



# AlphaServer GS60 and 8200

## Installation Guide

Order Number: EK-T8230-IN. B01

This guide is intended for use by customer service engineers and self-maintenance customers installing these systems.

Compaq Computer Corporation

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## Preface

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This manual describes both the Compaq AlphaServer GS60 and GS140 systems as well as the AlphaServer 8200 and 8400 systems. The AlphaServer 8200 and 8400 systems were introduced by Digital Equipment Corporation in 1995. Now Compaq Computer Corporation, with the introduction of the Alpha 21264 chip, is calling the latest offering Compaq AlphaServer Global Solutions (GS) systems.

The Compaq AlphaServer GS60 and GS140 systems offer all the robust features of the current 8200/8400 product plus the fastest processors in the industry, the Alpha 21264 (EV6), a new blue enclosure, and a Compaq AlphaServer brand name. The GS60 offers the same five-slot system bus with support for up to six CPUs, up to 12 Gbytes memory, and the same I/O options supported by the AlphaServer 8200. The GS140 has the same nine-slot system bus with support for up to 14 CPUs, up to 28 Gbytes memory, and the same I/O options as the AlphaServer 8400.

This manual was originally written to describe the DIGITAL AlphaServer 8200 and 8400 systems. Although the console displays in this book show an 8200 or 8400 system, the same examples and descriptions apply to the GS60 and GS140 systems. Only the identification line at the bottom of the display is different. A sample GS140 console display is shown in Example 1.

AlphaServer 8200 and 8400 systems can be upgraded to the new GS60 and GS140 systems, respectively, with simple to install CPU module upgrades and minimal operating system updates.

## Example 1 Sample GS140 Console Display

```

F   E   D   C   B   A   9   8   7   6   5   4   3   2   1   0   NODE #
      A   A   M   .   .   .   M   P   P   TYP
      o   o   +   .   .   .   +   ++   ++   ST1
      .   .   .   .   .   .   .   EE   EB   BPD
      o   o   +   .   .   .   +   ++   +-   ST2
      .   .   .   .   .   .   .   EE   BE   BPD
      +   +   +   .   .   .   +   ++   +-   ST3
      .   .   .   .   .   .   .   EE   BE   BPD

      +   +   +   +   .   +   +   +   C0   PCI   +
+   .   .   .   .   .   +   .   .   .   .   .   .   C1   XMI   +
+   .   .   .   .   .   +   .   .   +   +   .   .   .   C4   XMI   +
.   .   .   .   .   .   .   .   .   .   .   .   .   .   C5
.   .   .   .   .   .   .   .   .   .   .   .   .   .   C6
      .   .   .   .   .   .   .   .   .   .   .   +   C7   PCI   +
      .   .   .   .   .   .   .   +   +   EISA+

      .   .   A1   .   .   .   A0   .   .   ILV
      .   .1GB   .   .   .1GB   .   .   2GB
❶ Compaq AlphaServer GS140 4-6/525 Console V5.3-1, 1-SEP-1998 03:49:54
SROM V1.1, OpenVMS PALcode V1.39-1, Digital UNIX PALcode V1.40-1
System Serial=NI84177052, OS=OpenVMS, 8:43:39 September 1, 1998
Configuring I/O adapters...
.
.
.
P01>>>

```

- ❶ Indicates the type of system, the number of processors, the CMOS technology and speed, and the console firmware version.

## Intended Audience

This manual is written for customer service engineers and self-maintenance customers who require information to install an AlphaServer GS60 or 8200 system.

## Document Structure

This manual uses a structured documentation design. Topics are organized into small sections for efficient 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.

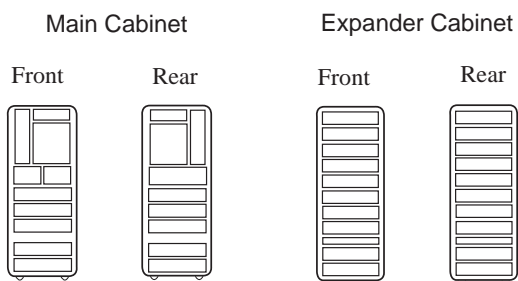


This manual has seven chapters as follows:

- **Chapter 1, Installation Overview**, provides a flowchart which summarizes the installation process.
- **Chapter 2, Installing the System Cabinet**, shows how to unpack and install the system cabinet.
- **Chapter 3, Installing an Expander Cabinet**, explains how to install one or more expander cabinets, if present.
- **Chapter 4, Making Console, SCSI, Ethernet, FDDI, and DSSI Connections**, shows how to connect the console, SCSI, Ethernet, and FDDI devices if present to the system.
- **Chapter 5, Powering Up the System**, explains how to start the system by applying main power.
- **Chapter 6, System Self-Test**, describes the system self-test and its results.
- **Chapter 7, Diagnostics and Utilities**, describes how to verify system operation using diagnostics and utilities.

## Conventions Used in This Document

*Icons.* The icons shown below are used in illustrations for designating part placement in the system described. A shaded area in the icon shows the location of the component or part being discussed.



**Table 1 AlphaServer GS60/140 and 8200/8400 Documentation**

<b>Title</b>	<b>Order Number</b>
<b>Hardware User Information and Installation</b>	
<i>Operations Manual</i>	EK-T8030-OP
<i>Site Preparation Guide</i>	EK-T8030-SP
<i>AlphaServer GS60/8200 Installation Guide</i>	EK-T8230-IN
<i>AlphaServer GS140/8400 Installation Guide</i>	EK-T8430-IN
<i>KFE72 Installation Guide</i>	EK-KFE72-IN
<i>AlphaServer GS60/140 8200/8400 Windows NT Administrator's Guide and Release Notes</i>	EK-T8WNT-RN
<b>Service Information Kit</b>	QZ-00RAC-GC
<i>Service Manual</i> (hard copy)	EK-T8030-SV
<i>Service Manual</i> (diskette)	AK-QKNFB-CA AK-QUW7B-CA AK-QUW6B-CA
<b>Reference Manuals</b>	
<i>System Technical Manual</i>	EK-T8030-TM
<i>System Technical Manual Supplement: CPU</i>	EK-T8030-TS
<i>System Technical Manual Supplement: Memory</i>	EK-MS7CC-TS
<i>DWLPA/DWLPB PCI Adapter Technical Manual</i>	EK-DWLPA-TM
<b>Upgrade Manuals for All Systems</b>	
<i>KN7CC CPU Module Installation Card</i>	EK-KN7CC-IN
<i>KN7CD CPU Module Installation Card</i>	EK-KN7CD-IN
<i>KN7CE CPU Module Installation Card</i>	EK-KN7CE-IN
<i>KN7CF CPU Module Installation Card</i>	EK-KN7CF-IN
<i>KN7CG CPU Module Installation Card</i>	EK-KN7CG-IN
<i>MS7CC Memory Installation Card</i>	EK-MS7CC-IN
<i>KFTHA System I/O Module Installation Guide</i>	EK-KFTHA-IN
<i>KFTIA Integrated I/O Module Installation Guide</i>	EK-KFTIA-IN

**Table 1 AlphaServer GS60/140 and 8200/8400 Documentation  
(Continued)**

Title	Order Number
<b>Upgrade Manuals: GS160/8400 Systems Only</b>	
<i>AlphaServer 8400 Upgrade Manual</i>	EK-T8430-UI
<i>BA654 DSSI Disk PIU Installation Guide</i>	EK-BA654-IN
<i>BA655 SCSI Disk and Tape PIU Installation Guide</i>	EK-BA655-IN
<i>DWLMA XMI PIU Installation Guide</i>	EK-DWLMA-IN
<i>DWLPA/DWLPB PCI PIU Installation Guide</i>	EK-DWL84-IN
<i>H7237 Battery PIU Installation Guide</i>	EK-H7237-IN
<i>H7263 Power Regulator Installation Card</i>	EK-H7263-IN
<i>KFMSB Adapter Installation Guide</i>	EK-KFMSB-IN
<i>KZMSA Adapter Installation Guide</i>	EK-KXMSX-IN
<i>RRDCD Installation Guide</i>	EK-RRDRX-IN
<b>Upgrade Manuals: GS60/8200 Systems Only</b>	
<i>DWLPA/DWLPB PCI Shelf Installation Guide</i>	EK-DWL82-IN
<i>H7266 Power Regulator Installation Card</i>	EK-H7266-IN
<i>H7267 Battery Backup Installation Card</i>	EK-H7267-IN



# Chapter 1

---

## Installation Overview

This chapter provides a quick overview of the installation procedure and relates the steps of the procedure with chapters in this manual. It consists of one section:

- Installation Flowchart

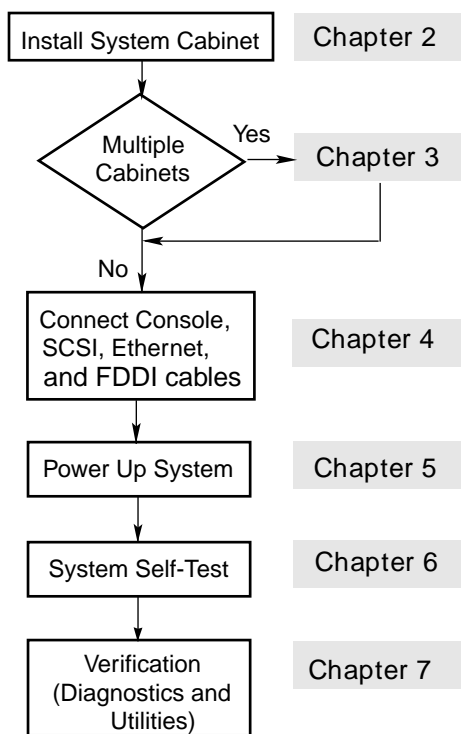
## 1.1 Installation Flowchart

---

**In general, a system is installed as shown in Figure 1-1.**

---

Figure 1-1 Installation Flowchart



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In general, the procedure is as follows (Figure 1-1):

1. Install the system cabinet as described in Chapter 2.
2. If the system has one or more expander cabinets, refer to Chapter 3 for installation instructions.
3. Connect the console, and, if appropriate, make the Ethernet, FDDI, and SCSI connections as described in Chapter 4.
4. Power up the system as described in Chapter 5.
5. Observe and consider the results of the system self-test as described in Chapter 6.
6. Verify system operation by running various diagnostics and utilities as described in Chapter 7.





## Chapter 2

---

# Installing the System Cabinet

This chapter describes how to install the AlphaServer 8200 system cabinet. The cabinet contains the CPU, memory, at least one PCI I/O subsystem, disks, and power.

If your system has an expander cabinet, unpack it and remove it from the pallet as described in the first four sections of this chapter.

Sections in this chapter include:

- Inspect the Shipment
- Collect Tools and Resources
- Remove Carton and Packing Material
- Remove from the Pallet
- Level the Cabinet
- Install Stabilizing Brackets

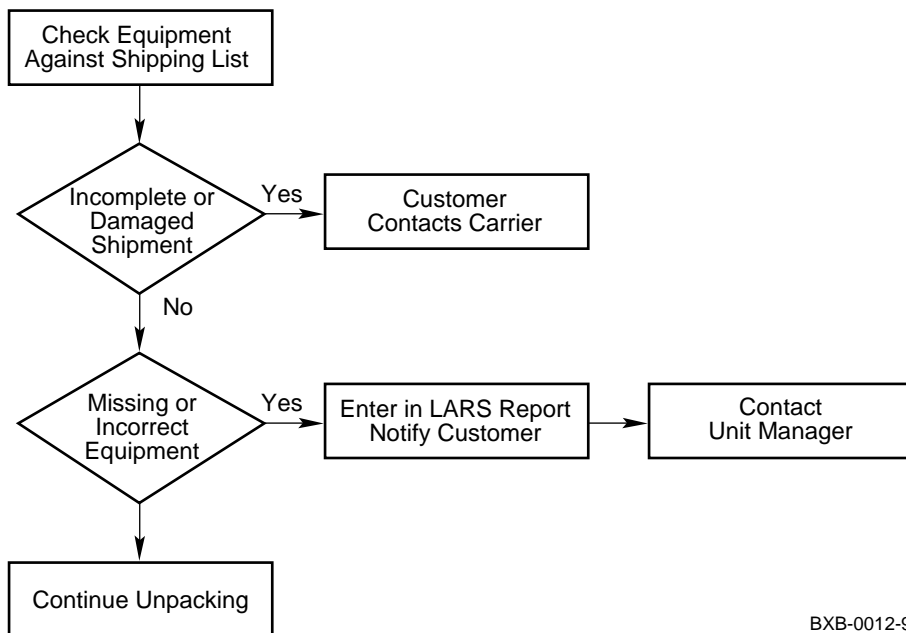
## 2.1 Inspect the Shipment

---

**Check that all system equipment is at the installation site.**

---

Figure 2-1 Inspection Flowchart



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*NOTE: Physically inspect the system to be sure parts have not become loose during shipment.*

If you find a damaged container or package, notify the customer. Wait until the customer contacts the insurance company and gives you permission to continue unpacking.

Compare items listed on the Product Delivery Document (in a slip envelope on the shipping box) 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 are opened.

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

## 2.2 Collect Tools and Resources

---

**You will need the items listed in Table 2-1 to unpack and install the system cabinet. The removal of the cabinet from the pallet requires at least two people.**

---

Table 2-1 Tools and Resources

Item	Use
Product Delivery Document and packing slip	To verify that all hardware has been delivered
Utility knife	To remove straps from cabinet shipping boxes
Adjustable wrench	To remove pallet brackets and to adjust leveler feet
Level	To verify that the cabinet is properly leveled
Socket wrench set	To remove and install bolts
Digital voltmeter	To check AC and DC voltages
Table or bench	Work space for unpacking and installation
Flathead screw-driver	For installation of I/O port module cable(s)

Review requirements such as power, environmental, and space requirements for the system.

*NOTE: Since the cabinet is heavy and has a high center of gravity, removing it from the pallet requires at least two people.*

**For more information:**  
***Site Preparation Guide***

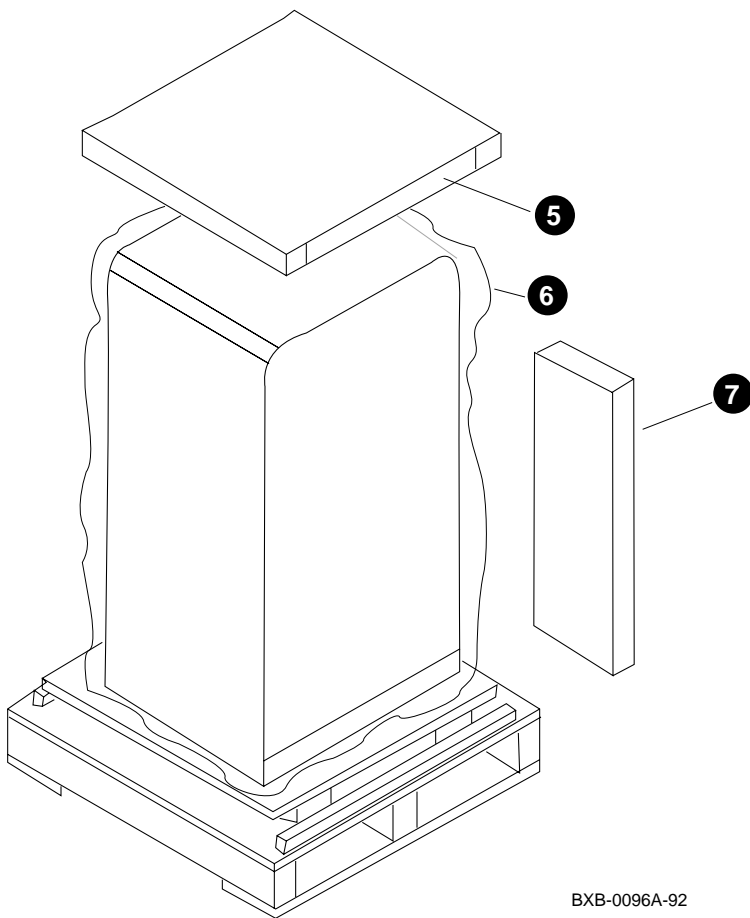
## 2.3 Remove Carton and Packing Material

---

**Take off the carton and remove all packing material to prepare the system cabinet for removal from the pallet.**

---

Figure 2-2 Packing Material



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Use the following procedure to unpack the system cabinet:

1. Position the carton so that the front faces an open space with enough clearance to allow the cabinet to be rolled down ramps.
2. Using a utility knife, cut the shipping straps from the carton.
3. Remove the outside top cardboard cover.
4. Remove the outside shipping box. This is typically done by using a 7/16" socket wrench to remove two bolts that hold the box together.
5. Remove the inside top cardboard cover.
6. Remove the protective plastic wrapping by slipping it up and over the cabinet.
7. Locate the box that contains the ramp kit and open it (see Figure 2-2).

*NOTE: It's a good idea to save all packing materials intact in case the system needs to be shipped in the future.*

**Table 2-2 Shipping Dimensions and Weights**

Cabinet	Height cm (in)	Width cm (in)	Depth cm (in)	Weight kg (lbs) <sup>1</sup>
System	195 (76.8)	91.4 (36.0)	122 (47.9)	309–626 (680–1380) <sup>2</sup>
Expander	195 (76.8)	91.4 (36.0)	122 (47.9)	309–626 (680–1380) <sup>2</sup>
<sup>1</sup> Weights are based on a fully configured cabinet.				
<sup>2</sup> For systems with battery backup add 29 kg (64 lbs) per power supply.				

## 2.4 Remove from the Pallet

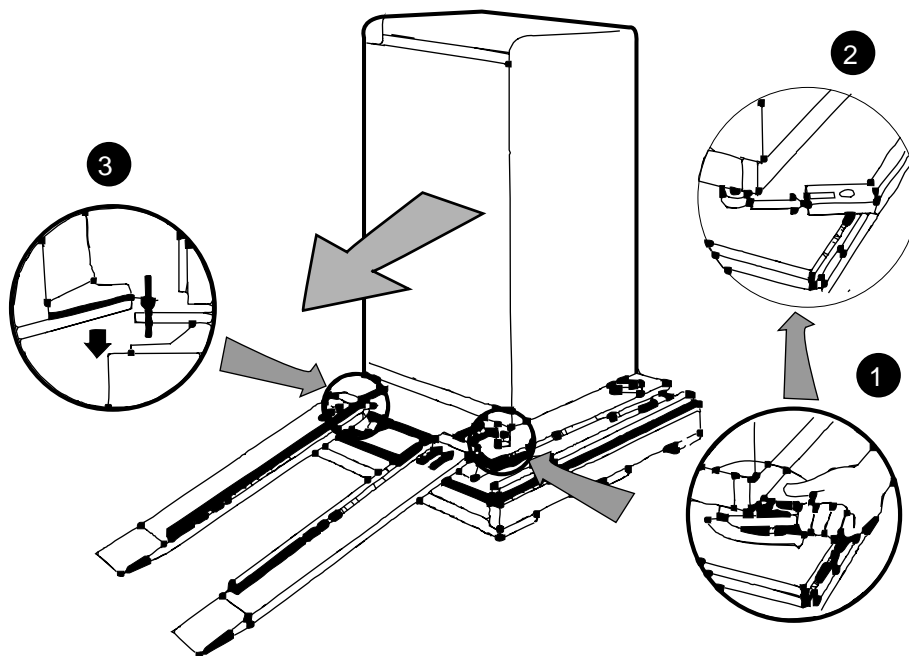
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**Check the cabinet for external damage. Remove the four shipping brackets that attach the cabinet to the pallet. Insert the ramps on the front of the pallet and remove the cabinet.**

---

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

Figure 2-3 Preparation and Removal from Pallet



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**WARNING:** *Serious injury may result if the cabinet is improperly handled or proper safety conditions are not met. Check the cabinet sides, top, front door, and rear panel for damage. If the cabinet is damaged, do the following:*

- a. Enter the location and extent of the damage on the LARS report.
  - b. Notify the customer and your unit manager.
  - c. Stop unpacking until the customer gives you permission to continue.
1. Using an adjustable wrench, remove the four bolts and shipping brackets that hold the cabinet leveler feet to the pallet (Figure 2-3).
  2. The leveler feet are lowered to the pallet surface for shipment. Using the adjustable wrench, raise the feet to the upmost position before removing the system from the pallet (see Section 2.5).
  3. 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 (see Figure 2-3).
  4. 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. This should be done on a firm level floor. To avoid static electricity which can cause system problems, do not place the system on a carpet.

**NOTE:** *Make sure the space under the cabinet is clear of any debris or extraneous materials.*

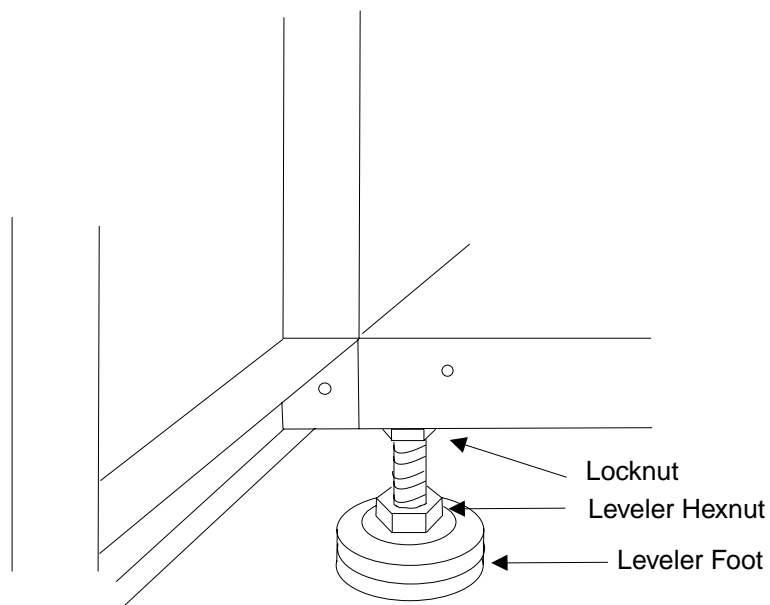
## 2.5 Level the Cabinet

---

**Inspect the rubber leveler feet to be sure they have not been damaged during shipping. To level the cabinet, adjust the feet and check the cabinet with a bubble level.**

---

Figure 2-4 Leveler Foot Adjustment



bx0449-94

1. Using an adjustable wrench, lower and adjust the leveler feet at each corner of the system. (A shipping bracket can also be used to lower the leveler feet. The bracket cutout and leveler feet hexnuts are the same size.)
2. Using a bubble level, check to see that the cabinet is properly leveled (side to side and front to back).
3. Once the cabinet is level, lock each of the feet into place by tightening the locknut at the top of each leveler foot.

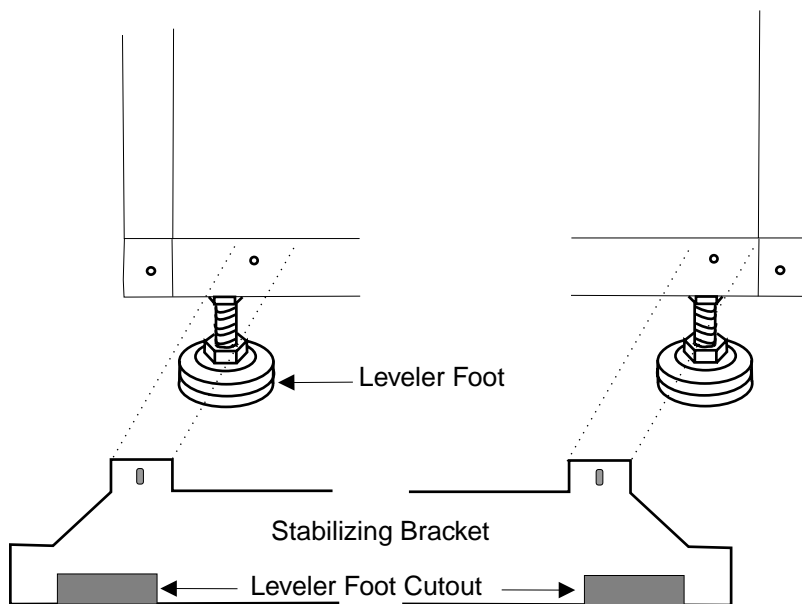
## 2.6 Install Stabilizing Brackets

---

**The AlphaServer 8200 is tall and narrow. Two stabilizing brackets need to be installed to stabilize the cabinet.**

---

Figure 2-5 Stabilizing Bracket Installation



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The two stabilizing brackets must be bolted to the cabinet frame at the front and the back of the machine.

1. Get the stabilizing brackets from the accessories box. (PN 74-49866)
2. Open the front door and install one bracket at the front of the system using two of the 6mm screws that come with the brackets. See Figure 2-5.
3. Move to the back of the system and install the other bracket as you did in step 2. You do not have to remove the back panel for this procedure.



## Chapter 3

---

# Installing an Expander Cabinet

This chapter explains how to install one or more expander cabinets for the system. An expander cabinet provides room for I/O adapters and additional storage for the system. The system can have a maximum of two expander cabinets.

The expander cabinet is designed for PCI I/O shelves and BA350 StorageWorks shelves. At the bottom of the cabinet there is room for two power supplies (one is optional) and a CCL panel. Above this area there are eight shelf slots for PCI I/O shelves and BA350 StorageWorks shelves. The maximum number of PCI I/O shelves in an expander cabinet is four. The maximum number of PCI I/O shelves for an entire system is eleven.

Sections in this chapter include:

- Unpack the Cabinet
- Position the Cabinet
- Level All Cabinets
- Install the Securing Brackets
- Connect the Power Control Cable
- Connect the I/O Cable

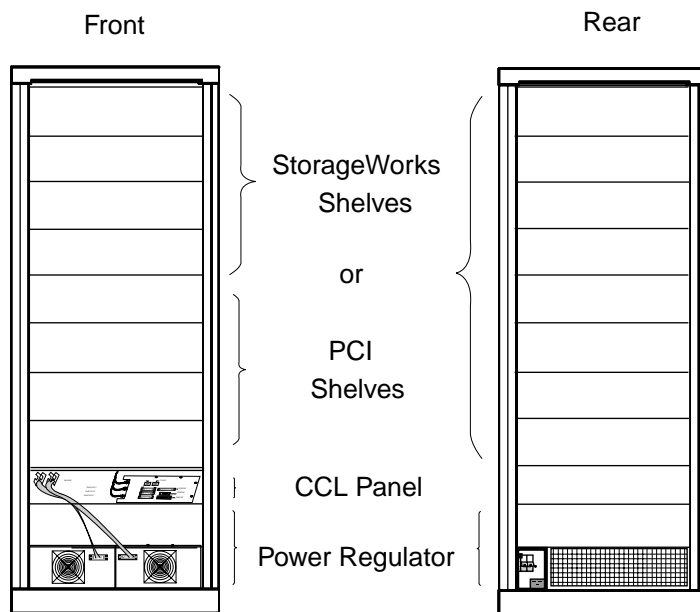
## 3.1 Unpack the Cabinet

---

**Unpack the expander cabinet in the same way you unpacked the system cabinet in Chapter 2.**

---

Figure 3-1 Expander Cabinet



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1. Inspect the shipment for the expander cabinet as done for the system cabinet (see Section 2.1).
2. Collect the tools and resources needed to install the expander cabinet (see Section 2.2).
3. Remove the carton and packing material from the expander cabinet (see Section 2.3). Identify and put aside the components of the installation kit.
4. Use two people to remove the expander cabinet from the shipping pallet (see Section 2.4).

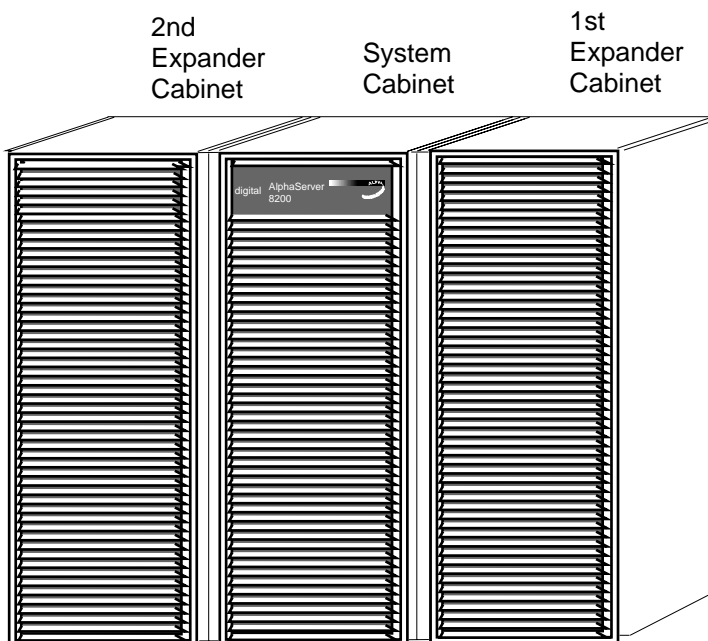
## 3.2 Position the Cabinet

---

**Position the expander cabinet next to the system cabinet. The first expander cabinet is positioned to the right of the system cabinet, and the second to the left as viewed from the front.**

---

Figure 3-2 Expander Cabinet Positioning



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1. As shown in Figure 3-2, place the first expander cabinet to the right of the system cabinet as viewed from the front of the system. Position a second expander cabinet to the left of the system cabinet. A system can have a maximum of two expander cabinets. Figure 3-3 shows the system layout with clearances for access, and Table 3-3 provides information on cabinet dimensions and weights.

Figure 3-3 System Layout

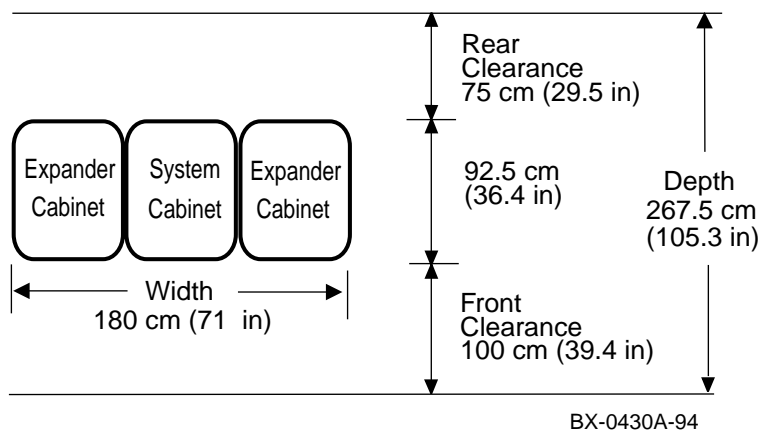


Table 3-1 Cabinet Dimensions and Weights

Cabinet	Height cm (in)	Width cm (in)	Depth cm (in)	Weight kg (lbs) <sup>1</sup>
8200 System	170 (67)	60 (23.6)	92.5 (36.4)	272–590 (600–1300) <sup>1</sup>
8200 Expander	170 (67)	60 (23.6)	92.5 (36.4)	272–590 (600–1300) <sup>1</sup>

<sup>1</sup> For 8200 systems with battery backup add 29 kg (64 lbs) per power supply.

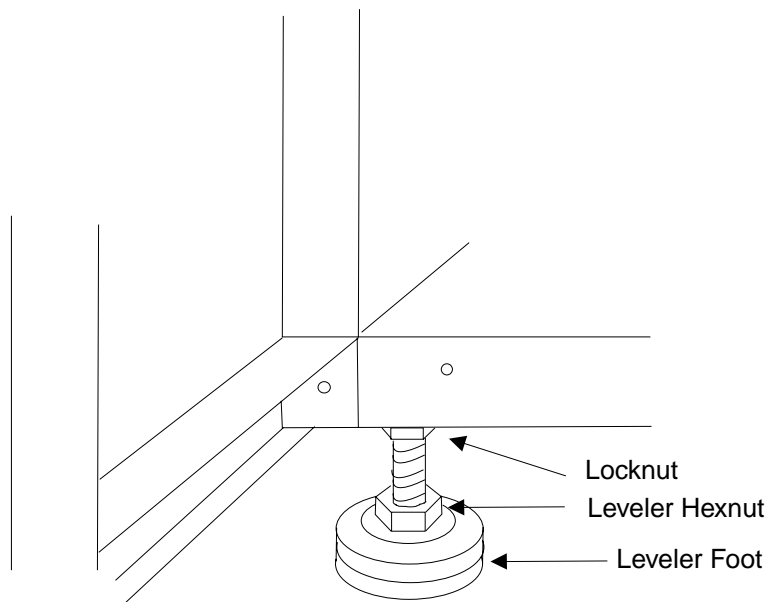
### 3.3 Level All Cabinets

---

**Level the cabinets by adjusting the rubber feet on all the cabinets and then check the cabinets with a bubble level. Be sure the sides of the cabinets butt each other and the cabinets are the same height.**

---

Figure 3-4 Leveler Foot Adjustment



bx0449-94

1. Use an adjustable wrench to lower and adjust the leveler feet. A shipping bracket can also be used to adjust the leveler feet, since the bracket cutout and leveler feet hexnuts are the same size.
2. Use a bubble level while adjusting the feet and make sure all cabinets are properly leveled in three dimensions (top to bottom, side to side, and front to back). The operation is complete when the tops are level and the sides of the cabinets are snug, top to bottom, front to back.
3. Once the cabinets are level, lock each of the feet into place by tightening the locknut at the top of each leveler foot.

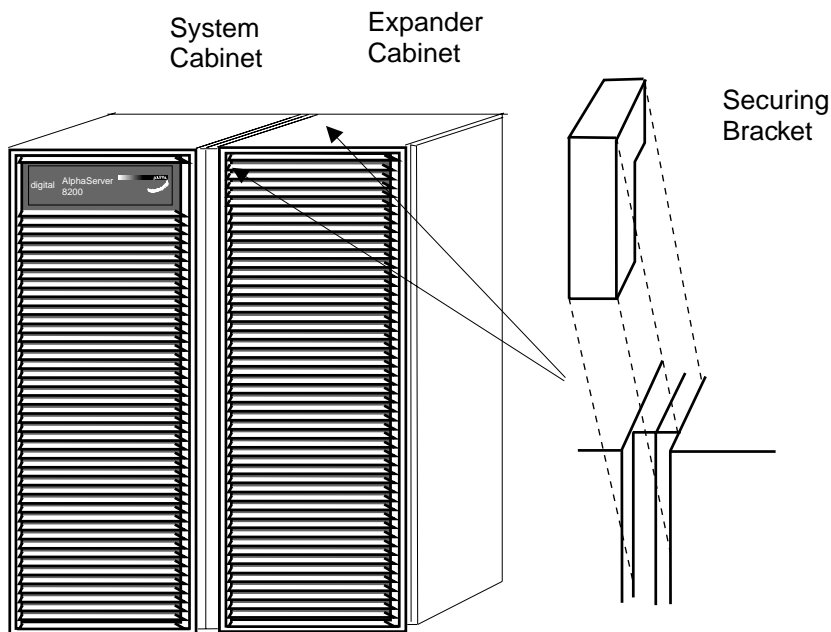
### 3.4 Install the Securing Brackets

---

**The expander cabinet is secured to the system cabinet by two L-shaped brackets inserted over the front and back top corners of the cabinet's sides.**

---

Figure 3-5 Installing Securing Brackets



BX-0618C-944

1. Locate the L-shaped multi-cabinet securing brackets (PN 74-49873-01) in the expander cabinet installation kit.
2. The two securing brackets are placed on the top corners of the side panels of adjacent cabinets. See Figure 3-5. The brackets are tight and require some force to install. If the cabinets are not snug against each other, the brackets will not fit and could damage the sides of the cabinets. Position the brackets as shown in Figure 3-5; the longer part of the bracket secures the edge of the cabinet sides and the shorter part of the bracket secures the top of the cabinet sides.
3. Repeat step 2 if there is a second expander cabinet.

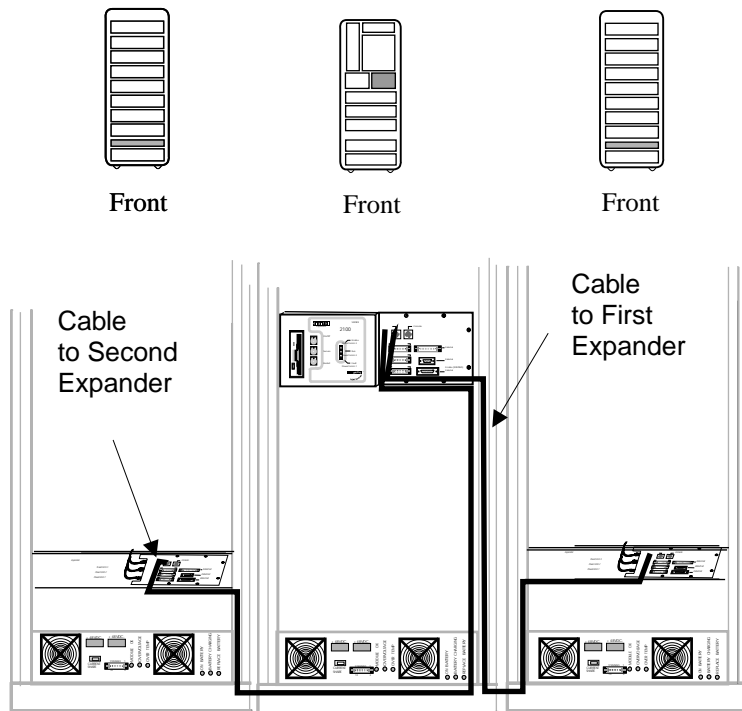
### 3.5 Connect the Power Control Cable

---

**Connect the power control cable from the control panel in the system cabinet to the CCL panel in the expander cabinet. If there are two expander cabinets, install the jack splitter into the control panel in the system cabinet and connect both power control cables to the splitter. Route each cable from the control panel in the system cabinet to the CCL panel in each expander cabinet.**

---

Figure 3-6 Power Control Cable Installation



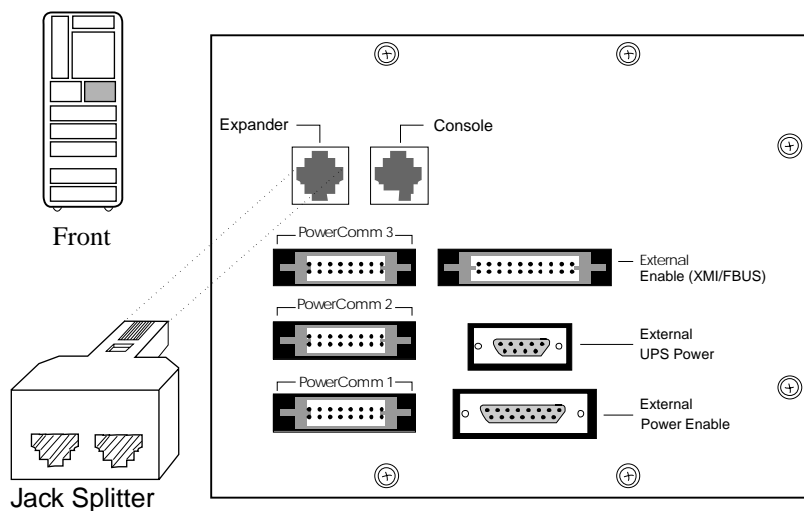
BX-0450B-94



**WARNING:** Before beginning this procedure, make sure the system is powered off.

1. If there are two expander cabinets, plug the jack splitter (PN 12-44937-01) into the system cabinet control panel jack marked Expander. See Figure 3-7.
2. For the right expander cabinet, plug the power control cable (PN 17-03511-04) into the jack splitter or the jack marked Expander on the system control panel in the system cabinet.
3. Route the cable according to Figure 3-6 and plug the other end of the cable into the jack marked Expander on the CCL panel in the right expander cabinet.
4. For the left expander cabinet, plug the second power control cable (PN 17-03511-04) into the jack splitter in the system cabinet.
5. Route the cable according to Figure 3-6 and plug the other end of the cable into the jack marked Expander on the CCL panel in the left expander cabinet.
6. Tie wrap the cables in place.

Figure 3-7 Control Panel and Jack Splitter



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### 3.6 Connect the I/O Cable

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**Connect the I/O cable(s) between the system and expander cabinets.**

---

Figure 3-8 I/O Cable Connections

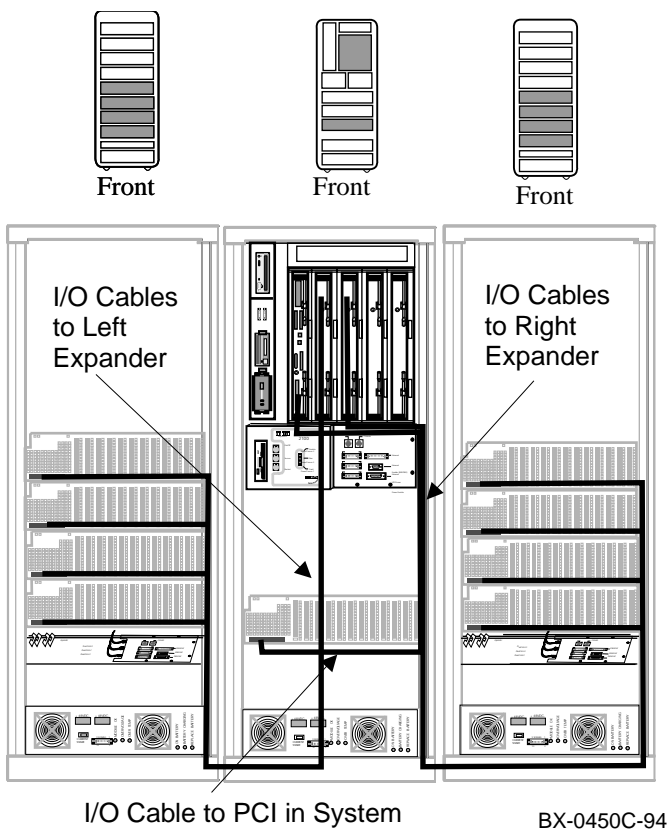


Figure 3-8 shows a system with nine PCIs. In this configuration, a single KFTIA is in TLSB slot 8 and two KFTHAs are in TLSB slots 7 and 6. There are nine PCIs, one in the system cabinet and four in each expander cabinet.

**Cabling Guidelines:**

1. The PCI in the system cabinet is connected to the KFTIA in slot 8.
2. If there is one expander cabinet, the PCIs in it are connected to the KFTHA in slot 7.
3. If there are two expander cabinets, the PCIs in the right expander are connected to the KFTHA in slot 6, and the PCIs in the left expander are connected to the KFTHA in slot 7.
4. The cable from the topmost connector on the KFTHA is connected to the PCI in the lowest position in the expander, the cable from the next topmost position is connected to the PCI that is above the lowest one in the expander. The other two cables follow this principle.

To install the cables:

1. Plan your cabling carefully taking into consideration the above conditions and how the cables are routed and bundled as shown in Figure 3-8.
2. Each PCI must be connected to a KFTHA or KFTIA. Cable 17-03085-04 connects the KFTIA to the PCI in the system cabinet, and the longer cable, the 17-03085-03, connects PCIs in expander cabinets to KFTHAs in the system cabinet.
3. Using a flathead screwdriver, install the end of the I/O cable labeled IOP (P/N 17-03085-0x) to the KFTHA or KFTIA connector. Be sure the connector is aligned before tightening the screws.
4. Route the I/O cable(s) as shown in Figure 3-8.
5. Using a flathead screwdriver, install the end of the I/O cable labeled PIU to the appropriate PCI shown in Figure 3-8.
6. Once all the cables are connected place tie-wraps on them and secure them as best you can in the positions shown in Figure 3-8.



## Chapter 4

---

# Making Console, SCSI, Ethernet, FDDI, and DSSI Connections

This chapter describes how to connect a console terminal and how to make SCSI, Ethernet, FDDI, and connections. It consists of the following sections:

- Connect the Console Terminal
- Connect the Console Load Device
- Connect SCSI Cables
- Connect Ethernet Cables
- Connect FDDI Cables (Optional)
- Connect DSSI Cables (Optional)

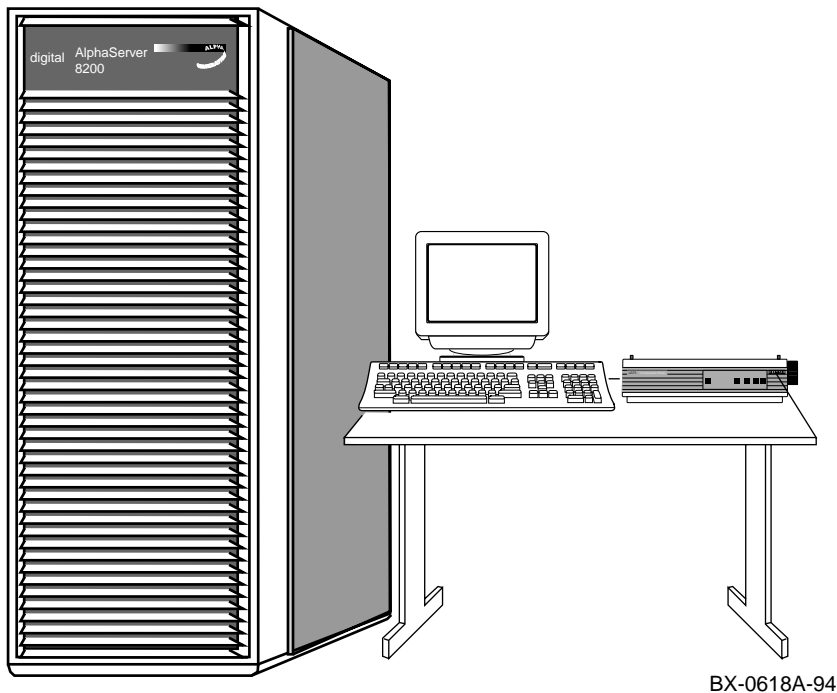
## 4.1 Connect the Console Terminal

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**Figure 4-1 shows a system cabinet with a console terminal. Connect the console terminal to the console terminal port in the system cabinet as shown in Figure 4-2.**

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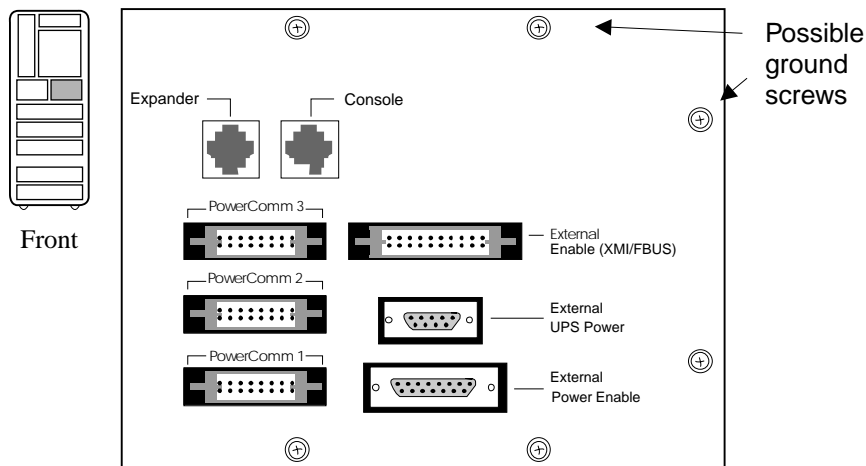
Figure 4-1 System Cabinet, Console Terminal, and Printer



*CAUTION: The system cabinet, console terminal, and printer should all use the same power distribution source to ensure a common ground.*

1. Unpack the VT510 console terminal. The console terminal signal cable is shipped in the loose piece box and consists of a 17-01364-02 cable and H8575-A adapter.
2. Open the front door and connect one end of the 17-01364-02 cable to the console terminal port on the control panel. Connect the cable ground wire to the cabinet grounding screw nearby (see Figure 4-2). Connect the other end of the cable to the H8575-A, which connects to a 25-pin D-subminiature connector on the console terminal. Connect the other end of the cable ground wire to one of the screws on the H8575-A.
3. If a printer is not present, skip this step. Otherwise, unpack the printer. Connect the BC16E-25 signal cable to the printer and to the console terminal. Plug in the printer.
4. The following are the default terminal characteristics. If the terminal does not have these characteristics, they must be set accordingly:
  - Baud rate = 9600 (transmit = receive)
  - 8 bits, no parity
  - 1 Stop Bit
  - Xoff at 64

Figure 4-2 Control Panel and Console Terminal Port



BX-0446-95

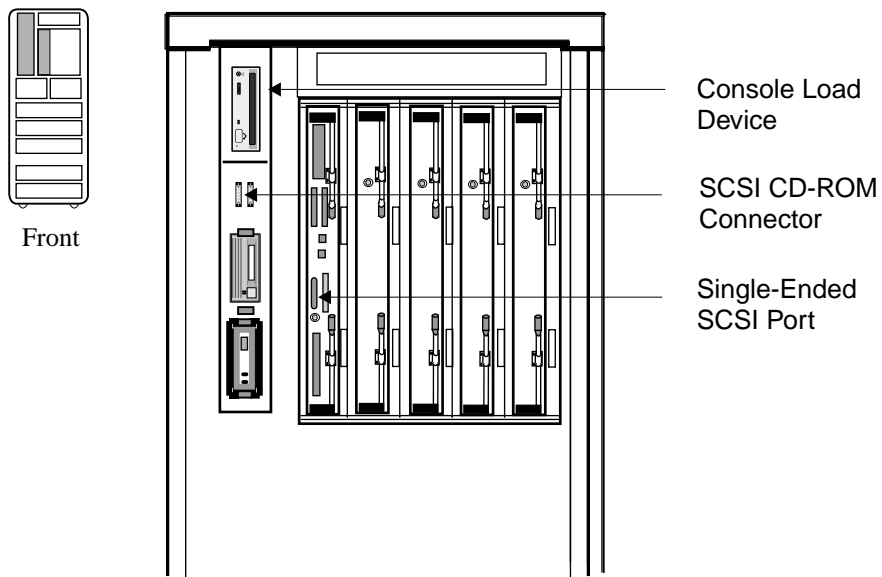
## 4.2 Connect the Console Load Device

---

**Should the console load device cable be dislodged during shipment, follow these instructions. The CD-ROM drive located at the top of the storage drawer in the upper left of the system cabinet is the system load device. It is supported by the KFTIA or a KZPAA in a PCI I/O subsystem.**

---

Figure 4-3 KFTIA as the Console Load Device Support



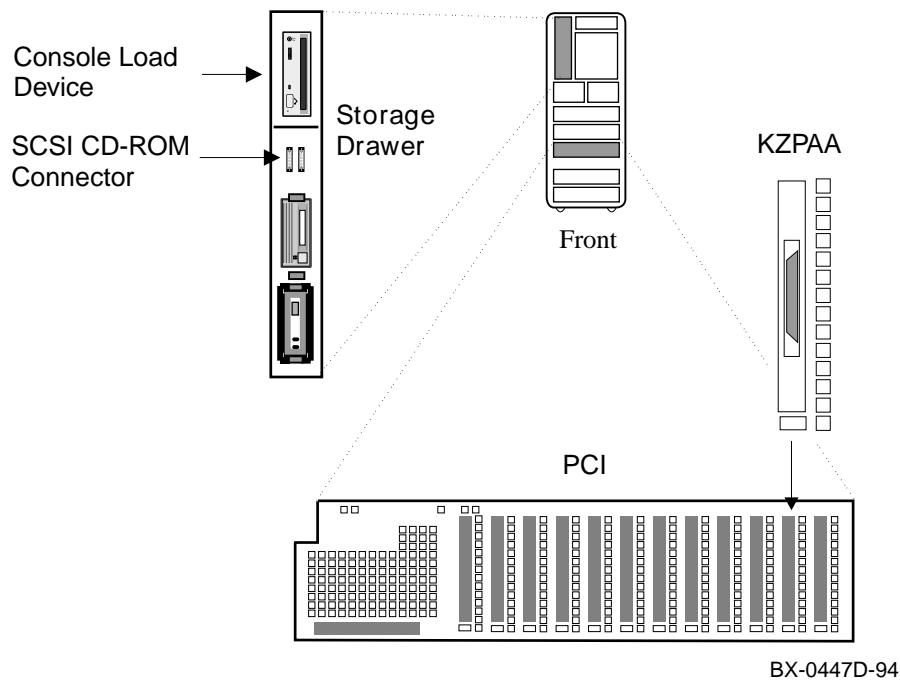
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The BN21H-0E cable is used to connect the CD-ROM drive to the single-ended port on the KFTIA. Figure 4-3 shows the KFTIA and the CD-ROM connector locations. Check to see that the BN21H-0E cable is installed properly.

If there is no KFTIA, support for the CD-ROM comes from the KZPAA in the PCI. Figure 4-4 shows the KZPAA connector on the PCI I/O subsystem. If need be, connect the BN21H-02 cable to the KZPAA and the CD-ROM connector on the storage drawer.

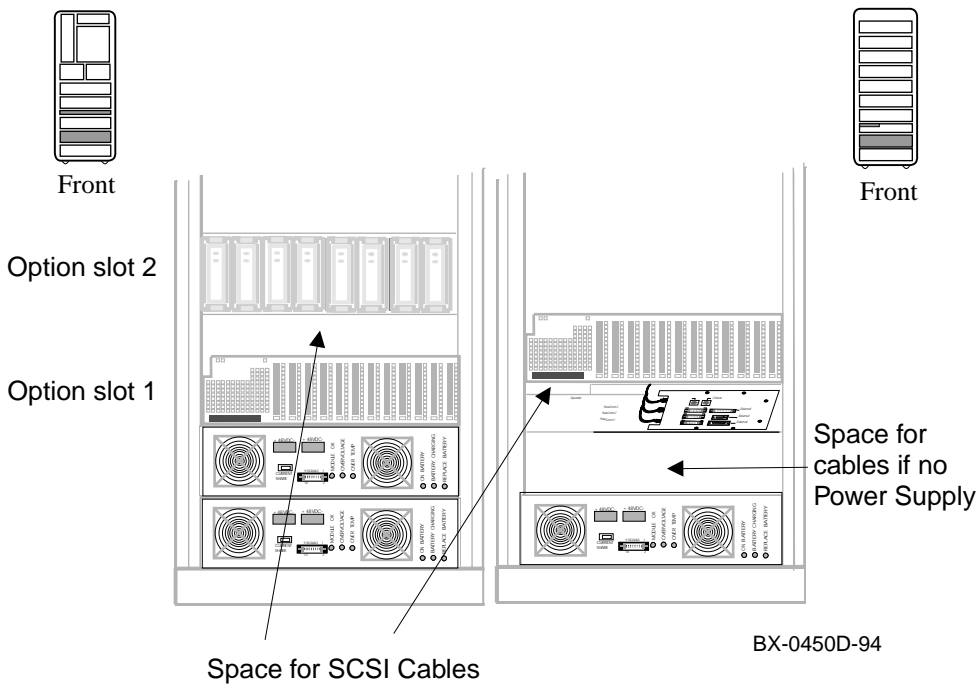
Figure 4-4 KZPAA as the Console Load Device Support



### 4.3 Connect SCSI Cables

**SCSI cable connections depend upon the customer order. Connecting and routing cables are dependent on placement of adapters and devices. Read the information provided and install the cables needed.**

Figure 4-5 System and Expander Cabinets



Multiple SCSI configurations are possible both inside system and expander cabinets and outside either cabinet. Manufacturing connects all SCSI devices it can in both system and expander cabinets. There is space in both cabinets to pass cables from front to back (see Figure 4-5). If there is only one power supply in the cabinet, pass the SCSI cables along the top of the supply. You can assume that loose SCSI cables provided with a system go from device adapters in the system cabinet to devices in another cabinet.

The following rules apply:

1. FWD SCSI ports on the KFTIA have "Y" cables (BN21W-0B) plugged into them. Cables to devices plug into these "Y" cables.
2. All SCSI buses must be terminated at both ends. The terminators for the AlphaServer 8200 are interchangeable and are the H879 or the H8863.
3. All cables exit and enter cabinets at the bottom front.
4. Signal cables should be routed away from the power cables on the front right and rear left frame.
5. SCSI cables that go to devices at the rear of either cabinet are routed through the space above the first option slot if there are two power supplies; otherwise, lay the cable on top of the only power supply.
6. The SCSI cables should not be routed in front of power supply fans.

Table 4-1 lists SCSI cables used in AlphaServer 8200 systems to connect devices outside the system cabinet with their adapters.

Table 4-1 SCSI Cables to Devices in Other Cabinets

Cable Number	From	To	Length (meters)
BN21H-05	PCI (M <sup>1</sup> )	BA350 (front & rear E <sup>2</sup> ) (SE)	5
BN21K-03	PCI (M) PCI (E)	DWZZA, BA350 (front E) (FWD) DWZZA, BA350 (rear E) (FWD)	3
BN21K-05	PCI (M)	DWZZA, BA350 (front & rear E)	5
<sup>1</sup> M = In main or system cabinet.			
<sup>2</sup> E = In expander cabinet.			

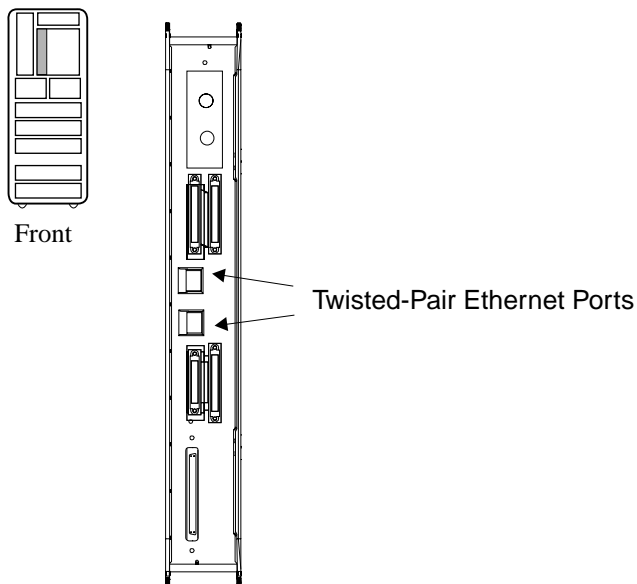
## 4.4 Connect Ethernet Cables

---

**Two Ethernet ports are available on the KFTIA. Connect the Ethernet cable to the KFTIA and to the Ethernet transceiver if the customer is planning to use this option. Ethernet ports are also available through the PCI I/O subsystem. To connect to the Ethernet through a subsystem, connect the Ethernet cable to the Ethernet adapter in the PCI and to the Ethernet transceiver.**

---

Figure 4-6 Ethernet Connectors on KFTIA

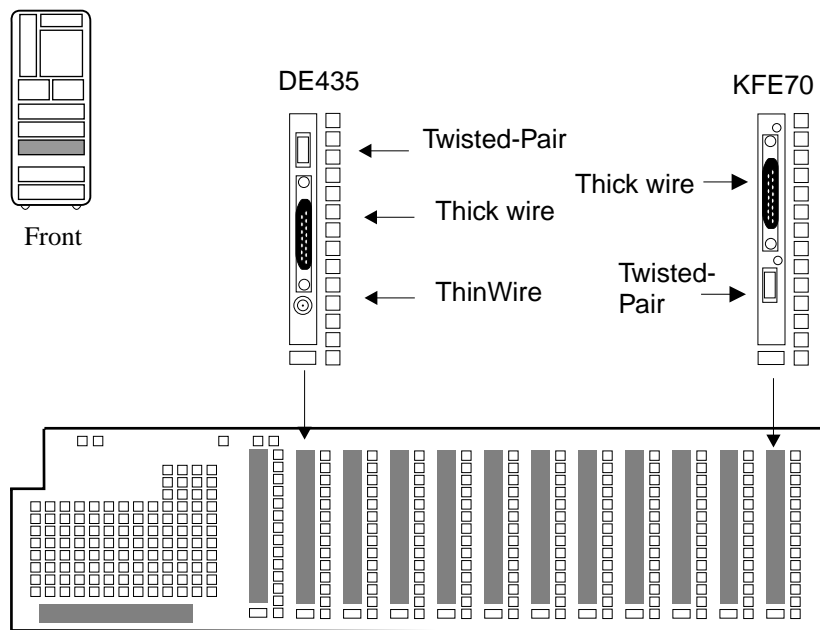


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Two DECchip 21040-AA Ethernet chips on the KFTIA are implemented as twisted-pair Ethernet. They are connected to the Ethernet by a BN25G-xx or a BN26M-xx transceiver cable. The DE435-AA, the PCI Ethernet adapter, implements all three Ethernet variants: twisted-pair, or thick wire, or ThinWire. The KFE70 has twisted-pair or thick wire.

1. Connect the transceiver cable (BN25G-xx (unshielded) or BN26M-xx (shielded)) to an Ethernet port on the KFTIA (see Figure 4-6).
2. Connect the other end of the cable to an Ethernet transceiver or to an appropriate conversion box. See the appropriate Ethernet transceiver manual for more information.
3. If there is a DE435-AA or a KFE70, connect appropriate cables to the PCI module (see Figure 4-7). The DE435 has a single chipset that supports either ThinWire, thick wire, or twisted-pair. The KFE70 supports either thick wire or twisted-pair.

Figure 4-7 Ethernet Connectors on PCI Adapters



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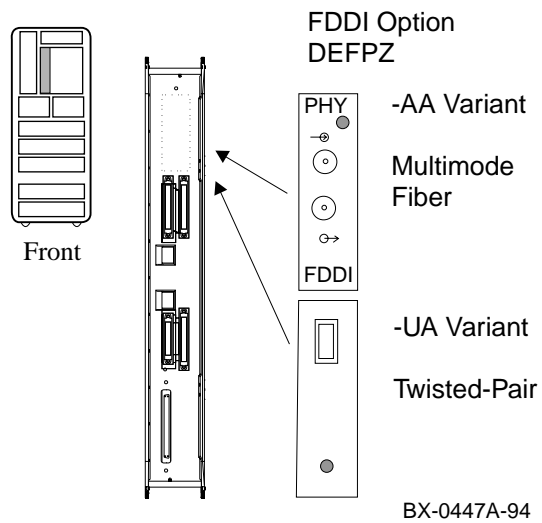
## 4.5 Connect FDDI Cables (Optional)

---

**If the system includes an FDDI option, connect the FDDI cable to the KFTIA or to the DEFPA option in the PCI I/O subsystem and to the FDDI transceiver.**

---

Figure 4-8 FDDI Connectors on KFTIA



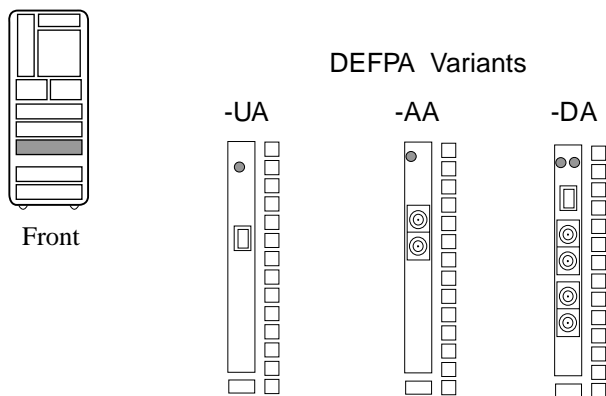
FDDI options are available by a daughter card (DEFPA-XX) on a KFTIA or by a PCI adapter (DEFPA-XX). Table 4-2 lists the FDDI options and the cables required. Figure 4-8 shows connectors for the DEFPA variants, and Figure 4-9 shows connectors for the DEFPA variants.

Table 4-2 FDDI Options and Cables

Option	Description	Location	Associated Cable
DEFPZ-AA	Multimode fiber (MMF)	KFTIA	BN24D or BN24E
DEFPZ-UA	Twisted-pair (UTP)	KFTIA	BN26M or BN26S
DEFPA-AA	Single attachment (MMF)	PCI	BN34A, BN34B, or BN34D
DEFPA-DA	Dual attachment (MMF)	PCI	BN34A, BN34B, or BN34D
DEFPA-UA	Twisted-pair (UTP)	PCI	BN26M or BN26S

1. If you have the KFTIA FDDI option, connect the appropriate cable to the KFTIA FDDI port shown in Figure 4-8, and go to step 3.
2. If you have a PCI FDDI option, connect the appropriate cable to the FDDI port (see Figure 4-9).
3. Connect the other end of the cable to the FDDI network. See the appropriate FDDI manual for details.

Figure 4-9 FDDI Connectors on PCI Adapter



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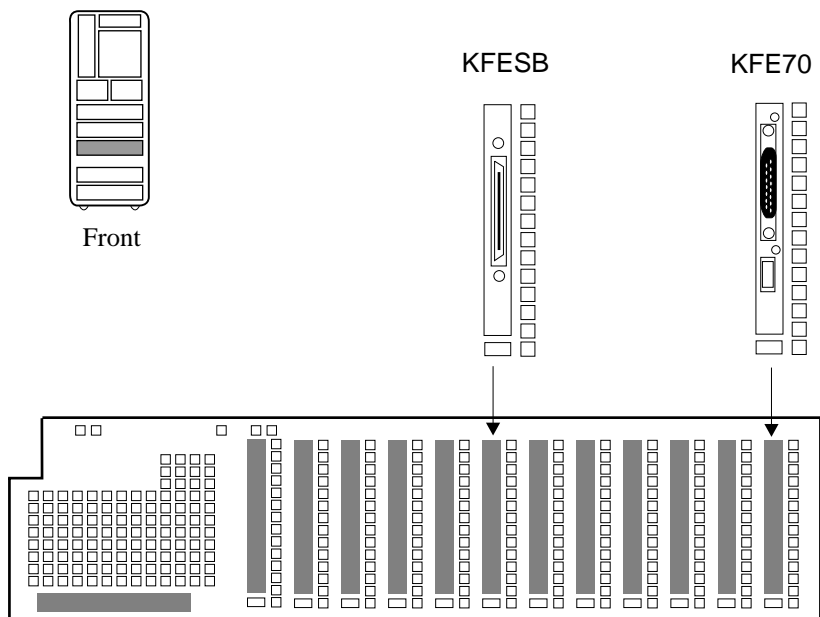
## 4.6 Connect DSSI Cables (Optional)

---

**If the system has a KFESB option on the EISA bus and manufacturing has not cabled it because the placement of the adapter and the devices are in different cabinets, cable the devices to the adapter.**

---

Figure 4-10 DSSI Connector on KFESB



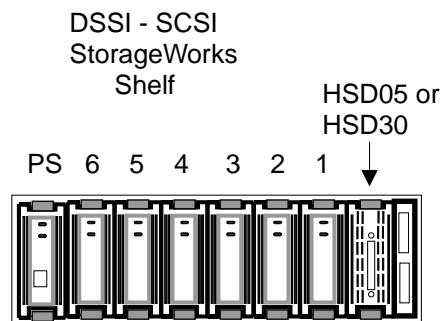
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The KFESB is an EISA to DSSI adapter. Required with this option is the KFE70 and its attendant hardware.

1. If the KFESB is not cabled, attach one end of the DSSI cable (BC29R-xx or BC29S-xx) to the KFESB connector in the PCI/EISA I/O subsystem (see Figure 4-10). Identify the slot location using the **show device** command. If necessary, install a terminator to terminate this end of the DSSI cable.
2. To route the DSSI cable, follow the instructions for SCSI cable routing described in Section 4.3.
3. Attach the end of the DSSI cable to the connector on the HSD05 or HSD30. (The HSD05 and HSD30 are array controllers that allow connectivity between the DSSI bus and the StorageWorks family of products (SCSI).) Figure 4-11 shows the placement of the HSDxx and its connector.
4. If necessary, configure the DSSI bus. (See accompanying KFESB documentation.)

Figure 4-11 StorageWorks Shelf with DSSI Controller



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## Chapter 5

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# Powering Up the System

This chapter provides an overview of the power-up procedure for the system. Sections include:

- Prepare to Check the AC Power
- Measure the AC Power
- Turn the Power On and Check Indicators

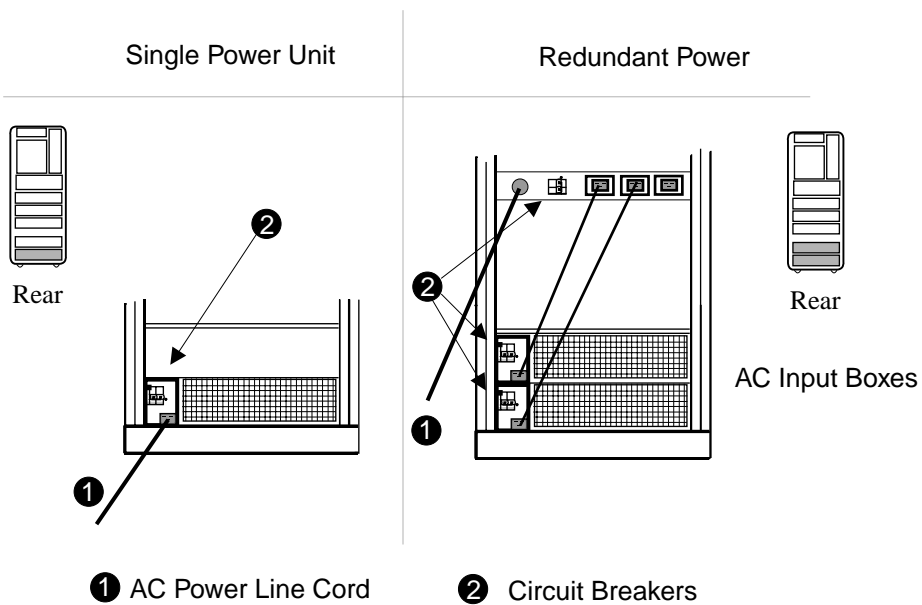
## 5.1 Prepare to Check the AC Power

---

**As a preliminary step before checking the AC power, make sure that the power cord is not plugged in and that the breaker switch is off.**

---

Figure 5-1 Circuit Breaker for the AC Power



BX-0440C-94

1. At this point, the AC power cord should still be unplugged.
2. Pull down the circuit breaker handle on the AC input box (see Figure 5-1).
3. At the control panel, make sure the pushbutton switch is in the off position.

The circuit breaker on the power supply controls power to the system. For normal operation, the circuit breaker handle must be in the on or up position. To shut the circuit breaker off, push the handle down.

For safety, current overload and over-temperature cause the circuit breaker to trip to the off position, removing all power from the system.

**WARNING:** *The **circuit breaker on the power supply** controls power to the system. In a battery backed-up system, if you unplug the system and leave the pushbutton switch in the on position, power is still present. Be sure circuit breakers **on the power supplies** are in the off position when working on the system. In systems with redundant power, the circuit breaker on the power strip controls AC input but does **not** control DC output in a battery backed-up system.*

## 5.2 Measure the AC Power

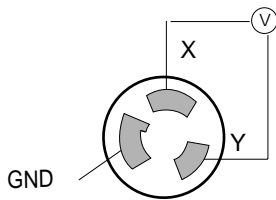
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**With a digital multimeter, check the AC power supplied at the receptacle at the installation site. There are two types of receptacles: one for Europe and the other for other parts of the world.**

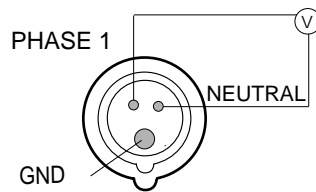
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Figure 5-2 Measuring System Power

202/208 V NOMINAL (30A)  
U.S. & Japanese Version  
NEMA L6-30R (50 - 60Hz)



230 V NOMINAL (32 A)  
IEC 309 Type (50 - 60Hz)



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1. Check that the receptacle provided is correct. This should have been done during site preparation.
2. Using a voltmeter, measure the voltages between lines in the receptacle as shown in Figure 5-2. Verify that the voltages are within the range specified in Table 5-1. If the voltages are out of range, contact an electrician.
3. Plug the power cord into the receptacle.

**Table 5-1 AC Input Voltage Specifications**

Voltage Measurement	208V Nominal	220/240V Nominal
line to line	208	220–240
line to ground (Phase 1 to GND)	120	220–240
neutral to ground	NA	0

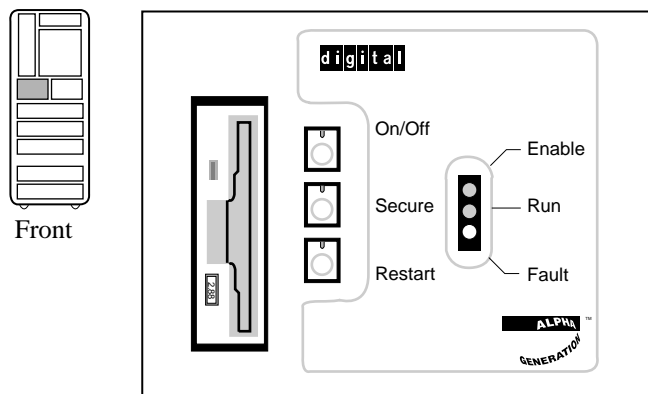
## 5.3 Turn the Power On and Check Indicators

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**Power up the system by pushing up the circuit breaker handle on the AC input box. Push the On/Off button; then monitor the state of the system as it powers up.**

---

Figure 5-3 Control Panel LEDs



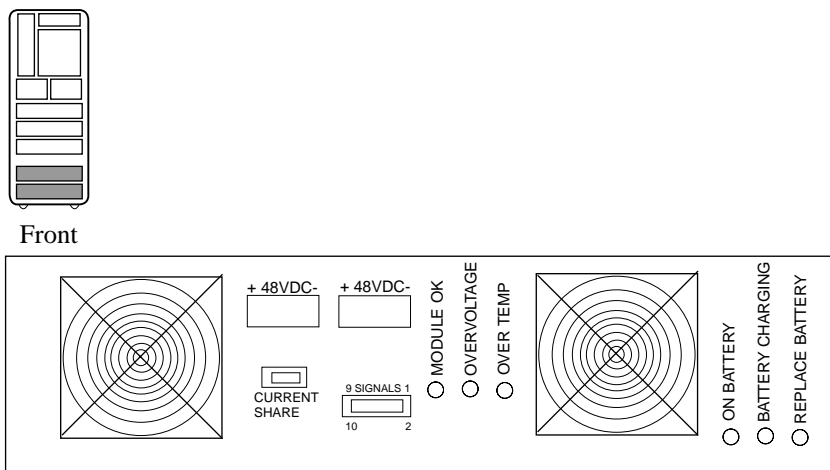
BX-0607-94



1. Turn the power on by pushing the circuit breaker handle up (see Figure 5-1).
2. Go to the front of the cabinet and check that the green power regulator LED(s) are blinking (see Figure 5-4).
3. Push the On/Off button. The following should occur (see Figure 5-3):
  - a. The yellow Fault indicator on the control panel blinks indicating power sequencing is taking place.
  - b. The blower turns on.
  - c. The yellow Fault indicator stays on continuously for a short time indicating self-test is taking place. Module self-test LEDs light as described in Section 6.1, and a self-test display appears on the console terminal as described in Section 6.2. The console prompt appears at the end of a successful self-test display. The yellow Fault indicator goes out when all modules pass self-test.

The power supplies have two sets of LEDs that indicate normal conditions, faults, or battery conditions. When the system is off, plugged in, and the circuit breaker on, power is present only in the power supply and no LEDs are lit. When the system is on, the MODULE OK LED should also light (see Figure 5-4).

Figure 5-4 Power Regulator



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## Chapter 6

---

# System Self-Test

On power-up, the system runs an automatic self-test. Self-test results are indicated by module LEDs, the self-test display at the console terminal, and the Fault light on the control panel.

Sections in this chapter include:

- Check Module Status LEDs
- Check the Self-Test Display

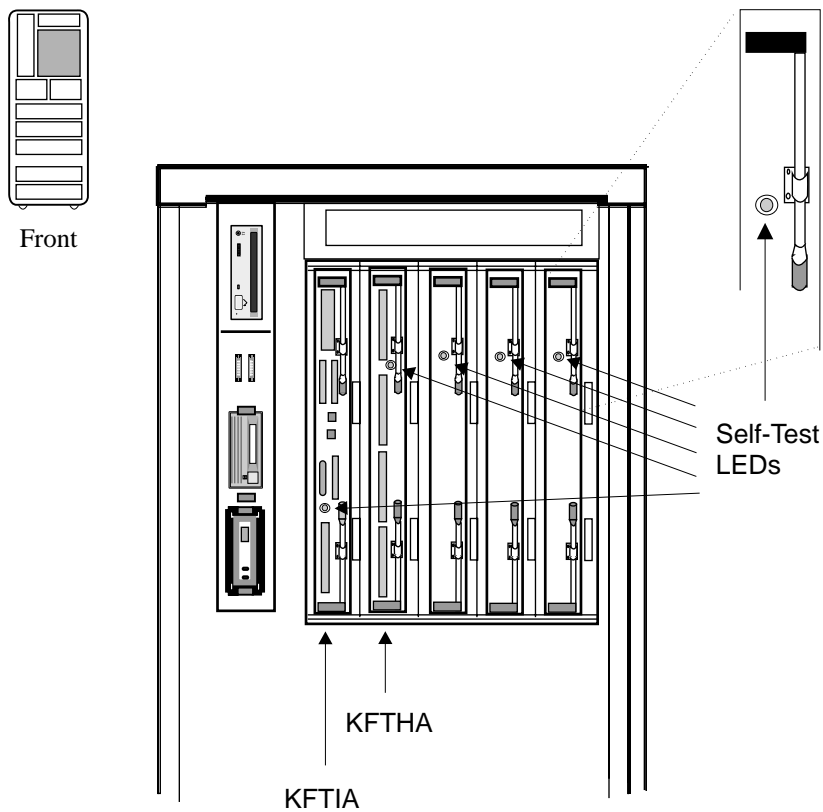
## 6.1 Check Module Status LEDs

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**Check the system module status LEDs for self-test success. If the LEDs indicate failure, refer to the *Operations Manual* for more information.**

---

**Figure 6-1** Powering Up and Checking the LEDs



BX-0606C-94

Processor and memory modules have a green LED that lights when the module passes or completes self-test. These LEDs can be viewed through holes in the shield of the module enclosure from the front of the cabinet. PCI I/O modules are not visible but some connectors have LEDs on them. Table 6-1 lists TLSB and DWLPA, the PCI motherboard, modules showing LED conditions after self-test. For the conditions of LEDs on PCI and EISA devices/adapters, see the related documentation.

**Table 6-1 LEDs After Self-Test**

Module	Self-Test Passed	Self-Test Failed
KN7CC <sup>1</sup>	Green ON	Green OFF
MS7CC	Green ON	Green OFF or ON <sup>2</sup>
KFTHA	Green ON	Green OFF
KFTIA	Green ON	Green OFF
DWLPA <sup>3</sup>	Green ON	Green OFF

<sup>1</sup> The green LED on the processor module indicates that a single CPU chip on a uni-processor module passed self-test or both CPU chips on a dual-processor module passed. The LED will be OFF if there is any failure on the module though it may be configured into the system.

<sup>2</sup> The green LED on the memory module indicates that self-test completed, not passed.

<sup>3</sup> The DWLPA, the PCI motherboard, has four LEDs. The self-test passed LED is the second from the hose connection.

**For more information:**

***Operations Manual***  
***Service Manual***

## 6.2 Check the Self-Test Display

---

The AlphaServer 8200 contains only the "back" half of the TLSB card cage. Nodes 4 through 8 reflect the right-to-left position of the TLSB slots as viewed from the front of the cabinet. Self-test results are displayed on the console terminal. The pass (+) or fail (-) status of each module is indicated.

---

### Example 6-1 Self-Test Results

```

F  E  D  C  B  A  9  8  7  6  5  4  3  2  1  0  NODE # ❶
                A  M  .  P  P  .  .  .  .  TYP  ❷
                O  +  .  ++ -+  .  .  .  .  ST1  ❸
                .  .  .  EE EB  .  .  .  .  BPD  ❹
                O  +  .  ++ -+  .  .  .  .  ST2  ❸
                .  .  .  EE EB  .  .  .  .  BPD
                +  +  .  ++ -+  .  .  .  .  ST3  ❸
                .  .  .  EE EB  .  .  .  .  BPD

                .  +  +  +  .  +  +  +  C0 PCI +❺
                .  .  .  .  .  .  .  +  +  +  C1 PCI +❶

                .  A0  .  .  .  .  .  .  ILV
                .128  .  .  .  .  .  .  128MB
AlphaServer 8200 Console V1.0, SR0M V1.0 APR 1 1995 00:00:00
P08>>>

```

❶ The NODE # line lists the (hexadecimal) node numbers on the TLSB and I/O buses. Node numbers and slot numbers are identical. For the PCI I/O subsystem nodes 0 - B are counted from right to left.

❷ The TYP line indicates the type of module at each TLSB node:

- An adapter: the I/O port module (A) is a KFTIA or a KFTHA
- A memory module (M)
- A processor (P)

A period (.) indicates the slot is empty or the module is not reporting.

❸ The ST1–ST3 lines show the results of the testing. The self-test bit in the TLCNR register of each module contains this information. For the KN7CC dual processor one CPU may pass, another fail. Entries are:

- + (pass) A .+ indicates a uniprocessor passed.
- – (fail) A -+ indicates one CPU failed and one CPU passed on a dual-processor module.
- o (does not apply). In this example, the I/O port module has "o" because there is no module-resident self-test.

❹ The BPD line indicates boot processor designation. The results on this line indicate:

- The boot processor (B)
- Processors eligible to become the boot processor (E)
- Processors ineligible to become the boot processor (D)

The BPD line is printed three times. After the first determination of the boot processor, the processors go through two more rounds of testing. Since it is possible for a processor to pass self-test at line ST1 and fail ST2 or ST3 testing, the processors again determine the boot processor following each round of tests.

❺ The I/O channel line C0 indicates the state of the internal PCI I/O channel on the KFTIA and shows that devices at nodes 0, 1, 2, 4, 5, and 6 all passed self-test. Line C1 indicates the self-test results for the DWLPA and all PCI adapters connected through the KFTIA's hose. In this example, self-test passed on PCI nodes 0, 1, 2, 3. Had a KFTHA been present, channel lines for each of the four I/O connections would have been shown.

**For more information:**

***Operations Manual***





## Chapter 7

---

# Diagnostics and Utilities

After the system passes self-test, you must verify proper system operation. First verify the presence of SCSI devices, then verify the boot device load path. After the path is verified, you can boot the operating system and use operating system-based test programs (such as VET) to complete system verification.

The system is tested automatically during power-up; no off-line loadable diagnostics are required or provided. The Loadable Firmware Update (LFU) Utility is currently the only supported off-line loadable program. It is used to update firmware on any module residing on the system that has updatable firmware.

Sections in this chapter include:

- Console Load Device
- Verification Overview
- Diagnostics Overview
- Run System Self-Test
- Show Commands for Installation
- Verify SCSI Devices
- If Necessary, Run the RAID Configuration Utility
- If Necessary, Run the EISA Configuration Utility
- Booting Factory Installed Software
- Booting OpenVMS from a CD-ROM
- Booting Digital UNIX from a CD-ROM
- Set Commands for Booting
- Booting LFU from a CD-ROM
- Running the System Exerciser VET

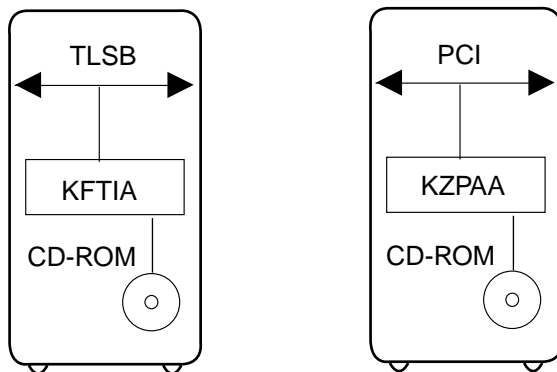
## 7.1 Console Load Device

---

**The compact disk (CD) drive is the in-cabinet console load device. During system installation the console load device is used to load software and boot various utilities like the Loadable Firmware Update (LFU) Utility.**

---

Figure 7-1 Accessing the Console Load Device



BX-0410B-94

The console load device is used for:

- Installing or updating software
- Loading a backup utility program
- Interchanging user data
- Updating module firmware
- The compact disk (CD) drive is the console load device for these systems. It is installed in the system cabinet and used to access software and online documentation. The CD-ROM is likely to be installed through the KFTIA, or through a KZPAA in a PCI I/O subsystem.

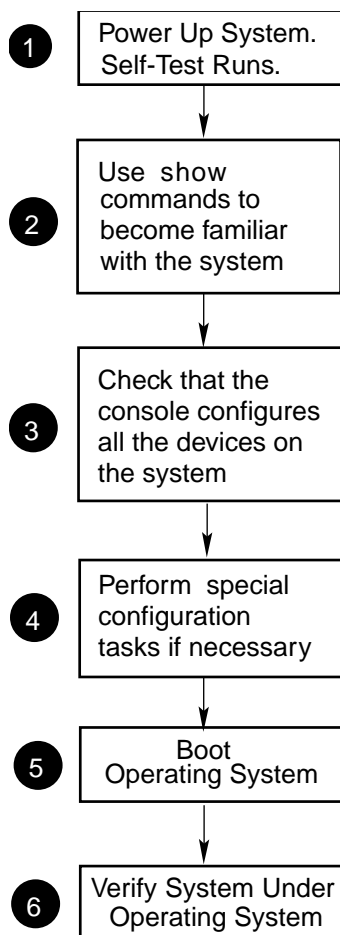
## 7.2 Verification Overview

---

**The following process is used to verify the system after installation.**

---

Figure 7-2 Verification Procedure



BX-0490-94

- ❶ When the system powers up, self-test runs. Verify that all tests have passed by checking the results in the self-test display.
- ❷ Use the **show configuration** and **show device** commands to determine the self-test status for the I/O adapters and devices. Identify the load device. Note what the console configures.
- ❸ Check that the console configured all the hardware on the system. Troubleshoot and repair if necessary.
- ❹ Run configuration utilities if necessary.
- ❺ Boot the factory installed operating system.
- ❻ Verify the system under the installed operating system.

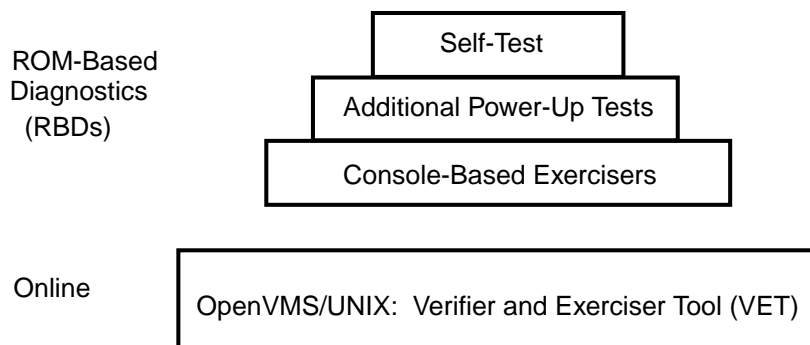
## 7.3 Diagnostics Overview

---

**Self-tests and additional ROM-based diagnostics are run automatically at power-up. Console-based exercisers can be run from the console in User Mode. The system Verifier and Exerciser Tool is run under the operating system.**

---

Figure 7-3 Diagnostic Overview



BXB-0065A-94

Table 7-1 lists diagnostics provided. Tests in the first two groups run at power-up. The console-based exercisers can be run from the console.

Table 7-1 Diagnostics

Test Group	Test
Self-test	CPU self-test
	Memory array self-test
	PCI adapter self-test <sup>1</sup>
	Device peripheral self-test
	Power subassembly self-test
Additional power-up tests	CPU/Memory interaction tests
	Multiprocessor tests
	KFTIA and KFTHA tests
	PCI tests
Console-based exerciser	Cache/Memory exerciser
	Disk exerciser <sup>2</sup>
	Floating-point exerciser
	Network exerciser <sup>2</sup>
<sup>1</sup> Self-test on PCI adapters is optional. If the device has and performs self-tests, they are reported by the console. <sup>2</sup> Run in internal loopback (at I/O adapter) mode only.	

*NOTE: To run console-based diagnostics and utilities using the **set host** and **test** commands, see the Service Manual.*

## 7.4 Run System Self-Test

---

**Gather adapter self-test and address information using self-test results as shown in Example 7-1.**

---

### Example 7-1 Self-Test Display

```

F  E  D  C  B  A  9  8  7  6  5  4  3  2  1  0  NODE #
                A  M  .  .  P  .  .  .  .  TYP
                O  +  .  .  ++ .  .  .  .  ST1  ❶
                .  .  .  .  EB .  .  .  .  BPD
                O  +  .  .  ++ .  .  .  .  ST2  ❷
                .  .  .  .  EB .  .  .  .  BPD
                +  +  .  .  ++ .  .  .  .  ST3  ❷
                .  .  .  .  EB .  .  .  .  BPD
                .  +  +  +  .  +  +  +  C0 PCI + ❸
                .  .  .  +  .  .  .  .  .  C1 PCI +
                .  A0 .  .  .  .  .  .  .  ILV
                .512 .  .  .  .  .  .  .  512MB
AlphaServer 8200 Console V1.0, SROM V1.0, Apr 1 1995 00:00:00

```



- ❶ Check the ST1 line in the self-test results to see that all CPU and memory modules passed self-test. Note that on a system with dual-processor modules, failing processors are disabled and appear in the ST1 line. Were both processors to fail on a dual-processor module, nothing appears on the ST1 line. There is minimal TLSB traffic during these tests.
- ❷ Check the ST2 line to see that memory and the CPU(s) passed their interaction tests and check the ST3 line to see that all three types of modules on the TLSB passed their tests.
- ❸ Check the C0 through C10 lines to determine which modules on the PCI I/O subsystem passed self-test. The example shows two PCIs, one internal to the KFTIA in slot 8 and the other connected to the KFTIA through a hose. (The maximum number of PCI I/O subsystems is eleven.)

*NOTE: If any module is badly broken on any bus, the console may not get a response or be able to read whether a device passed self-test. Under such conditions, self-test does not indicate a failure but instead indicates that the slot is empty.*

## 7.5 Show Commands for Installation

---

**Use show commands to obtain information on the system configuration.**

---

### Example 7-2 Show Configuration

P08>>> show configuration ❶

	Name	Type	Rev	Mnemonic
TLSB				
4++	KN7CC-AB	8014	0000	kn7cc-ab0
7+	MS7CC	5000	0000	ms7cc0
8+	KFTIA	2020	0000	kftia0
C0 Internal PCI connected to kftia0				
				pci0
0+	ISP1020	10201077	0001	isp0
1+	ISP1020	10201077	0001	isp1
2+	DECchip 21040-AA	21011	0023	tulip0
4+	ISP1020	10201077	0001	isp2
5+	ISP1020	10201077	0001	isp3
6+	DECchip 21040-AA	21011	0023	tulip1
7+	PCI NVRAM	71011	0000	pci_nvram0
C1 PCI connected to kftia0				
				pci1
0+	SIO	4828086	0003	sio0
5+	KZPSA	81011	0000	kzpsa0
6+	DECchip 21040-AA	21011	0023	tulip3
8+	ISP1020	10201077	0001	isp4
A+	DAC960	11069	0000	dac0
B+	DEC PCI FDDI	F1011	0000	pfi0
Controllers on SIO				
				sio0
0+	DECchip 21040-AA	21011	0023	tulip2
1+	FLOPPY	2	0000	floppy0
2+	KBD	3	0000	kdb0
3+	MOUSE	4	0000	mouse0
EISA connected to pci1 through sio0				
				eisa0
3+	KFESA	2EA310	0000	kfesa0

### Example 7-3 Show Device

```
P08>>> show device ②
polling for units on isp0, slot 0, bus 0, hose0...
dka200.2.0.0.0      DKA200          RZ26L  440C
dka400.4.0.0.0      DKA400          RZ26L  440C
polling for units on isp1, slot 1, bus 0, hose0...
dkb300.3.0.1.0      DKB300          RZ26L  440C
dkb500.5.0.1.0      DKB500          RZ26L  440C
dkb600.6.0.1.0      DKB600          RZ26L  440C
polling for units on isp2, slot 4, bus 0, hose0...
dkc100.1.0.4.0      DKC100          RZ26L  440C
dkc200.2.0.4.0      DKC200          RZ26L  440C
dkc300.3.0.4.0      DKC300          RZ26L  440C
polling for units on isp3, slot 5, bus 0, hose0...
dkd400.4.0.5.0      DKD400          RRD44  0000
dkd500.5.0.5.0      DKD500          RZ26L  440C
```

- ① Use the **show configuration** command to see a listing of the modules in the system. This command shows the module TLSB and PCI slot number, module name, module type, revision, mnemonic, and if self-test passed.
- ② The **show device** command displays information about each I/O device. Polling checks all I/O buses for device configurations. The next line contains the console device name, the name of the device given by the device controller, and the device type. Example 7-3 shows polling of only the internal bus of a KFTIA.
- ③ The **show network** command, not shown in the example, displays information about network connections.

Using these commands (**show configuration**, **show device**, and **show network**), make sure all devices and system resources are present and "seen" by the console. Check the results of the two console commands against the manufacturing system manifest. If something is missing, it is likely broken, needs reseating, or is back ordered.

**For more information:**

*Operations Manual*

## 7.6 Verify SCSI Devices

### 7.6.1 Check SCSI Devices Using Console Commands

**To verify SCSI devices, issue the console command `show device`. Check the output against the physical SBBs (storage building blocks). Nodes are defined by the physical position of the SBB and do not have to be set.**

#### Example 7-4 Checking SCSI Devices

```
Initializing... ❶
      :
      :
      . + + + . + + + C0 PCI +
      . . . . . . + . . . + . C1 PCI +
      . A0 . . . . . . . ILV
      . 512 . . . . . . . 512MB

AlphaServer 8200 Console V1.0 SR0M V1.0 Apr 1 1995 00:00:00
P08>>> show device ❷
polling for units on isp0, slot 0, bus 0, hose0...
polling for units on ispl, slot 1, bus 0, hose0...
polling for units on isp2, slot 4, bus 0, hose0...
polling for units on isp3, slot 5, bus 0, hose0...
dkd400.4.0.5.0 DKD400RRD44 0064
dkd500.5.0.5.0 DKD500RZ26L 440C
polling for units on kzpsa0, slot 5, bus 0, hoses1...
kzpsa0.7.0.5.1 dke TPwr 1 Fast 1 Bus ID 7 C01 A05
dke100.1.0.5.1 DKE100 RZ26L 440C
dke200.2.0.5.1 DKE200 RZ26L 440C
dke300.3.0.5.1 DKE300 RZ26L 440C ❸
dke400.4.0.5.1 DKE400 RZ26L 440C
dke500.5.0.5.1 DKE500 RZ26L 440C
dke600.6.0.5.1 DKE600 RZ26L 440C
```

**Basics:**

- There are four ways to attach to SCSI devices:
  - KZPAA, a PCI adapter with a single-ended SCSI port
  - KZPSA, a PCI adapter with a SCSI port
  - KZPSC, the RAID adapter with one to three FWD SCSI ports
  - ISP1020, a PCI chipset on the KFTIA; each KFTIA has three FWD (fast wide differential) SCSI ports and one single-ended SCSI port.
- Each port has a maximum of eight nodes per bus, including the initiator or host.
- Each modular storage shelf (BA350) has a power supply and can hold seven 3.5" SBBs (such as RZ26s or TLZ06s), two 5.25" SBBs (such as the RZ73 drives), or a combination of these.
- SCSI configurations vary depending upon the particular adapter being used. Read the manuals associated with each adapter to learn the configuration rules.

All cabling and node setting has been completed prior to shipping. To check the configuration, check self-test and issue a **show device** console command:

- ❶ The system goes through self-test. Check that the KFTIA, the KZPAA, the KZPSA, and/or the KZPSC adapters passed self-test.
- ❷ Issue a **show device** command. In this example, the SCSI ports on the KFTIA are polled first; only two devices are found on the single-ended port ips3. A KZPSA in slot 5 of the PCI that is connected to the KFTIA through hose1 is polled and shows the adapter at node 7 and six RZ26L disks at nodes 1 through 6.
- ❸ Each port connects to a shelf housing up to seven RZxx drives on one bus (see Figure 7-4). All devices in this example are reporting to the console and are working. When a DWZZA is used, it occupies a StorageWorks shelf slot, but it is not a node nor is it "seen" by the console.

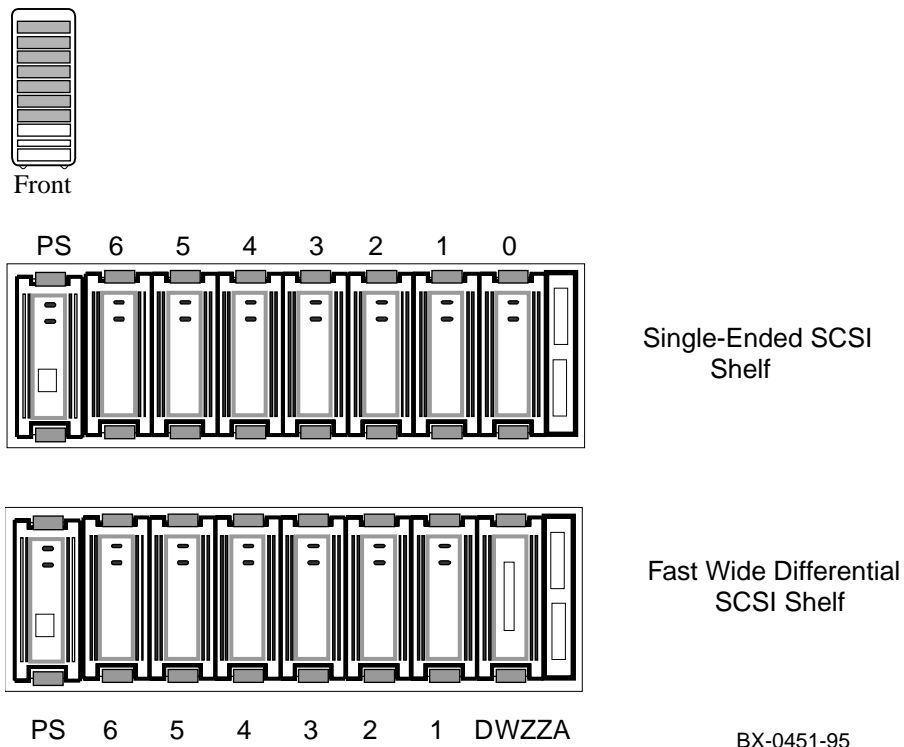
## 7.6.2 Check Console Output Against Physical Devices

---

**Next check the output from the show device command against the physical SBBs in the cabinet(s).**

---

Figure 7-4 SCSI Disks in StorageWorks Shelves



BX-0451-95

Check the output from the **show device** command against the physical SBBs. There should be a one-to-one correspondence between SBBs reporting to the console and the physical devices mounted. Note that the node number reported by the console corresponds to the physical position of an SBB within a shelf; the slots and nodes are numbered 0 to 6, from right to left (see Figure 7-4).

Figure 7-4 shows two storage shelves: one with a DWZZA and one without. A DWZZA is a bidirectional bus converter that converts differential signals to single-ended signals and converts single-ended signals to differential signals. Figure 7-4 is not exhaustive; other devices fit into StorageWorks shelves and look very different from the configuration shown.

The KFTIA has three differential ports (ips0, ips1, and ips2); RZ26, RZ26L, and RZ28 disks are single-ended devices used in StorageWorks shelves; DWZZAs are used to perform bus conversion if necessary. Although the DWZZA-VA takes up a slot, it is not a node on the bus and is not "seen" by the system.

Each SBB has two LEDs. The green LED on the top lights when the SBB is mounted and is being accessed. For a complete discussion of StorageWorks LED status, see the *StorageWorks Solutions Configuration Guide* (EK-BA350-CG).

If you have problems seeing devices, reseal the SBBs and reissue **show device**. If you need further testing, use the **test** command. Refer to BA350 documentation if you need to reconfigure the buses.

**For more information:**  
***Service Manual***  
***BA350 Modular Storage Shelf Subsystem Configuration Guide or User's Guide***

## 7.7 If Necessary, Run the RAID Configuration Utility

---

**If a KZPSC is in the system (it shows up in the console display as the DAC960), the customer may want RCU run. When the system was configured in manufacturing, default settings were used when RCU was run. Example 7-5 shows how to run RCU. See the KZ-PSC documentation for detailed information on configuring the devices. The RCU software is on a floppy and requires a KFE70.**

---

### Example 7-5 Running RCU

```
P08>>> set arc_enable on ①
```

```
P08>>> initialize ②
```

```
[Console display appears]
```

```
P08>>> run rcu -p 1
```

```
③
```

```
④
```



The RAID Configuration Utility (RCU) need only be run if a KZPSC controller is in the system. The controller comes with its own documentation describing the utility. The controller can operate in several different modes, and the customer should determine how to customize the disk farm. RCU enables the choices. Prior to running the utility, you should read the documentation and discuss which mode the customer wishes. Example 7-5 shows how to run RCU.

Place the RAID Configuration Utility floppy in the floppy drive.

- ❶ Use the **set** command to turn on the **arc\_enable** environment variable.
- ❷ **Initialize** the system to make the **set** command take effect.
- ❸ After self-test completes, enter **run rcu** to identify what program to run. The **run** command defaults to the floppy as the source of the program for execution so no device need be specified.
- ❹ **-p 1** specifies that PCI1 is to be configured. See Example 7-2 for the PCI number containing the KZPSC (shown by the console as the DAC960). (In this case it is connected to a KFTIA hose.)

## 7.8 If Necessary, Run the EISA Configuration Utility

---

**If the system has a KFE70, a PCI to EISA bridge, it may be necessary to run ECU, the EISA bus configuration tool. The console will tell you if this is necessary. ECU comes on a floppy that must be placed in the floppy drive.**

---

### Example 7-6 Running ECU

Power on the system ❶

[console display appears]

AlphaServer 8200 console v1.0. SR0M V1.0, Apr 1 1995 00:00:00

EISA Configuration Error - run the EISA Configuration Utility. ❷

P08>>> set arc\_enable on ❸

P08>>> initialize ❹

[console displays appears]

P08>>> runecu ❺

The EISA Configuration Utility need only be run if there is a PCI to EISA bridge and EISA devices on the system. Manufacturing will have run ECU prior to shipping the system, so running it again may not be necessary. The EISA Configuration Utility comes on a floppy, has online help, and configures the EISA bus. The **arc\_enable** environment variable must be on and in effect for ECU to run. There are two versions of the utility, one that runs on graphics terminals, and another that runs on character cell terminals. Both versions are on the floppy; the console determines what kind of terminal is on the system and chooses the correct ECU version to run. Example 7-6 shows how to run ECU.

Place the EISA Configuration Utility floppy in the floppy drive.

- ❶ Power on the system or initialize.
- ❷ After self-test, if the EISA bus is not configured, the console displays the message shown here.
- ❸ Use the **set** command to turn on the **arc\_enable** environment variable.
- ❹ **Initialize** the system to make the **set** command take effect.
- ❺ After self-test enter **runecu**, the console command to invoke ECU. The console loads ECU from the floppy drive and passes control to it.

If ECU is not run and OpenVMS is on the system and booted, OpenVMS prints the following message:

```
%SYSTEM-I-NOCONFIGDATA, IRQ Configuration data for EISA
slot xxx was not found, please run the ECU and reboot.
```

OpenVMS continues to boot after this message and will run without the EISA devices as system resources.

If ECU is not run and UNIX is on the system and booted, no information messages are printed. The operating system boots but does not use any EISA resources.

## 7.9 Booting Factory Installed Software

---

**The factory installs the operating system ordered by the customer. After determining that all devices are seen by the console, you will want to know where the operating system is installed and then boot it.**

---

### Example 7-7 Booting the Operating System

```
P08>>> show bootdef_dev      ❶
    bootdef_dev      dk200.2.0.2.0
P08>>> show boot_osflag     ❷
    boot_osflags     0 [for OpenVMS]
    or
    boot_osflags     a [for UNIX]
P08>>> boot
Building FRU table.....
(boot dka200.2.0.0.0 -flags 0,0) ❸
SRM boot identifier: scsi 0 0 0 2 200 ef00 10201077
boot adapter: isp0 rev 0 in bus slot 0 off of kftia0 in TLSB slot 8
block 0 of dka200.2.0.0.0 is a valid boot block
reading 1018 blocks from dka200.2.0.0.0
bootstrap code read in
base = 200000, image _start = 0, image_bytes = 7f400
initializing HWRPB at 2000
initializing page table at 1f2000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code

OpenVMS Alpha Operating System, Version V6.2 ❹
```

Example 7-7 shows the OpenVMS Alpha operating system as the factory installed software. Had the Digital UNIX operating system been installed, slight variations in the output shown would have occurred. The callouts in the following list refer to Example 7-7.

- ❶ Enter the **show bootdef\_dev** command to see what disk holds the operating system software.
- ❷ Enter the **show boot\_osflags** command to see what flags have been set. If the flag set is a 0 and the operating system is OpenVMS, the operating system will come up assuming flags of 0,0. If the flag is an **a** and the operating system is Digital UNIX, the operating system will come up in multiuser mode. See the *AlphaServer 8200/8400 Operations Manual* for a complete discussion of booting.
- ❸ Enter the **boot** command.
- ❹ After booting information messages are given, the operating system banner appears.

## 7.10 Booting OpenVMS from a CD-ROM

---

**This section shows how to boot OpenVMS from the CD-ROM drive. The first step is to issue the show device command to determine the mnemonic of the CD drive. This method of booting OpenVMS replaces standalone backup.**

---

### Example 7-8 CD-ROM OpenVMS Boot

```
P08>>> show device ❶
polling for units on isp0, slot 0, bus 0, hose0...
dka200.2.0.0.0      DKA200          RZ26L  440C
dka400.4.0.0.0      DKA400          RZ26L  440C
polling for units on isp1, slot 1, bus 0, hose0...
polling for units on isp2, slot 4, bus 0, hose0...
polling for units on isp3, slot 5, bus 0, hose0...
dkd400.4.0.5.0      DKD400          RRD44  0000
dkd500.5.0.5.0      DKD500          RZ26L  440C
P08>>> boot -flags 0,0 dkd400.4.0.5.0 ❷

Booting... ❸
Connecting to boot device dkd400
initializing HWRPB at 2000
initializing page table at 1ee000
initializing machine state
jumping to bootstrap at 1fa000

OpenVMS Alpha Operating System, Version V6.2 ❹
Copyright (c) 1995 Digital Equipment Corporation. All Rights Reserved.
Installing required known files...
Configuring devices...
*****
You can install or upgrade the OpenVMS Alpha operating
system or you can install or upgrade layered products that
are included on the OpenVMS Alpha operating system CD-ROM.
You can also execute DCL commands and procedures to
perform "standalone" tasks, such as backing up the system
disk.

Please choose one of the following:
  1) Install or upgrade OpenVMS Alpha Version V6.2
  2) List layered product kits that this procedure can
install
```

- 3) Install or upgrade layered product(s)
- 4) Execute DCL commands and procedures
- 5) Shut down this system

Enter CHOICE or ? to repeat menu:

- ❶ **Show device** displays information about each I/O device. Polling checks the KFTIA for device configurations. The next line contains four columns. The first column contains the device type and unit number, node number, device channel number, the internal PCI node number, and I/O channel number, separated by periods. The second column displays the name of the device given by the device controller. The third column shows the device type, and the fourth column shows the revision of the device. The CD drive in this case is the RRD44 and its mnemonic is DKD400.
- ❷ In the **boot** command, **-flags** indicates that additional command parameters follow, **0** is the system root of the boot device, **0** is the boot-strap option, **dk** is the device code of the boot device, **d** is the boot device controller designation, and **400** specifies the hexadecimal unit number of the boot device. The **4** is the node number, **0** is the channel number, **5** is the PCI node number, and **0** is the I/O channel number.
- ❸ The system boots OpenVMS from the CD-ROM.
- ❹ The operating system banner appears.

Example 7-8 shows that several choices can be made when booting OpenVMS in this fashion. Make the appropriate choice and continue. (Note that by choosing option 4 (Execute DCL commands and procedures) you can back up your system disk. Standalone backup is replaced by this method of booting OpenVMS.)

## 7.11 Booting Digital UNIX from a CD-ROM

---

**This section shows a sample boot of UNIX from the CD-ROM drive. The first step is to issue the show device command to determine the mnemonic of the CD drive.**

---

### Example 7-9 CD-ROM UNIX Boot

```
p08>>> show device ❶
polling for units on isp0, slot 0, bus 0, hose0...
dka200.2.0.0.0      DKA200                RZ26L  440C
polling for units on isp1, slot 1, bus 0, hose0...
polling for units on isp2, slot 4, bus 0, hose0...
polling for units on isp3, slot 5, bus 0, hose0...
dkd400.4.0.5.0     DKD400                RRD44  0000
dkd500.5.0.5.0     DKD500                RZ26L  440C
P08>>> boot dkd400.4.0.5.0 -fl a ❷
(boot dkd400.4.0.5.0 -flags a) ❸
SRM boot identifier: scsi 4 5 0 0 400 ef00 10201077
boot adapter: isp3 rev 0 in bus slot 5 off of kftia0 in TLSB slot 8
block 0 of dkd400.4.0.5.0 is a valid boot block
reading 16 blocks from dkd400.4.0.5.0
bootstrap code read in
base = 200000, image_start = 0, image_bytes = 2000
initializing HWRPB at 2000
initializing page table at 1f2000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code

OSF Boot - Thu Feb 2 18:13:26 EST 1995
Loading vmunix...
[I/O subsystem reset information, memory information
displayed, I/O bus adapters displayed, configured devices
displayed, network configuration information displayed]
The system is ready.

DEC UNIX Version 3.2B (oregon.acb.exz.dec.com) console
login:
```



- ❶ **Show device** displays information about each I/O device. Polling checks the KFTIA for device configurations. The next line contains four columns. The first column contains the device type and unit number, node number, device channel number, the internal PCI node number, and I/O channel number, separated by periods. The second column displays the name of the device given by the device controller. The third column shows the device type, and the fourth column shows the revision of the device. The CD drive in this case is the RRD44 and its mnemonic is DKD400.
- ❷ In the **boot** command, **dk** is the device code of the boot device, **d** is the boot device controller designation, and **400** specifies the hexadecimal unit number of the boot device. The **4** is the node number, **0** is the channel number, **5** is the PCI node number, and **0** is the I/O channel number. The **-fl a** causes UNIX to come up in multiuser mode.
- ❸ The system boots from the CD-ROM.
- ❹ After the system is configured, the operating system banner appears, and the user is given the **login:** prompt.

**For more information:**

***DEC OSF/1 Guide to System Administration***

## 7.12 Set Commands for Booting

---

**Use the set command to define a default boot device as shown in Example 7-10.**

---

### Example 7-10 Set Boot Commands

```
P08>>> set boot_reset on ❶  
P08>>> set bootdef_dev dka200.2.0.0.0 ❷  
P08>>> set boot_osflags "0,6" ❸  
P08>>> boot ❹
```

[the system initializes and boots]

- ❶ Enter **set boot\_reset on** to initialize the system before booting.
- ❷ If you boot from the same boot device each time, you can store the disk name by defining the default boot device. This is done by using the **set bootdef\_dev** command. The default boot device is used for booting during power-up and auto restarts.
- ❸ Use **set boot\_osflags** to define the boot command flag parameters of 0, 6. Note the flags shown here are for OpenVMS; UNIX uses different flags.
- ❹ Booting can now be done from that device by typing **boot** or just **b**.

*NOTE: Refer to the Operations Manual for more information on **set** commands and environment variables.*

## 7.13 Booting LFU from a CD-ROM

---

**The Loadable Firmware Update (LFU) Utility is on the Alpha CD-ROM (PN AG-PTMW\*-BE). Make sure this CD-ROM is mounted in the CD drive and then boot LFU.**

---

### Example 7-11 AlphaServer 8200 LFU Booting

```
P08>>> show device ❶
polling for units on isp0, slot 0, bus 0, hose0...
dka400.4.0.0.0      DKA400              RZ26L  440C
polling for units on isp1, slot 1, bus 0, hose0...
polling for units on isp2, slot 4, bus 0, hose0...
polling for units on isp3, slot 5, bus 0, hose0...
dkd400.4.0.5.0     DKD400              RRD44  0000
dkd500.5.0.5.0     DKD500              RZ26L  440C
P08>>> boot dkd400 -fl 0,a0 ❷
Building FRU table.....
(base boot dkd400.4.0.5.0 -flags 0,a0)
SRM boot identifier: scsi 4 0 5 0 400 ef00 81011
boot adapter: isp3 rev 0 in bus slot 5 off of kftia0 in TLSB slot 8
block 0 of dkd400.4.0.5.0 is a valid boot block
reading 1018 blocks from dkd400.4.0.5.0
bootstrap code read in
base = 200000, image_start = 0, image_bytes = 7f400
initializing HWRPB at 2000
initializing page table at 1f2000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code
Bootfile:[alpha8200]as8000_v01.exe ❸

***** Loadable Firmware Update Utility *****
-----
Function      Description
-----
Display      Displays the system's configuration table.
Exit         Return to loadable offline operating environment.
List         Lists the device types and firmware revisions
            supported by this revision of LFU.
Modify       Modifies port parameters and device attributes.
Show         Displays device mnemonic, hardware and firmware
            revisions.
```

Update	Replaces current firmware with loadable data image.
Verify	Compares loadable and device images.
? or Help	Scrolls the function table.

---

UPD>

④

- ① Use the **show device** command to find the mnemonic of the CD-ROM drive.
- ② Enter the **boot** command to boot from the RRD44. The RRD44 has a device name of dkd400.
- ③ Supply the bootfile directory and name: [alpha8200]as8000\_v01.exe. When this system is introduced, May 1995, the bootfile listed here is the correct name. Over time, the version of this file is likely to change. To obtain the correct file name, follow the instructions found in *Alpha Systems Firmware Update Version x.x Release Notes Overview* that comes with the system CD-ROM (AG-PTMW\*-BE).
- ④ LFU starts, displays a summary of its commands, and issues its prompt UPD>. (The Modify command appears only if there are devices on the system that have modifiable attributes.)

## 7.14 Running the System Exerciser VET

---

**Run the DEC Verifier and Exerciser Tool (VET). VET is a tool with generic exercisers designed to ensure proper installation and verification of hardware and operating system software. It is run under the operating system. Install VET from the system CD-ROM (AG-PTMW\*-BE) before running it. Example 7-12 shows a sample DEC VET user session. See the *DEC Verifier and Exerciser Tool User's Guide* (AA-PX73A-TE (OpenVMS) or AA-PTTMA-TE (UNIX)) for more information.**

---

### Example 7-12 Sample DEC VET User Session for Command Mode

```
$ vet ❶
  Running system sizer on node cpu2 ... please wait.

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VET_setup> load ❷
  Enter number of processes for CPU device (decimal [1]): 2 ❸
  Enter number of processes for MEMORY device (decimal [1]): 2
  Enter number of processes for NETWORK device (decimal [1]): 0
  Enter number of processes for FILE device (decimal [1]): 2
  Enter number of processes for each VIDEO device (decimal [1]): 0
...opening script file $19$dka500:[sys0.][sysmgr]vet_load.script.
Process 1, group exer for device CPU
Process 2, group exer for device CPU
Process 3, group exer for device MEMORY
Process 4, group exer for device MEMORY
Process 5, group exer for device FILE
Process 6, group exer for device FILE
...closing script file $19$dka500:[sys0.][sysmgr]vet_load.script.
VET_setup> start ❹
...starting [Process 1, Pass 1] group exer for device CPU.
...starting [Process 2, Pass 1] group exer for device CPU.
...starting [Process 3, Pass 1] group exer for device MEMORY.
...starting [Process 4, Pass 1] group exer for device MEMORY.
...starting [Process 5, Pass 1] group exer for device FILE.
...starting [Process 6, Pass 1] group exer for device FILE.
...completed [process 1] group exer for device CPU.
...completed [process 2] group exer for device CPU.
...completed [process 5] group exer for device FILE.
...completed [process 6] group exer for device FILE.
```

Table 7-2 lists the DEC VET exercisers and descriptions.

Table 7-2 DEC VET Exercisers

Exerciser	Description
CPU	Tests processor functions including binary operations, integer computations, floating-point computations, and data conversion.
Memory	Tests dynamic allocation and deallocation of virtual memory and verifies test patterns written.
Disk	Tests logical and physical disk I/O by performing read and write operations and verifies test patterns written.
File	Tests reading and writing to disk files and verifies test patterns written.
Tape	Tests reading and writing to tape device files and verifies test patterns written.
Network	Tests underlying protocol (including caches, buffers, and queues), physical network adapters, local and remote networks, destination adapters, and network services.
Printer	Tests printers by sending ASCII, PostScript, or a user specified file to a selected print queue. A PostScript file is provided with the exerciser.
Video	Tests text, graphic, and palette capabilities of video monitors.

- ❶ In Example 7-12 the user enters the command **vet** at the system prompt. The system sizer message is displayed. The system sizer process finds the devices that are connected to the system and obtains device information needed by the VET programs.
- ❷ At the VET\_setup prompt, the user issues the command **load**. The **load** command creates processes for most devices on the system. Note that the File test exercises disks.
- ❸ The VET program displays a series of questions. The user can select the number of processes to run for each device type. In the example, two processes are selected for the CPU device, memory device, and file device.
- ❹ Enter the **start** command to begin testing.

## Example 7-12 Sample DEC VET User Session (Continued)

```
^C 5
...stopping [Process 4] group exer for device MEMORY.
...stopping [Process 3] group exer for device MEMORY.
VET_suspend> show runtime 6
Process 1 Runtime:
  Requested runtime:    0 hours   0 minutes   0 seconds
  Elapsed runtime:     0 hours   0 minutes  22 seconds
  Remaining runtime:   0 hours   0 minutes   0 seconds

Process 2 Runtime:
  Requested runtime:    0 hours   0 minutes   0 seconds
  Elapsed runtime:     0 hours   0 minutes  22 seconds
  Remaining runtime:   0 hours   0 minutes   0 seconds

Process 3 Runtime:
  Requested runtime:    0 hours   0 minutes   0 seconds
  Elapsed runtime:     0 hours   3 minutes  39 seconds
  Remaining runtime:   0 hours   0 minutes   0 seconds

Process 4 Runtime:
  Requested runtime:    0 hours   0 minutes   0 seconds
  Elapsed runtime:     0 hours   3 minutes  39 seconds
  Remaining runtime:   0 hours   0 minutes   0 seconds

Process 5 Runtime:
  Requested runtime:    0 hours   0 minutes   0 seconds
  Elapsed runtime:     0 hours   2 minutes  30 seconds
  Remaining runtime:   0 hours   0 minutes   0 seconds

Process 6 Runtime:
  Requested runtime:    0 hours   0 minutes   0 seconds
  Elapsed runtime:     0 hours   3 minutes  20 seconds
  Remaining runtime:   0 hours   0 minutes   0 seconds

VET_suspend> continue 7
...continuing [process 3] group exer for device MEMORY.
...continuing [process 4] group exer for device MEMORY.
...completed [process 3] group exer for device MEMORY.
...completed [process 4] group exer for device MEMORY.

...testing completed. Total errors reported by all processes = 0. 8
VET_setup> exit 9
$
```



- ⑤ The user enters a Ctrl/C to suspend executing processes. DEC VET enters the suspend execution state.
- ⑥ Enter **show runtime** to list the requested, elapsed, and remaining run times of each process.
- ⑦ The **continue** command resumes execution of all suspended processes. After testing is completed, a message is displayed to inform the user of the number of errors reported. No errors were reported in this example (see ③).
- ⑧ Enter **exit** to exit the DEC VET program. The system prompt is displayed.



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