AlphaServer 4000/4100
Configuration and Installation Guide

Order Number: EK–4100A–CG. E01

This manual is for manufacturing and field personnel, and resellers who require AlphaServer 4000/4100 system drawer configuration information.

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Preface

Intended Audience

This manual is for anyone who manages, operates, or services the system drawer in a DIGITAL AlphaServer 4000/4100 system.

Document Structure

This manual uses a structured documentation design. Topics are organized into small sections for efficient online and printed reference. Each topic begins with an abstract. You can quickly gain a comprehensive overview by reading only the abstracts. Next is an illustration or example, which also provides quick reference. Last in the structure are descriptive text and syntax definitions.

This manual has seven chapters and two appendixes, as follows:

- **Chapter 1, Configuration Rules,** gives configuration guidelines on installing the system drawer and other components in the pedestal or cabinet.
- **Chapter 2, Preparing the Cabinet,** gives site preparation information and tells how to stabilize the cabinet.
- **Chapter 3, Preparing the Pedestal,** gives site preparation information.
- **Chapter 4, Installing Components in Cabinet,** provides installation instructions on how to install options in the cabinet.
- **Chapter 5, Installing StorageWorks Shelves in Pedestal,** tells how to install this option in the pedestal.
- **Chapter 6, Making Connections,** describes how to connect the console terminal and other components to the system.
- **Chapter 7, System Power-Up and Verification,** tells how to check your system after power-up and provides booting instructions.
- **Appendix A, Cabinet to Pedestal System Drawer Conversion**, gives instructions on how to convert a cabinet system drawer to a pedestal system drawer and then install it on the pedestal.
- **Appendix B, Using H9A10-EC Cabinets**, gives you the H9A10-EC (metric) cabinet configuration rules and installation instructions.

Documentation Titles

Table 1 lists the books in the DIGITAL AlphaServer 4000/4100 documentation set.

Table 1 DIGITAL AlphaServer 4000/4100 Documentation

Title	Order Number
AlphaServer 4100 User and Configuration Documentation Kit	QZ–00VAA–GZ
System Drawer User's Guide	EK–4100A–UG
Configuration and Installation Guide	EK–4100A–CG
AlphaServer 4000 User and Configuration Documentation Kit	QZ–00VAB–GZ
System Drawer User's Guide	EK–4000A–UG
Configuration and Installation Guide	EK–4100A–CG
Service Information	
AlphaServer 4000/4100 Service Manual (hard copy)	EK–4100A–SV
Service Manual (diskette)	AK–QXBJA–CA
System Drawer Upgrades	EK–4041A–UI
PCI Upgrade	EK–4000A–UI
Reference Information	
2T-RMSMC System Management Station Kit Installation Guide	EK–RMSMC–IN
KN30n CPU Installation Card	EK–KN300–IN
MS3n0 Memory Installation Card	EK–MS300–IN
H7291 Power Supply Installation Card	EK–H7291–IN
ServerWORKS Manager Administrator User's Guide	ER–4QXAA–UA

Chapter 1

Configuration Rules

This chapter provides configuration rules for the following:

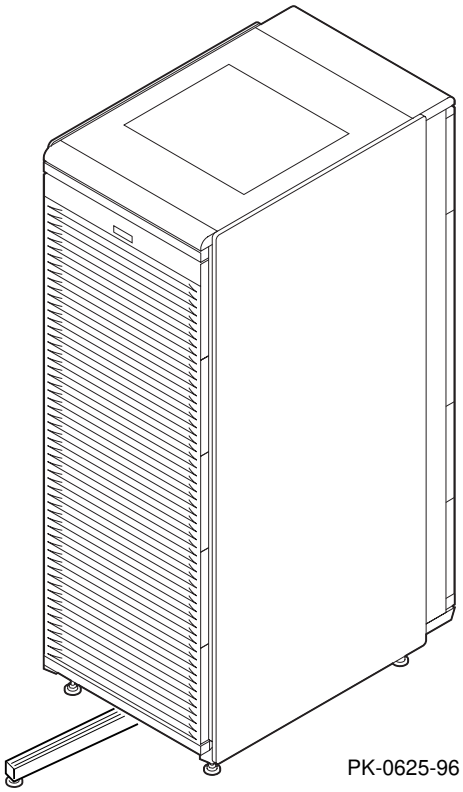
- Cabinet
- System Drawer Configuration Rules (Cabinet)
- Shelf Configuration Rules (Cabinet)
- Pedestal
- System Drawer Power System
- Cabinet Power System
- AC Power Strips in the Pedestal
- AlphaServer 4000 System Drawer
- AlphaServer 4100 System Drawer

NOTE: The location of system drawers, StorageWorks shelves, and other components in the cabinet affect both cabinet stability and cooling efficiency. Careful consideration is required for system upgrades and unique configurations to comply with UL1950 safety requirements and to prevent premature component failure.

1.1 Cabinet

Figure 1–1 shows the H9A10 cabinet with the stabilizer extended.

Figure 1–1 Cabinet



About the Cabinet

The cabinet contains the following components:

- Cabinet panel with fan and AC power-on LEDs
- Flushing fans
- Two AC power controllers, each with an AC circuit breaker
- Vertical mounting rails
- Stabilizer bar
- Wrist strap for static discharge protection

Cabinet Variants

The H9A10 cabinet has two variants. The H9A10-EL (domestic) cabinet contains two 120 V power controllers, each with 10 NEMA 5-15R outlets. The H9A10-EM (European) cabinet has two 240 V power controllers equipped with 12 IEC C13 outlets.

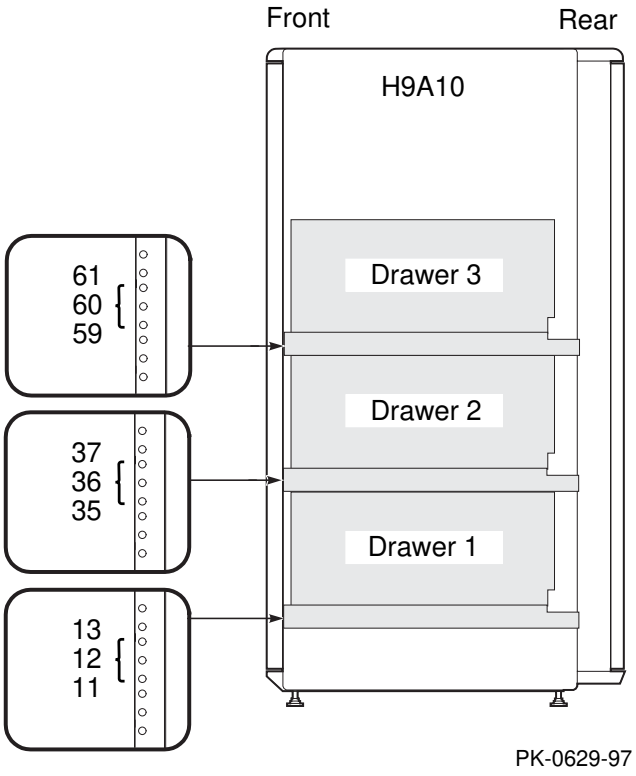
Cabinet Configuration Rules

- The maximum number of system drawers is three.
- The maximum number of StorageWorks shelves in a one-system drawer cabinet is eight.
- The maximum number of StorageWorks shelves in a two-system drawer cabinet is six.
- The maximum number of StorageWorks shelves in a three-system drawer cabinet is two.

1.2 System Drawer Configuration Rules (Cabinet)

The H9A10 (RETMA) cabinet rails have a total of 34 U-units with 102 mounting holes. Table 1-1 gives the mounting holes to be used for a cabinet containing one to three system drawers.

Figure 1–2 System Drawer Mounting Holes



The H9A10 cabinet rails have a total of 34 U-units of vertical mounting height. Each U-unit is 1.75 inches in length. When you install a system drawer, begin counting the mounting holes from the rail bottom to top. According to how many system drawers you install, mark off the mounting holes listed in Table 1-1.

Table 1-1 H9A10 System Drawer Mounting Holes

One System Drawer	Two System Drawers	Three System Drawers
11, 12, 13	First: 11, 12, 13	First: 11, 12, 13
	Second: 35, 36, 37	Second: 35, 36, 37
		Third: 59, 60, 61

1.3 Shelf Configuration Rules (Cabinet)

The maximum number of StorageWorks shelves is eight in a one-system drawer cabinet. The maximum number of StorageWorks shelves is six in a two-system drawer cabinet. Figure 1–3 shows shelf placement in a two-system drawer cabinet. Figure 1–4 shows shelf placement in a one-system drawer cabinet.

Figure 1–3 Shelves in Two-System Drawer Cabinet

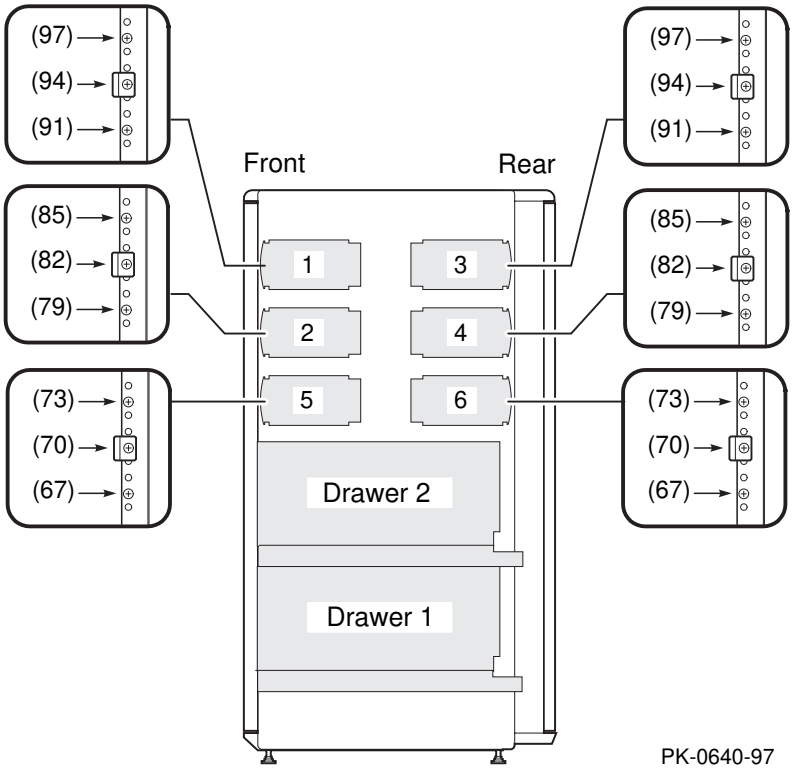
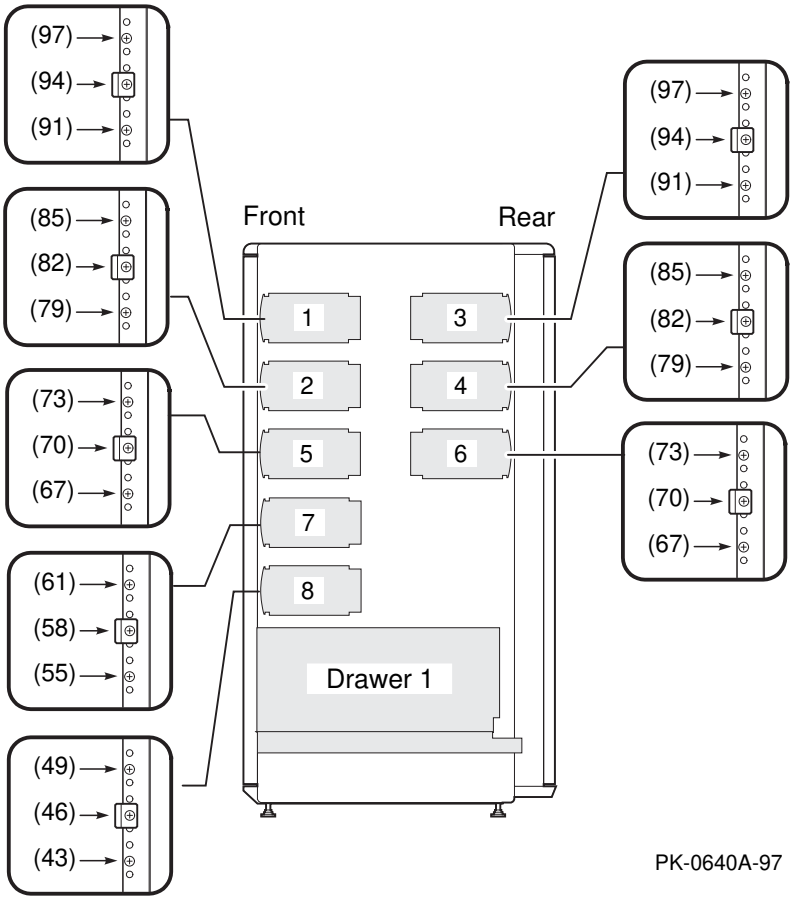


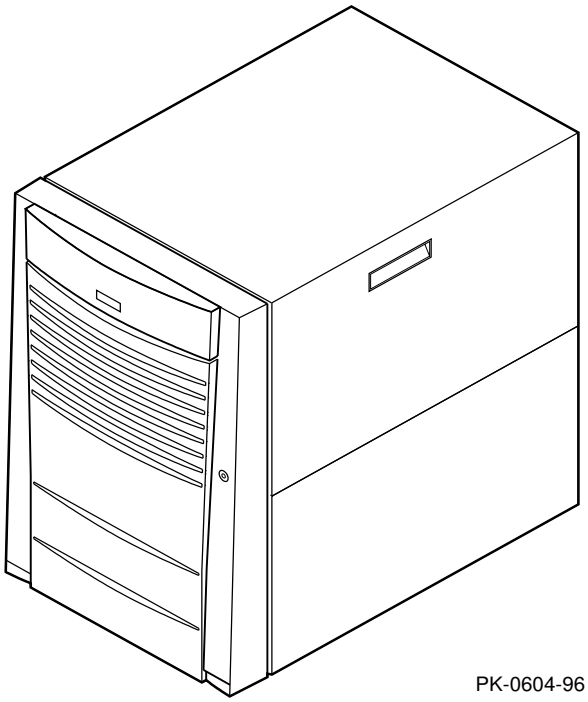
Figure 1–4 Shelves in One-System Drawer Cabinet



1.4 Pedestal

Figure 1–5 shows the pedestal.

Figure 1–5 Pedestal



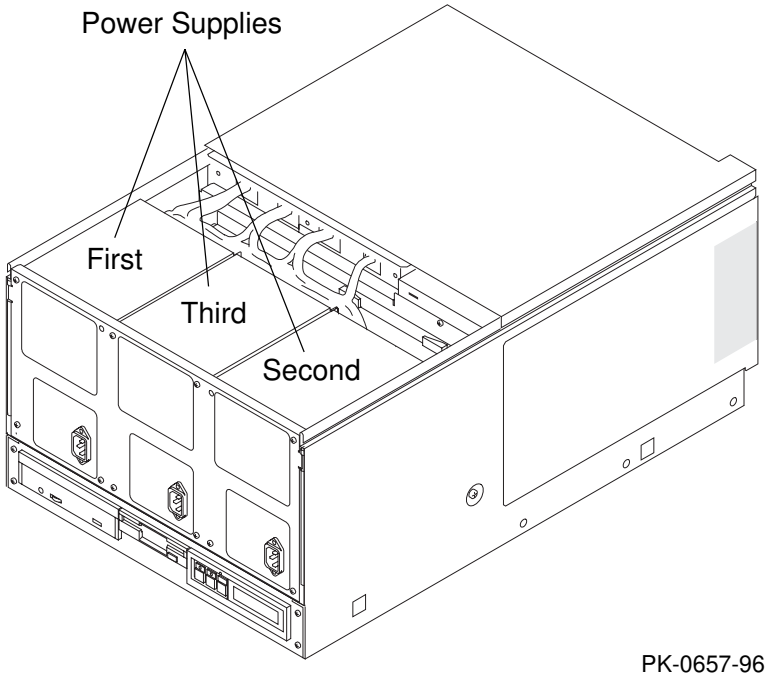
Pedestal Configuration Rules

- One system drawer is installed in the pedestal.
- The maximum number of StorageWorks shelves is three.

1.5 System Drawer Power System

The system drawer contains one to three power supplies and distribution cables. Figure 1–6 shows the power components in the system drawer. Two AC power controllers complete the power system. See Section 1.6.

Figure 1–6 System Drawer Power Components



About the Power System

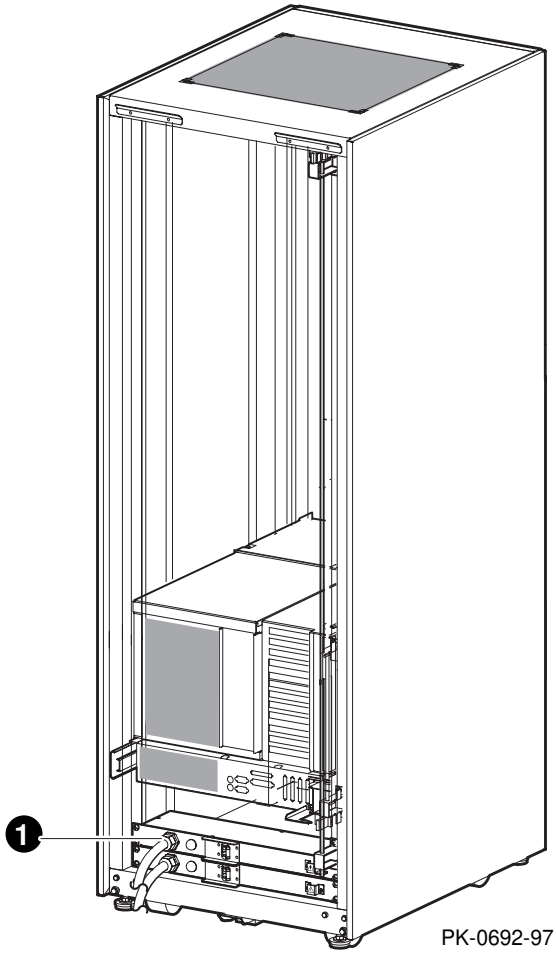
- A system drawer can contain up to three power supplies. The correct position of the three power supplies is shown in Figure 1–6.
- One power supply is required in a system with one or two CPUs.
- A second power supply is required for N+1 redundancy in a single- or dual-CPU system.
- Two power supplies are required in a system with three or more CPUs.
- Two power supplies are required in a system with two PCI card cages.
- A third power supply is required for N+1 redundancy in a system with three or more CPUs.
- A power harness connects the power supplies to the system motherboard, PCI motherboard, system fans, and drives.

NOTE: Three power supplies provide N+1 redundancy in AlphaServer 4100 systems with three or four CPUs and in AlphaServer 4000 systems with two PCI card cages.

1.6 Cabinet Power System

Figure 1–7 shows the two AC power controllers located at the bottom rear of the cabinet. The system drawer power cable(s) connect to the controllers. The controller power cables plug into a wall outlet.

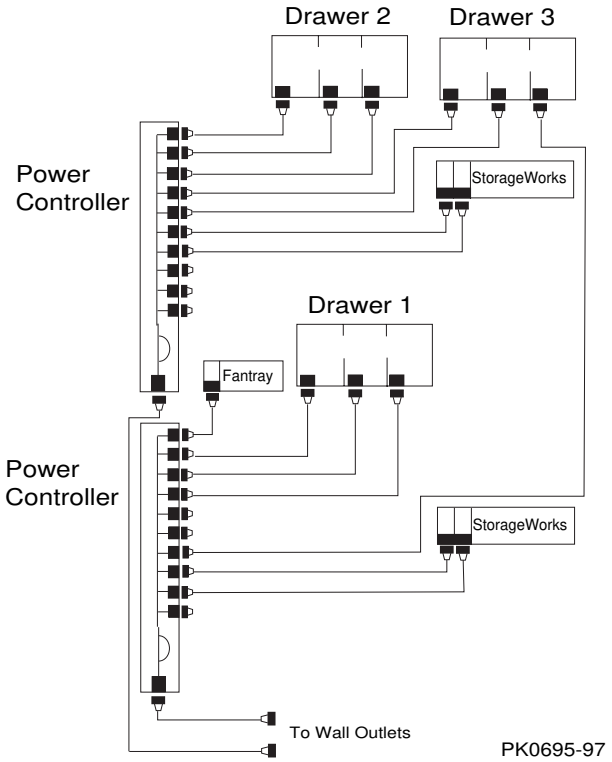
Figure 1–7 Cabinet Power Controllers



The power controllers connect to an AC wall outlet. Each controller has a main power switch and 10 outlets for system drawers, StorageWorks shelves, and fan tray. When connecting system components to the controllers, note that system drawer power cables are gray; StorageWorks shelf power cables and fan tray power cables are gray. Configuration rules are:

- A system drawer contains one to three power supplies; each power supply has one power cable that connects to a power controller.
- A StorageWorks shelf has one power cable; a shelf equipped with a redundant power supply has two power cables.
- Connect all system drawer power cables to the same AC power controller.
- If a cabinet has three system drawers, connect the power cables as shown in Figure 1–8.

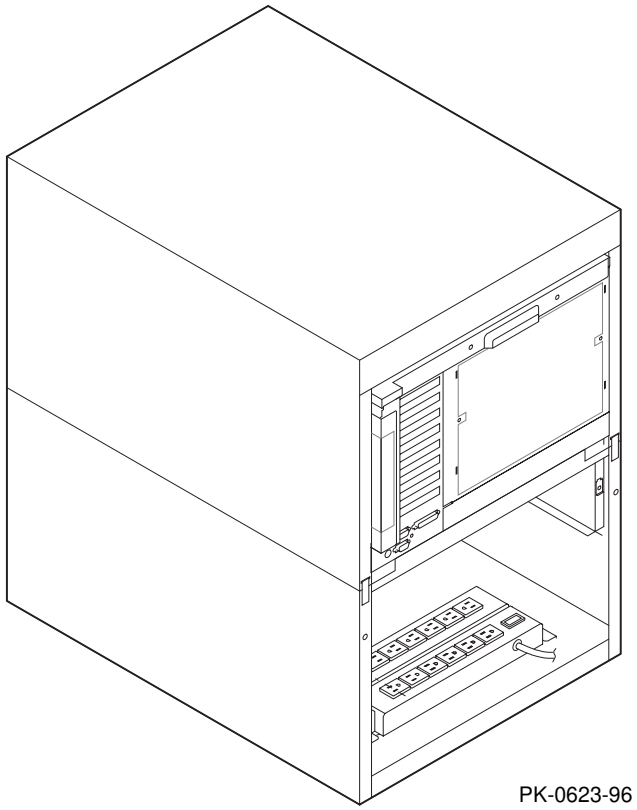
Figure 1–8 Power Connections for Three-Drawer Cabinet



1.7 AC Power Strips in the Pedestal

Figure 1–9 shows the pedestal with two AC power strips installed.

Figure 1–9 Pedestal with AC Power Strips



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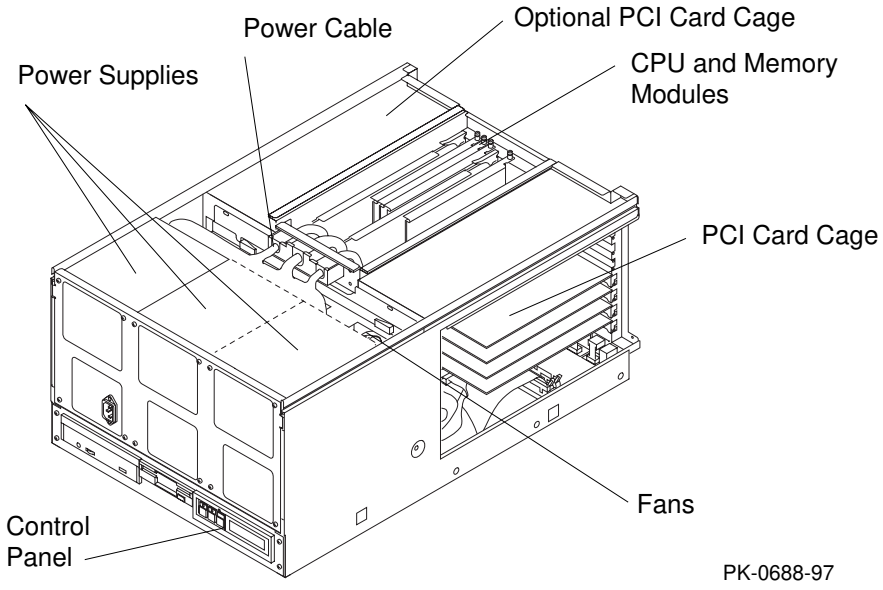
In pedestal systems, both AC power strip cables plug directly into a wall outlet. Configuration rules are:

- In North American models: one system drawer and one StorageWorks shelf per AC power strip
- In European models: one system drawer and two StorageWorks shelves per AC power strip
- In Japanese models: one system drawer and three StorageWorks shelves per AC power strip
- A second AC power strip is required if you install a third StorageWorks shelf in a North American or Japanese model.
- The maximum number of AC power strips is two.

1.8 AlphaServer 4000 System Drawer

Figure 1–10 shows the components of the AlphaServer 4000 system drawer. See Section 1.8.1 for system motherboard configuration rules. See Section 1.8.2 for PCI motherboard configuration rules.

Figure 1–10 AlphaServer 4000 System Drawer Components

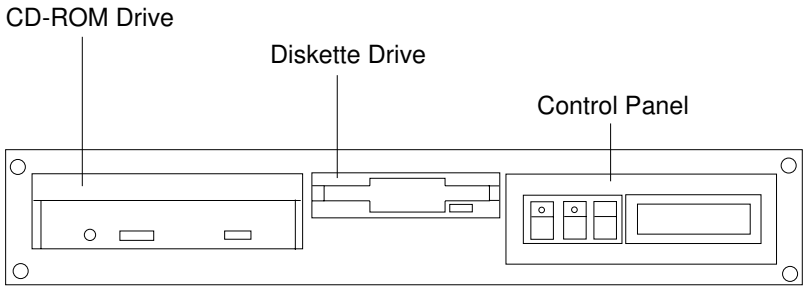


The AlphaServer 4000 system drawer contains the following components:

- CPU card cage containing the system motherboard, CPU modules, memory modules, and a system bus-to-PCI bus bridge module
- A PCI card cage containing a PCI motherboard and PCI and EISA modules
- An optional PCI card cage with a system bus-to-PCI bus bridge module (the optional PCI card cage contains only PCI modules)
- Power supplies and fans
- Control panel

In a cabinet system, the control panel is at the bottom front of the system drawer. In a pedestal system, the control panel is located at the top front of the enclosure.

Figure 1–11 AlphaServer 4000 Control Panel



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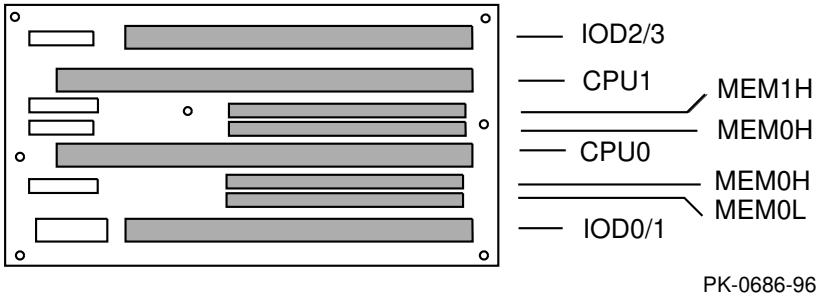
1.8.1 AlphaServer 4000 System Motherboard

The AlphaServer 4000 system motherboard has slots for the CPU, memory, and I/O bridge modules.

Figure 1–12 AlphaServer 4000 System Motherboard



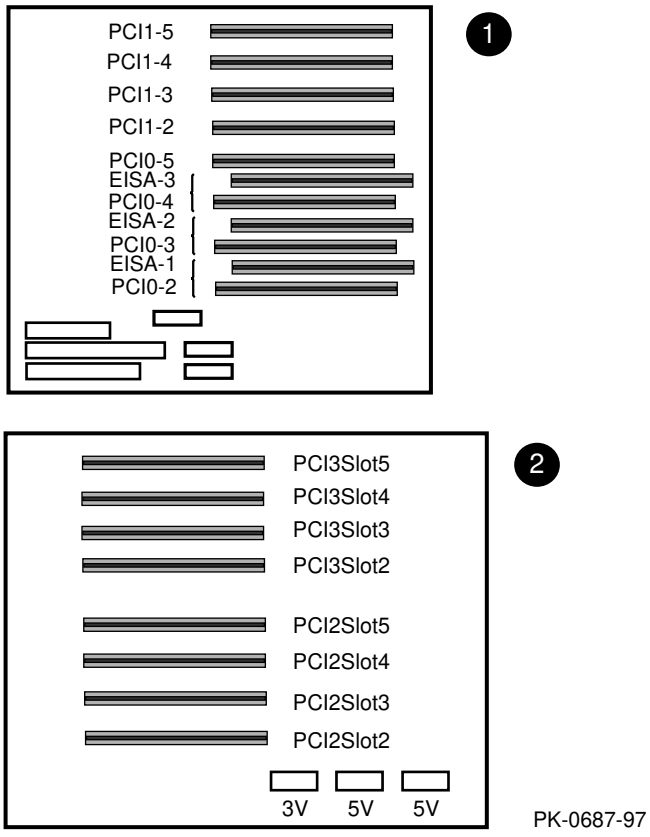
AlphaServer 4000 System Motherboard

- The system motherboard has slots for two processor modules.
- The first processor module must occupy slot CPU0.
- The system motherboard has slots for four memory modules (two memory pairs).
- Memory modules must be configured in matched pairs.
- When large memory pairs are configured with smaller memory pairs, the largest memory modules must be installed in the lowest order slots.
- The system motherboard has two slots for I/O.
- The power control module (PCM), located on the system motherboard, monitors voltages, CPU fan RPMs, system fan RPMs, and internal air temperature.

1.8.2 AlphaServer 4000 I/O Interface

The I/O interface consists of one system bus-to-PCI bus bridge module and a PCI motherboard. The bridge module is the logical and physical connection from the system motherboard to the PCI motherboard in the card cage. An optional PCI card cage is also available. The server control module provides ports for the console terminal, keyboard, mouse, and other components.

Figure 1–13 AlphaServer 4000 PCI Motherboards



AlphaServer 4000 I/O Interface Configuration Rules

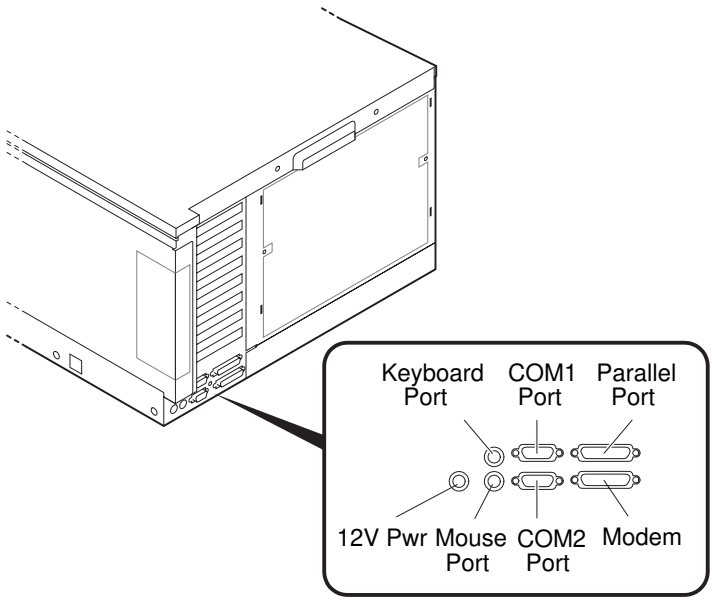
- The bridge modules connect the system motherboard to the PCI motherboard; they are in slots IOD0/1 and IOD2/3 on the system motherboard.
- The VGA module must be in a PCI0 slot.
- The base PCI card cage has a PCI motherboard with five slots for PCI options and three PCI/EISA combination slots.
- The optional PCI card cage has a PCI motherboard with eight slots for PCI options only.
- In a dual PCI card cage system, PCI motherboards support four PCI buses and one EISA bus.

Figure 1–13 shows the two PCI motherboards. At the rear of the system drawer, the base PCI motherboard (❶) is located at the left side of the drawer; the optional PCI motherboard (❷) is located at the right side.

Server Control Module

The server control module, located at the rear of the system drawer, has ports for the following devices: terminal (COM1), keyboard, mouse, printer, modem, 12V power, and an additional communications port (COM2).

Figure 1–14 Server Control Module Ports



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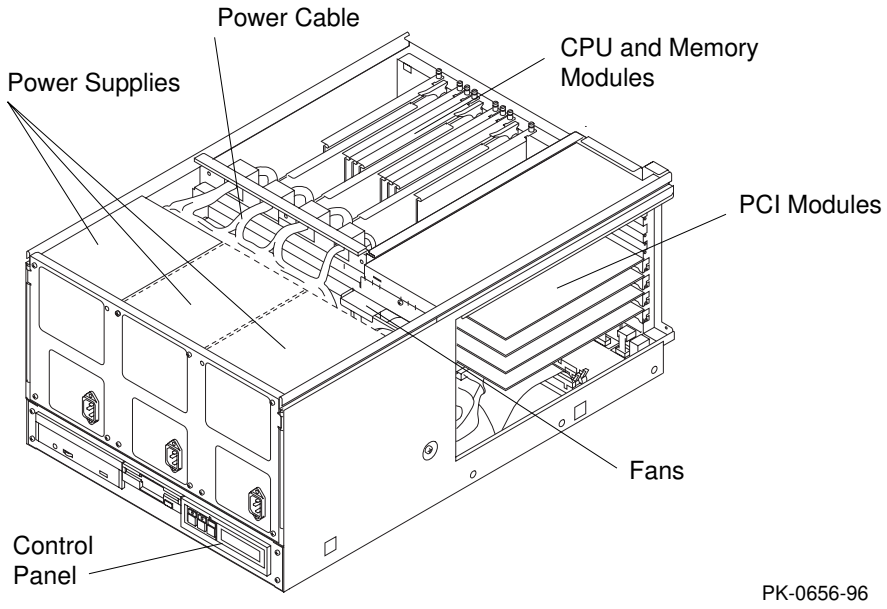
1.9 AlphaServer 4100 System Drawer

Figure 1–15 shows the components of the AlphaServer 4100 system drawer. See Section 1.9.1 for system motherboard configuration rules. See Section 1.9.2 for PCI motherboard configuration rules.

Figure 1–15 AlphaServer 4100 System Drawer Components

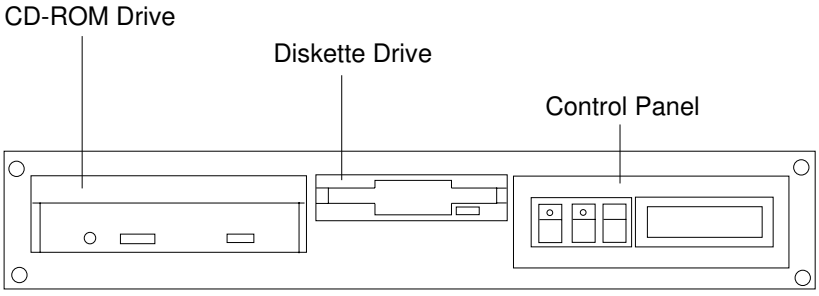


The AlphaServer 4100 system drawer contains the following components:

- CPU card cage containing the system motherboard, CPU modules, memory modules, and the system bus-to-PCI bus bridge module
- PCI card cage containing PCI motherboard and PCI and EISA modules
- Power supplies and fans
- Control panel

In a cabinet system, the control panel is at the bottom front of the system drawer. In the pedestal system, the control panel is located at the top front of the enclosure.

Figure 1–16 AlphaServer 4100 Control Panel



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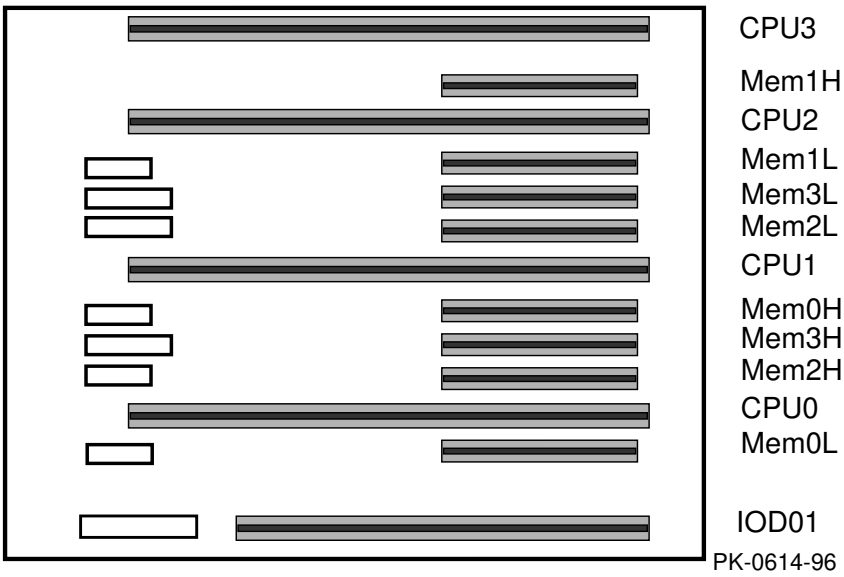
1.9.1 AlphaServer 4100 System Motherboard

The AlphaServer 4100 system motherboard has four processor slots, eight memory slots, and one I/O slot.

Figure 1–17 AlphaServer 4100 System Motherboard



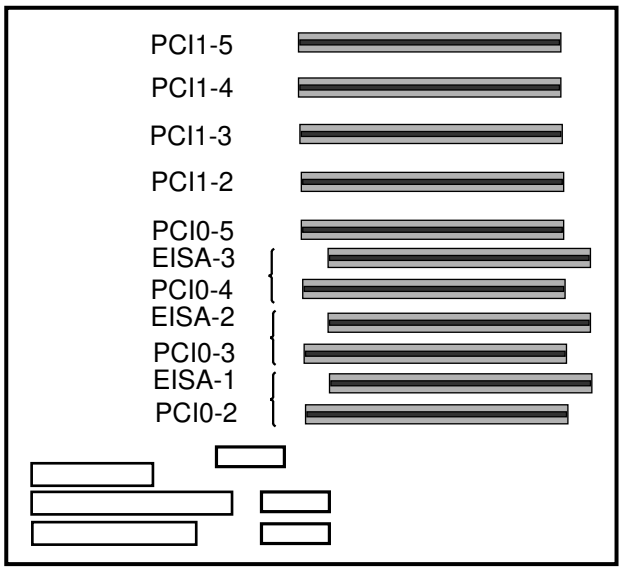
AlphaServer 4100 System Motherboard

- The system motherboard has slots for four processor modules.
- The first processor module must occupy slot CPU0.
- The system motherboard has slots for eight memory modules (four memory pairs).
- Memory modules must be configured in matched pairs.
- When large memory pairs are configured with smaller memory pairs, the largest memory modules must be installed in the lowest order slots.
- The system motherboard has one slot for I/O.
- The power control module (PCM), located on the system motherboard, monitors voltages, CPU fan RPMs, system fan RPMs, and internal air temperature.

1.9.2 AlphaServer 4100 I/O Interface

The I/O interface consists of the system bus-to-PCI bus bridge module and the PCI motherboard. The bridge module is the logical and physical connection from the system motherboard to the PCI motherboard. The server control module provides ports for the console terminal, keyboard, mouse, and other components.

Figure 1–18 AlphaServer 4100 PCI Motherboard



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I/O Interface Configuration Rules

- The bridge module connects the system motherboard to the PCI motherboard; it is in slot IOD0/1 on the system motherboard.
- The VGA module must be in a PCI0 slot.
- The PCI motherboard supports two PCI 64-bit buses and one EISA bus.

PCI and EISA Slots

As shown in Figure 1–18, the PCI motherboard has five dedicated PCI slots and three slot pairs with connectors for a PCI option and an EISA option. You can install an option into only one member of each pair. Maximum configurations are:

- Eight PCI options using the dedicated PCI slots and the PCI connectors in the three slot pairs. No EISA options can be installed with this configuration.
- Five PCI options using the dedicated PCI slots and three EISA options using EISA connectors on the three slot pairs.

NOTE: Multicard options, such as the CIPCA-AA storage adapter, which uses both one PCI and one EISA slot, or the CIPCA-BA, which uses two PCI slots, take up two of the eight available option slots.

Server Control Module

The server control module, located at the rear of the system drawer, has ports for the following devices: terminal (COM1), keyboard, mouse, printer, modem, 12V power, and an additional communications port (COM2). See Figure 1–14.

Chapter 2

Preparing the Cabinet

This chapter describes how to prepare the cabinet before installing system drawers and other components. Sections in this chapter include:

- Cabinet Environmental and Power Requirements
- Unpack and Check Cabinet
- Remove Cabinet from Pallet
- Stabilize the Cabinet
- Joining Two Cabinets

2.1 Cabinet Environmental and Power Requirements

Figure 2–1 shows the clearance area necessary for service access.

Figure 2–1 Cabinet Service Area

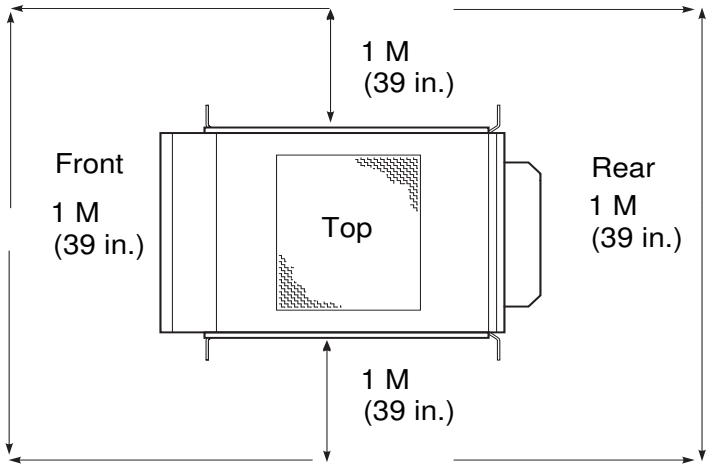

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Table 2–1 lists the environmental requirements. Table 2–2 lists the power requirements.

Table 2–1 Cabinet Environmental Specifications

Specification	Measurement
Operating temperature	10–35°C (50–95°F)
Relative humidity (noncondensing)	20–90%
Maximum operating altitude	3050 m (10,000 ft)
Minimum operating clearance	
Front	60 cm (24 in.)
Rear	60 cm (24 in.)

Table 2–2 Cabinet Power Requirements

Specification	Measurement
Maximum current rating	24 A
Operating voltage range	100–120 VAC (North American)
	220–240 VAC (Europe)
Maximum power consumption	Configuration-specific
Operating frequency range	50 Hz to 60 Hz

Tools Required

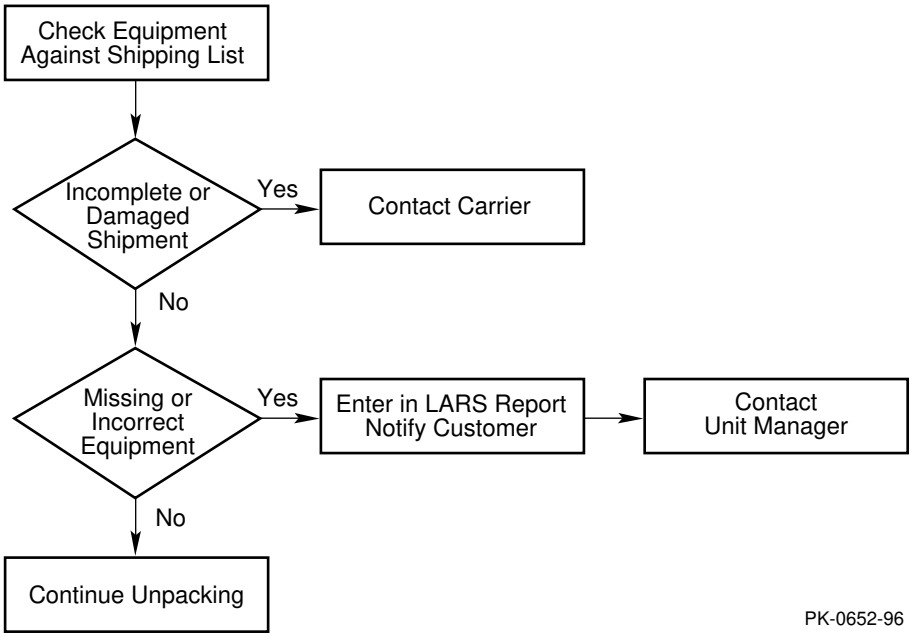
You will need the following tools to install components in the cabinet:

- Phillips screwdriver
- Adjustable wrench

2.2 Unpack and Check Cabinet

Check to ensure that all system equipment is at the installation site. Then, unpack the equipment.

Figure 2–2 Cabinet System Inventory



If you find a damaged container or package, notify the carrier.

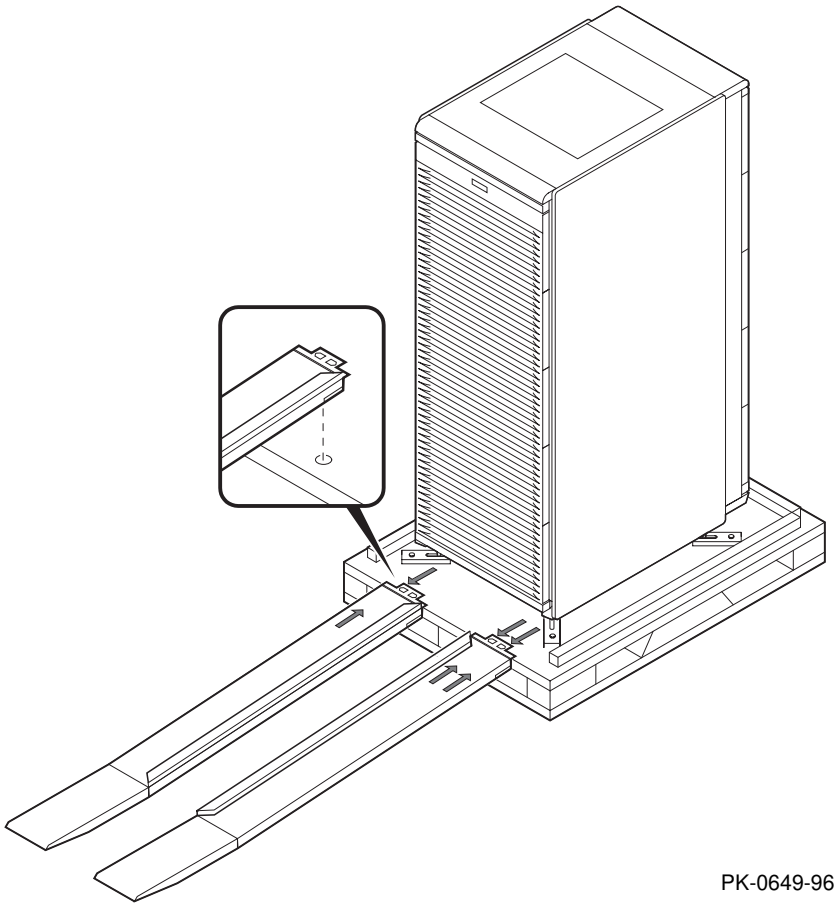
Compare items listed on the Product Delivery Document with the packing slip contained in a plastic envelope on the shipping box. Items should be compared throughout the installation procedure as boxes are unpacked and cabinets opened.

It is important to record information on damaged or opened containers on the Labor Activity Reporting (LARS) form.

2.3 Remove Cabinet from Pallet

Check the cabinet for external damage. Remove the four shipping brackets that attach the cabinet to the pallet. Insert the ramps on the front of the pallet and remove the cabinet.

Figure 2–3 Removal from Pallet



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WARNING: At least two people are required to remove the cabinet from the pallet.

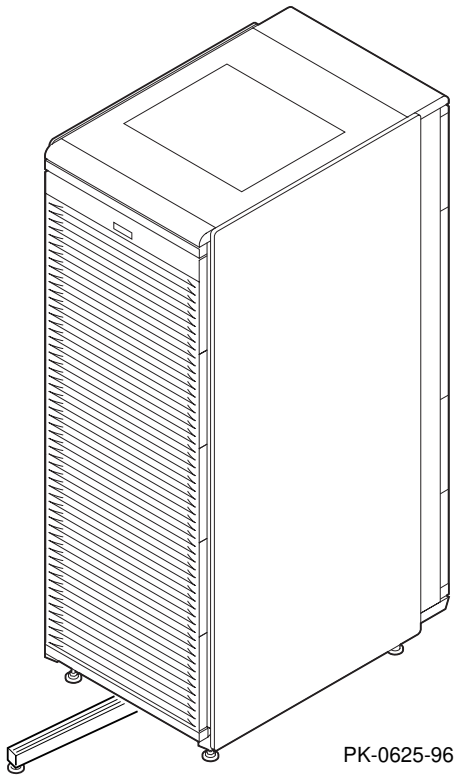
WARNING: Serious injury may result if the cabinet is improperly handled or proper safety conditions are not met.

1. Check the cabinet sides, top, and front and rear doors for damage. Report any damage to the cabinet to the customer and your unit manager. Stop unpacking until the customer gives you permission to continue.
2. Using an adjustable wrench, remove the four bolts and shipping brackets that hold the cabinet leveler feet to the pallet.
3. The leveler feet are lowered to the pallet surface for shipment. Using the adjustable wrench, raise the feet to the uppermost position before removing the cabinet from the pallet (see Figure 2–5).
4. Attach the ramps by fitting the prongs into the holes on the front of the pallet. Place the ramps so that the runners are on the inside. Align the arrows on the ramps and pallet.
5. With two people working together (one in front and one in back) slowly roll the cabinet off the pallet down the ramps. Move the cabinet into position.

2.4 Stabilize the Cabinet

The cabinet stabilizer bar is attached to the bottom of the cabinet. After removing the cabinet from the pallet, lower the cabinet leveler feet and then pull out the stabilizer bar.

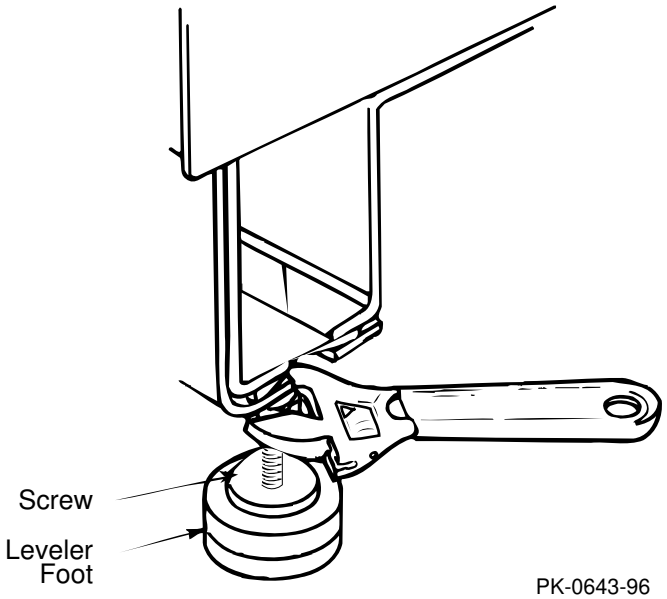
Figure 2–4 Using the Cabinet Stabilizer Bar



1. Using an adjustable wrench or your hand, lower and adjust the leveler feet (see Figure 2–5). Once the cabinet is level, lock each of the leveler feet in place by tightening the locknut at the top of each foot.
2. At the front of the cabinet, pull out the stabilizer bar from underneath the cabinet (see Figure 2–4). Adjust the leveler foot at the end of the stabilizer bar.

WARNING: Only DIGITAL Customer Service representatives or customer maintenance personnel who are familiar with computer hardware should slide system drawers out of the cabinet. Personnel should be experienced and trained in installing computers and related equipment. Before pulling a system drawer out, make sure that the stabilizer bar is fully extended; then adjust the leveler foot at the end of the bar so that it touches the floor.

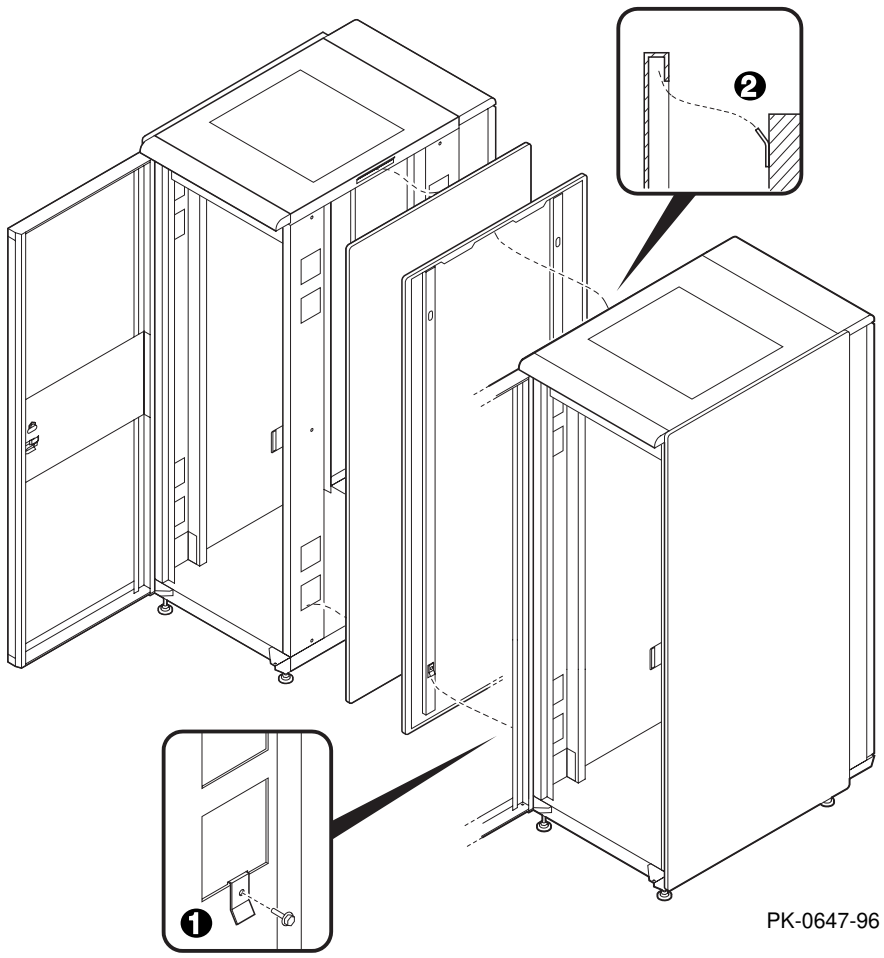
Figure 2–5 Leveler Foot Adjustment



2.5 Joining Two Cabinets

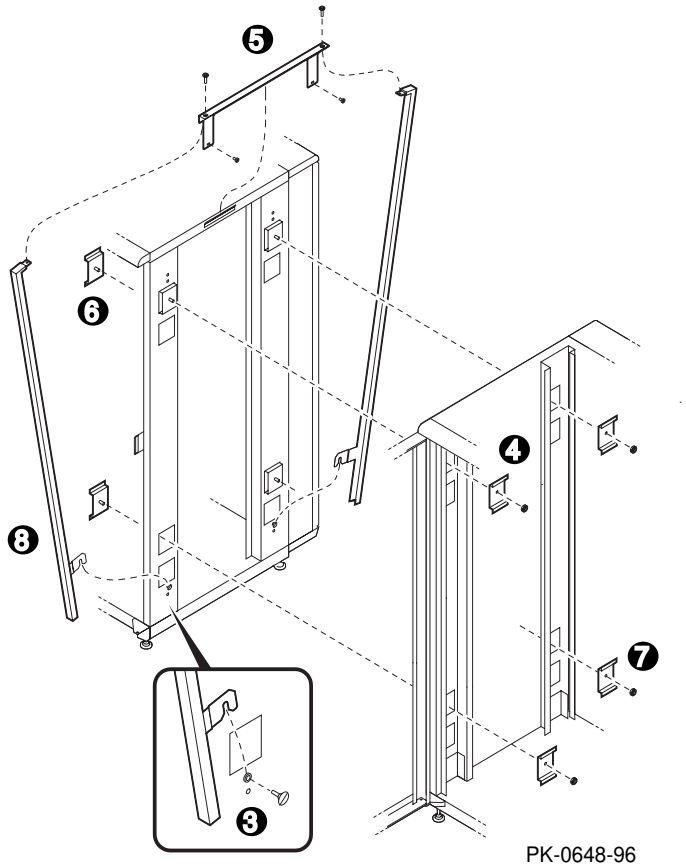
First, position the two cabinets side by side. Then, remove the inner side panels from each cabinet. Finally, install the joiner kit hardware and attach the cabinets together.

Figure 2–6 Side Panel Removal



1. Position the cabinets side by side.
2. To remove a side panel, remove the two M5 screws at the bottom front and rear of the cabinet (see ❶).
3. Remove the side panel by lifting it up and away from the cabinet. The side panel rests on the hanger bracket located at the top of the cabinet (see ❷).
4. Repeat steps 2 and 3 on the other cabinet. Install the keybuttons (see ❸).

Figure 2–7 Installing the Joiner Hardware



5. Install a black bracket at the upper front rail area in one cabinet (see ❹).
6. Install the top trim piece using two Phillips screws (see ❺).
7. Push the cabinets together.
8. Install a black bracket (❻) in the same area in the other cabinet. Attach the cabinets by bolting the brackets together.
9. Repeat the bracket installation at the space provided at the bottom rear of the cabinet (see ❼).
10. Install the front barrier piece by resting it on the keybutton (step 5) and attaching it to the cabinet top (see ❽).
11. Level the cabinets (see Figure 2–5).

Chapter 3

Preparing the Pedestal

This section gives environmental requirements and unpacking guidelines for the pedestal. Sections include:

- Pedestal Environmental and Power Requirements
- Unpack and Check Pedestal

3.1 Pedestal Environmental and Power Requirements

Figure 3–1 shows the clearance area necessary for service access.

Figure 3–1 Pedestal Service Area

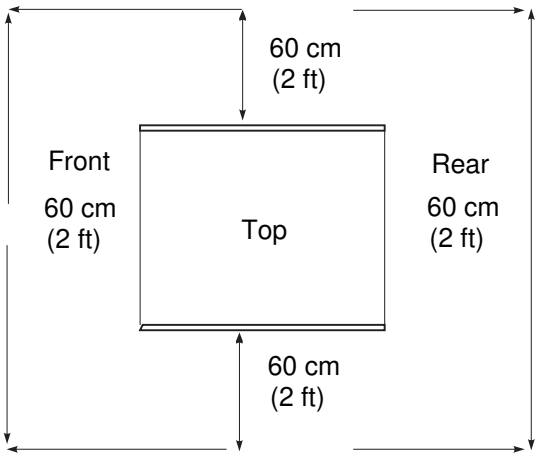


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Table 3–1 lists the environmental specifications. Table 3–2 lists the power requirements.

Table 3–1 Pedestal Environmental Specifications

Specification	Measurement
Operating temperature	10–35° C (50–95° F)
Relative humidity (noncondensing)	20–90%
Maximum operating altitude	3050 m (10,000 ft)
Minimum operating clearance	
Front	60 cm (2 ft)
Rear	60 cm (2 ft)

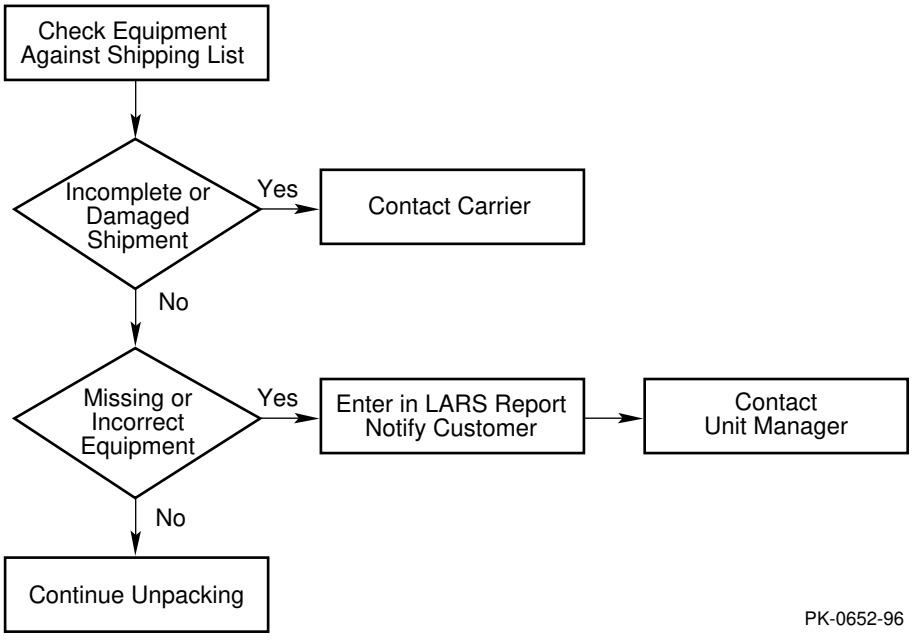
Table 3–2 Pedestal Power Requirements

Specification	Measurement
Maximum current rating	12 A (North American)
	10 A (Europe)
Typical power consumption	720 watts (AlphaServer 4100 system) 550 watts (AlphaServer 4000 system)
Operating voltage range	100–120/200–240 VAC
Operating frequency range	50 Hz to 60 Hz
AC power	100–120 V, 12 A, single phase (North America and Japan)
	200–240 V, 10 A, single phase (Europe)
Plug type	NEMA 5-15P (North America and Japan)

3.2 Unpack and Check Pedestal

Check to ensure that all system equipment is at the installation site. Then, unpack the equipment.

Figure 3–2 Pedestal System Inventory



If you find a damaged container or package, notify the carrier.

Compare items listed on the Product Delivery Document with the packing slip contained in a plastic envelope on the shipping box. Items should be compared throughout the installation procedure as boxes are unpacked and cabinets opened.

It is important to record information on damaged or opened containers on the Labor Activity Reporting (LARS) form.

Chapter 4

Installing Components in Cabinet

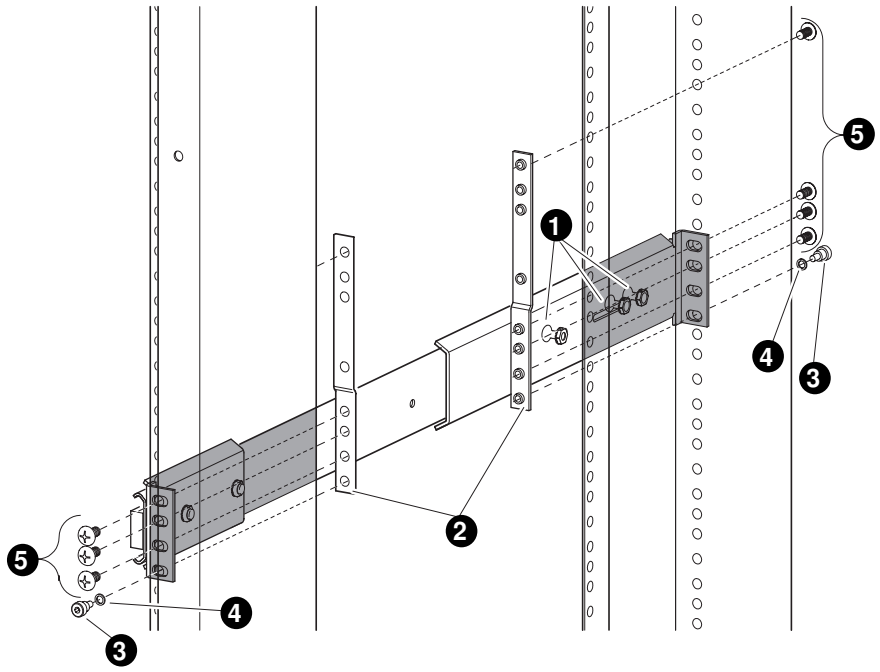
Some cabinet systems are shipped with factory-installed system drawers and StorageWorks shelves. However, both components may be ordered separately and slider rail kits are available when installing additional system drawers. This chapter provides guidelines for installing the system drawers and StorageWorks shelves in a cabinet. Sections include:

- Installing Slider Rails
- Installing the System Drawer
- Installing a StorageWorks Shelf

4.1 Installing Slider Rails

4.1.1 Attach Slide Assemblies to Cabinet Rails

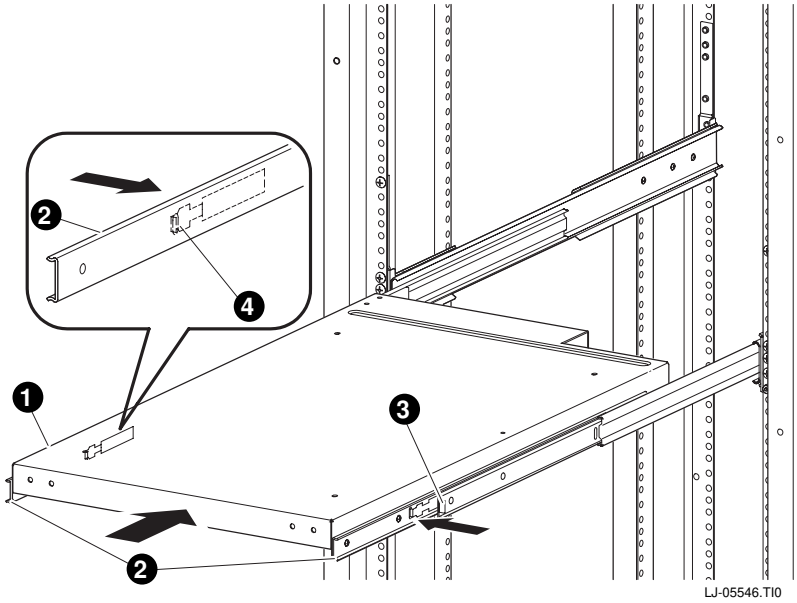
Figure 4–1 Attaching Slide Assemblies



1. Loosen the three screws and nuts ❶ securing the rear slide bracket to the slide assemblies (see Figure 4–1). This allows the length of the slide assemblies to be adjusted between the front and rear mounting rails.
2. Locate the right slide assembly.
3. Place the front slide bracket on the inside of the right front rail and align the holes from the bottom of the nut plate ❷ with the four slide bracket holes on the right front rail.
4. Install one screw ❸ and one washer ❹ to secure the front slide bracket to the right front rail. Do not tighten.
5. Place the rear slide bracket on the inside of the right rear rail and align the holes from the bottom of the nut plate ❷ with the four slide bracket holes on the right rear rail.
6. Install one screw and washer in the first hole to secure the rear slide bracket to the right rear rail. Do not tighten.
7. Install four truss-head screws ❺ to secure the rear slide bracket and nut plate to the right rear rail. Do not tighten.
8. Tighten the three pan-head screws and hexnuts ❶ that secure the right rear slide bracket to the right slide assembly.
9. Attach the left slide assembly to the left front and rear rails by repeating steps 1 through 8.
10. Tighten all screws only enough to allow play for the slides to align when the slide tray is installed in the cabinet.

4.1.2 Mount Slide Tray on Slides

Figure 4–2 Mounting the Slide Tray

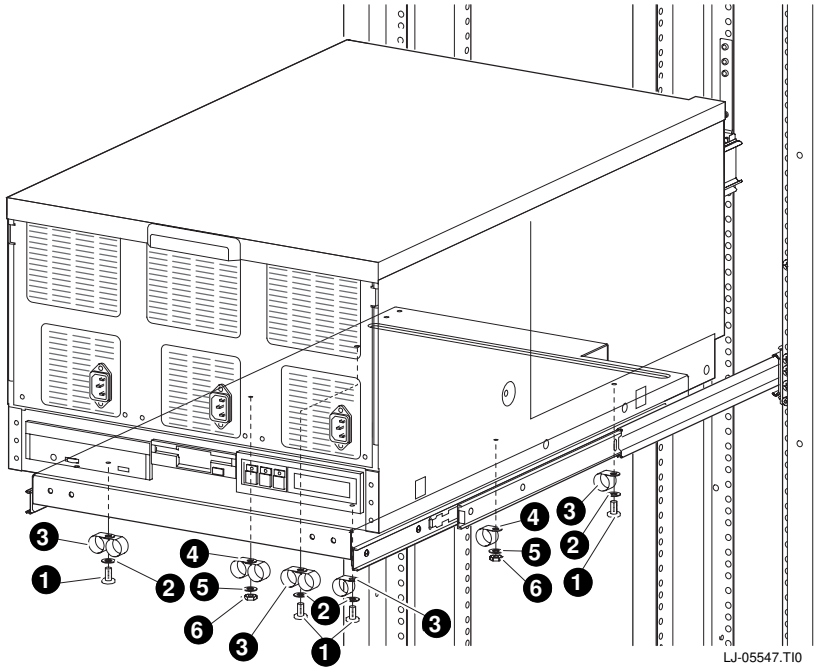


1. Fully extend the slides, then lift the slide tray ❶ and position it so that the inner races ❷ fit into the front end ❸ of the slides (see Figure 4–2).
2. Push the slide tray into the slides until it stops. Push in on the two locking levers ❹ if necessary and then push the slide tray into the cabinet.
3. Ensure the slide tray slides smoothly in and out of the cabinet.
4. Tighten the screws that secure each of the rear side brackets and nut plates to the rear rails.
5. Tighten the screws that secure each of the front side brackets and nut plates to the front rails.

4.2 Installing the System Drawer

4.2.1 Mount the System Drawer on Slide Tray

Figure 4–3 Mounting System Drawer on Slide Tray



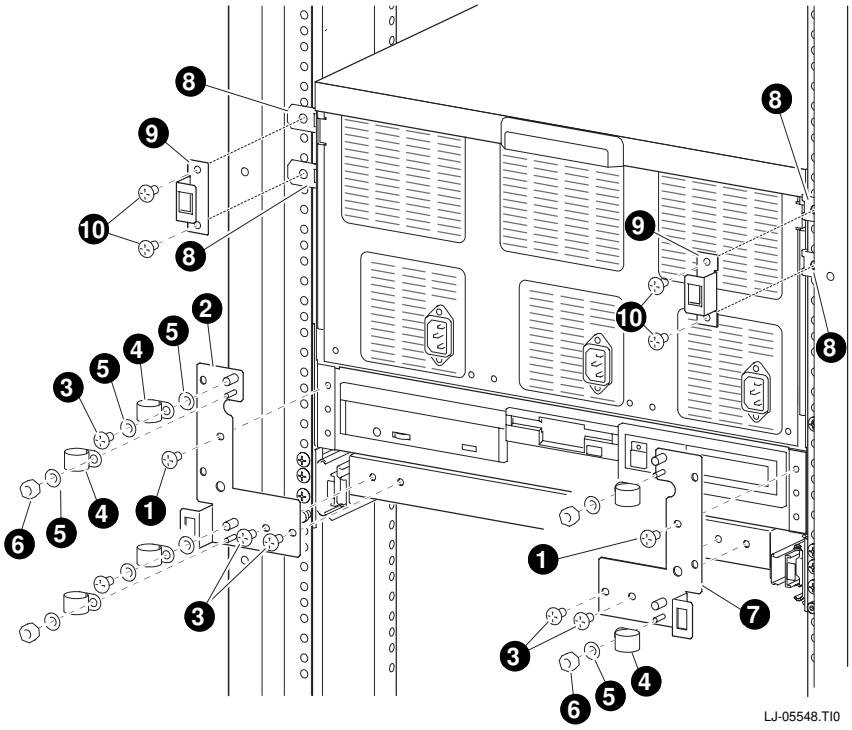
WARNING: Before mounting the system drawer on the slide tray, ensure that the cabinet stabilizer is in place.

WARNING: The system drawer, fully configured, weighs 45 kg (100 lbs). Two people are required to install the system drawer in the cabinet.

1. Extend the slide tray to its fully extended position. The slide locking levers lock when the slides are fully extended.
2. Lift the system drawer just above the slide tray and then move it back and onto the slide tray.
3. Carefully position the system drawer until the four mounting holes in the bottom of the drawer line up with the four mounting holes in the bottom of the slide tray.
4. Secure the drawer using four screws ❶ , flat washers ❷ , and cable clamps ❸. Two cable clamps go on each screw under the left side of the slide tray and one cable clamp goes on each screw under the right side of the slide tray.
5. Install the cable clamps ❹ on the two studs located underneath the slide tray on the left and right sides using flat washers ❺ and kepnuts ❻. Two cable clamps go on the left stud and one cable clamp goes on the right stud.

4.2.2 Attach the Brackets

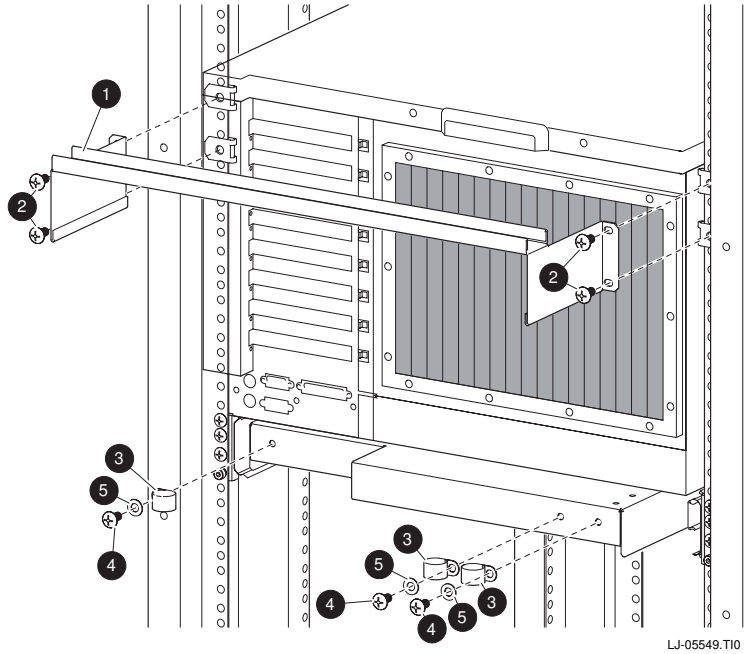
Figure 4–4 Attaching the Brackets



1. Remove the top screw ❶ on the left and right side of the system drawer control panel assembly (see Figure 4–4). Save the screws for later use.
2. Align the two holes at the bottom of the left catch bracket ❷ with the two holes in the left front edge of the slide tray.
3. Secure the left catch bracket to the slide tray with two truss-head screws ❸.
4. Secure the left catch bracket to the system drawer by replacing the screw removed in step 1.
5. Attach a cable clamp ❹ to each stud on the left catch bracket with flat washers ❺ and kepnuts ❻.
6. Attach a cable clamp to each standoff on the left catch bracket with flat washers and kepnuts.
7. Align the two holes at the bottom of the right catch bracket ❼ with the two holes in the right front edge of the slide tray.
8. Secure the right catch bracket to the slide tray with two truss-head screws.
9. Secure the right catch bracket to the system drawer by replacing the screw removed in step 1.
10. Attach a cable clamp to each of the studs on the right catch bracket with flat washers and kepnuts.

4.2.3 Install Cable Management Bracket

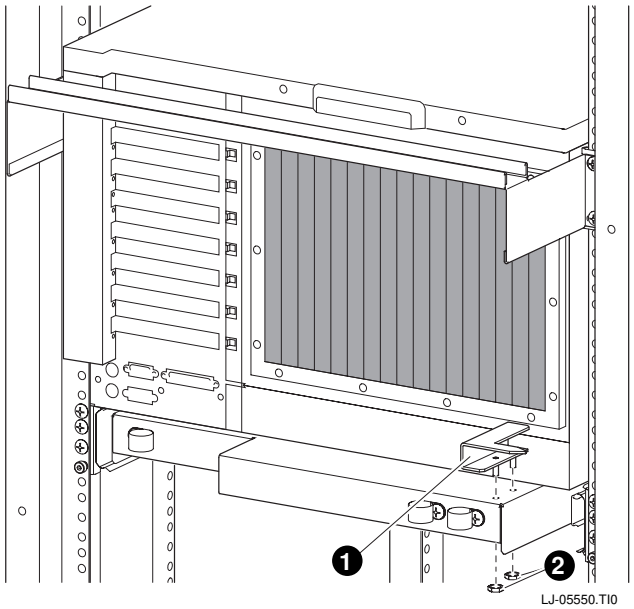
Figure 4–5 Installing Cable Management Bracket



1. At the rear of the cabinet, locate the bracket installation holes shown in Figure 4–5.
2. Install a U-nut over each hole. The thread of the U-nuts should face toward the inside of the cabinet.
3. Secure the cable management bracket ❶ to the rear rails by installing two truss-head screws ❷ on each rear rail.
4. Secure the three cable clamps ❸ to the rear edge of the slide tray with truss-head screws ❹ and flat washers ❺.

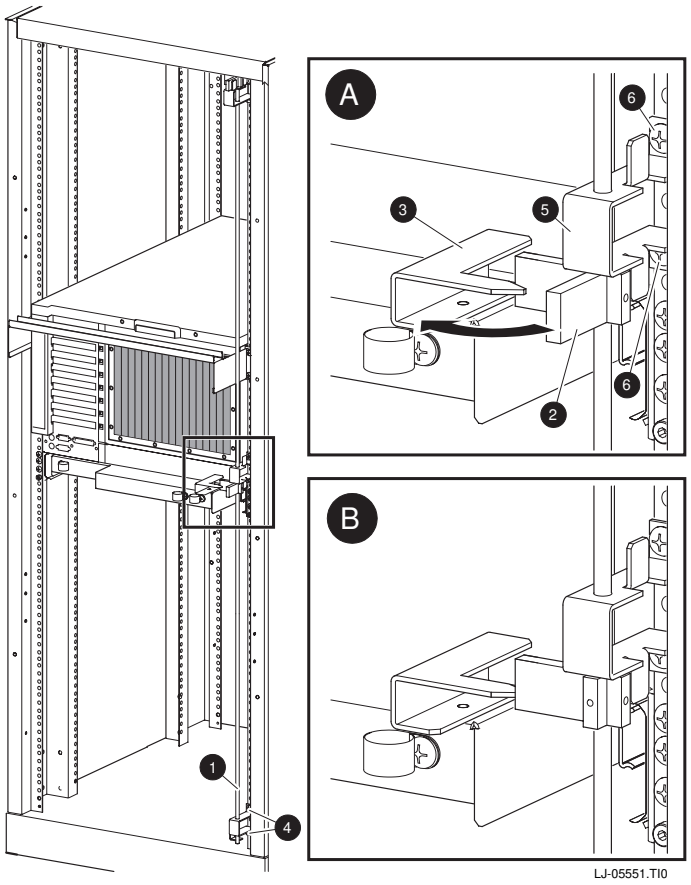
4.2.4 Install Interlock Actuator Assembly

Figure 4–6 Installing the Interlock Actuator



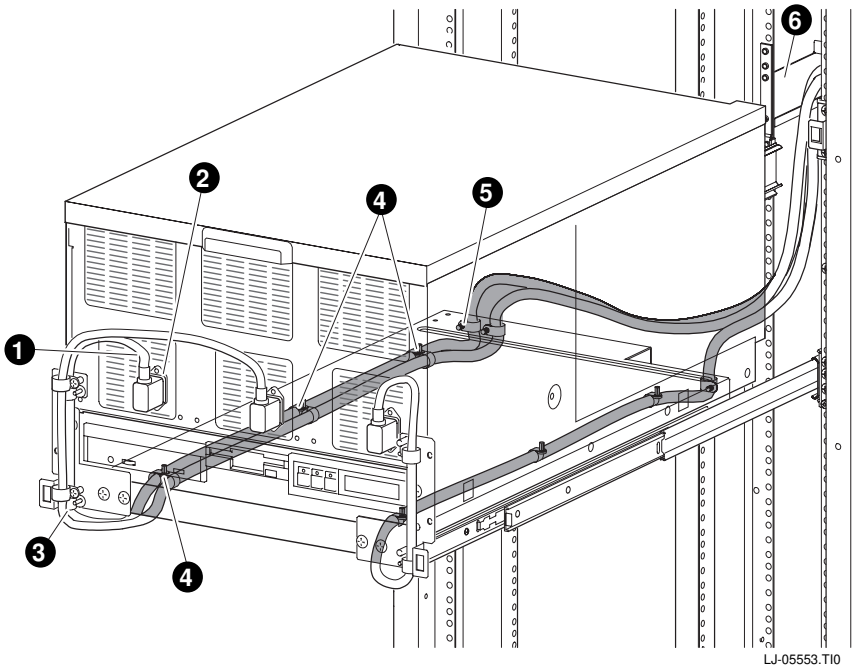
1. Mount the interlock actuator ❶ on the left rear of the slide tray using two kepnuts ❷ (see Figure 4–6).
2. Remove the screws securing the bottom mounting bracket ❹ (see Figure 4–7).
3. Slide the mounting bracket off the bottom of the vertical bar.
4. Slide the stabilizer bracket ❺ onto the bottom of the vertical bar.
5. Slide the actuator latch ❷ onto the bottom of the vertical bar.
6. Replace the bottom mounting bracket ❹ and install the screws removed in step 2. Do not tighten.
7. Secure the stabilizer bracket to the left rear rail with two truss-head screws ❻.
8. Position the actuator latch ❷ to properly engage the interlock actuator ❸, and tighten the two screws to secure the latch to the vertical bar.
9. Tighten the screws to secure the bottom mounting bracket.

Figure 4–7 Installing Stabilizing Bracket and Latch



4.2.5 Route the Power Cables

Figure 4–8 Routing Power Cables



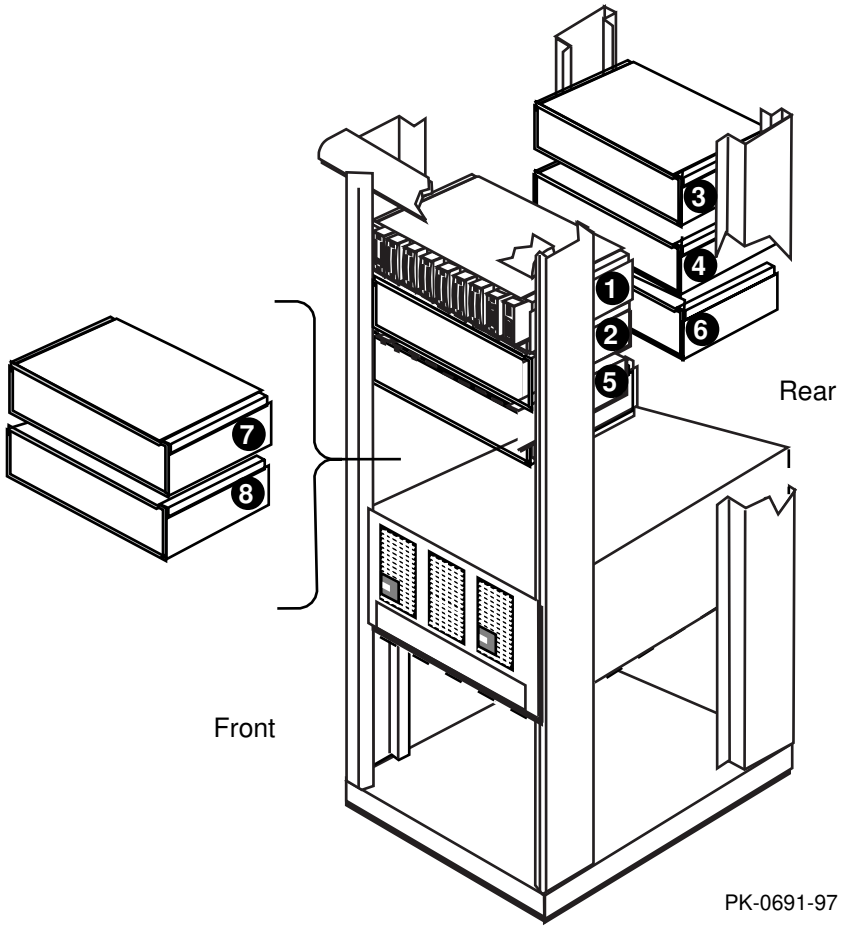
1. If necessary, remove the old power cables from the system. You must use the power cables shipped with the slider shelf assembly.
2. Fully extend the slide tray from the cabinet (see Figure 4–8).
3. Connect one end of the power cable(s) ❶ to the AC input receptacle(s) ❷ on the front of the system drawer.

   NOTE: When routing a power cable, you must remove the cable clamp, insert the cable in the clamp, and then reinstall it.
4. If the system has one power supply, route the power cable through the inside cable clamps ❸ on the left catch bracket.
5. If the system has a second power supply, route the power cable through the outside cable clamps on the left catch bracket.
6. Route the power cable through the cable clamps ❹ underneath the left side of the slide tray. Then route it through the two cable clamps on the left rear edge of the slide tray ❺.
7. Tie-wrap the cable to the cable management bracket ❻. Ensure that there is enough slack in the cable to prevent stress between the slide tray cable clamp and the cable management bracket.
8. If the system has a third power supply, route the power cable through the cable clamps on the right catch bracket. Then continue to route the cable as you did the others, using the cable clamps underneath the right side of the slide tray.

4.3 Installing a StorageWorks Shelf

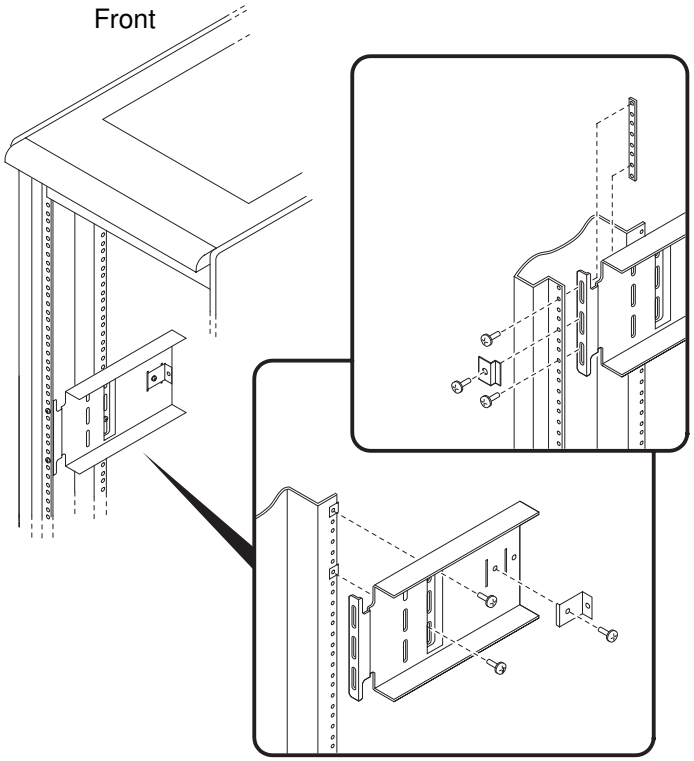
The number of StorageWorks shelves you can install depends on the number of system drawers in the cabinet. For example, there is space for eight StorageWorks shelves in a cabinet with one system drawer. See Figure 4–9.

Figure 4–9 Sample Cabinet Configuration



1. In the H910A cabinet, install the StorageWorks shelf mounting rails as shown in Figure 4–10.
2. Attach the U-nuts to the appropriate mounting holes.
3. Attach the mounting rail using two screws inserted into the two U-nut mounting holes.
4. Attach the front holding bracket and the two additional screws.
5. Attach the other holding bracket.
6. Install the StorageWorks shelf by sliding it onto the mounting rails.
7. Connect the shelf power cable to an AC power strip. Connect the shelf signal cable to the SCSI controller in the PCI card cage.

Figure 4–10 Installing Shelf Mounting Rails in H910A Cabinet



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Chapter 5

Installing StorageWorks Shelves in Pedestal

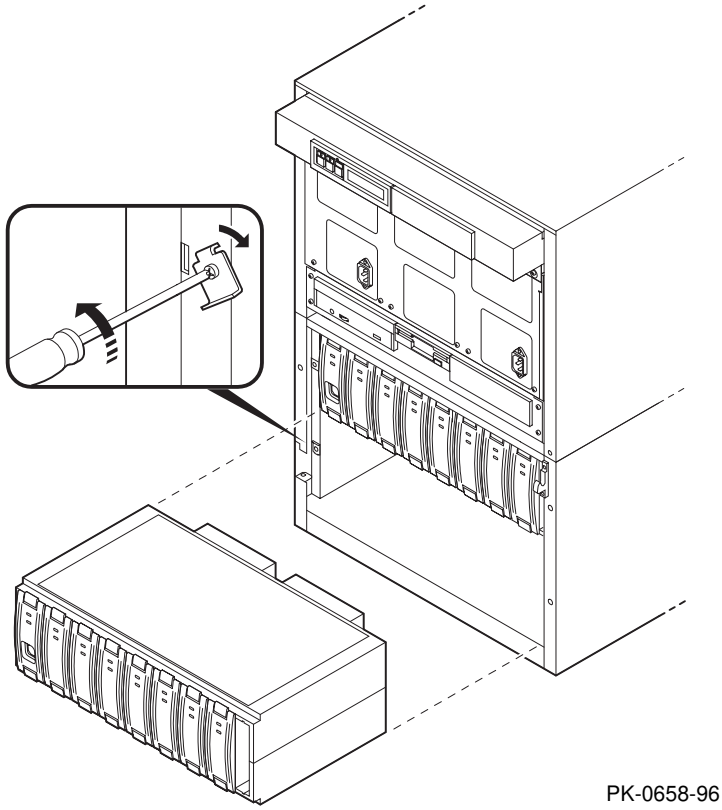
Up to three StorageWorks shelves can be installed in the pedestal.

- Install the StorageWorks Shelf

5.1 Install the StorageWorks Shelf

You can install a maximum of three StorageWorks shelves in a pedestal. There is space for two shelves in the front of the pedestal and one in the rear.

Figure 5–1 Installing a StorageWorks Shelf



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1. Remove the top cover from the pedestal.
2. Slide the StorageWorks shelf into the pedestal base (see Figure 5–1). The pedestal base contains three sets of support rails for the StorageWorks shelves.
3. Attach the shelf with the hardware included with the option.
4. Connect the StorageWorks signal cable to the PCI SCSI port.
5. Connect the StorageWorks power cable to the AC power strip.
6. Replace the top cover.

Chapter 6

Making Connections

This chapter describes how to connect system components and devices. Sections include:

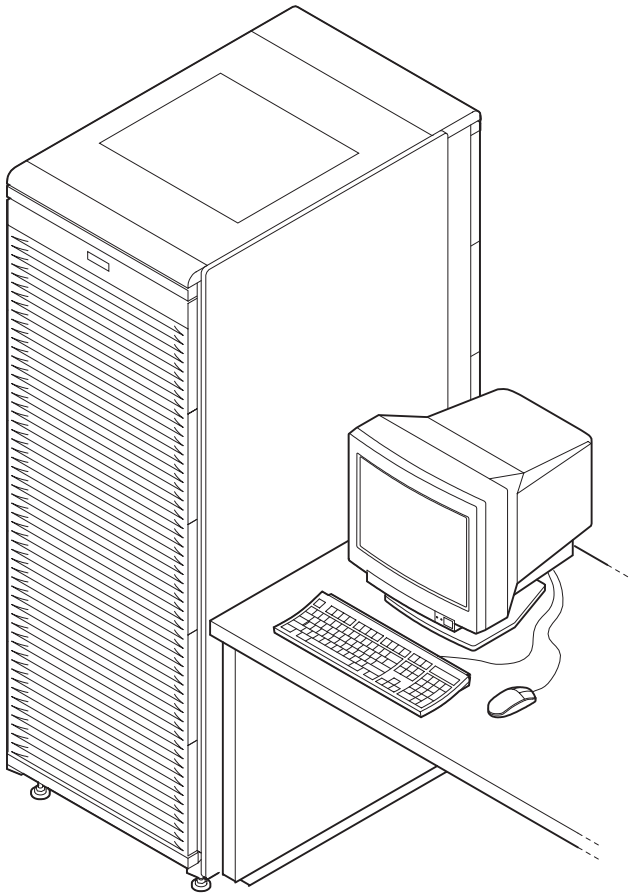
- Connecting a Serial Terminal [1]
- Connecting a Graphics Monitor
- Connecting the Remote Console Monitor
- Connecting the Ethernet Cable
- Connecting a StorageWorks Shelf

[1] This section shows a standard serial terminal. This terminal is connected to a single system drawer. Also available is the optional H4020-AA System Management Kit, a single terminal which mounts in the cabinet and can connect up to eight system drawers.

6.1 Connecting a Serial Terminal

Figure 6–1 shows the cabinet and a serial terminal. Connect the terminal to the COM1 port at the rear of the system drawer as shown in Figure 6–2. Keyboard, mouse, and printer ports are located near the console terminal port.

Figure 6–1 Cabinet and Console Terminal



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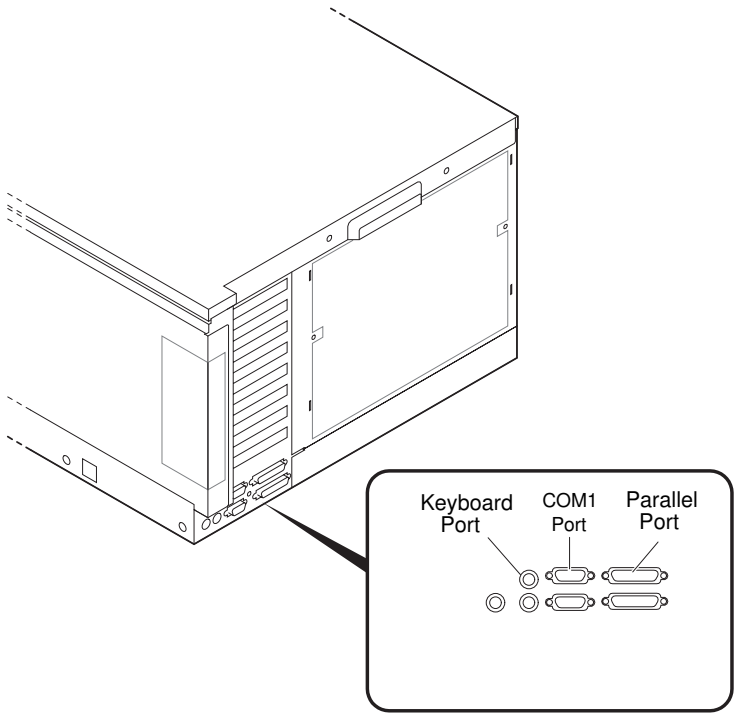
1. Unpack the serial terminal, if required. Locate the console terminal signal cable.
2. Connect one end of the cable to the COM1 port located at the rear of the system drawer (see Figure 6–2). Connect the other end of the cable to the console terminal, which connects to a 25-pin connector.
3. Connect the keyboard cable to the keyboard port at the rear of the serial terminal.
4. Connect the printer cable to the parallel port.

Figure 6–2 COM1, Serial Terminal Port



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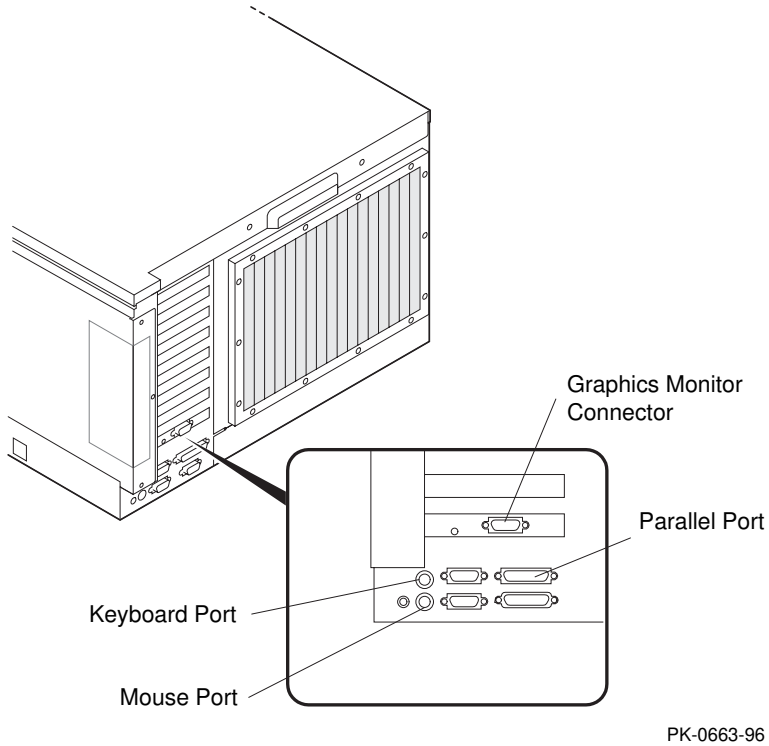
6.2 Connecting a Graphics Monitor

Figure 6–3 shows the ports used to connect a graphics monitor. You connect the graphics monitor to the VGA module in the PCI card cage. Keyboard, mouse, and printer ports are located at the rear of the system drawer.

Figure 6–3 Graphics Monitor Ports

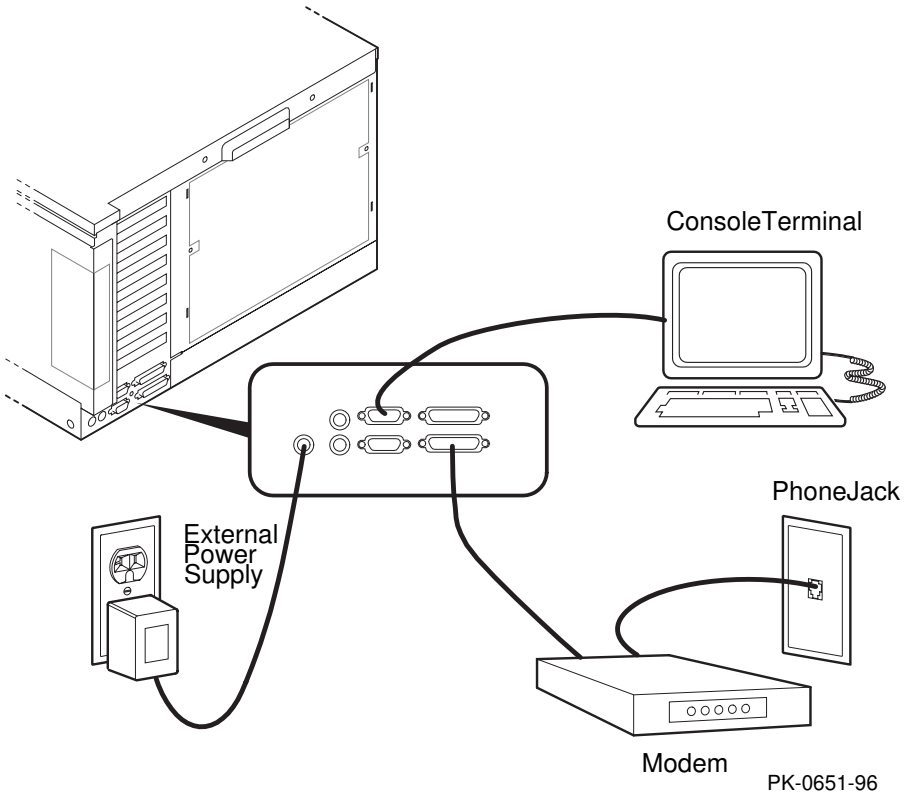


1. Unpack the graphics monitor, if required. Locate the signal cable.
2. Connect one end of the cable to the VGA port in the PCI card cage. Connect the other end of the cable to the graphics monitor, which connects to a 25-pin connector.
3. Connect the keyboard cable to the keyboard port at the rear of the system drawer.
4. Connect the mouse cable to the mouse port.
5. During power-up, you may want to capture the power-up display on a serial printer. To do this, connect a serial printer to the parallel port.

6.3 Connecting the Remote Console Monitor

Figure 6–4 shows the connections you make to enable the remote console monitor (RCM) in a pedestal system. The external 12V power supply is not required in cabinet systems. See the *System Drawer User's Guide* for instructions on how to operate the RCM.

Figure 6–4 Remote Console Monitor Connections

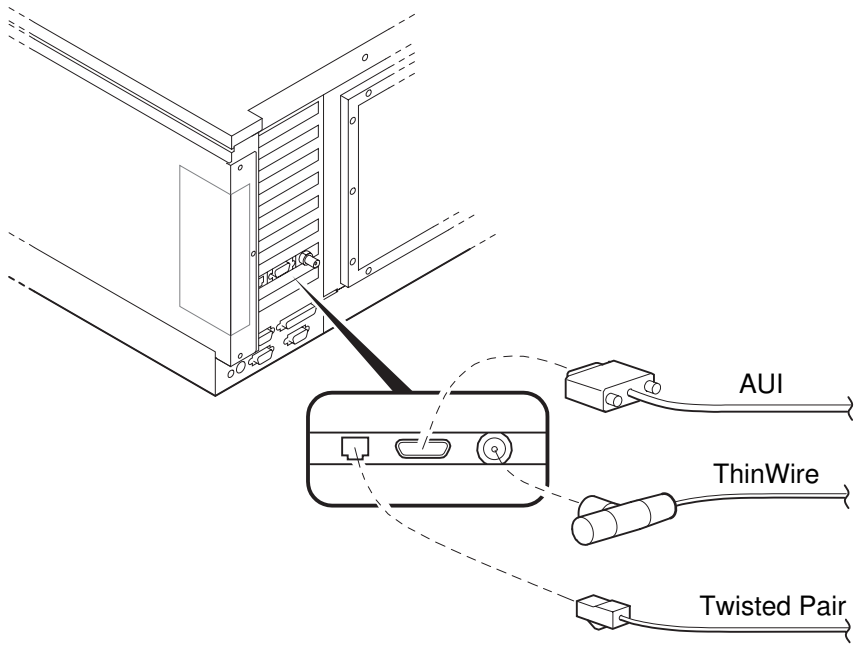


1. Connect the external power supply cable to the 12V power port (pedestal systems only). Connect the other end to a wall outlet (see Figure 6–4).
2. Connect the modem cable to the modem port. Connect the modem to a phone jack.

6.4 Connecting the Ethernet Cable

If the system includes an Ethernet port, connect the Ethernet cable to the I/O bulkhead and to the Ethernet transceiver. You can connect ThinWire, AUI, or twisted-pair Ethernet cables.

Figure 6–5 Ethernet Port

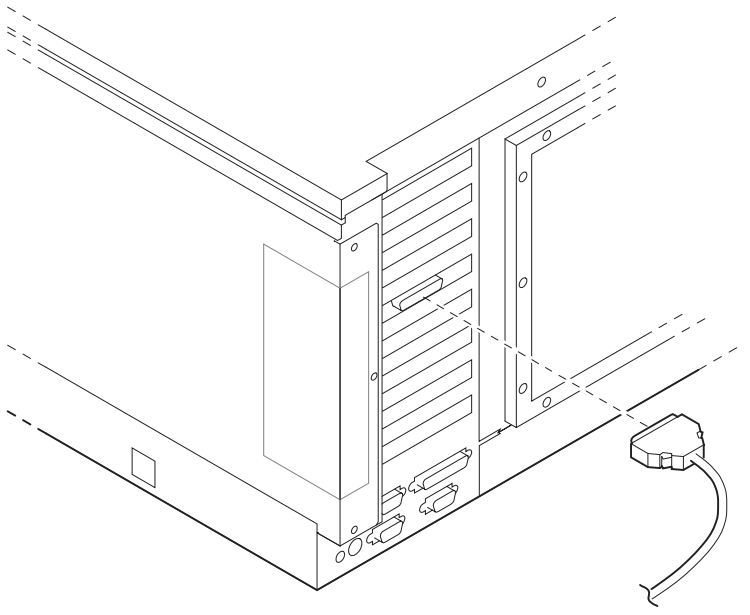


1. Connect the transceiver cable to the Ethernet port on the I/O bulkhead (see Figure 6–5).
2. Connect the other end of the cable to the Ethernet transceiver. See the appropriate Ethernet transceiver manual for more information.

6.5 Connecting a StorageWorks Shelf

When installing an additional StorageWorks shelf, connect the power cable to an AC power strip; connect the signal cable to the SCSI controller at the I/O bulkhead. See Chapter 1 for cabinet and pedestal configuration guidelines.

Figure 6–6 SCSI Port



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1. Connect the StorageWorks power cable to an AC power strip.
2. Connect the StorageWorks signal cable to the I/O bulkhead at the rear of the system.

Chapter 7

System Power-Up and Verification

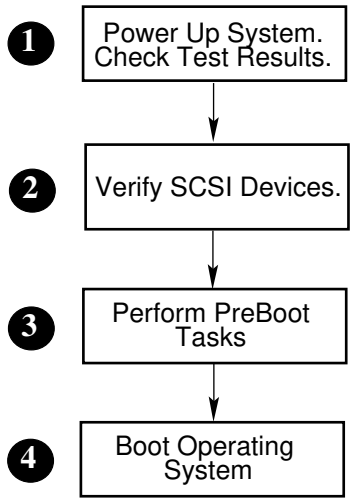
This chapter provides an overview of the power-up procedure, LED checks, and booting. Sections include:

- Verification Overview
- Turn On Power
- Check Power-Up Test Results
- If Power-Up Fails
  - Check Control Panel Message
  - Check Module LEDs
  - Check Cabinet Power and Fan LEDs
- Show Commands for Installation
- Preboot Tasks
  - Setting Environment Variables (EVs)
  - Running ECU
  - Running Utility Programs
  - Updating Firmware
- Booting OpenVMS or DIGITAL UNIX
- Booting Windows NT

7.1 Verification Overview

Use the following procedure to verify the system after installation.

Figure 7–1 Verification Procedure



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❶ When the system powers up, tests run. Verify that all tests have passed by checking the results in the test display.

❷ Enter the **show device** command and then check the output against the physical SBBs (storage building blocks).

❸ Perform preboot tasks such as setting environment variables and running ECU (EISA Configuration Utility), RCU (RAID Configuration Utility), and LFU (Loadable Firmware Update).

❹ Boot the operating system.

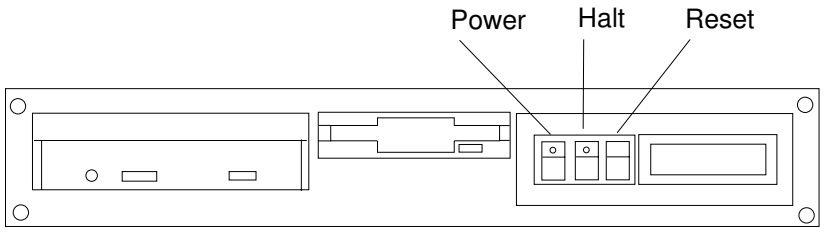
NOTE: Check all power cable connections from the system components to the AC power controllers. Make sure that both AC power controller circuit breakers are On.

NOTE: Before you power up the system, you may want to connect a printer to the parallel port (located at the rear of the system drawer) to capture the power-up test results.

7.2 Turn On Power

Check all power cable connections. Check that the AC power controller circuit breakers are On. Press in the Halt button on the system drawer control panel to force halting at the SRM console prompt. Then, press the Power button. See Figure 7–2.

Figure 7–2 Control Panel



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1. Press in the control panel Halt button to force the SRM console (this will override the SRM console **os_type** environment variable setting). The Halt button LED lights when pressed in.
2. Press the Power button to power up the system. The Power button LED lights when pressed in.

7.3 Check Power-Up Test Results

After powering up the system, testing begins and status messages display on the console terminal and on the control panel display. Check the test results on the console terminal. Example 7–1 shows a sample display of test results.

Example 7–1 Test Results

```
 SROM V2.0 on cpu0 ❶                #This section displays
 SROM V2.0 on cpu1                  #on serial terminals
XSROM V2.0 on cpu1 ❷                #only.
XSROM V2.0 on cpu0
BCache testing complete on cpu1 ❸
BCache testing complete on cpu0
mem_pair0 - 128 MB ❹
mem_pair1 - 128 MB
20..20..21..21..23..24..24.. ❺
Memory testing complete on cpu1
Memory testing complete on cpu0
```

```
starting console on CPU 0 ❻         #This section displays
sizing memory                       #on both serial and
  0    128 MB SYNC ❼                #graphics terminals.
  1    128 MB SYNC
starting console on CPU 1 ❽
probing IOD1 hose 1 ❾
  bus 0 slot 1 - NCR 53C810
  bus 0 slot 2 - DEC KZPSA
  bus 0 slot 3 - NCR 53C810
  bus 0 slot 4 - DECchip 21040-AA
  bus 0 slot 5 - DEC PCI MC
probing IOD0 hose 0
  bus 0 slot 1 - PCEB
  bus 0 slot 4 - DEC PCI FDDI
  bus 0 slot 5 - PBXGA-AA

configuring I/O adapters... ❿
  ncr0, hose 1, slot 1, bus 0
  kzpsa0, hose 1, slot 2, bus 0
  ncr1, hose 1, slot 3, bus 0
  tulip0, hose 1, slot 4, bus 0
  floppy0, hose 0, slot 0, bus 1
  pfi0, hose 0, slot 4, bus 0
```

```
System temperature is 24 degrees C ①
AlphaServer 4100 Console V2.0-1, 24-JUL-1996 10:47:18 ②

P00>>>
```

*NOTE: If the console and the system are configured in graphics mode (SRM **console** environment variable (EV) is set to **graphics**), test information covered by callouts ❶ through ❻ will not display. If the SRM console EV **os_type** is set to **NT**, the Windows NT AlphaBIOS console will be loaded by the SRM console, unless the control panel Halt button is depressed. If this is the case, the SRM console ignores the **os_type** setting and halts when the SRM power-up initialization and configuration is completed.*

❶ SRM code runs on each CPU. The processor chips are tested and the path to the system flash ROM is verified. Each CPU then loads XSROM from the system flash ROM.

❷ XSROM prints banner if it is successfully loaded and started.

❸ XSROM performs local B-cache initialization and testing on each CPU.

❹ XSROM sizes memory via the system IIC bus.

❺ Each CPU participates in memory initialization and testing.

❻ XSROM loads the SRM system console from system flash ROM.

❼ Console starts on the primary CPU and proceeds to re-size memory.

❽ The primary CPU, running console, signals each secondary (running XSROM) to start console.

❾ The primary CPU probes each PCI bus and the EISA bus to size the system.

❿ The primary CPU configures and initializes those I/O adapters requiring initialization.

① The system temperature is reported.

② The console displays its version banner and console prompt.

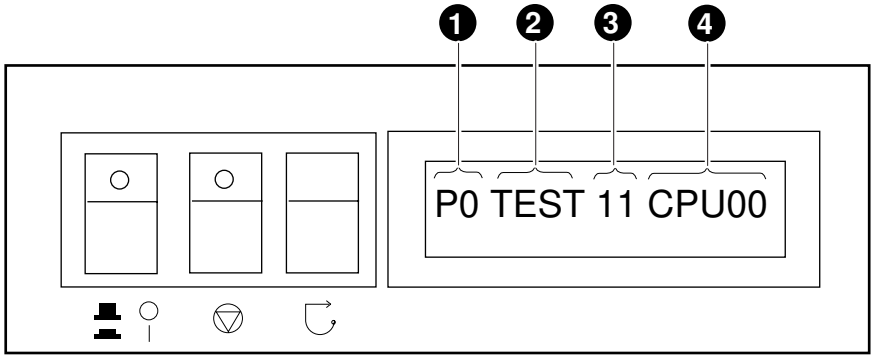
For a more detailed description of the test results, see the *System Drawer User's Guide.*

7.4 If Power-Up Fails

7.4.1 Check Control Panel Message

If the console prompt does not appear after test results, check the control panel message. Figure 7–3 shows the four display fields. Table 7–1 lists the description of each field.

Figure 7–3 Control Panel Display



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The control panel has a LED display (to control brightness, adjust the potentiometer located above the control panel Reset button). Status messages are displayed during power-up testing. Test failure information is also displayed.

NOTE: If an error occurs, you may need to reset the system and observe the display since display error messages are visible for approximately 4 seconds before power-up initialization and testing continues.

NOTE: If nothing is displayed on the control panel display and/or the serial display terminal, check the module LEDs (see Section 7.4.2). In cabinet systems, check the power and fan LEDs (see Section 7.4.3).

Table 7–1 Control Panel Display

Field	Content	Display	Meaning
❶	CPU number	P0–P3	CPU reporting status
❷	Status	TEST	Tests are executing
		FAIL	Failure has been detected
		MCHK	Machine check has occurred
		INTR	Error interrupt has occurred
❸	Test number (for DIGITAL use only)		
❹	Suspected device	CPU0–3	CPU module number [1]
		MEM0–3 and L, H, or *	Memory pair number and low module, high module, or either [2]
		IOD0	Bridge to PCI bus 0 [3]
		IOD1	Bridge to PCI bus 1 [3]
		IOD2	Bridge to PCI bus 2 [4]
		IOD3	Bridge to PCI bus 3 [4]
		FROM0	Flash ROM [5]
		COMBO	COM controller [5]
		PCEB	PCI-to-EISA bridge [5]
		ESC	EISA system controller [5]
		NVRAM	Nonvolatile RAM [5]
		TOY	Real-time clock [5]
		I8242	Keyboard and mouse controller [5]

[1] CPU module

[2] Memory module

[3] Bridge module (PCI 0 & 1)

[4] Bridge module (PCI 2 & 3) (16-PCI slot drawer only)

[5] PCI motherboard

7.4.2 Check Module LEDs

Figure 7–4 shows the CPU, bridge module, and power control module LEDs. Table 7–2 lists LED status following a successful power-up. You can see all module LEDs from the rear of the system drawer. For more information on troubleshooting procedures, see the *AlphaServer 4000/4100 Service Manual*.

Figure 7–4 Module LEDs

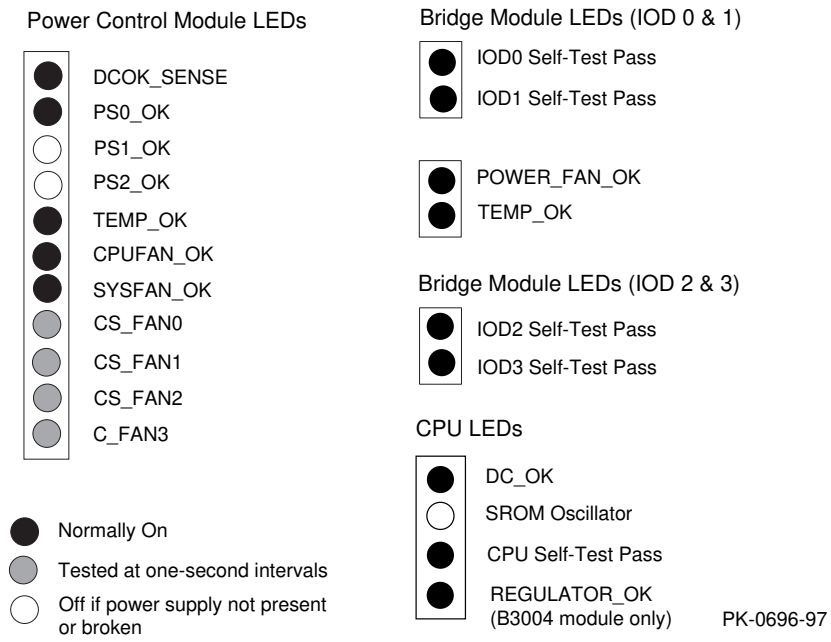

Table 7–2 Module LEDs on Power-Up

LED	Power-Up State	Description
CPU Module		
DC OK	On	DC power is OK.
SROM Oscillator	Off	SROM loaded into processor.
CPU Self-Test Pass	On	Processor chip passed SROM tests.
REGULATOR_OK	On	Regulator is working.
Base Bridge Module		
IOD0 Self-Test Pass	On	Bridge module passed SROM tests.
IOD1 Self-Test Pass	On	Bridge module passed SROM tests.
Optional Bridge Module		
IOD2 Self-Test Pass		
IOD3 Self-Test Pass		
POWER FAN OK	On	Power fan is running.
TEMP OK	On	Bridge module temperature is OK.
Power Control Module		
DCOK SENSE	On	DC power is okay.
PS0 OK	On	First power supply is operating.
PS1 OK	On (if present)	Second power supply is operating.
PS2 OK	On (if present)	Third power supply is operating.
TEMP OK	On	Temperature is OK.
CPUFAN OK	On	CPU fans are OK.
SYSFAN OK	On	System fans are OK.
CS FAN0	Blinking	Fan is OK.
CS FAN1	Blinking	Fan is OK.
CS FAN2	Blinking	Fan is OK.
C FAN3	Blinking	Fan is OK.

If a system drawer does not power up, the problem may be a disconnected power cord, a fan, or a cover interlock. Check the following:

- In a pedestal system, is the AC power strip breaker on?
- In a cabinet system, is the AC input box breaker on? Are the cabinet fans running? Check the green FAN LED on the fan tray. Is it on?
- Is the system drawer power cord(s) plugged into the AC power strip?
- Are the covers on the system drawer closed and the interlocks engaged? The cover interlocks must be engaged to enable power-up.

7.4.3 Check Cabinet Power and Fan LEDs

A fan tray with three exhaust fans is located at the top of the cabinet. The fans are powered by a power supply in the fan tray. A power LED and a fan LED are located on the fan tray front panel. Figure 7–5 shows the panel LEDs. See the *AlphaServer 4000/4100 Service Manual* for troubleshooting information on the cabinet fan tray.

Figure 7–5 Cabinet LEDs

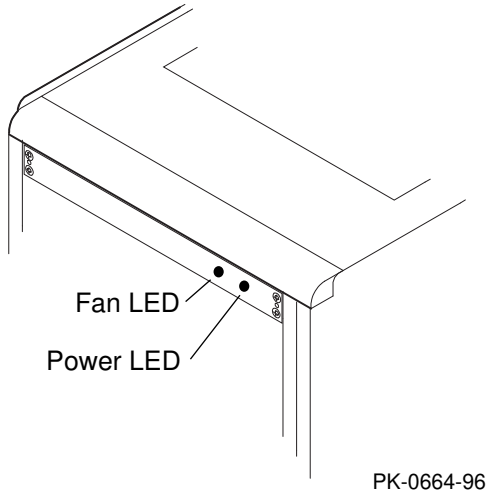

Table 7–3 Cabinet Power and Fan LEDs

LED	Power-Up State	Description
Power	On	Fan tray power is okay.
	Off	Fan tray power supply is broken, or there is an AC power problem.
Fan	Off	Fans are okay.
	Blinking	Replace malfunctioning fan.

7.5 Show Commands for Installation

Use show commands to obtain information on the system configuration and power status.

Example 7–2 Show Configuration

```
P00>>> show config❶
                          Digital Equipment Corporation
                                AlphaServer 4100

 Console V2.0-1       OpenVMS PALcode V1.18-8, Digital UNIX PALcode
V1.21-12

 Module                          Type     Rev    Name
 System Motherboard              0        0000   mthrbrd0
 Memory  128 MB SYNC             0        0000   mem0
 Memory   64 MB SYNC             0        0000   mem1
 CPU (1MB Cache)                 1        0000   cpu0
 CPU (1MB Cache)                 1        0000   cpu1
 Bridge (IOD0/IOD1)              600      0021   iod0/iod1
 PCI Motherboard                 8        0000   saddle0


 PCI0 (IOD0)
 Slot   Option Name              Type     Rev    Name
 1      PCEB                     4828086  0004   pceb0
 4      DEC PCI FDDI             f1011    0000   pfi0
 5      PBXGA-AA                 41011    0003   tga0


 eisa0 (EISA connected to pceb0)
 Slot   Option Name              Type     Rev    Name


 PCI1 (IOD1)
 Slot   Option Name              Type     Rev    Name
 1      NCR 53C810               11000    0002   ncr0
 2      DEC KZPSA                81011    0000   kzpsa0
 3      NCR 53C810               11000    0002   ncr1
 4      DECchip 21040-AA         21011    0023   tulip0
 5      DEC PCI MC               181011   008B   mc0
P00>>>
```

Example 7–3 Show Power

```
P00>>> show power❷

                    Status
Power Supply 0       good
Power Supply 1       not present
Power Supply 2       good
System Fans          good
CPU Fans             good
Temperature          good

The system was last reset via a system software reset

0 Environmental events are logged in nvram
P00>>>
```

❶ Use the **show configuration** command to see a listing of the modules in the system. This command shows the module motherboard or PCI slot number, module name, module type, revision, mnemonic, and the self-test status of PCI and EISA modules. In this example, all PCI and EISA modules passed (+) self-test.

❷ The **show power** command displays status information on the power supplies, system fans, CPU fans, and system temperature.

For more information on the show commands, see the *System Drawer User's Guide.*

7.6 Preboot Tasks

7.6.1 Setting Environment Variables

If you are running DIGITAL UNIX or OpenVMS, you may want to check the settings for several environment variables (EVs) to see if they match your configuration. For example, the os_type for DIGITAL UNIX and OpenVMS should be set to unix/vms. Example 7–4 shows other environment variables you may want to set.

Example 7–4 Setting Environment Variables

```
P00>>> show envar❶              #Enter this command to show EV
                                #settings.

      [EV settings are displayed]

P00>>> set os_type❷             #Sets the EV for your operating system.
P00>>> set ew*0_mode❸           #Sets the Ethernet device type.
P00>>> set pk*0_fast❹           #Sets the speed for fast SCSI devices.
P00>>> set bootdef_dev❺         #Sets the boot device.
P00>>> set boot_osflags❻        #Sets the boot flags.
P00>>> set console❼             #Sets the console type to serial or
                                #graphics.
```

❶ Enter the **show envar** command to display EV settings.

❷ The commands **set os_type openvms** or **set os_type unix** selects the corresponding operating system (OpenVMS or UNIX) and the corresponding SRM console. The command **set os_type nt** selects the AlphaBIOS console and Windows NT becomes the default operating system. The **os_type** EV takes effect only after a subsequent reset or power-up.

❸ The **ew*0_mode** environment variable is used to set an Ethernet controller to run an AUI, ThinWire, or twisted-pair Ethernet network. For example, issuing a **set ew*0 bnc** selects the ThinWire device type.

❹ Entering **set pk*0_fast** enables fast SCSI mode. Other possible pk*0 EVs include **pk*0_host_id**, which specifies the default value for a controller host bus node ID, and **pk*0_soft_term**, which enables or disables SCSI terminators on systems that use the QLogic ISP1020 SCSI controller.

❺ Use the command **set bootdef_dev** to set the name of the device on which the system software has been loaded.

❻ When you issue a **set boot_osflags**, you pass information to the boot command. For example, entering **set boot_osflags a** loads the operating software from the specified boot device (autoboot), and boots to multiuser mode when the operating system is DIGITAL UNIX. Refer to your operating system documentation for more information on **os_flags** definitions.

❼ Issue a **set console graphics** command to set the console mode to graphics. The other option is **serial**. This console EV takes effect only after a subsequent reset or power-up.

For more information on environment variables, see the *System Drawer User's Guide.*

7.6.2 Running ECU

The EISA Configuration Utility (ECU) is used to configure EISA options on AlphaServer systems. At the SRM console prompt, enter alphabios to bring up the AlphaBIOS console (you must run ECU in AlphaBIOS console mode). Example 7–5 shows the AlphaBIOS Setup display when run from a serial terminal.

Example 7–5 Running ECU

```
AlphaBIOS Setup                          F1=Help

Display System Configuration...
Upgrade AlphaBIOS
Hard Disk Setup...
CMOS Setup...
Install Windows NT
 Utilities                  Run ECU from floppy...
About AlphaBIOS...          OS Selection Setup...
                            Run Maintenance Program...



Insert the floppy containing EISA Configuration Utility
(ECU) and press ENTER to run it.


ESC=Exit
```

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The AlphaBIOS console can be run over the serial line on a system not having a keyboard plugged into it. All systems are shipped with a graphics card, a keyboard, and a mouse; however, a graphics monitor is required only on a system that will be running Windows NT. For DIGITAL UNIX and OpenVMS systems, having a monitor will be the exception, not the rule. Therefore, this description is slanted toward DIGITAL UNIX and OpenVMS systems. See the *System Drawer User's Guide* for more information on running the AlphaBIOS console with a graphics monitor.

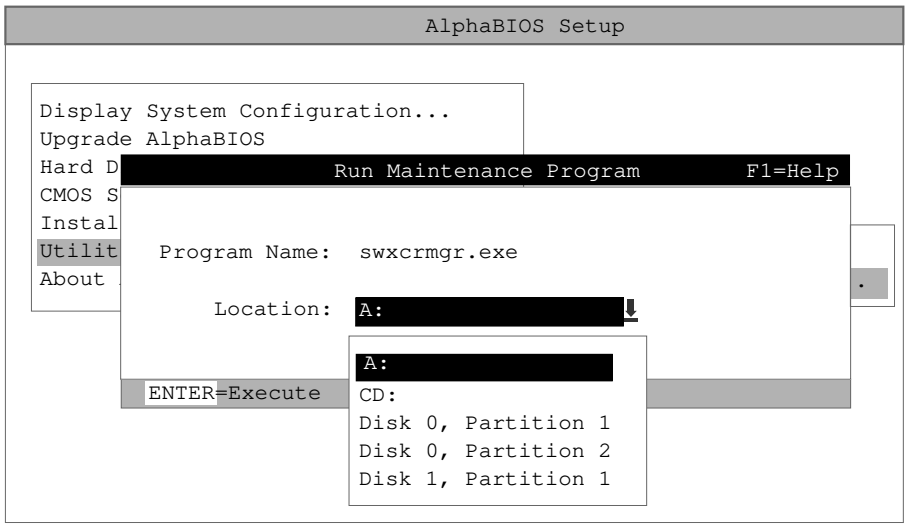
When AlphaBIOS is loaded from SRM, it checks to see if there is a graphics card or a keyboard. If one or the other is absent, then AlphaBIOS directs its output to the console serial line (top 9–pin connector). It assumes that the terminal connected to this port is a VT320 or later terminal.

1. Enter **alphabios** at the console prompt. The top-level AlphaBIOS screen appears.
2. At the top-level AlphaBIOS screen, select the operating system and press Enter to choose.
3. At the AlphaBIOS Setup screen, select Utilities. Under Utilities, select Run ECU from floppy. See Example 7–5.
4. Next, insert the floppy containing the EISA Configuration Utility and press Enter to run it.

7.6.3 Running Utility Programs

Maintenance programs such as RAID and EISA configuration utilities are run from the AlphaBIOS Utility menu. At the SRM console prompt, enter alphabios to bring up the AlphaBIOS console (you must run these utility programs in AlphaBIOS console mode). Example 7–6 shows the AlphaBIOS Setup screen and the Run Maintenance Program Dialog box.

Example 7–6 Run Maintenance Program Dialog Box



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1. At the Setup screen, select Utilities. Press Enter.
2. At the Utilities screen, select Run Maintenance Program. Press Enter.
3. In the Run Maintenance Program dialog box, type **swxcrmgr.exe** in the Program Name field.
4. Press Enter to execute the program.

7.6.4 Updating Firmware

The Loadable Firmware Utility (LFU) is used to update firmware on any module in the system. Example 7–7 shows a sample LFU session; the firmware load device is the local CD-ROM drive.

Example 7–7 Running LFU

```
P00>>> lfu ❶

          ***** Loadable Firmware Update Utility *****

Select firmware load device (cda0, dva0, ewa0), or
Press <return> to bypass loading and proceed to LFU: cda0 ❷

Please enter the name of the options firmware files list, or
Press <return> to use the default filename [AS4X00FW]: AS4X00CP ❸

Copying AS4X00CP from DKA500.5.0.1.1 .
Copying [as4x00]RHREADME from DKA500.5.0.1.1 .
Copying [as4x00]RHSRMROM from DKA500.5.0.1.1 ..........................
Copying [as4x00]RHARCROM from DKA500.5.0.1.1 ............

------------------------------------------------------------------------
Function    Description ❹
------------------------------------------------------------------------
 Display     Displays the system's configuration table.
 Exit        Done exit LFU (reset).
 List        Lists device, revision, firmware name, and update revision.
 Lfu         Restarts LFU.
 Readme      Lists important release information.
 Update      Replaces current firmware with loadable data image.
 Verify      Compares loadable and hardware images.
 ? or Help   Scrolls this function table.
------------------------------------------------------------------------

UPD> list ❺

Device          Current Revision    Filename            Update Revision
AlphaBIOS          V5.12-2          arcrom                 V6.40-1
srmflash           V1.0-9           srmrom                 V2.0-3

UPD> update * ❻
```

```
WARNING: updates may take several minutes to complete for each device.

Confirm update on: AlphaBIOS       [Y/(N)] y

                           DO NOT ABORT!
AlphaBIOS       Updating to V6.40-1...  Verifying V6.40-1...  PASSED.

Confirm update on: srmflash        [Y/(N)] y

                           DO NOT ABORT!
srmflash        Updating to V2.0-3...  Verifying V2.0-3...  PASSED.

UPD> exit❼
P00>>>
```

❶ Enter the **lfu** command at the SRM console prompt.

❷ The user is prompted to select a firmware load device (for example, CDA0 (local CD-ROM drive), DUA0 (floppy drive)), or EWA0 (Ethernet). In this example, the user selects the local CD-ROM drive as the load device.

❸ The user is prompted to enter the options firmware file list. The default filename is AS4X00FW.

❹ A list of the LFU functions is displayed.

❺ Enter **list** to get information on each device.

❻ The user enters **update *** to update firmware on each device.

❼ Enter **exit** to return to the console prompt.

7.7 Booting OpenVMS or DIGITAL UNIX

To boot OpenVMS or DIGITAL UNIX® from the SRM console, use the boot command.

Example 7–8 Booting OpenVMS or DIGITAL UNIX

```
P00>>> show device❶
polling ncr0 (NCR 53C810) slot 1, bus 0 PCI, hose 1   SCSI Bus ID 7
dka500.5.0.1.1      DKa500                     RRD45  1645
polling ncr1 (NCR 53C810) slot 3, bus 0 PCI, hose 1   SCSI Bus ID 7
dkb100.1.0.3.1      DKb100                     RZ29B  0007
dkb200.2.0.3.1      DKb200                     RZ29B  0007
dkb400.4.0.3.1      DKb400                     RZ29B  0007
polling floppy0 (FLOPPY) PCEB - XBUS hose 0
dva0.0.0.1000.0     DVA0                        RX23
polling tulip0 (DECchip 21040-AA) slot 2, bus 0 PCI, hose 1
ewa0.0.0.2.1: 08-00-2B-E5-B4-1A
P00>>> boot dka500❷
P00>>> boot dkb200❸
```

In Example 7–8, the user enters a **show device** ❶ command to see a list of system devices. Issuing a **boot dka500** ❷ command boots the operating system from the local CD-ROM drive. Issuing a **boot dkb200** ❸ command boots the operating system from a local SCSI drive.

DECevent Service Tool

AlphaServer 4000/4100 systems installed and/or supported by Digital Equipment Corporation are required to have all appropriate service tools installed and verified as part of the installation process. DECevent, a proprietary software tool, provides critical error event translation for AlphaServer systems running OpenVMS or DIGITAL UNIX.

Installation with DIGITAL UNIX

The DECevent software is provided on a DECevent/ASVR 4100 UNIX CD-ROM, part no. AG-QXSAA-BE (BOM to BR-MT4AG-S8) with systems shipped with the DIGITAL UNIX operating system.

To begin the installation, insert the DECevent CD and invoke 'setld' as follows:

```
# setld -l device_name
```

For example, for the CD device /dev/rz4c:

```
# setld -l /dev/rz4c
```

Follow DECevent installation procedures described in detail in the DECevent installation guide on the CD.

Installation with OpenVMS

The DECevent software is provided on a DECevent/ASVR 4100 OVMS CD-ROM, part no. AG-QXW6A-BE (BOM to BR-MT1AG-S8) with systems shipped with the OpenVMS operating system.

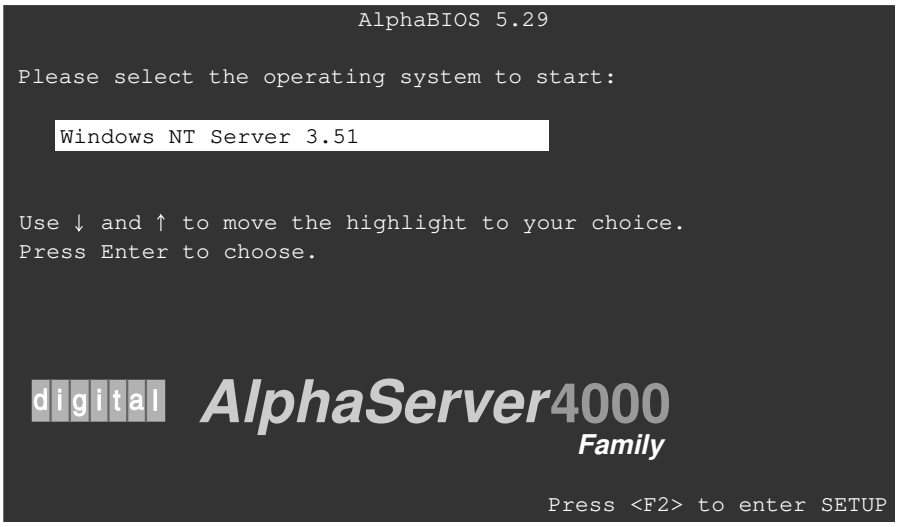
The DECevent installation procedure is described in detail in the DECevent installation guide on the DECevent CD. DECevent is installed using the OpenVMS installation command procedure VMSINSTAL.COM located in SYS$UPDATE.

See OpenVMS Alpha Release Notes and Installation Procedures for further information.

7.8 Booting Windows NT

To boot Windows NT from the AlphaBIOS console, select the correct version of the operating system from the AlphaBIOS boot screen and press F2 to enter setup.

Figure 7–6 Booting Windows NT



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AlphaBIOS boots Window NT in two stages. The first stage involves reading an OS Loader program from a disk. The name of the OS Loader program is OSLOADER.EXE. Once the OS Loader program executes, it uses the services provided by AlphaBIOS to load the operating system. After the operating system is loaded, the OS Loader starts execution of the operating system. See the *System Drawer User's Guide* or the *AlphaBIOS User's Guide* for more information on the AlphaBIOS interface and boot procedures.

Appendix A

Cabinet to Pedestal System Drawer Conversion

This appendix explains how to convert the system drawer from a cabinet unit to a pedestal unit. Sections include:

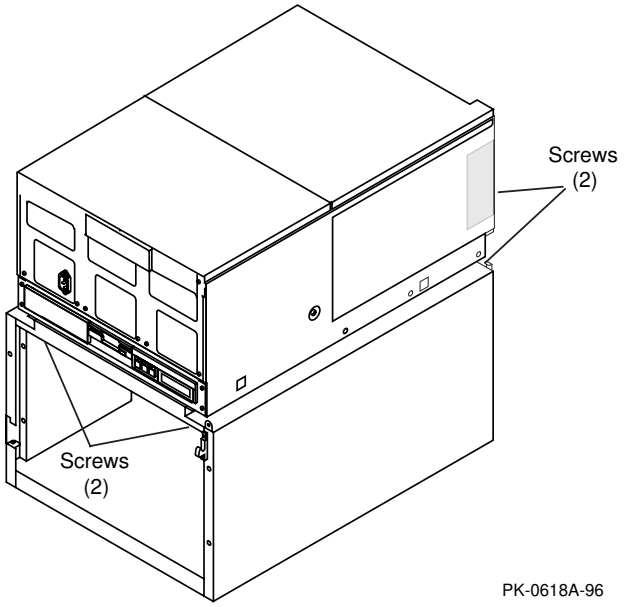
- Mount the System Drawer
- Remove the Control Panel
- Cabling
- Install the Control Panel

A.1 Mount the System Drawer

WARNING: The system drawer, fully configured, weighs 45 kg (100 lbs). Two people are required to mount the system drawer on the pedestal base.

1. Mount the system drawer on the pedestal base by securing it with four screws (see Figure A–1).

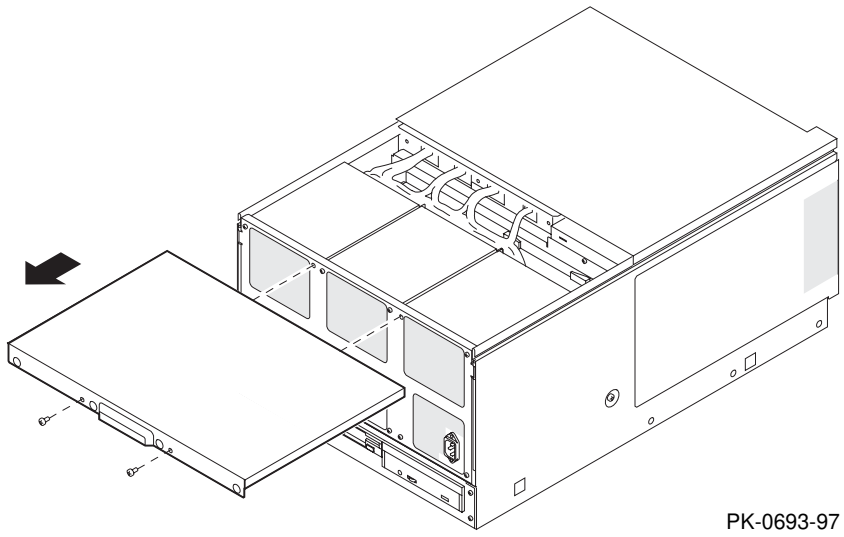
Figure A–1 Mounting the System Drawer



A.2 Remove the Control Panel

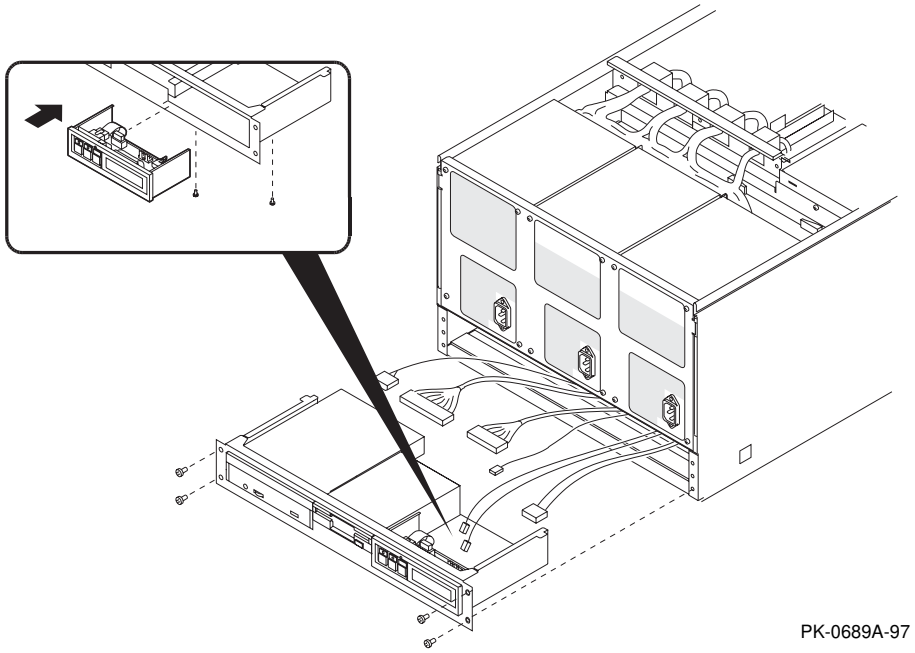
1. Remove the cover over the power supplies (2 screws). SeeFigure A–2. You will reuse this to cover the new control panel tray after installation.

Figure A–2 Removing the Cover



2. At the bottom of the system drawer, remove the four screws that secure the control panel tray to the drawer (see Figure A–3).
3. Pull out the control panel tray and remove the control panel by removing the two screws that attach it to the tray.
4. Disconnect the reset cable connector, the interlock cable connector, and the ribbon cable connector from the control panel. Note the cable connections.

Figure A–3 Removing the Control Panel



5. Open the conversion kit and locate the OCP housing (70-31990-01). Slide the OCP housing onto the system drawer.
6. Install a blank panel (70-31989-02) in the space left by the control panel removal.

A.3 Cabling

1. Locate the cable bulkhead (70-32020-01). Refer to Figure A–4 when making the cable connections.
2. Pull back the interlock cable to the bulkhead and connect it to the reset/interlock/power harness (17-04305-01). See ❶.
3. Carefully pull back the white cable to the bulkhead and connect it to the reset/interlock/power harness. See ❶.
4. A ribbon cable (17-04306-01) is attached to the bulkhead. Connect the other end of this cable to J14 on the system bus to PCI bus bridge module. See ❷. To access the module, remove the three screws that secure the PCI card cage cover and slide the cover away from the drawer.
5. The 12 V power cable is part of the reset/interlock/power harness on the bulkhead. Plug the cable into the connector near the CD drive. See ❹.
6. The SCSI cable (17-04306-01) has two connectors. Remove the terminator connector. Connect the SCSI connector to the bulkhead (two screws). See ❸.
7. Fasten the bulkhead to the chassis by installing the two screws. To access the two screw holes, slide the rear cover away. After you install the bulkhead, slide the rear cover to its original position.

   NOTE: Be sure that all cabling is positioned away from the fan assembly.
8. At the bottom of the system drawer, slide the old control panel tray back in place and fasten it to the system drawer (four screws).

Figure A–4 Cabling

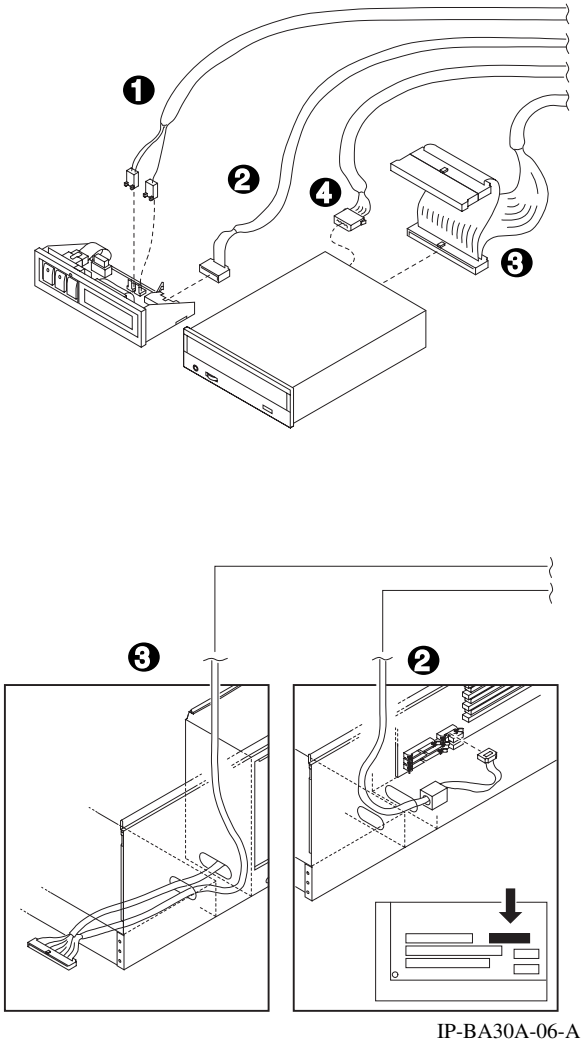
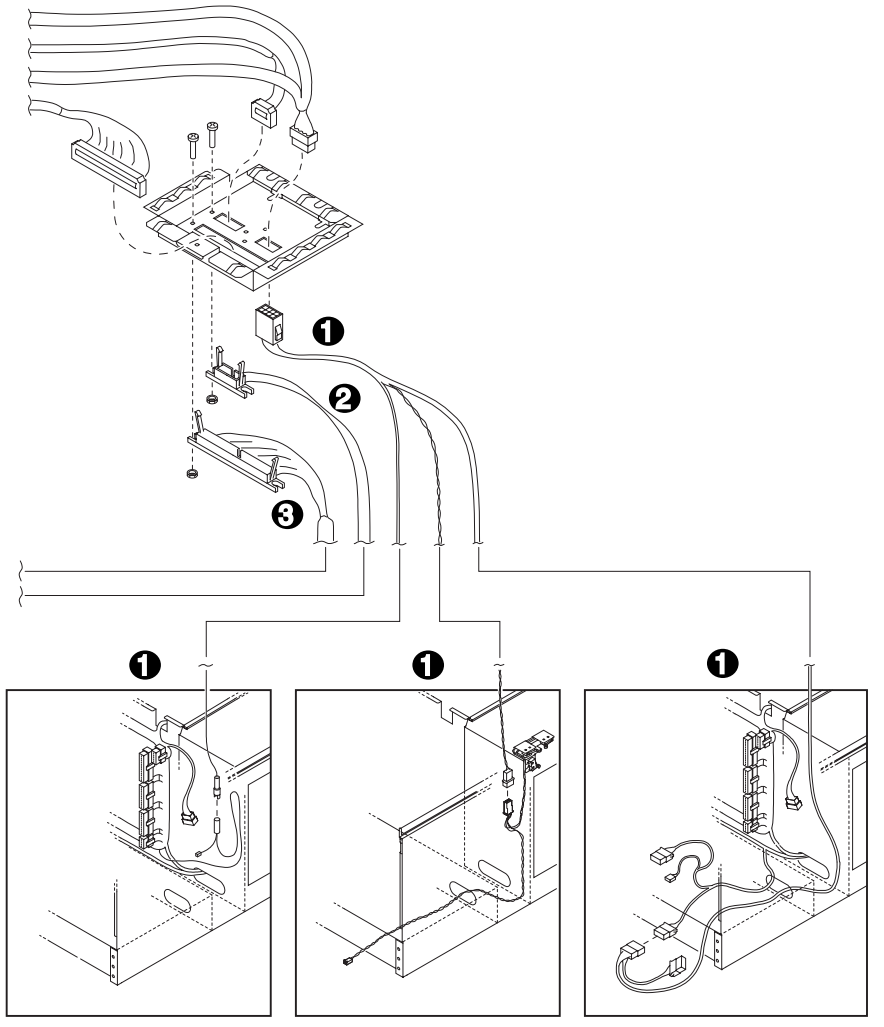


Figure A-4 Cabling (Continued)



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A.4 Install the Control Panel

1. Mount the control panel onto the left side of the OCP housing.
2. Install a blank panel on the right side of the OCP housing.
3. Connect the reset/interlock/power harness connectors to the control panel. See ❶ and ❷ in Figure A–4.
4. Connect the SCSI cable to the CD drive. See ❸.
5. Secure all cables with a cable clamp.
6. Attach the OCP housing to the drawer (2 screws).
7. Install the cover on the OCP housing (2 screws).
8. Secure the rear cover (2 screws).
9. Secure the PCI card cage cover (3 screws).

NOTE: To convert a pedestal system drawer to a cabinet system drawer, reverse the steps in this appendix.

NOTE: A ribbon cable (17-04201-01) is required when converting a pedestal system drawer to a cabinet system drawer. Be sure you have this cable before you begin the conversion.

Appendix B

Using H9A10-EC Cabinets

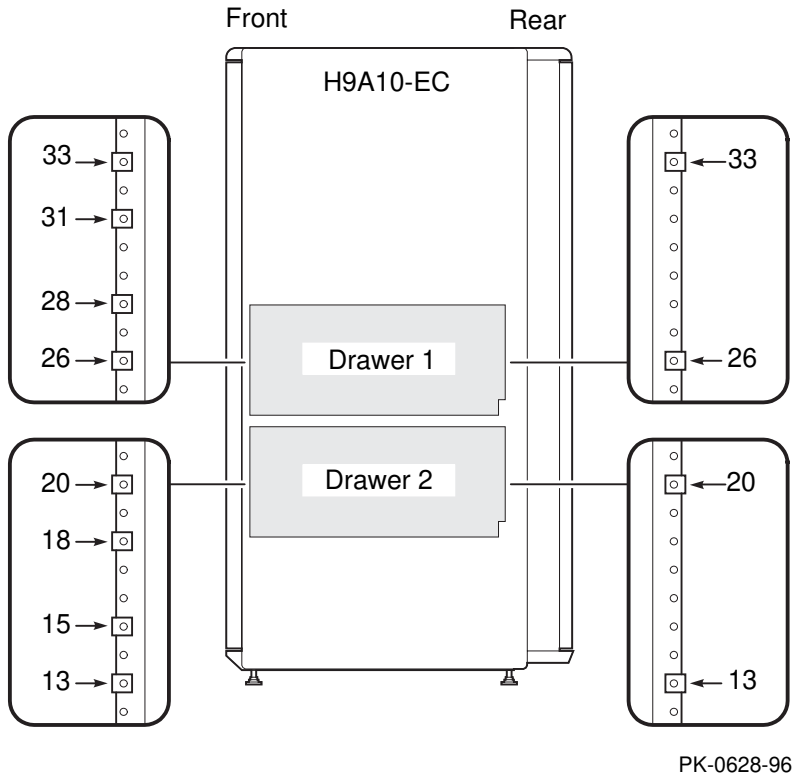
The H9A10-EC (metric) cabinet is available. Sections include:

- H9A10-EC Cabinet Mounting Rails
- Installing Support Rails in H9A10-EC Cabinet
- StorageWorks Shelves in H9A10-EC Cabinet
- Installing StorageWorks Mounting Rails
- H9A10-EC Cabinet Power Strips

B.1 H9A10-EC Cabinet Mounting Rails

The H9A10-EC (metric) cabinet has a total of 62 mounting holes (units). Table B–1 lists the mounting holes used for a cabinet containing one to four system drawers. Table B–2 lists the configuration guidelines for installing two system drawers in a cabinet.

Figure B–1 H9A10-EC Cabinet Mounting Rails



The H9A10-EC cabinet is IEC (or IEEE STD. 1301-1991) compliant. The cabinet rails have a total of 62 SU units of vertical mounting height. When you install a system drawer, begin counting the mounting holes from the rail bottom to top.

According to how many system drawers you install, mark off the mounting holes listed in Table B–1. Only the **topmost** mounting holes are listed.

Table B–1 H9A10-EC System Drawer Mounting Holes

One System Drawer	Two System Drawers	Three System Drawers	Four System Drawers
33	First: 33 Second: 20	First: 13 Second: 26 Third: 39	First: 13 Second: 26 Third: 39 Fourth: 53

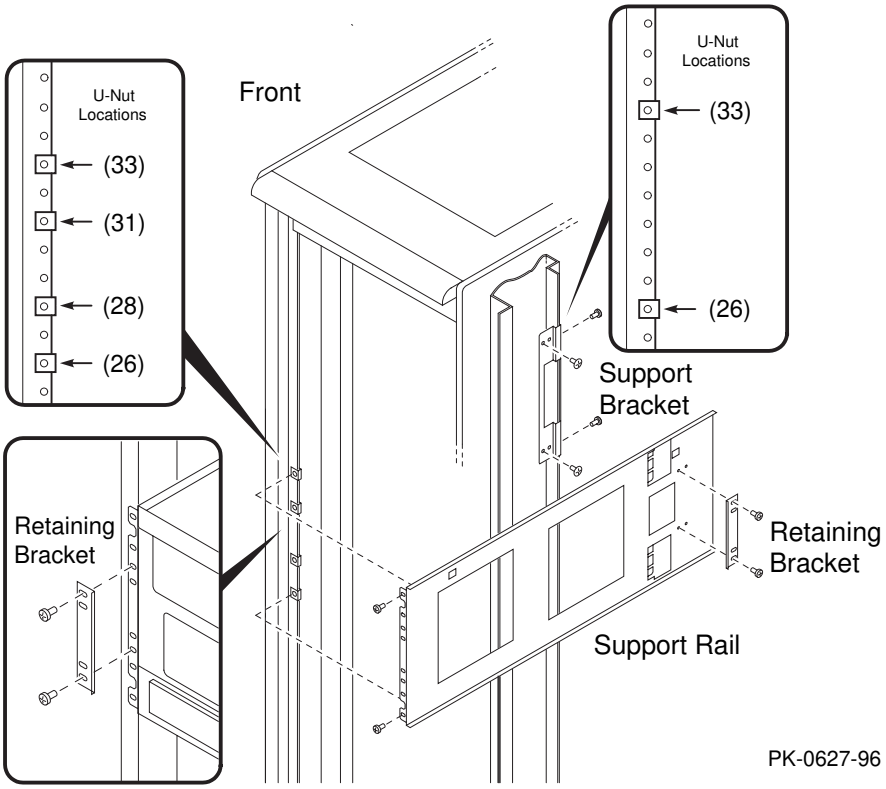
Table B–2 H9A10-EC Cabinet: Installing Drawers and Shelves

SU-Units Required	Component Installed	Height (Millimeters)
2	System display panel and fans	50
2	Empty	50
6	StorageWorks shelves 1 (front) and 3 (rear)	150
2	Empty	50
6	StorageWorks shelves 2 (front) and 4 (rear)	150
2	Empty	25
6	StorageWorks shelves 5 (front) and 6 (rear)	300
1	Space for cable clearance	25
12	System drawer (first)	300
1	Space for cable clearance	25
12	System drawer (second)	300
2	Empty	25
3	AC inlet	75

B.2 Installing Support Rails in H9A10-EC Cabinet

First, install the system drawer support rails. The rails have an interlock mechanism that holds the system drawer in place. Figure B–2 shows how to install the rails in the H9A10-EC (metric) cabinet.

Figure B–2 Installing Support Rails in the H9A10-EC Cabinet



1. Locate the proper mounting holes (cabinet front and rear) and insert the U-nuts over the holes. Note that there are two types of support rails; one support rail has two snap latches and the other has none. The support rails with snap latches must be installed on the right side of the cabinet when viewed from the cabinet front. In Figure B–2 the support rails installed will hold the first system drawer.
2. At the rear of the cabinet, line up and assemble the support bracket with the rail mounting holes, leaving the two side-mounted screws loose.
3. At the front of the cabinet, install the support rail on the two screws on the side of the support bracket and align with front rail mounting holes. Fasten the support rail to the mounting rail by installing the topmost and lowermost screws.
4. Tighten side mounting screws and secure support rail to bracket.
5. Install the other support rail.

B.3 StorageWorks Shelves in H9A10-EC Cabinet

The maximum number of StorageWorks shelves is eight in a one-system drawer H9A10-EC cabinet. The maximum number of StorageWorks shelves is six in a two-system drawer cabinet. See Figure B–3 and Figure B–4. These figures also show the proper mounting holes in the cabinet rails.

Figure B–3 H9A10-EC Cabinet: Shelves with One Drawer

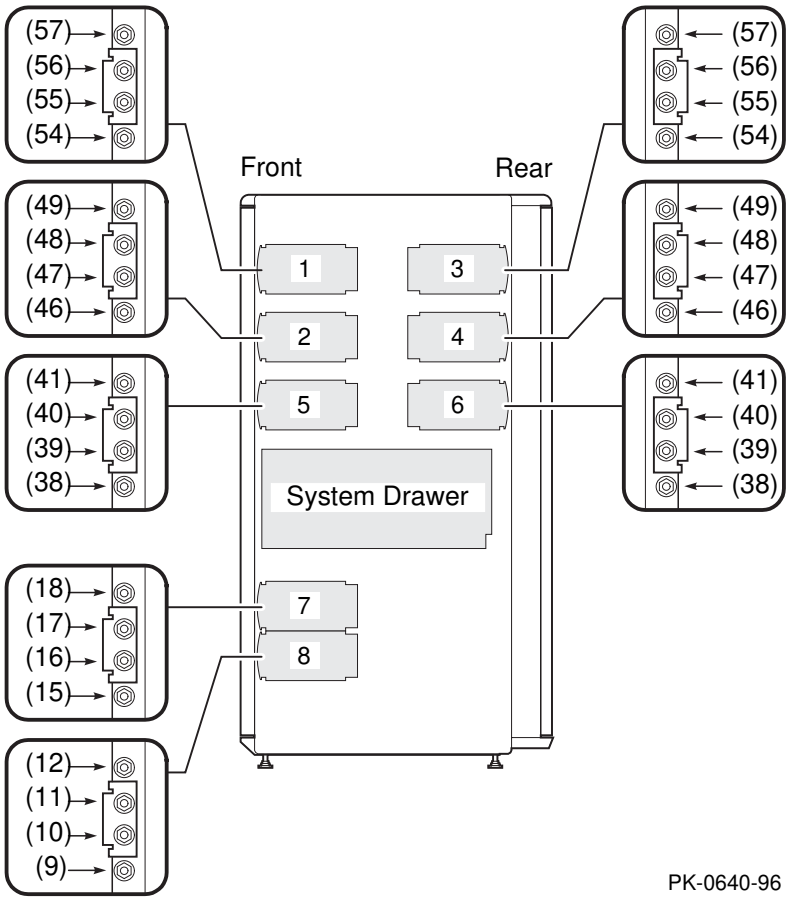
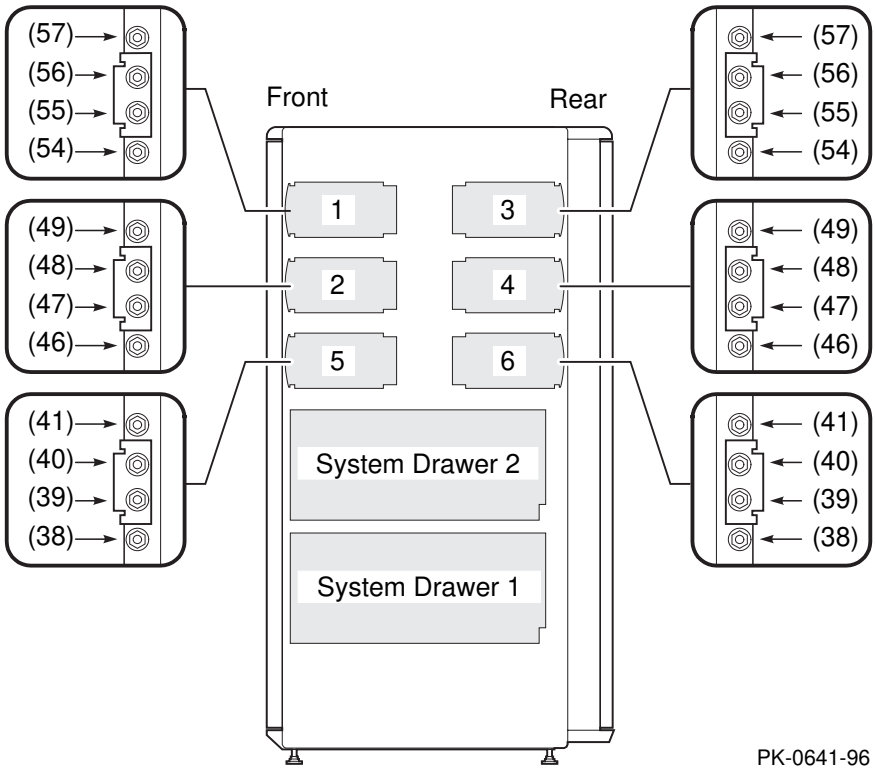


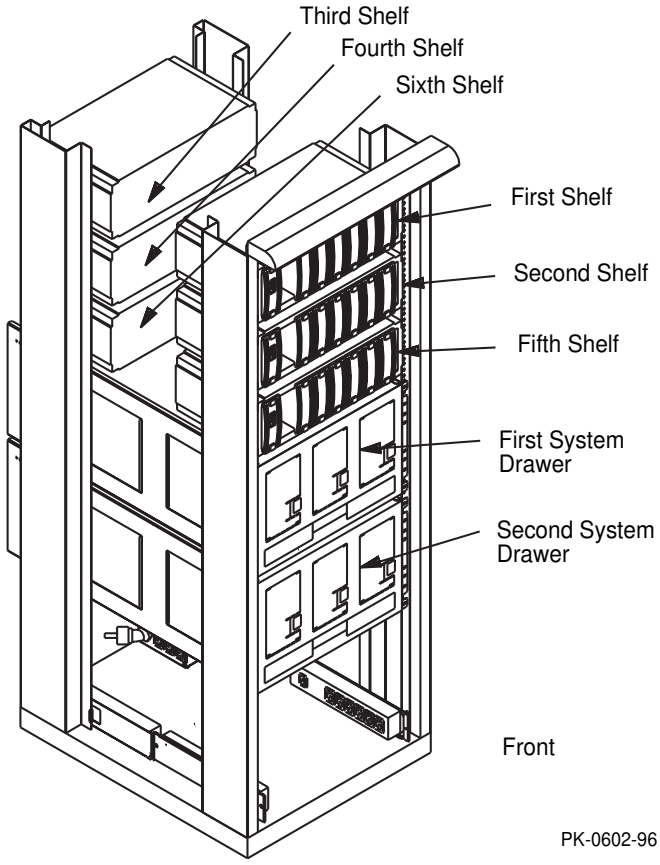
Figure B–4 H9A10-EC Cabinet: Shelves with Two Drawers



B.4 Installing StorageWorks Mounting Rails

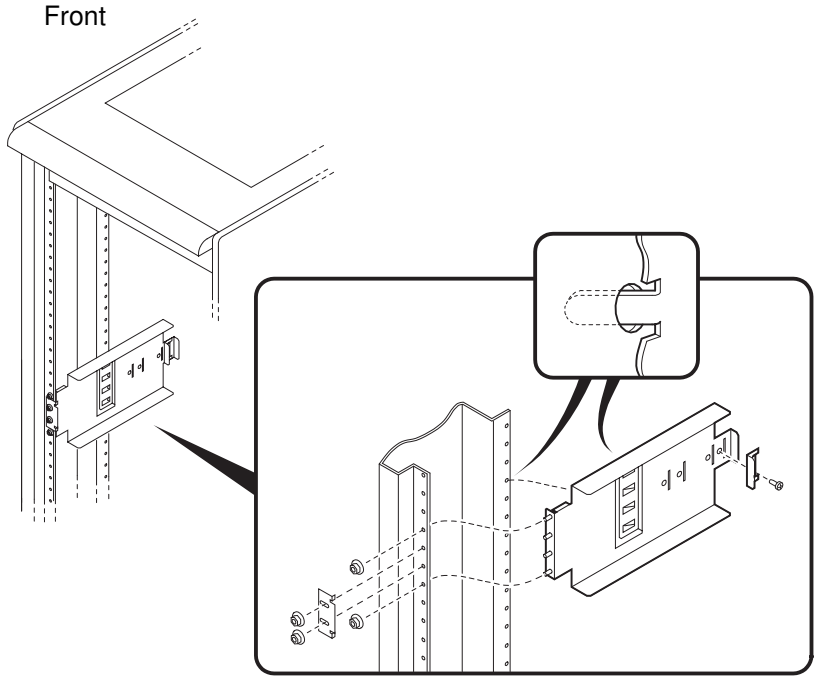
The number of StorageWorks shelves you can install depends on the number of system drawers in the cabinet. For example, there is space for six StorageWorks shelves in a cabinet with two system drawers. See Figure B–5.

Figure B–5 Sample Cabinet Configuration



1. In the H9A10-EC (metric) cabinet, install the StorageWorks shelf mounting rails as shown in Figure B–6.
2. Guide the rail flanges through the appropriate mounting holes.
3. Attach the mounting rail with the brackets and nuts, as shown.
4. Install the StorageWorks shelf by sliding it onto the mounting rails.
5. Connect the shelf power cable to an AC power strip. Connect the shelf signal cable to the SCSI controller in the PCI card cage.

Figure B–6 Installing Shelf Mounting Rails in H9A10-EC Cabinet



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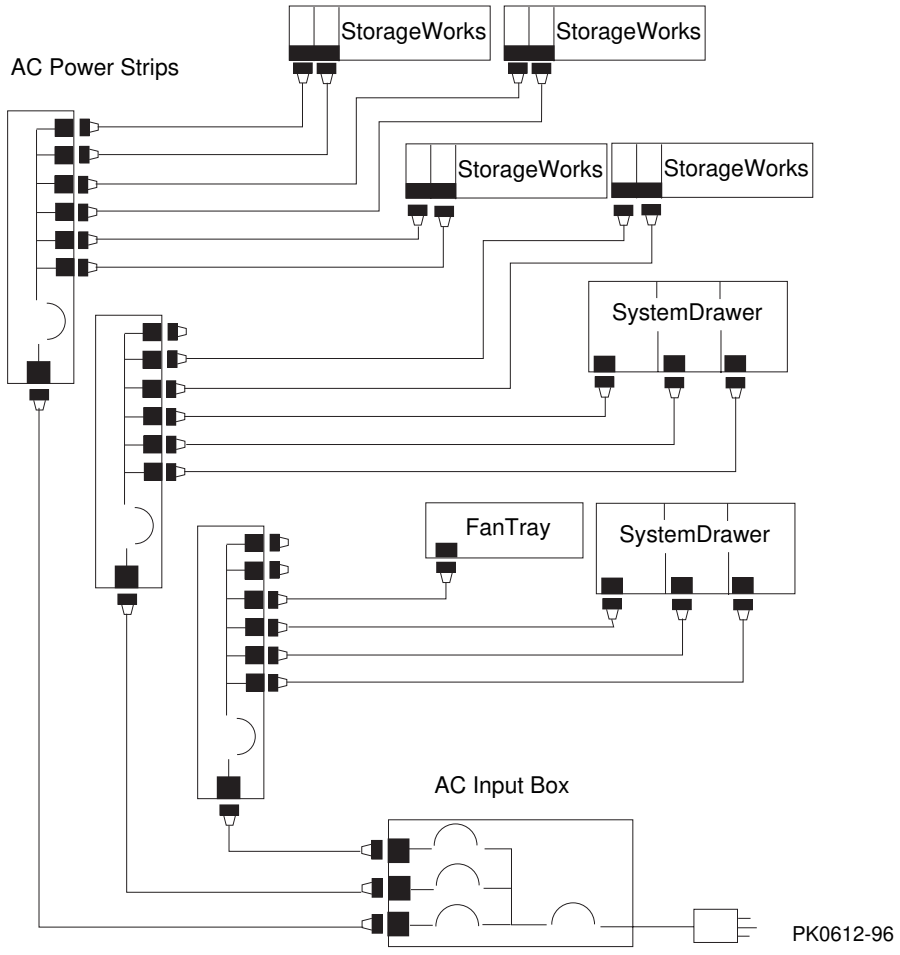
B.5 H9A10-EC Cabinet Power Strips

Figure B–7 shows a sample cabinet power configuration with two system drawers and four StorageWorks shelves. Each system drawer has three power supplies. Each StorageWorks shelf is equipped with a redundant power supply. Three AC power strips are used in this configuration.

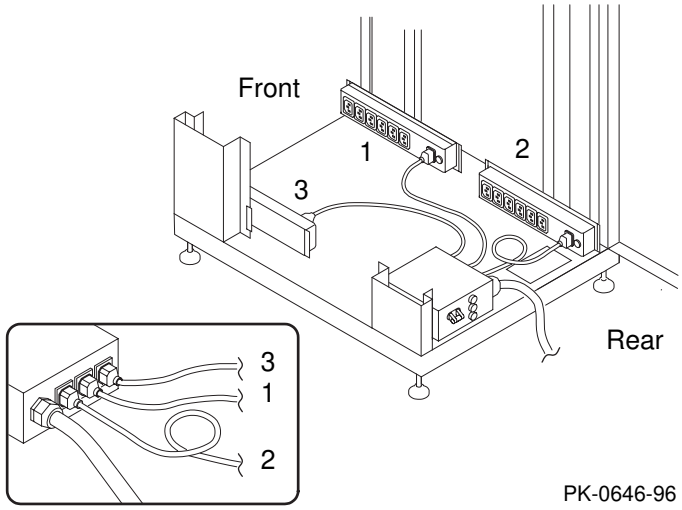
Figure B–7 Sample Cabinet Power Configuration



AC power strips connect to an AC input box outlet. The AC input box has a two-pole main circuit breaker. Each AC power strip has a single-pole thermal circuit breaker and six outlets for system drawers, StorageWorks shelves, and fan tray. A maximum of three AC power strips can be used in the cabinet; they are installed in order of the numbers shown in Figure B–8. When connecting system components to AC power strips, note that system drawer power cables are black; StorageWorks shelf power cables and fan tray power cables are gray. Configuration rules are:

- A system drawer contains one to three power supplies; each power supply has one power cable that connects to an AC power strip.
- A StorageWorks shelf has one power cable; a shelf equipped with a redundant power supply has two power cables.
- Connect all system drawer power cables to the same AC power strip.
- A second power strip is required if you install more than three StorageWorks shelves in a cabinet with one system drawer.
- If a cabinet has four system drawers, connect the fourth system drawer input power cables to different AC power strips.

Figure B–8 Three AC Power Strips



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