

Bull ESCALA EPC2400 & EPC2450

Installation Guide

ORDER REFERENCE
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Bull ESCALA EPC2400 & EPC2450

Installation Guide

Hardware

October 2000

BULL CEDOC
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FRANCE

ORDER REFERENCE
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Year 2000

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Communication Statements

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

Federal Communications Commission (FCC) Statement

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

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

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

European Union (EU) Statement

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

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

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

International Electrotechnical Commission (IEC) Statement

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

United Kingdom Telecommunications Safety Requirements

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

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

Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe A respecte toutes les exigences du 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

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

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

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

Electromagnetic Interference (EMI) Statement – Taiwan

警告使用者:

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

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

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

Radio Protection for Germany

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

Der Aussteller der Konformitätserklärung ist die IBM Germany.

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

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

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

Hinweis

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

Safety Notices

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

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

Electrical Safety

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

DANGER

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

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

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

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

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

CAUTION:

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

DANGER

To prevent electrical shock hazard, disconnect the power cable 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

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



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

CAUTION:

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

Class 1 laser products are not considered to be hazardous. The optical drive contains internally a Class 3B gallium–arsenide laser that is nominally 30 milliwatts at 830 nanometers. The design incorporates a combination of enclosures, electronics, and redundant interlocks such that there is no exposure to laser radiation above a Class 1 level during normal operation, user maintenance, or servicing conditions.

Data Integrity and Verification

These 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 our support websites for updated information and fixes applicable to the system and related software.

Environmental Notices

Product Recycling and Disposal

This unit contains materials such as circuit boards and connectors with lead that require special handling and disposal at end of life. Before this unit is disposed, these materials must be removed and recycled or discarded according to applicable regulations. This manual contains specific information on batteries where applicable. Contact your account representative for more information. This product may contain nickel–cadmium and /or lithium batteries. The battery(s) must be recycled or disposed of properly. Recycling facilities may not be available in your area.

For information on reuse, recycling or proper battery disposal procedures, contact your sales representative or local waste disposal facility.

Unit emissions

The unit–related emission value is equal to or lower than 70dB(A).

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

About this Book

This book provides information on how to set up and cable the system, install and remove options, and verify system options.

ISO 9000

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

Related Publications

The following publications are available:

The *ESCALA EPC2400 & EPC2450 User Guide*, order number 86 A1 18KX, contains information on how to set up and cable the system, install and remove options, and verify system operation.

The *ESCALA EPC2400 & EPC2450 Service Guide*, order number 86 A1 19KX, contains reference information, error codes, maintenance analysis procedures (MAPs), removal and replacement procedures, and a parts catalog.

The *ESCALA Site Preparation for Rack Systems*, order number 86 A1 30PX, provides a step-by-step approach to prepare a customer site for the installation of rack-mounted machines together with their subsystems and peripherals.

The *Diagnostics Information for Multiple Bus Systems*, order number 86 A1 26HX, contains information and procedures that are common to all systems.

The *Adapters Information Manual for Multiple Bus Systems*, order number 86 A1 27HX, contains cabling and technical information about some of the adapters and devices available for your system unit.

The *Disks and Tapes Configuration Information*, order number 86 A1 88GX, gives the jumper and switch settings to configure disks and tapes peripherals that use the Small Computer System Interface (SCSI).

The *High Availability Cluster Multi-Processing for AIX, Version 4.3: Enhanced Scalability Installation and Administration Guide Vol.1*, order number 86 A2 62KX, is needed for HACMP/ES planning information.

The *High Availability Cluster Multi-Processing for AIX, Version 4.3: Enhanced Scalability Installation and Administration Guide Vol.2*, order number 86 A2 89KX, is needed for HACMP/ES planning information.

The *High Availability Cluster Multi-Processing for AIX: Planning Guide*, order number 86 A2 55KX, is needed for HACMP/ES planning information.

Chapter 1. System Installation Procedure

Follow the procedures in this chapter to install the ESCALA EPC2400 and EPC2450. The estimated installation time for the system is:

Install Activity	3.5 Hours
Planning Activity	2.0 Hours
<hr/>	
Total Time	5.5 Hours

Step 1. Inventory

- *EPC2400 and EPC2450 User's Guide*, order number 86 A1 18KX
- *EPC2400 and EPC2450 Service Guide*, order number 86 A1 19KX
- *EPC2400 and EPC2450 Installation Guide*, order number 86 A1 10EF (this book)
- *Diagnostic Information for Multiple Bus Systems*, order number 86 A1 26HX
- *Adapters Information for Multiple Bus Systems*, order number 86 A1 27HX
- *System Unit Safety Information*, order number 86 X1 11WD
- 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 the Safety Notice During Installation

Observe the electrical safety instructions listed on page ix.

Step 3. Check the Customer Environment

- Verify with your Installation Planning Representative or the customer that any station–protector boxes used are correctly installed.
- 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 acceptable operating temperature range is 10°C (50°F) to 38°C (100°F), and the acceptable operating humidity range is 8% to 80%.
- Make sure the customer is aware that the front and rear service clearances around the system rack and I/O rack rack should be 36 inches (900mm). The service clearances are important for proper air circulation, weight distribution, and safety to both the service representative and the customer.

Refer to "Specifications" in the *Service Guide*, order number 86 A1 19KX, for more planning information.

Step 4. Check Customer Outlets

CAUTION:

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

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

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

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

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

3. Check the resistance from the ground pin of the receptacle to the receptacle case. Check resistance from the ground pin to building ground. The reading should be less than 1.0 ohm, which indicates the presence of a continuous grounding conductor.
4. If any of the three checks made in 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 corrections before continuing. Do not turn on the branch circuit CB until all the above steps are satisfactorily completed.

6. Have the customer turn on the branch circuit CB. Measure for appropriate voltages between phases. If no voltage is present on the receptacle case or grounded pin, the receptacle is safe to touch.
7. With an appropriate meter, verify that the voltage at the outlet is correct.
8. Verify that the grounding impedance is correct by using the ECOS 1020, 1023, B7106, or an appropriately approved ground impedance tester.

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

Step 5. Set Up the System Racks

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

CAUTION:

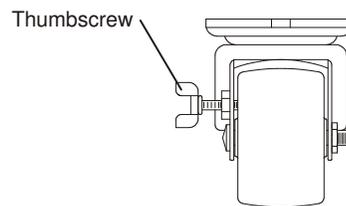
The stabilizer must be firmly attached to the bottom of the I/O rack to prevent the rack from turning over when the drawers are pulled out of the rack. Do not pull out or install any drawer or feature if the stabilizer is not attached to the rack.

Shipping material must be removed, and the system rack and I/O rack and place them where they are to be installed before installation can begin. If this has not been done, consult the customer and the marketing representative as necessary.

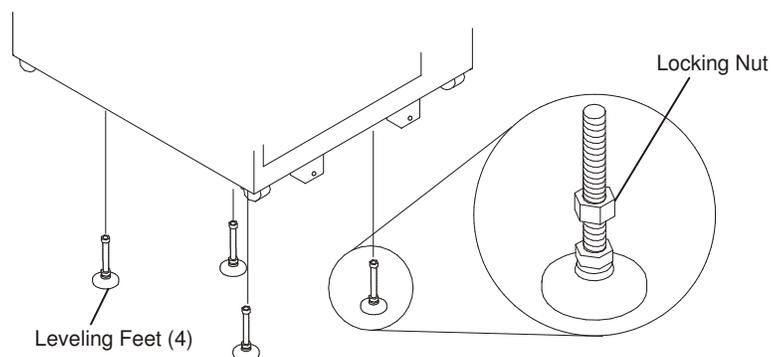
1. Remove all packing and tape, if present, from the system rack and the I/O rack.
2. Position the racks according to the customer floor plan.

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

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

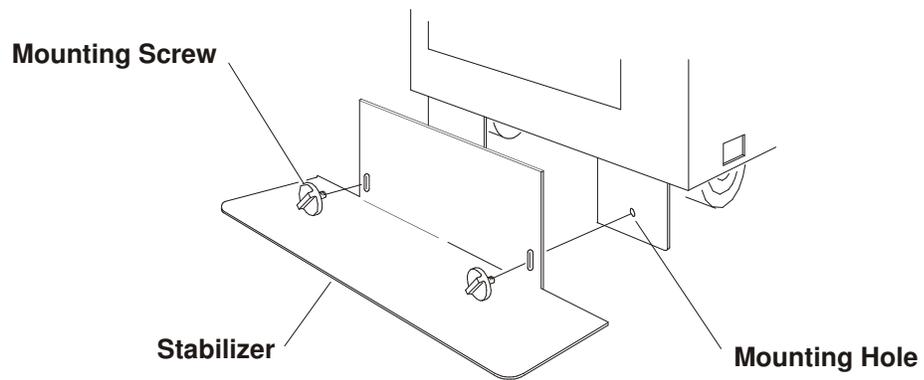


4. Adjust the leveling feet on the I/O rack by doing the following:
 - a. Loosen the locking nut by turning the locking nut counter-clockwise (away from the bottom of the rack).
 - b. Adjust the height of the leveling feet by rotating the leveling feet either upward or downward according to the level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

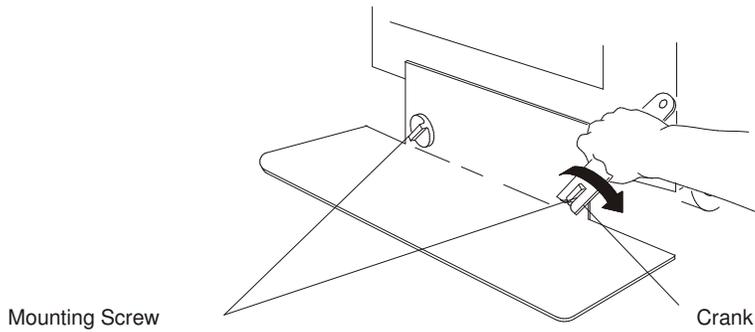


5. Align the slots in the stabilizer with the mounting holes in the bottom front of the I/O rack.
6. Ensure that the base of the stabilizer rests firmly on the floor.

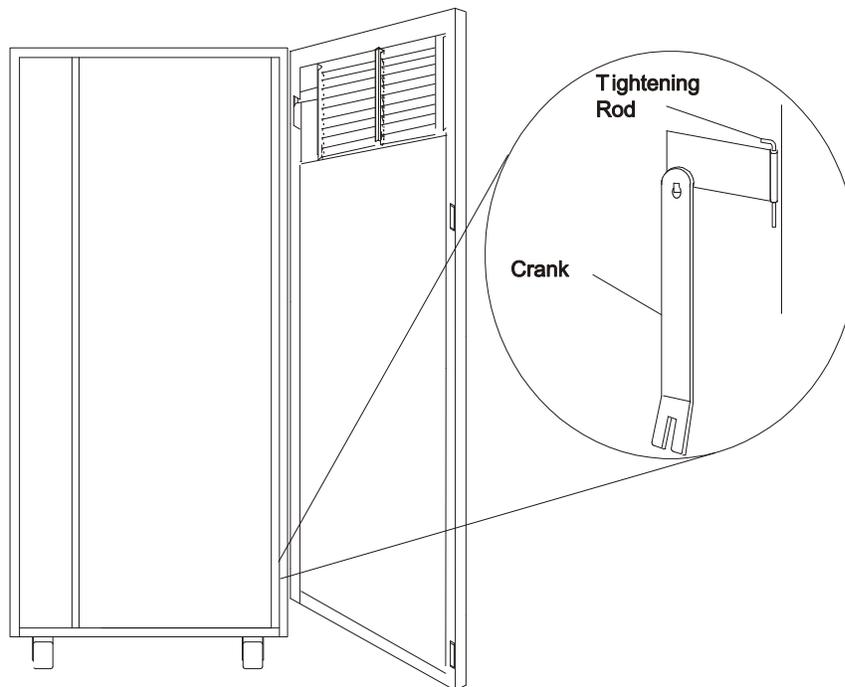
7. Install the two mounting screws and hand-tighten.



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

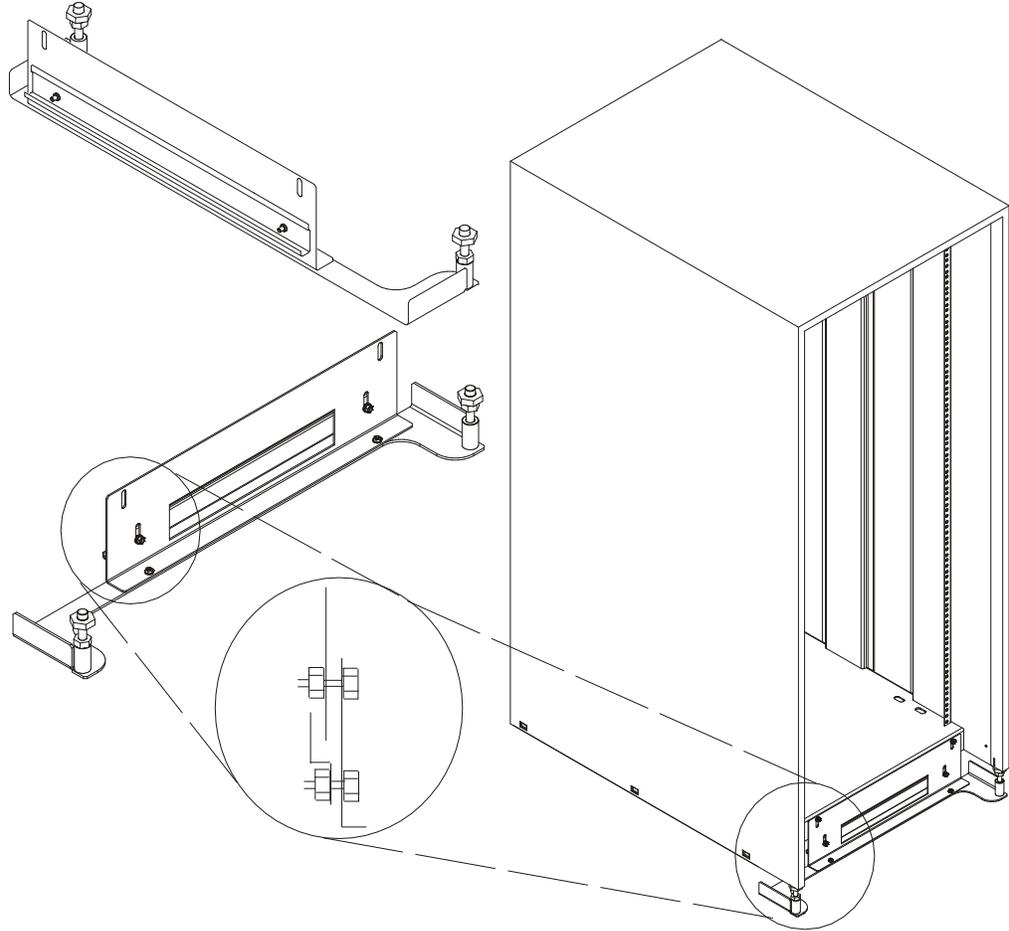


9. Hang the crank and tightening rod on the bracket near the bottom of the right wall inside the back of the rack.



10. Install the rear stabilizer on the I/O rack, as follows:

- a. Loosen the lower screws on the stabilizer assembly.
- b. Slide the stabilizer assembly onto the bottom of the rack.
- c. Install screws at the top of the stabilizer assembly and tighten.
- d. Tighten the lower screws on the stabilizer assembly.
- e. Adjust the bolts to the floor to ensure that the stabilizer is level and does not move.



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

Step 6A. Attach the I/O Rack to a Concrete Floor

Perform this step if the I/O rack is to be attached to a concrete floor or a concrete floor beneath a raised floor.

Notes:

1. Ensure that the primary I/O rack (the primary I/O rack contains the service processor) is positioned on the right side of the system rack when viewed from the front. A clearance of 10 cm (4 inches) between the racks is required to allow access to the I/O rack door.
2. If you are attaching the I/O rack:
 - To a concrete floor, continue with “Attaching the I/O Rack to a Concrete Floor” on page 1-6.
 - To a concrete floor below a raised floor, go to “Attaching the I/O Rack to a Concrete Floor Beneath a Raised Floor” on page 1-8.

If you are not attaching the I/O rack to a concrete floor, continue with Step 7. Attach the Front Electrical Outlet on page 1-15.

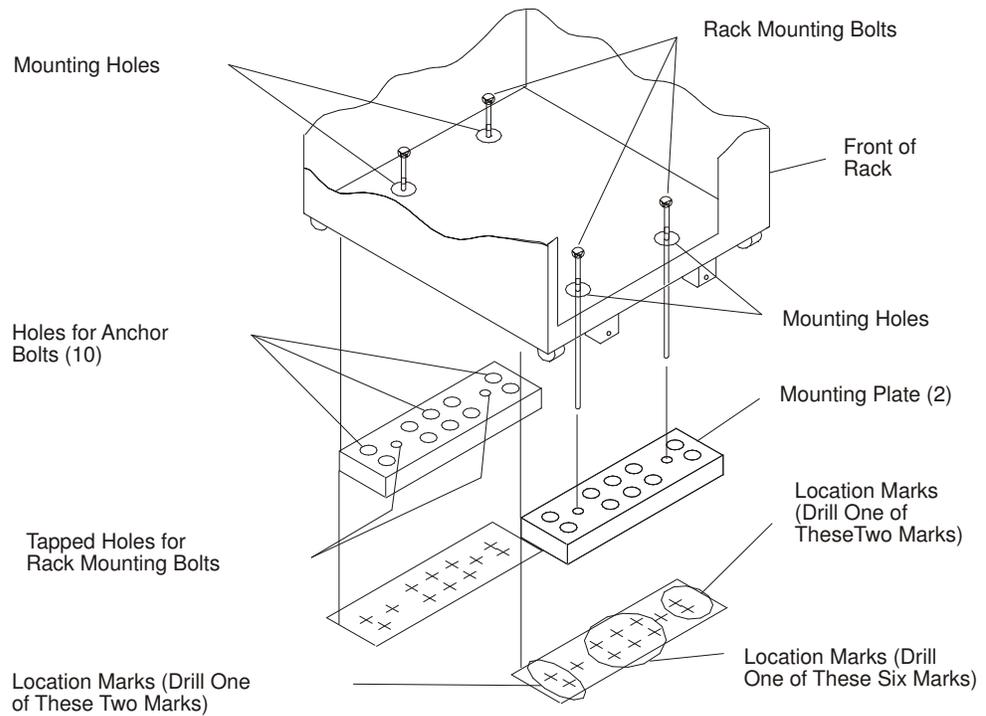
Attaching the I/O Rack to a Concrete Floor

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

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

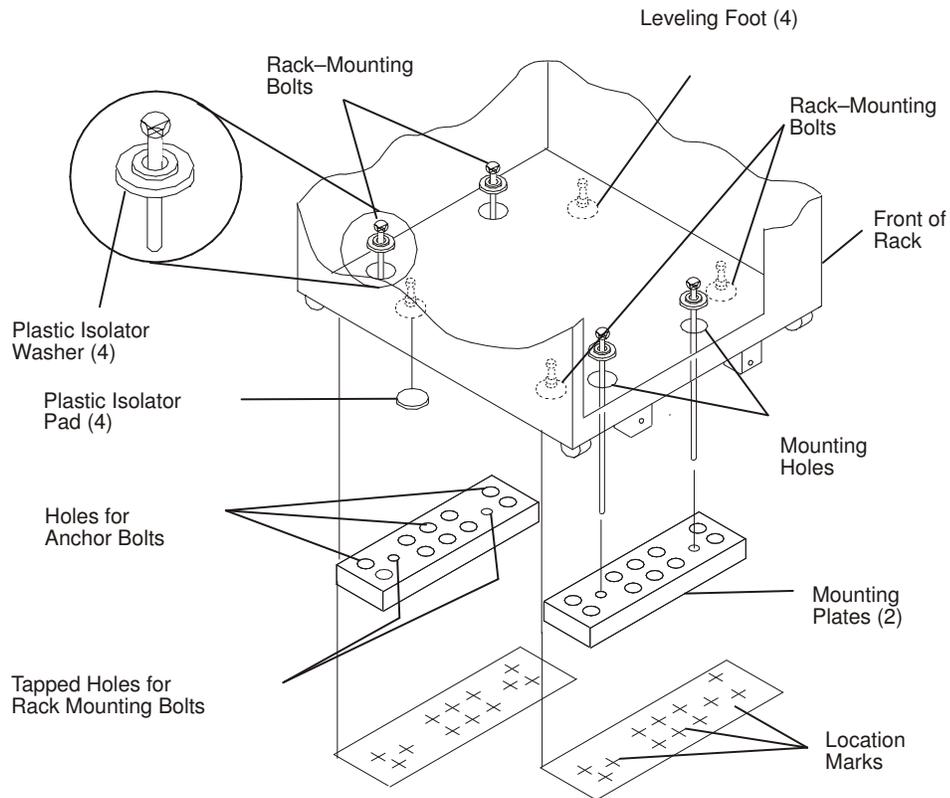
1. Mark the floor around the edge of each leveling foot.
2. Place the two mounting plates in the approximate mounting locations under the rack.
3. To align the rack over the mounting plates, do the following:
 - a. Place the four rack–mounting bolts through the mounting holes at the bottom of the rack.
 - b. Position the mounting plates under the four rack–mounting bolts so that the mounting bolts are centered directly over the tapped holes. Insert the rack–mounting bolts three or four rotations into the tapped holes.
4. Mark the floor around the edge of both mounting plates.
5. Remove the mounting bolts from the threaded holes.
6. To access the holes in the mounting plates, raise the four leveling feet, and then move the rack away from the mounting plates.
7. Mark the floor at the center of each hole in the mounting plates (including the tapped holes).
8. Remove the two mounting plates from the marked locations.
9. At the marked location of the tapped mounting holes, drill two holes approximately 1 inch to allow clearance for the ends of the two rack–mounting bolts. The ends of the rack–mounting bolts may protrude past the thickness of the mounting plate.

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



10. Drill one hole in each group of anchor bolt location marks as indicated on the marked floor.
 11. Using at least three anchor bolts for each mounting plate, mount the two mounting plates to the concrete floor.
 12. Using the location marks for leveling feet as a guide, reposition the rack over the mounting plates.
 13. Place the four rack-mounting bolts through the four metal washers, and then through the four plastic isolator washers. The flat side of the plastic isolator washer must be facing upward.
 14. To further align the rack over the mounting plates, do the following:
 - a. Place the four rack-mounting bolts (with the four plastic isolator washers) through the mounting holes in the bottom of the rack.
 - b. Align the four mounting bolts to the location of the four tapped holes in the two mounting plates.
 - c. Insert the rack-mounting bolts three to four rotations into the tapped holes.
- Note:** The bottom of the four leveling feet must be positioned over the four plastic isolator pads when the rack is leveled.
If you are installing an ac-powered rack, do not use the four plastic isolator pads
15. Place the four plastic isolator pads under the four leveling feet, and then level the rack using the four adjustable leveling feet.

16. Tighten the locking nuts on the leveling feet.



17. Tighten the four rack-mounting bolts into the two mounting plates.

18. If a drawer was removed from the bottom position of the rack, reinstall it.

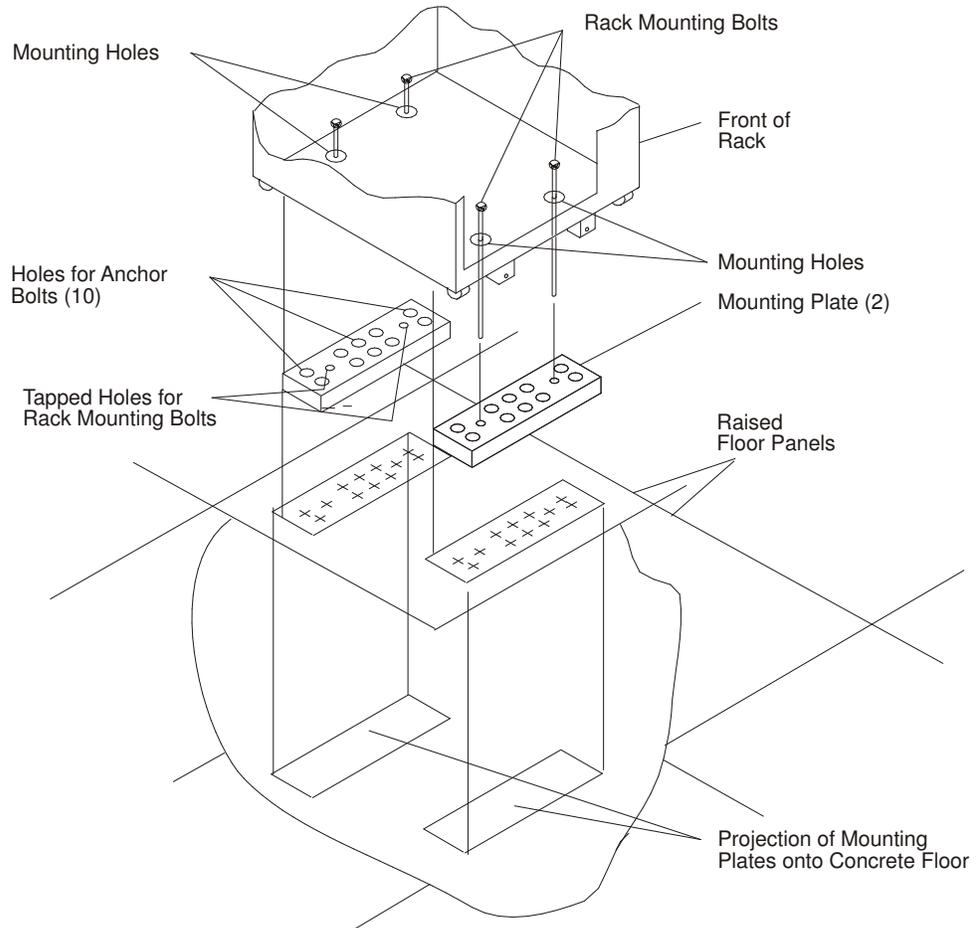
Attaching the I/O Rack to a Concrete Floor Beneath a Raised Floor

The customer is responsible for obtaining the services of a mechanical contractor to attach the rack-mounting plates on the raised floor with hardware that goes through the raised floor into the concrete floor below the raised floor. The mechanical contractor should determine that the raised floor support and the hardware used to attach the rack mounting plates is sufficient to meet the customer's requirements for the installation.

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

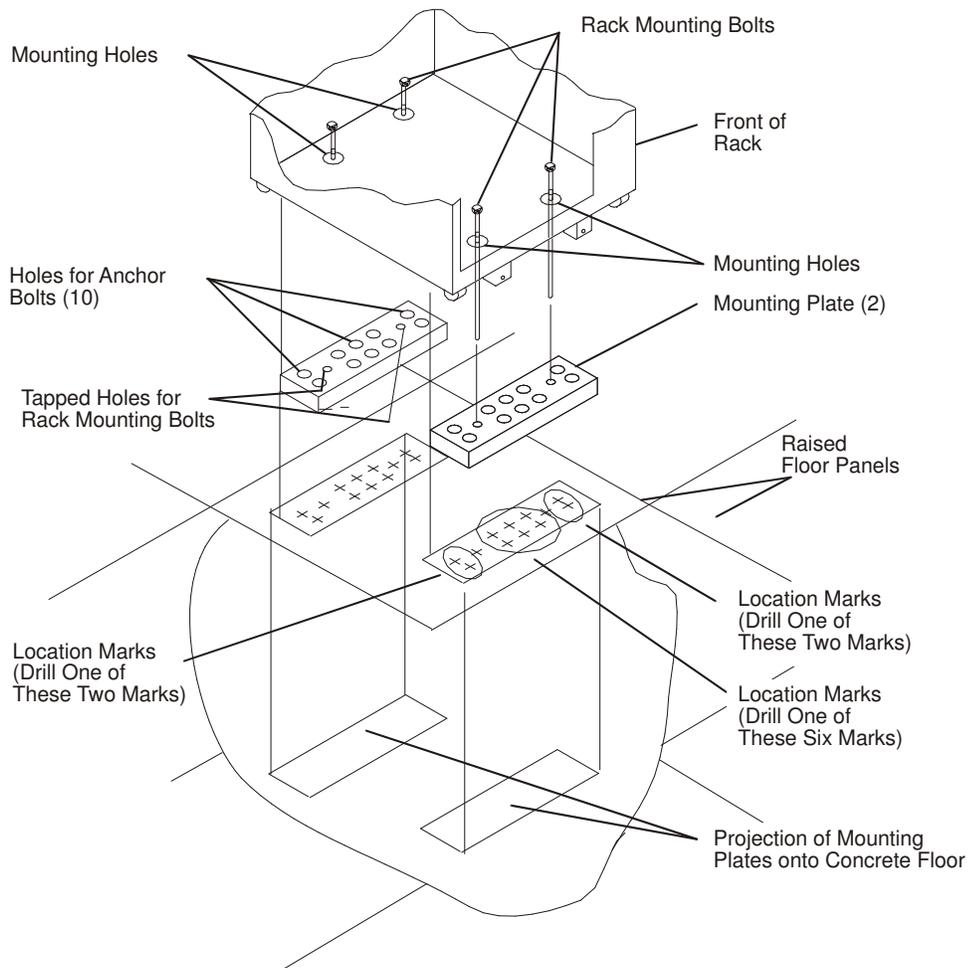
1. Mark the floor around the edge of each leveling foot.
2. Place the two mounting plates in the approximate mounting locations under the rack.
3. To align the rack over the mounting plates, do the following:
 - a. Place the four rack-mounting bolts through the mounting holes at the bottom of the rack.
 - b. Position the mounting plates under the four rack-mounting bolts so that the mounting bolts are centered directly over the tapped holes. Insert the rack-mounting bolts three or four rotations into the tapped holes.
4. Mark the raised-floor panel around the edge of both mounting plates.
5. Remove the mounting bolts from the threaded holes.
6. To access the holes in the mounting plates, raise the four leveling feet, and then move the rack away from the mounting plates.

7. Mark the raised-floor panel at the center of each hole in the mounting plates (including the tapped holes).
8. Remove the two mounting plates from the marked locations.



9. At the marked location of the tapped mounting holes, drill two holes approximately 1 inch to allow clearance for the ends of the two rack-mounting bolts. The ends of the rack-mounting bolts may protrude past the thickness of the mounting plate.
- Note:** A minimum of three anchor bolts for each mounting plate must be used to mount the plates to the raised-floor panel. For each mounting plate, select at least three usable holes, two that are on opposite sides and opposite ends of each other, and one hole at the center.
10. Drill one hole in each group of anchor bolt location marks as indicated on the marked raised floor panel.
 11. Ensure that the marks for the holes for the anchor bolts in the concrete floor align with the holes in the raised floor panel.

12. Drill the holes in the concrete floor for the anchor bolts.



13. Place the two mounting plates on the locations indicated on the marked raised-floor panel.

14. Using at least three anchor bolts for each mounting plate, mount the two mounting plates through the raised-floor panel to the concrete floor.

15. Using the location marks for leveling feet as a guide, reposition the rack over the mounting plates.

16. Place the four rack-mounting bolts through the four metal washers, and then through the four plastic isolator washers. The flat side of the plastic isolator washer must be facing upward.

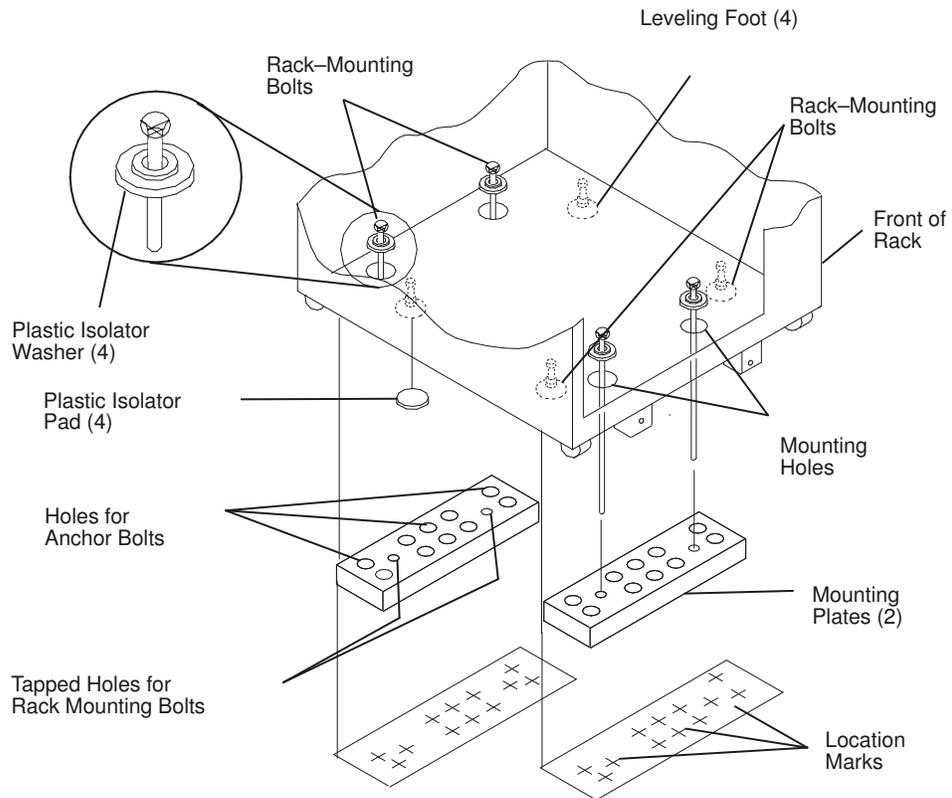
17. To further align the rack over the mounting plates, do the following:

- a. Place the four rack-mounting bolts (with the four plastic isolator washers) through the mounting holes in the bottom of the rack.
- b. Align the four mounting bolts to the location of the four tapped holes in the two mounting plates.
- c. Insert the rack-mounting bolts three to four rotations into the tapped holes.

Note: The bottoms of the four leveling feet must be positioned over the four plastic isolator pads when the rack is leveled. If you are installing an AC powered rack, do not use the four plastic isolator pads.

18. Place the four plastic isolator pads under the four leveling feet, and then level the rack using the four adjustable leveling feet.

19. Tighten the locking nuts on the leveling feet.



20. Tighten the four rack-mounting bolts into the two mounting plates.

21. If you are attaching an electrical outlet and mounting plate, skip to Step 7. Attach the Front Electrical Outlet on page 1-15 or Step 8. Attach the Rear Electrical Outlet on page 1-18 as appropriate, then return here.

22. If a drawer was removed from the bottom position of the rack, reinstall it.

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

Perform this step if the system rack is to be attached to a concrete floor or a concrete floor beneath a raised floor.

Notes:

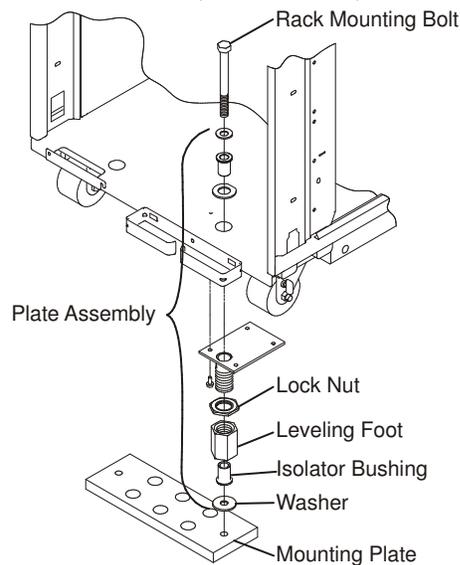
1. Ensure that the primary I/O rack (the primary I/O rack contains the service processor) is positioned on the right side of the system rack when viewed from the front. A clearance of 10 cm (4 inches) between the racks is required to allow access to the I/O rack door.
2. If you are attaching the system rack:
 - To a concrete floor, continue with “Attaching the System Rack to a Concrete Floor” on page 1-12.
 - To a concrete floor below a raised floor, go to “Attaching the System Rack to a Concrete Floor Beneath a Raised Floor” on page 1-13.

If you are not attaching the system rack to a concrete floor, continue with Step 7. Attach the Front Electrical Outlet on page 1-15.

Attaching the System Rack to a Concrete Floor

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

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



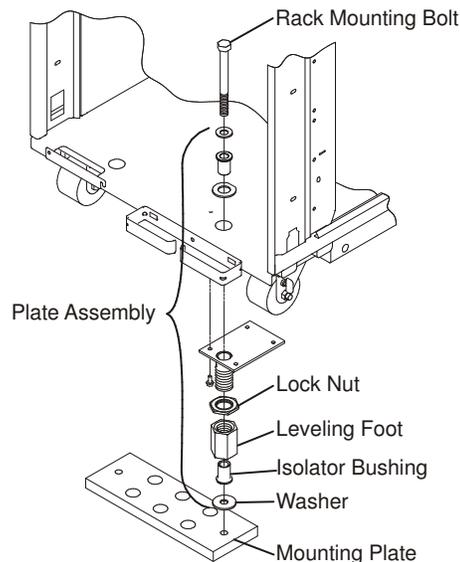
2. Place the mounting plates, front and rear, (note that they are different) in the approximate mounting position under the system rack.
 3. To align the system rack over the mounting plate, do the following:
 - a. Place the four rack–mounting bolts through the plate assembly holes at the bottom of the rack (install the bushings and washers to ensure bolt positioning).
 - b. Position the mounting plates under the four rack–mounting bolts so that the mounting bolts are centered directly over the tapped holes.
 - c. Insert the rack–mounting bolts three or four rotations into the tapped holes.
 4. Mark the floor around the edge of the mounting plates.
 5. Remove the mounting bolts from the threaded holes.
 6. Move the rack away from the mounting plates.
 7. Mark the floor at the center of each hole in the mounting plate (including tapped holes).
 8. Remove the mounting plates from the marked locations.
 9. At the marked location of the tapped mounting holes, drill two holes approximately 1 inch to allow clearance for the ends of the two rack–mounting bolts. The ends of the rack–mounting bolts may protrude past the thickness of the mounting plate.
- Note:** A minimum of three anchor bolts for each mounting plate must be used to mount the plates to the concrete floor. Because some of the drilled holes may be aligned with concrete reinforcement rods below the surface of the concrete floor, some of the drilled holes may not be usable. For each mounting plate, select at least three usable holes, two that are on opposite sides and opposite ends of each other, and one hole at the center.
10. Drill one hole in each group of anchor bolt location marks as indicated on the marked floor.
 11. Using at least three bolts for each mounting plate, mount the mounting plates to the concrete floor.
 12. Reposition the system rack over the mounting plates.

13. Place the four rack–mounting bolts through the plate assemblies with the D–washer positioned so that the straight side of the washer is facing inward toward the system rack.
14. Place the isolator bushing inside the leveling foot with a washer between the isolator bushing and the floor plate.
15. Insert the rack–mounting bolts three or four rotations into the tapped holes.
16. Turn the leveling foot of the plate assembly down until it contacts the mounting plate, and then level the rack using the four leveling feet.
17. Lock the leveling feet by tightening the lock nut.
18. Tighten the four rack–mounting bolts into the mounting plates.

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

The customer is responsible for obtaining the services of a mechanical contractor to attach the rack–mounting plates on the raised floor with hardware that goes through the raised floor into the concrete floor below the raised floor. The mechanical contractor should determine that the raised floor support and the hardware used to attach the rack mounting plates is sufficient to meet the customer’s requirements for the installation.

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



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

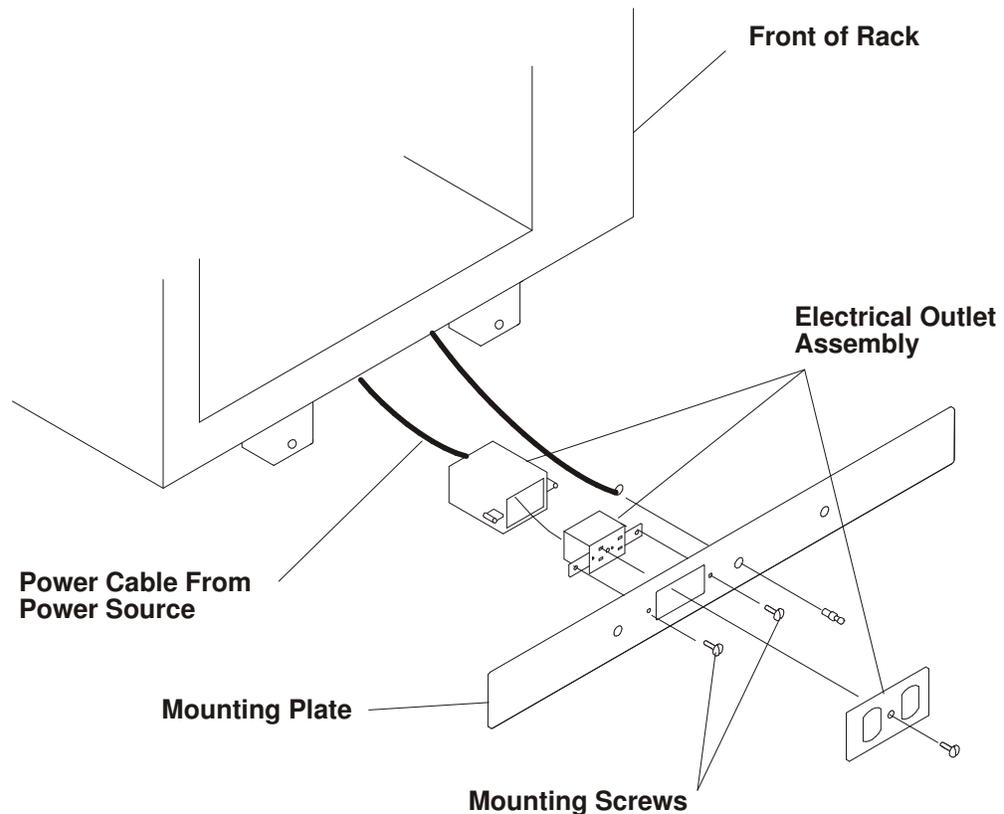
7. Mark the raised floor at the center of each hole in the mounting plates (including the tapped holes).
 8. Remove the two mounting plates from the marked locations.
 9. At the marked location of the tapped mounting holes, drill two holes approximately 1 inch to allow clearance for the ends of the two rack–mounting bolts. The ends of the rack–mounting bolts may protrude past the thickness of the mounting plate.
- Note:** A minimum of three anchor plates for each mounting plate must be used to mount the plates to the concrete floor. Because some of the drilled holes may be aligned with concrete reinforcement rods below the surface of the concrete floor, some of the drilled holes may not be usable. For each mounting plate, select at least three usable holes, two that are on opposite sides and opposite ends of each other, and one hole at the center.
10. Drill one hole in each group of anchor bolt location marks as indicated on the marked raised–floor panel.
 11. Project the holes now in the raised–floor panel down to the concrete floor below. Ensure that the marks for the holes for the anchor bolts in the concrete floor align with the holes in the raised floor panel.
 12. Drill the holes in the concrete floor for the anchor bolts.
 13. Place the mounting plates on the locations on the marked raised–floor panel.
 14. Using the three anchor bolts for each mounting plate, mount the two mounting plates through the raised–floor panel to the concrete floor.
 15. Reposition the system rack over the mounting plates.
 16. Place the four rack–mounting bolts through the plate assemblies with the D–washer positioned so that the straight side of the washer is facing inward toward the system rack.
 17. Place the isolator bushing inside the leveling foot with a washer between the isolator bushing and the floor plate.
 18. Insert the rack–mounting bolts three or four rotations into the tapped holes.
 19. Turn the leveling foot of the plate assembly down until it contacts the mounting plate, and then level the rack using the four leveling feet.
 20. Lock the leveling feet by tightening the lock nut.
 21. Tighten the 4 rack–mounting bolts into the mounting plates.

Step 7. Attach the Front Electrical Outlet

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

Notes:

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



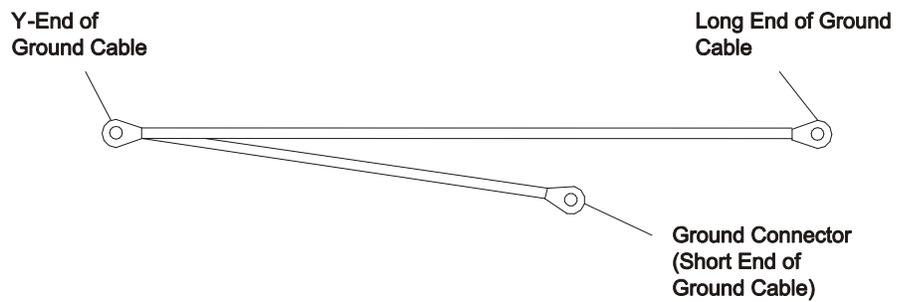
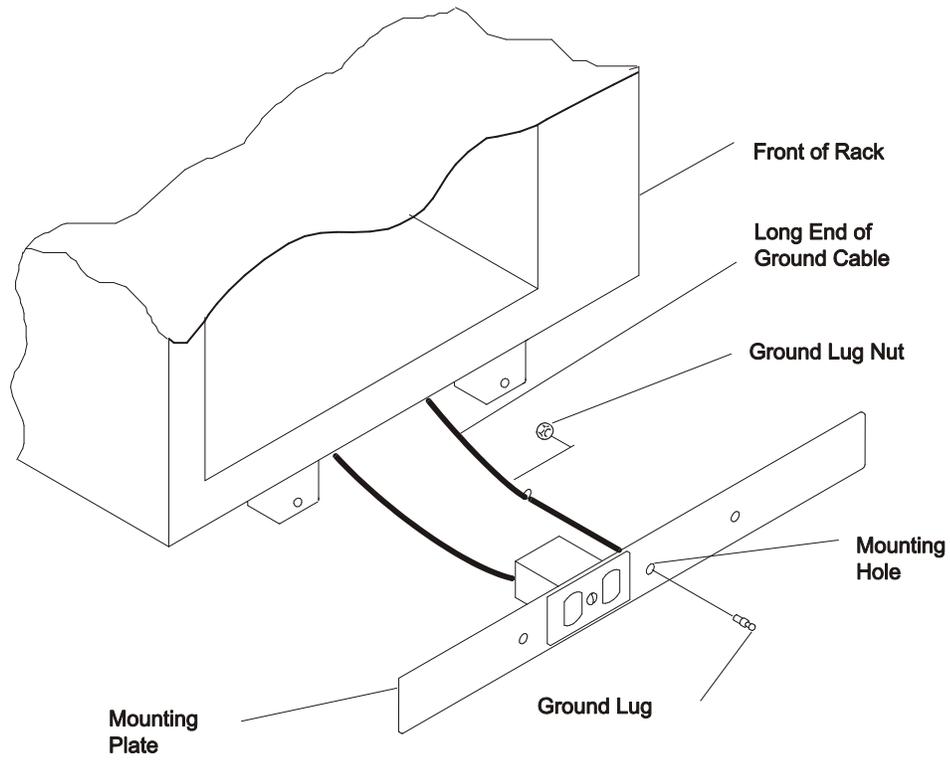
2. If the customer does not want to connect an electrical outlet to the front mounting plate, install the mounting plate without the electrical outlet.
3. The customer is responsible for providing and connecting the electrical outlet assembly.

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

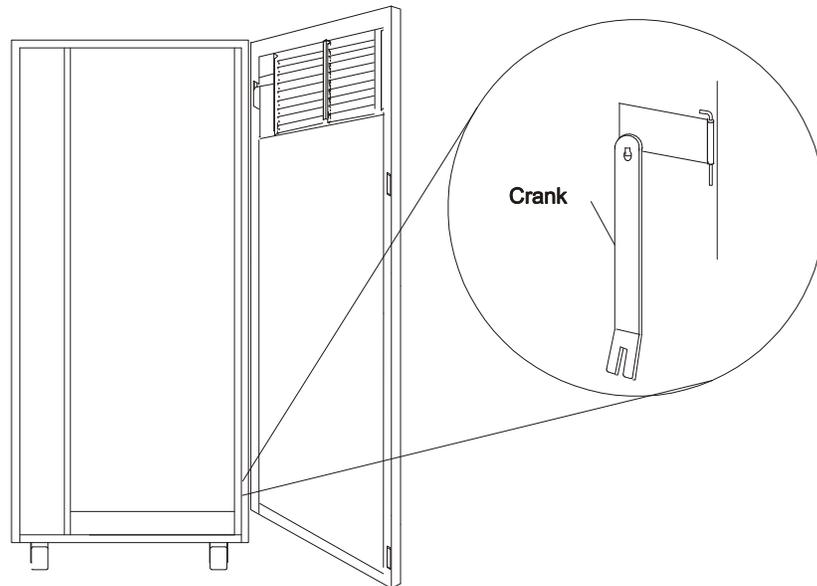
1. After the customer has connected the power cable from the customer power source to the electrical outlet assembly, mount the electrical outlet assembly to the mounting plate using the two mounting screws (provided by the customer).
2. Place the ground–cable lug through the mounting hole of the mounting plate.

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

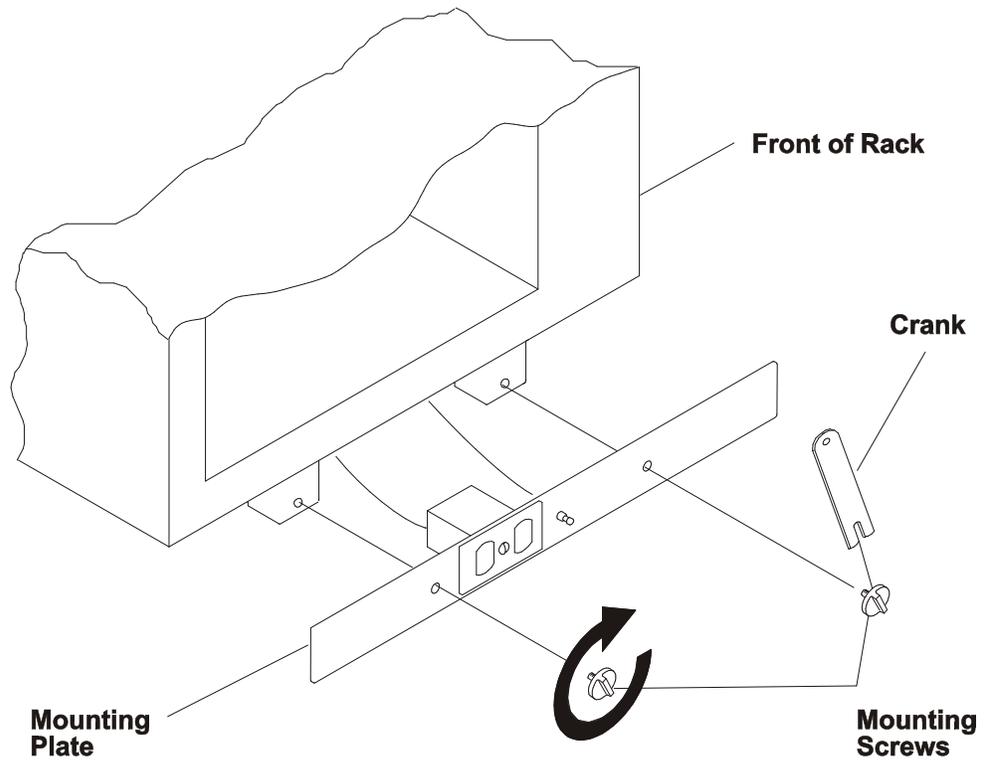
Note: The two remaining connections of the ground cable are done in Step 8. Attach the Rear Electrical Outlet on page 1-18.



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



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



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

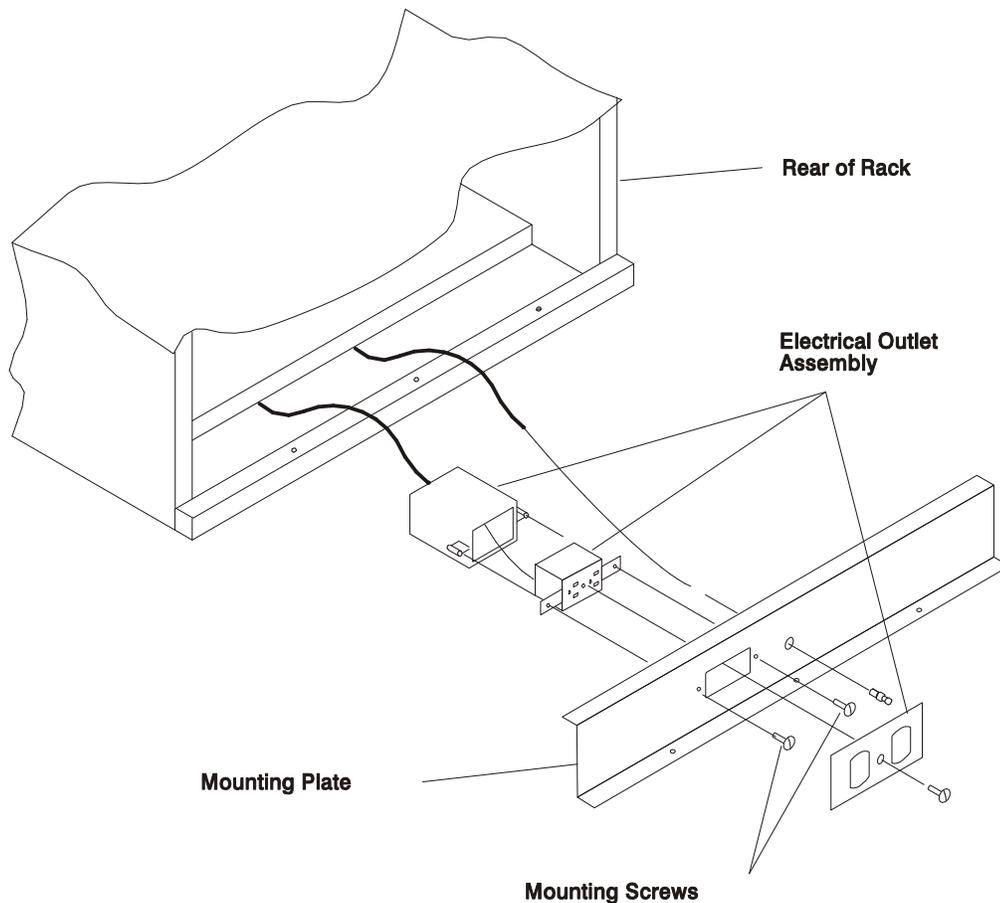
Step 8. Attach the Rear Electrical Outlet

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

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

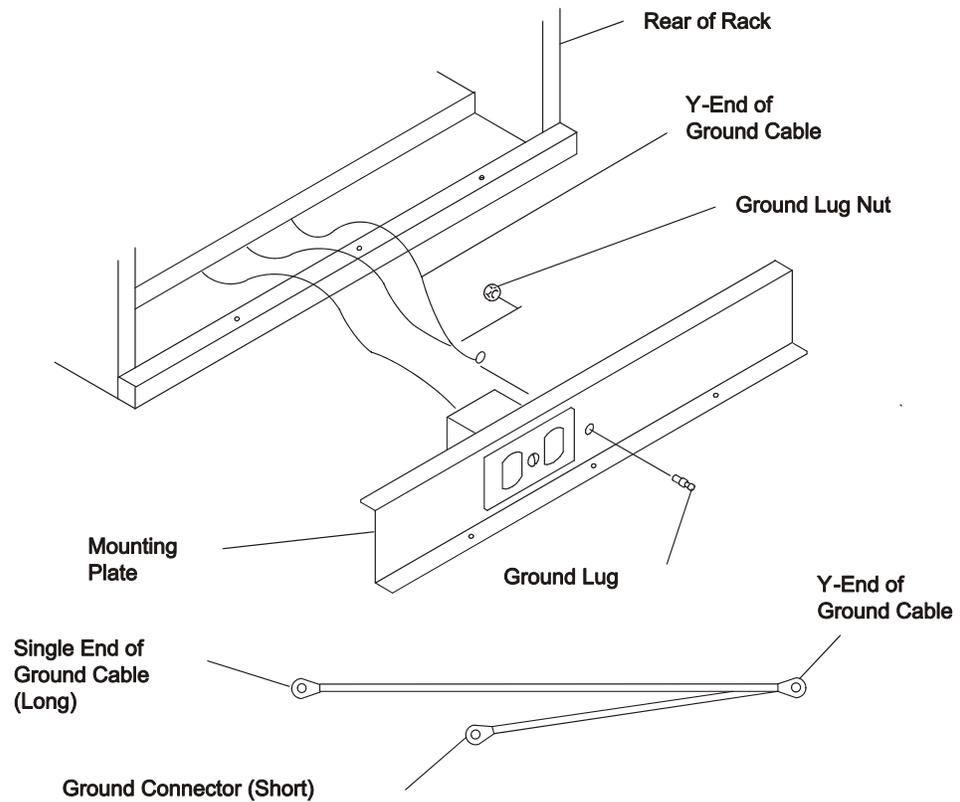
The customer is also responsible for providing and connecting the power cable from the customer power source to the rear electrical outlet.

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

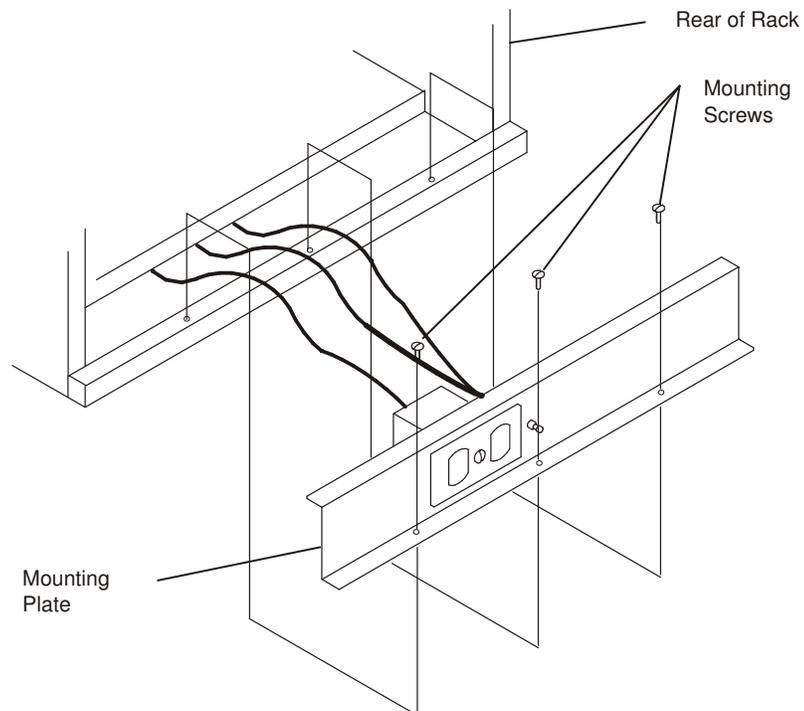


3. Place the ground cable lug through the mounting hole of the mounting plate.

4. Connect the short ground cable to the threaded side of the ground cable lug, and then install and tighten the ground lug nut.

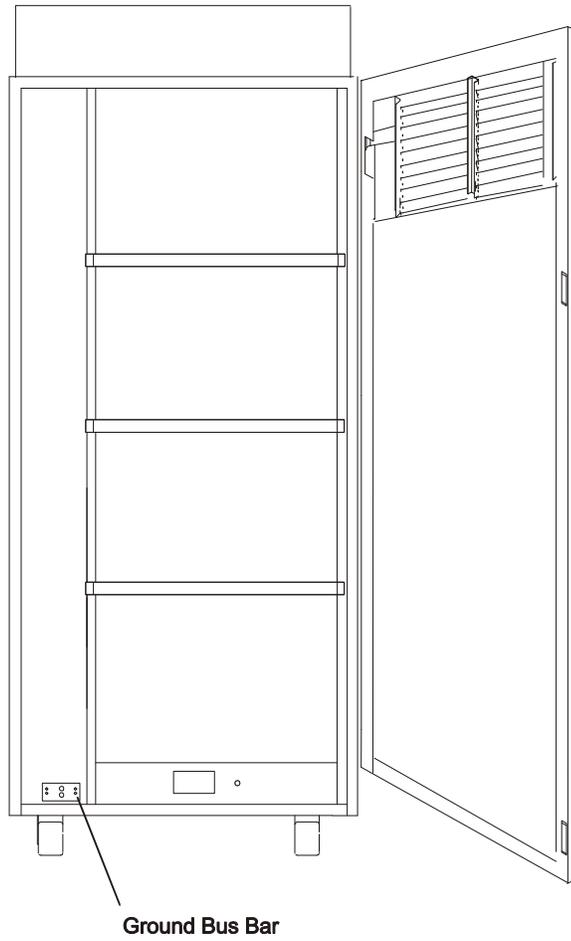


5. Attach the mounting plate to the rack by installing and tightening the three mounting screws.



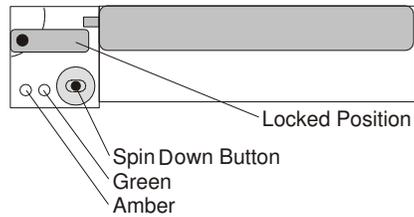
6. Connect the ground connector of the ground cable to the ground bus bar.
7. If a drawer was removed from the bottom position of the rack, reinstall it.

8. Close the rear door of the rack.

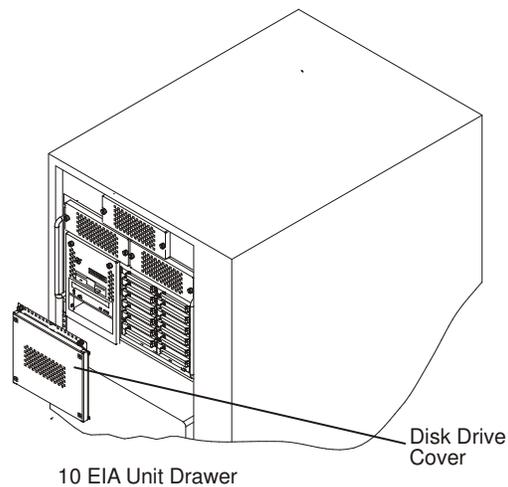


Step 9. Remove the Shipping Brackets and Install Covers

1. Remove any shipping materials from the system rack, I/O racks and from the front and rear of the I/O drawers.
2. Remove the disk drive cover from the front of each I/O drawer. Inspect the disk drives to ensure that the disk-drive carriers are all seated completely and that the carrier latch is in the horizontal locked position.

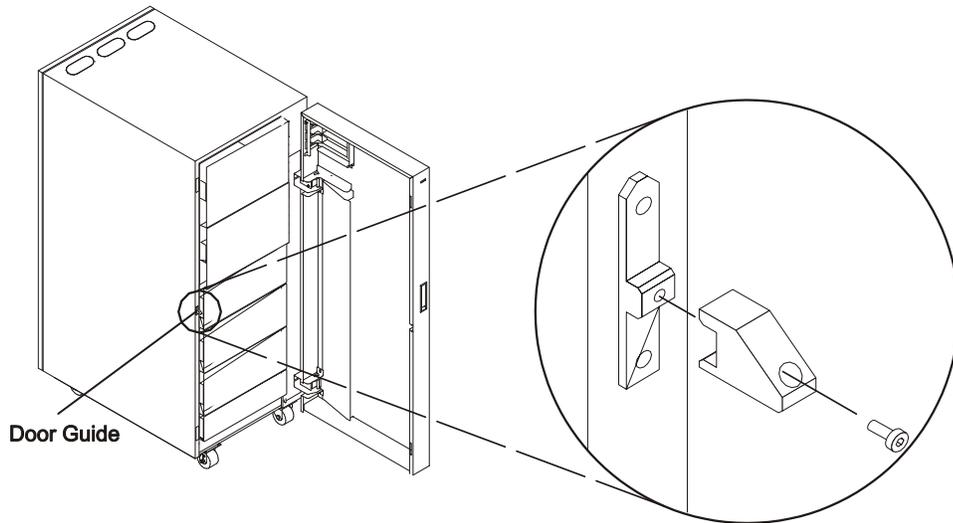


3. Install any covers and shields that you have removed, or that were shipped separately.



Step 10. Install the I/O Rack Door Guide

1. Locate the I/O rack door guide.
2. Position the door guide as shown.
3. Using a 3mm allen wrench, fasten the door guide to the I/O rack as shown.



Step 11. Connect the Operator Panel Cable and the JTAG Cable Between the Racks

Using the cables provided, connect the cables between the system rack and the primary I/O drawer. Refer to Appendix C, “Cabling the System Rack and I/O Rack” for connector locations for these cables.

Step 12. Connect RIO and SPCN Cables Between the Racks

Using the cables provided, connect the RIO and SPCN cables between the system rack and the I/O drawers. Refer to Appendix C, “Cabling the System Rack and I/O Rack” for valid cabling configurations.

Step 13. Set 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 I/O rack now.

Do the setup procedures in the documentation for each device being attached to the I/O rack; then return to Step 14. Update the Device Records.

Connect the ASCII terminal to serial port S1. Connect the keyboard, mouse, and graphics display (if available). Refer to “I/O Drawer Locations” on page C-9 for the locations of the connectors.

Step 14. Update the Device Records

External devices used with the systems are connected to connectors on the primary I/O drawer or to adapters that are installed inside any of the I/O drawers.

Update the "System Records" in Appendix A, System Records to reflect the configuration of the system adapters and devices that are installed.

Step 15. Attach External Devices

External devices used with the systems are connected to connectors on the primary I/O drawer or to adapters that are installed inside any of the I/O drawers. Refer to Appendix A, "System Records" for listings of installed adapters to determine where to attach external devices. Attach any external devices now.

Step 16. Connect the Power

1. Plug the drawer power cords into the power distribution bus (PDB) of the I/O rack.

Attention: If the system has the dual line cord feature, be sure that both power supplies have power cords plugged in.

2. Plug the power cords of the external devices into power outlets.
3. Plug the PDB power cord into the customer's electrical outlet.
4. Plug the system rack power cord into the customer's electrical outlet.

Step 17. Power On and Check Out the System

1. If your system is a high-availability system, make sure all power control interface cables (if installed) are disconnected. High-availability systems usually require drawers to remain powered on when the system rack is powered off. If the power control to certain drawers in your system is different from the factory settings, use your planning information and any documentation supplied for the power control system to understand power control.
2. Press the white power button on the operator panel. The operator panel is located inside the front door of the system rack.
3. Go to the chapter titled "Installation Checkout Procedure" in the *Diagnostic Information for Multiple Bus Systems* manual, order number 86 A1 26HX, and follow the procedures there to check out the system.

Checklist If Problems Occur

If you have a problem when your try to turn on the system power, check to ensure:

- The EPO switch is on
- Rack power cables are installed
- PDB circuit breakers CP1 – CP6 are set correctly (refer to "I/O Rack Rear Locations" on page C-8 for locations)
- Customer's supply voltage is correct.

If any failures occur, refer to "Maintenance Analysis Procedures (MAPs)" in the ESCALA EPC2400 and EPC2450 Service Guide, order number 86 A1 19KX.

If you have a problem when you try to IPL the system, do the following:

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

If any failures occur, refer to "Maintenance Analysis Procedures (MAPs)" in the ESCALA EPC2400 and EPC2450 Service Guide, order number 86 A1 19KX.

Step 18. Service Processor Setup and Test

Refer to "Service Processor Setup and Test" in the ESCALA EPC2400 and EPC2450 User's Guide, order number 86 A1 18KX, and perform the steps necessary to set up and test the service processor, then return here.

Note: If this system will be attached to an SP system, you only need to modify the "System Name" parameter. See "Privileged User Menus" in the ESCALA EPC2400 and EPC2450 Service Guide, order number 86 A1 19KX.

Step 20. Finish the Installation

1. Record the system identification numbers.

The system has important identification information that may be needed if service is required. Record this information in Appendix A, System Records.

2. The Capacity Upgrade on Demand feature may be installed.

If so, see "Capacity Upgrade on Demand Processor Enabling" in Capacity Upgrade on Demand Installing and Upgrading Processors, order number 86 A1 11EF, for information regarding installing and enabling this feature.

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

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

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

If any failures occur, refer to "Maintenance Analysis Procedures (MAPs)" in the ESCALA EPC2400 and EPC2450 Service Guide, order number 86 A1 19KX.

Chapter 2. Using the System Verification Procedure

The system verification procedure checks the system for correct hardware operation.

If you are analyzing a hardware problem, use “Hardware Problem Determination” in the *User’s Guide*, order number 86 A1 18KX.

Step 1. Considerations before Running This Procedure

Notes:

1. If this system unit is directly attached to another system unit or attached to a network, make sure that communications with the other system unit are stopped.
 2. This procedure requires use of all of the system resources. No other activity can be running on the system while you are doing this procedure.
- This procedure requires a display connected to the video port or an ASCII terminal attached to the S1 port.
 - Before starting this procedure, stop all programs and the operating system.
 - This procedure runs the online diagnostics in service mode or standalone diagnostics. If the online diagnostics are installed, they should be run. See the operator manual for your type of ASCII terminal to find the key sequences you need to respond to the diagnostics.
 - If you need more information about diagnostics, see the *ESCALA EPC2400 and EPC2450 User’s Guide*, order number 86 A1 18KX.
 - If a console display is not selected, the diagnostics stop. The instructions for selecting a console display are displayed on all of the graphic displays and any terminal attached to the S1 port. Follow the instructions to select a console display.

Go to step 2.

Step 2. Loading the Diagnostics

1. Stop all application programs running on the operating system.
2. Stop the operating system.
3. Turn the power off.
4. If you are loading the standalone diagnostics and running them from an ASCII terminal, do the following:
 - The attributes for the terminal must be set to match the defaults of the diagnostics.
 - If you need to change any settings, record the normal settings, and be sure the terminal attributes are set to work with the diagnostics. If needed, see “Running the Diagnostics from a TTY Terminal” in the *ESCALA EPC2400 and EPC2450 User’s Guide*, order number 86 A1 18KX.
 - Proceed to substep 5 when you finish checking the attributes.
5. Turn the power on.
 - a. When the `keyboard` indicator appears, press the 5 key on the keyboard to load the standalone diagnostics or press the 6 key to load the online diagnostics.
 - b. Enter any requested passwords.
 - c. Follow the instructions to select a console.

6. When the Diagnostic Operating Instructions display, go to Step 3. Running System Verification. If you are unable to load the diagnostics, go to "Problem Determination When Unable to Load Diagnostics" in the *ESCALA EPC2400 and EPC2450 User's Guide*, order number 86 A1 18KX.

Step 3. Running System Verification

1. On the Diagnostic Operating Instructions screen, press the Enter key.
2. If the terminal type has not been defined, you must use the `Initialize Terminal` option on the Function Selection menu to initialize the operating system environment before you can continue with the diagnostics.
3. If you want to do a general checkout with minimal operator action, select the `Diagnostic Routines` option on the Function Selection menu.

If you want 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; they may instruct you to install wrap plugs to better isolate a problem.

4. Select the `System Verification` option on the Diagnostic Mode Selection menu.
5. If you want to run a general checkout of all installed resources, select the `All Resource` option on the Diagnostic Selection menu.

If you want to check one particular resource, select that resource on the Diagnostic Selection menu.

6. Go to Step 4. Additional System Verification.

Step 4. Additional System Verification

The checkout programs end with either the Testing Complete menu and a message stating `No trouble was found` or the `A Problem Was Detected On (Time Stamp)` menu with an SRN.

1. Press Enter to return to the Diagnostic Selection menu.
2. If you want 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.

Step 5. Stopping the Diagnostics

1. If you are running online diagnostics, shut down the system, using the following procedure:
 - a. Press the 3 key repeatedly until you get to the Diagnostic Operating Instructions, then follow the displayed instructions.
 - b. Press the 3 key once, and then follow the displayed instructions to shut down the system.
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. Report the SRN if you received one to the service organization. To do a normal boot, turn off the system unit and wait 30 seconds, and then turn the system power on.

Chapter 3. Installing Options for the System

There are no customer–installable options for the EPC2400 or the EPC2450.

The Capacity Upgrade On–Demand feature may be installed. See *Capacity Upgrade on Demand Installing and Upgrading Processors*, order number 86 A1 11EF, for information regarding installing and enabling this feature.

Appendix A. System Records

Record the Identification Numbers

System Rack

Record and retain the following information.

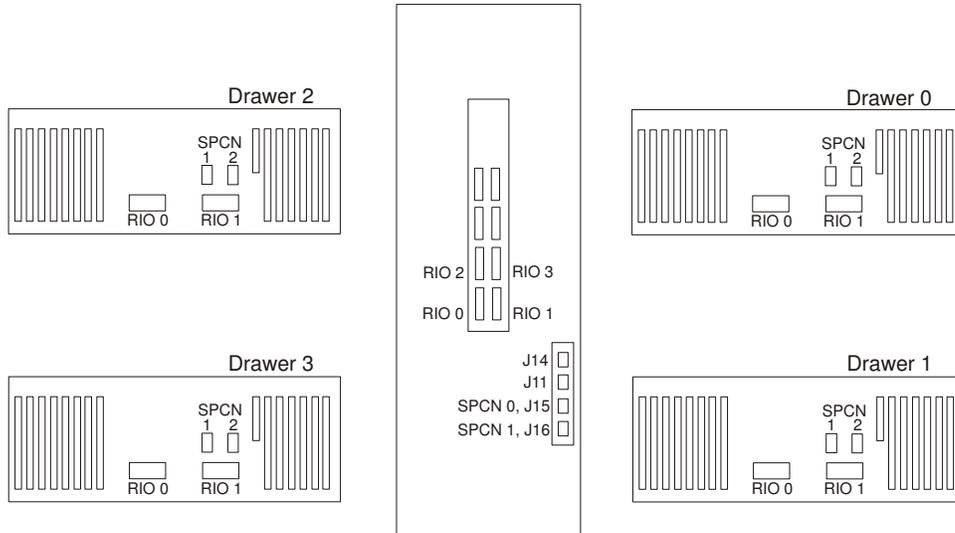
Product Name	EPC2400 and EPC2450
CPU Type/Speed	_____
Serial Number	_____
Key Serial Number	_____

System Rack Memory Configuration

Memory Quad	Slots	Memory Card Size
Quad A	M1, M2 M03, M24	_____
Quad B	M8, M9 M10, M11	_____
Quad C	M12, M13 M14, M15	_____
Quad D	M20, M21 M22, M23	_____

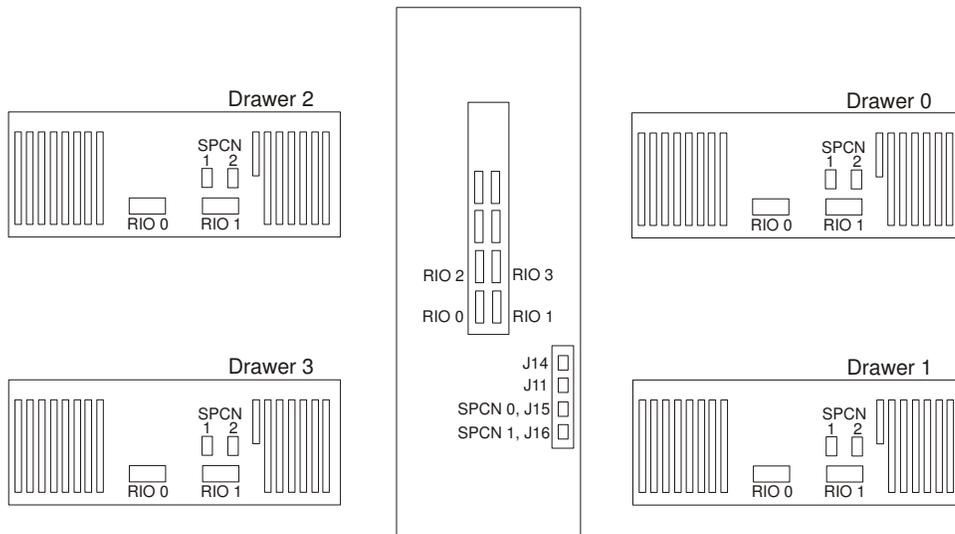
System Rack Cabling Configurations – RIO Cabling

Use the following diagram to draw the RIO cabling configuration from the System Rack to the I/O Drawer(s).



System Rack Cabling Configurations – SPCN Cabling

Use the following diagram to draw the SPCN cabling configuration from the System Rack to the I/O Drawer(s).



Primary I/O Drawer 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 server or if you ever need to have your server serviced.

Table A-1. Internal and External Options in Primary Drawer (0)

Location	Option Description
Mouse Connector	IBM Mouse <input type="checkbox"/> Other: _____
Keyboard Connector	Space Saving <input type="checkbox"/> Enhanced <input type="checkbox"/> Other: _____
Expansion Slot 14	_____
Expansion Slot 13	_____
Expansion Slot 12	_____
Expansion Slot 11	_____
Expansion Slot 10	_____
Expansion Slot 9	_____
Expansion Slot 8	RESERVED – Service Processor
Expansion Slot 7	_____
Expansion Slot 6	_____
Expansion Slot 5	_____
Expansion Slot 4	_____
Expansion Slot 3	_____
Expansion Slot 2	_____
Expansion Slot 1	_____
Parallel Port	_____
Serial Port 1	_____
Serial Port 2	_____

Refer to the following diagram of your server's banks/bays when completing Table A-2.

10 EIA Unit I/O Drawer

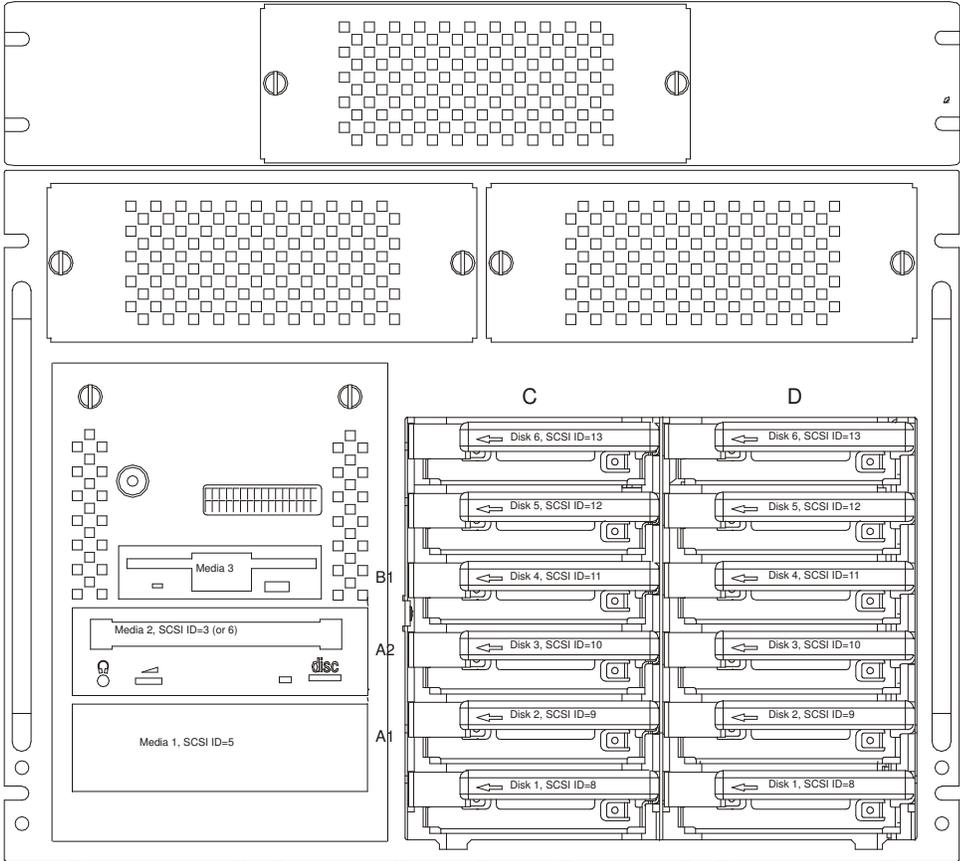


Table A-2. Internal Files and Devices in Primary Drawer (0) 10 EIA Unit I/O Drawer

Location/Drive	SCSI ID	Drive Description
Bank B, Bay 1	Non-SCSI	<u>3.5-Inch 1.44MB Diskette Drive</u>
Bank A, Bay 2	3	<u>CD-ROM Drive</u>
Bank A, Bay 1	5	_____
Bank C, Drive 1	8	_____
Bank C, Drive 2	9	_____
Bank C, Drive 3	10	_____
Bank C, Drive 4	11	_____
Bank C, Drive 5	12	_____
Bank C, Drive 6	13	_____
Bank D, Drive 1	8	_____
Bank D, Drive 2	9	_____
Bank D, Drive 3	10	_____
Bank D, Drive 4	11	_____
Bank D, Drive 5	12	_____
Bank D, Drive 6	13	_____
_____	_____	_____
-		
_____	_____	_____
-		
_____	_____	_____
-		
_____	_____	_____
-		

Additional I/O Drawer 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 server or if you ever need to have your server serviced.

Table A-3. Internal and External Options in Secondary Drawer (1)

Location	Option Description / Drawer # Description
Expansion Slot 14	_____
Expansion Slot 13	_____
Expansion Slot 12	_____
Expansion Slot 11	_____
Expansion Slot 10	_____
Expansion Slot 9	_____
Expansion Slot 8	_____
Expansion Slot 7	_____
Expansion Slot 6	_____
Expansion Slot 5	_____
Expansion Slot 4	_____
Expansion Slot 3	_____
Expansion Slot 2	_____
Expansion Slot 1	_____

Table A-4. Internal and External Options in Secondary Drawer (2)

Location	Option Description / Drawer # Description
Expansion Slot 14	_____
Expansion Slot 13	_____
Expansion Slot 12	_____
Expansion Slot 11	_____
Expansion Slot 10	_____
Expansion Slot 9	_____
Expansion Slot 8	_____
Expansion Slot 7	_____
Expansion Slot 6	_____
Expansion Slot 5	_____
Expansion Slot 4	_____
Expansion Slot 3	_____
Expansion Slot 2	_____
Expansion Slot 1	_____

Table A-5. Internal and External Options in Secondary Drawer (3)

Location	Option Description / Drawer # Description
Expansion Slot 14	_____
Expansion Slot 13	_____
Expansion Slot 12	_____
Expansion Slot 11	_____
Expansion Slot 10	_____
Expansion Slot 9	_____
Expansion Slot 8	_____
Expansion Slot 7	_____
Expansion Slot 6	_____
Expansion Slot 5	_____
Expansion Slot 4	_____
Expansion Slot 3	_____
Expansion Slot 2	_____
Expansion Slot 1	_____

Table A-8. Internal Files and Devices in Secondary Drawer (3)

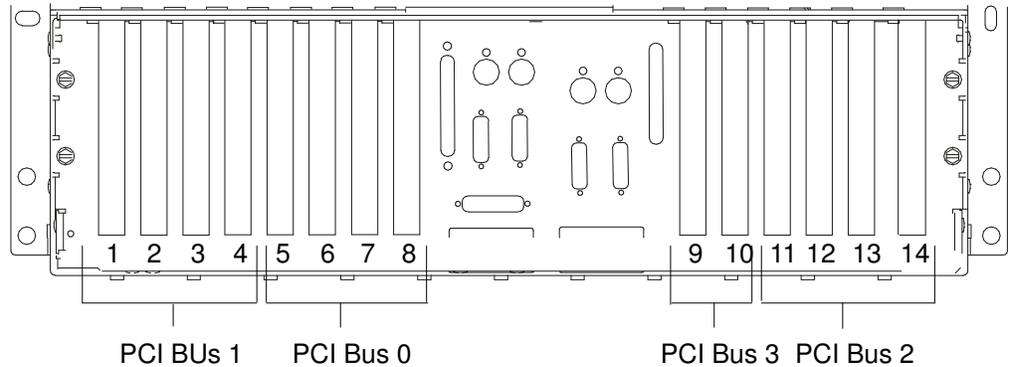
Location/Drive	SCSI ID	Drive Description
Bank A, Bay 2	---	_____
Bank A, Bay 1	---	_____
Bank __, Drive __	---	_____
Bank __, Drive __	---	_____
Bank __, Drive __	---	_____
Bank __, Drive __	---	_____
Bank __, Drive __	---	_____
Bank __, Drive __	---	_____
Bank __, Drive __	---	_____
Bank __, Drive __	---	_____
Bank __, Drive __	---	_____
Bank __, Drive __	---	_____
Bank __, Drive __	---	_____
Bank __, Drive __	---	_____
-	_____	_____
-	_____	_____
-	_____	_____
-	_____	_____

Appendix B. Adapters Placement Notes

This appendix lists a few important considerations regarding placement of adapters within your system unit.

Installing an Adapter

These systems are designed for service representatives to install adapters. Use this section to determine if there are specific slot requirements for adapters that your service representative may be installing.



(I/O Drawer Rear View with 14 Slots and 4 PCI Buses)

Note: Each drawer has four PCI buses per drawer: Slots 1–4 (PCI Bus 1), 5–8 (PCI Bus 0), 9–10 (PCI Bus 3), 11–14 (PCI Bus 2). Slots 1, 5, 9, 10 and 14 are 64-bit slots. Remaining slots are 32-bit. The 32-bit adapters also function in the 64-bit slots. Each bus is considered a primary bus. All slots are 33 MHz.

Adapters Placement

Some adapters must be placed in specific I/O drawer slots to function correctly and to achieve highest performance.

The following tables show the slot plugging guidelines for the systems. The information in this table has been verified in system testing performed using maximum configurations.

If two different adapters can be placed in the same slot, the highest priority adapter starts at the top of the table. The list of slot numbers represent the order that the slots should be used in a drawer.

For complete system placement, the first slot for a group of adapters is selected in the first drawer, and then the first slot is selected in the next drawer. After the first slot selection has been used for each drawer, the second slot in the list is used. This also rotates through the available drawers. If a card has already been placed in a slot, the slot is not available for future adapter placement.

The primary drawer referenced in the following table is the I/O drawer that has a service processor card installed in slot 8. Secondary drawers are additional I/O drawers that may be added to a system configuration. Secondary drawers do not have a service processor installed.

Adapter	Slot Usage	Maximum
Service Processor	Primary drawer slot 8	1 per system
PCI Ultra SCSI Single-Ended Factory installed to support internal media drives.	Primary drawer – slot 7 Secondary drawer – slot 8 (As required)	1 per drawer
PCI Ultra SCSI Single-Ended Factory installed to support internal SCSI drives.	Primary drawer – slots 13, 6 Secondary drawer – slots 13, 6 (As required)	2 per drawer
Fibre Channel Adapter	Primary drawer – slots 10, 14, 1 Secondary drawer – slots 1, 5, 10, 14	8 per system
1GB Ethernet–SX PCI	Primary drawer – slots 10, 1, 9, 3, 4, 2 Secondary drawer – slots 1, 5, 10, 9, 3, 7	8 per system ³
10/100/1000 Base–T Ethernet PCI	Primary drawer – slots 10, 1, 9, 3, 4, 2 Secondary drawer – slots 1, 5, 10, 9, 3, 7	19 per system ³
10/100 4–Port Ethernet	Primary drawer – slots 3, 10, 1, 9, 4, 2 Secondary drawer – slots 1, 5, 10, 3, 7, 9, 4	26 per system
Token Ring PCI	Primary drawer – slots 2, 4, 9, 11, 13, 3, 10, 12, 6, 1, 5 Secondary drawer – slots 2, 4, 6, 8, 9, 11, 13, 3, 7, 10, 12, 14, 1, 5	26 per system
POWER GXT130P ¹	Primary drawer – slots 1, 4	1 per system
155 TURBOWAYS ATM PCI UTP 155 TURBOWAYS ATM PCI MMF	Primary drawer – slots 2, 4, 9, 11, 13, 3, 10, 12, 6, 1, 5 Secondary drawer – slots 2, 4, 6, 8, 9, 11, 13, 3, 7, 10, 12, 14, 15	16 per system
10/100 Mbps Ethernet PCI	Primary drawer – slots 2, 4, 9, 11, 13, 3, 10, 12, 6, 1, 5 Secondary drawer – slots 2, 4, 6, 8, 9, 11, 13, 3, 7, 10, 12, 14, 1, 5	26 per system
SysKonnnect SK-NET FDDI-UP SAS PCI SysKonnnect SK-NET FDDI-UP DAS PCI SysKonnnect SK-NET FDDI-LP SAS PCI	Primary drawer – slots 2, 4, 9, 11, 13, 3, 10, 12, 6, 1, 5 Secondary drawer – slots 2, 4, 6, 8, 9, 11, 13, 3, 7, 10, 12, 14, 1, 5	26 per system
8-Port Asynchronous PCI	Primary drawer – slots 1, 3, 4, 11, 12, 13, 14, 10, 5, 9 Secondary drawer – slots 1, 5, 10, 11, 3, 6, 12, 14, 2, 6, 9, 13, 4, 7	16 per system
128-Port Asynchronous PCI	Primary drawer – slots 1, 3, 4, 11, 12, 13, 14, 10, 5, 9, 7 Secondary drawer – slots 1, 5, 10, 11, 3, 6, 12, 14, 2, 6, 9, 13, 4, 7	32 per system
PCI SCSI-2 F/W Single-Ended PCI Single-Ended Ultra SCSI	Primary drawer – slots 1, 10, 14, 3, 9, 4, 12, 11, 5, 6, 2, 7 Secondary drawer – slots 9, 2, 1, 5, 10, 11, 3, 6, 12, 4, 7, 13, 8, 14	40 per system ²
PCI SCSI-2 F/W Differential PCI Differential Ultra SCSI	Primary drawer – slots 1, 10, 14, 3, 13, 4, 12, 11, 5, 6, 7 Secondary drawer – slots 1, 5, 10, 11, 3, 6, 12, 4, 7, 13, 8, 14	40 per system ²
1–Port Synchronous PCI	Primary drawer – slots 10, 14, 3, 13, 4, 12, 11, 5, 9, 1, 2, 5 Secondary drawer – slots 1, 5, 10, 11, 3, 6, 12, 4, 7, 13, 8, 14, 9, 2	8 per system

Adapter	Slot Usage	Maximum
4-Port Synchronous PCI	Primary drawer – slots 10, 14, 3, 13, 4, 12, 11, 5, 9, 1, 2, 5 Secondary drawer – slots 1, 5, 10, 11, 3, 6, 12, 4, 7, 13, 8, 14, 9, 2	8 per system
2-Port Multiprotocol PCI	Primary drawer – slots 10, 14, 3, 13, 4, 12, 11, 5, 9, 1, 2, 5 Secondary drawer – slots 1, 5, 10, 11, 3, 6, 12, 4, 7, 13, 8, 14, 9, 2	18 per system

Notes:

1. The manufacturer strongly recommends you locate the POWER GXT130P adapter in the primary I/O drawer. This placement provides you with the maximum amount of diagnostic feedback if your system encounters errors.
2. A maximum of 40 storage adapters per system and 10 storage adapters per I/O drawer.
3. For maximum performance, install only two Gigabit Ethernet–SX PCI or two 10/100/1000 Base–T Rthernet PCI adapters (or one or each) per I/O drawer, one per bus.

Configuration Details

- The recommended location for the boot device (SCSI or Network) and graphics adapter is within the primary I/O drawer (Drawer 0). This configuration provides service personnel with the maximum amount of diagnostic information if your system encounters errors in the boot sequence.
- Consider placing the AIX rootvg volume group in the primary I/O drawer. This allows AIX to boot if other I/O drawers are found off–line during boot.
- The default Boot Drive is in the lowest location in the center bay six–pack of the primary SCSI I/O drawer. If a boot source other than the internal SCSI disk is configured, the supporting SCSI adapter must also be in the primary I/O drawer.
- SCSI–2 disk bays in an I/O drawer are connected and driven by a single SCSI adapter, installed in **slot 9** or **slot 13**. Ultra SCSI disk bays can each be driven from separate Ultra SCSI adapters. In this configuration, slot 13 drives the default boot device and slot 6 drives the second Ultra SCSI disk bay. These adapters are optional on secondary I/O drawers.
- SCSI–2 Media bays in an I/O drawer are connected and driven by a single SCSI adapter, installed in **slot 2**. Ultra systems have the media bay driven from slot 7. This adapter is optional on secondary I/O drawers.
- The Service Processor must occupy **slot 8** of the primary I/O drawer.
- The SCSI–2 Fast/Wide PCI RAID adapter installed in the primary SCSI I/O drawer can only be connected to external devices. The SCSI RAID Adapter installed in secondary I/O drawers may be connected to internal disk bays.
- Maximum limitations exist on adapters and devices that are specific to the adapter or device and are not interaction limits with others.
- I/O slot 9 does not support any long PCI adapter with backside components.

Appendix C. Cabling the System Rack and I/O Rack

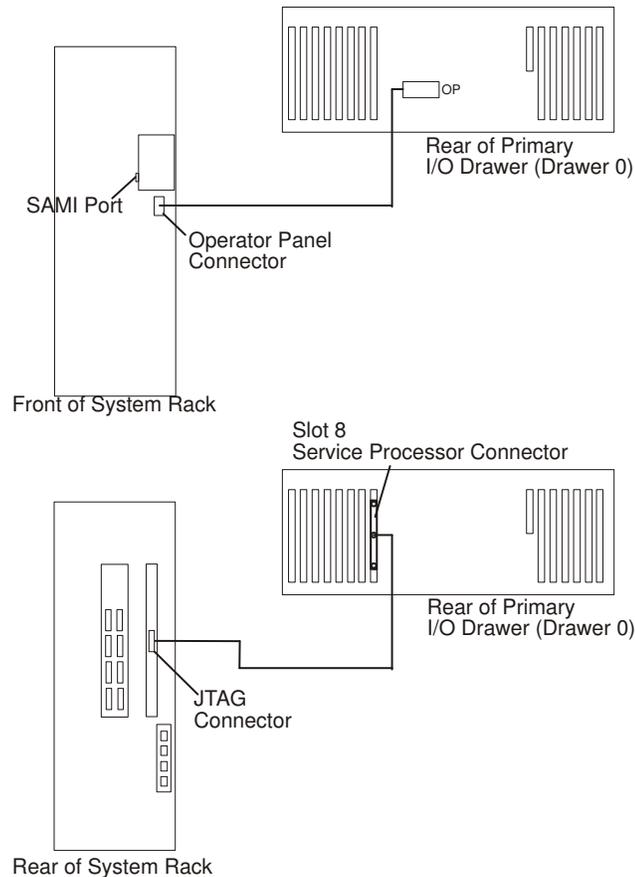
The minimum system consists of two racks. The system rack contains the system processors, memory and supporting hardware. The I/O rack contains I/O drawer(s) with PCI adapters, disk drives, and media drives. The systems must have a minimum of one I/O drawer. This drawer is called the primary I/O drawer and it contains the service processor for the system. Additional I/O drawers can be added to the system. These drawers are called secondary I/O drawers. Secondary I/O drawers are connected to the system rack but do not contain a service processor. The systems support up to a total of four I/O drawers in various I/O rack configurations.

There are two steps to connecting the system rack to the I/O drawers in their I/O racks.

1. Connect the JTAG cable and the operator panel cable. These two cables are connected only between the system rack and the primary I/O drawer. See “Connecting JTAG and Operator Panel Cables” on page C-2 for diagrams showing these cables.
2. Connect the RIO cables and the SPCN cables. These cables connect between the system rack and all the I/O drawers in loops. See “Connecting RIO and SPCN Cables” on page C-2 for diagrams showing these cables.

Connecting JTAG and Operator Panel Cables

Use the following figure to connect the JTAG and operator panel (OP) cables.



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 basic rules must be followed when connecting these two types of cables:

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

RIO Cabling

The following rules apply to RIO cable connections:

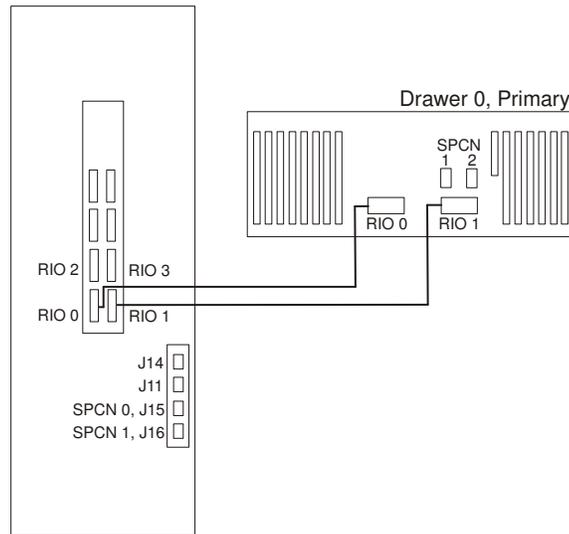
- I/O drawers 0 and 1 are connected using the first RIO loop, which uses RIO ports 0 and 1 on the system rack.
- I/O drawers 2 and 3 are connected using the second RIO loop, which uses RIO ports 2 and 3 on the system rack.
- The primary I/O drawer must be installed and connected to RIO port 0 of the system rack. The connection must be made from RIO port 0 of the system rack to RIO port 0 of the

primary I/O drawer. This connection is required to make the primary drawer the first drawer in the loop, which allows the firmware to initialize the system.

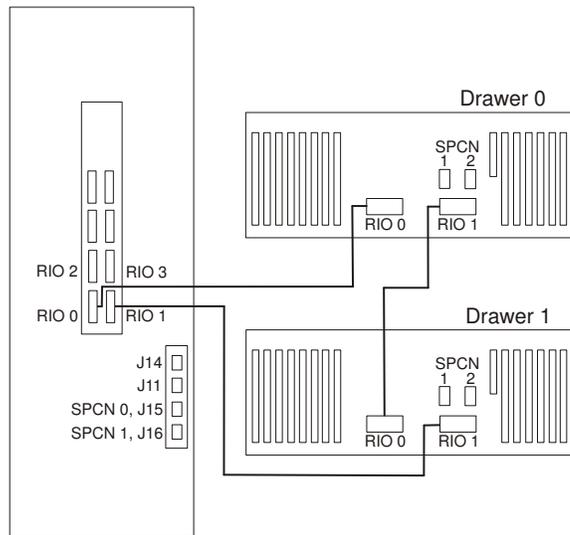
- If the loop connection between RIO 2 and RIO 3 is broken, the system is not able to differentiate between I/O drawer 2 and I/O drawer 3. The system still configures RIO 0 and RIO 1 ports, but does not configure RIO 2 or RIO 3 ports.

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

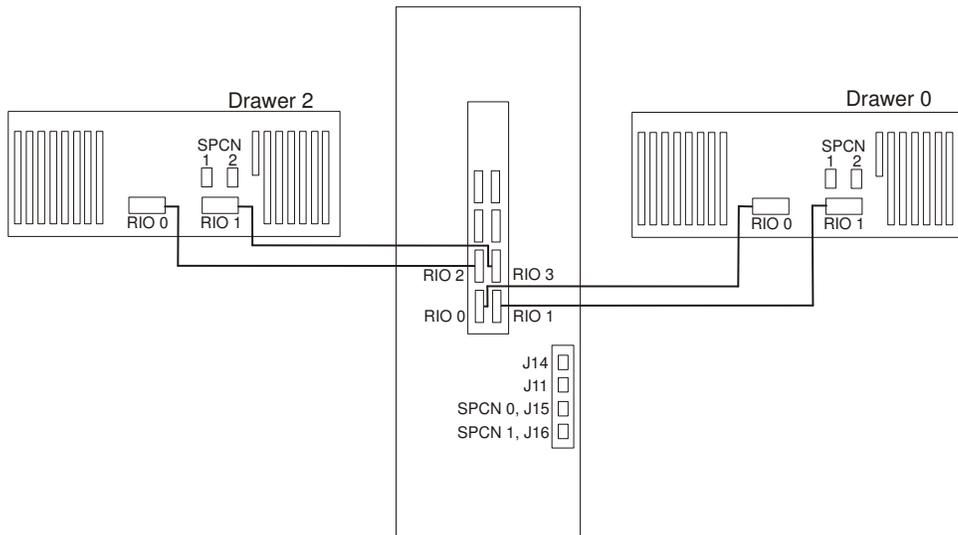
System Rack Attached to One I/O Drawer



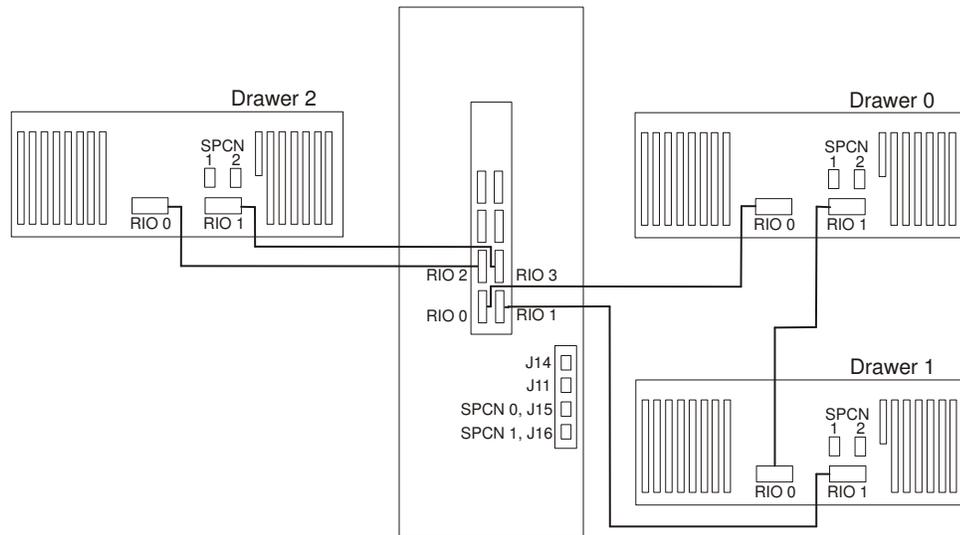
System Rack Attached to Two I/O Drawers



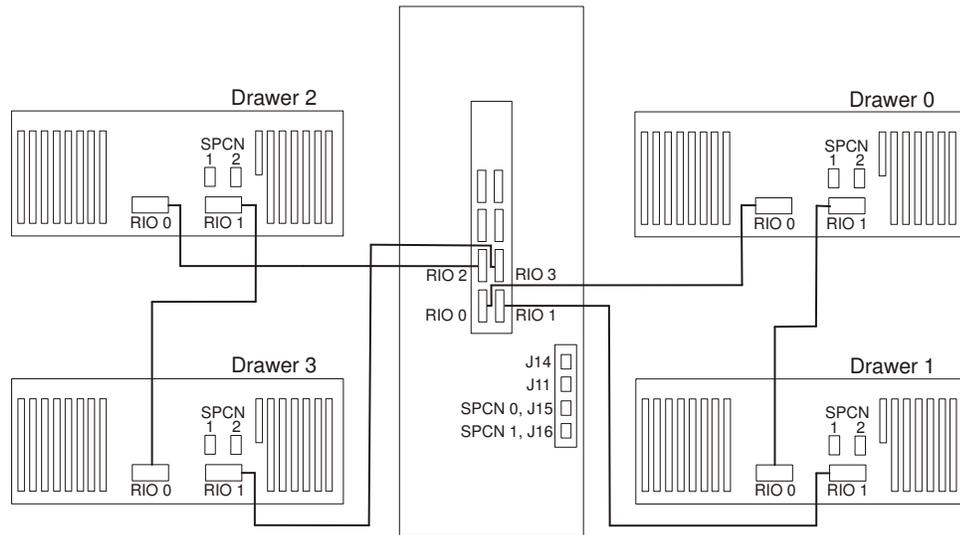
OR



System Rack Attached to Three I/O Drawers



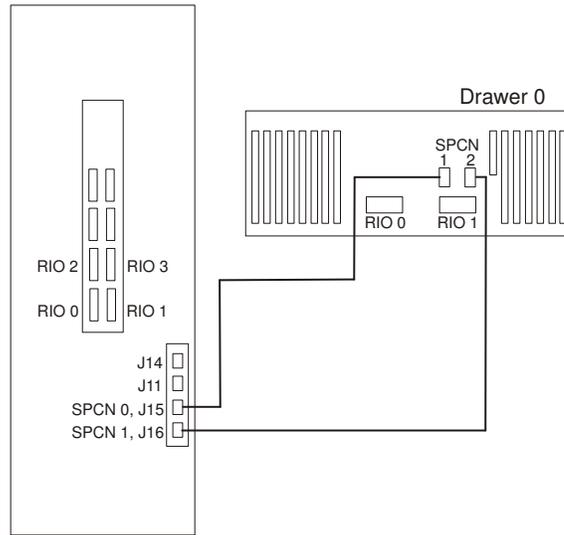
System Rack Attached to Four I/O Drawers



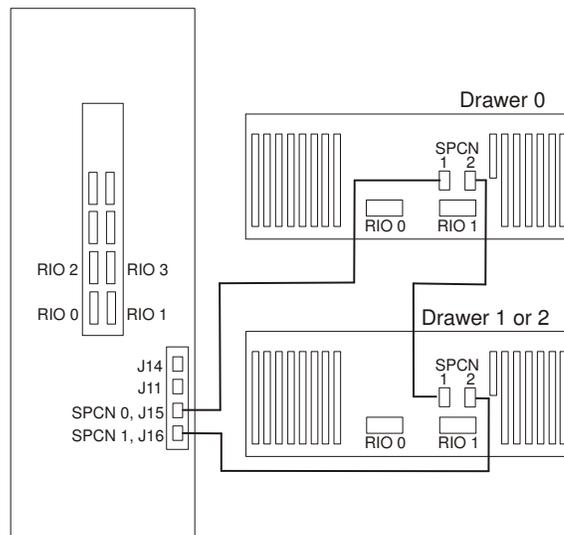
SPCN Cabling

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

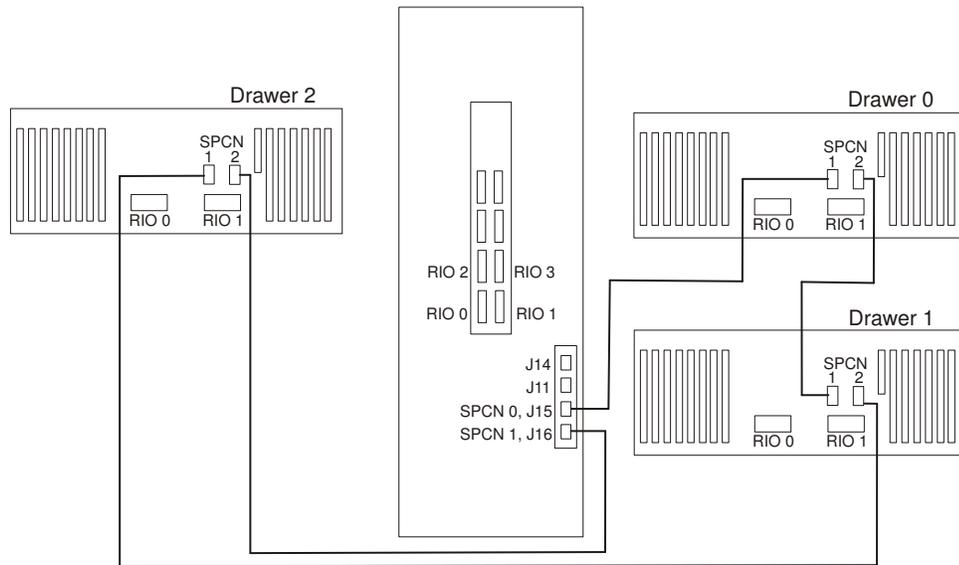
System Rack Attached to One I/O Drawer



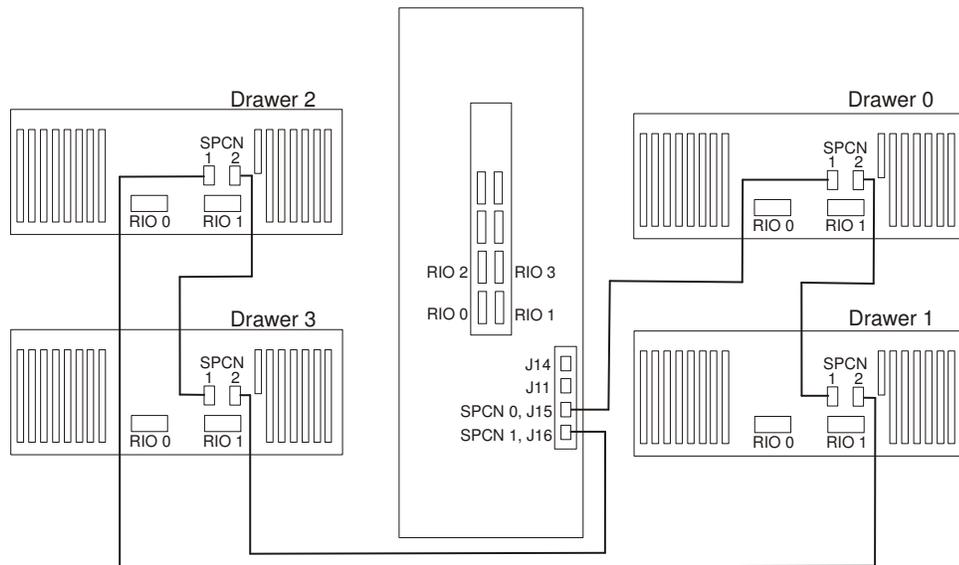
System Rack Attached to Two I/O Drawers



System Rack Attached to Three I/O Drawers

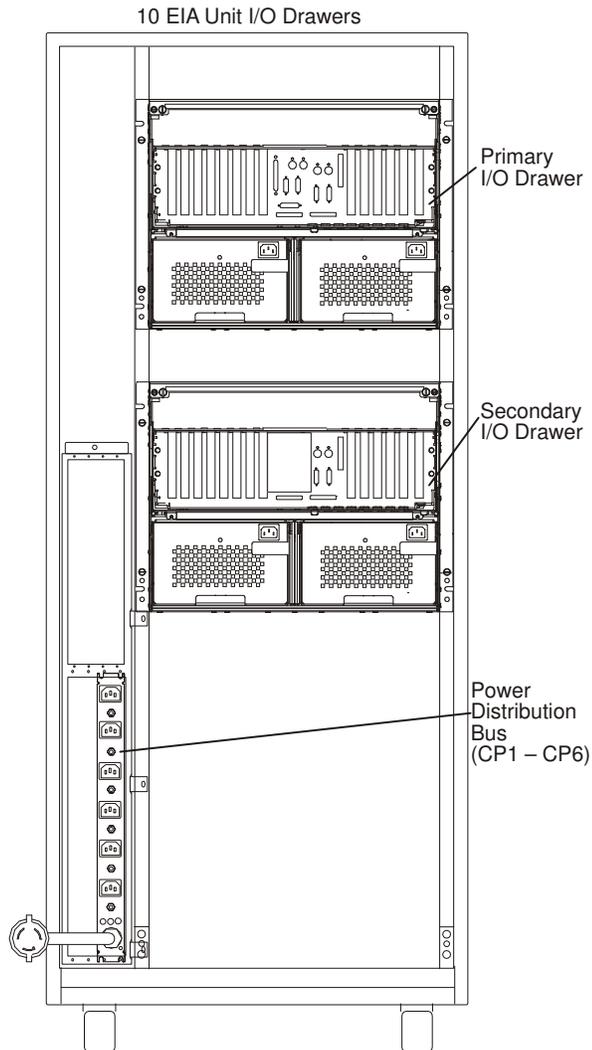


System Rack Attached to Four I/O Drawers



I/O Rack Rear Locations

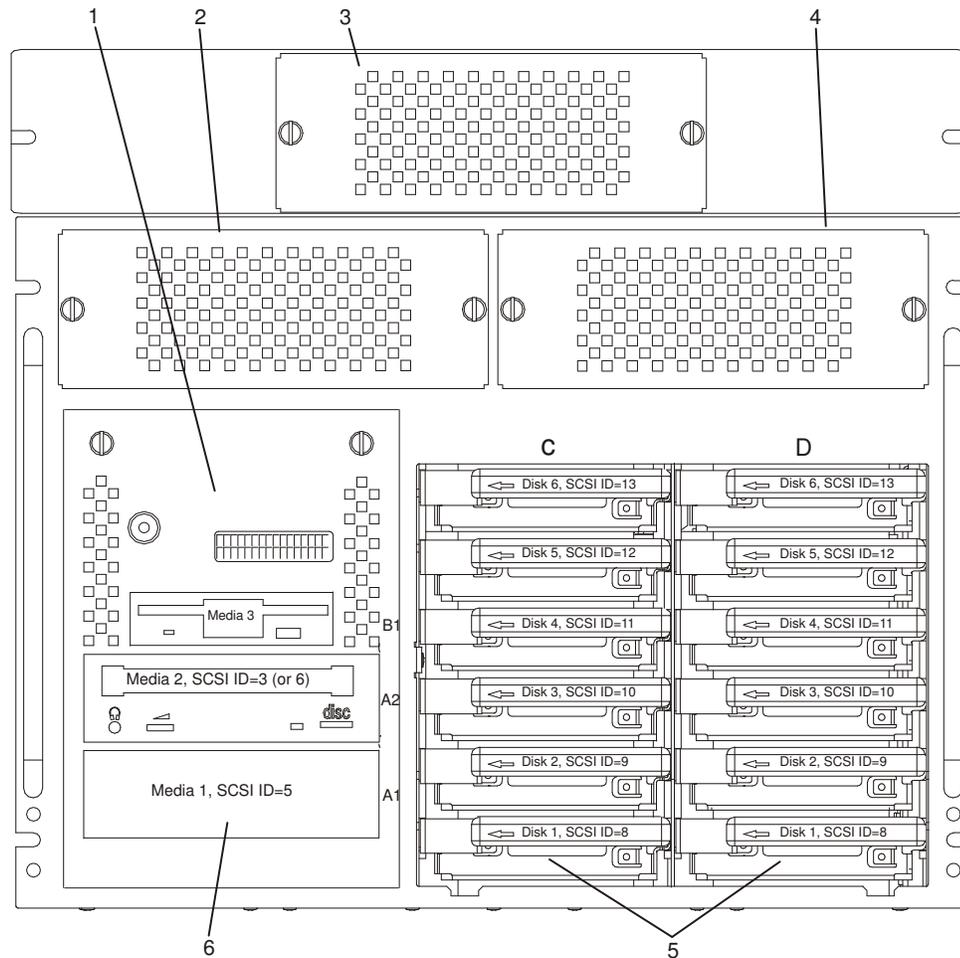
The following figure shows the rear of an I/O rack. 10 EIA unit I/O drawers can be installed, as shown in the figure.



I/O Drawer Locations

This section shows component locations for the 10 EIA unit I/O drawer.

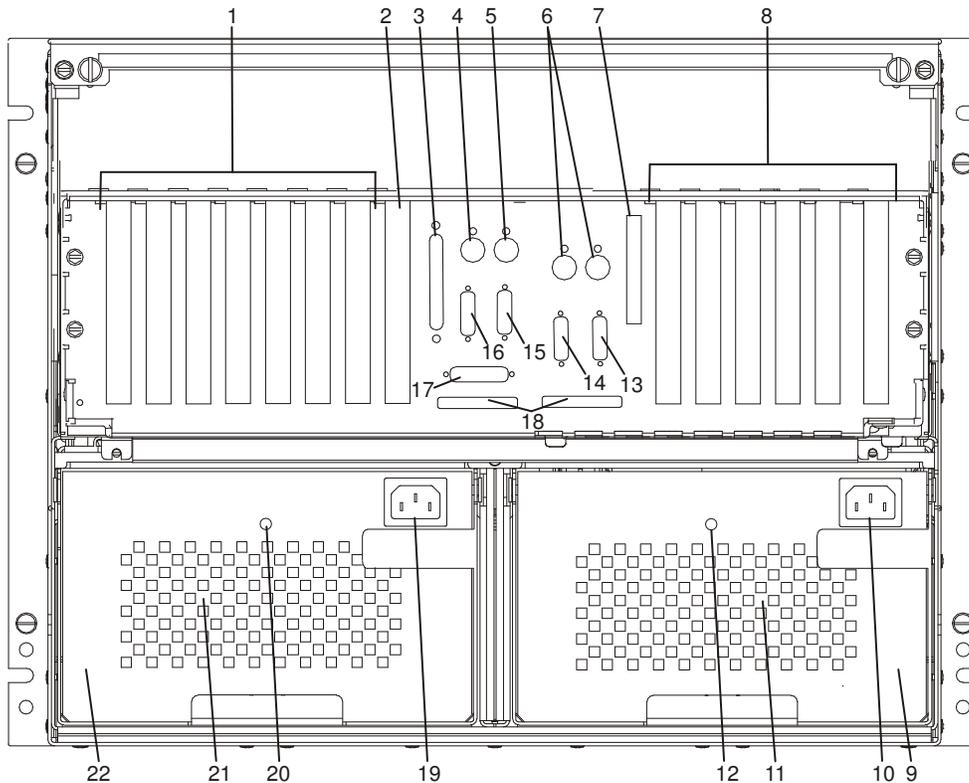
10 EIA Unit I/O Drawer Front View



Note: The SCSI IDs shown for media devices indicate how these devices are set when shipped from the factory.

1. Indicator Panel
2. Blower 1 (left)
3. Blower 3 (center)
4. Blower 2 (right)
5. Hot Swap Disk Drive Bays
6. Media Bay

10 EIA Unit I/O Drawer Rear View



1. PCI adapter slots (1 – 7)
 2. PCI adapter slot 8, service processor card and JTAG cable in primary I/O drawer (drawer 0)
 3. Parallel connector
 4. Keyboard connector
 5. Mouse connector
 6. Reserved
 7. Reserved
 8. PCI adapter slots (9 – 14)
 9. Right power supply
 10. Power cord connector for right power supply
 11. Fans (mounted on front end of right power supply)
 12. Right power supply, power good LED
 13. SPCN2 connector
 14. SPCN1 connector
 15. Serial port S2*
 16. Serial port S1* (Used for TTY terminal connection)
- Note:** In an SP environment, there is normally a cable attached from this port to the SP Control Workstation. To directly attach a TTY terminal to this port, the cable to the SP Control Workstation must be disconnected. Be sure to reconnect this cable after servicing the system.
17. Operator panel (OP) connector
 18. RIO 0 and RIO 1

- 19. Power cord connector for left power supply
- 20. Left power supply, power good LED
- 21. Fans (mounted on front end of left power supply)
- 22. Left power supply

* Serial ports 1 and 2 can only be used for service processor menus. No "heartbeat" type devices can be used on these ports.

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