



pSeries 690
Installation Guide

SA38-0587-03





@server

pSeries 690
Installation Guide

SA38-0587-03

Fourth Edition (May 2003)

Before using this information and the product it supports, read the information in “Safety Notices” on page vii, Appendix B, “Environmental Notices”, on page 43, and Appendix C, “Notices”, on page 45.

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Safety Notices

Attention: When moving or relocating certain configurations of the system, the Bulk Power Regulators (BPRs) must be removed from the top of the rack (front and rear) to ensure product stability. Specifically, removal of the top two BPRs in the front and rear is required in systems that have fewer than 2 I/O drawers in the rack.

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

- vii
- 16

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

- viii
- ix
- 16
- 18

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

Electrical Safety

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

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.

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

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

D06

CAUTION:

This product is equipped with a four-wire (three-phase and ground) power cable for the user's safety. Use this power cable with a properly grounded electrical outlet to avoid electrical shock.

C27

DANGER

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

D01

CAUTION:

This unit has more than one power supply cord. Follow procedures for removal of power from the system when directed.

C28

CAUTION:

Energy hazard, remove power before servicing.

C22

CAUTION:

Energy hazard, remove all jewelry before servicing.

C29

Laser Safety Information

CAUTION:

This product may contain a CD-ROM, DVD-ROM, or laser module on a PCI card, which are class 1 laser products.

C30

Laser Compliance

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

CAUTION:

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

C25, C26

Data Integrity and Verification

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

About This Book

This book provides information about how to set up and cable the server, install and remove options, and verify server operation.

ISO 9000

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

Highlighting

The following highlighting conventions are used in this book:

Bold	Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels, and icons that the user selects.
<i>Italics</i>	Identifies parameters whose actual names or values are to be supplied by the user.
Monospace	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you should actually type.

Accessing Information

Documentation for the IBM @server pSeries is available online. Visit the IBM @server pSeries Information Center at http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base.

- To access the pSeries publications, click **Hardware documentation**.
- To view information about the accessibility features of @server pSeries hardware and the AIX operating system, click **AIX and pSeries accessibility**.

References to AIX Operating System

This document may contain references to the AIX operating system. If you are using another operating system, consult the appropriate documentation for that operating system.

This document may describe hardware features and functions. While the hardware supports them, the realization of these features and functions depends upon support from the operating system. AIX provides this support. If you are using another operating system, consult the appropriate documentation for that operating system regarding support for those features and functions.

Related Publications

The following publications provide related information:

- The *System Unit Safety Information*, order number SA23-2652, contains translations of safety information used throughout this book.
- The *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590, provides information to system administrators about how to install and use a hardware management console (HMC) to manage a system.
- The *@server pSeries 690 Service Guide*, order number SA38-0589, contains reference information, maintenance analysis procedures (MAPs), error codes, removal and replacement procedures, and a parts catalog.
- The *@server pSeries 690 User's Guide*, order number SA38-0588, contains information about how to use the system, use diagnostics, use service aids, and verify system operations.

- The *RS/6000 and @server Diagnostic Information for Multiple Bus Systems*, order number SA38-0509, contains diagnostic information, service request numbers (SRNs), and failing function codes (FFCs).
- The *RS/6000 and @server Adapters, Devices and Cable Information for Multiple Bus Systems*, order number SA38-0516, contains information about adapters, devices, and cables for your server. This manual is intended to supplement the service information found in the *Diagnostic Information for Multiple Bus Systems*.
- The *PCI Adapter Placement Reference*, order number SA38-0538, contains information regarding slot restrictions for adapters that can be used in this system.
- The *Site and Hardware Planning Information*, order number SA38-0508, contains information to help you plan your installation.
- The *Electronic Service Agent for pSeries and RS/6000 User's Guide*, order number LCD4-1060, contains information about using the Electronic Service Agent.

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- AIX
- AIX 5L
- Electronic Service Agent
- @server
- pSeries
- RS/6000

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Chapter 1. Reference Materials

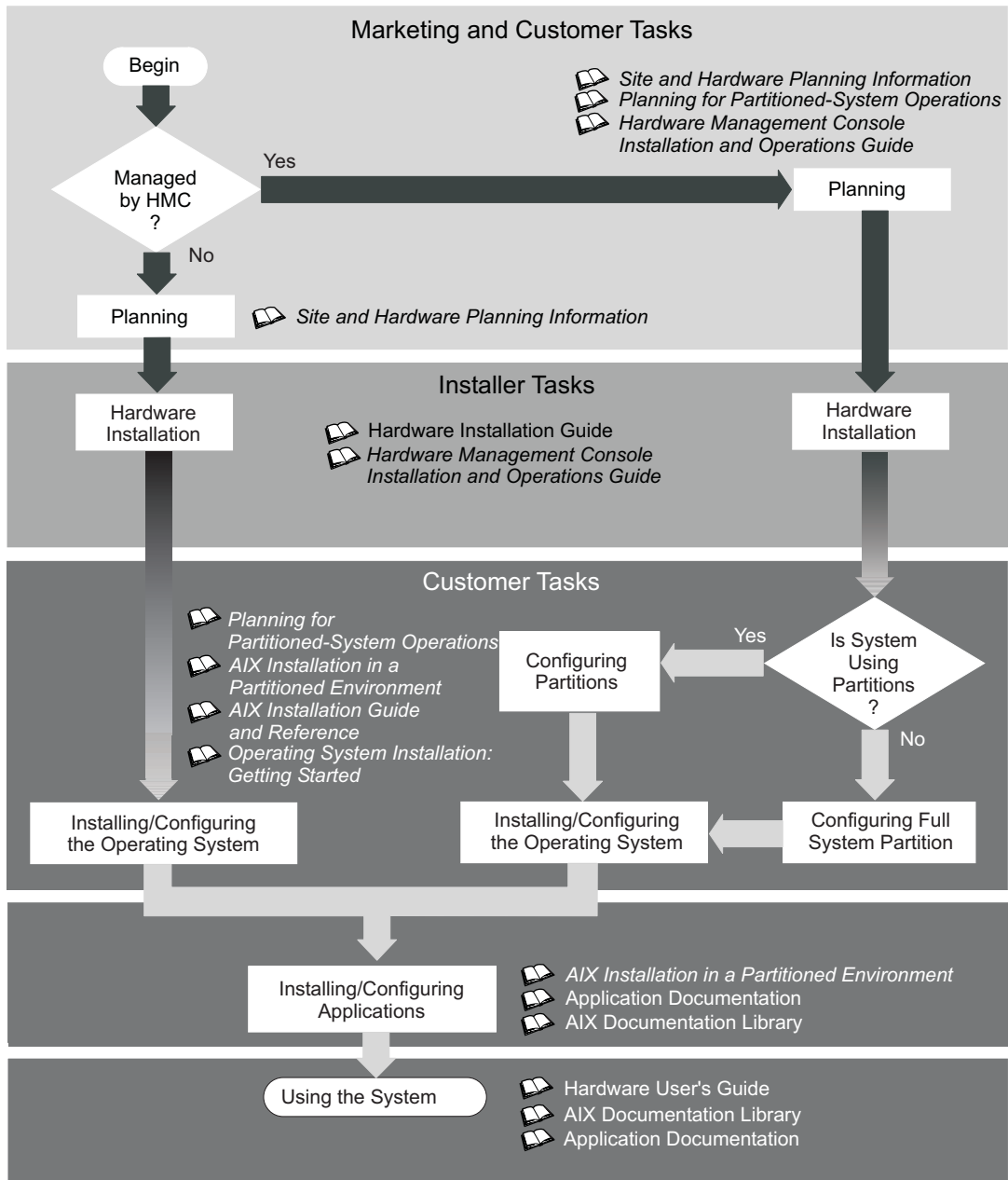
Note: This document may contain references to the AIX operating system. If you are using another operating system, consult the appropriate documentation for that operating system.

This document may describe hardware features and functions. While the hardware supports them, the implementation of these features and functions depends on support from the operating system. AIX provides this support. If you are using another operating system, consult the appropriate documentation for that operating system regarding support for those features and functions.

This chapter helps you get started with installing and configuring the @server pSeries environment. The following information is included in the chapter:

- @server pSeries Roadmap
- Documentation Overview - Brief description of the printed and softcopy documentation shipped including targeted audience

The @server pSeries Roadmap helps you locate marketing, service, and customer task information. The roadmap guides you through the tasks and the publications that document those tasks.



The publications listed in this section are available online. To access the online books, visit our IBM @server pSeries Information Center at http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base.

Documentation Overview

This section provides descriptions and target audience information for the @server pSeries and AIX 5L documentation libraries. Some of the documentation may only be available in printed form or in softcopy form. Based on the documentation content, the books are divided into the following categories: **Planning**, **Installing and Configuring**, and **Using the System**.

Table 1. Planning

Documentation Title	Description	Audience	Type
<i>Site and Hardware Planning Information</i>	Contains information to help plan for site preparation tasks, such as floor-planning, electrical needs, air conditioning, and other site-planning considerations.	Marketing, system administrators	softcopy
<i>Planning for Partitioned-System Operations</i>	Describes planning considerations for partitioned systems, including information on dynamic partitioning and Capacity Upgrade on Demand.	System administrators	printed and softcopy
<i>Hardware Management Console for pSeries Installation and Operations Guide</i>	Provides information on how to install, configure, and use a Hardware Management Console (HMC). Logical partition (LPAR) tasks, such as configuring and managing partitions on multiple host servers, are included.	System administrators	printed and softcopy

Table 2. Installing and Configuring

Documentation Title	Description	Audience	Type
Hardware Installation Guide	Provides information on how to install system hardware, cable the system, and verify operations.	System installer	printed and softcopy
<i>Planning for Partitioned-System Operations</i>	Describes planning considerations for partitioned systems, including information on dynamic partitioning and Capacity Upgrade on Demand.	System administrators	printed and softcopy
<i>Hardware Management Console for pSeries Installation and Operations Guide</i>	Provides information on how to install, configure, and use a Hardware Management Console (HMC). Logical partition (LPAR) tasks, such as configuring and managing partitions on multiple host servers, are included.	System administrators	printed and softcopy
<i>AIX Installation in a Partitioned Environment</i>	Provides information on how to install the AIX operating system in an LPAR environment.	System administrators	printed and softcopy
<i>AIX Operating System Installation: Getting Started</i>	Provides information on how to install and configure the AIX operating system on a standalone system using a CD-ROM device.	System administrators	printed and softcopy
<i>AIX 5L Installation Guide and Reference</i>	Provides information on installing the AIX 5L operating system on standalone systems, as well as on client systems using the Network Installation Management (NIM) interface.	System administrators	printed and softcopy
<i>PCI Adapter Placement Reference</i>	Outlines system-specific PCI adapter slot placement and adapter support configurations.	System administrators, service personnel	softcopy
<i>AIX 5L Release Notes</i>	Provides late-breaking information for a specific AIX release.	System administrators	printed and softcopy
<i>AIX 5L Documentation CD</i>	AIX documentation library (system management guides, user guides, application programmer guides, commands and files references, AIX man pages, and so on).	System administrators	softcopy

Table 3. Using the System

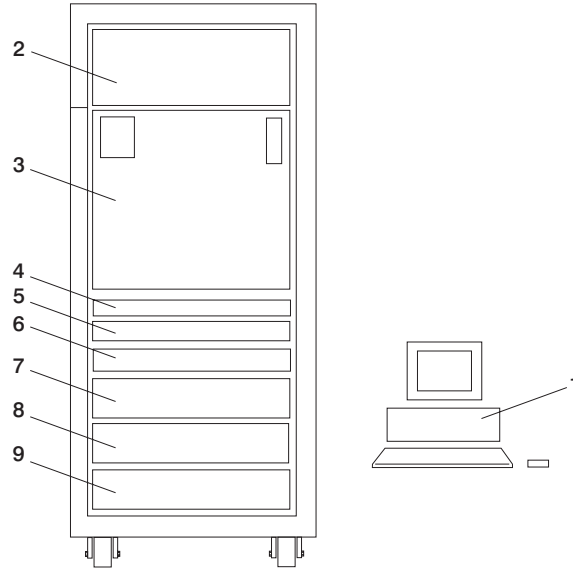
Documentation Title	Description	Audience	Type
<i>Hardware Management Console for pSeries Installation and Operations Guide</i>	Provides information on how to install, configure, and use a Hardware Management Console (HMC). Logical partition (LPAR) tasks, such as configuring and managing partitions on multiple host servers, are included.	System administrators	printed and softcopy
Hardware User's Guide	Provides using, problem determination, and service processor information.	System administrators	printed and softcopy
<i>Diagnostic Information for Multiple Bus Systems</i>	Combines operating instructions for hardware diagnostic programs with common MAPs and SRNs (Service Request Numbers).	Service personnel	printed and softcopy
<i>PCI Adapter Placement Reference</i>	Outlines system-specific PCI adapter slot placement and adapter support configurations.	System administrators, service personnel	printed
<i>Hardware Management Console for pSeries Maintenance Guide</i>	Contains MAPs, removal and replacement, error code, and parts information to help diagnose and repair the system.	Service personnel	printed and softcopy
<i>Adapters, Devices, and Cable Information for Multiple Bus Systems</i>	Provides information about adapters, devices, and cables that are attached to or used within the system.	System administrators	printed and softcopy
<i>System Unit Safety Information</i>	Contains the English version of safety notices, as well as translations of those safety notices into other languages.	System administrators, service personnel	printed and softcopy
<i>AIX 5L Documentation CD</i>	AIX documentation library (system management guides, user guides, application programmer guides, commands and files references, AIX man pages, and so on).	System administrators	softcopy

Chapter 2. Installing the @server pSeries 690

Use the procedures in this chapter to set up your pSeries 690. Installing the pSeries 690 can take approximately eight hours.

Minimum System Configuration

The minimum system configuration consists of the redundant bulk power subsystem, one processor subsystem, a media subsystem, and one I/O subsystem in the same rack, as well as access to a hardware management console for pSeries (HMC).



1	Hardware Management Console	5*,6*	Primary 7040 Model 61R Integrated Battery Feature (IBF) (Optional) for the Primary Power Subsystem
2	7040 Model 61R Bulk Power Subsystem	7	Redundant 7040 Model 61R Integrated Battery Feature (IBF) (Optional) is placed in the rear
3	7040 Model 681 Processor Subsystem	8	7040 Model 61D I/O Subsystem
4	7040 Model 681 Media Subsystem	9	7040 Model 61D I/O Subsystem (Optional)
		*	7040 Model 61D I/O Subsystem (Optional, if features 5 and 6 are not installed).

A secondary rack may be required to support additional I/O subsystems and is placed to the left of the primary rack.

Multiple System Configurations

The system configuration may vary. Other configurations include the following:

- Multiple pSeries 690 servers attached to one HMC. For more information on this configuration, see Appendix E, “Attaching Multiple pSeries 690s to One Hardware Management Console”, on page 61.
- Multiple HMCs attached to one pSeries 690.

Prerequisites to Installing the pSeries 690

Before installing the pSeries 690, ensure that the following have been completed:

- Doors have been ordered. The pSeries 690 has the following types of doors:
 - Primary Rack Front Door (Universal)
 - Secondary Rack Front Door (Universal)
 - Primary/SecondaryRack Rear Door (Slimline)
 - Primary/Secondary Rack Rear Door (Acoustical)
- Planning procedures outlined in *Site and Hardware Planning Information*, order number SA38-0508, are complete.

Weight Reduction

Certain system configurations may include a primary rack that weighs in excess of 2500 pounds (doors removed) as shipped from manufacturing. Some elevators have a weight restriction that prevents lifting these systems. To reduce the weight of affected systems to less than 2500 pounds, service personnel must remove all (up to six) Bulk Power Regulators (BPRs) installed in the system. For instructions on removing the BPRs, see step 3 on page 115.

Racks affected by this weight limitation are those in which the primary 7040 Model 61R frame with a 7040 Model 681 Processor Subsystem has three (or more) 7040 Model 61D I/O Subsystem and four (or more) IBFs. This weight reduction is only required for these systems when the installation process requires the primary rack to be reduced temporarily to less than 2500 pounds.

Note: Systems ordered with the height reduction feature do not require this weight reduction.

Before You Begin

To ensure that all of the installation steps are complete, the installer should use the following installation checklist during the installation process:

- “Complete the Installation Checklist” on page 33

Note: If the system you are installing will be managed by an HMC, and the HMC is not installed and functional, see the *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590, for instructions on installing the HMC. Install the HMC, then return here to continue with this procedure.

Step 1. Unpack the pSeries 690

Unpack the pSeries 690, and proceed to “Step 2. Check the Inventory”.

Step 2. Check the Inventory

To verify that you have all the items shipped with the pSeries 690, use the packing lists for each ship group.

The contents of the pSeries 690 tool kit are as follows:

Quantity	Description
5	Pad Cleaning Brush
2	Door Key
1	MCM Torque Wrench
1	L3 Support Tray

Quantity	Description
1	Magnifier Lens
1	Wrench
1	DASD Tool
1	Test Card
1	Tool Box Kit
2	Insertion Tool
1	Book Assembly
1	Tool Kit Case
1	Screwdriver
1	ASM Tool

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

- A floor plan, showing where to place each rack
- The items necessary for installing a modem, including the correct telephone jack, power cords, cables, and a power source

For information about the HMC inventory, refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide*.

Primary Rack Inventory

The following is a list of rack inventory items:

- Front and rear door for the primary rack
- Two power cords
- Optional display and keyboard

Secondary Rack Inventory (If Ordered)

The following is a list of secondary rack inventory items:

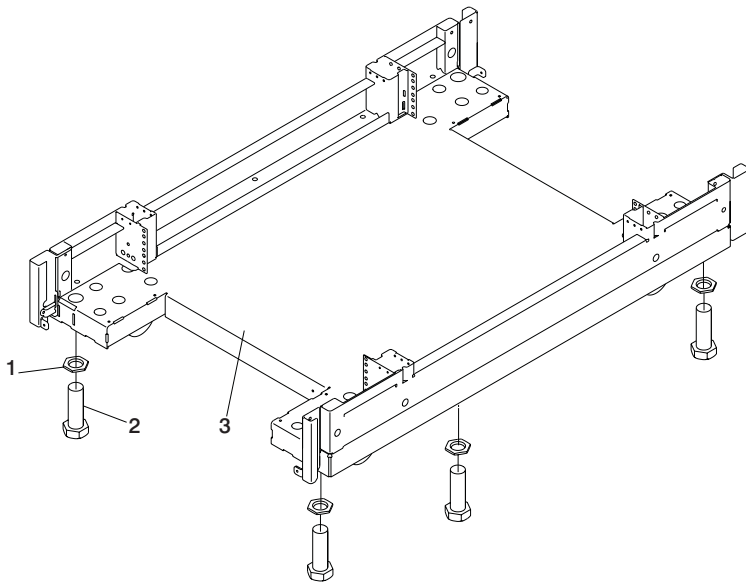
- Front and rear door for the secondary rack
- Rack bolt-together kit hardware
- Optional display and keyboard

Step 3. Position and Level the PrimaryRack

If the customer plans to secure the rack to the floor, see Appendix D, “Securing the Rack”, on page 47.

To adjust the leveling feet on the rack, do the following:

1. Ensure the rack is positioned according to the customer plan.
2. Loosen the jam nut on each leveling foot by turning the nut counterclockwise (away from the bottom of the rack).
3. Rotate each leveling foot downward until it contacts the surface on which the rack is placed.
4. Adjust the leveling feet downward as needed until the rack is level. When the rack is level, tighten the jam nuts against the base by turning the nut clockwise (toward the bottom of the rack).



1
2
3

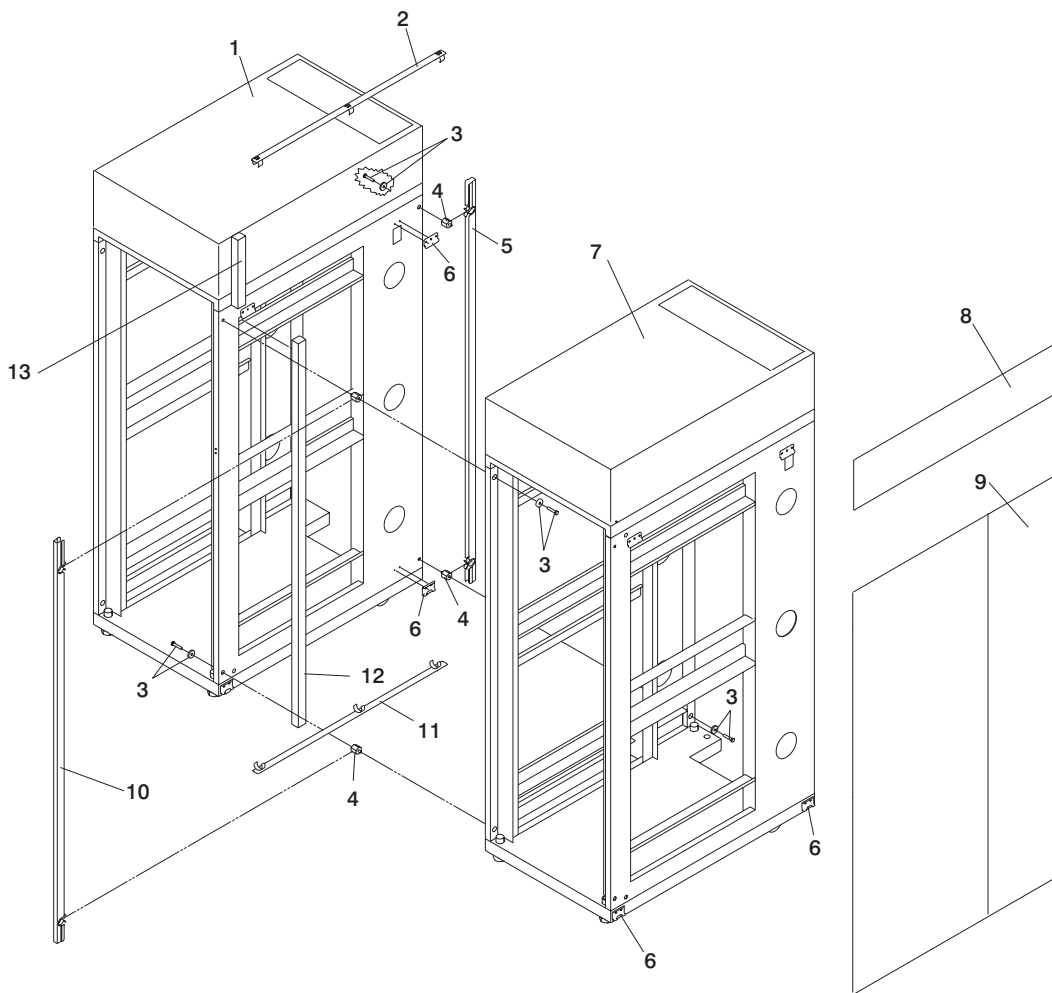
Jam Nut
Leveling Foot
Rack Base (Front)

Step 4. Attach and Cable Secondary Rack (If Ordered)

For more information about following this procedure, use the illustration on page 12. To attach and connect cables to the secondary rack, complete the following steps:

1. Screw two threaded standoffs to the primary rack and the other two standoffs to the secondary rack.
2. Attach the bottom EMC trim (part number 11P2872) to the secondary rack, using four screws.
3. Place the lower vertical foam on the secondary rack, starting at the EMC bottom trim.
4. Place the top vertical foam on top of the bottom foam.
5. Place the EMC top trim (part number 11P1105) on top of the secondary rack, using the middle two screws. Do *not* tighten the screws yet.
6. Place the two vertical EMC trim panels (part number 11P095) into position. The trim panels are located so that the flanges point into the frame and fit on the tabs of the bottom and top EMC trim.
7. Screw down the top EMC trim to lock in the vertical trim.
8. Roll the two frames together, being careful not to damage the EMC trim that has the standoffs.

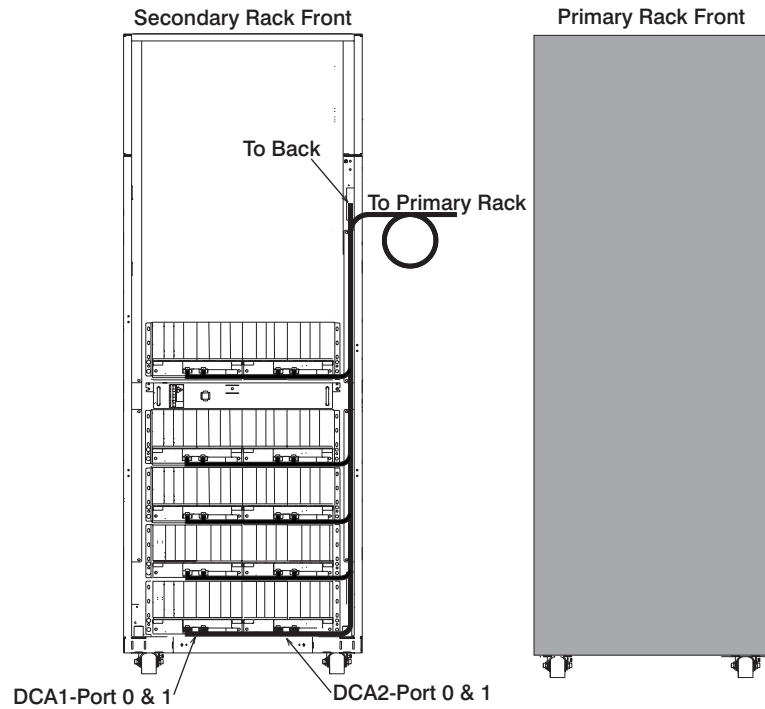
9. Use screws and washers to screw the frames together.



- | | |
|------------------------------------|------------------------------------|
| 1 Secondary Rack | 8 Top Frame Side Cover |
| 2 EMC Top Trim (P/N 11P1105) | 9 Primary Side Cover |
| 3 Bolt and Washer (Qty. 4 each) | 10 Rear Vertical Trim (P/N 11P095) |
| 4 Threaded Standoff (Qty. 4 each) | 11 EMC Bottom Trim (P/N 11P2872) |
| 5 Front Vertical Trim (P/N 11P095) | 12 Lower Vertical Foam |
| 6 J Bracket (Qty. 4) | 13 Top Vertical Foam |
| 7 Primary Rack | |

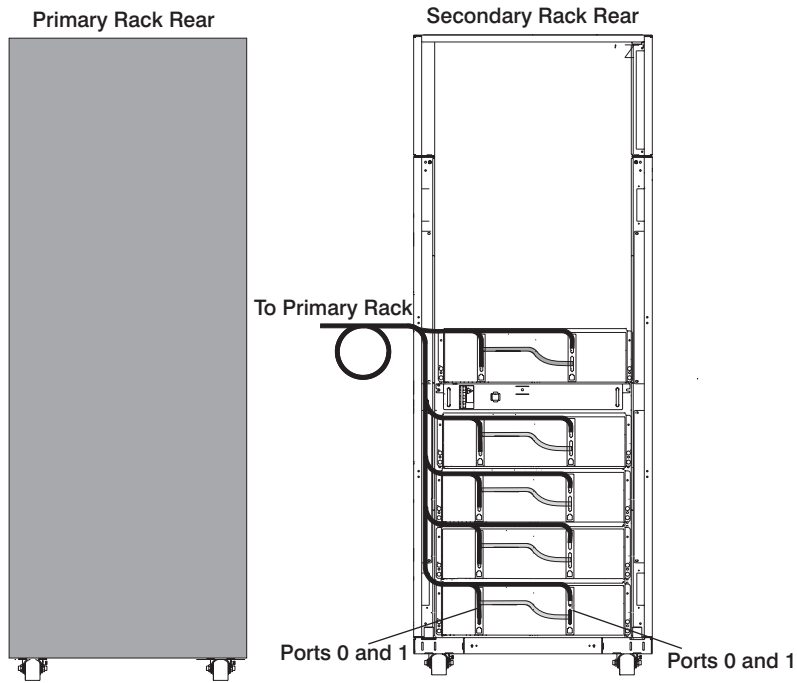
Connecting Internal Power Cords for the Secondary Rack

If you are installing a secondary rack, route the power cords from the primary rack to the secondary rack and connect them to the drawers in the secondary rack. For additional information on routing power cords, see Appendix H, “Cabling Information”, on page 101.



Connecting I/O Cables for the Secondary Rack

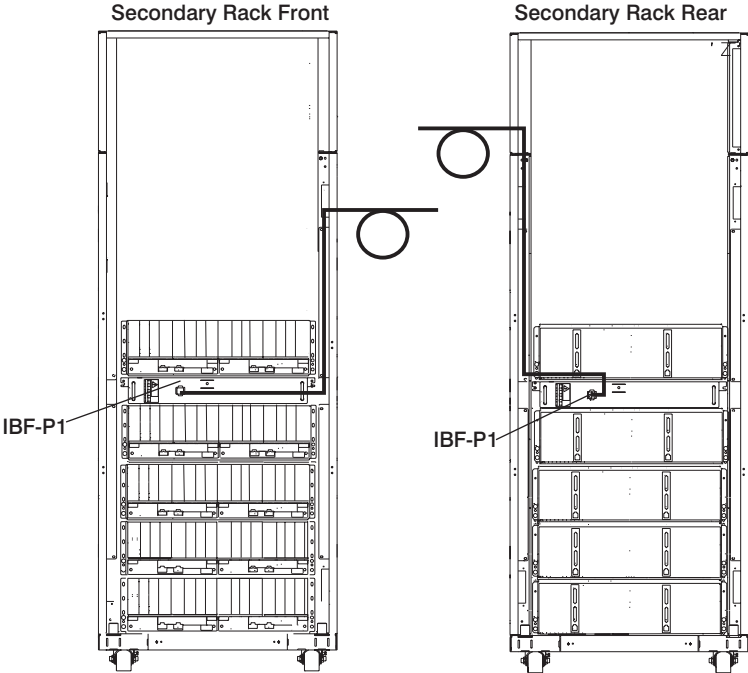
If you are installing a secondary rack, route the I/O cables from the primary rack to the secondary rack and connect them to the drawers in the secondary rack.



Note: For more information about cabling the pSeries 690, see Appendix G, “Subsystem Positioning and Cabling”, on page 77.

Connecting the Integrated Battery Feature Power for the Secondary Rack

If you are installing an IBF for the secondary rack, route the cables as shown in the following illustration:



Step 5. Affix the MCM/L3/Passthrough Plug Map to the Right Frame Extender

With the front cover open, locate the right frame extender (located on the opposite side of the unit emergency power off (UEPO) switch). The 50-mm (approximately 2 inch) wide label should be installed vertically, along this extender, approximately in line with EIA frame positions 22 - 28.

The trifold label has two hook-and-loop strips attached to the back. Remove the adhesive backing from the fastener and attach it to the frame extender as described above. A small piece of fastener is used to help keep it folded while attached to the frame.

Using the Map Label

Whenever an MCM or passthrough module is added as an MES, or replaced or reseated during a repair action, a sticker with the module's serial number is provided for use with the map label according to its plugging location. If the serial number label is not available, record the serial number of the MCM or passthrough module when it is added, reseated, or replaced, along with the number of times plugged. This module is then allowed three plugs with each plug recorded on label. If the module must be removed and reinstalled a fourth time, it must be replaced from field spares or with an MES.

The process is similar for the L3 module, except that a separate serial number sticker is not provided. Instead, the serial number is located on a sticker attached to the L3 heatsink. Record the serial number of the L3 module when it is added, replaced, and reseated, along with the number of times plugged. If the module must be removed and reinstalled a fourth time, it must be replaced from field spares or with an MES.

In addition, whenever an MCM, passthrough, or L3 module is replaced or reseated, the interposer plug count menu, which is one of the service processor menus, must be updated. See the "Interposer Plug Count Menu" in the *@server pSeries 690 Service Guide* for more information.

Step 6. Observe this Safety Notice During Installation

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.

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 four-wire (three-phase and ground) power cables 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. Follow procedures for removal of power from the system when directed.

CAUTION:

Energy hazard, remove all jewelry before servicing.

Step 7. Check the Cables and Connect I/O Devices

Cables may loosen during shipping. Check for loose cables before completing the installation. For cabling illustrations, see Appendix G, “Subsystem Positioning and Cabling”, on page 77. For further details on the cable descriptions and labels, see Appendix H, “Cabling Information”, on page 101.

Connect any externally attached I/O devices to the I/O subsystems at this time using the following procedures:

Note: If a display, Universal Serial Bus (USB) keyboard, and a USB mouse were ordered, do the following. If these components were not ordered, perform steps 4 and 5.

1. Connect the keyboard cable to the Keyboard/Mouse Attachment Card (adapter type N-D).

Note: Use any one of the four ports on the adapter; however, the adapter can support only one connection at a time.

2. Connect the mouse cable to the USB port on the upper corner of the rear of the keyboard.
3. Attach the display cable to either one of the two ports located on the graphics adapter.
4. Check all blind swap cassettes for broken latches by lightly pushing down on the rear of the handles. Replace any broken latches.
5. Check to ensure adapters are seated by pushing down on the small metal tab on top of the adapter.

The placement of the graphics adapters and keyboard adapters is described in the *PCI Adapter Placement Reference*.

Step 8. Verify that the Unit Emergency Power Off (UEPO) Switch is in the Off Position

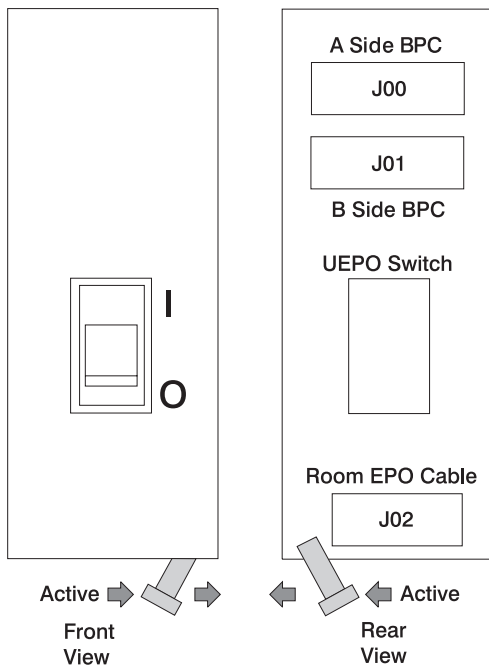
Note: *UEPO* refers to the red unit emergency power off switch located on the unit. *EPO* refers to the computer room emergency power off.

The unit emergency power off (UEPO) switch is located on the front of the primary frame (A Frame) of each pSeries 690. When the switch is tripped, utility power is confined to the machine power compartment. All volatile data will be lost.

Computer Room Emergency Power Off (EPO)

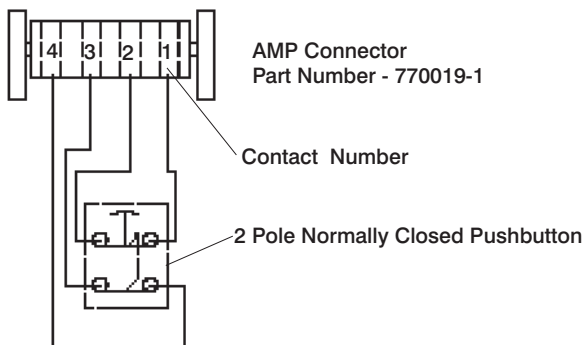
Attention: When the integrated battery feature (IBF) is installed and the room EPO is tripped, the batteries will engage and the computer will continue to run. It is possible to attach the computer room EPO system to the machine UEPO. When this is done, tripping the room EPO will disconnect all power from the power cords and the IBF backup unit. In this event, all volatile data will be lost.

To incorporate the IBF into the room EPO, a cable connection must be made to connect to the back of the system UEPO panel. The following diagrams illustrate how this connection is made.



The preceding figure illustrates the back of the machine UEPO panel with the room EPO cable plugging into the machine. After the switch actuator is moved to make the cable connection possible, the room EPO cable must be installed for the machine to power on.

In the following figure, an AMP connector 770019-1 is needed to connect to the system UEPO panel. For room EPO cables using wire sizes #20 AWG to #24 AWG, use AMP pins part number 770010-4.



Step 9. Check the Outlets and the Power Source

CAUTION:

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

Do the following to ensure that the customer has provided the correct power to the system:

- ___ 1. This system is equipped to use 200-240 V / 380-415 V / 480 V ac, three-phase. Check that the correct power source is available.

- ___ 2. Have the customer locate and turn off the branch circuit breaker and attach tag S229-0237, which reads “Do Not Operate.”

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

- ___ 3. 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.

- ___ 4. 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.

Note: If measured impedance is greater than 1 ohm and the test instrument used was a digital multimeter, verify that the grounding impedance is correct by using an appropriately approved ground-impedance tester.

- ___ 5. If any of the checks made in substeps 2, 3 and 4 are not correct, ask the customer to remove the power from the branch circuit and make the wiring corrections; then check the receptacle again.
- ___ 6. Check for infinite resistance between the phase pins. This is a check for a wiring short.

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.

- ___ 7. Have the customer remove tag S229-0237, which reads “Do Not Operate” and turn on the branch circuit breaker.

Note: If your power source does not have a standard receptacle, check for voltage using local procedures.

Measure for appropriate voltages between phases. If no voltage is present on the receptacle case or grounded pin, the receptacle is safe to touch.

- ___ 8. With an appropriate meter, verify that the voltage at the outlet is correct.

Note:

- For 200-240 V, the acceptable phase-phase voltage measurement range is 180-254 V.
- For 380-415 V, the acceptable phase-phase voltage measurement range is 342-440 V.
- For 480 V, the acceptable phase-phase voltage measurement range is 432-509 V.

- ___ 9. Verify that the grounding impedance is correct by using the ECOS 1020, 1023, B7106, or an appropriately approved ground impedance tester.
- ___ 10. Have the customer turn off the branch circuit breaker and attach tag S229-0237, which reads “Do Not Operate.”

Step 10. Connect and Route the Power Cords to the pSeries 690

Before you connect the power cords, loosen or remove the cable retainers and filler plate located along the side and bottom of the frame.

The following lists each of the brackets and recommended range of cable sizes for each:

Part Number	Description	Quantity	Recommended Usage
07H6823	Cable Retention Bracket	2	Use in the base of the frame to retain cables leaving the frame. This bracket is used for large diameter cables.
07H6824	Cable Retention Bracket	12	Use in the base of the frame to retain the cables leaving the frame. This bracket is used for medium diameter cables.
11P1262	Cable Retention Bracket	4	Use in the base of frame to retain the cables leaving the frame. This bracket is used for small diameter cables and fiber.
07H6764	Filler Plate (thin)	3	Use in the base of the frame to cover the openings. Install in the base of the frame after all of the cable retention brackets are installed.
07H6763	Filler Plate (wide)	4	Use in the base of the frame to cover openings. Install in the base of the frame after all of the cable retention brackets are installed.
31L7174	Soft Cable Ties (roll)	1	Use to organize the cables leaving frame.

The pSeries 690 has two power cords, one in the rear and one in the front. To route the front power cord, do the following:

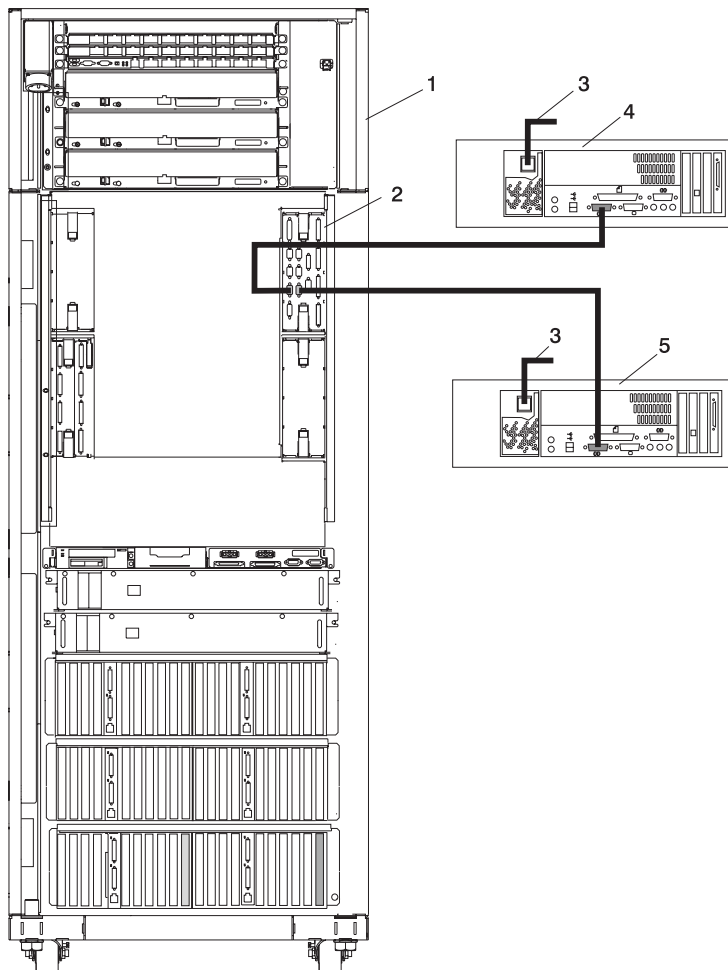
1. Connect the plug to the Bulk Power Assembly (BPA), and ensure that the dots are aligned on the plug and receptacle.
2. Secure the power cord in the channel, with the brackets from top to bottom.
3. Loosen the screw on the brackets in the track on the left side. Remove the UEPO switch, and route the power cord behind the UEPO switch.
4. Remove the lower panel of the frame, and route the cord through the channel under the frame.
5. Route the front power cord underneath the frame to the front floor tile hole. For more information about floor cutouts, refer to the *Site and Hardware Planning Information*, order number SA38-0508.
6. Replace the lower panel of the frame.
7. Replace the UEPO switch on the front of the system.

To route the rear power cord, do the following:

1. Connect the plug to the Bulk Power Assembly (BPA), and ensure that the dots are aligned on the plug and receptacle.
2. Secure the power cord in the channel with the brackets from top to bottom.
3. Remove the lower panel of the frame, and route the cord through the channel under the frame.
4. Route the rear power cord underneath the frame to the back floor tile hole. For more information about floor cutouts, refer to the *Site and Hardware Planning Information*, order number SA38-0508.
5. Replace the lower panel of the frame.

Step 11. Verify the Hardware Management Console (HMC) Installation

Verify that the HMC is installed, then connect the HMC serial cable to serial port HMC1 on the primary I/O book. For two HMCs, connect the redundant HMC into serial port HMC2 on the primary I/O book. The following illustration shows the location of the serial ports on the rear of the HMC and the HMC connectors located on the primary I/O book.



- | | | | |
|---|---|---|--|
| 1 | Primary Rack | 4 | Primary HMC Connected to serial port HMC1* in Primary I/O Book |
| 2 | Primary I/O Book | 5 | Optional Second HMC Connected to serial port HMC2* in Primary I/O Book |
| 3 | Power Plug to External Power Source (wall plug) | | * May be labeled HSC1 and HSC2 |

The part numbers for the serial cables for the pSeries 690 are the following:

Part Number and Description	Position
11P3955 6-m cable	9 Position to 9 Position
11P3956 15-m cable	9 Position to 9 Position
31L7196 15-m cable	9 Position to 25 Position

Step 12. What is the Next Step?

The next step in the installation procedure is to apply power to the system and verify that the system is ready to be used for regular operations. Complete the steps in the checklist in Chapter 4, “Completing the Installation”, on page 33 to verify that the system is ready, and then return to “Step 13. Turn on the IBF Breaker (If Present)” to complete the installation.

Step 13. Turn on the IBF Breaker (If Present)

Turn on the Integrated Battery Feature (IBF) breaker before turning the UEPO switch on the pSeries 690.

Step 14. Have the Customer Activate the Designated Circuit Breakers

Have the customer activate the designated circuit breakers by doing the following:

1. Ensure that the tag S229-0237, which reads “Do Not Operate,” has been removed.
2. Reset the circuit breaker.

Note: The following steps should be performed only by the service representative.

3. Turn the pSeries 690 UEPO switch to the ON position.
4. Verify that the LEDs on the bulk power assembly are on. Verify that OK displays on the pSeries 690 operator panel.

Step 15. Install the Doors

This step describes how to install the front and rear doors on the pSeries 690. For more information about the doors, see “Prerequisites to Installing the pSeries 690” on page 8.

Note: The upper pin is longer than the bottom pin. The door is made of aluminum for weight reasons.

Install the Front Door

To install the front door, do the following (refer to the illustration on page 23):

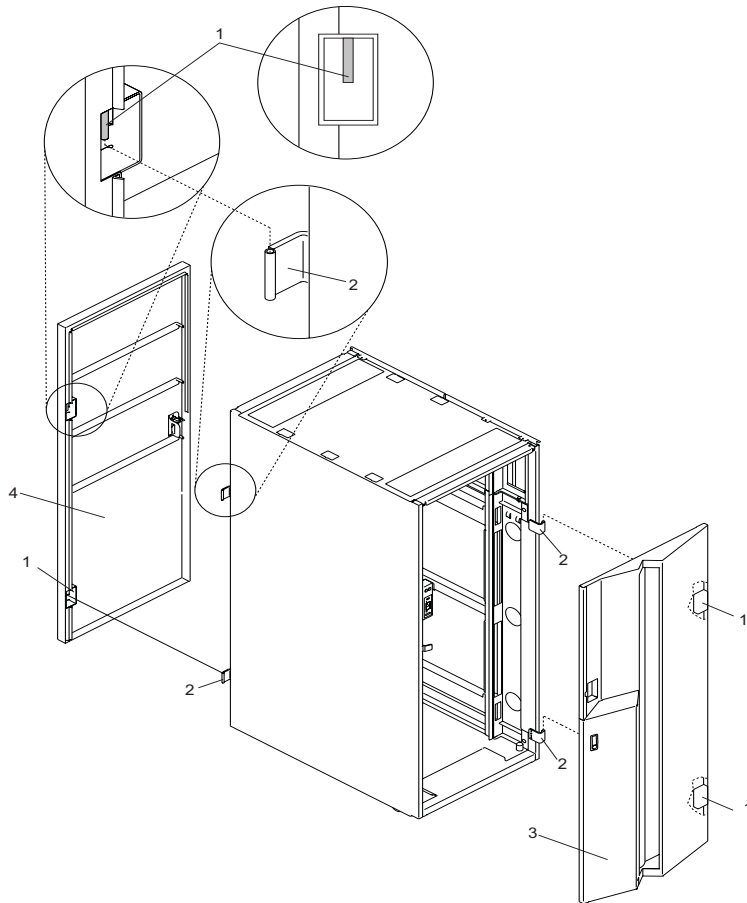
Note: After installing the front and rear doors, it may be necessary to adjust the latch.

1. Holding the door vertically and opened at approximately 45 degrees from the frame, lift the door and carefully engage the top pin into the hinge hole.
2. Continue to hold the door vertically and lift slightly to engage the bottom pin. Before removing your hands from the door, verify that the pins are engaged in the hinge holes.
3. Position the door so that both the top and the bottom hinge pins (1) partially engage the hinges.
4. Simultaneously slide the top and bottom hinge pins on the front door into the top and bottom hinges (2) on the rack.
5. Close the front door, and engage the latch on the left side of the door.

Install the Rear Door

To install the rear door, do the following (refer to the illustration on page 23):

1. Position the door so that both the top and the bottom hinge pins (1) partially engage the hinges.
2. Simultaneously slide the top and bottom hinge pins on the rear door into the top and bottom hinges (2) on the rack.
3. Close the rear door, and engage the latch on the left side of the door.



1 Hinge Pin (Typical Front and Rear Door)

2 Rack Hinge (Typical Front and Rear Door)

3 Front Door

4 Rear Door

Proceed to Verifying the Hardware Operation

Proceed to Chapter 3, "Verifying the Hardware Operation", on page 25.

Chapter 3. Verifying the Hardware Operation

Use the system verification procedure discussed in this chapter to check the system for correct hardware operation.

Considerations Before Running This Procedure

Read the following before using this procedure:

- The AIX operating system must be installed on your system before you attempt to perform this procedure.
- If this system unit is directly attached to another system unit or attached to a network, be sure communications with the other systems are stopped.
- This procedure requires use of all of the system resources. No other activity can be running on the system while you are performing this procedure.
- This procedure requires a hardware management console for pSeries (HMC) attached to the HMC port on the pSeries 690.
- This procedure runs the AIX online diagnostics in service mode on a system booted in full system partition mode.

Does the system have AIX diagnostics preinstalled?

Yes Go to “Loading the Online Diagnostics in Service Mode” on page 28.

No Go to “Loading the Standalone Diagnostics from CD-ROM” on page 28.

Power On the System

You can power on the pSeries 690 by using HMC or by using the power button on the media subsystem operator panel.

For more information about using the HMC, refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide*.

HMC Power-On

To power on the managed system, you must be a member of one of the following roles:

- System Administrator
- Advanced Operator
- Operator
- Service Representative

To use the HMC to power on the managed system, do the following:

1. In the Navigation area, click the **Partition Management** icon.
2. In the Contents area, select the managed system.
3. In the menu, click **Selected**.
4. Select **Power On**.

You are asked to select a power-on mode from the following:

- Partition Standby
- Full System Partition
- System Profile
- Power-on Autostart

The next section discusses each of these power-on modes.

Note: You must power off your managed system to switch between using the full system partition and using either logical or affinity partitions. You must also power off the system between using logical partitions and affinity partitions.

Partition Standby

The partition standby power-on option allows you to create and activate logical partitions. When the partition standby power-on is completed, the operator panel on the managed system displays LPAR..., indicating the managed system is ready for you to use the HMC to partition its resources.

Note: The full system partition is listed as *Not Available* because the managed system was powered on using the partition standby option.

Full System Partition

The full system partition power-on option allows you to use all of the system's resources under one operating system after the system has been powered on. This is the traditional single-system method of using your system's resources.

The physical operator panel on your managed system displays progress codes when you boot the system in this mode.

If you select the full system partition option, you can then select one of the following profiles:

Power On Normal

This profile boots an operating system from the designated boot device.

Power On SMS

This profile boots to the System Management Services (SMS) menus. The SMS menus include:

- Select Language
- Change Password Options not Available in LPAR Mode
- View Error Log
- Setup Remote IPL (Initial Program Load)
- Change SCSI Settings
- Select Console not Available in LPAR Mode
- Select Boot Options

Power On Diagnostic Stored Boot List

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

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

Power On Diagnostic Default Boot List

This profile is similar to Power On Diagnostic Stored Boot List Profile, except the system boots using the default boot list that is stored in the system firmware.

Power On Open Firmware OK Prompt

This profile is used only by service representatives to obtain additional debug information. When this selection is enabled, the system boots to the open firmware prompt.

For more information about these power-on options, see the service documentation for your managed system.

System Profile

The system profile option powers on the system according to a predefined set of profiles.

Note: The profiles are activated in the order in which they are shown in the system profile.

Power-on Autostart

This option powers on the managed system to partition standby mode and then activates all partitions that have been powered on by the HMC at least once. For example, if you create a partition with four processors, and then you use dynamic logical partitioning (DLPAR) to remove one processor, and then shut down the system, the Power-on Autostart option activates this partition with three processors. The system activates the partition with three processors because the three-processor configuration was the last configuration used, and the HMC ignores whatever you have previously specified in the partition's profile. Using this option, the partitions boot using AIX, even if some of the partitions had previously been defined to use another power-on option.

Media Subsystem Operator Panel Power-On

Perform the following steps to power-on the processor subsystem and attached I/O subsystems using the power button on the media subsystem operator panel.

1. Open the rack door. Look for OK in the primary operator panel display, which indicates that the system is in standby mode.

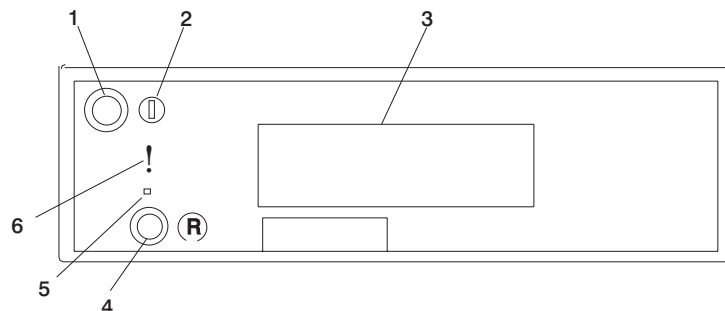
Note: If the power has recently been connected to the system, you might need to allow approximately five minutes after the OK prompt displays before pressing the power-on button on the media subsystem, or using the service processor, to turn the system power on.

2. Press the power-on button on the media subsystem operator panel.

The power LED on the media subsystem operator panel starts blinking at a fast rate. 9xxx checkpoints appear in the operator panel display.

When the power-on sequence is complete, the following events have occurred:

- The power LED on the media subsystem operator panel stops blinking and stays on.
- The power LEDs on the I/O subsystem come on and stay on.



1 Power-on button

2 Power LED

3 Operator panel display

4 Reset button

5 Service processor reset button
(Service use only)

6 Disturbance or system
attention LED

Loading the Online Diagnostics in Service Mode

Note: Online diagnostics are not available when the system is running Linux.

To run the online diagnostics in service mode from the boot hard disk, do the following:

1. From the HMC, click **Server**.
2. From the HMC, click **Partition Management**.
For more information about full system partitions, refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590.
3. From the HMC, click **Server Management**.
4. Select the pSeries 690 in the Contents area, right-click on the mouse, and select **Open Terminal Window**.
5. From the service processor menu on the VTERM, select Option 2 **System Power Control**.
6. Select option 6. Verify that the state changes to currently disabled. Disabling fast system boot automatically enables slow boot.
7. Select option 98 to exit the system power control menu.
8. Use the HMC to power on the managed system in full system partition mode by selecting the managed system in the Contents area.
9. Highlight the desired system by right-clicking on or selecting the system in the Contents area. On the menu, click **Selected**.
10. Click **Power On**.
11. Click the **Power on Diagnostics Stored Boot List**.
12. Ensure that the media subsystem contains no media devices.
13. Enter any passwords, if requested.

Note: If you are unable to load the diagnostics to the point when the DIAGNOSTIC OPERATING INSTRUCTIONS display, go to “Loading the Standalone Diagnostics from CD-ROM”.

Go to “Running System Verification” on page 29.

Loading the Standalone Diagnostics from CD-ROM

To run standalone diagnostics in service mode from CD-ROM, use the following steps:

1. Stop all programs, including the operating system (get help if needed).
2. Remove all tapes, diskettes, and CD-ROMs.
3. Power off the pSeries 690 (for more information, see *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590, for more information).
4. In your desktop area, right-click on the mouse and select **Open Terminal Window**.
5. From the service processor menu on the VTERM, select option 2, **System Power Control Menu**.
6. Select option 6. Verify that the state changes to currently disabled. Disabling fast system boot automatically enables slow boot.
7. Select option 98 to exit the system power control menu.
8. Use the HMC to power on the managed server in full system partition mode. Select **Power on Diagnostic Default Boot List**.
9. Insert the CD-ROM into the CD-ROM drive in the media subsystem in the pSeries 690 (*not* into the HMC CD-ROM drive).

Go to “Running System Verification” on page 29.

Note: If you are unable to load standalone diagnostics, call your support center for assistance.

Running System Verification

Before you run system verification, the diagnostics must have been loaded. For information about how to load diagnostics, see Chapter 3, “Verifying the Hardware Operation”, on page 25.

When the Diagnostic Operating Instructions display, do the following to run system verification:

1. Press Enter.
2. If the terminal type is requested, you must use the **Initialize Terminal** option on the Function Selection menu to initialize the operating system before you can continue with the diagnostics.
3. Select the **System Verification** option on the Diagnostic Mode Selection menu.
4. To run a general checkout of all installed resources, select the **All Resource** option on the Diagnostic Selection menu. Follow the instructions on the screen to complete the checkout procedure.
To check one particular resource, select that resource on the Diagnostic Selection menu.

The checkout program ends with either of the following results:

- The Testing Complete screen displays a message stating No trouble was found.
- The A Problem Was Detected On (Time Stamp) menu displays, with either a service request number (SRN) or an error code. Make a note of any codes displayed on the display or operator panel.

To perform additional system verification, go to “Performing Additional System Verification”. To exit diagnostics, go to “Stopping the Diagnostics”.

Performing Additional System Verification

To perform additional system verification, do the following:

1. Press Enter to return to the Diagnostic Selection menu.
2. To check other resources, select the resource. When you have checked all of the resources you need to check, go to “Stopping the Diagnostics”.

Stopping the Diagnostics

To stop the diagnostics, do the following:

1. To exit the diagnostics, press the F3 key (from a defined terminal) or press 99 (from an undefined terminal).
2. If you changed any attributes on your terminal to run the diagnostics, change the settings back to normal.
3. This completes the system verification.

If the server passed all the diagnostic tests, the verification process is complete and your server is ready to use.

If you received an error code, record the code and go to the *@server pSeries 690 Service Guide*.

Verifying that the Latest Firmware and Adapter and Drive Microcode are Installed

Use the procedures in this section to verify that the latest firmware and adapter microcode are installed on the system. The firmware and microcode are available from either of the following sources:

- Web site:
<http://techsupport.services.ibm.com/server/mdownload2/download.html>

From the Web site, follow the instructions for checking your system's firmware level and for downloading the latest level of code. Adapter and drive microcode packages are also available from this Web site.

- Current Object Repository (CORE):

If you have access to CORE, do the following to access the firmware and microcode:

1. Access Current Object Repository (CORE).
2. Select **CORE Product Family** and **eServer pSeries - RS/6000**
3. Select **CORE Machine Type** and **pSeries - RS/6000 - Microcode-System/Service**

Verifying Partition Standby Operation

Use the following instructions to verify that the system can be booted to partition standby mode. Perform this procedure just before you turn the system over to the customer.

1. At the HMC, select **Server**, then **Partition**.
2. In the Navigation Area, select **Server Management**.
3. In the Contents area, select the managed system and right click on the managed system.
4. Select **Power On**.
5. In the Power On Operations menu, select **Partition Standby**.
6. Click OK.
7. If the boot to partition standby is successful, **LPAR** will appear in the operator panel. Reboot the system to full system partition.
8. If the boot to partition standby is not successful, follow normal service procedures to correct the problem.

Verifying that the Latest HMC Software is Installed

Use the following instructions to verify the software level of the HMC that is managing the system you just installed.

1. Determine the level of the HMC software running on the HMC. If you don't know the level of your HMC's software, refer to the section entitled "Updating the HMC Software" in the *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590.
2. Go to the following Web site for the latest HMC corrective service software:
<http://techsupport.services.ibm.com/server/hmc/corrsrv.html>. If the level of software on your HMC is not at the same level as the version on the Web, download and update the HMC software to the latest level. Instructions for updating the HMC software can be found in the *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590.

Final Installation Tasks

This section contains information on completing the installation of the pSeries 690.

For instructions on returning the crates, refer to the crate unpacking instructions provided with the pSeries 690.

Completing System Records and Installation Procedure

Update the "System Records" in Appendix F, "System Records", on page 69 to reflect the configuration of the system adapters and devices that are installed. After completing the records, deliver this book to the system administrator. The system administrator can proceed with installing and configuring the operating system.

Configuring the Network

To configure the network, the following tasks must be performed:

- Configuring Inventory Scout
- Collecting Vital Product Data (VPD)
- Configuring Service Agent

For more information about performing these tasks, refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide*.

Chapter 4. Completing the Installation

This chapter contains information about how to ensure that the installation is complete and you are ready to turn the system over to the system administrator. Complete the steps described in this chapter *after* you verify the hardware operation as described in Chapter 3, “Verifying the Hardware Operation”, on page 25.

Complete the Installation Checklist

The installation instructions prompt you through the installation procedure. Use this checklist as you work to ensure that the installation process is complete.

Note: The procedures referenced in this section might be optional on your system. Contact your service support representative for more information.

To complete an installation when an HMC is used to manage a full system partition on a managed system, the installer must complete the following:

- ___ 1. Locate the installed HMC. If the HMC is not already installed, install it now. Refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590.
 - ___ 2. Arrange the HMC and attached devices so that they can be used comfortably. Refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590.
 - ___ 3. Ensure that the HMC is running. Refer to *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590.
 - ___ 4. Connect the power to the system. Refer to “Step 10. Connect and Route the Power Cords to the pSeries 690” on page 20.
 - ___ 5. Verify the system operation by completing the procedures in Chapter 3, “Verifying the Hardware Operation”, on page 25.
 - ___ 6. Verify that the latest firmware and adapter/drive microcode code are installed. Refer to “Verifying that the Latest Firmware and Adapter and Drive Microcode are Installed” on page 29.
 - ___ 7. Ensure that the operating system is installed:
 - If an operating system has been preinstalled in your system, go to the next step.
 - If you plan to install the operating system now, see the installation instructions provided with the operating system.
 - The operating system can be installed from a CD (if a CD-ROM drive is installed). For this method, the system must have a CD-ROM drive.
 - The operating system can be installed from a Network Installation Management (NIM) server. For information about installing AIX from a NIM server, see the *AIX 5L Installation Guide and Reference*, order number SC23-4389.
 - ___ 8. If the system is not running, start the system. Refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590, for procedures on starting the system from the HMC.
 - ___ 9. Configure the network and the automated service reporting functions. Perform the following procedures:
 - ___ a. Configure Inventory Scout Services and Service Agent.
 - ___ b. Collect vital product data.
 - ___ c. Transmit vital product data.
- For more information about performing these tasks, refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590.
- ___ 10. Leave this installation guide with the system administrator.

Leave this Document with your Customer

Because customers may need this guide to perform various tasks, leave this guide with them for their reference.

Chapter 5. Capacity Upgrade on Demand Features

This chapter is intended for system administrators to use as a reference if the system has any Capacity Upgrade on Demand features. Read this chapter for more information about those features, including how to activate or deactivate them.

Capacity Upgrade on Demand

The Capacity Upgrade on Demand (CUoD) features available on your system allow the system to be manufactured with additional capacity, such as processors and memory. The hardware is delivered with these features built in, ready to be activated when you need them. If your system is ordered with a CUoD feature, you can activate the feature and pay for the increased processing power as your needs grow.

CUoD features enable you to start small, and then increase your processing capacity without disrupting any of your current operations.

After your system with the ordered CUoD features is delivered, you can activate those features in the following ways:

- Capacity Upgrade on Demand (CUoD) for processors
- Capacity Upgrade on Demand (CUoD) for memory
- On/Off Capacity on Demand - for processors
- Trial Capacity on Demand - for processors or memory

These choices allow you to try CUoD features for a period of time or to permanently activate features that you decide you need. On/Off Capacity on Demand allows you to use additional capacity when you need it, and then to turn it off.

Processor CUoD

When you activate processor CUoD, additional processors are permanently activated and usable on your system. Processor CUoD enables you to handle business peaks or add new workloads without having to reboot the server.

For further information about activating processor CUoD on your system, refer to “Activation Process for CUoD Features” on page 37, or refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590, that was delivered with your hardware management console.

Memory CUoD

When you activate memory CUoD, it is permanently activated and usable on your system. Memory CUoD enables you to handle business peaks or add new workloads without having to reboot the server.

For further information about activating memory CUoD on your system, refer to “Activation Process for CUoD Features” on page 37, or refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590, that was delivered with your hardware management console.

On/Off Capacity on Demand

On/Off Capacity on Demand allows you to use extra processor resources that are available on your system. On/Off Capacity on Demand is ordered ahead of time so that the capacity is available on the system when it is needed. When you have finished using the extra capacity, you can turn it off and save the remaining time until the resource is needed again. You use an activation code to order the amount of usage time. Turning the processors on and off is performed from the HMC interface.

For further information about activating and deactivating On/Off Capacity on Demand on your system, refer to “Activation Process for CUoD Features” on page 37, or refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590, that was delivered with your hardware management console.

Trial Capacity on Demand

Trial Capacity on Demand enables CUoD features to be activated one time for a period of 30 consecutive days. If your system was ordered with CUoD features and they have not yet been activated, you can turn the features on for a one-time trial period. With the trial capability, you can gauge how much capacity you might need in the future, if you decide to permanently activate the resources you need.

Alternatively, the Trial Capacity on Demand function can be used to immediately activate resources while processing an order for a permanent activation code.

For further information about using Trial Capacity on Demand, refer to “Activation Process for CUoD Features” on page 37, or refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide*, order number SA38-0590, that was delivered with your hardware management console.

Capacity Planning

If you are doing capacity planning for models with CUoD features, plan ahead for any potentially disruptive actions that might inhibit your using fully the capacity of the system. Some actions you may want to take prior to activating any CUoD features are as follows:

- Perform any I/O updates, such as adding adapters necessary to increase system capacity
- Perform memory upgrades (CUoD) or standard memory features
- Prepare logical partitions

By planning ahead, you can accommodate the growth of existing workloads, as well as handle new workloads without requiring a server outage. Each component of a server affects performance and overall throughput of workloads. By planning ahead and taking into account the complete server configuration, you can help ensure that you get the full benefit of CUoD activations.

Note: If you have questions about capacity-planning topics not covered here, contact your sales representative for assistance.

Processor CUoD Ordering

Permanent CUoD capacity can be activated in either one of the following scenarios. The description of each scenario indicates if and when it is necessary to send vital product data (VPD) to IBM.

- **New system order (new footprint):** An order can contain a number of CUoD-activation features. The manufacturing facility fills orders directly at the plant of manufacture, before the server is delivered to the customer.
- **Ordering activation features for an installed server:** After you have determined that you want to permanently activate some or all of your CUoD features, contact your business partner or sales representative to place an order.

When the order record and the VPD are both available to the manufacturing facility, a processor CUoD activation code unique to your server is generated. The activation code is mailed to you and posted at <http://www.ibm.com/servers/eserver/pseries/cuod/index.html>.

As part of the order process, VPD collected from the installed server is combined with information from the order records for CUoD activation features. This combined information is used to generate a CUoD activation code specifically for your server, enabling the activation of the appropriate features. Allow some time for the order processing and posting of the processor on demand activation code to take place. Then use the code to activate the processor on demand features directly on your server.

If you need to activate resources immediately, you can activate features using the Trial Capacity on Demand function. This allows you to use the resources immediately while the permanent activation code is being processed.

CUoD activation features will not be fulfilled until you submit the VPD through the Electronic Service Agent or manually to <http://www.ibm.com/servers/eserver/pseries/cuod/index.html>.

When you enter a CUoD activation code, standby processors or memory will immediately become activated for use. If your operating system is enabled for dynamic LPAR operations, the resource status changes from standby to active. The resources then can be dynamically moved to the partition where they are needed.

If a CUoD activation feature is ordered and then canceled, an action by the service representative is required to cancel the order. After the activation code is posted on the Web or mailed, the order for CUoD activation features is considered fulfilled, and the billing process is started.

Electronic Service Agent and Capacity Upgrade on Demand

When Electronic Service Agent is used to electronically report VPD on a regular basis, you can eliminate potential delays in the order process for CUoD activation features (no manual reporting of VPD is necessary prior to the fulfillment of a feature upgrade order). To optimize Electronic Service Agent and to be prepared to activate CUoD features conveniently, make sure that Electronic Service Agent and related communications equipment are up and running. If this is done before the CUoD activation features are ordered, the VPD for the system will already be up to date, and the manual process of updating the VPD is not needed.

After Electronic Service Agent is installed, follow the procedures under “Activation Process for CUoD Features” to enable the system to collect and transfer the required VPD for CUoD.

Dynamic Processor Sparing

In environments with CUoD, dynamic processor sparing allows inactive processors to act as *dynamic spares*. An inactive processor is activated if a failing processor reaches a predetermined error threshold, thus helping to maintain performance and improve system availability. Starting with AIX 5.2, this capability is offered on pSeries servers with CUoD to help minimize the impact to server performance caused by a failed processor. Dynamic sparing will happen dynamically and automatically when using dynamic logical partitioning (DLPAR) and the failing processor is detected prior to failure. If not detected prior to failure or not using DLPAR, a reboot of the system activates an alternate processor from the inactive spares. The user can then re-establish required performance levels without waiting for parts to arrive on-site. Dynamic processor sparing does not require the purchase of an activation code; it requires only that the system have inactive CUoD processors available.

Software Licenses and Processor CUoD

Activating a processor may change the terms and conditions for applications that you use on your server. To determine if the license terms and conditions requirements change based on hardware configuration, consult the application documentation.

Activation Process for CUoD Features

The process begins when you determine a potential need for more processing capability in the future and want to have the hardware installed on the server now. If CUoD feature is ordered for your server, they are included in the server when it is delivered. To activate additional capacity when it is needed, use the following steps:

1. Determine the additional capacity that you want to activate.
2. Contact your sales representative or business partner to place an order for specific processor CUoD activation features.
3. The sales representative places an order to the system coordinator or feature coordinator for the features you request. The order specifies the upgrade features to add.
4. To process the order, you must send the system Vital Product Data (VPD) to IBM in either of the following ways:
 - Electronic process (Electronic Service Agent)

- Web-based VPD entry. For details on how to submit the VPD either through the Electronic Service Agent or using the Web, view the *Planning Guide for Capacity Upgrade on Demand* located at <http://www.ibm.com/servers/eserver/pseries/cuod/index.html>.
5. After the activation code is received (from either the Web or the mailed copy), use the HMC to enter the activation code. Detailed procedures are available in the *Planning Guide for Capacity Upgrade on Demand*.

After you have finished the activation process, you can assign the activated processors to a partition. If you are using dynamic partitioning (DLPAR), you need not reboot the system to use the processors. If you are not using DLPAR, you must reboot the managed system before the newly activated processors can be used.

Before adding processors to a partition that is running Linux, you must stop the Linux partitions and then restart them after you have assigned the processors.

Begin using the new capacity. If you encountered any problems using the preceding process, see <http://www.ibm.com/servers/eserver/pseries/cuod/index.html>.

Appendix A. 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 is 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 60950.

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 Règlement 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

<p>この装置は、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。</p> <p>VCCI-A</p>

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

<p>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。</p>

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.

Appendix B. Environmental Notices

Product Recycling and Disposal

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets and connectors which may contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. IBM offers product return programs in several countries, for country specific instructions please refer to the following web site:

<http://www.ibm.com/ibm/environment/products/prp.phtml>

This product may contain a sealed lead acid battery(s) or nickel-cadmium battery(s). The battery(s) must be recycled or disposed of properly. Recycling facilities may not be available in your area. In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used sealed lead acid, nickel cadmium and nickel metal hydride batteries and battery packs from IBM equipment. For information on proper disposal of the batteries in this product, please contact IBM at 1-800-426-4333. For information on disposal of sealed lead acid or nickel cadmium batteries outside the United States, contact your local waste disposal or recycling facility.

Environmental Design

The environmental efforts that have gone into the design of this system signify IBM's commitment to improve the quality of its products and processes. Some of these accomplishments include the elimination of the use of Class 1 ozone-depleting chemicals in the manufacturing process and reductions in manufacturing wastes. For more information, contact an IBM account representative.

Acoustical Noise Emissions

The equivalent continuous A-weighted sound pressure level at workstations (emission sound pressure level at the 1-meter bystander positions) does not exceed 70 dB(A).

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

Declared Acoustical Noise Emissions

Product Configuration	Acoustical Characteristic			
	Declared A-Weighted Sound Power Level, L_{WA_d} (B)		Declared A-Weighted Sound Pressure Level, L_{pAm} (dB)	
	Operating	Idle	Operating	Idle
Processor Subsystem	6.1 ⁵	6.1 ⁵	44 ⁶	44 ⁶
Notes: <ol style="list-style-type: none"> Noise levels cited are for the typical configuration (A-Frame: Bulk Power, CEC cage, battery option, media drawer, and two I/O drawers). The 0.6-B (6-dB) reduction in noise emission levels with the acoustical rear door corresponds to a factor of 4 reduction. That is, the noise level of a single A-Frame with Slimline covers is about the same as the noise level of four A-Frames with acoustical covers. L_{WA_d} is the upper-limit A-weighted sound power level; L_{pAm} is the mean A-weighted sound pressure level at the 1-meter bystander positions; 1 B = 10 dB. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296. 				

Appendix C. Notices

This information was developed for products and services offered in the U.S.A.

The manufacturer may not offer the products, services, or features discussed in this document in other countries. Consult the manufacturer's representative for information on the products and services currently available in your area. Any reference to the manufacturer's product, program, or service is not intended to state or imply that only that product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any intellectual property right of the manufacturer may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any product, program, or service.

The manufacturer may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the manufacturer.

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This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. The manufacturer may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Information concerning products made by other than the manufacturer was obtained from the suppliers of those products, their published announcements, or other publicly available sources. The manufacturer has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to products made by other than the manufacturer. Questions on the capabilities of products made by other than the manufacturer should be addressed to the suppliers of those products.

Appendix D. Securing the Rack

This appendix contains information about installing the rack for the pSeries 690. This procedure is optional and should be performed if the customer has ordered the appropriate hardware kits to bolt the system to the floor. For further information, refer to part number 44P0159, the installation instructions for RPQs 8A1183, 8A1185, and 8A1186 as follows:

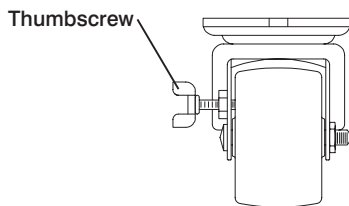
- RPQ 8A1183 for attaching the rack-mounting plates to the concrete floor (non-raised floor)
- RPQ 8A1185 to attach the rack to a concrete floor when on a raised floor (9-1/2 inches to 11-3/4 inches high)
- RPQ 8A1186 to attach the rack to a concrete floor when on a raised floor (11-3/4 inches to 16 inches high)

Positioning the Rack

Note: The customer should unpack the rack and position it in the room. If this has not been done, consult the customer and the marketing representative as necessary.

To unpack and position the rack, do the following:

1. Remove all packing and tape from the rack.
2. Position the rack according to the customer floor plan.
3. Lock each caster wheel by tightening the thumbscrew on the caster.



Installing the Frame Kit

The following tables show the parts required for each of the tie-down kits (a non-raised floor, short-raised floor, and a long-raised floor).

Rack Tie-Down Kits

11P4759 Frame Tie-down Kit (Non-Raised Floor) (RPQ 8A1183)			
Item	Part Number	Qty	Description
Item 3 in illustration on page 49.	11P3527	2	Shipping bar (lower)
Item 5 in illustration on page 49.	11P3529	4	Hinge plate
Item 8 in illustration on page 49.	11P3530	2	Latch plate
Item 6 in illustration on page 49.	11P3531	2	EQ support
Item 2 in illustration on page 49.	11P3532	2	Shipping bar (upper)
Item 7 in illustration on page 49.	76X4687	2	Latch bolt
Item 1 in illustration on page 49.	1624804	20	Screw (hex flange, 20mm, long)
Item 9 in illustration on page 49.	1621546	8	Screw (hex, 25mm, long, hinge)
Item 10 in illustration on page 49.	1622307	8	Washer (M8, hinge)
Item 1 in illustration on page 51.	11P3528	2	Plate lock-down

Item 2 in illustration on page 51.	05N6345	4	Spacer
Item 4 in illustration on page 51.	05N6344	4	Bushing
Item 5 in illustration on page 51.	21L4309	4	Washer
Item 3 in illustration on page 51.	0130985	4	Washer
Item 6 in illustration on page 51.	05N6346	4	Bolt

11P4757 Frame Tie-down Kit (Short-Raised Floor) (RPQ 8A1185)			
Item	Part Number	Qty	Description
Illustration on page 57.	44P0673	4	Turnbuckle Assembly (short)
Item 3 in illustration on page 49.	11P3527	2	Shipping bar (lower)
Item 5 in illustration on page 49.	11P3529	4	Hinge plate
Item 8 in illustration on page 49.	11P3530	2	Latch plate
Item 6 in illustration on page 49.	11P3531	2	EQ support
Item 2 in illustration on page 49.	11P3532	2	Shipping bar (upper)
Item 7 in illustration on page 49.	76X4687	2	Latch bolt
Item 1 in illustration on page 49.	1624804	20	Screw (hex flange, 20mm, long)
Item 9 in illustration on page 49.	1621546	8	Screw (hex, 25mm, long, hinge)
Item 10 in illustration on page 49.	1622307	8	Washer (M-8, hinge)

11P4758 Frame Tie-down Kit (Long-Raised Floor) (RPQ 8A1186)			
Item	Part Number	Qty	Description
Illustration on page 57.	44P0674	4	Turnbuckle Assembly (long)
Item 3 in illustration on page 49.	11P3527	2	Shipping bar (lower)
Item 5 in illustration on page 49.	11P3529	4	Hinge plate
Item 8 in illustration on page 49.	11P3530	2	Latch plate
Item 6 in illustration on page 49.	11P3531	2	EQ support
Item 2 in illustration on page 49.	11P3532	2	Shipping bar (upper)
Item 7 in illustration 49.	76X4687	2	Latch bolt
Item 1 in illustration on page 49.	1624804	20	Screw (hex flange, 20mm, long)
Item 9 in illustration on page 49.	1621546	8	Screw (hex, 25mm, long, hinge)

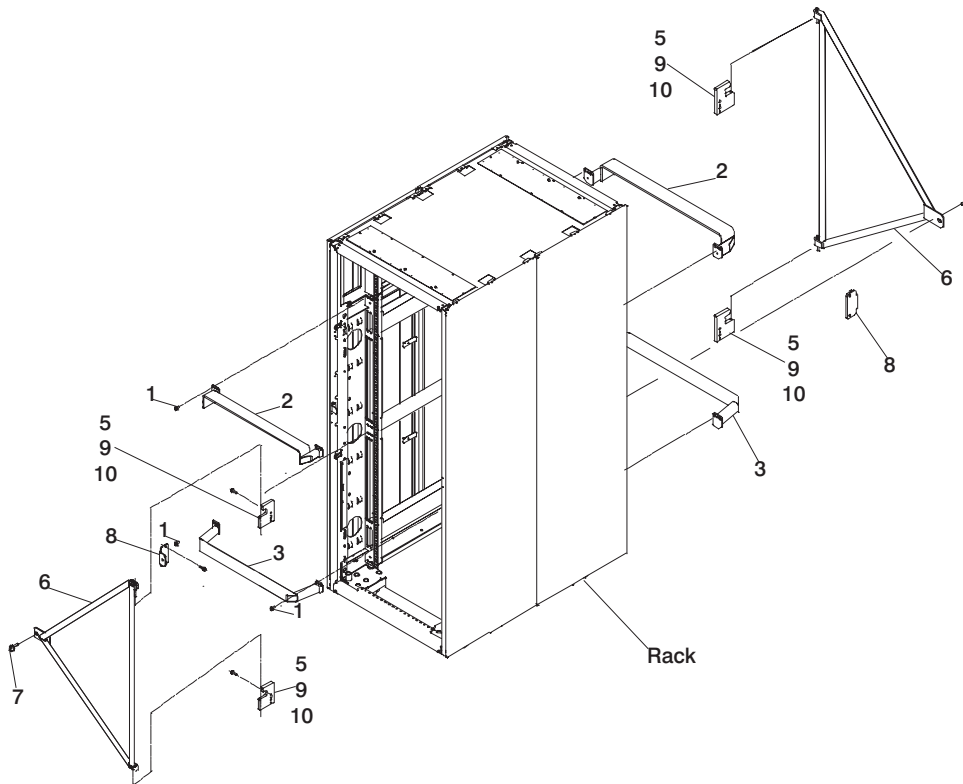
Item 10 in illustration on page 49.	1622307	8	Washer (M-8, hinge)
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Mounting Internal Rack Components

To mount the internal rack components, do the following:

Attention: This procedure is performed by the service representative.

- Using four M-8 (20 mm) screws (item 1 in illustration on page 49), install the top shipping bar (item 2 in illustration on page 49) at EIA unit location 32.
- Using four M-8 screws (item 1 in illustration on page 49), install the bottom shipping bar (item 3 in illustration on page 49) at EIA unit location 18.
- Repeat steps 1 and 2 to install shipping bars in the rear of the rack.
- Attach the front top hinge (item 5 in illustration on page 49) on the vertical rail (located approximately at EIA unit 29-30 on the vertical rail) with two 25 mm screws (item 9 in illustration on page 49) and two washers (item 10 in illustration on page 49).
- Attach the front bottom hinge (item 5 in illustration on page 49) on the vertical rail (located approximately on EIA unit 6-7 on the vertical rail) with two 25 mm screws (item 9 in illustration on page 49) and two washers (item 10 in illustration on page 49).
- Repeat steps 4 and 5 to install the hinges on the rear rail.
- Attach the latch plate (item 8 in illustration on page 49) with two M-8 (20 mm) screws (item 1 in illustration on page 49).
- Repeat step 7 to attach the latch plate in the rear of the rack.
- Attach the triangular braces (item 6 in illustration on page 49) in both the front and rear of the rack.
- Install the latch bolts (item 7 in illustration on page 49).



1 Screw (hex flange, 20 mm long)

7 Latch Bolt

2	Shipping bar (upper)	8	Latch Plate
3	Shipping bar (lower)	9	Screw (hex, 25mm, long, hinge)
5	Hinge Plate	10	Washer (M 8, hinge)
6	EQ Support		

Determine Your Next Step

Use the following to determine your next step:

- If the rack is being attached to a concrete (non-raised) floor, proceed to “Attach the Rack to a Concrete (Non-Raised) Floor” on page 51.
- If the rack is being attached to a raised floor, proceed to “Attaching the Rack to a Short-Raised or Long-Raised Floor” on page 54.
- If the rack is not being attached to the floor, proceed to “Step 3. Position and Level the PrimaryRack” on page 10.

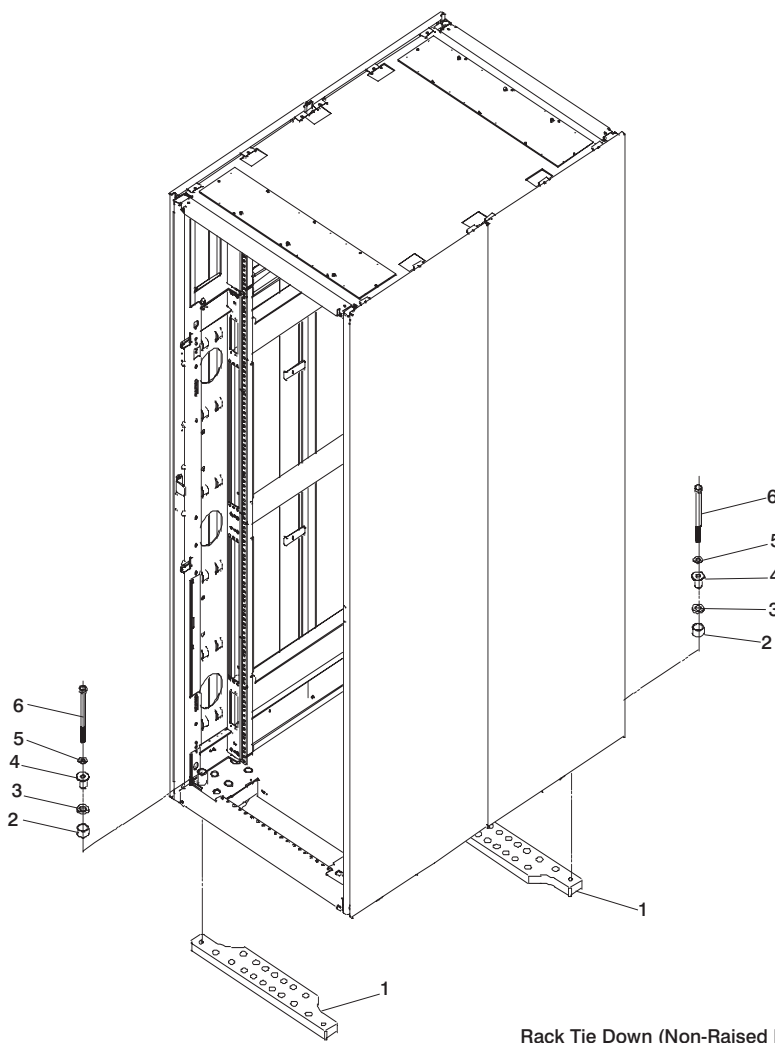
Attach the Rack to a Concrete (Non-Raised) Floor

Use this procedure to attach the rack to a concrete (non-raised) floor.

Attention: It is the customer's responsibility to ensure the following steps are completed before the service representative performs the tie-down procedure.

Note: The customer should obtain the service of a qualified structural engineer to determine appropriate anchoring of the mounting plates. A minimum of three anchor bolts for each mounting plate must be used to secure 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, additional holes must be drilled. Each mounting plate must have at least three usable holes, two that are on opposite sides and opposite ends of each other, and one hole at the center. The mounting plates should be able to withstand 2500 pounds pulling force on each end.

1. Be sure the rack is in the correct location.

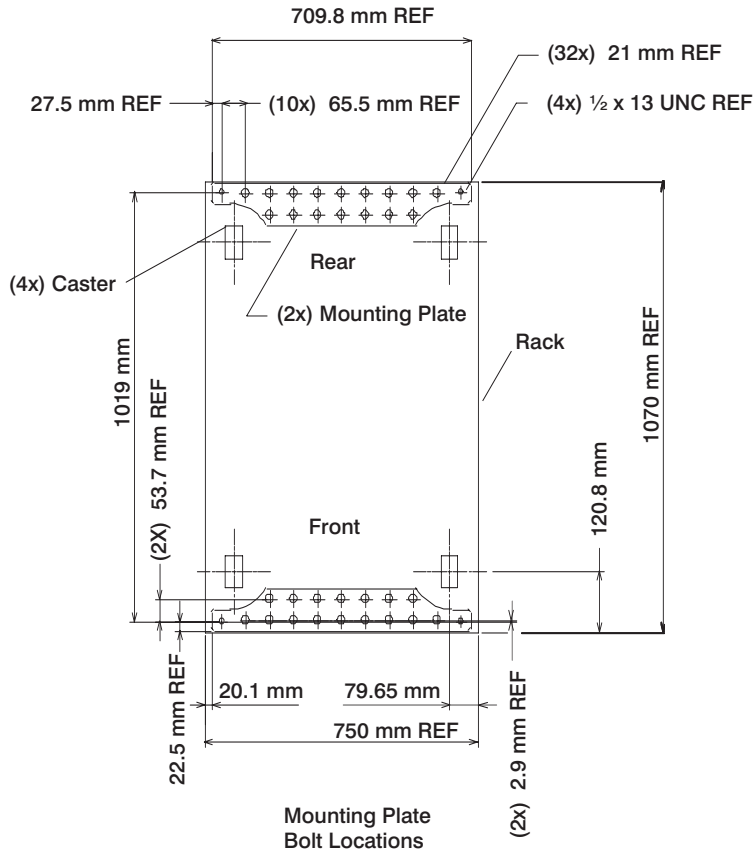


Rack Tie Down (Non-Raised Floor)

- | | | | |
|---|-----------------------------------|---|---------|
| 1 | Plate Lock-Down (mounting plates) | 4 | Bushing |
| 2 | Spacer | 5 | Washer |
| 3 | Washer | 6 | Bolt |

2. Place the mounting plates (item 1 in illustration on page 51), front and rear, in the approximate mounting position under the system rack.

3. To align the mounting plates to the system rack, do the following:
 - a. Place the four rack-mounting bolts (item 6 in illustration on page 51) through the plate assembly holes at the bottom of the rack. Install the bushings and washers (item 4 and 5 in illustration on page 51) to ensure bolt positioning.
 - b. Position the mounting plates (item 1 in illustration on page 51) under the four rack-mounting bolts (item 6 in illustration on page 51) so that the mounting bolts are centered directly over the tapped holes.
 - c. Turn the rack-mounting bolts (item 6 in illustration on page 51) three or four rotations into the tapped holes.
4. Mark the floor around the edge of the mounting plates, as shown in the following illustration:



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 bolts may protrude past the thickness of the mounting plate. 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.

Attention: It is the service representative's responsibility to complete the following steps.

1. Reposition the system rack over the mounting plates.
2. 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.

3. Place the isolator bushing (item 4 in illustration on page 51) inside the leveling foot, with a washer between the isolator bushing and the floor plate.
4. Turn the rack-mounting bolts three or four rotations into the tapped holes.
5. 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.
6. Lock the leveling feet by tightening the lock nut.
7. Tighten the four rack-mounting bolts into the mounting plates.

Attaching the Rack to a Short-Raised or Long-Raised Floor

Attention: It is the customer's responsibility to ensure the following steps are completed before the service representative performs the tie-down procedure.

Note: To accommodate a floor with a depth of more than 16 inches, a steel beam or a steel channel adapter for mounting the subfloor eyebolts is required. The customer must supply the floor eyebolts.

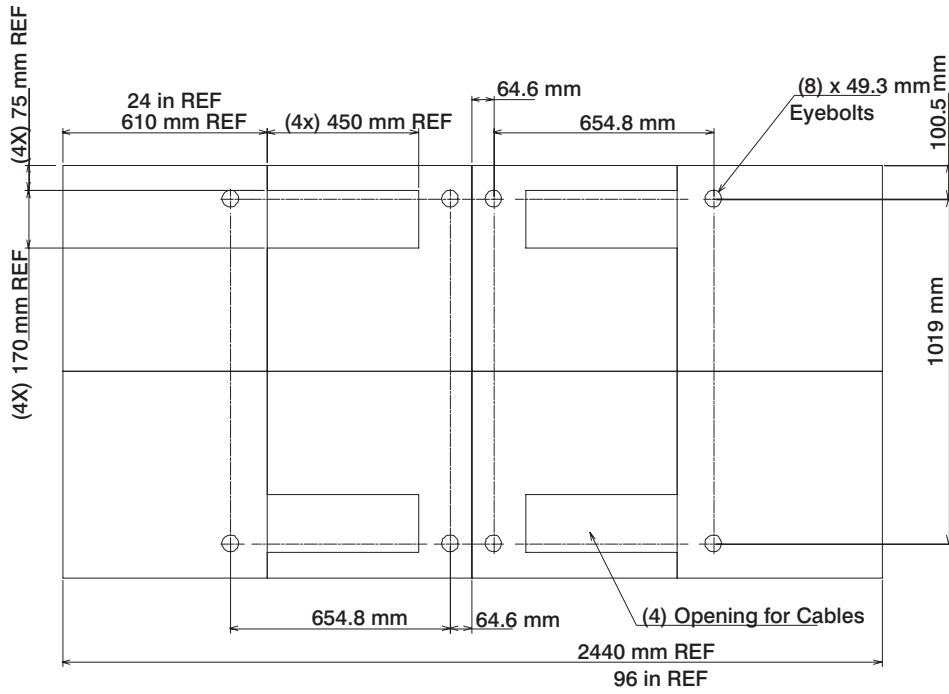
Consider the following when preparing the floor for tie-down:

- The hardware is designed to support a frame weighing no more than 2636 pounds.
- The estimated maximum concentrated load on one caster for a 2636-pound system is 900 pounds. For a multiple system installation, it is possible that one floor tile will bear a total concentrated load of 1800 pounds.

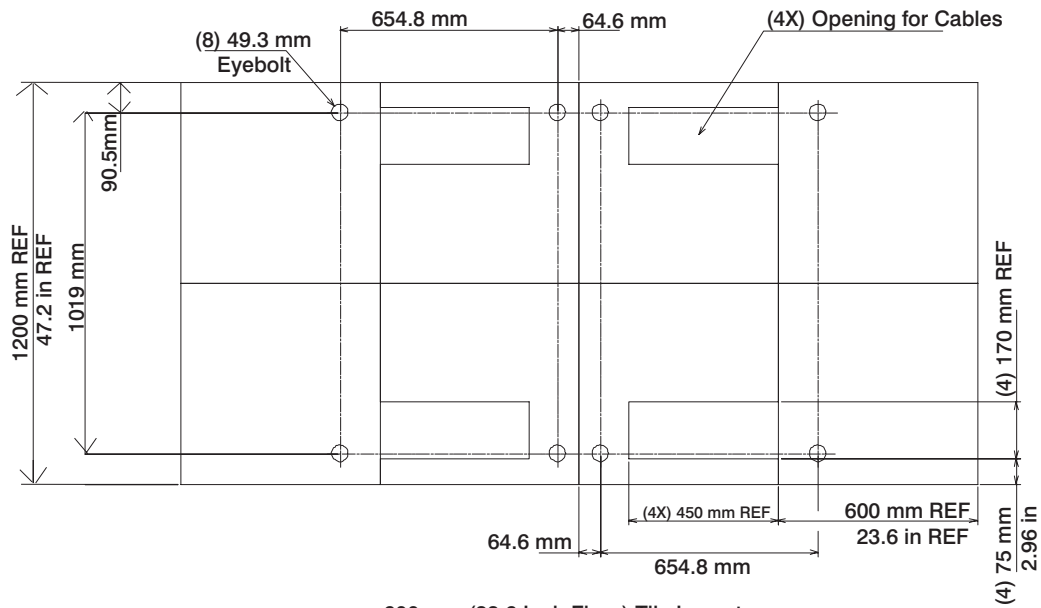
To install the eyebolts, do the following:

1. Obtain the service of a qualified structural engineer to determine the appropriate installation of the eyebolts.
2. Consider the following before installing the eyebolts:
 - Floor eyebolts must be securely anchored to the concrete floor.
 - The minimum height of the center of the internal diameter is 1 inch above the concrete floor surface.
 - The maximum height is 2.5 inches above the concrete floor surface. Higher than 2.5 inches can cause excessive lateral deflection to the tie-down hardware.
 - The eyebolt's internal diameter should be 1-3/16 inch, and each eyebolt should be able to withstand 2700 pounds. The customer should obtain the service of a qualified consultant or structural engineer to determine the appropriate anchoring method for these eyebolts and to ensure that the raised floor can support the floor-loading specifications provided in the *Site and Hardware Planning Information*, order number SA38-0508.

3. Install the four eyebolts that match the dimensions given in the following illustrations.



24 Inch Floor Tile Layout



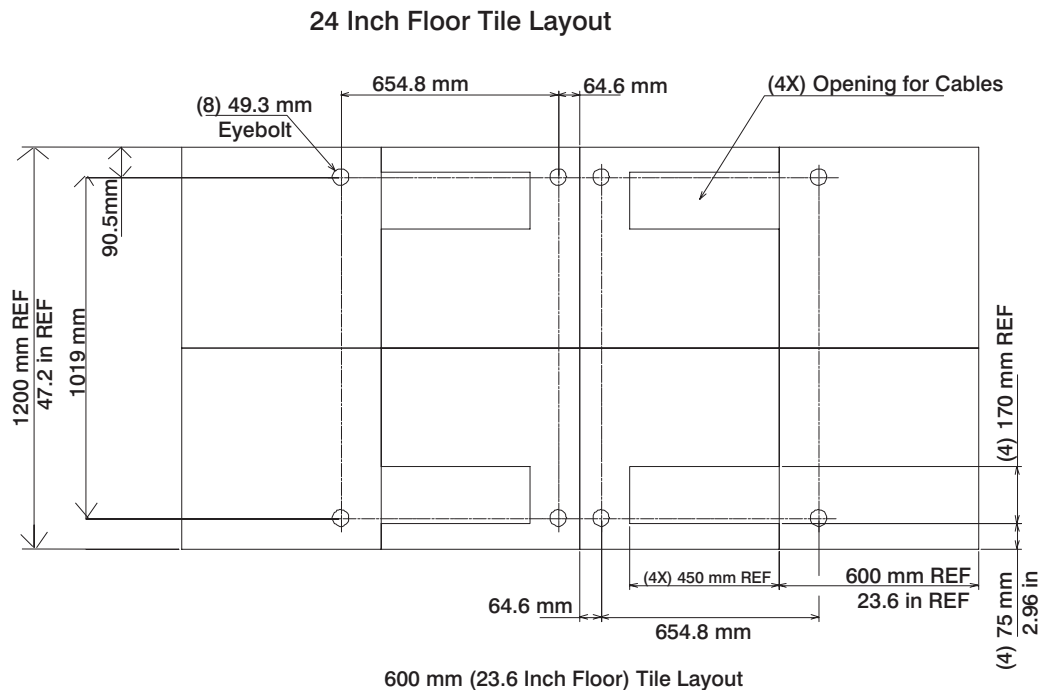
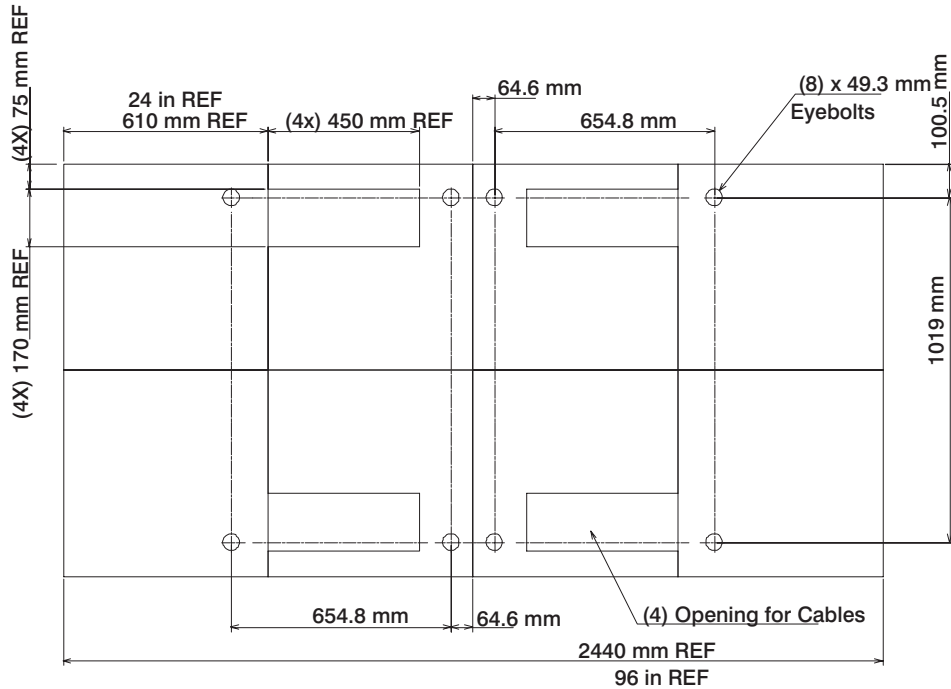
600 mm (23.6 Inch Floor) Tile Layout

4. Install the eyebolts in the floor.

To install the frame, do the following:

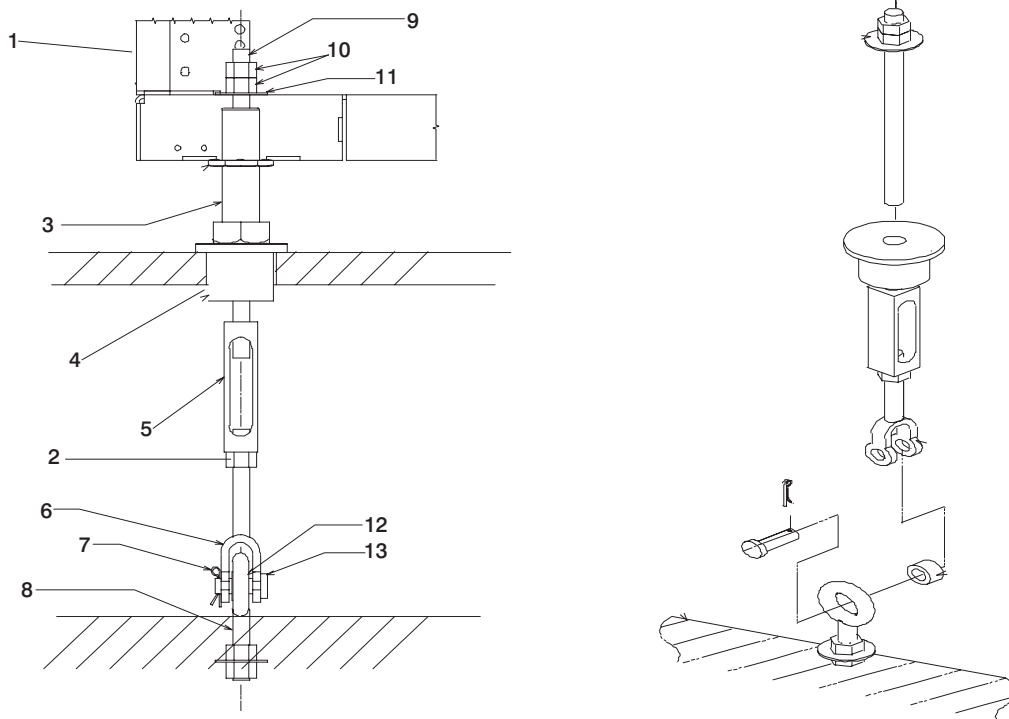
Attention: It is the service representative's responsibility to complete the following steps.

1. Before starting the installation, check all cable openings in the floor panel and location of the rubber bushing holes so that they match the dimensions given in the following illustrations.



2. Power off the system and make sure all cables and connectors are disconnected and are not dangling around the frame. The frame should be free to roll.
3. The floor eyebolts should be already secured to the concrete floor. Verify the height of the center of the floor eyebolt to the concrete floor or the steel beam/channel adapter mounted to the concrete floor. Ensure that the turnbuckles can accommodate the total height of the raised floor.

4. Remove the floor tiles around the area where the frame(s) will be installed.
5. Remove the pin and the spacer from the lower jaw (see the following illustrations).



1	Frame	8	Floor Eyebolt (customer-supplied)
2	Jam Nut	9	Threaded Rod
3	Rack Leveler	10	Nut
4	Rubber Bushing	11	Washer
5	Turnbuckle (Short or Long)	12	Spacer
6	Lower Jaw	13	Shaft
7	Pin		

Note: The difference between the two turnbuckle assemblies is the length of the turnbuckle.

The Short Turnbuckle Assembly (part number 11P4755) is used for a 9-1/2 inches to 11-3/4 inches raised floor.

The Long Turnbuckle Assembly (part number 11P4756) is used for an 11-3/4 inches to 16 inches raised floor.

6. Place the spacer inside the floor eyebolt, and place the floor eyebolt between the lower jaw. Reinstall the shaft, pin, and spacer.
7. Remove the threaded rod and rubber bushing from the turnbuckle assembly.
8. Install the floor tile that has the rubber bushing holes that are aligned with the eyebolt locations.
9. Install the rubber bushings in the floor tiles.
10. Move the frame so that the frame leveler is located over the rubber bushings.

Attention: To avoid a tipping hazard, make sure that the frame casters do not roll into the cable opening.
11. Turn the leveling foot of the plate assembly down until it contacts the bushing, and level the rack by tightening the lock nuts on the four leveling feet.
12. Lock the leveling feet by tightening the lock nut.

13. Insert the threaded rod into the inner hole of the leveler and the rubber bushing.
14. Thread down the threaded rod until the tip of the rod is approximately 1 inch inside the turnbuckle.
15. Insert the nuts and hand-tighten the nuts.
16. Repeat the previous three steps so that all assemblies are completely installed, as shown in the previous illustration.
17. Tighten all the nuts to 40 ft-pounds.

The frame is now secured.

Installing the Frame-Ground Straps

Install a frame-ground strap on all pSeries 690 systems if the following conditions are met:

- A frame-ground strap is provided for installation.

AND

- The customer provides a ground to which the frame-ground strap will attach.

Attention: It is recommended that all pSeries 690 systems that are installed in 7040 Model W42 racks, be grounded. However, two frame-ground straps are *required* on a rack for a switched clustered environment (for example, when in a scalable parallel (SP) Switch-2 connected clustered environment). One frame-ground strap must be installed at the front bottom-left side of the rack, and the second frame-ground strap must be installed at the rear bottom-left side of the rack.

Raised-Floor Environments

Raised-floor environments can be short-raised or long-raised floors. For additional information on site planning for the system, refer to pSeries 690 information in Chapter 2 of the *Site and Hardware Planning Information*. The frame-ground straps provided with the system are intended for use with a grounded raised floor. If the installation does not use a grounded raised floor, refer to the alternate grounding means in the pSeries 690 information in Chapter 2 of the *Site and Hardware Planning Information*.

Attention: If the site raised floor has pedestals that are not grounded, ask the customer to consult with a certified electrical contractor to have the floor pedestals grounded, or refer them to pSeries 690 information in Chapter 2 of the *Site and Hardware Planning Information* for an alternate solution if the installation site does not have a grounded raised floor.

To install the frame-ground straps on a rack in a grounded raised-floor environment, perform the following steps.

1. Ensure that the raised-floor is grounded. A grounded-raised floor has pedestals that are connected with ground wire so that an electrical ground can be installed from equipment to pedestals, and then to an earth ground.

If the raised floor is not grounded, stop, and ask the customer to arrange to have the floor grounded, and refer them to pSeries 690 information in Chapter 2 of the *Site and Hardware Planning Information*.

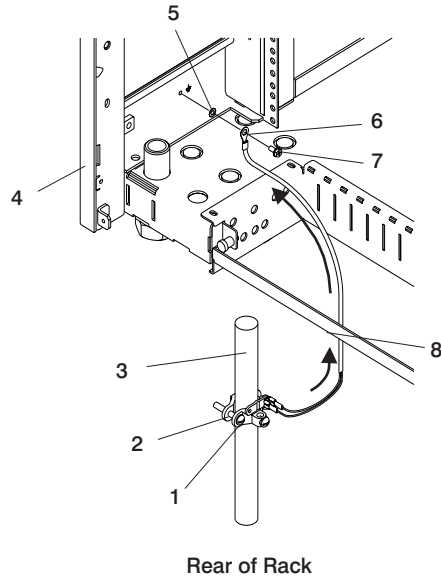
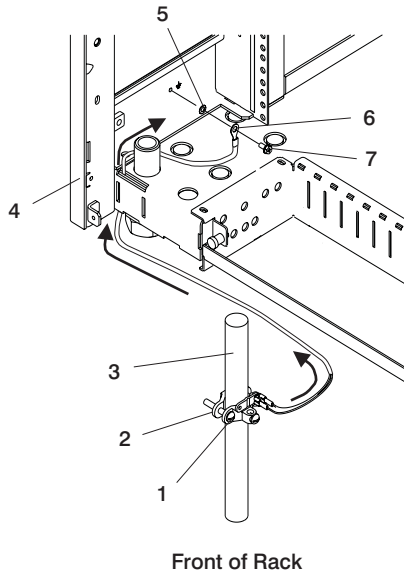
If the raised floor is grounded, go to the next step.

2. If the rear door on the rack is not open, open the door.
3. To install a frame-ground strap at the front bottom-left side of the rack, do the following:
 - a. At the front bottom-left side of the rack, attach the lug end of the ground strap (part number 44P2814) to the ground connection symbol on the rack using a screw (part number 2665528) and a lockwasher (part number 1623347, if supplied). Tighten the screw using an 8-mm nutdriver.

The ground strap can run alongside the rack power cord to exit the frame.

Note: Ensure that the lockwasher is installed between the frame surface and the ground-strap lug.

See the front view of the rack in the following illustration.



- 1 Screw on Ground Clamp (for tightening the clamp)
- 2 Grounding Clamp
- 3 Metal Floor Pedestal
- 4 Rear Bottom-left Side of Rack

- 5 Lockwasher (install if supplied)
 - 6 Ground-Strap Lug
 - 7 Screw (for attaching lug to rack)
 - 8 Ground Strap
- Note:** See the different routing for the frame-ground strap at the front and rear of the rack.

- b. Position the grounding clamp (part number 5457808) around a grounded floor pedestal.
 - c. Using a screwdriver, tighten the screw on the ground clamp to secure the clamp to the floor pedestal.
 - d. Attach the other end of the ground strap to the ground strap clamp on the floor pedestal.
4. To install a frame-ground strap at the rear bottom-left side of the rack, do the following:
- a. At the rear bottom-left side of the rack, attach the lug end of the ground strap (part number 44P2814) to the ground connection symbol on the rack, using a screw (part number 2665528) and a lockwasher (part number 1623347, if supplied). Tighten the screw using an 8-mm nutdriver.

Note: Ensure that the lockwasher is installed between the frame surface and the ground strap lug.

See the rear view of the rack in the previous illustration.

- b. Position the ground strap clamp (part number 5457808) around a grounded floor pedestal.
 - c. Using a screwdriver, tighten the ground strap clamp screw to secure the clamp to the floor pedestal.
 - d. Attach the other end of the ground strap to the ground strap clamp on the floor pedestal.
5. If no other service procedures are being performed at the rear of the rack, close the rack door.

Non-Raised Floor Environments

Determine if the frame-ground straps are required (refer to the *Attention* in “Installing the Frame-Ground Straps” on page 59). If the system is installed in a switched clustered environment (Switch-2 connected clustered environment), refer to pSeries 690 information in Chapter 2 of the *Site and Hardware Planning Information* for an alternate solution.

Appendix E. Attaching Multiple pSeries 690s to One Hardware Management Console

This appendix details how to attach multiple pSeries 690 servers to one HMC. The HMC might have an 8-port async adapter or a 128-port async adapter installed to allow multiple servers to connect. Procedures for configuring both of the async adapters follow.

Installing the 8-Port async Adapter

The 8-port serial adapter is an option for the HMC. The 8-port serial adapter software is included in the HMC's base software image. The 8-port async adapter must be configured by the service representative when the HMC is installed. You must log in as root user to do these procedures.

For instructions on how to install and configure the 8-port adapter in the system with the HMC, see the *IBM Hardware Management Console for pSeries Installation and Operations Guide*.

To install and configure the 8-port adapter in the system, do the following:

1. To access the HMC microcode maintenance function, obtain the password from software support and log in as hscope.
2. In the HMC Navigation area, click **Problem Determination**.
3. In the Contents area, click **Microcode Maintenance**. The User Authentication window opens.
4. Enter the HMC system unit's serial number and the password provided by software support. The Microcode Maintenance Menu window opens.
5. Select **Launch xterm shell** to open a command prompt window.
6. Type `su -`, then log in as root user.
7. Type the following command to run the configuration utility: `/usr/sbin/digiConf`. You must provide the following answers to the following questions:
 - a. Question: How many boards would you like to install? Answer: Enter the total number of 8-port and/or 128-port async adapters in the system.
 - b. Question: Board #1. What type of board is this? ('L' for list) Answer: Use board type 15
 - c. Question: Do you want to set Altpin on this board? ('y' or 'n') Answer: No

If two 8-port adapters are installed in the system, you must provide the following answers to the following questions:

- a. Question: Board #2. What type of board is this? ('L' for list) Answer: Use board type 15
 - b. Question: Do you want to set Altpin on this board? ('y' or 'n') Answer: No
8. The HMC is configured. Reboot your PC to load the adapter device driver.

Connect the Serial Cables from the pSeries 690 to the 8-Port Async Adapters

Up to two optional 8-port async adapters can be installed. The D-shell connector on the back of the adapter attaches to the 8-port expansion cable. The cable is approximately 3 feet long, and on the other end, has a slim box (8-1/2 inches x 3 inches x 1-1/2 inches) with 8 separate serial port connectors on it. The cable is labeled *ISA 8-Port Cable*. Serial cables can be connected from any of the ports on the 8-port expansion cable to the HMC1 ports on the managed systems.

If you are using a second, redundant HMC, connect cables from all the pSeries 690 HMC1 ports to the 8-port cable on the primary HMC, and connect all the pSeries 690 HMC2 ports to the 8-port cable on the redundant HMC.

Note: The second HMC system serial port is reserved for use by the modem.

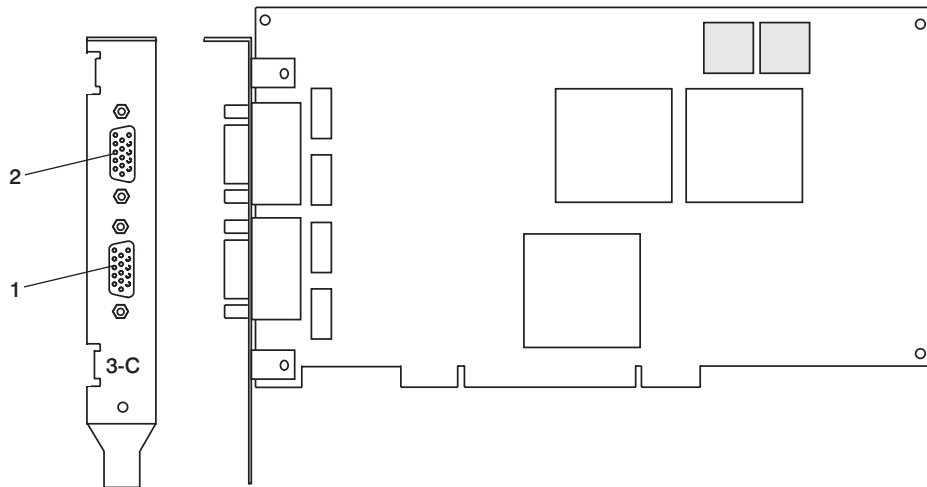
Installing the 128-Port Async Adapter

The 128-port async adapter is an option for the HMC. It must be configured by the service representative when the HMC is installed. The 128-port async adapter software is included in the HMC base software installation package.

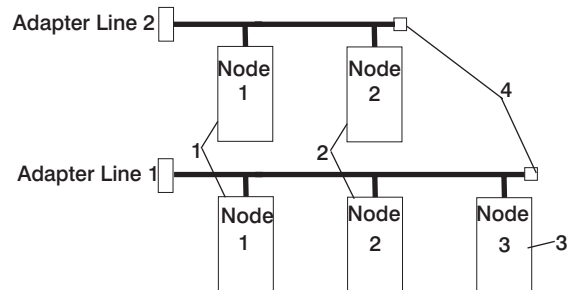
This adapter provides the control function and connectors to attach eight 16-port remote async nodes (RANs). When all eight nodes are attached, this combination provides 128 EIA-232 or RS-422 communication ports.

128-Port Async Adapter Line Connectors

The 128-port async adapter contains two 15-pin D-shell connectors. The connector that is closest to the edge connector that plugs into the HMC is line 1. The RANs are cabled in a daisy chain and are terminated using a line terminator. The following illustration shows the adapter and the line connectors.



The following illustration shows an example of a typical RAN configuration. In this example, RANs are connected to both line 1 and line 2 of the adapter.



1	RAN Nodes	3	RAN Node
2	RAN Nodes	4	Terminators

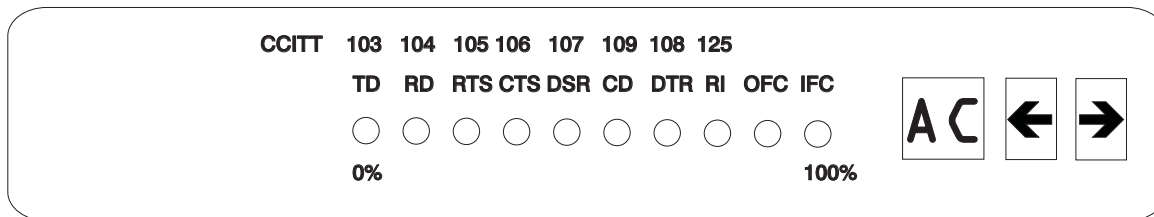
- Up to eight RANS can be attached to one adapter total. If four are attached to line one, then only four more can be attached to line 2.
- RANs *must* be numbered in ascending order. The RAN closest to the adapter is assigned as node 1. No gaps in the numbering should occur. Example, numbering RANs as 1, 3, 4 in a line will cause configuration problems.

Setting a RAN Node Number

The *AIX Asynchronous Communications Guide* provides information about configuring and running diagnostics on the 128-port async adapter and associated RANs. To access the *AIX Asynchronous Communications Guide*, see the AIX online documentation.

Documentation for the AIX operating system is available from the IBM @server pSeries Information Center at http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base. Select **AIX documentation**. The *AIX Documentation* CD contains the base set of publications for the operating system, including system-management and end-user documentation.

The adapter identifies RANs by their node numbers. Each RAN in a daisy chain must have a unique node number ($1n-4n$), which must be set during installation. The node numbers must be assigned in ascending order with the lowest number assigned to the RAN closest to the 128-port async adapter. The following illustration shows the front panel of a RAN.



To set the RAN node number, do the following:

1. Turn on the RAN and wait for the power-on self-test (POST) to complete.
2. When P1 is displayed on the front panel seven-segment LED display, press the left arrow button once. The current node number is displayed, for example, 1n for node 1.
3. Press the right arrow button to advance the node number through the eight possible settings ($1n-8n$).
4. When the desired node number is displayed, press the left arrow button again to select the number. The display now reads Pn (indicating a pass condition). If there was an error, the display reads En. In the case of duplicate node numbers, the RAN farthest from the host adapter displays En, instead of AC, when the system is started.

Configuring the 128-Port Async Adapter

When a 128-port async adapter is installed in the HMC and the HMC is first used, the adapter must be configured.

For instructions on how to install and configure the 8-port adapter in the system via the HMC, see the *IBM Hardware Management Console for pSeries Installation and Operations Guide*.

To configure the 128-port async adapter in the HMC, do the following:

1. Obtain the root password from the customer.
2. To access the HMC microcode maintenance functions as the hscpe user, contact software support to obtain the password.
3. In the HMC Navigation area, click **Problem Determination**.
4. In the Contents area, click **Microcode Maintenance**. The User Authentication window opens.
5. Enter the HMC system unit's serial number and the password provided by software support. The Microcode Maintenance Menu window opens.
6. Select **Launch xterm shell** to open a command prompt window.
7. Type `su -`, then log in as root user.
8. Type the following command to run the configuration utility: `/usr/sbin/digiConf`. The configuration utility will guide you through a series of questions:

- a. Question: How many boards would you like to install? Answer: Enter the total number of 8-port and/or 128 -port async adapters that are installed in the HMC PC.
- b. Question: Board #1. What type of board is this? ('L' for list) Answer: Use board type 16 (IBM 128-port async PCI)
- c. Question: How many ports does this digiBoard have? Possible values:
 - 8
 - 16
 - 24
 - 32
 - 40
 - 48
 - 56
 - 64
 - 72
 - 80
 - 88
 - 96
 - 104
 - 112
 - 120
 - 128

Board #1 How many ports? (1-16) Answer: Count the total number of enhanced RANs you are attaching to the 128-port async adapter and multiply by 2. For example: two (RANs) multiplied by 2 equals 4. Enter the selection number 4), for 32 in this example, at the prompt.

- d. Question: Do you want to set Altpin on this board? ('y' or 'n') Answer: No
If two 128-port async adapters are installed in the system, the utility repeats the previous sequence of questions for each adapter.
9. Type the following command to run the second configuration utility: `/usr/sbin/cxconf`. The configuration utility will guide you through a series of questions. The term *C/CON* is synonymous with *Enhanced RAN* or *RAN*:
 - a. Question: How many C/X cards do you have? Answer: Enter the total number of 128-port async adapters installed in the HMC PC.
 - b. Question: How many C/CONs (RANs) are connected to card 1 line 1? Answer: Enter the total number of RANs on line 1. For this example, two C/CONs (RANs) are connected to line 1.
 - c. Question: What type of wiring scheme are you going to use for card 1, line 1?
 - A) 8 Wire Direct
 - B) 4 Wire Direct
 - C) RS422 Sync
 - D) RS232 Sync

Answer: A

- d. Enter the type of communication mode to use on line 1.(Type L for a list) [14] Answer: 14
- e. Question: How many ports does this C/CON (RAN) support? (conc #1) Answer: 16
Note: The maximum number of ports here is 16.
- f. Question: How many C/CONs (RANs) are connected to card 1, line 2? Answer: Enter the number of RANs connected to line 2. If RANs are connected to Line 2, return to step 9c above, and repeat the previous steps for line 2.

The HMC is configured to load the adapter device driver upon reboot. Reboot the HMC PC.

Connect the Serial Cables from the pSeries 690 to the 128-Port Async Adapters

Up to two optional 128-port async adapters can be installed. The D-shell connectors on the back of the adapter attach to RANs. Serial cables can be connected from any of the ports on a RAN to the HMC1 ports on the managed systems.

If you are using a second, redundant HMC, connect cables from all the pSeries 690 HMC1 ports to the RAN on the primary HMC, and connect all the pSeries 690 HMC2 ports to the RANs on the redundant HMC.

Note: The use of the second HMC system serial port is not recommended because, by default, this port is to be used for the modem.

Verify that Installation is Complete by Using the HMC Interface

The HMC provides a predefined user ID called hscroot. The hscroot password is abc123. This hscroot user ID is a member of the System Administrator rolehscroot. When the console is powered on for the first time, use this user ID to log in. After you are logged in, you can create additional users.

Note: If the customer is installing a second pSeries 690, the HMC may have been preinstalled, and the hscroot password has probably been changed. If the HMC was already present from a previous installation, ask the customer for a login ID. The customer may have already set up a special login for a service representative; if so, use this login ID. You might request that a special user ID be created for the service representative role to perform service functions.

After you power on your HMC, the HMC login window displays, and prompts you to enter your user ID and password.

After the installation is complete, the pSeries 690 displays on the HMC interface. It may take a few minutes for a new system to display in the user interface after the cable is connected. When you log in to the HMC, the HMC management window opens, and the management environment is already selected. Select **Partition Management** to see the list of managed systems. This window is divided into the Navigation area and the Contents area.

The navigation panel displays a hierarchy of icons that represent collections of systems, individual systems, managed resources, and tasks. Each Navigation area icon identifies an application. At the highest point, or *root* of the tree, is the Management Environment. The Management Environment contains one or more host system applications that is managed by the console. Each system application contains its own set of applications that contain managed objects, tasks, and actions for a related set of system entities or resources.

The contents area panel displays results based on the item you select in the Navigation area. When you click on an application in the Navigation area, the Contents area displays the tasks you can perform using that application.

Each HMC contains the following set of application icons:

- System Manager Security
- Server Management
- System Configuration
- Users
- Frame
- HMC
- Inventory Scout Services
- Service Agent
- Service Focal Point
- Problem Determination

If the pSeries 690 is not displayed on the HMC interface, refer to the *@server pSeries 690 Service Guide* for additional information.

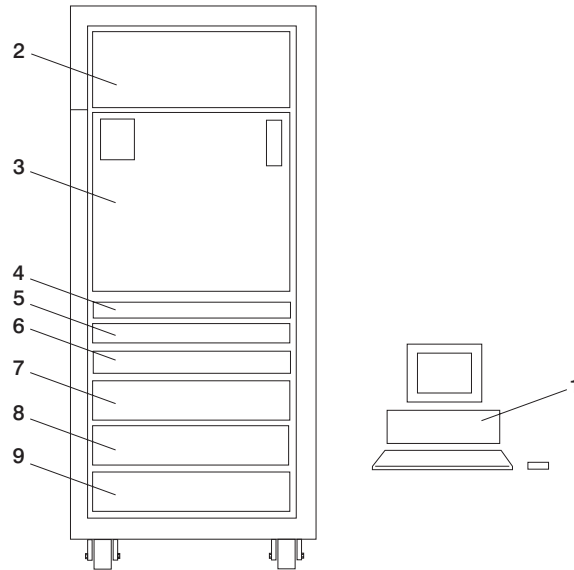
Verify that the installation is complete for each pSeries 690 that you have connected to the HMC using the serial port, the 8-port async adapter, or the 128-port async adapter. When you have finished the verification procedure, go to Chapter 3, “Verifying the Hardware Operation”, on page 25.

Appendix F. System Records

Use this appendix to keep a record of your server configuration.

Record the Identification Numbers

The basic server consists of the redundant bulk power subsystem, one processor subsystem, a media subsystem, and one I/O subsystem in the same rack, as well as access to one HMC.



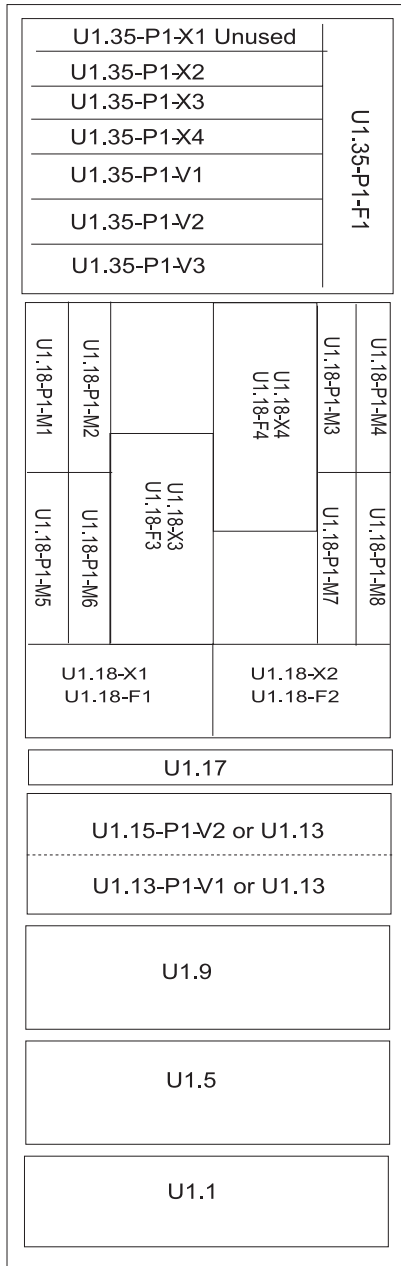
<p>1</p>	<p>Hardware Management Console</p>	<p>5*,6*</p>	<p>Primary 7040 Model 61R Integrated Battery Feature (IBF) (Optional) for the Primary Power Subsystem</p> <p>Redundant 7040 Model 61R Integrated Battery Feature (IBF) (Optional) is placed in the rear</p>
<p>2</p>	<p>7040 Model 61R Bulk Power Subsystem</p>	<p>7</p>	<p>7040 Model 61D I/O Subsystem</p>
<p>3</p>	<p>7040 Model 681 Processor Subsystem</p>	<p>8</p>	<p>7040 Model 61D I/O Subsystem (Optional)</p>
<p>4</p>	<p>7040 Model 681 Media Subsystem</p>	<p>9</p>	<p>7040 Model 61D I/O Subsystem (Optional)</p>
		<p>*</p>	<p>7040 Model 61D I/O Subsystem (Optional, if features 5 and 6 are not installed).</p>

Use the following to keep a record of your components.

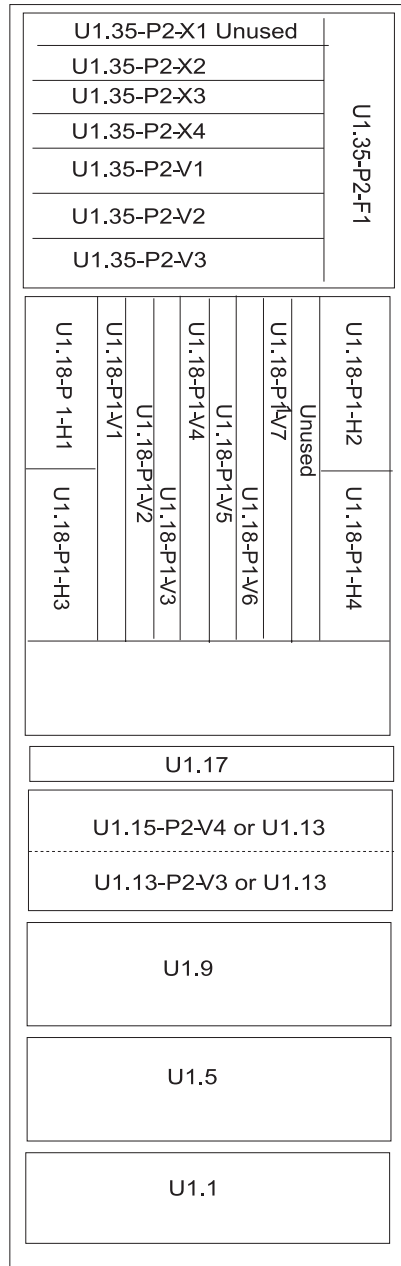
Component	Serial Number
pSeries 690	
I/O Drawer 1	
I/O Drawer 2	
I/O Drawer 3	
I/O Drawer 4 (or Drawer 7 if installed)	
I/O Drawer 5	
I/O Drawer 6	
I/O Drawer 7	
I/O Drawer 8	

Record System - Processor, Memory, and I/O Configuration

The following illustration shows the location codes for the primary rack. These codes are used to identify the major functional units in the pSeries 690.

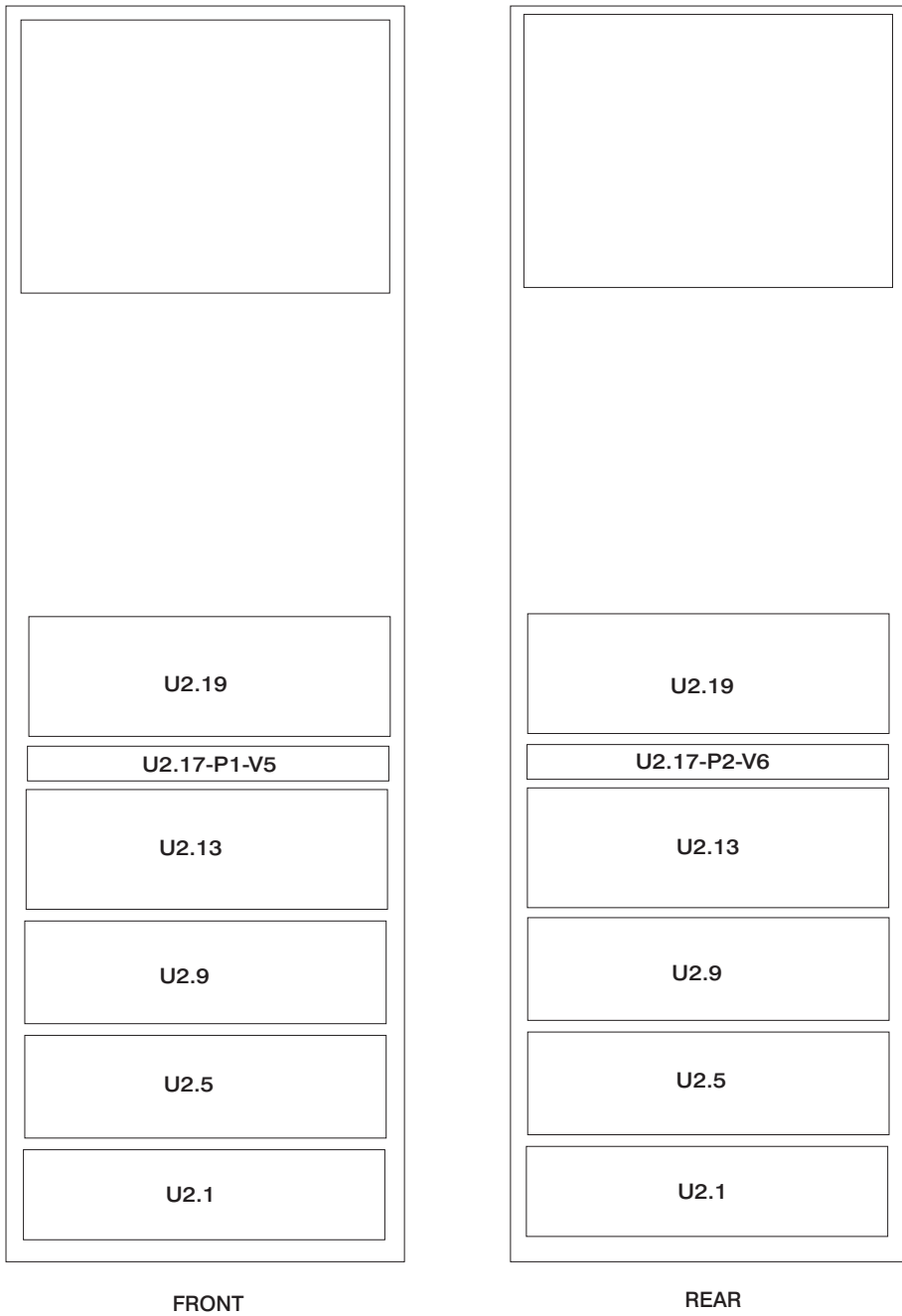


FRONT



REAR

The following illustration shows the location codes for the secondary rack. These codes are used to identify the major functional units in the pSeries 690 systems.



Physical Memory Card	Location available	Other Information
MCM 0 installed	U1.18-P1-C1	
MCM 0 VPD Card	U1.18-P1-H2.3	
Memory	U1.18-P1-M2	Memory Book <ul style="list-style-type: none"> • 4 GB • 8 GB • 16 GB • 32 GB • 64 GB
Memory	U1.18-P1-M3	Memory Book <ul style="list-style-type: none"> • 4 GB • 8 GB • 16 GB • 32 GB • 64 GB
L3 Modules	<ul style="list-style-type: none"> • U1.18-P1-C6 • U1.18-P1-C7 • U1.18-P1-C10 • U1.18-P1-C11 	
L3 VPD Card	U1.18-P1-H2.1	
MCM 2 installed	U1.18-P1-C4	
MCM 2 VPD Card	U1.18-P1-H2.4	
Memory	U1.18-P1-M6	Memory Book <ul style="list-style-type: none"> • 4 GB • 8 GB • 16 GB • 32 GB • 64 GB
Memory	U1.18-P1-M7	Memory Book <ul style="list-style-type: none"> • 4 GB • 8 GB • 16 GB • 32 GB • 64 GB
L3 Modules	<ul style="list-style-type: none"> • U1.18-P1-C14 • U1.18-P1-C15 • U1.18-P1-C18 • U1.18-P1-C19 	
L3 VPD Card	U1.18-P1-H2.1	
MCM 1 installed	U1.18-P1-C3	
MCM 1 VPD Card	U1.18-P1-H2.5	

Physical Memory Card	Location available	Other Information
Memory	U1.18-P1-M4	Memory Book <ul style="list-style-type: none"> • 4 GB • 8 GB • 16 GB • 32 GB • 64 GB
Memory	U1.18-P1-M8	Memory Book <ul style="list-style-type: none"> • 4 GB • 8 GB • 16 GB • 32 GB • 64 GB
L3 Modules	<ul style="list-style-type: none"> • U1.18-P1-C8 • U1.18-P1-C12 • U1.18-P1-C16 • U1.18-P1-C20 	
L3 VPD Card	U1.18-P1-H2.1	
MCM 3 installed	U1.18-P1-C2	
MCM 3 VPD Card	U1.18-P1-H2.6	
Memory	U1.18-P1-M1	Memory Book <ul style="list-style-type: none"> • 4 GB • 8 GB • 16 GB • 32 GB • 64 GB
Memory	U1.18-P1-M5	Memory Book <ul style="list-style-type: none"> • 4 GB • 8 GB • 16 GB • 32 GB • 64 GB
L3 Modules	<ul style="list-style-type: none"> • U1.18-P1-C5 • U1.18-P1-C9 • U1.18-P1-C13 • U1.18-P1-C17 	
L3 VPD Card	U1.18-P1-H2.1	
Primary I/O Book	<ul style="list-style-type: none"> • U1.18-P1-H2 - Slot 0 - I/O Drawer 1 • - I/O Drawer 2 	<ul style="list-style-type: none"> • RIO Connector A0 and A1 • RIO Connector B0 and B1
Secondary I/O Book	<ul style="list-style-type: none"> • U1.18-P1-H3 - Slot 2 - I/O Drawer 3 • - I/O Drawer 4 	<ul style="list-style-type: none"> • Inside RIO Connector C0 and C1 • Inside RIO Connector D0 and D1

Physical Memory Card	Location available	Other Information
Secondary I/O Book	<ul style="list-style-type: none"> • U1.18-P1-H3 - I/O Slot 2 - Drawer 5 • Drawer 6 	<ul style="list-style-type: none"> • Outside RIO Connector A0 and A1 • Outside RIO Connector B0 and B1
Secondary I/O Book	<ul style="list-style-type: none"> • U1.18-P1-H4 - I/O Slot 3 - Drawer 7 • Drawer 8 	<ul style="list-style-type: none"> • Outside RIO Connector C0 and C1 • Outside RIO Connector D0 and D1

Verify that All Hardware is Present

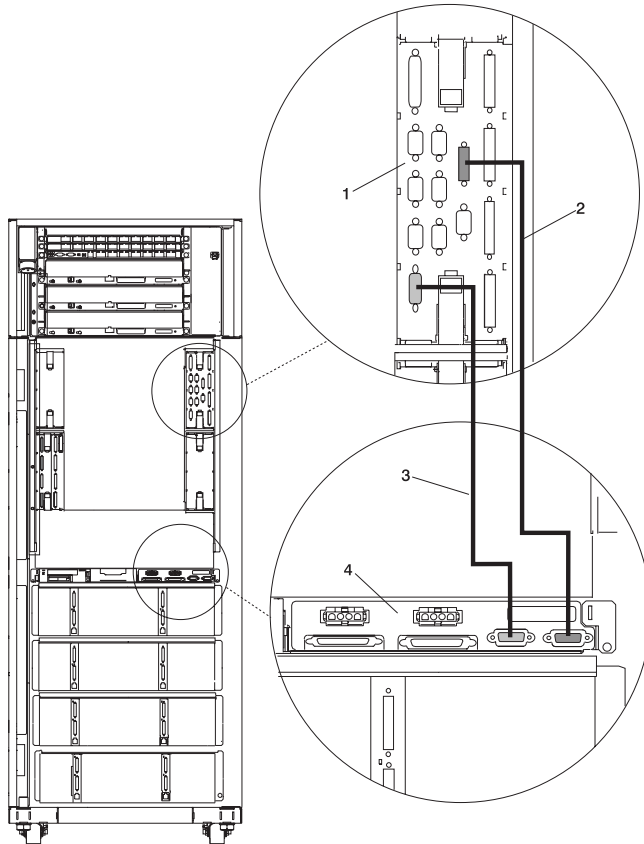
To verify that all hardware is present, do the following at the command line:

- Run **lsslot -cpci** to verify the adapters are plugged into the physical slot they are plugged in. Make note of the adapter types and positions the adapters are plugged in.
- Run **lsdev -Cc adapter** to verify that all the adapters are in the available state. If any adapters are in defined state, contact your next level of support.
- Run **lspv** and count the number of hdisks (hard disks) that appear in the system. Verify that the number equals the number of hard disks physically in the system. Make note of the hard disks and which one(s) contain rootvg (root volume group).
- Run **lsdev -Cc disk** to verify that all the hard disks are in the available state. If any of the hard disks are in the defined state, contact your next level of support.
- Run **lsattr -El mem0** to verify the total amount of memory recognized by the system. If the total is not the correct amount, contact your next level of support.
- Run **bindprocessor -q** to verify how many processors are available. If the correct number or processors are not available, contact your next level of support.

Appendix G. Subsystem Positioning and Cabling

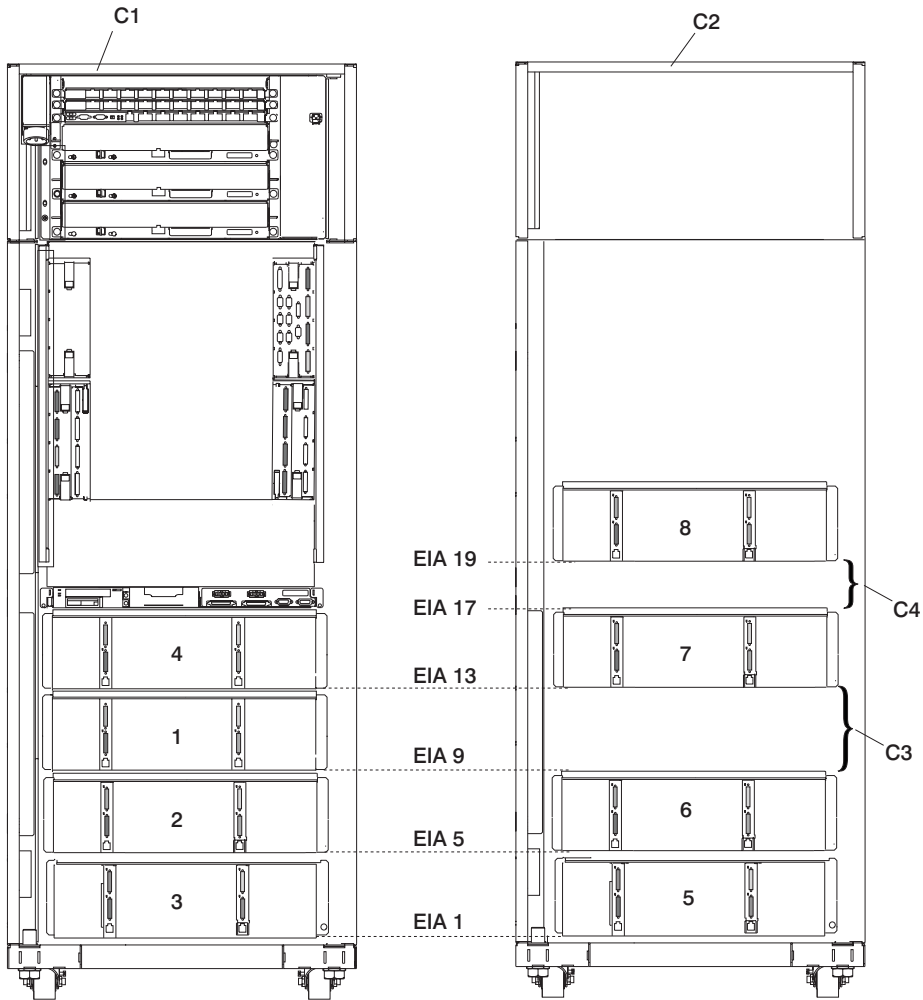
This appendix describes subsystem positioning and cabling for the pSeries 690.

Operator Panel Cable and Diskette Drive Cable to the Media Subsystem (Rear View)



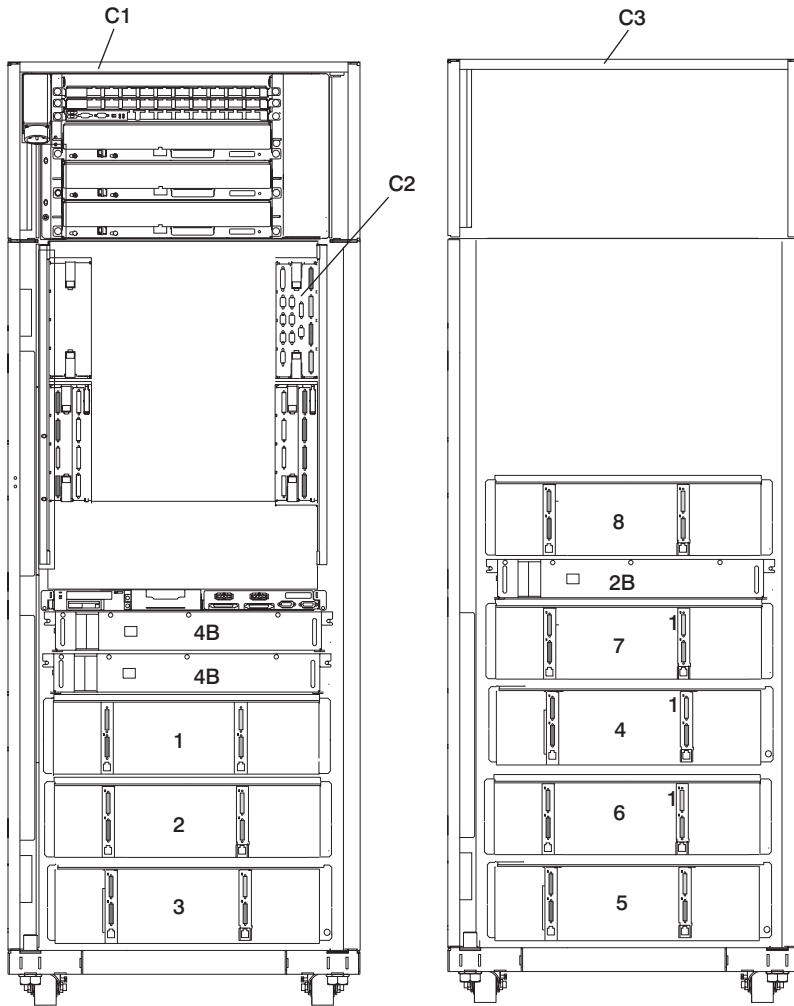
- | | | | |
|----------|--|----------|---------------------------|
| 1 | Primary I/O Book | 3 | Diskette Drive Data Cable |
| 2 | Cable Connecting the Operator Panel to the Media Subsystem | 4 | Media Subsystem |

I/O Subsystem Positions, Fully Populated Primary and Secondary Rack (Rear View without IBF)



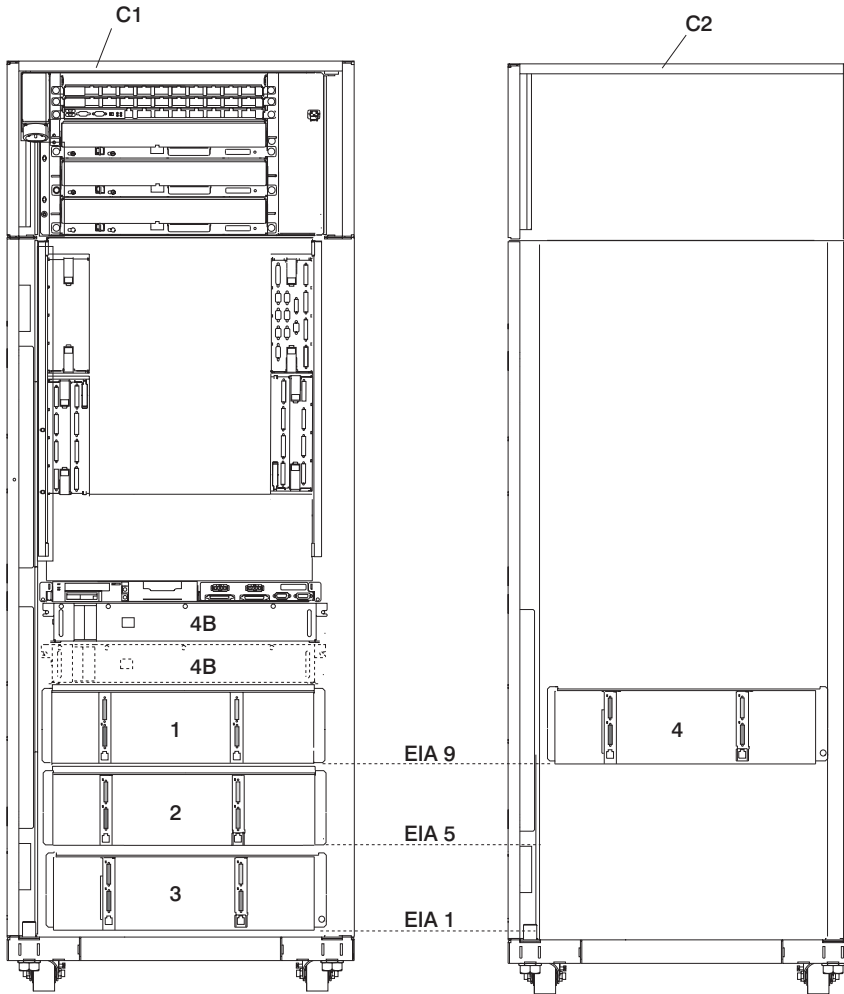
C1	Primary Rack	3	Third I/O Subsystem
C2	Secondary Rack	4	Fourth I/O Subsystem
C3	Blank Space	5	Fifth I/O Subsystem
C4	Blank Space	6	Sixth I/O Subsystem
1	First I/O Subsystem	7	Seventh I/O Subsystem
2	Second I/O Subsystem	8	Eighth I/O Subsystem

I/O Subsystem Positions, Fully Populated Primary and Secondary Rack (Rear View with IBFs)



C1	Primary Rack	4B	Four IBFs (primary rack), Position 4
C2	Primary I/O Book (Book 0)	5	Fifth I/O Subsystem
C3	Secondary Rack	6	Sixth I/O Subsystem
1	First I/O Subsystem	7	Seventh I/O Subsystem
2	Second I/O Subsystem	2B	Two IBFs (secondary rack)
3	Third I/O Subsystem	8	Eighth I/O Subsystem
4	Fourth I/O Subsystem		

Placement of Subsystem 4 in a Two-Rack Configuration (Rear View with IBF)



C1	Primary Rack	3	Third I/O Subsystem
C2	Secondary Rack	4	Fourth I/O Subsystem
1	First I/O Subsystem	4B	Four IBFs
2	Second I/O Subsystem		

Note: The physical location shown for I/O Subsystem 4 is populated only when IBFs are present and four or more I/O subsystems are installed.

RIO and RIO-G Cabling Rules

If the CEC RIO ports are standard RIO, thumbscrew-style connectors, then connect a two-planar I/O loop to the RIO ports of the CEC in the following order:

1. Primary I/O Book 0 (1, 2, 3, or 4 MCMs): RIO 1 A0&A1, RIO 2 B0&B1
2. Secondary I/O Book 2:
 - 2 MCMs: RIO 3 C0&C1, RIO 4 D0&D1
 - 3 or 4 MCMs: RIO 3 C0&C1, RIO 4 D0&D1, RIO 5 A0&A1, RIO 6 B0&B1
3. Secondary I/O Book 3 (4 MCMs): RIO 7 C0&C1, RIO 8 D0&D1

Notes:

1. Secondary I/O Book 1 is not allowed with CEC standard RIO connections.
2. One I/O planar loops are not allowed with CEC standard RIO connections.

If the CEC RIO ports are gigabyte RIO, or RIO-G, connectors, then connect either a one I/O planar loop or a two planar I/O loop to the first 16 RIO ports of the CEC in the following order:

1. Primary I/O Book 0 (1, 2, 3, or 4 MCMs): RIO 1 A0&A1, RIO 2 B0&B1
2. Secondary I/O Book 2:
 - 2 MCMs: RIO 3 C0&C1, RIO 4 D0&D1
 - 3 or 4 MCMs: RIO 3 C0&C1, RIO 4 D0&D1, RIO 5 A0&A1, RIO 6 B0&B1
3. Secondary I/O Book 3:
 - 2 MCMs: RIO 5 A0&A1, RIO 6 B0&B1
 - 3 or 4 MCMs: RIO 7 A0&A1, RIO 8 B0&B1

Although two I/O planar loops are not permitted on the last twelve RIO ports of the CEC, you can connect additional one I/O planar loops to the next twelve RIO ports of the CEC in the following order:

1. Secondary I/O Book 3 (4 MCMs): RIO 9 C0&C1, RIO 10 D0&D1
2. Secondary I/O Book 1:
 - 3 MCMs: RIO 9 C0&C1, RIO 10 D0&D1, RIO 11 A0&A1, RIO 12 B0&B1
 - 4 MCMs: RIO 11 C0&C1, RIO 12 D0&D1, RIO 13 A0&A1, RIO 14 B0&B1

Note: Use required pairs of RIO ports without omitting any.

The following RIO port speeds are available:

- Standard RIO uses a thumbscrew retention physical connector and runs at 500 MB per second.
- Gigabyte RIO, or RIO-G, uses a bayonette retention physical connector and runs at 1 GB per second.

Two I/O planars are available, one for RIO and one for RIO-G, that may be placed in either side of an I/O subsystem. They can be identified by their RIO connector style.

Rules for connecting RIO and RIO-G CEC ports to I/O subsystem RIO and RIO-G ports are the following:

- CEC RIO ports must not be connected to I/O subsystem RIO-G ports, even with the available RIO-G to RIO cables.
- RIO-G to RIO cables must only be used to connect CEC RIO-G ports to I/O subsystem RIO ports.
- RIO to RIO cables must only be used to connect CEC RIO ports to I/O subsystem RIO ports.
- RIO-G to RIO-G cables must only be used to connect CEC RIO-G ports to I/O subsystem RIO-G ports.

Rules for connecting RIO and RIO-G I/O planars to the CEC RIO and RIO-G ports are the following:

- CEC RIO ports must be connected to 2 RIO planars per loop. Up to 8 I/O subsystems can be connected.

- CEC RIO-G ports can be connected to RIO and RIO-G I/O planars with appropriate cables in one planar loop or two planar loops in the following order:
 1. Cable any I/O subsystems with RIO I/O planars in both the left and the right positions with 2 I/O planar loop connections. The maximum data rate for each RIO I/O planar is 500 MB per second.
 2. Cable any I/O subsystems with RIO-G I/O planars in both the left and right positions with 2 I/O planar loop connections. The maximum data rate for each RIO-G I/O planar is 1 GB per second.
 3. Cable any I/O subsystems with a RIO I/O planar in one side and a RIO-G I/O planar in the other side with 1 I/O planar loop connection.

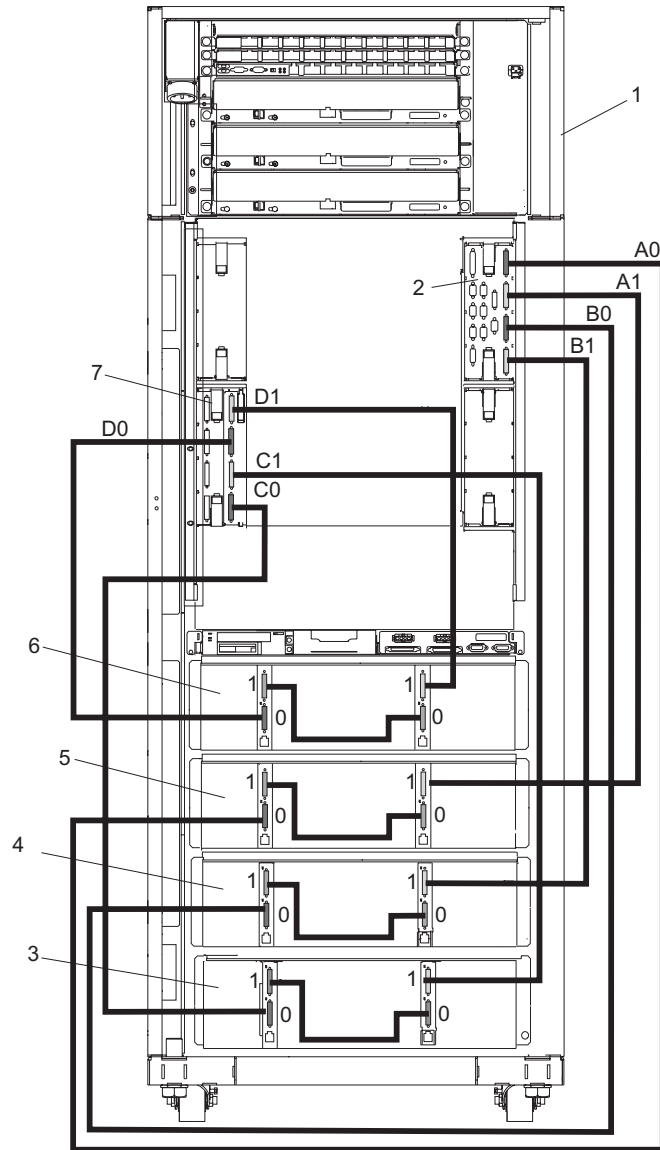
The maximum data rate for the RIO I/O planar is 500 MB per second, and for the RIO-G I/O planar, the maximum data rate is 2 GB per second. However, in the event of a cable failure, there is no redundant path for the 2 GB per second RIO-G I/O planar. Restoring the redundant path for the RIO-G planar reduces the data rate to 1 GB per second. I/O subsystems with a RIO I/O planar in one side and a RIO-G I/O planar in the other side with 2 I/O planar loop connections are not allowed.

4. Cable any I/O subsystems with RIO-G I/O planars in both the left and the right positions with one I/O planar loop connections. The maximum data rate for each RIO-G I/O planar is 1 GB per second with data path redundancy, or 2 GB per second without data path redundancy.

Note: If all I/O planars are connected to the CEC with one I/O planar loop, the maximum number of I/O subsystems connected to the system is reduced to seven.

I/O Subsystems (1 Through 4 without IBFs) RIO Cabling to I/O Books, Two I/O Planar Loop Configuration, 2, 3, or 4 MCMs Only

Note: The following graphic applies to CECs with RIO, or thumbscrew retention, connections.

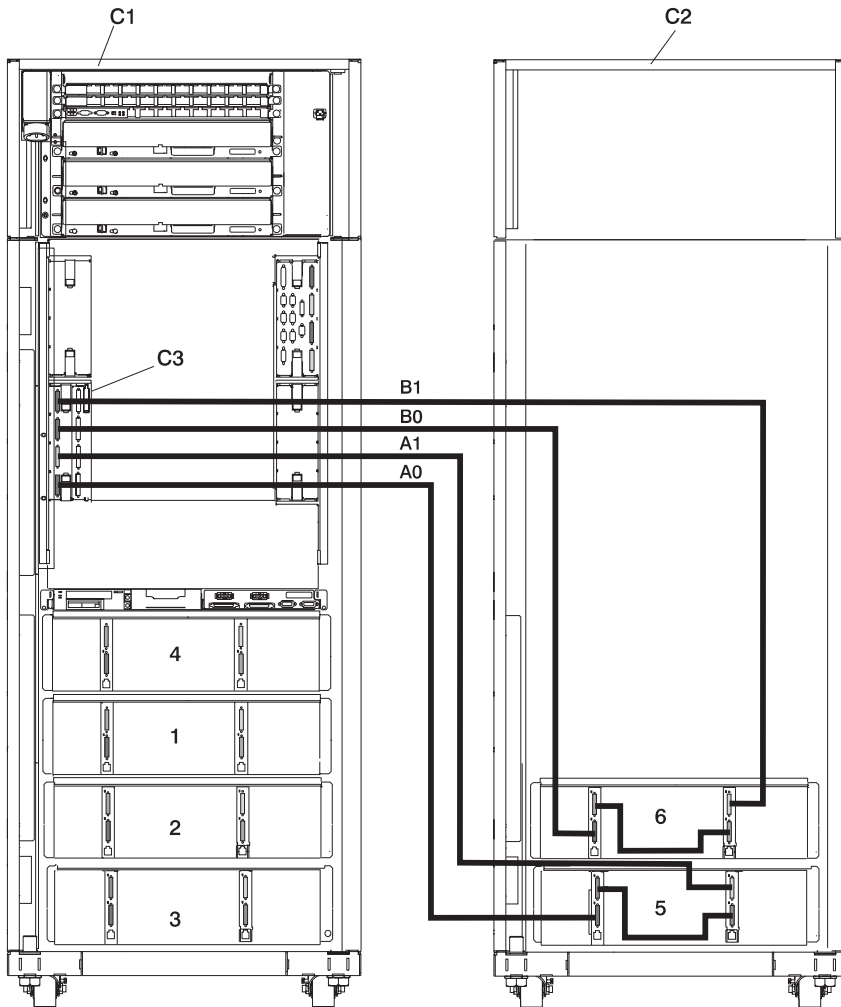


- | | | | |
|---|----------------------|---|----------------------|
| 1 | Primary Rack | 5 | First I/O Subsystem |
| 2 | Primary I/O Book | 6 | Fourth I/O Subsystem |
| 3 | Third I/O Subsystem | 7 | Secondary I/O Book |
| 4 | Second I/O Subsystem | | |

I/O Subsystems (5 and 6) RIO Cabling to the Secondary I/O Book, Two I/O Planar Loop Configuration, 3 or 4 MCMs Only

Note: The following graphic applies to CECs with RIO, or thumbscrew retention, connections.

Shown Without IBFs



C1 Primary Rack

C2 Secondary Rack

C3 Secondary I/O Book

5 Fifth I/O Subsystem

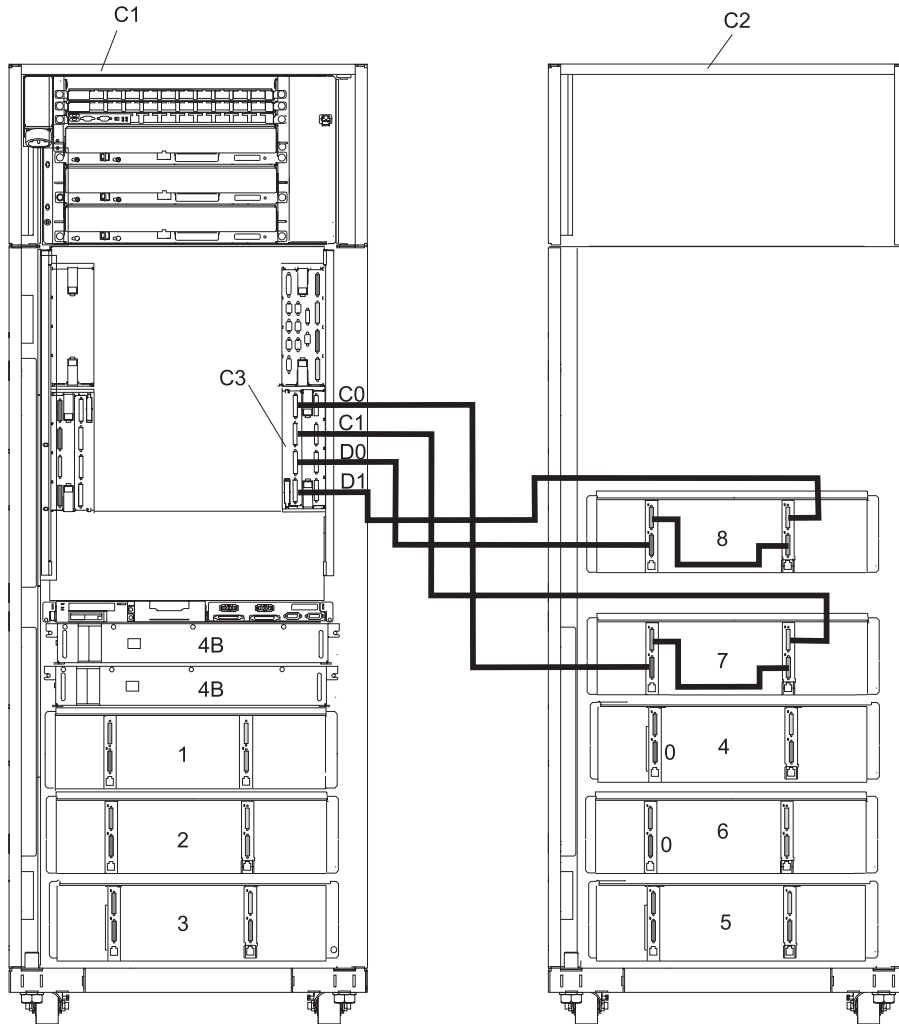
6 Sixth I/O Subsystem

Note: RIO cabling to I/O Subsystems 5 and 6 is the same for configurations with or without the IBFs.

I/O Subsystems (7 and 8) RIO Cabling to the Third I/O Book, Two I/O Planar Loop Configuration, 4 MCMs Only

Note: The following graphic applies to CECs with RIO, or thumbscrew retention, connections.

Shown with IBFs

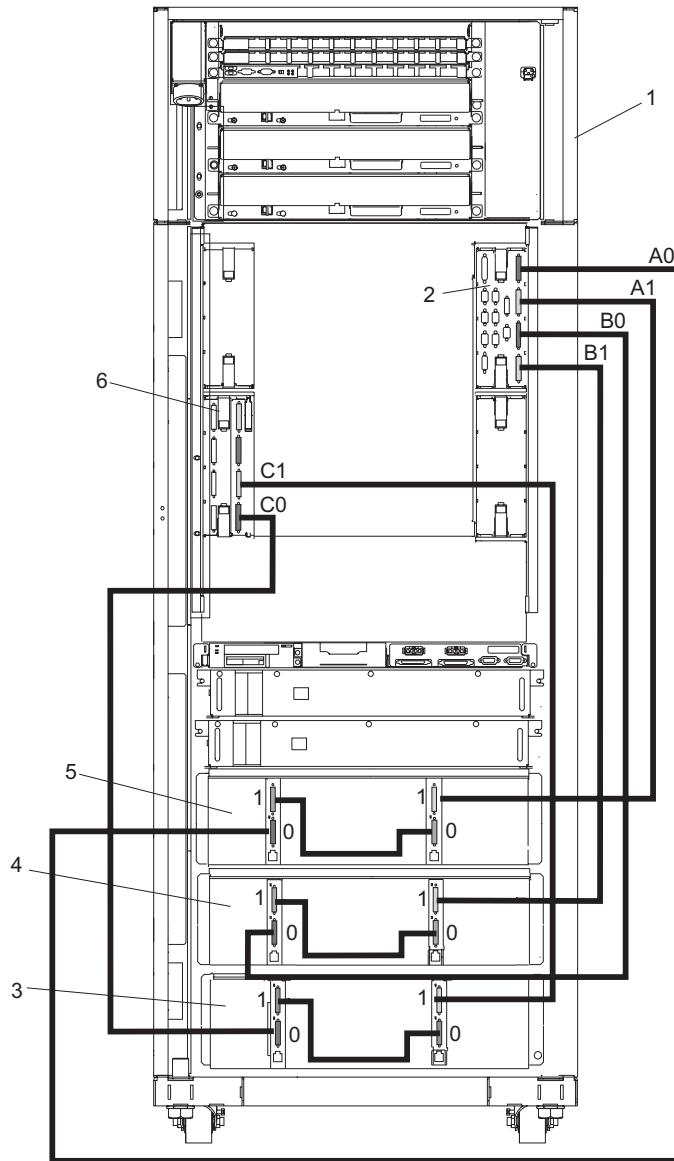


- | | | | |
|-----------|-------------------------|-----------|--------------------------------|
| C1 | Primary Rack | 4 | Fourth I/O Subsystem |
| C2 | Secondary Rack | 4B | Two IBFs (maximum), Position 4 |
| C3 | Third I/O Book (Book 3) | 5 | Fifth I/O Subsystem |
| 1 | First I/O Subsystem | 6 | Sixth I/O Subsystem |
| 2 | Second I/O Subsystem | 7 | Seventh I/O Subsystem |
| 3 | Third I/O Subsystem | 8 | Eighth I/O Subsystem |

Note: RIO cabling to I/O subsystems 7 and 8 is the same for configurations with or without the IBFs.

I/O Subsystems (1 through 3 with IBFs) RIO Cabling to I/O Books, Two I/O Planar Loop Configuration, 2, 3, or 4 MCMs Only

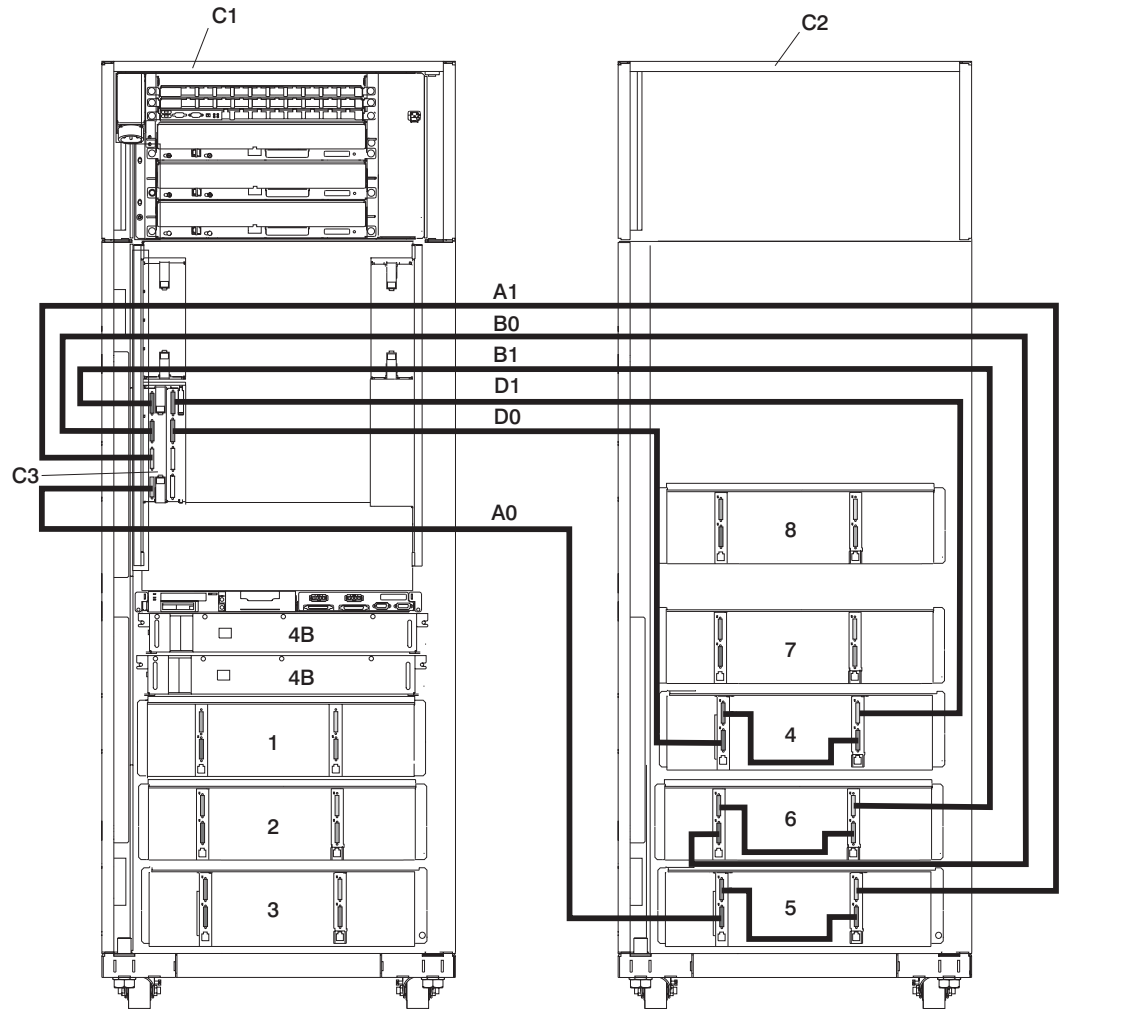
Note: The following graphic applies to CECs with RIO, or thumbscrew retention, connections.



- | | | | |
|----------|----------------------|-----------|---------------------------------|
| 1 | Primary Rack | A0 | Connection to I/O Book (Book 0) |
| 2 | Primary I/O Book | A1 | Connection to I/O Book (Book 0) |
| 3 | Third I/O Subsystem | B0 | Connection to I/O Book (Book 0) |
| 4 | Second I/O Subsystem | B1 | Connection to I/O Book (Book 0) |
| 5 | First I/O Subsystem | C0 | Connection to I/O Book (Book 2) |
| 6 | Secondary I/O Book | C1 | Connection to I/O Book (Book 2) |

I/O Subsystems (4 through 6 with IBFs) RIO Cabling to I/O Books, Two I/O Planar Loop Configuration, 3 or 4 MCMs Only

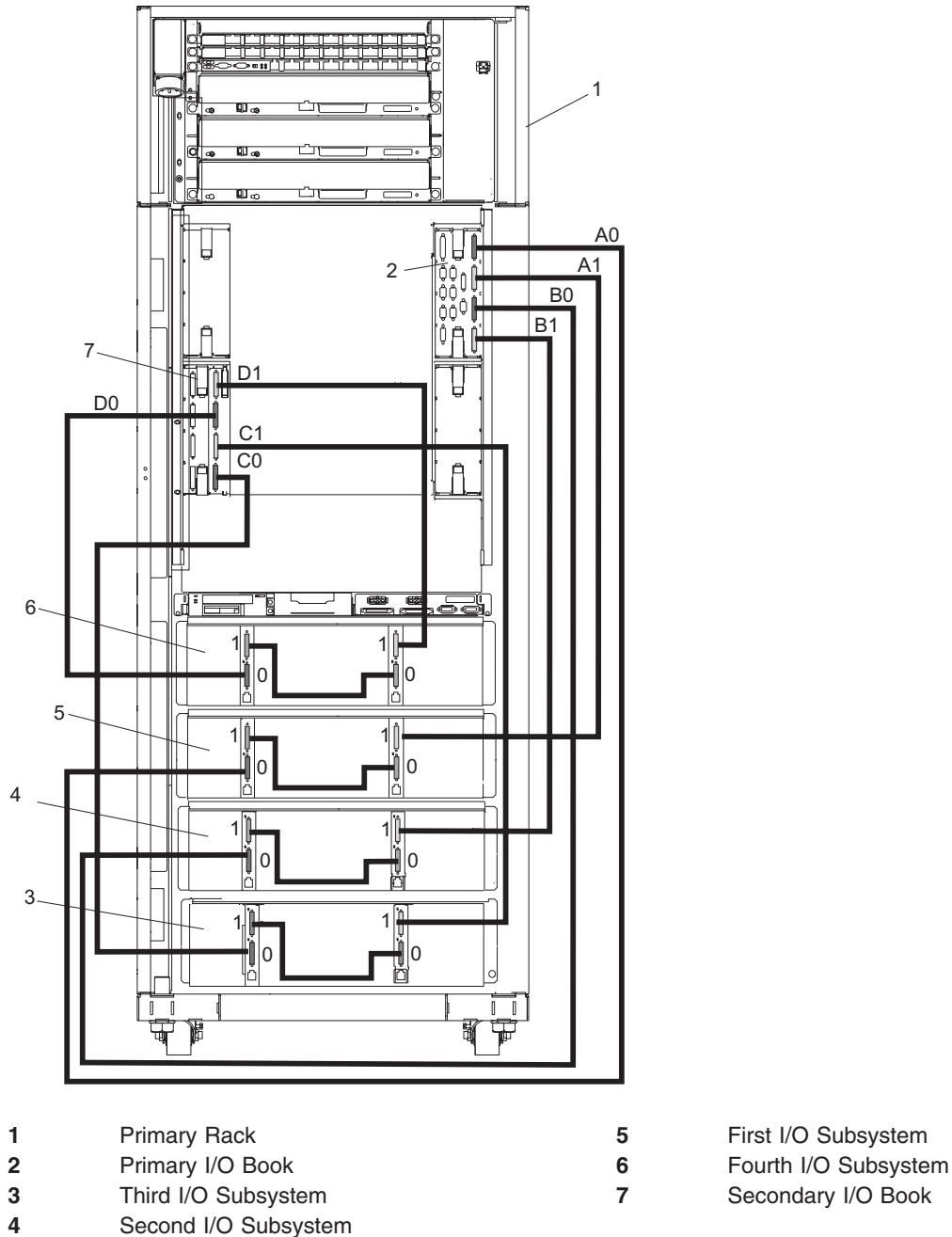
Note: The following graphic applies to CECs with RIO, or thumbscrew retention, connections.



- | | | | |
|-----------|----------------------------------|-----------|---------------------------------|
| C1 | Secondary Rack | 6 | Sixth I/O Subsystem |
| C2 | Primary Rack | 7 | Seventh I/O Subsystem |
| C3 | Secondary I/O Book in I/O Slot 3 | 8 | Eighth I/O Subsystem |
| C4 | Secondary I/O Book in Slot 2 | A0 | Connection to I/O Book (Book 2) |
| 1 | First I/O Subsystem | A1 | Connection to I/O Book (Book 2) |
| 2 | Second I/O Subsystem | B0 | Connection to I/O Book (Book 2) |
| 3 | Third I/O Subsystem | B1 | Connection to I/O Book (Book 2) |
| 4 | Fourth I/O Subsystem | D0 | Connection to I/O Book (Book 2) |
| 4B | Integrated Battery Feature (IBF) | D1 | Connection to I/O Book (Book 2) |
| 5 | Fifth I/O Subsystem | | |

I/O Subsystems (1 Through 4 without IBFs) RIO-G Cabling to I/O Books, Two I/O Planar Loop Configuration, 2, 3, or 4 MCMs Only

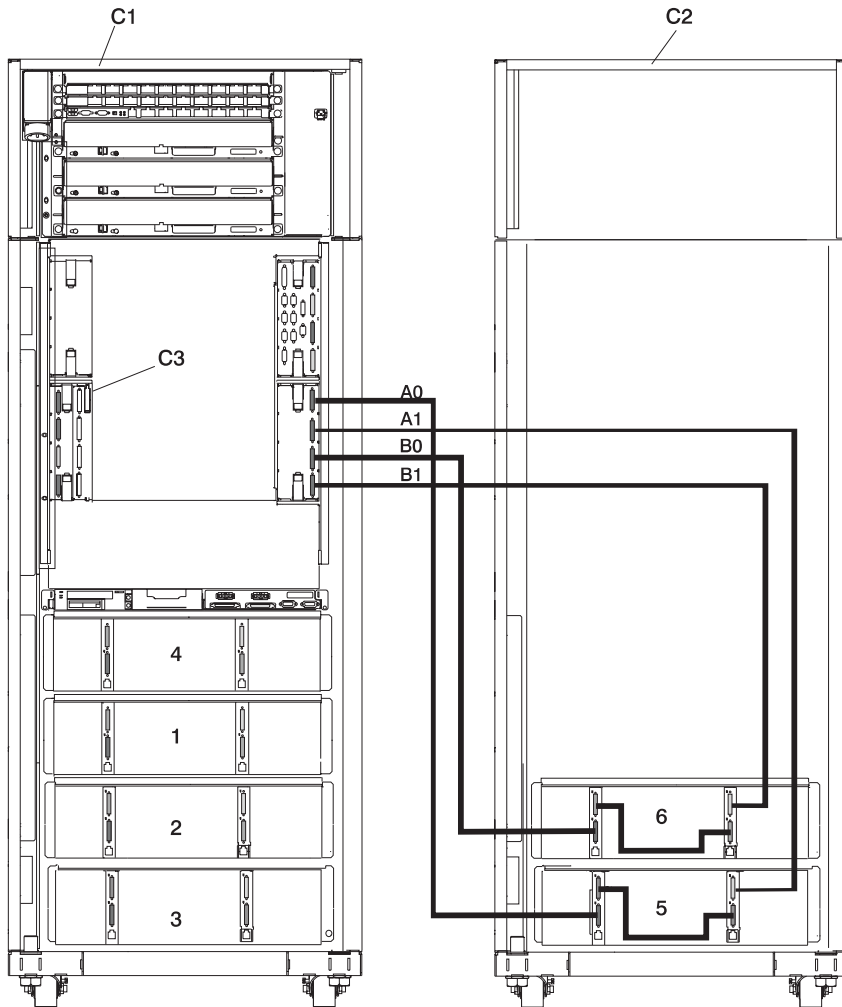
Note: The following graphic applies to CECs with RIO-G, or bayonette retention, connections.



I/O Subsystems (5 and 6) RIO-G Cabling to the Secondary I/O Book, Two I/O Planar Loop Configuration, 2 MCMs Only

Note: The following graphic applies to CECs with RIO-G, or bayonette retention, connections.

Shown Without IBFs



C1 Primary Rack
C2 Secondary Rack
C3 Secondary I/O Book

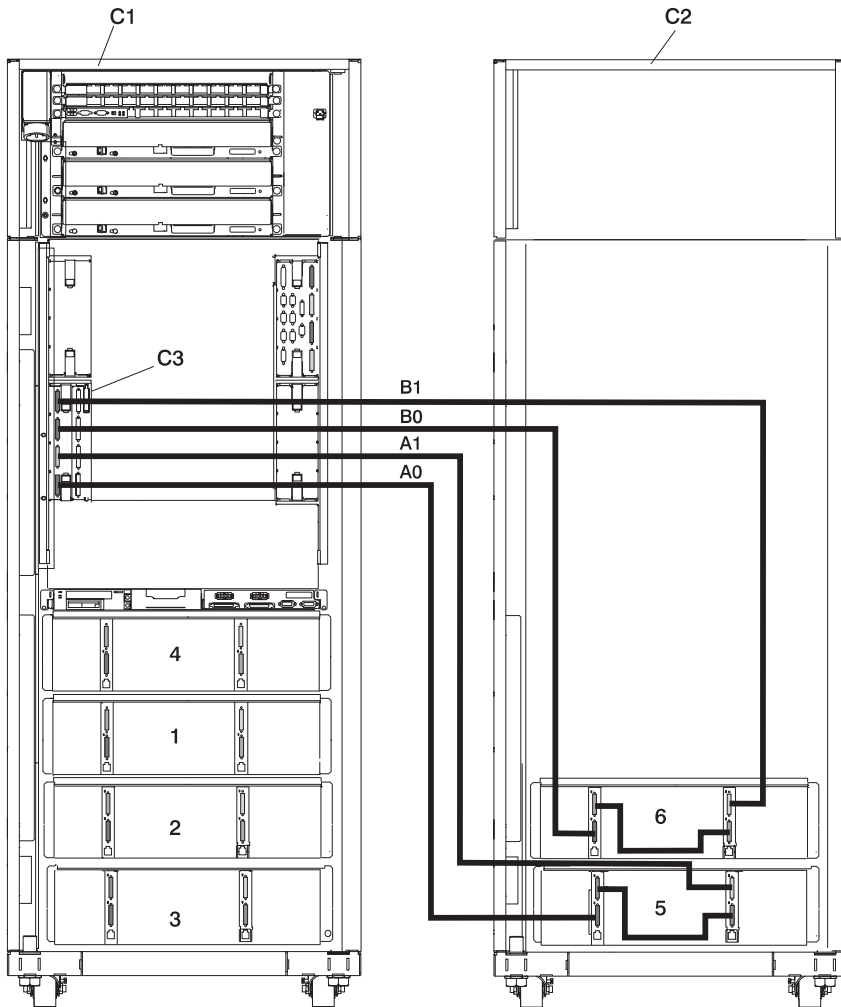
5 Fifth I/O Subsystem
6 Sixth I/O Subsystem

Note: RIO cabling to I/O Subsystems 5 and 6 is the same for configurations with or without the IBFs.

I/O Subsystems (5 and 6) RIO-G Cabling to the Secondary I/O Book, Two I/O Planar Loop Configuration, 3 or 4 MCMs Only

Note: The following graphic applies to CECs with RIO-G, or bayonette retention, connections.

Shown Without IBFs



C1 Primary Rack

C2 Secondary Rack

C3 Secondary I/O Book

5 Fifth I/O Subsystem

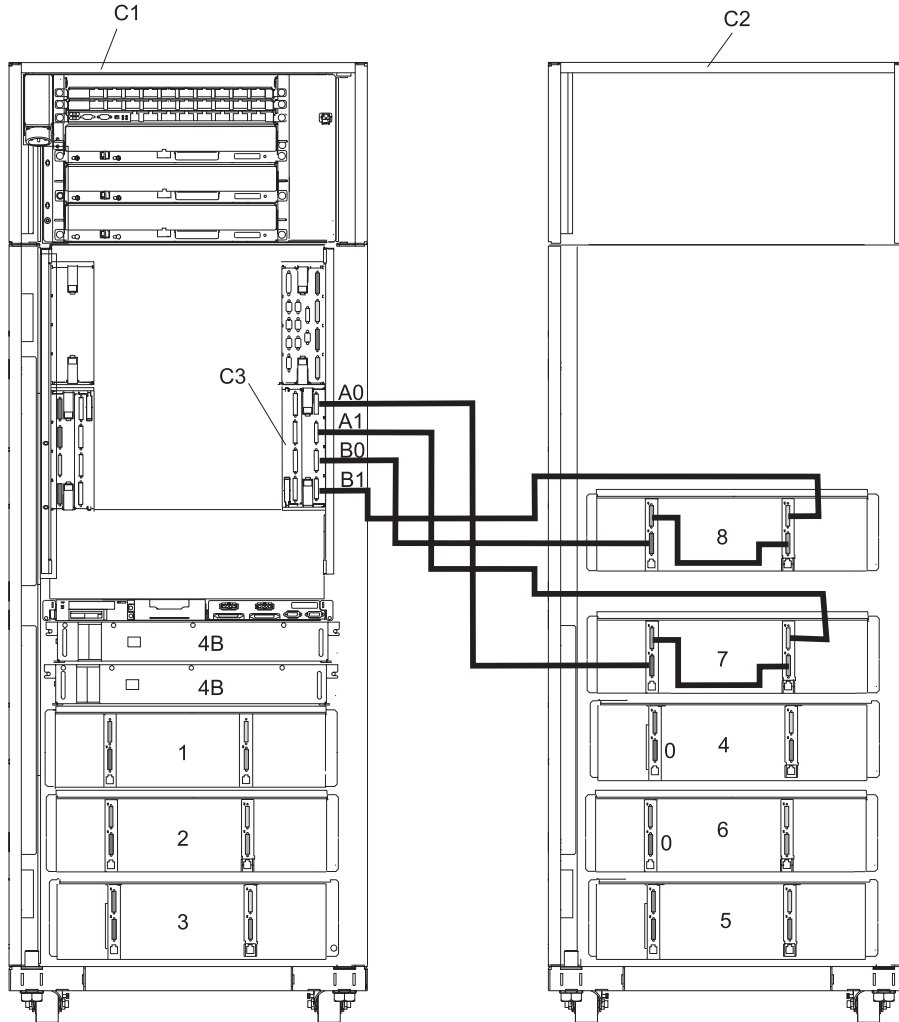
6 Sixth I/O Subsystem

Note: RIO cabling to I/O Subsystems 5 and 6 is the same for configurations with or without the IBFs.

I/O Subsystems (7 and 8) RIO-G Cabling to the Third I/O Book, Two I/O Planar Loop Configuration, 3 or 4 MCMs Only

The following graphic applies to CECs with RIO-G, or bayonette retention connections.

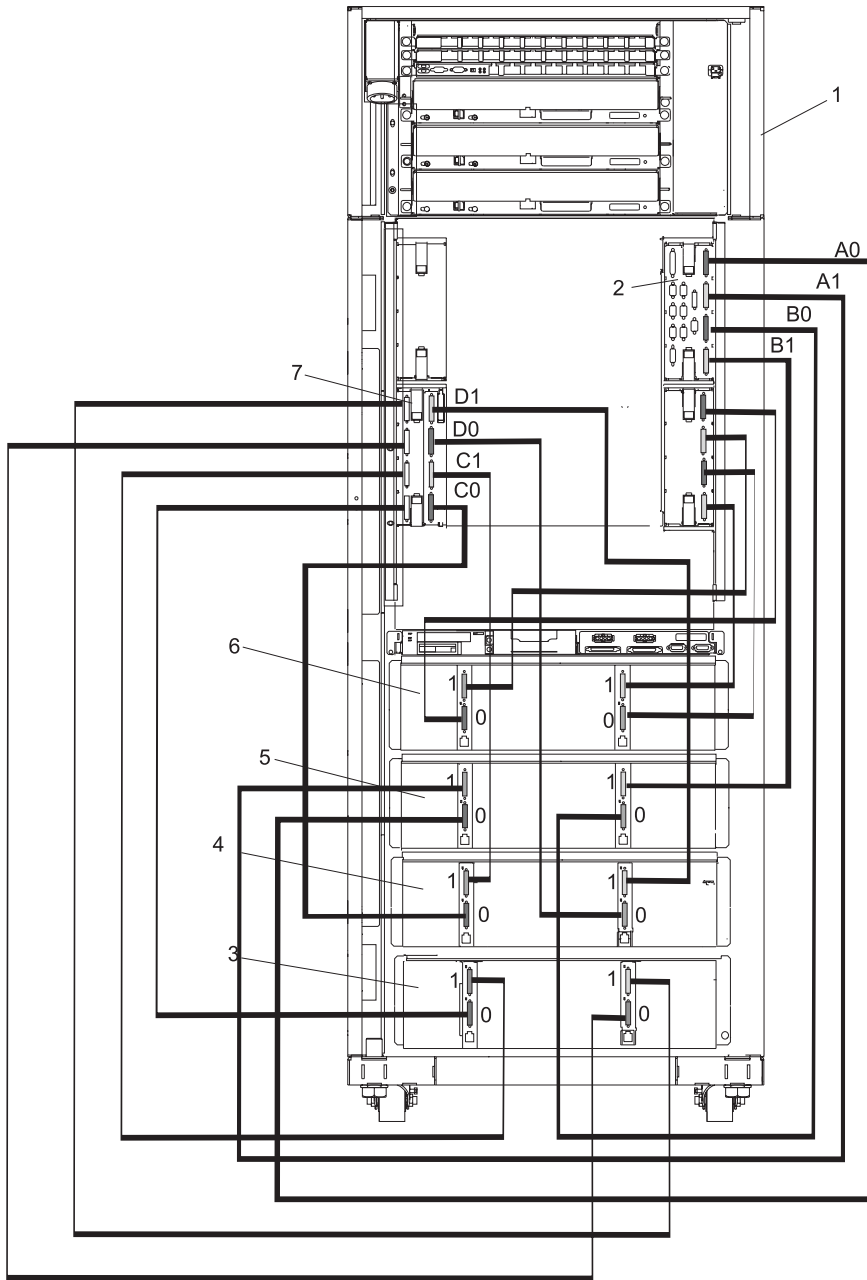
Shown with IBFs



- | | | | |
|-----------|--------------------------------|-----------|---------------------------------|
| C1 | Primary Rack | 5 | Fifth I/O Subsystem |
| C2 | Secondary Rack | 6 | Sixth I/O Subsystem |
| C3 | Third I/O Book (Book 3) | 7 | Seventh I/O Subsystem |
| 1 | First I/O Subsystem | 8 | Eighth I/O Subsystem |
| 2 | Second Subsystem | A0 | Connection to I/O Book (Book 3) |
| 3 | Third I/O Subsystem | A1 | Connection to I/O Book (Book 3) |
| 4 | Fourth I/O Subsystem | B0 | Connection to I/O Book (Book 3) |
| 4B | Two IBFs (maximum), Position 4 | B1 | Connection to I/O Book (Book 3) |

I/O Subsystems (1 Through 4 without IBFs) RIO-G Cabling to I/O Books, One I/O Planar Loop Configuration, 3 or 4 MCMs Only

Note: The following graphic applies to CECs with RIO-G, or bayonette retention, connections.

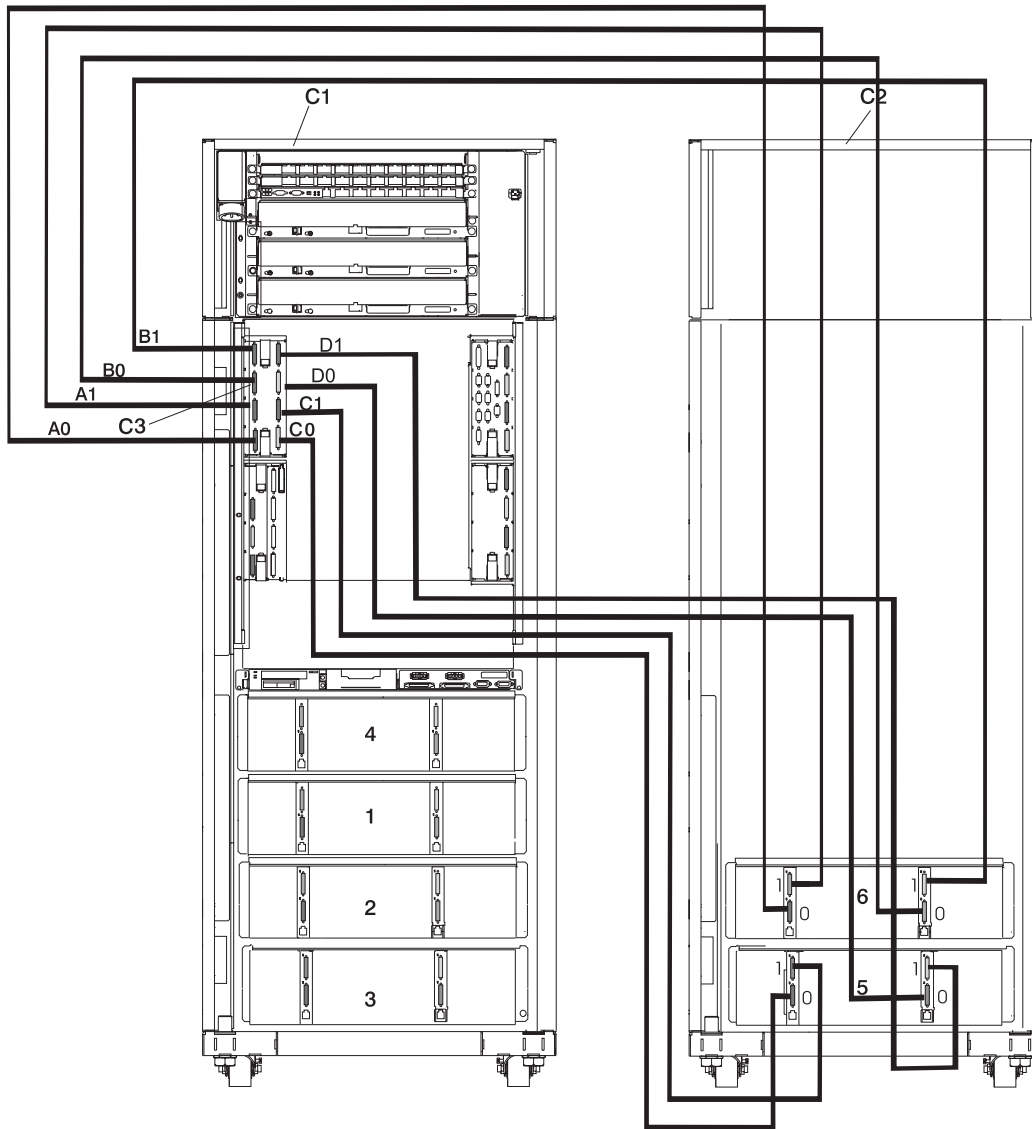


- | | | | |
|---|----------------------|---|----------------------|
| 1 | Primary Rack | 5 | First I/O Subsystem |
| 2 | Primary I/O Book | 6 | Fourth I/O Subsystem |
| 3 | Third I/O Subsystem | 7 | Secondary I/O Book |
| 4 | Second I/O Subsystem | | |

I/O Subsystems (5 and 6) RIO-G Cabling to the Secondary I/O Book, One I/O Planar Loop Configuration, 3 MCMs Only

Note: The following graphic applies to CECs with RIO-G, or bayonette retention, connections.

Shown Without IBFs



C1 Primary Rack

C2 Secondary Rack

C3 Secondary I/O Book

5 Fifth I/O Subsystem

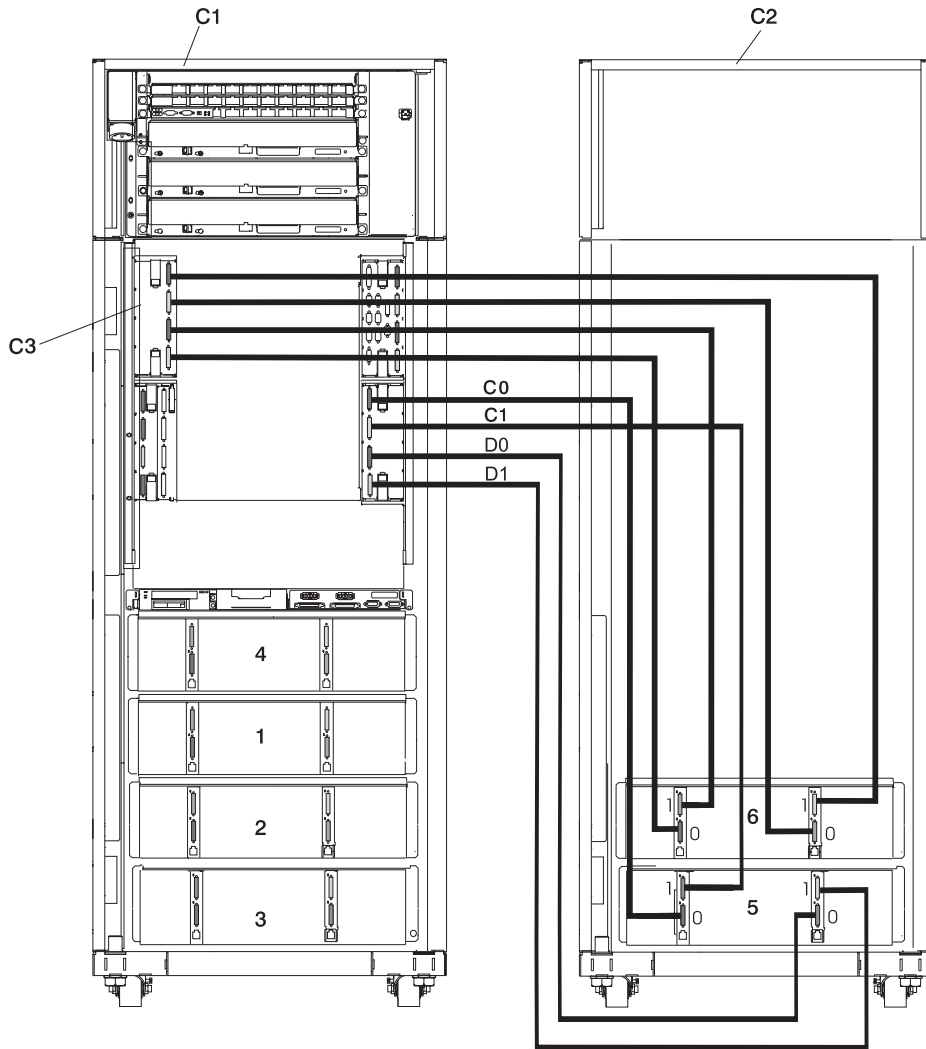
6 Sixth I/O Subsystem

Note: RIO cabling to I/O Subsystems 5 and 6 is the same for configurations with or without the IBFs.

I/O Subsystems (5 and 6) RIO-G Cabling to the Secondary I/O Book, One I/O Planar Loop Configuration, 4 MCMs Only

Note: The following graphic applies to CECs with RIO-G, or bayonette retention, connections.

Shown Without IBFs



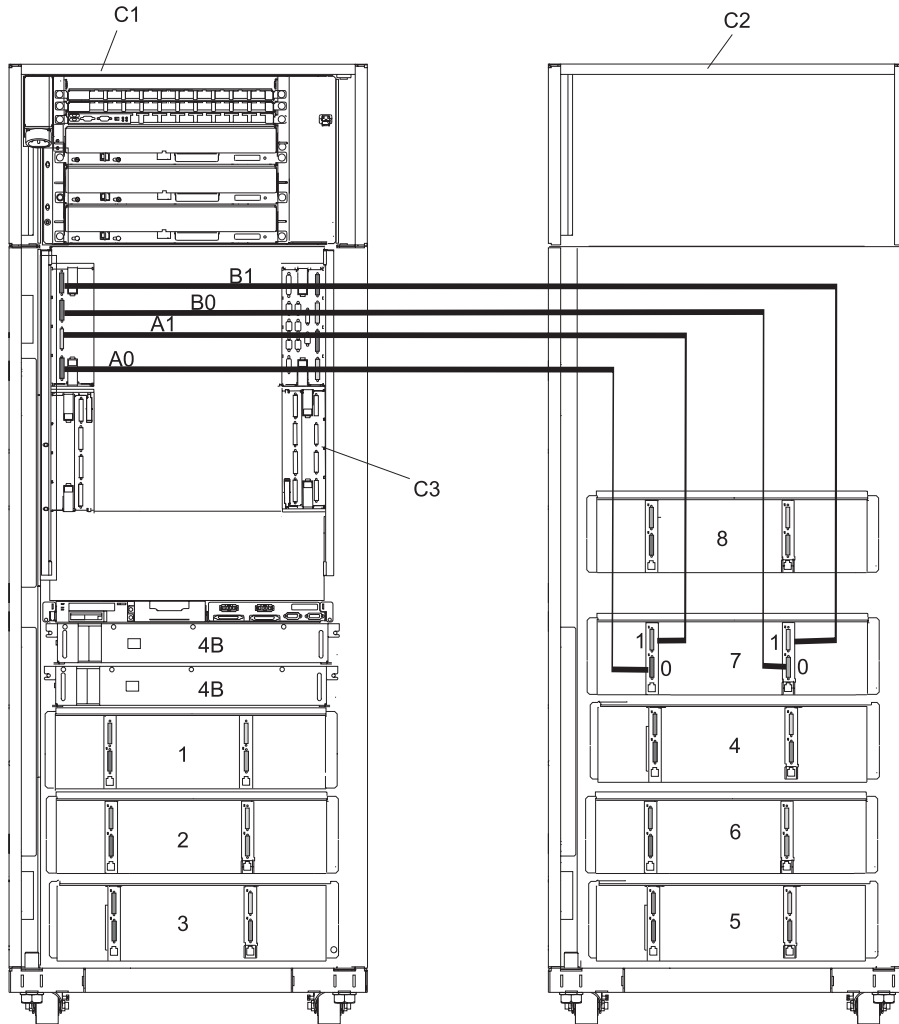
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|-----------|--------------------|----------|---------------------|
| C1 | Primary Rack | 5 | Fifth I/O Subsystem |
| C2 | Secondary Rack | 6 | Sixth I/O Subsystem |
| C3 | Secondary I/O Book | | |

Note: RIO cabling to I/O Subsystems 5 and 6 is the same for configurations with or without the IBFs.

I/O Subsystems (7) RIO-G Cabling to the Fourth I/O Book, One I/O Planar Loop Configuration, 4 MCMs Only

Note: The following graphic applies to CECs with RIO-G, or bayonette retention, connections.

Shown with IBFs



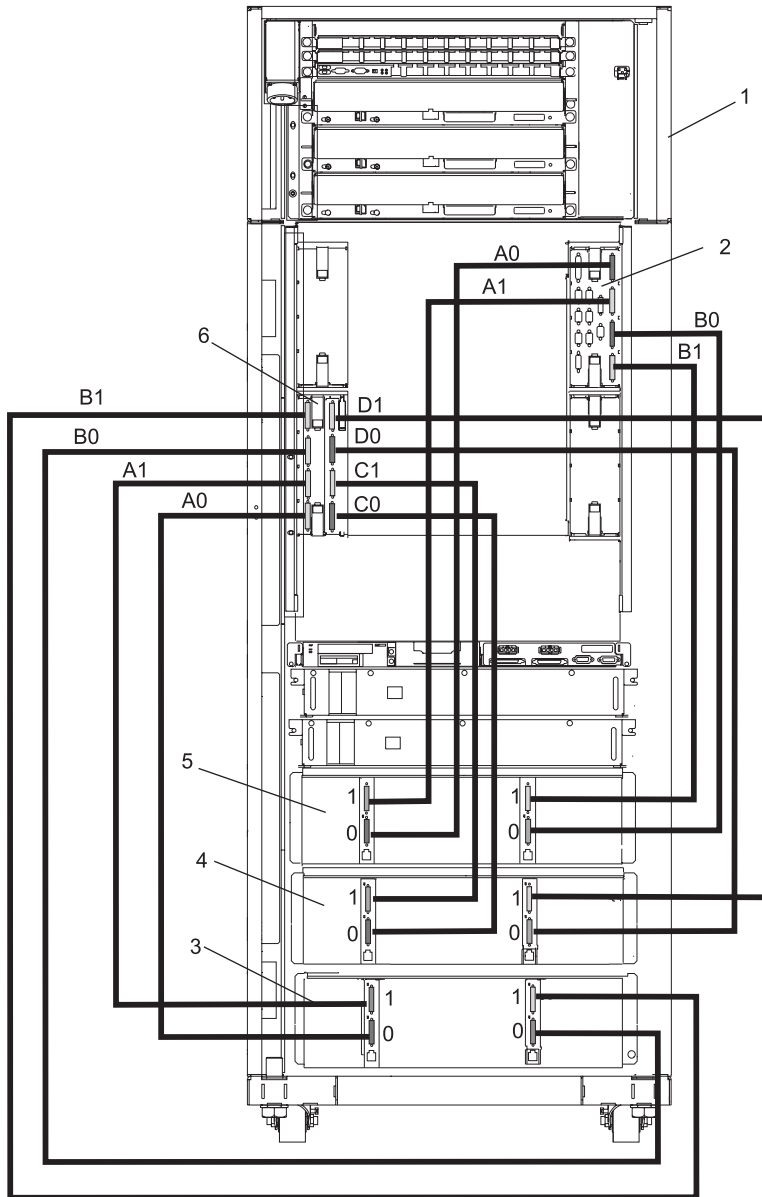
C1	Primary Rack	4	Fourth I/O Subsystem
C2	Secondary Rack	4B	Two IBFs (maximum), Position 4
C3	Third I/O Book (Book 3)	5	Fifth I/O Subsystem
1	First I/O Subsystem	6	Sixth I/O Subsystem
2	Second I/O Subsystem	7	Seventh I/O Subsystem
3	Third I/O Subsystem	8	Eighth I/O Subsystem

Notes:

1. RIO cabling to I/O subsystem 7 is the same for configurations with or without the IBFs.
2. The maximum number of I/O subsystems allowed is reduced to seven when all I/O planars are connected to their own RIO-G port pairs.

I/O Subsystems (1 through 3 with IBFs) RIO-G Cabling to I/O Books, One I/O Planar Loop Configuration, 3 or 4 MCMs Only

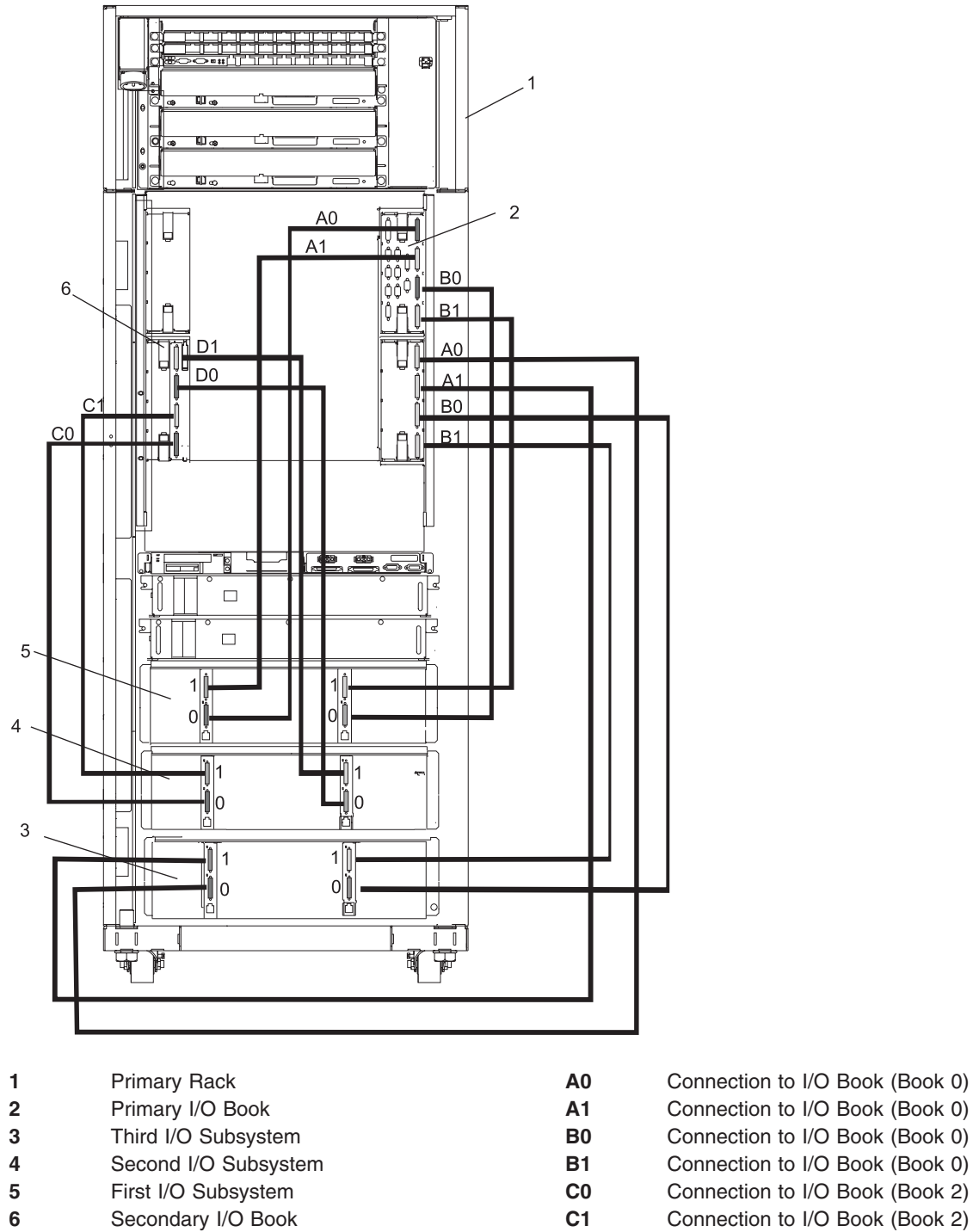
Note: The following graphic applies to CECs with RIO-G, or bayonette retention, connections.



1	Primary Rack	A0	Connection to I/O Book (Book 0)
2	Primary I/O Book	A1	Connection to I/O Book (Book 0)
3	Third I/O Subsystem	B0	Connection to I/O Book (Book 0)
4	Second I/O Subsystem	B1	Connection to I/O Book (Book 0)
5	First I/O Subsystem	C0	Connection to I/O Book (Book 2)
6	Secondary I/O Book	C1	Connection to I/O Book (Book 2)

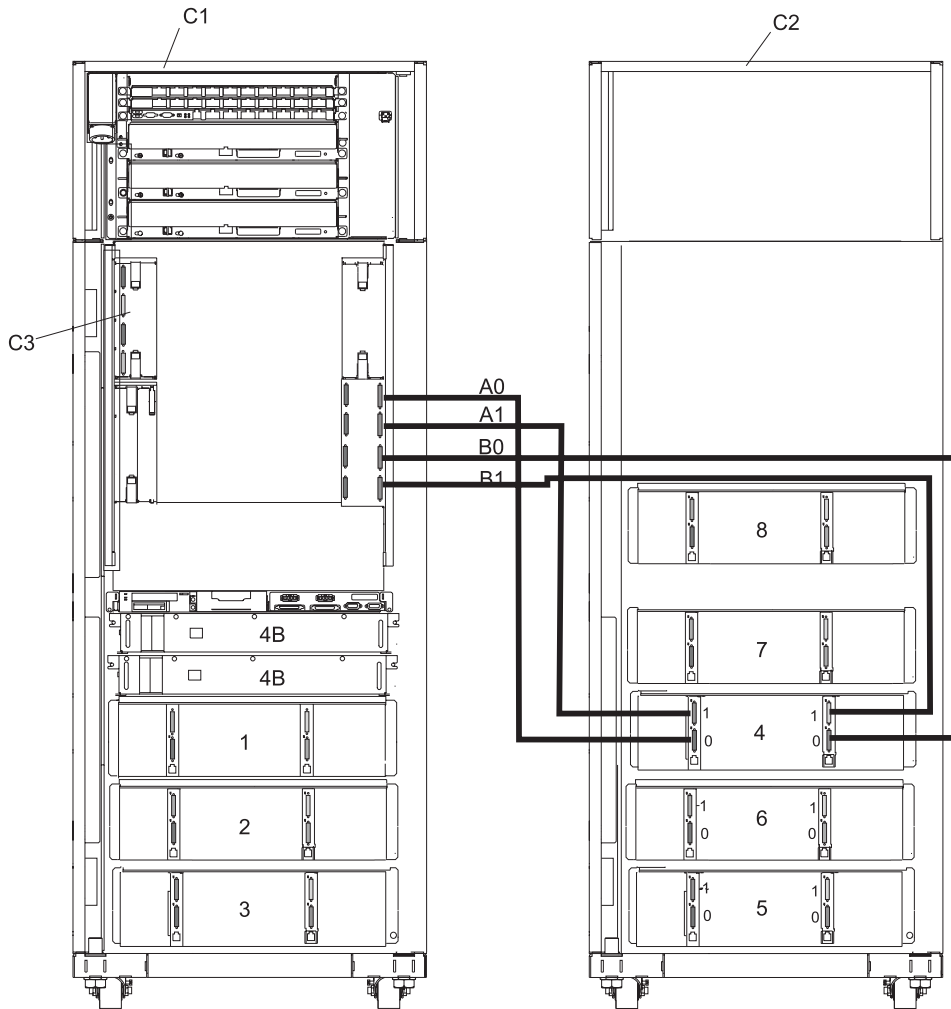
I/O Subsystems (1 through 3 with IBFs) RIO-G Cabling to I/O Books, One I/O Planar Loop Configuration, 2 MCMs Only

Note: The following graphic applies to CECs with RIO-G, or bayonette retention, connections.



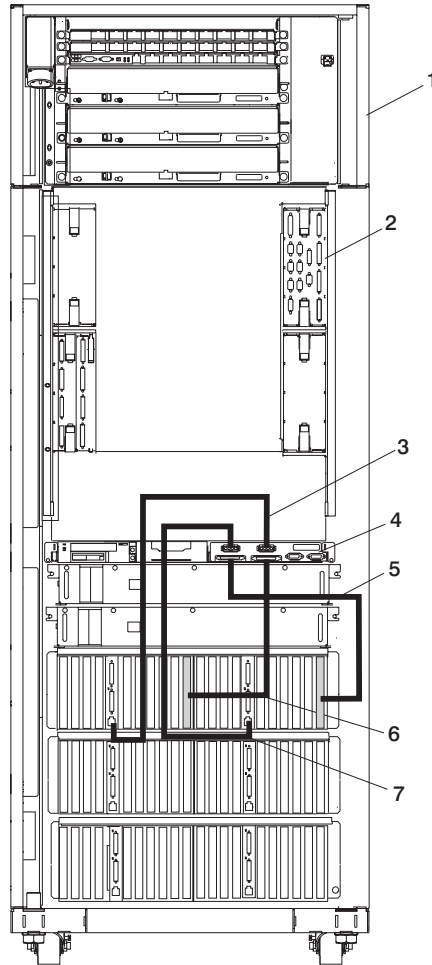
I/O Subsystem (4 with IBFs Installed) RIO-G Cabling to I/O Book 3, One I/O Planar Loop Configuration, 3 or 4 MCMs Only

Note: The following graphic applies to CECs with RIO-G, or bayonette retention, connections.



C1	Secondary Rack	6	Sixth I/O Subsystem
C2	Primary Rack	7	Seventh I/O Subsystem
C3	Secondary I/O Book in I/O Slot 3	8	Eighth I/O Subsystem
C4	Secondary I/O Book in Slot 2	A0	Connection to I/O Book (Book 2)
1	First I/O Subsystem	A1	Connection to I/O Book (Book 2)
2	Second I/O Subsystem	B0	Connection to I/O Book (Book 2)
3	Third I/O Subsystem	B1	Connection to I/O Book (Book 2)
4	Fourth I/O Subsystem	D0	Connection to I/O Book (Book 2)
4B	Integrated Battery Feature (IBF)	D1	Connection to I/O Book (Book 2)
5	Fifth I/O Subsystem		

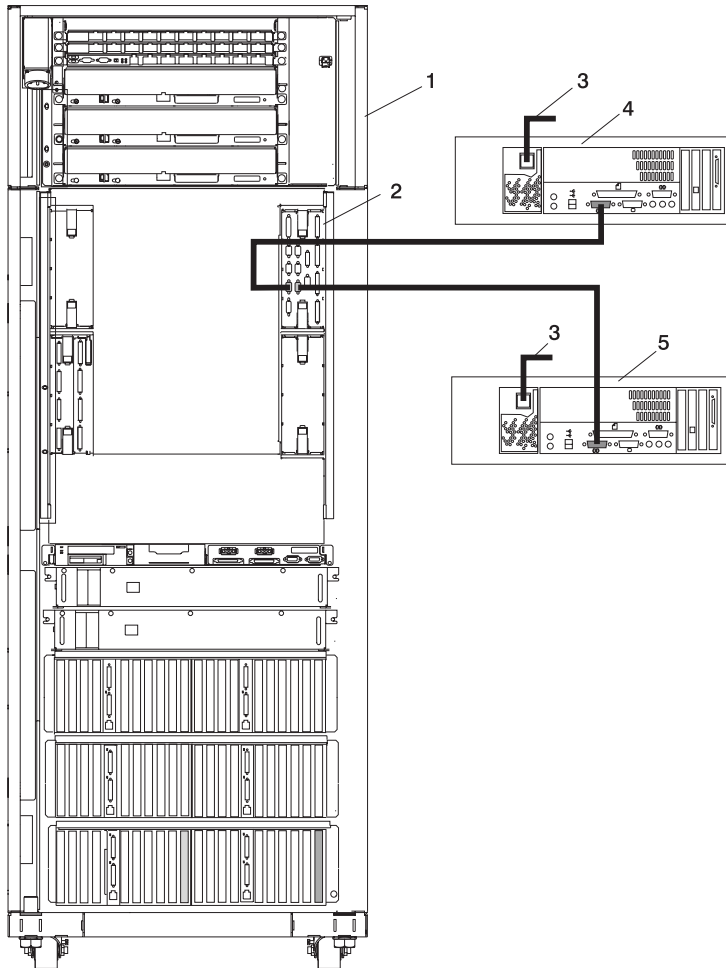
Power and SCSI Cables to the Media Subsystem



- | | | | |
|---|--|---|---|
| 1 | Primary Rack | 5 | SCSI Cable for Media Subsystem Rear Drives |
| 2 | Primary I/O Book | 6 | SCSI Cable for Media Subsystem Front Drives |
| 3 | Power Cable for Media Subsystem Front Drives | 7 | Power Cable for Media Subsystem Rear Drives |
| 4 | Rear of Media Subsystem | | |

Hardware Management Console for pSeries (HMC) to the Primary I/O Book

To connect your HMC to the pSeries 690, connect the serial cable into serial port 1 located on the back of the HMC. Connect the other end of the serial cable into the HMC1 connector located on the primary I/O book in the managed system. The following illustration shows the location of the serial ports on the back of the HMC and the HMC connectors located on the processor subsystem.

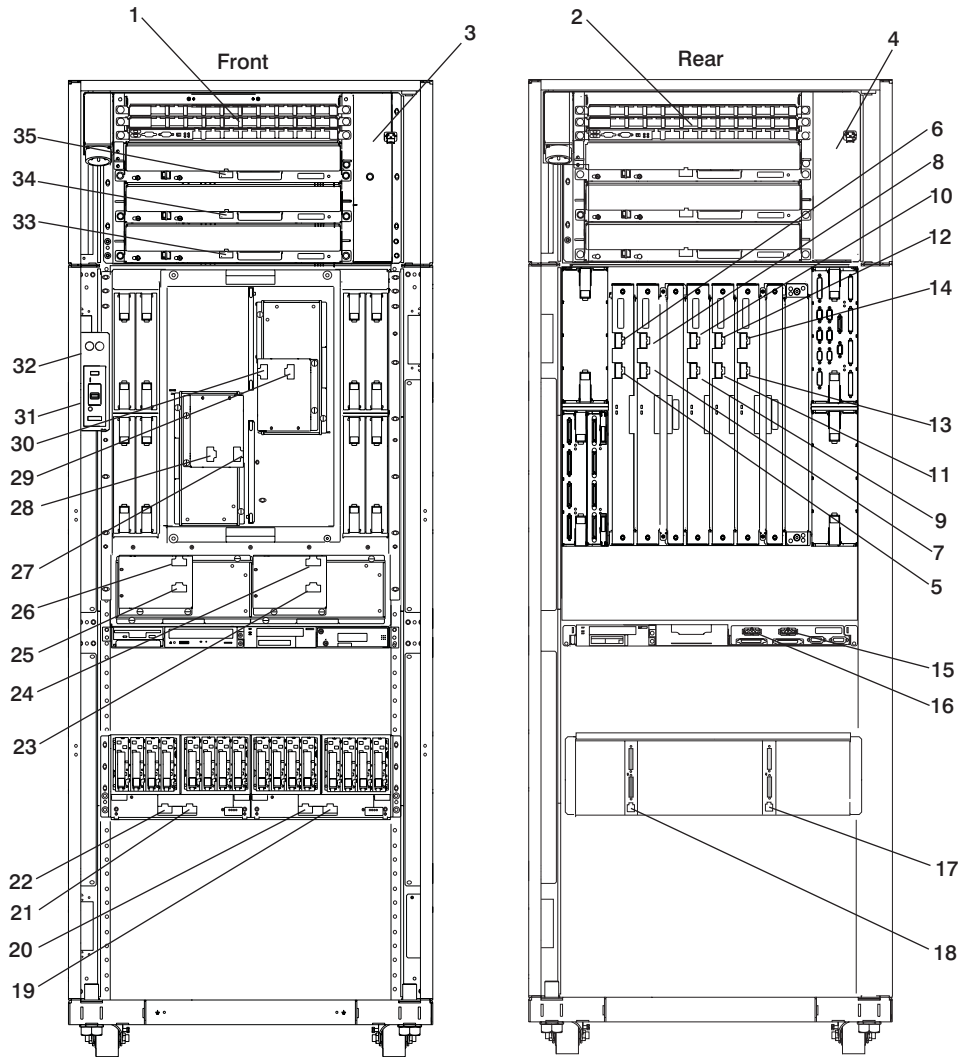


- | | | | |
|---|---|---|--|
| 1 | Primary Rack | 4 | Primary HMC Connected to HMC #1 in Primary I/O Book (HMC #1 may be labeled HSC #1) |
| 2 | Primary I/O Book | 5 | Optional Second HMC Connected to HMC #2 in Primary I/O Book (HMC #2 may be labeled HSC #2) |
| 3 | Power Plug to External Power Source (wall plug) | | |

Appendix H. Cabling Information

This appendix provides information about the location and label colors of the pSeries 690 cables.

Power Cabling



Index	Part Number	Units Per Assy	Description
1	N/A		Bulk Power Distribution on the A side of the system (BPD A Side)
2	N/A		Bulk Power Distribution on the B side of the system (BPD B Side)
3	N/A	1	A35-BPC-P03 to Bulk Power Fan P1-F1, Cable attached to FAN (BPF-A)
4	N/A	1	B35-BPC-P03 to Bulk Power Fan P2-F1, Cable attached to FAN (BPF-B)
5	11P4449	1	B35-BPC-P08 to DCA-1-P01, Red
6	11P4448	1	A35-BPC-P08 to DCA-1-P00, Red with white stripe
7	11P4451	1	B35-BPC-P09 to DCA-2-P01, Red
8	11P4450	1	A35-BPC-P09 to DCA-2-P00, Red with white stripe
9	11P4453	1	B35-BPC-P10 to DCA-3-P01, Red
10	11P4452	1	A35-BPC-P10 to DCA-3-P00, Red with white stripe

Index	Part Number	Units Per Assy	Description
11	11P4455	1	B35-BPD1-P08 to DCA-4-P01, Red
12	11P4454	1	A35-BPD1-P08 to DCA-4-P00, Red with white stripe
13	11P4457	1	B35-BPD1-P09 to DCA-5-P01, Red
14	11P4456	1	A35-BPD1-P09 to DCA-5-P00, Red with white stripe
15 to 17	11P4303	1	I/OB9-P00 to Media P02
16 to 18	11P4303	1	I/OB9-P01 to Media P00
19, 20, 21, 22	N/A		B35-BPDx-P0x to I/O Subsystem #x For more information about these cables, refer to "RIO Cables, RIO-G Cables, and I/O Power Cables" on page 103
23	11P4462	1	B35-BPC-P05 to (AMD2-P01) MDA2-J02, Red
24	11P4461	1	A35-BPC-P05 to (AMD2-P00) MDA2-J01, Red with white stripe
25	11P4460	1	A35-BPC-P04 to (AMD1-P01) MDA1-J02, Red
26	11P4459	1	A35-BPC-P04 to (AMD1-P00) MDA1-J01, Red with white stripe
27	11P4463	1	A35-BPC-P06 to (AMD3-P00) MDA3-J01, Red with white stripe
28	11P4464	1	B35-BPC-P06 to (AMD3-P01) MDA3-J02, Red
29	11P4465	1	B35-BPC-P07 to (AMD4-P00) MDA4-J02, Red with white stripe
30	11P4466	1	B35-BPC-P07 to (AMD4-P01) MDA4-J01, Red
31	11P1596	1	B35-BPC-P02 to UEPO J01, Red
32	11P1595	1	A35-BPC-P02 to UEPO J00, Red with white stripe
33	11P2998	2	A35-BPR-P00 to A-IBF3-P00 (Secondary Frame) B35-BPR-P00 to B-IBF3-P00 (Secondary Frame)
34	11P4248	2	A35-BPR-P00 to A13-IBF2-P00 B35-BPR-P00 to B13-IBF2-P00
35	11P2998	2	A35-BPR-P00 to A15-IBF1-P00 B35-BPR-P00 to B15-IBF1-P00

RIO Cables, RIO-G Cables, and I/O Power Cables

FRU Part Number	Units Per Assy	Description
11P2355	Up to 8	RIO cable 0.5-meter
11P0272	Up to 16	RIO cable 2-meter
44H9137	Up to 16	RIO cable 15-meter
00P5238	Up to 8	RIO-G cable 1.75-meter
00P5239	Up to 16	RIO-G cable 2.5-meter
21P5477	Up to 16	RIO to RIO-G cable 6-meter
53P5242	Up to 16	RIO to RIO-G cable 1-meter
53P5243	Up to 16	RIO to RIO-G cable 3-meter
53P5454	Up to 16	RIO-G to RIO-G cable 1-meter
53P2675	Up to 16	RIO-G to RIO-G cable 8-meter
53P2676	Up to 16	RIO-G to RIO-G cable 3.5-meter
11P4490	1	I/O Subsystem 1 power cable (DCA1-P01)
11P4491	1	I/O Subsystem 1 power cable (DCA1-P00)
11P4492	1	I/O Subsystem 1 power cable (DCA2-P01)
11P4493	1	I/O Subsystem 1 power cable (DCA2-P00)
11P4494	1	I/O Subsystem 2 power cable (DCA1-P01)
11P4495	1	I/O Subsystem 2 power cable (DCA1-P00)
11P4496	1	I/O Subsystem 2 power cable (DCA2-P01)
11P4497	1	I/O Subsystem 2 power cable (DCA2-P00)
11P4498	1	I/O Subsystem 3 power cable (DCA1-P01)
11P4499	1	I/O Subsystem 3 power cable (DCA1-P00)
11P4500	1	I/O Subsystem 3 power cable (DCA2-P01)
11P4501	1	I/O Subsystem 3 power cable (DCA2-P00)
11P4502	1	I/O Subsystem 4 power cable, primary rack (DCA1-P01)
11P4503	1	I/O Subsystem 4 power cable, primary rack (DCA1-P00)
11P4504	1	I/O Subsystem 4 power cable, primary rack (DCA2-P01)
11P4505	1	I/O Subsystem 4 power cable, primary (DCA2-P00)
11P4514	1	I/O Subsystem 4 power cable, secondary rack (DCA1-P01)
11P4515	1	I/O Subsystem 4 power cable, secondary rack (DCA1-P00)
11P4516	1	I/O Subsystem 4 power cable, secondary rack (DCA2-P01)
11P4517	1	I/O Subsystem 4 power cable, secondary rack (DCA2-P00)
11P4506	1	I/O Subsystem 5 power cable (DCA1-P01)
11P4507	1	I/O Subsystem 5 power cable (DCA1-P00)
11P4508	1	I/O Subsystem 5 power cable (DCA2-P01)
11P4509	1	I/O Subsystem 5 power cable (DCA2-P00)
11P4510	1	I/O Subsystem 6 power cable (DCA1-P01)
11P4511	1	I/O Subsystem 6 power cable (DCA1-P00)
11P4512	1	I/O Subsystem 6 power cable (DCA2-P01)
11P4513	1	I/O Subsystem 6 power cable (DCA2-P00)
44P0190	1	I/O Subsystem 7 power cable (DCA1-P01)
44P0191	1	I/O Subsystem 7 power cable (DCA1-P00)
44P0192	1	I/O Subsystem 7 power cable (DCA2-P01)
44P0193	1	I/O Subsystem 7 power cable (DCA2-P00)
44P0194	1	I/O Subsystem 8 power cable (DCA1-P01)
44P0195	1	I/O Subsystem 8 power cable (DCA1-P00)
44P0196	1	I/O Subsystem 8 power cable (DCA2-P01)
44P0197	1	I/O Subsystem 8 power cable (DCA2-P00)

Note: The cables tied along the raceway may settle during shipment and might be tight when reconnecting to the BPA. To be reconnected, the cable ties may need to be loosened and the cable slack pulled up.

From	To (A=Primary) (Z=Secondary)	Description	Label Color
A35B-BPD1A-P00	A09B-DCA1-P01	BPD1A to I/O Subsystem #1	Purple W/Stripes
A35P-BPD1B-P00	A09B-DCA1-P00	BPD1B to I/O Subsystem #1	Purple
A35B-BPD1A-P01	A09B-DCA2-P01	BPD1A to I/O Subsystem #1	Purple W/Stripes
A35P-BPD1B-P01	A09B-DCA2-P00	BPD1B to I/O Subsystem #1	Purple
A35B-BPD1A-P02	A05B-DCA1-P01	BPD1A to I/O Subsystem #2	Yellow W/Stripes
A35P-BPD1B-P02	A05B-DCA1-P00	BPD1B to I/O Subsystem #2	Yellow
A35B-BPD1A-P03	A05B-DCA2-P01	BPD1A to I/O Subsystem #2	Yellow W/Stripes
A35P-BPD1B-P03	A05B-DCA2-P00	BPD1B to I/O Subsystem #2	Yellow
A35B-BPD1A-P04	A01B-DCA1-P01	BPD1A to I/O Subsystem #3	Green W/Stripes
A35P-BPD1B-P04	A01B-DCA1-P00	BPD1B to I/O Subsystem #3	Green
A35B-BPD1A-P05	A01B-DCA2-P01	BPD1A to I/O Subsystem #3	Green W/Stripes
A35P-BPD1B-P05	A01B-DCA2-P00	BPD1B to I/O Subsystem #3	Green
A35B-BPD1A-P06	A13B-DCA1-P01	BPD1A to I/O Subsystem #4 (no IBF)	Blue W/Stripes
A35P-BPD1B-P06	A13B-DCA1-P00	BPD1B to I/O Subsystem #4 (no IBF)	Blue
A35B-BPD1A-P07	A13B-DCA2-P01	BPD1A to I/O Subsystem #4 (no IBF)	Blue W/Stripes
A35P-BPD1B-P07	A13B-DCA2-P00	BPD1B to I/O Subsystem #4 (no IBF)	Blue
A35B-BPD2A-P04	Z09B-DCA1-P01	BPD1A to I/O Subsystem #4 (with IBF)	Yellow W/Stripes
A35P-BPD2B-P04	Z09B-DCA1-P00	BPD1B to I/O Subsystem #4 (with IBF)	Yellow
A35B-BPD2A-P05	Z09B-DCA2-P01	BPD1A to I/O Subsystem #4 (with IBF)	Yellow W/Stripes
A35P-BPD2B-P05	Z09B-DCA2-P00	BPD1B to I/O Subsystem #4 (with IBF)	Yellow
A35B-BPD2A-P00	Z01B-DCA1-P01	BPD2A to I/O Subsystem #5	Red W/Stripes
A35P-BPD2B-P00	Z01B-DCA1-P00	BPD2B to I/O Subsystem #5	Red
A35B-BPD2A-P01	Z01B-DCA2-P01	BPD2A to I/O Subsystem #5	Red W/Stripes

From	To (A=Primary) (Z=Secondary)	Description	Label Color
A35P-BPD2B-P01	Z01B-DCA2-P00	BPD2B to I/O Subsystem #5	Red
A35B-BPD2A-P02	Z05B-DCA1-P01	BPD2A to I/O Subsystem #6	Purple W/Stripes
A35P-BPD2B-P02	Z05B-DCA1-P00	BPD2B to I/O Subsystem #6	Purple
A35B-BPD2A-P03	Z05B-DCA2-P01	BPD2A to I/O Subsystem #6	Purple W/Stripes
A35P-BPD2B-P03	Z05B-DCA2-P00	BPD2B to I/O Subsystem #6	Purple
A35B-BPD2A-P06	Z13B-DCA1-P01	BPD2A to I/O Subsystem #7	Green W/Stripes
A35P-BPD2B-P06	Z13B-DCA1-P00	BPD2B to I/O Subsystem #7	Green
A35B-BPD2A-P07	Z13B-DCA2-P01	BPD2A to I/O Subsystem #7	Green W/Stripes
A35P-BPD2B-P07	Z13B-DCA2-P00	BPD2B to I/O Subsystem #7	Green
A35B-BPD2A-P08	Z19B-DCA1-P01	BPD2A to I/O Subsystem #8	Blue W/Stripes
A35P-BPD2B-P08	Z19B-DCA1-P00	BPD2B to I/O Subsystem #8	Blue
A35B-BPD2A-P09	Z19B-DCA2-P01	BPD2A to I/O Subsystem #8	Blue W/Stripes
A35P-BPD2B-P09	Z19B-DCA2-P00	BPD2B to I/O Subsystem #8	Blue

Appendix I. Service Processor Setup and Test

Attention: This procedure applies to modems attached to the serial ports (S1 and S2) on the primary I/O book (location U1.18-P1-H2). It does not affect the operation of the modem attached to the hardware management console for pSeries (HMC).

The call-out function is normally handled by the Service Focal Point running on the HMC.

For your convenience, an example of a basic service processor setup checklist is included here. Your setup may include more or fewer of the available features, so you can adjust this checklist for your own application.

Note: The call-out and surveillance options are disabled in partitioned systems.

Service Processor Setup Checklist

1. Shut down the managed system, and wait for the OK in the physical operator panel.
2. Open a virtual terminal window on the HMC.
3. Start the service processor menus.
4. Set the system name.
5. Enable Surveillance.
6. Configure call-in/call-out.
7. Attach modems if necessary. If modem attachment is not necessary, proceed to step 8. To attach a modem, do the following:
 - a. Exit the service processor menus.
 - b. Disable the 350 V dc outputs from the BPA by placing the UEPO switch in the *off* position.
Attention: With the UEPO *off*, power is still present within the BPA.
 - c. Attach the cables and modems.
 - d. Place the UEPO switch in the *on* position.
8. Test both of the following:
 - Call-In, go to “Testing Call-In” on page 108
 - Call-Out, go to “Testing Call-Out” on page 108
9. Use the “Save or Restore Hardware Management Policies,” in the “Introduction to Tasks and Service Aids” section of the *RS/6000 and @server Diagnostic Information for Multiple Bus Systems* to back up the service processor settings.

Note: This action is strongly recommended to protect the usefulness of the service processor and the availability of the server.

Your service processor is now ready for use.

Testing the Service Processor Setup

This section contains sample testing procedures to help ensure your service processor setup is working.

These tests include communicating with the server operating system. Before you start, ensure that the necessary serial port(s) is configured. If you need assistance, refer to “Serial Port Configuration”.

The server should be powered off as a result of the “Service Processor Setup Checklist” on page 107.

Testing Call-In

1. At your remote terminal, call in to your server. Your server answers and offers you the service processor Main Menu after requesting your privileged-access password.
2. Select **System Power Control**.
3. Select **Power-On System**.
When you are asked if you wish to continue powering on the system, type Y.
4. After the system firmware and operating system have initialized the server, the login prompt displays at your remote terminal if you set up seamless modem transfer. This may take several minutes. When the login prompt displays, you have successfully called the service processor.
5. Type `logout` to disconnect from the operating system. The message `No Carrier` displays on your remote terminal.
6. Call your server again. The operating system answers and offers you the login prompt. If these tests are successful, call-in is working.
7. Log in and type `shutdown -F` to shut down your server.
8. The message `No Carrier` displays on your remote terminal.

Testing Call-Out

During the setup, you entered your phone numbers for the pager and customer voice. These numbers are used for this test.

1. Your remote terminal is disconnected as a result of the Call-In test.
2. Call your server again.
3. At the service processor Main Menu, select **Call-In/Call-Out Setup** menu, then select **Call-Out** test. This action causes a simulated error condition for the purposes of this test.
4. After a few moments, a message displays, regarding an illegal entry. Press `Enter` to clear the message and return to the main menu.
5. When your telephone rings, answer the call. You should hear the sound of a telephone being dialed. This is your computer trying to page you.

If this test is successful, call-out is working correctly.

Serial Port Configuration

To configure the serial port on an AIX system, do the following from an AIX console:

1. Log in as root user.
2. To determine if you have any serial ports already configured, type:
`lsdev -Cc tty`

If no serial ports are configured, none are listed. If you want to configure serial ports that are not listed, continue with the remaining steps.

3. Identify the serial port(s) with the modem(s).
4. Type `smit tty`.
5. Select **add tty**.

6. Select **RS232**.
7. Select **Baud rate 9600** or higher.
8. Select **login enable** and set the flow control to RTS.
9. Commit the selections and set up any other needed serial ports.
10. Exit SMIT.

Appendix J. Removing and Installing the Rack Top Frame

The following scenarios exist for performing this procedure:

- Removing and installing the rack top frame for clearance through doorways
- Installing the rack top frame that was shipped unattached from the rest of the frame

Note: If the clearance is close (an interference of 1/2 inch or less), removing the side covers may be all that is required. For side cover removal instructions, see “Removing the Covers” on page 113. For additional information, refer to RPQ8A1173. For clearance procedures, go to “Removing the Rack Top Frame for Clearance Through Doorways” on page 114. For the reduced height procedure, go to “Preparing for Rack Top-Frame Installation for pSeries 690 (Reduced Height Option) RPQ8A1173” on page 119.

Attention: Due to the weight of the rack top frame, two people are required to restore the rack to full height.

The weight of components is outlined as follows:

Item	Weight
Rack Top Frame and Crate	463 lbs.
Rack Top Frame with Power (4 BPRs and 4 BPDs)*	329 lbs.
BPR	30 lbs.
BPD	14 lbs.
BPE	40 lbs.
Rack Top Frame without Rails	66 lbs.
Rack Top Frame with Rails	73 lbs.
Notes:	
1. Maximum total weight can be up to 561 lbs.	
2. * Can be shipped with up to six BPRs and six BPDs.	

Required Tools

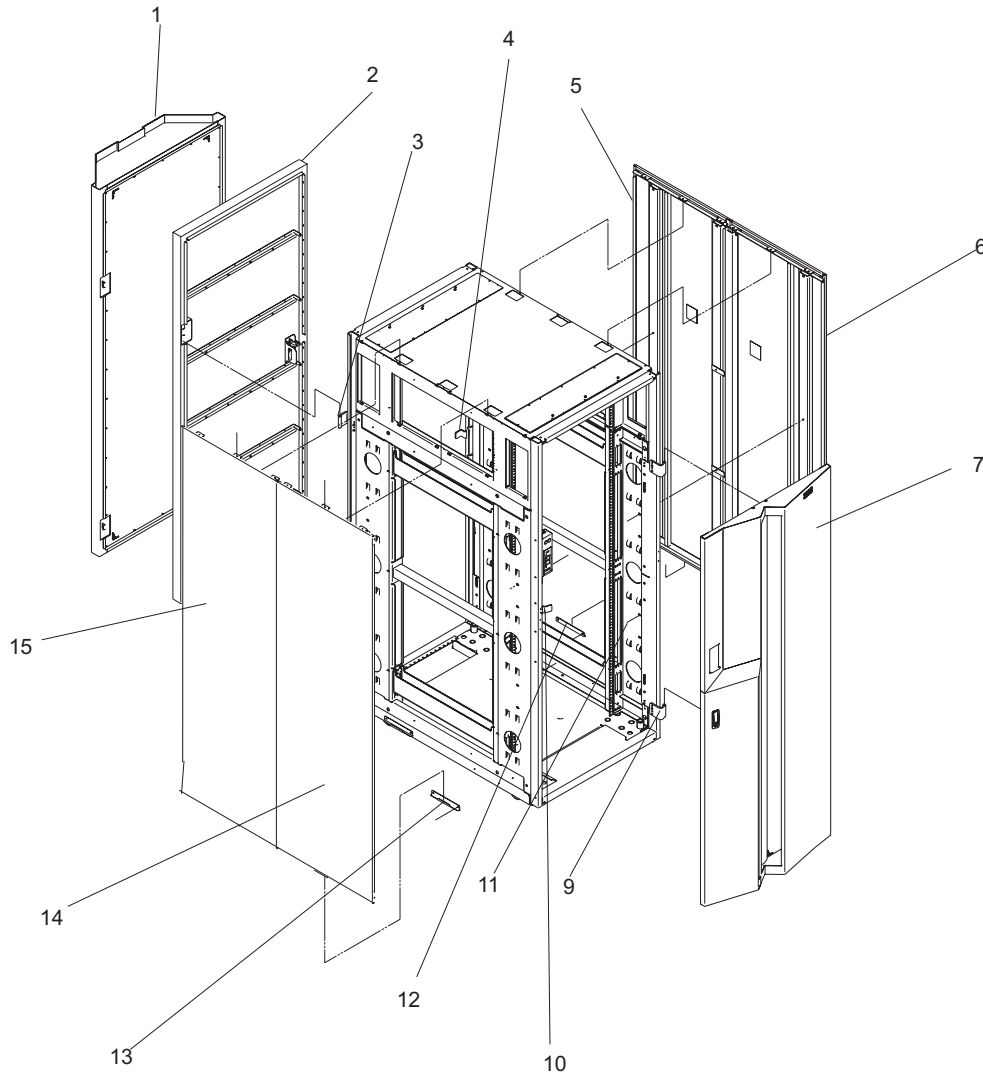
The following tools are necessary to remove or install the rack top frame:

- Ladder
- Stepladder

Tool	Description
Ratchet	3/8 inches Square Drive
Ratchet Accessories	3/8 inches Drive, 6 inches Extension X2 (8-inch reach required)
Drive Socket	3/8 inches (10mm)
Drive Ratchet	1/4 inches
Drive Socket	5/16 inches (8mm)
Torque Tool (Part Number 6422789)	Included in the tool kit and used for various FRUs, such as the BPR, BPC, BPDs, and BPFs.

Removing the Covers

This procedure describes how to remove and replace the side covers of the pSeries 690.



- | | |
|---|--|
| 1 Part Number 44P0127 Rear Cover | 9 Part Number 11P3535 Hinge
Part Number 2665525 Screw |
| 2 Part Number 44P0107 Rear Cover | 10 Part Number 11P1096 Front Latch
Part Number 54G2882 Screw |
| 3 Part Number 11P4106 Hinge
Part Number 2665525 Screw | 11 Part Number 77G0599 Screw
Part Number 1625437 Washer, Side Cover |
| 4 Part Number 44P0126 Rear Latch
Part Number 54G2882 Screw | 12 Part Number 05N6585 J Bracket
Part Number 2665528 Screw, Side Cover |
| 5 Part Number 44P0126 Right Cover
Part Number 54G2882 Screw | 13 Part Number 05N6585 J Bracket
Part Number 2665528 Screw |
| 6 Part Number 11P3600 Left Cover
Part Number 44P0125 Screw | 14 Part Number 44P0126 Right Cover
Part Number 54G2882 Screw |
| 7 Part Number 44P0105 Front Cover | 15 Part Number 44P0125 Left Cover
Part Number 54G2882 Screw |

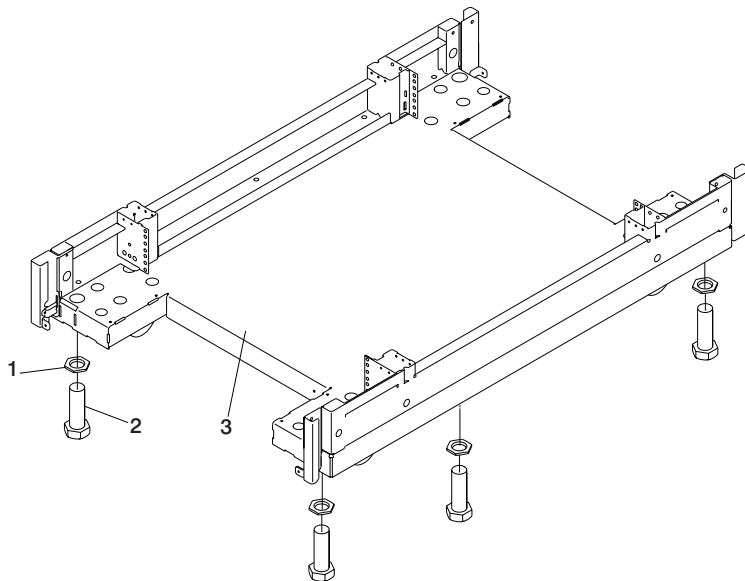
Complete the following steps to remove the side covers:

1. Always remove the right side cover first.
2. Remove the (2) screws and washers inside the frame (part numbers 77G0599 and 1625437).
3. Remove the (3) screws at the top of the frame (part number 54G2882). The use of a stepladder is recommended for this procedure.
4. With all the screws removed, rock the cover to the right from the top. There are features built into the cover that lock it behind the left cover, and these features must be clear before you can lift the cover from the frame. To make lifting the cover easier, tilt the top of the cover away from the frame after the feature tabs have cleared the left cover.
5. Use steps 2 and 3 to remove the the left side cover.
6. With all the screws removed from the cover, tilt the top of the cover away from the frame and lift off.

Removing the Rack Top Frame for Clearance Through Doorways

The following steps describe removal of the rack top frame for clearance through doorways.

1. Use the jack screws to stabilize and lift the rack off the floor, as follows:
 - a. Loosen the jam nut on each leveling foot by turning the nut counterclockwise.
 - b. Rotate each leveling foot downward until it contacts the surface on which the rack is placed.
 - c. Adjust the leveling feet downward as needed until the rack is level. When the rack is level, tighten the jam nuts against the base by turning the nut clockwise.

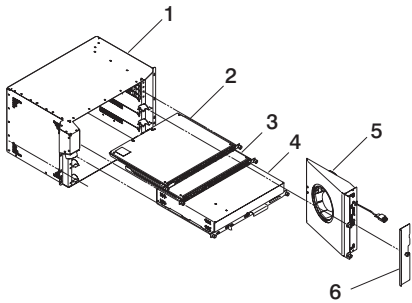


- 1 Jam Nut
2 Leveling Foot

- 3 Rack Base

2. Disconnect cables from the BPDs.
3. Remove the front and rear BPRs, BPDs, BPCs, and the fan assemblies.

Attention: Make note of location identification of the BPRs and BPEs for later reinstallation. If these components are not reinstalled in their original location, the pSeries 690 will not power on.



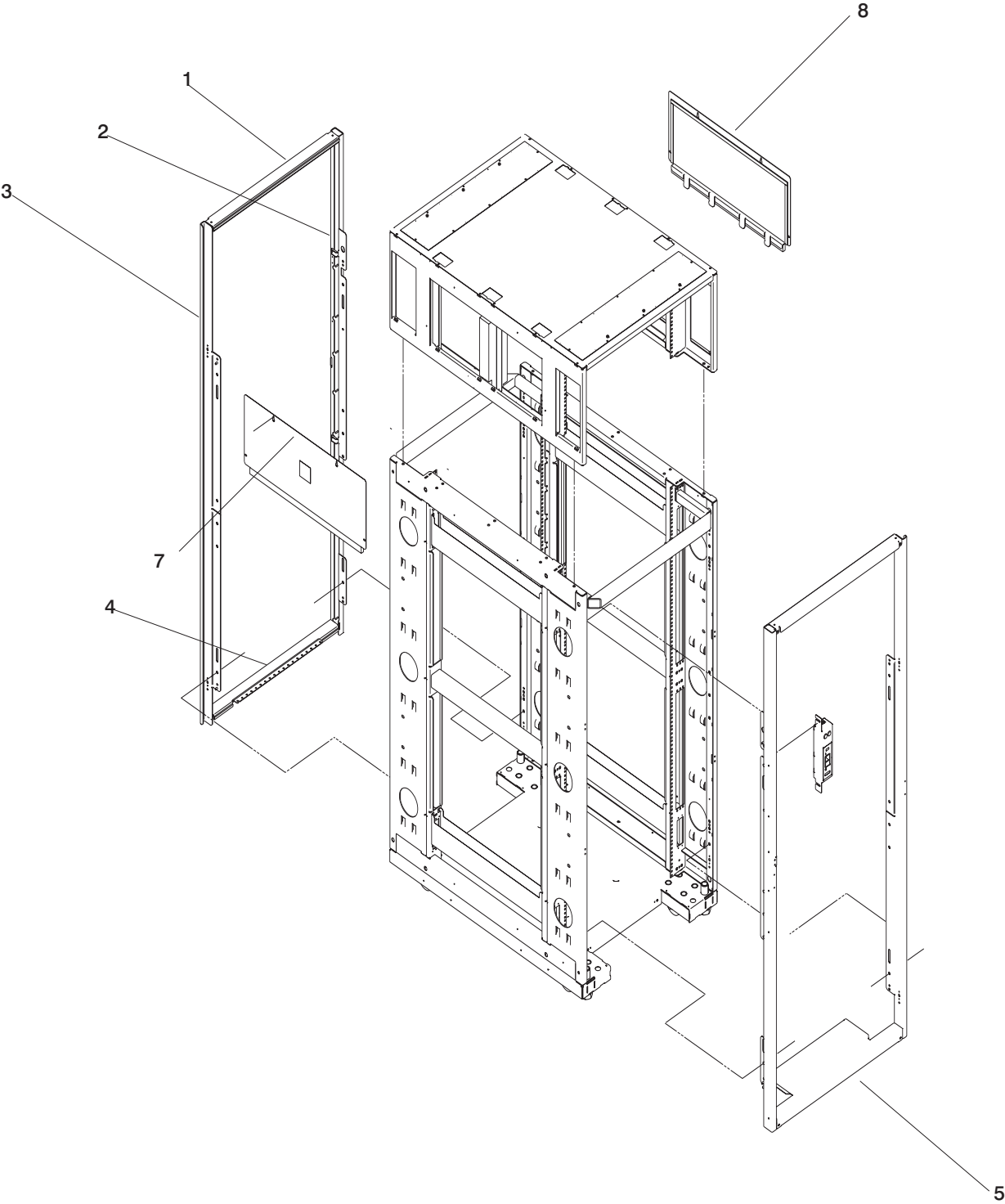
1	BPE	4	BPR
2	BPD	5	BPF
3	BPC	6	Fan Cover Plate

- a. Remove the BPRs (item 4 in the previous illustration), as follows:
 - 1) Make sure the ON/OFF switch is in the UNLOCK/OFF position.
 - 2) Loosen the thumbscrew on each side of the BPR, using the torque tool (part number 6422789).
 - 3) Rotate the release levers up on each side of the BPR. This will unseat the BPR.
 - 4) Pull the BPR straight out from the Bulk Power Enclosure (BPE).
 - 5) Repeat for the other BPRs. There can be up to six BPRs, with three in front and three in back.
- b. Remove the Bulk Power Controllers (BPCs) (item 3 in the previous illustration), as follows:
 - ___ Step 1) Loosen the thumbscrew on each side of the BPC, using the torque tool.
 - ___ Step 2) Pull the BPC straight out from the Bulk Power Enclosure.
 - ___ Step 3) Repeat for the other BPC. There are two BPCs, with one in front and one in back.
- c. Remove the BPDs (item 2 in the previous illustration), as follows:
 - ___ Step 1) Loosen the thumbscrew on each side of the BPD, using the torque tool.
 - ___ Step 2) Pull the BPD straight out from the Bulk Power Enclosure (BPE).
 - ___ Step 3) Repeat for the other BPDs. There can be up to four BPDs, with two in front and two in back.
- d. Remove the BPFs (item 5 in the illustration on page 115) as follows:

Note: A grille covers the fan on the front of the fan assembly.

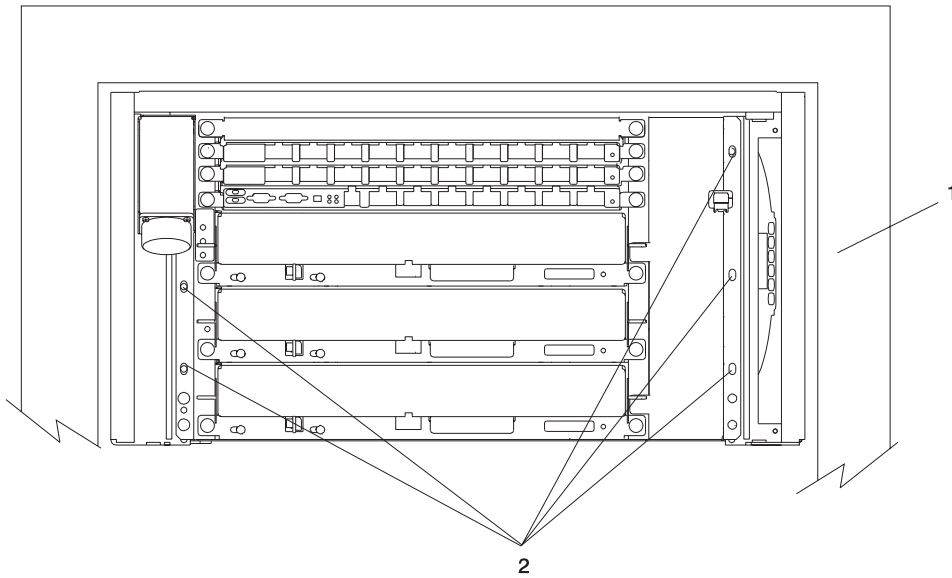
 - 1) Locate the BPF to be replaced.
 - 2) Remove the fan cover plate (item 6 in the illustration on page 115).
 - 3) Loosen the upper and lower fasteners using the torque tool.
 - 4) Pull the BPF straight out of the BPE.
 - 5) Repeat for the other BPF. There are two BPFs, one in front and one in back.
- e. Remove any front and rear bulk power fillers.
4. Remove the top frame side covers (items 7 and 8 in the illustration on page “Removing the Covers” on page 113), as follows:
 - a. Remove the two screws at the top of each side panel.
 - b. Lift up the panel from the top, and pull it away from the rack.
5. Remove the frame extenders as follows:
 - a. Remove the UEPO switch (item 6 in the following illustration), as follows:
 - 1) Unplug the cables.
 - 2) Remove the top and bottom screws.
 - b. Remove the rear top and bottom frame extender (items 1 and 4 in the following illustration) by removing the two screws (one on each side).
 - c. Remove both rear frame extenders (items 2 and 3 in the following illustration) by removing the three bolts on each side.

d. Repeat steps 5b and 5c for the front frame extenders.



- | | | | |
|---|----------------------|---|---------------------------------|
| 1 | Top Frame Extender | 5 | Front Frame Extender |
| 2 | Left Frame Extender | 6 | UEPO Switch |
| 3 | Right Frame Extender | 7 | Rack Top Frame Left Side Cover |
| 4 | Rear Frame Extender | 8 | Rack Top Frame Right Side Cover |

6. **Attention:** Two people are required to remove the BPEs.
Remove the BPEs (item 1 in the illustration on page 117).

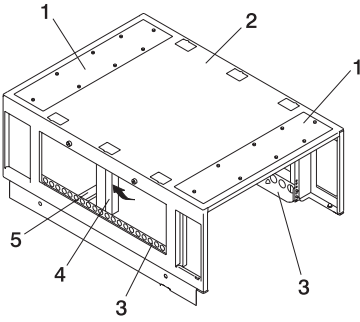


1 Bulk Power Enclosure

2 Hex-Head Screw Locations

- a. Remove the five hex-head screws from the front BPE.
- b. Remove the five hex-head screws from the rear BPE.
- c. Install two shipping brackets (part number 11P2923) on both the front and rear of the frame using 8 M8 X 16mm bolts (part number 164803).

7. To reduce the weight so that it is the maximum two-person limit, do the following:



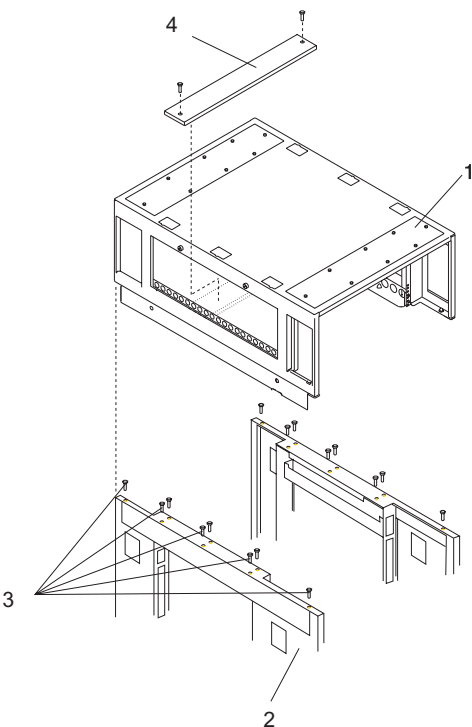
- 1 Top Panels for Front and Rear Rack Top Frame
- 2 Rack Top Frame
- 3 Left and Right BPE Rails

- 4 Foam and Metal Air Baffle
- 5 Rack Top-Frame Cross Brace

- a. Remove the eight screws around the perimeter of the top panels at the front and rear of the rack top-frame assembly. Remove the two top panels (item 1 in the preceding illustration).
- b. Carefully note the orientation and position of the foam and metal air baffle (item 4 in the preceding illustration) at the middle left side of the rack top frame assembly. Remove the screw, then tilt the baffle toward the front of the rack top frame.

Note: The foam and metal upright air baffle *must* be reinstalled on the left side in its original location. The foam baffle is a critical part for proper cooling of the BPEs.

- c. Remove the single screw at each end of the cross brace (item 5 in the illustration on page 118). Remove the cross brace.
- d. Remove the two screws at the front of the left BPE rail, and remove the rail (item 3 in illustration on page 118).
- e. Remove the two screws at the rear of the right BPE rail, and remove the rail (item 3 in illustration on page 118).



- 1 Rack Top Frame
- 2 Rack Chassis

- 3 Top Frame Bolts
- 4 Rack Top-Frame Cross Brace

8. Remove the 16 M8 X 20mm bolts (part number 1624804)
9. Lift the rack top frame off the locating pins and remove it.

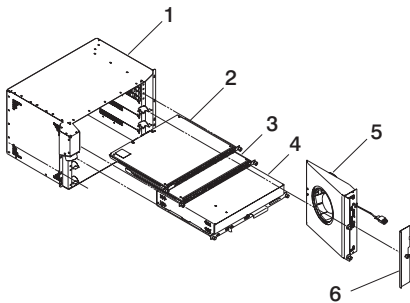
Note: Two people are required to lift and position the rack top-frame assembly.

Preparing for Rack Top-Frame Installation for pSeries 690 (Reduced Height Option) RPQ8A1173

To prepare the rack top frame for installation, do the following:

1. Unpack the frame.
2. Unpack the rack top frame.
3. Use the jack screws to stabilize and lift the rack off the floor.
 - a. Loosen the jam nut on each leveling foot by turning the nut counterclockwise.
 - b. Rotate each leveling foot downward until it contacts the surface on which the rack is placed.
 - c. Adjust the leveling feet downward as needed until the rack is level. When the rack is level, tighten the jam nuts against the base by turning the nut clockwise.
4. Remove the front and rear BPRs, BPDs, BPCs, and the fan assemblies.

Attention: Make note of location identification of the BPRs and BPEs for later reinstallation. If these components are not reinstalled in their original location, the pSeries 690 will not power on.

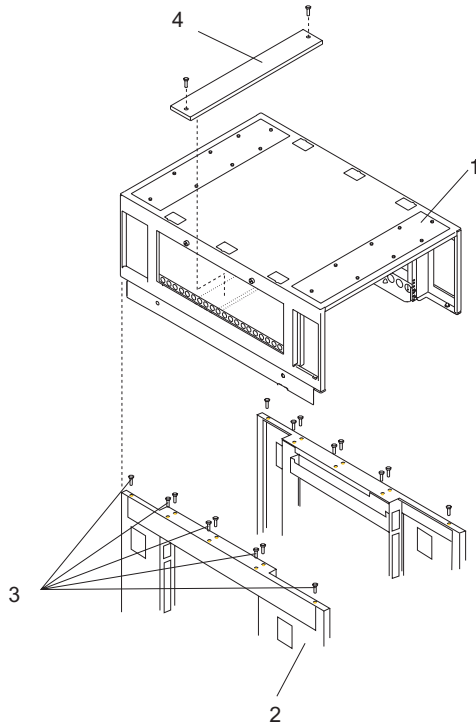


- | | |
|-------|-------------------|
| 1 BPE | 4 BPR |
| 2 BPD | 5 BPF |
| 3 BPC | 6 Fan Cover Plate |

- a. Remove the BPRs (item 4 in the previous illustration), as follows:
 - 1) Make sure the ON/OFF switch is in the UNLOCK/OFF position.
 - 2) Loosen the thumbscrew on each side of the BPR, using the torque tool (part number 6422789).
 - 3) Rotate the release levers up on each side of the BPR. This will unseat the BPR.
 - 4) Pull the BPR straight out from the Bulk Power Enclosure (BPE).
 - 5) Repeat for the other BPRs. There can be up to six BPRs, with three in front and three in back.
- b. Remove the Bulk Power Controllers (BPCs) (item 3 in the previous illustration), as follows:
 - 1) Loosen the thumbscrew on each side of the BPC using the torque tool.
 - 2) Pull the BPC straight out from the Bulk Power Enclosure.
 - 3) Repeat for the other BPC. There are two BPCs, with one in front and one in back.
- c. Remove the BPDs (item 2 in the previous illustration), as follows:
 - 1) Loosen the thumbscrew on each side of the BPD, using the torque tool.
 - 2) Pull the BPD straight out from the Bulk Power Enclosure (BPE).
 - 3) Repeat for the other BPDs. There can be up to four BPDs, with two in front and two in back.
- d. Remove the BPF (item 5 in the illustration on page 119) as follows:

Note: A grille covers the fan on the front of the fan assembly.

- 1) Locate the BPF to be replaced.
 - 2) Remove the fan cover plate (item 6 in the illustration on page 119).
 - 3) Loosen the upper and lower fasteners, using the torque tool.
 - 4) Pull the BPF straight out of the BPE.
 - 5) Repeat for the other BPF. There are two BPFs, one in front and one in back.
- e. Remove any front and rear bulk power fillers.
5. To reduce the weight so that it is the maximum two-person limit, do the following:



- 1 Top Panels for Front and Rear Rack
Top Frame
- 2 Rack Top Frame
- 3 Left and Right BPE Rails

4

Foam and Metal Air Baffle

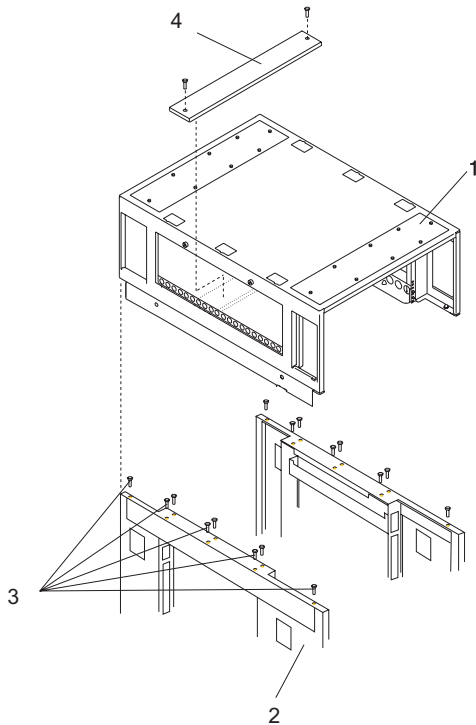
5

Rack Top Frame Cross Brace

- a. Remove the two screws at the left and right of the top frame side covers (items 7 and 8 in the illustration on 116).
- b. Lift off the covers.
- c. Remove the eight screws around the perimeter of the top panels at the front and rear of the rack top-frame assembly. Remove the two top panels (item 1 in the illustration on page 120).
- d. Carefully note the orientation and position of the foam and metal air baffle (item 4 in the illustration on page 120) at the middle left side of the rack top frame assembly. Remove the screw, then tilt the baffle toward the front of the rack top frame.

Note: The foam and metal air baffle *must* be reinstalled on the left side in its original location. The foam baffle is a critical part for proper cooling of the BPEs.

- e. Remove the single screw at each end of the cross brace (item 5 in the illustration on page 120). Remove the cross brace.
- f. Remove the two screws at the front of the left BPE rail, and remove the rail (item 3 in illustration on page 120).
- g. Remove the two screws at the rear of the right BPE rail, and remove the rail (item 3 in illustration on page 120).



1 Rack Top Frame

2 Rack Chassis

3 Top Frame Bolts

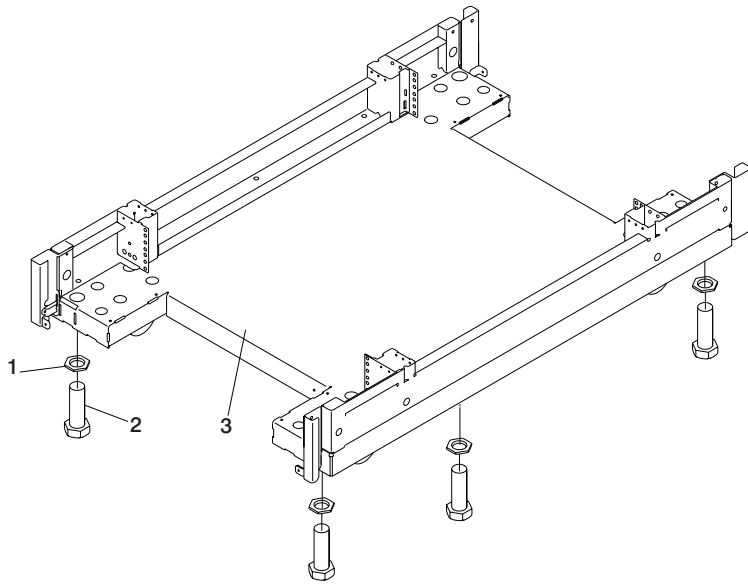
4 Rack Top Frame Cross Brace

Proceed to “Installing the Rack Top Frame”.

Installing the Rack Top Frame

To install the rack top frame, complete the following:

1. If you have not done so, use the jack screws to stabilize and lift the rack off the floor, as follows:
 - a. Loosen the jam nut on each leveling foot by turning the nut counterclockwise.
 - b. Rotate each leveling foot downward until it contacts the surface on which the rack is placed.
 - c. Adjust the leveling feet downward as needed until the rack is level. When the rack is level, tighten the jam nuts against the base by turning the nut clockwise.

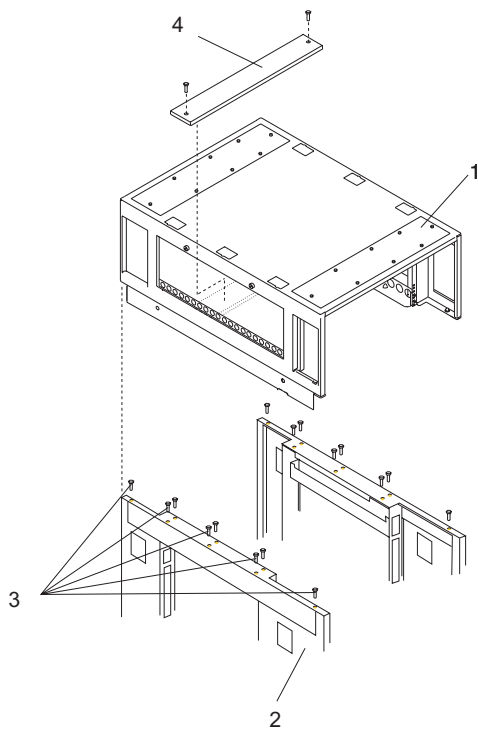


1 Jam Nut
2 Rack Base

3 Rack Base

- Position the rack top frame on top of the rack by orienting the two front labels on the rack top frame assembly and the frame. As you face the frame, this label is on the right front of the frame.

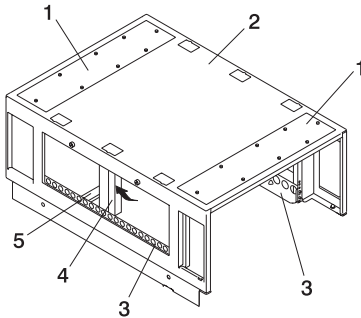
Note: Two people are required to lift and position the top frame assembly. To assist with the installation, a stepladder and ladder are provided with the reduced height option (RPQ8A1173) ship group.



1 Rack Rack Top Frame
2 Rack Chassis

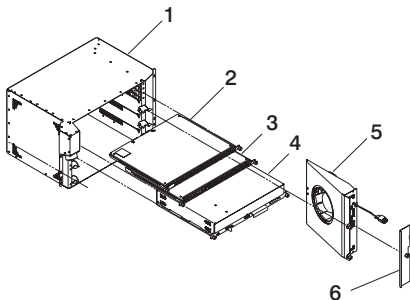
3 Top Frame Bolts
4 Rack Top-Frame Cross Brace

- a. Align the rack top frame with the four alignment guides on top of the rack.
- b. Fasten the rack top frame to the rack, using 16 M8 X 20mm bolts (part number 1624803). Tighten the bolts securely to ensure solid contact along the mating surfaces of the rack and the rack top frame.
3. Install the front and rear top panels (item 1 in illustration on page 123) for the rack top frame.
4. Install the left and right BPE rails, (item 3 in the illustration on page 123).



- | | |
|--|------------------------------|
| 1 Top Panels for Front and Rear Rack Top Frame | 4 Foam and Metal Air Baffle |
| 2 Rack Top Frame | 5 Rack Top-Frame Cross Brace |
| 3 Left and Right BPE Rails | |

5. Insert and align the foam and metal air baffle (item 4 in the illustration on page 123) to the left side of the rack top frame, securing it in place with a screw.
6. Install the rack top-frame cross brace (item 5 in the illustration on page 122).
7. Install the front and rear BPEs (item 1 in the illustration on page 123).



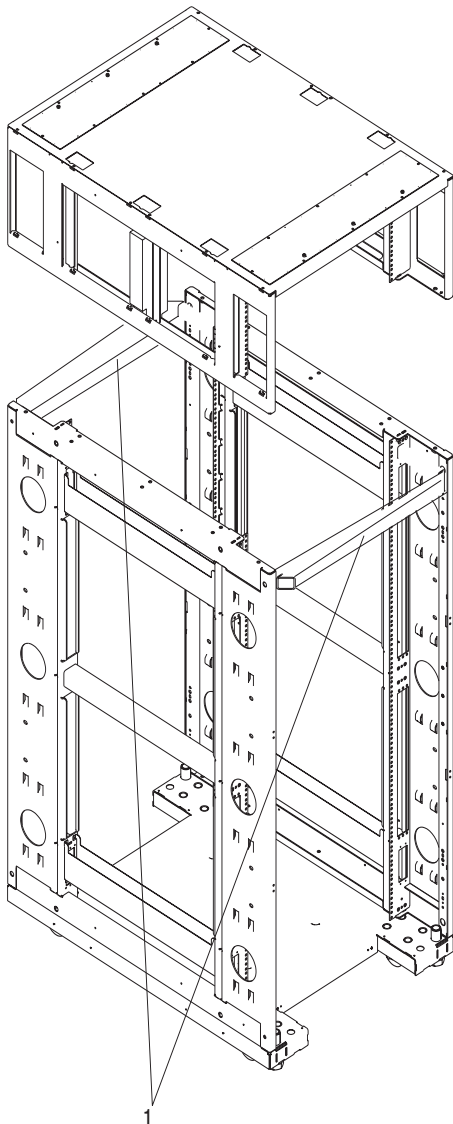
- | | |
|-------|-------------------|
| 1 BPE | 4 BPR |
| 2 BPD | 5 BPF |
| 3 BPC | 6 Fan Cover Plate |

8. Install the BPRs (item 4 in illustration on page 123) as follows:
 - a. Make sure the ON/OFF switch is in the UNLOCK/OFF position.
 - b. Push the BPR straight into the Bulk Power Enclosure (BPE).
 - c. Tighten the thumbscrew on each side of the BPR, using the torque tool (part number 6422789).
 - d. Rotate the release levers down on each side of the BPR.
 - e. Repeat for the other BPRs. There can be up to six BPRs, with three in front and three in back.
9. Install the Bulk Power Controllers (BPCs) as follows:
 - a. Push the BPC straight into the Bulk Power Enclosure (BPE).
 - b. Tighten the thumbscrew on each side of the BPC, using the torque tool.
 - c. Repeat for the other BPCs. There are two BPCs, with one in front and one in back.
10. Install the BPDs as follows:
 - a. Push the BPD straight into the Bulk Power Enclosure (BPE).

- b. Tighten the thumbscrew on each side of the BPD, using the torque tool.
 - c. Repeat for the other BPDs. There can be up to four BPDs, with two in front and two in back.
11. Install the BPFs (item 5 in the illustration on page 123) as follows:

Note: A grille covers the fan on the front of the fan assembly.

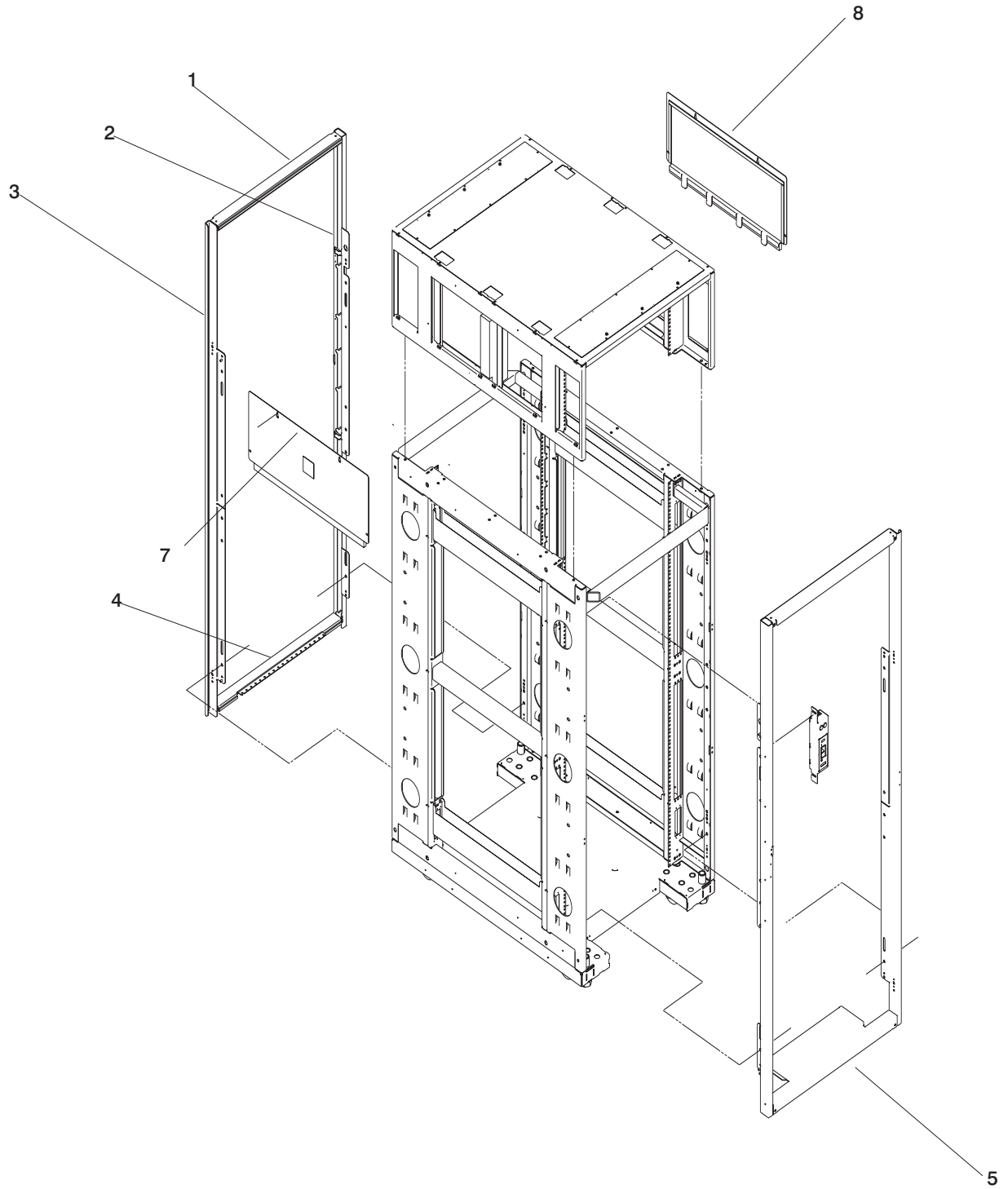
- a. Locate the BPF to be installed.
 - b. Install the fan cover plate (item 6 in the illustration on page 123).
 - c. Push the BPF straight out of the BPE.
 - d. Tighten the upper and lower fasteners, using the torque tool.
 - e. Repeat for the other BPF. There are two BPFs, one in front and one in back.
12. Install any front and rear bulk power fillers.
13. For the reduced height option, remove the front and rear upper shipping bars (item 1 in the following illustration).



1 Shipping Bars

- 14. Install left and right top-frame side covers (items 7 and 8 in the following illustration).
- 15. Attach all removed cables to the BPD. If an IBF exists, also attach all removed cables for the BPC and the BPR. For cabling instructions, see Appendix H, “Cabling Information”, on page 101 and Appendix G, “Subsystem Positioning and Cabling”, on page 77.

16. Install the frame extenders.



- 1 Top Frame Extender
- 2 Left Frame Extender
- 3 Right Frame Extender
- 4 Rear Frame Extender

- 5 Front Frame Extender
- 6 UEPO Switch
- 7 Left Side Cover
- 8 Right Side Cover

17. Install the UEPO switch, as follows:
 - a. Install the top and bottom screws. Screws should be bottomed against the end of the slot prior to tightening.
 - b. Plug in the cables.
-

Replacing Covers

Refer to page “Removing the Covers” on page 113 while performing this task.

1. Examine the bottom of the frame side for two “U” brackets installed at the bottom. These correspond to open slots in the bottom of the covers.
2. Always install the left side cover first.
3. Lift the cover and engage the slot into the “U” bracket, holding the cover at approximately a 30-degree angle, with the top away from the frame.
4. Install the top three screws (part number 54G2882). Use a stepladder for this procedure. Push against the top of the cover to compress the gasket to allow alignment with the tapped holes in the top of the frame.
5. Install the two inside screws and washers (part numbers 77G0599 and 1625437).
6. Install the right side cover into the “U” bracket, while holding it an angle away from the frame.
7. Because the right side cover has tab features that engage behind the left side cover, the cover must be rocked to the right from the top to clear the left side cover. After clearing the cover with the tabs, push the cover against the frame while rocking it back to the left. The cover should rest on the “U” bracket. The top flange should rest on the frame, and the tabs should be positioned behind the left cover.

Note: The covers should be flush in the middle with a small gap between them.

8. Repeat steps 4 and 5 to complete the installation of the right side cover.

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