Service Handbook

HP VISUALIZE
J Class Workstations

Edition 3

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New editions of this manual incorporate all material updated since the previous edition. Update packages may be issued between editions and contain replacement and additional pages to be merged into the manual by the user.

The manual part number and printing date indicate its current edition. The manual part number changes when extensive technical changes are incorporated. The printing date changes when a new edition is printed. (Minor corrections and updates which are incorporated at reprint do not cause the date to change.)

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1 Product Information

This chapter provides general product information about the HP VISUALIZE J5xxx and J7xxx workstations. This information is provided to help familiarize you with the main features and components of these workstations.

Chapter Overview

This chapter contains the following main sections:

- Product Description
- Front Panel Components
- Rear Panel Components
- Internal Components
- Monitors
- Keyboard and Mouse
- Site Preparation and Installation

Product Description

The HP VISUALIZE J5xxx and J7xxx workstations are high-performance systems capable of handling the most complex problems in computational analysis, advanced 3-D design, and electronic circuit design and verification.

The J5xxx and J7xxx workstations are similar in many ways. However, they differ in their system boards and power supplies. The J5xxx has two PA-RISC microprocessors and eight memory slots on its system board, and an 830 Watt power supply with no DC/DC converter units required. The J5600 is the same as the J5000 except that the J5600 has two 552 MHz PA-8600 microprocessors instead of 440 MHz PA-8500 processors. In contrast, the J7xxx has four PA-RISC microprocessors and sixteen memory slots on its system board, and a 1,350 Watt power supply with two DC/DC converter units. A detailed list of both workstations' features is provided in the "Key Features" subsection on the next page.

Physical Dimensions and Net Weights

Both workstations use a common chassis, which is 17.5 inches (44.5 cm) high × 13.6 inches (34.5 cm) wide × 21.0 inches (53.3 cm) deep. Both are also rack-mountable, using the J1458A Rack Mount Kit. Table 1-1 lists the net weights for each workstation.

Table 1-1. Net Weights for the J5xxx and J7xxx Workstations

	J5xxx	J7xxx
Minimum Configuration	74 pounds (34 Kg)	81 pounds (37 Kg)
Maximum Configuration	88 pounds (40 Kg)	96 pounds (44 Kg)

NOTE For environmental and electrical requirements, see Appendix A.

Key Features

The J5xxx and J7xxx workstations have the following key features.

- **CPUs:**
  - — *J5xxx* – Two 440 MHz PA-8500 microprocessors, each with 1.5 MB on-chip cache
  - — *J5600* – Two 440 MHz PA-8600 microprocessors, each with 1.5 MB on-chip cache
  - — *J7xxx* – Four 440 MHz PA-8500 microprocessors, each with 1.5 MB on-chip cache
- **Operating System:** Native HP-UX
  - — 32-bit support requires HP-UX version 10.20 plus the June 1999 Workstation ACE (Additional Core Enhancements)
  - — 64-bit support requires HP-UX version 11.0 plus ACE 9911
- **User Interface:** HP CDE (Common Desktop Environment) graphical user interface
- **Compatibility**: Source- and binary-code compatible with the B-, C-, and J-Class product families
- **Main Memory:** Using 256 MB or 512 MB DIMMs
  - — *J5xxx* – Eight DIMM slots (from 512 MB up to 4 GB total)
  - — *J7xxx* – Sixteen DIMM slots in pairs (from 4 GB up to 8 GB total)
- **Power Supply:**
  - — *J5xxx* – 830 Watt with *no* DC/DC converter units
  - — *J7xxx* – 1,350 Watt with two DC/DC converter units
- **Internal Storage Devices:**
  - — Up to four hot-pluggable, SCA (Single Connector Attach) hard disk drives
  - — Optionally, one CD ROM drive
  - — Optionally, either one DDS-3 tape drive or one 3.5-inch floppy disk drive
- **Standard Networking:** Ethernet IEEE 802.3 RJ45, Twisted Pair 10/100 Base T
- **Standard I/O:** 2 GB/sec aggregate I/O bandwidth
  - — Two RS-232C Serial ports
  - — Two USB (Universal Serial Bus) Series A ports for the keyboard and mouse only
  - — One Parallel (IEEE 1284) port
  - — One NSE (Narrow Single-Ended) SCSI-2 port
  - — One Ultra2 Wide LVD (Low Voltage Differential) SCSI port
  - — Four 16-bit Audio ports (Mic In, Headphones, Line Out, Line In)

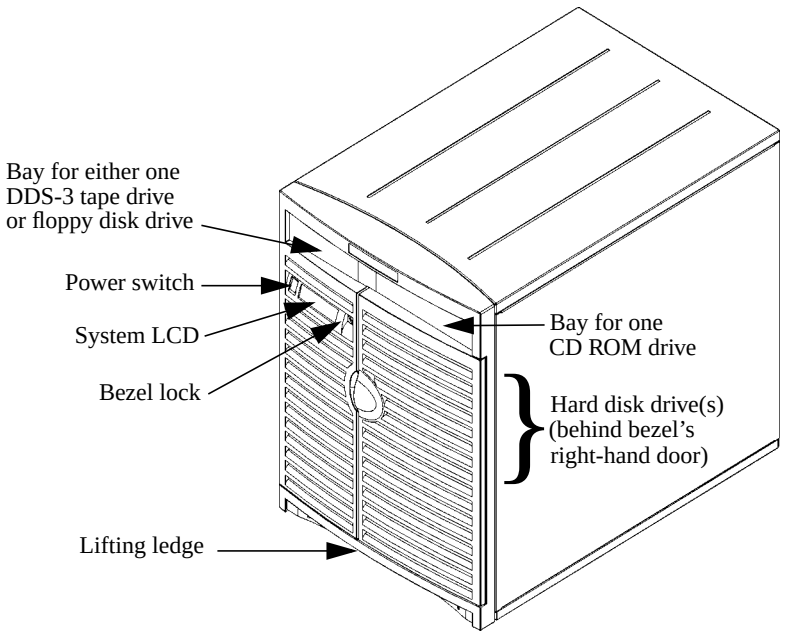
- **I/O Expansion Capabilities:** 64-bit PCI (Peripheral Connect Interface) slots
  - — Five PCI-2X slots at 5V, 33 MHz
  - — Two PCI-4X slots at 3.3V, 66 MHz
  - — One slot for power only
- **Graphics Cards Currently Supported:**
  - — HP VISUALIZE-EG
  - — HP VISUALIZE-FX^2
  - — HP VISUALIZE-FX^6
  - — HP VISUALIZE-FXe
- **Monitors Currently Supported:**
  - — 19-inch VGA 1600×1200 color monitor (Product Number A4575A)
  - — 21-inch VGA 1600×1200 color monitor (Product Number A4576A)
  - — 18.1-inch L1800 flat panel display (Product Number D5065W)
- **Standard Keyboard:** USB (Universal Serial Bus) Series A
- **Mouse:** USB (Universal Serial Bus) Series A, either scroll wheel or three-button type

Front Panel Components

This section describes the components that are located on the front panel of the J5xxx and J7xxx workstations.

Figure 1-1 shows the front panel components with the bezel attached.

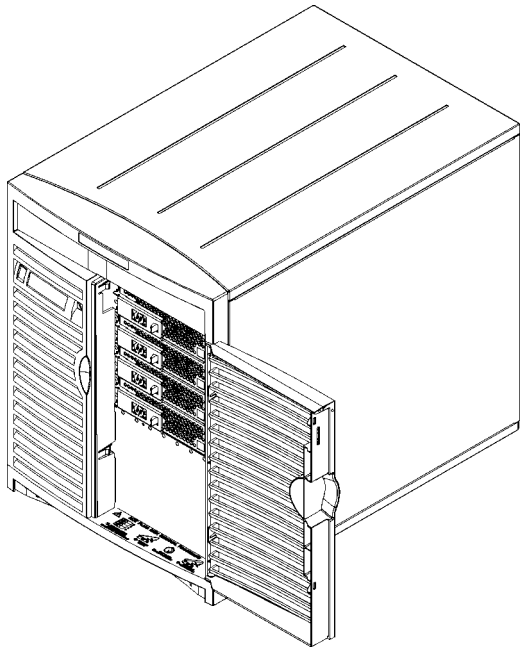
Figure 1-1. Components on the Front Panel with the Bezel Attached



CAUTION The lifting ledge at the bottom, front of the workstation is strong enough to use as a handhold when lifting the workstation. However, note that this workstation is designated for two-person lifting; it weighs approximately 74 to 96 pounds (34 to 44 Kg), depending on the configuration. Do not attempt to lift it by yourself, or injury may result.

As noted in Figure 1-1, the hard disk drives are located behind the right-hand door of the front bezel. Figure 1-2 on the next page shows the workstation with the bezel door open, so that the four hard disk drive brackets can be seen.

Figure 1-2. Front Panel with the Bezel Door Open

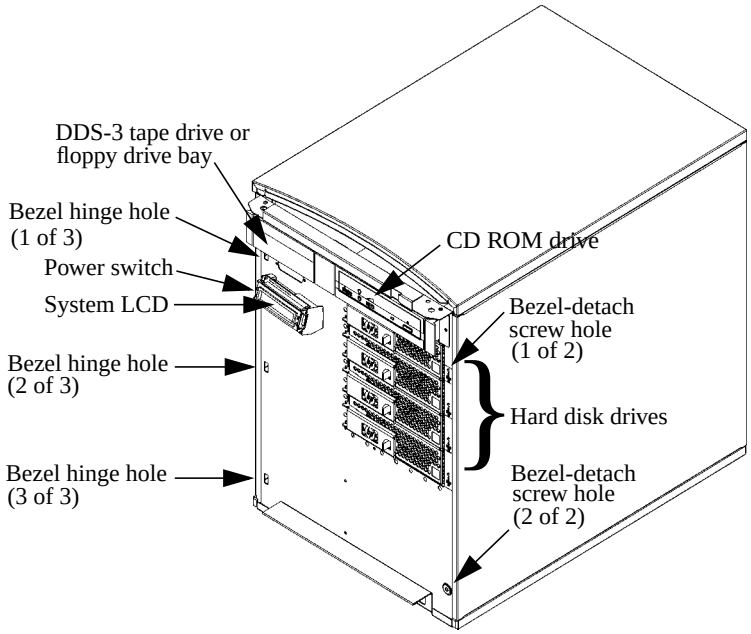


The bezel on the front of the workstation can be locked with the bezel lock for security reasons. The front bezel must be removed in order to install or remove a DDS-3 tape drive, a floppy disk drive, a CD ROM drive, or the power switch/LCD assembly. Note, however, that the front bezel does *not* need to be removed for installing or removing hard disk drives – only the front bezel's right-hand door needs to be opened to access the hard disk drive bays.

Figure 1-3 on the next page shows the front panel of the workstation with the bezel removed. This figure shows an empty bay on the top, left-hand side where an optional DDS-3 tape drive or floppy disk drive can be installed. It also shows the optional CD ROM drive installed in the top, right-hand bay, as well as four hard disk drive brackets in the hard disk drive bays on the right-hand side of the workstation. (As noted earlier, these workstations can support up to four hard disk drives.)

In addition, Figure 1-3 shows the location of the two bezel-detach screw holes on the right-hand side of the front panel, as well as the three bezel hinge holes on the left-hand side of the front panel.

Figure 1-3. Components on the Front Panel with the Bezel Removed



The following subsections describe the components that are located on the front panel of the J5xxx and J7xxx workstations, including:

- Power switch
- System LCD
- Internal storage devices:
  - — Hard disk drive(s)
  - — Optional CD ROM drive
  - — Optional DDS-3 tape drive or floppy disk drive

Power Switch

The power switch is located on the left side of the front panel as part of the power switch/LCD assembly. Use the power switch to power the workstation on and off.

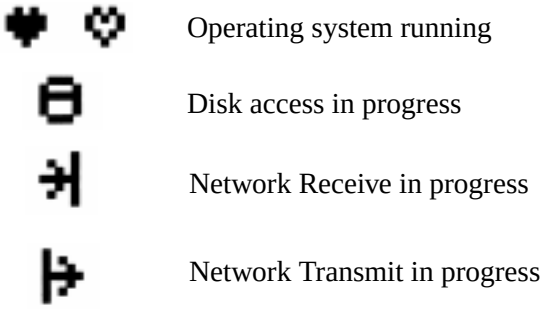
NOTE The J5xxx and J7xxx workstations have a “soft power down” feature that shuts the operating system down in a controlled manner when you power off the workstation with the power switch. (That is, you do *not* need to execute `shutdown -h` prior to pressing the power switch to power off the workstation.)

System LCD

The Liquid Crystal Display (LCD) indicator is located on the left side of the front panel as part of the power switch/LCD assembly. The LCD lights when the workstation power is on. The LCD has a 2-line display, with up to 16-characters per line. It displays messages about the state of the system, which are called chassis codes. See Chapter 3 for a complete listing of the possible chassis codes which can be displayed on the LCD.

The following symbols appear in the LCD, representing different system activities.

Figure 1-4. LCD Symbols



Internal Storage Devices

The J5xxx and J7xxx workstations support the following internal storage devices, which are also located on the front panel:

- Up to four hot-pluggable, SCA (Single Connector Attach) hard disk drives
- Optionally, one CD ROM drive
- Optionally, either one DDS-3 tape drive, or one 3.5-inch floppy disk drive

The following subsections describe these internal storage devices.

Hard Disk Drive(s)

The J5xxx and J7xxx workstations can support up to four hot-pluggable, SCA (Single Connector Attach) hard disk drives. These hard disk drives are 3.5-inch form factor, 10K RPM devices which connect to Ultra2 Wide LVD (Low Voltage Differential) SCSI interfaces on the disk bay backplane. The hard disk drive bays are located behind the right-hand door of the bezel that is attached to the workstation's front panel.

The two hard disk drive models currently supported are:

- 9 GB LVD 10K RPM disk drive (Product Number A4997A)
- 18 GB LVD 10K RPM disk drive (Product Number A4998A)

NOTE The ability to hot plug the hard disk drive(s) requires MirrorDisk/UX (Product Number B5403BA on HP-UX 10.20, or B2491BA on HP-UX 11.0 ACE 9911).

CD ROM Drive (Optional)

As an optional component, the J5xxx and J7xxx workstations support one CD ROM drive with an ATAPI (IDE) interface (Product Number A5001A). The CD ROM drive is a 5.25-inch, half- height form factor device which connects to the workstation via a 40-pin IDE ribbon cable, a 4-pin audio cable, and a 4-pin power cable. The CD ROM drive bay is located on the top, right-hand side of the front panel.

Figure 1-5 shows the operating features of the CD ROM drive, and Table 1-2 describes these features.

Figure 1-5. CD ROM Drive Features

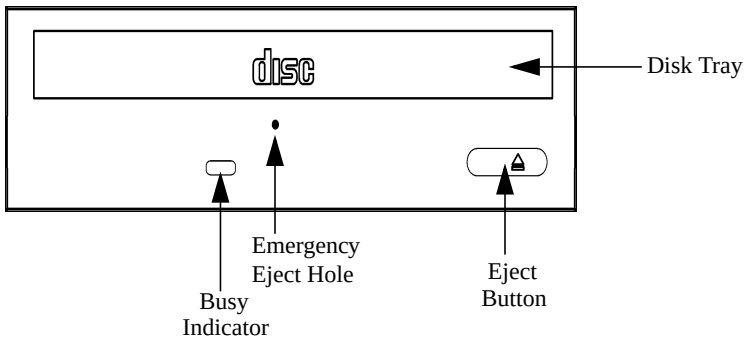


Table 1-2. CD ROM Drive Features

Feature	Purpose
Busy Indicator	Lights during a data access operation and blinks during a data transfer. The indicator blinks initially and then stays lit when there is one of the following: • A defective disk • A disk insertion error (for example, an upside-down disk) • No disk present
Emergency Eject Hole	Opens the Disk Tray when the end of a paper clip is inserted into it. Used when the workstation does not have power and the Disk Tray cannot be opened by pressing the Eject Button.
Eject Button	Opens the Disk Tray so that a CD ROM disk may be inserted in it or removed from it. When the drive is in use, press the Eject Button for more than one second to open the Disk Tray. The Disk Tray does not open if the workstation power is off.
Disk Tray	Holds the CD ROM disk. (Note that this style of CD ROM drive does not use a disk caddy.)

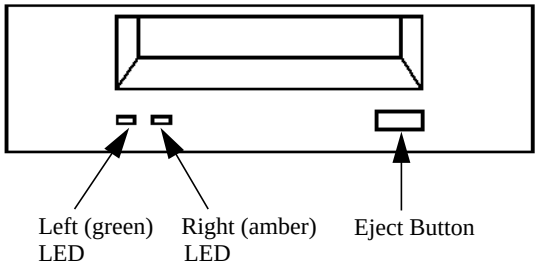
DDS-3 Tape Drive (Optional)

The J5xxx and J7xxx workstations support either one DDS-3 tape drive or one 3.5-inch floppy disk drive as an optional component. (Since the DDS-3 tape drive and the floppy disk drive use the same device bay, only one or the other can be installed.) The bay for the DDS-3 tape drive or floppy disk drive is located on the top, left-hand side of the front panel.

The optional DDS-3 tape drive (Product Number A5011A) is a 3.5-inch, half-height form factor device with an NSE (Narrow Single-Ended) SCSI-2 interface. It connects to the workstation via a 50-pin NSE SCSI-2 ribbon cable and a 4-pin power cable. It has 12 GB native capacity, or approximately 24 GB with data compression. It conforms to the DDS format standard for storing computer data, and is a high-capacity, high transfer-rate device for data storage on tape cartridge.

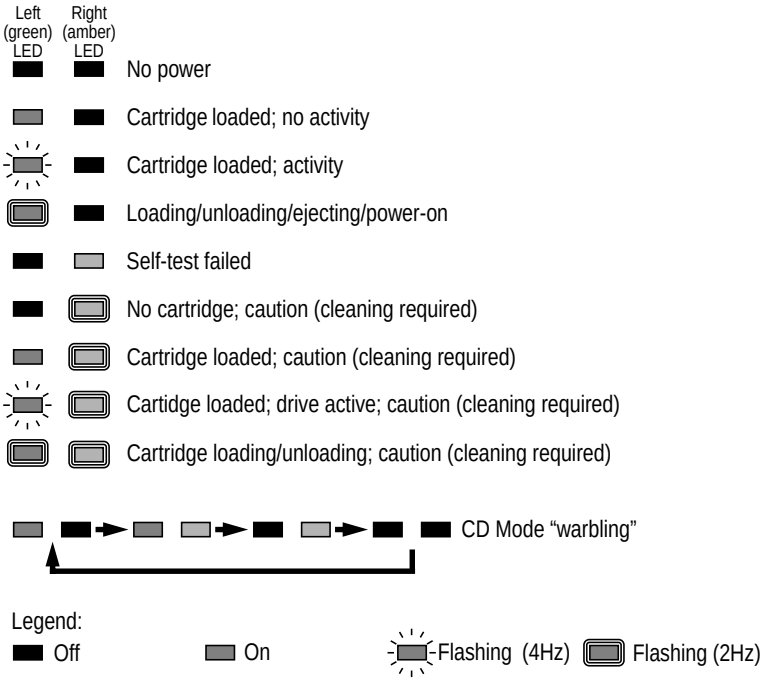
Figure 1-6 shows the operating features of the DDS-3 tape drive.

Figure 1-6. DDS-3 Tape Drive Features



The two colored LEDs on the DDS-3 tape drive indicate different activities or problems that may occur. Figure 1-7 lists the LED codes and their meanings.

Figure 1-7. DDS-3 Tape Drive LED Display Codes



Floppy Disk Drive (Optional)

The J5xxx and J7xxx workstations support either one DDS-3 tape drive or one 3.5-inch floppy disk drive as an optional component. (Since the DDS-3 tape drive and the floppy disk drive use the same device bay, only one or the other can be installed.) The bay for the floppy disk drive or DDS-3 tape drive is located on the top, left-hand side of the front panel.

The optional floppy disk drive (Product Number A5009A) is a 3.5-inch form factor device with a PC/AT interface. It connects to the workstation via a 34-pin PC/AT ribbon cable and a 4-pin power cable. The floppy disk drive has up to 1.44 MB capacity depending on the media and format used.

Figure 1-8 shows the operating features of the floppy disk drive, and Table 1-3 describes these features.

Figure 1-8. Floppy Disk Drive Features

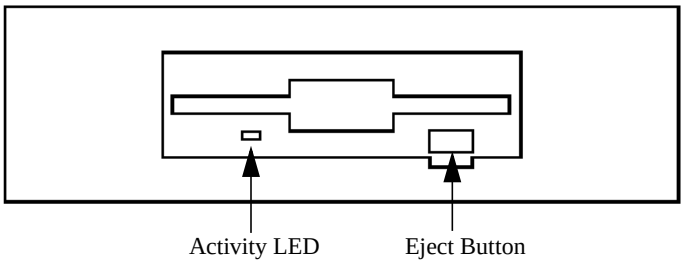


Table 1-3. Floppy Disk Drive Features

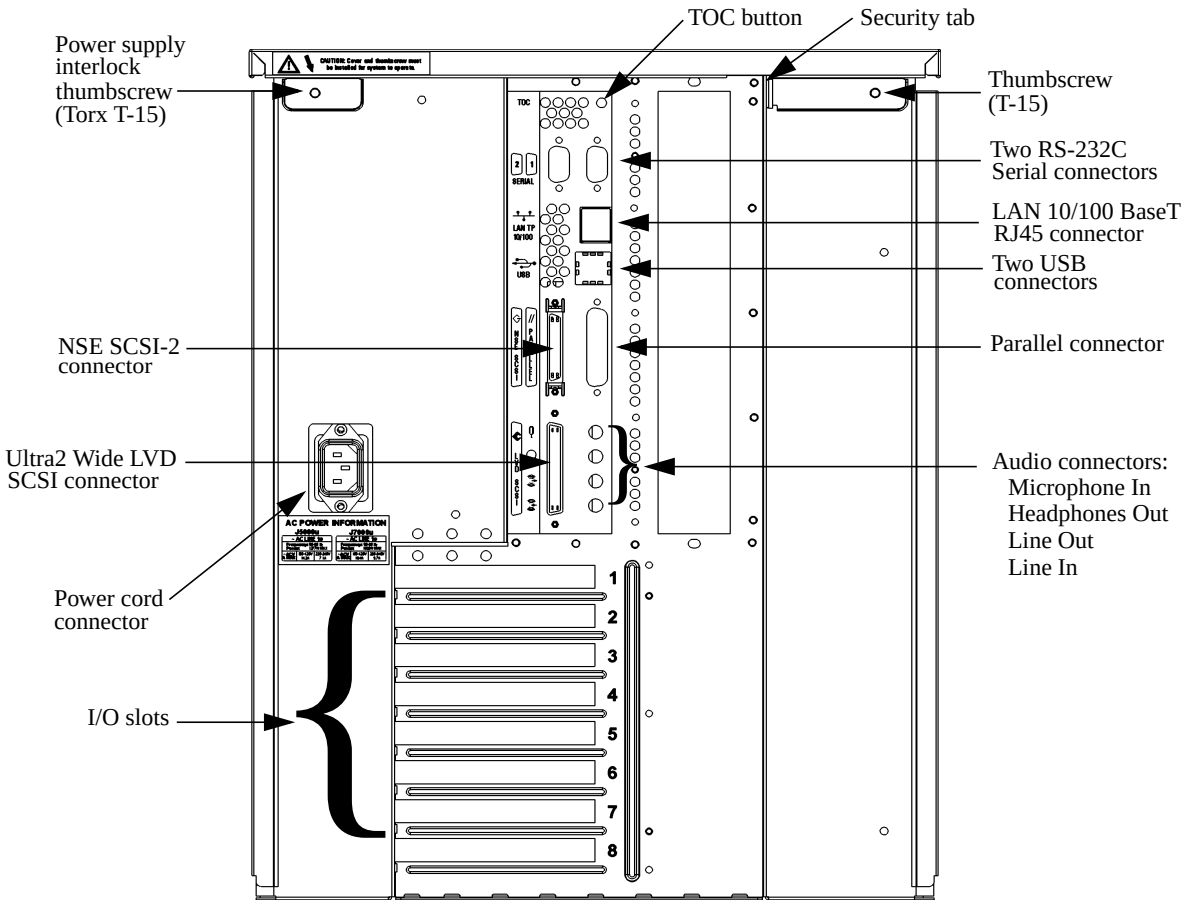
Feature	Purpose
Activity LED	Flashes to indicate the floppy disk drive is in use.
Eject Button	Push to eject a floppy disk from the drive.

Rear Panel Components

This section describes the various components located on the rear panel of the J5xxx and J7xxx workstations. Figure 1-9 shows the locations of these rear panel components.

NOTE To maintain FCC/EMI compliance, verify that all cables are fully seated and properly fastened.

Figure 1-9. Components on the Rear Panel



The following three subsections describe the thumbscrews, connectors, and miscellaneous components that are located on the rear panel of the J5xxx and J7xxx workstations.

Thumbscrews on the Rear Panel

There are two T-15 thumbscrews in the upper corners of the rear panel. Loosening these two screws allows the top panel to be removed, which in turn allows the left and right side panels to be removed from the workstation.

The upper-left thumbscrew engages the safety interlock switch with the workstation's power supply. Removing this thumbscrew disengages all power outputs of the power supply, reducing the danger of electric shock while servicing the workstation. Thus, make sure that this power supply interlock thumbscrew is firmly retightened when you finish servicing the workstation, or the power supply may still be disengaged.

CAUTION Do *not* use the power supply interlock thumbscrew to power down the workstation. This power down method may hang the operating system in an unrecoverable state. Instead, press the power switch on the front panel to power down the workstation.

Connectors on the Rear Panel

This subsection describes the following connectors that are located on the rear panel. Note that these connectors are discussed in the order in which they are located, top to bottom, on the rear panel.

- RS-232C Serial connectors
- LAN 10/100 BaseT RJ45 connector
- USB connectors (for keyboard and mouse only)
- Parallel connector
- SCSI connectors
- Audio connectors
- Power cord connector

RS-232C Serial Connectors

There are a variety of pointing devices (such as a mouse or trackball) or peripheral devices (including printers, plotters, modems, and scanners) that can attach to the two RS-232C SIO (Serial Input/Output) ports on these workstations. Consult the documentation that accompanies each serial pointing device or peripheral device for specific information concerning its use.

The SIO ports are programmable, allowing functions such as bit rate, character length, parity, and stop bits to be set. The SIO ports are used as interfaces for serial asynchronous devices to the CPU. The ports operate at up to a 115.2 Kbaud rate.

Table 1-4 on the next page shows the SIO connector pin listings. The serial connectors are 9-pin D-sub connectors. Signal names are those specified in the EIA RS-232 standard.

Table 1-4. Serial I/O Pins

Pin No.	Signal	Description
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator

LAN 10/100 BaseT RJ45 Connector

The J5xxx and J7xxx workstations have one built-in, Ethernet IEEE 802.3, RJ45 Twisted Pair connector for 802.3 (Ethernet) or 10/100 BaseT networking. Connections to ThinLAN networks require an external transceiver. The workstation automatically selects the correct network setting.

USB Connectors

The two USB (Universal Serial Bus) Series A connectors on the rear panel of the J5xxx and J7xxx workstations provide interfaces for the standard keyboard and mouse only. Either connector can be used for either the keyboard or the mouse.

See the “Keyboard and Mouse” section for a description of these input devices. Also consult the documentation that accompanies the keyboard and the mouse for specific information concerning the use of each device.

Parallel Connector

The 25-pin HP Parallel I/O interface uses Centronics interface protocols to support peripheral devices such as printers and plotters. Consult the documentation that accompanies each parallel peripheral device for specific information concerning its use.

SCSI Connectors

There are two SCSI connectors on the rear panel: one NSE (Narrow Single-Ended) SCSI-2 connector, and one Ultra2 Wide LVD (Low Voltage Differential) SCSI connector. Use the SCSI connectors to connect external SCSI devices such as hard disk drives, optical disk drives, DDS-format tape drives, and CD ROM drives.

Consult the documentation that accompanies each SCSI device for specific information concerning its use. Also see Appendix C, “SCSI Connections,” for information about connecting SCSI devices to the J5xxx and J7xxx workstations.

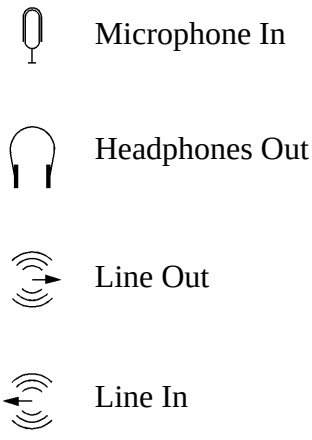
CAUTION Do *not* connect NSE SCSI devices to the LVD SCSI connector, or vice versa, because damage may occur. Currently Hewlett-Packard does not support mixing NSE and LVD devices on the same SCSI bus.

NOTE When attaching external SCSI devices, be sure to terminate the last device on each external SCSI bus. (Terminators are included in a small plastic bag shipped with the workstation.) If there are no external SCSI devices, the terminators must be installed directly on the connectors on the rear panel.

Audio Connectors

The J5xxx and J7xxx workstations have audio-input and -output capabilities through external input and output connectors on the rear panel and through an internal speaker. The sound is 16-bit, 44 kHz (CD ROM-quality). Figure 1-10 shows the four audio connectors on the rear panel.

Figure 1-10. Audio Connectors



The audio connectors are standard stereo audio mini-jacks. Hewlett-Packard recommends using gold-plated plugs available through audio retailers for best quality recording and playback through the external connectors. Table 1-5 on the next page provides a summary of the audio electrical specifications.

Table 1-5. Audio Electrical Specifications

Frequency Response	25 Hz to 20 kHz
Input Sensitivity/Impedance: – Line in – Microphone	 2.0 Vpk/47 Kohm 22 mVpk/1 Kohm
Maximum Output Level/Impedance: – Line out – Headphones – Speaker (internal)	 2.8 Vpp/47 Kohm 2.75 Vpp/50 ohm 5.88 Vpp/48 ohm
Output Impedance: – Line out – Headphones	 619 ohm 118 ohm

Power Cord Connector

Plug the power cord into the power cord connector to provide AC power to the workstation. The power cord provides either 15A power to the J5xxx, or 20A power to the J7xxx, at 100–120V.

The J5xxx and J7xxx workstations have different power cord connectors and power cords, because of their differing power requirements. Figure 1-11 shows the two power cord connectors.

Figure 1-11. Power Cord Connectors

J5xxx
power connector

J7xxx
power connector

Miscellaneous Components on the Rear Panel

This subsection describes the following, miscellaneous components that are also located on the rear panel of the J5xxx and J7xxx workstations:

- Security tab
- TOC button
- I/O slots

Security Tab

The security tab, which is located at the top of the rear panel, can be used to lock the workstation with a padlock or similar type of lock. It prevents the workstation's top and side panels from being removed so that unauthorized persons cannot access the workstation's internal components. Note that a lock is not provided with the workstation – the customer must supply a lock to use with this security tab.

TOC Button

The TOC (Transfer Of Control) button interrupts the system.

I/O Slots

The I/O slots located on the rear panel are 64-bit PCI (Peripheral Connect Interface) slots, providing I/O expansion capabilities for the workstations. There are five PCI-2X slots, two PCI-4X slots, and one slot for power only. The I/O slots are defined as follows:

1. Power only – Top slot
2. PCI-2X (5V, 33 MHz)
3. PCI-2X (5V, 33 MHz)
4. PCI-4X (3.3V, 66 MHz)
5. PCI-2X (5V, 33 MHz)
6. PCI-2X (5V, 33 MHz)
7. PCI-4X (3.3V, 66 MHz)
8. PCI-2X (5V, 33 MHz) – Bottom slot

NOTE Slot 1 is reserved for power only and should *not* be used for an I/O card. Also note that slot 7 is the primary preferred graphics slot, and slot 4 is the secondary preferred graphics slot.

For more information about the I/O slots, see the configuration section in Chapter 2, as well as the FRU removal and replacement section in Chapter 4.

Internal Components

This section describes the internal components of the J5xxx and J7xxx workstations. The first subsection describes the internal components that are located on the left side as you are facing the front of the workstation. The second subsection then describes the internal components on the right side of the workstation.

For instructions on how to remove the workstation's top and side panels in order to access these internal components, as well as instructions on how to remove and replace these internal components to service them, see Chapter 4.

Internal Components on the Left Side

As you face the J5xxx and J7xxx workstation, the internal components on the left side of the workstations include the system board and three system board fans. The J7xxx also has two DC/DC converter units mounted on its system board, as well as two air dividers.

Figures 1-12 and 1-13 show the internal components located on the left side of the J5xxx and the J7xxx workstation, respectively. (In both figures, the left side panels have been removed from the workstations so that the internal components can be viewed.) As you can see by comparing these two figures, the system boards in the J5xxx and J7xxx are different in the number and placement of their PA-RISC microprocessors, the number of their memory slots, and the fact that the J7xxx has two DC/DC converter units, where the J5xxx has none.

Figure 1-12. Internal Components on the Left Side of the J5xxx

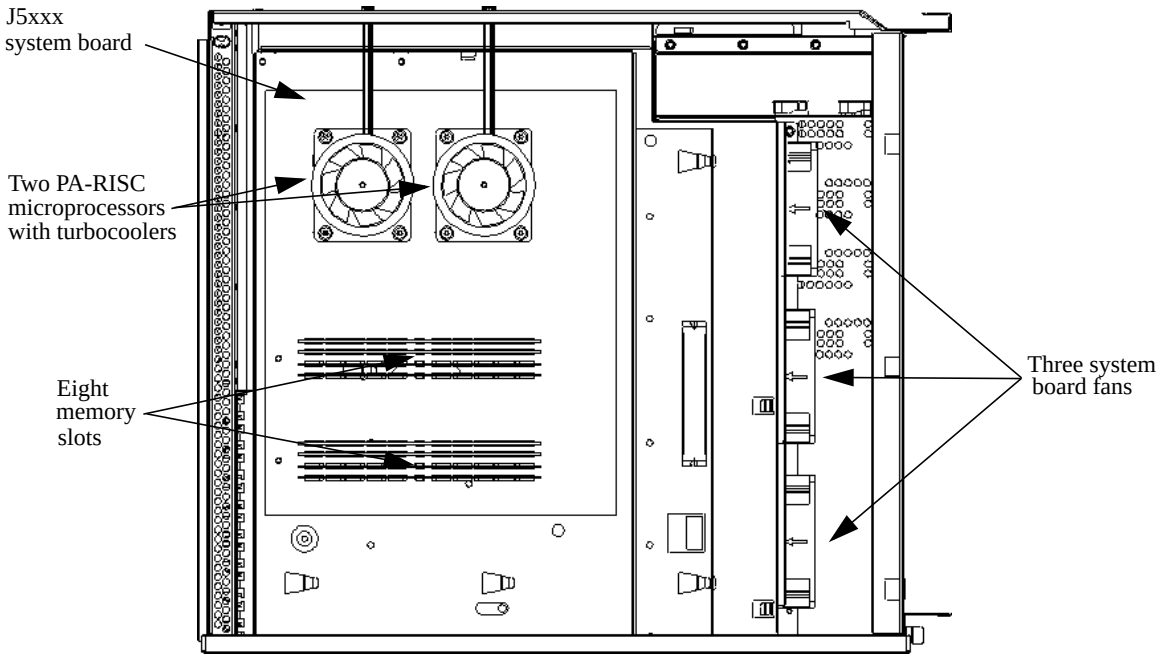
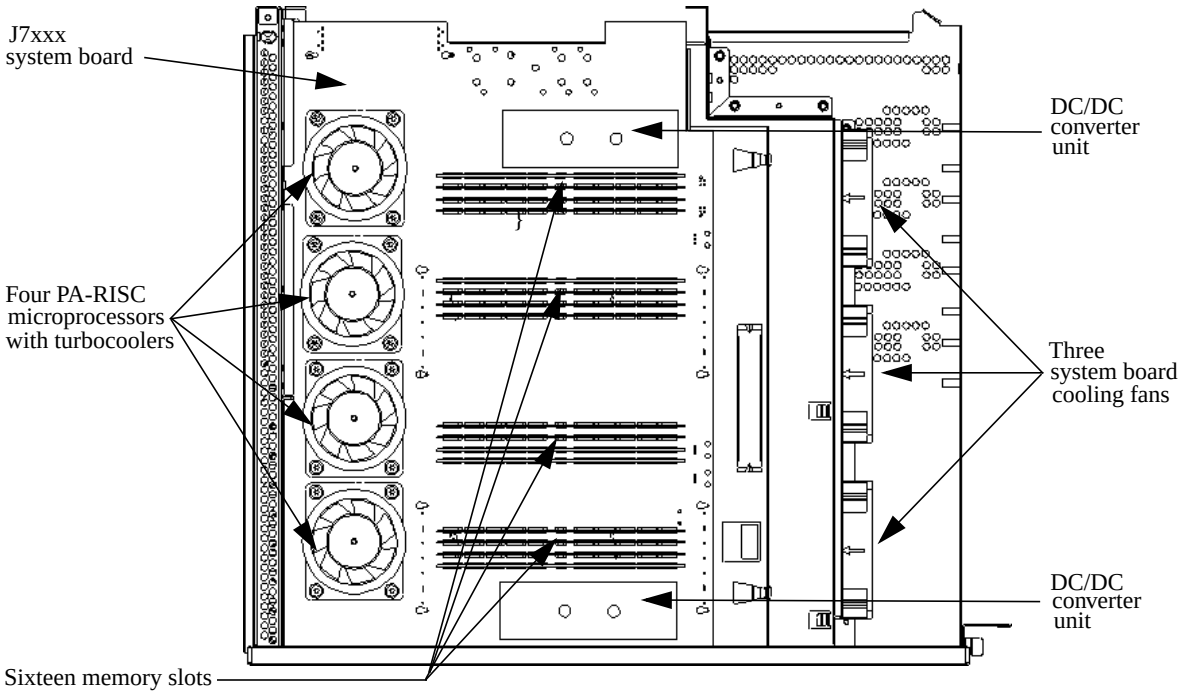


Figure 1-13. Internal Components on the Left Side of the J7xxx



System Board

The system boards in the J5xxx and J7xxx contain the PA-RISC microprocessors and memory slots, as well as connectors to other components. Each system board is mounted on a tray, which has a handle. The system board tray assembly is then attached to the workstation by sheet metal hooks in the center wall of the chassis.

Over the center wall of the chassis, the system board is attached to the workstation's I/O board by a flex cable and to the power supply by gold plated bus bars. In addition, the system board has connections to the system board fans, which are also located on the left side of the workstation, and to the power switch/LCD assembly, which is on the front panel of the workstation.

Microprocessors: You can determine which workstation model it is by counting the microprocessors on the system board. Each microprocessor is cooled by a "turbocooler," which consists of a cylindrical heat sink and an integrated fan. The J5xxx has two of these turbocoolers; thus, it has two PA-RISC microprocessors. The J7xxx has four turbocoolers; thus, it has four PA-RISC microprocessors.

Memory Slots: The J5xxx and J7xxx workstations also differ in the number of memory slots each has on their system boards, as well as how the slots can be loaded with memory DIMMs. The J5xxx has eight memory slots, and memory DIMMs can be installed individually in this workstation. In contrast, the J7xxx has sixteen memory slots, and memory DIMMs must be installed in pairs of equal size in it.

For more information about the sizes of memory DIMMs each workstation supports, as well as the DIMM loading order for each, see the configuration section for in Chapter 2.

DC/DC Converter Units and Air Dividers (J7xxx Only)

The J7xxx has two DC/DC converter units, which provide DC/DC conversion for the workstation, and two air dividers on its left side. (The J5xxx does not require any DC/DC converter units nor the air dividers.) The DC/DC converter units and air dividers are attached to the J7xxx by metal tie-down straps. (In the previous Figure 1-13, the air dividers and the metal tie-down straps have been removed so only the DC/DC converter units are shown.) Each DC/DC converter unit connects to the system board by a 30-pin connector. Note that both of the DC/DC converter units are interchangeable, and that the air flow holes on each unit are facing inward to the center of the J7xxx's system board.

System Board Cooling Fans

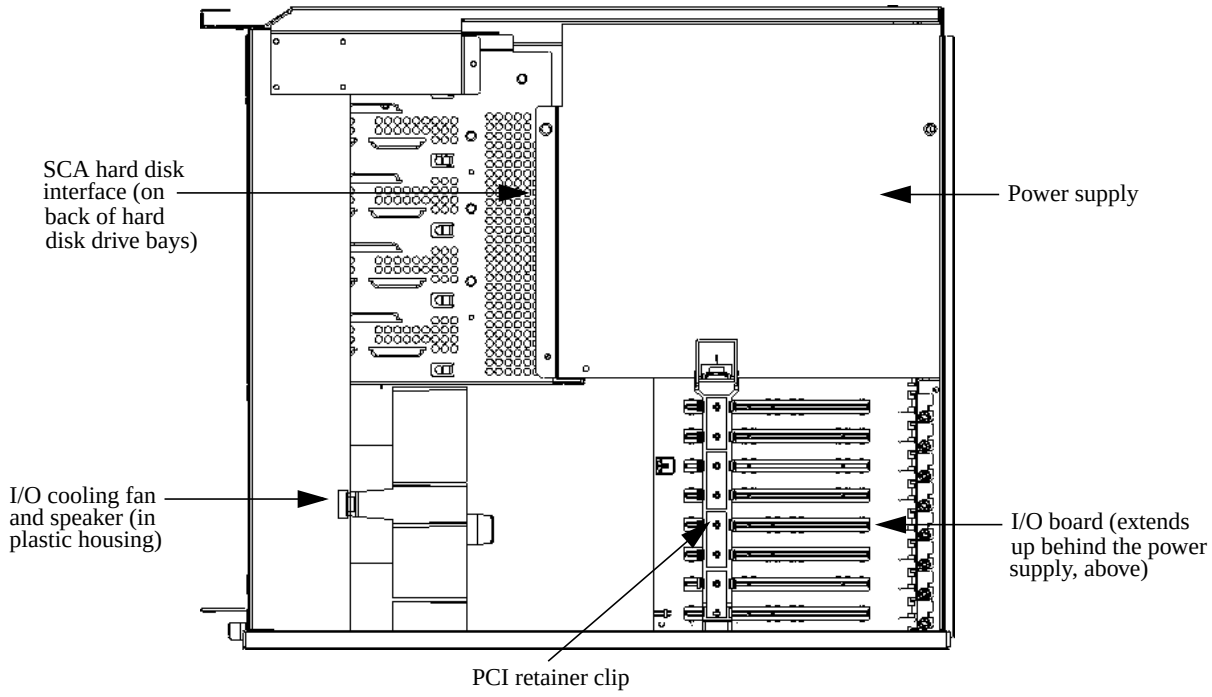
There are three system board cooling fans in three separate mounting brackets on the front, left side of the J5xxx and J7xxx workstations. These fans draw air flow from the front of the workstation inward to cool the system board.

Internal Components on the Right Side

As you face the J5xxx and J7xxx workstation, the internal components on the right side of the workstations include the power supply, I/O board, SCA (Single Connector Attach) hard disk interface (also known as the backplane board), I/O cooling fan, and speaker.

Figure 1-14 shows the internal components located on the right side of both the J5xxx and J7xxx workstation. (In this figure, the right side panel has been removed from the workstation so that the internal components can be viewed. Also note that the J5xxx and J7xxx have different power supplies; however, their power supplies *look* the same.)

Figure 1-14. Internal Components on the Right Side of the J5xxx and J7xxx



Power Supply

Although the power supplies in the J5xxx and J7xxx *look* the same, their power outputs, weight, and the number of bus bars connecting them to the system board are different.

The power supply in the J5xxx supplies 830 Watts of power to the workstation, weighs approximately 14 pounds, and is connected to the system board by three gold plated bus bars over the center wall of the chassis. In contrast, the power supply in the J7xxx supplies 1,350 Watts of power, weighs approximately 17 pounds, and is connected to the system board by four gold plated bus bars. Both the J5xxx's and the J7xxx's power supply has two internal cooling fans.

I/O Board

The I/O board is mounted on the center wall of the workstation chassis, partially behind the power supply. Over the center wall of the chassis, the I/O board is attached to the workstation's system board by a flex cable. The I/O board, which is the same in both the J5xxx and J7xxx, has connections to the Serial, LAN, USB, Parallel, SCSI, and audio built-in I/O.

The I/O board also has 64-bit slots for PCI (Peripheral Connect Interface) cards, providing I/O expansion capabilities for the workstations. There are five PCI-2X slots at 5V and 33 MHz each, and two PCI-4X slots at 3.3V and 66 MHz each. Slot 1 is reserved for power only; an I/O card should *not* be installed in slot 1.

SCA Hard Disk Interface

The SCA (Single Connector Attach) hard disk interface (also known as the backplane board) is mounted on the back of the hard disk drive bays in the J5xxx and J7xxx. The SCA hard disk interface is connected to the I/O board by an Ultra2 Wide LVD (Low Voltage Differential) SCSI ribbon cable.

I/O Cooling Fan

The I/O cooling fan is located in the fan/speaker mounting bracket in the bottom of the front, right side of the workstation. This fan draws air flow from the front of the workstation inward to cool PCI cards that are inserted into the I/O slots on the I/O board.

Speaker

The speaker is mounted within a bracket assembly with the I/O cooling fan. The speaker has 16-bit, 44 kHz CD ROM-quality sound.

Monitors

The J5xxx and J7xxx workstations currently support the following HP monitors:

- 19-inch (18.3-inch viewable) VGA 1600×1200 color monitor (Product Number A4575A)
- 21-inch (19.9-inch viewable) VGA 1600×1200 color monitor (Product Number A4576A)
- 18.1-inch L1800 color flat panel display VGA up to 1280×1024 (Product Number D5065W)
- 19-inch (18-inch viewable) display VGA 1600x1200 (Product Number D8910W)
- 21-inch (19.8-inch viewable) display VGA 1800x1440 (Product Number D2847A)
- 24-inch (22.5-inch viewable) display VGA 1920x1200 (Product Number A1295A)

Keyboard

The standard USB keyboard (Product Number A4983-604*xx* – the actual suffix number depends on the localized version of the keyboard) with the J5xxx and J7xxx workstations is a 104-key input device. It is a PC-104 compatible keyboard.

Mouse

The USB mouse is either a scroll wheel type mouse (Product Number A4983-60101) where the scroll wheel also serves as the middle button, or a true three-button type mouse (Product Number A4983-60111).

Site Preparation and Installation

For information on:

- Preparing customers' sites for the delivery and installation of J5xxx and J7xxx workstations, refer to the *HP VISUALIZE J5xxx/J7xxx Site Preparation Guide* (Part Number A4978-90021)
- Installing J5xxx and J7xxx workstations, refer to the *HP VISUALIZE J Class Owner's Guide* (Part Number A5991-90000)

For a listing of other related documentation for the J5xxx and J7xxx workstations, see Appendix D.

2 Configuration

This chapter provides details about setting up and changing the system configuration for HP VISUALIZE J5xxx and J7xxx workstations.

Chapter Overview

This chapter contains the following main sections:

- Workstation Configurations
- Field Replaceable Unit (FRU) Configurations
  - — Internal Storage Devices
  - — Memory
  - — I/O Cards
  - — Monitor-Type Selection

Workstation Configurations

Refer to the HP Workstations Website for a complete list of supported accessories, peripherals, and operating system versions for the J5xxx and J7xxx workstations. The URL for the Website is:

```
http://hp.unixworkstations.com
```

Field Replaceable Unit (FRU) Configurations

This section provides information for setting up or changing the configuration of the Field Replaceable Units (FRUs) for the J5xxx and J7xxx workstations.

Internal Storage Devices

Hard Disk Drive Configuration

The SCSI IDs for hard disk drives are hard-wired into the SCA Ultra2 Wide LVD SCSI interfaces in the backplane of the four disk bays within the J5xxx and J7xxx workstations. Hence, SCSI IDs do not need to be set for the hard disk drives (up to four) installed in these workstations. From top to bottom, the pre-set SCSI IDs for hard disk drives are: 6, 5, 4, and 3.

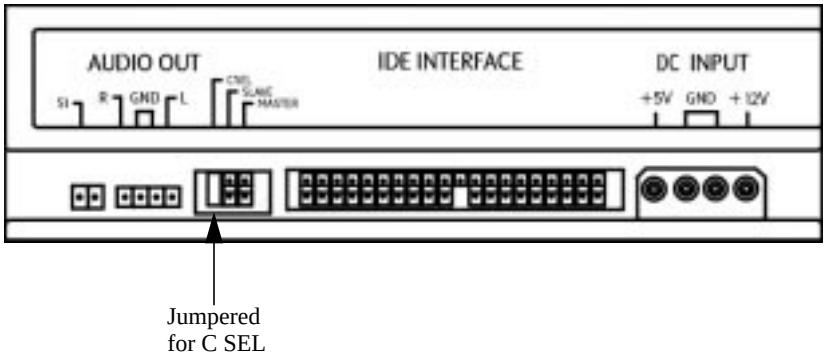
Similarly, no jumpers are installed at the factory, nor is any jumper installation required at the customer's site, on either of the hard disk drive models that are supported with the J5xxx and J7xxx workstations. Both hard disk drive models may be installed as is into these workstations.

CD ROM Drive (Optional) Configuration

The optional CD ROM drive connects to the ATAPI (IDE) interface in the CD ROM drive bay backplane within the J5xxx and J7xxx workstations via a 40-pin ribbon cable, a 4-pin audio cable, and a 4-pin power cable. No interface addressing is required for the CD ROM drive.

However, as shown in Figure 2-1, the CD ROM drive should have a jumper set on the C SEL (Cable Select) selection pins. (The CD ROM drive should ship from the factory already jumpered for C SEL.)

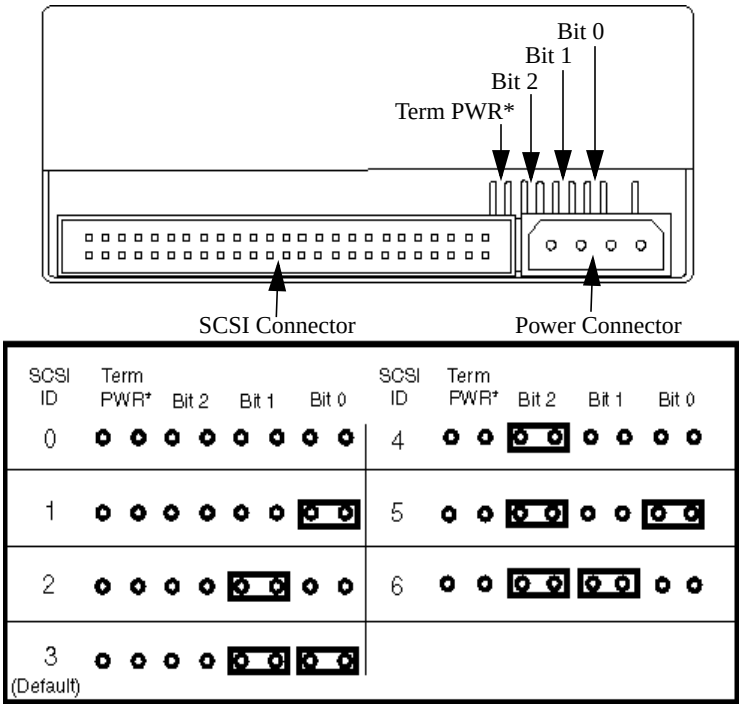
Figure 2-1. CD ROM Drive Jumper Setting



DDS-3 Tape Drive (Optional) Configuration

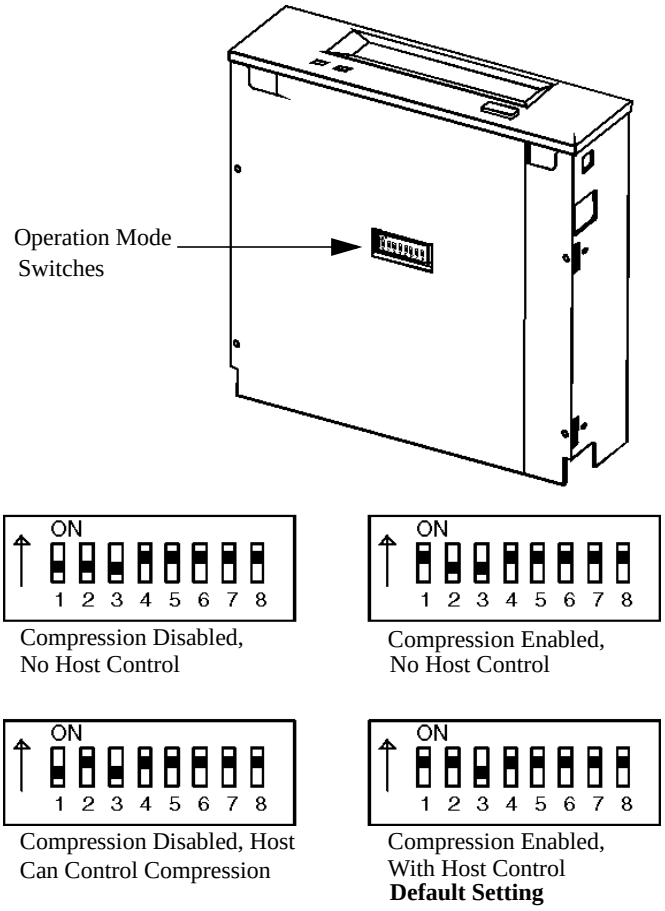
Figure 2-2 shows the NSE SCSI-2 ID/jumper settings for the optional DDS-3 tape drive. Figure 2-3 on the next page shows the switch settings for Data Compression Operation Mode for the DDS-3 tape drive.

Figure 2-2. DDS-3 Tape Drive NSE SCSI-2 ID/Jumper Settings



* Term PWR is not used in HP workstation configurations.

Figure 2-3. DDS-3 Tape Drive Settings for Data Compression Operation Mode



Floppy Disk Drive (Optional) Configuration

The optional 3.5-inch floppy disk drive requires no ID, switch, or jumper settings.

Memory

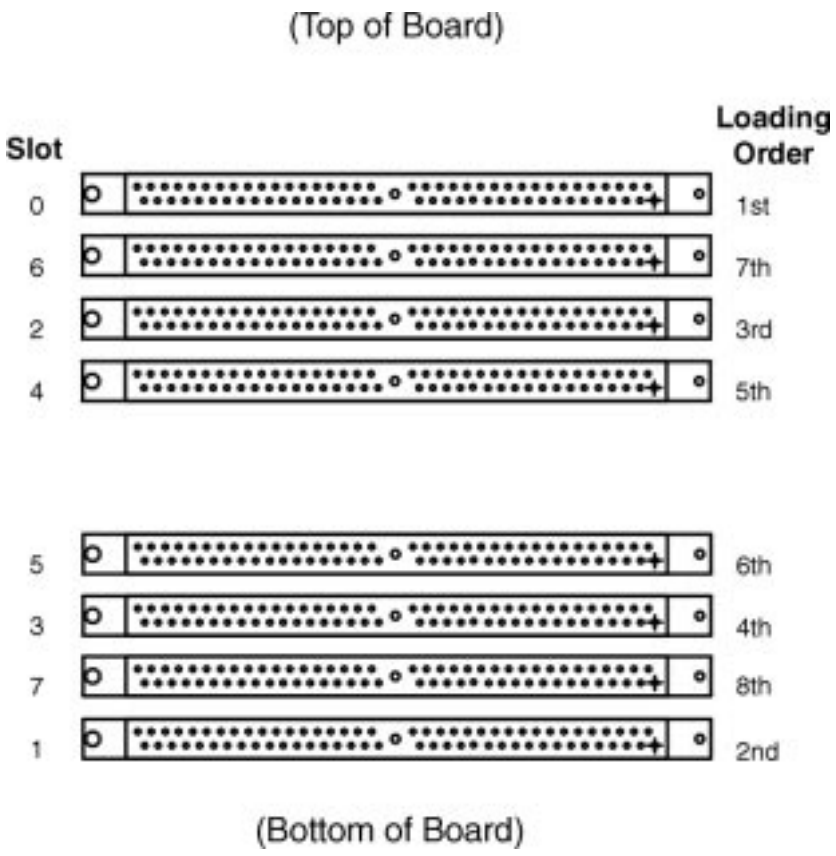
J5xxx Memory Configuration

The J5xxx workstation has eight memory slots, labeled 0 to 7. Memory DIMMs can be installed individually in this workstation. The DIMMs for this workstation currently come in 256 MB and 512 MB sizes (Product Numbers A4994A and A4995A, respectively). This workstation comes with one 512 MB DIMM as its standard configuration from the factory. Thus, currently the minimum memory configuration for this workstation is 512 MB, and the maximum is 4 GB.

DIMMs should be loaded in the order shown in Figure 2-4 on the next page, with slot 0 being the first DIMM loaded, and 7 being the last DIMM loaded. Different sizes of DIMMs can be loaded in this workstation (that is, 256 MB DIMMs can be loaded with 512 MB DIMMs).

There is a label on the floor of the workstation's interior showing the J5xxx's memory loading order.

Figure 2-4. Memory Loading Order in the J5xxx



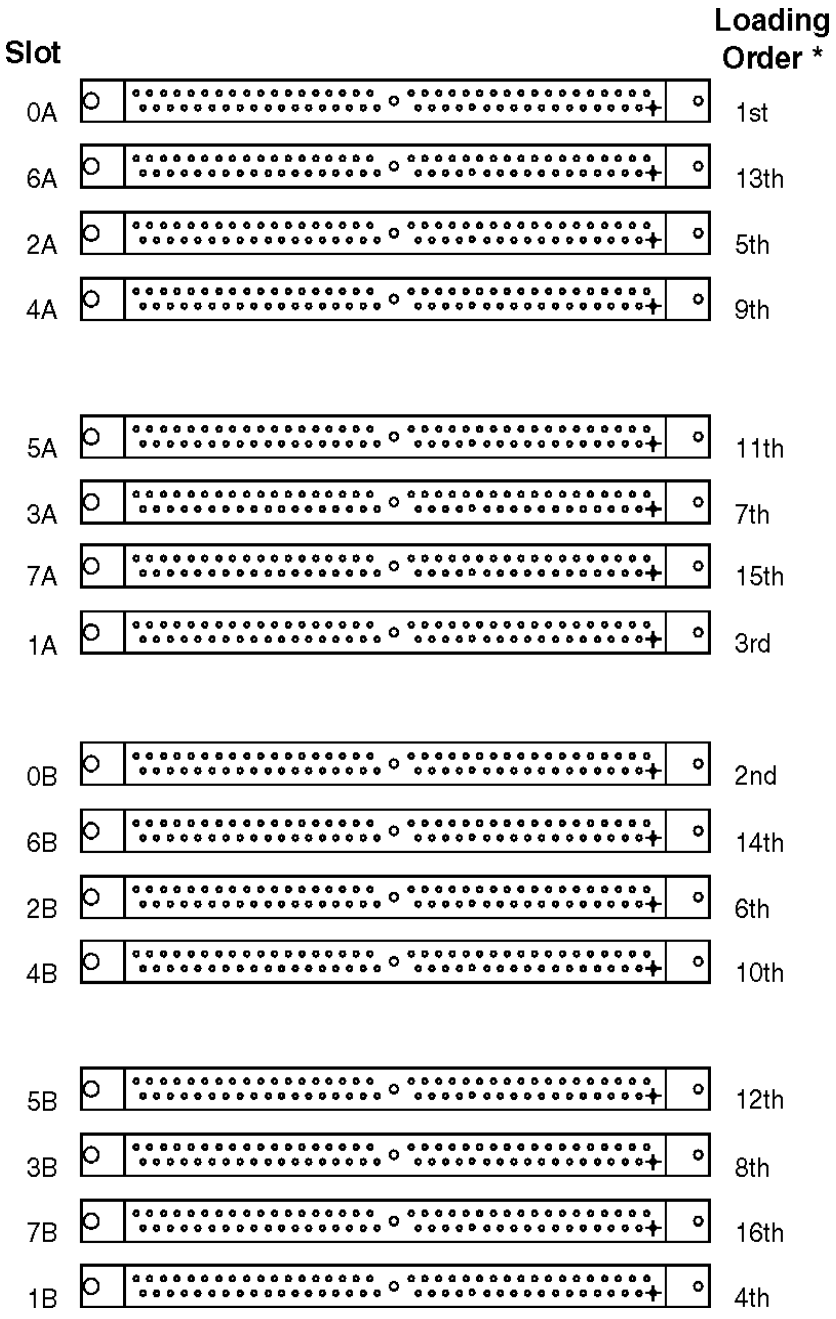
J7xxx Memory Configuration

The J7xxx workstation has sixteen memory slots, labeled 0A, 0B to 7A, 7B. Memory DIMMs *must* be installed in pairs in this workstation, and both DIMMs in each pair *must* be of equal size. The DIMMs for this workstation currently come in 256 MB and 512 MB sizes (Product Numbers A4994A and A4995A, respectively). This workstation comes with eight 512 MB DIMMs as its standard configuration from the factory. Thus, currently the minimum memory configuration for this workstation is 4 GB, and the maximum is 8 GB.

DIMMs should be loaded in the order shown in Figure 2-5 on the next page, with 0A, 0B being the first pair of DIMMs loaded, and 7A, 7B being the last pair loaded.

There is a label on the floor of the workstation's interior showing the J7xxx's memory loading order.

Figure 2-5. Memory Loading Order in the J7xxx



* J7xxx memory must be installed in pairs, and both DIMMs in the pair must be of equal size.

I/O Cards

The I/O slots located on the rear panel of the J5xxx and J7xxx workstations are 64-bit PCI (Peripheral Connect Interface) slots, providing I/O expansion capabilities for the J5xxx and J7xxx workstations. There are five PCI-2X slots, two PCI-4X slots, and one slot for power only. The I/O slots are defined as follows:

1. Power only – Top slot
2. PCI-2X (5V, 33 MHz)
3. PCI-2X (5V, 33 MHz)
4. PCI-4X (3.3V, 66 MHz)
5. PCI-2X (5V, 33 MHz)
6. PCI-2X (5V, 33 MHz)
7. PCI-4X (3.3V, 66 MHz)
8. PCI-2X (5V, 33 MHz) – Bottom slot

NOTE Slot 1 is reserved for power only and should *not* be used for an I/O card. Also note that slot 7 is the primary preferred graphics slot, and slot 4 is the secondary preferred graphics slot.

The following are configuration guidelines for installing I/O cards in the J5xxx or J7xxx:

- Put graphics cards into slot 7 first and slot 4 second. A graphics card can be added to any slot that physically has room once slots 7 and 4 are used.

  Note, however, that slots 7 and 4 may be used for very high-bandwidth, general I/O cards when not needed for graphics.
- Put I/O cards into slot 2 first, slot 8 second, slot 3 third, slot 5 fourth, and slot 6 fifth.
- Do *not* put any I/O card into slot 1, as that slot is reserved for power only.

CAUTION The J5xxx and J7xxx workstations supply about 264 Watts of power to the PCI slots. Do not insert I/O cards that together draw more than 264 Watts, or damage to the workstation may result.

NOTE If you install three HP VISUALIZE FX^6 graphics cards simultaneously (as in the HP VISUALIZE Center configuration), there are some power constraints imposed on the remaining I/O slots. Each of these graphics cards, while electrically connected to only one I/O slot, takes the physical space of two slots, and each card draws about 78 Watts. So, three of these graphics cards will occupy six of the eight I/O slots and will draw 234 Watts altogether, leaving only about 30 Watts for the remaining two slots combined, should those two slots be used.

Monitor-Type Selection

The J5xxx and J7xxx workstations currently support the following HP monitors:

- 19-inch (18.3-inch viewable) VGA 1600×1200 color monitor (Product Number A4575A)
- 21-inch (19.9-inch viewable) VGA 1600×1200 color monitor (Product Number A4576A)
- 18.1-inch L1800 color flat panel display VGA up to 1280×1024 (Product Number D5065W)
- 19-inch (18-inch viewable) display VGA 1600x1200 (Product Number D8910W)
- 21-inch (19.8-inch viewable) display VGA 1800x1440 (Product Number D2847A)
- 24-inch (22.5-inch viewable) display VGA 1920x1200 (Product Number A1295A)

The monitor type does not have to be changed on these workstations since they are set up to support these monitors. However, if for some reason the monitor type needs to be changed, refer to Chapter 5.

NOTE Unsupported monitors may “lock up” if they cannot sync to a scan rate.

3 Troubleshooting

This chapter provides information about isolating a failing component, known as a Field Replaceable Unit (FRU), in HP VISUALIZE J5xxx and J7xxx workstations.

Chapter Overview

This chapter contains the following main sections:

- Introduction to Troubleshooting
- Flowcharts for Troubleshooting
- Dealing with a Boot Failure
- Identifying LCD-Indicated Conditions
- Running System Verification Tests
- Running ODE-Based Diagnostics
- Fan Problems

Introduction to Troubleshooting

To troubleshoot HP VISUALIZE J5xxx and J7xxx workstations, you must be familiar with the HP-UX operating system and be able to start and stop processes. You should also be familiar with the boot ROM diagnostics, ISL diagnostics, and the Support Tools Manager online tests, which are described in this chapter.

First note any error or status messages, and then run the power-up boot ROM diagnostics, known as Selftest. If the Selftest diagnostics fail, replace the FRU that is indicated. If the tests pass but you still suspect a problem, run the ISL diagnostics and the Support Tools Manager online tests.

For a complete description of using ISL diagnostics and using the Support Tools Manager, see the *Support Media User's Manual* (Part Number B3782-90176).

Flowcharts for Troubleshooting

The following four figures contain troubleshooting flowcharts you can follow to isolate a failing Field Replaceable Unit (FRU). Figure 3-1 on the next page contains the main troubleshooting flowchart. Figures 3-2 through 3-4 on the following pages contain the flowcharts for console, bootable device, and HP-UX troubleshooting, respectively.

Figure 3-1. Main Flowchart for Troubleshooting

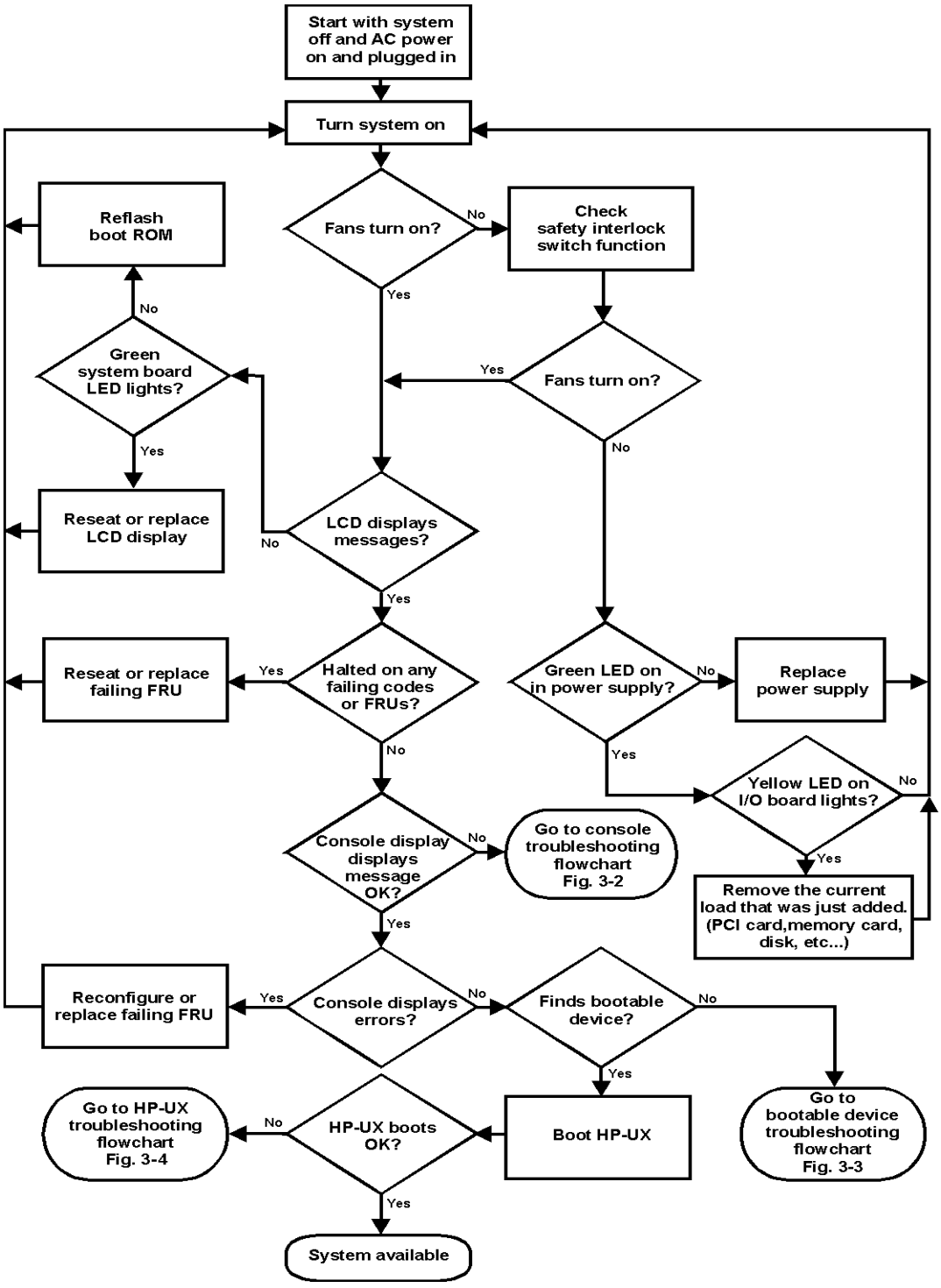


Figure 3-2. Console Troubleshooting Flowchart

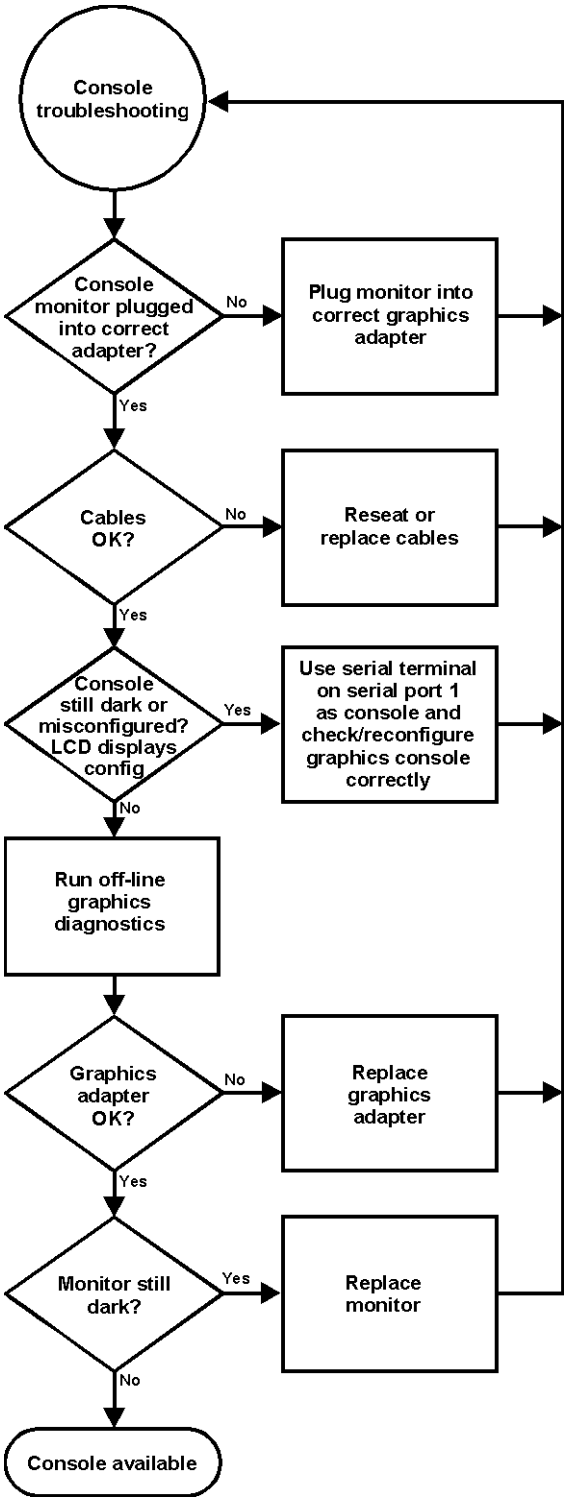


Figure 3-3. Bootable Device Troubleshooting Flowchart

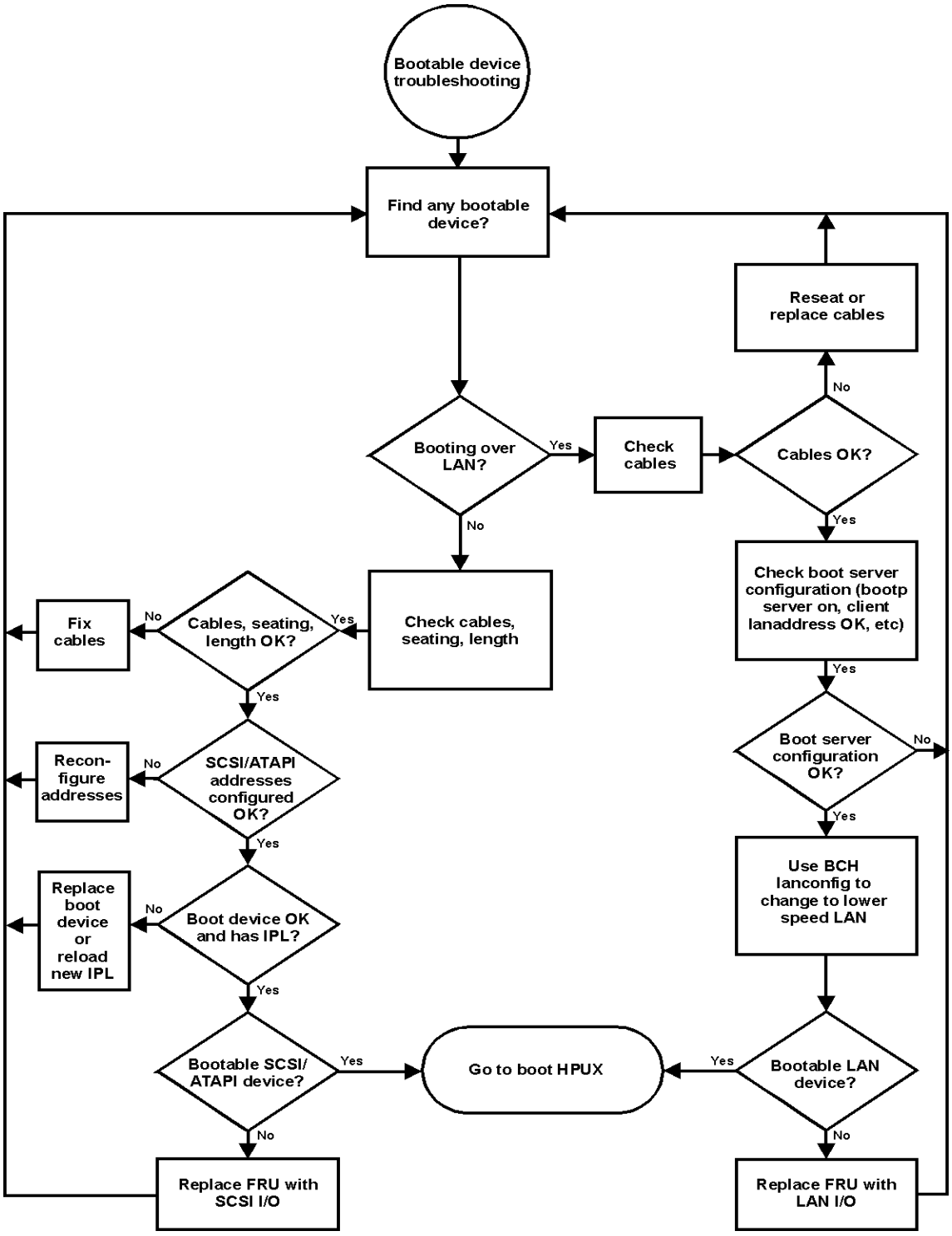
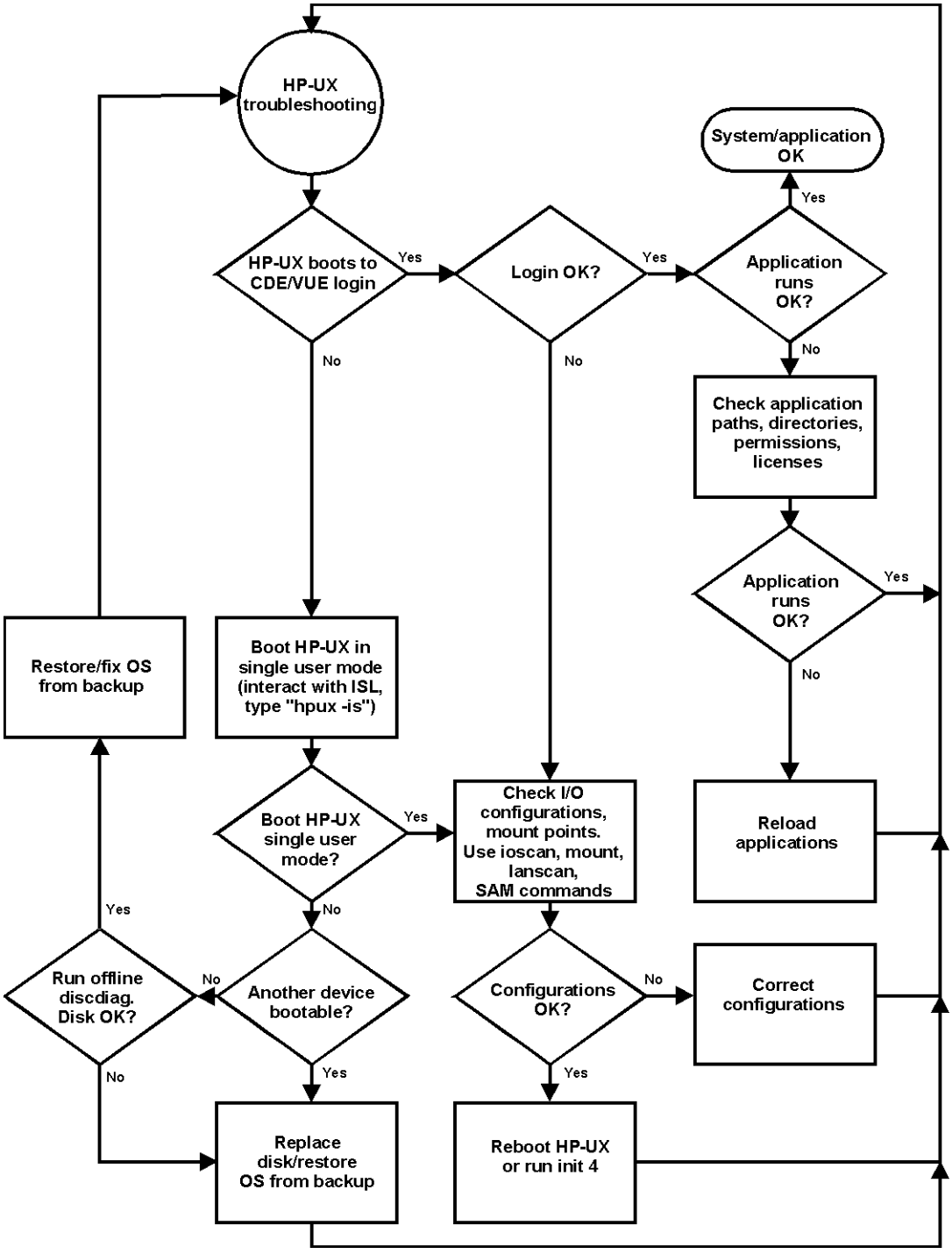


Figure 3-4. HP-UX Troubleshooting Flowchart



Dealing with a Boot Failure

To start this workstation from an operating system stored on a device different from the usual boot device, to boot from a different disk, or to boot from another type of device (such as an alternate hard disk or CD ROM), see the following situations and examples that use the Boot Console Handler. To access the Boot Console Handler, and for details on using it, see Chapter 5 of this handbook.

- To boot from a known device containing a bootable operating system, type the following at the prompt:

  ```
  Main Menu: Enter command > boot device [Enter]
  ```

  where *device* is the hardware path to the device, specified in Mnemonic Style Notation.

  For example, to boot an operating system stored on a DDS-format tape in a drive located at `scsi.1.0`, go to the Main Menu of the Boot Console Handler and then type the following command at the prompt:

  ```
  Main Menu: Enter command > boot scsi.1.0 [Enter]
  ```

  The operating system on the specified device is used to start the workstation.

- To interact with the Initial System Loader (ISL) before booting the workstation, type the following at the prompt:

  ```
  Main Menu: Enter command > boot device [Enter]
  ```

  You are prompted: `Interact with ISL (Y or N) > y [Enter]`

  Answering yes (`y`) causes the ISL to be loaded from the specified device. After a short time, the following prompt appears on the screen:

  ```
  ISL>
  ```

  ISL is the program that actually controls the loading of the operating system. By interacting with ISL, you can choose to load an alternate version of the HP-UX operating system.

  For example, if the usual kernel (`/stand/vmunix`) on the root disk has become corrupted, boot the workstation from the backup kernel (`/stand/vmunix.prev`) by typing the following at the `ISL>` prompt:

  ```
  ISL> hpux /stand/vmunix.prev [Enter]
  ```

- To find the location of the bootable operating systems on the various media in the file system, use the `search ipl` command. See the next subsection, “Searching for Bootable Media.”

Searching for Bootable Media

To list all devices that contain bootable media, go to the Main Menu of the Boot Console Handler, and then type the following at the prompt:

```
Main Menu: Enter command > search ipl [Enter]
```

The `search` command searches all buses. The search may turn up more devices than there are lines on the display. If you are using a text terminal, you can control the progress of the search from the terminal's keyboard by doing any of the following:

- To temporarily suspend the search, press `[Ctrl]-[S]`.
- To continue the search, press `[Ctrl]-[Q]`.
- To halt the search, press any other key.

These flow-control commands do not work with a bitmapped display, but such a display can show more than forty lines of text, so you are unlikely to need them.

To search for devices of just one type that actually contain bootable media, go to the Main Menu of the Boot Console Handler, and then type the following at the prompt:

```
Main Menu: Enter command > search ipl device_type [Enter]
```

where *`device_type`* is one of the following:

- `fwscsi` is the built-in, Ultra2 Wide LVD (Low Voltage Differential) SCSI bus.
- `scsi` is the built-in, NSE (Narrow Single-Ended) SCSI-2 bus.
- `lan` is all connections to the built-in LAN.
- `ide` is the built-in CD ROM drive.
- `pci`*`n`* is an optional SCSI interface in slot number *n*.

Stable Storage

Stable Storage is non-volatile memory associated with the PA-RISC processor module. Stable Storage is used by the processor (CPU) to store device path information, the state of the boot flags, HPMC error information, and operating system initialization data.

Boot Command Notations

The boot command supports the following two notations:

- Mnemonic
- Path number

Type `help scsi` or `help lan` for more information on the boot path parameters.

Here are examples of mnemonic notation:

- `boot` with no parameters selects the primary boot path in stable storage.
- `boot` with the `alternate` or `alt` parameter selects the alternate boot path in stable storage.

Here is an example of path number notation:

- `boot p1 [Enter]` attempts to boot from the second path in a list generated by a previous `search` command.

Supported Boot Paths

SCSI devices are bootable when connected to any SCSI port on the system. Diskless workstations can only boot from the LAN port on the system board. The workstation can be booted from the CD ROM drive for software installation.

ISL Environment

The ISL environment provides the means to load the operating system (HP-UX) environment. The ISL environment also provides an offline platform to execute diagnostic and utility programs from a boot device when HP-UX does not load.

The ISL program is the first program loaded into main memory from an external media (LAN, disk, or tape) and launched by the initial program loader (IPL) routine during the Boot Administration environment.

The ISL environment provides the following capabilities:

- Execute user-entered commands to modify boot device paths and boot options in stable storage.
- Run off-line diagnostic programs and utilities.
- Provide automatic booting of the HP-UX operating system after power-on or reset.

Identifying LCD-Indicated Conditions

This workstation uses a 2-line LCD, with up to 16-characters per line, to display firmware/operating system progress codes. These codes are referred to as chassis codes. The information displayed on the LCD has the following format:

```
XXX YYYY: ZZZZZZ        (Line 1)
AAAAAAAAAAAAAAAA        (Line 2)
```

Where:

XXX – represents a 3-character Ostat
YYYY – represents a 4-digit hex code identifying the code module being executed
ZZZZZZ – represents a 6-digit FRU descriptor
AAAAAAAAAAAAAAAA – represents text (up to 16 characters) relating a diagnostic message

The 3-character Ostat can be one of the following:

- **FLT** (fault) – A hardware error has been detected
- **TST** (test) – Hardware being tested
- **INI** (initialize) – Hardware being initialized
- **SHU** (shutdown) – System being shutdown
- **WRN** (warning) – A non-optimal operating condition exists
- **RUN** (running) – System is running operating system

Selftest Failures

Chassis codes are the key to debugging selftest errors. If a failure is found during selftest, chassis codes are displayed in the system LCD. To debug a failure:

1. In Table 3-1 starting on the next page, find the chassis code listed on the LCD.
2. In the Boot Console Handler, use the Service Menu's `pim`, `pdt`, and `ChassisCodes` commands to get additional information about the failure.

The FRU column in Table 3-1 shows messages printed on the LCD that refer to system FRUs. All codes are listed in numeric order.

Memory Failures

The J5xxx and J7xxx workstations require special Memory Page Deallocation to be implemented. This feature allows the workstation to provide information to the operating system about memory failures.

HP-UX 10.x uses this information to map out failing memory areas and continue normal operation. You can check the Memory Page Deallocation Table (PDT) using the `pdt` command in the Service menu of the Boot Console Handler (refer to Chapter 5). If a failing DIMM is replaced, use the command `pdt clear` in the Service Menu to clear out the PDT.

Chassis Codes

Table 3-1 lists all of the chassis codes for the J5xxx and J7xxx workstations.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
FLT	1*n*01	SYS BD	HPMC occurred	CPU *n* detected an unexpected HPMC.
FLT	1*n*02	SYS BD	powerfail intrpt	CPU *n* detected an unexpected power fail interrupt.
FLT	1*n*03	SYS BD	recvry cntr trap	CPU *n* detected an unexpected recovery counter trap.
FLT	1*n*04	SYS BD	external intrrpt	CPU *n* detected an unexpected external interrupt.
FLT	1*n*05	SYS BD	LPMC occurred	CPU *n* detected an unexpected LPMC.
FLT	1*n*06	SYS BD	ITLB mis/Ipg flt	CPU *n* detected an unexpected ITLB miss or instruction page fault.
FLT	1*n*07	SYS BD	I mem prot trap	CPU *n* detected an unexpected instruction memory protection trap.
FLT	1*n*08	SYS BD	illegal inst trp	CPU *n* detected an unexpected illegal instruction trap.
FLT	1*n*09	SYS BD	break instr trap	CPU *n* detected an unexpected break instruction trap.
FLT	1*n*0A	SYS BD	privilgd op trap	CPU *n* detected an unexpected privileged operation trap.
FLT	1*n*0B	SYS BD	privlgd reg trap	CPU *n* detected an unexpected privileged register trap.
FLT	1*n*0C	SYS BD	overflow trap	CPU *n* detected an unexpected overflow trap.
FLT	1*n*0D	SYS BD	conditional trap	CPU *n* detected an unexpected conditional trap.
FLT	1*n*0E	SYS BD	assist exep trap	CPU *n* detected an unexpected assist exception trap.
FLT	1*n*0F	SYS BD	DTLB mis/Dpg flt	CPU *n* detected an unexpected DTLB miss or data page fault.
FLT	1*n*10	SYS BD	non-acc ITLB mis	CPU *n* detected an unexpected non-access ITLB miss fault.
FLT	1*n*11	SYS BD	non-acc DTLB mis	CPU *n* detected an unexpected non-access DTLB miss or data page fault.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
FLT	1*n*12	SYS BD	data mem prot tr	CPU *n* detected an unexpected data memory protection trap.
FLT	1*n*13	SYS BD	data mem brk trp	CPU *n* detected an unexpected data memory break trap.
FLT	1*n*14	SYS BD	TLB dirty bit tr	CPU *n* detected an unexpected TLB dirty bit trap.
FLT	1*n*15	SYS BD	page refrnce trp	CPU *n* detected an unexpected page reference trap.
FLT	1*n*16	SYS BD	assist emul trap	CPU *n* detected an unexpected assist emulation trap.
FLT	1*n*17	SYS BD	hi-priv xfer trp	CPU *n* detected an unexpected higher-privilege transfer trap.
FLT	1*n*18	SYS BD	lo-priv xfer trp	CPU *n* detected an unexpected lower-privilege transfer trap.
FLT	1*n*19	SYS BD	taken branch trp	CPU *n* detected an unexpected taken-branch trap.
FLT	1*n*1A	SYS BD	data mem acc rts	CPU *n* detected an unexpected data memory access rights trap.
FLT	1*n*1B	SYS BD	data mem prot ID	CPU *n* detected an unexpected data memory protection ID trap.
FLT	1*n*1C	SYS BD	unalign data ref	CPU *n* detected an unexpected unaligned data reference trap.
FLT	1*n*1D	SYS BD	perf mon intrrpt	CPU *n* detected an unexpected performance monitor interrupt.
TST	1*n*20	SYS BD	CPU*n* basic test	CPU *n* is starting its basic operations self-test.
TST	1*n*21	SYS BD	CPU*n* alu test	CPU *n* is starting its arithmetic and logical unit self-test.
TST	1*n*22	SYS BD	CPU*n* branch test	CPU *n* is starting its branch instruction self-test.
TST	1*n*23	SYS BD	CPU*n* arith cond	CPU *n* is starting its arthimetic condition self-test.
TST	1*n*24	SYS BD	CPU*n* bit opers	CPU *n* is starting its bit operation instruction self-test.
TST	1*n*25	SYS BD	CPU*n* cntrl regs	CPU *n* is starting its control register self-test.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
TST	1*n*26	SYS BD	CPU*n* ext intrpt	CPU *n* is starting its external interrupt self-test.
TST	1*n*27	SYS BD	CPU*n* itimer test	CPU *n* is starting its interval timer self-test.
TST	1*n*28	SYS BD	CPU*n* multi-media	CPU *n* is starting its multi-media instructions self-test.
TST	1*n*29	SYS BD	CPU*n* shadow reg	CPU *n* is starting its shadow register self-test.
TST	1*n*2A	SYS BD	CPU*n* diagnse reg	CPU *n* is starting its diagnose register self-test.
TST	1*n*2B	SYS BD	CPU*n* rdr test	CPU *n* is starting its remote diagnose register self-test.
TST	1*n*2C	SYS BD	CPU*n* bypass test	CPU *n* is starting its integer bypass operation self-test.
TST	1*n*30	SYS BD	CPU*n* start est	CPU *n* is starting its early (pre-memory) self-tests.
WRN	1*n*31	SYS BD	CPU*n* skip est	CPU *n* is bypassing its early self-tests to save time.
FLT	1*n*32	SYS BD	CPU*n* bad tst mod	CPU *n* detected an unsupported system mode.
INI	1*n*3C	SYS BD	CPU*n* initialize	CPU *n* is initializing after self-tests.
TST	1*n*3E	SYS BD	CPU*n* exit est	CPU *n* finished its early self-tests.
TST	1*n*A0	SYS BD	CPU*n* fpu tests	CPU *n* is starting its floating-point unit self-tests.
TST	1*n*A1	SYS BD	CPU*n* fpu reg tst	CPU *n* is starting its floating-point register self-test.
TST	1*n*A2	SYS BD	CPU*n* fpu inst	CPU *n* is starting its floating-point instruction self-test.
TST	1*n*A3	SYS BD	CPU*n* fpu traps	CPU *n* is starting its floating-point trap self-test.
TST	1*n*A4	SYS BD	CPU*n* fpu misc	CPU *n* is starting its floating-point miscellaneous operations self-test.
TST	1*n*A5	SYS BD	CPU*n* fpu bypass	CPU *n* is starting its floating-point bypassing self-test.
TST	1*n*B1	SYS BD	CPU*n* TLB RAM tst	CPU *n* is starting its TLB register self-test.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
TST	1*n*B2	SYS BD	CPU*n* TLB trans	CPU *n* is starting its TLB translation self-test.
FLT	1*n*BA	SYS BD	monarch CPU *fail*	The monarch CPU failed.
FLT	1*n*BB	SYS BD	bad CPU*n* number	The CPU identifier was out of range.
FLT	1*n*BF	SYS BD	CPU*n* halt boot	Bootstrap failure--machine halted.
INI	1*n*CA	SYS BD	CPUn sys bus arb	Monarch CPU is initializing the system bus arbitration.
WRN	1*n*CD	SYS BD	CPU*n* deconfig	CPU *n* deconfigured itself.
WRN	1*n*CE	SYS BD	CPU*n* extinguish	PDC_PROC halted CPU *n*.
FLT	1*n*CF	SYS BD	slave*n* failed	Slave CPU *n* failed self-test.
WRN	1*m*D*s*	SYS BD	slaves deconfig	Monarch CPU *m* deconfigured slave CPU *s*.
WRN	1*n*EF	SYS BD	CPU*n* slftst warn	CPU *n* detected a non-fatal error during its self-tests.
WRN	1*m*F*s*	SYS BD	mon*m* stop slave*s*	Monarch CPU *m* halted slave CPU *s*.
INI	1*n*FC	SYS BD	CPUn sync'ing	CPU *n* is synchronizing with the rest of the system.
INI	1*n*FD	SYS BD	CPU*n* stat wd tst	CPU *n* is testing the system status word.
FLT	1*n*FF	SYS BD	monarch*n* selftst	Monarch CPU *n* failed self-test.
TST	2*n*20	SYS BD	CPU*n* icache RAM	CPU *n* is starting its instruction cache RAM self-test.
FLT	2*n*25	SYS BD	CPU*n* ic ld d err	CPU *n* detected a data error during data cache load.
FLT	2*n*26	SYS BD	CPU*n* ic ld t err	CPU *n* detected a tag error during data cache load.
TST	2*n*30	SYS BD	CPU*n* icache tag	CPU *n* is starting its instruction cache tag self-test.
TST	2*n*40	SYS BD	CPU*n* icache par	CPU *n* is starting its instruction cache parity detection self-test.
TST	2*n*50	SYS BD	CPU*n* dc stor que	CPU *n* is starting its data cache store queue self-test.
FLT	2*n*51	SYS BD	CPU*n* dc st q err	CPU *n* detected an error during its data cache store queue self-test.
TST	2*n*70	SYS BD	CPU*n* dcache RAM	CPU *n* is starting its data cache RAM self-test.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
TST	2*n*80	SYS BD	CPU*n* dcache tag	CPU *n* is starting its data cache tag self-test.
TST	2*n*90	SYS BD	CPU*n* dcache ECC	CPU *n* is starting its data cache ECC self-test.
FLT	2BAD	SYS BD	assertion fail	A firmware assertion failed.
TST	3*n*00	SYS BD	ROM checksum tst	Monarch CPU *n* is testing the boot ROM integrity.
FLT	3*n*00	SYS BD	ROM checksum BAD	The boot ROM failed checksum.
INI	3*n*00	SYS BD	ROM checksum ok	The boot ROM passed checksum.
TST	3*n*01	SYS BD	PDH control test	Monarch CPU *n* is testing PDH control register.
INI	3*n*01	SYS BD	PDH control init	Monarch CPU *n* is initializing the PDH control register.
FLT	3*n*01	SYS BD	PDH control err	Monarch CPU *n* detected an error in the PDH control register.
TST	3*n*02	SYS BD	scratch RAM test	Monarch CPU *n* is testing scratch RAM.
INI	3*n*02	SYS BD	scratch RAM ok	The scratch RAM test failed.
FLT	3*n*02	SYS BD	scratch RAM bad	The scratch RAM test passed.
WRN	3*n*03	SYS BD	stbl st read err	CPU *n* detected a non-fatal error reading the stable store.
FLT	3*n*03	SYS BD	stbl st read err	CPU *n* detected a non-fatal error reading the stable store.
INI	3*n*C4	SYS BD	clearing EEPROM	Monarch CPU *n* is clearing the EEPROM.
INI	3*n*D4	SYS BD	deflting EEPROM2	Monarch CPU *n* is initializing the EEPROM to system defaults.
WRN	3*n*04	SYS BD	EEPROM write err	CPU *n* detected a non-fatal error writing the EEPROM.
FLT	3*n*04	SYS BD	EEPROM write err	CPU *n* detected a fatal error writing the EEPROM.
FLT	3*n*05	SYS BD	EEPROM wrt limit	CPU *n* detected a fatal error writing the EEPROM.
WRN	3*n*06	SYS BD	EEPROM read err	CPU *n* detected a non-fatal error reading the EEPROM.
FLT	3*n*06	SYS BD	EEPROM read err	CPU *n* detected a fatal error reading the EEPROM.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
INI	3*n*07	SYS BD	CPU*n* invoke LDB	CPU *n* is starting the low-level debugger.
FLT	3*n*09	SYS BD	bad sys mde byte	CPU *n* detected an unsupported system mode.
WRN	3*n*1A	SYS BD	hversion mismtch	Stable store hardware version doesn't match system.
TST	3*n*1B	SYS BD	chck model strng	Check model string with version in stable store.
WRN	3*n*1B	SYS BD	model str msmtch	Model string doesn't match that in stable store.
FLT	3*n*1B	SYS BD	fatal model str	Error reading model string from stable store.
TST	3*n*1C	SYS BD	test software ID	Check LANIC address.
WRN	3*n*1C	SYS BD	update sw ID	Update LANIC address.
FLT	3*n*1C	SYS BD	update sw ID err	Error updating LANIC address.
INI	3*n*2*s*	SYS BD	Invoke LDB: *s*	CPU *n* is awaiting the low-level debugger for *s* more seconds.
TST	3*n*BC	IO BD	test sys clocks	CPU *n* is verifying processor clocks with the real-time clock.
INI	3*n*BC	SYS BD	init sys clocks	CPU *n* has initialized the processor clocks.
FLT	3*n*BC	IO BD	RTC tick timeout	The real-time clock is ticking too slowly or not at all.
TST	3*n*CD	SYS BD	check defaults	CPU *n* is initializing stable store values to system defaults.
INI	3*n*CD	SYS BD	init defaults	CPU *n* finished initializing stable store values.
FLT	3*n*CD	SYS BD	init EEPROM err	CPU *n* detected an error writing to stable store.
FLT	3*n*EC	SYS BD	bad sys config	CPU *n* detected an illegal CPU board configuration.
FLT	3*n*F4	SYS BD	EEPROM boot limt	CPU *n* detected a fatal error writing the EEPROM.
FLT	3*n*FC	SYS BD	bad sys bd id	CPU *n* cannot identify CPU board.
TST	4*n*00	SYS BD	CPU*n* start lst	CPU *n* is starting its late (with memory) self-tests.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
WRN	4*n*01	SYS BD	CPU*n* skip lst	CPU *n* is bypassing its late self-tests to save time.
TST	4*n*0E	SYS BD	CPU*n* exit lst	CPU *n* finished its late self-tests.
TST	4*n*20	SYS BD	CPU*n* lst erly st	CPU *n* is re-executing some of its early self-tests from system memory.
TST	4*n*21	SYS BD	CPU*n* lst basic	CPU *n* is re-executing its basic operations self-test.
TST	4*n*22	SYS BD	CPU*n* lst alu	CPU *n* is re-executing its arithmetic and logic unit self-test.
TST	4*n*23	SYS BD	CPU*n* lst branch	CPU *n* is re-executing its branch instruction self-test.
TST	4*n*24	SYS BD	CPU*n* lst arth cd	CPU *n* is re-executing its arithmetic conditions self-test.
TST	4*n*25	SYS BD	CPU*n* lst bit ops	CPU *n* is re-executing its bit operations self-test.
TST	4*n*26	SYS BD	CPU*n* lst ctl reg	CPU *n* is re-executing its control register self-test.
TST	4*n*27	SYS BD	CPU*n* lst ext int	CPU *n* is re-executing its external interrupt self-test.
TST	4*n*28	SYS BD	CPU*n* lst itimer	CPU *n* is re-executing its interval timer self-test.
TST	4*n*29	SYS BD	CPU*n* lst mltimed	CPU *n* is re-executing its multi-media instructions self-test.
TST	4*n*2A	SYS BD	CPU*n* lst shadow	CPU n is re-executing its shadow register self-test.
TST	4*n*2B	SYS BD	CPU*n* lst dg regs	CPU *n* is re-executing its diagnose register self-test.
TST	4*n*2C	SYS BD	CPU*n* lst rdrs	CPU *n* is re-executing its remote diagnose register self-test.
TST	4*n*2D	SYS BD	CPU*n* lst bypass	CPU *n* is re-executing its integer bypass operation self-test.
TST	4*n*30	SYS BD	CPU*n* cache byte	CPU *n* is starting its data cache sub-word operations self-test.
TST	4*n*40	SYS BD	CPU*n* cache flush	CPU *n* is starting its cache flush self-test.
TST	4*n*50	SYS BD	CPU*n* icache miss	CPU *n* is starting its instruction cache miss self-test.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
TST	4*n*60	SYS BD	CPU*n* dcache miss	CPU *n* is starting its data cache miss self-test.
FLT	5*n*00	SYS BD	unknown bus err	CPU *n* detected an unknown error on the system bus (Runway).
FLT	5*n*02	SYS BD	path err assertd	CPU *n* detected a path error on the system bus (Runway).
FLT	5*n*04	SYS BD	data parity err	CPU *n* detected a data, address, or control parity error on the system bus (Runway).
FLT	5*n*07	SYS BD	Runway dir error	CPU *n* detected a directed error on the system bus (Runway).
FLT	5*n*08	SYS BD	Runway broad err	CPU *n* detected a broadcast error on the system bus (Runway).
FLT	5*n*0A	SYS BD	illegal response	CPU *n* received data that did not match any outstanding data request.
FLT	5*n*0B	SYS BD	bus timeout	CPU *n* timed out before receiving requested data. The responder is logged in the system responder address.
FLT	5*n*0C	SYS BD	CPU sync failure	CPU *n*'s synchronizer detected a rule violation on the system bus (Runway).
INI	7000	DIMM	start DIMM scan	Start looking for installed DIMMs.
INI	7002	SYS BD	init mem tables	Initialize memory data structures.
FLT	7004	SYS BD	mem plt upd fail	Error updating memory platform data.
FLT	7005	DIMM	insufficient mem	Insufficient memory detected to continue.
TST	7010	DIMM	check DIMM order	Start memory DIMM order check.
WRN	7011	DIMM	skip DIMM ord ck	Bypass memory DIMM order check.
FLT	7012	DIMM	DIMM order error	Memory DIMMs are not in the proper order.
FLT	7013	DIMM	DIMM order error	Memory DIMMs are not in the proper order. As a result, the system cannot access one or more DIMMs and has deallocated all inaccessible DIMMs.
TST	7016	DIMM	DIMM pair check	Start memory DIMM pair check (DIMMs in a pair (e.g. 0a/0b) must match in J7xxx).
WRN	7017	DIMM	skip mem pair ck	Bypass memory DIMM set check.
FLT	701F	DIMM	no memory found	Memory scan couldn't find any DIMMs.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
TST	7020	SYS BD	search for IMM	Try to find a single memory bank to use for the initial memory module.
TST	703*s*	DIMM	DIMM *s* IMM vrfy	DIMM *s* was the initial memory module last boot. Verify it still works.
FLT	704*s*	DIMM	DIMM *s* IMM fail	DIMM *s* failed the initial memory module test.
TST	705*s*	DIMM	DIMM *s IMM test*	Test DIMM in slot *s* as the initial memory module.
INI	706*s*	DIMM	DIMM *s* is IMM	DIMM *s* chosen as initial memory module.
INI	70F0	DIMM	DIMM scan done	Memory DIMM scan complete.
TST	7100	SYS BD	mem register tst	Start testing registers in memory controller.
WRN	7101	SYS BD	skip mem reg tst	Bypass the memory controller register test.
FLT	7102	SYS BD	mem addr reg tst	Firmware detected an error in the memory controller address registers.
FLT	7103	SYS BD	mem mbat reg tst	Firmware detected an error in the memory controller bank registers.
FLT	7104	SYS BD	mem reg tst fail	Firmware detected an error in the memory controller memory registers.
FLT	7105	SYS BD	mem err reg test	Firmware detected an error in the memory controller error registers.
FLT	7106	SYS BD	mem err clr fail	Firmware was unable to clear the error registers after testing.
INI	7200	DIMM	strt DIMM detect	Start the Serial Presence Detection (SPD) to search for memory DIMMs.
INI	7201	DIMM	DIMM detect *x*%	SPD is *x*% finished.
WRN	7202	SYS BD	skip DIMM detect	Bypass Serial Presence Detection.
FLT	7203	DIMM	unsupp DIMM type	SPD found an unsupported DIMM type.
FLT	7204	DIMM	SPD fatal error	SPD detected an unexpected, fatal error.
INI	7205	DIMM	add HP DIMM type	New HP manufactured DIMM type added to tables.
INI	7206	DIMM	non-HP DIMM type	New non-HP DIMM type added to tables (use at own risk).

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
FLT	7207	DIMM	DIMM table full	The DIMM table is full--cannot add new type.
FLT	7208	DIMM	no DIMMs found	SPD didn't find any memory DIMMs.
INI	721*s*	DIMM	is DIMM *s* inst?	SPD is checking memory slot *s*.
INI	722*s*	DIMM	???? DIMM in *s*	SPD found a DIMM in slot *s*, but can't determine its size. DIMM will not be used.
INI	723*s*	DIMM	128M DIMM in *s*	SPD found a 128MB DIMM in slot *s*.
INI	724*s*	DIMM	256M DIMM in *s*	SPD found a 256MB DIMM in slot *s*.
INI	725*s*	DIMM	512M DIMM in *s*	SPD found a 512MB DIMM in slot *s*.
FLT	72A*s*	DIMM	DIMM *s* checksum	DIMM in slot *s* failed SPD checksum and will not be used.
FLT	72C*s*	DIMM	DIMM *s* mismatch	DIMM in slot *s* didn't match the other in pair. (J7xxx only--DIMMs must be in matched pairs.)
FLT	72D*s*	DIMM	DIMM *s* load err	Memory DIMMs are not in the proper order. As a result, the system cannot access DIMM *s* and has deallocated it.
INI	7300	SYS BD	mem config start	Starting main memory configuration.
TST	7301	SYS BD	check mem config	Checking for memory configuration change since last boot.
WRN	7302	SYS BD	mem confg changd	Memory physical configuration changed since last boot.
INI	7303	SYS BD	use confg change	Memory physical configuration didn't use saved configuration change. Use stored configuration data.
INI	7304	SYS BD	build mem intrlv	Building memory configuration with all DIMMs interleaved.
INI	7305	SYS BD	save mem config	Saving memory configuration information in non-volatile memory.
WRN	7306	SYS BD	use alt mem conf	Memory will be configured from fixed values, instead of detected DIMMs.
INI	7307	SYS BD	interleve memory	Generating the memory interleave.
FLT	7308	SYS BD	PDT is disabled	Firmware detected bad memory pages, but the Page Deallocation Table is disabled.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
FLT	7309	DIMM	insufficient mem	Insufficient error-free memory to continue.
FLT	730C	SYS BD	mem intrlv fail	Memory interleave generation failed.
INI	730F	SYS BD	mem config done	Main memory configuration complete.
TST	7400	DIMM	non-dest mem tst	Starting non-destructive memory test.
TST	740F	DIMM	non-dst tst done	Non-destructive memory test complete.
INI	7500	SYS BD	memory reset	Resetting memory system.
WRN	7501	SYS BD	mem log clr warn	Memory error logs didn't clear on first try.
FLT	7502	SYS BD	mem err log fail	Firmware could not clear memory error logs.
TST	7600	DIMM	dest mem test	Starting the destructive memory test.
WRN	7601	DIMM	mem init only	Skip the test, just initialize memory to save time.
TST	7602	DIMM	tst 1st mem page	Starting 3-pass test of first memory page.
TST	7603	DIMM	tst rest of mem	Starting 3-pass test of the rest of memory.
TST	7604	DIMM	start 1st pass	Starting 1st pass of memory test (write pseudorandom sequence).
TST	7605	DIMM	1st pass *x%*	First pass is *x*% complete.
TST	7606	DIMM	start 2nd pass	Starting 2nd pass of memory test (verify pseudorandom sequence, write inverse).
TST	7607	DIMM	2nd pass *x%*	Second pass is *x*% complete.
TST	7608	DIMM	start 3rd pass	Starting 3rd pass of memory test (verify inverse sequence).
TST	7609	DIMM	3rd pass *x%*	Third pass is *x*% complete.
TST	760A	DIMM	start mem init	Starting memory initialization. (Initialize to zero to set ECC.)
TST	760B	DIMM	mem init *x%*	Memory initialization is *x*% complete.
WRN	760C	DIMM	repeat dest test	Re-execute destructive test for hardware troubleshooting.
FLT	760D	DIMM	mem code cpy err	Firmware tried to copy code from ROM to memory, but the copy didn't match the original.
FLT	7610	DIMM	ECC wrt/read err	Writing and reading back good data caused memory ECC error.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
FLT	7611	DIMM	ECC single data	Memory ECC test failed to detect single-bit data error.
FLT	7612	DIMM	ECC single ECC	Memory ECC test failed to detect single-bit ECC error.
FLT	7613	DIMM	ECC multipl data	Memory ECC test failed to detect multiple-bit data error.
FLT	7614	DIMM	ECC multpl signl	Memory ECC test failed to signal multiple-bit error.
FLT	7800	SYS BD	mem err summary	Printing memory error summary word to RS-232.
FLT	7801	SYS BD	bus ctrl par err	System bus (Runway) control parity error detected.
FLT	7802	SYS BD	bus addr par err	System bus (Runway) address parity error detected.
FLT	7803	SYS BD	bus data par err	System bus (Runway) data parity error detected.
FLT	7804	SYS BD	mem out of range	Memory access outside configured memory space.
FLT	7805	SYS BD	bus broadcst err	System bus (Runway) broadcast error detected.
FLT	7806	SYS BD	mem addr par err	Memory bus address parity error detected.
FLT	7807	SYS BD	mem ctlr stat wd	Printing memory controller status word to RS-232.
FLT	781*s*	SYS BD	DIMM *s* uncor err	Uncorrectable ECC error detected in DIMM s.
FLT	782*s*	SYS BD	DIMM *s* corr err	Correctable ECC error detected in DIMM *s*.
FLT	7840	SYS BD	unexpected HPMC	Unexpected HPMC detected.
FLT	7841	SYS BD	mem status invld	Memory error status word is invalid.
FLT	7842	SYS BD	mem summ invalid	Memory summary word is invalid.
FLT	7843	SYS BD	fwd prog invalid	Memory forward progress word is invalid.
FLT	7844	SYS BD	mem HPMC summ wd	Printing memory error summary word to RS-232.
FLT	7845	SYS BD	mem ctlr stat wd	Printing memory controller status word to RS-232.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
FLT	7846	SYS BD	mem err overflow	Multiple memory errors detected.
FLT	7848	SYS BD	addr not mapped	Memory address outside configured memory space.
FLT	785*s*	DIMM	MBE in DIMM *s*	Destructive memory test detected an uncorrectable memory error in DIMM *s*.
FLT	786*s*	DIMM	SBE&MBE DIMM *s*	Destructive memory test detected both an uncorrectable and a correctable memory error in DIMM *s*.
FLT	787*s*	DIMM	mem err DIMM *s*	Destructive memory test detected a pattern compare error in DIMM *s*.
FLT	788*s*	DIMM	SBE in DIMM *s*	Destructive memory test detected a correctable memory error in DIMM *s*.
FLT	7890	DIMM	MBE overwrt SBE	Firmware replaced a correctable memory error entry in the PDT with an uncorrectable memory error entry at the same address.
FLT	7891	DIMM	dup entry in PDT	The PDT already contains an entry at that address.
FLT	7892	SYS BD	PDT write error	Error adding the entry to the PDT.
FLT	7893	SYS BD	PDT is full	The PDT is full--cannot add new entry.
FLT	7900	SYS BD	no DMT entry	Internal error--cannot find DIMM entry.
FLT	7901	SYS BD	no rank entry	Internal error--cannot find rank entry.
FLT	7902	SYS BD	bad refrsh intvl	Computed refresh interval is invalid.
FLT	7903	SYS BD	mem intrlv fail	Cannot generate memory interleave.
FLT	7904	SYS BD	mem reloc failed	Cannot interleave with relocated range (3.75GB - 4.0GB).
FLT	7905	SYS BD	mem intrlv error	Undefined memory interleave failure.
FLT	79FF	SYS BD	mem firmware err	Internal error--never expected this to happen.
WRN	80F3	SYS BD	err rd IODC byte	Cannot read IODC from ROM or card.
WRN	80F4	EXT IO	boot read error	Cannot load IODC entry_init for boot device.
WRN	80F5	EXT IO	boot exec error	Error initializing boot device.
WRN	80F6	EXT IO	boot read error	Cannot load IODC entry_io for boot device.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
WRN	80F7	EXT IO	boot IO error	Error detected during boot device I/O.
WRN	80F8	EXT IO	invalid boot dev	Invalid boot device class; bad IODC?
WRN	80FC	EXT IO	invalid boot dev	Unexpected error; bad IODC?
INI	8800	IOCARD	PCI BusWlk start	Starting PCI bus and device discovery.
INI	88*r*1	IOCARD	PCI Rope *r* walk	Starting PCI bus and device discovery on Rope *r*.
INI	8802	IOCARD	PCI BusWalk done	PCI bus and device discovery complete.
INI	8803	SYS BD	PCI alloc done	Done allocating address space for PCI devices.
INI	8804	SYS BD	PCI config done	Done configuring PCI devices.
FLT	881*r*	IO BD	R2PCI*r* not found	Rope-to-PCI bridge *r* not found.
WRN	882*r*	IO BD	R2PCI*r* not found	Rope-to-PCI bridge r initialization failed.
FLT	883*r*	IO BD	Rope*r* config err	Rope *r* configuration failed.
INI	884*r*	EXT IO	Rope*r* debug tggl	Rope *r* debug register toggled.
FLT	884*r*	EXT IO	Rope*r* tgl fail	Rope *r* debug register toggle failed.
INI	8850	SYS BD	early rope0 init	Initializing rope 0 for early RS-232 output.
FLT	8850	SYS BD	rope0 init fail	Couldn't initialize rope 0.
INI	8860	SYS BD	rope0 init done	Rope 0 initialization complete.
INI	8870	IO BD	early R2PCI init	Initializing Rope-to-PCI bridge 0 for early RS-232 output.
FLT	8870	IO BD	R2PCI init fail	Couldn't initialize Rope-to-PCI bridge 0.
INI	8880	IO BD	R2PCI init done	Rope-to-PCI bridge 0 initialization complete.
INI	8890	IO BD	early Super init	Initializing Super-I/O for early RS-232 output.
FLT	8890	IO BD	Super init fail	Couldn't initialize Super-I/O.
INI	88A0	IO BD	Super init done	Super-I/O initialization complete.
WRN	8A03	EXT IO	No graph console	Cannot re-establish communications with the graphics console.
WRN	8A04	EXT IO	No USB keyboard	Cannot re-establish communications with the USB keyboard.
TST	8C06	EXT IO	PCI BIST test	Running PCI Built-In Self-Test

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
WRN	8C07	EXT IO	PCI BIST error	PCI Built-In Self-Test failed.
WRN	8C08	SYS BD	PCI alloc error	PCI address space allocation failed.
WRN	8C09	IO BD	PCI mem mngr err	Memory allocation for PCI device failed.
WRN	8C0A	EXT IO	PCI mem type err	PCI device requested invalid memory type.
WRN	8C0B	IO BD	PCI max bus dpth	PCI bus depth exceeded maximum supported depth.
WRN	8C0C	EXT IO	PCI dev not cnfg	Unable to configure PCI device.
WRN	8C0F	IO BD	dev tree ovrflow	Data space for PCI devices is full.
WRN	8DEC	IO BD	init LAN SROM	Initializing the core LAN serial EPROM.
SHU	8DEC	IO BD	resetting system	Restarting system after core LAN initialization.
FLT	8E10	IO BD	PARALEL port cfg	Parallel port configuration failed.
FLT	8E11	IO BD	SERIAL1 port cfg	Serial 1 port configuration failed.
FLT	8E12	IO BD	SERIAL2 port cfg	Serial 2 port configuration failed.
FLT	8E13	IO BD	FLOPPY drive cfg	Floppy drive configuration failed.
FLT	8E20	IO BD	bad USB port cfg	USB port configuration failed.
WRN	9001	EXT IO	no console found	Search for console display device failed.
INI	9151	IO BD	init SERIAL_1	Initializing serial 1 port as console display.
INI	9152	IO BD	init SERIAL_2	Initializing serial 2 port as console display.
INI	915F	IO BD	init unknown dev	Initializing unknown device as console display.
INI	916*s*	EXT IO	init PCI slot *s*	Initializing PCI device in slot *s* as console display.
INI	91DB	IO BD	init SERIAL_LDB	Initializing serial LDB port as console display.
INI	9C51	IO BD	consol is SER_1	Console display is on serial port 1.
WRN	9C51	IO BD	bad init SERIAL1	Serial port 1 failed to initialize as a console device.
INI	9C52	IO BD	consol is SER_2	Console display is on serial port 2.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
INI	9160	EXT IO	builtin GRAPHICS	Initializing built-in graphics as console display.
WRN	9C52	IO BD	bad init SERIAL2	Serial port 2 failed to initialize as a console device.
INI	9C6*s*	EXT IO	consol is GRAPH*s*	Console display is on graphics card in PCI slot *s*.
WRN	9C6*s*	EXT IO	bad PCI slot *s*	Graphics in PCI slot *s* failed to initialize as a console device.
INI	9C8*t*	EXT IO	cnfg mon type *t*	Set graphics console to monitor type *t*. (Seen when cycling through types.)
WRN	9C8*t*	EXT IO	mon type *t* fail	Failed to configure console to monitor type *t*.
INI	9CDB	IO BD	consl is SER_LDB	Console display is on serial LDB port.
WRN	9CDB	IO BD	bad init SER_LDB	Serial LDB port failed to initialize as a console device.
FLT	A088	IO BD	consl path fault	Unable to boot--no console device found.
WRN	A008	EXT IO	no boot device	Unable to boot--no bootable device found.
WRN	A0BD	EXT IO	device not ready	Boot device not ready--operation may be retried.
FLT	A0FF	EXT IO	unknown launch	Unable to boot. Explanation may appear on console.
WRN	A50F	EXT IO	init pri pth err	Unable to boot from primary boot device.
WRN	A70F	EXT IO	init otr pth err	Unable to boot from non-primary boot device.
INI	C10*m*	SYS BD	CPU*m* is monarch	CPU *m* was chosen as the monarch processor. (All other CPUs are slaves.)
INI	C30*m*	SYS BD	monarch*m* test	CPU *m* finished the monarch-only tests and system initialization.
INI	C30C	SYS BD	mnrch slv chck	The monarch CPU is checking whether the slaves are in the correct rendezvous.
INI	C3FF	SYS/IO	late monarch tst	The monarch CPU is starting the late (post-memory) monarch-only tests.
FLT	C3FF	SYS/IO	late monarch flt	The late (post-memory) monarch-only tests failed.
INI	C4CC	SYS BD	initialize ccp	Searching for (lab-only) debugger card.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
INI	C4CD	SYS BD	no ccp found	Debugger card not found.
INI	C4CE	SYS BD	ccp disabled	Debugger card disabled.
INI	C4CF	SYS BD	ccp found	Debugger card found.
INI	C500	SYS BD	get primary path	Autoboot is reading primary boot path from stable store.
INI	C540	EXT IO	init pri path	Autoboot is trying to boot from primary boot device.
INI	C580	EXT IO	load IPL pri pth	Loading IPL from primary boot device.
WRN	C5F0	EXT IO	err read pri IPL	Error loading IPL from primary boot device.
FLT	C5F0	EXT IO	pri IPL fault	Error loading IPL from primary boot device.
WRN	C5F1	EXT IO	err read pri IPL	Cannot load IPL from primary boot device--load address invalid.
WRN	C5F2	EXT IO	err read pri IPL	Cannot load IPL from primary boot device--file is not IPL image.
WRN	C5F3	EXT IO	err read pri IPL	Cannot load IPL from primary boot device--IPL image size invalid.
WRN	C5F4	EXT IO	err read pri IPL	Cannot load IPL from primary boot device--IPL entry point address invalid.
WRN	C5F8	EXT IO	err read pri IPL	Cannot load IPL from primary boot device--IPL image checksum failed.
INI	C5FF	<blank>	launch pri IPL	Booting from primary boot path.
INI	C642	EXT IO	init kybrd consl	Try to initialize USB keyboard.
FLT	C642	EXT IO	keyboard error	An error was detected trying to access the keyboard.
WRN	C643	EXT IO	keyboard reinit	Keyboard was re-initialized.
WRN	C64F	EXT IO	reset montr type	The console device failed to initialize with the given monitor type. Try again with type 1.
TST	C680	SYS BD	builtin graphics	Look for built-in graphics card.
TST	C68*s*	SYS BD	test graph in *s*	Look for graphics card in PCI slot *s*.
INI	C68*s*	SYS BD	init graph in s	Successfully initialized graphics card in PCI slot *s*.
WRN	C68*0*	SYS BD	bultin graphics	built-in graphics initialization failed.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
WRN	C68*s*	SYS BD	fail graph in *s*	Card in PCI slot *s* failed graphics initialization or is not a graphics card.
INI	C740	EXT IO	init other path	Autoboot is trying to boot from non-primary boot device.
INI	C780	EXT IO	ld IPL othr path	Loading IPL from non-primary boot device.
WRN	C7F0	EXT IO	other IPL fault	Error loading IPL from non-primary boot device.
WRN	C7F1	EXT IO	bad alt IPL read	Cannot load IPL from non-primary boot device--load address invalid.
WRN	C7F2	EXT IO	bad alt IPL read	Cannot load IPL from non-primary boot device--file is not IPL image.
WRN	C7F3	EXT IO	bad alt IPL read	Cannot load IPL from non-primary boot device--IPL image size invalid.
WRN	C7F4	EXT IO	bad alt IPL read	Cannot load IPL from non-primary boot device--IPL entry point address invalid.
WRN	C7F8	EXT IO	bad alt IPL read	Cannot load IPL from non-primary boot device--IPL image checksum failed.
WRN	C7FF	<blank>	launch IPL other	Booting from a device other than the primary boot path.
INI	CB00	SYS BD	TOC initiated	A Transfer of Control entered the firmware TOC handler.
WRN	CB01	SYS BD	no OS TOC vector	There is no TOC vector for the operating system. Firmware will soft boot the system.
WRN	CB02	SYS BD	bad OS TOC addr	The operating system TOC handler vector is invalid. Firmware will soft boot the system.
WRN	CB03	SYS BD	bad OS TOC code	The operating system TOC handler is invalid. Firmware will soft boot the system.
WRN	CB04	SYS BD	bad OS TOC len	The size of the operating system TOC handler is invalid. Firmware will soft boot the system.
WRN	CB05	SYS BD	bad OS TOC chksm	The operating system TOC handler failed the checksum test. Firmware will soft boot the system.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
WRN	CB0A	SYS BD	prev TOC logged	Firmware detected unread PIM data from a previous TOC and will not overwrite it. (PIM for this TOC is lost.)
INI	CB0B	SYS BD	branch to OS TOC	Branching to the operating system TOC handler.
WRN	CB0C	SYS BD	br OS TOC failed	Branch to the operating system TOC handler failed. Firmware will soft boot the system.
WRN	CB10	SYS BD	LPMC initiated	A Low-Priority Machine Check entered the firmware LPMC handler. The handler should log the error and return to normal operation.
WRN	CB11	SYS BD	icache LPMC err	An instruction cache parity error caused the LPMC.
WRN	CB12	SYS BD	dcache LPMC err	A data cache parity/ECC error caused the LPMC.
WRN	CB13	SYS BD	dcache tag error	The parity error is in the tag portion of the data cache.
WRN	CB14	SYS BD	dcache data err	The parity error is in the data portion of the data cache.
FLT	CB1F	SYS BD	OS LPMC failed	Firmware couldn't branch to the operating system LPMC handler. It will halt the CPU, requiring a power cycle to recover.
WRN	CB71	SYS BD	HPMC occurred	A High-Priority Machine Check caused entry to PDCE_CHECK (the firmware trap handler).
WRN	CB72	SYS BD	LPMC occurred	A Low-Priority Machine Check caused entry to PDCE_CHECK (the firmware trap handler).
WRN	CB73	SYS BD	TOC occurred	A Transfer of Control caused entry to PDCE_CHECK (the firmware trap handler).
FLT	CB9*r*	IO BD	Error on roper	An error was detected on rope *r*.
FLT	CB99	SYS BD	seed IVA handler	PDC_SEED_ERROR triggered an HPMC.
FLT	CB9A	SYS BD	HPMC overwrite	Firmware is overwriting PIM data from a previous HPMC.
OFF	CBA1	SYS BD	AIOC int dat err	I/O controller internal error.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
OFF	CBA2	IO BD	EtoA rope perr	Parity error between I/O controller and Rope-to-PCI bridge.
OFF	CBA3	SYS BD	access invld TLB	An invalid I/O TLB entry was accessed.
OFF	CBA4	IO BD	EtoA rp cmd perr	Command parity error between I/O controller and Rope-to-PCI bridge.
OFF	CBA5	IO BD	CDF timeout	Rope Command/Data FIFO is backed up.
OFF	CBA6	IO BD	R2PCI resp tmout	Rope-to-PCI bridge timed out. Could be a failure of the PCI card, rope, or R2PCI bridge.
OFF	CBA7	IO BD	Unknown AIOC err	Unknown I/O controller error.
OFF	CBB1	IO BD	PCI timeout	A PCI card requested the bus but failed to use it.
OFF	CBB2	IO BD	PCI timeout; OV	More than once aPCI card requested the bus but failed to use it.
OFF	CBB3	IO BD	R2PCI intrnl err	Rope-to-PCI bridge internal error.
OFF	CBB4	IO BD	R2PCI int err;OV	Multiple Rope-to-PCI bridge internal errors.
OFF	CBB6	IO BD	PCI data req err	PCI bus data requestor error: R2PCI detected PERR# assertion.
OFF	CBB8	IO BD	PCI D req err;OV	Rope-to-PCI bridge detected multiple PERR# assertions.
OFF	CBBA	IO BD	PCI data par err	PCI bus data parity error.
OFF	CBBC	IO BD	PCI Dpar err;OV	Multiple PCI bus data parity errors.
OFF	CBBE	IO BD	R2PCI intrnl err	Error in R2PCI internal data to PCI bus.
OFF	CBC0	IO BD	R2PCI int err;OV	Multiple R2PCI internal data to PCI bus errors.
OFF	CBC2	IO BD	PCI data parity	PCI data parity error. I/O error log word 3 contains the error address.
OFF	CBC4	IO BD	PCI data par; OV	Multiple PCI data parity errors. I/O error log word 3 contains the error address.
OFF	CBC6	IO BD	R2PCI intrnl err	Rope-to-PCI bridge internal data error: R2PCI detected PERR# assertion.
OFF	CBC8	IO BD	R2PCI int err;OV	Multiple R2PCI internal data errors: R2PCI detected multiple PERR# assertions.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
OFF	CBCA	IO BD	PCI data rs err	PCI bus data responder error: R2PCI detected PERR# assertion.
OFF	CBCC	IO BD	PCI D rs err; OV	Multiple PCI bus data responder errors: R2PCI detected multiple PERR# assertions.
OFF	CBCE	IO BD	R2PCI T-Abort	Rope-to-PCI bridge signalled Target Abort.
OFF	CBD0	IO BD	R2PCI T-Abort;OV	Rope-to-PCI bridge signalled multiple Target Aborts.
OFF	CBD2	IO BD	PCI parity err	PCI address/command parity error.
OFF	CBD4	IO BD	PCI par err; OV	Multiple PCI address/command parity errors.
OFF	CBD6	IO BD	PCI no DEVSEL#	No PCI device selected (DEVSEL# assertion). I/O error log word 3 contains the error address.
OFF	CBD8	IO BD	PCI no DEVSEL;OV	Multiple DEVSEL# assertions. I/O error log word 3 contains the error address.
OFF	CBDA	IO BD	PCI target abort	A PCI device signalled Target Abort. I/O error log word 3 contains the error address.
OFF	CBDC	IO BD	PCI T-Abort; OV	A PCI device signalled multiple Target Aborts. I/O error log word 3 contains the error address.
OFF	CBDD	IO BD	PCI assrts LOCK#	A PCI device asserted LOCK#.
OFF	CBDE	IO BD	PCI LOCK#; OV	A PCI device asserted LOCK# multiple times.
OFF	CBE0	IO BD	PCI assrts SERR#	A PCI device asserted SERR#: address parity error or other system error.
OFF	CBE2	IO BD	PCI SERR#; OV	A PCI device asserted SERR# multiple times.
OFF	CBE3	IO BD	Unknown PCI err	Unknown PCI error detected.
OFF	CBE6	SYS BD	AtoE rope perr	Parity error between system I/O controller and Rope-to-PCI bridge.
OFF	CBE7	IO BD	R2PCI intrnl err	Rope-to-PCI bridge internal data error.
OFF	CBE8	SYS BD	AtoE rope perr	Command parity error between system I/O controller and Rope-to-PCI bridge.
OFF	CBE9	IO BD	Unknown Rope err	Unknown rope error occurred.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
FLT	CBF0	SYS BD	HPMC initiated	A High-Priority Machine Check entered the firmware HPMC handler.
FLT	CBF1	SYS BD	no OS HPMC IVA	There is no HPMC vector for the operating system. Firmware will halt the CPU, requiring a power cycle to recover.
FLT	CBF2	SYS BD	bad OS HPMC len	The size of the operating system HPMC handler is invalid. Firmware will halt the CPU, requiring a power cycle to recover.
FLT	CBF3	SYS BD	bad OS HPMC addr	The operating system HPMC handler vector is invalid. Firmware will halt the CPU, requiring a power cycle to recover.
FLT	CBF4	SYS BD	bad OS HPMC cksm	The operating system HPMC handler failed the checksum test. Firmware will halt the CPU, requiring a power cycle to recover.
FLT	CBF5	SYS BD	OS HPMC vector 0	The size of the operating system HPMC handler is zero. Firmware will halt the CPU, requiring a power cycle to recover.
WRN	CBFA	SYS BD	prev HPMC logged	Firmware detected unread PIM data from a previous HPMC and will overwrite it.
FLT	CBFB	SYS BD	brnch to OS HPMC	Branching to the operating system HPMC handler.
FLT	CBFC	SYS BD	OS HPMC br err	Branch to the operating system HPMC handler failed. Firmware will halt the CPU, requiring a power cycle to recover.
FLT	CBFD	SYS BD	unknown check	The firmware trap handler didn't detect an HPMC, LPMC, or TOC.
FLT	CBFE	SYS BD	HPMC during TOC	A High-Priority Machine Check occurred during Transfer of Control processing.
FLT	CBFF	SYS BD	multiple HPMCs	A High-Priority Machine Check occurred while processing another HPMC.
INI	CC0*n*	SYS BD	CPU*n* OS rendezvs	Slave CPU *n* entering the final rendezvous, waiting for the operating system to awaken it.
INI	CC1*n*	SYS BD	CPU*n* early rend	Slave CPU *n* entering the early rendezvous, waiting for the monarch CPU to initialize scratch RAM and other system state.

Table 3-1. Chassis Codes for J5xxx and J7xxx Workstations

Ostat	Code	FRU	Message	Description
INI	CC2*n*	SYS BD	CPU*n* rendezvous	Slave CPU *n* entering rendezvous. Slave CPUs enter this rendezvous numerous times during boot.
INI	CC3*n*	SYS BD	CPU*n* cache rend	Slave CPU *n* entering cached rendezvous, waiting for the monarch CPU to configure the system bus.
INI	CC4*n*	SYS BD	CPU*n* mem rendez	Slave CPU *n* entering memory rendezvous, waiting for the monarch CPU to select a boot device.
TST	D000	SYS BD	micro controller	Firmware is initializing communications with the system controller.
WRN	D004	SYS BD	micro not resp	Firmware detected a communications error with the system controller.
INI	D005	SYS BD	set dom1 fan spd	Firmware is initializing communications with the system controller.
INI	D006	SYS BD	set dom2 fan spd	Firmware is initializing communications with the system controller.
WRN	D007	SYS BD	bad microctl cmd	Firmware detected a communications error with the system controller.
FLT	D01*n*	SYS/IO	fan *n*: failure!	Firmware detected system fan *n* stopped.
WRN	D02*n*	SYS/IO	fan *n*: too slow!	Firmware detected system fan *n* is running too slowly.

Running System Verification Tests

HP-UX uses an online diagnostics product called the Support Tools Manager that allows system operation verification.

Three interfaces are available with the Support Tools Manager: a command line interface (accessed through the `cstm` command), a menu-driven interface (accessed through the `mstm` command), and the graphical user interface (accessed through the `xstm` command).

For more information on these user interfaces, see the online man pages by entering the following at a command line prompt:

```
man cstm [Enter]

man mstm [Enter]

man xstm [Enter]
```

For information on the enhanced online diagnostics, see the *Support Media User's Manual* (HP Part Number B3782-90176).

To access the Support Tools Manager, perform the following steps:

1. In a terminal window, type the following at the # prompt to invoke the command line interface:

   ```
   # cstm [Enter]
   ```

2. The following message appears:

   ```
   Support Tool Manager        Version A.01.00
   Type 'help' for a list of available commands.
   CSTM>
   ```

3. To verify the system operation, type the following at the `CSTM>` prompt:

   ```
   CSTM> verify all [Enter]
   ```

   Messages similar to the following appear:

   ```
   Verification has started on device (CPU).
   Verification has started on device (FPU).

   CSTM> Verification of (FPU) has completed.
   CSTM> Verification of (CPU) has completed.
   ```

4. Press `[Enter]` to return to the `CSTM>` prompt after all test results are reported.
5. To exit the Support Tools Manager, enter the following:

   ```
   CSTM> exit [Enter]
   ```

If any tests failed, run Selftest and ISL diagnostics to isolate the problem.

Running ODE-Based Diagnostics

The Offline Diagnostic Environment (ODE) consists of diagnostic modules for testing and verifying system operation. ODE provides all the necessary functions for the user to load specified tests and interact with those tests.

ODE is an ISL utility. To boot ODE:

1. Invoke the ISL environment from the system disk or a CD ROM.
2. Type `ode [Enter]` after the `ISL>` prompt to invoke ODE from the LIF directory on the system disk. The prompt changes to `ODE>`.

Not all of the test modules are available on all systems. To see what test modules are available to run on this system, type `ls` at the `ODE>` prompt. The available modules include the following:

- `astrodiag` – tests and verifies the basic functionality of the Astro memory controller/I/O chip.
- `siodiag` – tests and verifies the basic functionality of the SuperI/O multifunction I/O chip, including serial, parallel, USB, and so forth.
- `wdiag` – tests and verifies the functionality of the PA-RISC chip.
- `memtest` – tests and verifies the memory arrays. If an error is detected, the diagnostic reports the memory card and its slot number that needs replacement. It also provides a map of the memory configuration so that the user can identify the type of memory and its slot location.
- `fupdate` – updates the system's Processor Dependent Code (PDC) firmware on the FEPROM.
- `mapper` – identifies the configuration of HPPA systems. It displays path, identification, and revision information of I/O components, configuration of memory controllers, processors, co-processors, cache, and TLB, as well as processor board component revisions and values of various HPPA system identifiers, revisions, and capabilities.

For further information on the various ODE commands and a complete listing of the command set, type `help [Enter]` at the `ODE>` prompt or at the prompt of one of the test modules.

Fan Problems

A chassis code which indicates that a fan has failed (`FLT D01`*n*) or is running too slowly (`WRN D02`*n*) within a J5xxx or J7xxx workstation specifies the fan number, *n*. Table 3-2 maps these fan numbers to the physical locations of the fans within each workstation.

Table 3-2. Fan Numbers and Locations within the J5xxx and J7xxx Workstation

Fan # (*n*)	J5xxx	J7xxx
1	(Not used)	(Not used)
2	System board fan, top	System board cooling fan, top
3	System board fan, middle	System board cooling fan, middle
4	System board fan, bottom	System board cooling fan, bottom
5	Turbocooler fan, left	Turbocooler fan, top
6	Turbocooler fan, right	Turbocooler fan, second down from top
7	(Not used)	Turbocooler fan, third down from top
8	(Not used)	Turbocooler fan, bottom
9	I/O cooling fan	I/O cooling fan
A	Power supply fan, top	Power supply fan, top
B	Power supply fan, bottom	Power supply fan, bottom

In the case of a fan problem, you will need to replace:

- The fan itself, if it is either a system board cooling fan or an I/O cooling fan
- The entire system board tray assembly, if it is a turbocooler fan (that is, a fan mounted on a PA-RISC microprocessor on the system board)
- The power supply, if it is a power supply fan

See Chapter 4 for the procedures you should follow to remove and replace these components.

4 Field Replaceable Units (FRUs)

This chapter lists the Field Replaceable Units (FRUs) for the HP VISUALIZE J5xxx and J7xxx workstations. This chapter then provides procedures for removing and replacing the FRUs in the workstations.

Chapter Overview

This chapter contains the following main sections:

- Tools Required
- Exchange and Nonexchange Part Numbers
- FRU Removal and Replacement
  - — Electrostatic Discharge (ESD) Precautions
  - — Prerequisite Steps for All Removal and Replacement Procedures
  - — Exploded View Diagram
  - — Front Bezel and Outer Panels
  - — Power Switch/LCD Assembly
  - — Internal Storage Devices
  - — Memory DIMMs
  - — DC/DC Converter Units and Air Dividers (J7xxx Only)
  - — System Board Tray Assembly
  - — Battery on System Board
  - — System Board Cooling Fans
  - — I/O Cards
  - — Power Supply
  - — I/O Board
  - — SCA Hard Disk Interface
  - — I/O Cooling Fan
  - — Speaker

WARNING **For all removal and replacement procedures in this chapter, you must power off the workstation and unplug the workstation power cord from the AC power outlet.**

NOTE To maintain FCC/EMI compliance, verify that all covers are replaced and that all screws are properly seated.

Tools Required

Use the following tools to remove or replace FRUs:

- Light-duty flat blade screwdriver with 6-inch (150 mm) blade
- #1 Posi-Drive screwdriver
- T-10, T-15, and T-20 Torx drivers
- Needle-nosed pliers
- ESD equipment (see the “Electrostatic Discharge (ESD) Precautions” section later in this chapter for detailed information)

Exchange and Nonexchange Part Numbers

In this chapter we refer to *exchange* and *nonexchange* part numbers. You must return FRUs with exchange part numbers in exchange for replacement FRUs. Do *not* return FRUs with nonexchange part numbers – you may discard them.

The following Tables 4-1 and 4-2 list the exchange part numbers for the J5xxx and the J7xxx workstation, respectively.

Table 4-1. J5xxx Exchange Part Numbers

Part Number	Description
A4978-69010	PCA J5000 system board tray assembly
A5991-69010	PCA J5600 system board tray assembly
A4978-69001	Power supply 830 W
A4978-69020	PCA - I/O board
A3862-69001	256 MB SDRAM DIMM
A3863-69001	512 MB SDRAM DIMM
A1658-69027	LVD hard disk drive 9 GB 10K RPM
A1658-69026	LVD hard disk drive 18 GB 10K RPM
C1537-69202	SCSI DDS-3 tape drive 12 GB

Table 4-2. J7xxx Exchange Part Numbers

Part Number	Description
A4978-69015	PCA J7xxx system board tray assembly
A4981-69001	Power supply 1,350 W
A4978-69020	PCA - I/O board
A3862-69001	256 MB SDRAM DIMM
A3863-69001	512 MB SDRAM DIMM
A1658-69027	LVD hard disk drive 9 GB 10K RPM
A1658-69026	LVD hard disk drive 18 GB 10K RPM
C1537-69202	SCSI DDS-3 tape drive 12 GB

The following Tables 4-3 and 4-4 list the nonexchange part numbers for the J5xxx and the J7xxx workstation, respectively.

Table 4-3. J5xxx Nonexchange Part Numbers

Part Number	Description
A4978-86007	Assembly - chassis (NOTE: Order this for all sheet metal parts, unless otherwise listed)
A4978-62004	Assembly - front bezel
A4978-84005	Nameplate
A4978-00039	Thumbscrew - top panel
A4978-62025	Assembly - LCD/power switch and bracket
A4978-62005	Assembly - SCA hard disk drive bracket
A4978-89006	PCA - SCA hard disk interface (backplane board)
A4978-62006	Assembly - CD ROM drive bracket
D4385-60001	ATAPI CD ROM drive
A4978-62006	Assembly - floppy drive bracket
D2035-60282	Floppy disk drive
A1658-63012	Terminator - NSE SCSI-2
A4986-63008	Terminator - LVD SCSI
A1658-86004	Real-time clock module
A4978-62012	I/O cooling fan - 92 mm
A4978-86014	System board cooling fan - 120 mm

Table 4-3. J5xxx Nonexchange Part Numbers

Part Number	Description
0361-1315	Rivet - fan mounting
5063-4513	Speaker
A4978-40011	Bracket - fan/speaker mounting
A4978-62003	Assembly - expansion board retainer
A4986-40007	PCI retainer clip
A4978-40013	Bus bar voltage safety shield
A4978-00042	Thumbscrew - power supply bus bar
A4978-63009	Cable - LCD/power switch
A4978-63005	Cable - hard disk drives power
A4978-63004	Cable - DDS-3 tape/floppy disk/CD ROM drive
5182-1857	Cable - CD ROM audio
A4978-89005	Flex cable
A4978-00073	Flex cable retainer
A4983-60101	USB mouse, scroll wheel
A4983-60111	USB mouse, 3 buttons
A4983-60401	USB keyboard, U.S. English
A4983-60403	USB keyboard, German, Euro
A4983-60404	USB keyboard, Spanish, Euro
A4983-60405	USB keyboard, French, Euro
A4983-60406	USB keyboard, Kanji, JIS-109
A4983-60409	USB keyboard, Norwegian, Euro
A4983-60411	USB keyboard, Swiss-German, Euro
A4983-60412	USB keyboard, Swedish, Euro
A4983-60413	USB keyboard, U.K. English, Euro
A4983-60414	USB keyboard, Belgian/Flemish, Euro
A4983-60416	USB keyboard, Danish, Euro
A4983-60421	USB keyboard, Korean
A4983-60423	USB keyboard, Chinese/Trad
0624-0727	6 - 32 × 1.437 T-15 Torx screws

Table 4-4. J7xxx Non-Exchange Part Numbers

Part Number	Description
A4978-86007	Assembly - chassis (NOTE: Order this for all sheet metal parts, unless otherwise listed)
A4978-62004	Assembly - front bezel
A4978-84011	Nameplate
A4978-00039	Thumbscrew - top panel
A4978-62025	Assembly - LCD/power switch and bracket
A4978-62005	Assembly - SCA hard disk drive bracket
A4978-89006	PCA - SCA hard disk interface (backplane board)
A4978-62006	Assembly - CD ROM drive bracket
D4385-60001	ATAPI CD ROM drive
A4978-62006	Assembly - floppy drive bracket
D2035-60282	Floppy disk drive
A1658-63012	Terminator - NSE SCSI-2
A4986-63008	Terminator - LVD SCSI
A4981-86002	DC/DC converter unit
A4978-00067	DC/DC converter unit tie-down strap
A4981-62030	Front air divider
A4978-00076	Rear air divider
A1658-86004	Real-time clock module
A4978-62012	I/O cooling fan - 92 mm
A4978-86014	System board cooling fan - 120 mm
0361-1315	Rivet - fan mounting
5063-4513	Speaker
A4978-40011	Bracket - fan/speaker mounting
A4978-62003	Assembly - expansion board retainer
A4986-40007	PCI retainer clip
A4978-40013	Bus bar voltage safety shield
A4978-00042	Thumbscrew - power supply bus bar
A4978-63009	Cable - LCD/power switch

Table 4-4. J7xxx Non-Exchange Part Numbers

Part Number	Description
A4978-63005	Cable - hard disk drives power
A4978-63004	Cable - DDS-3 tape/floppy disk/CD ROM drive
5182-1857	Cable - CD ROM audio
A4978-89005	Flex cable
A4978-00073	Flex cable retainer
A4983-60101	USB mouse, scroll wheel
A4983-60111	USB mouse, 3 buttons
A4983-60401	USB keyboard, U.S. English
A4983-60403	USB keyboard, German, Euro
A4983-60404	USB keyboard, Spanish, Euro
A4983-60405	USB keyboard, French, Euro
A4983-60406	USB keyboard, Kanji, JIS-109
A4983-60409	USB keyboard, Norwegian, Euro
A4983-60411	USB keyboard, Swiss-German, Euro
A4983-60412	USB keyboard, Swedish, Euro
A4983-60413	USB keyboard, U.K. English, Euro
A4983-60414	USB keyboard, Belgian/Flemish, Euro
A4983-60416	USB keyboard, Danish, Euro
A4983-60421	USB keyboard, Korean
A4983-60423	USB keyboard, Chinese/Trad
0624-0727	6 - 32 × 1.437 T-15 Torx screws

FRU Removal and Replacement

The procedures in this section describe how to remove and replace J5xxx and J7xxx workstation FRUs. Observe the electrostatic discharge (ESD) precautions and the prerequisites for removing and replacing FRUs in the next two subsections, as well as any NOTEs, CAUTIONs, and WARNINGs in each FRU removal and replacement procedure.

NOTE If you need to install a new FRU, simply follow the procedures for *replacing* the FRU in this chapter. (That is, replacement procedures are the same as those for installing new FRUs.)

Electrostatic Discharge (ESD) Precautions

To prevent damage to the J5xxx/J7xxx workstation, observe all of the following ESD precautions while performing FRU removal and replacement procedures:

1. Remove all ESD-generating materials from the work area in which you will remove and replace a workstation's FRU(s).
2. Stand on an ESD (static-free) mat.
3. Wear a grounding wrist strap to ensure that any accumulated electrostatic charge discharges from your body to ground.
4. Connect all equipment together, including the ESD mat, grounding wrist strap, workstation, and peripherals.
5. Keep uninstalled printed circuit boards in their protective antistatic bags.
6. Once you have removed printed circuit boards from their protective antistatic bags, handle the printed circuit boards by their edges only.

Prerequisite Steps for All Removal and Replacement Procedures

You must complete the following steps before performing any of the FRU removal and replacement procedures in this chapter:

1. Power off the workstation (either by executing `shutdown -h` as `root`, or by simply pressing the power switch on the front panel of the workstation, which accomplishes the same thing), as well as the monitor and any attached peripheral devices.

CAUTION Do *not* use the power supply interlock thumbscrew on the rear panel to power down the workstation. This power down method may hang the operating system in an unrecoverable state.

2. Unplug the workstation power cord and all peripheral devices from AC power outlets.
3. Attach the static-grounding wrist strap by following the instructions on the package. Attach the sticky end of the wrist strap to bare metal on the rear panel of the workstation.

NOTE To make access to the internal FRUs easier, you may want to place the workstation on a table or workbench instead of leaving it on the floor.

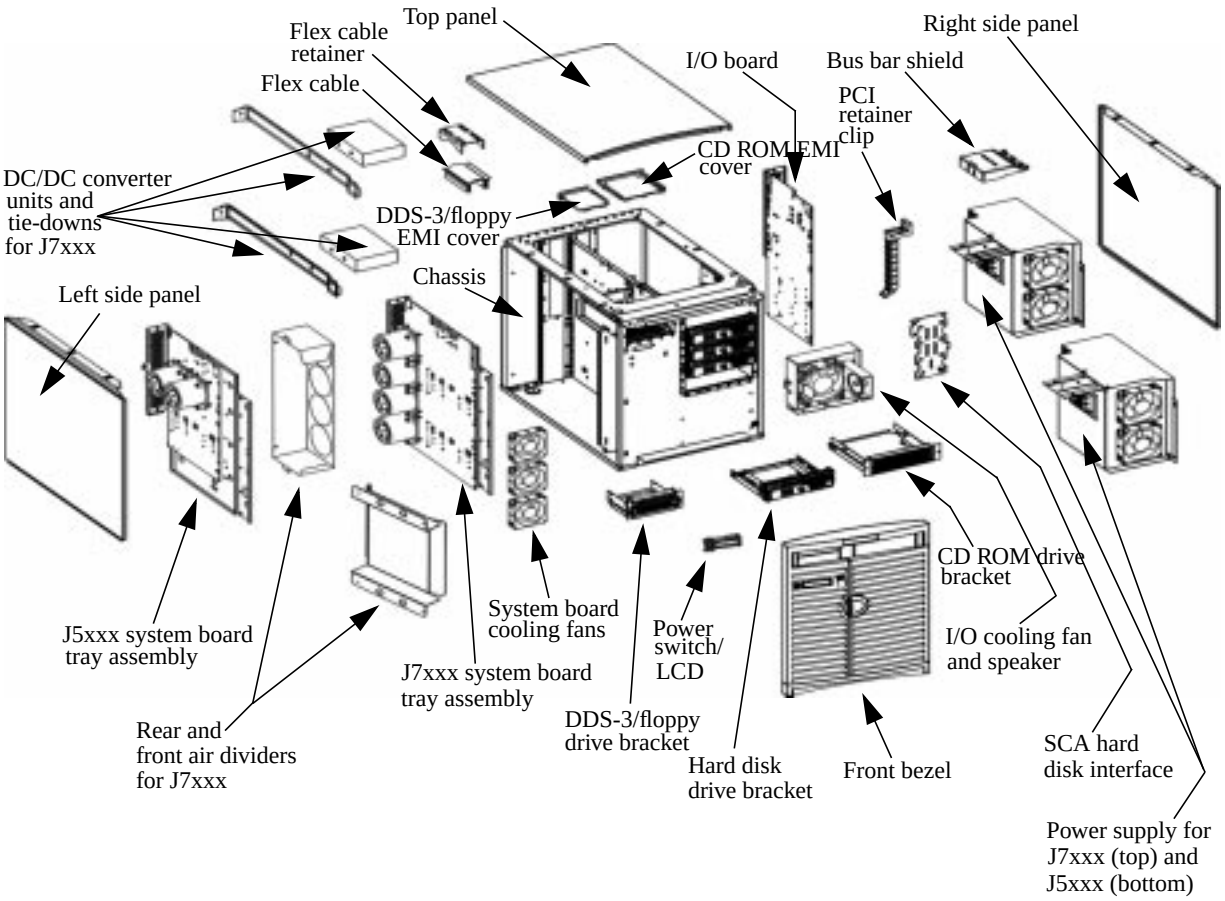
CAUTION The lifting ledge at the bottom, front of the workstation is strong enough to use as a handhold when lifting the workstation. However, note that this workstation is designated for two-person lifting; it weighs approximately 74 to 96 pounds (34 to 44 Kg), depending on the configuration. Do not attempt to lift it by yourself, or injury may result.

Exploded View Diagram

Figure 4-1 shows an exploded view of the internal components (FRUs) in the J5xxx and J7xxx workstations. Note that this figure calls-out those components which are different for the J5xxx versus the J7xxx.

Refer to this figure to identify the various workstation FRUs while performing the FRU removal and replacement procedures in this chapter.

Figure 4-1. Exploded View of the J5xxx and J7xxx Workstation



Front Bezel and Outer Panels

This section describes how to remove and replace the J5xxx and J7xxx workstation's front bezel, as well as the top and the two side outer panels.

Note that you can perform certain operations, like removing and replacing hard disk drives, simply by opening the door on the front bezel of the workstation; the disk drives are accessible through the open door. Other operations require more access to the interior of the workstation, so you will need to remove the front bezel or outer panels to perform those procedures.

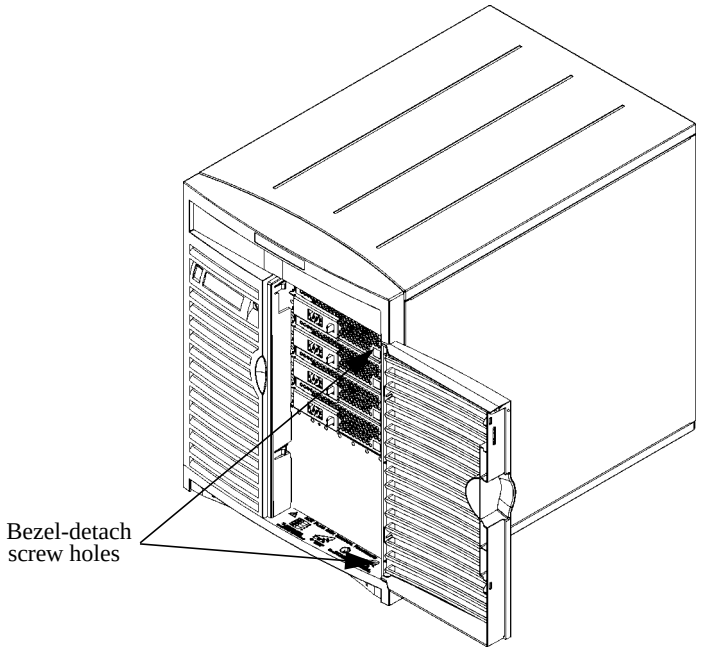
CAUTION Do not attempt to operate the workstation with the front bezel, top panel, or side panels removed. In addition to maintaining FCC/EMI compliance, the front bezel, top panel, and side panels are needed to ensure proper air flow and, hence, sufficient system cooling.

Removing the Front Bezel

To remove the front bezel, do the following:

1. Open the right-hand door of the front bezel. If the door does not easily release, you may need the bezel lock's key to unlock the door.

Figure 4-2. Front Bezel with Door Opened



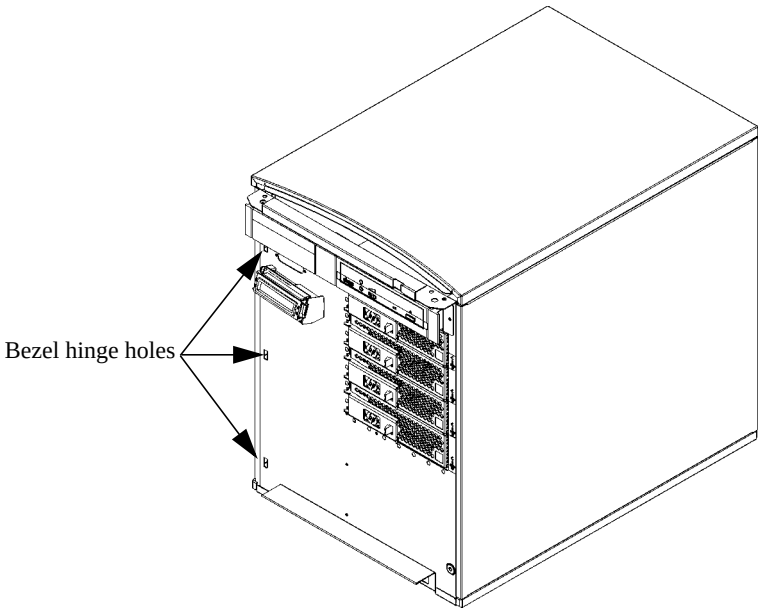
2. Remove the two T-15 Torx bezel-detach screws on the top and bottom, right inside corners of the front bezel.
3. Grasp and pull out on the outer right edge of the front bezel, rotating the front bezel clockwise and pulling it away from the front panel.

Replacing the Front Bezel

To replace the front bezel, do the following:

1. Align the three metal bezel hooks into the three bezel hinge holes along the left edge of the workstation's front panel.

Figure 4-3. Locations of the Bezel Hinge Holes



2. Press inward while rotating the front bezel counterclockwise.
3. Press firmly on the upper-right corner of the front bezel until it snaps into place.
4. Open the right-hand door of the front bezel and install the two T-15 Torx bezel-detach screws on the top and bottom, right inside corners of the front bezel.

Removing the Top Panel

To remove the top panel, do the following:

1. Remove the two thumbscrews in the top left and right corners of the workstation's rear panel.

NOTE The upper-left thumbscrew has a power supply interlock. Removing this thumbscrew disengages all power outputs of the power supply, reducing the shock hazard while removing and replacing internal FRUs. However, be aware that cutting off power to the workstation via this power supply interlock does not do a clean shutdown of the workstation. Instead, press the power switch on the front panel to shutdown the workstation properly.

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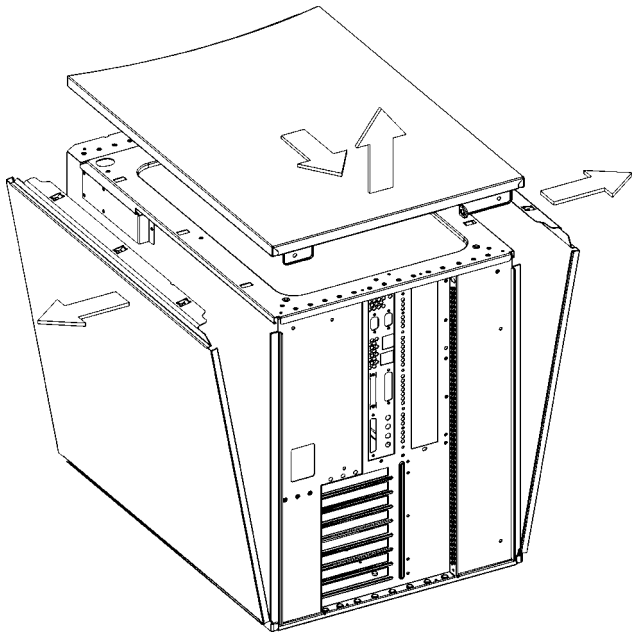
2. Firmly grip the top panel and slide it an inch or two away from the front edge, toward the rear of the workstation.
3. Remove the top panel by lifting straight up.

Figure 4-4. Removing the Top and Side Panels



To replace the top panel, see "Replacing the Top and Side Panels" on the next page.

Removing the Side Panels

To remove one or both of the side panels, do the following:

1. Remove the top panel, as explained in the previous procedure.
2. Remove each side panel by tipping it out and away from the workstation, as shown in Figure 4-4 on the previous page.

To replace the side panels, see "Replacing the Top and Side Panels" below.

Replacing the Top and Side Panels

To replace the top and side panels, do the following:

1. Place each side panel into the groove in the bottom edge of the workstation's side, and then press the top of the each side panel into the top edge of the workstation's side.
2. Place the top panel on the top of the workstation, with about an inch of its back edge protruding over the workstation's rear panel. Then push the top panel straight forward, so its front edge slides underneath the lip of the front panel's top edge. The top panel fits snugly, so you may have to get a firm grip on it in order to slide it into place.
3. Screw the two thumbscrews into the tabs in the upper corners of the rear panel. Note that the upper-left thumbscrew is the power supply interlock screw; so be sure that it is firmly retightened, or the power supply may not engage.

Power Switch/LCD Assembly

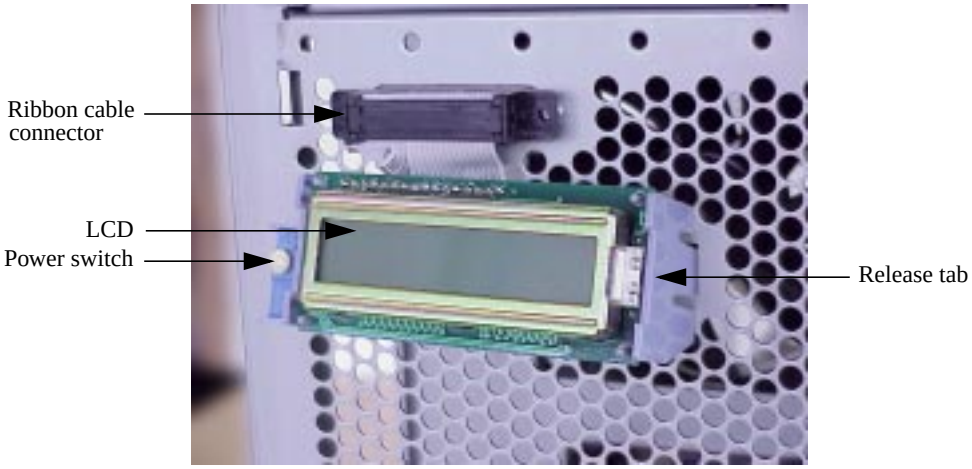
This section describes how to remove and replace the J5xxx and J7xxx workstation's power switch/LCD assembly, which is located on the front panel.

Removing the Power Switch/LCD Assembly

To remove the power switch/LCD assembly, do the following:

1. Remove the front bezel of the workstation.
2. Unplug the ribbon cable from the 25-pin connector.

Figure 4-5. Power Switch/LCD Assembly



3. The power switch/LCD assembly has two chassis hooks on the left side and a release tab on the right side. Squeeze the release tab and rotate the bracket outward to lift the hooks out of the chassis slots.

Replacing the Power Switch/LCD Assembly

To replace the power switch/LCD assembly, do the following:

1. Engage the chassis hooks on the left side of the power switch/LCD assembly into the chassis slots.
2. Squeeze the right side tab while rotating the assembly into the chassis position. When the assembly is flush with the chassis, release the tab. The power switch/LCD assembly will snap into place.
3. Plug the ribbon cable into the 25-pin connector.
4. Replace the front bezel of the workstation.

Internal Storage Devices

This section describes how to remove and replace the J5xxx and J7xxx workstation's internal storage devices, including:

- Hard disk drives
- Optional CD ROM drive
- Optional DDS-3 tape drive
- Optional floppy disk drive

Hard Disk Drives

This subsection describes how to remove and replace hard disk drives.

NOTE You do *not* need to remove the workstation's front bezel, top or side panels to access the hard disk drive bays. The bays are fully accessible when the right door of the front panel's bezel is open.

NOTE The ability to hot plug the hard disk drive(s) requires MirrorDisk/UX (Product Number B5403BA on HP-UX 10.20, or B2491BA on HP-UX 11.0 ACE 9911). If MirrorDisk/UX is installed on the workstation, you do *not* need to power down the workstation nor unplug the workstation's power cord while removing or replacing hard disk drives. Also see the "Hot Plug Disk Removal Procedure" label on the bottom lip of the front panel for basic instructions.

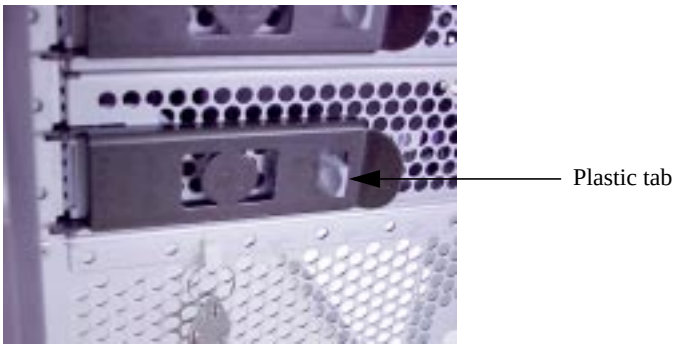
Removing a Hard Disk Drive:

1. Open the right door of the bezel on the workstation's front panel.

CAUTION If you are hot-plugging a hard disk drive, the drive to be removed must be inactive.

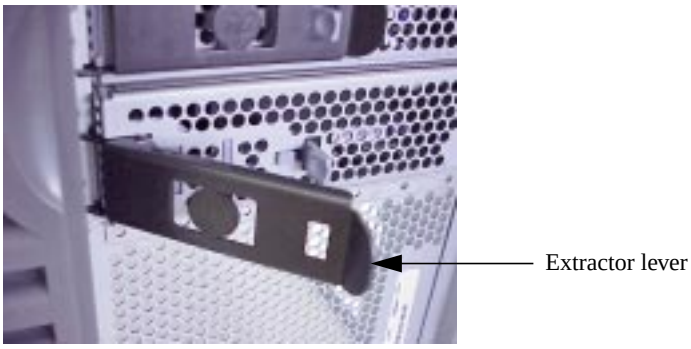
2. Push the plastic tab on the front of the hard disk to the right, which unlatches the metal extractor lever.

Figure 4-6. Plastic Tab with Extractor Lever Closed



3. Pull the metal extractor lever outward to disconnect the hard disk from the SCA hard disk interface (backplane board) on the back of the hard disk drive bay.

Figure 4-7. Extractor Lever Opened



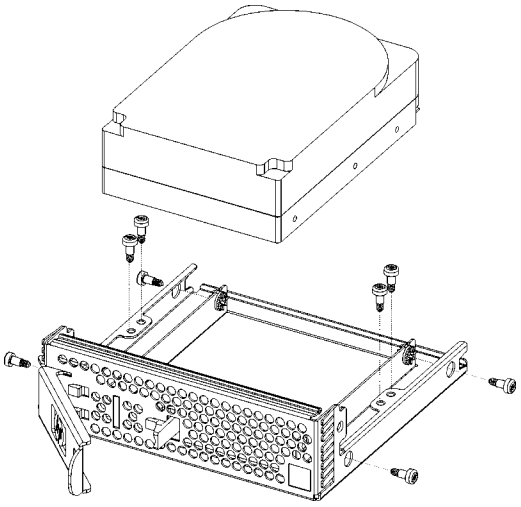
4. If you are hot-plugging the hard disk drive, wait 30 seconds for the drive to spin down.
5. Carefully slide the hard disk drive out of the chassis guide rails while grasping the body with the other hand.

CAUTION Dropping the hard disk drive can cause severe damage to the drive hardware.

---

6. To remove the hard disk drive from the bracket, unscrew the four T-15 Torx screws from the sides of the bracket as shown in Figure 4-8. (You can then store the screws on top of the bracket rails as shown in Figure 4-8, if you wish.)

Figure 4-8. Removing the Hard Disk Drive from the Bracket



Replacing a Hard Disk Drive:

NOTE If you are installing a new hard disk drive, the T-15 Torx screws for attaching the drive in the bracket are stored on the bracket rails. Also see “Hard Disk Drive Configuration” on page 36 for information about configuring a hard disk drive for installation.

1. Open the right door of the bezel on the workstation’s front panel.
2. Perform the previous removal procedure in reverse order.

NOTE To verify a good connection with the SCA hard disk interface (backplane board) connector, press firmly on the outside corners of the bracket.

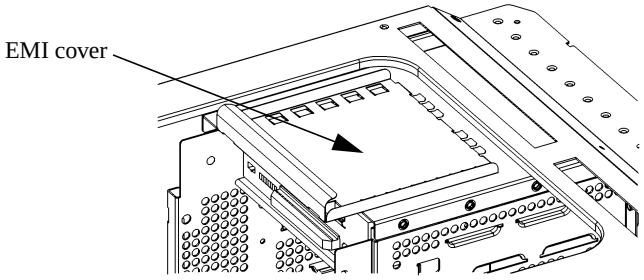
CD ROM Drive (Optional)

This subsection describes how to remove and replace the optional CD ROM drive.

Removing a CD ROM Drive:

1. Remove the front panel bezel and the top panel from the workstation.
2. In the top, right front of the workstation above the CD ROM drive bay, remove the EMI (electromagnetic interference) cover that is held in place by tabs. The EMI cover is shown in Figure 4-9.

Figure 4-9. EMI Cover for the CD ROM Drive



3. Remove the two T-15 Torx screws securing the CD ROM drive bracket assembly to the front panel of the workstation chassis and slide the bracket out half-way.
4. From the top of the workstation, reach behind the CD ROM drive and disconnect the audio cable, power cable, and ATAPI interface ribbon cable from the rear of the CD ROM drive.
5. Slide the CD ROM drive bracket assembly out of the chassis guide rails.
6. To remove the CD ROM drive from the bracket, remove the four T-10 Torx screws (two on each side) securing the CD ROM drive to the bracket.

Replacing a CD ROM Drive:

NOTE See “CD ROM Drive (Optional) Configuration” on page 37 for information about configuring a CD ROM drive for installation.

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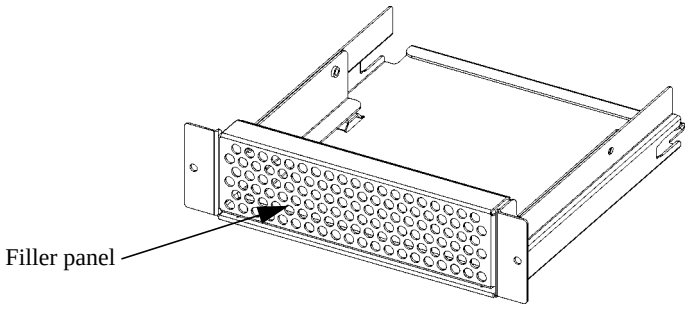
1. Remove the front panel bezel and the top panel from the workstation.
2. In the top, right front of the workstation above the CD ROM drive bay, remove the EMI (electromagnetic interference) cover that is held in place by tabs. The EMI cover is shown in Figure 4-9 above.
3. If you are installing a new CD ROM drive into the empty CD ROM drive bay:
   a. Remove the two T-15 Torx screws securing the CD ROM drive bracket to the front panel of the workstation.
   b. Slide the CD ROM drive bracket out of the chassis guide rails.
   c. Remove the filler panel from the CD ROM drive bracket as shown in Figure 4-10 on

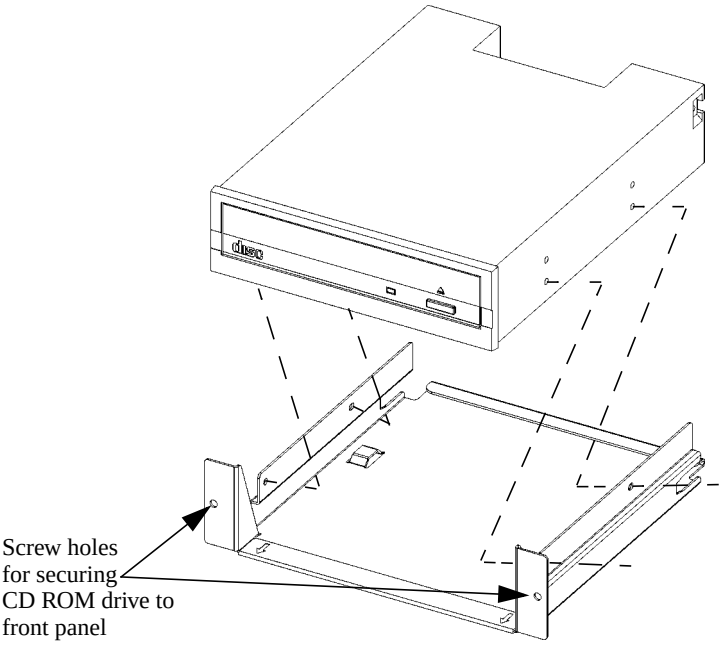
the next page.

Figure 4-10. Filler Panel in the CD ROM Drive Bracket



4. Insert the CD ROM drive into the bracket as shown in Figure 4-11. Secure the CD ROM drive in the bracket using four T-10 Torx screws (two on each side) driven into the holes indicated by the dashed lines in Figure 4-11.

Figure 4-11. Inserting the CD ROM Drive into the Bracket



5. Slide the CD ROM drive bracket assembly halfway into the CD ROM drive bay.
6. From the top of the workstation, reach behind the CD ROM drive and connect the audio cable, power cable, and ATAPI interface ribbon cable to the rear of the CD ROM drive. Carefully fold in the cables to avoid damage during the next step.
7. From the front of the workstation, push the CD ROM drive bracket assembly to seat flush against the front panel, taking care not to pinch the cables.
8. Insert and tighten the two T-15 Torx screws to secure the CD ROM drive to the front panel of the workstation as shown in Figure 4-11 above.

9. Replace the EMI cover, the top panel, and front panel bezel.
10. After rebooting, use SAM to confirm that the CD ROM drive is recognized by the system.

DDS-3 Tape Drive (Optional)

This subsection describes how to remove and replace the optional DDS-3 tape drive.

NOTE The bracket assembly and drive bay may be used for either one DDS-3 tape drive, or one floppy disk drive.

Removing a DDS-3 Tape Drive:

1. Remove the front panel bezel from the workstation.
2. Remove the two T-15 Torx screws securing the DDS-3 tape drive to the front panel of the workstation chassis.

Figure 4-12. Front Panel Screws

3. Slide the DDS-3 tape/floppy disk drive bracket assembly out of the chassis guide rails. Disconnect the the power and ribbon cables from the DDS-3 tape drive.
4. To remove the DDS-3 tape drive from the bracket, remove the four T-10 Torx screws (two on each side) securing the DDS-3 tape drive to the bracket.

Replacing a DDS-3 Tape Drive:

NOTE See “DDS-3 Tape Drive (Optional) Configuration” on page 38 for information about configuring a DDS-3 tape drive for installation.

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1. Remove the front panel bezel and the top panel from the workstation.
2. In the top, left front of the workstation above the DDS-3/floppy disk drive bay, remove the EMI (electromagnetic interference) cover.

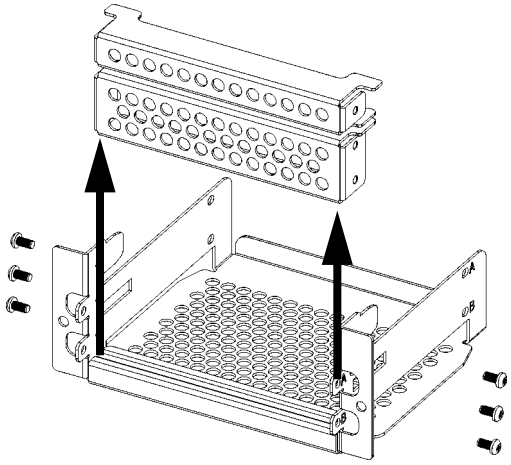
3. If you are installing a new DDS-3 tape drive into the empty DDS-3 tape/floppy disk drive bay:

   a. Remove the two T-15 Torx screws securing the DDS-3 tape/floppy disk drive bracket to the front panel of the workstation.

   b. Slide the DDS-3 tape/floppy disk drive bracket out of the chassis guide rails.

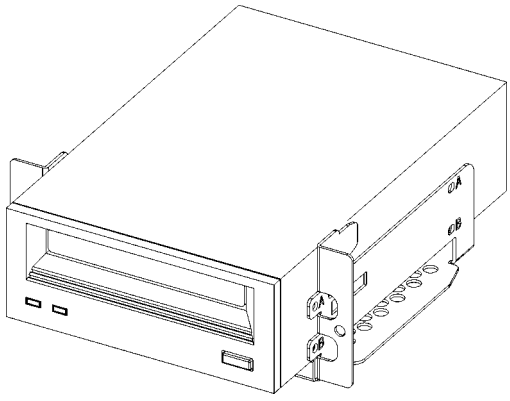
   c. Remove the filler panels from the DDS-3 tape/floppy disk drive bracket as shown in Figure 4-13.

Figure 4-13. Removing the Filler Panels from the Bracket



4. Insert the DDS-3 tape drive into the bracket and secure the drive in the bracket using four of the six T-10 Torx screws (two on each side).

Figure 4-14. DDS-3 Tape Drive Installed in the Bracket



5. Connect the power and ribbon cables in the drive bay to the rear of the DDS-3 tape drive.

6. Push the DDS-3 tape/floppy disk drive bracket assembly into the drive bay, taking care not to pinch the cables. Seat the bracket assembly flush against the front panel.

7. Insert and tighten the two T-15 Torx screws to secure the DDS-3 tape drive to the front panel of the workstation, as shown in Figure 4-12 on page 101.
8. Replace the DDS-3/floppy disk drive EMI cover and top panel.
9. Replace the front panel bezel.
10. After rebooting, use SAM to confirm that the DDS-3 tape drive is recognized by the system.

Floppy Disk Drive (Optional)

This subsection describes how to remove and replace the optional floppy disk drive.

NOTE The bracket assembly and drive bay may be used for either one DDS-3 tape drive, or one floppy disk drive.

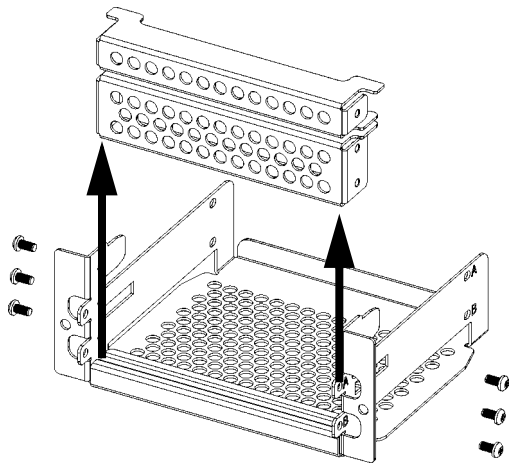
Removing a Floppy Disk Drive:

1. Remove the front panel bezel from the workstation.
2. Remove the two T-15 Torx screws securing the floppy disk drive to the front panel of the workstation chassis.
3. Slide the DDS-3 tape/floppy disk drive bracket assembly out of the chassis guide rails. Disconnect the the power and ribbon cables from the floppy disk drive.
4. To remove the floppy disk drive from the bracket, remove the four T-10 Torx screws (two on each side) securing the floppy disk drive to the bracket.

Replacing a Floppy Disk Drive:

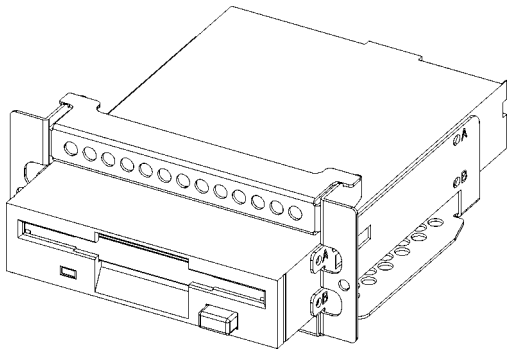
1. Remove the front panel bezel and the top panel from the workstation.
2. In the top, left front of the workstation above the DDS-3/floppy disk drive bay, remove the EMI (electromagnetic interference) cover.
3. If you are installing a new floppy disk drive into the empty DDS-3 tape/floppy disk drive bay:
   a. Remove the two T-15 Torx screws securing the DDS-3 tape/floppy disk drive bracket to the front panel of the workstation.
   b. Slide the DDS-3 tape/floppy disk drive bracket out of the chassis guide rails.
   c. Remove the filler panels from the DDS-3 tape/floppy disk drive bracket as shown in Figure 4-15.

Figure 4-15. Removing the Filler Panels from the Bracket



4. Insert the floppy disk drive into the bracket and secure the drive in the bracket using four of the six T-10 Torx screws (two on each side).
5. Install the smaller of the two filler panels on top of the floppy disk drive as shown in Figure 4-16. Secure the filler panel with the two remaining T-10 Torx screws.

Figure 4-16. Floppy Disk Drive and Filler Panel Installed in the Bracket



6. Connect the power and ribbon cables in the drive bay to the rear of the floppy disk drive.
7. Push the DDS-3 tape/floppy disk drive bracket assembly into the drive bay, taking care not to pinch the cables. Seat the bracket assembly flush against the front panel.
8. Insert and tighten the two T-15 Torx screws to secure the floppy disk drive to the front panel of the workstation.
9. Replace the DDS-3/floppy disk drive EMI cover and top panel.
10. Replace the front panel bezel.
11. After rebooting, use SAM to confirm that the floppy disk drive is recognized by the system.

Memory DIMMs

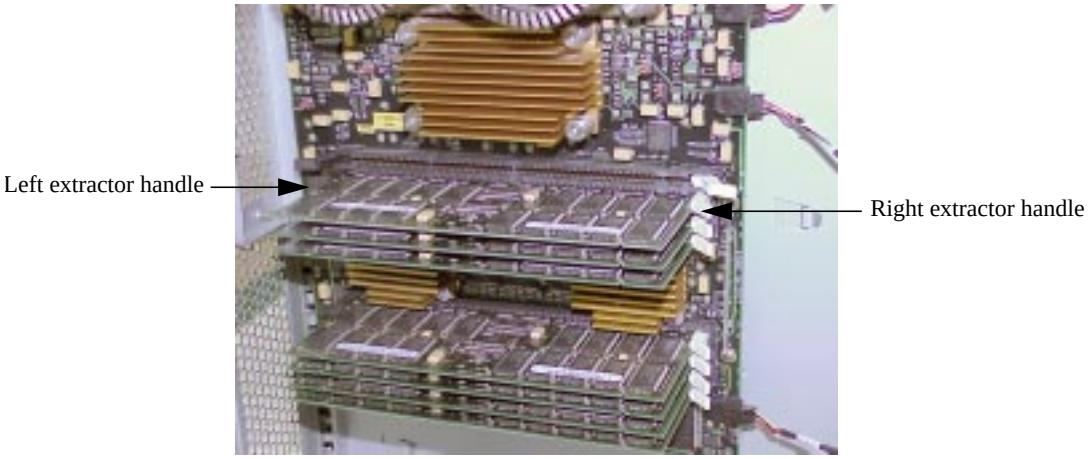
The J5xxx workstation has eight slots for memory DIMMs, while the J7xxx has sixteen slots. As you face the workstation, the memory DIMM slots are located on the system board on the left side of the workstation.

Removing a Memory DIMM

To remove a DIMM, do the following:

1. Remove the top panel and the left side panel of the workstation.
2. If this is a J7xxx workstation, remove the four T-15 Torx screws from the front air divider on the left side of the workstation, and then remove the front air divider.
3. Locate the DIMM slots on the system board on the left side of the workstation.
4. Press down on the left and right DIMM extractor handles to release the DIMM from the slot. Figure 4-17 shows the left and right extractor handles for one DIMM installed in a J5xxx workstation.

Figure 4-17. DIMM Extractor Handles



5. Carefully pull out the DIMM and place it in an antistatic bag for storage.

Replacing a Memory DIMM

To replace a DIMM, do the following:

1. If you will install additional DIMMs in the workstation, use the Boot Console Handler procedure in “Displaying the Current Monitor Configuration” on page 162 in Chapter 5 to determine the current memory configuration of the workstation.
2. Remove the top panel and the left side panel of the workstation.
3. If this is a J7xxx workstation, remove the four screws from the front air divider on the left side of the workstation, and then remove the front air divider.
4. Locate the DIMM slots on the system board on the left side of the workstation.

5. Familiarize yourself with the order in which DIMMs must be inserted. This information is on the "Memory Installation Sequence" label on the floor of the workstation's left side. For more details, see the configuration section titled "Memory" on page 39 in Chapter 2.

NOTE The J7xxx workstation requires that DIMMs are installed in *pairs of equal memory size*. In contrast, individual DIMMs of different memory sizes (namely, 256 and 512 MB) may be installed in the J5xxx workstation.

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6. Angle the left and right DIMM extractor handles on the empty DIMM slot outward.
7. Position the DIMM correctly to allow insertion into the DIMM slot.
8. Press firmly and evenly on the DIMM until it is fully seated in the slot. The extractor handles will close inward as the DIMM is inserted.
9. If this is a J7xxx workstation, replace the front air divider and the four T-15 Torx screws securing the front air divider.
10. Replace the workstation's top and left side panels.
11. To verify that the DIMM installation was successful, use the Boot Console Handler procedure in "Displaying the Current Monitor Configuration" on page 162 in Chapter 5.
12. If you replaced a faulty DIMM, use the `pdt clear` command in the Service Menu of the Boot Console Handler. Answer `y` (yes) to the prompt `Continue? (Y/N) >`.

DC/DC Converter Units and Air Dividers (J7xxx Only)

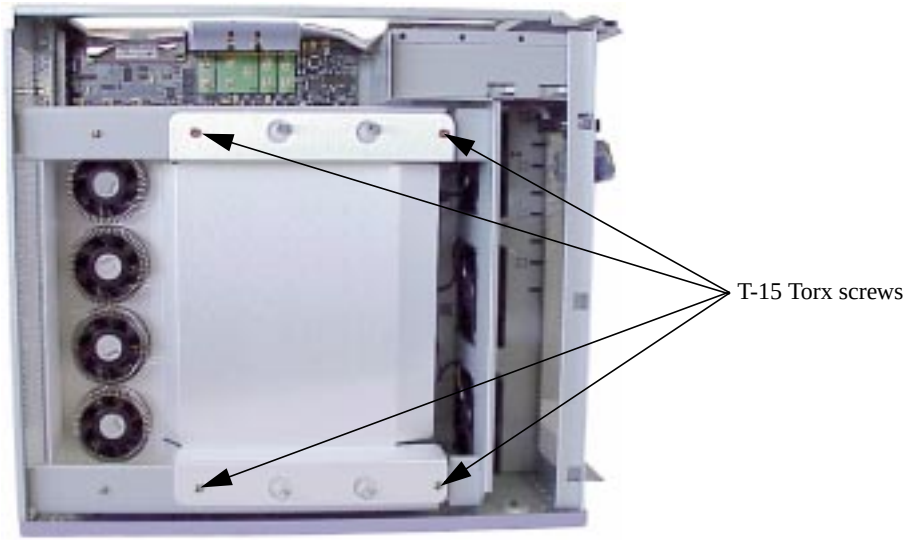
The J7xxx workstation has two DC/DC converter units and two air dividers on its left side. (The J5xxx does not require any DC/DC converter units nor the air dividers.) The DC/DC converter units and air dividers are attached to the J7xxx by metal tie-down straps. Each DC/DC converter unit connects to the system board by a 30-pin connector.

Removing the DC/DC Converter Units and Air Dividers

To remove the DC/DC converter units and air dividers, do the following:

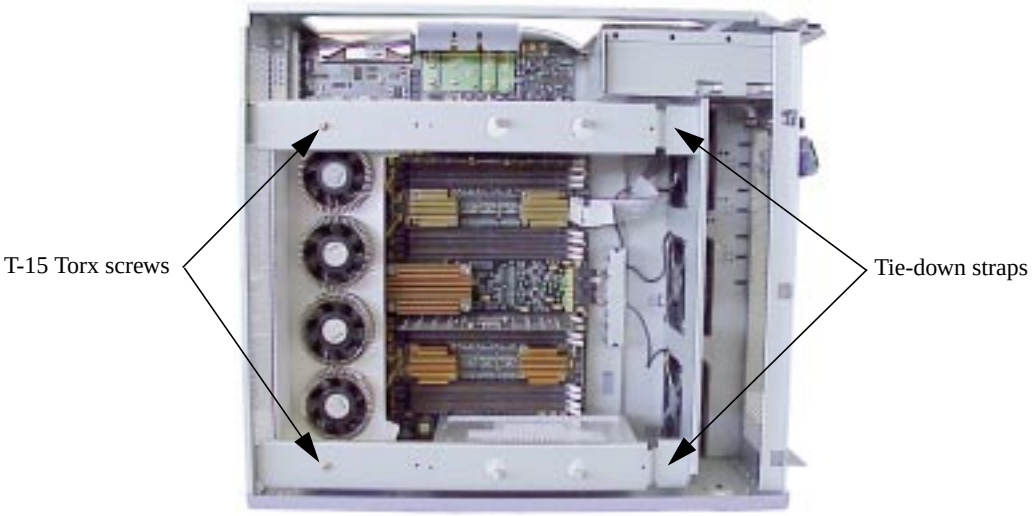
1. Remove the J7xxx workstation's top panel and left side panel.
2. On the left side of the workstation, remove the four T-15 Torx screws from the front air divider as shown in Figure 4-18, and then remove the front air divider.

Figure 4-18. Screws on the Front Air Divider



3. There are two tie-down straps over the DC/DC converter units and the rear air divider, as shown in Figure 4-19 on the next page. The front edge of each metal tie-down slips into a slot on the system board fan wall, and the rear edge is secured by a T-15 Torx screw on the rear panel of the workstation. Each metal tie-down is also secured to the rear air divider by a T-15 Torx screw.

Figure 4-19. Tie-down Straps and Screws



To remove the tie-downs:

a. Remove the T-15 Torx screws securing the tie-downs to the rear air divider.

b. Remove the T-15 Torx screws from the rear panel of the workstation.

c. Rotate each tie-down out counterclockwise. The tab edge will unhinge from the fan wall.

4. Remove the rear air divider.
5. Remove the two captive screws on the DC/DC converter unit.
6. Grasp the DC/DC converter unit by the edges and pull it straight out from the system board.

Replacing the DC/DC Converter Units and Air Dividers

To replace the DC/DC converter units and air dividers, do the following:

1. Remove the J7xxx workstation's top panel and left side panel.
2. Perform the previous removal procedure in reverse order.

NOTE The two DC/DC converter units are interchangeable. The air flow holes on each unit should face inward to the center of the J7xxx's system board.

System Board Tray Assembly

The system board in the J5xxx and J7xxx workstation is mounted on a tray. The following procedures describe how to remove and replace the system board tray assembly as a complete unit.

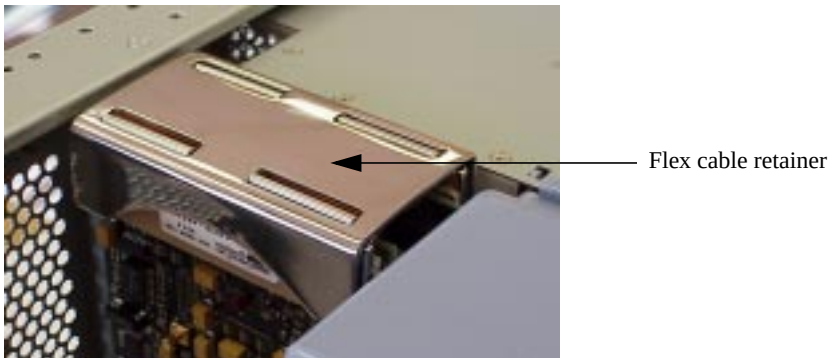
NOTE If the LCD displays an error message that relates to a turbocooler fan on a microprocessor mounted on the system board, you will need to replace the entire system board tray assembly. Follow the removal and replacement procedures in this section to do so.

Removing the System Board Tray Assembly

To remove the system board tray assembly, do the following:

1. Remove the top panel and left side panel from the workstation.
2. Remove the one side of the flex cable that is connected to the system board. (You do *not* need to remove the flex cable entirely. That is, you do *not* need to also remove the other side of the flex cable that is connected to the I/O board for this procedure.) To do this:
   a. Remove the flex cable retainer covering the flex cable. (The flex cable retainer and the flex cable are located at the top of the workstation, near the rear. The flex cable straddles the center wall of the chassis, connecting the system board to the I/O board.) Figure 4-20 shows the flex cable retainer in place.

Figure 4-20. The Flex Cable Retainer



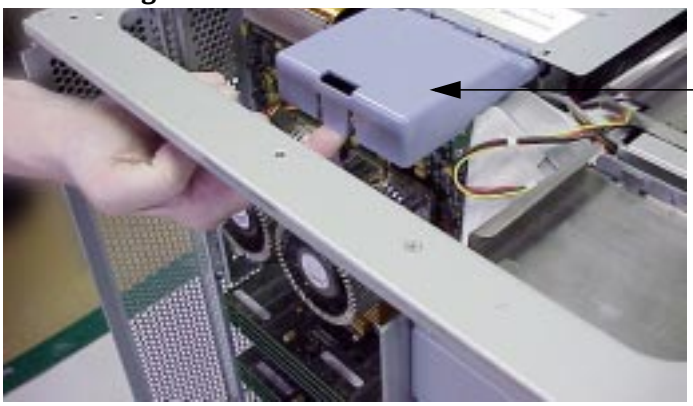
   b. On the system board side of the flex cable, pull outward on the two *outer corners* of the flex cable's ejector handle. As shown in Figure 4-21 on the next page, the arrows on the flex cable indicate where you should pull on the ejector handle. (See the following CAUTION.) This disconnects the flex cable from the system board connector.

CAUTION Do *not* pull on the center of the flex cable's ejector handle, as this may bend or break the ejector handle. *Only* pull on the two outer corners of the ejector handle, as indicated by the arrows on the flex cable.

Figure 4-21. Arrows Indicate Where to Pull on the Ejector Handle

3. Remove the bus bar shield at the top of the workstation, as shown in Figure 4-22.

Figure 4-22. Removing the Bus Bar Shield

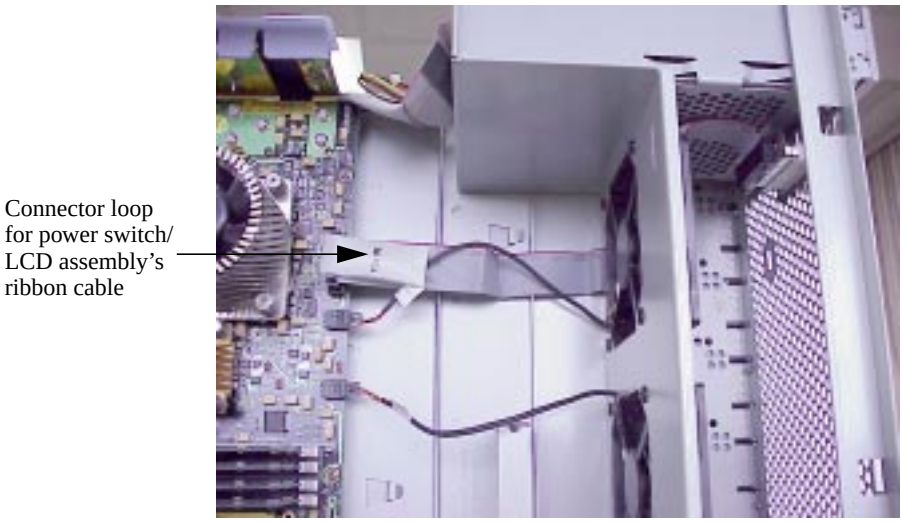


4. Remove either the four bus bar thumbscrews on the J5xxx workstation, or the five bus bar thumbscrews on the J7xxx. Figure 4-23 shows these thumbscrews on the J5xxx workstation.

Figure 4-23. Bus Bar Thumbscrews

5. If you are removing the system board from a J7xxx workstation, you must also remove the front and rear air dividers and the two DC/DC converter units that are attached to the J7xxx's system board. To remove these components, follow the removal procedures in "DC/DC Converter Units and Air Dividers (J7xxx Only)" on page 108.
6. Remove the memory DIMMs from the system board to avoid damage to the DIMMs. To do this, follow the removal procedures in "Memory DIMMs" on page 106.
7. Disconnect the ribbon cable for the power switch/LCD assembly from the system board by pulling on the loop, as shown in Figure 4-24.

Figure 4-24. Ribbon Cable Connector Loop for Power Switch/LCD Assembly



8. Disconnect the three fan cables by squeezing their connector tabs to release them from the system board. Figure 4-25 on the next page shows the locations of the connector tabs for these cables on a J5xxx. Note that you must also pull the J7xxx workstation's fan cables out of the system board's tray handle for clearance.

Figure 4-25. Fan Cable Connector Tabs and Rear Panel Screws

9. Remove the three T-15 Torx screws that secure the system board tray assembly to the rear panel of the workstation, as shown in Figure 4-25 above.

CAUTION The J7xxx workstation's system board has four turbocoolers mounted vertically to the left edge. Thus, the complete system board tray assembly will be heavily weighted to one side. Approximate total weight for the system board tray assembly is 12 lbs. Be prepared to handle the weight accordingly in the next two steps.

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10. Grasp the handle on the system board tray assembly and firmly slide the tray assembly to the right, toward the front of the workstation. The sheet metal hooks on the workstation's center wall will disengage from the holes on the system board tray assembly.
11. Support the left side of the system board tray assembly and carefully pull the tray outward.

NOTE Do *not* remove the system board from the tray.

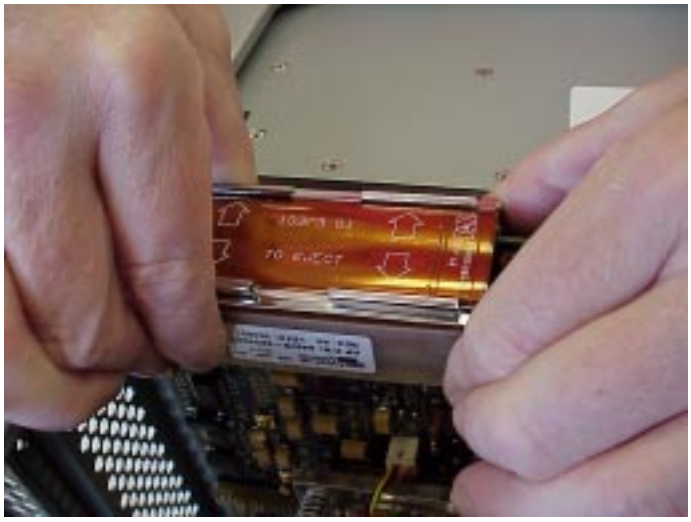
Replacing the System Board Tray Assembly

To replace the system board tray assembly, do the following:

1. Remove the top panel and the left side panel of the workstation.
2. Fold back all fan cables and the ribbon cable for the power switch/LCD assembly to avoid interference and damage while inserting the system board tray assembly into the workstation.
3. Hold the system board tray assembly vertical to the workstation floor and align the holes in the tray assembly to the right of the sheet metal hooks on the workstation's center wall.
4. Carefully slide the system board tray assembly to the left to engage the center wall hooks. Inspect to ensure that all hooks are engaged in the holes of the system board tray assembly.
5. Insert and tighten the T-15 Torx screws that secure the system board tray assembly to the rear panel of the workstation.
6. Connect the three fan cables and the ribbon cable for the power switch/LCD assembly to the system board. Refer to Figures 4-24 and 4-25 on the previous two pages. You should also pull the J7xxx workstation's fan cables through the system board's tray handle for clearance.
7. Connect the flex cable to the system board and I/O board connectors as shown in Figure 4-26.

NOTE Failure to fully connect the flex cable to both the system board and the I/O board will cause the workstation not to function.

Figure 4-26. Connecting the Flex Cable



8. Attach the flex cable retainer to the flex cable.

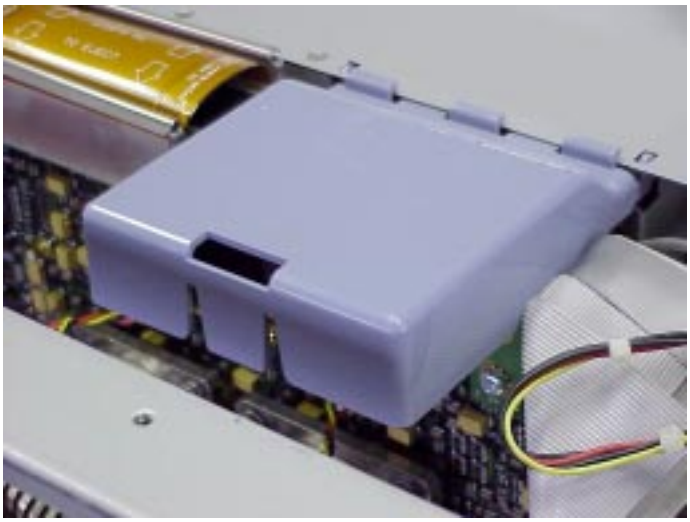
9. Secure the bus bars to the system board with either the four bus bar thumbscrews on the J5xxx workstation, or the five bus bar thumbscrews on the J7xxx. Figure 4-27 shows these thumbscrews on the J5xxx workstation.

NOTE Failure to sufficiently tighten the bus bar thumbscrews will cause the power supply to not activate.

Figure 4-27. Bus Bar Thumbscrews

10. Replace the bus bar shield by aligning the edge with the power supply edge while inserting the hooks into the slots. Rock the bus bar shield into place by pressing down towards the chassis floor. Figure 4-28 shows the bus bar shield correctly installed.

Figure 4-28. Bus Bar Shield Installed



11. Replace the memory DIMMs in the system board by following the replacement procedures in “Memory DIMMs” on page 106.
12. If you are replacing the system board in a J7xxx workstation, you must also replace the two DC/DC converter units that are attached to the J7xxx’s system board, as well as the front and rear air dividers. To replace these components, follow the replacement procedures in “DC/DC Converter Units and Air Dividers (J7xxx Only)” on page 108.
13. Replace the top panel and the left side panel of the workstation.

System Board Cooling Fans

There are three system board cooling fans located behind the left side of the workstation's front panel. This section describes how to remove and replace them.

NOTE If the LCD displays an error message that relates to a turbocooler fan on a microprocessor mounted on the system board, you will need to replace the entire system board tray assembly. Follow the removal and replacement procedures in "System Board Tray Assembly" on page 110.

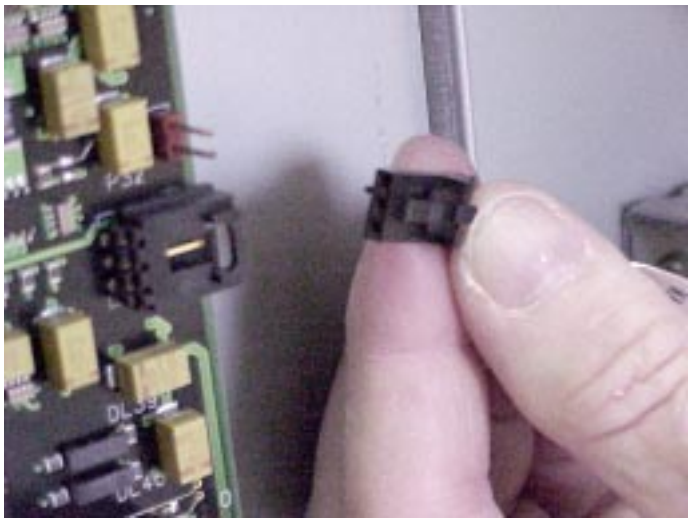
Removing a System Board Cooling Fan

To remove a system board cooling fan, do the following:

1. Remove the top panel and the left side panel of the workstation.
2. If you are removing a system board cooling fan from a J7xxx workstation, you must also remove the front and rear air dividers and the two DC/DC converter units that are attached to the J7xxx's system board. To do this, follow the removal procedures in "DC/DC Converter Units and Air Dividers (J7xxx Only)" on page 108.
3. Disconnect the appropriate fan cable from the system board. Figure 4-29 shows the locations of the three system board cooling fans and their respective cables. Figure 4-30 on the next page shows the removal of a fan cable from its connector on the system board.

Figure 4-29. System Board Cooling Fans and Fan Cables

Figure 4-30. Removing a Fan Cable from the System Board Connector



4. Each fan is attached to the inner fan wall by four plastic rivets. Using your index finger, press on each rivet from the front side of the workstation to remove the back side of the plastic rivets from the rivet inserts, as shown in Figure 4-31.

Figure 4-31. Removing a Rivet

5. Push the fan toward the front to release it from the rivets.

Replacing a System Board Cooling Fan

To replace a system board cooling fan, do the following:

1. Position the fan so that the air flow arrow on the fan, as shown in Figure 4-32, points toward the rear of the workstation.

Figure 4-32. Fan Air Flow Arrow

2. Locate the fan cable's guide slot in the sheet metal and thread the cable accordingly, as shown in Figure 4-33.

Figure 4-33. Threading the Fan Cable

3. Hold the fan in position flush to the inner sheet metal while aligning the fastener holes.

4. Guide the insertion barrel into the fan fastener hole from the center of the workstation. Press the rivet pin into the barrel which is held in place by the chassis inner wall and the fan housing. Repeat for the other three rivet pins.
5. Connect the fan cable to the system board connector.
6. If you are replacing a system board cooling fan in a J7xxx workstation, you must also replace the two DC/DC converter units that are attached to the J7xxx's system board, as well as the front and rear air dividers. To replace these components, follow the replacement procedures in “DC/DC Converter Units and Air Dividers (J7xxx Only)” on page 108.
7. Replace the top panel and the left side panel of the workstation.

I/O Cards

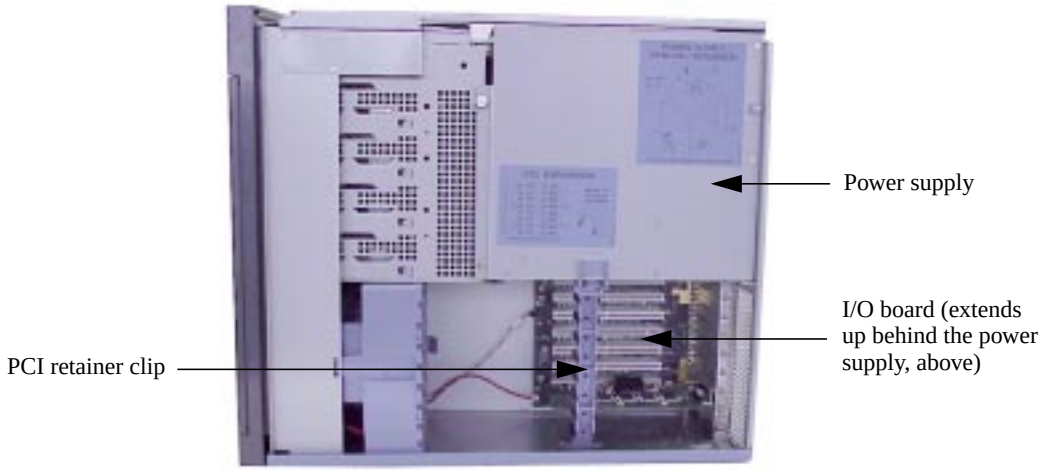
The J5xxx and J7xxx workstations have 64-bit slots for PCI (Peripheral Connect Interface) I/O cards. As you face the front of the workstation, the I/O slots are located on the I/O board on the right side of the workstation. There are five PCI-2X slots, two PCI-4X slots, and one slot for power only.

Removing an I/O Card

To remove an I/O card, do the following:

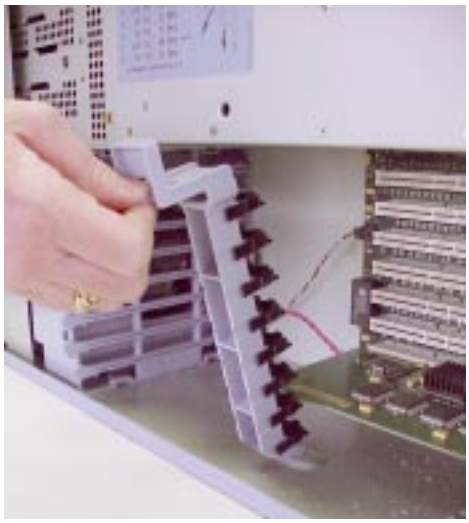
1. Remove the top panel and the right side panel of the workstation.
2. Locate the I/O board and its I/O slots on the right side of the workstation, as shown in Figure 4-34. Note that the I/O board extends up behind the power supply, and that the eight I/O slots are located below the power supply.

Figure 4-34. I/O Board



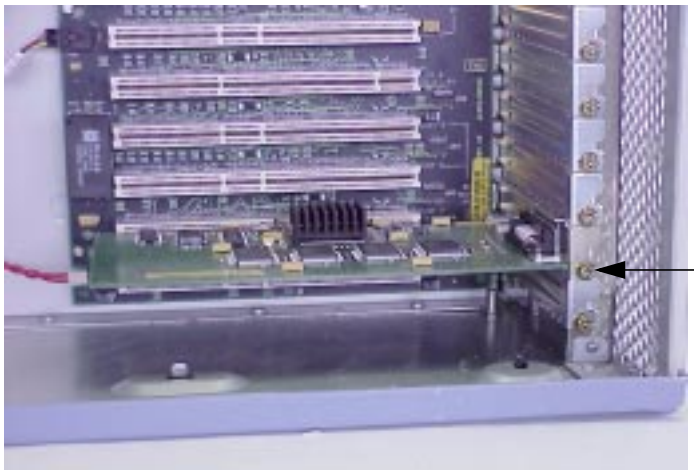
3. Remove the PCI retainer clip by pressing down on the thumb tab and pulling the clip forward to rotate it out of the chassis floor hole, as shown in Figure 4-35 on the next page.

Figure 4-35. Removing the PCI Retainer Clip



4. Remove the screw that secures the I/O card to the I/O slot. An example I/O slot screw for an installed I/O card is shown in Figure 4-36. Save the screw for future use (for example, to install a new I/O card or to replace the I/O slot with a filler plate).

Figure 4-36. I/O Slot Screw



5. Grasp the I/O card by its edge and pull straight out. Place the I/O card in an antistatic bag for storage.

Replacing an I/O Card

To replace an I/O card, do the following:

1. Remove the top panel and the right side panel of the workstation.
2. Locate the I/O board and its I/O slots on the right side of the workstation, as shown in Figure 4-34 on the previous page. Note that the I/O board extends up behind the power supply, and that the eight I/O slots are located below the power supply.

3. Remove the PCI retainer clip by pressing down on the thumb tab and pulling the clip outward to rotate it out of the chassis floor hole, as shown in Figure 4-35 on the previous page.
4. Determine the appropriate I/O slot for installing the I/O card. There are five PCI-2X slots, two PCI-4X slots, and one slot for power only. The I/O slots are defined as follows:

   1. Power only – Top slot
   2. PCI-2X (5V, 33 MHz)
   3. PCI-2X (5V, 33 MHz)
   4. PCI-4X (3.3V, 66 MHz)
   5. PCI-2X (5V, 33 MHz)
   6. PCI-2X (5V, 33 MHz)
   7. PCI-4X (3.3V, 66 MHz)
   8. PCI-2X (5V, 33 MHz) – Bottom slot

NOTE Slot 1 is reserved for power only and should *not* be used for an I/O card. Also note that slot 7 is the primary preferred graphics slot, and slot 4 is the secondary preferred graphics slot.

Refer to the PCI slot label for the proper insertion location on the I/O board. The slot numbers and voltage are identified on the I/O board.

The following are configuration guidelines for installing I/O cards in the J5xxx or J7xxx:

- Put graphics cards into slot 7 first and slot 4 second. A graphics card can be added to any slot that physically has room once slots 7 and 4 are used.

  Note, however, that slots 7 and 4 may be used for very high-bandwidth, general I/O cards when not needed for graphics.
- Put I/O cards into slot 2 first, slot 8 second, slot 3 third, slot 5 fourth, and slot 6 fifth.
- Do *not* put any I/O card into slot 1, as that slot is reserved for power only.

CAUTION The J5xxx and J7xxx workstations supply about 264 Watts of power to the PCI slots. Do not insert I/O cards that together draw more than 264 Watts, or damage to the workstation may result.

NOTE If you install three HP VISUALIZE FX^6 graphics cards simultaneously (as in the HP VISUALIZE Center configuration), there are some power constraints imposed on the remaining I/O slots. Each of these graphics cards, while electrically connected to only one I/O slot, takes the physical space of two slots, and each card draws about 78 Watts. So, three of these graphics cards will occupy six of the eight I/O slots and will draw 234 Watts altogether, leaving only about 30 Watts for the remaining two slots combined, should those two slots be used.

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5. If a filler plate is installed in the I/O slot on the rear panel of the workstation, remove the screw that secures the filler plate and remove the filler plate. Save the screw for securing the I/O card you will install, and save the filler plate for later use.
6. Insert the I/O card in the card guides and press the card firmly and evenly into the I/O slot connector until the I/O card is fully seated in the slot.

CAUTION To avoid damage to the connector, do *not* rock the I/O card from side to side during insertion.

7. Secure the I/O card with the filler panel screw to the I/O slot.
8. Replace the PCI retainer clip.
9. Replace the workstation's top and right side panels.
10. After rebooting, use SAM to confirm that the I/O card is recognized by the system.

Battery on I/O Board

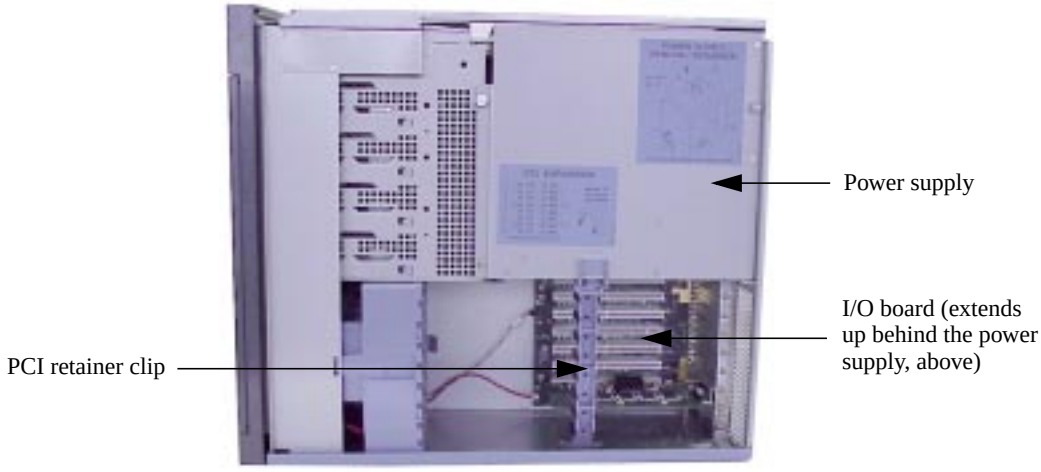
The battery in the J5xxx and J7xxx workstations is contained within the real-time clock module on the I/O board. This section describes how to remove and replace the real-time clock module containing the battery.

Removing the Battery on the I/O Board

To remove the battery from the I/O board, do the following:

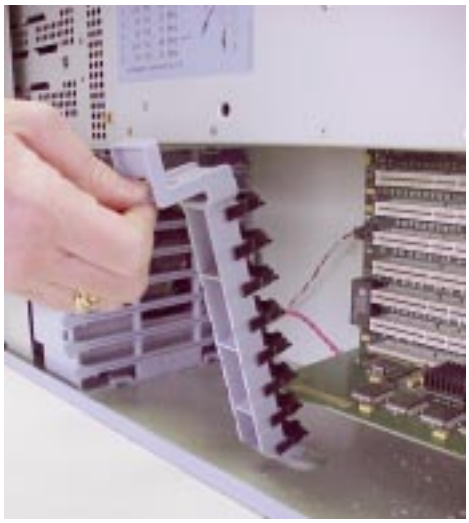
1. Remove the top panel and the right side panel of the workstation.
2. Locate the I/O board and its I/O slots on the right side of the workstation, as shown in Figure 4-37. Note that the I/O board extends up behind the power supply, and that the eight I/O slots are located below the power supply.

Figure 4-37. I/O Board



3. Remove the PCI retainer clip by pressing down on the thumb tab and pulling the clip forward to rotate it out of the chassis floor hole, as shown in Figure 4-38 on the next page.

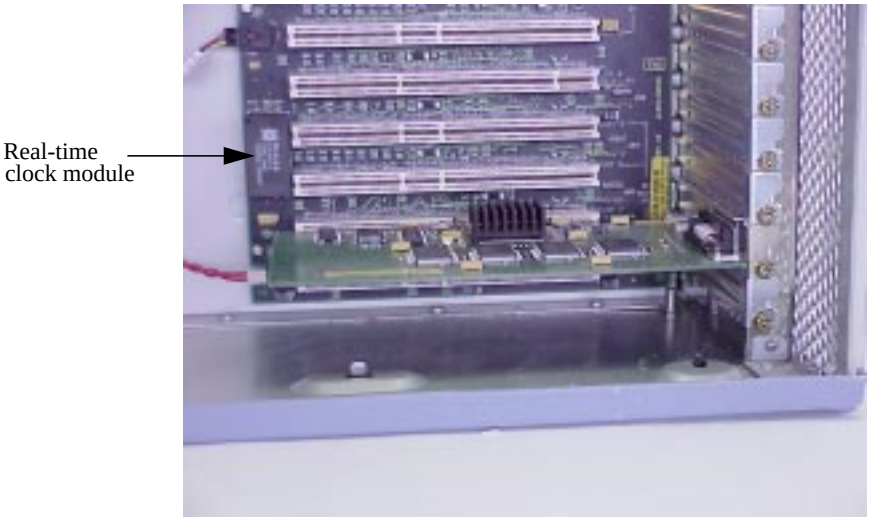
Figure 4-38. Removing the PCI Retainer Clip



4. Locate the real-time clock module, which is designated as U49 and is between PCI slots 5 and 6 on the I/O board, as shown in Figure 4-39.

NOTE To access the real-time clock module, you may need to remove some I/O cards. To do this, follow the removal procedures in “I/O Cards” on page 121.

Figure 4-39. Real-time Clock Module



5. Carefully remove the real-time clock module, which contains the battery. Note the polarity dot which is silk-screened on the component side of the circuit board.

CAUTION Dispose of used batteries according to the manufacturer’s instructions.

Replacing the Battery on the I/O Board

To replace the battery on the I/O board, do the following:

1. Insert the real-time clock module on the I/O board between PCI slots 5 and 6, as shown in Figure 4-39 on the previous page. Note the polarity dot which is silk-screened on the component side of the circuit board; insert the real-time clock module with the correct polarity to ensure proper functionality.

CAUTION There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

---

2. Replace any I/O cards that you removed to access the real-time clock module. To do this, follow the replacement procedures in “I/O Cards” on page 121.
3. Replace the PCI retainer clip.
4. Replace the top panel and the right side panel of the workstation.

Power Supply

This section describes how to remove and replace the power supply in the J5xxx and J7xxx workstations. As you face the workstation, the power supply is on the right side.

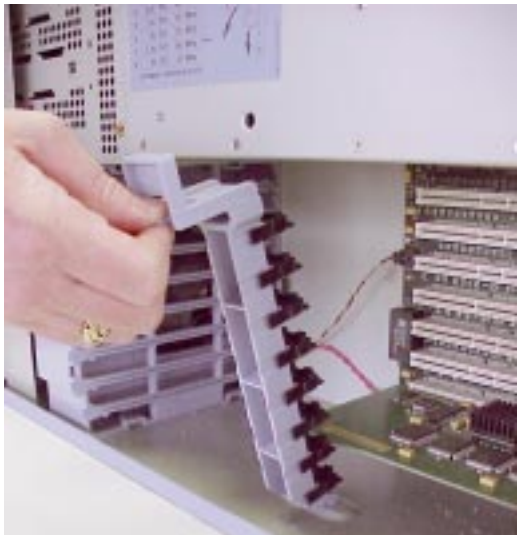
NOTE If the LCD displays an error message that relates to one of the power supply's internal cooling fans, you will need to replace the entire power supply. Follow the removal and replacement procedures in this section to do so.

Removing the Power Supply

To remove the power supply, do the following:

1. Remove the top panel and the right side panel of the workstation.
2. Remove the PCI retainer clip by pressing down on the thumb tab and pulling the clip forward to rotate it out of the chassis floor hole, as shown in Figure 4-40.

Figure 4-40. Removing the PCI Retainer Clip



3. Remove the bus bar shield at the top of the workstation, as shown in Figure 4-41.

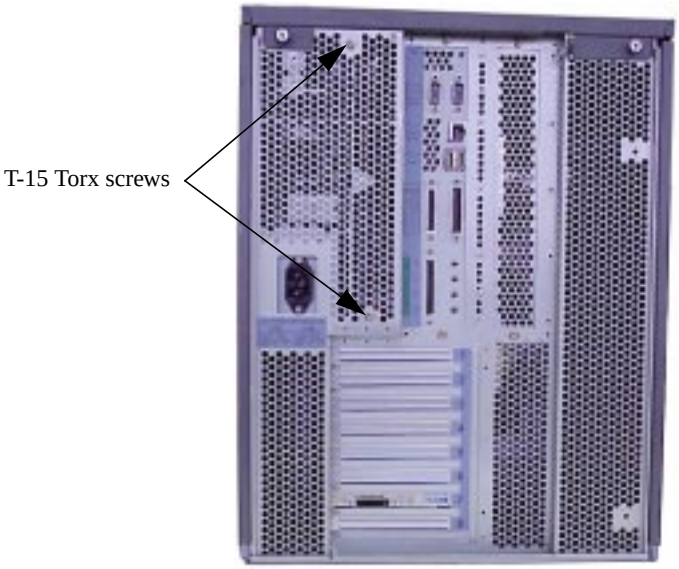
Figure 4-41. Removing the Bus Bar Shield

4. Remove either the four bus bar thumbscrews on the J5xxx workstation, or the five bus bar thumbscrews on the J7xxx. Figure 4-42 shows these thumbscrews on the J5xxx workstation.

Figure 4-42. Bus Bar Thumbscrews

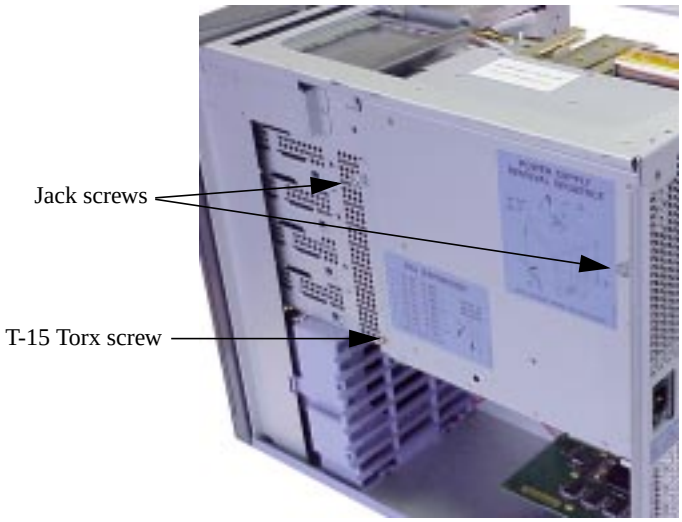
5. Remove the two T-15 Torx screws that secure the power supply to the rear panel of the workstation, as shown in Figure 4-43.

Figure 4-43. Screws for the Power Supply on the Rear Panel



6. As you face the power supply on the right side of the workstation, remove the T-15 Torx screw in the lower-left corner of the power supply, as shown in Figure 4-44.

Figure 4-44. Screws on the Power Supply



7. Alternately unscrew the two jack screws on the power supply to evenly unseat the I/O board connectors, as shown in Figure 4-44 above.

CAUTION The power supplies for the J5xxx and J7xxx weigh approximately 14 pounds and 17 pounds, respectively. Be prepared to handle the weight accordingly in the next step.

---

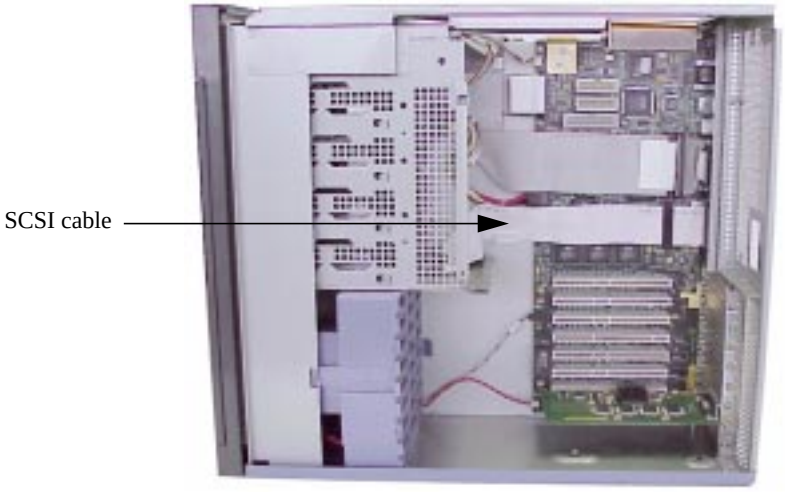
8. Once the connectors have disengaged, use both hands to carefully remove the power supply.

Replacing the Power Supply

To replace the power supply, do the following:

1. Remove the top panel and the right side panel of the workstation.
2. Inspect the underside of the gold plated bus bars for missing or damaged conductive interface material. The conductive interface material provides a biting function when the bus bars are properly tightened down.
3. Inspect to ensure that the SCSI cable from the SCA hard disk interface (backplane board) to the I/O board does not interfere with the power supply's guide rails, as shown in Figure 4-45 on the next page.

Figure 4-45. SCSI Cable from the SCA Hard Disk Interface



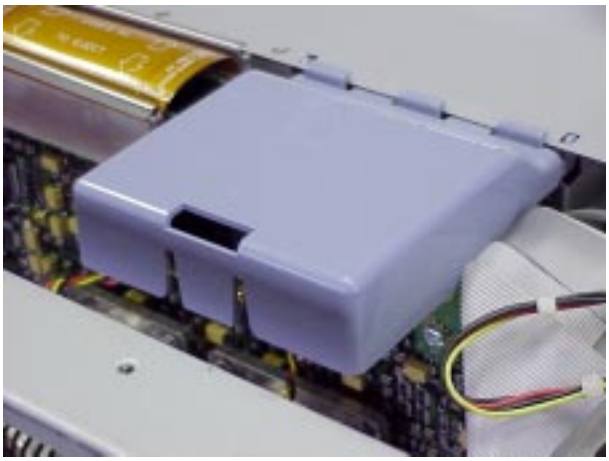
4. Pick up the power supply with both hands and align the power supply with the guide rails. Slide the power supply forward on the guide rails to seat it in the I/O board connectors.
5. Insert and alternately tighten the two power supply jack screws, as shown in Figure 4-44 on the previous page. Take care to align the rear face of the power supply to the rear wall of the mainframe chassis so that the jack screws will mate properly. Continue tightening until the screws stop.
6. Secure the bus bars to the system board with either the four bus bar thumbscrews on the J5xxx workstation, or the five bus bar thumbscrews on the J7xxx. Figure 4-46 shows these thumbscrews on the J5xxx workstation.

NOTE Failure to sufficiently tighten the bus bar thumbscrews will cause the power supply to not activate.

Figure 4-46. Bus Bar Thumbscrews

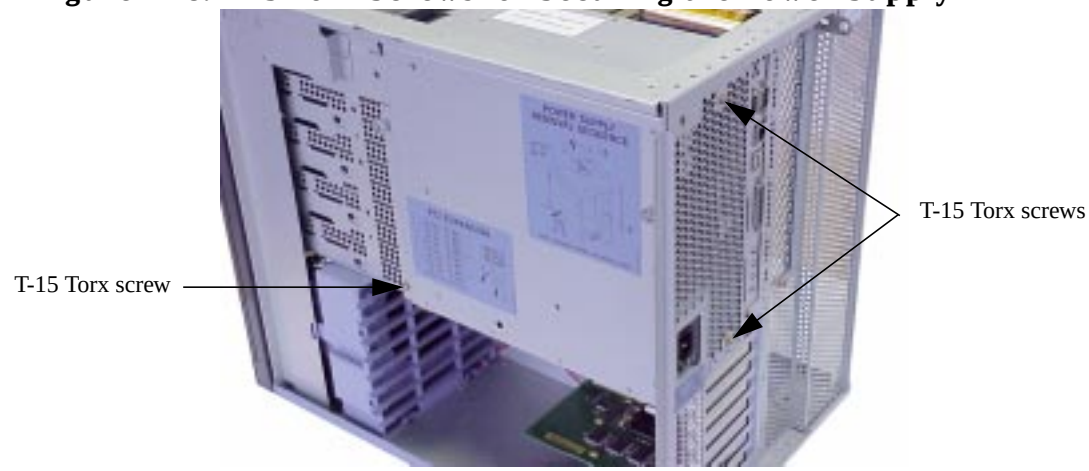
7. Replace the bus bar shield by aligning the edge with the power supply edge while inserting the hooks into the slots. Rock the bus bar shield into place by pressing down towards the chassis floor. Figure 4-47 shows the bus bar shield correctly installed.

Figure 4-47. Bus Bar Shield Installed



8. Insert and tighten the front, lower-left T-15 Torx screw on the power supply and the two rear panel T-15 Torx screws to secure the power supply, as shown in Figure 4-48.

Figure 4-48. T-15 Torx Screws for Securing the Power Supply



9. Replace the PCI retainer clip.
10. Replace the top panel and the right side panel of the workstation.

I/O Board

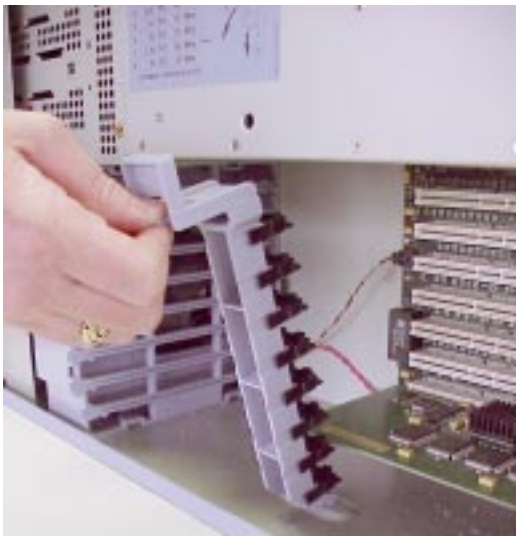
This section describes how to remove and replace the I/O board in J5xxx and J7xxx workstations.

Removing the I/O Board

To remove the I/O board, do the following:

1. Remove the top panel and the right side panel from the workstation.
2. Remove the PCI retainer clip by pressing down on the thumb tab and pulling the clip forward to rotate it out of the chassis floor hole, as shown in Figure 4-49.

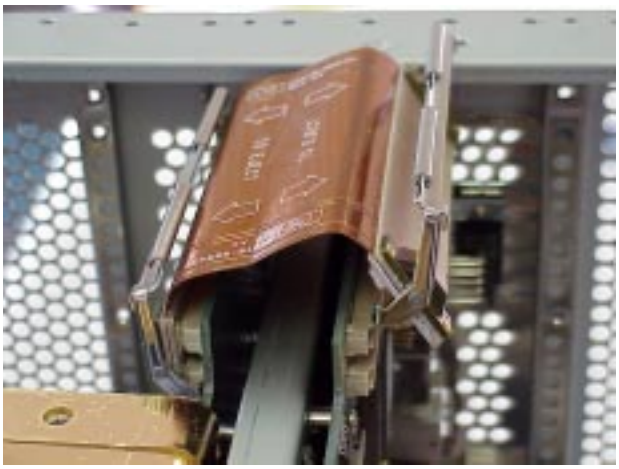
Figure 4-49. Removing the PCI Retainer Clip



3. Remove the power supply by following the removal procedures in “Power Supply” on page 128.
4. Remove all I/O cards and note their locations for reinstallation later. See the removal procedures in “I/O Cards” on page 121 for details.
5. Remove the one side of the flex cable that is connected to the I/O board. (You do *not* need to remove the flex cable entirely. That is, you do *not* need to also remove the other side of the flex cable that is connected to the system board for this procedure.) To do this:
   a. Remove the flex cable retainer covering the flex cable. (The flex cable retainer and the flex cable are located at the top of the workstation, near the rear. The flex cable straddles the center wall of the chassis, connecting the I/O board to the system board.)
   b. On the I/O board side of the flex cable, pull outward on the two *outer corners* of the flex cable’s ejector handle. The arrows on the flex cable indicate where you should pull on the ejector handle. (See the CAUTION on the next page.) This disconnects the flex cable from the system board connector, as shown in Figure 4-50 on the next page.

CAUTION Do *not* pull on the center of the flex cable's ejector handle, as this may bend or break the ejector handle. *Only* pull on the two outer corners of the ejector handle, as indicated by the arrows on the flex cable.

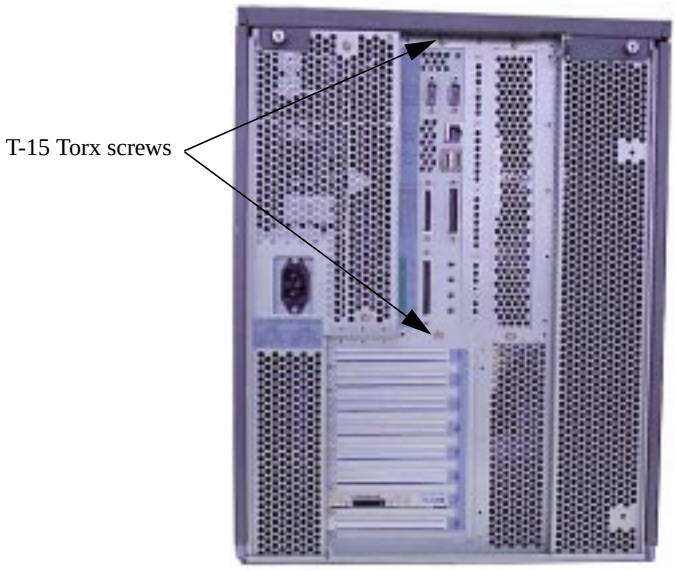
Figure 4-50. The Flex Cable Disconnected from the I/O Board Side



6. Disconnect all cables from the I/O board, including:
   - Ultra2 Wide LVD SCSI cable
   - NSE SCSI-2 cable
   - DDS-3 tape drive/floppy disk drive cable
   - Speaker cable
   - Fan cable
   - Power cable
   - CD ROM drive power cable and audio cable

7. Remove the two T-15 Torx screws that secure the I/O board to the rear panel of the workstation, as shown in Figure 4-51 on the next page.

Figure 4-51. Screws for the I/O Board on the Rear Panel



8. Slide the I/O board to the left, which disengages the ten keyhole standoffs holding the I/O board to the center wall of the chassis.
9. Pull the I/O board straight out until it clears the keyhole standoffs, and then lift it out of the chassis.

Replacing the I/O Board

To replace the I/O board, do the following:

1. Remove the top panel and the right side panel from the workstation.
2. Perform the previous removal steps in reverse.

NOTE For correct installation, you must slide the I/O board to the rear of the workstation chassis until the EMI (electromagnetic interference) fingers have been compressed.

During installation, it is also very easy to miss some of the keyhole standoffs that hold the I/O board to the center wall of the chassis. Therefore, be sure to verify that all ten of the keyhole standoffs are engaged with the I/O board.

SCA Hard Disk Interface

This section describes how to remove and replace the SCA (Single Connector Attach) hard disk interface (also known as the backplane board), which is mounted on the back of the hard disk drive bays in the J5xxx and J7xxx workstations.

Removing the SCA Hard Disk Interface

To remove the SCA hard disk interface, do the following:

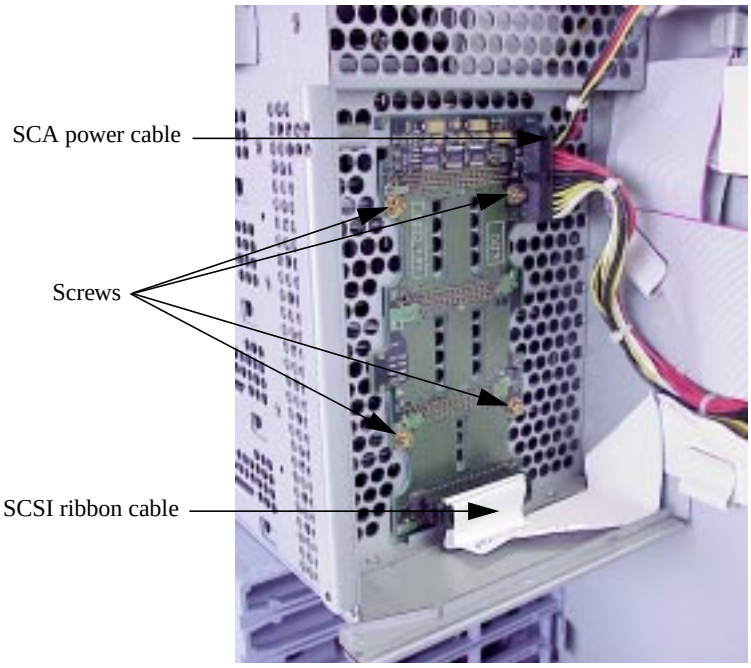
1. Disconnect all hard disk drives from the front panel by following the removal procedures in “Hard Disk Drives” on page 96. Note which hard disk drive is the root disk for proper reinstallation later.

NOTE You *must* remove the hard disk drives before you can remove the SCA hard disk interface.

---

2. Remove the top panel and right side panel of the workstation.
3. Remove the power supply by following the removal procedures in “Power Supply” on page 128.
4. Remove the Ultra2 Wide LVD SCSI ribbon cable from the SCA hard disk interface, as shown in Figure 4-52.

Figure 4-52. SCA Hard Disk Interface



5. Remove the SCA power cable from the top right edge of the SCA hard disk interface, as shown in Figure 4-52 above.

6. Remove the four screws from the SCA hard disk interface, as shown in Figure 4-52 on the previous page.
7. Raise the SCA hard disk interface straight up and pull outward to relieve it from the internal chassis hooks.

Replacing the SCA Hard Disk Interface

To replace the SCA hard disk interface, do the following:

1. Remove the top panel and the right side panel from the workstation.
2. Perform the previous removal steps in reverse.

I/O Cooling Fan

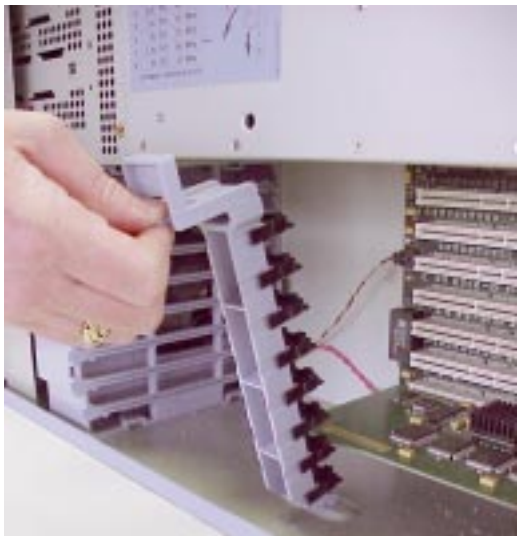
This section describes how to remove and replace the I/O cooling fan, which is located in the fan/speaker mounting bracket in the bottom of the front, right side of the workstation.

Removing the I/O Cooling Fan

To remove the I/O cooling fan, do the following:

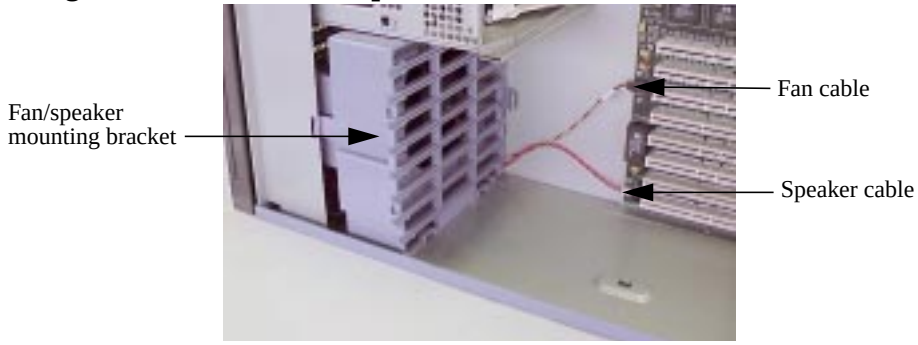
1. Remove the top panel and the right side panel from the workstation.
2. Remove the PCI retainer clip by pressing down on the thumb tab and pulling the clip forward to rotate it out of the chassis floor hole, as shown in Figure 4-53.

Figure 4-53. Removing the PCI Retainer Clip



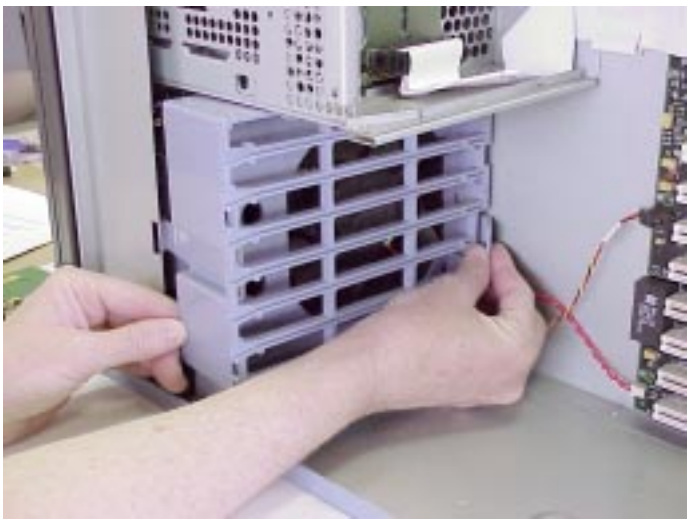
3. Remove all I/O cards from the I/O board and note their locations for reinstallation later. See the removal procedures in “I/O Cards” on page 121 for details.
4. Remove the power supply by following the removal procedures in “Power Supply” on page 128.
5. Disconnect the fan and speaker cables from the I/O board, as shown in Figure 4-54.

Figure 4-54. Fan and Speaker Cables Connected to the I/O Board



6. Pull on the fan/speaker mounting bracket tab that is closest to the internal chassis wall, as shown in Figure 4-55.

Figure 4-55. Loosening the Fan/Speaker Mounting Bracket



7. Rotate and tilt the mounting bracket to remove it from the chassis, as shown in Figure 4-56.

Figure 4-56. Removing the Fan/Speaker Mounting Bracket

8. Place the mounting bracket on a flat surface with the fan vertical to the surface.

9. Simultaneously push both tabs outward with your thumbs while using your index fingers to lift the fan out of the mounting bracket, as shown in Figure 4-57.

Figure 4-57. Removing the Fan from the Mounting Bracket

10. Carefully guide the fan cable out of the bracket. The fan cable should not be threaded through the card guides.

Replacing the I/O Cooling Fan

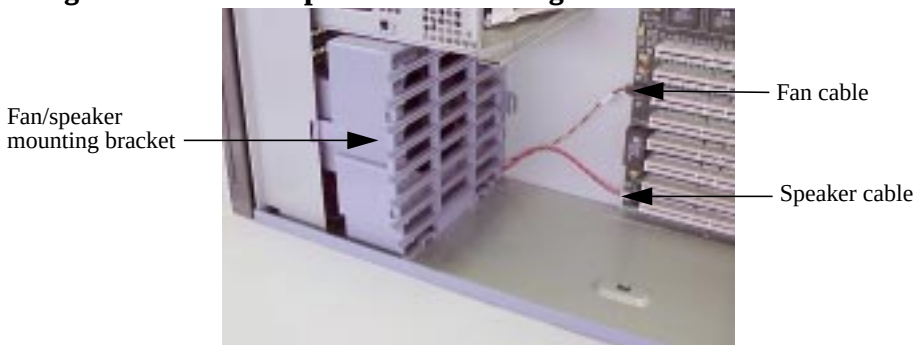
To replace the I/O cooling fan, do the following:

1. Reinsert the fan in the fan/speaker mounting bracket.
2. Position the fan so that the flow arrow points towards the I/O card guide rails.
3. To avoid interference with the I/O card guide rails, you must thread the fan cable through the plastic slot adjacent to the release tab for the fan/speaker mounting bracket, as shown in Figure 4-58.

Figure 4-58. Threading the Fan Cable through the Plastic Slot

4. Align the mounting bracket to snap in place over the mounting bracket's housing posts. Slide the mounting bracket along the chassis floor until it snaps into place. Take care not to pinch the cables to the inner chassis wall. Figure 4-59 shows the fan/speaker mounting bracket correctly installed.
5. Connect the fan and speaker cables to the I/O board, as shown in Figure 4-59.

Figure 4-59. Fan/Speaker Mounting Bracket and Cables Installed



6. Reinstall the power supply by following the replacement procedures in "Power Supply" on page 128.
7. Reinstall the I/O cards by following the replacement procedures in "I/O Cards" on page 121.
8. Replace the PCI retainer clip.
9. Replace the top panel and the right side panel of the workstation.

Speaker

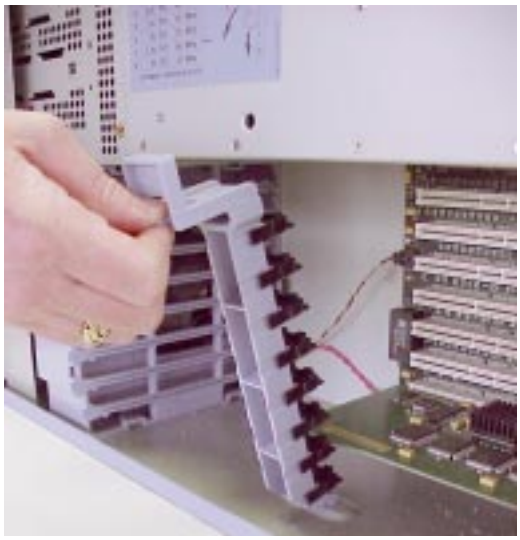
This section describes how to remove and replace the speaker, which is located in the fan/speaker mounting bracket in the bottom of the front, right side of the workstation.

Removing the Speaker

To remove the speaker, do the following:

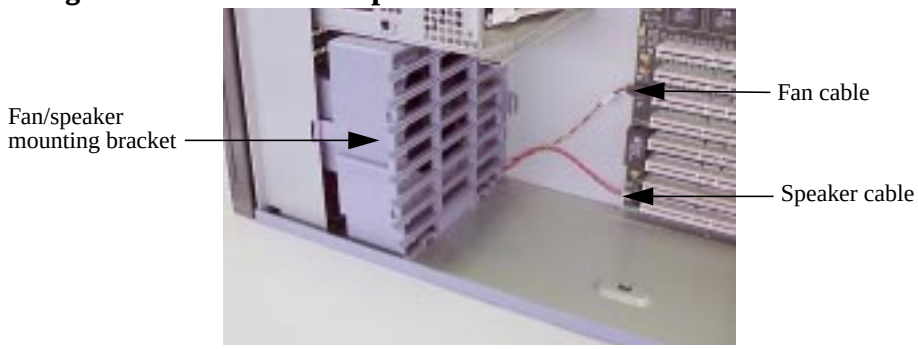
1. Remove the top panel and the right side panel.
2. Remove the PCI retainer clip by pressing down on the thumb tab and pulling the clip forward to rotate it out of the chassis floor hole, as shown in Figure 4-60.

Figure 4-60. Removing the PCI Retainer Clip



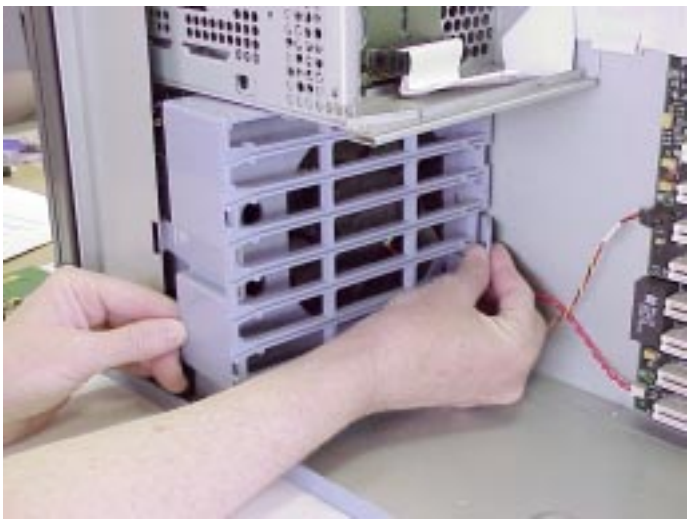
3. Remove all I/O cards from the I/O board and note their locations for reinstallation later. See the removal procedures in the section “I/O Cards” on page 121 for details.
4. Remove the power supply by following the removal procedures in “Power Supply” on page 128.
5. Disconnect the fan and speaker cables from the I/O board, as shown in Figure 4-61.

Figure 4-61. Fan and Speaker Cables Connected to the I/O Board



6. Pull on the fan/speaker mounting bracket tab that is closest to the internal chassis wall, as shown in Figure 4-62.

Figure 4-62. Loosening the Fan/Speaker Mounting Bracket



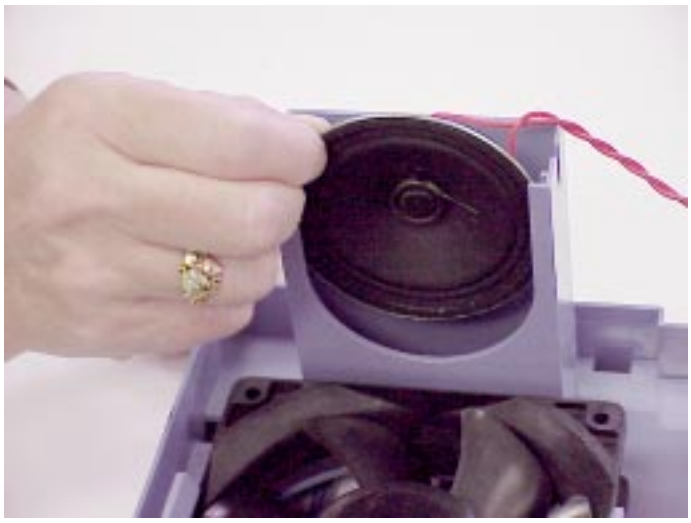
7. Rotate and tilt the mounting bracket to remove it from the chassis, as shown in Figure 4-63.

Figure 4-63. Removing the Fan/Speaker Mounting Bracket

8. Place the bracket on a flat surface with the speaker vertical to the surface.

9. Slide the speaker out of the guides in the fan/speaker mounting bracket, as shown in Figure 4-64.

Figure 4-64. Removing the Speaker from the Mounting Bracket



Replacing the Speaker

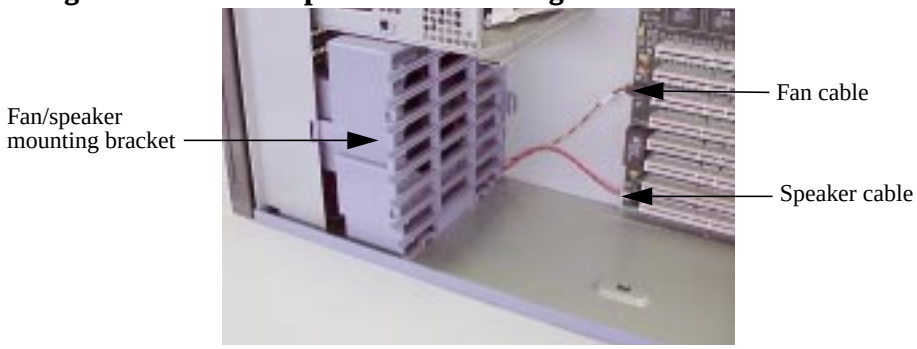
To replace the speaker, do the following:

1. Reinsert the speaker in the fan/speaker mounting bracket.
2. To avoid interference with the I/O card guide rails, you must thread the speaker and fan cables through the plastic slot adjacent to the release tab for the fan/speaker mounting bracket, as shown in Figure 4-65.

Figure 4-65. Threading the Fan Cable through the Plastic Slot

3. Align the mounting bracket to snap in place over the mounting bracket's housing posts. Slide the mounting bracket along the chassis floor until it snaps into place. Take care not to pinch the cables to the inner chassis wall. Figure 4-66 shows the fan/speaker mounting bracket correctly installed.
4. Connect the fan and speaker cables to the I/O board, as shown in Figure 4-66.

Figure 4-66. Fan/Speaker Mounting Bracket and Cables Installed



5. Reinstall the power supply by following the replacement procedures in "Power Supply" on page 128.
6. Reinstall the I/O cards by following the replacement procedures in "I/O Cards" on page 121.
7. Replace the PCI retainer clip.
8. Replace the top panel and the right side panel of the workstation.

5 Boot Console Handler

This chapter explains how to use the Boot Console Handler, which provides an interactive environment after the power-on sequence in HP VISUALIZE J5xxx and J7xxx workstations.

Chapter Overview

This chapter contains the following main sections:

- Boot Console Handler Features
- Accessing the Boot Console Handler
- Boot Console Menus
- Booting the Workstation
- Searching for Bootable Media
- Resetting the Workstation
- Displaying and Setting Paths
- Displaying and Setting the Monitor Type
- Displaying the Current Memory Configuration
- Displaying the Status of the I/O Slots
- Setting the Auto Boot and Auto Search Flags
- Displaying and Setting the Security Mode
- Displaying and Setting Fastboot Mode
- Displaying the LAN Station Address
- Displaying System Information
- Displaying PIM Information
- Stable Storage
- ISL Environment

Boot Console Handler Features

There are times when you want to interact directly with the hardware of the J5xxx or J7xxx workstation before it boots the operating system. These workstations provide a menu-driven Boot Console Handler that allows you to perform special tasks, display information, and set certain system parameters, even if the operating system is unavailable.

Here are some of the things you can do:

- Boot the workstation
- Search for bootable media
- Reset the workstation
- Display and set boot paths
- Display and set the monitor type
- Display memory configuration information
- Display the status of the I/O slots
- Set Auto Boot, Auto Search, and Auto Start
- Display and set Security mode
- Set Fastboot
- Display LAN information
- Display system information
- Display PIM information

NOTE All of the tasks in the Boot Console Handler should be performed by a system administrator with superuser (`root`) login permissions.

Accessing the Boot Console Handler

To access the Boot Console Handler, follow these steps:

1. Close any files and applications on the workstation.
2. Press the power switch on the front panel of the workstation to power it off.

NOTE There is no need to manually shut down the HP-UX operating system on the workstation before powering it off. When you press the power switch, the workstation automatically shuts down the operating system before terminating the power.

   Make sure you do not unplug the workstation's power cord or otherwise interrupt power to the workstation at this time.

3. Power on the workstation after the system has completely shut down.

   If `auto boot` is turned off, the boot sequence automatically stops at the boot console Main Menu.

   If `auto boot` is turned on, you will see the following message:

   ```
   Processor is starting auto boot process. To discontinue, press any key
   within 10 seconds.
   ```

   If `auto boot` and `auto search` are both turned on, you will see the following message:

   ```
   Processor is booting from first available device. To discontinue, press
   any key within 10 seconds.
   ```

NOTE If you are using a power-saving monitor, you will have less than 10 seconds from the time this message appears to press a key.

4. Press a key. You will then see the following message:

   ```
   Boot terminated
   ```

   The Main Menu of the Boot Console Handler appears.

Boot Console Menus

The boot console menus follow, showing the various tasks you can perform and the available information.

The shortened version of each command is indicated by the uppercase letters.

Help is available for all the menus and commands by using either help, he, or ? and the menu or command for which you want help.

```
------ Main Menu --------------------------------------

Command                              Description

-------                              -----------

BOot [PRI|ALT|<path>]                Boot from specified path
PAth [PRI|ALT|CON|KEY [<path>]]      Display or modify a path
SEArch [DIsplay|[[IPL] [<path>]]]    Search for boot devices

COnfiguration [<command>]            Access Configuration menu/commands
INformation [<command>]              Access Information menu/commands
SERvice [<command>]                  Access Service menu/commands

DIsplay                              Redisplay the current menu
HElp [<menu>|<commands>]             Display help for menu or command
RESET                                Restart the system

Main Menu: Enter command >
```

```
------ Configuration Menu -----------------------------

Command                          Description
-------                          -----------

AUto [BOot|SEArch] [ON|OFF]      Display or set specified auto flag
BootID [<proc> [<boot ID>]]      Display or modify processor boot ID
BootINfo                         Display boot-related information
BootTimer [0 - 200]              Seconds allowed for boot attempt
CPUconfig [<proc> [ON|OFF]]      Config/deconfig processor
DEfault                          Set the system to predefined values
FastBoot [ON|OFF]                Display or set boot tests execution
LanConfig [<config_type>]        Display or set LAN configuration
MOnitor [LIST|[<path> <type>]]   Change the current monitor type
PAth [PRI|ALT|CON|KEY [<path>]]  Display or modify a path
PreviousPower [ON|OFF]           Set previous power state
SEArch [DIsplay|[[IPL][<path>]]  Search for boot devices
SECure [ON|OFF]                  Set/show security mode
TIme [c:y:m:d:h:m:s]             Read or set real time clock in GMT
Previous Power [ON|OFF]          Set previous power state

BOot [<menu>|<command>]          Boot from specified path
DIsplay                          Redisplay the current menu
HElp [<menu>|<command>]          Display help for menu or command
RESET                            Restart the system
MAin                             Return to Main Menu
-----
Configuration Menu: Enter command >
```

```
------ Information Menu -------------------------------

Command                  Description
-------                  -----------

ALL                      Display all system information
BootINfo                 Display boot-related information
CAche                    Display cache information
ChipRevisions            Display revisions of VLSI and firmware
COprocessor              Display coprocessor information
FwrVersion               Display firmware version
IO                       Display I/O interface information
LanAddress               Display built-in system LAN address
MEmory                   Display memory information
PRocessor                Display processor information
SysConfig                Display the system configuration
WArnings                 Display selftest warning messages

BOot [PRI|ALT|<path>]    Boot from specified path
DIsplay                  Redisplay the current menu
HElp [<menu>|<command>] Display help for menu or command
RESET                    Restart the system
MAin                     Return to Main Menu
------
Information Menu: Enter command >
```

```
------ Service Menu -----------------------------------

Command                          Description
-------                          -----------

ChassisCodes [<proc>|ON|OFF]     Display/enable/disable chassis codes
CLEARPIM                         Clear (zero) the contents of PIM
EepromRead [<addr> [<len>]]      Read EEPROM locations
MemRead <addr>[<len>] [<type>]   Read memory locations
PCIDelay [<value>]               Display or set PCI delay value
PDT [CLEAR]                      Display or clear the Page
                                 Deallocation Table
PIM [<proc>] [HPMC|LPMC|TOC]     Display PIM information
ScRoll [ON|OFF]                  Display or change scrolling ability

BOot [PRI|ALT|<path>]            Boot from specified path
DIsplay                          Redisplay the current menu
HElp [<menu>|<command>]          Display help for menu or command
RESET                            Restart the system
MAin                             Return to Main Menu
-----
Service Menu: Enter command >
```

Booting the Workstation

You usually start a workstation by turning it on and waiting for HP-UX to boot automatically. However, you may not always want the usual boot sequence to occur.

For example, you may want to start the workstation from an operating sytem that is stored on a device that is different from the usual boot device. If the normal operating system kernel or the disk on which it resides becomes damaged or unusable, you may wish to boot from a different disk or perhaps from another type of device, such as a CD ROM drive.

Here are some possible booting scenarios you may encounter:

- If you know which device you want to boot from, and you know that it contains a bootable operating system, follow the directions in "Accessing the Boot Console Handler" on page 150, and then type the following at the prompt:

  ```
  Main Menu: Enter command > boot device [Enter]
  ```

  where *device* is the hardware path to the device, specified in Mnemonic Style Notation. For example, if you wish to boot an operating system that is stored on a DDS-format tape drive that is located at the hardware path `scsi.1.0`, you would type the following command at the prompt:

  ```
  Main Menu: Enter command > boot scsi.1.0 [Enter]
  ```

- If you do not know which device you want to boot from, then type the following at the prompt:

  ```
  Main Menu: Enter command > search [Enter]
  ```

  A message similar to the following will be displayed:

  ```
  Path Number    Device Path      Device Type
  -------------  -------------    ------------

  P0             IDE              TEAC CD-532E-B
  P1             FWSCSI.6.0       SEAGATE ST39102LC
  ```

  At the prompt, you might type the following:

  ```
  Main Menu: Enter command > boot P1 [Enter]
  ```

  Note that the operating system on the specified device (`P1`) is used to boot the system (also see the next section, "Searching for Bootable Media").

- If you wish to interact with the Initial System Loader (ISL) before booting the workstation, follow the directions in “Accessing the Boot Console Interface” on page 150, and then type the following at the prompt:

  ```
  Main Menu: Enter command > boot device [Enter]
  ```

  The following prompt will appear:

  ```
  Interact with ISL (Y,N,Q)>
  ```

  Answering yes (Y) causes the ISL to be loaded from the specified device. After a short time, the following prompt appears on the screen:

  ```
  ISL>
  ```

  ISL is the program that actually controls the loading of the operating system. By interacting with ISL, you can choose to load an alternate version of the HP-UX operating system. If you do not want to interact with ISL, you must enter no (N).

  For example, if the usual kernel (`/stand/vmunix`) on the root disk (`fwscsi.6.0`) has become corrupted, and you wish to boot the workstation from the backup kernel (`/stand/vmunix.prev`), type the following at the `ISL>` prompt :

  ```
  ISL> hpux /stand/vmunix.prev [Enter]
  ```

- If you do not know which media in the file systems have bootable operating systems, you can find them with the `search ipl` command. See the next section, “Searching for Bootable Media.”

Searching for Bootable Media

To list all devices that contain bootable media, follow the directions in "Accessing the Boot Console Handler" on page 150, and then type the following at the prompt:

```
Main Menu: Enter command > search ipl [Enter]
```

The `search` command searches all buses. The search may turn up more devices than there are lines on the display. If you are using a text terminal, you can control the progress of the search from the terminal's keyboard by doing any of the following:

- To temporarily suspend the search, press `[Ctrl]-[S]`.
- To continue the search, press `[Ctrl]-[Q]`.
- To halt the search, press any other key.

These flow-control commands do not work with a bit-mapped display, but such a display can show more than forty lines of text, so you are unlikely to need them.

To search for devices of just one type that actually contain bootable media, follow the directions in "Accessing the Boot Console Handler" on page 150, and then type the following at the prompt:

```
Main Menu: Enter command > search ipl device_type [Enter]
```

where *`device_type`* is one of the following:

- `fwscsi` is the built-in, Ultra2 Wide LVD (Low Voltage Differential) SCSI bus.
- `scsi` is the built-in, NSE (Narrow Single-Ended) SCSI-2 bus.
- `lan` is all connections to the built-in LAN.
- `ide` is the built-in CD ROM drive.
- `pci`*`n`* is an optional SCSI interface in slot number *n*.

For more information about the `search` command, type the following at the prompt:

```
Main Menu: Enter command > help search [Enter]
```

Resetting the Workstation

To reset the workstation to its predefined values, follow the directions in “Accessing the Boot Console Handler” on page 150, and then type the following at the prompt to access the Configuration Menu:

```
Main Menu: Enter command > co [Enter]
```

When the Configuration Menu appears, type the following at the prompt:

```
Configuration Menu: Enter command > default [Enter]
```

Then type the following at the prompt :

```
Configuration Menu: Enter command > reset [Enter]
```

Displaying and Setting Paths

A path is the hardware address of a device that is attached to the I/O system of a workstation. The `path` command sets the system paths shown in Table 5-1.

The `path` command sets and displays the hardware address of a specified device attached to the I/O bus of the workstation.

Table 5-1. System Paths

Path Type	Device
`primary` or `pri`	The workstation's default boot device (usually the root disk)
`alternate` or `alt`	The workstation's alternate boot device (usually a DDS-format tape device)
`console` or `con`	The workstation's primary display device
`keyboard` or `key`	The workstation's primary ASCII input device

To display the current settings for the system paths, type the following at the prompt:

```
Main Menu: Enter command > path [Enter]
```

The paths are displayed in Mnemonic Style Notation, as shown in Table 5-2.

Table 5-2. Mnemonic Style Notation

I/O Type	Specification Format
Built-in LVD SCSI	`fwscsi.`*`scsi_address.logical_unit_number`*
Built-in NSE SCSI	`scsi.`*`scsi_address.logical_unit_number`*
Built-in LAN	`lan.`*`server_address.init_timeout.io_timeout`*
Optional SCSI	`pci`*`n.scsi_address.logical_unit_number`*
Built-in IDE	`IDE`

To display the current setting for a particular system path, follow the directions in "Accessing the Boot Console Handler" on page 150, and then type the following at the prompt:

```
Main Menu: Enter command > path path_type [Enter]
```

where *`path_type`* is one of the path types listed in Table 5-1.

For example, to get the path to the primary boot device, follow the directions in "Accessing the Boot Console Handler" on page 150, and then type the following at the prompt:

```
Main Menu: Enter command > path primary [Enter]
```

To set a system path to a new value, follow the directions in “Accessing the Boot Console Handler” on page 150, and then type the following at the prompt:

```
Main Menu: Enter command > path path_type path [Enter]
```

where *path_type* is one of the path types listed in Table 5-1 and *path* is the specification of the path in Mnemonic Style Notation (as described in Table 5-2). For example, to set the primary boot path to a SCSI disk with an ID of 6.0, follow the directions in “Accessing the Boot Console Handler” on page 150, and then type the following at the prompt:

```
Main Menu: Enter command > path pri scsi.6.0 [Enter]
```

Displaying and Setting the Monitor Type

The workstation ships from the factory preset to use a monitor with a specific resolution and frequency. If the workstation's monitor is replaced with a different type of monitor, you may have to reconfigure the workstation to support the new monitor.

The Monitor Command

The `monitor` command lets you change the workstation's graphics configuration. This command is available in the Configuration Menu of the Boot Console Handler.

NOTE The `monitor` command lets you change a workstation's graphics configuration before you replace the monitor. For information about changing the configuration after you replace the monitor, go to the section "Setting the Monitor Type at Power On" on page 164.

To display the current graphics and console information, type the following set of commands:

```
Main Menu: Enter command > configuration [Enter]
Configuration Menu: Enter command > monitor [Enter]
```

The correct usage for setting the graphics configuration is:

```
Configuration Menu: Enter command > monitor graphics_path type [Enter]
```

where valid *graphics_path* parameters are:

- `graphics(2)` - Graphics adapter installed in slot 2
- `graphics(3)` - Graphics adapter installed in slot 3
- `graphics(4)` - Graphics adapter installed in slot 4 (primary graphics slot)
- `graphics(5)` - Graphics adapter installed in slot 5
- `graphics(6)` - Graphics adapter installed in slot 6
- `graphics(7)` - Graphics adapter installed in slot 7 (primary graphics slot)
- `graphics(8)` - Graphics adapter installed in slot 8

NOTE No blanks or spaces may be used in the *graphics_path*.

type is the numerical monitor type as shown with the monitor list command. See "Setting the Monitor Type" on page 162 for a list of types. For example, an HP VISUALIZE- EG graphics card (Product Number A4977A) installed in option slot 7 would be `graphics(7)`. Note that there are two preferred I/O slots for graphics cards in the J5xxx and J7xxx workstation: slots 4 and 7.

Displaying the Current Monitor Configuration

To display the current monitor configuration for the workstation from the Configuration Menu of the Boot Console Handler, follow the directions in "Accessing the Boot Console Handler" on page 150. Once you are in the Boot Console Handler's Main Menu, type:

```
Main Menu: Enter command > configuration [Enter]
```

This places you in the Configuration Menu. From here, type:

```
Configuration Menu: Enter command > monitor [Enter]
```

This displays a list of the current graphics adapters and their monitor types configured for the workstation. For example:

```
MONITOR INFORMATION

   Path    Slot   Head  HPA         Resolution  Freq  Type  Class
------------ --------  -------  ------------  ----------------  -------  -------  -------
GRAPHICS(7) 7     1     fffa000000  1600x1200  75Hz  8    PCI

Configuration Menu: Enter command >
```

In this example, only the graphics adapter (located in slot 7) `GRAPHICS(7)` is configured. The monitor type for `GRAPHICS(7)` is set to type 8, which (for this graphics adapter) is a 1600x1200 monitor that uses a frequency of 75 Hz.

Setting the Monitor Type

NOTE The HP VISUALIZE-EG, -FX^2, and FX^6 graphics adapters (which are the supported graphics cards for the J5xxx and J7xxx workstations) disagree about monitor type 1 (72 Hz versus 75 Hz). Only one of these card families works unless the workstation has a multisync monitor. Therefore, the monitor type must be changed any time a graphics adapter is either added to a slot or moved from one slot to another.

You can set the monitor type for a graphics adapter by typing the following:

```
Configuration Menu: Enter command > monitor graphics(n) tt [Enter]
```

where *n* is the number of the graphics adapter and *tt* is the monitor type.

To display a list of supported monitors that are used by a graphics card, type the following:

```
Configuration Menu: Enter command > monitor list [Enter]
```

A list of valid monitor types similar to the following is displayed.

NOTE Each graphics adapter will have a different list of valid monitor types. The meaning of any monitor type will therefore differ for each graphics adapter.

```
MONITOR INFORMATION

Path       Slot Head Type    Size    Freq Class
----       ---- ---- ----  --------- ---- -----
GRAPHICS(7)  7    1    1   1280x1024 75Hz PCI
GRAPHICS(7)  7    1    2   1280x1024 75Hz PCI, Double buffered
GRAPHICS(7)  7    1    3   1280x1024 75Hz PCI, Greyscale
GRAPHICS(7)  7    1    4   1280x1024 75Hz PCI, Double buffered, Greyscale
GRAPHICS(7)  7    1    5   1280x768  75Hz PCI
GRAPHICS(7)  7    1    6    800x600  75Hz PCI
GRAPHICS(7)  7    1    7    640x480  75Hz PCI
GRAPHICS(7)  7    1    8   1600x1200 75Hz PCI
GRAPHICS(7)  7    1    9   1600x1200 75Hz PCI, Greyscale
GRAPHICS(7)  7    1   10   1200x1600 75Hz PCI
GRAPHICS(7)  7    1   11   1200x1600 75Hz PCI, Greyscale
GRAPHICS(7)  7    1   12   1280x1024 72Hz
GRAPHICS(7)  7    1   13   1280x1024 72Hz Double buffered
GRAPHICS(7)  7    1   14    640x480  60Hz
GRAPHICS(7)  7    1   15   ---------- user defined -----------

Configuration Menu: Enter command >
```

To set the monitor type for `GRAPHICS(7)` to monitor type 8, type the following:

```
Configuration Menu: Enter command > monitor graphics(7) 8 [Enter]
```

This will take effect on the next reboot or reset of the workstation.

```
MONITOR INFORMATION
   Path    Slot   Head   HPA       Resolution  Freq  Type  Class
------------ --------  -------- ------------  ----------------  -------  -------  -------
GRAPHICS(7) 7    1   fffa000000  1600x1200  75Hz  8     PCI
```

The new monitor selection will either take effect the next time you reboot the workstation if this is a non-console monitor, or immediately if this is a console monitor. The boot console also displays the new monitor information.

Trying to change the monitor type to a number not listed for that graphics device fails and gives you the following warning message:

```
Value of monitor type n out of range (n - nn)
```

NOTE Changing the monitor type on an empty slot works; the monitor type will be saved for a future graphics card.

Setting the Monitor Type at Power On

If you replace a workstation's monitor with a different monitor type, and do not set the workstation's graphics parameters by using the monitor command before doing so, you may need to perform the following if your screen is blank.

Cycle the power to the workstation. Wait 2 seconds after the Num Lock light flashes near the end of the boot sequence, and then press [Tab] to initiate the automatic monitor selection process. If the screen remains blank after two minutes, however, see the "Troubleshooting Monitor Problems" subsection on the next page.

NOTE It takes approximately one minute after powering on the workstation before the Num Lock light flashes.

The system cycles through the available monitor types one at a time. When you see a message similar to the following, and it is the correct monitor type, select the monitor type by pressing [Enter]:

```
MONITOR INFORMATION
   Path    Slot   Head   Type      Size        Freq  Type  Class
------------ --------  -------  ------------  -----------------  -------  -------  -------
GRAPHICS(7) 7     1      n        nnnnxnnnn    nnHz     8    PCI
Press [RETURN] to select this monitor type (type n of n types)
```

The system queries you to confirm your selection. Press Y (yes) to save this monitor type.

If you press any key other than Y, the following message is displayed:

```
Monitor type not saved.
```

At this point, the new monitor type is active, but not saved. Because you did not save the monitor type, the next time you reboot the workstation the original monitor type will be used.

Next, the following message is displayed:

```
To select a new Graphics Monitor Type press the <TAB> key now, otherwise
EXIT by entering any other key (or will time out in 15 seconds)...
```

To restart the monitor selection process, press [Tab].

Troubleshooting Monitor Problems

In the event that the console stops displaying to the graphics device, use the following procedure to set the console for displaying to an external terminal:

1. Turn off the workstation's power.
2. Disconnect the USB keyboard connector from the rear panel.
3. Connect a serial terminal emulator to the Serial 1 connector (the left serial connector) on the rear panel. Configure the terminal for: 9600 baud, No Stop Bits, No Parity, and 8 Bits.
4. Power on the workstation. The system will now display the console to the terminal connected to Serial 1 port. Note that you can use a 9-pin to 9-pin serial cable (HP Part Number F1044-80002) to connect an HP OmniBook serial port to the workstation.
5. Set the monitor type and path using the Boot Console Handler.

Changing the Console to an External Terminal

In the event that the console stops displaying to the graphics device, use the following procedure to display the console to an external Serial terminal so that you can configure the graphics console:

1. Turn off the workstation's power.
2. Disconnect the USB keyboard connector from the rear panel.
3. Connect a Serial terminal to the Serial 1 connector (the left serial connector) on the rear panel. Configure the terminal for: 9600 baud, No Stop Bits, No Parity, and 8 Bits.
4. Power on the workstation.

The workstation will now display the console to the terminal connected to the Serial 1 port.

Displaying the Current Memory Configuration

The following sample screen output uses the memory command to show a memory configuration table with properly-installed and configured memory.

To display the current memory configuration for a workstation, first follow the directions in “Accessing the Boot Console Handler” on page 150. Once you are in the Boot Console Handler’s Main Menu, type the following:

```
Main Menu: Enter command > information [Enter]
```

This places you in the Information Menu. From here, type the following:

```
Information Menu: Enter command > memory [Enter]
```

The screen displays status and configuration information for the memory DIMMs installed in the workstation. The following sample shows the memory information when memory DIMMs are properly installed and configured.

```
MEMORY INFORMATION


  MEMORY STATUS TABLE

  Slot    Size    Status
  ----   ------   -------------
    0     256MB   Active
    1     256MB   Active
    2     256MB   Active

  TOTAL MEMORY = 768MB


  MEMORY FAULT TABLE

  Slot    Size    Status
  ----   ------   -------------


   Active, Installed Memory          : 768MB of SDRAM
   Deallocated Pages                 : 0 Pages
                                       -----------
   Available Memory                  : 768MB

   Good Memory Required by OS        :          0 (Not Initialized)

         Memory
   HVERSION  SVERSION
   -------- ----------
    0x0860   0x0900
```

Displaying the Status of the I/O Slots

The IO command lets you identify all built-in I/O devices and optional I/O devices installed in the option slots. It is available in the Information Menu.

To use the IO command from the Information Menu of the Boot Console Handler, type the following:

```
Information Menu: Enter command > io [Enter]
```

Information about the built-in and optional I/O devices is displayed. For example:

```
I/O MODULE INFORMATION

                                                                IODC  IODC
Path          Decimal     Type          Location  HVER  SVER  Vers  Dep
----          -------     ----          --------  ----  ----  ----  ---
LAN           10/0/12/0   Ethernet      built-in  0060  a200  0x02  0x00
AUDIO         10/0/13/0   Audio         built-in
IDE           10/0/14/0   IDE           built-in  0060  a300  0x00  0x00
SUPERIO MISC  10/0/14/0   Bridge Device built-in
FLOPPY        10/0/14/1/0 Floppy Disk   built-in
SERIAL_1      10/0/14/1/1 RS232 port    built-in  0060  8c00  0x01  0x00
SERIAL_2      10/0/14/1/2 RS232 port    built-in  0060  8c00  0x01  0x00
PARALLEL      10/0/14/1/3 Parallel port built-in
USB           10/0/14/2   USB           built-in  0060  a900  0x95  0x00
SCSI          10/0/15/0   SCSI          built-in  0060  a300  0x00  0x00
FWSCSI        10/0/15/1   SCSI          built-in  0060  a300  0x00  0x00
GRAPHICS(2)   10/6/2/0    Display       slot 2    0070  8500  0x01  0x00

Main Menu: Enter command >
```

Setting the Auto Boot and Auto Search Flags

The auto boot and auto search flags are variables stored in the system's non-volatile memory. (Non-volatile memory retains its contents even after power is turned off.) If you reset these flags to new values, the change takes effect the next time you reboot the workstation.

To examine the state of the auto boot and auto search flags, type the following:

```
Configuration Menu: Enter command > auto [Enter]
```

If auto boot is set to on, the workstation automatically attempts to boot the operating system when powered on. If auto boot is set to off, the workstation enters the boot administration mode of the Boot Console Handler.

The state of the auto search flag determines how the workstation seeks a boot device during autoboot. If auto search is set to on, the workstation will search for other boot devices if the primary boot device is not available. If auto search is off, the workstation will default to the boot administration mode if it can't see the primary boot device.

To change the state of the auto boot or auto search flags, type either:

```
Configuration Menu: Enter command > auto boot state [Enter]
```

OR:

```
Configuration Menu: Enter command > auto search state [Enter]
```

where *state* is on or off.

Displaying and Setting the Security Mode

The secure flag is a variable stored in non-volatile memory. (Non-volatile memory retains its contents even after power is turned off.) If you reset this flag to a new value, the change takes effect the next time you reboot the workstation.

When the secure flag is set to on, auto boot and auto search are enabled and cannot be stopped. The workstation boots from the default boot paths regardless of user intervention.

To display the current setting for the secure flag, type the following:

```
Configuration Menu: Enter command > secure [Enter]
```

To set the secure flag on, type the following:

```
Configuration Menu: Enter command > secure on [Enter]
```

To set the secure flag off, you need to disconnect all possible boot devices to interrupt the boot sequence and force the prompt to the Boot Console Handler. Next, type the following:

```
Configuration Menu: Enter command > secure off [Enter]
```

Displaying and Setting Fastboot Mode

When `fastboot` is enabled (set to `on`), the workstation does a quick check of the memory and skips some processor selftests during its power-on selftests. This enables the workstation to complete its boot process quicker. The default factory setting is for `fastboot` to be enabled (set to `on`).

When `fastboot` is disabled (set to `off`), more extensive memory and processor testing is performed during the selftests, causing the boot process to take longer.

If you are experiencing difficulty in booting the workstation, set `fastboot` to `off` and reboot the system. The more extensive testing may reveal the error condition.

To display the status of `fastboot`, type the following:

```
Configuration Menu: Enter command > fastboot [Enter]
```

To disable `fastboot`, type the following:

```
Configuration Menu: Enter command > fastboot off [Enter]
```

To enable `fastboot`, type the following:

```
Configuration Menu: Enter command > fastboot on [Enter]
```

Displaying the LAN Station Address

It is sometimes necessary to supply the LAN station address of the workstation to other users. For example, if the workstation is to become a member of a cluster, the cluster administrator needs to know the LAN station address in order to add the workstation to the cluster.

A LAN station address is the label that uniquely identifies the LAN connection for the workstation at the link level (the hardware level).

To display the workstation's LAN station address, type the following:

```
Information Menu: Enter command > lanaddress [Enter]
```

The LAN station address is displayed as a twelve-digit number in hexadecimal notation, similar to the following:

```
LAN Station Addresses:        001083-000429
```

The address is for the workstation's built-in LAN interface.

Displaying System Information

The `all` command allows you to display the system's processor revision and speed, cache size, memory size, flag settings, and the boot and console paths. To display system information, from the Information Menu type the following:

```
Information Menu: Enter command > all [Enter]
```

This information is paged to allow you to view it as necessary, unless the `ScRoll` command has been used to disable scrolling.

Displaying PIM Information

The `pim` command allows you to display the most recent PIM information for the specified fault type. To display PIM information for a specific fault, from the Service Menu, type the following:

```
Service Menu: Enter command > pim processor_number fault_type [Enter]
```

Stable Storage

Stable storage is non-volatile memory associated with the PA-RISC processor module. Stable storage is used by the processor (CPU) to store:

- Device path information
- The state of the boot flags
- HPMC error information
- Operating system initialization data

ISL Environment

The ISL environment provides the means to load the operating system (HP-UX) environment. The ISL environment also provides an offline platform to execute optional diagnostic and utility programs from a boot device when HP-UX does not load.

The ISL program is the first program loaded into main memory from an external medium (LAN, disk, or tape) and launched by the initial program loader (IPL) routine from the Boot Administration environment.

The ISL environment provides the following capabilities:

- Execute user-entered commands to modify boot device paths and boot options in stable storage.
- Run offline diagnostic programs and utilities.
- Provide automatic booting of the HP-UX operating system after power-on or reset.

Invoking ISL from the Boot Console Handler

Perform the following steps to invoke ISL from the Boot Console Handler:

1. Follow the directions in “Accessing the Boot Console Handler” on page 150, and then type the following at the prompt:

   ```
   Main Menu: Enter command > boot device [Enter]
   ```

   You are prompted:

   ```
   Interact with ISL (Y or N) > y [Enter]
   ```

2. Answering yes (`y`) causes the ISL to be loaded from the specified device. After a short time, the following prompt appears on the screen:

   ```
   ISL>
   ```

   ISL is the program that actually controls the loading of the operating system. By interacting with ISL, you can choose to load an alternate version of the HP-UX operating system.

   For example, if the usual kernel (`/stand/vmunix`) on the root disk has become corrupted, and you wish to boot the workstation from the backup kernel (`/stand/vmunix.prev`), type the following at the `ISL>` prompt:

   ```
   ISL> hpux /stand/vmunix.prev [Enter]
   ```

ISL User Commands

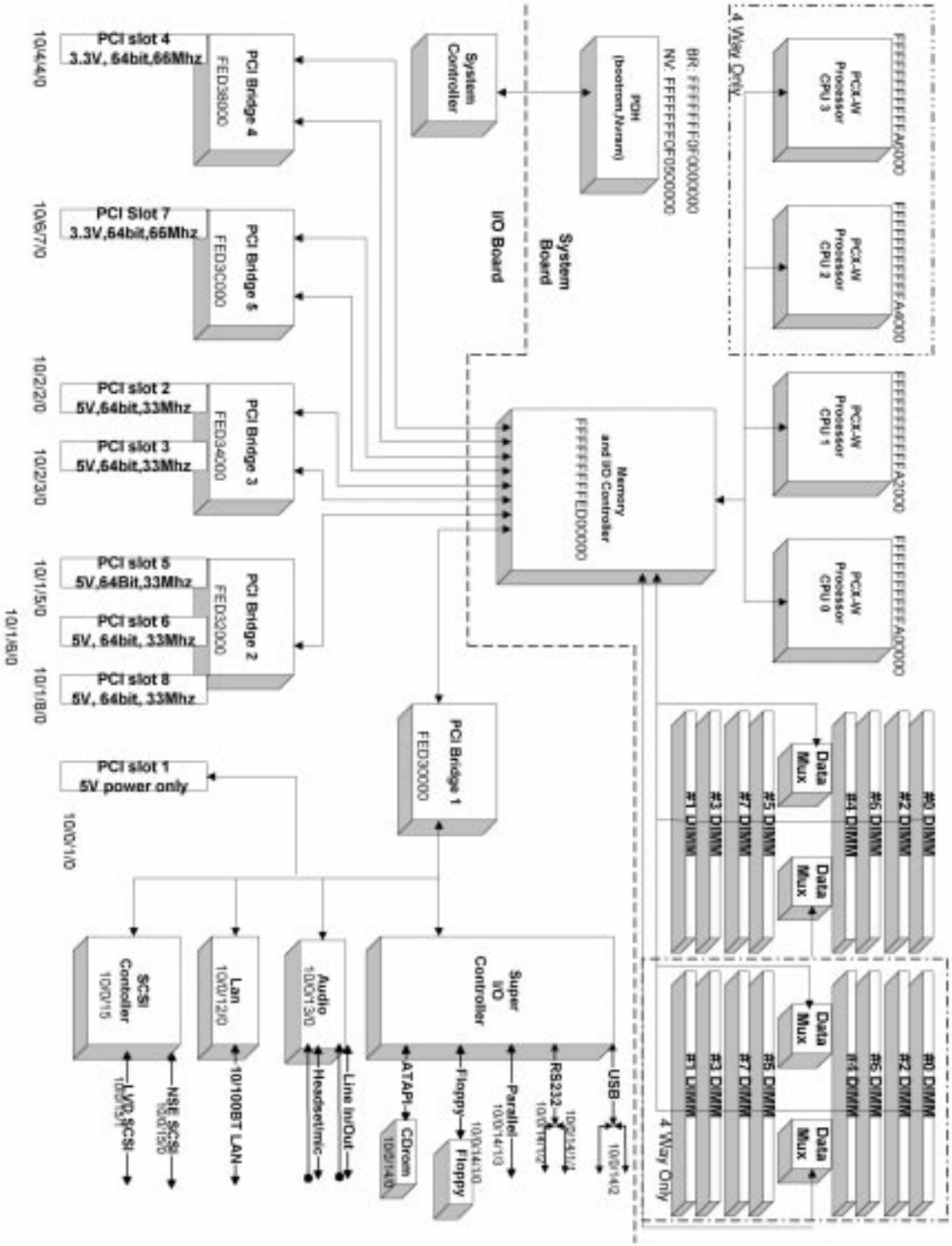
The following commands that are available in the ISL environment allow you to display and modify the boot characteristics of the system.

- `help` - lists ISL command menu and available utilities.
- `display` - displays the boot and console paths in Stable Storage and the current setting of the ISL Boot Flags.
- `primpath` - modifies the primary boot path entry in Stable Storage. The entry in Stable Storage for the primary boot device begins at byte address 0 and ends at 31.
- `altpath` - modifies the alternate boot path entry in Stable Storage. The entry for the alternate boot device begins at byte address 128 and ends at 159.
- `conspath` - modifies the console path entry in Stable Storage. The entry in Stable Storage for the console device begins at byte address 96 and ends at byte address 127. The entry for the keyboard and mouse devices begins at byte address 160 and ends at 191.
- `listautofl` or `lsautofl` - lists the contents of the (HP-UX) autoboot file.
- `support` - boots the Support Tape from the boot device.
- `readss` - displays 4 bytes (one word) from Stable Storage. The `readss` command requires a decimal number between 0 and 255 to address four bytes in Stable Storage.

6 Block Diagram

This chapter contains the system block diagram for the J5xxx/J7xxx workstations.

Figure 6-1. Block Diagram of the J5xxx/J7xxx Workstations



A Specifications

This appendix lists the environmental and electrical specifications for the HP VISUALIZE J5xxx and J7xxx workstations.

Environmental Specifications

Altitude

Operating: 0–10,000 ft (0–3,000 m) @ 0 to +45˚ C

Non-operating: 15,000 ft (0–4,500 m) @ –40 to +70˚ C

DC Magnetic Field Interference

Operating: <1 Gauss at surface of product

Non-operating: <2 milli Gauss @ 7 feet

Electromagnetic Interference (EMI)

Emissions: FCC Class B CISPR B

Electrostatic Discharge

Air discharge: 8kV

Contact discharge: 4kV

Temperature

Operating: 0 to +45˚ C

Non-operating: –40 to +70˚ C

Humidity (Non-condensing)

Operating: 15 to 80%, 26˚ C max wet bulb for removable media

Non-operating: 0 to 90%

Leakage Current

Less than 3.5 mA

Shock

Operating: 20g at 3ms, 1/2 sine in normal axis with no hard errors

Non-operating: 80g at 3ms, 1/2 sine, normal axis

Vibration

Operating random: 0.21 G_{rms}, 5–500 Hz

Swept sine survival: 0.5 g peak, 5–500 Hz

Random survival: 2.09 G_{rms}, 5–500 Hz

Electrical Specifications

Input Power

- **J5xxx:**
  - — 14.2 Amps RMS max @ 100–120V
  - — 7.1 Amps RMS max @ 220–240V
- **J7xxx**:
  - — 19.4 Amps RMS max @ 100–120V
  - — 9.7 Amps RMS max @ 220–240V

Line Power

	J5xxx	J7xxx
AC Frequency:	47–63 Hz	47–63 Hz
AC Voltage:	90–132 VAC	198–264 VAC
Maximum Power Input:	1,277 Watts	1,928 Watts
Maximum Current:	12 Amps	16 Amps

B Regulatory and Safety Information

This appendix lists the regulatory requirements, as well as the regulatory and safety statements, for the HP VISUALIZE J5xxx and J7xxx workstations.

Regulatory Requirements

This section lists the regulatory requirements met by the J5xxx and J7xxx workstations.

Product Safety

Canada	cUL listing to CSA 22.2 No. 950
Europe	EN 60950 (with Nordic deviations), TUV GS Mark Low Voltage Directive 73/23/EEC and 93/68/EEC
ISE (Eastern European countries)	CB Report to IEC 950=+A1+A2+A3+A4
U.S.A.	UL 1950 certification
Singapore	PSB

Ergonomics

- German ZH1-618 requirements for color, reflectivity, and gloss
- TUV GS mark

Electromagnetic Interference (EMI) Regulatory Compliance

- FCC 47 CFR, part 15 subpart J, Class B
- VCCI Class B
- CISPR 11/EN 55011, CISPR 22/EN 55022

Electromagnetic Compatibility (EMC) Regulatory Compliance

- EN 50082-1:1992
- AS/NZS 2064.1/2:1992, 3548:1995, 4252.1:1994 (Australia/New Zealand)
- EN 61000-4-2, 4-3, 4-4, 3-2:1995 +A13:1997, 3-3:1995

Regulatory and Safety Statements

This section lists the regulatory and safety statements for the J5xxx and J7xxx workstations.

Declaration of Conformity

Declaration of Conformity

according to ISO/IEC Guide 22 and EN 45014

Manufacturer: Hewlett-Packard Company
3404 East Harmony Road
Fort Collins, CO 80528
USA

Declares that the

Product Name: HP VISUALIZE Workstation
Product Class: J Class
Product Options: all

conforms to the following specifications:

Safety
IEC 950:1991+A1+A2+A3 +A4 / EN 60950:1992+A1+A2+A3+A4 +A11
IEC 60825-1:1993/EN60825-1:1994+A11 Class 1 for LEDs
USA 21CFR Subpart J - for FC Laser module
China GB4943-1995
Russia GOST R 50377-92

EMC
CISPR 11: 1997 / EN 55011: 1998 Class B
CISPR 22: 1993+A1+A2 / EN 55022: 1994+A1+A2 Class B
EN 50082-1:1992
Also compliant with…
IEC 1000-3-2:1994 / EN 61000-3-2:1998
IEC 1000-4-2:1995+A1 / EN 61000-4-2:1999 - 4 kV CD, 8 kV AD
IEC 1000-4-3:1995 / EN 61000-4-3:1996 - 10 V/m
IEC 1000-4-4:1995 / EN 61000-4-4:1995 - 2 kV Signal, 4 kV Power Lines
Australia/New Zealand AS/NZS 2064.1/2:1992, AS/NZS 3548:1995, and AS/NZS 4251.1:1994
China GB9254-1988
Japan VCCI Class B
Russia GOST R 29216-94
Taiwan CNS13438 Class A
US FCC Part 15, Class B

and is certified by:

UL Listed to UL1950, 2nd edition, File E146385
cUL Listed to CSA 22.2 No.950-M93
TÛV Certified to EN60950 2nd edition with A1+A2+A3+A4+A11
HP Fort Collins CCQD HTC

supplementary information:
The product herewith complies with the requirements of the following Directives and carries the CE marking accordingly:
- the EMC directives 89/336/EEC, 92/31/EEC, and 93/68/EEC
- the Low Voltage Directives 73/23/EEC and 93/68/EEC

This product was tested in a typical Hewlett Packard workstation configuration.

Ruth Lutes, Site Quality Manager Fort Collins, CO, USA

For Compliance Information ONLY, contact:
European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department HQ-TRE Standards Europe, Herrenberger Straße 130, D-71034 Böblingen (FAX: +49-7031-14-3143)

Americas Contact: Hewlett-Packard, Fort Collins Site Quality Manager, mail stop 64, 3404 E. Harmony Rd., Ft. Collins, CO 80528, USA

Emissions Regulations

Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules and the Canadian Department of Communications. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception (determined by turning the equipment off and on), you can correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Ask the dealer or an experienced radio/television technician for help.

Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and HP shielded cables, such as those you receive with your computer. Changes or modifications not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment.

Operation of this device is subject to the following conditions:

- This device may not cause harmful interference.
- This service must accept interference received, including interference that may cause undesired operation.
- Cables used with this device must be properly shielded to comply with the requirements of the FCC.

Special Video Configuration Statement

The following statement applies only to those applications which include a cable connected to the S-Video connector on the A248A card. No modification to the regulatory statements is necessary for applications which include cables connected to other connectors on the card but not to the S-Video connector.

For EN55022 or CISPR 22 Applications:

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

VCCI Class 2 ITE

Figure B-1. EMI Class A RRL (Korea)

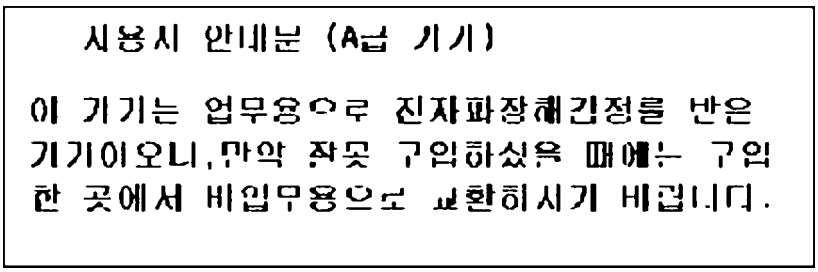


Figure B-2. VCCI Class B ITE (Japan)

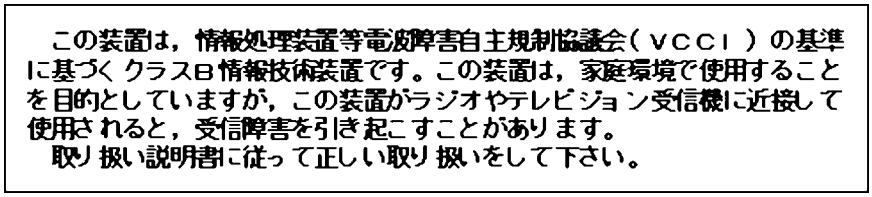
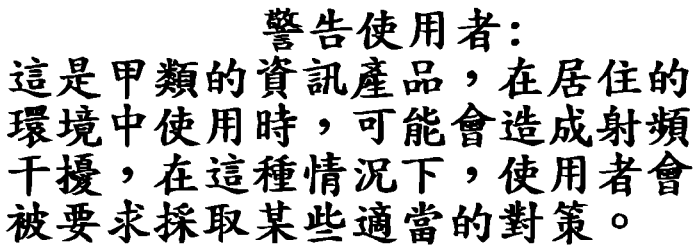


Figure B-3. EMI Class A (Taiwan)



Emissions Regulations Compliance

Any third-party I/O device installed in HP system(s) must be in accordance with the requirements set forth in the preceding Emissions Regulations statements. In the event that a third-party non-compliant I/O device is installed, the customer assumes all responsibility and liability arising therefrom.

Acoustics

Regulation On Noise Declaration for Machines -3. GSGV

Lpa <70dB	Lpa <70dB
operator position	am Arbeitsplatz
normal operation	normaler Betrieb
per ISO 7779	nach DIN 45635 T

Laser Safety Statement (U.S.A. Only)

(For workstations that have a CD ROM drive installed.)

The CD ROM mass-storage system is certified as a Class-1 laser product under the U.S. Department of Health and Human services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968.

This means that the mass-storage system does not produce hazardous laser radiation. Because laser light emitted inside the mass-storage system is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

Electrostatic Discharge (ESD) Precautions

Electrostatic charges can damage the integrated circuits on printed circuit boards. To prevent such damage from occurring, observe the following precautions when unpacking and installing the board.

- Stand on a static-free mat.
- Wear a static strap to ensure that any accumulated electrostatic charge discharges from your body to ground.
- Connect all equipment together, including the static-free mat, static straps, routing nodes, and peripheral units.
- Keep uninstalled printed circuit boards in their protective antistatic bags.
- Once you have removed printed circuit boards from their protective antistatic bags, handle printed circuit boards by their edges only.

Warnings

WARNING:

Removing the device cover may expose sharp edges in the equipment chassis. To avoid injury, use care when installing customer add-on devices.

WARNUNG:

Das Entfernen der Geräteabdeckung legt die scharfen Kanten im Inneren des Gerätes frei. Um Verietzungen zu vermeiden, seien Sie vorsichtig beim Einbau von zusätzlichen Bauteilen, die vom Kunden selber eingebaut werden können.

AVERTISSEMENT:

Des bords tranchants du châssis de l'équipement peuvent être exposés quand le cache de l'unité n'est pas en place. Pour éviter des blessures, faire très attention lors de l'installation de modules supplémentaires par le client.

WARNING:

Disconnect the power plug from the wall outlet or power source before moving or removing the device, or installing add-on components.

WARNUNG:

Entfernen Sie die Stromzuführung von der Steckdose oder der Stromquelle bevor Sie das Gerät bewegen, abbauen, oder zusätzliche Bauteile installieren.

AVERTISSEMENT:

Débrancher la fiche de la prise de courant ou de la source d'alimentation électrique avant de déplacer ou de retirer l'unité, ou avant d'installer des modules supplémentaires.

C SCSI Connections

This appendix provides information about connecting SCSI (Small Computer System Interface) devices to an HP VISUALIZE J5xxx or J7xxx workstation.

Appendix Overview

This appendix contains the following main sections:

- SCSI Bus Differences
- SCSI Restrictions
- SCSI Bus Length Constraints
- Assigning SCSI Device IDs
- Connecting to the SCSI Ports

NOTE When attaching external SCSI devices, be sure to terminate the last device on each external SCSI bus. (Terminators are included in a small plastic bag shipped with the workstation.) If there are no external SCSI devices, the terminators must be installed directly on the connectors on the rear panel.

SCSI Bus Differences

A SCSI (Small Computer Systems Interface) bus is an IEEE standard bus for connecting a workstation to internal and external SCSI devices running at different speeds. There may be one device connected to the external SCSI port, or several SCSI devices may be daisy-chained together and connected to the external SCSI port. Examples of these SCSI devices are 4 mm DDS-format tape drives, CD ROM drives, and hard disk drives.

There are two types of SCSI buses available with the J5xxx and J7xxx workstation: a Narrow Single-Ended SCSI-2 bus (NSE), and an Ultra2 Wide Low Voltage Differential SCSI bus (LVD). The following table shows the specification differences between these two SCSI buses.

CAUTION Do *not* connect NSE SCSI devices to the LVD SCSI connector, or vice versa, because damage may occur. Currently Hewlett-Packard does not support mixing NSE and LVD devices on the same SCSI bus.

Table C-1. SCSI Bus Differences

SCSI Type	Transfer Rate	Data Bus Width	Maximum Addresses[1]	Maximum Cable Length	Device Physical Location[2]
NSE	Up to 20 MB/sec	8 bits	0 through 6	3.0 meters (9.84 feet)	Internal and external
LVD	Up to 80 MB/sec	16 bits	0 through 6; 8 through 15	12 meters (39.37 feet)	Internal and external

[1] Address 7 is reserved for host controller use on all buses.

[2] This information is specific to the HP VISUALIZE J5xxx and J7xxx workstations.

SCSI Restrictions

This section describes the SCSI restrictions that apply to the J5xxx and J7xxx workstations in the following areas:

- Cables
- Terminators
- SCSI configuration constraints

NOTE The NSE SCSI bus supports only 7 devices because address 7 is reserved by the system. Similarly, the LVD SCSI bus supports only 15 devices because address 7 is reserved by the system.

Cables

Only SCSI cables approved by HP can be used to connect a J5xxx or J7xxx workstation to SCSI devices. HP offers the following SCSI cables for NSE SCSI devices:

- 1.0 meter (3.281 feet) cable (HP Product Number C2908A)
- 1.5 meter (4.922 feet) cable (HP Product Number C2956A)

HP offers the following SCSI cables for LVD SCSI devices:

- 0.5 meter (1.64 feet) cable (HP Product Number C2978A)
- 1.5 meter (4.922 feet) cable (HP Product Number C2979A)

CAUTION SCSI cables approved by HP are designed to function within the SCSI tolerances for HP devices. Use of other cables can result in significant problems with system operation.

Always use the shortest possible cable(s) for a configuration.

NOTE See “SCSI Bus Length Constraints” on page 194 to determine the total length of SCSI cables.

Terminators

The terminators for NSE and LVD SCSI are different. The NSE terminator has 50 pins and will fit on an NSE connector only. The LVD terminator has 68 pins and will fit on an LVD connector only. The following SCSI terminators are shipped with the J5xxx and J7xxx workstation:

- 50-pin NSE terminator (HP Product Number A1658-63012)
- 68-pin LVD terminator (HP Product Number A4986-63008)

NOTE It is necessary to put a terminator on unused SCSI connectors on the rear panel of the workstation. Also, a SCSI device attached to the SCSI bus, or the last external device connected to the SCSI bus, must be terminated with a SCSI terminator.

SCSI Configuration Constraints

The number of SCSI devices per bus is limited (see Table C-1 earlier in this appendix). Before adding another SCSI device, determine if the system can support the additional device.

SCSI Bus Length Constraints

This section discusses SCSI bus lengths constraints for the NSE and LVD SCSI buses.

NSE SCSI Bus Length

The maximum cable length for an NSE SCSI bus is 3 meters. The J5xxx and J7xxx workstation use a negligible amount of this maximum cable length.

NOTE When calculating the total NSE SCSI cable/bus/trace length used externally, remember to account for cables connecting external devices together as well as the bus length internal to those devices.

There are two total cable length specifications you need to consider when dealing with an NSE SCSI bus on a workstation. Note that these specifications are based on the requirement that the SCSI device being connected to the NSE SCSI bus does not exceed the maximum capacitance of 25 picofarads (pF). Please check with the vendor of the SCSI device if you are not sure of the device's maximum capacitance.

The total cable length specifications are as follows:

- For a total of one to four devices being connected to the NSE SCSI bus, the total length of cable used should not exceed 3.0 meters.
- For a total of five to eight devices being connected to the NSE SCSI bus, the total length of cable used should not exceed 1.5 meters.

NOTE The computer is counted as one of the devices, and the internal length of its cabling is .15 meters. This length needs to be considered in determining the total cable length.

LVD SCSI Bus Length

The maximum cable length for an LVD SCSI bus is 12 meters. The J5xxx and J7xxx workstation use 1 meter of this maximum cable length internally. This means that up to 11 meters of cable can be used for connecting external LVD SCSI devices to this workstation.

NOTE When calculating the total LVD SCSI cable/bus/trace length used externally, remember to account for cables connecting external devices together as well as the bus length internal to those devices.

Assigning SCSI Device IDs

Before assigning a SCSI device ID to a new SCSI device, you need to determine which SCSI device IDs are available. To view the SCSI IDs already in use, type the following command at the prompt and press [Enter]:

```
/usr/sbin/ioscan -f
```

After a few moments, the ioscan utility lists all of the I/O devices it could find. The list appears similar to the following:

```
Class       I  H/W Path       Driver    S/W State   H/W Type     Description
============================================================================
bc          0                  root      CLAIMED     BUS_NEXUS
bc          1  10              ccio2     CLAIMED     BUS_NEXUS    I/O Adapter
ba          0  10/0          ROPEtoPCI CLAIMED     BUS_NEXUS    PCI Bus Bridge
- ROPEtoPCI
graphics    0  10/0/1/0       graph3    CLAIMED     INTERFACE    PCI(103c1005)
lan         0  10/0/12/0      btlan3    CLAIMED     INTERFACE    PCI(10110019)
audio       0  10/0/13/0      audio     CLAIMED     INTERFACE    Built-in Audio
ext_bus     0  10/0/14/0      side      CLAIMED     INTERFACE    PCI(100b0002)
target      0  10/0/14/0.0    tgt       CLAIMED     DEVICE
disk        0  10/0/14/0.0.0  sdisk     CLAIMED     DEVICE       HITACHI
CDR-8435 CDROM
target      0  10/0/14/0.7    tgt       CLAIMED     DEVICE
ctl         0  10/0/14/0.7.0  sctl      CLAIMED     DEVICE       Initiator
ba          1  10/0/14/1      superio   CLAIMED     BUS_NEXUS    PCI Core I/O
Adapter
tty         0  10/0/14/1/1    asio0     CLAIMED     INTERFACE    Built-in
RS-232C
tty         1  10/0/14/1/2    asio0     CLAIMED     INTERFACE    Built-in
RS-232C
ext_bus     1  10/0/14/1/3    SCentIf   CLAIMED     INTERFACE    Built-in
Parallel Interface
pc          0  10/0/14/1/4    siofdc    CLAIMED     INTERFACE    Built-in
Floppy Drive
floppy      0  10/0/14/1/4.1  sioflop   CLAIMED     DEVICE
HP_PC_FDC_FLOPPY
usb         0  10/0/14/2      hcd       CLAIMED     INTERFACE    Built-in USB
Interface
usbhub      0  10/0/14/2.1    hub       CLAIMED     DEVICE       USB Root Hub
ext_bus     2  10/0/15/0      c720      CLAIMED     INTERFACE    Ultra2 Wide
SCSI Dual Port
target      1  10/0/15/0.7    tgt       CLAIMED     DEVICE
```

```
ctl         1  10/0/15/0.7.0  sctl      CLAIMED     DEVICE       Initiator
ext_bus     3  10/0/15/1      c720      CLAIMED     INTERFACE    Ultra2 Wide
SCSI Dual Port
target      2  10/0/15/1.6    tgt       CLAIMED     DEVICE
disk        0  10/0/15/1.6.0  sdisk     CLAIMED     DEVICE       SEAGATE
ST39102LC
target      3  10/0/15/1.7    tgt       CLAIMED     DEVICE
ctl         2  10/0/15/1.7.0  sctl      CLAIMED     DEVICE       Initiator
ba          2  10/1           ROPEtoPCI CLAIMED     BUS_NEXUS    PCI Bus Bridge
- ROPEtoPCI
ba          3  10/2           ROPEtoPCI CLAIMED     BUS_NEXUS    PCI Bus Bridge
- ROPEtoPCI
ba          4  10/4           ROPEtoPCI CLAIMED     BUS_NEXUS    PCI Bus Bridge
- ROPEtoPCI
ba          5  10/6           ROPEtoPCI CLAIMED     BUS_NEXUS    PCI Bus Bridge
- ROPEtoPCI
processor   0  32              processor CLAIMED     PROCESSOR    Processor
processor   1  34              processor CLAIMED     PROCESSOR    Processor
```

Assigning NSE SCSI Device IDs

You can determine which NSE SCSI devices are currently in use by looking under the `H/W Path` heading in the output from the `ioscan` command. The entry `10/0/15/0` is the built-in NSE SCSI bus. For devices connected to the built-in NSE SCSI bus, such as disks, the number between the two decimals and after the third "/" in the hardware path specifies the SCSI ID for that device. For example, a hardware path of `10/0/15/0.2.0` specifies an NSE SCSI device at SCSI ID 2. Here is the breakdown of the hardware path:

SCSI device `10/0/15/0.2.0`

NSE SCSI `10/0/15/0.2.0`

SCSI ID 2 `10/0/15/0.2.0`

CAUTION Do not use SCSI device ID 7 for any device. It is reserved for the built-in SCSI bus controller.

Assigning LVD SCSI Device IDs

You can determine which LVD SCSI devices are currently in use by looking under the `H/W Path` heading in the output from the `ioscan` command discussed previously. The entry `10/0/15/1` is the built-in LVD SCSI bus. For devices connected to the built-in LVD SCSI bus, such as disks, the number between the two decimals and after the third "/" in the hardware path specifies the SCSI ID for that device. For example, a hardware path of `10/0/15/1.5.0` specifies a LVD SCSI device at SCSI ID 5. Here is the breakdown of the hardware path:

SCSI device	`10/0/15/1.5.0`
LVD SCSI	`10/0/15/1.5.0`
SCSI ID 5	`10/0/15/1.5.0`

CAUTION Do not use SCSI device ID 7 for any device. It is reserved for the built-in SCSI bus controller.

Connecting to the SCSI Ports

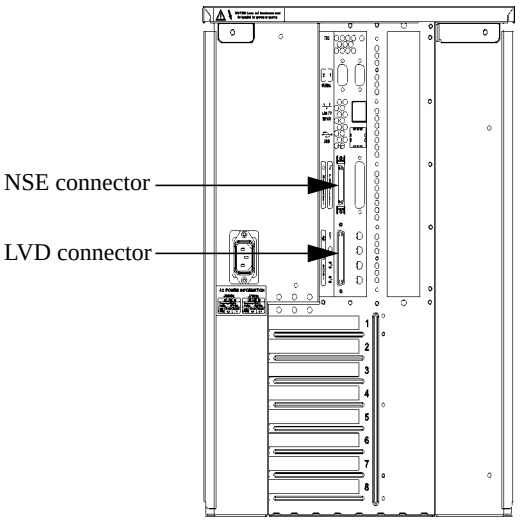
This section describes how to connect to the workstation's NSE and LVD SCSI ports.

The J5xxx and J7xxx workstation contains two SCSI connectors:

- Narrow Single-Ended SCSI-2 (NSE SCSI) connector
- Ultra2 Wide Low Voltage Differential SCSI (LVD SCSI) connector

The Figure C-1 shows the two SCSI connectors on the rear panel of the J5xxx and J7xxx workstation. SCSI cables connect to these ports with a high-density thumbscrew connector.

Figure C-1 SCSI Port Connections



NOTE It is necessary to put a terminator on either an unused SCSI connector on the rear panel of the workstation, or the last device connected to the SCSI bus. Terminators are shipped with the workstation. Be sure to use the NSE SCSI terminator for the NSE SCSI bus, and the LVD terminator for the LVD SCSI bus.

D Related Documentation

This appendix lists the part numbers and titles of documents related to the HP VISUALIZE J5xxx and J7xxx workstations.

Site Preparation Guide

- A4978-90220 – *HP VISUALIZE J5xxx/J7xxx Site Preparation Guide*

Owner's Guide

- A5991-90000 – *HP VISUALIZE J Class Owner's Guide*

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