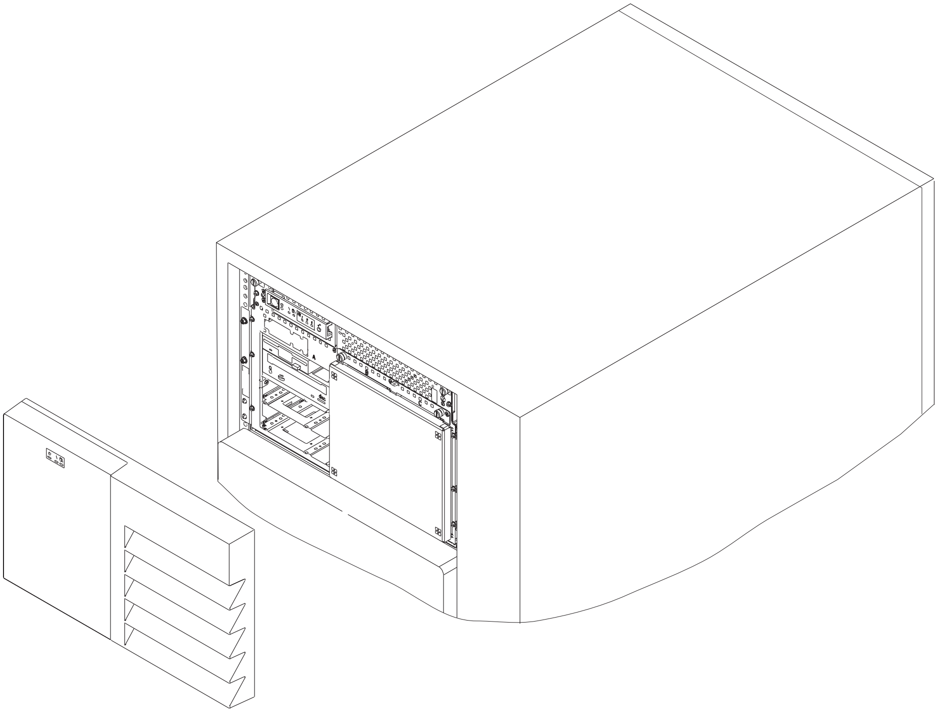
Removal: This procedure describes how to remove hot swap disk drives from a hot swap bay while the I/O Drawer is powered on.

If you remove a hot swap disk drive when the I/O Drawer power is off, steps 4 and 5 do not apply.

Attention: Caution should be used when handling all hard disk drives. Drives are more likely to be damaged during installation and service. Bumping or handling drives roughly causes latent failures. Don't stack drives and always use appropriate ESD practices. For ESD information, see “Handling Static-Sensitive Devices” on page 9-3. A drop of as little as 6.5 mm (.25 inches) can cause latent failures. Media can take 30 seconds to spin down, so ensure at least a 30 second delay has passed after switching off hot-swappable drives for removal.

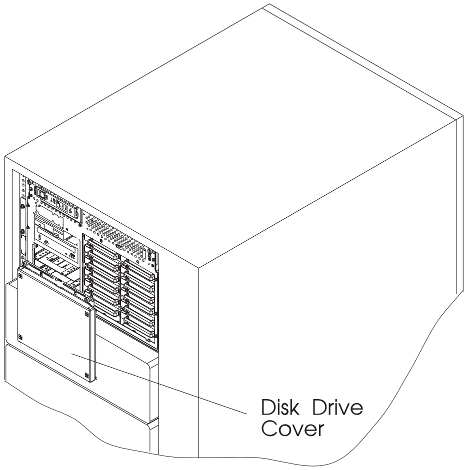
1. To remove a hot swap disk drive from I/O Drawer, remove the bezel by grasping each side and gently pulling the bezel towards you.

   Note: Rack is shown with front door and hinges removed.



2. Loosen the screws that hold the disk drive cover to the drawer and remove the disk drive cover from the drawer, storing it in a safe place.

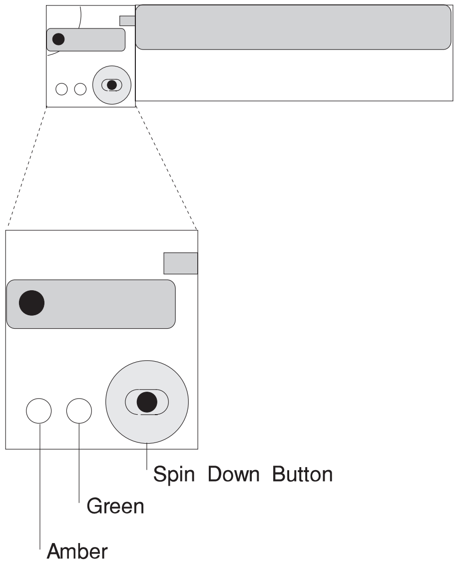
   Note: Rack is shown with front door and hinges removed.



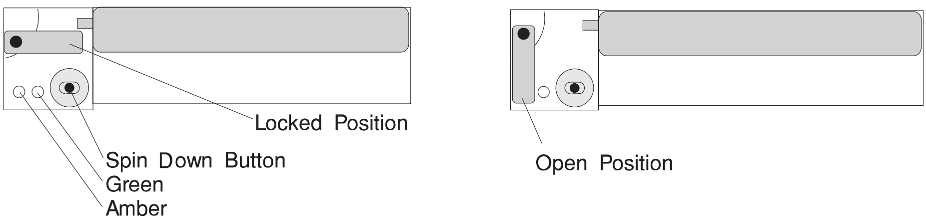
   Attention: Physically removing a hot swap drive from the I/O Drawer before it has been removed from the system configuration, may cause unrecoverable data corruption.

3. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-46 and verify that the device has been removed from the system configuration; the yellow LED on the hot swap disk drive should be off.

4. Press the spin down button on the hot swap disk drive; observe the green flashing LED.



5. Rotate the carrier latch to the open position.



6. Pull the hot swap disk drive out of the hot swap bay, keeping it straight to prevent damage.
7. Place the hot swap disk drive in an antistatic bag.
8. Replace the front disk drive cover.
9. Reinstall the bezel.

Replacement: This procedure describes how to add an additional hot swap disk drive or install a new hot swap disk drive in a hot swap bay while the I/O Drawer is powered on.

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

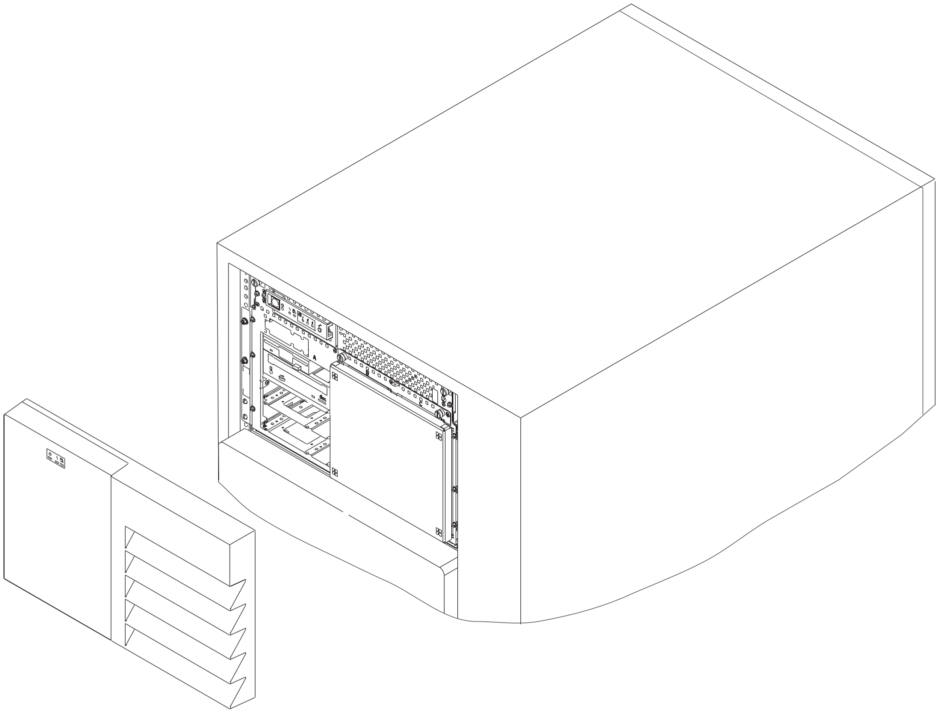
Notes:

1. This procedure is the same for any hot swap disk drive that is supported by this drawer.
2. For additional information regarding the operation of the hot swap disk drives, see the installation and users guide that came with the drives.

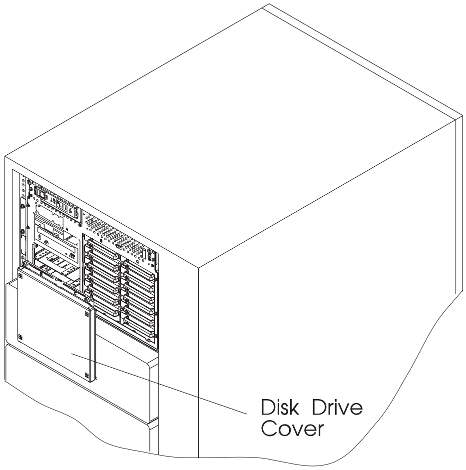
This section gives the instructions for installing hot swap disk drives in banks B and C.

1. Remove the bezel by grasping each side and gently pulling the bezel toward you.

   Note: Rack is shown with front door and hinges removed.



2. Remove the screws that hold the disk drive cover to the drawer and remove the disk drive cover from the drawer, storing it in a safe place.



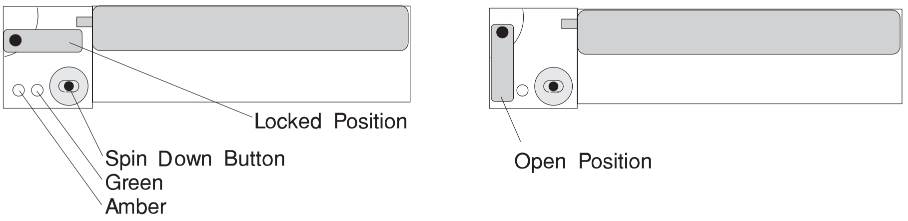
3. Each hot swap disk drive you plan to replace must have the hot swap SCSI disk drive carrier attached.

   Attention: Handle the hot swap disk drive with care as it is very fragile and can be easily damaged if exposed to shock, electrostatic discharge, or rough handling.

4. It is recommended that you install the hot swap disk drive in the next unused position of bank B first, and then bank C.

   Attention: Attaching SCSI address jumpers on the hot swap disk drive rather than using the automatic ID furnished by the backplane is not advised. Attaching jumpers can cause service problems, multiple drives at the same address, or confusion locating the correct drive.

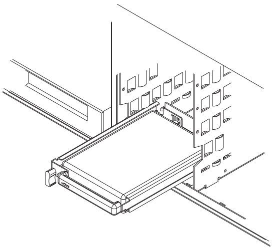
a. Rotate the carrier latch to the open position.

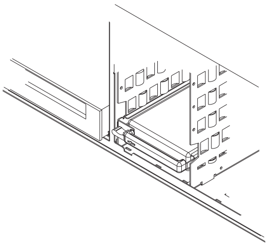


b. Position the drive carrier assembly horizontally, with the connector facing into the bay.

c. Align the side of the carrier with the raised guides on the left of the bay.

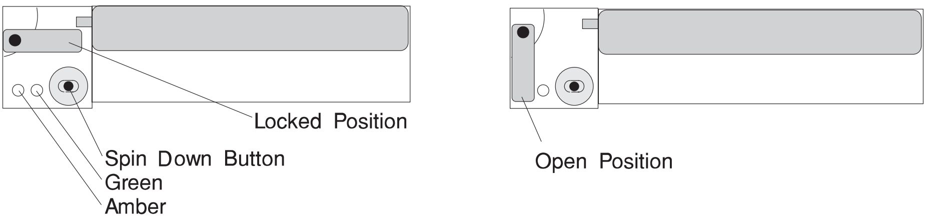
d. Slide the carrier into the bay gently to keep from damaging the hot swap disk drive. Slide the carrier to the rear of the bay until it is seated into the connector.





e. Move the carrier latch to the locked position. If the carrier does not lock, check that the drive carrier is fully seated in the backplane. When the drive carrier is fully seated and power is turned on, the green LED on the drive carrier is illuminated.

SCSI Disk Drive Status Lights



The following table explains the meaning of the green and amber status lights and spin down button on a SCSI disk drive.

SCSI Disk Drive Status Lights		
Light or Button	**Status**	**Definition**
Amber	On	Drive spinning
	Off	Drive not spinning
Green	On	Power On
	Off	Power Off
	Blinking	Power Off/Drive identify
Spin down	Depressed	Spin down drive and remove power

5. Go to 'Installed Device Records' in *RS/6000 Enterprise Server S70 User's Guide* to record the drive location and the SCSI ID assigned to the drive; then return here to determine your next step.
6. If you have other hot swap disk drives to install, go to page 9-51.
7. If you have other devices to install, refer to “Media Devices (CD-ROM Drive, Tape Drive, Diskette Drive)” on page 9-54.
8. If you do not have any other procedures to perform, replace the cover that you removed in step 2 on page 9-51.
9. Reinstall the bezel and close the front door.
10. Go to “Unconfiguring or Configuring a Disk Drive” on page 9-46 and configure the drive you just replaced.

Media Devices (CD-ROM Drive, Tape Drive, Diskette Drive)

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

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

Notes:

1. This procedure is the same for any media device that is supported by this drawer.
2. For additional information regarding the operation of the media drives see the installation and users guide that came with the drives.

Removal

1. Remove the top cover as described in “Front Chassis Cover” on page 9-35.
2. Note which cables are connected to each device. Label them to ensure that each cable is returned to the correct device when replacing them.
3. If necessary, remove any devices that impede access to the device that you are removing.
4. Disconnect the power and signal cables to the drive you are removing.
5. Slide the drive forward to remove.

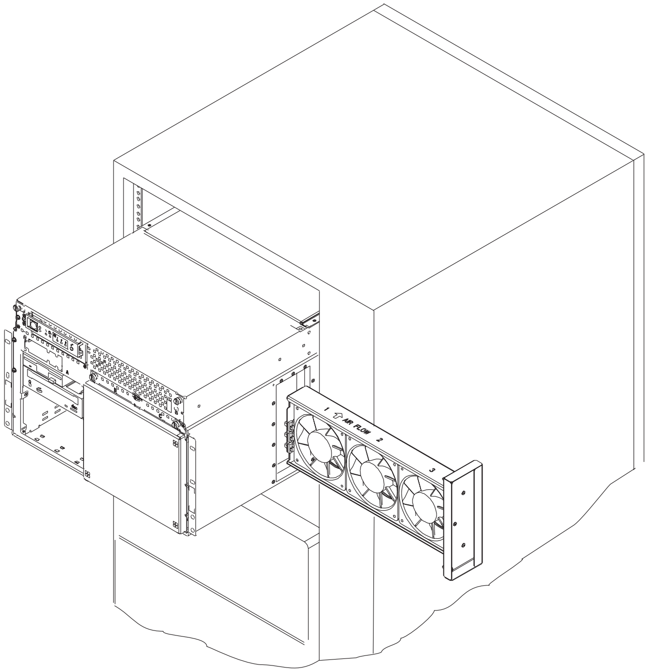
Replacement

1. If there is an interposer, remove it from the device.
2. Remove the metal plate from the device you just removed.
3. Attach the metal plate to the replacement device.
4. Attach the interposer that you removed earlier to the replacement device.
5. Slide the device into the proper media bay.
6. Connect the power and signal cables to the device you are installing, making sure that the correct cables are connected to each device .
7. Replace and connect any devices that you removed to access this device.
8. Replace the top cover as described in “Front Chassis Cover” on page 9-35.

Three Fan Assembly

Removal

1. Remove the front door from the Input/output Rack as described in “Front Door” on page 9-26.
2. Place the drawer in the service position, as described in “Service Position” on page 9-31.
3. Loosen the two retained screws holding the fan assembly in position.
4. Remove the fan assembly by pulling it out.

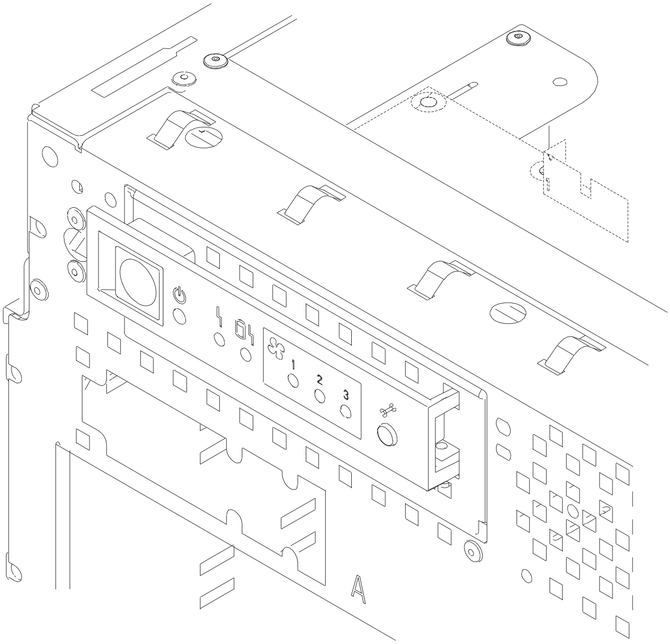


Replacement: Replace in reverse order. Ensure that the retained screws are properly engaged, as they draw the fan assembly into the fan connectors.

Indicator Panel Bezel

Removal

1. If you have not already done so, place the drawer in the front service position and remove the front top cover as described in "Front Chassis Cover" on page 9-35.
2. Press the snap in detent on the right side of the indicator panel to release the bezel.
3. Rotate the bezel forward and out of the mounting bracket.

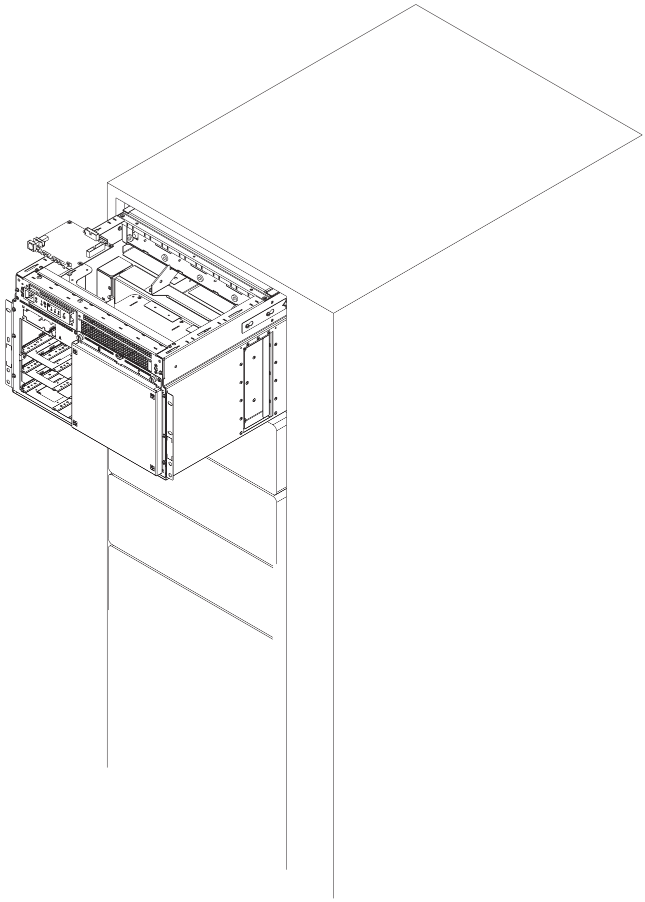


Replacement: Replace in reverse order.

Indicator Card

Removal

1. Do the front cover removal procedure as described in “Front Chassis Cover” on page 9-35.
2. Note the locations of the cables that attach to the card.
3. Disconnect all cables from the card.
4. Remove the four screws that hold the card in place.
5. Remove the card by pulling it up and out.



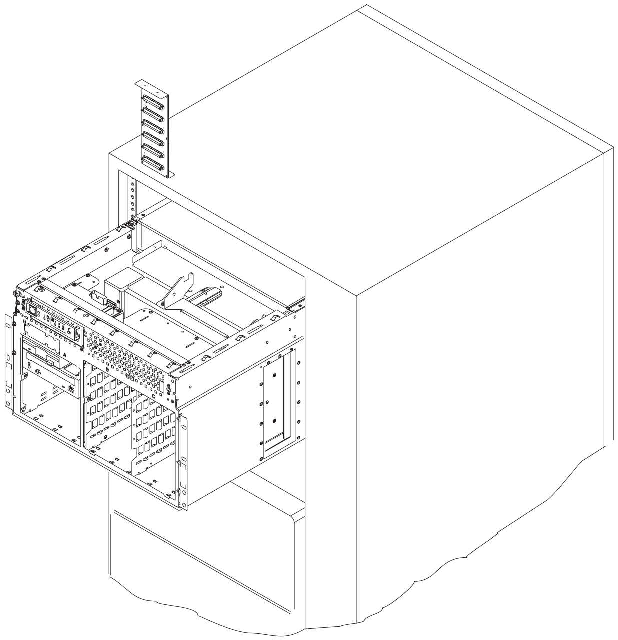
Replacement: Replace in reverse order.

I35 SCSI Card

Removal

1. Do the front cover removal procedure as described in “Front Chassis Cover” on page 9-35.
2. Remove the disk drive cover from the front of the drawer.
3. Disconnect the disk drive carriers from the I35 SCSI card and slide them out just enough that they clear the connectors.
4. Remove the screw that holds the I35 SCSI card in place.
5. Remove the card by pulling it up and out.
6. Note the locations of the cables that attach to the I35 SCSI card.
7. Disconnect the cables that attach to the backplane card.

   Note: Rack is shown with front door and hinges removed.

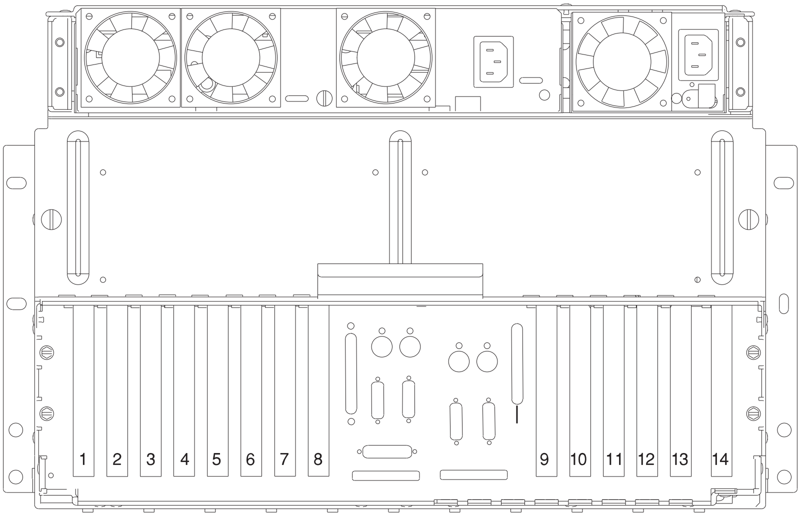


Replacement: Replace in reverse order.

Adapters

Removal

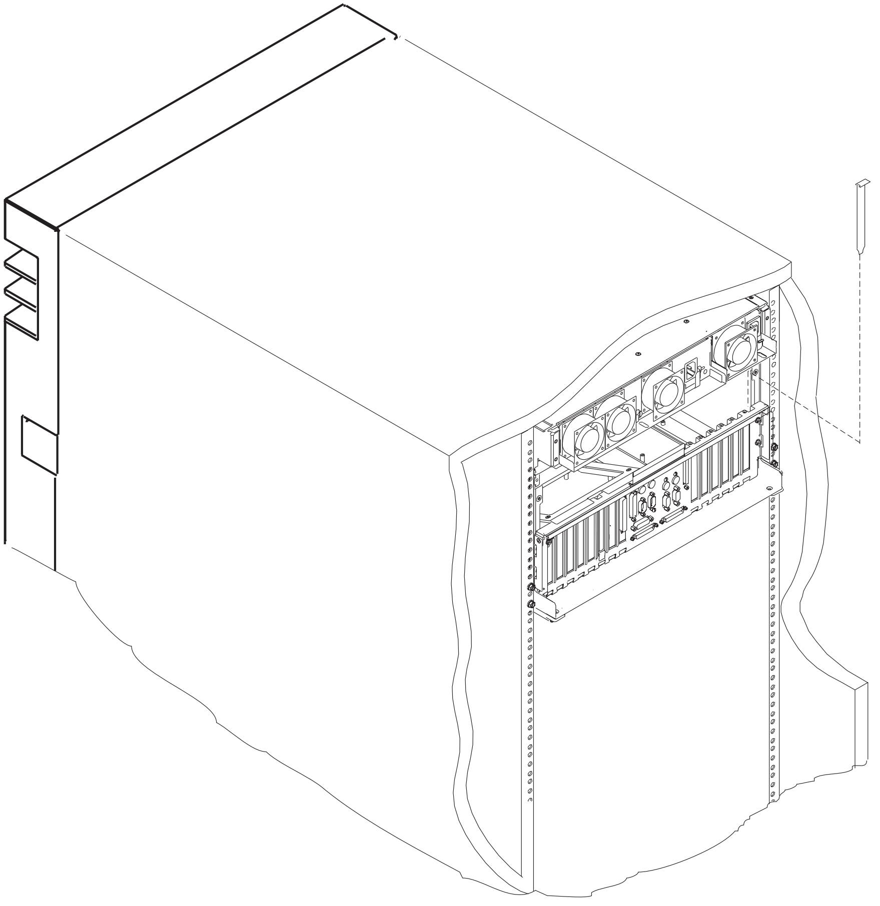
1. Remove the acoustic baffle in the rear of the I/O Drawer, as described in "Acoustic Baffle" on page 9-34.
2. Note the slot number of the adapter you are removing.



3. If there are any external cables attached to the adapter, disconnect them.
4. Loosen and remove the screw on top of the adapter's bracket.
5. If there are any internal cables attached to the adapter, disconnect them.
6. Carefully pull the adapter out of the slot.

   Note: To minimize difficulty with the EMI gasket between the adapter and bulkhead, remove and replace only one adapter or slot cover at a time. Never have two adjacent slots open.

7. If you are installing another adapter in this expansion slot, follow the instructions given under "Replacement" on page 9-60 below.
8. If you are not installing another adapter in this expansion slot, replace the expansion-slot cover:
   a. Slide the cover over the open expansion slot.
   b. Tighten the expansion-slot screw on the top of the expansion-slot cover.

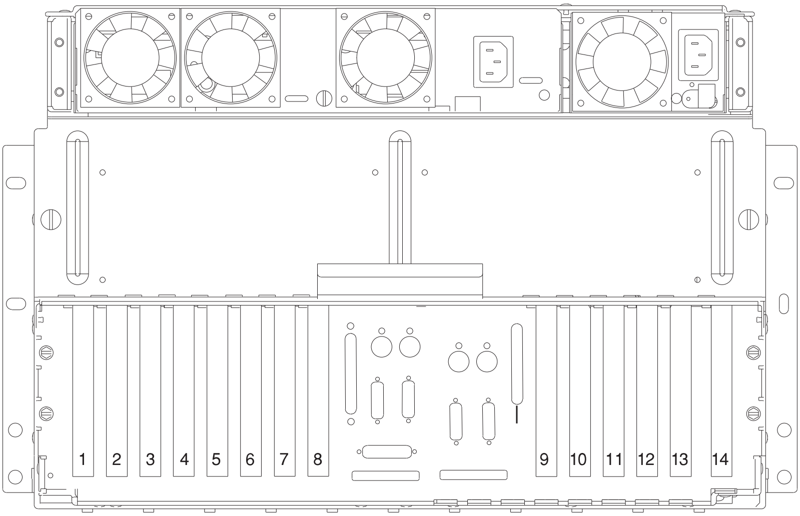


Replacement: To replace an adapter, perform the removal steps in the reverse order.

Service Processor Card

Removal

1. Turn system power off.
2. The service processor is in slot 8 of the primary I/O Drawer.



3. Remove the acoustic baffle from the rear of the I/O Drawer, as described in "Acoustic Baffle" on page 9-34.
4. Remove the 3/4 power supply, do the removal procedure for the 3/4 power supply under "Power Supplies" on page 9-38.
5. Remove the screw that secures the service processor card bracket to the system chassis.
6. Remove the service processor card by pulling it straight up.
7. Disconnect all cables that are attached to the service processor card and remove the card.

Replacement: Replace in reverse order.

Note: An Service Processor firmware update is required if other than the original version is on the system. Refer to Appendix D on page D-1 for instructions on obtaining the latest level firmware, downloading and installation. If a BACKUP set of diskettes exists from a prior update, these may be used.

Tell the customer to reset their passwords. Passwords can be set using the Service Processor menus, see Appendix C on page C-1 for more information. The Service Processor menus also are used to reset the service processor call-in functions after a service processor card replacement. See Appendix C on page C-1 and "Service Processor Call-In Security" on page C-29 for more information.

Bulkhead Card

Removal

1. Turn the system power off.
2. Open the rear Input/output Rack door.
3. Remove the acoustic baffle from the rear of the I/O Drawer, as described in "Acoustic Baffle" on page 9-34.
4. If required to gain access to the bulkhead card, do the removal procedure in "Adapters" on page 9-59.
5. If required to gain access to the bulkhead card, do the removal procedure in "Service Processor Card" on page 9-61.
6. Note the connector locations and disconnect all cables connected to the bulkhead card.
7. Remove the standoff screws from each of the connectors on the bulkhead card from the rear of the I/O Drawer.

   Note: The screws are color coded. Note the location of the screws as you remove them. The screws must be installed in the same positions on the new bulkhead card.

Replacement: Replace in reverse order.

I/O Planar

Removal

1. Do the removal procedure in “Adapters” on page 9-59.
2. Do the removal procedure in “Service Processor Card” on page 9-61.
3. Note the locations of all cables that are connected to the I/O planar and then disconnect them all from the planar.
4. Remove the screws that attach the I/O planar to the I/O Drawer frame.
5. Remove the four standoffs from the RIO connectors (RIO 0 and RIO 1) on the rear bulkhead.
6. Slide the planar toward the front of the system unit, tilt the rear of the I/O planar upward, and remove it from the drawer.

Replacement: To replace the system planar, do the removal steps in the reverse order.

Internal Cables

Removal

1. Determine which cable is faulty.
2. Refer to the diagrams in "I/O Drawer Power Cables" on page 10-38, "I/O Planar to Bulkhead Cabling" on page 10-40, and "SCSI and I/O Signal Cabling (1 of 2)" on page 10-42 to identify the cables.
3. If necessary to gain access to the cable connectors, place the drawer in the service position, as described in "Service Position" on page 9-31.
4. Note the locations of the connectors.
5. Unplug the faulty cable.
6. Replace it with the new cable.
7. When all faulty cables have been replaced in the drawer, place it in the operating position, as described in "Operating Position" on page 9-32.

Chapter 10. S70 Parts

This chapter contains parts information for the S70 system which includes:

- Part-Name to Part-Number Index
- System Rack Parts
- Input/output Rack Parts

Part-Name to Part-Number Index

The tables below identify each part by name and provide the part number. If you are directed to replace a part, these tables provides a quick cross reference for the name that is called out in the diagnostic procedures to the part number for the part. The complete parts listings for the S70 system follow these table.

System Rack

FRU Name	FRU Number
16MB DIMM	19H0288
32MB DIMM	19H0289
64MB DIMM	35H8751
128MB Memory Card	90H9831
256MB Memory Card	90H9834
512MB Memory Card	90H9837
1024MB Memory Card	90H9840
-48 V dc power cable, -48 V dc powered systems	93H6158
AC Box, Domestic (US), single phase	93H3753
AC Box, World Trade, two of three phase	93H3734
AC Box, World Trade, single phase	93H3682
Blower	21H6959
Bulk Power Supply (AC)	21H7030
Bulk Power Supply (-48 V dc)	07L6658
Circuit Breaker Panel	93H7381
Clock Card	21H6559
Control Panel Cable (Internal)	21H6996
DC Box (-48 V dc systems)	07L6656
DIMM Based Memory Card, Right Hand	93H7688
DIMM Based Memory Card, Left Hand	93H7689
JTAG Cable (Internal)	90H6513
Memory Regulator Assembly	21H7100
Operator Panel Assembly	91H1381
Operator Panel Cable (Internal)	21H7760
Operator Panel Card	91H1383
Operator Panel Battery	16G8095
Power Distribution Harness, AC powered systems	21H6969
Power Distribution Harness, -48 V dc powered systems	93H6159
Processor Card, Type 1	90H9662
Processor Card, Type 2	90H9694
Programmable Regulator Assembly	21H7763
RIO Cable (Internal)	21H7376
RIO Card Assembly	21H4808
SPCN Card Assembly	21H6961
System Backplane Assembly	90H9429

I/O Rack	
FRU Name	**FRU Number**
20/10 Amp Circuit breaker panel	07L6551
15 Amp Circuit breaker panel	07L6553
Terminal Strip	07L6554
1/4 Power Supply Cable, -48 V dc	94H0403
3/4 Power Supply Cable, -48 V dc	94H0404

Cables, System Rack to I/O Drawers	
FRU Name	**FRU Number**
JTAG Cable 3M	21H7375
OP Panel Cable 5M	21H7374
RIO Cable 2M	90H9795
RIO Cable 6M	21H7643
RIO Cable 15M	21H7377
SPCN Cable 2M	87G6235
SPCN Cable 6M	21F9469
SPCN Cable 15M	21H7377

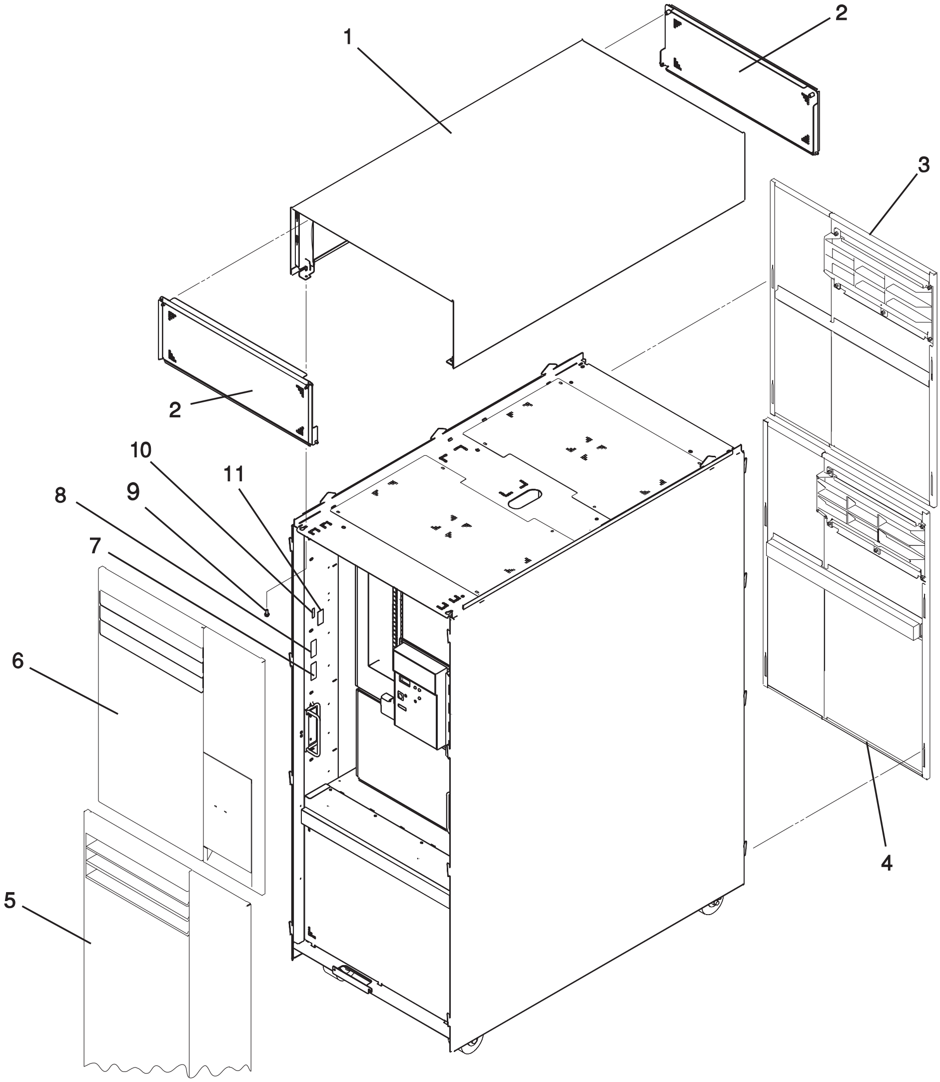
I/O Drawer

FRU Name	FRU Number
1/4 Power Supply (AC)	93H7905
3/4 Power Supply (AC)	93H8714
1/4 Power Supply (-48 V dc)	93H7539
3/4 Power Supply, (-48 V dc)	93H7542
+3.3 V to Planar Cable, Power Supply to Planar	93H7081
+5 V to Planar Cable, Power Supply to Planar	93H7078
Bulkhead Card	93H8185
DASD Power Cable, Power Supply to DASD	93H7076
Diskette Cable, Serv Proc to Diskette Drive	93H2454
Fan Cable, Indicator card to 3 fan assembly	40H4866
I35 SCSI Card	93H2166
I35 to Indicator card Cable, I35 to Indicator card	40H7401
I/O Planar	12H0014
Indicator Card	93H8502
Keyboard/Mouse Cable, Serv Proc to Bulkhead	93H2453
Media Power Cable, Power Supply to Media bay	93H7082
Op Panel Cable, Serv Proc to Bulkhead	93H2452
Parallel Port Cable, Serv Proc to Bulkhead	93H8043
Power Distribution Bus, single phase	93H6661
Power Distribution Bus, two phase	52G6060
Power/Signal to Planar Cable	93H7079
Planar Power Cable, Power Supply to Planar	93H7077
Planar to Indicator card Cable	93H4232
SCSI Cable, Media Bay to SCSI adapter slot 2	93H2455
SCSI Cable, I35 to SCSI adapter slot 9 to SE/SE SCSI Redrive card	93H2456
SCSI Cable, I35 to SCSI to SE/SE SCSI Redrive card to adapter slot 9	07L7005
SCSI Cable, I35 to I35	93H2485
SE/SE SCSI Redrive Card	93H6409
Serial Port Cable, Serv Proc to Bulkhead	93H8046
Service Processor Card	93H2275
SPCN control Cable, Planar to Bulkhead	93H2451
Three Fan Assembly	40H4878
Y Power Cable, Power Dist Bus to Drawer	89X2629

System Rack Parts

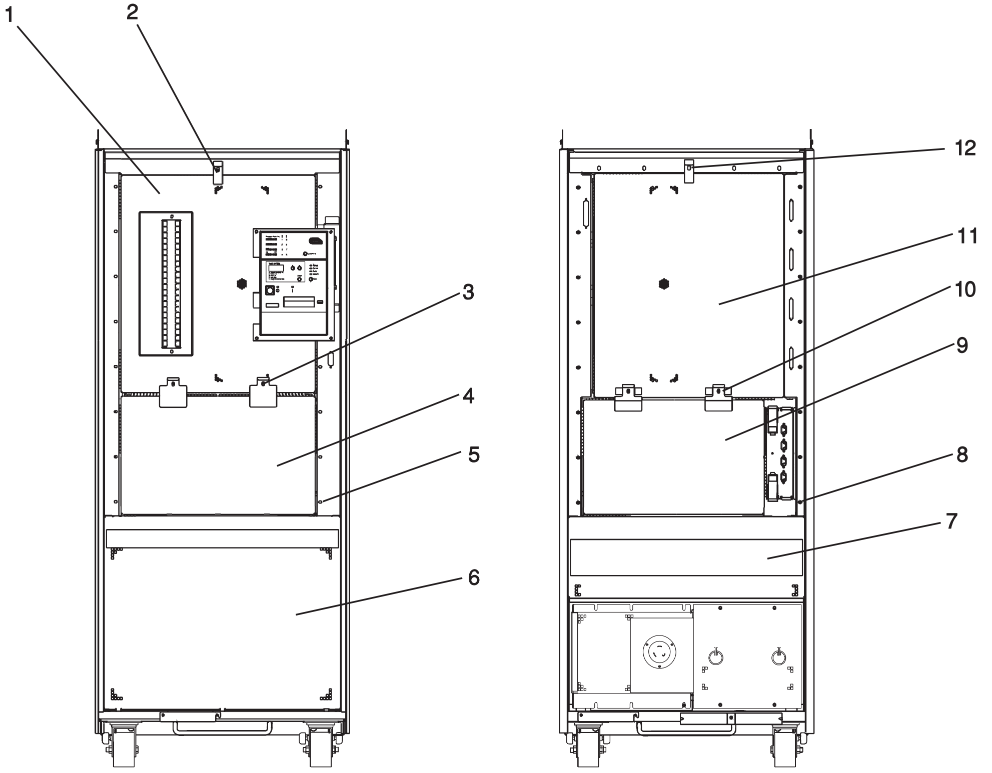
This section contains parts information for the System Rack.

Front, Rear, and Top Covers



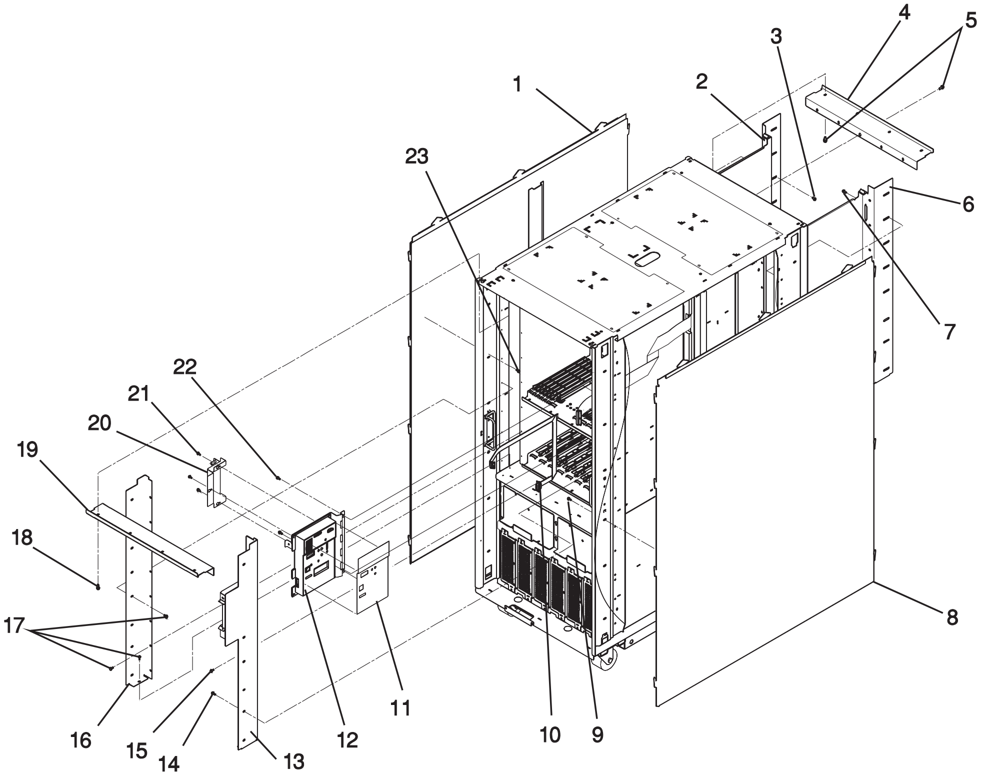
Index	FRU Part Number	Units Per	Description
1	21H7211	1	Cover, top
2	21H7523	2	EMC shield
3	93H5373	1	Upper rear cover assembly (same for -48 volt systems)
4	93H5374	2	Lower rear cover assembly (same for -48 volt systems)
5	93H5374	1	Lower front cover assembly (same for -48 volt systems)
6	93H5363	1	Upper front cover assembly (same for -48 volt systems)
7	44H8386	1	Label, S/N Barcode (same for -48 volt systems)
8	44H8386	1	Label, MFG work unit control (same for -48 volt systems)
9	1621811	4	Screw, top cover mounting
10	90H6339	2	Label, s/n (same for -48 volt systems)
11	46G3577	1	Label, security (same for -48 volt systems)

Internal Shields (Front and Rear)



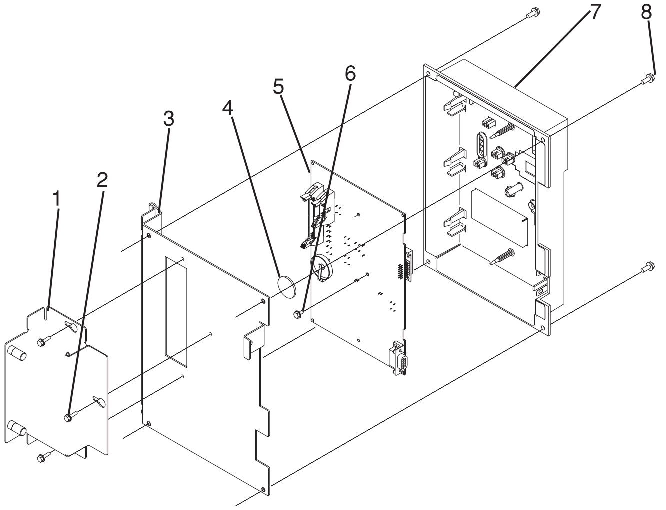
Index	FRU Part Number	Units Per	Description
1	21H7495	1	Shield, front processor/memory
2	1621811	1	Screw, front processor/memory shield
3	1621811	2	Screw, regulator shield
4	21H7604	1	Shield, regulator
5	1621811	15	Screw, front regulator
6	21H7516	1	Shield, front power
7	21H7517	1	Shield, rear blower
8	1621811	4	Screw, M4 x 10
9	21H7605	1	Shield, rear regulator
10	1621811	2	Screw, M4 x 10
11	21H7606	1	Shield, rear processor/memory shield
12	1621811	1	Screw, M4 x 10

Operator Panel, Brackets, and Covers (Front View)



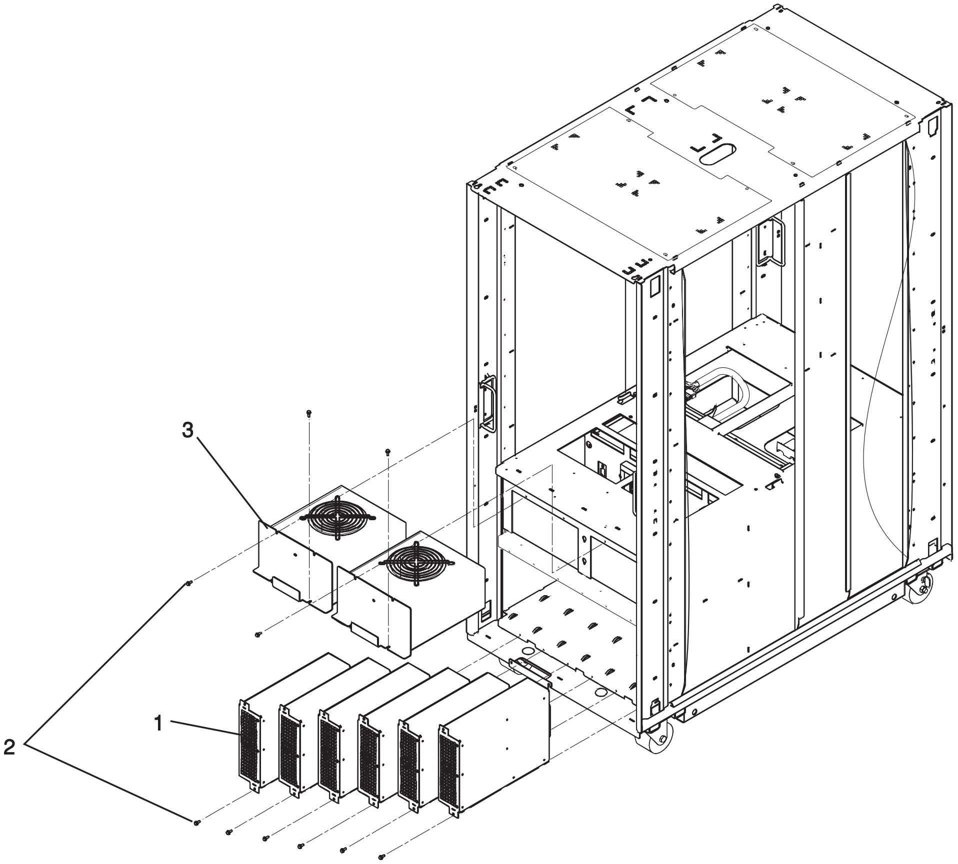
Index	FRU Part Number	Units Per	Description
1	93H5464	1	Left side cover
2	21H7511	1	Bracket, rear left
3	1621811	16	Screw, rear left
4	21H7510	1	Bracket, upper rear
5	1621811	9	Screw, upper
6	21H7512	1	Bracket, rear right
7	1621811	16	Screw, rear right
8	93H5465	1	Right side cover
9	1621811	8	Screw, side cover, M4 x 10
10	21H6996	1	Control panel cable (internal)
11	91H1373	1	Label, operator panel
	90H9774	1	Label, operator panel
12	91H1381	1	Operator panel assembly
13	21H7508	1	Bracket, front right
14	1621811	14	Screw, front right
15	1614920	2	Hex Standoff, operator panel cable
16	21H7509	1	Bracket, front left
17	1621811	16	Screw, front left
18	1621811	9	Screw, upper System Rack
19	21H7505	1	Bracket, Upper Front
20	21H3733	1	Cover, operator panel connector
21	1621811	3	Screw, connector cover M4 x 10
22	1621811	2	Screw, operator panel M4 x 10
23	1621811	8	Screw, operator panel M4 x 10

Operator Panel Assembly



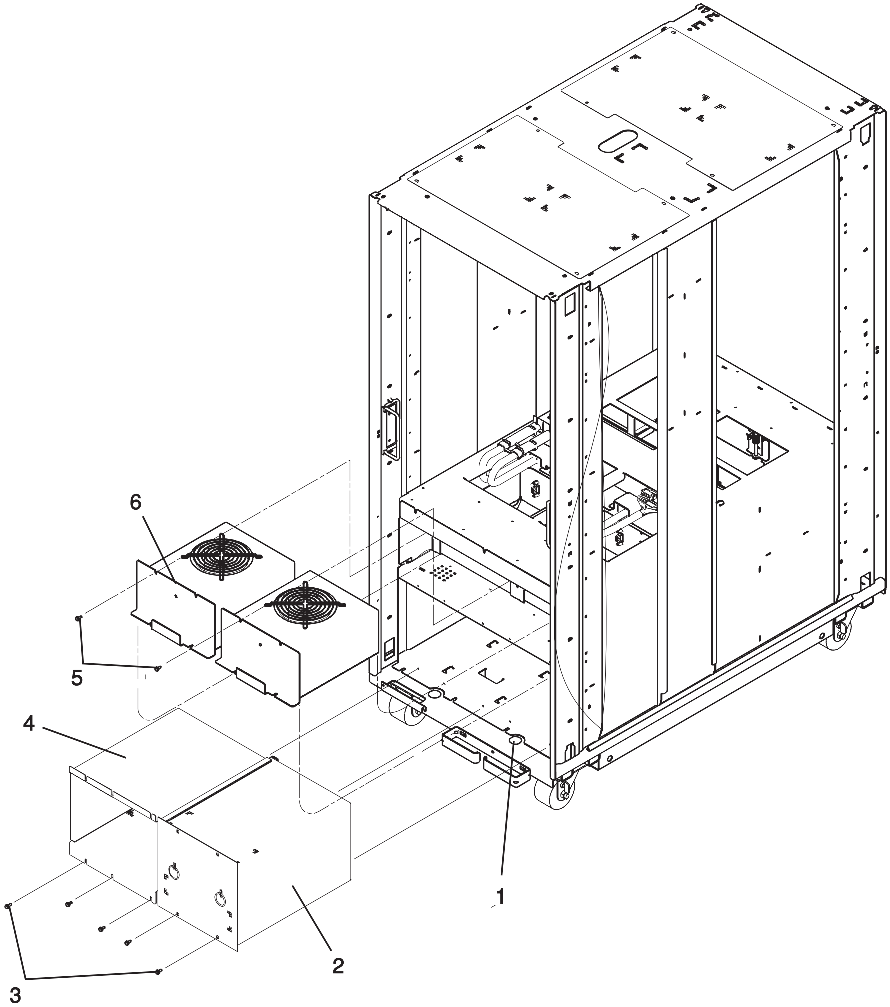
Index	FRU Part Number	Units Per	Description
1	21H3733	1	Connector cover
2	1621812	3	Connector cover screws
3	21H3732	1	Mounting bracket
4	16G8095	1	Battery
5	91H1383	1	Card assembly
6	1622673	2	Card assembly screws
7	21H3729	1	Bezel assembly
8	1621812	4	Bezel assembly screws

Bulk Power Supplies and Front Blowers (Front View)



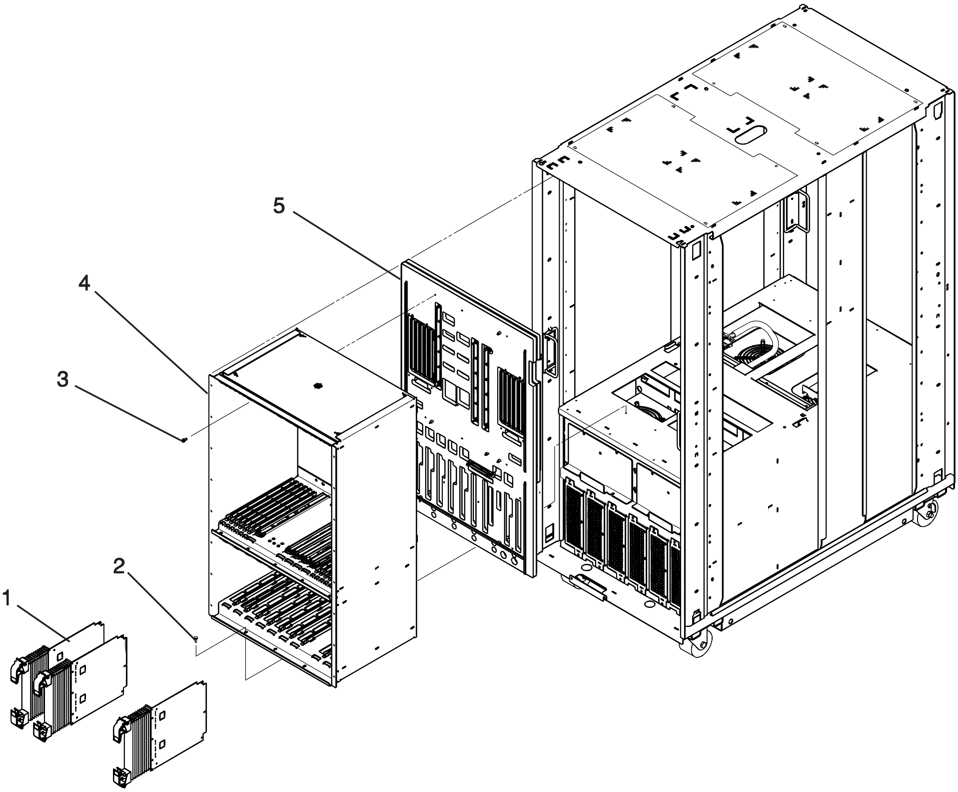
Index	FRU Part Number	Units Per	Description
1	21H7030	6	Bulk Power Supplies, (AC)
	07L6658	6	Bulk Power Supplies, (-48 V dc)
2	1621811	20	Screws, M4 x 10
3	21H6959	2	Blowers

AC Module Assembly and Rear Blowers (Rear View)



Index	FRU Part Number	Units Per	Description
1	90H6343	4	Plug
2	93H3753	1	AC box, Domestic (US), single phase
	93H3734	1	AC box, World Trade, three phase
	93H3682	1	AC box, World Trade, single phase
	07L6656	1	DC box, -48 V dc powered systems
3	1621811	10	Screws, blower mounting
4	93H5454	1	Shield, EMC
5	1621811	8	Screws
6	21H6959	2	Blowers

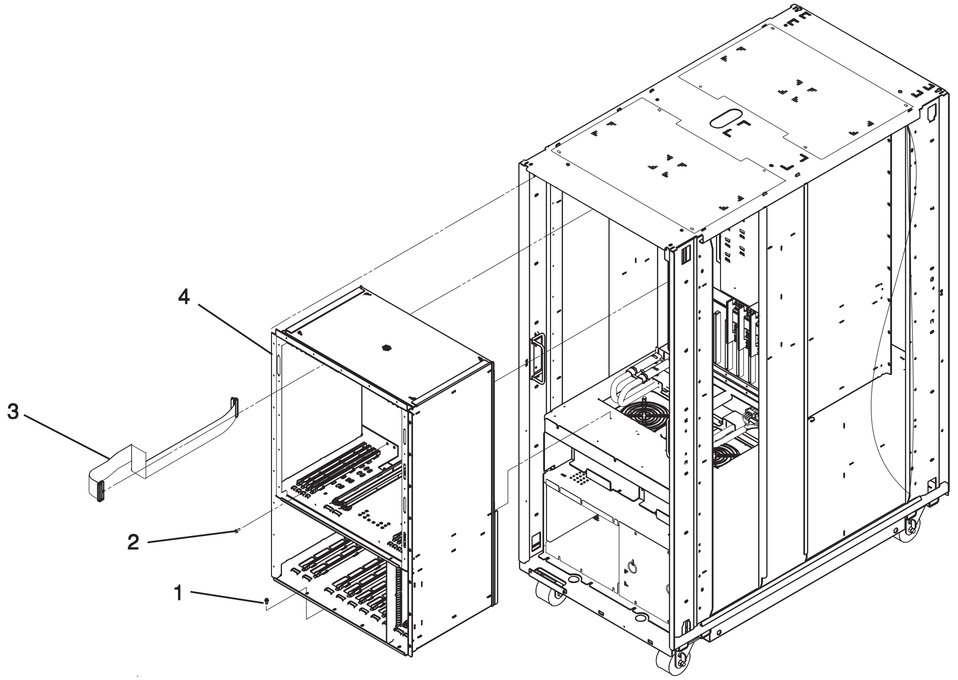
Front Electronics Cage and System Backplane Assembly



Index	FRU Part Number	Units Per	Description
1	21H7763	9	Programmable regulator assembly
	21H7100	2	Memory regulator assembly (See note)
2	1621811	3	Screws, cage mounting
3	1624766	6	Machine Screws, system backplane assembly mounting
4	21H7407	1	Front cage assembly
5	90H9429	1	System backplane assembly (consists of the system backplane, power backplane, and mounting hardware)

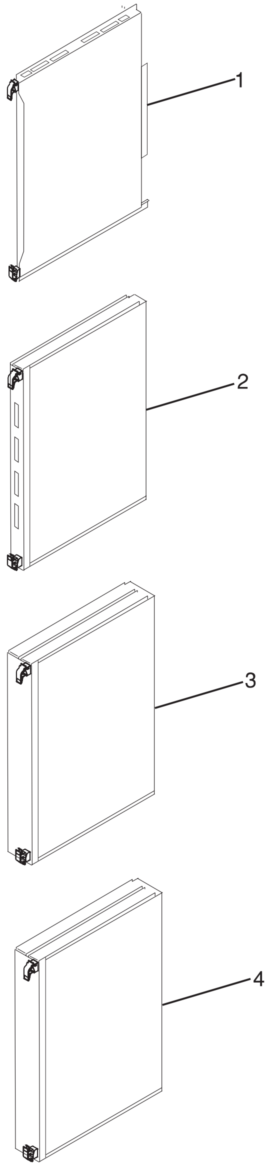
Note: Refer to "S70 Locations" on page 1-9 and "Memory Locations and Ordering Rules" on page 1-20 for locations information.

Electronics Cage (Rear View)



Index	FRU Part Number	Units Per	Description
1	1621811	6	Screws, cage mounting
2	1624766	6	Machine screw, system backplane assembly mounting
3	21H7760	1	Operator panel cable (internal)
4	21H7420	1	Rear cage

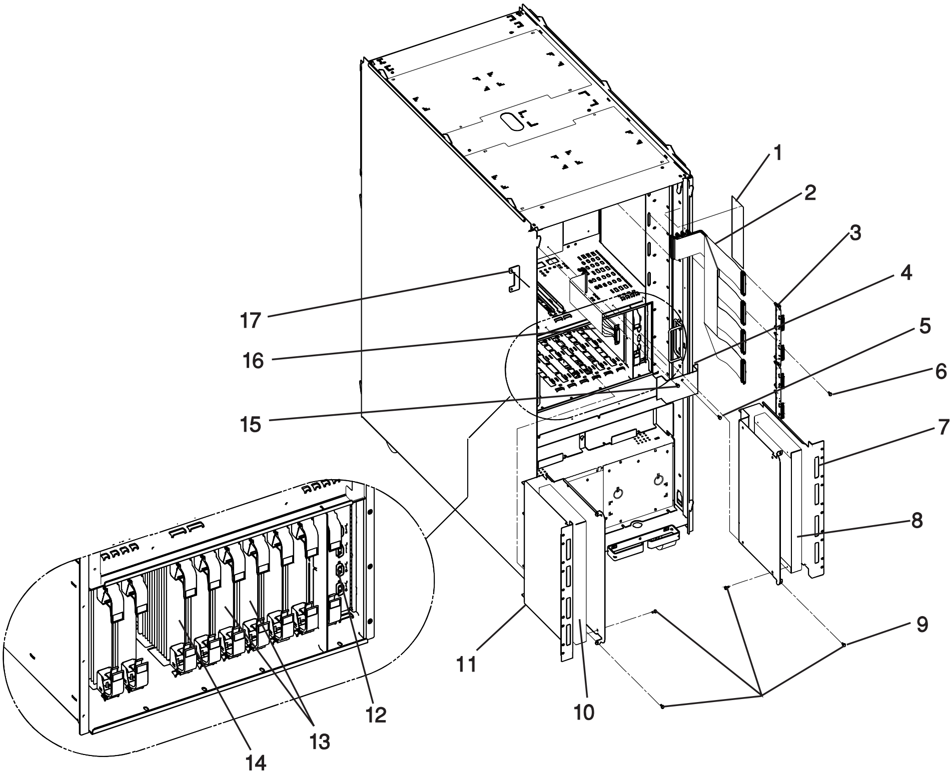
Electronic Cards



Index	FRU Part Number	Units Per	Description
1	90H9831	Up to 20	128 MB memory card
	90H9834	Up to 20	256 MB memory card
	90H9837	Up to 20	512 MB memory card
	90H9840	Up to 16	1024 MB memory card
2	21H6559	1	Clock Card
3	93H7688	2	DIMM based memory card, right hand
3	93H7689	2	DIMM based memory card, left hand
	19H0288	See note	16MB DIMMS
	19H0289	See note	32MB DIMMs
	35H8751	See note	64MB DIMMs
4	90H9662	Up to 2	Processor card, Type 1
4	90H9694	Up to 1	Processor card, Type 2

Note: Refer to “S70 Locations” on page 1-9 and “Memory Locations and Ordering Rules” on page 1-20 for locations information.

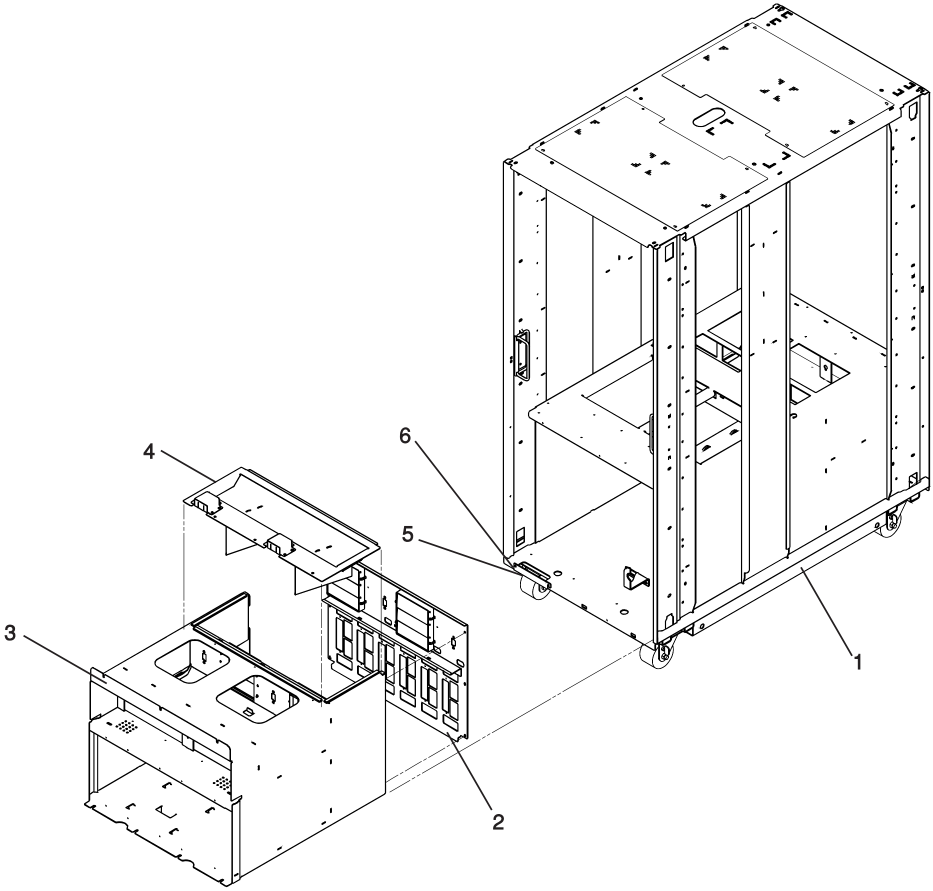
Power Regulators, Cables, and Air Baffles (Rear View)



Index	FRU Part Number	Units Per	Description
1	65X2932	1	Label, VCCI
2	21H7376	1	Cable, RIO
3	21H4808	2	RIO card assembly
4	21H8020	1	Air Baffle, lower
5	1621811	1	Screw, air baffle
6	46G3537	8	Hex standoff RIO
7	21H7639	1	Shield, cable
8	21H7660	1	Air Baffle
9	1621811	22	Screw, shield mounting
10	21H7660	1	Air baffle
11	21H7639	1	Shield, cable
12	21H6961	1	SPCN card assembly (see note)
13	21H7180	2	Memory regulator assembly (see note)
14	21H7763	3	Programmable regulator assembly (see note)
	21H7100		Memory regulator assembly (see note)
15	1614920	2	Hex standoff JTAG
16	90H6513	1	JTAG cable
17	90H6579	1	Bracket, mounting

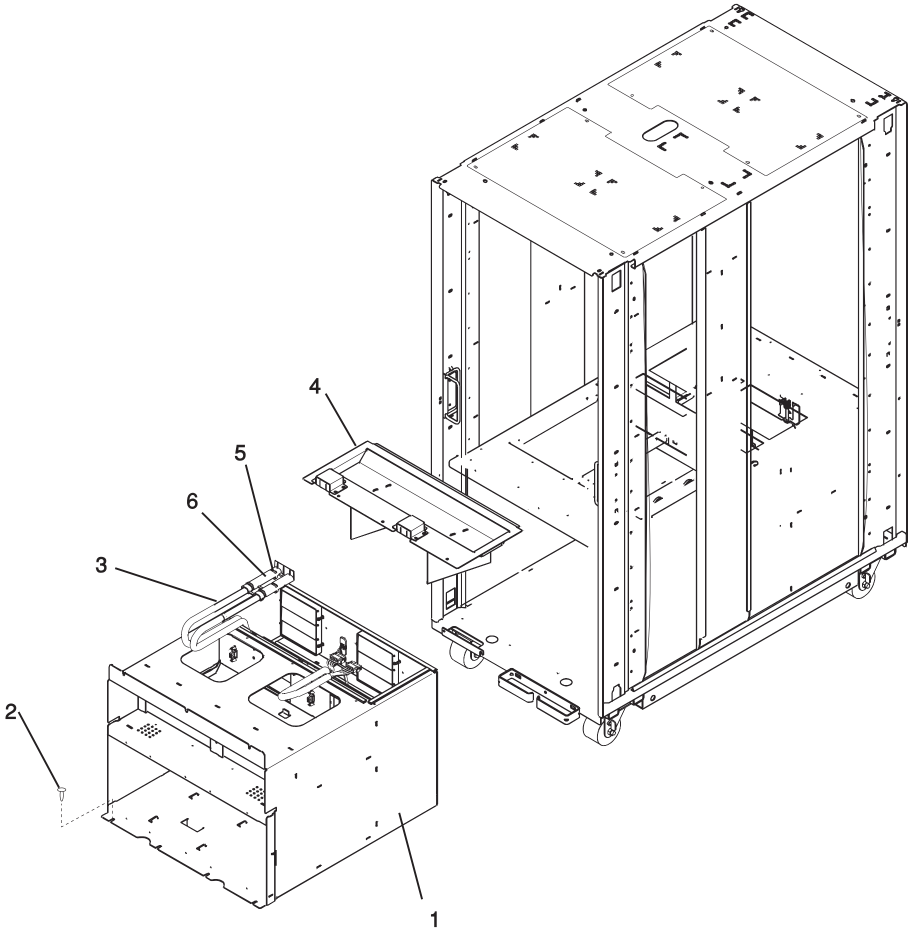
Note: Refer to “S70 Locations” on page 1-9 and “Memory Locations and Ordering Rules” on page 1-20 for locations information.

Power Subframe (Rear View, 1 of 3)



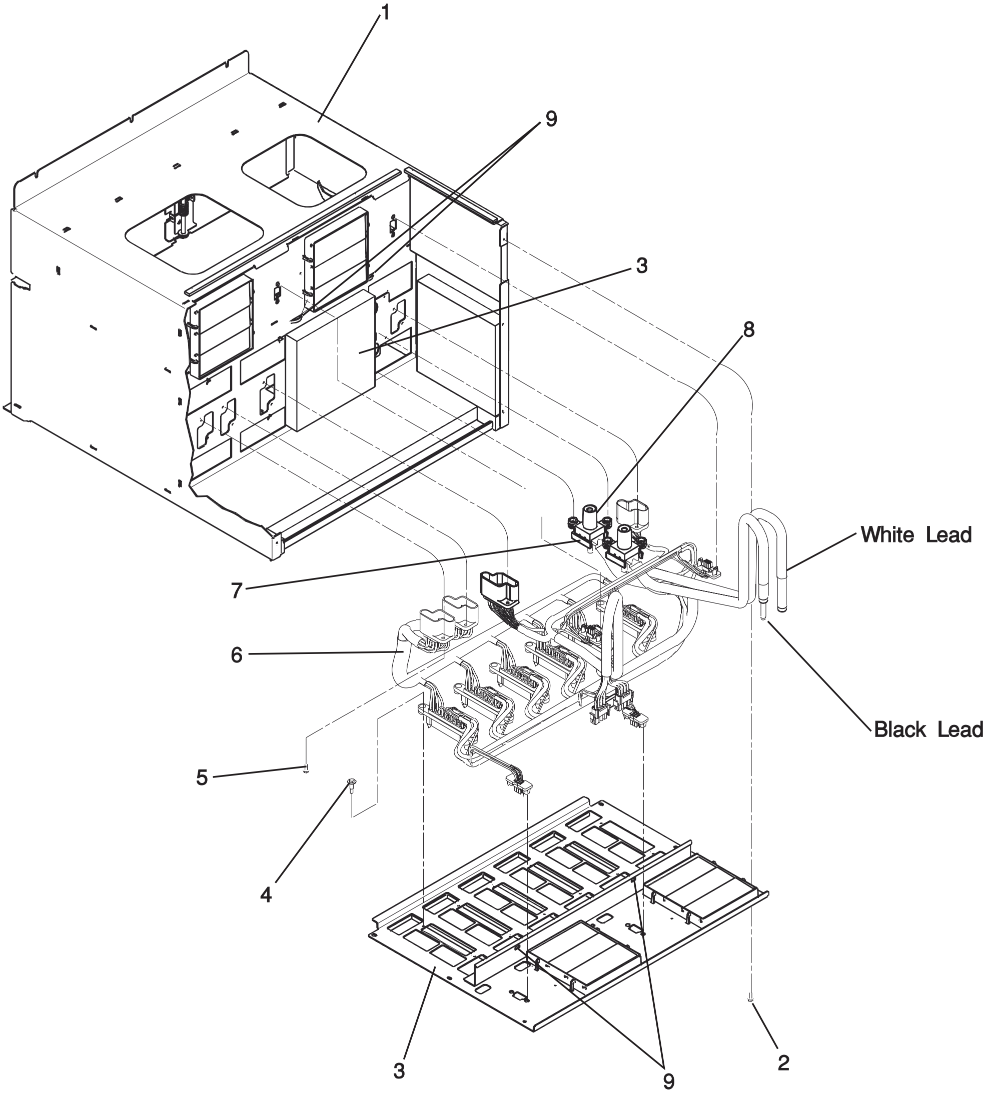
Index	FRU Part Number	Units Per	Description
1	21H7557	1	Frame Assembly
2	21H7259	1	Back Cover
3	21H7531	1	Power subframe assembly
4	21H7513	1	Top cover
5	21H7248	2	Cable Retainer
6	1621811	4	Screw, M4 x 10

Power Subframe (Rear View, 2 of 3)



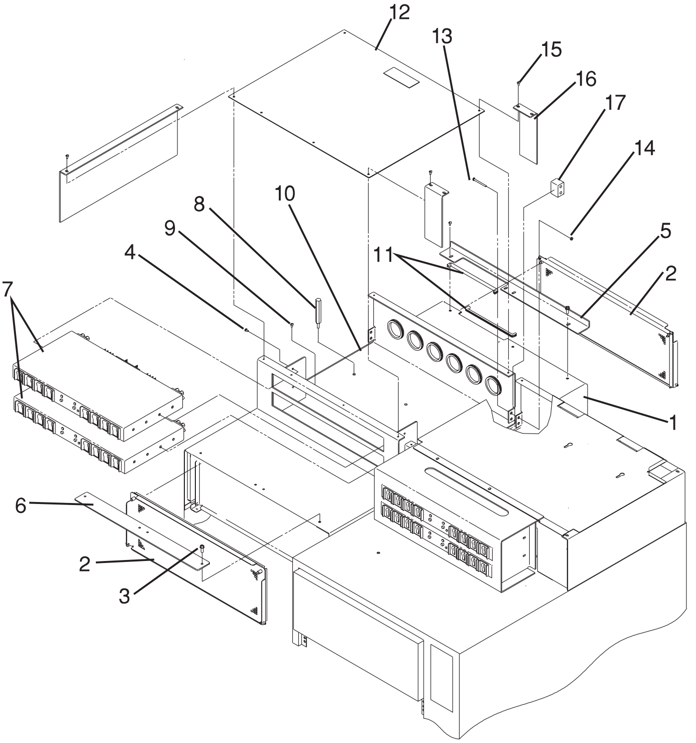
Index	FRU Part Number	Units Per	Description
1	21H7531	1	Power Subframe Assembly
2	1621811	7	Screw, power subframe
3	21H6969	1	Power distribution harness (ac)
	93H6159	1	Power distribution harness (-48 V dc)
4	21H7513	1	Top cover
5	21H3754	1	Retainer bracket
6	0533783	2	Cable ties

Power Subframe (3 of 3)



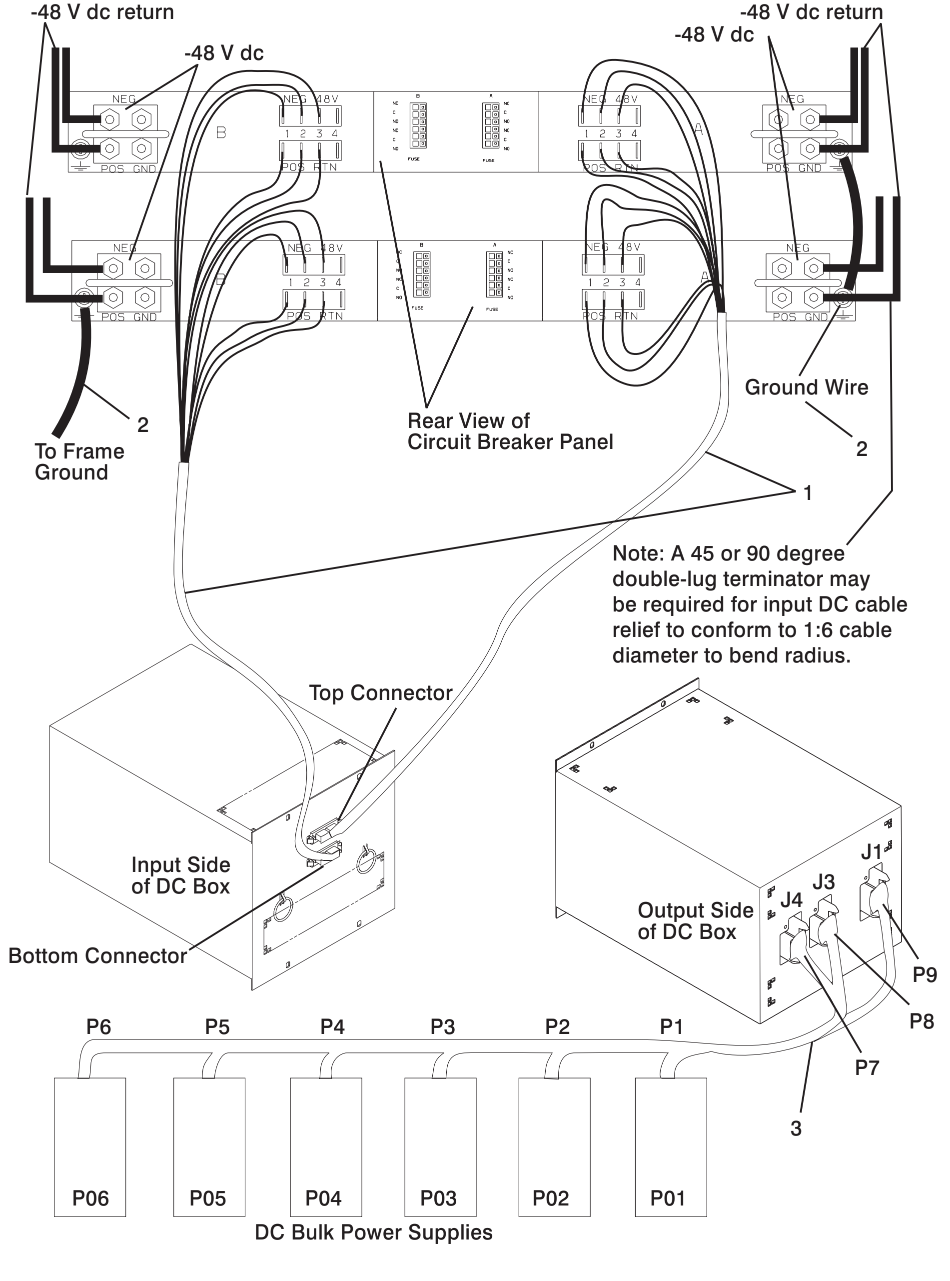
Index	FRU Part Number	Units Per	Description
1	21H7531	1	Power Subframe Assembly
2	1621811	6	Screw, back mounting
3	21H7259	1	Back cover
4	90H6284	16	Shoulder screw
5	1621814	8	Screw, power distribution harness
6	21H6969	1	Power distribution harness (ac)
6	93H6159	1	Power distribution harness (-48 V dc)
7	21H7468	2	Insulator
8	21H7467	2	Insulator
9	0533783	4	Tie wrap

System Rack -48 Volt Power Distribution Assembly (1 of 2)



Index	FRU Part Number	Units Per	Description
1	93H6142	1	Cover, top
2	21H7523	2	EMC shield
3	1621811	20	Screw, M4 x 10
4	93H4919	8	Screw, 10-32 x 18 SOC H
	1622347	8	Star washer, M5 Ext.
5	93H7960	1	Plate, Cover Rear
6	93H7959	1	Plate, Cover Front
7	93H7381	2	Circuit Breaker Panel
8	52G5554	3	Rod, Top Tray
9	1695141	3	Screw, M6 x 12 HH
10	93H6143	1	Tray, cable
11	50N9504	2	Grommet
12	94H0318	1	Plate PDP cover
13	1621237	2	Screw
14	1622405	2	Nut
15	1624779	2	Screw, M5 x 14 cover plate mounting
16	94H0124	2	Cover plate, L-bracket
17	93H8225	2	Spacer block

System Rack -48 Volt Power Distribution Assembly (2 of 2)

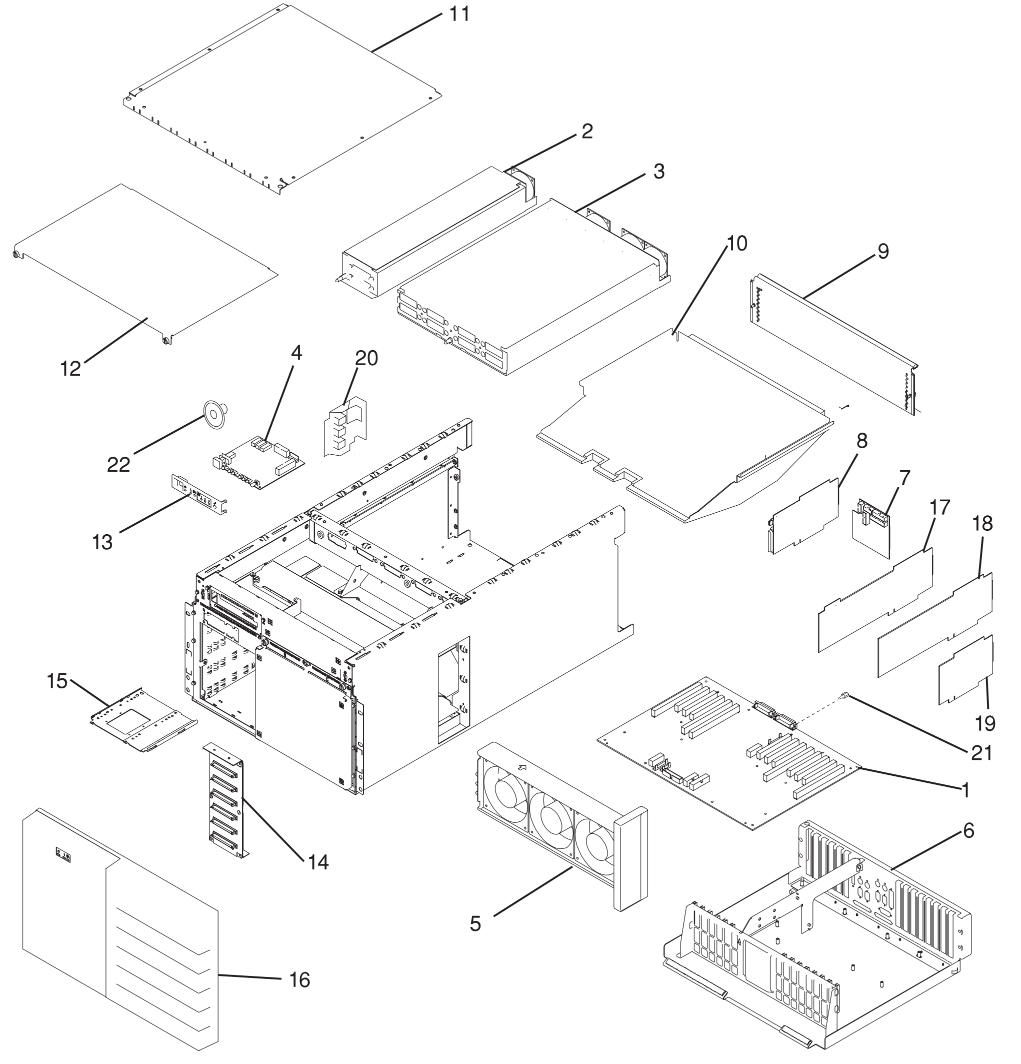


Index	FRU Part Number	Units Per	Description
1	93H6158	1	-48 V dc power cable, circuit beaker panel to DC box
2	07L6561	2	Cable, ground, circuit breaker panel to circuit breaker panel, circuit breaker panel to frame
3	93H6159	1	-48 V dc power distribution harness, DC box to DC bulk power supplies

Input/output Rack Parts

This section is for parts that are included in the Input/output Rack.

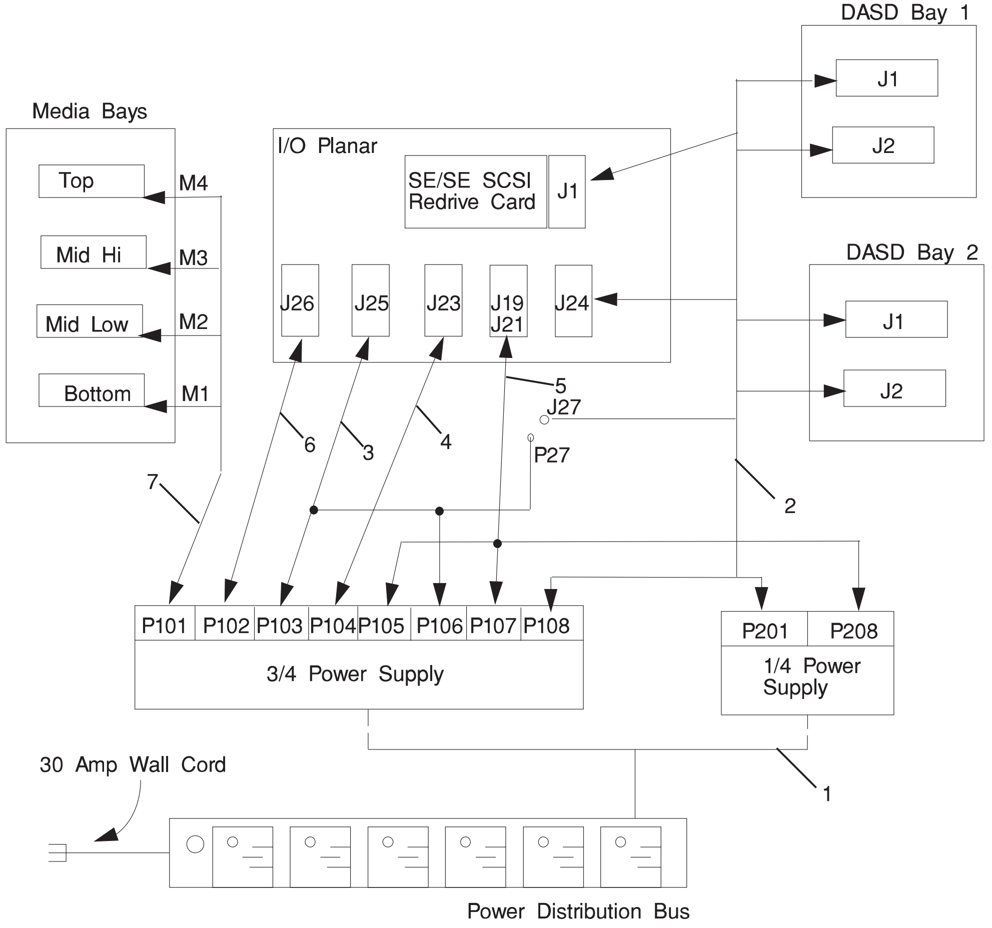
I/O Drawer Parts



Index	FRU Part Number	Units Per	Description
1	12H0014	1	I/O planar
	94H0800	16	Screw
	1622302	16	Washer
2	93H7905	1	1/4 power supply (AC)
	93H7539	1	1/4 power supply (-48 V dc)
3	93H8714	1	3/4 power supply, (AC)
	93H7542	1	3/4 power supply (-48 V dc)
4	93H8502	1	Indicator Card
	00G1268	4	Screw
5	40H4878	1	Three fan assembly
6	93H2446	1	I/O tray housing
	00G1268	4	Screw
	93H8026	1	Gasket 25p D
	93H8027	1	Gasket 15p D
7	93H8185	1	Bulkhead card
	93H8028	6	Standoff (black)
	1622344	6	Lockwasher
	93H6316	6	Standoff (Op, S1, S2 connectors)
	1622344	6	Lock washer
	0438548	4	Screw (K, M, PCI connectors)
8	93H6409	1	SE/SE SCSI redrive card
	27H0863	2	Standoff
	1622344	2	Lockwasher
9	93H4235	1	Cover plate (rear)
10	93H2447	1	Air deflector
11	93H1344	1	Cover plate (top)
	00G1268	9	Screw
12	40H4911	1	Cover plate (front)
13	40H4880	1	Indicator card bezel
14	93H2166	1	I35 SCSI card
	92F1294	2	Screw
	40H0423	4	Strapping
15	06H2792	1 to 3	Media mounting plate
16	40H4896	1	Cover, drawer front
17	93H2275	1	Service processor (SP) card
18	See note.		Adapters, I/O adapters other than primary drawer SCSI adapters.
19	See note.	2	SCSI Adapters (slots 2 and 9 of the primary I/O Drawer only)
20	40H4864	1	Fan power bracket
	00G1268	1	Screw
21	46G3537	4	RIO Standoff
22	93H4231	1	Speaker
	See note.		Disk drives or media devices

Note: See *Diagnostic Information for Multiple Bus Systems* for part numbers.

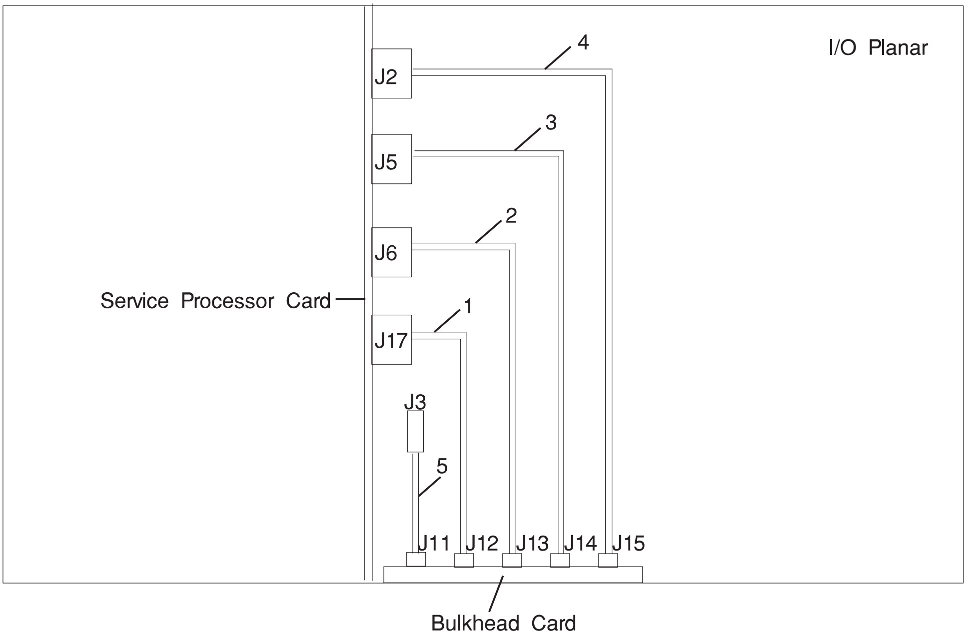
I/O Drawer Power Cables



Note: The power distribution bus, and the Y-cable (index number 1) shown above are not used on -48 V dc systems. See "Input/output Rack -48 Volt Power Distribution Assembly (2 of 2)" on page 10-56 for -48 V dc power distribution parts.

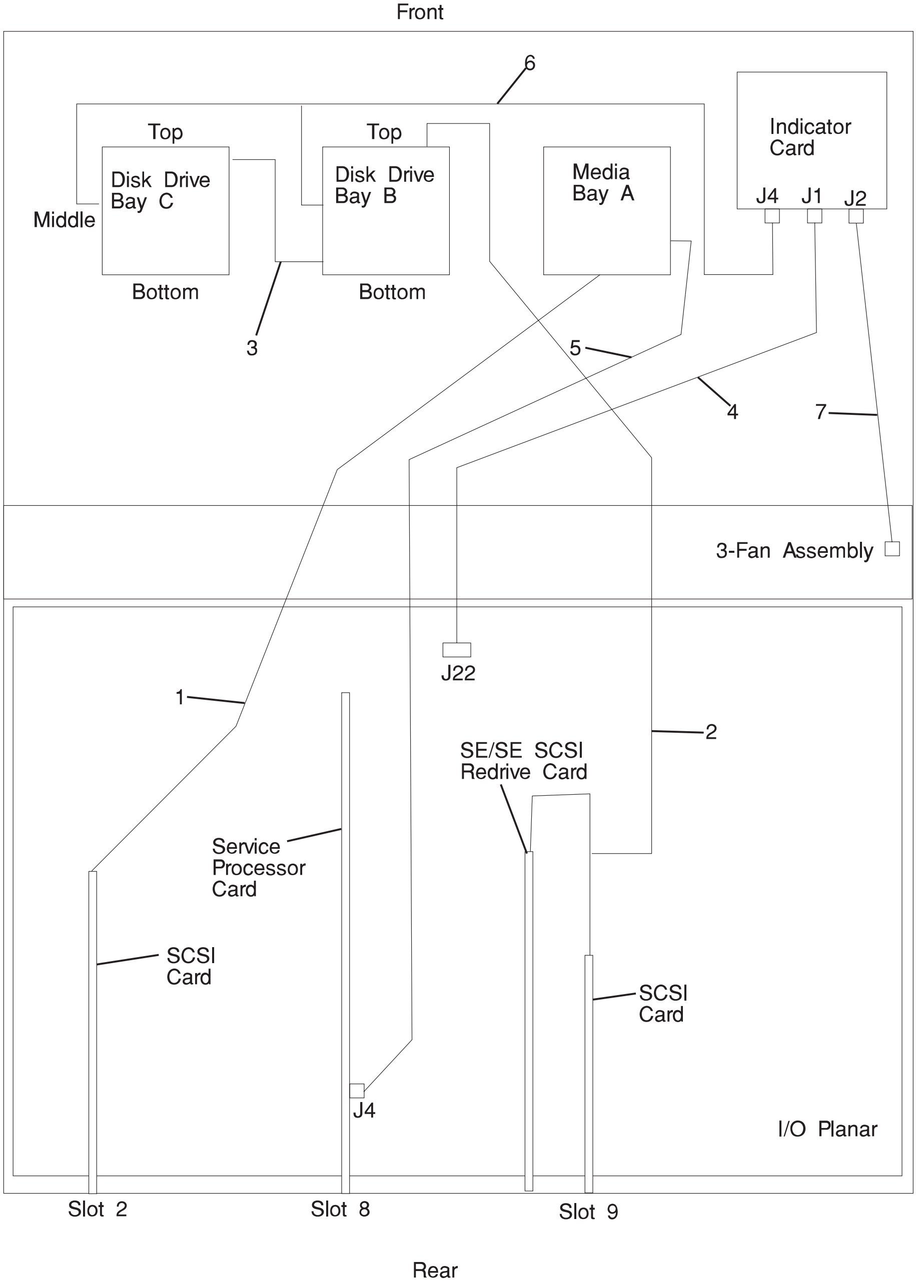
Index Number	FRU Part Number	Units Per Assy	Description
1	89X2629	1	Y Power cable, power distribution bus to I/O Drawer
2	93H7076	1	DASD Power Cable, power supply to DASD
3	93H7077	1	I/O planar power cable, power supply to I/O planar
4	93H7078	1	+5 V dc to planar cable, power supply to I/O planar
5	93H7079	1	Power/signal to planar cable, power supply to I/O planar
6	93H7081	1	+3 V dc to I/O planar cable, power supply to planar
7	93H7082	1	Media power cable, power supply to media bay

I/O Planar to Bulkhead Cabling



Index Number	FRU Part Number	Units Per Assy	Description
1	93H2452	1	Operator Panel Cable, service processor to bulkhead
2	93H2453	1	Keyboard/mouse cable, service processor to bulkhead
3	93H8043	1	Parallel port cable, service processor to bulkhead
4	93H8046		Serial port cable, service processor to bulkhead
5	93H2451	1	SPCN control cable, I/O planar to bulkhead

SCSI and I/O Signal Cabling (1 of 2)



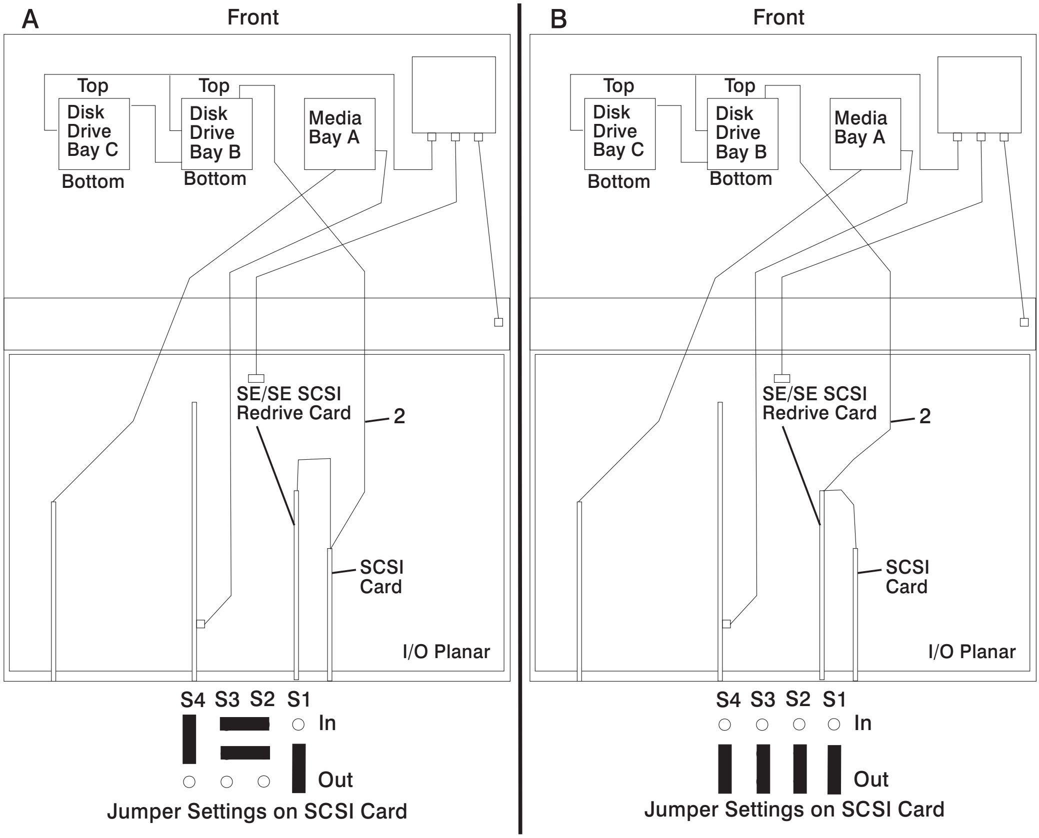


Figure A shows SCSI disk drive bay cabling and SCSI card jumper settings when using cable FRU PN 93H2456
Figure B shows SCSI disk drive bay cabling and SCSI card jumper settings when using cable FRU PN 07L7005

Index Number	FRU Part Number	Units Per Assy	Description
1	93H2455	1	SCSI cable, media bay to SCSI adapter slot 2
2	93H2456	1	SCSI cable, I35 to SCSI adapter slot 9 to SCSI redrive card (see figure A above)
	07L7005	1	SCSI cable, I35 to SCSI adapter slot 9 to SCSI redrive card (see figure B above)
3	93H2485	1	SCSI cable, I35 to I35 card
4	93H4232	1	I/O planar to indicator card cable, planar to indicator card
5	93H2454	1	Diskette cable, service processor to diskette drive
6	40H7401	1	I35 to indicator card cable, I35 card to indicator card
7	40H4866	1	Fan Cable, indicator card to 3-fan assembly

SCSI and I/O Signal Cabling (2 of 2)

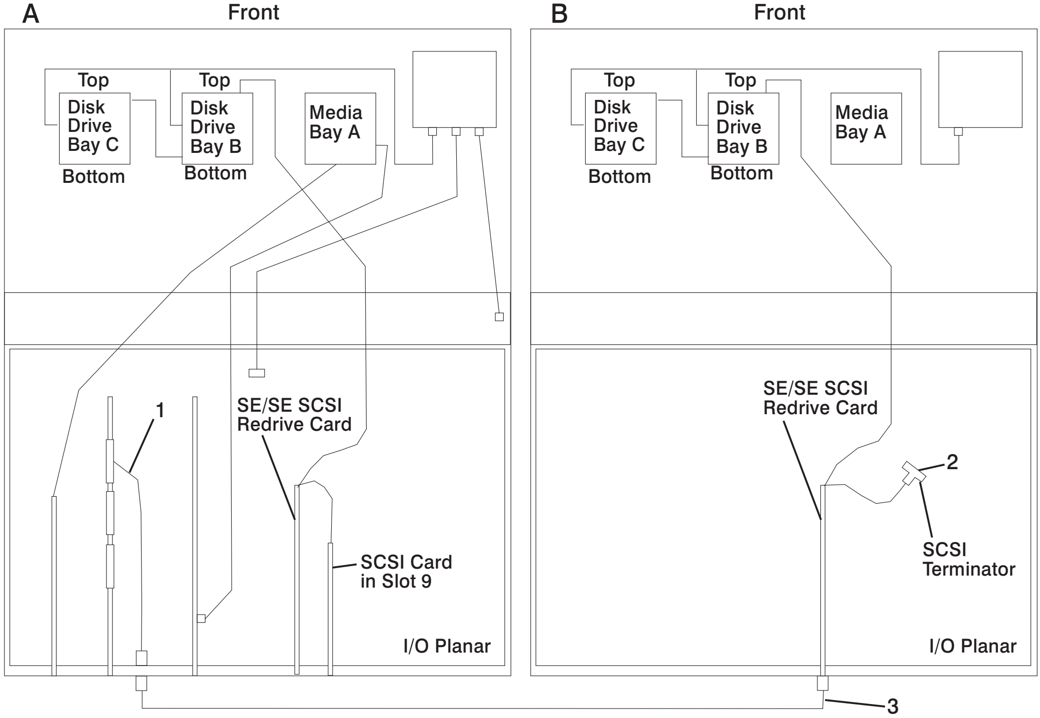
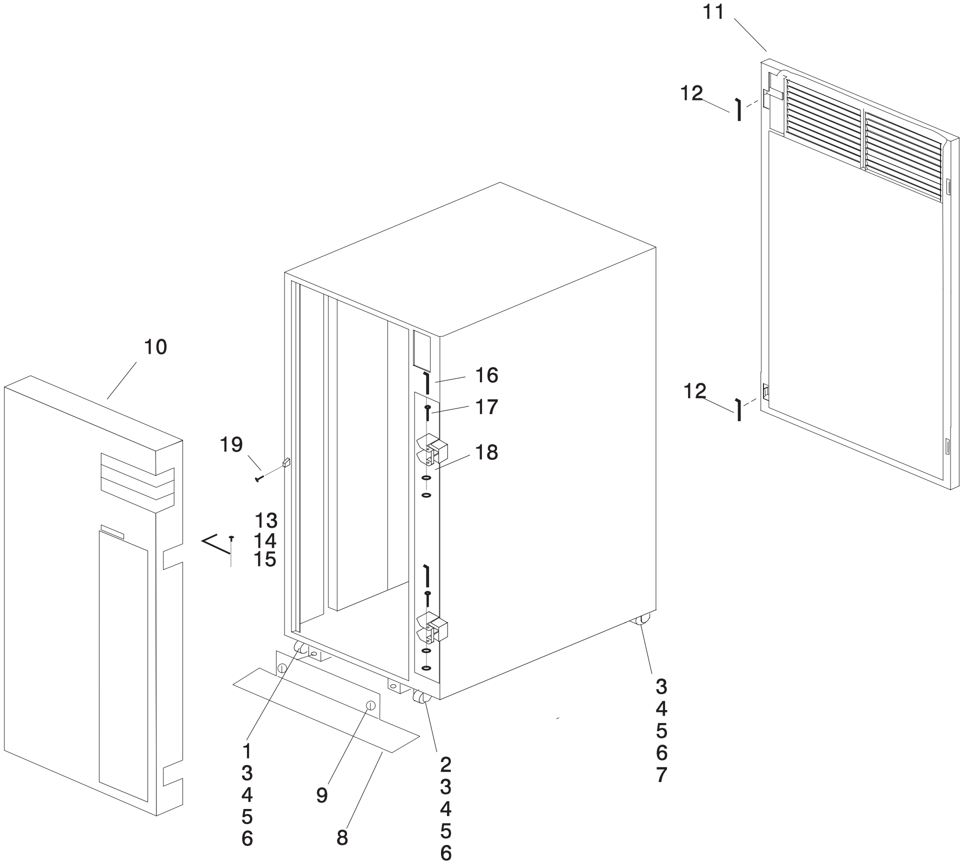


Figure A shows the primary I/O drawer with the disk drive bays connected to the SCSI card installed in slot 9. Figure B shows a secondary I/O drawer with the SCSI disk drive bays connected through an external cable to the SE/SE Redrive card. This external connection can be made between cards in the same drawer.

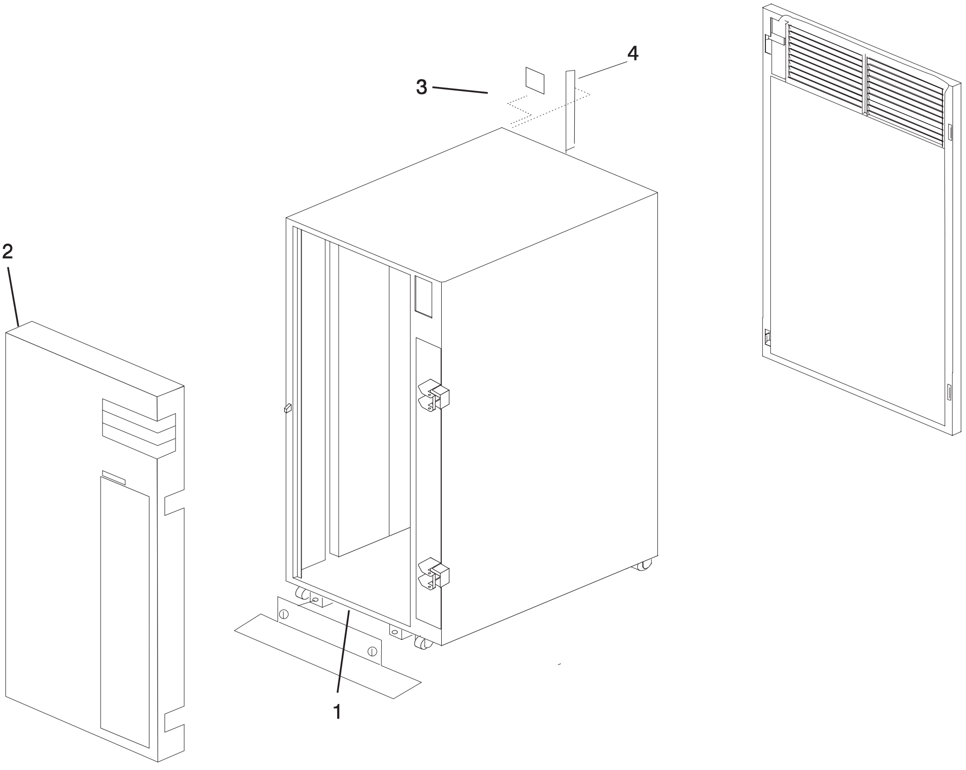
Index Number	FRU Part Number	Units Per Assy	Description
1	73H3142	1	Cable, Internal SCSI card to bulkhead
2	88G3977	1	SCSI Terminator
3	52G4291	1	Cable, external SCSI bulkhead to SE/SE SCSI redrive card, 0.6m
	06H6036	1	Cable, external SCSI bulkhead to SE/SE SCSI redrive card, 1.0m
	52G4233	1	Cable, external SCSI bulkhead to SE/SE SCSI redrive card, 2.5m

Input/output Rack Covers



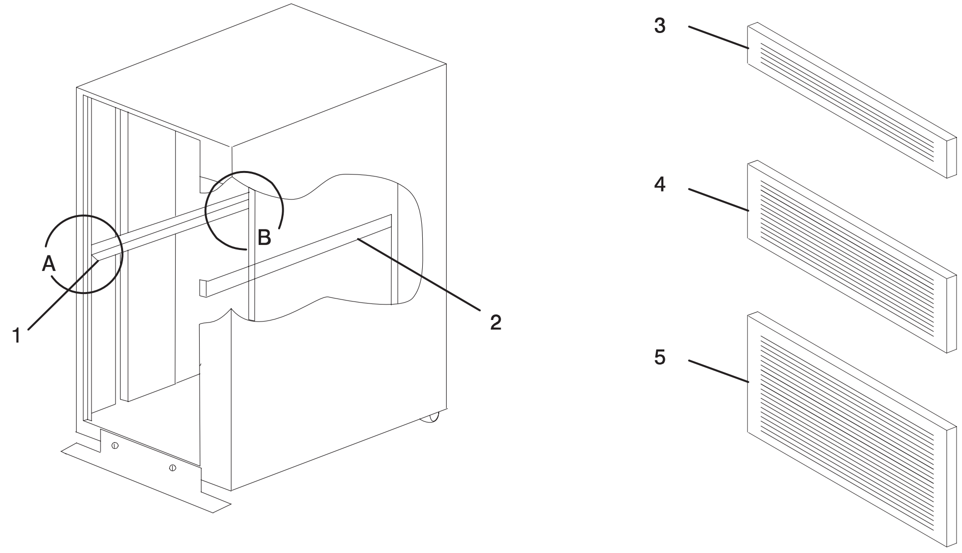
Index	FRU Part Number	Units Per	Description
1	89X2627	1	Caster, (offset) left
2	89X2628	1	Caster, (offset) right
3	1621823	16	Screw, hex Hd w/washer, self tap, M6 x 16
4	1622306	16	Washer
5	1622320	16	Lock washer
6	1621596	16	Screw
7	62X3601	2	Caster, Swivel
8	93H8181	1	Stabilizer
9	93H9182	2	Thumbscrews
10	93H7817	1	Front Door
11	93H8220	1	Rear Door
12	11F0118	2	Hinge pin, rear door
13	1621098	2	Screws
14	93H7378	1	Ground Strap
15	1622348	2	Star Washers
16	93H7372	2	Pins
17	93H7374	2	Bearings
18	27760	2	Washers
19	07L7168	1	Door Ramp Mounting Screw, M3 x 10

Input/output Rack Labels



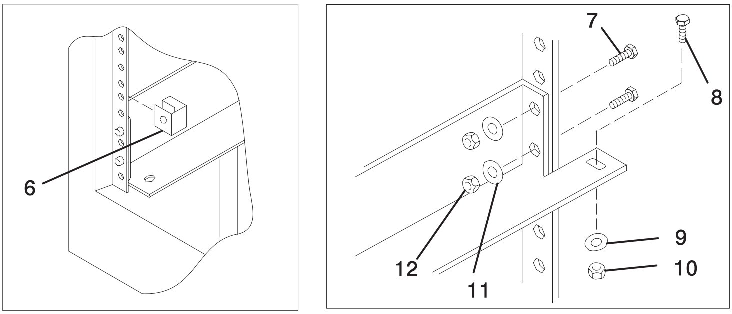
Index	FRU Part Number	Units Per	Description
1	69X1264	1	Label, safety (English)
1	62X3442	1	Label, safety (U.K./English)
1	62X3476	1	Label, safety (Spanish)
1	62X3477	1	Label, safety (Norwegian)
1	62X3478	1	Label, safety (Dutch)
1	62X3479	1	Label, safety (Finnish)
1	62X3483	1	Label, safety (Italian)
1	62X3493	1	Label, safety (German)
1	62X3531	1	Label, safety (Danish)
1	62X3532	1	Label, safety (French)
1	62X3533	1	Label, safety (French/Dutch)
1	62X3534	1	Label, safety (Japanese)
1	62X3538	1	Label, safety (Swedish)
1	69X1279	1	Label, safety (Portuguese)
1	69X1281	1	Label, safety (Italy/Germany/France)
1	69X1264	1	Label, safety (Canada/French)
2.	90H6340	1	Label
2	59F3003	1	Nameplate, U.S.
3	69X1262	1	Label, rack identifier
4	62X3561	1	Label, EIA identifier

Rails and Front Bezels



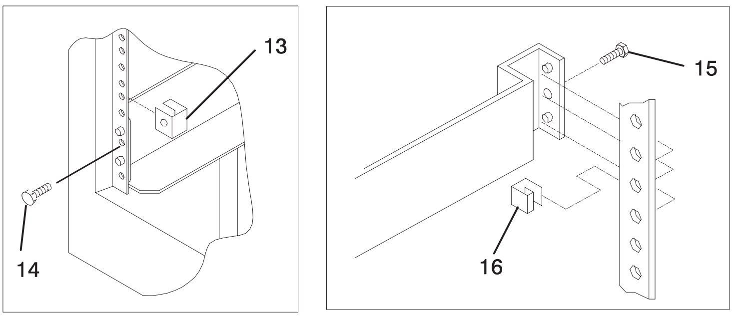
Mounting Hardware For CPU Enclosures

Detail A - Front of Rail　　Detail B - Rear of Rail



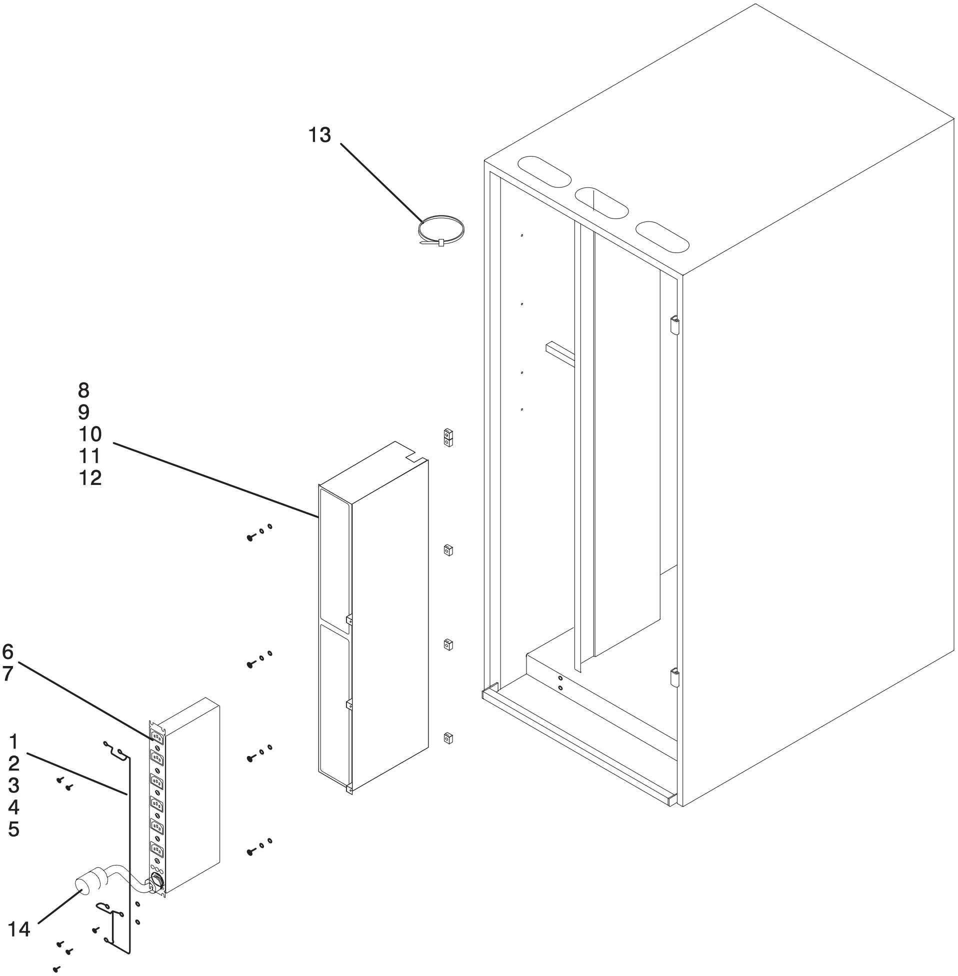
Mounting Hardware for Drawers
Other Than CPU Enclosures

Detail A - Front of Rail　　Detail B - Rear of Rail



Index Number	FRU Part Number	Units Per Assy	Description
1	02G7232	1	Rail, left (for CPU Enclosures)
1	375816	1	Rail, left (for non-CPU Enclosures)
2	02G7263	1	Rail, right (for CPU Enclosures)
2	0375714	1	Rail, right (for non-CPU Enclosures)
3	55F4515	1	Front bezel (for empty drawer position), 1 EIA unit
4	55F4516	1	Front bezel (for empty drawer position), 3 EIA units
5	55F4517	1	Front bezel (for empty drawer position), 5 EIA units
6	0375867	4	Nut clip
7	02G7295	4	Screw, rail mounting
8	1624779	2	Screw, M5 x 14
9	1622319	2	Lock washer
10	1622404	2	Nut
11	1622320	4	Lock washer
12	1622405	4	Nut
13	1621210	2	Screw, pan head, M5 x 10

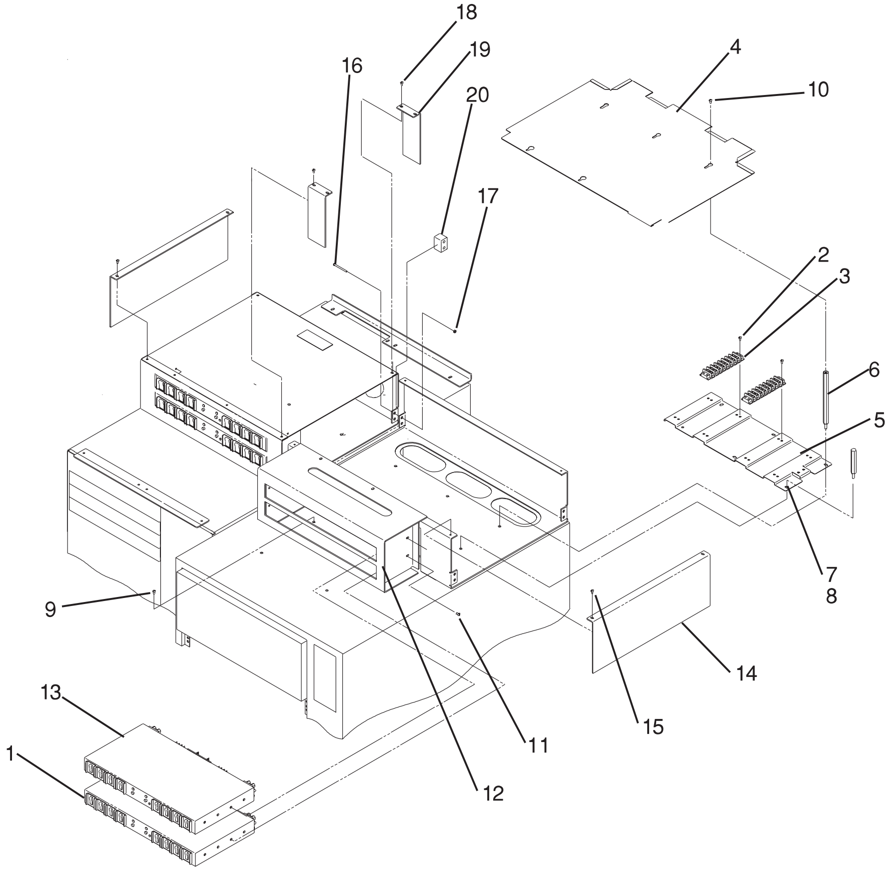
Power Distribution Bus



Index Number	FRU Part Number	Units Per Assy	Description
1	88G0165	1	Ground wire harness
2	1624779	1	Screw
3	00G1268	1	Screw
4	1622347	1	Lock washer
5	1622346	1	Washer
6	52G6059	Up to 2	Power distribution bus - single phase
6	93H6451	Up to 2	Power distribution bus - single phase, WT
6	52G6060	Up to 2	Power distribution bus - two of three phase, WT
6	52G6061	Up to 2	Power distribution bus - three phase (Switzerland)
7	1624779	4	Screw
8	52G6112	1	Enclosure
9	1624779	4	Screw
10	1622347	4	Lock washer
11	1622305	4	Washer
12	0375867	3	Nut clip
13	32G0111		Cable restraint strap
14	*See note		Cord, power

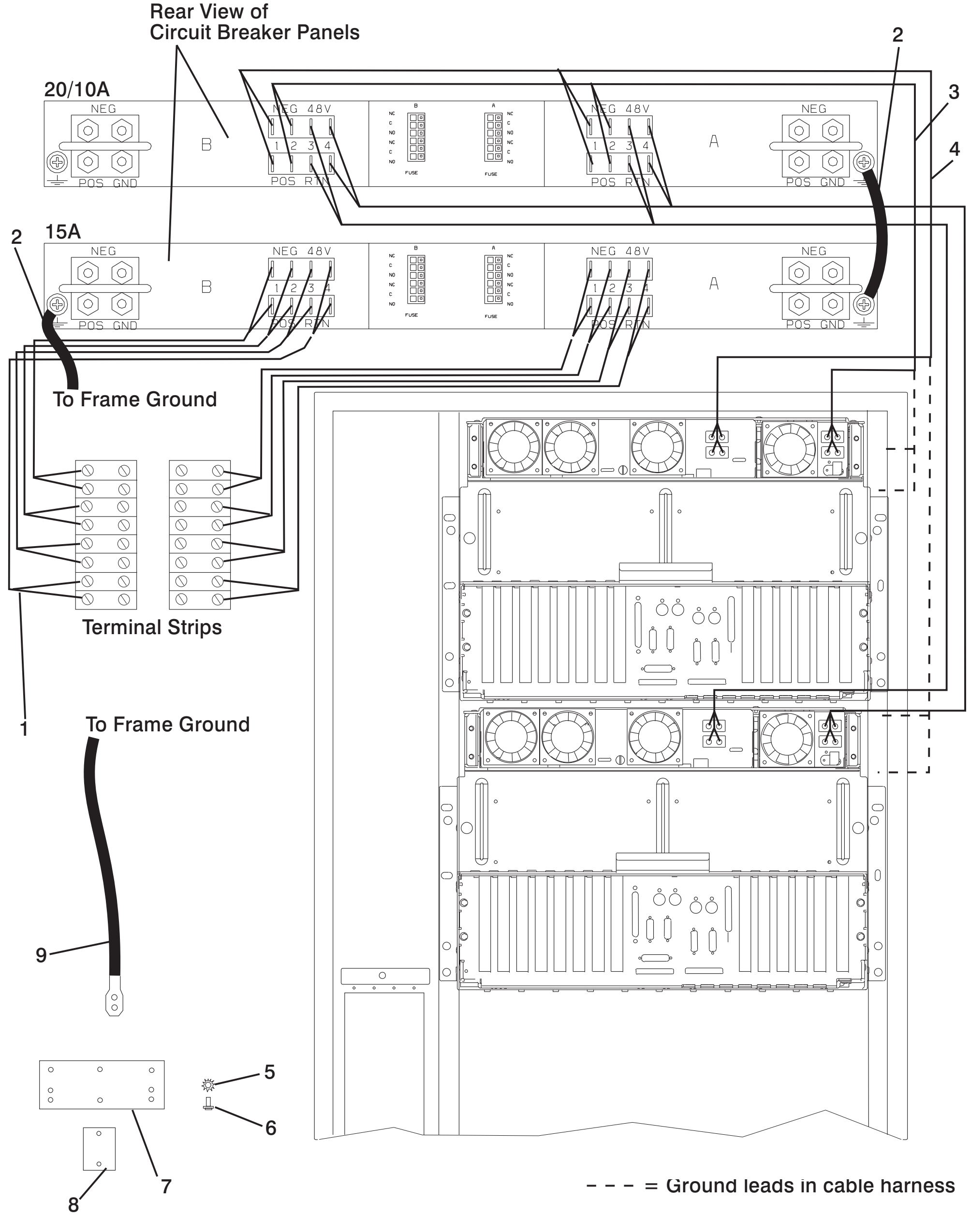
Note: See “Power Cords” on page 10-62 for power cord part numbers.

Input/output Rack -48 Volt Power Distribution Assembly (1 of 2)



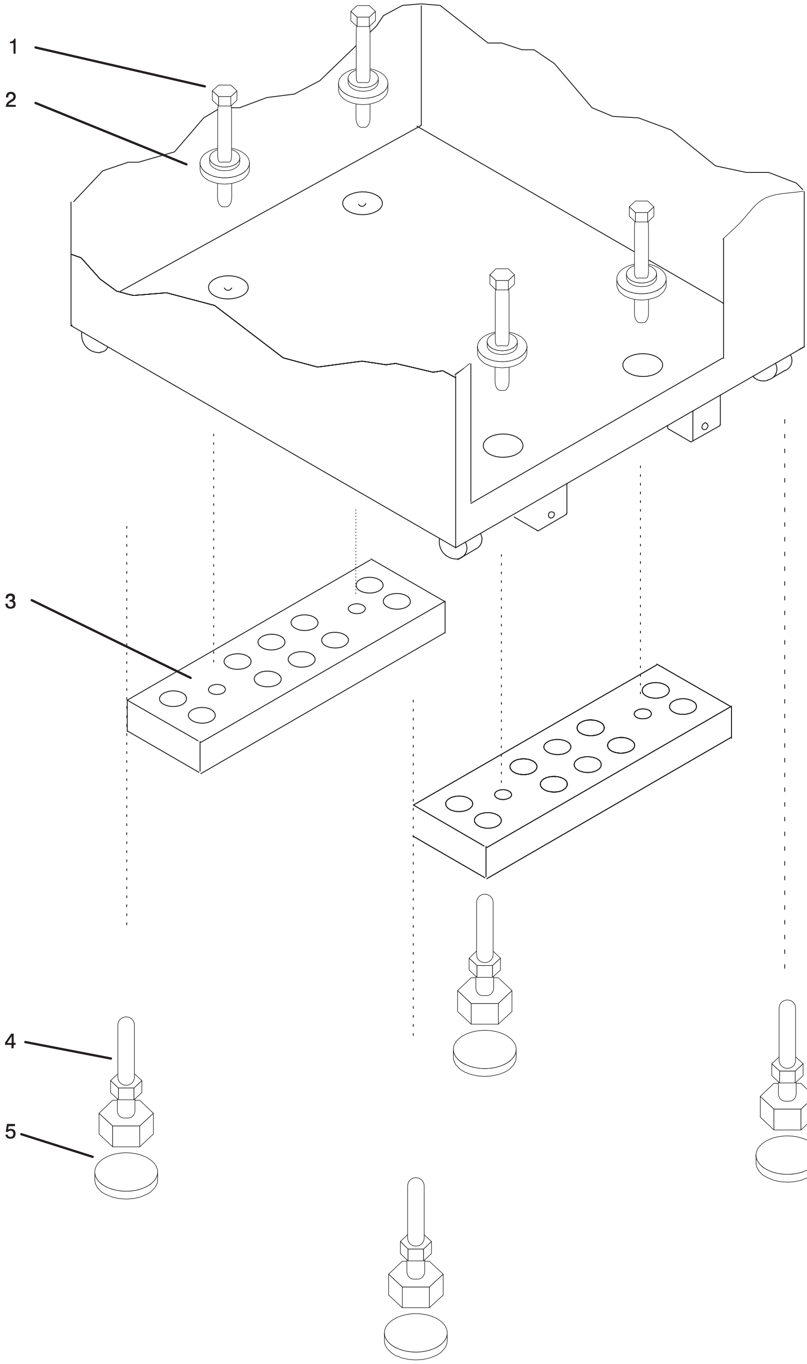
Index Number	FRU Part Number	Units Per Assy	Description
1	07L6553	1	15A circuit breaker panel
2	1621193	8	Terminal mounting screws
3	07L6554	2	Terminal strips
4	07L6555	1	Tray cover bracket
5	07L6558	1	Terminal strip mounting bracket
6	07L6559	3	Standoff
7	1621210	4	Ground cable mounting screws
8	1622347	4	Ground cable mounting lockwashers
9	1621230	2	Tray mating screws
10	1624779	5	Cover bracket mounting screws
11	93H4919	8	Circuit breaker panel mounting screws
12	93H8459	1	-48 V dc circuit breaker panel mounting screws
13	07L6551	1	10A - 20A dc circuit breaker panel
14	93H7813	2	Side panel
15	1624779	4	Side panel screws
16	1621237	2	Screw
17	1622405	2	Nut
18	1624779	2	Screw
19	94H0124	2	Cover plate, L-Bracket
20	93H8225	2	Spacer block

Input/output Rack -48 Volt Power Distribution Assembly (2 of 2)



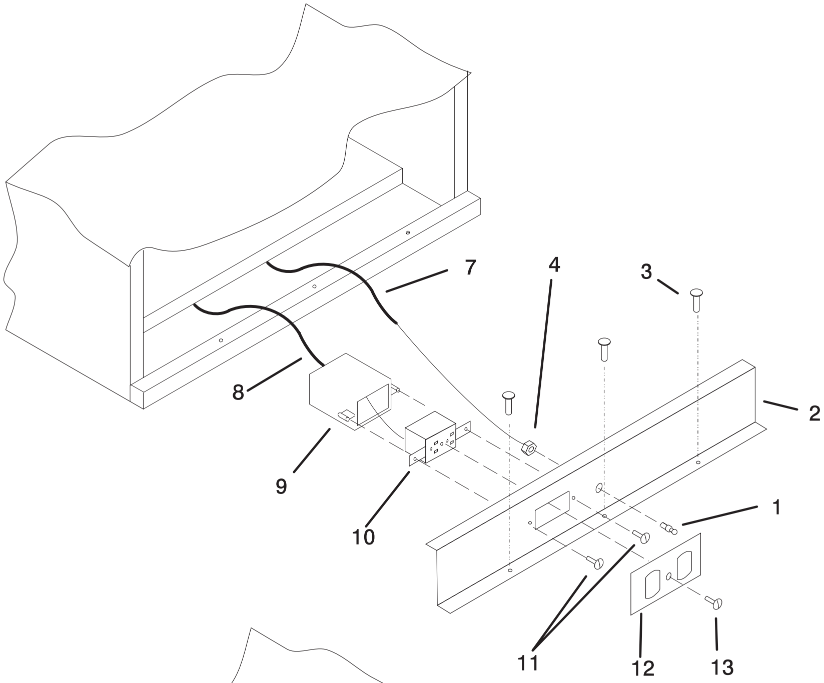
Index Number	FRU Part Number	Units Per Assy	Description
1	07L6560	8	Terminal strip power cable, circuit breaker panel to terminal strips
2	07L6561	2	Cable ground, circuit breaker panel to circuit breaker panel, circuit breaker panel to frame ground.
3	94H0403	Up to 4	1/4 Power supply cable, -48 V dc
4	94H0404	Up to 4	3/4 Power supply cable, -48 V dc
5	1622347	2	Lock washer, M5 Ext. bus bar mounting
6	1624781	2	Screw M5 x 20, bus bar mounting
7	40H0453	1	Bus bar
8	40H0454	1	Bus bar mounting spacer
9	40H0456	1	Main ground jumper

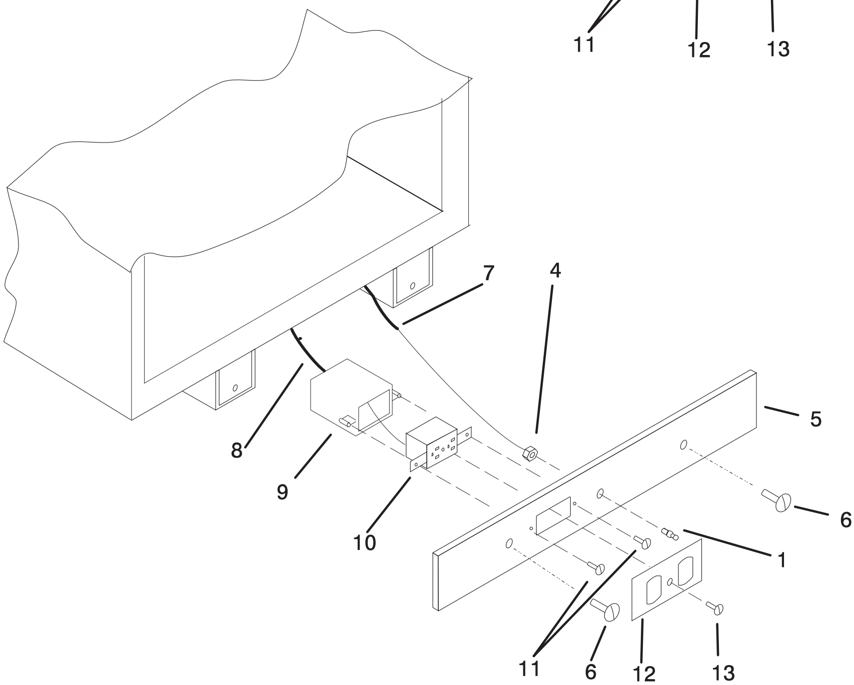
Leveling Feet and Bolt Down Hardware



Index Number	FRU Part Number	Units Per Assy	Description
1	88G4725	4	Mounting Bolts
2	65G3593	4	Plastic isolator Washer, 15.8mm
3	52G5650	2	Mounting Plates
4	52G6058	4	Levelling Feet
5	88G4727	4	Plastic Isolator Pads

Accessory Electrical Outlet Mounting Plates



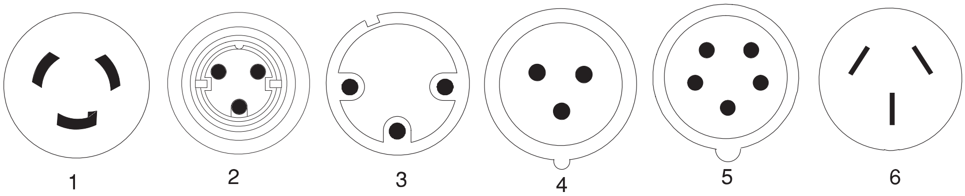


Index Number	FRU Part Number	Units Per Assy	Description
1	52G5643	1 per plate	Clip Stud for Grounding Wire
2	94H0608	1	Rear Electrical Mounting Plate
3	1624779	3	M5 x 14mm Mounting Screws
4	1622403	1 per plate	M4 x 0.7 Nut for Grounding Wire
5	94H0609	1	Front Electrical Mounting Plate
6	93H9182	2	Thumbscrews
7	40H0455	1	Grounding Cable
8	n/a	1	Power Cable
9	n/a	1	AC Outlet Box
10	n/a	1	AC Outlet
11	n/a	2	AC Outlet Mounting Screws
12	n/a	1	AC Outlet Cover Plate
13	n/a	1	AC Outlet Cover Plate Mounting Screw

Note: Part numbers 8 through 13 in this diagram are customer supplied and maintained parts. These parts are not FRUs.

Accessories

Power Cords



Index Number	FRU Part Number	Units Per Assy	Description
1	11F0113	2	For System Rack or Input/output Rack, U.S. standard, type 12 plug, L6-30P, 250V, single phase, 14 ft., 30A Canada, U.S.A.
1	11F0114	2	For System Rack or Input/output Rack, U.S. Chicago, type 12 plug, L6-30P, 250V, single phase, 6 ft., 30A Chicago, Illinois, U.S.A.
1	11F0115	2	For System Rack or Input/output Rack, AFE, type 12 plug, L6-30P, 250V, single phase, 14 ft., 30A Argentina, Bahamas, Bangladesh, Barbados, Bermuda, Bolivia, Brunei, Chile, Columbia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Hong Kong, India, Indonesia, Jamaica, Japan, Maco, Malaysia, Mexico, Myanmar, Netherlands Antilles, Panama, Peoples Republic of China, Peru, Philippines, Singapore, Sri Lanka, Suriname, Uruguay, Venezuela
2	46F4593	2	For System Rack or Input/output Rack, U.S. Chicago, WP, type 40 plug, R&S 3750, 250V, single phase, 6 ft., 30A Chicago, Illinois U.S.A
2	46F4594	2	For System Rack or Input/output Rack, U.S., WP, type 40 plug, R&S 3750, 250V, single phase, 14 ft., 30A U.S.A.
3	11F0106	2	For System Rack or Input/output Rack, Wilco WP, type PDL, 250 V, single phase, 14ft., 30A Australia
3	11F0107	2	For System Rack or Input/output Rack, Wilco WP, type PDL, 250 V, single phase, 14ft., 30A, right angle New Zealand

Index Number	FRU Part Number	Units Per Assy	Description
4	21H7693	2	For System Rack or Input/output Rack, IEC 309, type 46 (2P+G), 250 V, single phase, 14ft., 32A New Zealand Belgium, Bahrain, Egypt, France, Greece, Iceland, Iraq, Ireland, Italy, Jordan, Kuwait, Lebanon, Malawi, Norway, Oman, Portugal, Qatar, Saudi Arabia, Spain, Turkey, U.K., United Arab Emirates
5	21H7691	1	For System Rack, IEC 309, type 46 (3P+N+G), 250 V, two of three phase, 14ft., 16A Austria, Czech Republic, Denmark, Estonia, Finland, Israel, Latvia, Lithuania, Netherlands, Norway, Pakistan, Portugal, Russia, South Africa, Sweden, Switzerland, Turkey
5	88G4763	1	For System Rack, IEC 309, type 46 (3P+N+G), 250 V, two of three phase, 14ft., 32A Austria, Czech Republic, Denmark, Estonia, Finland, Israel, Latvia, Lithuania, Netherlands, Norway, Pakistan, Portugal, Russia, South Africa, Sweden, Turkey
5	88G4764	1	For Input/output Rack, IEC 309, type 46 (3P+N+G), 250 V, three phase, 14ft., 32A Switzerland
6	87G6067	2	For System Rack or Input/output Rack, type KP, right angle, 250V, single phase, 14 ft., 30A Korea

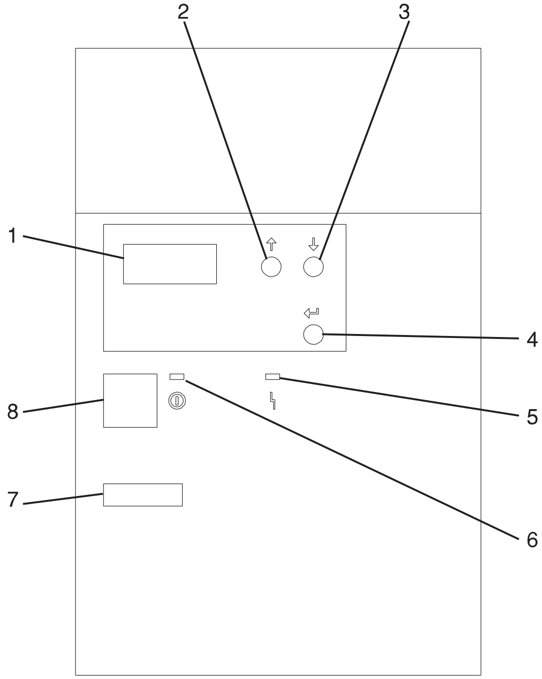
Keyboards

Index Number	FRU Part Number	Units Per Assy	Description
1	93H8120	1	Keyboard, 101 United States English (ID 103P)
	93H8121	1	Keyboard, 102 Canada French (ID 058)
	93H8122	1	Keyboard, 102 Canada French (ID 445)
	93H8123	1	Keyboard, 102 Spanish (ID 171)
	93H8124	1	Keyboard, 104 Brazil Portuguese (ID 275)
	93H8125	1	Keyboard, 102 Arabic (ID 238)
	93H8126	1	Keyboard, 102 Belgium French (ID 120)
	93H8127	1	Keyboard, 102 Belgium (ID 120)
	93H8128	1	Keyboard, 102 Bulgarian (ID 442)
	93H8129	1	Keyboard, 102 Czech (ID 243)
	93H8130	1	Keyboard, 102 Danish (ID 159)
	93H8131	1	Keyboard, 102 Dutch (ID 143)
	93H8132	1	Keyboard, 102 French (ID 189)
	93H8133	1	Keyboard, 102 German (ID 129)
	93H8134	1	Keyboard, 102 Greek (ID 319)
	93H8135	1	Keyboard, 101 Hebrew (ID 212)
	93H8136	1	Keyboard, 102 Hungarian (ID 208)
	93H8137	1	Keyboard, 102 Iceland (ID 197)
	93H8138	1	Keyboard, 102 Italy (ID 142)
	93H8139	1	Keyboard, 102 Norwegian (ID 155)
	93H8140	1	Keyboard, 102 Polish (ID 214)
	93H8141	1	Keyboard, 102 Portuguese (ID 163)
	93H8142	1	Keyboard, 102 Romainian (ID 446)
	93H8143	1	Keyboard, 101 Russian (ID 443)
	93H8144	1	Keyboard, 102 Serbian (ID 118)
	93H8145	1	Keyboard, 102 Slovak (ID 245)
	93H8146	1	Keyboard, 102 Spanish (ID 172)
	93H8147	1	Keyboard, 102 Sweden/Finland (ID 153)
	93H8148	1	Keyboard, 105 Swiss F/G (ID 150)
	93H8149	1	Keyboard, 102 Turkish (ID 179)
	93H8150	1	Keyboard, 102 Turkish (ID 440)
	93H8151	1	Keyboard, 102 UK English (ID 166)
	93H8152	1	Keyboard, 102 Latvia (ID 234)
	93H8153	1	Keyboard, US English ISO9995 (ID 103P)
	93H8154	1	Keyboard, 106 Japan (ID 194)
	93H8155	1	Keyboard, 101 Chinese/US (ID 467)
	93H8156	1	Keyboard, 103 Korea (ID 413)
	93H8157	1	Keyboard, 101 Thailand (ID 191)
2	67H5084	1	Three Button Mouse

Appendix A. Operator Panel Functions

System Rack Operator Panel

The following diagram shows the locations of the operator panel display and the operator panel.



1 Operator Panel Display
2 Scroll Up Pushbutton
3 Scroll Down Pushbutton
4 Enter Pushbutton
5 Attention LED
6 Power On LED
7 Serial Number
8 Power Pushbutton

Function Code Table

The operator panel functions and descriptions are listed in the following table. For details about the function, see “Operator Panel Function Descriptions” on page A-4.

Notes:

1. The x can be any number 0 through 9, any letter A through F, or a blank.
2. If the function was being performed by the customer, verify why the function was selected and if it is complete.
3. If you cannot change the Function/Data display or complete the selected function, go to "Starting Point for All Problems" in the Problem Analysis information for your system.
4. Bold function codes indicate supported codes for trained service personnel.

Table A-1 (Page 1 of 3). Operator Panel Function Codes

Function Code	Function Selected
01 xxxx xxxx	Pressing the Enter button toggles between: 1. Display the currently selected IPL type. 2. Display the currently selected IPL speed override for the next IPL.
02 xxxx xxxx	1. Pressing the Enter button once allows selection of the IPL types A or B (and mode on some system types). **Attention**: IPL types C and D are for trained service personnel only and may cause data loss if used improperly. 2. Pressing the Enter button twice allows selection of an IPL speed override for the next IPL. Subsequent IPLS are performed at the system selected speed.
03 xxxx xxxx	Start an IPL and load the system. The IPL uses the selected IPL options.
04 xxxx xxxx	Lamp test; all displays and indicators are switched on.
05 xxxx xxxx	Informational System Power Control Network (SPCN) system reference code (SRC); displays an SRC on the operator panel.
06 xxxx xxxx	Reserved

Table A-1 (Page 2 of 3). Operator Panel Function Codes	
Function Code	**Function Selected**
07 xxxx xxxx	**Attention**: This function allows concurrent maintenance to be performed by trained service personnel. Inadvertent use may cause system failures. Pressing the Enter button allows execution of the following sub-functions to restore system power and perform concurrent maintenance. ****** Cancel Request **01** System Power On **02** Blower Power Off **03** Bulk Power Off **04** Blower Power On **05** Bulk Power On
08 xxxx xxxx	Fast power off.
09 xxxx xxxx through 10 xxxx xxxx	Reserved
11 xxxx xxxx through **19 xxxx xxxx**	System reference code (SRC); displays an SRC on the operator panel.
20 xxxx xxxx	Reserved
21 xxxx xxxx	Reserved
22 xxxx xxxx	Initiates AIX dump.
23 xxxx xxxx	Reserved
24 xxxx xxxx	Reserved
Note: Do not use functions 25 or higher unless directed to by service support personnel.	
25 xxxx xxxx	The service representative switch 1 is set; this function is the first step necessary to set the service function range from 50 to 70.
26 xxxx xxxx	The service representative switch 2 is set; this function is the second step necessary to set the service function range from 50 to 70.
27 xxxx xxxx through 31 xxxx xxxx	Reserved
32 xxxx xxxx	Reserved
33 xxxx xxxx	Reserved
34 xxxx xxxx	Reserved
35 xxxx xxxx through 49 xxxx xxxx	Reserved
50 xxxx xxxx	System processing unit stop.
51 xxxx xxxx	System processing unit status. Displays the following values: B0 register contents, System instruction address register (IAR) address, Current task dispatching element (TDE) contents.

Table A-1 (Page 3 of 3). Operator Panel Function Codes	
Function Code	**Function Selected**
52 xxxx xxxx	System processing unit start.
53 xxxx xxxx	Path switch and reset.
54 xxxx xxxx	Reserved
55 xxxx xxxx	Display low-level diagnostic service processor log buffer.
56 xxxx xxxx	Display low-level diagnostic service processor code area.
57 xxxx xxxx	Reserved
58 xxxx xxxx	Display low-level diagnostic IPL parameters area.
59 xxxx xxxx	Set first character of base address for function 62 display.
60 xxxx xxxx	Set second character of base address for function 62 display.
61 xxxx xxxx	Set third character of base address for function 62 display.
62 xxxx xxxx	Display service processor control storage.
63 xxxx xxxx	System status SRC trace.
64 xxxx xxxx	Service processor diagnostic status SRC trace.
65 xxxx xxxx	Reserved
66 xxxx xxxx	Reserved
67 xxxx xxxx	Reserved
68 xxxx xxxx	Reserved
69 xxxx xxxx	Reserved
70 xxxx xxxx	Reserved
You cannot find the code in this chart.	If you cannot find the function code in this chart, the customer support for added features or devices may not have been available when this information was produced. Look for any supplement unit function code information for the function code you have displayed on the operator panel. If you do not find any additional function code information, go to “Function 04 - Lamp Test” on page A-6 and verify that the lamps are working correctly.

Operator Panel Function Descriptions

Values for IPL Types and Speeds

See Table A-2 and Table A-3 on page A-5 for tables of valid IPL types and speeds used in operator panel functions 01 and 02.

Table A-2 (Page 1 of 2). IPL Types	
IPL Type	**Description**
A	IPL using copy A of the system firmware.

Table A-2 (Page 2 of 2). IPL Types	
IPL Type	**Description**
B	IPL using copy B of the system firmware.
C	**Attention**: Not supported; may cause data loss if used.
D	**Attention**: Not supported; may cause data loss if used.

Table A-3. IPL Speeds		
IPL Speed	**Description**	**Details**
F:	Fast Override	Fast diagnostics run. The following are skipped: • Mainstorage tests • CEC Inter-chip interface tests (wire test) • Extended Logical Build-in Self Tests • Also, cache data is not provided in mainstorage dumps.
S:	Slow Override	Full hardware diagnostics run. Use whenever hardware is changed, for intermittent hardware failures and on the first install IPL.
V = (F or S):	Use system selected speed	

Function 01 - Display Selected IPL Type, Mode and Speed

This function allows you to display the IPL type and IPL speed. Pressing the Enter button in Function 01 toggles between:

1. Display IPL type (A or B).
2. Display IPL speed (F, S, or V = F or V = S).

Table A-4. Function 01	
Function/Data	**Description**
01 _ _ _ _ _ _ _	Use the scroll up or scroll down buttons and scroll to Function 01.
01 _ _ _ A _ _	Press Enter to enter Function 01 Selected IPL Type display. Valid types, which appear in the sixth character position of the Function/Data display are A or B. See Table A-2 on page A-4 for descriptions of IPL types.
01 _ _ V = F _	Use Enter again to toggle to Selected IPL Speed display. Valid speed displays are F, S, V=F or V=S. • F: Fast override selected. • S: Slow override selected. • V = (F or S): Use system selected speed.
01 _ _ _ A _ _	Use Enter to toggle to Selected IPL Type display.

Function 02 - Select IPL Type, Mode and Speed

This function allows you to select the IPL type and IPL speed. System power must be off to change IPL speed.

1. Pressing Enter once puts you into the change IPL type (A or B) operation.

   Attention: IPL types C and D are not supported and may cause data loss if used.

2. Pressing the Enter button twice puts you into the operation for overriding the system IPL speed (F, S, V) for the next IPL. Subsequent IPLs are performed at the system selected speed.

For example, if you want to select IPL Type, select Function 02. Push the Enter button once, and then use the scroll up or scroll down button to select an IPL type. Pressing Enter again saves that value and exits the Select IPL Type display.

If you want to change the IPL speed, you must have system power off. Select Function 02, push the Enter button twice, use the scroll up or scroll down button to select F, S, or V and then press Enter to activate the override (F or S) or cancel it (V) and exit the Select IPL Speed display. See Table A-3 on page A-5 for recommended speed settings.

Table A-5. Function 02 Select IPL Type

Function/Data	Description
02 _ _ _ _ _ _ _	Use the scroll up or scroll down button and scroll to Function 02.
02 _ _ _ A _ _	Press Enter once to enter Function 02. Select IPL Type display. Use the scroll up or scroll down buttons to scroll through the IPL types A, B, C and D. See Table A-2 on page A-4 for descriptions of IPL types. Pressing Enter saves the selected IPL type and exits Function 02.

Function 03 - Start IPL

Function 03 is enabled only when the system is powered on.

This function starts an IPL using the selected IPL mode when the Enter button is pressed.

Note: No system shut down is performed before the IPL.

Function 04 - Lamp Test

This function ensures that no indicators are burned out and that characters displayed at the operator panel are valid. When this test is activated, the following lights go on:

- On the system operator panel:
  - The System Attention light
  - The Power On light
  - A 5 x 7 dot pattern for each character in the Function/Data display.

The lamp test continues on the system operator panel until you perform another operator panel function or a power procedure.

Use this procedure to verify that the lights on the system operator panel are working correctly. If you cannot complete these steps, go to the "Starting Point for All Problems" in the Problem Analysis information for your system to start problem analysis.

1. Power on the system.
2. Press the scroll up or scroll down button on the operator panel to display Function 04.

   Press Enter on the operator panel.
3. Do all of the following lights on the operator panel go on?
   - System Attention light
   - Power On light
   - A 5 x 7 dot pattern for each character in the Function/Data display.

   Yes The lights on the system operator panel are working correctly.

   No Exchange the operator panel or the ac module.

This ends this procedure.

Function 05 - SPCN (System Power Control Network) Informational SRC

Function 05 displays information about power faults and provides informational reference codes during concurrent maintenance procedures. The format for this function is as follows:

```
 05        1RRU rrrr

  RR = Frame number refers to the particular I/O Drawer
       or System Rack
   U = Always 1 for information pertaining to the System Rack
       or I/O Drawers other than the primary.
       Always C is for the primary I/O Drawer.
rrrr = Service reference code (SRC)
```

Function 07 - Restore System Power and Perform Concurrent Maintenance Repair

Attention: This function allows concurrent maintenance to be performed by trained service personnel. Inadvertent use may cause system failures.

Function 07 is available only when the system is powered on. It is used for concurrent maintenance repair on bulk power supplies and blowers.

When Function 07 is first entered, the operator panel enters ***subfunction mode*** by displaying **. Increment and decrement functions scroll to selectable values. If an SPCN communications error is present when a subfunction is selected, the subfunction is not executed and `FF` (execution failed) displays in the rightmost display positions. Entry of a valid subfunction when no SPCN communications errors are present results in a `00` (execution successful) displays in the rightmost display positions. Pressing Enter when ** is displayed results in exiting subfunction mode.

Table A-6. Function 07 Restore System Power and Perform Concurrent Maintenance Repair

Function/Data	Description
07 _ _ _ _ _ _	Use increment or decrement functions and scroll to Function 07.
07 * * _ _ _ _	Press Enter once to enter Function 07 subfunction mode.
07 0 4 _ _ _ _	Use the increment or decrement buttons to scroll desired subfunction (04 in this example). Valid subfunctions are 01, 02, 03, 04 and 05.
07 0 4 _ _ 0 0 briefly, then 07 * * _ _ _ _	Press Enter to execute subfunction 04. An SPCN communications error was not present, resulting in `00`. If an error occurs, `FF` displays.
07 F 3 _ _ 0 0	Use the increment or decrement buttons to select a specific device (in this case F0 - F3).
07 0 4 _ _ 0 0 briefly, then 07 * * _ _ _ _	Press Enter to exit the subfunction for the specified device and exit the subfunction level.

****** Cancel Request

This subfunction is returned when the user selects ** for subfunction and activates Enter. This is used to cancel a pending subfunction 2 - 5 concurrent maintenance operation. SPCN responds with an EPF 1 - 5 to clear any other subfunction range previously enabled.

01 System Power On

This command causes a Rack Power On command to be transmitted to the network, if the CEC is powered on. This function is used to restore power to towers turned off or faulted off after concurrent repairs have been completed.

02 Blower Power Off

This function is used to select a concurrent blower power off operation. SPCN responds by enabling subfunction range F0 - F3 to select the blower to be powered off.

03 Bulk Power Off

This function is used to select a concurrent bulk power off operation. SPCN responds by enabling subfunction range B0 - B5 to select the bulk to be powered off.

04 Blower Power On

This function is used to select a concurrent blower power on operation. SPCN responds by enabling subfunction range F0 - F3 to select the blower to be powered on.

This function is only needed if the wrong blower is powered off. A concurrently repaired blower is automatically started after the blower is inserted.

05 Bulk Power On

This function is used to select a concurrent bulk power on operation. SPCN responds by enabling subfunction range B0 - B5 to select the bulk to be powered off.

This function is only needed if the wrong bulk is powered off. A concurrently repaired bulk is automatically started after the bulk is installed.

F0 - F3 Select Blower

This subfunction is used to select the blower for the previously selected concurrent repair operation. If accepted, SPCN performs the operation and disables this subfunction range. A function 5 SRC is displayed when the blower is turned off and removed when the blower is installed.

B0 - B5 Select Bulk

This subfunction is used to select the bulk for the previously selected concurrent repair operation. If accepted, SPCN performs the operation and disables this subfunction range. A function 5 SRC is displayed when the bulk is turned off and removed when the bulk is installed.

Function 08 - Fast Power Off

Use this function when the system is suspended and a power down cannot be performed.

Initially, an attention SRC (11-x A1xx 8008) is displayed. This indicates that Function 08 has been selected.

Note: If the server has Unattended Start Mode (USM) enabled, selecting this function causes the server to power off and then power on again.

Functions 09 to 10 - Reserved

These functions are reserved for future operator panel operations.

Functions 11 to 19 - System Reference Code

Functions 11 through 19, if enabled, represent the words of the SRC.

Note: Function 11 provides the primary SRC. Function 12 is an informational status message only and not used. Functions 13 through 19 provide secondary reference codes in addition to the primary SRC.

Press Enter to view the SRC. If no SRC is present, press Enter to continue to the next function.

SRC information should be recorded for error reporting.

Note: Depending on the source of the SRC, some functions do not report any SRC status. All SRCs start with information in Function 11.

For more information on interpreting SRCs, refer to Chapter 3 on page 3-1 and "Unit Reference Codes" on page 6-25.

Extended Operator Panel Functions

The extended operator panel functions provide greater debug capability for the S70. Function 22 is used by trained service personnel to provide an AIX dump to media. **Functions 25 and higher are primarily enabled for product engineering test and evaluation only.** These are referred to as restricted panel functions. Functions 50 through 70 are available only by using functions 25 and 26 which act as switches to allow access to functions 50 through 70.

Note: When a function is not available, either FF is displayed, or the function may not be selectable.

Function 22 - AIX Storage Dump

This function is supported only during AIX runtime, and it must have been previously setup and enabled from AIX. Refer to *AIX Problem Solving Guide* for more information about dumps.

Note: If dump capability has not been enabled from AIX, attempting to initiate a dump results in the response `D1068000` and the system powers off and reboots.

To initiate a dump:

1. Select Function 22 on the operator panel and press Enter. The response `A1003022` displays on the operator panel.
2. Select Function 22 again and press Enter. The response `D1823080` displays on the operator panel. This indicates the dump request has been accepted by AIX, and the process continues, displaying 4-character progress messages.
3. When the dump is complete, the system automatically powers off and reboots according to the power-on timer setting.

Attention: Functions 25 and higher are primarily enabled for product engineering test and evaluation only.

Functions 25 and 26 - Switches 1 and 2

Switches 1 and 2 can be used to enable or disable the Functions 50 through 70. If Functions 50 through 70 are enabled, entry of either switch disables them. If the Functions 50 through 70 are disabled, entry of service switch 1 followed by service switch 2 enables them.

A data response of 25 _ _ _ _00 or 26 _ _ _ _00 is always returned. It is followed by the display of the present IPL mode (Function 01) if the extended function range has been changed.

Restricted Panel Functions

These functions are enabled when Functions 25 and 26 are entered. The following is a list of all the panel functions and a description of each.

Service Functions 50 through 70 are available when switch 1 (Function 25) has been entered, followed by the entry of switch 2 (Function 26). The restricted panel functions may be disabled again by selecting and entering either switch 1 (Function 25) or switch 2 (Function 26).

Note: Low-level debug functions are available only after a terminating error.

Using Subfunctions

Subfunctions are used with Functions 51 and 55 through 64. After selecting and entering the function, the subfunction field appears with two asterisks. You may now select and enter a subfunction value. When selected and entered, actual data YY

FF (where YY is the function number) is displayed. The "YY FF" response indicates that no data is present for this subfunction value. The data is displayed as eight hexadecimal digits, which is 4 bytes of data.

These steps may be repeated for different subfunction values. To exit subfunctions, select and enter the two asterisks for the subfunction value. The following table shows an example of a subfunction data display.

Function	Subfunction	Data Display
51	**	Subfunction mode entered
51	00, 01	NIA (8 bytes)
51	02, 03	Current TDE (8 bytes)

Function 50 - System Processor Stop

This function stops the system processor.

Attention: This function may cause the system to end abnormally. Do not use unless you are directed by your support personnel.

Function 51 - System Processor Status

This function displays the following values:

- NIA (next instruction address)
- Current TDE address

The data may be displayed 8 digits at a time. Select and enter a subfunction number to display each word of data from 00 to FF.

Function 52 - System Processor Start

This function starts the system processor (after it has stopped).

Function 53 - Path Switch

This function resets communications between the service processor and the operator panel.

Low-Level Debug (LLD) Panel Functions

These functions are enabled when the system is stopped and Functions 25 and 26 are selected. These functions are used for analyzing IPL errors. The following is a list of all the low level debug (LLD) panel functions and a description of each.

Function 55 - Display Service Processor Log Buffer Type B

The display service processor log buffer type B contains data related to the system terminating. The data may be displayed 8 digits at a time. Select and enter a subfunction number to display each word of data from 00 to FF.

Function 56 - Display Service Processor Code Area Type B

The service processor code area type B contains the state of the system processor and service processor at the time of failure. This area contains data such as the failing LID (Load ID) which indicates what LID the service processor wanted from the load-source IOP. The data may be displayed 8 digits at a time. Select and enter a subfunction number to display each word of data from OO to FF.

Function 58 - Display IPL Parameter Area

The IPL parameters are contains the status of the type of IPL being performed. The data may be displayed 8 digits at a time. Select and enter a subfunction number to display each word of data from OO to FF.

Function 63 - System Status SRC Trace

The system status SRC trace is a copy of the last 25 status SRCs (usually associated with the IPL sequence or the power-off sequence).

Enter a subfunction between hexadecimal 00 and 18 to look at the status SRCs in sequential order. The most recent SRC (the last status SRC) is viewed at subfunction hexadecimal 18.

Function 64 - Diagnostic Status SRC Trace

The diagnostic status SRC trace is a copy of the last 25 status SRCs (usually associated with the service processor function of problem determination and main store dump).

Enter a subfunction between hexadecimal 00 and 18 to look at the status SRCs in sequence. The most recent SRC (the last status SRC) is seen at subfunction hexadecimal 18, and the extended SRC words for this SRC are seen at subfunction 19 through 20.

Appendix B. Service Processor Setup and Test

For your convenience, a sample Service Processor setup procedure is provided below. Your setup may include more or less of the available features, so you may wish to adjust this checklist for your own application.

Service Processor Setup Checklist

1. Ensure the server is powered off.
2. Attach a local ASCII terminal for this setup procedure.
3. Attach a modem (if needed), see "How to access Service Processor menus locally" on page C-3, and see "Modem Configuration Menu" on page C-17 for the menus needed to configure your modem.
4. Power on the server, the local terminal, and the modem.
5. Bring up the SP Menus, see Appendix C on page C-1.

   ATTENTION: While the server is booting up, watch the operator panel display for checkpoint E043. The next checkpoint is E07A, which is visible for approximately ten seconds and begins with three beeps. During this window, strike any key on the local terminal. This causes the SP menus to appear on the local terminal.
6. Set the System Name, see "Privileged User Menus" on page C-7.
7. Enable Surveillance, see C-9.
8. Configure Call-In/Call-Out, see "Call-In/Call-Out Setup Menu" on page C-16.
9. Exit the SP menus
10. Wait until the system offers a logon prompt. Log on and perform an orderly system shutdown using the AIX `shutdown -F` command.
11. Power off the server.
12. Test Call-In, page B-2
13. Test Call-Out, page B-3
14. Use the "Save or Restore Hardware Management Policies," in the "Introduction to Tasks and Service Aids" section of the *Diagnostic Information for Multiple Bus Systems* to backup the service processor settings.

    Note: This is strongly recommended to protect the usefulness of the service processor and the availability of the server.

Your Service Processor is ready to go to work.

Testing the Service Processor Setup

These tests include communicating with the server's operating system. Be sure the necessary serial port(s) is configured. If you need assistance, refer to “Serial Port Configuration” on page B-3.

Use following procedure to verify your Service Processor setup is working.

The server should still be powered off as a result of the setup checklist steps on page B-1.

Call-In

1. From any telephone, call the server's telephone number. After you hear three rings, hang up. The server powers on, but cannot provide any signal for you that it did so.
2. Give the server five minutes to boot up and prepare to receive another call.
3. From an ASCII terminal or terminal emulator, call the server again. The server answers and presents the SP Menus on your terminal.
4. If required, enter your privileged access password. If no password is required, the Main Menu displays.
5. From the Main Menu, select `Continue System Boot` to view the IPL progress messages. Select `Exit from Menus` if you do not wish to see these messages.

   Note: Exiting from the menus does not stop the boot process. It only suppresses the IPL progress messages from displaying on your terminal.

   Depending on your server's configuration, the boot up sequence may take several minutes. Once the boot up completes, the logon prompt displays. You have successfully called into the Service Processor and brought up the server.
6. Log in and then log out to disconnect from the operating system. The message "No Carrier" displays on your terminal.
7. Call your server again. The operating system answers and offers the login prompt.

   If these tests are successful, call-in is working correctly. You must now shut down and power off the server. To do this, perform the following steps:
8. Login in and command your server to shutdown and power off. In AIX, use the `shutdown -F` command.
9. As AIX proceeds with the shutdown, the message "No Carrier" displays on your remote terminal.

Call-Out

During the Service Processor setup, you entered your phone number for the Pager (on page C-21) and Customer Voice (on page C-21) phone numbers. These numbers are used for this test.

1. Power on the server.
2. Bring up the SP Menus, see Appendix C on page C-1.

   ATTENTION: While the server is booting up, watch the operator panel display for checkpoint E043. The next checkpoint is E07A, is visible for approximately ten seconds and begins with three beeps. During this window, strike any key on the local terminal. This causes the SP menus to appear on the local terminal.
3. At the **Service Processor Main Menu**, select Call-In/Call-Out Setup menu, then select Call-Out test. This causes a simulated error condition for the purposes of this test.
4. When your telephone rings, answer the call. You should hear the sound of a telephone being dialed. This is your system unit trying to page you.

If this test is successful, call-out is working.

You should now select “Telephone Number Setup Menu” on page C-20 to enter the actual telephone numbers your server uses to report problems.

Serial Port Configuration

To configure the serial port on an AIX system, enter the following commands from an AIX console:

1. Log in as `root`.
2. To find if you have any serial ports already configured, enter:

   `lsdev -Cc tty`

   If no serial ports are configured, none are listed. If you wish to configure serial ports that are not listed, continue with the remaining steps.
3. Identify the serial port(s) with the modem(s).
4. Enter

   `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.

Programming System Vital Product Data

Some software uses the System Vital Product Data (VPD) when operating to identify the type and model of system it is operating on. This procedure provides a method of programming the VPD on the S70.

Attention: The Service Processor (SP) allows programming of the System VPD only once. Take care to enter the fields correctly. The following procedure takes you through the steps of programming the system VPD.

1. To access the SP, connect a local ASCII terminal to either serial port 1 or serial port 2 of the host server.
2. Power-On the system. When the operator panel "beeps" and displays `E07A`, strike the Enter key on the local terminal.
3. Type `37222` to access the hidden menu function for programming System VPD. If VPD is already programmed, SP will print “illegal value entered” on the terminal.
4. Type “A,” SP will prompt you to enter 7 ASCII characters for the VPD Serial Number [SE]. Enter the system serial number (example: `0YE6129`).
   SP will confirm that the serial number has been successfully programmed.
5. SP will prompt you to enter 8 ASCII characters for the Type and Model [TM] data. field (example: `7017-S70`).
6. SP will confirm that the TM field has been successfully programmed.
7. SP will prompt you to press Return (Enter) to continue, which brings you back to the SP Main Menu.
8. Select `System Power Control Menu`.
9. Select `Power-Off System`.
10. When the system has been off for about one minute, power the system on by pressing the white button on the operator panel.

Appendix C. Service Processor Menus

The Service Processor (Service Processor) menus make it possible for you to configure Service Processor options, as well as enable and disable functions.

Service Processor (SP) menus are available using an ASCII terminal while the system is powering on or when the Service Processor has detected a server problem (such as a surveillance failure).

For a summary of the Service Processor functions and the methods used to invoke them, see Table C-1 on page C-2.

Table C-1. Service Processor Functions

SP Functions	SP Menus (ASCII terminals)	SP Service Aids (ASCII or graphics terminals)	SMS (ASCII or graphics terminals)
Read VPD image from last system boot	Y[3]		
Read System POST Errors	Y[3]		
Read SP Error Logs	Y[3]		
View Progress Indicators from last Boot	Y[3]		
Power-off System	Y[2]		
Read NVRAM	Y[2]		
Start Talk Mode	Y[2]		
Enable/Disable Console Mirroring	Y[2]		
Setup Reboot/Restart Policy	Y[2]	Y[1]	
Enable/Disable Modem	Y[2]	Y[1]	
Setup Modem Configuration	Y[2]	Y[1]	
Setup Dial-out Phone Numbers	Y[2]	Y[1]	
Setup Surveillance	Y[2]	Y[1]	
Select Modem Line Speed	Y[2]	Y[1]	
Update SP Flash EPROM		Y[1]	
Save/Restore Hardware Maintenance Policies		Y[1]	
Change General Access Password	Y[2]		
Change Privileged Access Password	Y[2]		Y[2]
Select Language	Y[2]		Y[2]
Enable/Disable Unattended Start Mode	Y[2]	Y[1]	Y[2]

Passwords required (if set):

[1] Operating system root password
[2] Privileged access password
[3] General access (power-on) password

Service Processor Menus

The Service Processor (Service Processor) menus are divided into two groups:

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

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

If the server is powered on, the Service Processor menus may be accessed locally or remotely as described below.

How to access Service Processor menus locally

Service Processor menus may be accessed locally by connecting an ASCII terminal to either serial port 1 or 2. Because the presence of the ASCII terminal cannot be confirmed by the Service Processor, you must press a key (any key) on the ASCII terminal to confirm its presence. The key on the ASCII terminal must be pressed during the time when the operator panel display shows the code E07A.

You can recognize when the Service Processor menu access time begins in the following ways:

- The checkpoint prior to the access checkpoint is E043.
- The system beeps three times as it enters checkpoint E07A.

When you gain access, the Service Processor prompts you for a password (if set), and when verified, displays the Service Processor menus.

How to access Service Processor menus remotely

If your system has a modem connected and configured for call-in (see “Modem Configuration Menu” on page C-17), Service Processor menus can be accessed remotely as follows:

1. With the system powered off, call in from a remote terminal. Wait for at least two rings and hang up. The system powers on upon detecting ring-indicate, and pauses for a return call if call-in is enabled.
2. Wait five minutes and call-in again. The Service Processor prompts you for a password (if set). When verified, the Service Processor menus display remotely.

Saving and Restoring Service Processor Settings

All the settings you make (execpt 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 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 this service aid is used 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 "Introduction to Tasks and Service Aids" section of the *Diagnostic Information for Multiple Bus Systems*.

How to return to Service Processor Menus

When exiting Service Processor menus using option "99", there is a 10 second delay before the system continues its boot procedure. During that 10 seconds, you may strike a key on the ASCII terminal to return to the menus and select other options.

During the 10 second delay, an information message appears on the display. After the 10 second delay, Service Processor menus are no longer available until either the next system boot or the Service Processor regains control due to a system failure.

Menu Inactivity

To prevent loss of control due to power loss or power surges, Service Processor attempts to leave menu mode after 10 minutes of inactivity by simulating the option 99 selection. This attempt is successful on menus containing the "99" option. On the other menus, the attempt is unsuccessful and the following message displays with each attempt:

```
Illegal value entered
Press Return to continue
```

If for some reason you want to hold the server in menu mode, select one of the menus that do not have the "99" option. Boot activity cannot continue if Service Processor is in menu mode, and power losses or surges could result in unpredictable server responses.

General User Menus

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

```
      GENERAL USER MENU

 1. Continue System Boot

 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

99. Exit from Menus
```

- **Continue System Boot**

  Allows the user to continue with and monitor the system boot already in progress using the current ASCII terminal as the active console.

  Make this selection if you wish to monitor the IPL progress messages on your terminal. If you do not wish to monitor the IPL progress messages, select option **99. Exit from Menus**.

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

  Displays manufacturer vital product data, such as serial numbers, part numbers, etc., 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 (check points), up to a maximum of 100, from the system boot prior to the one in progress now. This historical information may be useful to help diagnose system faults.

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

The progress indication codes are chronological from bottom to top. The dashed line merely represents the point where the latest boot started. For an example, refer to "LCD Progress Indicator Log" on page C-38.

- **Read Service Processor Error Logs**

  Displays the Service Processor error logs. For an example, refer to "Service Processor Error Logs" on page C-37.

- **Read System POST Errors**

  Displays the results of the System Firmware POST (Power-On Self Test). Your server may be able to start in the presence of POST errors if there is sufficient working system resources. If POST errors occur during start-up, this error log when used with the diagnostics helps to isolate faults. For an example, refer to "Service Processor Error Logs" on page C-37.

Privileged User Menus

The following menus are available to privileged users only. The user must know the Privileged Access Password, if set, to access these menus.

Main Menu

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

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

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

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

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

```
               Service Processor Firmware
               VERSION:  19970814
               Copyright 1997, IBM Corporation
                    SYSTEM NAME


          MAIN MENU

    1. Service Processor Setup Menu

    2. System Power Control Menu

    3. System Information Menu

    4. Language Selection Menu

    5. Call-In/Call-Out Setup Menu

    6. Set System Name

   99. Exit from Menus
```

Service Processor Setup Menu

```
       SERVICE PROCESSOR SETUP MENU

 1. Change Privileged Access Password

 2. Change General Access Password

 3. Enable/Disable Console Mirroring:
          Currently Enabled

 4. Start Talk Mode

 5. OS Surveillance Setup Menu

98. Return to Previous Menu

99. Exit from Menus
```

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

Passwords

Passwords can be any combination of up to 8 alphanumeric characters. You can enter longer passwords, but the entries are truncated to include only the first 8 characters. Privileged Access Password can be set from SP menus or from System Management Services (SMS) utilities. General Access Password can be set only from SP menus.

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

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

If the error threshold is reached by someone entering passwords remotely, SP commands the server to power down to prevent potential security attacks on the server by unauthorized remote users. The following illustrates what you can access with the Privileged Access Password and the General Access Password.

Privileged Access Password	General Access Password	Resulting Menu
None	None	Service Processor MAIN MENU displayed
None	Set	Users with the password see the GENERAL USER MENU. Users without the password see Service Processor MAIN MENU.
Set	None	Users with the password see the Service Processor MAIN MENU. Users without password see the GENERAL USER MENU.
Set	Set	Users see menus associated with the entered password

Note: If you *forget* the password, you must remove the battery for at least 30 seconds to disable the password. See “Operator Panel Battery” on page 9-15 for details.

- **Change Privileged Access Password**

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

- **Change General Access Password**

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

  Note: The General Access Password can only be set or changed while the Privileged Access Password is set.

- **Enable/Disable Console Mirroring**

  When Console Mirroring is enabled, the Service Processor sends information to both serial ports. This capability may be enabled by local or remote users. This provides local users the capability to monitor remote sessions. Console mirroring may be enabled for the current session only. For more information, see "Console Mirroring" on page C-36.

- **Start Talk Mode**

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

- **OS Surveillance Setup Menu**

  This option may be used to setup operating system (OS) surveillance.

```
       OS Surveillance Setup Menu

  1. Surveillance:
       Currently Enabled

  2. Surveillance Time Interval:
       2 minutes

  3. Surveillance Delay:
       2 minutes


 98. Return to Previous Menu
```

  – **Surveillance**

    May be set to Enabled or Disabled.

  – **Surveillance Time Interval:**

    May be set to any number from 2 through 255.

  – **Surveillance Delay:**

    May be set to any number from 0 through 255.

  Refer to “Service Processor System Monitoring - Surveillance” on page C-33 for more information about surveillance.

System Power Control Menu

```
        SYSTEM POWER CONTROL MENU

 1. Enable/Disable Unattended Start Mode:
        Currently Enabled

 2. Reboot/Restart Policy Setup Menu

 3. Continue System Boot

 4. Power-Off System

98. Return to Previous Menu

99. Exit from Menus
```

- **Enable/Disable Unattended Start Mode**

  This option may be used to instruct Service Processor to restore the power-state of the server after a temporary power failure. Unattended Start Mode can also be set via SMS Menus. It is intended to be used on servers that require automatic power-on after a power failure. For more information, see "System Power-On Methods" on page C-28.

- **Reboot/Restart Policy Setup Menu**

  See "Reboot/Restart Policy Setup Menu" on page C-24.

- **Continue System Boot**

  Allows the user to continue with and monitor the system boot already in progress using the current ASCII terminal as the active console.

  Make this selection if you wish to monitor the IPL progress messages on your terminal. If you do not wish to monitor the IPL progress messages, select option **99. Exit from Menus**.

- **Power-off System**

  Allows the user to power-off the server.

System Information Menu

```
      SYSTEM INFORMATION MENU

 1. Read VPD Image from Last System Boot

 2. Read Progress Indicators from Last System Boot

 3. Read Service Processor Error Logs

 4. Read System POST Errors

 5. Read NVRAM

98. Return to Previous Menu

99. Exit from Menus
```

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

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

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

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

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

  The progress indication codes are chronological from bottom to top. The dashed line merely represents the point where the latest boot started. For an example, refer to “LCD Progress Indicator Log” on page C-38.

- **Read Service Processor Error Logs**

  Displays error conditions detected by the Service Processor. Refer to “Service Processor Error Logs” on page C-37 for an example of this error log.

- **Read System POST Errors**

  Selecting this item lets you review the results of the POST (Power-On Self Test). Your server may be able to start in the presence of POST errors if there are sufficient working system resources. If POST errors occur during start-up, this error log when used with the diagnostics helps to isolate faults. Refer to "System POST Errors" on page C-37 for an example of this error log.

- **Read NVRAM**

  Displays Non-Volatile Random Access Memory (NVRAM) content.

Language Selection Menu

```
          LANGUAGE SELECTION MENU

  1. English

  2. Francais

  3. Deutsch

  4. Italiano

  5. Espanol

  6. Svenska

 98. Return to Previous Menu

 99. Exit from Menus
```

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

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

Call-In/Call-Out Setup Menu

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

     1. Modem Configuration Menu

     2. Serial Port Selection Menu

     3. Serial Port Speed Setup Menu

     4. Telephone Number Setup Menu

     5. Call-Out Policy Setup Menu

     6. Customer Account Setup Menu

     7. Call-Out Test

    98. Return to Previous Menu

    99. Exit from Menus
```

- **Modem Configuration Menu**, see “Modem Configuration Menu” on page C-17.
- **Serial Port Selection Menu**, see “Serial Port Selection Menu” on page C-18.
- **Serial Port Speed Setup Menu**, see “Serial Port Speed Setup Menu” on page C-19.
- **Telephone Number Setup Menu**, see “Telephone Number Setup Menu” on page C-20.
- **Call-Out Policy Setup Menu**, see “Call-Out Policy Setup Menu” on page C-22.
- **Customer Account Setup Menu**, see “Customer Account Setup Menu” on page C-23.

Modem Configuration Menu

The first two lines of the Modem Configuration Menu are status lines showing the current selections. Selections are made in the two 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. If you want to set up both serial ports with modems, make your selections one port at a time.

```
          Modem Configuration Menu

    Port 1 Modem Configuration File Name:
    Port 2 Modem Configuration File Name:

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

 Modem Ports:
    1. Serial port 1
    2. Serial port 2

 Modem Configuration File Name:
    3. modem_f_sp
    4. modem_f0_sp
    5. modem_f1_sp
    6. modem_z_sp
    7. modem_z0_sp
    8. none

    9. Save configuration to NVRAM and Configure modem
   98. Return to Previous Menu
```

For information on choosing a modem configuration file, see “Sample Modem Configuration Files” on page E-1, and “Seamless Transfer of a Modem Session” on page E-5.

Serial Port Selection Menu

```
      Serial Port Selection Menu

  1. Serial Port 1 Call-Out:
      Currently Disabled

  2. Serial Port 2 Call-Out:
      Currently Disabled

  3. Serial Port 1 Call-In:
      Currently Disabled

  4. Serial Port 2 Call-In:
      Currently Disabled

 98. Return to Previous Menu
```

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

Note: For security, if the service processor detects an operator panel battery failure, the Serial Port Dial-In capability becomes disabled. See "Service Processor Call-In Security" on page C-29 for more information.

Serial Port Speed Setup Menu

```
       Serial Port Speed Setup Menu

 1. Serial Port 1 Speed:
       Currently 9600

 2. Serial Port 2 Speed:
       Currently 9600

98. Return to Previous Menu
```

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

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

Telephone Number Setup Menu

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

- **Service Center Telephone Number** - The telephone number of the maintenance provider's computer.
- **Customer Administration Center Telephone Number** - The telephone number of the local system support provider's computer.
- **Digital Pager Telephone Number** - The telephone number of the digital pager used by the person responsible for problem calls.
- **Customer Voice Telephone Number** - The telephone number service personnel use to reach the system user.
- **Customer System Telephone Number** - The telephone number to which the server's modem is connected.

```
          Telephone Number Setup Menu

    1. Service Center Telephone Number:
         Currently Unassigned

    2. Customer Administration Center Telephone Number:
         Currently Unassigned

    3. Digital Pager Telephone Number:
         Currently Unassigned

    4. Customer Voice Telephone Number:
         Currently Unassigned

    5. Customer System Telephone Number:
         Currently Unassigned

   98. Return to Previous Menu
```

- **Service Center Telephone Number** is the number of the service center computer. The service center usually includes a computer that takes calls from servers with call-out capability. This computer is referred to as "the catcher." The catcher expects messages in a specific format to which Service Processor conforms. For more information about the format and catcher computers, refer to the README file in the AIX `/usr/samples/syscatch` directory. Contact your service provider for the correct telephone number to enter here. Until you have that number, leave this field unassigned.
- **Customer Administration Center Telephone Number** is the number of the System Administration Center computer (catcher) that receives problem calls from servers. Contact your system administrator for the correct telephone number to enter here. Until you have that number, leave this field unassigned.
- **Digital Pager Telephone Number** is the number for a numeric pager carried by someone who responds to problem calls from your server. Contact your administration center representative for the correct telephone number to enter here. For test purposes, enter your telephone number here. You can change it later when testing is complete.
- **Customer Voice Telephone Number** is the telephone number of a phone near the server or answered by someone responsible for the server. This is the telephone number left on the pager for callback. For test purposes, enter your telephone number here. You can change it after testing is completed.
- **Customer System Telephone Number** is the telephone number to which your server's modem is connected. The service or administration center representatives need this number to make direct contact with your server for problem investigation. This is also referred to as the **call-in** phone number.

Call-Out Policy Setup Menu

```
      CALL-OUT POLICY SETUP MENU

 1. Call-Out policy (First/All):
    Currently First

 2. Remote timeout, (in seconds):
    Currently 120

 3. Remote latency, (in seconds):
    Currently 2

 4. Number of retries:
    Currently 2

98. Return to Previous Menu
```

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

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

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

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

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

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

Customer Account Setup Menu

```
       Customer Account Setup Menu

 1. Customer Account Number:
     Currently Unassigned

 2. Customer RETAIN Login userid:
     Currently Unassigned

 3. Customer RETAIN login password:
     Currently Unassigned

98. Return to Previous Menu
```

- **Customer Account Number** is assigned by your service provider for record keeping and billing. If you have an account number, enter it here. Otherwise, leave this field unassigned.
- **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 unassigned if your service provider does not use RETAIN.

Reboot/Restart Policy Setup Menu

```
      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
```

Reboot is the process of bringing up the system hardware. For example, from a system reset or power on. **Restart** is activating the operating system after the system hardware is re-initialized. Restart must follow a successful reboot.

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

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

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

     OR

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

     Refer to “Service Processor Reboot/Restart Recovery” on page C-30.

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

Service Processor Functions

The following section discusses some of the Service Processor (Service Processor) features in greater detail.

The S70 Service Processor supports the following functions:

Built-in Functions	Initialization and Test	Service Processor Basic Instructions Test (BIST)
		System Chip Initialization
	Error Data Collection	BIST/POST errors and status
		Isolation to Field Replaceable Unit (FRU) on fail.
	Configuration	CPU Complex validation
		VPD Collection
	System Management	Reset and Reboot on System Firmware fails
		Reboot on system failure
Local User Function	User Interface	Local async console
		Text based menus with NLS
		Operator Panel messages
	Power and Miscellaneous	Power On/Off
		Configurable Reboot Policy
	Status and Data Access	VPD
		Error data (SP)
		Error data (system)
	SP Setup Utilities	Passwords
		Phone numbers
		Language (NLS) selection
		Call-In/Call-Out enable/disable
		System Name
		Modem Configuration

Remote User Functions	Call-Out (Call Home) Reporting	OS termination
		Boot failure
		Surveillance failure
		Checkstop
		Machine check
		Identify system by name
	Call-In	Power-on via ring-indicate
		Password/security check
		Console mirroring

System Power-On Methods

- Power-on Switch - see "Powering On the System" on page 9-5.
- Remote Power-on via Ring-Indicate Signal

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

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

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

  Note: For security, if the system is powered on by the remote power-on via ring indicate signal and the service processor detects an operator panel battery failure, the service processor causes the system to power off. See "Service Processor Call-In Security" on page C-29 for more information.

- Unattended start mode - refer to **Enable/Disable Unattended Start Mode** on page C-13.

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

  It is recommended that the system rack and I/O rack both receive their AC power from the same building circuit on the same circuit breaker, if not the same electrical outlet box, in such a way that primary power cannot be lost to one rack separately from the other. If such a condition occurs, Unattended Start Mode may not be able to restart system operation when a primary power interruption is restored.

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

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

  Note: If an AC power loss is in progress when the Timed Power-On attempt occurs, the server is not be able to power on when AC power is restored.

- Follow-up to a Failed Boot Attempt

  The Service Processor initiates a power-on sequence upon detection of a failed boot attempt (due to a hardware or software failure).

- Fast/Slow Boot (IPL) Capabilities

  Using the operator panel functions, you can select the IPL type, mode and speed of your boot capabilities. For more information, refer to operator panel functions 01 and 02 in "Operator Panel Function Descriptions" on page A-4.

  ATTENTION: Selecting fast IPL results in several diagnostic tests being skipped.

Service Processor Call-In Security

If the service processor detects bad battery-powered storage (indicating that the battery in the Operator Panel has failed or is disconnected), 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 AIX.

Once 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 SP menus. See "Service Processor Setup Menu" on page C-9 and "Serial Port Selection Menu" on page C-18.

Service Processor Reboot/Restart Recovery

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

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

Boot (IPL) Speed

When the server enters reboot recovery, slow IPL is automatically invoked. This is to give the POST an opportunity to locate and report any problems that may otherwise be untested. For more information on IPL speed, refer to “Values for IPL Types and Speeds” on page A-4.

Failure During Boot Process

During the boot process, either initially after system power-on or upon reboot after a system failure, the Service Processor (SP) monitors the boot progress. If progress stops, the SP can reinitiate the boot process (reboot) if enabled to do so. SP can re-attempt this process according to the number of retries selected in the Reboot/Restart Policy Setup Menu.

Failure During Normal System Operation

When the boot process completes and control transfers to the operating system (OS), the SP can monitor operating system activity (see the SERVICE PROCESSOR SETUP MENU item Set Surveillance Parameters). If OS activity stops due to a hardware or software induced failure, the SP can initiate a reboot/restart process based on the settings in the SP Reboot/Restart Policy Setup Menu and the OS automatic restart settings (see OS documentation).

If the operating system is AIX, the menu item under SMIT for setting the restart policy is Automatically Reboot After Crash (True/False), and the default is False. When the setting is True, and if the SP parameter "Use OS-Defined Restart Policy" is Yes (the default), SP 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) indicates the OS response to a system crash. The SP can be instructed to refer to that policy, or not, by the Use OS-Defined Restart Policy menu item.

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

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

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

Enable supplemental restart policy - The default setting is NO. If set to YES, the Service Processor restarts the server when the OS loses control and either:

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

   OR

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

Refer to "Service Processor Reboot/Restart Recovery" on page C-30.

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

OS Automatic reboot/restart after crash setting	SP to use OS-Defined restart policy?	SP 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] SP default
[2] AIX default

Service Processor System Monitoring - Surveillance

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

Surveillance is available during two phases:

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

System Firmware Surveillance

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

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

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

Operating System Surveillance

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

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

Operating system surveillance can be enabled and disabled via:

- Service Processor Menus
- Service Processor Service Aids

Three parameters must be set for operating system surveillance:

1. Surveillance enable/disable
2. Surveillance interval

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

3. Surveillance delay

   This is the length of time to wait from when the operating system is started to when the first heartbeat is expected.

Surveillance does not take effect until the next time the operating system is started after setting the parameters.

If operating system surveillance is enabled (and system firmware has passed control to the operating system), and Service Processor does not detect any heartbeats from the operating system, the Service Processor assumes the system is hung and takes action according to the reboot/restart policy settings. See “Service Processor Reboot/Restart Recovery” on page C-30.

Call-Out (Call-Home)

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

- System firmware surveillance failure
- Operating system surveillance failure (if supported by Operating System)
- Restarts
- Critical hardware failure
- Abnormal OS termination

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

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

Console Mirroring

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

System Configuration:

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

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

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

Service Processor Error Logs

The Service Processor error logs contain error conditions detected by the Service Processor

```
                           Error Log

19970626223337  0. Error detected..
                     4B00F010
                     B455440004B007107000013700000000000000000007420A40001000000
0000000000000

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

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

System POST Errors

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

```
                           Read System POST Errors


Version : 1
Severity : 2
Disposition : 0
Initiator : 0
Event being reported : 0
Extended Error Log Data:
c2 00 84 09 20 09 06 00
19 97 09 03 00 00 49 42
4d 2c 73 70 00 00 00 00
00 00 2b a0 00 13 00 01
00 00 00 00 00 00 00 00
49 42 4d 00 55 30 2e 31
2d 50 31 2d 58 31 00

                   (Press Return to Continue)
```

LCD Progress Indicator Log

The following is an example of the LCD progress indicator log.

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

The progress indication codes are chronological from bottom to top. The dashed line merely represents the point where the latest boot started.

```
                         LCD Progress Indicator Log
          C33744FE
          C33644FE
          C33544FE
          C33444FE
          C33344FE
          C33244FE
          C33144FE
          C33044FE
          C1022001
          C13F2090
          C13F2060
          C13F2050
          C1012001
          C1002001
          C100D500
          C100806E
          --------
          E075
          E07A
          E075

 Press Return to continue, or 'x' to return to menu.  >
```

Appendix D. Microcode Update Procedures

This section applies to all RS/6000 S70 versions. There is specific System Firmware (FW) and Service Processor (SP) microcode to support specific machine types and models.

Determining the Microcode Versions

If the server is in operation, the installed microcode versions can be determined using AIX. If the server is about to be initialized, the installed microcode versions can be determined by using the SMS utilities for FW versions and SP menus for SP versions.

On S70 architecture servers, the AIX command `lscfg -pv | pg` produces a system configuration report. To read the report for SP, enter `/SP_CARD` on the command line. To read the report for firmware, enter `/openprom` on the command line. The following is an example of the SP_CARD report:

```
SP_CARD_:
     Part Number...................93H4228
     EC Level......................E76324A
     FRU Number....................93H4214
     Manufacture ID................3966-1944843
     Serial Number.................00000089
     ROM Level (alterable).........19970801 (B)  19970530 (A)
```

The **ROM Level (alterable)** number corresponds to the version number. In this example, the system was booted from the B version since it is listed first. If the most recent version number (A or B) is less than the update version number available for your server, you should consider installing the update.

When you have determined the version number(s), exit the configuration report by typing `q` and then press Enter.

During system IPL, an ASCII terminal on serial port 1 or 2 can be used to access the SP menus. The SP version number is contained in the heading of the first menu. The following is an example of what the heading with the SP microcode version looks like:

```
Service Processor Firmware
   Version  19970801
Copyright 1997 IBM Corporation
```

The numbers in the second line show the booted version number. If this version number is less than the update version number available for your server, you should consider installing the update.

Similarly, the FW version numbers can be accessed from the SMS utilities.

To determine the version of system microcode, power on your server and do the following:

- If you are using a graphics display:

  Press F1 after the Keyboard icon appears but before the Speaker icon appears. When the tests have completed, and any required passwords have been entered, the SMS utilities menu appears.

  When the graphics display is initialized and the icons begin to appear along the bottom of the screen, the microcode version is displayed in the bottom right-hand corner of the display.

- If you are using an ASCII terminal:

  Press number 1 after the word 'keyboard' appears but before the word 'speaker' appears. When the tests have completed, and any required passwords have been entered, the SMS utilities menu appears. On the second line of the heading is a version number, date and time.

Obtaining the Microcode Update Package

Update packages are available from the RS/6000 Support page under RS/6000 Microcode Updates. The URL is:

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

Filenames are supplied in the table on the microcode download page. The most current downloading, unpacking and installation instructions are either on-line or included in the download package.

Downloading Microcode Updates

Find the most recent update package for your server. Print the description file and download ONE of the update file sets, depending on the workstation being used for downloading, as follows.

Prior to downloading the microcode, you are asked to read and accept the terms of the Machine Code License Agreement. Once you accept the terms, you are assigned a password. Write down this password as it is required later to unpack the files you download.

Downloading to the AIX Server You are Updating

1. Transfer the AIX single-file format file to an empty subdirectory on your server.

   Note: For the following instructions, we assume the name of this empty subdirectory is `/home/download`.

2. Execute this file on your server.

3. When prompted, enter the password assigned to you when you accepted the terms of the download agreement.

   This unpacks the download. It is now ready for local processing.

4. Erase the downloaded file to conserve file space. You no longer need that file.

5. View the contents of subdirectory `/home/download` to get the full name of the **.bak** file for use now and when installing the update.

6. Execute the following AIX command:

   ```
   /etc/restore -x -f/home/download/*.bak    (replace * with the filename)
   ```

   This creates a new subdirectory containing at least two **.img** files. Other files that may be included are documentation (text) files.

   The new subdirectory name can be observed on your monitor during the execution of the restore command. For these instructions, we use an example name of `mcupdate` for the subdirectory. The actual subdirectory name is different.

7. After reading any accompanying description and installation instructions, proceed to the installation instructions. When asked for the source of the update image, it is in the new subdirectory and has a **.img** filetype.

   Note: The file **promote.img** is for use **AFTER** you have processed and tested the update.

   If there is any conflict in the instructions, those accompanying the update files take precedence.

Downloading to an AIX Workstation

In this process, you need to create update diskettes for use at the server being updated. Use the following procedures to accomplish this.

Note: The file **promote.img** is for use **AFTER** you have processed and tested the update.

1. Download the AIX multiple-file format set of files, if there is one, to an empty subdirectory on your workstation. If there is no multi-file format selection, choose the available AIX selection.

   Note: For the following instructions, we assume the name of this empty subdirectory is `/home/download`.

2. Execute each of the downloaded files.

3. When prompted, enter the password assigned to you when you accepted the terms of the download agreement.

   This unpacks the download(s) and makes them ready for local processing.

4. Transfer the unpacked **.bak** file(s) to diskette(s) with the following AIX command:

   ```
   dd if=/home/download/[filenamex].bak of=/dev/rfd0/ bs=9216
   ```

   [filename] represents the name of the file and **x** signifies the label number of each diskette image, if there are more than one.

   Continue these transfers to diskette for each **.bak** file in the `/home/download` directory. Other files that may appear in `/home/download` are documentation (text) files.

5. Label the diskette(s) with the update version number, the diskette number (x) and the word BACKUP.

6. After reading the accompanying description and installation instructions, proceed to the installation instructions. When asked for the source of the update image, it is on the diskette(s) you just created.

   If there is any conflict in the instructions, those accompanying the update files take precedence.

Downloading to a DOS, OS/2 or Windows-based PC Workstation

In this process, you need to create update diskettes for use at the server being updated. Use the following procedures to accomplish this.

Note: The file **promote.img** is for use **AFTER** you have processed and tested the update.

1. Download the DOS format set of files to an empty subdirectory on your workstation.

   Note: For the following instructions, we assume the name of this empty subdirectory is `d:[Path]\download`.

2. Execute each of these downloaded *.EXE files.

3. When prompted, enter the password assigned to you when you accepted the terms of the download agreement.

   This unpacks the download(s) and makes them ready for local processing.

4. With AIX-formatted diskettes ready (one for each **.bak** file in the subdirectory), insert a diskette into your workstation and enter the following command at a DOS prompt:

   ```
   d:[Path]\download\DSK4DOS [filename].bak a:
   ```

   Continue these transfers to diskette for each **.bak** file in the `d:[Path]\download` directory. Other files that may appear in `d:[Path]\download` are documentation (text) files.

5. Label the diskette(s) with the update version number, the diskette number (x), if there is more than one, and the word BACKUP.

6. After reading the accompanying description and installation instructions, proceed to the installation instructions. When asked for the source of the update image, it is on the diskettes you just created.

   If there is any conflict in the instructions, those accompanying the update files take precedence.

Update Process Overview

The following information provides an overview of the update process in general, and applies to all available update methods described on the following pages.

When updating from diskettes, insert the first diskette in the drive before selecting the Update System or Service Processor Flash service aid. This precaution ensures proper early diskette recognition. The service aid, however, may still ask for the diskette even with it already in place.

To conserve resources in your server, restoring the update image from diskettes is a two-pass process. In the first pass, the service aid is collecting a list of filenames and sizes to be restored, and comparing resources needed to resources available.

If this first pass determines more resources are needed, it may request an increase in size for the file system `/var`. Use standard AIX techniques to do this. If the update image does not fit into this file system, the update cannot be successful. The second pass restores the update.

As the microcode update takes place, during the processes shutdown sequence following the microcode transfer, progress can be monitored from the operator panel. The checkpoints E080 and E081 alternately appear while the update is in progress.

How to Install a Microcode Update

Updating the microcode requires rebooting the server. The update is applied during the processes shutdown sequence following the microcode transfer. The next boot uses the updated microcode for its control.

The new microcode is placed in the IPL Type B location for use while your acceptance tests are under way. When you are satisfied with the performance of the new version, "promote" it to the IPL Type A location. There is no time limit on when promotion must occur. Thorough testing of any changes to your system is recommended before committing to them.

Keeping an archive of microcode levels allows recovery in case newer levels are found to create problems with your specific applications.

This section describes the update and promotion procedures.

Updating microcode in the S70 servers MUST be initiated from either the Update Flash Diagnostic Service Aid or directly from an AIX command line.

Updating from the Service Aids

Review "Update System or Service Processor Flash" in the Service Aids section of the *RS/6000 Enterprise Server S70 User's Guide* for any special considerations for using this utility.

1. Invoke the Service Aids from either on-line or standalone diagnostics. For more information, refer to “Introduction to Tasks and Service Aids” in *Diagnostic Information for Multiple Bus Systems.*
2. Choose Update System or Service Processor Flash service aid.
3. Follow the on-screen update steps as they are presented.

   When asked for the filename, first list the files and then select the appropriate one for your update. If the filenames contain numbers, begin with the filename that contains the number 1.

Following a successful update initialization, the server automatically performs the update, reboots, and loads at the new level. Since the update occurs during this shutdown/reboot sequence, it is important to protect the server from interruptions.

After acceptance testing is completed, make your microcode update permanent. See “Promoting the Microcode Update” on page D-8.

Updating from the AIX command line

The Service Aids collect the information needed to construct an AIX command. You can create that same command directly using the following syntax:

```
update_flash [-q] -f filename
```

or

```
update_flash [-q] -D device -l
```

or

```
update_flash [-q] -D device -f filename
```

where

```
-q           updates the flash and reboots the system without asking for
             confirmation.

-D device    specifies the flash image file is on diskette(s) in the
             specified device.

-f filename  is the fully qualified pathname of the flash update image
             file.

-l           provides a list of files on the diskette for the user to
             select the flash update image file.  l is a lower case
             letter L.
```

For a microcode image file named "filename.img." located in a file system in the example path `/tmp/mcupdate` enter:

```
/usr/lpp/diagnostics/bin/update_flash -f /tmp/mcupdate/filename.img
```

For microcode images located on diskette(s), and to obtain a selection list of files on the diskette(s), enter:

```
/usr/lpp/diagnostics/bin/update_flash -D /dev/rfd0 -l
```

Information similar to the example below is displayed. Enter a numeric response.

```
Choose one of the following
by number, then press "Enter":
      0. No choice
      1. [Path]filename.img
      2. [Path]profile.img
      3. [Path][other files]
```

For a microcode image file "filename.img" located on diskette, and to perform the update without asking the user for confirmation to reboot the system, enter:

```
/usr/lpp/diagnostics/bin/update_flash -D /dev/rfd0 -f filename.img -q
```

Note: A system reboot is necessary to update the microcode. The default action of the command is to locate the image file, then ask for confirmation to proceed with the microcode update and required reboot. If the `-q` flag is set, the command does not ask for confirmation before beginning the microcode update and reboot.

Promoting the Microcode Update

Your S70 server allows a trial period for testing the update before committing to the new version. When this update has been tested thoroughly, refer to the commands you previously entered to install the update. Enter the same commands, this time specifying the filename **promote.img** rather than the filename you selected previously. Be aware that the promotion process requires the server to shut down its processes to rewrite IPL Type A and reboot from it.

Your S70 maintains two copies of System and Service Processor microcode. These copies reside in locations referred to as **IPL TYPE A** and **IPL TYPE B**.

Your server normally runs IPL Type A. New microcode updates are stored in IPL Type B until they are promoted. Once promotion takes place, the two IPL Types are identical.

When a microcode update is processed, the server automatically begins using IPL Type B. When promotion is processed, the server automatically begins using IPL Type A.

Between the time of a microcode update and the promotion procedure, the server may be instructed (using operator panel function 02) to use either IPL type for the purpose of microcode testing. When you are ready to promote the new microcode, the server MUST be using IPL Type B. Otherwise, the promotion fails. The recovery procedure is:

- Turn off the server power.

- Switch the server's operation to IPL Type B.
- Turn on the server power to IPL from Type B.

Operator panel function 01 may be used to determine which IPL type is in use at any given time. See "Operator Panel Function Descriptions" on page A-4 for more information about these operator panel functions.

As the promotion occurs, during the processes shutdown sequence, checkpoint E082 appears during the promotion activity. This checkpoint can last up to a few minutes.

Archiving the Updates

In the event it becomes necessary to restore your server to a previous microcode level, it is suggested you identify and archive the materials for each update you install.

If the download process produces diskettes, label and store them in a safe place.

If the download process produces only an update image file, archive and identify the file for convenient retrieval.

Appendix E. Modem Configurations

Sample Modem Configuration Files

With hundreds of modems to choose from, and various modem programming standards, configuring a modem for use with the Service Processor can be challenging. The Service Processor is designed to place little demand on an attached modem, thereby increasing the setup and connection success rates. Several sample modem configuration files are supplied that will either work directly with your modem, or provide a good starting point for a custom setup, if required.

The sample modem configuration files can be found in your Service Processor firmware and in the `/usr/share/modems` subdirectory (if your server is using AIX) with the following names. A listing of each file is included at the end of this appendix.

AIX File Name	SP 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

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

Configuration File Selection

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

   If yes, go to step 3.
   If not, continue with step 2 below.

2. Does your modem respond to:

   a. ATZ reset command, or

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

      If ATZ, configuration file modem_z.cfg is recommended.
      If ATZn, configuration file modem_z0.cfg is recommended.

   Selection is complete. If you find it necessary to adjust either of these configuration files, do so with reference to the manual that came with your modem.[1] It is recommended you select settings that enable hardware flow control and respond to DTR.

3. Does your modem respond to:

   a. AT&F reset command, or

   b. AT&Fn reset commands, where n can be 0, 1, etc.?

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

   Selection is complete. If you find it necessary to adjust any of these configuration files, do so with reference to the manual that came with your modem.[1] It is recommended you select settings that enable hardware flow control and respond to DTR.

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

Examples

Modem	Setup Z	Setup Z0 (Rare)	Setup F	Setup F0	Setup F1
AT&T DataPort 2001 **				X	
Bocamodem 1440E			X		
Hayes Smart Modem 300	X				
IBM 5841	X				
IBM 5843	X				
IBM 7851				X	
IBM 7852-10				X	
IBM 7855					X
USRobotics 36.6K Sportster					X
Zoom V.32			X		

Note: ** Ring interrupt only on first ring.

Customizing the Modem Configuration Files

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

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

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

Terminal Emulators

The Service Processor is compatible with simple ASCII terminals, and therefore compatible with most emulators. It is for the cases when a remote session is handed off from Service Processor to the operating system that agreeing terminal emulators becomes important.

The server's operating system will have some built-in terminal emulators. Your server may also have a commercially available terminal emulation. It is important that the local and host computers select the same or compatible terminal emulators so the key assignments and responses will match. This will assure successful communications and control.

For best formatting, choose line wrap in your terminal emulator setup.

Recovery Procedures

Line noises, power surges, etc., can sometimes cause your modem to enter an undefined state. When it is being used for dial in, dial out or Ring Indicate Power-On, your modem is initialized each time one of these actions is expected. If one of these environmental conditions occur after your modem has been initialized, it may be necessary to recover your modem to a known state.

If your modem communicates properly with remote users, it is probably in control. It may be wise to occasionally change some of the functional settings and then change them back, just for the sense of security that the modem is communicating, and to assure it has been initialized recently.

Another strategy, particularly if your system is difficult to access physically, is to protect it with an Uninterruptable Power Source (UPS) and a phone-line surge protector.

In case recovery becomes necessary, your system should be shut down as gracefully as possible. Disconnect and reconnect modem power, and power on the system to allow complete reinitialization of your system.

Seamless Transfer of a Modem Session

There are about as many modem command variations as there are modems. The sample modem configuration files have been written to capture the largest number of workable modem settings.

The modem command &Dn (where 'n' is a number) generally sets the modem response to the Data Terminal Ready (DTR) signal from the server's serial port. The desired response is that the modem will hold a connection while DTR is enabled, and drop the connection when DTR is released. This is the mechanism by which the server "hangs up" on a connection under normal conditions.

Usually the command &D2 will work, but not always. The sample modem configuration files[1] take this high percentage position. You should consult your modem's manual for its specific response scheme for the &Dn command.

There are two methods for dealing with the modem's response to DTR:

1. Recovery
2. Prevention

Before proceeding with one of these strategies, you need to determine if your server's modem is set up properly to respond to DTR.

With the remote terminal connected to serial port 1 and defined as the **primary** console device, there are two tests you can perform:

1. Will the modem **drop** the connection after the "System initialization complete" message appears at the remote terminal?

   If yes, this is the correct response. The modem is set up correctly.

   If no, try another &Dn setting for your server's modem. See your modem manual for this information. The &Dn command appears in three places each in three of the sample modem configuration files[1].

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 shutdown and power off. (The AIX command `shutdown -F` will do this.) Watch for the message `NO CARRIER` on your remote terminal.

   If yes, this is the correct response. The modem is set up correctly.

   If no, try another &Dn setting for your server's modem. See your modem manual for this information. The &Dn command appears in three places each in three of the sample modem configuration files[1].

Recovery Strategy

The recovery strategy consists of making **three** calls to establish a remote session. This is the easiest solution to implement, and allows more freedom for configuring your server's serial ports.

To set up a remote terminal session, dial in to the server and start the system. Wait 5 minutes for the initialization period and call again to gain control via the Service Processor menus. Continue booting the system from the System Power control menu. After the operating system is loaded and initialized, the connection is dropped. At this point, when you call the server back the operating system answers and offers you the login prompt.

Prevention Strategy

The disconnect is caused by the operating system when it initializes the **primary** console. The tests listed above are conducted with the remote terminal selected as the primary console to manifest the modem's response to DTR transitions.

If a local ASCII terminal or a graphics console is to be a permanent part of your server, then make one of them the primary console. Your remote terminal 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.

---

[1] 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.

Modem Configuration Samples

Sample File modem_z.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP Z
#
# FUNCTIONS: Modem configuration file for many early Hayes* compatible modems.
#  This example uses the ATZ reset command to choose the factory defaults.
#  This setup will work for many modems, but it is required for early vintage
#  modems which respond to neither the ATZ0 reset command nor the extended (&)
#  commands.  Refer to your modem manual.
#
# * Trademark of Hayes Microcomputer Products, Inc.
#
# (C) COPYRIGHT International Business Machines Corp. 1996
# All Rights Reserved
# Licensed Materials - Property of IBM
#
# US Government Users Restricted Rights - Use, duplication or
# disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultTO 10
CallDelay 120
#  AT  Attention Code             ,   Inserts delay in dialing commands
#  Z   Reset to factory defaults Q0   Turn on responses
#  E0  Turn echo off             Q1   Turn off responses
#  V0  Use numeric responses     S0=0 Automatic answer inhibit
# +++  Escape to command mode    S0=2 Answer on second ring
#  H0  Hang-up                   T =  Tone mode.  When used as T\r, it is a
#                                     no op to maintain program synchronization
#                                     when modem may/will echo the commands.
#
#  %N  Call-Out phone number    %P   Paging phone number
#  %S  Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses.  Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:    send "ATZQ0T\r"                     # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0T\r"                    #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=0\r"                     # Set AutoAnswer OFF
            expect "0\r" timeout 2              # Confirm command successful.
            done

connect:    send "ATDT%N\r"                     # Tone dialing command.
                                                # %N from Call Home setup.

                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done
```

```
retry:      send "A/"                             # Repeat the previous command.

                                                  # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

disconnect:
            delay 2                               # Separate from previous data.
            send "+++"                            # Assure command mode.
            delay 2                               # Allow mode switching delay.
            send "ATH0T\r"                        # Set modem switch-hook down
                                                  #  (i.e., hang up).
            ignore "0\r" or "OK\r" timeout 2      # Ignore modem response.
            send "ATE0Q1\r"                       # Initialize modem: Echo OFF,
                                                  #  Disable responses.
            ignore "0\r" timeout 1
            done

condin:     send "ATZQ0T\r"                       # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2    # Ignore modem response.
            send "ATE0T\r"                        # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2    #  Enable responses (Numeric),
            send "ATQ0V0T\r"                      #  Limit response codes.
            expect "0\r" timeout 2                # Confirm commands successful.
            send "ATS0=2\r"                       # Set AutoAnswer ON
            expect "0\r" timeout 2                # Confirm command successful.
            done

waitcall: ignore "2\r" timeout 1                  # Ignore first ring.
          expect "2\r" timeout 10                 # Pick up second ring
                                                  #  or timeout.
                                                  # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
 timeout 60
            done

page:       send "ATDT%N,,,,%R;\r"                # %N = pager call center number
                                                  # Add enough commas to wait for
                                                  #  time to enter paging number.
                                                  # %R = paging number

                                                  # Confirm successful command.
            expect "0\r" timeout 60
            delay 2                               # Wait before hanging up.
            send "ATH0T\r"                         # Hang up.
            expect "0\r" timeout 2                # Confirm successful command.
            done

ripo:       send "ATZQ0T\r"                       # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2    # Ignore modem response.
            send "ATE0T\r"                        # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2    #  Enable responses (Numeric),
            send "ATQ0V0T\r"                      #  Limit response codes.
            expect "0\r" timeout 2                # Confirm commands successful.
            send "ATS0=0\r"                       # Set AutoAnswer OFF
            expect "0\r" timeout 2                # Confirm command successful.
            done                                  # RI Power On enabled.

error:                                            # Handle unexpected modem
                                                  #  responses.
            expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
            delay 2
            done
```

Sample File modem_z0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP Z0
#
# FUNCTIONS: Modem configuration file for some early Hayes* compatible modems.
#  This example uses the ATZ0 reset command to choose the factory defaults.
#  This setup is recommended for modems that will respond to the ATZ0 command
#  and which do not respond to the extended (&) commands.  Refer to your modem
#  manual.
#
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultTO 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 (").

condout:    send "AT&FQ0T\r"                     # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                       # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                   #  Limit response codes.
            expect "0\r" timeout 2               # Confirm commands successful.
            send "ATS0=0\r"                      # Set AutoAnswer OFF
            expect "0\r" timeout 2               # Confirm command successful.
            send "AT&C1&D2\r"                    # Detect carrier and DTR.
            expect "0\r" timeout 2               # Confirm command successful.
            done

connect:    send "ATDT%N\r"                      # Tone dialing command.
                                                 # %N from Call Home setup.

                                                 # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
```

```
            done

retry:      send "A/"                            # Repeat the previous command.

                                                 # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

disconnect:
            delay 2                              # Separate from previous data.
            send "+++"                           # Assure command mode.
            delay 2                              # Allow mode switching delay.
            send "ATH0T\r"                       # Set modem switch-hook down
                                                 #  (i.e., hang up).
            ignore "0\r" or "OK\r" timeout 2     # Ignore modem response.
            send "ATE0Q1\r"                      # Initialize modem: Echo OFF,
                                                 #  Disable responses.
            ignore "0\r" timeout 1
            done

condin:     send "AT&FQ0T\r"                     # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2   # Ignore modem response.
            send "ATE0T\r"                       # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2   #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                   #  Limit response codes.
            expect "0\r" timeout 2               # Confirm commands successful.
            send "ATS0=2\r"                      # Set AutoAnswer ON
            expect "0\r" timeout 2               # Confirm command successful.
            send "AT&C1&D2\r"                    # Detect carrier and DTR.
            expect "0\r" timeout 2               # Confirm command successful.
            done

waitcall: ignore "2\r" timeout 1                 # Ignore first ring.
          expect "2\r" timeout 10                # Pick up second ring
                                                 #  or timeout.
                                                 # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
 timeout 60
            done

page:       send "ATDT%N,,,,%R;\r"               # %N = pager call center number
                                                 # Add enough commas to wait for
                                                 #  time to enter paging number.
                                                 # %R = paging number

                                                 # Confirm successful command.
            expect "0\r" timeout 60
            delay 2                              # Wait before hanging up.
            send "ATH0T\r"                        # Hang up.
            expect "0\r" timeout 2               # Confirm successful command.
            done

ripo:       send "AT&FQ0T\r"                     # Reset to factory defaults.
            ignore "0\r" or "OK\r\n" timeout 2   # Ignore modem response.
            send "ATE0T\r"                       # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2   #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                   #  Limit response codes.
            expect "0\r" timeout 2               # Confirm commands successful.
            send "ATS0=0\r"                      # Set AutoAnswer OFF
            expect "0\r" timeout 2               # Confirm command successful.
            send "AT&C1&D2\r"                    # Detect carrier and DTR.
            expect "0\r" timeout 2               # Confirm command successful.
            done                                 # RI Power On enabled.

error:                                           # Handle unexpected modem
                                                 #  responses.
```

```
expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
delay 2
done
```

Sample File modem_f0.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F0
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
#  This example uses the AT&F0 reset command to choose the factory defaults.
#  This set up is preferred for modems with extended (&) commands.  For early
#  vintage modems, setup Z or Z0 is recommended.  If your modem responds to
#  the extended (&) commands and to factory default choices (&Fn), but doesn't
#  work properly with this setup file, setup F1 is recommended.
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#
#
# If the modem has configuration switches, they should be set to the
# factory default settings.

ICDelay 1
DefaultTO 10
CallDelay 120
#  AT  Attention Code            ,   Inserts delay in dialing commands
# &F0  Reset. Restore profile 0 Q0   Turn on responses
#  E0  Turn echo off            Q1   Turn off responses
#  V0  Use numeric responses    S0=0 Automatic answer inhibit
# +++  Escape to command mode   S0=2 Answer on second ring
#  H0  Hang-up                  X0=0 Limit modem response codes
#                               T =  Tone mode.  When used as T\r, it is a
#                                    no op to maintain program synchronization
#                                    when modem may/will echo the commands.
#
# &C1  Detect CD                &D2  Respond to DTR (often the default)
# &R1  Ignore RTS (CTS)
#
#  %N  Call-Out phone number    %P   Paging phone number
#  %S  Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses.  Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:    send "AT&F0Q0T\r"                   # Reset modem. Select profile 0
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=0\r"                     # Set AutoAnswer OFF
            expect "0\r" timeout 2              # Confirm command successful.
            send "AT&C1&D2&R1\r"                # Detect carrier and DTR,
                                                #  Ignore RTS.
            expect "0\r" timeout 2              # Confirm command successful.
            done

connect:    send "ATDT%N\r"                     # Tone dialing command.
                                                # %N from Call Home setup.

                                                # Expect a connection response.
```

```
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

retry:      send "A/"                           # Repeat the previous command.

                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
            done

disconnect:
            delay 2                             # Separate from previous data.
            send "+++"                          # Assure command mode.
            delay 2                             # Allow mode switching delay.
            send "ATH0T\r"                      # Set modem switch-hook down
                                                #  (i.e., hang up).
            ignore "0\r" or "OK\r" timeout 2    # Ignore modem response.
            send "ATE0Q1\r"                     # Initialize modem: Echo OFF,
                                                #  Disable responses.
            ignore "0\r" timeout 1
            done

condin:     send "AT&F0Q0T\r"                   # Reset modem. Select profile 0
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=2\r"                     # Set AutoAnswer ON
            expect "0\r" timeout 2              # Confirm command successful.
            send "AT&C1&D2&R1\r"                # Detect carrier and DTR,
                                                #  Ignore RTS.
            expect "0\r" timeout 2              # Confirm command successful.
            done

waitcall: ignore "2\r" timeout 1                # Ignore first ring.
          expect "2\r" timeout 10               # Pick up second ring
                                                #  or timeout.
                                                # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
 timeout 60
            done

page:       send "ATDT%N,,,,%R;\r"              # %N = pager call center number
                                                # Add enough commas to wait for
                                                #  time to enter paging number.
                                                # %R = paging number

                                                # Confirm successful command.
            expect "0\r" timeout 60
            delay 2                             # Wait before hanging up.
            send "ATH0T\r"                       # Hang up.
            expect "0\r" timeout 2              # Confirm successful command.
            done

ripo:       send "AT&F0Q0T\r"                   # Reset modem. Select profile 0
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                      # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                  #  Limit response codes.
            expect "0\r" timeout 2              # Confirm commands successful.
            send "ATS0=0\r"                     # Set AutoAnswer OFF
            expect "0\r" timeout 2              # Confirm command successful.
            send "AT&C1&D2&R1\r"                # Detect carrier and DTR,
                                                #  Ignore RTS.
            expect "0\r" timeout 2              # Confirm command successful.
```

```
        done                                # RI Power On enabled.

error:                                      # Handle unexpected modem
                                            #  responses.
        expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
        delay 2
        done
```

Sample File modem_f1.cfg

```
#
# COMPONENT_NAME: (ESPSETUP) ENTRY SERVICE PROCESSOR SETUP F1
#
# FUNCTIONS: Modem configuration file for many recent Hayes* compatible modems.
#  This example uses the AT&F1 reset command to choose the factory defaults.
#  This set up is for modems with extended (&) commands and which do not work
#  properly with setup F0.  For early vintage modems, setup Z or Z0 is
#  recommended.
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#
#
# 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
# &F1  Reset. Restore profile 1 Q0   Turn on responses
#  E0  Turn echo off            Q1   Turn off responses
#  V0  Use numeric responses    S0=0 Automatic answer inhibit
# +++  Escape to command mode   S0=2 Answer on second ring
#  H0  Hang-up                  X0=0 Limit modem response codes
#                               T =  Tone mode.  When used as T\r, it is a
#                                    no op to maintain program synchronization
#                                    when modem may/will echo the commands.
#
# &C1  Detect CD                &D2  Respond to DTR (often the default)
# &R1  Ignore RTS (CTS)
#
#  %N  Call-Out phone number    %P   Paging phone number
#  %S  Modem speed (available to users)
#
# Following are common responses from a wide range of modems:
# 16, 15, 12, 10, 5 and 1 are connection responses.  Add others as required.
# 7=busy; 6=no dial tone; 4=error; 3=no carrier; 2=ring; 0=OK
#
# PROGRAMMING NOTE: No blanks between double quote marks (").

condout:    send "AT&F1Q0T\r"                      # Reset modem. Select profile 1
            ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
            send "ATE0T\r"                         # Initialize modem: Echo OFF,
            expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
            send "ATQ0V0X0T\r"                     #  Limit response codes.
            expect "0\r" timeout 2                 # Confirm commands successful.
            send "ATS0=0\r"                        # Set AutoAnswer OFF
            expect "0\r" timeout 2                 # Confirm command successful.
            send "AT&C1&D2&R1\r"                   # Detect carrier and DTR,
                                                   #  Ignore RTS.
            expect "0\r" timeout 2                 # Confirm command successful.
            done

connect:    send "ATDT%N\r"                        # Tone dialing command.
                                                   # %N from Call Home setup.

                                                   # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
```

```
 timeout 60
           done

retry:     send "A/"                        # Repeat the previous command.

                                            # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r" busy "7\r"
 timeout 60
           done

disconnect:
           delay 2                          # Separate from previous data.
           send "+++"                       # Assure command mode.
           delay 2                          # Allow mode switching delay.
           send "ATH0T\r"                   # Set modem switch-hook down
                                            #  (i.e., hang up).
           ignore "0\r" or "OK\r" timeout 2   # Ignore modem response.
           send "ATE0Q1\r"                  # Initialize modem: Echo OFF,
                                            #  Disable responses.
           ignore "0\r" timeout 1
           done

condin:    send "AT&F1Q0T\r"                # Reset modem. Select profile 1
           ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
           send "ATE0T\r"                   # Initialize modem: Echo OFF,
           expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
           send "ATQ0V0X0T\r"               #  Limit response codes.
           expect "0\r" timeout 2           # Confirm commands successful.
           send "ATS0=2\r"                  # Set AutoAnswer ON
           expect "0\r" timeout 2           # Confirm command successful.
           send "AT&C1&D2&R1\r"             # Detect carrier and DTR,
                                            #  Ignore RTS.
           expect "0\r" timeout 2           # Confirm command successful.
           done

waitcall: ignore "2\r" timeout 1            # Ignore first ring.
          expect "2\r" timeout 10           # Pick up second ring
                                            #  or timeout.
                                            # Expect a connection response.
 expect "16\r" or "15\r" or "14\r" or "12\r" or "10\r" or "5\r" or "1\r"
 timeout 60
           done

page:      send "ATDT%N,,,,%R;\r"           # %N = pager call center number
                                            # Add enough commas to wait for
                                            #  time to enter paging number.
                                            # %R = paging number

                                            # Confirm successful command.
           expect "0\r" timeout 60
           delay 2                          # Wait before hanging up.
           send "ATH0T\r"                    # Hang up.
           expect "0\r" timeout 2           # Confirm successful command.
           done

ripo:      send "AT&F1Q0T\r"                # Reset modem. Select profile 1
           ignore "0\r" or "OK\r\n" timeout 2  # Ignore modem response.
           send "ATE0T\r"                   # Initialize modem: Echo OFF,
           expect "0\r" or "OK\r\n" timeout 2  #  Enable responses (Numeric),
           send "ATQ0V0X0T\r"               #  Limit response codes.
           expect "0\r" timeout 2           # Confirm commands successful.
           send "ATS0=0\r"                  # Set AutoAnswer OFF
           expect "0\r" timeout 2           # Confirm command successful.
           send "AT&C1&D2&R1\r"             # Detect carrier and DTR,
                                            #  Ignore RTS.
           expect "0\r" timeout 2           # Confirm command successful.
           done                             # RI Power On enabled.
```

```
error:                                        # Handle unexpected modem
                                              #  responses.
            expect "8\r" or "7\r" or "6\r" or "4\r" or "3\r"
            delay 2
            done
```

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