

RS/6000 Enterprise Server Model M80
@server pSeries 660 Model 6M1



Installation Guide

Third Edition (September 2001)

Before using this information and the product it supports, read the information in "Safety Notices" on page vii, Appendix B, "Environmental Notices" on page 57, and Appendix C, "Notices" on page 59.

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Safety Notices

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

- viii
- 2
- 27

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
- 2
- 4
- 7
- 10
- 27

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

Rack Safety Instructions

- Do not install this unit in a rack where the internal rack ambient temperatures will exceed 40 degrees C.
- Do not install this unit in a rack where the air flow is compromised. Any side, front, or back of the unit used for air flow through the unit must not be in indirect contact with the rack.
- Ensure that a hazardous condition is not created due to uneven mechanical loading when installing this unit in a rack. If the rack has a stabilizer, it must be firmly attached before installing or removed this unit.
- Consider the connection of the equipment to the supply circuit so that the overloaded circuits do not compromise the supply wiring or overcurrent protection.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Electrical Safety

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

DANGER

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

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

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

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

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

CAUTION:

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

DANGER

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

CAUTION:

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

Laser Safety Information

CAUTION:

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

Laser Compliance

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

CAUTION:

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

Data Integrity and Verification

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

About This Book

This book provides information about the RS/6000 Enterprise Server Model M80 and @server pSeries 660 Model 6M1, specifically how to install and remove options, use the system, use diagnostics and service aids, and verify system operation. In this book, the RS/6000 Enterprise Server Model M80 and @server pSeries 660 Model 6M1 are hereafter referred to as the "system."

ISO 9000

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

Online Publications

IBM @server pSeries publications are available online. To access the online books, visit our Web site at: http://www.ibm.com/servers/eserver/pseries/library/hardware_docs/

Related Publications

The following publications provide additional information about your system unit:

- *System Unit Safety Information*, order number SA23-2652, contains translations of safety information used throughout this book.
- The *RS/6000 Enterprise Server Model M80, @server pSeries 660 Model 6M1 User's Guide*, order number SA38-0570, contains information on how to use the system, use diagnostics, use service aids, and verify system operations.
- The *RS/6000 Enterprise Server Model M80, @server pSeries 660 Model 6M1 Service Guide*, order number SA38-0571, contains reference information, maintenance analysis procedures (MAPs), error codes, removal and replacement procedures, and a parts catalog.
- The *7014 Series Model T00 and T42 Rack Installation and Service Guide*, order number SA38-0577, contains information regarding the racks in which the system may be installed.
- The *RS/6000 Enterprise Server and @server pSeries Diagnostic Information for Multiple Bus Systems*, order number SA38-0509, contains diagnostic information, service request numbers (SRNs), and failing function codes (FFCs).
- The *RS/6000 Enterprise Server and @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems*, order number SA38-0516, contains information about adapters, devices, and cables for your system. This manual is intended to supplement the service information found in the *RS/6000 Enterprise Server and @server pSeries 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.

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- RS/6000
- pSeries
- e (logo)

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Chapter 1. Setting Up the System

The RS/6000 Enterprise Server Model M80 and @server pSeries 660 Model 6M1 are designed to be set up and installed by a certified service representative. Follow the procedures in this chapter to set up the system.

Step 1. Checking Inventory

Before you begin the installation, check your inventory.

- ___ • The *About Your Machine* listing (in a plastic bag attached to the outside of the carton). Check the listing to verify that you have all the items shipped with the system.
- ___ • *RS/6000 Enterprise Server Model M80, @server pSeries 660 Model 6M1 Installation Guide*, SA38-0576 (this book)
- ___ • *PCI Adapter Placement Reference*, SA38-0538
- ___ • *System Unit Safety Information*, SA23-2652
- ___ • *Service Director for RS/6000 CE Information Guide*, ZA38-0383
- ___ • Support Information and Warranty

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.
- A console, including cables and a power source.
- A modem for the electronic customer-support function (if the customer ordered this function). This includes the correct telephone jack, cables, and a power source.

Step 2. Observe Safety Notices

Observe these safety notices 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.

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

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

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

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

CAUTION:

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

CAUTION:

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

CAUTION:

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

Step 3. Checking the Customer Environment

Check the customer environment as follows:

- Verify with your installation planning representative or the customer that any station-protector boxes used are correctly installed according to the *Site and Hardware Planning Information* manual.
- Make sure the customer is aware that the recommended temperature for this system is 24° C (75° F) and the recommended relative humidity is 45%. The following are the acceptable operating ranges:
 - Temperature: 10° C (50° F) to 38° C (100° F)
 - Humidity: 8% to 80%
- Make sure the customer is aware that the front and rear service clearances around the CEC drawer and rack should be 36 inches (900 mm). The service clearances are important for proper air circulation, weight distribution, and safety to both the service representative and the customer.

Step 4. Checking Customer Outlets

Check the power outlets before installing the system.

CAUTION:

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

This system may be configured for 220 V ac or -48 V dc power. If the system is going to be used in a dc environment, you will need to have dc power cables and a dc power supply.

Check the customer outlets as follows:

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

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

- ___ 2. Some receptacles are enclosed in metal housings. On receptacles of this type, perform the following steps:
 - a. Check for less than 1 volt from the receptacle case to any grounded metal structure in the building, such as a raised-floor metal structure, water pipe, building steel, or similar structure.
 - b. Check for less than 1 volt from receptacle ground pin to a grounded point in the building.

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

- ___ 3. Check the resistance from the ground pin of the receptacle to the receptacle case. Check resistance from the ground pin to building ground. The reading should be less than 1.0 ohm, which indicates the presence of a continuous grounding conductor.
- ___ 4. If any of the checks made in substeps 2 and 3 are not correct, ask the customer to remove the power from the branch circuit and make the wiring corrections; then check the receptacle again.

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

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

CAUTION:

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

- ___ 6. Have the customer turn on the branch circuit CB. Measure for appropriate voltages between phases. If no voltage is present on the receptacle case or grounded pin, the receptacle is safe to touch.
- ___ 7. With an appropriate meter, verify that the voltage at the outlet is correct.

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

Step 5. Setting Up Rails in the Rack

If your system arrived installed in a rack with all the cables attached, skip to “Step 8. Setting Up Attached Devices” on page 24. If not, continue with this step.

Note: Read the following drawer-placement notes and caution statements before installing the system rails.

Note: Service clearance may be required on the early model I/O drawers. Refer to the following notes for specific instructions.

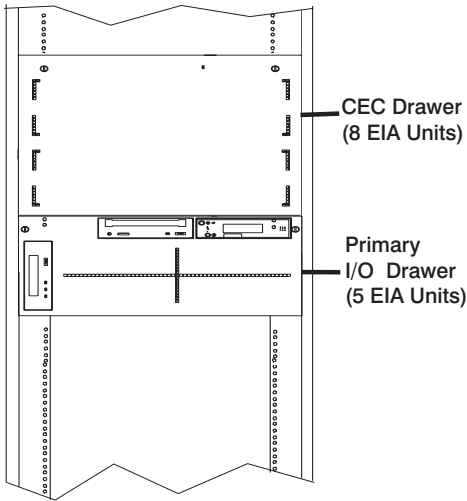
Notes:

1. The 7014 Model T00 and T42 racks have EIA numbers visible from the front and rear that start with 1 (at the bottom) to 36 or 42 (at the top). Therefore, the rail surface on which a drawer sits is approximately in line with the lower edge of the EIA position for that drawer. The lowest EIA number completely occupied by a drawer is said to be that drawer's *EIA position*. An EIA number is also used in identifying cables attached to that drawer. The CEC drawer occupies 8 EIA units, and the I/O drawers occupy 5 EIA units each.
2. The I/O drawers have two service positions. One position is with the drawer pulled out the front of the rack, and the other position is with the drawer pulled out the rear of the rack.
3. Two stabilizers are required on the rack before installing the system if the rack is not bolted to the floor. One stabilizer must be installed at the bottom front of the rack unit, and the other at the bottom rear of the rack unit. Both stabilizers must be installed prior to servicing the system.
4. If the system is the only system in the rack, follow these placement guidelines:
 - 7014 T42 rack: Start from the bottom, or center the drawers at about the 17th EIA location.
 - 7014 T00 rack: Start from the bottom, or mount rails so that the top drawer does not exceed the 32nd EIA location.

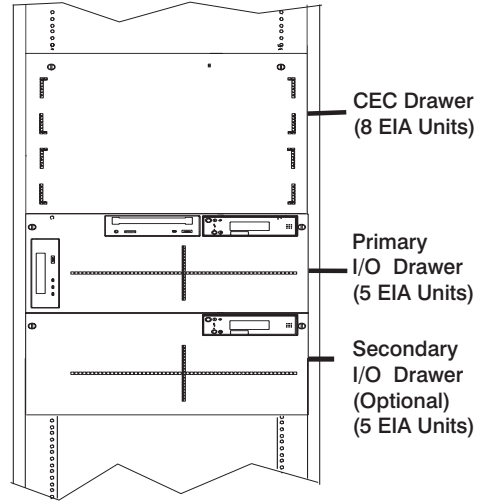
Note: In order to address concurrent serviceability issues on racks with multiple systems installed, it is suggested that the 1st EIA unit be left vacant to allow the bottom drawer room to pass over the cables when the drawer is moved into the rear service position.

- 7014 S00 rack: This rack has no specific placement guidelines.
5. Some I/O drawers require 4 EIA units service clearance from the top of the rack when placed in their rear service position. These early drawers have a rear service stop latch 11.25 inches (285.75 mm) from the rack mounting flange at the front of the drawer. The current drawers have a rear service stop latch 5.75 inches from the rack-mounting flange at the front of the drawer and do not have this service clearance requirement.
 6. If there are no drawers placed immediately above the I/O drawers, install drawer anti-tip guides as shown in the rack drawer rail instructions shipped with the system. This will help support the I/O drawers when they are placed in their rear service position.

System unit with
One I/O Drawer



System unit with
Two I/O Drawers



CAUTION:

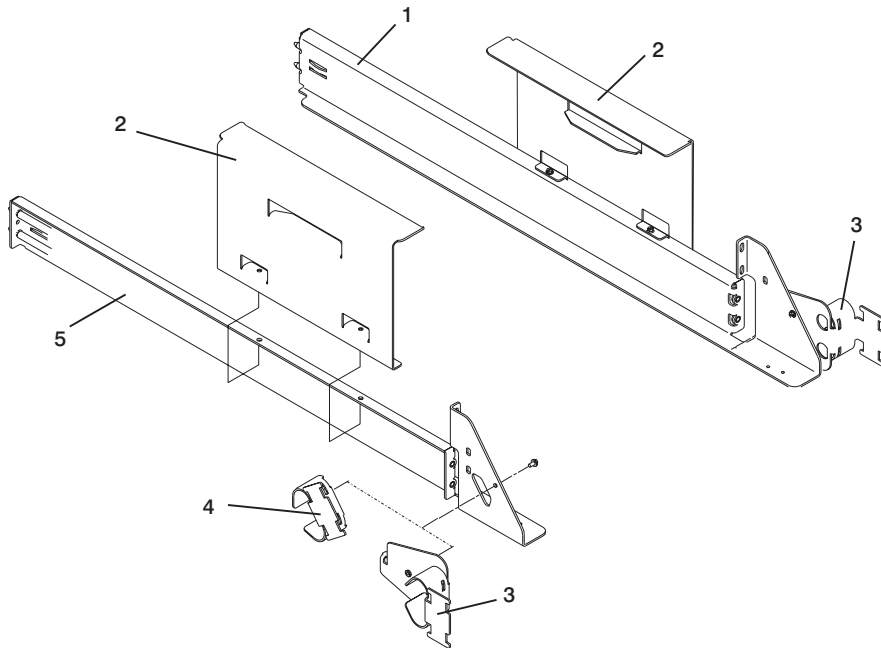
The stabilizer must be firmly attached to the bottom front of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the stabilizer is not attached to the rack.

CAUTION:

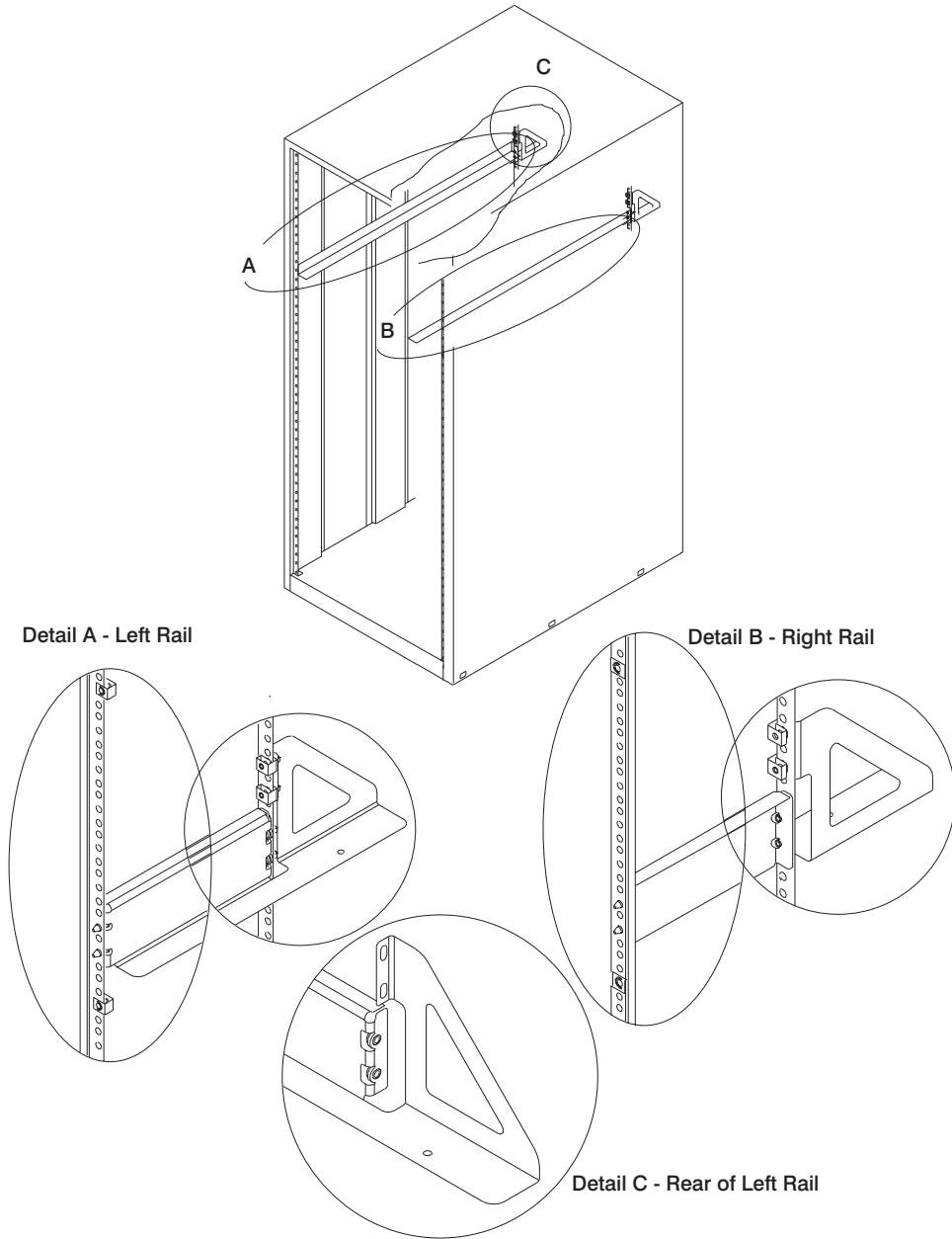
The stabilizer must be firmly attached to the bottom rear of the rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the stabilizer is not attached to the rack.

To set up the rails in the rack, do the following:

1. Determine the EIA locations for the drawer rails. (See the previous figures.)
2. Assemble the drawer rails as follows:
 - a. Use two screws to attach an anti-tip guide **(2)** to each rail.
 - b. Use one screw to attach a Model T00 type cable guide **(3)** to each rail. The Model T00 type rack has room for guides on both the left and right rails.



3. Install the rails in the rack unit. As you install the right rail into the rack, install the drawer latch reset bracket above the right rail.



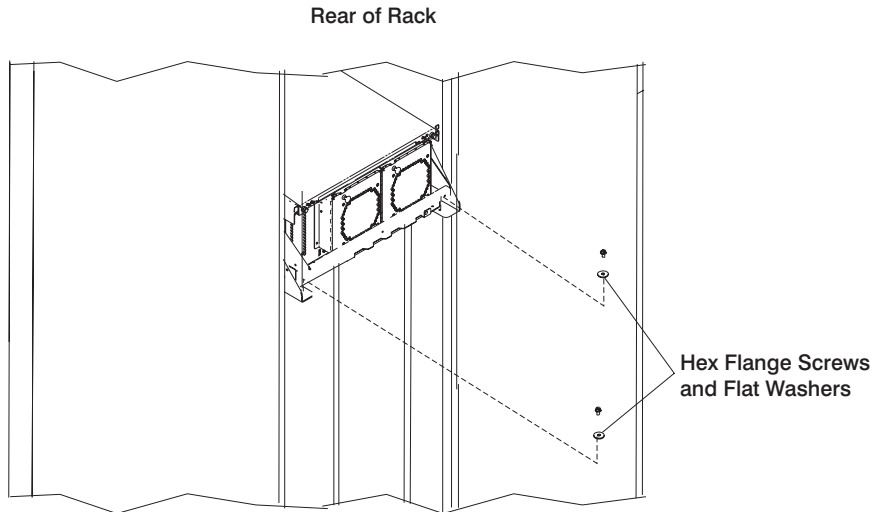
Step 6. Installing Drawers in the Rack

CAUTION:

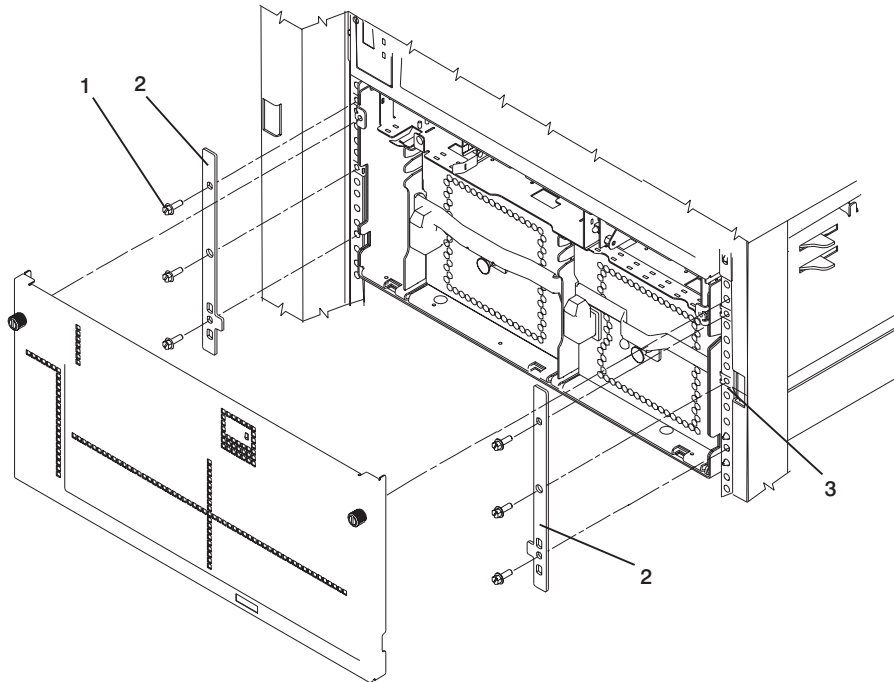
This unit weighs between 32 kg (70.5 pounds) and 55 kg (121.2 pounds). Three persons are required to safely move it. Using less than three persons to move it can result in injury.

To install the drawers in the rack, do the following:

1. If present, remove the front door of the rack to make installing the drawer easier.
2. Slide the shipping box containing the drawer in front of the rack.
3. Remove the following parts to facilitate lifting the drawer into the rack unit:
 - a. Front bezel
 - b. Both power supplies
4. Lift the drawer onto the support rails, and slide it *slowly* into the rack.
5. Continue sliding the drawer into the rack until the front of the drawer rests against the nut clips on the rack.
6. Attach the rear of the drawer to the rack rails with the two hex flange screws and the two flat washers provided with the drawer. This action secures the drawer to the rack. See the following figure.



7. Install a drawer stop **(2)**, on each side at the front of the rack to prevent the drawer from sliding out the front. Use six screws **(1)** and four nut clips **(3)** to attach the drawer stops. See the following figure.



8. Replace the parts that you removed earlier:
 - a. Both power supplies
 - b. Front bezel

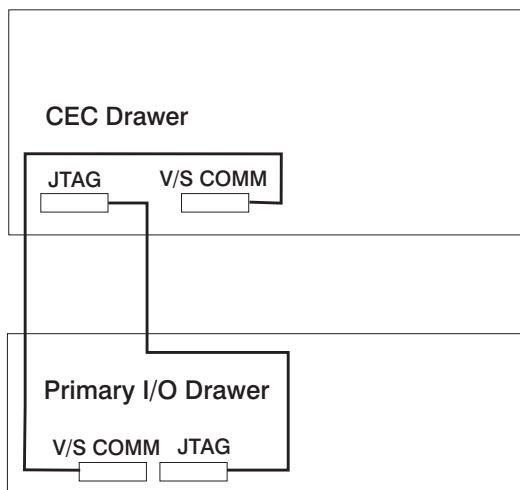
Step 7. Connecting the Cables

Follow the procedures in this section to connect the cables. For instructions on routing and securing cables, see “Routing and Securing Cables” on page 21.

Connecting JTAG and VS/COMM Cables

Refer to the following figure to connect the JTAG and VS/COMM cables.

CEC Drawer Attached to One I/O Drawer



Connecting RIO and SPCN Cables

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

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

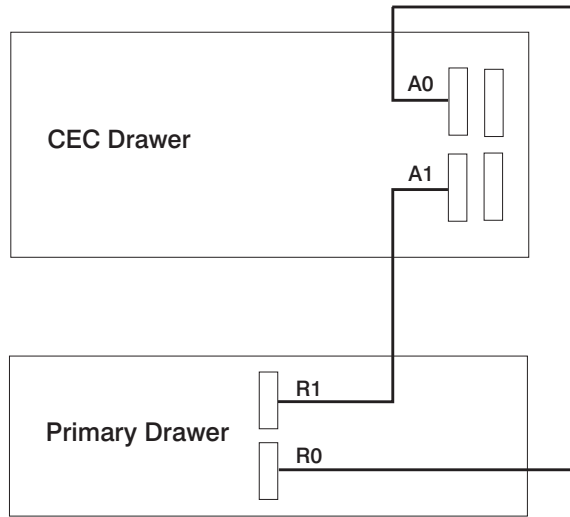
RIO Cabling

The following rules apply to RIO cable connections:

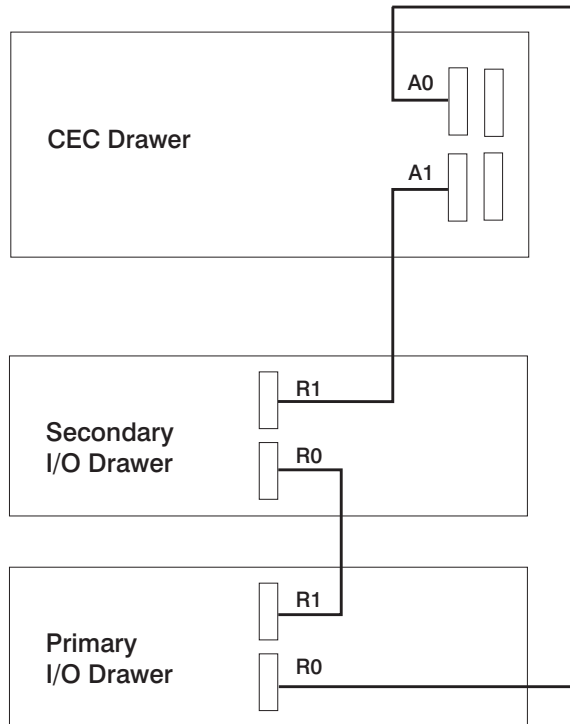
- I/O drawers 0 and 1 are connected using the first RIO loop, which uses RIO ports 0 and 1 on the CEC drawer.
- The primary I/O drawer must be installed and connected to RIO port 0 of the CEC drawer. The connection must be made from RIO port 0 of the CEC drawer to RIO port 0 of the primary I/O drawer. This connection is required to make the primary drawer the first drawer in the loop, which allows the firmware to initialize the system.

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

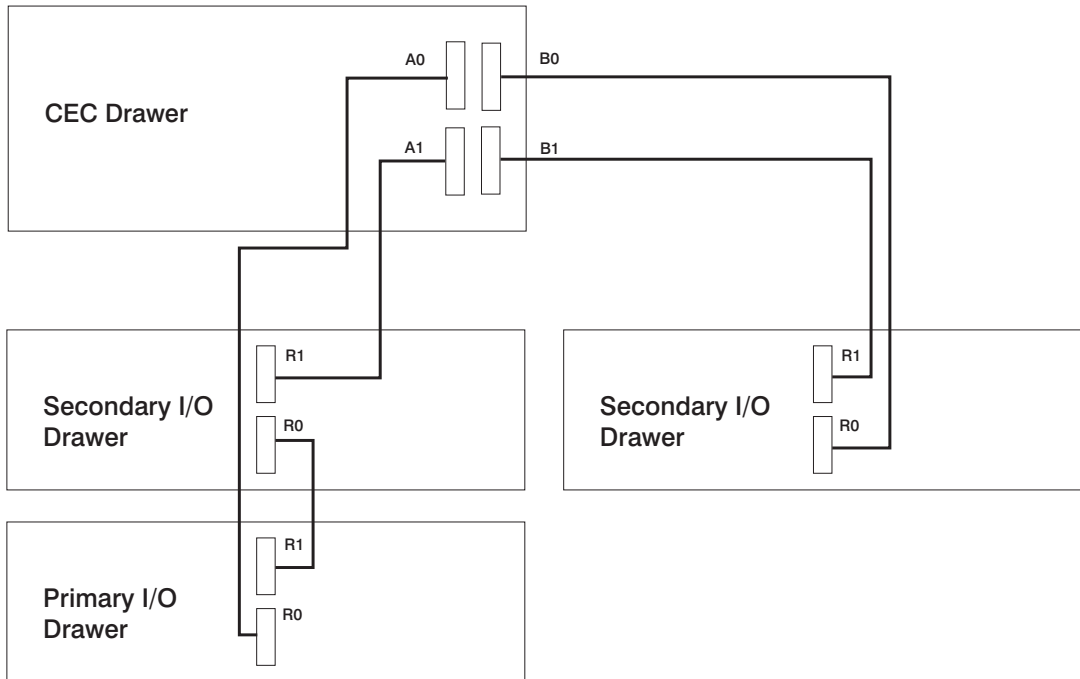
CEC Drawer Attached to One I/O Drawer



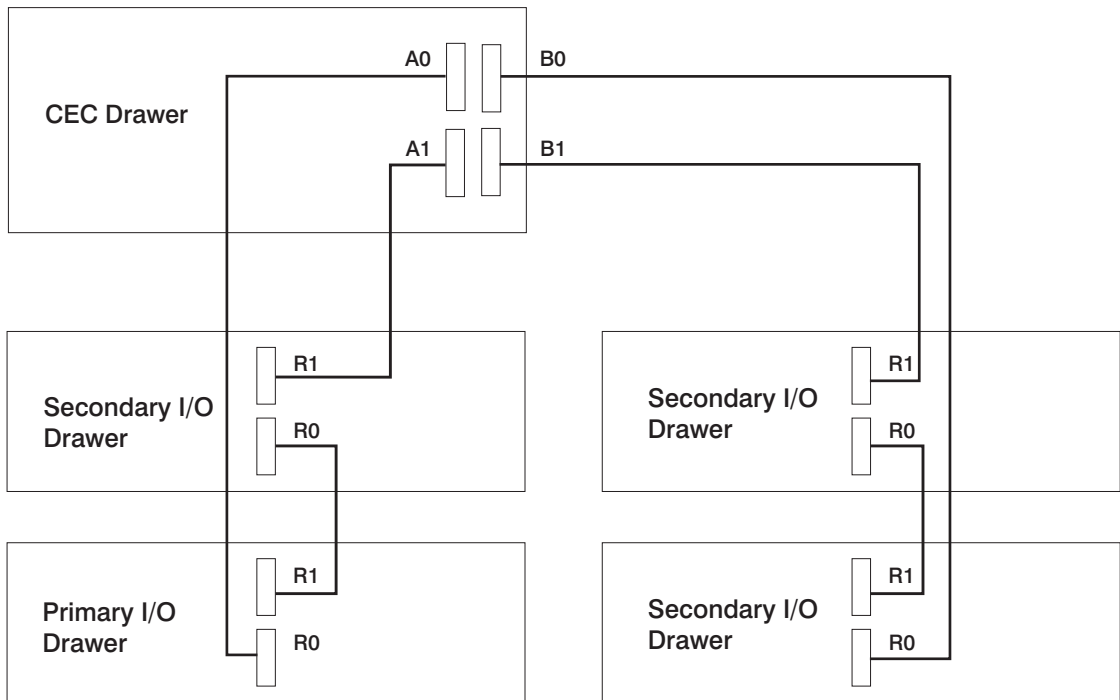
CEC Drawer Attached to Two I/O Drawers Type A



CEC Drawer Attached to Three I/O Drawers



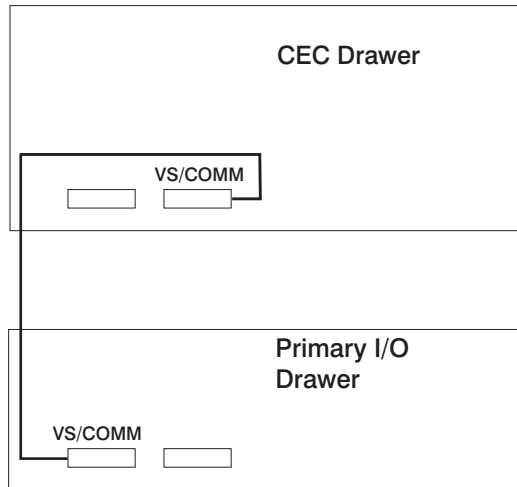
CEC Drawer Attached to Four I/O Drawers



SPCN Cabling

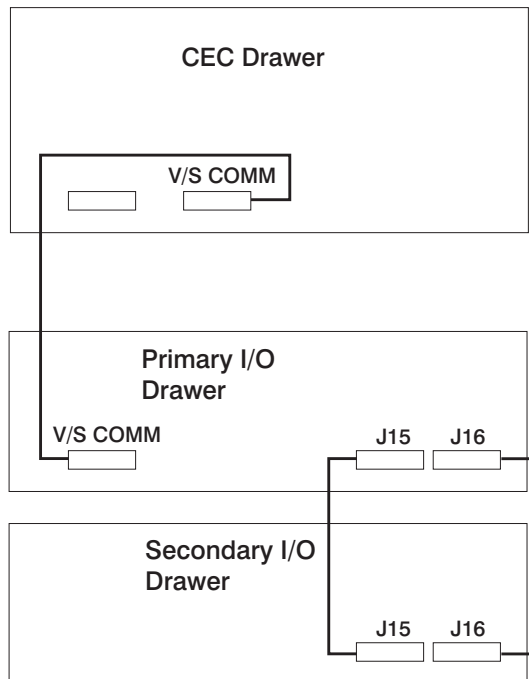
The following figures provide cabling examples for all valid cabling configurations. Match your configuration to the appropriate figure and connect your SPCN cables as shown.

CEC Drawer Attached to One I/O Drawer

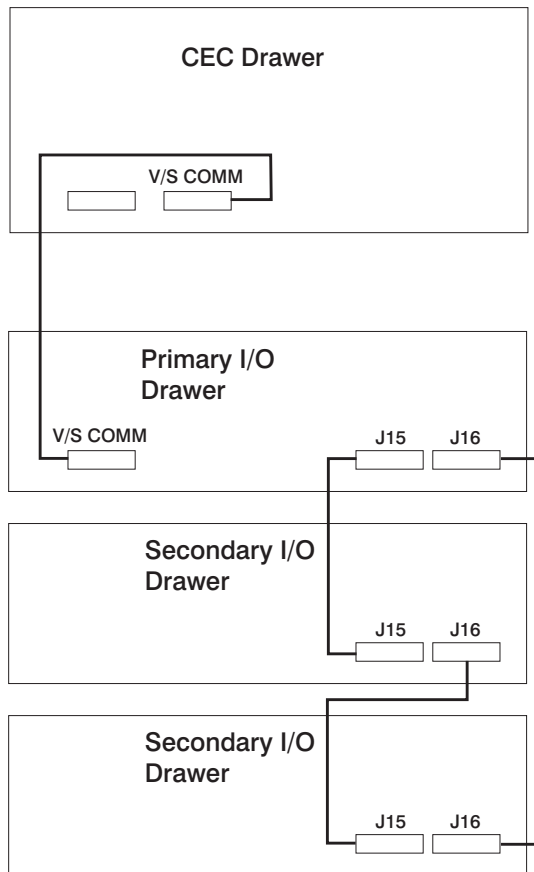


Note: The V/S COMM cable incorporates SPCN wiring.

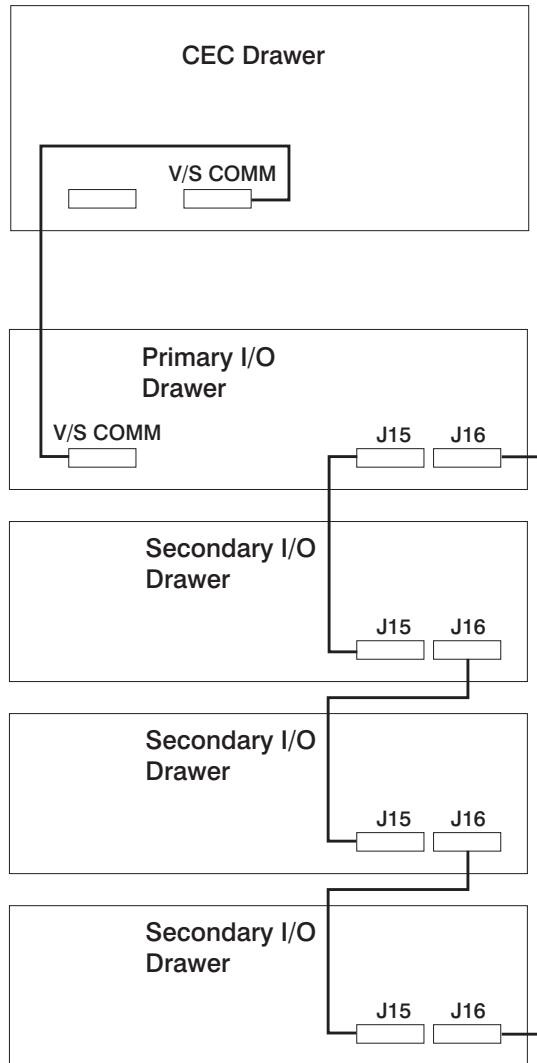
CEC Drawer Attached to Two I/O Drawers



CEC Drawer Attached to Three I/O Drawers



CEC Drawer Attached to Four I/O Drawers



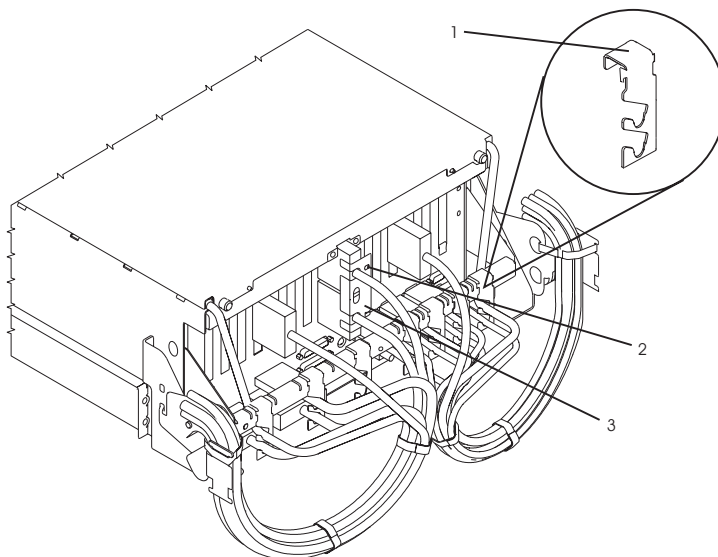
Routing and Securing Cables

To route and secure the cables, use the following descriptions.

I/O Drawer Cables: Use two screws **(2)** to connect the RIO drawer cables to the I/O drawer and secure the cables with the RIO cable retainer **(3)**.

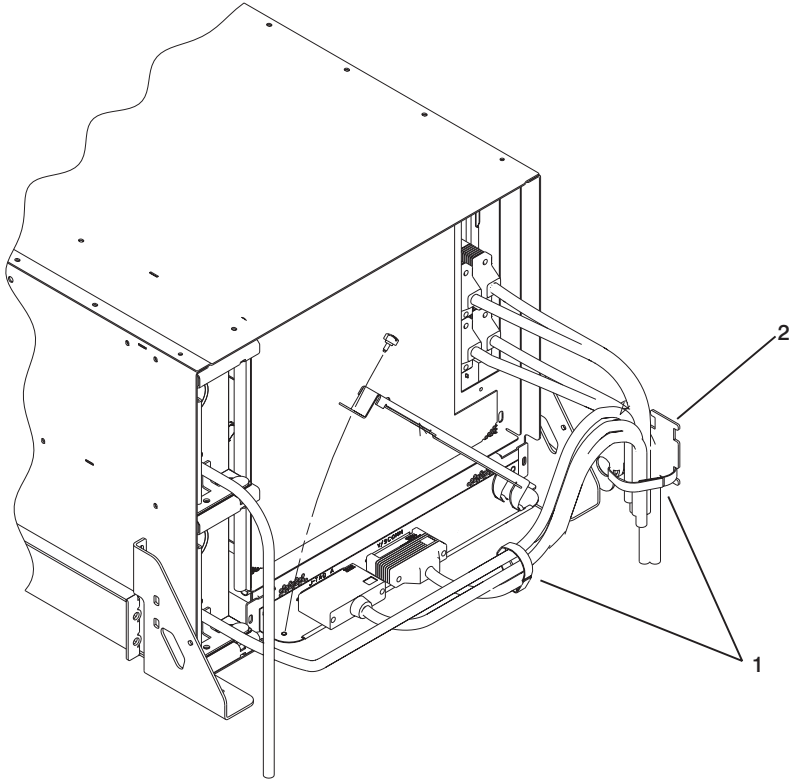
Use the cable hanging brackets **(1)** as needed to hold the cables.

Route the cables over the cable guides and secure the cables with Velcro strips.

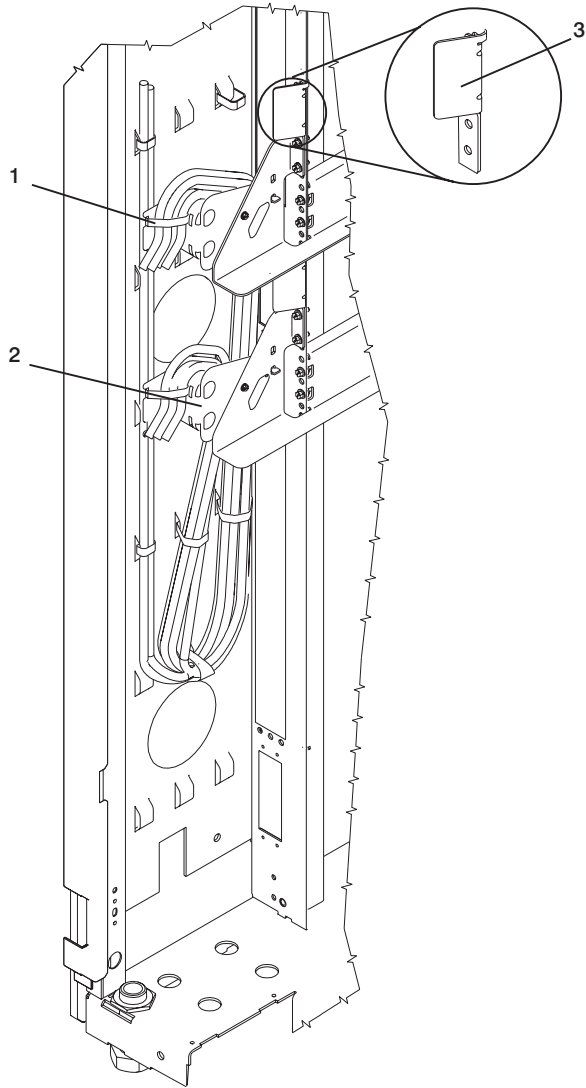


CEC Drawer Cables: Route the CEC drawer cables toward the right rack rail, and secure the cables with Velcro strips **(1)**.

Use the cable hanging brackets **(2)** as needed to hold the cables.



Securing Drawer Cables: Route the cables over the cable guides (2), and secure the cables with Velcro strips (1). Leave a loop that is large enough so that the drawer can be pulled out the back.

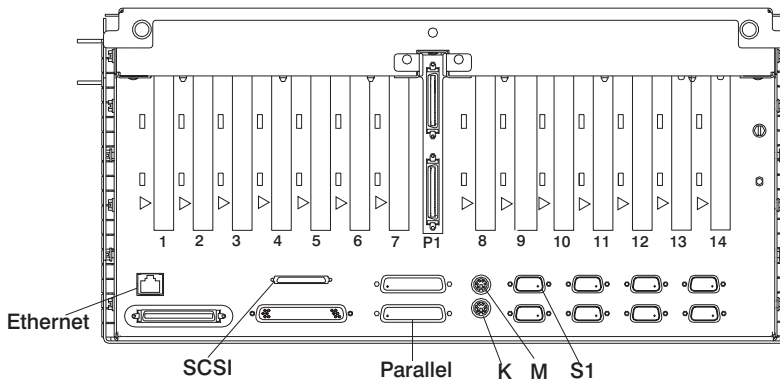


Step 8. Setting Up Attached Devices

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

Perform the setup procedures for each device being attached to the rack. (Refer to the documentation provided with each device.) Then return to “Step 9. Updating the Device Records”.

Connect the ASCII terminal to serial port 1 (S1). Connect the keyboard (K), mouse (M), and graphics display (if available). Refer to the following figure for the connector locations.



Step 9. Updating the Device Records

Update the “System Records” in Appendix D, “System Records” on page 61 to reflect the configuration of the system adapters and devices that are installed.

Step 10. Attaching External Devices

External devices used with the system are connected to connectors on the I/O drawers or to adapters that are installed inside any of the I/O drawers. Attach any external devices now.

Step 11. Connecting the Power

To connect the power, do the following:

1. Plug the drawer power cords into the PDB (power distribution bus) of the rack.
2. Plug the power cords of the external devices into power outlets.
3. Plug the PDB power cord into the customer's electrical outlet.

Step 12. Installing a System with Capacity Upgrade on Demand

If you are installing a system that was ordered with a processor Capacity Upgrade on Demand feature, go to Chapter 3, "Using the Capacity Upgrade on Demand Feature" on page 41. Then return here and continue with Chapter 2, "Installing Options In Your System" on page 27.

Step 13. Installing Options

If you have any options to install, go to Chapter 2, "Installing Options In Your System" on page 27 and install them at this time.

Return here after installing your options.

Step 14. Starting the Operating System

If you plan to install the AIX operating system now, refer to the *AIX Installation Guide*, order number SC23-4112.

If the AIX operating system was preinstalled on your system, go to the *AIX System Management Guide: Operating System and Devices*. This publication is available at the following Web address: <http://www-1.ibm.com/servers/aix/library/>. Select **Technical Publications**. AIX documentation is also located on the *AIX Documentation CD*. The documentation information is made accessible by loading the documentation CD onto the hard disk or by mounting the CD in the CD-ROM drive.

To turn on the CEC drawer and attached I/O drawers, do the following:

1. Open the rack door. Look for OK in the primary I/O drawer operator panel display, which indicates that the system is in standby mode.
2. Press the power button on the primary I/O drawer operator panel.

The power LED on the primary I/O drawer operator panel starts blinking at a fast rate. Checkpoint codes (9xxx) appear in the operator panel display.

When the power-on sequence is complete:

- The power LED on the primary I/O drawer operator panel stops blinking and stays on.
- The power LED on the CEC drawer stops blinking and stays on.

Step 16. Verifying the Hardware Operation

If your system did not load the AIX operating system successfully, or you would like to test your hardware, go to Chapter 4, “Verifying the Hardware Operation” on page 49.

Step 17. Accessing Documentation for Your New System

If you are installing this system and another person is the system administrator, deliver this book to the system administrator when the installation is complete. Ensure that the system administrator reads the following information and is aware of the options to access the documentation for the new system.

Hardware Documentation

Hardware documentation, in addition to this installation guide, is available on the Web or can be ordered in printed hardcopy.

To access the hardware documentation on the Web, go to:

http://www.ibm.com/servers/eserver/pseries/library/hardware_docs

Installation, Using, and Service documentation is available from this Web site. To order printed versions of the books that are available in hardcopy, go to:

<http://www.ibm.com/shop/publications/order>

Operating System Documentation

Documentation for the AIX operating system is available either from the AIX documentation CD or from the Web.

If you ordered the AIX documentation CD with your operating system, you can access the information by loading the documentation CD onto a hard disk on your system or by mounting the AIX documentation CD in the CD-ROM drive. This CD contains the base set of documentation for the AIX operating system.

To access the complete library for AIX operating system documentation, go to:

<http://www.ibm.com/servers/aix/library/techpubs.html>

Chapter 2. Installing Options In Your System

This chapter provides instructions to help you add options to your system. Some option-removal instructions are provided, in case you need to remove one option to install another. If you have several internal options to install, these instructions enable you to add them all at one time.

Safety Considerations

Observe the following safety precautions anytime you work with this system unit.

DANGER

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

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

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

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

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

CAUTION:

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

CAUTION:

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

CAUTION:

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

Handling Static-Sensitive Devices

Attention: Adapters, planars, diskette drives, and disk drives are sensitive to static electricity discharge. These devices are wrapped in antistatic bags to prevent this damage.

Take the following precautions:

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

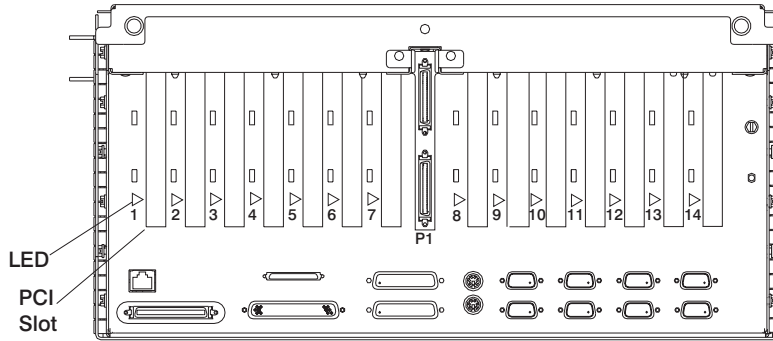
Stopping the System Unit

Attention: When shutting down your system to install options, shut down all applications first and then shut down the operating system. The system power turns off and the system will be in standby mode when the operating system is shut down. Before removing power from the system unit, ensure that the shutdown process is complete. Failure to do so can result in the loss of data. Some option-installation procedures do not require the system to be stopped for installation. If necessary, the option-installation procedures in this section will direct you here if stopping the system is required.

1. Log in as root user.
2. Stop any applications that are running on the system.
3. At a command line, type `shutdown` to stop the operating system.
4. After you shut down the operating system, set the power switches of any attached devices to Off.
5. The system unit is powered down by the shutdown procedure.

I/O Drawer PCI Slot LED Definitions

The following table describes the possible states of the LEDs associated with the I/O drawer PCI slots. These LEDs are located at the rear of the I/O drawer. One LED is associated with each PCI slot.



LED Indication	PCI Slot State	Definition
Off	Off	Slot power is off. It is safe to remove or replace an adapter.
On (not flashing)	On	Slot power is on. Do not remove or replace an adapter.
Flashing slowly (one flash per second)	Identify	Slot has been identified by the software. Do not remove or replace an adapter at this time.
Flashing rapidly (six to eight flashes per second)	Action	Slot is ready for removal or replacement of an adapter.

Installing Capacity Upgrade on Demand

Capacity Upgrade on Demand is a flexibility option for your system that allows increased processor capacity when you want it. You can order the feature on a new system, or add it to an installed system to ensure that you have additional processing power available if you need it. After the hardware is installed, additional processors are available anytime. When changes to the system configuration are made, Electronic Service Agent notifies the CUoD (Capacity Upgrade on Demand) project office of the change by communicating through a modem and a dedicated phone line.

You can increase your system's processing capacity in increments of two processors by entering a command on the operating system command line. For more information about Capacity Upgrade on Demand, see Chapter 3, "Using the Capacity Upgrade on Demand Feature" on page 41.

If you are installing a system that was ordered with a processor Capacity Upgrade on Demand feature, go to "Installing a System with the Capacity Upgrade on Demand Feature" on page 43 and follow the instructions to install and verify the feature.

If the Capacity Upgrade on Demand feature is already installed in your system and you want to upgrade to use additional processors, go to "Enabling the Capacity Upgrade on Demand Feature" on page 45.

Installing PCI Adapters

Note: If you are installing devices that connect to an adapter, install the devices and cables before you install the adapter.

If the adapter you are installing requires device driver software, see the documentation for the adapter, and load the software before installing the adapter.

With this system, you can install PCI adapters with the power on. These adapters are referred to as *hot-pluggable* PCI adapters. Some adapters are not hot-pluggable, and power must be removed from the system for adapter installation.

Before you install the adapter, determine if the PCI adapter you are installing is hot-pluggable. See the *PCI Adapter Placement Reference*, order number SA38-0538.

If you are installing a PCI adapter that is:

- Not hot-pluggable, go to "Installing a Non-Hot-Pluggable PCI Adapter" on page 31.
- Hot-pluggable, go to "Installing a Hot-Pluggable PCI Adapter" on page 32.

Installing a Non-Hot-Pluggable PCI Adapter

To install the non-hot-pluggable adapter, perform the following steps:

1. Turn off the power and unplug the system unit power cable from the electrical outlet.

If the system is operating under AIX, type `shutdown` to power off the system.

If you cannot use this method, you can power off the system by using the following operator panel power-button procedure.

Attention: Using the primary I/O drawer operator panel power button to power off the system may cause unpredictable results in the data files, and the next IPL will take longer to complete.

- a. Open the rack door.
- b. Press the power button on the primary I/O drawer operator panel.
The primary I/O drawer operator panel power LED starts blinking at a fast rate. B0FF appears in the primary operator panel display.

When the power-off sequence is complete, the system will go into standby mode, as evidenced by:

- 0K appears in the primary operator panel display.
 - The primary I/O drawer operator panel LED will start blinking at a slow rate.
 - The CEC drawer power LED will start blinking at a slow rate.
2. If you have more than one I/O drawer, determine into which drawer you will install the adapter.
 3. Place the I/O drawer in the rear service position, as follows:
 - a. If you have not already done so, open the front door of the rack unit.
 - b. Loosen the two thumbscrews that attach the front bezel to the drawer.
 - c. Grasp both sides of the front bezel and pull the bezel off the drawer.
 - d. If you have not already done so, open the rear door of the rack unit.
 - e. If present, remove the two retaining screws at the rear of the drawer. See the figure on page 10.
 - f. Grasp the bar at the rear of the drawer, and pull the drawer to the rear until it is stopped by the two detents on the top of the drawer.

Note: Make sure that you do not damage the cables while pulling out the drawer.

4. Remove the two thumbscrews, and remove the top cover from the drawer.
5. See the *PCI Adapter Placement Reference*, order number SA38-0538, for adapter placement information. Then select an empty PCI slot for the adapter.
6. Turn the locking latch and lift the plastic stop for the adapter you are installing.
7. Remove the blank slot cover.
8. Carefully grasp the adapter by the edges and align the adapter in the slot guides. Insert the adapter fully into the adapter slot connector. If you are installing a full-length adapter, ensure that both ends of the adapter engage the card guides.
9. Lower the plastic stop over the adapter bracket, and rotate the locking latch clockwise until it clicks into the locked position.

10. Connect appropriate cables to the adapter.
11. Install the covers that you removed earlier, and return the drawer to the normal operating position.
12. Plug in the system unit power cables.
13. Turn on the power.

Installing a Hot-Pluggable PCI Adapter

Note: If you have more than one I/O drawer, determine into which drawer you will install the adapter. Note the drawer number if displayed on the I/O drawer operator panel.

To install the adapter, perform the following steps:

1. Place the I/O drawer in the rear service position:
 - a. If you have not already done so, open the front door of the rack unit.
 - b. Loosen the two thumbscrews that attach the front bezel to the drawer.
 - c. Grasp both sides of the front bezel and pull the bezel off the drawer.
 - d. If you have not already done so, open the rear door of the rack unit.
 - e. If present, remove the two retaining screws at the rear of the drawer. See the figure on page 10.
 - f. Grasp the bar at the rear of the drawer, and pull the drawer to the rear until it is stopped by the two detents on the top of the drawer.

Note: Make sure that you do not damage the cables while pulling out the drawer.

2. Remove the two thumbscrews, and remove the top cover from the drawer.
3. Refer to “PCI Hot-Plug Manager Access” on page 37, and follow the steps in the access procedure to select **PCI Hot Plug Manager**. Then return here to continue.
4. From the PCI Hot-Plug Manager menu, select **Add a PCI Hot-Plug Adapter** and, then press Enter. The Add a Hot-Plug Adapter window displays.
5. See the *PCI Adapter Placement Reference*, order number SA38-0538, for adapter placement information. Then select an empty PCI slot for the adapter. If you noted the drawer’s number, use it to select the slot in the appropriate drawer.
6. Select the appropriate empty PCI slot from the ones listed on the screen, and press Enter.
7. Turn the locking latch, lift the plastic stop, and remove the blank slot cover.
8. Follow the instructions on the screen to install the adapter until the visual indicator (LED) for the specified PCI slot is set to the action state. See “I/O Drawer PCI Slot LED Definitions” on page 29.
9. When you are instructed to install the adapter in the adapter slot, carefully grasp the adapter by the edges and align the adapter in the slot guides. Insert the adapter fully into the adapter slot connector. If you are installing a full-length adapter, ensure that both ends of the adapter engage the card guides.

10. Lower the plastic stop over the adapter bracket and rotate the locking latch clockwise until it clicks into the locked position. Some full-length cards can be supported by rotating the blue adapter latch on the right end of the adapter counterclockwise.
11. Connect appropriate cables and devices to the adapter.
12. Continue to follow the screen instructions until you receive a message that the installation is successful. Successful installation is indicated by the OK message displayed next to the **Command** field at the top of the screen.
13. Press the F3 key to return to the PCI Hot-Plug Manager menu.
14. Select **Install/Configure Devices Added After IPL** and press Enter. Then follow the instructions on the screen.
15. Press F10 to exit the Hot-Plug Manager.
If you have added, removed, or replaced any adapters, run the **diag -a** command. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.
16. If you have other adapters to install, return to step 4 on page 32.
17. If you do not have other adapters to install, replace the covers and return the drawer to the normal operating position.

Removing PCI Adapters

With this system, you can remove PCI adapters with the power on. These adapters are referred to as *hot-pluggable* PCI adapters. Some adapters are not hot-pluggable and power must be removed from the system for adapter removal.

Before you remove the adapter, determine if the PCI adapter you are removing is hot-pluggable. See the *PCI Adapter Placement Reference*, order number SA38-0538.

If you are removing a PCI adapter that is:

- Not hot-pluggable, go to “Removing a Non-Hot-Pluggable PCI Adapter”.
- Hot-pluggable, go to “Removing a Hot-Pluggable PCI Adapter” on page 34.

Removing a Non-Hot-Pluggable PCI Adapter

To remove a non-hot-pluggable adapter, perform the following steps:

1. Turn power off and unplug the system unit power cable from the electrical outlet.

If the system is operating under AIX, type `shutdown` to power off the system.

If you cannot use this method, you can power off the system by using the following operator panel power-button procedure.

Attention: Using the primary I/O drawer operator-panel power button to power off the system may cause unpredictable results in the data files, and the next IPL will take longer to complete.

- a. Open the rack door.
- b. Press the power button on the primary I/O drawer operator panel.

The primary I/O drawer operator panel power LED starts blinking at a fast rate. B0FF appears in the primary operator panel display.

When the power-off sequence is complete, the system will go into standby mode, as evidenced by:

- OK appears in the primary operator panel display.
 - The primary I/O drawer operator panel LED will start blinking at a slow rate.
 - The CEC drawer power LED will start blinking at a slow rate.
2. Place the I/O drawer in the rear service position, as follows:
 - a. If you have not already done so, open the front door of the rack unit.
 - b. Loosen the two thumbscrews that attach the front bezel to the drawer.
 - c. Grasp both sides of the front bezel and pull the bezel off the drawer.
 - d. If you have not already done so, open the rear door of the rack unit.
 - e. If present, remove the two retaining screws at the rear of the drawer. See the figure on page 10.
 - f. Grasp the bar at the rear of the drawer, and pull the drawer to the rear until it is stopped by the two detents on the top of the drawer.

Note: Make sure that you do not damage the cables while pulling out the drawer.

3. Remove the two thumbscrews, and remove the top cover from the drawer.
4. Determine the slot from which you are removing the adapter.
5. Disconnect any cables that are connected to the adapter being removed.
6. Turn the locking latch, and lift the plastic stop for the adapter.
7. Carefully grasp the adapter by the edges and pull it straight out from the I/O board. Store the adapter in a safe place.
8. Place a blank slot cover in the adapter slot, and then lower the plastic stop over the adapter bracket. Rotate the locking latch clockwise until it clicks into the locked position.
9. If you have other adapters to remove, remove them at this time.
10. If you do not have other adapters to remove, replace all covers, and return the drawer to the normal operating position.
11. Plug the system unit power cable into an electrical outlet.
12. Turn on the power.

Removing a Hot-Pluggable PCI Adapter

To remove a hot-pluggable adapter, perform the following steps:

1. Place the I/O drawer in the rear service position, as follows:
 - a. If you have not already done so, open the front door of the rack unit.
 - b. Loosen the two thumbscrews that attach the front bezel to the drawer.
 - c. Grasp both sides of the front bezel and pull the bezel off the drawer.
 - d. If you have not already done so, open the rear door of the rack unit.
 - e. If present, remove the two retaining screws at the rear of the drawer. See the figure on page 10.
 - f. Grasp the bar at the rear of the drawer, and pull the drawer to the rear until it is stopped by the two detents on the top of the drawer.

2. Remove the two thumbscrews, and remove the top cover from the drawer.
3. Determine the slot from which you are removing the adapter.
4. Ensure that any processes or applications that might use the adapter are stopped.

Note: Removing a hot-pluggable PCI adapter requires the system administrator to take the PCI adapter offline before performing any PCI adapter hot-plug procedures. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

For additional information about taking an adapter offline or removing it from the system configuration, see the *AIX System Management Guide: Operating System and Devices*. This publication is available at the following Web address: <http://www-1.ibm.com/servers/aix/library/>. Select **Technical Publications**. AIX documentation is also located on the *AIX Documentation CD*. The documentation information is made accessible by loading the documentation CD onto the hard disk or by mounting the CD in the CD-ROM drive.

5. Refer to "PCI Hot-Plug Manager Access" on page 37, and follow the steps in the access procedure to select **PCI Hot Plug Manager**. Then return here to continue.
6. Select **Unconfigure a Device**, and then press Enter.
7. Press F4 to display the Device Names menu.
8. Select the adapter you are removing from the menu.
9. If you are replacing an adapter with an identical one, answer YES to **Keep Definition**. If you are removing an adapter permanently, use the Tab key to answer NO to **Keep Definition**. Press Enter.
10. The ARE YOU SURE screen displays. Press Enter to verify the information.
11. Press F3 to return to the PCI Hot-Plug Manager.
12. Select **Replace/Remove a PCI Hot-Plug Adapter** and press Enter. The Replace/Remove a PCI Hot-Plug Adapter menu displays.
13. Move the cursor to select the adapter that you are removing and press Enter. (The description entry displays as unknown).
14. Press the Tab key until the entry field displays the desired operation and then press the Enter key. Follow the instructions that display on the screen until you are instructed to remove the adapter.
15. When you are instructed to remove the adapter from the adapter slot, disconnect any cables that are connected to the adapter being removed.
16. Turn the locking latch and lift the plastic stop for the adapter. Some full-length adapter cards can be removed by rotating the blue adapter latch on the right end of the adapter divider clockwise.
17. Carefully grasp the adapter by the edges and pull it straight out from the system board. Store the adapter in a safe place.

18. If you are not replacing the adapter with an identical adapter, place a blank slot cover in the adapter slot and then lower the plastic stop over the adapter bracket. Otherwise, insert the new adapter and rotate the locking latch clockwise until it clicks into the locked position.
19. Continue to follow the screen instructions until you receive a message that the adapter removal is successful. Successful removal is indicated by the OK message displayed next to the **Command** field at the top of the screen.
20. Press F10 to exit the Hot-Plug Manager.
21. If you have added, removed, or replaced any adapters, run the **diag -a** command. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.
22. If you have other adapters to remove, return to step 12 on page 35. If you do not have other adapters to remove, install the covers that you removed earlier and return the drawer to the normal operating position.

PCI Hot-Plug Manager Access

The installation instructions for hot-pluggable PCI adapters refer you to these procedures when it is appropriate to perform them.

Note: A PCI adapter is only hot-pluggable if the PCI adapter is supported for hot-plug applications. See the *PCI Adapter Placement Reference*, order number SA38-0538.

Accessing Hot-Plug Management Functions

Note: Removing or installing a hot-pluggable PCI adapter requires the system administrator to take the PCI adapter offline prior to performing any PCI adapter hot-plug procedures. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

For additional information about taking an adapter offline or removing it from the system configuration, see the *AIX System Management Guide: Operating System and Devices*. This publication is available at the following Web address: <http://www-1.ibm.com/servers/aix/library/>. Select **Technical Publications.AIX** documentation is also located on the *AIX Documentation* CD. The documentation information is made accessible by loading the documentation CD onto the hard disk or by mounting the CD in the CD-ROM drive.

To access the hot-plug menus, do the following:

1. Log in as root user.
2. At the command line, type `smitty`.
3. Select **Devices**.
4. Select **PCI Hot Plug Manager**, and then press Enter.

Note: The PCI Hot-Plug Manager menu displays. See the following section for descriptions of the menu options. Then return to the procedure that directed you here.

PCI Hot-Plug Manager Menu

The following options are available from the PCI Hot Plug Manager menu:

Note: For information about the PCI slot LED states, see “I/O Drawer PCI Slot LED Definitions” on page 29.

List PCI Hot-Plug Slots

Provides a descriptive list of all slots that support PCI hot-plug capability. If the listing for a slot indicates it holds an unknown device, select **Install/Configure Devices Added after IPL** to configure the adapter in that slot.

Add a PCI Hot-Plug Adapter

Allows the user to add a new PCI hot-plug-capable adapter to the slot with the system turned on. You will be asked to identify the PCI slot that you have selected prior to the actual operation. The selected PCI slot will go into the action state and finally into the on state.

Note: The system will indicate the slot holds an unknown device until you perform the **Install/Configure Devices Added After IPL** option to configure the adapter.

Replace/Remove a PCI Hot-Plug Adapter

Allows the user to remove an existing adapter, or replace an existing adapter with an identical one. For this option to work, the adapter must be in the defined state (see “Unconfigure a Device” option below).

You will be asked to identify the PCI slot prior to the actual operation. The selected PCI slot will go into the action state.

Identify a PCI Hot-Plug Slot

Allows the user to identify a PCI slot. The selected PCI slot will go into the identify state. See “I/O Drawer PCI Slot LED Definitions” on page 29.

Unconfigure a Device

Allows the user to put an existing PCI adapter into the defined state if the device is no longer in use.

This step must be completed successfully before starting a removal or replacement operation. If this step fails, the customer must take action to release the device.

Configure a Defined Device

Allows a new PCI adapter to be configured into the system if software support is already available for the adapter. The selected PCI slot will go into the on state.

Install/Configure Devices Added After IPL

The system attempts to configure any new devices and tries to find and install any required software from a user-selected source.

The add, remove, and replace functions return information to the user indicating whether the operation was successful. If additional instructions are provided on the screen, complete the recommended actions. If the instructions do not resolve the problem, see the following:

- If the adapter is listed as unknown, perform the **Install/Configure Devices Added After IPL** option to configure the adapter.
- If you receive a warning indicating that the required device packages are not installed, the system administrator must install the specified packages before you can configure or diagnose the adapter.
- If you receive a failure message indicating a hardware error, the problem might be either the adapter or the PCI slot. Isolate the problem by retrying the operation in another PCI slot, or trying another adapter in the slot. If you determine that you have failing hardware, call your service representative.

Chapter 3. Using the Capacity Upgrade on Demand Feature

The Capacity Upgrade on Demand feature allows a new system to be ordered with extra processor capacity that can be enabled by the system administrator. Also, if a system that is already in use requires additional processor capacity, the system can be upgraded with additional capacity that can be enabled by the system administrator anytime additional capacity is required. The service representative can also enable processors during hardware upgrade installation.

Note: The Capacity Upgrade on Demand feature is available for this system when a minimum of four processors running at 750 MHz processor are installed. The Capacity Upgrade on Demand feature is not available on systems in which 500 MHz processors are installed.

System Processors

The processors are ordered by feature code (FC) for the system on which you are installing the additional capacity. The following feature codes can be ordered with the system, or added as upgrades to allow additional processors to be installed in the system and then enabled later.

FC 8306

This Capacity Upgrade on Demand feature code causes a processor board with four processors to be installed, but none of the processors are enabled. Only one of these feature codes can be installed.

FC 8307

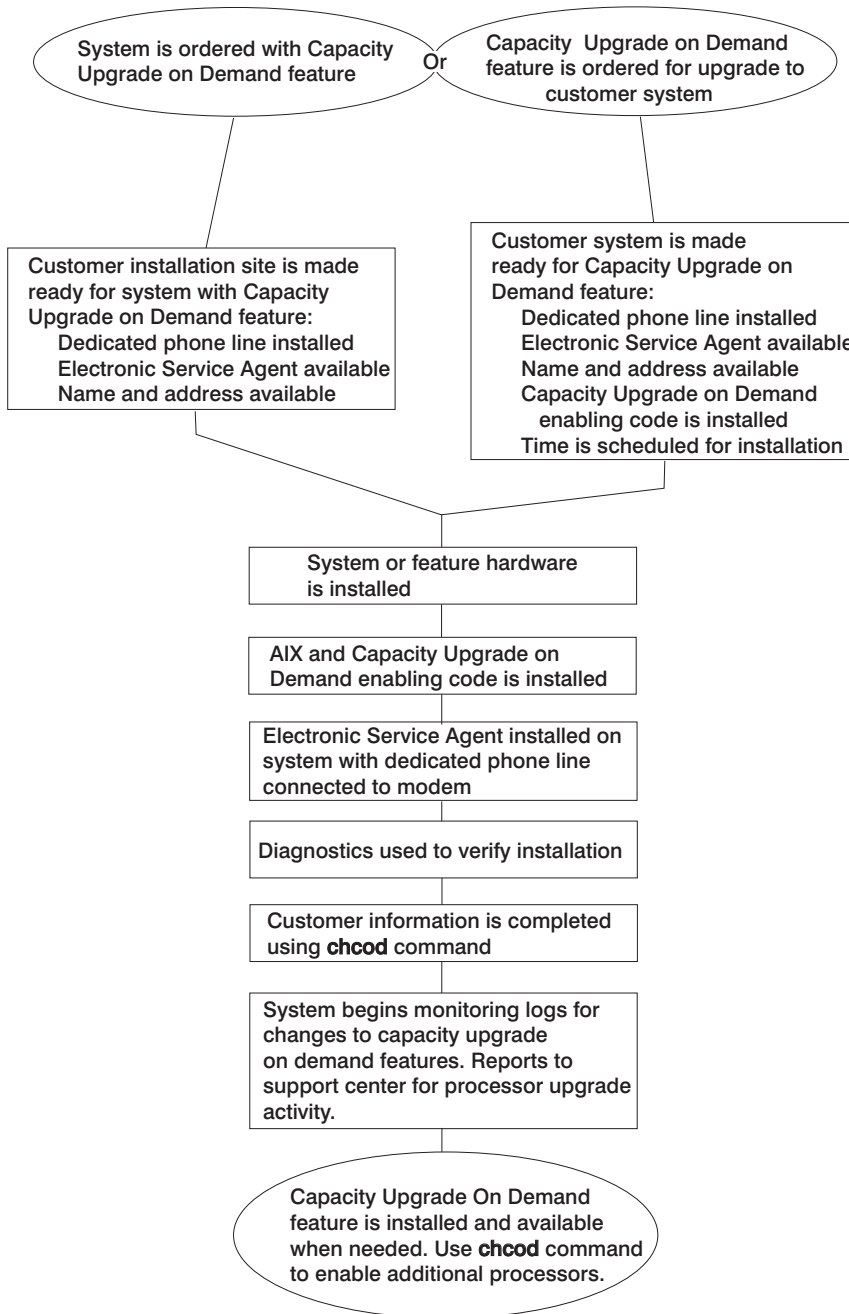
This Capacity Upgrade on Demand feature code causes a processor board with four processors to be installed, and two of the processors are enabled.

After the system is running with any of the above features installed, if the system administrator enables additional processors on a processor board, the records for the system are changed to show that the appropriate feature code is in use.

As processors are enabled by the system administrator, the feature records for the system are automatically updated in the AIX error logs to reflect the number of processors in use. For system records purposes, the error logs record changes to the processor configuration and the changes are sent, using the Electronic Service Agent, to the CUoD (Capacity Upgrade on Demand) project office.

Process Flow for Capacity Upgrade on Demand

The following flowchart provides an overview of the process that is required to enable Capacity Upgrade on Demand on systems that need reserve capacity.



Installing a System with the Capacity Upgrade on Demand Feature

If you are installing a system that was ordered with a processor Capacity Upgrade on Demand feature, continue with this section to install the Capacity Upgrade on Demand feature.

If the Capacity Upgrade on Demand feature is already installed in your system and you want to upgrade to use additional processors, go to “Enabling Additional Capacity Upgrade on Demand Processors” on page 47.

Verifying System Communication Capabilities

The system *must* have Electronic Service Agent installed and configured to call out on a dedicated phone line. The service representative is responsible for ensuring that Electronic Service Agent is operational.

To verify the system communication capabilities, do the following:

1. As part of the Capacity Upgrade on Demand system installation, the service representative must configure and test the Electronic Service Agent. Locate the CD that contains the Electronic Service Agent application and user's guide PDF document provided with the system.
2. Use the Electronic Service Agent user's guide to complete the tasks in the following sections:
 - Prerequisites
 - Obtaining and installing Electronic Service Agent
 - Basic Electronic Service Agent configuration
 - Advanced configuration tasks that *must* be completed to support Capacity Upgrade on Demand:
 - If the system having Capacity Upgrade on Demand installed is not the Electronic Service Agent gateway, the Electronic Service Agent client code must be installed on this system and this system must be added to the list of Electronic Service Agent-monitored systems.
 - A test PMR must be sent to the Electronic Service Agent server and completed successfully.
3. Return here and continue with these instructions after completing steps 1 and 2 above.

Configuring the Capacity Upgrade on Demand Feature

This section provides instructions to use the **chcod** command to configure the Capacity Upgrade on Demand feature and allow the system to update the system records. For full details about the **chcod** command syntax, go to Appendix E, “Using the chcod Command” on page 69.

Note: Ensure that the system and all new hardware have been installed before beginning this procedure.

Note: If the Capacity Upgrade on Demand processor feature is not installed, the service representative should install the processor feature at this time. Do *not* continue with the steps below. Refer to the installation instructions that were provided with the feature.

To install a system with the Capacity Upgrade on Demand feature hardware, do the following:

1. Log in to the system as root user or as a user with system group privileges.
2. Type the following command:

```
chcod
```

Record the displayed information below:

```
Current MailAddress _____Reserved_____
```

```
Current CustInfo _____
```

```
Current Model and System ID = IBM, xxxx-_____IBM, _____
```

```
Current number of authorized proc(s) out of (xx_____) installed on system = (yy_____)
```

where (xx) is the number of processors installed in the system, (yy) is the number of Capacity Upgrade on Demand-enabled processors.

If (yy) is equal to 0, then Capacity Upgrade on Demand is not enabled.

If (yy) is greater than 0, then Capacity Upgrade on Demand is enabled.

3. To enable testing of all the installed processors, disable Capacity Upgrade on Demand by setting the number `_of_` processors (yy) equal to 0:

```
chcod -r proc -n 0
```

4. Shut down and reboot the system, as follows:

```
shutdown -Fr
```

5. To verify the installed processors, type the following at the command line:

```
bindprocessor -q
```

Information about installed processor boards displays. The available processors should be listed as 0 to 7.

If the number of installed processors is not correct, use the normal maintenance package procedures to correct any problems.

6. To test the system, type the following at the command line:

```
diag
```

7. Select **Advanced Diagnostics**.

8. Select System Verification mode on `sysplanar0` and all processors. Use the normal maintenance package procedures to correct any problems.

Enabling the Capacity Upgrade on Demand Feature

When the system is ready to return to normal operations, enable the Capacity Upgrade on Demand feature, as follows:

1. Log in to the system as root user or as a user with system group privileges.
2. Type the following at the command line:

```
chcod -c "CustomerNname-CustomerNumber_nnnnnnn-CustomerPhoneNumber_(333)_444-5555"
```

Note: You can obtain the customer number and the customer phone number from the customer or the marketing representative. Use that information when you use the **chcod** command. For example:

```
chcod -c Jane_Doe-CustomerNumber_9999999-Phone_(333)_444-5555
```

Note: The customer information cannot contain any blank spaces.

To verify that the information was entered correctly, type the following at the command line:

```
chcod
```

The following information is displayed:

```
Current MailAddress _____Reserved_____
```

```
Current CustInfo      Jane_Doe-CustomerNumber_9999999-Phone_(333)_444-5555
```

```
Current Model and System ID = IBM, xxxx-xxx_IBM,xxxxxxx
```

```
Current number of authorized proc(s) out of (xx____) installed on system = (0)
```

3. Type the following at the command line:

```
chcod -r proc -n total_number_of_processors
```

where the *total_number_of_processors* is equal to the value of (yy) recorded in step 2 on page 44.

4. To verify the error log, type the following at the command line:

```
errpt -a | pg
```

The following information displays:

```
LABEL :          COD_CHANGED
IDENTIFIER :     nnnnnAnnB
Date/Time :     DDD MM YY  TIME
Machine ID :    nnnnnnnnnnnnnn
Note ID :       abcdefxxx
Class :         x
Type :          INFO
Resource Name : Cod Notify
Description
CHANGING CAPACITY UPGRADE ON DEMAND
Probable Causes
User Causes
USER RAN Chcod COMMAND
```

```
Recommended Action
NONE
Detail Data
SYSTEM MODEL
IBM, xxxx-xxx_IBM, xxxxxxxxx
RESOURCE CHANGE
proc
RESOURCE INSTALLED
.....
```

The RESOURCE INSTALLED is equal to the total number of installed processors (xx).

```
OLD VALUE
0
NEW VALUE
.....
```

The NEW VALUE must equal (yy), recorded in step 2 on page 44.

5. Shutdown and reboot the system, as follows:

```
shutdown -Fr
```

6. Log in to the system as root user or as a user with system group privileges.

7. Type the following at the command line:

```
chcod
```

The following information displays:

```
Current MailAddress _____Reserved_____
```

```
Current CustInfo      Jane_Doe-CustomerNumber_9999999-Phone_(333)_444-5555
```

```
Current Model and System ID = IBM, xxxx-xxx_IBM,xxxxxxx
```

```
Current number of authorized proc(s) out of (xx____) installed on system = (yy____)
```

The values of (xx) and (yy) should match the values recorded in step 2 on page 44.

The processor Capacity Upgrade on Demand feature is enabled and ready to be used. If you want to enable additional processors, go to “Enabling Additional Capacity Upgrade on Demand Processors” on page 47.

Enabling Additional Capacity Upgrade on Demand Processors

This section provides instructions to use the **chcod** command to enable the appropriate processors as they are needed. For details about the **chcod** command syntax, go to Appendix E, “Using the chcod Command” on page 69.

If the Capacity Upgrade on Demand feature is already installed in your system and you want to upgrade to use additional processors, continue with this section.

Determining Processor Configuration

If your system has a Capacity Upgrade on Demand processor board feature, to determine the current configuration of installed processors and processors authorized for use, do the following:

1. Log in to the system as root user or as a user with system group privileges.
2. Type the following command At the command line:

```
chcod
```

Record the displayed information below:

```
Current MailAddress _____Reserved_____
```

```
Current CustInfo      Jane_Doe-CustomerNumber_9999999-Phone_(333)_444-5555
```

```
Current Model and System ID = IBM, xxxx-xxx_IBM,xxxxxxx
```

```
Current number of authorized proc(s) out of (xx_____) installed on system = (yy_____)
```

The values of (xx) and (yy) are the current values for the number of processors installed (xx) and the number of authorized processors (yy). Use this information about the current configuration to determine the number of processors to enable.

3. Continue with “Adding Processor Capacity” on page 48 to enable any additional processors that you need.

Adding Processor Capacity

To enable additional processors in the configuration of a system that has the Capacity Upgrade on Demand feature installed and running, do the following.

1. To increase the number of authorized processors, type the following at the command line:

```
chcod -r proc -n total_number_of_processors
```

The following is an example of the above command:

```
chcod -r proc -n 6
```

In the example above, the value of **-n 6** is equal to the total number of processors that you want to have authorized (*yy*) by entering this command. To upgrade your system to use more of the installed processors, increase the value of (*yy*) in increments of 2. In this case, 6 would represent 4 base processors plus 2 additional Capacity Upgrade on Demand processors.

When the system performs the command to enable additional processors, information about the new system configuration is added to the error log and sent through the Electronic Service Agent to the service support center.

2. Shut down and reboot the system to enable the additional processors, as follows:

```
shutdown -Fr
```

3. Log in to the system as root user or as a user with system group privileges.
4. Type the following at the command line:

```
chcod
```

The following information displays:

```
Current MailAddress _____Reserved_____
```

```
Current CustInfo      Jane_Doe-CustomerNumber_9999999-Phone_(333)_444-5555
```

```
Current Model and System ID = IBM, xxxx-xxx_IBM,xxxxxxx
```

```
Current number of authorized proc(s) out of (xx____) installed on system = (yy____)
```

The values of (*yy*) should match the value you entered for the *total_number_of_processors* in step 1.

For details about the flag variables entered in the **chcod** command, see Appendix E, “Using the chcod Command” on page 69.

Chapter 4. Verifying the Hardware Operation

The system verification procedure checks the system for correct hardware operation. If you have a problem with your system in the future, use this procedure to test the system hardware to help you determine if you have a hardware problem. Run the system verification procedure as described in the following steps.

Step 1. 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.

Step 2. Loading the Diagnostics

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

1. Stop all programs including the AIX operating system (get help if needed).
2. Remove all tapes, diskettes, and CD-ROM discs.
3. Turn off the system unit power.
4. Turn on the system unit power.
5. After the **keyboard** POST indicator displays on the firmware console and before the last POST indicator (**speaker**) displays, press the numeric 6 key on either the directly attached keyboard or the ASCII terminal to indicate that a service mode boot should be initiated using the customized service mode boot list.
6. Enter any requested password.

Note: If you are unable to load the diagnostics to the point when the DIAGNOSTIC OPERATING INSTRUCTIONS display, call your support center for assistance.

Step 3. Running System Verification

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

1. Press Enter.
2. To do a general checkout with minimal operator action, select the **Diagnostic Routines** option on the Function Selection menu.

To do a more complete checkout including the use of wrap plugs, select the **Advanced Diagnostics** option on the Function Selection menu. The advanced diagnostics are primarily for the service representative; the advanced diagnostics may instruct you to install wrap plugs to better isolate a problem.

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 “Step 4. Performing Additional System Verification”. To exit diagnostics, go to “Step 5. Stopping the Diagnostics” on page 51.

Step 4. 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 “Step 5. Stopping the Diagnostics” on page 51.

Step 5. 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 ASCII terminal to run the diagnostics, change the settings back to normal.
3. This completes the system verification. If you received an error code, record the code and report it to the service organization.

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

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

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

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

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

Radio Protection for Germany

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

Der Aussteller der Konformitätserklärung ist die IBM Germany.

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

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

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

Hinweis

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

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 refer to the following web site:
<http://www.ibm.com/ibm/environment/products/prp.phtml>

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries, contact your local waste disposal facility.

In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and other battery packs from IBM Equipment. For information on proper disposal of these batteries, please contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

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).

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.

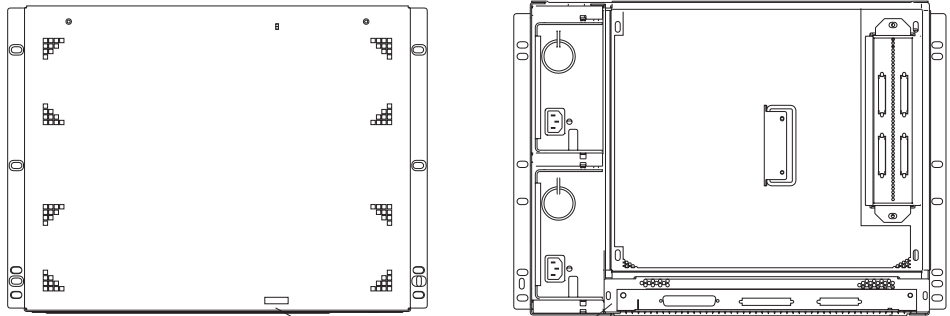
Appendix D. System Records

Record the Identification Numbers

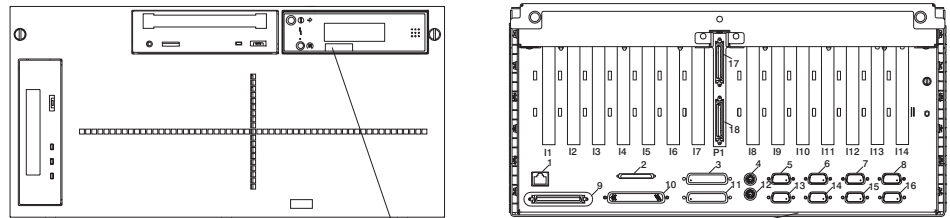
Record and retain the following information.

Product Name:	_____
CPU Type/Speed:	_____
Serial Number:	_____ _____

The identification numbers for the system are located on the front cover and on the rear of the system, as shown in the following figures:



CEC Serial Number



I/O Drawer Serial Number

Device Records

Use the following tables to keep a record of the options installed in or attached to your system. This information can be helpful when you install additional options in your system or if you ever need to have your system serviced.

Memory Riser Card 1

D	128MB() 256MB() 512MB() 1GB()	D	128MB() 256MB() 512MB() 1GB()
C	128MB() 256MB() 512MB() 1GB()	C	128MB() 256MB() 512MB() 1GB()
B	128MB() 256MB() 512MB() 1GB()	B	128MB() 256MB() 512MB() 1GB()
A	128MB() 256MB() 512MB() 1GB()	A	128MB() 256MB() 512MB() 1GB()
D	128MB() 256MB() 512MB() 1GB()	D	128MB() 256MB() 512MB() 1GB()
C	128MB() 256MB() 512MB() 1GB()	C	128MB() 256MB() 512MB() 1GB()
B	128MB() 256MB() 512MB() 1GB()	B	128MB() 256MB() 512MB() 1GB()
A	128MB() 256MB() 512MB() 1GB()	A	128MB() 256MB() 512MB() 1GB()
D	128MB() 256MB() 512MB() 1GB()	D	128MB() 256MB() 512MB() 1GB()
C	128MB() 256MB() 512MB() 1GB()	C	128MB() 256MB() 512MB() 1GB()
B	128MB() 256MB() 512MB() 1GB()	B	128MB() 256MB() 512MB() 1GB()
A	128MB() 256MB() 512MB() 1GB()	A	128MB() 256MB() 512MB() 1GB()
D	128MB() 256MB() 512MB() 1GB()	D	128MB() 256MB() 512MB() 1GB()
C	128MB() 256MB() 512MB() 1GB()	C	128MB() 256MB() 512MB() 1GB()
B	128MB() 256MB() 512MB() 1GB()	B	128MB() 256MB() 512MB() 1GB()
A	128MB() 256MB() 512MB() 1GB()	A	128MB() 256MB() 512MB() 1GB()
D	128MB() 256MB() 512MB() 1GB()	D	128MB() 256MB() 512MB() 1GB()
C	128MB() 256MB() 512MB() 1GB()	C	128MB() 256MB() 512MB() 1GB()
B	128MB() 256MB() 512MB() 1GB()	B	128MB() 256MB() 512MB() 1GB()
A	128MB() 256MB() 512MB() 1GB()	A	128MB() 256MB() 512MB() 1GB()

Memory Riser Card 2

D	128MB() 256MB() 512MB() 1GB()	D	128MB() 256MB() 512MB() 1GB()
C	128MB() 256MB() 512MB() 1GB()	C	128MB() 256MB() 512MB() 1GB()
B	128MB() 256MB() 512MB() 1GB()	B	128MB() 256MB() 512MB() 1GB()
A	128MB() 256MB() 512MB() 1GB()	A	128MB() 256MB() 512MB() 1GB()
D	128MB() 256MB() 512MB() 1GB()	D	128MB() 256MB() 512MB() 1GB()
C	128MB() 256MB() 512MB() 1GB()	C	128MB() 256MB() 512MB() 1GB()
B	128MB() 256MB() 512MB() 1GB()	B	128MB() 256MB() 512MB() 1GB()
A	128MB() 256MB() 512MB() 1GB()	A	128MB() 256MB() 512MB() 1GB()
D	128MB() 256MB() 512MB() 1GB()	D	128MB() 256MB() 512MB() 1GB()
C	128MB() 256MB() 512MB() 1GB()	C	128MB() 256MB() 512MB() 1GB()
B	128MB() 256MB() 512MB() 1GB()	B	128MB() 256MB() 512MB() 1GB()
A	128MB() 256MB() 512MB() 1GB()	A	128MB() 256MB() 512MB() 1GB()
D	128MB() 256MB() 512MB() 1GB()	D	128MB() 256MB() 512MB() 1GB()
C	128MB() 256MB() 512MB() 1GB()	C	128MB() 256MB() 512MB() 1GB()
B	128MB() 256MB() 512MB() 1GB()	B	128MB() 256MB() 512MB() 1GB()
A	128MB() 256MB() 512MB() 1GB()	A	128MB() 256MB() 512MB() 1GB()
D	128MB() 256MB() 512MB() 1GB()	D	128MB() 256MB() 512MB() 1GB()
C	128MB() 256MB() 512MB() 1GB()	C	128MB() 256MB() 512MB() 1GB()
B	128MB() 256MB() 512MB() 1GB()	B	128MB() 256MB() 512MB() 1GB()
A	128MB() 256MB() 512MB() 1GB()	A	128MB() 256MB() 512MB() 1GB()

Primary I/O Drawer Records

Location	Option Description
Mouse Connector	<u>IBM Mouse</u> <input type="checkbox"/> Other: _____
Keyboard Connector	<u>Space Saving</u> <input type="checkbox"/> <u>Enhanced</u> <input type="checkbox"/> Other: _____
Ethernet Connector	_____
SCSI Connector	_____
Expansion Slot 1	_____
Expansion Slot 2	_____
Expansion Slot 3	_____
Expansion Slot 4	_____
Expansion Slot 5	_____
Expansion Slot 6	_____
Expansion Slot 7	_____
Expansion Slot 8	_____
Expansion Slot 9	_____
Expansion Slot 10	_____
Expansion Slot 11	_____
Expansion Slot 12	_____
Expansion Slot 13	_____

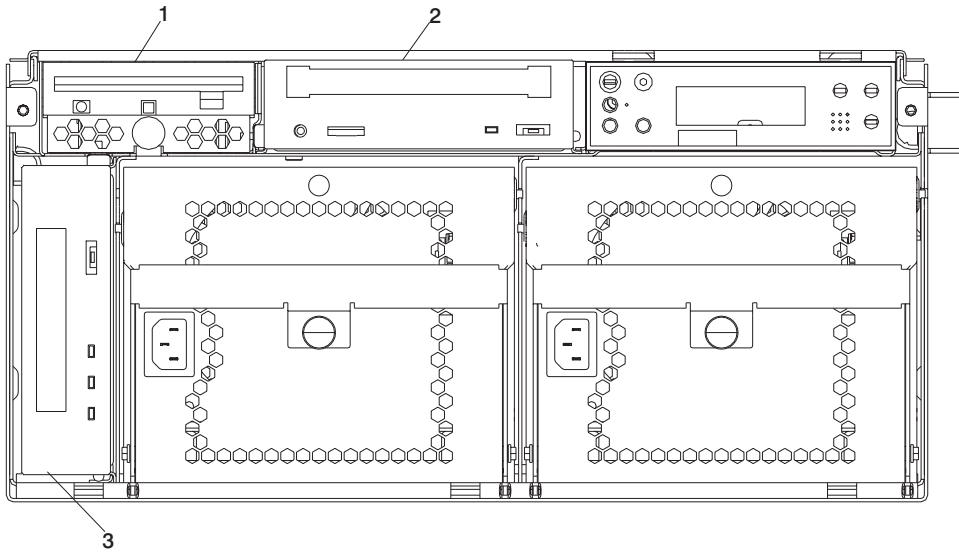
Location	Option Description
Expansion Slot 14	_____
Parallel Port	_____
Serial Port 1	_____
Serial Port 2	_____
Serial Port 3	_____
Serial Port 4	_____

Secondary I/O Drawer Records

Location	Option Description
SCSI Connector	_____
Expansion Slot 1	_____
Expansion Slot 2	_____
Expansion Slot 3	_____
Expansion Slot 4	_____
Expansion Slot 5	_____
Expansion Slot 6	_____
Expansion Slot 7	_____

Location	Option Description
Expansion Slot 8	_____
Expansion Slot 9	_____
Expansion Slot 10	_____
Expansion Slot 11	_____
Expansion Slot 12	_____
Expansion Slot 13	_____
Expansion Slot 14	_____

Refer to the following diagram of the bays for the system when completing the following table.



- 1 Bay A1 - Diskette
- 2 Bay A2 - CD-ROM
- 3 Bay B1 - Optional Media

Notes:

1. If you attach a drive or other device to an adapter, record the expansion-slot number for that adapter in the Adapter field of the following table.
2. The SCSI bus IDs in bays A1, B1, and B2 are the recommended values. Field installations may not comply with these recommendations.

Adapter	Location	SCSI ID	Drive Description
Integrated	Bay A1	Non-SCSI	<u>Diskette Drive</u>
Integrated	Bay A2	1	<u>CD-ROM Drive</u>
Integrated	Bay B1	0	<u>Optional Media</u>

Appendix E. Using the `chcod` Command

Purpose

Manages the Capacity Upgrade on Demand feature.

Syntax

```
chcod [-r ResourceType -n NbrResource] [-c CustomerInfo] [-h]
```

Description

The **chcod** command manages the Capacity Upgrade on Demand feature, which allows configuration of more *ResourceType*, in this instance processors, on the system than were initially configured. The additional resources may be enabled if they are available, and if the system supports Capacity Upgrade on Demand for the specified *ResourceType*. Only one *ResourceType* can be managed at a time. The change in the number of *ResourceType* takes effect after the next system boot.

Capacity Upgrade on Demand management also includes displaying the current number of *ResourceType* that have Capacity Upgrade on Demand support, monitoring the number of *ResourceType* on the system, and notifying appropriately. Notification occurs when *NbrResources* changes and also on a periodic basis. Notification (in the form of error logging) is sent through Electronic Service Agent to the service support center. The *CustomerInfo* text is included in the error log.

Flags

-c *CustomerInfo*

Specifies the text string to include in the error log. *CustomerInfo* cannot be more than 255 characters in length. Blank spaces cannot be included in the string. After *CustomerInfo* has been specified, subsequent uses of the **chcod** command do not have to specify the **-c** flag, but you do have the option of changing it. *CustomerInfo* can consist of alphanumeric characters and any of "." (decimal point), "," (comma), "-" (hyphen), "(" (open parenthesis), or ")" (closed parenthesis). This flag is optional.

-h Displays the usage message. This flag is optional.

-n *NbrResources*

Specifies the number of *ResourceType* to be authorized on the system. The value for *NbrResources* should be entered in increments of 2. The number that is entered represents the total number of processors for the system. If you are adding the first additional processor board, the number should be 6, 8, 10, or 12. Each time a processor board is added, the total number of desired processors is entered. If the number is 0, Capacity on Demand will be disabled for the specified *ResourceType*. This flag is optional. If **-n** is specified, then **-r** must also be specified.

-r *ResourceType*

Specifies the *ResourceType* (proc for processors) to be enabled and monitored on the system. The system must support Capacity Upgrade on Demand for *ResourceType*. If **-r** is specified, then **-n** must also be specified.

The default for the **chcod** command (with no flags) displays the current value of *CustomerInfo*, a reserved field named *MailAddr*, the system's model name and serial number, and the current values for any *ResourceType*.

Appendix F. General Attributes Required When Using a TTY Terminal

The following general attributes are the default settings for the diagnostic programs. Be sure your terminal is set to these attributes.

Note: Set these attributes before the diagnostic programs are loaded.

General Setup Attributes	3151 /11/31/41 Settings	3151 /51/61 Settings	3161 /3164 Settings	Description
Machine mode	3151	3151 PC	3161 or 3164	The diagnostic programs are set to emulate use of the 3161 ASCII Display Terminal. If your terminal can emulate a 5085, 3161 or 3164 terminal, use these attribute settings. Otherwise, refer to your operator's manual, compare the attribute descriptions with those of your terminal, and set your attributes accordingly.
Generated Code Set		ASCII		
Screen	Normal	Normal		Uses the EIA-232 interface protocol.
Row and Column	24 x 80	24 x 80		Uses the EIA-232 interface protocol.
Scroll	Jump	Jump	Jump	When the last character on the bottom line is entered, the screen moves down one line.
Auto LF	Off	Off	Off	For the "On" setting, pressing the Return key moves the cursor to the first character position of the next line. For the "Off" setting, pressing the Return key moves the cursor to the first character position of the current line. The CR and LF characters are generated by the New line setting.
CRT saver	Off	Off	10	The "10" setting causes the display screen to go blank if there is no activity for 10 minutes. When the system unit sends data or a key is pressed, the screen contents display again.

General Setup Attributes	3151 /11/31/41 Settings	3151 /51/61 Settings	3161 /3164 Settings	Description
Line wrap	On	On	On	The cursor moves to the first character position of the next line in the page after it reaches the last character position of the current line in the page.
Forcing insert	Off	Off		
Tab	Field	Field	Field	The column tab stops are ignored, and the tab operation depends on the field attribute character positions.
Trace			All	Both inbound data (data to the system unit) and outbound data (data from the system unit) to and from the main port can be transferred to the auxiliary port without disturbing communications with the system unit when the Trace key is pressed.

Additional Communication Attributes

The following communication attributes are for the 3151, 3161, and 3164 terminals.

Communication Setup Attributes	3151/11 /31/41) Settings	3151 /51/61, Settings	3161 /3164 Settings	Description
Operating mode	Echo	Echo	Echo	Data entered from the keyboard on the terminal is sent to the system unit for translation and then sent back to the display screen. Sometimes called <i>conversational mode</i> .
Line speed	9600 bps	9600 bps	9600 bps	Uses the 9600 bps (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	No	No	No	Does not add a parity bit and is used together with the word length attribute to form the 8-bit data word (byte).
Stop bit	1	1	1	Places a bit after a data word (byte).

Communication Setup Attributes	3151/11 /31/41) Settings	3151 /51/61, Settings	3161 /3164 Settings	Description
Turnaround character	CR	CR	CR	Selects the carriage return (CR) character as the line turnaround character.
Interface	EIA-232	EIA-232	EIA-232	Uses the EIA-232 interface protocol.
Line control	IPRTS	IPRTS	IPRTS	Uses the 'permanent request to send' (IPRTS) signal to communicate with system unit.
Break signal (ms)	500	500	500	The terminal sends a break signal to the system unit within 500 ms after the Break key is pressed.
Send null suppress	On	On		Trailing null characters are not sent to the system unit.
Send null			On	Trailing null characters are sent to the system unit.
Response delay (ms)	100	100	100	The terminal waits for 100 ms for the system unit to respond.

Additional Keyboard Attributes

The following keyboard attributes are for the keyboard attached to the 3151, 3161, and 3164 terminals.

Keyboard Setup Attributes	3151/11 /31/41 Settings	3151 /51/61 Settings	3161 /3164 Settings	Description
Enter	Return	Return	Return	The Enter key functions as the Return key.
Return	New line	New line	New line	The cursor moves to the next line when the Return key is pressed.
New line	CR	CR	CR	The Return key generates the carriage return (CR) and the line feed (LF) characters. The line turnaround occurs after the CR and LF characters are generated.
Send	Page	Page	Page	The contents of the current page are sent to the system unit when the Send key is pressed.
Insert character	Space	Space	Space	A blank character is inserted when the Insert key is pressed.

Additional Printer Attributes

The following printer attributes are for a printer attached to the 3151, 3161, and 3164 terminals.

Printer Setup Attributes	3151/11 /31/41 Settings	3151 /51/61 Settings	3161 /3164 Settings	Description
Line speed	9600	9600	9600	Uses 19200 or 9600 bps (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	Even	Even	No	
Stop bit	1	1	1	Places a bit after a data word (byte).
Characters	ALL	ALL		
Line end			CR-LF	
Print			View port	
Print EOL			Off	
Print null			Off	

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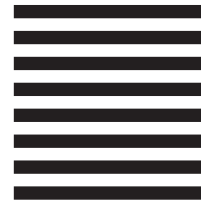
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