Service Handbook

J Class Workstation

HP Part No. A2876–90041
Edition E0498

Update to Service Handbook J Class Workstation
HP Part No. A2876–90040

Hewlett–Packard Company

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Product Information 1

This chapter introduces the HP 9000 J Class workstation, including its controls and indicators. Included in this chapter are the following topics:

- Product description
- System unit controls
- Understanding the LED and LCD
- System unit rear panel connectors
- Monitor information
- Keyboard information
- Operating system overview

Product Description

This workstation contains the following key features:

- Operating System: Native HP-UX
  J280/282 requires version 10.20 and later
  J2240 requires version 10.20 ACE (Feb 1998) plus J2240 Hardware Extensions
- User Interface:
  HPVUE graphical user interface
  HPCDE graphical user interface
- Compatibility: Source and binary code compatible with the Series 700 product family
- Monitors:
  – 20-inch 1280x1024 color monitor
- Optional Graphics:
  – Fast 2D color graphics; choice of 1 or 2 head
  – HCRX-8/HCRX-24 Fast 8-plane or 24-plane graphics
  – HCRX-8Z/HCRX-24Z Accelerated 8-plane or 24-plane graphics
  – CRX-48Z 24-plane Accelerated, double-buffered graphics
  – HP VISUALIZE–FX2, FX4, FX6 (J2240 only)
- Main Memory:
  – 32 MB to 2 GB (J282) for systems running HP-UX 10.20 or later
  – 32 MB to 3.3 GB (J2240 only, 32 MB to 4 GB with HP–UX 11.x only)

- Internal Storage Devices:

  – Ultra, Wide–SE SCSI Hard Disk Drives – up to two (J2240 only)
    4.0 GB Drive
    9.0 GB Drive
  – Fast, Wide SCSI Hard Disk Drives – up to two:
    1.0 GB Drive
    2.0 GB Drive
  – Single-Ended SCSI Removable Media – up to two
    CD-ROM Drive
    2.0–8.0 GB, 4-mm DDS Tape Drive
    SCSI Floppy Drive

- Standard Network:

  – Ethernet IEEE 802.3 AUI Thicknet
    or
  – RJ45, UTP Twisted Pair
  – 10 BaseT/100 BaseT (J2240 only)

- Standard I/O:

  – One Narrow Single–Ended SCSI: 8-bit (for removable devices)
    5 MB/sec synchronous,1.5 MB/sec asynchronous ALT-1, 50-pin, high density SCSI-2 connector
  – One Fast,Wide Differential SCSI: 16–bit (for hard disk drives)
    20 MB/sec synchronous
    68-pin, high-density SCSI-3 P connector
  – One Ultra, Wide–SE SCSI: 16–bit (for hard disk drives, J2240 only)
    20 MB/sec synchronous
    68-pin, high-density SCSI-3 P connector
  – Two Serial Interfaces RS232C, 9-pin male
  – One Parallel Interface Centronics, BUSY handshake 25-pin female

- EISA/GSC/PCI: 5 slots total; 4 EISA and 3 GSC that can be used as follows:
  2 individual EISA, 1 individual GSC, and 2 combination EISA or GSC
  J2240: five slots total; one EISA (optional), three 32–bit PCI, two 64–bit PCI, and threeGSC that can be used as follows: one 32–bit PCI, one EISA or 32–bit PCI, one GSC or 32–bit PCI and two GSC or 64–bit PCI.

- Keyboards:

  – PS/2 Keyboard
    or
  – ITF Keyboard (also known as HP HIL)

System Unit Front Panel Controls

Figure 1–1 shows the location of the system unit front panel controls.

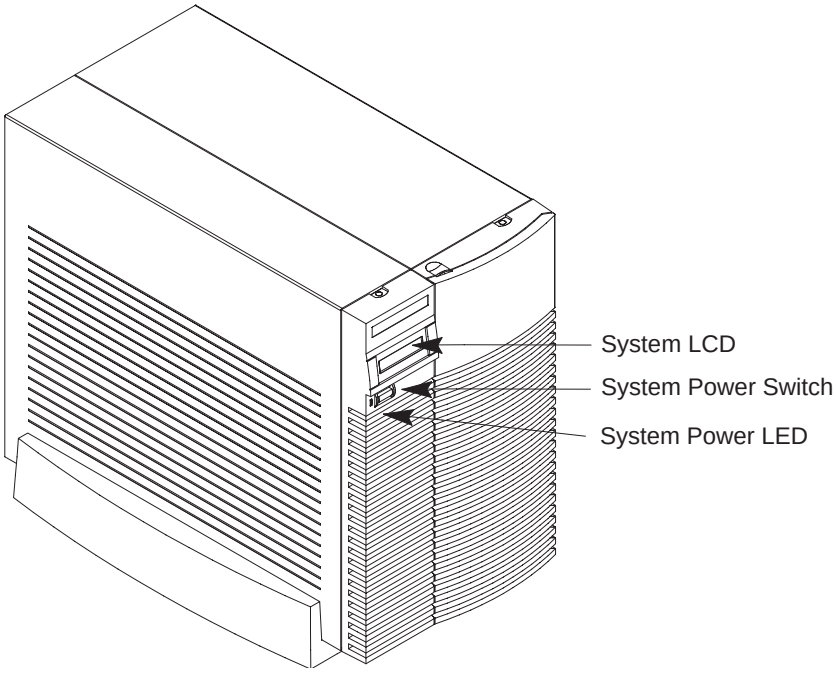


Figure 1–1. System Unit Front Panel Controls

System LCD

The Liquid Crystal Display (LCD) is located on the left side of the front panel. It displays messages about the state of the system, including error codes. The following symbols appear in the LCD representing the different system activities shown:

Operating system running

Disk Access in progress

Network Receive in progress

Network Transmit in progress

Figure 1–2. LCD Symbols

System Power Switch

Use the Power switch to power the system unit on and off.

CAUTION: **Do not** turn off the power to the workstation without first performing the recommended shutdown procedure. Not shutting down the workstation properly, can damage the programs and data on the disk.

Using the proper shutdown method for the workstation and operating system ensures that remote users receive shutdown notices, messages can be broadcast, or shutdown can be delayed for a specified number of minutes.

If this workstation is running HP-UX 10.20 or later, follow the instructions in *Using Your HP Workstation* to shut it down.

System Power LED

The Power Light Emitting Diode (LED) is located on the left side of the front panel. It lights when the system unit power is on and flashes until the OS is booted. Once the OS is booted, the LED remains on without flashing, indicating that a soft shutdown is enabled.

Storage Device Controls and Features

This workstation allows up to two of the following internal storage devices: CD-ROM drive, DDS tape drive, or floppy drive. The following sections describe the controls and features of these devices.

CD-ROM Drive

Figure 1–3 shows the operating controls and features of the CD-ROM drive, and Table 1–1 describes those controls and features.

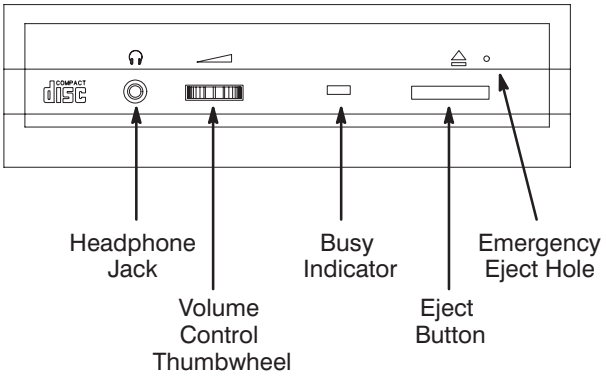


Figure 1–3. CD-ROM Drive Controls and Features

Table 1–1. CD-ROM Drive Controls and Features

Control/Feature	Purpose
Headphone Jack	Accommodates mini-headphones with a 3.5 mm diameter miniature stereo plug.
Volume Control	Adjusts the audio output volume to the headphone jack.
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 disc • A disc insertion error (for example, an upside-down disc) • No disc present
Eject Button	Press to open the Disc Tray and insert or remove a disc. When the drive is in use, press the eject button for more than one second to open the Disc Tray.
Emergency Eject	Remove the Phillips type screw and insert the end of a paper clip to open the Disc Tray when the workstation does not have power.
Disc Tray	Holds the CD-ROM disc. This style of CD-ROM drive does not use a disc caddy. The disc tray does not open if the workstation power is off.
NOTICE:	The Volume Control, Headphone Jack, and Audio Jack features of the CD-ROM drive are supported through applications only.

DDS Tape Drive

Depending on the configuration, this DDS drive may be a DDS-DC drive, a DDS–2 drive or a DDS–3 drive.

The DDS tape drive is a 3 1/2-inch form factor DDS tape drive with data compression and a SCSI interface. It conforms to the DDS format standard for storing computer data, and incorporates a data compression capability. It's a high-capacity, high transfer-rate device for data storage on tape.

Figure 1–4 shows the operating controls and features of the DDS tape drive.

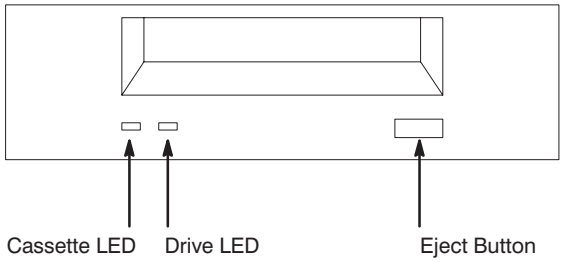


Figure 1–4. DDS Tape Drive Controls and Features

LEDs – DDS-DC Drive

The front panel has two colored LEDs: the Cassette Light and the Drive Light. A **green** light indicates normal operation, and an **amber** light indicates a warning condition. Pulsing shows activity between the drive and the SCSI bus.

If the Cassette Light (left LED) shows steady amber, it means that the cassette is write–protected. If the Drive Light (right LED) shows steady amber, this indicates a fault condition. Table 1–2 lists the LED codes and their meanings.

Table 1–2. LED Display Codes – DDS-DC Drive

Cassette Light	Drive Light	Meaning
		Cassette (un)loading
		Cassette loaded/online
		Cassette loaded/activity
		Cassette loaded/offline
Write–Protect States		
		Cassette (un)loading
		Cassette loaded/online
		Cassette loaded/activity
		Cassette loaded/offline
Error States		
		Media wear (caution)
		High humidity
		Self–test (normal)
		Self–test (failure)

Key

- OFF
- Green
- Amber
- Pulsing Green
- Pulsing Amber
- Pulsing Green and Amber

LED Warning Conditions – DDS–DC Drive

High Humidity – If the LEDs display the high humidity signal, the humidity is too high and the drive does not perform any operations until the humidity drops.

Self–Test (Failure) – If the LEDs display the self–test (failure) signal, a fault was diagnosed during the self tests. Note the pattern of the pulses and contact your local service representative.

Media Wear (Caution) – Hewlett–Packard DDS drives continually monitor the number of errors they have to correct when reading and writing to a tape to determine tape wear and tape head cleanliness. If excessive tape wear or dirty tape heads are suspected, the drive warns you by displaying the Media Wear (Caution) signal on the LED indicators.

If the LED indicators on your DDS–format drive display the Media Wear (Caution) condition, follow this procedure:

1. Check the system console for any tape error messages. A hard error during a read or write operation may have occurred.

2. Clean the heads with a cleaning cassette (HP92283K) as described in the “Cleaning the Tape Heads” section, later in this chapter.

3. Repeat the operation you performed when the Media Wear (Caution) signal displayed. If the Media Wear (Caution) signal still displays, then the data cassette should be replaced.

4. If you are performing a backup from disk to tape, discard the data cassette and back up your files using a new data cassette.

5. If you are performing a restore from tape to disk, complete the restore, then discard the data cassette and back up the files to a new data cassette.

LEDs – DDS-2, DDS–3

The front panel has two colored LEDs: the Tape Light and the Clean/Attention Light. The Tape Light flashes **green** to show activity (loading, unloading, reading, and writing). Steady green means a cartridge is loaded.

The Clean/Attention Light flashes **amber** to indicate head cleaning is needed or a cartridge is near the end of its life. Steady amber means a hard fault.

Table 1–3 lists the LED codes and their meanings.

Table 1–3. LED Display Codes – DDS-2, DDS–3 Drives

Tape Light	Clean/ Attention	Meaning
		Activity – load or unload
		Activity – read or write
		Cartridge loaded
Any		Cleaning needed
Any		Fault

Key	
	OFF
	Steady Green
	Steady Amber
	Flashing Green 1/2 sec on, 1/2 sec off
	Flashing Amber 1/2 sec on, 1/2 sec off
	Fast Flash Green 1/4 sec on, 1/4 sec off

Floppy Disk Drive

Figure 1–5 shows the operating controls and features of the floppy drive, and Table 1–4 describes those controls and features.

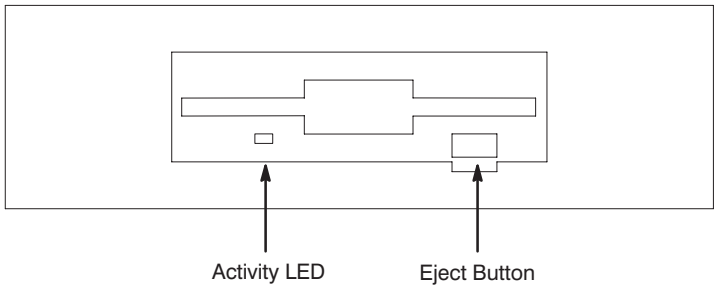


Figure 1–5. Floppy Drive Controls and Features

Table 1–4. Floppy Drive Controls and Features

Control/Feature	Purpose
Floppy Drive Eject Button	Push the eject button to remove floppy diskettes from the drive.
Floppy Drive Activity LED	The floppy drive LED flashes to indicate the drive is in use.

System Unit Rear Panel Connectors

This section describes the following connectors on the system unit's rear panel:

- Headphones connector
- Audio Mic connector
- Audio IN/OUT connectors
- PS2 keyboard and mouse connectors
- HP parallel Centronics I/O connector
- 802.3 AUI LAN connector
- 802.3 TP (Twisted Pair) LAN connector (100 BaseT J2240 only)
- RS-232C serial I/O connectors
- HP HIL keyboard connector
- Monitor connector
- SCSI connectors
- TOC button
- Power cord connector

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

Figure 1–6 shows the locations of the connectors on the system unit's rear panel.

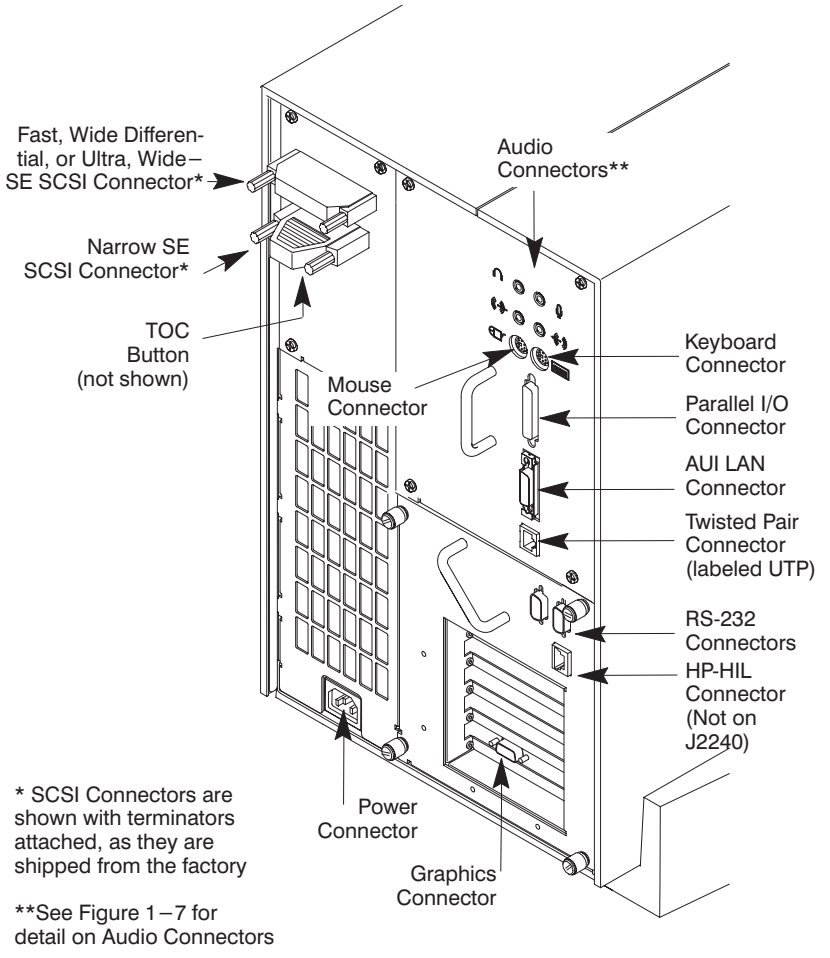


Figure 1–6. System Unit Rear Panel Connectors

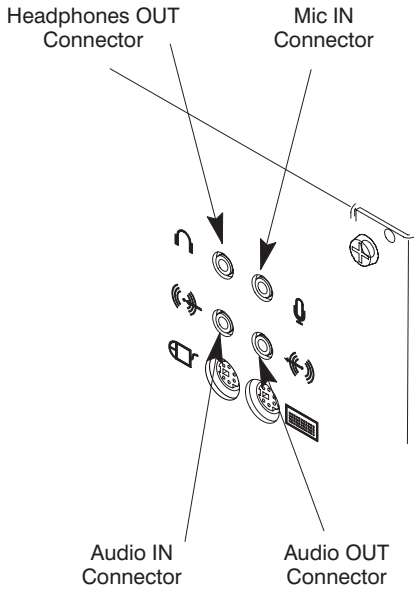


Figure 1–7. Audio Connectors

Audio Connectors

This workstation has audio input and output capability through external input and output connectors on the rear panel and through an internal speaker. The rear panel contains the Audio IN (Stereo line-in) and Mic (Mic-in), and Audio OUT (Stereo line-out) and Headphones (headphone-out) 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. The following is a summary of the workstation audio features:

- Audio Features

  Programmable sample rates:
  8kHz, 16kHz, 32kHz, 48kHz, 11.025kHz, 22.05kHz, and 44.1kHz.

  Programmable output attenuation:
  0 to –96dB in –1.5dB steps

  Programmable input gain:
  0 to 22.5dB in 1.5dB steps.

  Input monitoring:
  16-bit linear, 8-bit u-law, or A-law coding

- Audio Inputs — Line-in

  Mono microphone compatible with 1.5V phantom supply (bias voltage supplied by the system)

  CD-ROM audio (if internal CD-ROM is installed)
- Audio Outputs — Line-out
  Headphone
  Mono speaker jacks
  Built-in mono speaker
- Audio CODEC — Crystal CS4215

The audio electrical specifications for this workstation are summarized in Table 1–5.

Table 1–5. Audio Electrical Specifications

Frequency Response	25–20,000Hz
Input Sensitivity/Impedance	
Line in	2.0Vpk/47kohm
Microphone	22mVpk/1kohm
Max Output Level/Impedance	
Line Out	2.8Vpp/47kohm
Headphone	2.75Vpp/50ohm
Speaker (internal)	5.88Vpp/48ohm
Output Impedence	
Line Out	619ohm
Headphone	118ohm
Signal to Noise*	
Line Out	65dB
Headphone	61dB
Speaker	63dB
Line in	61dB
Microphone	57dB
THD (w nominal load)	
Line Out	–73dB
Headphone	–70dB
Speaker	–68dB
Line in	–75dB
Microphone	–73dB

* To convert from dB to number of significant bits use the formula:

$$n = \frac{dB}{20 \log_{10}} \approx \frac{dB}{6}.$$ For example, for 61dB S/N then n= 61/6 $\approx$ 10

significant bits, or in other words, about 6 bits of noise.

Keyboard Connectors

PS/2 Keyboard Connectors

The PS/2 connectors provide an interface for the keyboard, mouse, and a variety of other pointing devices, such as trackballs, to the system. Consult the documentation that accompanies each input device for specific information concerning its use.

ITF Keyboard Connector

The HP HIL connector provides an interface for the ITF Keyboard to the system. Consult the documentation that accompanies each input device for specific information concerning its use.

You can use an HP three-button mouse, a trackball, or other options as pointing devices with your workstation by using the serial ports or the HIL port. For

instructions on using your particular pointing device, see the manual that came with it.

HP Parallel I/O 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 peripheral device for specific information concerning its use.

802.3 Network Connectors

The J200 workstation has built-in ThickNet LAN AUI and TP (Twisted Pair) connectors for the 802.3 (ETHERNET) or 10 BaseT/100 BaseT (J2240 only) network. Connections to ThinLAN networks require an external transceiver. The workstation automatically selects the correct network setting.

RS-232 Serial Input/Output Connectors

There are a variety of pointing devices (mouse or trackball) or peripheral devices that can attach to the RS-232 Serial Input/Output (SIO) ports on this workstation. Peripheral devices include printers, plotters, modems, and scanners. Consult the documentation that accompanies each 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 operates at up to a 19.2 K baud rate.

Table 1–6 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 1–6. 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

SCSI Connectors

Use the SCSI connectors to connect external SCSI devices such as DDS-format tape drives and CD-ROM drives. Consult the documentation that accompanies each SCSI device for specific information concerning its use. Refer to Appendix C for information about connecting SCSI devices to your workstation.

NOTICE: There must ALWAYS be a terminator at both ends of a SCSI bus. This means one internal terminator and one external terminator.

TOC Button

The TOC (transfer of control) button resets the system and transfers control from the default device to an auxiliary device.

Power Cord Connector

Plug the workstation's power cord into the power cord connector to provide ac power to the system.

Monitor Information

The J Class supports using one of the following four HP monitors:

- 20-inch, 1280x1024 color monitor (A4033A/B, A4331A/B)
- 21–inch, 1600x1200 color monitor (A4576A)

For information on the A403x monitors, see:

- *HP A4032/A4033 Color Monitor CE Handbook* (A4033–90099)

For information on the A433x monitors, see:

- *HP A4330 Color Monitor CE Handbook* (A4330–90039)
- *HP A4331 Color Monitor CE Handbook* (A4331–90039)

Keyboards

There are two types of Hewlett-Packard keyboards available for use with this workstation. They are the following:

- PS/2 Keyboard
- ITF Keyboard

CAUTION: Use only devices that conform to the HP-HIL specification with Hewlett-Packard computer systems. Devices that are not HP-HIL compatible but have similar connectors may appear to be compatible, but will damage your system.

Keyboard Differences

Aside from the obvious difference in the appearance of the ITF and PC style keyboards due to the arrangement of the keys, there is also a difference in the keys and their output codes. Some keys on one keyboard (the ITF keyboard for example) may not exist on the other keyboard. These keys generate codes that may not exist as output from the other keyboard (or may be generated by a different key). Codes that are generated when a key is pressed are called *keycodes*.

Some applications expect to use keycodes generated by keys existing on one of the keyboards (the ITF keyboard for example). Since the keys do not exist on the other keyboard (the PC keyboard for example), an accommodation must be made if the PC keyboard is to be used. In most cases, it is still possible to use some other key that is equivalent (generates the same keycode from a different keycap). To do this, it is necessary to know which keys are equivalent on the two keyboards. Table 1–7 compares the equivalent keys of the ITF and PC keyboards.

NOTICE: Keyboard keys not mentioned in Table 1–7 are the same on both keyboards.

Table 1–7. PC Keyboard to ITF Keyboard Equivalent Keys

PC Keycap Symbol	ITF Keycap Symbol
F9	blank1 (left)
F10	blank2
F11	blank3
F12	blank4 (right)
PrintScreen / SysReq	**Menu**
Scroll Lock	**Stop**
Pause / Break	**Break / Reset**
Page Up	**Prev**
Num Lock	**System / User**
End	**Select**
Page Down	**Next**
Enter	**Return**
Alt (left)	**Extend Char** (left)
Alt (right)	**Extend Char** (right)
No Equivalent	**Clear Line**
No Equivalent	**Clear Display**
No Equivalent	**Insert Line**
No Equivalent	**Delete Line**
No Equivalent	**Print / Enter**
No Equivalent	**,** (number pad)
No Equivalent	**Tab** (number pad)

(Continued)

Table 1–6. PC Keyboard to ITF Keyboard Equivalent Keys (cont.)

PC Keycap Symbol	ITF Keycap Symbol
Esc	**Esc / Del**
Insert	**Insert Char**
Home	
Delete	**Delete Char**
Caps Lock	**Caps**
Esc Shifted	**Esc / Del** Shifted
Pause / Break Shifted	**Break / Reset** Shifted
Num Lock Shifted	**System / User** Shifted
0 / Ins (number pad)	**0** (number pad)
1 / End (number pad)	**1** (number pad)
2 / ▼ (number pad)	**2** (number pad)
3 / Pg Dn (number pad)	**3** (number pad)
4 / ◀ (number pad)	**4** (number pad)
6 / ▶ (number pad	**6** (number pad)
7 / Home (number pad)	**7** (number pad)
8 / ▲ (number pad)	**8** (number pad)
9 / Pg Up (number pad)	**9** (number pad)
. / Del (number pad)	**.** (number pad)
Ctrl (left)	**Ctrl**
Ctrl (right)	No Equivalent

Operating System Overview

This workstation uses the HP-UX operating system, version 10.20 and later. Instant Ignition systems (systems with preloaded software) have X-windows and the Hewlett-Packard HP VUE 3.0 graphical user interface installed and configured. See the user's guide for more information.

To verify which version of the operating system you are running, use the following command in a terminal window:

grep fv /system/UX-CORE/index Enter

If you're running HP-UX 10.20 , the result from this command will be:

```
fv: A.B.10.20.1M
```

For problems or questions with Instant Ignition, refer to *Using Your HP Workstation* for more information.

Memory Failures

The J Class system (with HP-UX 10.20 and later) uses Memory Page Deallocation, a feature that allows the system to provide information to the operating system about memory failures.

You can use the command **memrpt** with the **detail** switch to obtain information about the Memory Page Deallocation Table (PDT) as well as single bit errors logged by the system.

/usr/sbin/sysdiag Enter
DUI >**logtool** Enter
LOGTOOL> **memrpt detail** Enter

The pdt can also be checked using the **pdt** command in the Service menu of the boot console handler (Refer to Chapter 9). If a failing DIMM is replaced, use the Service menu **pdt clear** command to clear out the PDT.

Environmental/ Installation/PM 2

This chapter lists the environmental specifications, power specifications, and regulatory requirements for the system. Installation and preventive maintenance information, if applicable, is also provided.

Environmental Specifications

Table 2–1 lists the environmental specifications for this workstation.

Table 2–1. Environmental Specifications

Type	**Specification**
Altitude	
Operating	0–15,000 ft
Non-operating	40,000 ft
DC magnetic field	
Operating	<5 Gauss
Non-operating	<2 Gauss @ 7 feet
Electromagnetic Interference (EMI)	
Emissions	FCC Class B CISPR B
Susceptibility	FCC Class B CISPR B
Electrostatic Discharge	
Air discharge	0–16 kV, no effect
Contact discharge	0–3 kV, no effect
Humidity (Non-condensing)	
Operating	95%
Leakage Current	less than 3.5 mA
Temperature	
Operating	+5 to +40° C
Non-operating	–40 to +70° C
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, 5–50 Hz
Swept sine survival	0.5 G peak, 5–500 Hz
Random survival	2.09 G rms, 5–500 Hz
Acoustics	<5 bels 5–30° C <6 bels 30–40° C

Regulatory Requirements

This section lists the regulatory approvals met by the J Class workstation.

Product Safety

- Underwriters Laboratories (UL) listed UL 1950
- Canadian Standards Assoc. (CSA) certified CSA22.2 950 –M89
- TUV EN60950

Ergonomics

- ZHI/618
- ISO9241
- 90/270 EEC

Regulatory Compliance

- FCC 47 CFR, part 15 subpart J, Class B
- VCCI Class 2

Electromagnetic Compatibility (EMC) Directive

- EN55022/CISPR 22 Class B
- EN50082–1/IEC801–4

Installation

Refer to the *Hardware Installation Guide J Class* (Part Number A2876–90010) for system installation information.

Preventive Maintenance

The system unit requires no preventive maintenance. Some removable media storage devices require operator preventive maintenance. Refer to the *J Class Owner's Guide* (Part Number A2876–90013) for more information.

Configuration 3

This chapter provides details about setting up and changing the system configuration.

Workstation Configurations

Refer to the *HP 9000 Series 700 Configuration Guide* for a complete list of supported accessories, peripherals, and operating systems for this workstation.

FRU Configurations

This section provides information for setting up or changing the configuration of the system Field Replaceable Units (FRUs).

Internal Storage Configurations

Table 3–1 lists the recommended SCSI IDs for internal storage devices. Figures 3–1, 3–2 and 3–3 show the Fast,Wide Differential SCSI ID settings for the hard disk drives. Figure 3–4 shows the Ultra Wide Single–Ended SCSI ID settings for the hard disk drives. Figure 3–5 show the Narrow Single-Ended SCSI ID settings for the CD-ROM drive and the DDS drive. Figure 3–6 shows the Operation Mode switches for the DDS drive. Figure 3–7 shows the Narrow Single-Ended SCSI ID settings for the floppy drive, and Figure 3–8 shows the floppy drive terminator location.

NOTICE: There must ALWAYS be a terminator at both ends of a SCSI bus. This means one internal terminator and one external terminator.

These SCSI IDs are the recommended IDs for each storage device. If an existing device already uses an ID, select an alternate ID.

Table 3−1. Default SCSI IDs

FWD or UWSE SCSI	
1st Hard Disk Drive	ID6
2nd Hard Disk Drive	ID5
Narrow Single-Ended SCSI	
CD-ROM Drive	ID2
DDS Drive	ID3
Floppy Drive	ID0

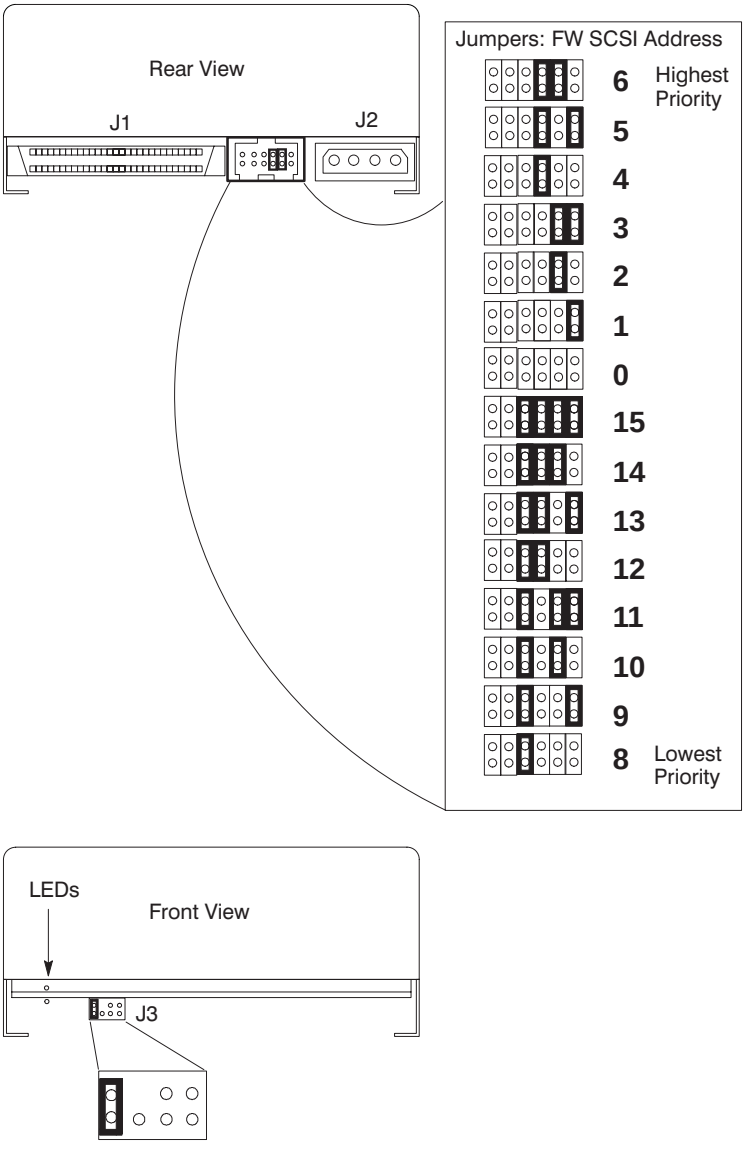


Figure 3–1. 1.0 GB, 2.0 GB, 3.5 inch, Fast, Wide Differential Disk Drive Jumper Settings

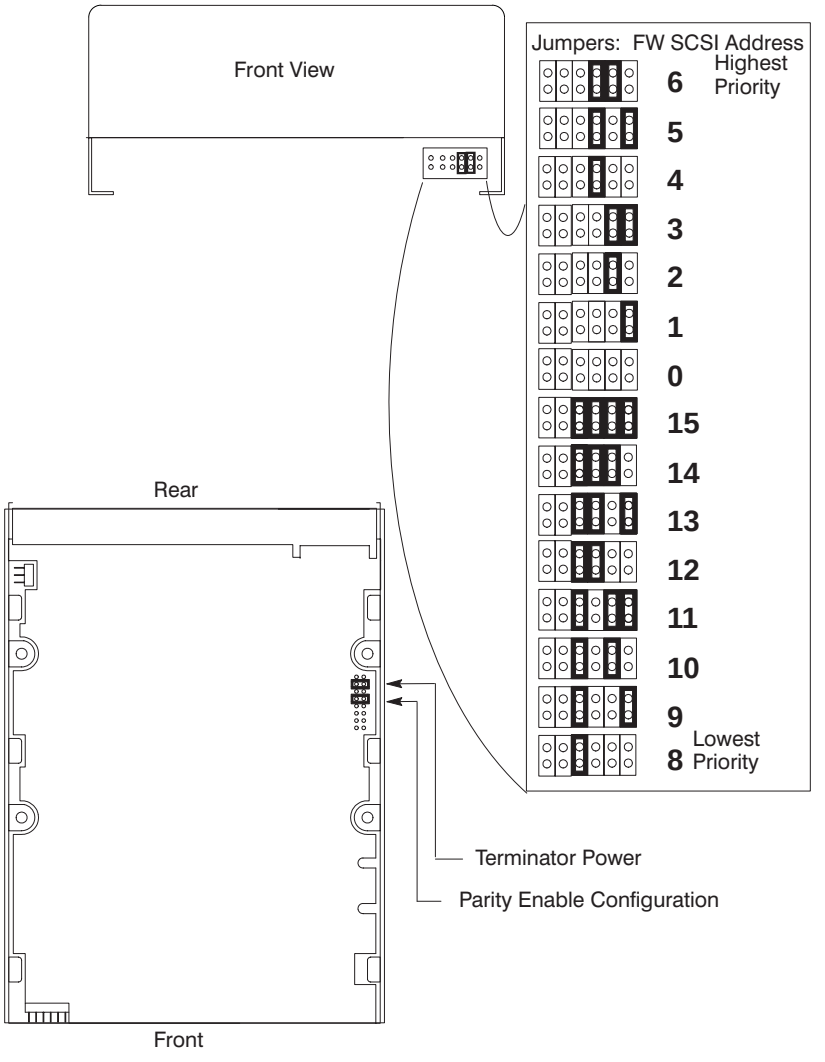


Figure 3–2. 1.0 GB, 2.0 GB, Fast, Wide Differential Disk Drive Jumper Settings

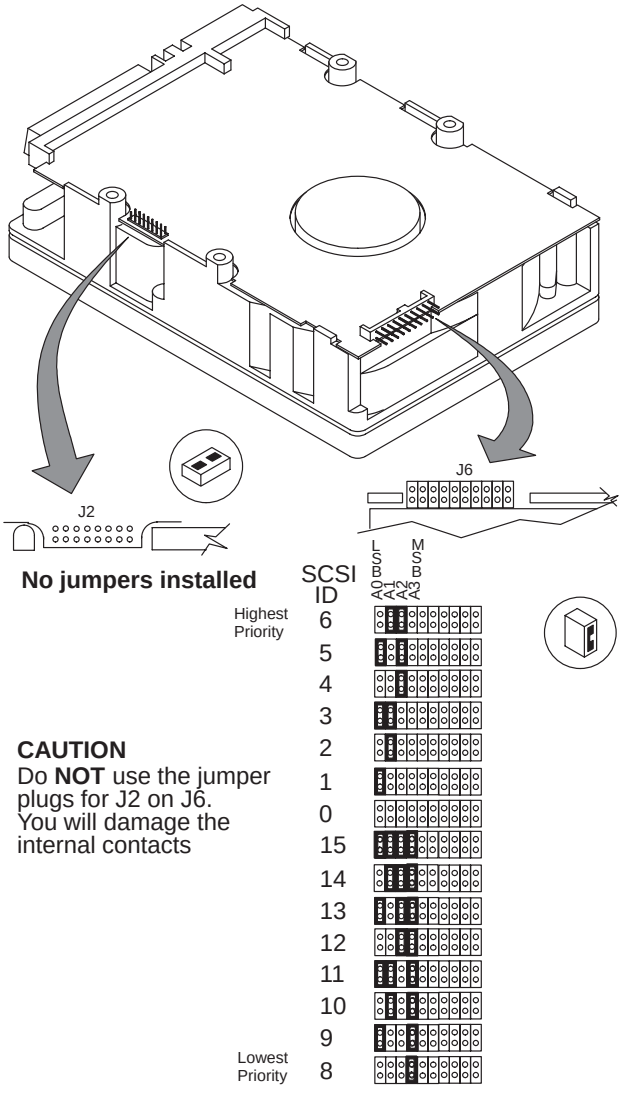


Figure 3–3. 9.0 GB, Fast, Wide Differential Disk Drive Jumper Settings

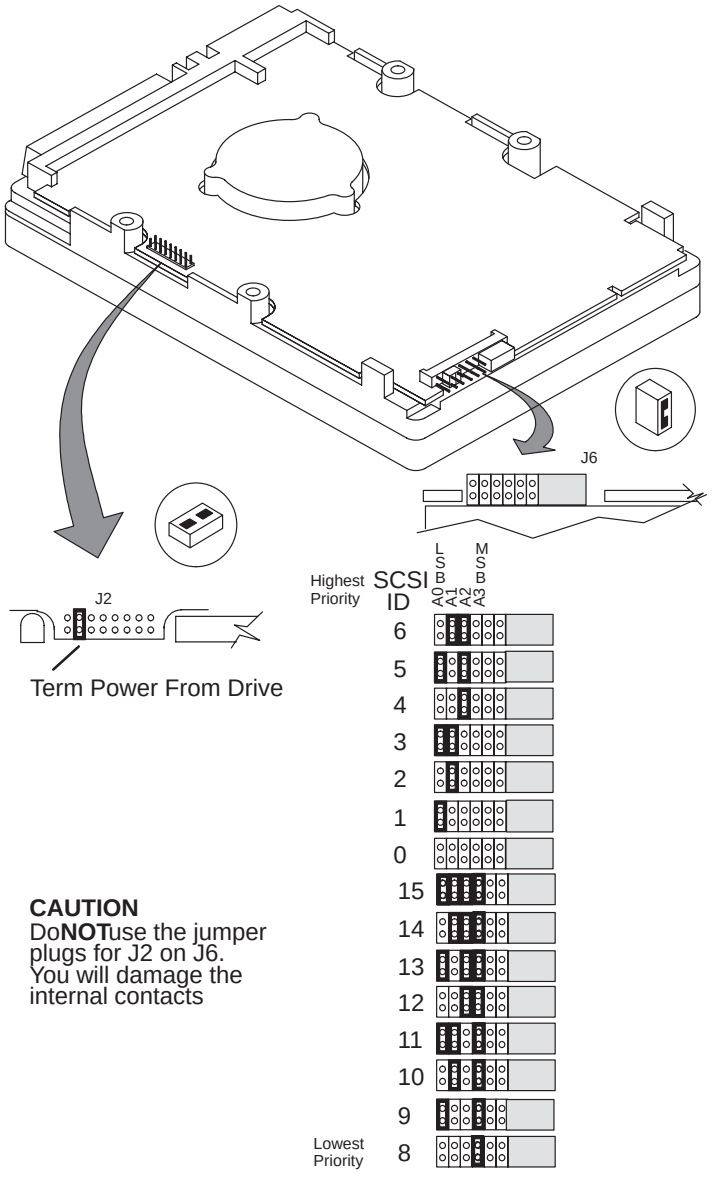


Figure 3–4. 2, 4, 9GB UWSE Disk Drive Jumper Settings

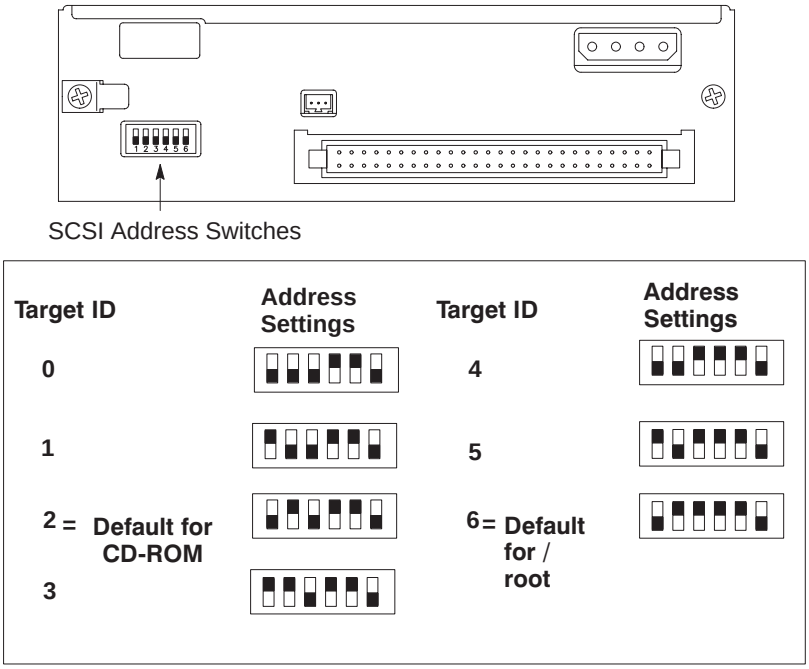


Figure 3–5. CD-ROM Drive SCSI Address/Jumper Settings

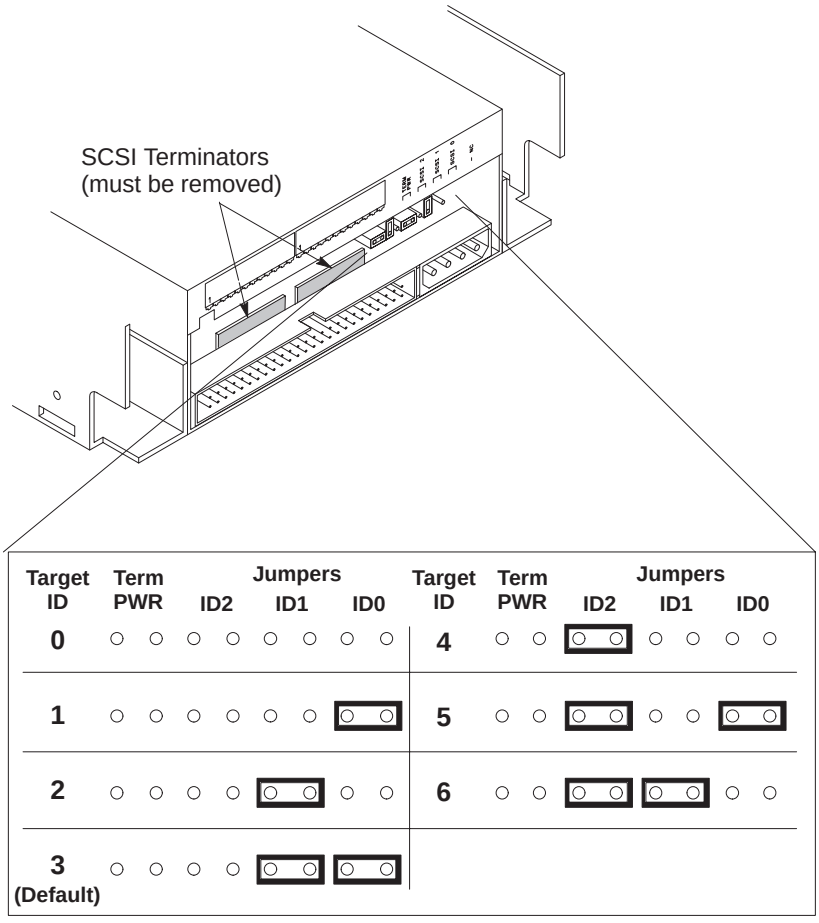
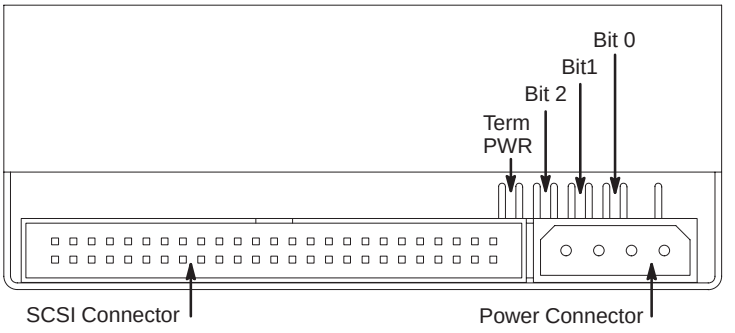


Figure 3–6. DDS-DC Drive SCSI Address/Jumper Settings



SCSI ID	Term PWR*	Bit 2	Bit 1	Bit 0
0	○ ○	○ ○	○ ○	○ ○
1	○ ○	○ ○	○ ○	■ ■
2	○ ○	○ ○	■ ■	○ ○
3 (Default)	○ ○	○ ○	■ ■	■ ■

SCSI ID	Term PWR*	Bit 2	Bit 1	Bit 0
4	○ ○	■ ■	○ ○	○ ○
5	○ ○	■ ■	○ ○	■ ■
6	○ ○	■ ■	■ ■	○ ○

*Term PWR is not used in HP workstation configurations.

Figure 3–7. DDS-2 Tape Drive and SCSI Address/Jumper Settings

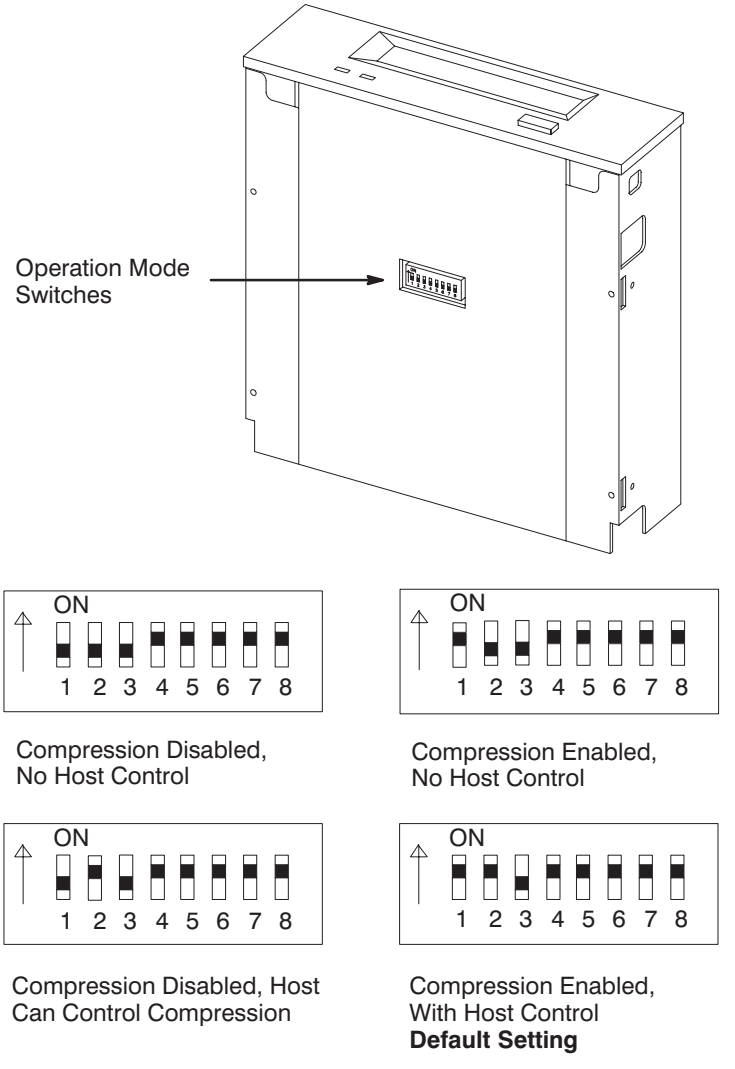
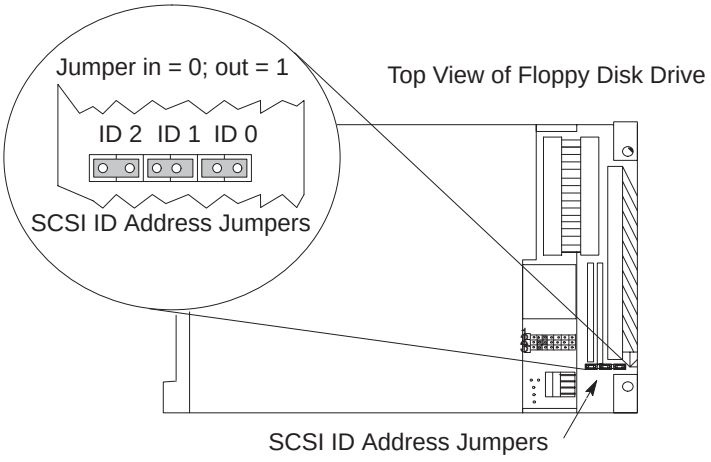


Figure 3–8. Switch Settings for Data Compression Operation Mode



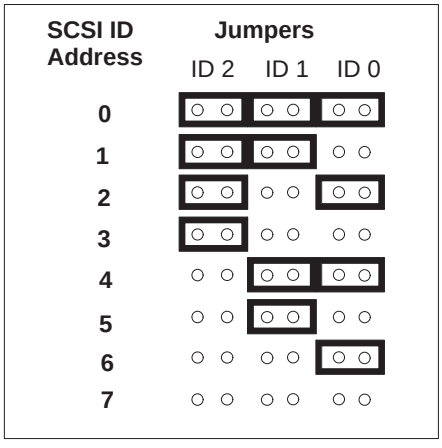


Figure 3–9. Floppy Drive SCSI Address/Jumper Settings

Top View of Floppy Disk Drive

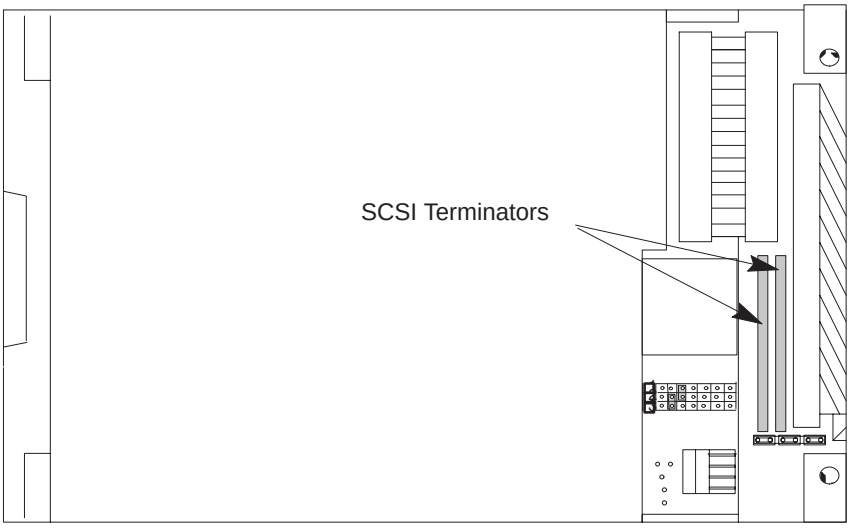


Figure 3–10. Floppy Drive Terminators

Memory

This workstation has 16 memory slots, labeled 0A, 0B through 7A, 7B. Memory can be configured from 32 MB to 2 GB (3.2 GB on J2240 only or 4 GB if you are running HP-UX 11.x). Memory can be configured in combinations of pairs of 32 MB, 128 MB and 256 MB DIMM pairs. Memory DIMMs must be installed in pairs of equal size, with 256 MB DIMM pairs installed first, followed by 128 MB, then 64 MB and finally, 32 MB DIMM pairs. Figure 3–11 gives the recommended order for installing pairs of DIMMs.

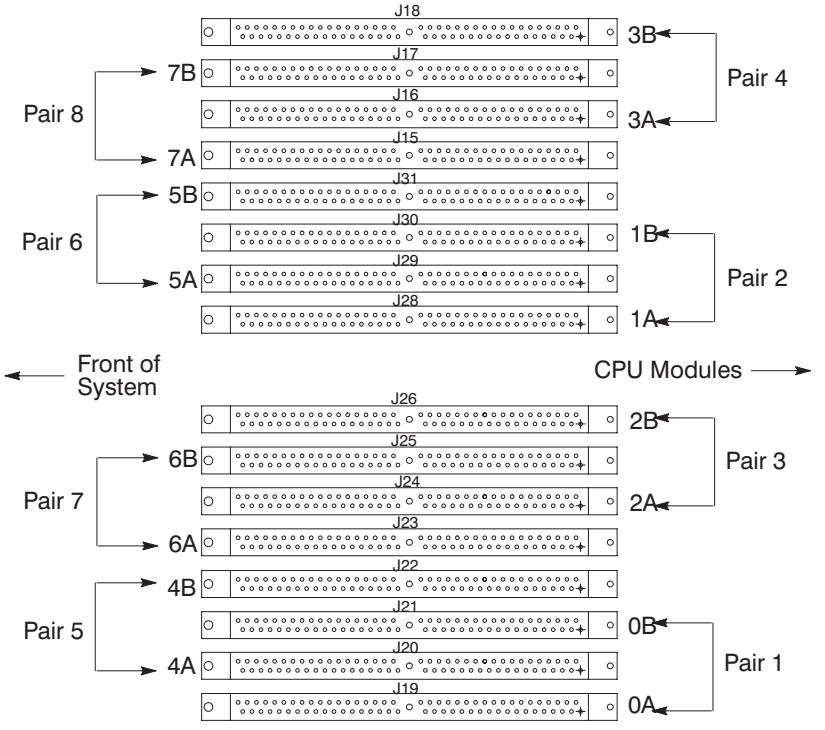


Figure 3–11. Memory Connectors

NOTICE: Any combination of memory may be used although, for maximum performance, the use of common-sized memory boards is recommended; either all 32 MB, 128 MB, or 256 MB board pairs. Therefore, users who wish to achieve both maximum performance and maximum future capacity are advised to use 256 MB board pairs exclusively.

See chapter 5 of this manual for details on installing memory modules.

Monitor-Type Selection

The J Class workstation supports the following three monitors:

- 20-inch, 1280x1024 color monitor (A4030/31)
- 21–inch, 1600x1200 color monitor (A4576A)

The monitor type does not have to be changed on this workstation since the workstation is set up to support these monitors. However, if for some reason the monitor type needs to change, refer to Chapter 9 of this book.

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

Troubleshooting 4

This chapter provides information about isolating a failing component, known as a Field Replaceable Unit (FRU), in a J Class workstation.

To troubleshoot a J Class workstation, 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 we describe in this chapter.

Note any error or status messages, then run the power-up boot ROM diagnostics, known as Self Test. If the Self Test 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 *Precision Architecture RISC: HP 9000 Series 700 Diagnostics Manual* (HP Part Number 92453–90010).

First check that the power LED on the front of the system unit lights. If the LED doesn't light, follow the instructions in the flowchart in Figure 4–1. If the LED lights, follow the instructions in the flowchart in Figure 4–2 to isolate a failing Field Replaceable Unit (FRU).

NOTICE: The motherboard contains a surface-mount fuse that fuses +5 volts from the system to the keyboard. This fuse (1) blows if an overvoltage occurs, and (2) protects the system if the keyboard is shorted. Therefore, if the keyboard fails a diagnostic or won't function, replace the keyboard and the motherboard.

NOTICE: On the J280, there are three fans on the CPU board and system board assembly. These fans are connected to a fan failure detect circuit. If any of the fans fail, power is shut down within ten seconds of the fan failure.

NOTICE: On the J282 and J2240, there are five fans total. Three on the CPU board and system board assembly. One for the EISA board and one for the power supply. These fans are connected to a fan failure detect circuit. If any of the fans fail, power is shut down within ten seconds of the fan failure.

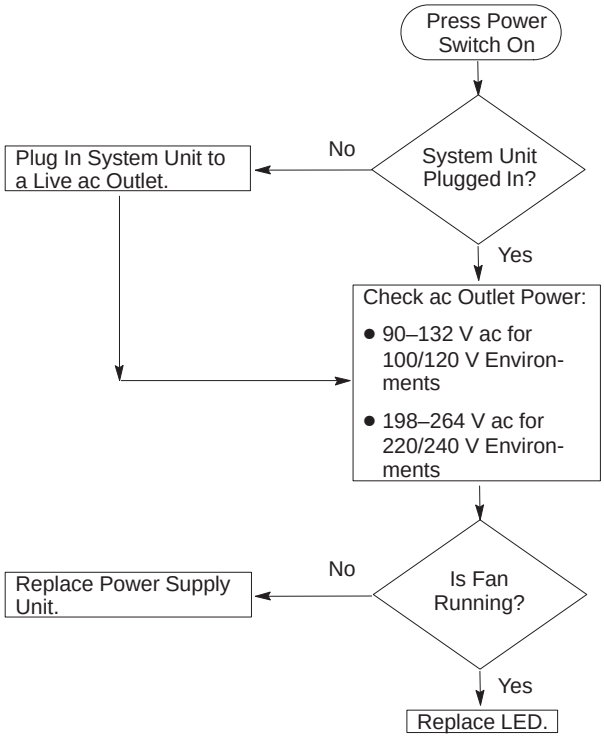


Figure 4–1. LED Not Lit

NOTICE: For a complete description of using ISL diagnostics and the Support Tools Manager, see the *Precision Architecture RISC: HP Apollo 9000 Series 700 Diagnostics Manual*.

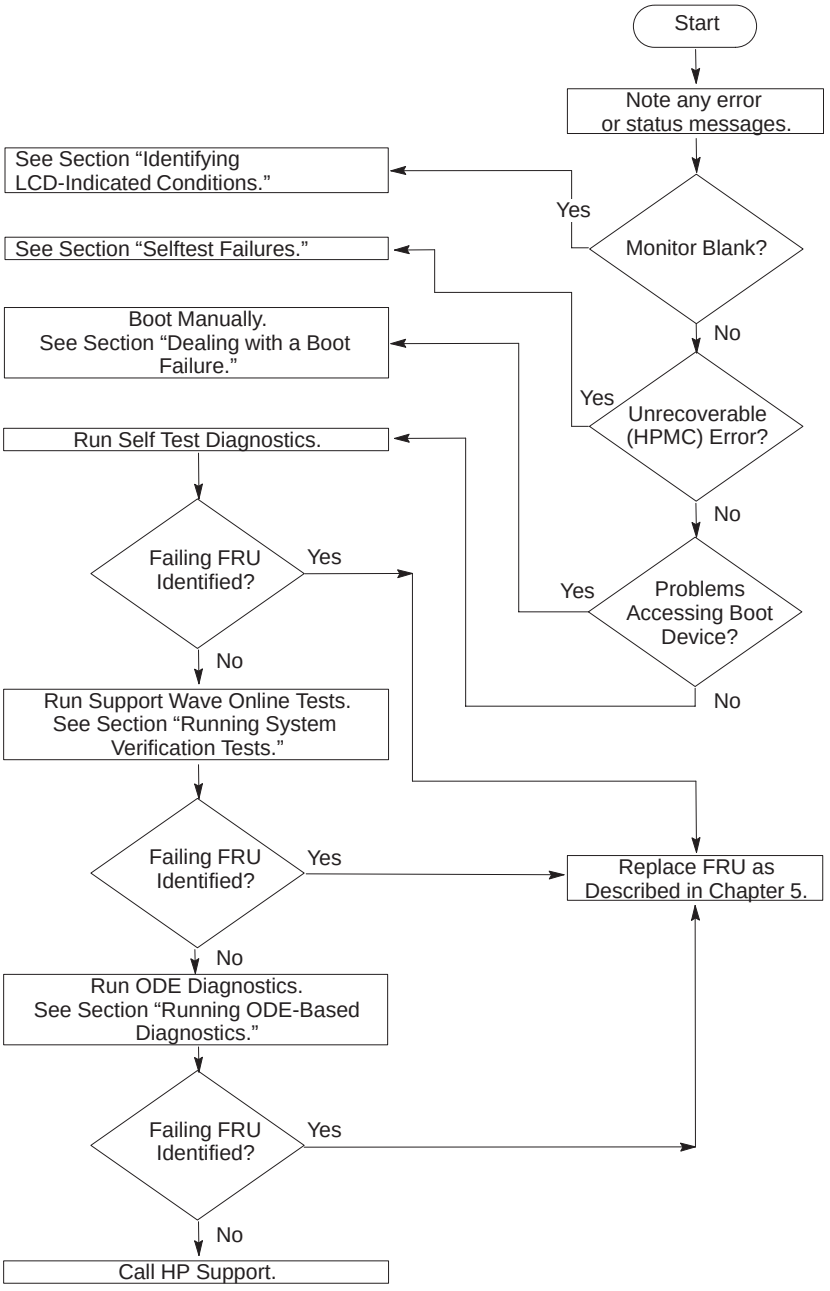


Figure 4–2. Troubleshooting the J Class Workstation

Identifying LCD-Indicated Conditions

This workstation uses an LCD panel to display firmware/OS progress codes. The codes, referred to as chassis codes, consist of one of the mnemonics (up to 4 characters) listed below followed by a 4-digit hex number identifying the code module being executed:

- FLT – A hardware error has been detected
- TEST – Hardware being tested
- INIT – Hardware being initialized
- SHUT – System being shutdown
- WARN – A non-optimal operating condition exists
- RUN – System is running operating system

This workstation also has messages describing forward progress. In addition, failures (FLT codes) result in a message describing the FRU that was being tested when the failure occurred.

In general, the LCD has the following format:

Where

ZZZZ represents a 4 character Ostat
YYYY represents a 4 digit hex code
CPUXX represents CPU slots occupied in the system
♥ represents the system heart beat
WWWWWWWWWWWWWWWW represents text relating diagnostic messages

During a normal boot sequence, the following set of “windows” appear.

Window 1

When the system is hard booted, the LCD will be cleared and the following message will be displayed for approximately 1 second. Then the pdh is verified.

```
Proceeding To          <- line 1
 Turn DC On            <- line 2
```

Window 2

While the pdh is being verified, the following message is displayed:

```
ZZZZ YYYY             <- line 1
Selftest Sys Bd       <- line 2
```

Window 3

After the pdh is verified, the selftest is executed. The display changes to:

```
ZZZZ YYYY     ♥       <- line 1  - '♥' flashes with Z Y field change
Selftest              <- line 2
```

Window 4

When the selftest is complete, the message (once the console is found) is:

```
ZZZZ YYYY CPUXX♥      <- line 1  - '♥' flashes with Z Y field change
AAAAAAAA console      <- line 2

where AAAAAA - RS-232A, RS-232B, or GRAPHICS (all fields left justi-
fied)
```

Window 5

When an attempt to boot is made, the following message is displayed once IPL is successfully loaded and launched:

```
ZZZZ YYYY CPUXX♥      <- line 1  - '♥' flashes with Z Y field change
BBBBBBBBBBBBBBBB      <- line 2

where BBBBBBBBBBBBBBBB - first 16 characters of the model string
from stable store (e.g. 9000/J200)
```

If the system encounters an FLT code while the system is booting, the FLT code is interpreted and one of the following messages is displayed:

--------- FLT CODE MESSAGES ---------		Meaning of X
1.	Selftest Sys Bd	
2.	Selftest cpu X	(0 or 1)
3.	Selftest EISA X	(0 to 4)
4.	Selftest DIMM XX	(DIMM pair 0 to 7)
5.	Selftest Mem Sys	
6.	Selftest Graph X	(0 to 2)
7.	Unexp. Trap XX	(0 to 28)
8.	HPMC occurred !	

By default, if a FRU cannot be located from the FLT code, message 1 (Selftest Sys Bd) is displayed.

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 a DDS tape drive), see the following situations and examples that use the Boot Console Interface. To access the Boot Console Interface, see Chapter 9 of this book.

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

  `Main Menu: Enter a command or a menu >` **boot** *<device>*

  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 Interface and then type the following command at the prompt:

  `Main Menu: Enter a command or a menu >` **boot scsi.1.0**

  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 a command or a menu >` **boot** *<device>*

  You are prompted: `Interact with ISL (Y or N) >` **y**

  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** for 10.20) on the root disk (**fwscsi.6.0**) has become corrupted, boot the workstation from the backup kernel **(/stand/vmunix.prev** for 10.20**)** by typing the following at the `ISL>` prompt:

  `ISL>` **hpux /stand/vmunix.prev** `(for 10.20)`

- To find the location of the bootable operating systems on the various media in the file system, use the **search** command.

Searching for Bootable Media

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

```
Main Menu: Enter a command or a menu >  search ipl
```

The search may turn up more devices than there are lines on the display. If using a text terminal, control the progress of the search from the terminal's keyboard by performing the following steps:

- To hold the display temporarily, press Ctrl S
- To continue the display, press Ctrl Q
- To halt the search, press Esc

These flow-control commands do not work with a bitmapped display, but such a display can show more than forty lines of text, so they are unnecessary.

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

```
Main Menu: Enter a command or a menu >  search ipl  device_type
```

where *device_type* is one of the following:

fwscsi is the built-in fast, wide differential or ultra, wide single–ended SCSI bus
scsi is the built-in single-ended SCSI bus
lan is all connections to the built-in LAN

Stable Storage

Stable Storage is non-volatile memory associated with each 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** Enter 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 indicated by the **search** command.

Supported Boot Paths

SCSI devices are bootable when connected to the FWSCSI port on the System card. Diskless workstations can only boot from the LAN port on the System card.

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 (TDIAG, IOMAP).
- Provide automatic booting of the HP-UX O/S after power-on or reset.

The ISL program provides a standalone environment for loading offline diagnostic and utility programs from the LIF directory. The ISL program also provides user commands to configure the boot parameters into Stable Storage.

Selftest Failures (J200/210/210XC)

Chassis codes are the key to debugging selftest errors. If a failure is found during selftest, chassis codes are displayed in the LCD. The procedure for using these codes to debug a failure is as follows:

NOTICE: These chassis codes **DO NOT** include the J280/282. The J280/282 chassis codes are shown in Tables 4–4 through 4–16.

1. Using Table 4–1, find the chassis code listed on the LCD.

   Codes 7000 through 7Dxx are memory errors.
   Codes CBxx through 500F in Table 4–1 are HPMC errors.

2. A 7Fxx code means a memory DIMM error. Figure 4–3 is a layout of the memory DIMMs on the CPU board that goes down to the DIMM pair. To continue beyond the pair, run Offline Diagnostics.

To get additional information about failures from the boot console interface, use the Service menu **pim**, **pdt**, and **ChassisCode** commands.

In the following table, the FRU column shows messages printed on the LCD that refer to system FRUs. Only FLT codes have FRUs associated with them. Some WARN codes are also device-specific, especially to IODC calls; for example, 8XXY codes. Test and INIT codes don't correspond to any FRU. All codes are listed in numeric order.

For the FRUs labled 'Selftest CPU 0', there is also a corresponding CPU x code, where x indicates the CPU number.

Memory Failures

The J Class system requires special Memory Page Deallocation (PDC) to be implemented. This PDC feature allows the workstation to provide information to the operating system about memory failures.

HP-UX 10.x uses PDC information to map out failing memory areas and continue normal operation. You can use the command **memrpt** with the detail switch to obtain information about the Memory Page Deallocation Table (PDT) as well as single bit errors logged by the system.

```
# /usr/sbin/sysdiag  Enter
DUI >logtool  Enter
LOGTOOL> memrpt detail  Enter
```

The PDT can also be checked using the **pdt** command in the Service menu of the boot console handler (Refer to Chapter 9). If a failing DIMM is replaced, use the command **pdt clear** in the Service menu to clear out the PDT.

HP-UX 9.0x will halt upon detecting the presence of bad memory at boot up and display the following message:

```
ISL booting hpux
Secondary Loader 9000/700
Revision 3.08
Booting /hp-ux
2103692 + 319488 + 309344 start 0x25030

panic: Memory self-test failed
```

Table 4–1. I/O Failure Codes

FRU	Ostat	Code	Name	Notes
Selftest Sys Bd	FLT	0100	CHASSIS_PA_NOT_ENOUGH_ IO_SPACE	
Selftest Sys Bd	FLT	0110	CHASSIS_TOO_MANY_BC	
Selftest Sys Bd	FLT	0120	CHASSIS_BAD_BC	
Selftest Sys Bd	FLT	0130	CHASSIS_UNARCHITECTED_IO	
Selftest Sys Bd	FLT	0140	CHASSIS_ERR_ASSIGNING_SPA	
Selftest Sys Bd	FLT	1000	UNEXPECTED_INTERRUPT	
HPMC	FLT	1001	UNEXPECTED_INTERRUPT	HPMC Occurred!
Unexp. Trap 2	FLT	1002	UNEXPECTED_INTERRUPT	Powerfail interrupt (unused)*
Unexp. Trap 3	FLT	1003	UNEXPECTED_INTERRUPT	Recovery Counter Trap*
Unexp. Trap 4	FLT	1004	UNEXPECTED_INTERRUPT	External Interrupt
Unexp. Trap 5	FLT	1005	UNEXPECTED_INTERRUPT	LPMC
Unexp. Trap 6	FLT	1006	UNEXPECTED_INTERRUPT	ITLB page fault*
Unexp. Trap 7	FLT	1007	UNEXPECTED_INTERRUPT	Instruction mem protection trap*
Unexp. Trap 8	FLT	1008	UNEXPECTED_INTERRUPT	Illegal instruction trap
Unexp. Trap 9	FLT	1009	UNEXPECTED_INTERRUPT	Break instruction trap
Unexp. Trap 10	FLT	100a	UNEXPECTED_INTERRUPT	Privileged instruction trap*
Unexp. Trap 11	FLT	100b	UNEXPECTED_INTERRUPT	Privileged register trap*
Unexp. Trap 12	FLT	100c	UNEXPECTED_INTERRUPT	Overflow trap*
Unexp. Trap 13	FLT	100d	UNEXPECTED_INTERRUPT	Conditional trap*
Unexp. Trap 14	FLT	100e	UNEXPECTED_INTERRUPT	Assist exception trap
Unexp. Trap 15	FLT	100f	UNEXPECTED_INTERRUPT	DTLB miss/page fault*
Unexp. Trap 16	FLT	0101	UNEXPECTED_INTERRUPT	Non-access ITLB fault*
Unexp. Trap 17	FLT	1011	UNEXPECTED_INTERRUPT	Non-access DTLB/page fault*
Unexp. Trap 18	FLT	1012	UNEXPECTED_INTERRUPT	Data memory protection trap*
Unexp. Trap 19	FLT	1013	UNEXPECTED_INTERRUPT	Data memory break trap*
Unexp. Trap 20	FLT	1014	UNEXPECTED_INTERRUPT	TLB dirty bit trap*
Unexp. Trap 21	FLT	1015	UNEXPECTED_INTERRUPT	Page Reference trap*
Unexp. Trap 22	FLT	1016	UNEXPECTED_INTERRUPT	Assist emulation trap*
Unexp. Trap 23	FLT	1017	UNEXPECTED_INTERRUPT	Higher-privilege transfer trap*

*Unexpected interrupts cannot be associated with a FRU and to a first approximation can be considered system board faults.

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
Unexp. Trap 24	FLT	1018	UNEXPECTED_INTERRUPT	Lower-privilege transfer trap*
Unexp. Trap 25	FLT	1019	UNEXPECTED_INTERRUPT	Taken branch trap*
	TEST	1030	CHASSIS_STARTING_EST	Starting Early ST
	WARN	1031	CHASSIS_EST_SKIPPED	Early ST skipped
Selftest CPU 0	FLT	1032	CHASSIS_BAD_CPU_TEST_ MODE	
	INIT	103c	CHASSIS_CPU_INIT	Initialize CPU
	TEST	103e	CHASSIS_EXITING_EST	Exiting Early ST
Selftest CPU 0	FLT	103f	CHASSIS_CACHE_LOAD_ERR	
	TEST	1040	CHASSIS_CPU_BASIC	(0x1040 – 0x1048)
Selftest CPU 0	FLT	1040	CHASSIS_CPU_BASIC_ERR	
	TEST	1049	CHASSIS_CPU_ALU Test ALU	(0x1049 – 0x1050)
Selftest CPU 0	FLT	1049	CHASSIS_CPU_ALU_ERR	ALU error
	TEST	1051	CHASSIS_CPU_BR	(0x1051 – 0x1058)
Selftest CPU 0	FLT	1051	CHASSIS_CPU_BR_ERR	
	TEST	1059	CHASSIS_CPU_SIDE_EFF	(0x1059 – 0x105a)
Selftest CPU 0	FLT	1059	CHASSIS_CPU_SIDE_EFF_ERR	
	TEST	1061	CHASSIS_CPU_CB	(0x1061 – 0x1066)
Selftest CPU 0	FLT	1061	CHASSIS_CPU_CB_ERR	
	TEST	1067	CHASSIS_CPU_ARITH_COND	(0x1067 – 0x1075)
Selftest CPU 0	FLT	1067	CHASSIS_CPU_ARITH_COND_ ERR	
	TEST	1076	CHASSIS_CPU_BIT_OP	(0x1076 – 0x1077)
Selftest CPU 0	FLT	1076	CHASSIS_CPU_BIT_OP_ERR	
	TEST	1078	CHASSIS_CPU_SAR	(0x1078 – 0x1079)
Selftest CPU 0	FLT	1078	CHASSIS_CPU_SAR_ERR	
	TEST	107a	CHASSIS_CPU_EX_DEP	(0x107a – 0x1080)
Selftest CPU 0	FLT	107a	CHASSIS_CPU_EX_DEP_ERR	
	TEST	1081	CHASSIS_CPU_BB	(0x1081 – 0x1083)
Selftest CPU 0	FLT	1081	CHASSIS_CPU_BB_ERR	
	TEST	1084	CHASSIS_CPU_CR	(0x1084 – 0x1089)
Selftest CPU 0	FLT	1084	CHASSIS_CPU_CR_ERR	
	TEST	108b	CHASSIS_CPU_EXT_INT	(0x108b – 0x108d)

*Unexpected interrupts cannot be associated with a FRU and to a first approximation can be considered system board faults.

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
Selftest CPU 0	FLT	108b	CHASSIS_CPU_EXT_INT_ERR	
	TEST	108e	CHASSIS_CPU_ITIME	(0x108e – 0x1093)
Selftest CPU 0	FLT	108e	CHASSIS_CPU_ITIME_ERR	
	TEST	1094	CHASSIS_CPU_SHADOW	(0x 1094 – 0x1097)
Selftest CPU 0	FLT	1094	CHASSIS_CPU_SHADOW_ERR	
	TEST	1098	CHASSIS_CPU_DIAGS	(0x1098 – 0x1099)
Selftest CPU 0	FLT	1098	CHASSIS_CPU_DIAGS_ERR	
	TEST	10a0	CHASSIS_COPROC_TESTS	
	TEST	10a1	CHASSIS_COPROC_REG	
Selftest CPU 0	FLT	10a1	CHASSIS_COPROC_REG_0100	
	TEST	10a2	CHASSIS_COPROC_INSTR	
Selftest CPU 0	FLT	10a2	CHASSIS_COPROC_INSTR_0100	
	TEST	10a3	CHASSIS_COPROC_TRAPS	
Selftest CPU 0	FLT	10a3	CHASSIS_COPROC_TRAPS_0100	
	TEST	10a4	CHASSIS_COPROC_MISC	
Selftest CPU 0	FLT	10a4	CHASSIS_COPROC_MISC_0100	
	WARN	10af	CHASSIS_FPU_S_DISABLED	FPU’s are disabled
	TEST	10b0	CHASSIS_TLB_INIT	
Selftest CPU 0	FLT	10b0	CHASSIS_TLB_INIT_ERR	
Selftest CPU 0	FLT	10ba	CHASSIS_BOOT_ABDICATION	Bad Monarch CPU
Selftest CPU 0	FLT	10bb	CHASSIS_BAD_CPU_NUMBER	CPU number is greater than three
Selftest CPU 0	FLT	10bc	CHASSIS_BAD_CLOCKS	Bad CPU Clock Speed
Selftest CPU 0	FLT	10bd	CHASSIS_BAD_CPU_ORDER	No bd in cpu slot 0 You must first fill this slot
Selftest CPU 0	FLT	10bf	CHASSIS_BOOT_FAILURE	Slave CPU halted due to catastrophic boot failure
	INIT	10ca	CHASSIS_RWAY_CPU_ARB	Initializing RUNWAY CPU Arbitration
Selftest CPU 0	FLT	10cb	CHASSIS_CPU_REV_BAD	Mismatched CPU REV
Selftest CPU 0	FLT	10cc	CHASSIS_CPU_CACHE_BAD	Mismatched Cache size
	WARN	10cd	CHASSIS_CPU_DECONFIG	CPU was deconfigured
	WARN	10d0	CHASSIS_MONARCH_DCNF	Monarch deconfigured
	WARN	10ce	CHASSIS_CPU_EXTINGUISH	CPU was idled via a call to PDC_PROC[0]
	WARN	10f0	CHASSIS_SLAVE_CPU_FAIL	Monarch stopped a non-responding Slave CPU

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
	FLT	10cf	CHASSIS_SLAVE_FAILED	Slave halted because selftest failed
Selftest CPU 0	FLT	10df	CHASSIS_MONARCH_FAIL_DI	Monarch failed Dual Issue test
	WARN	10ef	CHASSIS_ST_WARNING	Selftests returned a warning
	INIT	10fc	CHASSIS_FIND_CPUS	Synchronizing CPUs
Selftest CPU 0	FLT	10ff	CHASSIS_MONARCH_ST_FLT	Selftests returned a failure
	TEST	2000	CHASSIS_ICACHE_ALINE	Testing the I-cache address lines
Selftest CPU 0	FLT	2001	CHASSIS_ICACHE_ALINE_0100	Control failure
Selftest CPU 0	FLT	2002	CHASSIS_ICACHE_ALINE_0105	Shorts failure
Selftest CPU 0	FLT	2003	CHASSIS_ICACHE_ALINE_0110	Opens failure
	TEST	2010	CHASSIS_ICACHE_DLINE	Testing the I-cache data lines
Selftest CPU 0	FLT	2011	CHASSIS_ICACHE_DLINE_0100	
Selftest CPU 0	FLT	2012	CHASSIS_ICACHE_DLINE_0105	Data error
	TEST	2020	CHASSIS_ICACHE_RAM	Testing the I-cache ram
Selftest CPU 0	FLT	2021	CHASSIS_ICACHE_RAM_DATA_ ERR	Data error
Selftest CPU 0	FLT	2022	CHASSIS_ICACHE_RAM_TAG_ ERR	Tag error
Selftest CPU 0	FLT	2023	CHASSIS_ICACHE_RAM_ LOAD_ERR	Load error
	TEST	2030	CHASSIS_CACHE_ITAG	Testing the I-cache tag circuitry
Selftest CPU 0	FLT	20b3	CHASSIS_DCACHE_WORD1_ PARITY	Dcache word1 parity error
	WARN	20c0	CHASSIS_ICACHE_PARITY	Icache parity error
	WARN	20c1	CHASSIS_ICACHE_TAG_PARITY	Icache tag parity error
	WARN	20c2	CHASSIS_ICACHE_WORD0_ PARITY	Icache word0 parity error
	WARN	20c3	CHASSIS_ICACHE_WORD1_ PARITY	Icache word1 parity error
	TEST	3000	CHASSIS_ROM_XSUM_TEST	Start ROM checksum selftest
Selftest Sys Bd	FLT	3000	CHASSIS_ROM_XSUM_ERR	ROM checksum fatal error
	INIT	3000	CHASSIS_ROM_XSUM_INIT	ROM checksum init successful
	TEST	3001	CHASSIS_PDH_CNTRL_TEST	Testing PDH CONTROL_ REGISTER

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
	INIT	3001	CHASSIS_PDH_CNTRL_INIT_ CONTROL_REGISTER	Initialized PDH
Selftest Sys Bd	FLT	3001	CHASSIS_PDH_CNTRL_ERR	Failed PDH CON-TROL_REGISTER
	TEST	3002	CHASSIS_SCR_SELFTEST	Selftesting scratch RAM
	INIT	3002	CHASSIS_SCR_INIT	Scratch RAM init successful
Selftest Sys Bd	FLT	3002	CHASSIS_SCR_FATAL_ERR	Fatal error in scratch RAM
	WARN	3003	CHASSIS_SS_ERROR	Error reading from Stable Storage Contents invalid
Selftest Sys Bd	FLT	3003	CHASSIS_SS_FATAL_ERROR	Fatal Error reading from Stable Storage
	WARN	3004	CHASSIS_ERR_WRITING_ EEPROM	Error occurred writing to EEPROM
Selftest Sys Bd	FLT	3004	CHASSIS_FATAL_ERR_ WRITING_EEPROM	Fatal Error occurred writ-ing to EEPROM
Selftest Sys Bd	FLT	3005	CHASSIS_EEPROM_WRITE_ LIMIT	Write limit exceeded
	WARN	3006	CHASSIS_ERR_READING_ EEPROM	Warning error reading EEPROM
Selftest Sys Bd	FLT	3006	CHASSIS_FATAL_ERR_ READING_EEPROM	Fatal error reading EEPROM
	INIT	3007	CHASSIS_INVOKE_LDB	Entering LDB (front door)
Selftest Sys Bd	FLT	3008	CHASSIS_BAD_SYS_BRD_BYTE	
Selftest Sys Bd	FLT	3009	CHASSIS_BAD_SYS_MODE_ BYTE	
Selftest Sys Bd	FLT	300a	CHASSIS_BAD_SYS_MFG_ TEST_BYTE	
Selftest Sys Bd	FLT	300b	CHASSIS_BAD_RTC	
	WARN	301a	CHASSIS_HVERSION MISMATCH	
	INIT	30c4	CHASSIS_CLEARING_EEPROM	
	TEST	4000	CHASSIS_STARTING_LST	Starting Late Self Test
	WARN	4001	CHASSIS_LST_SKIPPED	Late Self Test skipped
	TEST	400e	CHASSIS_EXITING_LST	Exiting Late Self Test
	TEST	4010	CHASSIS_CACHE_PM_BYTE	
Selftest CPU 0	FLT	4010	CHASSIS_CACHE_PM_BYTE_ ERR	
	TEST	4020	CHASSIS_CACHE_BYTE	
Selftest CPU 0	FLT	4020	CHASSIS_CACHE_BYTE_ERR	(0x4020 to 0x4027)
	TEST	4030	CHASSIS_CACHE_PM_FLUSH	

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
Selftest CPU 0	FLT	4030	CHASSIS_CACHE_PM_FLUSH_ ERR	
	TEST	4040	CHASSIS_CACHE_FLUSH	
Selftest CPU 0	FLT	4040	CHASSIS_CACHE_FLUSH_ERR	(0x4040 to 0x4047)
	TEST	4050	CHASSIS_ICACHE_MISS	
Selftest CPU 0	FLT	4051	CHASSIS_ICACHE_MISS_ERR	
	TEST	4060	CHASSIS_DCACHE_MISS	
Selftest CPU 0	FLT	4060	CHASSIS_DCACHE_MISS_ERR	(0x4060 to 0x4066)
	WARN	4060	CHASSIS_DCACHE_MISS_ WARN	
	TEST	4070	CHASSIS_DUAL_ISSUE	
Selftest CPU 0	FLT	4071	CHASSIS_DUAL_ISSUE_ ERROR	
Selftest Mem Sys	FLT	7000	CHASSIS_MEM_HPMC_ERR	HPMC in memory system
Selftest CPU 0	FLT	7001	CHASSIS_ ICACHE_PARITY_ ERROR	Icache parity error
Selftest CPU 0	FLT	7002	CHASSIS_DCACHE_PARITY_ ERROR	Dcache parity error
Selftest Mem Sys	FLT	7003	CHASSIS_MSI_READ_ERROR	Memory MSI read error
Selftest Mem Sys	FLT	7004	CHASSIS_MSI_WRITE_ERROR	Memory MSI write error
Selftest Mem Sys	FLT	7005	CHASSIS_RUNWAY_ERROR	Runway error
Selftest Mem Sys	FLT	7006	CHASSIS_WRITE_BOMB_ERR	Memory Write Bomb error
Selftest Mem Sys	FLT	7007	CHASSIS_MEMORY_ADDRESS_ ERROR	Memory address error
Selftest Mem Sys	FLT	7008	CHASSIS_MULTI_BIT_ERROR	Memory multi bit error
Selftest Mem Sys	FLT	7009	CHASSIS_SINGLE_BIT_ERROR	Memory single bit error
Selftest Mem Sys	FLT	7fff	CHASSIS_CATASTROPHIC_ MEM_ERR	Catastrophic memory error
HPMC Occurred!	FLT	70ff	CHASSIS_UNKNOWN_HPMC	Unknown HPMC
Selftest Mem Sys	FLT	7101	CHASSIS_MMC_NOT_ RESPONDING	MMC not responding
Selftest Mem Sys	FLT	7102	CHASSIS_MMC_NOT_READY_ ERROR	MMC not ready
Selftest Mem Sys	FLT	7103	CHASSIS_MMC_FAILED_TO_ CLEAR	MMC failed to clear
Selftest Mem Sys	FLT	7104	CHASSIS_MMC_STICKY_BITS	
Selftest Mem Sys	FLT	7105	CHASSIS_MMC_BAD_REV	MMC bad revision
Selftest Mem Sys	FLT	7106	CHASSIS_MMC_REG_ERROR	MMC register error
Selftest Mem Sys	FLT	7107	CHASSIS_MMC_ERR_IN_ CPU_TEST	x = SMC number

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
Selftest Mem Sys	FLT	7200	CHASSIS_NO_SMC_AVAILABLE	No SMC available
Selftest Sys Bd	FLT	721x	CHASSIS_SMC_FAILED	SMC failed, x = smc number
Selftest Sys Bd	FLT	722x	CHASSIS_SMC_BAD_REV	SMC bad revision, x = SMC number
Selftest Sys Bd	FLT	723x	CHASSIS_SMC_FAILED_TO_ RESPOND	SMC failed to respond, x = SMC number
Selftest Mem Sys	FLT	7301	CHASSIS_DIMM_0_DATA_ERR	DIMM 0 bytes are not equal
Selftest Mem Sys	FLT	7302	CHASSIS_DIMM_1_DATA_ERR	DIMM 1 bytes are not equal
Selftest Mem Sys	FLT	7303	CHASSIS_DIMM_MISMATCH_ ERROR	DIMM 0 data <> DIMM 1 data
Selftest Mem Sys	FLT	7304	CHASSIS_UNKNOWN_SIZING_ ERROR	Unknown sizing compare error
Selftest Mem Sys	FLT	7305	CHASSIS_SIZING_MBE_ERROR	MBE occurred during sizing
Selftest Mem Sys	FLT	7306	CHASSIS_ADDR_TEST_ERROR	Address test failed on bank
Selftest Mem Sys	FLT	7307	CHASSIS_ECC_TEST_ERROR	ECC test failed on bank
Selftest Mem Sys	FLT	7308	CHASSIS_MBE_BY_SBE_ERROR	SBE caused the MBE
Selftest Mem Sys	FLT	7401	CHASSIS_NO_DRAMS	No DRAMS installed
Selftest Mem Sys	FLT	7402	CHASSIS_MIXED_DRAMS	Mixed DRAMS
Selftest Mem Sys	FLT	7403	CHASSIS_BAD_ADDR	Address did not map to bank
Selftest Mem Sys	FLT	7404	CHASSIS_BAD_GCT_ADDR	Address did not map in GCT
Selftest Mem Sys	FLT	7405	CHASSIS_DUAL_ISSUE_FAILED	
Selftest Mem Sys	FLT	7500	CHASSIS_NO_RAM_FOUND	NO RAM found
Selftest Mem Sys	FLT	7501	CHASSIS_GOOD_MEM_FAILED	Good memory failed
Selftest Mem Sys	FLT	7502	CHASSIS_BCH_MEM_FAILED	BCH memory failed
Selftest Mem Sys	FLT	7604	CHASSIS_BAD_MCT_MEM_ TEST_STATUS	No bits set in Test Status
	WARN	7701	CHASSIS_USING_ALT_CONFIG	Using alternate configuration
	WARN	770	CHASSIS_MEMORY_INIT_ONLY	
	WARN	7703	CHASSIS_SIM_LOADING_ WARNING	
	WARN	7704	CHASSIS_RAM_BUSS_ WARNING	

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
	WARN	7705	CHASSIS_GOOD_MEM_GOOFY	GOOD_MEM > memory size
	WARN	770f	CHASSIS_REV_1_SMC_ WARNING	
	WARN	7800	CHASSIS_PDT_DISABLED_ WARNING	
Selftest Mem Sys	FLT	7800	CHASSIS_PDT_DISABLED_ HALT	
	WARN	7801	CHASSIS_UPDATE_SBE_ OVRWRT	
	WARN	7802	CHASSIS_UPDATE_DUP_ENTRY	
Selftest Mem Sys	FLT	7803	CHASSIS_UPDATE_EEPROM_ ERR	
Selftest Mem Sys	FLT	7804	CHASSIS_UPDATE_TABLE_ FULL	
Selftest Sys Bd	FLT	7d03	CHASSIS_HPMC_MSI_READ_ ERROR	Memory MSI read error (LCD displays Selftest Mem Sys)
Selftest Sys Bd	FLT	7d04	CHASSIS_HPMC_MSI_WRITE_ ERROR	Memory MSI write error (LCD displays Selftest Mem Sys)
Selftest Sys Bd	FLT	7d05	CHASSIS_HPMC_RUNWAY_ ERROR	Runway parity error (LCD displays Selftest Mem Sys)
Selftest Sys Bd	FLT	7d06	CHASSIS_HPMC_WRITE_ BOMB_ERROR	Memory Write Bomb error (LCD displays Selftest Mem Sys)
Selftest Sys Bd	FLT	7d07	CHASSIS_HPMC_MEMORY_ ADDRESS_ERR	Memory address error (LCDdisplays Selftest Mem Sys)
Selftest Mem Sys	FLT	7d08	CHASSIS_HPMC_MULTI_BIT_ ERROR	Memory multi bit error
Selftest Mem Sys	FLT	7d09	CHASSIS_HPMC_SINGLE_BIT_ ERROR	Memory single bit error
Selftest Mem Sys	FLT	7d0a	CHASSIS_HPMC_BAD_ADDR	Address did not map to bank
Selftest DIMM 3	FLT	7f00	CHASSIS_MEM_FRU_ID	Error in DIMM Pair 3
Selftest DIMM 5	FLT	7f01	CHASSIS_MEM_FRU_ID_05	Error in DIMM Pair 5
Selftest DIMM 6	FLT	7f02	CHASSIS_MEM_FRU_ID_06	Error in DIMM Pair 6
Selftest DIMM 0	FLT	7f03	CHASSIS_MEM_FRU_ID_00	Error in DIMM Pair 0
Selftest DIMM 2	FLT	7f10	CHASSIS_MEM_FRU_ID_02	Error in DIMM Pair 2
Selftest DIMM 4	FLT	7f11	CHASSIS_MEM_FRU_ID_04	Error in DIMM Pair 4
Selftest DIMM 7	FLT	7f12	CHASSIS_MEM_FRU_ID_07	Error in DIMM Pair 7

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
Selftest DIMM 1	FLT	7f13	CHASSIS_MEM_FRU_ID_01	Error in DIMM Pair 1
Selftest DIMM 0	FLT	7f20	CHASSIS_MEM_FRU_ID_10	Error in DIMM Pair 0
Selftest DIMM 6	FLT	7f21	CHASSIS_MEM_FRU_ID_16	Error in DIMM Pair 6
Selftest DIMM 5	FLT	7f22	CHASSIS_MEM_FRU_ID_15	Error in DIMM Pair 5
Selftest DIMM 3	FLT	7f23	CHASSIS_MEM_FRU_ID_13	Error in DIMM Pair 3
Selftest DIMM 1	FLT	7f30	CHASSIS_MEM_FRU_ID_11	Error in DIMM Pair 1
Selftest DIMM 7	FLT	7f31	CHASSIS_MEM_FRU_ID_17	Error in DIMM Pair 7
Selftest DIMM 4	FLT	7f32	CHASSIS_MEM_FRU_ID_14	Error in DIMM Pair 4
Selftest DIMM 2	FLT	7f33	CHASSIS_MEM_FRU_ID_12	Error in DIMM Pair 2

Format is – FLT 8xye, where x=slot, y=bus, e=error

Selftest Sys Bd	FLT	8001	CHASSIS_IOA_RAM_TEST	x = IOA number
Selftest Sys Bd	FLT	8002	CHASSIS_IOA_TLB_TEST	x = IOA number
Selftest Sys Bd	FLT	800c	CHASSIS_IOA_DMA_TEST	x = IOA number
	TEST	8300	CHASSIS_LASI_TEST_SCSI	
	TEST	8301	CHASSIS_LASI_TEST_LAN	
		8302	CHASSIS_LASI_TEST_KYBD	
	TEST	8306	CHASSIS_WAX_MAP_TEST	
	TEST	8307	CHASSIS_WAX_ID_TEST	
	TEST	8308	CHASSIS_WAX_8042_SELFTEST	
	WARN	8308	CHASSIS_WAX_8042_WARN	

Codes associated with the execution of console/boot iodc will use the codes defined below. The value of Y shows the failure:

Y = 3 CHASSIS_ERR_READING_IODC_BYTES
Y = 4 CHASSIS_ERR_READING_EINIT
Y = 5 CHASSIS_ERR_EXEC_EINIT
Y = 6 CHASSIS_ERR_READING_EIO
Y = 7 CHASSIS_ENTRY_IO_ERR
Y = 8 CHASSIS_INVALID_DEV_CLASS

	WARN	84xY		Graphics in logical slot x=0thru3
	WARN	850Y		LASI rs232 port
	WARN	851Y		EISA rs232 port
	WARN	852Y		LASI ps2, port 0
	WARN	853Y		LASI ps2, port 1
	WARN	854Y		EISA HIL

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
	WARN	855Y		LASI LAN
	WARN	86xY		LASI SE SCSI x = SCSI address
	WARN	87xY		FW SCSI card x=FW SCSI address
	WARN	88xY		Architected devce on IOA0. x = GSC slot number
	WARN	8AxY		Architected device on IOA 1. x = GSC slot number
	WARN	8FFY		Unknown unarchitected device
	WARN	8003	CHASSIS_ERR_READING_IODC BYTES	
	WARN	8004	CHASSIS_ERR_READING_EINIT	
	WARN	8005	CHASSIS_ERR_EXEC_EINIT	
	WARN	8006	CHASSIS_ERR_READING_EIO	
	WARN	8007	CHASSIS_ENTRY_IO_ERR	
	WARN	8008	CHASSIS_INVALID_DEV_CLASS	
	WARN	80f9	CHASSIS_ERR_READING_ ETEST	
	WARN	80fa	CHASSIS_ERR_EXEC_ETEST	
	WARN	80fb	CHASSIS_ERR_ETEST_LIST	
	WARN	80fc	CHASSIS_INVALID_DEVICE	
Selftest Sys Bd	FLT	802b	CHASSIS_IO_BUS_OVERLAP	
Selftest Sys Bd	FLT	803b	CHASSIS_TOO_MANY_ GRAPHICS	
	TEST	8300	CHASSIS_LASI_TEST	
Selftest Sys Bd	FLT	8fff	CHASSIS_LATE_ST_FLT	
	WARN	8fff	CHASSIS_LATE_ST_WARN	
	WARN	9000	CHASSIS_NO_GO_SS_CONS	SS console wasn’t found
	WARN	9001	CHASSIS_NO_CONS_FOUND	Alt console wasn’t found
	WARN	a008	CHASSIS_NO_BOOT_ SELECTION	No bootable device found
	WARN	a00f	CHASSIS_RETRIEVE_PATH_ FAILED	Call to init_boot_device
Selftest Sys Bd	FLT	a088	CHASSIS_NO_BOOT_NO_CONS	No console, unable to boot
	WARN	a50f	CHASSIS_INIT_PRI_PATH_ FAILED	Call to init_boot_device

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
	WARN	a70f	CHASSIS_INIT_OTHR_PATH_ FAILED	Call to init_boot_device
Selftest Sys Bd	FLT	a0ff	CHASSIS_UNKNOWN_ LAUNCH_FLT	Code returned from IPL
	WARN	a0bd	CHASSIS_DEVICE_NOT_READY	

BBAA and BBAD are used in Manufacturing Mode by the firmware

	INIT	c100	CHASSIS_MONARCH_ SELECTED	Monarch selected
	INIT	c300	CHASSIS_MONARCH_TEST	
	INIT	c30c	CHASSIS_MONARCH_SLAVE_ CHECK	
	TEST	c3aa	CHASSIS_MONARCH_SLAVE_ TEST	
	TEST	c3ee	CHASSIS_MONARCH_SLAVE_ TEST_END	
	INIT	c3ff	CHASSIS_LATE_MONARCH_ TEST	
	TEST	c210	CHASSIS_MEM_RESET_HARD	
	TEST	c220	CHASSIS_PHYSICAL_CONFIG	
	TEST	c230	CHASSIS_BANK_SIZING	
	TEST	c240	CHASSIS_CONFIG_FROM_ EEPROM	
	TEST	c250	CHASSIS_INTRLV_CONFIG	
	TEST	c260	CHASSIS_INTRLV_RAM_TEST	
	TEST	c261	CHASSIS_TEST_FIRST_PAGES	
	TEST	c262	CHASSIS_TEST_DUAL_ISSUE	
	TEST	c263	CHASSIS_TEST_WRITE	
	TEST	c264	CHASSIS_TEST_READ_WRITE	
	TEST	c265	CHASSIS_TEST_READ	
	TEST	c270	CHASSIS_UPDATING_CONFIG	
	TEST	c280	CHASSIS_CONFIG_TO_EEPROM	
	TEST	c2a0	CHASSIS_FLAT_CONFIG	
	TEST	c2b0	CHASSIS_FLAT_RAM_TEST	
	TEST	c2c1	CHASSIS_MEM_RESET_SOFT	
	TEST	c2c2	CHASSIS_NON_DEST_RAM_ TEST	Non-destructive RAM test
	TEST	c2e0	CHASSIS_MEM_STUFF_DONE	
	TEST	c200	CHASSIS_RAM_CONFIG	

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
	INIT	c20f	CHASSIS_RAM_CONFIG_FP	Forward progress indicator
	INIT	c201	CHASSIS_BEG_DESTR_MEM_ INIT	Starting destructive memory initialization
	INIT	c202	CHASSIS_BEG_NONDESTR_ MEM_INIT	Begin initializing m e mory non-destructively
	INIT	cde0	CHASSIS_INIT_EISA_ COMPLETE	Finished EISA subsystem initialization
	INIT	cdea	CHASSIS_INIT_EISA Starting EISA	Subsystem initialization
	INIT	cdeb	CHASSIS_EISA_CHECK- ING_FOR_CARDS	Checking for cards in EISA slots
	WARN	cdec	CHASSIS_EISA_NO_CFG_DATA	No configuration data for card in this slot
	WARN	cded	CHASSIS_EISA_CFGID_NE_ CARDID	The ID read from the card does not match the stored ID
	WARN	cdee	CHASSIS_EISA_CARD_INIT_ ERROR	Error during card initialization
Selftest EISA 0	FLT	cdef	CHASSIS_NO_EISA_FOUND	No EISA found
	INIT	cdfx	CHASSIS_EISA_SLOT_INIT	Trying to initialize the EISA card in slot
	INIT	c400	CHASSIS_GET_SS_CONS	
	INIT	c440	CHASSIS_INIT_SS_CONS	
	INIT	c4cc	CHASSIS_INIT_CCP	Initialize close console
	INIT	c4cf	CHASSIS_CCP_FOUND	Found the close console
	INIT	c4cd	CHASSIS_NO_CCP	Close console dead
	INIT	c600	CHASSIS_GET_DEFAULT_CONS	
	INIT	c601	CHASSIS_GET_GRAPHICS_ CONS	
	INIT	c602	CHASSIS_GET_KEYBOARD_ CONS	
	INIT	c640	CHASSIS_INIT_DEFAULT_CONS	
	INIT	c641	CHASSIS_INIT_GRAPHICS_ CONS	
	INIT	c642	CHASSIS_INIT_KEYBOARD_ CONS	
	INIT	c500	CHASSIS_GET_PRI_PATH	
	INIT	c540	CHASSIS_INIT_PRI_PATH	
	INIT	c550	CHASSIS_TEST_PRI_PATH	
	INIT	c700	CHASSIS_GET_MANUF_DFLTS	

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
	INIT	c740	CHASSIS_INIT_MANUF_DFLTS	
	INIT	c740	CHASSIS_INIT_OTHR_PATH	
	INIT	c750	CHASSIS_TEST_OTHR_PATH	
	INIT	c580	CHASSIS_LOAD_IPL_PRI_PATH	
	WARN	c5f0	CHASSIS_PRI_IPL_FAULT	
Selftest Sys Bd	FLT	c5f0	CHASSIS_PRI_IPL_FAULT_ FATAL	
	WARN	c5f1	CHASSIS_BAD_IPL_ADDR_PRI	
	WARN	c5f2	CHASSIS_BAD_LIF_MAGIC_PRI	
	WARN	c5f3	CHASSIS_BAD_IPL_SIZE_PRI	
	WARN	c5f4	CHASSIS_BAD_IPL_ENTRY_PRI	
	WARN	c5f8	CHASSIS_BAD_IPL_CHECK-SUM_PRI	
	INIT	c5ff	CHASSIS_LAUNCH_IPL_PRI	Branching to IPL
	INIT	c780	CHASSIS_LOAD_IPL_OTHR_ PATH	
	WARN	c7f0	CHASSIS_OTHR_IPL_FAULT	
	WARN	c7f1	CHASSIS_BAD_IPL_ADDR_ OTHR	
	WARN	c7f2	CHASSIS_BAD_LIF_MAGIC_ OTHR	
	WARN	c7f3	CHASSIS_BAD_IPL_SIZE_OTHR	
	WARN	c7f4	CHASSIS_BAD_IPL_ENTRY_ OTHR	
	WARN	c7f8	CHASSIS_BAD_IPL_CHECK-SUM_OTHR	
	INIT	c7ff	CHASSIS_LAUNCH_IPL_OTHR	Branching to IPL
	INIT	cb00	CHASSIS_TOC_INITIATED	TOC handler entered
	WARN	cb01	CHASSIS_NO_OS_TOC	No OS_TOC vector
	WARN	cb02	CHASSIS_BAD_OS_TOC_ ADDRESS	Invalid OS_TOC vector
	WARN	cb03	CHASSIS_BAD_OS_TOC_CODE	Invalid OS_TOC code
	WARN	cb04	CHASSIS_BAD_OS_TOC_LEN	Invalid OS_TOC code len
	WARN	cb05	CHASSIS_BAD_OS_TOC_ CHECKSUM	Invalid OS_TOC checksum
	WARN	cb09	CHASSIS_TOC_SEED_IVA	Seed error TOC entered
	WARN	cb0a	CHASSIS_PREV_TOC	Previous TOC logged
	INIT	cb0b	CHASSIS_BR_TO_OS_TOC	Branching to OS_TOC

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
	WARN	cbOC	CHASSIS_OS_TOC_FAILED	
	WARN	cb10	CHASSIS_LPMC_INITIATED	LPMC handler entered
	WARN	cb15	CHASSIS_ULPMC	Runway LPMC error
	WARN	cb19	CHASSIS_LPMC_SEED_IVA	
	INIT	cb1b	CHASSIS_BR_TO_OS_LPMC	Branching to OS_LPMC
HPMC Occurred!	FLT	cb1f	CHASSIS_OS_LPMC_FAILED	Branch to OS_LPMC returned
HPMC Occurred!	FLT	cb9a	CHASSIS_HPMC_OVERWRIT-TEN	HPMC PIM overwritten
HPMC Occurred!	FLT	cb99	CHASSIS_SEED_IVA_HANDLER	PDC_SEED_ERROR iva table hpmc handler called
HPMC Occurred!	FLT	cbf0	CHASSIS_HPMC_INITIATED	HPMC handling initiated
HPMC Occurred!	FLT	cbf1	CHASSIS_NO_OS_HPMC_IN_ IVA	OS did not replace IVA
HPMC Occurred!	FLT	cbf2	CHASSIS_BAD_OS_HPMC_LEN	Invalid length of OS_HPMC
HPMC Occurred!	FLT	cbf3	CHASSIS_BAD_OS_HPMC_ ADDR	Invalid addr for OS_HPMC
HPMC Occurred!	FLT	cbf4	CHASSIS_BAD_OS_HPMC_ CHECKSUM	Invalid OS_HPMC checksum
HPMC Occurred!	FLT	cbf5	CHASSIS_OS_HPMC_VECTOR_0	IVA + 32 == 0
	INIT	cbf7	CHASSIS_PDC_IO_INITIATED	
	INIT	cbf8	CHASSIS_PDC_IO_EXITED	
	WARN	cbf9	CHASSIS_BC_NOT_ CONFIGURED	
	WARN	cbfa	CHASSIS_PREV_HPMC	Previous HPMC logged
HPMC Occurred!	FLT	cbfb	CHASSIS_BR_TO_OS_HPMC	Branching to OS_HPMC
HPMC Occurred!	FLT	cbfc	CHASSIS_BR_TO_OS_HPMC_ FAILED	
HPMC Occurred!	FLT	cbfd	CHASSIS_UNKNOWN_CHECK	Check for no known reason
HPMC Occurred!	FLT	cbfe	CHASSIS_HPMC_DURING_TOC	HPMC interrupted TOC
HPMC Occurred!	FLT	cbff	CHASSIS_MULTIPLE_HPMCS	Nested HPMC occurred (hanging the machine)
	INIT	cc0x	CHASSIS_OS_RENDEZVOUS	x = slave cpu number
	INIT	cc1x	CHASSIS_EARLY_CPU_ RENDEZVOUS	x = slave cpu number
	INIT	cc2x	CHASSIS_CPU_RENDEZVOUS	x = slave cpu number
	INIT	cc3x	CHASSIS_CACHE_CPU_ RENDEZVOUS	x = slave cpu number

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
	INIT	cc4x	CHASSIS_MEM_CPU_RENDEZ-VOUS	x = slave cpu number
Selftest Sys Bd	FLT	ccfx	CHASSIS_SLAVE_BIG_ERR	x = slave cpu number
	TEST	cdyx	CHASSIS_IOA_TEST	y = bus number, x = IOA number
	INIT	cdyx	CHASSIS_INITIALIZE_IO	
	INIT	cd08	CHASSIS_FOUND_IOA_0	Found U2 IOA 0 – with LASI
Selftest Sys Bd	FLT	cd08	CHASSIS_NO_IOA_0	Didn't find U2 IOA 0 – with LASI
	INIT	cd0a	CHASSIS_FOUND_IOA_1	Found U2 IOA 1 – with EISA
Selftest Sys Bd	FLT	cd0a	CHASSIS_NO_IOA_1	Didn't find U2 IOA 1 – with EISA
	INIT	cd0f	CHASSIS_CHK_MMC	Checking for MMC
	INIT	cd1f	CHASSIS_SET_UP_LASI	Doing LASI set up
Selftest Sys Bd	FLT	cd1f	CHASSIS_LASI_NOT_THERE	LASI is not there
	INIT	cd2e	CHASSIS_SET_UP_WAX	Setting up IOA with EISA
Selftest EISA 0	FLT	cd2e	CHASSIS_SET_UP_WAX_ERR	EISA did not respond! (LCD message displayed is Selft Sys Bd)
	INIT	cd10	CHASSIS_CHECK_FOR_ZALON	Checking for core zalon
Selftest sys Bd	FLT	cd10	CHASSIS_NO_ZALON	Core Zalon didn't respond!
	INIT	cd20	CHASSIS_CHECK_EXP_0	PA sizing slot 0 on GSC with EISA on it
Selftest Graph 0	FLT	cd20	CHASSIS_CHECK_EXP_0_ERR	PA error sizing slot 0 on GSC with EISA on it
	INIT	cd21	CHASSIS_CHECK_EXP_1	PA sizing slot 1 on GSC with EISA on it
Selftest sys Bd	FLT	cd21	CHASSIS_CHECK_EXP_1_ERR	PA error sizing slot 1 on GSC with EISA on it
	INIT	cd22	CHASSIS_CHECK_EXP_2	PA sizing slot 2 on GSC with EISA on it
Selftest Graph 1	FLT	cd22	CHASSIS_CHECK_EXP_2_ERR	PA error sizing slot 2 on GSC with EISA on it
	INIT	cd23	CHASSIS_CHECK_EXP_3	PA sizing slot 3 on GSC with EISA on it
Selftest Graph 2	FLT	cd23	CHASSIS_CHECK_EXP_3_ERR	PA error sizing slot 3 on GSC with EISA on it
	INIT	cd24	CHASSIS_CHASSIS_CHECK_ EXP_4	PA sizing slot 4 on GSC with EISA on it

Table 4–1. I/O Failure Codes (Cont.)

FRU	Ostat	Code	Name	Notes
Selftest sys Bd	FLT	cd24	CHASSIS_CHECK_EXP_4_ERR	PA error sizing slot 4 on GSC with EISA on it
	INIT	cd25	CHASSIS_CHECK_EXP_5	PA sizing slot 5 on GSC with EISA on it
Selftest sys Bd	FLT	cd25	CHASSIS_CHECK_EXP_5_ERR	PA error sizing slot 5 on GSC with EISA on it
	INIT	cd2a	CHASSIS_CHK_GRAPHICS_1	Graphics sizing expansion slot 1
Selftest Graph 1	FLT	cd2a	CHASSIS_CHK_GRAPHICS_1_ ERR	Error in graphics sizing expansion slot 1
	INIT	cd2b	CHASSIS_CHK_GRAPHICS	Graphics sizing expansion slot 2
	INIT	cd2b	CHASSIS_CHK_GRAPHICS_2	Graphics sizing expansion slot 2
Selftest Graph 2	FLT	cd2b	CHASSIS_CHK_GRAPHICS_2_ ERR	Error in graphics sizing expansion slot 2
	INIT	cd2c	CHASSIS_CHK_GRAPHICS_0	Graphics sizing expansion slot 0
Selftest Graph 0	FLT	cd2c	CHASSIS_CHK_GRAPHICS_0_ ERR	Error in graphics sizing expansion slot 0
	INIT	cd2d	CHASSIS_CHK_GRAPHICS_3	Graphics sizing expansion slot 0 (logical)
Selftest Graph 0	FLT	cd2d	CHASSIS_CHK_GRAPHICS_3_ ERR	Error in graphics sizing expansion slot 0 (logical)
	INIT	cdff	CHASSIS_INITIALIZE_SYS_MAP	
	INIT	ceaf	CHASSIS_SET_UP_LASI_IOA	
	INIT	ce8e	CHASSIS_SET_UP_WAX_IOA	
	INIT	cd80	CHASSIS_SET_UP_LASI_IOA	
	INIT	cda0	CHASSIS_SET_UP_WAX_IOA	

NOTICE: HPMCs cannot be isolataed to a FRU.

Table 4–2. I/O Failure Codes – Runway (Control) Bus

FRU	Ostat	Code	Name	Notes
HPMC Occurred!	FLT	5000	CHASSIS_UNKNOWN BUS_ERROR	Unknown bus error
HPMC Occurred!	FLT	5001	CHASSIS_INTERNAL_ERROR	Internal error
HPMC Occurred!	FLT	5002	CHASSIS_PATH_ERROR_ ASSERTED	Assertion of PATH_ERROR detected
HPMC Occurred!	FLT	5003	CHASSIS_MODE_PHASE_ERR	Mode phase error
HPMC Occurred!	FLT	5004	CHASSIS_PARITY_ERROR	Data Parity error
HPMC Occurred!	FLT	5005	CHASSIS_PROTOCOL_ERROR	Bus protocol error
HPMC Occurred!	FLT	5006	CHASSIS_NO_SLAVE_ACK	Failure to assert PATH_ SLAVE_ACK
HPMC Occurred!	FLT	5007	CHASSIS_DIR_ERROR	Runway Directed Error
HPMC Occurred!	FLT	5008	CHASSIS_BROAD_ERROR	Runway Broad Error
HPMC Occurred!	FLT	5009	CHASSIS_IMPROPER_ACCESS	Improper access
HPMC Occurred!	FLT	500a	CHASSIS_ILLEGAL_RESPONSE	Illegal response
HPMC Occurred!	FLT	500b	CHASSIS_BUS_TIMEOUT	Bus time#out
HPMC Occurred!	FLT	500d	CHASSIS_WATCHDOG_ TIMEOUT	
HPMC Occurred!	FLT	500e	CHASSIS_GBOA_TOC_ERROR	GeckoBoa TOC Error
HPMC Occurred!	FLT	500f	CHASSIS_TLB_FAULT	U2 TLB fault or invalid PDIR entry

Table 4–3. Hard Physical Addresses (HPAs) – I/O Modules

Module Name	HPA	Additional I/O Pages (SPA)
Opt. Graphics, GSC1	0xF4000000	0
Opt. Graphics, GSC0	0xF8000000	0
LASI	0xFFD00000	1
Opt. Graphics, GSC2	0xF6000000	0
EISA Bus Adapter	0xFC000000	128
EISA Slot 1	0xFC001000	1
EISA Slot 2	0xFC002000	1
EISA Slot 3	0xFC003000	1
EISA Slot 4	0xFC004000	1
EISA Slot 5	0xFC005000	1
EISA Slot 6	0xFC006000	1
EISA Slot 7	0xFC007000	1
EISA Slot 8	0xFC008000	1
EISA Slot 9	0xFC009000	1
EISA Slot 10	0xFC00A000	1
EISA Slot 11	0xFC00B000	1
EISA Slot 12	0xFC00C000	1
EISA Slot 13	0xFC00D000	1
EISA Slot 14	0xFC00E000	1
EISA Slot 15	0xFC00F000	1
WAX Bus Adapter	0xFFE00000	1
Opt. Graphics, GSC0*	0xFA000000	0
Processor	0xFFFA0000 or 0xFFFA2000	1
Memory	0xFFFB1000	1
Slot 0, Fast Wide SCSI	0xF3FC0000	0
Slot 1, Fast Wide SCSI	0xF3FC8000	0
Slot 2, Fast Wide SCSI	0xF3FCC000	0
Core Fast Wide SCSI	0xF3F80000	1
LASI SCSI	0xFFD06000	1
LASI LAN	0xFFD07000	1
LASI RS-232	0xFFD05000	1
LASI Parallel	0xFFD02000	1
LASI Audio	0xFFD04000	1

*This HPA and slot assignment is not supported.

Table 4–3. Hard Physical Addresses (HPAs) – I/O Modules (Cont.)

LASI Floppy	0xFFD0A000	1
LASI PS/2 0 Keyboard	0xFFD08000	1
LASI PS/2 1 Mouse	0xFFD08100	1
WAX HIL	0xFFE01000	1
WAX RS-232	0xFFE02000	1

Allowable Memory Configurations

Figure 4–3 shows the allowable memory configurations for the J Class workstation.

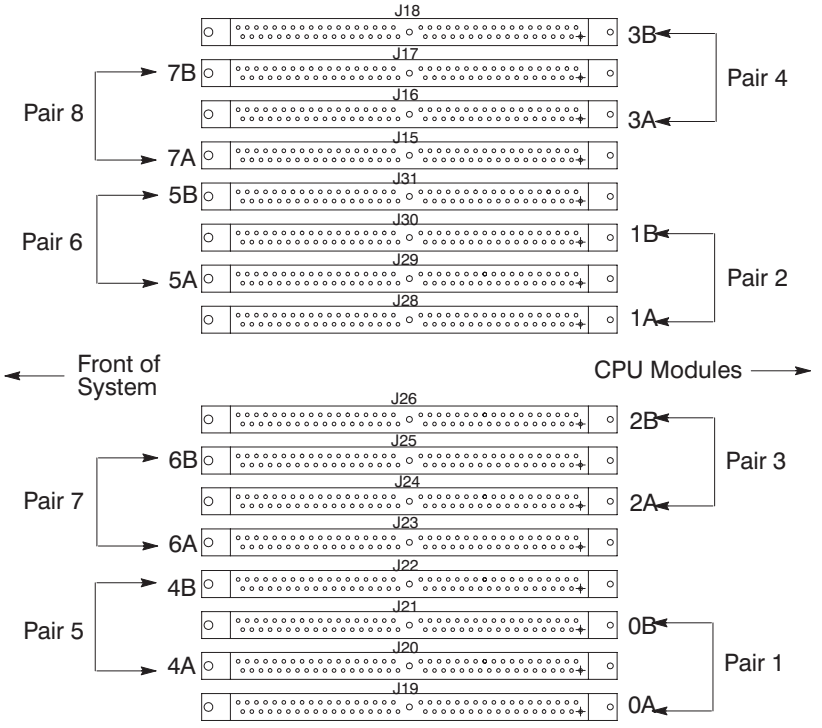


Figure 4–3. Allowable Memory Configurations

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 *Precision Architecture RISC HP 9000 Series 700 Diagnostics Manual* (HP Part Number 92453–90010).

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 Self Test 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.

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:

- **lasidiag** – tests and verifies the core I/O functionality within the LASI chip. The diagnostics test the SCSI interface, LAN interface logic, parallel interface, audio, RS-232, PS/2 keyboard and mouse interface, real time clock, and the PC floppy interface and drive.

- **ldiag** – tests and verifies the basic functionality of the PCX-L chip. This tool tests the CPU, cache, TLB and floating point functions.

- **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. Memtest also provides a map of the memory configuration so that the user can identify the type of memory and its slot location.

- **update** – 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.

Selftest Failures (J280/282/2240 only)

Chassis codes are the key to debugging selftest errors. If a failure is found during selftest, chassis codes are displayed in the LCD. The procedure for using these codes to debug a failure is as follows:

1. Using the following tables, find the chassis code listed on the LCD.

   Codes CB9x through CBFx in Table 4–16 are HPMC errors.

2. A 7xxx code means a memory error. Figure 4–3 is a layout of the memory DIMMs on the CPU board that goes down to the DIMM pair. To continue beyond the pair, run Offline Diagnostics.

To get additional information about failures from the boot console interface, use the Service menu **pim**, **pdt**, and **ChassisCode** commands.

Memory Failures

The J Class system requires special Memory Page Deallocation (PDC) to be implemented. This PDC feature allows the workstation to provide information to the operating system about memory failures.

HP-UX 10.x uses PDC information to map out failing memory areas and continue normal operation. You can use the command **memrpt** with the detail switch to obtain information about the Memory Page Deallocation Table (PDT) as well as single bit errors logged by the system.

```
# /usr/sbin/sysdiag  Enter
DUI >logtool  Enter
LOGTOOL> memrpt detail  Enter
```

The PDT can also be checked using the **pdt** command in the Service menu of the boot console handler (Refer to Chapter 9). If a failing DIMM is replaced, use the command **pdt clear** in the Service menu to clear out the PDT.

Table 4–4. Interrupts

Ostat	Code	Name	Notes
FLT	1000	UNEXPECTED_INTERRUPT	Interrupt during PDC execution
FLT	1x01	UNEXPECTED_INTERRUPT	HPMC
FLT	1x02	UNEXPECTED_INTERRUPT	Powerfail interrupt (unused)*
FLT	1x03	UNEXPECTED_INTERRUPT	Recovery Counter Trap*
FLT	1x04	UNEXPECTED_INTERRUPT	External Interrupt
FLT	1x05	UNEXPECTED_INTERRUPT	LPMC
FLT	1x06	UNEXPECTED_INTERRUPT	ITLB page fault*
FLT	1x07	UNEXPECTED_INTERRUPT	Instruction mem protection trap*
FLT	1x08	UNEXPECTED_INTERRUPT	Illegal instruction trap
FLT	1x09	UNEXPECTED_INTERRUPT	Break instruction trap
FLT	1x0A	UNEXPECTED_INTERRUPT	Priviliged instruction trap*
FLT	1x0B	UNEXPECTED_INTERRUPT	Priviliged register trap*
FLT	1x0C	UNEXPECTED_INTERRUPT	Overflow trap*
FLT	1x0D	UNEXPECTED_INTERRUPT	Conditional trap*
FLT	1x0E	UNEXPECTED_INTERRUPT	Assist exception trap
FLT	1x0F	UNEXPECTED_INTERRUPT	DTLB miss/page fault*
FLT	1x10	UNEXPECTED_INTERRUPT	Non–access ITLB fault*
FLT	1x11	UNEXPECTED_INTERRUPT	Non–access DTLB/page fault*
FLT	1x12	UNEXPECTED_INTERRUPT	Data memory protection trap*
FLT	1x13	UNEXPECTED_INTERRUPT	Data memory break trap*
FLT	1x14	UNEXPECTED_INTERRUPT	TLB dirty bit trap*
FLT	1x15	UNEXPECTED_INTERRUPT	Page Reference trap*
FLT	1x16	UNEXPECTED_INTERRUPT	Assist emulation trap*
FLT	1x17	UNEXPECTED_INTERRUPT	Higher–privilege transfer trap*
FLT	1x18	UNEXPECTED_INTERRUPT	Lower–privilege transfer trap*
FLT	1x19	UNEXPECTED_INTERRUPT	Taken branch trap*
FLT	1x1a	UNEXPECTED_INTERRUPT	Data memory access rights trap
FLT	1x1b	UNEXPECTED_INTERRUPT	Data memory protection ID trap
FLT	1x1c	UNEXPECTED_INTERRUPT	Unaligned data reference trap

x = Runway slot number

*These unexpected interrupts should never occurr in PDC mode

Table 4–5. SelfTests and Diagnostics – CPU/TLB

Ostat	Code	Name	Notes
TEST	1x20	CPU_BASIC	Starting CPU basic selftest
TEST	1x21	CPU_ALU	Starting CPU ALU selftest
TEST	1x22	CPU_BR	Starting CPU branch selftest
TEST	1x23	CPU_ARITH_COND	Starting CPU arithmatic conition selftest
TEST	1x24	CPU_BIT_OP	Starting CPU bit operation selftest
TEST	1x25	CPU_CR	Starting CPU control register selftest
TEST	1x26	CPU_EXT_INT	Starting CPU external interrupt selftest
TEST	1x27	CPU_ITIMER	Starting CPU Itimer selftest
TEST	1x28	CPU_MULTI_MEDIA	Starting CPU Multimedia selftest
TEST	1x29	CPU_SHADOW	Starting CPU Shadow register selftest
TEST	1x2A	CPU_DRS	Starting CPU Diagnose regidter selftest
TEST	1x2B	CPU_RDRS	Starting CPU Remote Diagnose register selftest
TEST	1x2C	CPU_BYPASS	Starting CPU Bypass selftest
TEST	1x30	STARTING_EST	Starting Early selftest
TEST	1x3E	EXITING_EST	Exiting Early selftest
TEST	1xA0	COPORC	Starting CPU COPROC selftest
TEST	1xA1	COPORC_REG	Starting COPROC register selftest
TEST	1xA2	COPORC_INSTR	Starting COPROC instruction selftest
TEST	1xA3	COPORC_TRAPS	Starting COPROC traps selftest
TEST	1xA4	COPORC_MISC	Starting COPROC miscellaneous selftest
TEST	1xA5	COPORC_BYPASS	Starting COPROC Bypass selftest
TEST	1xB1	TLB_RAM	TLB RAM Test
TEST	1xB2	TLB_TRANS	TLB Translation/Protection/Access Rights Test
INIT	1x3C	CPU_INIT	Initialize CPU
WARN	1x31	EST_SKIPPED	Early selftest skipped
WARN	1x4y	CPU_RDR_WARN	RDR selftest failure, where y is rdr number
WARN	1xAF	FPU_S_DISABLED	FPUs are disabled

Table 4–5. SelfTests and Diagnostics – CPU/TLB (Cont.)

Ostat	Code	Name	Notes
FLT	1x20	CPU_BASIC_ERR	CPUbasic selftest failure
FLT	1x21	CPU_ALU_ERR	CPU ALU selftest error
FLT	1x22	CPU_BR_ERR	CPU branch selftest failure
FLT	1x23	CPU_ARITH_COND_ERR	CPU arithmatic condition selftest failure
FLT	1x24	CPBIT_OP_ERR	CPU bit operation selftest failure
FLT	1x25	CPU_CR_ERR	
FLT	1x26	CPU_EXT_INT_ERR	CPU external interupt selftest failure
FLT	1x27	CPU_ITIMER_ERR	CPU itimer selftest failure
FLT	1x28	CPU_MULTI_MEDIA	CPU Multimedia selftest failure
FLT	1x29	CPU_SHADOW_ERR	CPU Shadow register selftest failure
FLT	1x2A	CPU_DRS_ERR	CPU Diagnose register selftest failure
FLT	1x2B	CPU_RDRS	CPU Remote Diagnose register selftest failure
FLT	1x2C	CPU_BYPASS	CPU Register Bypass selftest failure
FLT	1x32	BAD_CPU_TEST_MODE	
FLT	1x3F	CACHE_LOAD_ERROR	
FLT	1xA1	COPORC_REG _ERR	COPORC register selftest failure
FLT	1xA2	COPORC_INSTR_ERR	COPORC instructions selftest failure
FLT	1xA3	COPORC_TRAPS_ERR	COPORC traps selftest failure
FLT	1xA4	COPORC_MISC_ERR	COPORC misc selftest failure
FLT	1xA5	COPORC_BYPASS_ERR	COPORC bypass selftest failure
FLT	1xB1	TLB_RAM_ERR	TLB RAM selftest failure
FLT	1xB2	TLB_TRANS_ERR	TLB Translation selftest failure

x = CPU number

Table 4–6. Boot Errors

Ostat	Code	Name	Notes
TEST	1xBC	TEST_CPU_CLOCKS	Test for matching CPU clock speed
INIT	1xBC?	INIT_CPU_CLOCKS	Finished test for CPU clock Speed
INIT	1xCA	RWAY_CPU_ARB	Initializing Runway CPU arbitration
INIT	1xFC	FIND_CPUs	Synchronizing CPUs
WARN	1xBC	WARN_CPU_CLOCKS	Skipped test for CPU clock speed
WARN	1xCD	CPU_DECONFIG	CPU was deconfigured
WARN	1xCE	CPU_EXTINGUISH	CPU was extinguished due to call to PDC_PROC
WARN	1xD0	MONARCH_DCNF	Monarch was deconfigured
WARN	1xEF	ST_WARNING	Selftests returned a warning
WARN	1xFy	SLAVE_CPU_FAIL	M<onarch has stopped a non–responding slave x = Moxnarch CPU #, y = Slave CPU #
FLT	1xBA	BOOT_ABDICATION	Bad Monarch CPU, x = CPU number
FLT	1xBB	BAD_CPU_NUMBER	CPU number is greater than 3
FLT	1xBC	BAD_CLOCKS	Bad CPU clock speed detected
FLT	1xBD	BAD_CPU_ORDER	Enforcing CPU ordering
FLT	1xBE	CPU_LOAD_MISSING	Missing Load Board
FLT	1xBF	BOOT_FAILURE	Slave CPU halted due to catastrophic boot failure
FLT	1xCB	CPU_REV_BAD	Mismatched CPU revisions
FLT	1xCC	CPU_CACHE_BAD	Mismatched cache sizes
FLT	1xCE	CPU_EXTINGUISH	CPU was extinguished via PDC_PROC call
FLT	1xCF	SLAVED_FAILED	Slave halted itself when selftest status <0
FLT	1xDF	MONARCH_FAIL_DI	Monarch failed Dual Issue
FLT	1xFF	MONARCH_ST_FLT	Selftest returned a failure

x = Runway slot number

Table 4–7. SELFTESTS AND DIAGNOSTICS – Cache

Ostat	Code	Name	Notes
TEST	2x10	ICACHE_ALINE	Starting Icache Address line selftest
TEST	2x11	ICACHE_ALT_WRITE	
TEST	2x20	ICACHE_RAM	Starting Icache RAM selftest
TEST	2x22	ICACHE_ALT_READ	
TEST	2x30	ITAG	Starting Icache tag circuitry selftest
TEST	2x33	DCACHE_ALT_WRITE0	
TEST	2x40	CACHE_IERR1	Starting Icache error circuitry selftest
TEST	2x44	DCACHE_ALT_READ0	
TEST	2x50	DCACHE_STORE_QUEUE	
TEST	2x55	DCACHE_ALT_WRITE1	
TEST	2x60	DCACHE_ALINE	Starting Dcache Address line selftest
TEST	2x66	DCACHE_ALT_READ1	
TEST	2x70	DCACHE_RAM	Starting Dcache RAM selftest
TEST	2x77	DCACHE_ALT_WRITE2	
TEST	2x80	DTAG	Starting Dcache tag circuitry selftest
TEST	2x88	DCACHE_ALT_READ2	
TEST	2x90	CACHE_DERR	
TEST	2x99	DCACHE_ALT_WRITE3	
TEST	2xAA	DCACHE_ALT_READ3	
TEST	2xBB	XTRA_ICACHE_RAM	
TEST	2xCC	XTRA_DCACHE_RAM	
TEST	2xD1	LOOP_ON_MEM_READ	
TEST	2xD2	LOOP_ON_IO_READ	
TEST	2xD3	LOOP_ON_MEM_WRITES	
TEST	2xD4	LOOP_ON_IOA_WRITES	
TEST	2xD5	LOOP_ON_DCACHE_NOISE	
TEST	2xD6	ERROR_ON_DCACHE_NOISE	
TEST	2xD7	LOOP_ON_ICACHE_NOISE	
TEST	2xD8	ERROR_ON_ICACHE_0_NOISE	
TEST	2xD9	ERROR_ON_ICACHE_F_NOISE	
WARN	2xC0	ICACHE_PARITY	Icache parity error
WARN	2xC1	ICACHE_TAG_PARITY	Icache tag parity error
WARN	2xC2	ICACHE_WORD0_PARITY	Icache word0 parity error

Table 4–7 SELFTESTS AND DIAGNOSTICS – Cache (cont.)

Ostat	Code	Name	Notes
FLT	2x11	ICACHE_ALINE_SHORT	Icache aline shorts failure
	Extended info D005/F005		D = data short, F = tag short
		Address in error[0:15]	
		Address in error[16:31]	
		Expected data[0:15]	
		Expected data[16:31]	
		Expected data[32:47]	
		Expected data[48:63]	
		Expected data[64:79]	(data short only)
		Expected data[80:95]	(data short only)
		Expected data[96:111]	(data short only)
		Expected data[112:127]	(data short only)
		Actual data[0:15]	
		Actual data[16:31]	
		Actual data[32:47]	
		Actual data[48:63]	
		Actual data[64:79]	(data short only)
		Actual data[80:95]	(data short only)
		Actual data[96:111]	(data short only)
		Actual data[112:127]	(data short only)
FLT	2x12	ICACHE_ALINE_OPEN	Icache aline opens failure
	Extended info D000/F000		D = data open, F = tag open
		Control Address [0:15]	
		Control Address [16:31]	
		Test Address [0:15]	
		Test Address [16:31]	
		Actual data[0:15]	(NOTE: Expected data is always 0)
		Actual data[16:31]	
		Actual data[32:47]	
		Actual data[48:63]	
		Actual data[64:79]	(data short only)
		Actual data[80:95]	(data failure only)
		Actual data[96:111]	(data failure only)
		Actual data[112:127]	(data failure only)
FLT	2x21	ICACHE_RAM_DATA_ERR	Icache RAM data error
	Extended info D000		
		Address in error[0:15]	
		Address in error[16:31]	
		Expected data[0:15]	
		Expected data[16:31]	
		Expected data[32:47]	
		Expected data[48:63]	
		Expected data[64:79]	
		Expected data[80:95]	
		Expected data[96:111]	
		Expected data[112:127]	
		Actual data[0:15]	
		Actual data[16:31]	
		Actual data[32:47]	
		Actual data[48:63]	
		Actual data[64:79]	
		Actual data[80:95]	
		Actual data[96:111]	
		Actual data[112:127]	

Table 4–7 SELFTESTS AND DIAGNOSTICS – Cache (cont.)

Ostat	Code	Name	Notes
FLT 2x22	2x22 Extended info F000 Address in error[0:15] Address in error[16:31] Expected data[0:15] Expected data[16:31] Expected data[32:47] Expected data[48:63] Actual data[0:15] Actual data[16:31] Actual data[32:47] Actual data[48:63]	ICACHE_RAM_TAG_ERROR	Icache RAM tag error
FLT	2x23	ICACHE_RAM_LOAD_ERROR	
FLT	2x25	ICACHE_RAM_LD_D_ERROR	Icache RAM load data error from icache_load. SAME AS FLT 2x21
FLT	2x26 Extended info F000 Address in error[0:15] Address in error[16:31] Expected data[0:15] Expected data[16:31] Expected data[32:47] Expected data[48:63] Actual data[0:15] Actual data[16:31] Actual data[32:47] Actual data[48:63]	ICACHE_RAM_LD_T_ERROR	Icache RAM load tag0 error from icache_load
FLT	2x51	DCACHE_D_ST_QUEUE_ERR	
FLT	2x52	DCACHE_T_ST_QUEUE_ERR	
FLT	2x61 Extended info D000/F000 Address in error[0:15] Address in error[16:31] Expected data[0:15] Expected data[16:31] Expected data[32:47] Expected data[48:63] Actual data[0:15] Actual data[16:31] Actual data[32:47] Actual data[48:63]	DCACHE_ALINE_0105	Dcache aline shorts failure D=data, F=tag Addresses ending in 0 are even bank errors Addresses ending in 8 are odd bank errors
FLT	2x62 Extended info D000/F000 Control Address [0:15] Control Address [16:31] Test Address [0:15] Test Address [16:31] Actual data[0:15] Actual data[16:31] Actual data[32:47] Actual data[48:63]	DCACHE_ALINE_0110	Dcache aline opens failure D=data open, F=tag open (NOTE: Expected data is always 0)

Table 4–7 SELFTESTS AND DIAGNOSTICS – Cache (cont.)

Ostat	Code	Name	Notes
FLT	2x71	DCACHE_RAM_D_ERR	Dcache RAM data error
FLT	2x72 DCACHE_RAM_TAG_ERR Extended info		Dcache RAM tag error SAME AS 2x22
FLT	2xB0	DCACHE_PARITY	Dcache parity error
FLT	2xB1	DCACHE_EVEN_TAG_PARITY	
FLT	2xB2	DCACHE__ODD_TAG_PARITY	
FLT	2xB3	DCACHE_EVEN_TAG_PARITY	
FLT	2xB4	DCACHE__ODD_TAG_PARITY	
FLT	2xC3	ICACHE_WORD1_PARITY	Icache word1 parity error

x = Runway slot number

Table 4–8. PROCESSOR DEPENDENT HARDWARE (PDH)

Ostat	Code	Name	Notes
TEST	3x00	ROM_XSUM_TEST	Start checksumming the FEPROM
TEST	3x01	PDH_CNTRL_TEST	Testing_PDH_CONTROL_REGISTER
TEST	3x02	SCR–SELFTEST	Scratch RAM under test
TEST	3x0B	PDH_IO_CNTRL_TEST	Test PDH_IO_CNTRL_REG
TEST	3x1B	CHECK_MODEL_STRING	Model string check
TEST	3x1C	TEST–SW–ID	Check SW_ID
TEST	3xBC	TEST–SYSTEM–CLOCKS	Test system clock setup
TEST	3xCD	CHECK–DEFAULTS	Cecking stable storage validity
INIT	3x00	ROM_XSUM_INIT	FEPROM checksum correct
INIT	3x01	PDH_CNTRL_INIT	Init the PDH_CNTRL_REGISTER
INIT	3x02	SCR–INIT	Scratch RAM successfully initialized
INIT	3x07	INVOKE_LBD	Entering LBD
INIT	3x0B	PDH_IO_CNTRL_INIT	Init PDH_IO_CONTROL_REG
INIT	3x1C	UPDATE_SW_ID	Perform SW_ID update
INIT	3xBC	INIT–SYSTEM–CLOCKS	Done system clock check
INIT	3xC4	CLEARING_EEPROM	Clearing and revalidating EEPROM
INIT	3xCD	INIT–DEFAULTS	Initializing Stable Storage
INIT	3xD4	DEFAULTING_EEPROM2	(not on J280)
WARN	3x03	SS_ERROR	Error reading stable storage

Table 4–8 PROCESSOR DEPENDENT HARDWARE (PDH) (cont.)

Ostat	Code	Name	Notes
WARN	3x04	ERR_WRITING_EEPROM	Error writing to the EEPROM
WARN	3x06	ERR_READING_EEPROM	Error reading EEPROM
WARN	3x1A	HVERSION_MISMATCH	Stable Store HVERSION didn't match cacalculated version
WARN	3x1B	MODEL_STRING_MISMATCH	Model string didn't match caculated vet.
WARN	3x2A	HVERSION_CALC_FAIL	Calculation of HVERSION failed for CPU x
WARN	3xBC	WARN_SYSTEM_CLOCKS	Skipped system clock test.
FLT	3x00	ROM_XSUM_ERR	EEPROM checksum failed
FLT	3x01	PDH_CNTRL_ERR	PDH_IO_CNTRL_REGISTER failure
FLT	3x02	SCR_FATAL_ERR	Fatal error in scratch RAM
FLT	3x03	SS_FATAL_ERROR	Contents invalid and no console
FLT	3x04	FATAL_ERR_WRITNG_EEPROM	Fatal error writing to the EEPROM
FLT	3x05	EEPROM_WRITE_LIMIT	Write limit exceeded
FLT	3x06	FATAL_ERR_READING_EEPROM	Fatal error reading EEPROM
FLT	3x08	BAD_SYS_BRD_BYTE	Invalid SYSTEM_BOARD_BYTE
FLT	3x09	BAD_SYS_MODE_BYTE	Invalid SYSTEM_MODE_BYTE
FLT	3x0A	BAD_SYS_MFG_TEST_BYTE	Invalid SYSTEM_MFG_TEST_BYTE
FLT	3x0B	PDH_IO_CNTRL_ERR	PDH_IO_CONTROL_REG failed
FLT	3x1B	FATAL_MODEL_STRING	Fatal error while checking model string
FLT	3x1C	FATAL_UPDATE_SW_ID	Failed SW_ID update
FLT	3xBC	BAD_SYSTEM_CLOCKS	Improper system clock setup
FLT	3xCC	EARLY_BAD_CACHE_SIZE	PDH cache size is bad
FLT	3xCD	FATAL_DEFAULTS	Fatal error initilaizing stable storage
FLT	3xF4	EEPROM_BOOT_LIMIT	Number of boots exceeded 95,000 limit
FLT	3xFC	BAD_SYS_BD_ID	Bad or unknown BD ID (not in J280)
FLT	3xFF	FAN_FAILURE	Fan failure detection

x = CPU number

Table 4–9. LATE SELFTESTS

Ostat	Code	Name	Notes
TEST	4x00	STARTING_LST	Starting Late Selftest
TEST	4x0E	EXITING_LST	Exiting Late Selftest
TEST	4x20	LST_EST	Starting cache execution of early cpu selftests
TEST	4x21	LST_BASIC	Starting Late cpu basic selftest
TEST	4x22	LST_ALU	Starting Late cpu alu selftest
TEST	4x23	LST_BR	Starting Late cpu br selftest
TEST	4x24	LST_ARITH_COND	Starting Late cpu arith cond selftest
TEST	4x25	LST_BIT_OPS	Starting Late cpu bit operations selftest
TEST	4x26	LST_CR	Starting Late cpu control register selftest
TEST	4x27	LST_EXT_INT	Starting Late cpu external interrupt selftest
TEST	4x28	LST_ITIMER	Starting Late cpu inner selftest
TEST	4x29	LST_MULTI_MEDIA	Starting Late cpu multi–media selftest
TEST	4x2A	LST_SHADOW	Starting Late shadow register selftest
TEST	4x2B	LST_DRS	Starting Late diagnose register selftest
TEST	4x2C	LST_RDRS	Starting Late remote diagnose register selftest
TEST	4x2D	LST_BYPASS	Starting Late cpu register selftest
TEST	4x30	CACHE_BYTE	Starting cache byte selftest
TEST	4x40	CACHE_FLUSH	Starting cache flush selftest
TEST	4x50	ICACHE_MISS	Starting Icache miss selftest
TEST	4x60	DCACHE_MISS	Starting Dcache miss selftest
TEST	4x70	CACHE_DERR	Starting Dcache error circuitry selftest
TEST	4x80	DCACHE_STORE_QUEUE	Starting Dcache Store Queue selftest
TEST	4x90	BR_TARGET_CACHE	
WARN	4x01	LST_SKIPPED	Skipping Late selftest
FLT	4x21	LST_BASIC_ERR	Late cpu basic selftest failure
FLT	4x22	LST_ALU_ERR	Late cpu alu selftest failure
FLT	4x23	LST_BR_ERR	Late cpu br selftest failure
FLT	4x24	LST_ARITH_COND_ERR	Late cpu arith cond selftest failure
FLT	4x25	LST_BIT_OPS_ERR	Late cpu bit operations selftest failure
FLT	4x26	LST_CR_ERR	Late cpu control register selftest failure
FLT	4x28	LST_ITIMER_ERR	Late cpu itimer selftest failure
FLT	4x29	LST_MULTI_MEDIA_ERR	Late cpu multi–media selftest failure
FLT	4x2A	LST_SHADOW_ERR	Late cpu shadow register selftest failure

Table 4–9 LATE SELFTESTS (cont.)

Ostat	Code	Name	Notes
FLT	4x2D	LST_BYPASS_ERR	Late cpu bypass register selftest failure
FLT	4x30	CACHE_BYTE_ERR	Cache byte selftest failure
FLT	4x40	CACHE_FLUSH_ERR	Cache flush selftest failure
FLT	4x50	ICACHE_MISS_ERR	Icache miss selftest failure
FLT	4x60	DCACHE_MISS_ERR	Dcache miss selftest failure
FLT	4x81 Extended info D000 Address in error[0:15] Address in error[16:31] Expected data[0:15] Expected data[16:31] Expected data[32:47] Expected data[48:63] Actual data[0:15] Actual data[16:31] Actual data[32:47] Actual data[48:63]	DCACHE_D_ST_QUEUE_ERR	Failure in data portion of dcache store queue D=data Addresses ending in 0 are even bank errors Addresses ending in 8 are odd bank errors

x = Runway slot number

Table 4–10. BUS TRANSACTIONS

Ostat	Code	Name	Notes
FLT	5xy0	UNKNOWN_BUS_ERROR	
FLT	5xy1	INTERNAL_ERROR	
FLT	5xy2	PATH_ERROR_ASSERTED	Assertion of PATH_ERROR detected
FLT	5xy3	MODE_PHASE_ERROR	
FLT	5xy4	PARITY_ERROR	Data Parity Error
FLT	5xy5	PROTOCOL_ERROR	Bus Protocol Error
FLT	5xy6	NO_SLAVE_ACK	Failure to Assert PATH_SLAVE_ACK
FLT	5xy7	DIR_ERROR	Runway directed error
FLT	5xy8	BROAD_ERROR	Runway Broad Error
FLT	5xy9	IMPROPER_ACCESS_ERROR	
FLT	5xyA	ILLEGAL_RESPONSE	
FLT	5xyB	BUS_TIMEOUT	
FLT	5xyD	WATCHDOG_TIMEOUT	
FLT	5xyE	GBOA_TOC	GeckoBoa TOC Error
FLT	5xyF	TLB_FAULT	U@ TLB fault or invalid PDIR entry

x = Master ID, y = bus number (will always be 0, which is Runway bus)
Master IDs are:

0 CPU0	4 IOA0
1 CPU1	5 IOA1
2 CPU2	6 IOA2
3 CPU3	7 IOA3

Major Code Category 6 – Reserved

Table 4–11. MEMORY SUBSYSTEM FAULT Codes

Ostat	Code	Name	Notes
WARN	7701	USING_ALT CONFIG	Using alternate memory config
WARN	7702	MEMORY_INIT_ONLY	Memory not tested, initialized only
WARN	7703	SIM_LOADING_WARNING	
WARN	7704	RAM_BUS_WARNING	
WARN	7705	GOOD_MEM_GOOFY	GOOD_MEM>memory size
WARN	7706	MIXED_DRAMS	Has EDO and Standard memory installed
WARN	770F	SMC_REV_1_WARNING	
WARN	7800	PDT_DISABLED_WARNING	
WARN	7801	UPDATE_SBE_OVRWRT	Overwrite SBE with MBE
WARN	7802	UPDATE_DUP_ENTRY	Duplicate PDT entry
FLT	7000	MEM_HPMC_ERR	HPMC in memory system
FLT	7001	ICACHE_PARITY_ERROR	Icache parity error in memory test
FLT	7002	DCACHE_PARITY_ERROR	Dcache parity error in memory test
FLT	7003	MSI_READ_ERROR	MSI read timeout
FLT	7004	MSI_WRITE_ERROR	MSI write timeout
FLT	7005	RUNWAY_ERROR	Runway parity error
FLT	7006	WRITE_BOMB_ERROR	Write bomb error
FLT	7007	MEMORY_ADDRESS_ERROR	Memory address error
FLT	7008	MULTI_BIT_ERROR	Multi–bit memory error
FLT	7009	SINGLE_BIT_ERROR	Single–bit memory error
FLT	70FF	UNKNOWN_HPMC	
FLT	7FFF	CATASTROPHIC_MEM_ERR	
FLT	7101	MMC_NOT_RESPONDING	
FLT	7102	MMC_NOT_READY_ERROR	
FLT	7103	MMC_FAILED_TO_CLEAR	
FLT	7104	MMC_STICKY_BITS	
FLT	7105	MMC_BAD_REV	
FLT	7106	MMC_REG_ERR	
FLT	7107	MMC_ERR_IN_ECC_TEST	

Table 4–11 MEMORY SUBSYSTEM FAULT Codes (cont.)

Ostat	Code	Name	Notes
FLT	7200	NO_SMC_AVAILABLE	
FLT	721x	SMC_FAILED	x = SMC number
FLT	722x	SMC_BAD_REV	x = SMC number
FLT	7230	SMC_FAILED_TO_RESPOND	
FLT	7301	DIMM_0_DATA_ERROR	DIMM 0 bytes are not equal
FLT	7302	DIMM_1_DATA_ERROR	DIMM 1 bytes are not equal
FLT	7303	DIMM_MISMATCH_ERROR	DIMM 0 data <> DIMM 1 data
FLT	7304	UNKNOWN_SIZING_ERROR	Unknown sizing compare error
FLT	7305	SIZING_MBE_ERROR	MBE occurred during sizing
FLT	7306	ADDR_TEST_ERROR	Addr test failed in bank
FLT	7307	ECC_TEST_ERROR	Ecc test failed on bank
FLT	7308	MBE_BY_SBE_ERROR	SBE caused an MBE
FLT	7Fxy	MEM_FRU_ID	x = Extender, y = DIMM pair
FLT	7401	NO_DRAMS	No DRAMS installed
FLT	7403	BAD_ADDR	Address did not map to bank
FLT	7404	BAD_GCT_ADDR	Address did not map in GCT
FLT	7500	NO_RAM_FOUND	
FLT	7501	GOOD_MEM_FAILED	Not enough good memory to run OS
FLT	7502	BCH_MEM_FAILED	Not enough good memory to run BCH
FLT	7604	BAD_MCT_MEM_TEST_STATUS	No bits set in Test Status
FLT	7Fxy	MEM_FRU_ID	x = Extender, y = DIMM pair
FLT	7800	PDT_DISABLED_HALT	
FLT	7803	UPDATE_EEPROM_ERR	
FLT	7804	UPDATE_TABLE_FULL	PDT table is full

PDCE_HPMC Memory Fault Codes

The following codes are displayed by the PDCE_HPMC handler when an HPMC has occurred and the Memory controller has an eror logged. These codes are different than the fault codes displayed when there is a memory fault during memory config test or init.

Table 4–12. PDCE_HPMC MEMORY FAULT Codes

Ostat	Code	Name	Notes
FLT	7D00	HPMC_MEM_ERROR	HPMC is in memory system
FLT	7D01	HPMC_ICACHE_PARITY_ERROR	Icache parity error in memory test
FLT	7D02	HPMC_DCACHE_PARITY_ERROR	Dcache parity error in memory test
FLT	7D03	HPMC_MSI_READ_ERROR	MSI read timeout
FLT	7D04	HPMC_MSI_WRITE_ERROR	MSI write timeout
FLT	7D05	HPMC_RUNWAY_ERROR	Runway parity error
FLT	7D06	HPMC_WRITE_BOMB_ERROR	Write bomb error
FLT	7D07	HPMC_MEMORY_ADDR_ERROR	Memory address error
FLT	7D08	HPMC_MULTI_BIT_ERROR	Multi–bit memory error
FLT	7D09	HPMC_SINGLE_BIT_ERROR	Single–=bit memory error
FLT	7D0A	HPMC_BAD_ADDR	Address did not map to bank

Table 4–13. I/O DEVICE FAULT Codes

Ostat	Code	Name	Notes
TEST	8000	GECKOBOA_REG	
TEST	8400	LASI_TEST	Begin LASI tests
TEST	8404	LASI_TEST_RS232	
TEST	8405	LASI_TEST_SCSI	
TEST	8406	LASI_TEST_LAN	
TEST	8407	LASI_TEST_KYBD	
TEST	8500	WAX_EISA_MAP_TEST	
TEST	8501	WAX_EISA_ID_TEST	
TEST	8C06	PCI_BIST_TEST	Start exec dev's BIST test
TEST	8C10	INIT_PCI	
TEST	8C11	TEST_PCI_COMPLETE	Test complete for DINO on GSC bus 1
TEST	8C12	INIT_PCI_COMPLETE	PCI init complete for DINO on GSC bus 1
TEST	8C20	INIT_PCI	
TEST	8C21	TEST_PCI_COMPLETE	Test complete for DINO on GSC bus 2
TEST	8C22	INIT_PCI_COMPLETE	PCI init complete for DINO on GSC bus 2
WARN	80F3	ERR_READING_IODC_BYTES	PDC_IODC failed to retrieve header info
WARN	80F4	ERR_READING_EINIT	PDC_IODC failed to return entry_init
WARN	80F5	ERR_EXEC_EINIT	PDC_IODC failed to execute entry_init
WARN	80F6	ERR_READING_EIO	PDC_IODC failed to return entry_io
WARN	80F7	ERR_ENTRY_IO_ERR	
WARN	80F8	INVALID_DEVICE_CLASS	
WARN	80F9	ERR_READIN_ETEST	PDC_IODC failed to return entry_test
WARN	80FA	ERR_EXEC_ETEST	
WARN	80FC	INVALID_DEVICE	
WARN	811A	HOT_SWAP_RETRY	Boot disk failed to spin up, retrying after waiting amount of time specified by the BootTimer value*
WARN	8FFF	LATE_ST_WARN	
FLT	8001	GECKOBOA_REG_0100	UBC register failed
FLT	8002	GECKOBOA_REG_0105	LBC register failed
FLT	8003	GECKOBOA_REG_0110	Error register failed
FLT	8004	GECKOBOA_REG_0115	CMD_RST_ST failed
FLT	8005	GECKOBOA_NIO	

FLT	8006	GECKOBOA_NIO–100_	
FLT	8007	GECKOBOA_NIO_0105	
FLT	8008	GECKOBOA_NIO_0110	
FLT	8009	GECKOBOA_NIO_0115	
FLT	800A	GECKOBOA_NIO_0120	
FLT	800B	GECKOBOA_NIO_0125	
FLT	802B	IO_BUS_OVERLAP	
FLT	803D	TOO_MANY_GRAPHICS	
FLT	8404	LASI_FLT_RS232	Failed LASI RS232 test
FLT	8405	LASI_FLT_SCSI	Failed LASI SCSI test
FLT	8406	LASI_FLT_LAN	Failed LASI LAN test
FLT	8407	LASI_FLT_KYBD	Failed LASI LAN test
FLT	84FF	FLT_NO_LASI	No LASI present
FLT	8500	WAX_EISA_MAP_ERR	
FLT	8501	WAX_EISA_ID_ERR	
FLT	8C05	PCI_PATH_ERR	PATH error – wrong HW?
FLT	8C07	PCI_BIST_ERR	Dev's BIST test failed
FLT	8C08	PCI_ALLOC_ERR	Resource allocation error
FLT	8C09	PCI_MEM_MANAGER_ERR	Memory manager error
FLT	8C0A	PCI_MEM_TYPE_ERR	Dev wanted memory below 1 Mb
FLT	8C0B	PCI_MAX_BUS_EXCEEDED	> max allowed bus depth
FLT	8C0C	PCI_DEV_NOT_CONFIGURED	Dev not configured
FLT	8C0D	PDC_SYS_MAP_OVERFLOW	PDC_SYS_MMAP is full
FLT	8C0E	SYS_PCI_MAP_OVERFLOW	SYS_PCI_MAP is full
FLT	8C13	PCI_NOT_FOUND	No DINO found on GSC bus 1
FLT	8C14	PCI_TEST_ERR	A DINO test failed on GSC bus 1
FLT	8C23	PCI_NOT_FOUND	No DINO found on GSC bus 2
FLT	8C24	PCI_TEST_ERR	A DINO test failed on GSC bus 2
FLT	8FFF	LATE_ST_FLT	

NOTICE: ENTRY_TEST is attempted for devices which failed either ENTRY_INIT or ENTRY_TEST and do not support the *return_messages* option for these calls. CIO devices are an exception, and ENTRY_TEST will never be called.

Table 4–14. CONSOLE INITIALIZATION Errors

Ostat	Code	Name	Notes
WARN	9x00	NO_SS_CONS	Stable Storage Console not found
WARN	9x01	NO_CONS_FOUND	Alternate console(s) not found

x = flex field of the slave's HPA in the processor local bus

Table 4–15. BOOT DEVICE INITIALIZATION Errors

Ostat	Code	Name	Notes
WARN	Ax08	NO_BOOT_SELECTION	No bootable device found
WARN	A50F	INIT_PRI_PATH_FAILED	
WARN	A70F	INIT_DTHER_PATH_FAILED	
WARN	Ax0F	RETRIEVE_PATH_FAILED	
WARN	AxBD	DEVICE_NOT_READY	IODC returned –8, trying again
FLT	Ax88	NO_BOOT_NO_CONS	No console, unable to boot
FLT	A0FF	UNKNOWN_LAUNCH_FLT	

x = flex field of the slave's HPA in the processor local bus

Major Code Category B OS PANIC – output by the OS

Table 4–16. SYSTEM INITIALIZATION Codes

Ostat	Code	Name	Notes
TEST	C0FF	CHASSIS_GSC_SLOT_TEST	Check for proper GSC slot offsets
INIT	C0FF	CHASSIS_GSC_SLOT_INIT	Program offsets to proper values
FLT	C0FF	CHASSIS_GSC_SLOT_ERROR	Unable to cause PDH poweron reset
PROCESSOR INITIALIZATION			
INIT	C10x	MONARCH_SELECTION	Starting the Monarch selection
MEMORY INITIALIZATION			
TEST	C200	RAM_CONFIG	Starting memory configuration
TEST	C201	BEG_DESTR_MEM_INIT	Starting destructive memory test
TEST	C202	BEG_NONDESTR_MEM_INIT	Starting non–destructive memory test
TEST	C20F	RAM_CONFIG_FP	RAM confi forward progress indicator
TEST	C210	MEM_RESET_HARD	
TEST	C220	PHYSICAL_CONFIG	
TEST	C230	BANK_SIZING	
TEST	C240	CONFIG_FROM_EEPROM	
TEST	C250	INTRLV_CONFIG	
TEST	C260	INTRLV_RAM_TEST	
TEST	C261	TEST_1ST_PAGES	
TEST	C262	TEST_DUAL_ISSUE	
TEST	C263	TEST_WRITE	
TEST	C264	TEST_READ_WRITE	
TEST	C265	TEST_READ	
TEST	C270	UPDATINT_CONFIG/RE_INTERLEAVE	
TEST	C280	CONFIG_TO_EEPROM	
TEST	C2A0	FLAT_CONFIG	
TEST	C2B0	FALT_RAM_TEST	
TEST	C2E0	MEM_STUFF_DONE (also calculating 10 millesecond wait timer)	
TEST	C2C1	MEM_RESET_SOFT	
TEST	C2C2	NON_DEST_RAM_TEST	
TEST	C2Dx	MEM_LOGICAL_BANK	x = logical bank number
INIT	C200	RAM_CONFIG	Starting memory configuration
INIT	C201	BEG_DESTR_MEM_INIT	Starting destructive memory test
INIT	C202	BEG_NONDESTR_MEM_INIT	Starting non–destructive memory test
INIT	C20F	RAM_CONFIG_FP	

MONARCH EXTENDED SELFTESTS			
TEST	C3AA	MONARCH_SLAVE_TEST	
TEST	C3EE	MONARCH_SLAVE_TEST_END	
INIT	C300	MONARCH_TEST	monarch is executing extended selftests
INIT	C30C	MONARCH_SLAVE_CHECK	
INIT	C3FF	LATE_MONARCH_TEST	

Table 4–16 SYSTEM INITIALIZATION Codes (cont.)

Ostat	Code	Name	Notes
CONSOLE INITIALIZATION			
INIT	C400	GET_SS_CONS	Retrieving the SS console path
INIT	C40A	GET_SPECIAL_CONS	(not in J280)
INIT	C440	INIT_SS_CONS	Initializing the SS console path
INIT	C44A	INIT_SPECIAL_CONS	(not in J280)
INIT	C4CC	INIT_CCP	Initialize Close Console
INIT	C4CD	NO_CCP	Close Console not found
INIT	C4CE	CCP_DISABLED	Close Console disabled
INIT	C4CF	CCP_FOUND	Found the Close Console
INIT	C600	GET_DEFAULT_CONS	Retrieving default console path
INIT	C601	GET_GRAPHICS_CONS	
INIT	C602	GET_KEYBOARD_CONS	
INIT	C603	GET_MFG_SS_CONS	Retrieving the manufacturing SS console path
INIT	C605	GET_AP_CONS	(not in J280)
INIT	C640	INIT_DEFAULT_CONS	Initialize default console path
INIT	C641	INIT_GRAPHICS_CONS	
INIT	C642	INIT_KEYBOARD_CONS	
INIT	C643	INIT_MFG_SS_CONS	Initializing the manufacturing SS console path
INIT	C645	INIT_AP_CONS	(not in J280)
INIT	C64F	RESET_MONITOR_TYPE	Retrying bad monitor type
INIT	C650	INIT_MONITOR	
INIT	C650	INIT_MONITOR_F4	Initialize GSC or PCI graphics at HPA F4
INIT	C650	INIT_MONITOR_F6	Initialize GSC or PCI graphics at HPA F6
INIT	C650	INIT_MONITOR_F8	Initialize GSC or PCI graphics at HPA F8
INIT	C650	INIT_MONITOR_FA	Initialize GSC or PCI graphics at HPA FA
BOOT DEVICE INITIALIZATION AND IPL CODES FOR PRIMARY PATH			
INIT	C500	GET_PRI_PATH	Retrieving the primary boot path
INIT	C540	INIT_PRI_PATH	Initializing the primary boot path
INIT	C550	TEST_PRI_PATH	Execute ENTRY_TEST for primary boot path
INIT	C580	LOAD_IPL_PRI_PATH	Loading IPL from the primary boot path
INIT	C5FF	LAUNCH_IPL_PRI	Branching to IPL from the primary boot device

Table 4–16 SYSTEM INITIALIZATION Codes (cont.)

Ostat	Code	Name	Notes
WARN	C5F0	PRI_IPL_FAULT	An error occurred reading IPL
WARN	C5F1	BAD_IPL_ADDR_PRI	LIF file address is not 2K byte aligned or it is zero
WARN	C5F2	BAD_LIF_MAGIC_PRI	LIF file not present on media
WARN	C5F3	BAD_IPL_SIZE_PRI	LIF file is not a multiple of 2K bytes, is zero, or is greater than 256K bytes
WARN	C5F4	BAD_IPL_ENTRY_PRI	LIF file entry point is not word aligned or is greater than or equal to the size
WARN	C5F8	BAD_IPL_CHECKSUM_PRI	The arithmetic sum of the words in IPL <> 0
FLT	C5F0	PRI_IPL_FAULT_FATAL	An error occurred reading IPL and there was no console
BOOT DEVICE INITIALIZATION AND IPL CODES FOR ALL OTHER PATHS			
INIT	C700	GET_MFG_DFLTS	
INIT	C740	INIT_OTHR_PATH	Initializing a non–primary boot path
INIT	C750	TEST_OTHR_PATH	Execute ENTRY_TEST for a non–primary boot path
INIT	C770	INIT_MFG_DFLTS	Initialize manufacturing defaults
INIT	C780	LOAD_IPL_OTHR_PATH	Loading IPL from non–primary boot path
INIT	C7FF	LAUNCH_IPL_OTHR	Branching to IPL from the primary boot device
WARN	C7F0	OTHER_IPL_FAULT	An error occurred reading IPL
WARN	C7F1	BAD_IPL_ADDR_OTHR	LIF file address is not 2K byte aligned or it is zero
WARN	C7F2	BAD_LIF_MAGIC_OTHR	LIF file not present on media
WARN	C7F3	BAD_IPL_SIZE_OTHR	LIF file is not a multiple of 2K bytes, is zero, or is greater than 256K bytes
WARN	C7F4	BAD_IPL_ENTRY_OTHR	LIF file entry point is not word aligned or is greater than or equal to the size
WARN	C7F8	BAD_IPL_CHECKSUM_OTHR	The arithmetic sum of the words in IPL <> 0

Table 4–16 SYSTEM INITIALIZATION Codes (cont.)

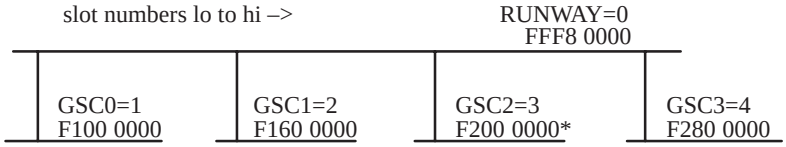
Ostat	Code	Name	Notes
TRANSFER OF CONTROL (TOC) CODES			
INIT	CB00	TOC_INITIATED	TOC handling initiated
INIT	CB0B	BR_TO_OS_TOC	Branching to OS_TOC handler
WARN	CB01	NO_OS_TOC	No OS_TOC vector
WARN	CB02	BAD–OS_TOC_ASSRESS	Invalid OS_TOC vector
WARN	CB03	BAD_OS_TOC_CODE	Invalid OS_TOC code
WARN	CB04	BAD_OS_TOC_LEN	Invalid OS_TOC code length
WARN	CB05	BAD_OS_TOC_CHECKSUM	Invalid checksum for OS_TOC code
WARN	CB09	TOC_SEED_IVA	Seed Error TOC entered
WARN	CB0A	PREV_TOC	Previous TOC PIM logged
WARN	CB0C	BR_TO_OS_TOC_FAILED	Branching to OS TOC
LPMC CODES			
INIT	CB1B	BR_TO_OS_LPMC	Branching to OS_LPMC handler
WARN	CB10	LPMC_INITIATED	LPMC handling initiated
WARN	CB15	ULPMC	Runway LMPC error
WARN	CB19	LPMC_SEED_IVA	Seed error LPMC entered
FLT	CB1F	OS_LPMC_FAILED	Branch to OS_LPMC
HPMC CODES			
INIT	CBF7	PDC_IO_INITIATED	PDC_IO initiated
INIT	CBF8	PDC_IO_EXITED	PDC_IO exited
WARN	CBF1	HPMC_ENCOUNTERED	HPMC encountered
WARN	CBF2	LPMC_ENCOUNTERED	LPMC encountered
WARN	CBF3	TOC_ENCOUNTERED	TOC encountered
WARN	CBF9	BC_NOT_CONFIGURED	PDC_IO found unconfigured so lower busses cannot be walked for errors
WARN	CBFA	PREV_HPMC	Previous HPMC PIM logged

Table 4–16 SYSTEM INITIALIZATION Codes (cont.)

Ostat	Code	Name	Notes
FLT	CB99	SPEED_IVA_HANDLER	
FLT	CB9A	HPMC_OVERWRITE	
FLT	CBF0	HPMC_INITIATED	HPMC handling initiated
FLT	CBF1	NO_OS_HPMC_IN_IVA	OS did not replace PDC IVA
FLT	CBF2	BAD_OS_HPMC_LEN	Invalid length for OS_HPMC code
FLT	CBF3	BAD_OS_HPMC_ADDR	Invalid address for OS_HPMC code
FLT	CBF4	BAD_OS_HPMC_CHECKSUM	Invalid checksum for OS_HPMC code
FLT	CBF5	OS_HPMC_VECTOR_0	IVA + 32 was zero
FLT	CBFB	BR_TO_OS_HPMC	Branching to the OS HPMC handler
FLT	CBFC	BR_TO_OS_HPMC_FAILED	Branching to the OS HPMC handler failed
FLT	CBFD	UNKNOWN_CHECK	Check for no known reason
FLT	CBFE	HPMC_DURING_TOC	HPMC interrupted a TOC
FLT	CBFF	MULTIPLE_HPMCS	Nested HPMC occurred
OPERATING SYSTEM CHASSIS CODES (reference only)			
INIT	CE00	Unknown	
INIT	CE0F	Unknown	
INIT	CEC0	HP–UX boot loaded	
INIT	CED0	HP–UX boot in main	
INIT	CEDB	HP–UX boot loading kernal	
INIT	CEDF	HP–UX boot about ot launch kernal	
INIT	CEE0	Kernal loaded	
INIT	CEE1	Unknown	
INIT	CEF0	Kernal in main	
INIT	CEF2	Kernal configuring IO	
INIT	CEF4	Kernal mounting root	
INIT	CEF6	Kernalsetting up page–out	
INIT	CEF8	Kernal about to start init	
SHUT	D000	Shutdown beginning	
SHUT	D100	Shutdown continuing	
SHUT	D200	Going..	
SHUT	D600	Going..	
SHUT	D800	Going..	
SHUT	DA00	Gone	

Table 4–16 SYSTEM INITIALIZATION Codes (cont.)

Ostat	Code	Name	Notes
RUN	FxyF	HP–UX Running, x=run queue length, y=CPU count	
SLAVE CPU INITIALIZATION			
INIT	CC0x	OS_RENDEZVOUS	
INIT	CC1x	EARLY_CPU_RENDEZVOUS	
INIT	CC2x	CPU_RENDEZVOUS	
INIT	CC3x	CACHE_CPU_RENDEZVOUS	
INIT	CC4x	MEM_CPU_RENDEZVOUS	
FLT	CCFx	SLAVE_BIG_ERROR	
BUS INITIALIZATION CODES			



* not on Firehawk

Figure 4–4. I/O Bus Numbering Scheme for Chassis Displays and Default Bootstrap HPAs

Ostat	Code	Name	Notes
TEST	CD00	IOA_TEST	
INIT	CDxy	INIT_BUS_SLOT	Where x=bus and y=slot
INIT	CD08	IOA0_INIT	0 –> RUNWAY, 8=MASTER ID
INIT	CD88	IOA0_RESET	
INIT	CD0A	IOA1_INIT	0 –> RUNWAY, A=MASTER ID
INIT	CD8A	IOA1_RESET	
INIT	CDxA	INIT_GRAPHICS (F400)	x=GSC + bus number
INIT	CDxB	INIT_GRAPHICS (F600)	x=GSC + bus number
INIT	CDxC	INIT_GRAPHICS (F800)	x=GSC + bus number
INIT	CDxD	INIT_GRAPHICS (FA00)	x=GSC + bus number
INIT	CDxE	INIT_WAX	x=GSC + bus number (EISA)

Table 4–16 SYSTEM INITIALIZATION Codes (cont.)

Ostat	Code	Name	Notes
INIT	CDxF	INIT_LASI	x=GSC + bus number
INIT	CDFF	INIT_SYSTEMMAP_TABLE	Building the system map table
INIT	CDE0	INIT_EISA_COMPLETE	
INIT	CDE1	EISA_SLOT_INIT	
INIT	CDEA	INIT_EISA	
INIT	CDEB	EISA_CHECKING_FOR_CARDS	
INIT	CDFF	INITIALIZE_SYS_MAP	Initialize sys IO map
WARN	CDC4	F4_GR_DISABLE	F4000000 graphics disabled
WARN	CDC6	F6_GR_DISABLE	F6000000 graphics disabled
WARN	CDC8	F8_GR_DISABLE	F8000000 graphics disabled
WARN	CDCA	FA_GR_DISABLE	FA000000 graphics disabled
WARN	CDEC	EISA_NO_CFIG_DATA	No config data
WARN	CDED	EISA_CFGID_NECARDID	Config ID not equal to card ID
WARN	CDEE	EISA_CARD_INIT_ERROR	Card initialization error
WARN	CDEF	NO_EISA_FOUND	No EISA found
FLT	CDxy	INITIALIZE_IO_FLT	x=bus and y=slot

Major Code Category D, SHUTDOWN Codes – output by the OS

Major Code Category E, WARNING Codes – output by the OS

Major Code Category F, RUN Codes – output by the OS

Fan Failures (J282/2240 only)

Chassis codes 3z80–3z9F indicate fan failures in the J282/2240. The lower five bits indicate which fan has failed as follows:

1xxxx – processor 0 fan
x1xxx – processor 1 fan
xx1xx – system board fan
xxx1x – eisa board fan
xxxx1 – power supply fan

Multiple bits set indicate multiple fan failures.

CAUTION: After repairing a fan failure, ensure the power supply is disconnected from the power source for at least 30 seconds.

Field Replaceable Units 5

This chapter lists the J Class Field Replaceable Units (FRUs) and provides procedures and illustrations showing their removal and replacement.

Use the following tools to remove or replace FRUs:

- Light-duty flat blade screwdriver with 150-mm (6-in.) blade
- #1 Posi-Drive driver
- Needlenose pliers
- ESD equipment (see the “ESD Precautions” section in the Preface for detailed information)

WARNING: For each of the removal procedures in this chapter, you **must** power off the system and unplug the power cord from the wall.

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

The J Class workstation is designed as a series of modules. Figure 5–1 shows the five basic modules.

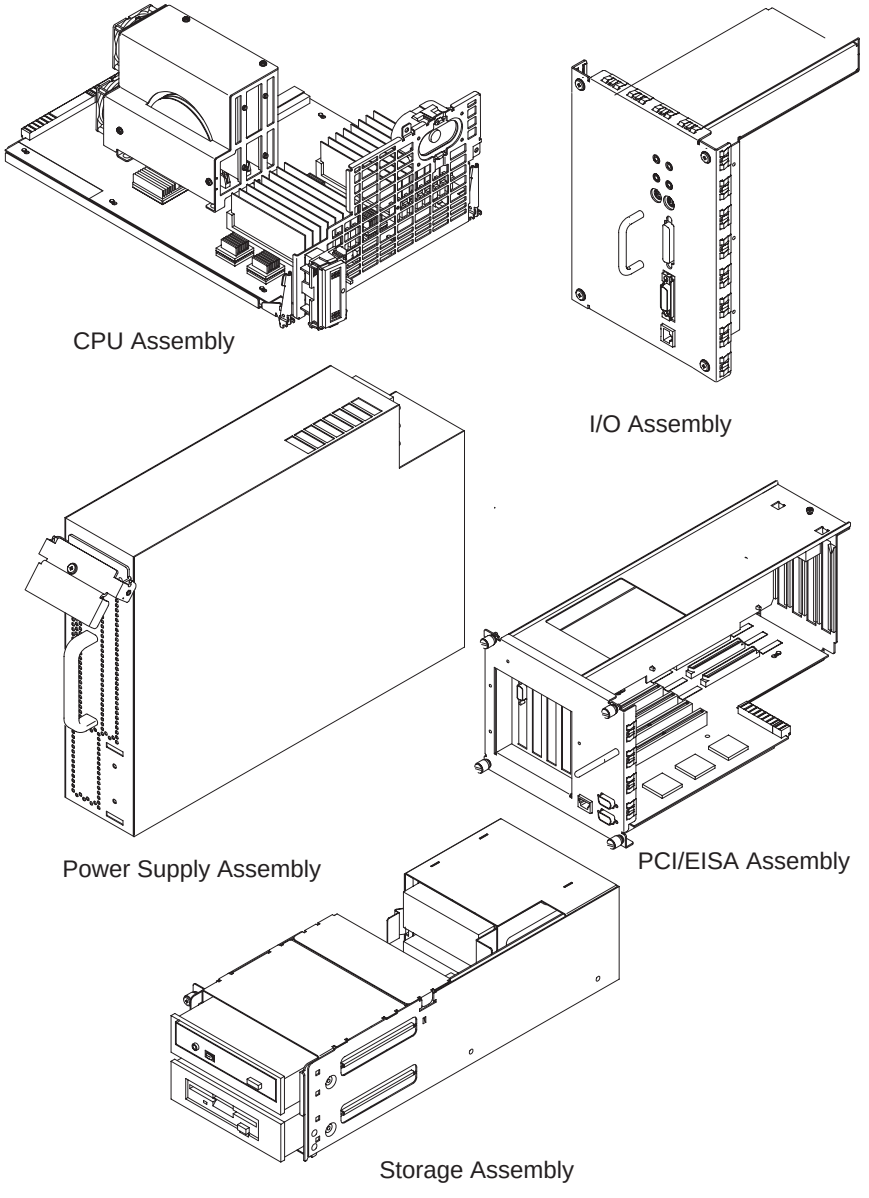


Figure 5–1. J Class Modules

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 a replacement FRU. Do not return FRUs with nonexchange part numbers. You may discard them.

Each of the J Class modules is shown separately with a table of its own FRUs. In each module FRU table, the exchange parts are clear, while the nonexchange parts are shown shaded.

The figures and tables following these show the individual parts within each major subsystem or module. Where there are numbers in drawings, those numbers correspond to the table for that major assembly.

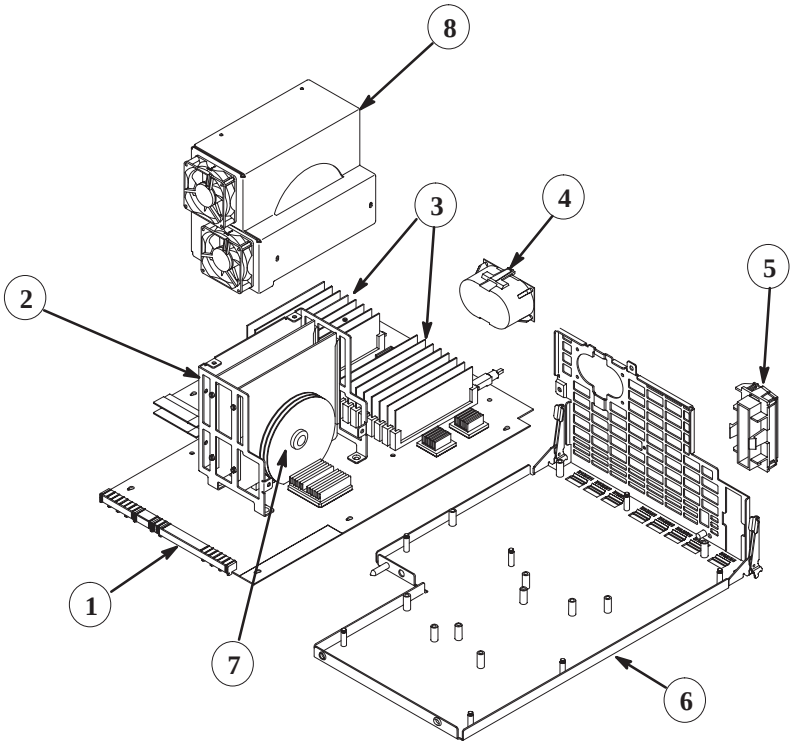


Figure 5–2. CPU Assembly

Table 5–1. CPU Assembly (A4081–66001) FRU List

Reference Number	Part Number	Description
7	A2375–69057	CPU Module, 100 MHz (256 K x 256 K cache) (J200 only)
7	A2375–69056	CPU Module, 120 MHz (256 K x 256 K cache) (J210 only)
7	A3398–69008	CPU Module, 120 MHz (1 MB x 1 MB cache) (J210XC only)
Not Shown	A2876–69002	CPU Module, 180 MHz (J280) (1 MB x 1 MB cache) (J280 only)
Not Shown	A4487–69520	CPU Module, 180 MHz (J282) (1 MB x 1 MB cache) (J282 only)
Not Shown	A4457–69520	CPU Module, 236 MHz (J2240) (1 MB x 1 MB cache) (J2240 only)
1	A4081–69001	Motherboard PCA J200–J210XC)
1	A2876–69001	Motherboard PCA (J280)
1	A4487–69510	Motherboard PCA (J282)
1	A4457–69010	Motherboard PCA (J2240 with UWSE I/O)
1	A4457–69011	Motherboard PCA (J2240 with FWD I/O)
3	A2579–69001	16 MB DIMM
3	A2580–69001	64 MB DIMM
	1420–0314	Lithium Battery
2	A4081–00067	Processor Guide
8	A4081–00068	Processor Cover
Not Shown	A2876–00003	Processor Cage (J280)
Not Shown	A4487–00005	Processor Cage (J282, J2240)
Not Shown	A2876–00004	Processor Cover (J280)
Not Shown	A4190–62030	Fan Assembly CPU/SRAM (J280 only)
Not Shown	A2876–62014	Fan–80mm/LED/Thermistor cable Assembly (J280)
Not Shown	A4190–62030	Fan Assembly EISA Tray (J282, J2240)
5	A4081–40013	Display Mounting Bracket
	A4081–62014	Cable and LCD Display Assembly
	A4081–62028	LED Cable Assembly
	A4081–62032	Fan Cable Assembly
6	A4081–62008	Motherboard Carrier Assembly
6	A2876–62015	Motherboard Carrier Assembly (J282, J2240)
6	A4457–62009	System Board Tray (J2240)
	A4081–60026	Motherboard Extractor
4	A4081–62021	Speaker Assembly
	A4081–40015	Speaker Enclosure

	1813–1167	CLK OSC XTAL 45 MHz
	1813–1018	CLK OSC XTAL 50 MHz
	1813–1017	CLK OSC XTAL 60 MHz
	1818–5956	EEPROM, prgrmd (J200/J210)
	1818–5956	EEPROM, prgrmd (J280)
	0950–299FH	DC/DC Converter (J280 only)

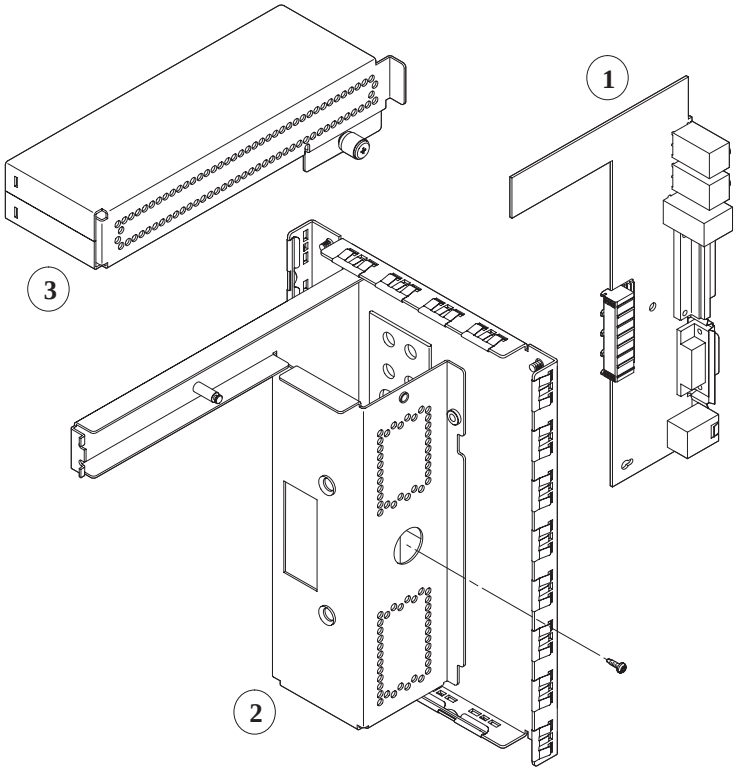


Figure 5–3. I/O Assembly

Table 5–2. I/O Assembly (A4081–62026) FRU List

Reference Number	Part Number	Description
1	A4081–66004	I/O Connector PCA
1	A4457–66550	I/O Connector PCA (J2240 only)
2	A4081–62026	I/O Bulkhead Assembly
3	A4081–62027	I/O Support Assembly

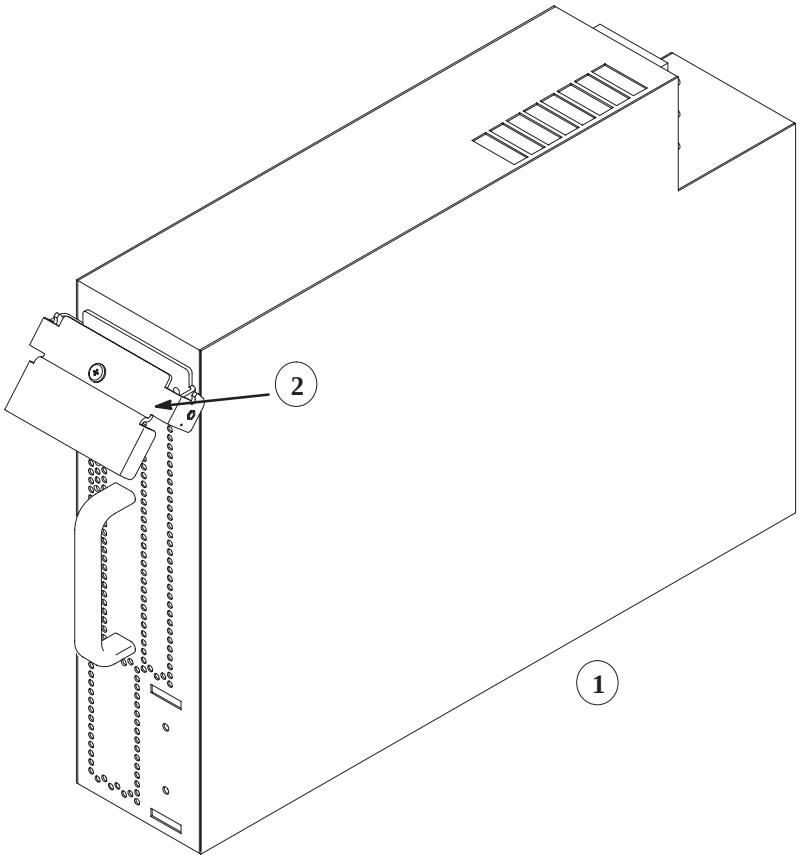


Figure 5–4. Power Supply Assembly

Table 5–3. Power Supply (0950–2497) Assembly FRU List

Reference Number	Part Number	Description
1	A4487–69001	Power Supply – 750W (J282, J2240)
1	0950–2497	Power Supply (J200–J280 only)
2	A4081–62023	Power Supply Extractor Assembly

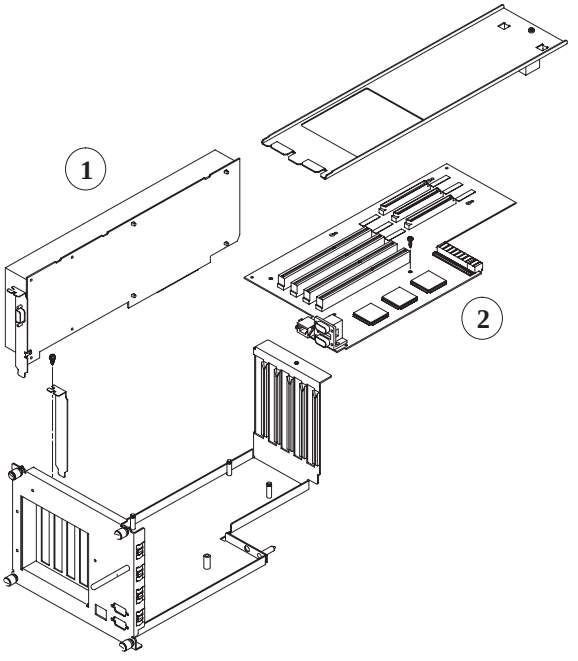


Figure 5–5. EISA Assembly

Table 5–4. EISA Assembly FRU List

Reference Number	Part Number	Description
2	A4081–69002	EISA PCA (J200–J280 only)
2	A4487–69530	EISA PCA (J282)
2	A4457–69530	PCI PCA w/ EISA (J2240 only)
2	A4457–69531	PCI PCA w/o EISA (J2240 only)
2	A4457–62009	J2240 Adapter Board (not shown)
1	A4072–69512	HCRX Z-Accelerator Board
1	A4070–69504	HCRX-8
1	A4071–69507	HCRX-24
1	A4073–69001	GSC CRX-48Z Interface
1	A4081–69009	Color Graphics Card
	A4450–69501	HP VISUALIZE–EG
	A4451–69501	HP DUAL VISUALIZE–EG
	A4081–62007	EISA Module
	A4081–00033	EISA Bracket
	A4457–62008	PCI PCA Tray (J2240 only)

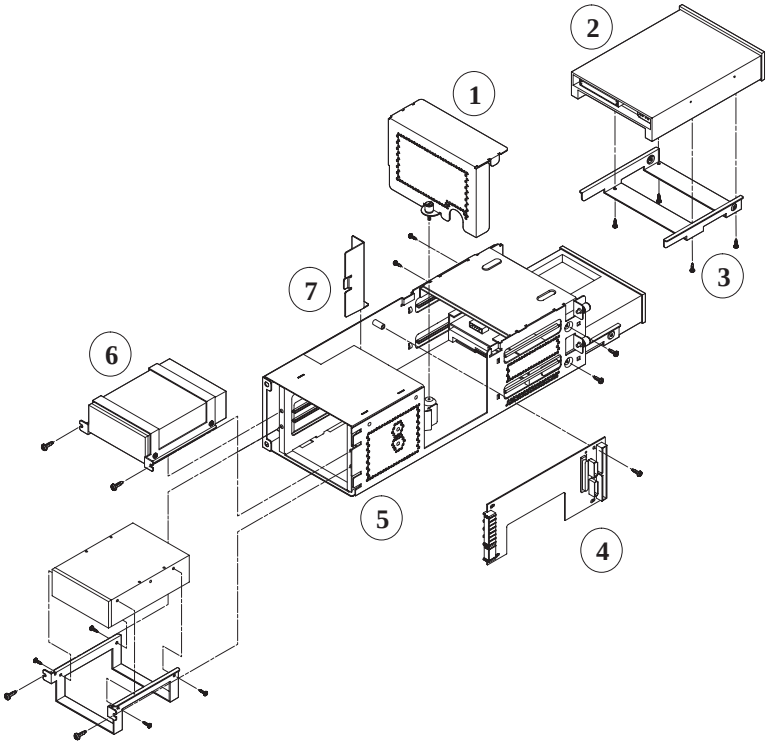


Figure 5–6. Peripheral Assembly

Table 5–5. Peripheral Assembly FRU List

Reference Number	Part Number	Description
2	C1504–69201	DAT/DDS 4–8 GB Tape Drive
	C1537–69201	DAT 12 GB Tape Drive
6	A1658–69109	1 GB LP Fast, Wide 3.5” Disk
6	A1658–69103	2 GB Fast, Wide 3.5” Disk
	A4081–69003	4 GB WD 3.5” Disk
	A1658–69010	2 GB WD 7200RPM Disk
	A1658–69011	4 GB WD 7200RPM Disk
	A4218–69016	9 GB WD 7200RPM Disk

	A1658–69020	2 GB UWSE Disk
	A1658–69021	4 GB UWSE Disk
	A1658–69022	4 GB UWSE Disk
2	A2084–69005	Flpy Drive 3.5” SCSI
4	A4081–66007	SCSI Disk PCA
4	A4457–66540	SCSI Disk PCA (J2240 only)
1	A4081–00024	EMI Peripheral Divider NOTE: Must order fan assmbly kit
	A4081–62029	CD-ROM Cable
	A1311–62004	CD-ROM Audio Cable (J280)
7	A4081–00064	Peripheral Baffle
	A4081–62005	Internal SCSI2 Cable
	A4081–62006	Internal SCSI3 Cable
	A4457–63001	UWSE SCSI Cable, Internal (J2240)
	A4457–63002	UWSE SCSI Cable, External (J2240)
	A4081–62013	Peripheral Power Cable
5	A4081–62010	Peripheral Carrier Assembly
3	A4081–00032	3.5” Disk Bracket
2	D2992–63002	CD-ROM Drive
2	A4325–60001	4X CD–ROM Disk Drive
	A1658–62016	Terminator, SCSI2
	A1658–62024	Terminator, SCSI3
	A1658–62022	FW Diff SCSI Terminator
	A2876–60011	Fan Assembly Kit (ALL)

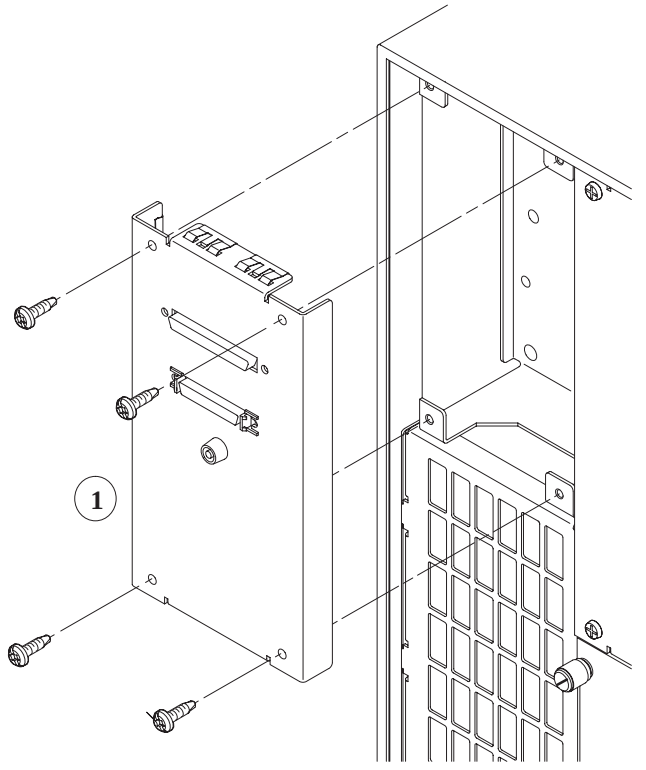


Figure 5–7. SCSI Bulkhead

Table 5–6. SCSI Bulkhead FRU List

Reference Number	Part Number	Description
1	A4081–00022	SCSI Bulkhead Assembly
	A4081–62011	External SCSI2 Cable (not shown)
	A4081–62012	External SCSI3 Cable (not shown)
	A4457–63002	External UWSE SCSI Cable (not shown)
	A4081–62025	TOC Cable (not shown)

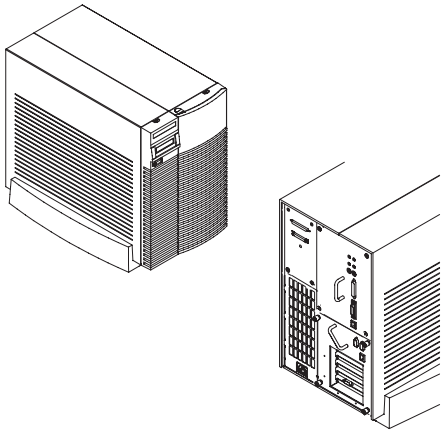


Figure 5–8. Chassis

Table 5–7. Chassis FRU List

Reference Number	Part Number	Description
	A4487–69500	Backplane PCA (J282, J2240)
	A4081–66003	System Backplane (J200–J280)
	A2876–62015	System Board Carrier Assembly
	A4081–62003	Chassis Subassembly
	A4081–62004	Front Bezel
	A4081–40004	Peripheral Door
	A4081–40014	Breakaway Hinge
	A4081–00014	Backplane Support
	A4081–62025	TOC Cable
	A4081–40001	Dress Panel Left
	A4081–40002	Dress Panel Right
	A4081–40003	Pedestal
	A4081–84008	Logo J200 Series 9000
	A4081–84007	Logo J210 Series 9000
	A2876–84001	Logo VISUALIZE J280
	A4487–84001	Logo VISUALIZE J282
	A4457–84001	Logo VISUALIZE J2240
	A4081–00045	EMI Clip
	A4081–00041	EMI Clip
	A4457–00015	EMI Clip Display

	S1311—00004	Memory Hold Down Bracket
	A4081–66011	Jumper PCA

FRU Removal and Replacement

The procedures in this section describe how to remove system unit FRUs. Observe any notices and prerequisites for removing a FRU. Replacement is the reverse of removal, unless noted.

Before performing these procedures, observe the following precautions:

1. Power off the system, the monitor, and any peripheral devices.

   Follow the directions in *Using Your HP Workstation* for shutting down.

2. Unplug the system unit power cord and the power cord of any peripheral devices from ac wall outlets.

3. Unplug the system unit power cord from the ac input connector.

   NOTICE: Your workstation automatically shuts down the operating system before terminating the power.

Front Bezel

This section describes how to remove the J Class front bezel or cover of the system unit.

CAUTION: **Do not** attempt to operate the workstation with the front cover removed. The cover is needed for proper air flow for system cooling.

1. Attach the static-grounding wrist strap by following the instructions on the package. Attach the the sticky end of the wrist strap to bare metal of the system unit.

2. Release the front cover by pushing in the two locking tabs at the front of the system unit as shown in Figure 5–9.

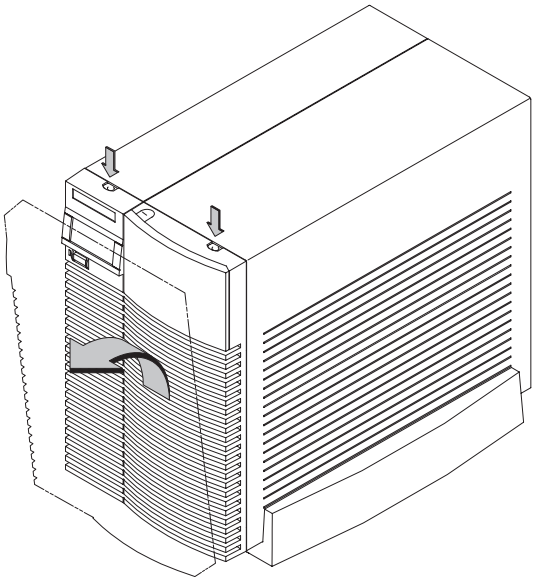


Figure 5–9. Opening the System Unit

3. Swing the panel down and pull up slightly so the two guide pins on the bottom clear their guides and lay the front cover down.

Reverse this process to replace the J Class front cover.

Be sure top latches snap completely into position.

CPU Assembly

This section describes how to remove the J Class CPU assembly.

To remove the CPU assembly, open the system unit and follow these steps:

1. Remove the two screws in the center of the CPU Assembly.

2. Pull the ejector latches on the left side, top and bottom of the CPU Assembly to release the assembly from the internal connectors. See Figure 5–10.

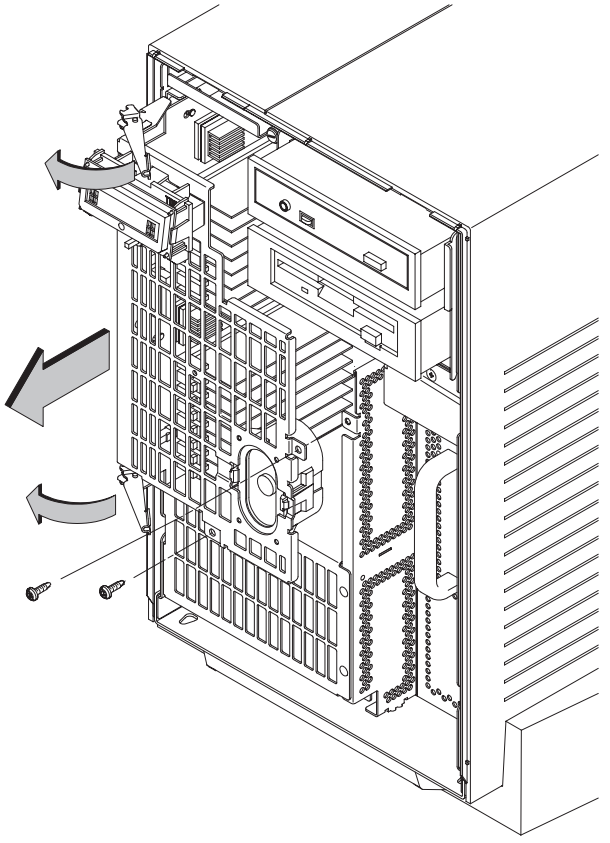


Figure 5–10. Removing the CPU Assembly

3. Pull the CPU Assembly straight out and place on a flat surface. This assembly is heavy. Move it slowly and be sure it is properly supported.

When replacing the CPU Assembly follow these steps:

1. Pull drawer latches to open position.

2. Align the top of the CPU assembly with the guides on the system unit. Then, align the bottom with the guides and slide the CPU Assembly into the system unit. See Figure 5–11. See also the installation label on the back of the assembly.

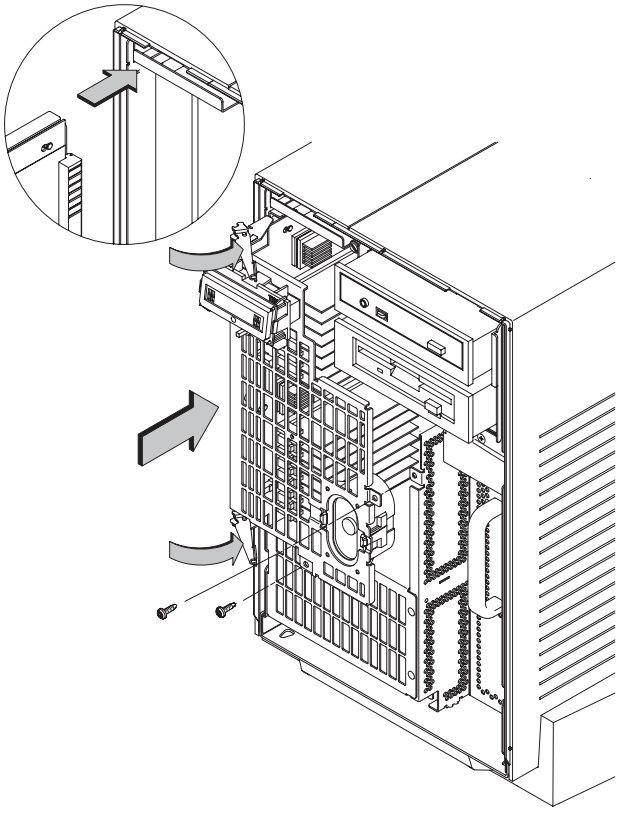


Figure 5–11. Replacing the CPU Assembly

3. Press the drawer latches all the way in and replace the two screws in the center of the CPU Assembly. The drawer latches must be completely depressed to ensure proper seating of the connectors.

Memory DIMM Removal

Before removing memory DIMMs, open the system unit and remove the CPU assembly.

Figure 5–12 shows the memory DIMM locations on the CPU Assembly. Figure 5–13 and Figure 5–14 show how to remove the memory DIMMs. Perform the following steps to remove a memory DIMM from the system unit:

1. Locate the memory DIMMs on the CPU Assembly, shown in Figure 5–12.

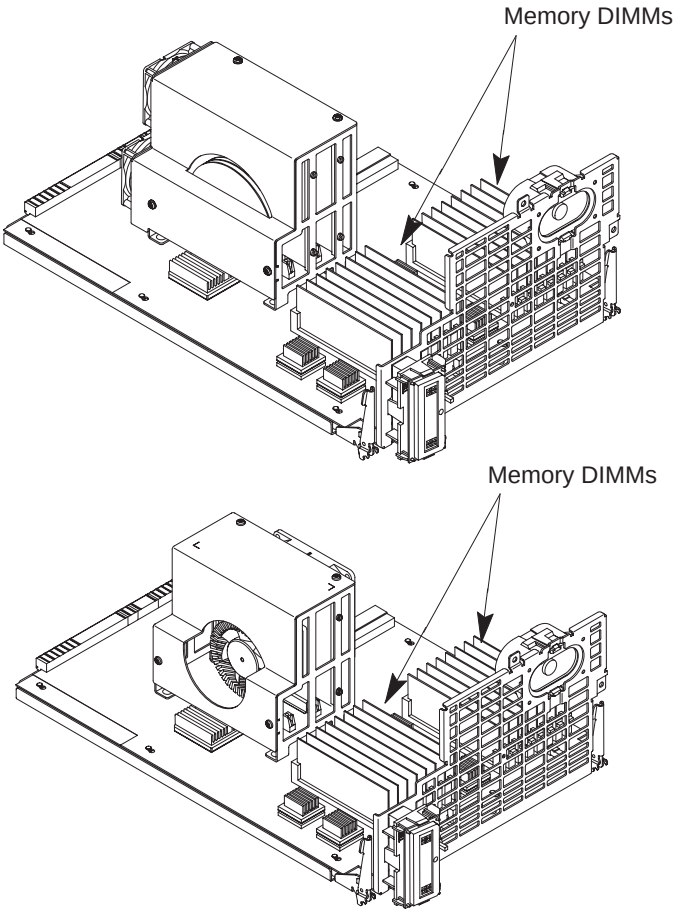


Figure 5–12. Memory DIMM Location

2. Remove the memory retention bracket, if equipped, shown in Figure 5–13 by removing the two attachment screws.

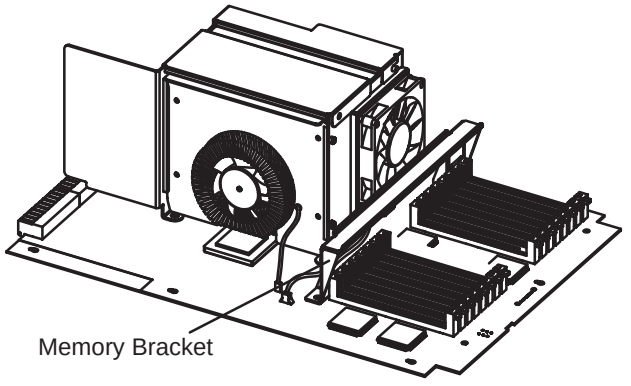


Figure 5–13. Memory Retention Bracket

3. To remove a memory DIMM, open the ejector handles on both sides of the DIMM. Lift the memory DIMM up and out of the connector. Place the memory DIMM on a static-free surface. Figure 5–14 shows how to remove the memory DIMM.

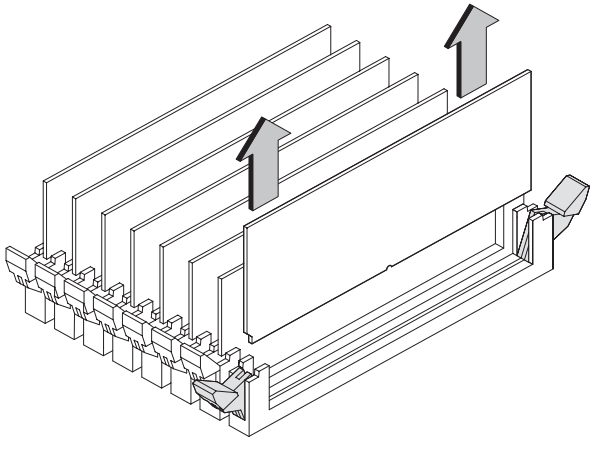


Figure 5–14. Removing Memory DIMMs

4. Go to the following section, “Memory DIMM Installation,” to install the replacement DIMM.

Memory DIMM Installation

Before installing memory DIMMs, open the system unit and remove the CPU assembly.

Refer to Chapter 3 for information about memory DIMM configurations.

1. To install a new memory DIMM, open the ejector tabs and line the DIMM up with the guides as shown in Figure 5–15, making sure to put the notched end toward the white ejector handle.

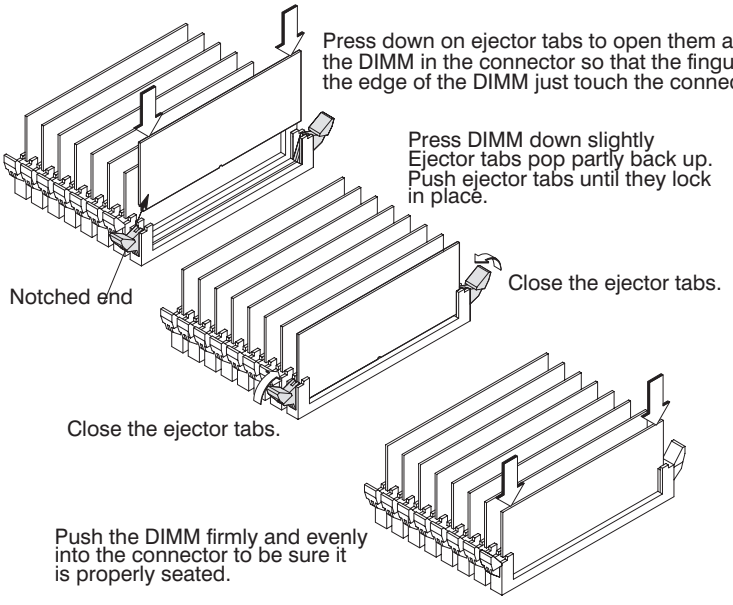


Figure 5–15. Installing Memory DIMMs

2. Close the ejector tabs.

3. Press firmly and evenly on the DIMM to ensure that it is fully seated.

4. To verify that this installation was successful, display the current memory information using the Boot Console Interface. For more information on the Boot Console Interface, see Chapter 9 of this handbook. If only a faulty DIMM is replaced, use the **pdt clear** command in the service menu of the Boot Console Interface. Answer **y** to the prompt `Continue? (Y/N)`.

Processor Module

To remove or replace a processor module, perform the following procedures:

- Open the system unit
- Remove the CPU assembly

NOTICES: All processors must be the same type. Therefore 100 MHz/256 K cache, 120 MHz/256 K cache, and 120 MHz/1 M cache processors are incompatible. If mixed, selftest will fail.

The Model J280 only supports one 180 MHz processor module.

1. Locate the CPU shroud as shown in Figure 5–16, Figure 5–17 and Figure 5–18.

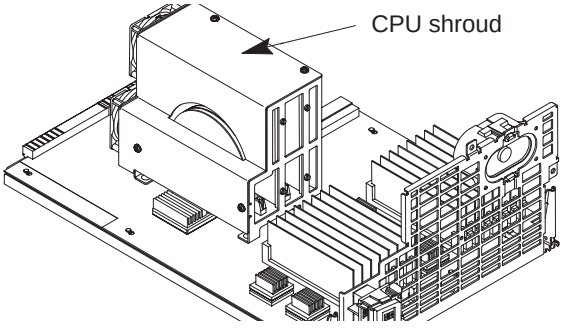


Figure 5–16. CPU Shroud Location

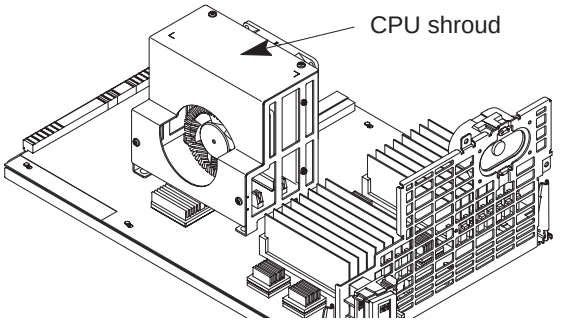


Figure 5–17. CPU Shroud Location (J280)

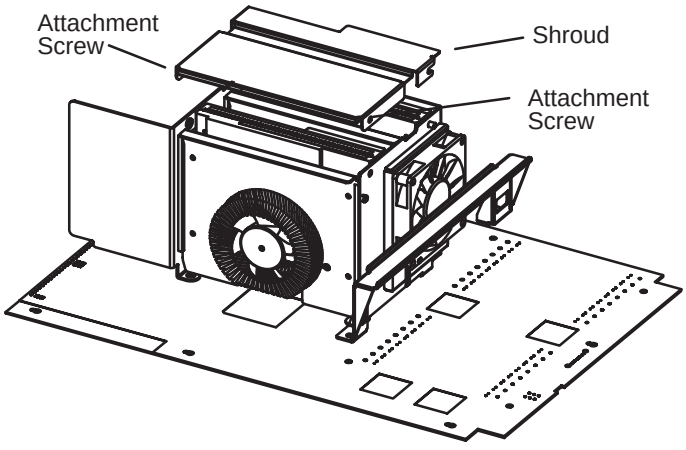


Figure 5–18. CPU Shroud Location (J282, J2240)

2. Disconnect the fan cable from the system motherboard. Refer to Figure 5–19 or Figure 5–20.

   CAUTION: Be sure to reconnect the fan cable(s) when you have finished installing the processor. Failure to reconnect the fan could cause the unit to overheat and damage the processor(s).

3. Remove the screws attaching the CPU shroud to the system motherboard and pull the shroud straight up. Set the shroud aside. See , Figure 5–18, Figure 5–19 or Figure 5–20.

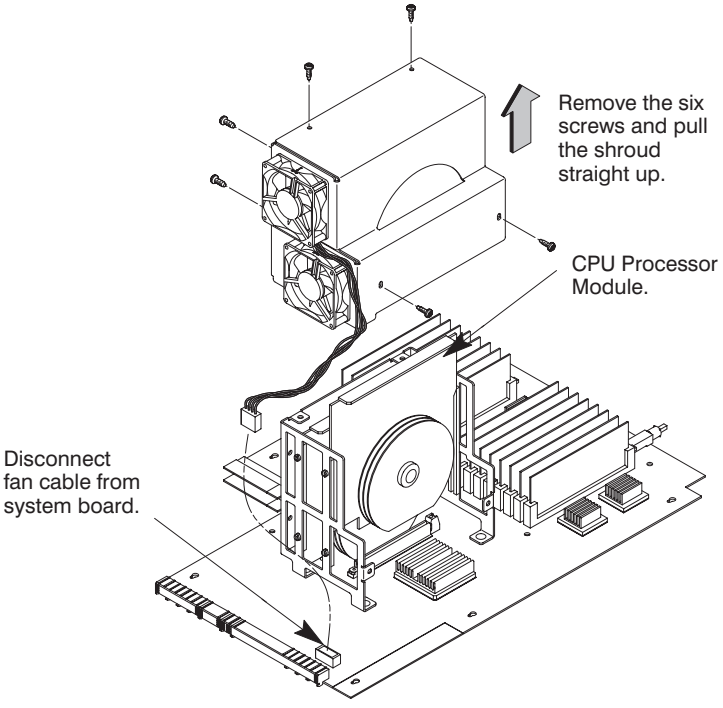


Figure 5–19. Removing a CPU Processor Module

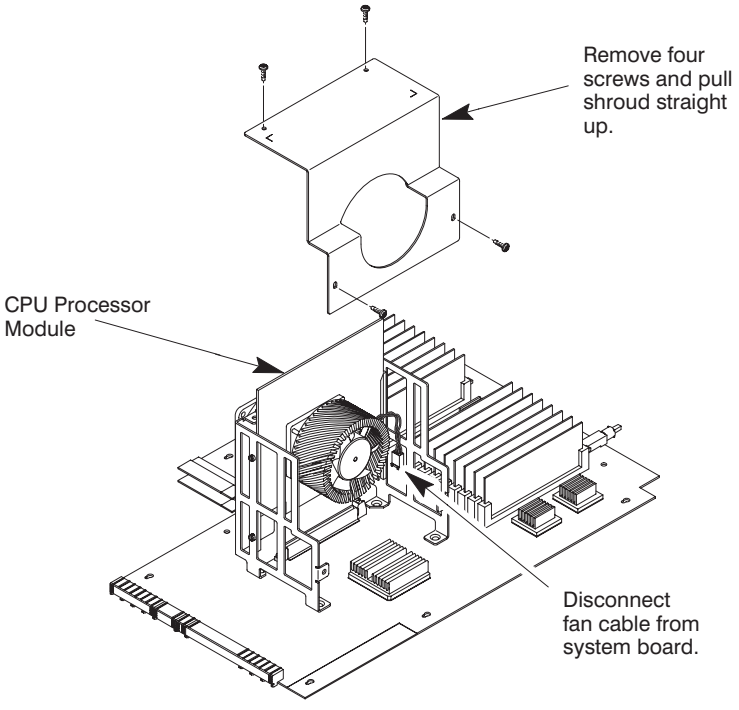


Figure 5–20. Removing the CPU Processor Module (J280)

4. To remove a processor module, grasp the board and pull straight up.

   NOTICE: If you have only one processor, it must be installed in CPU slot 0.

5. To replace a module or add a second module, insert the board into the guides and press firmly and evenly into place to ensure the board is properly seated. Make sure that the protective dust cover is removed from the processor module connector on the motherboard and the replacement processor module. See Figure 5–21 or Figure 5–22.

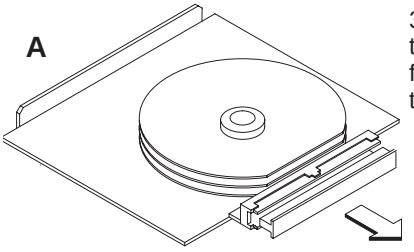
6. Replace the CPU shroud over the processor and replace the six screws attaching the CPU shroud to the system board.

7. Reconnect the fan cable to the system board.

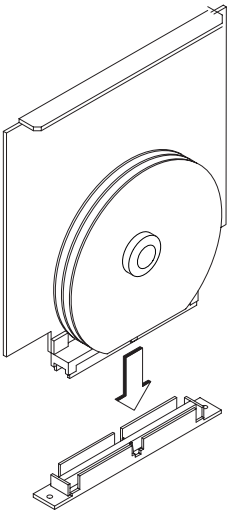
   CAUTION: Failure to reconnect the fan cable to the system board WILL cause the processor modules to overheat. This can badly damage the processor modules.

1. To remove the protective dust cover on the processor module, grasp and pull the cover evenly

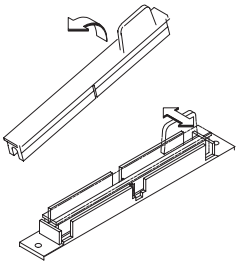
A



3. To install processor module, insert the module into the guides and press firmly and evenly into place to ensure the module is properly seated.



B 2. To remove the protective dust cover on the system board, grasp the tab at the end of the cover and gently rock the cover back and forth while gently pulling it up



NOTE: Replace the protective dust cover on the processor module being returned

Figure 5–21. Processor Module and System Board Dust Covers

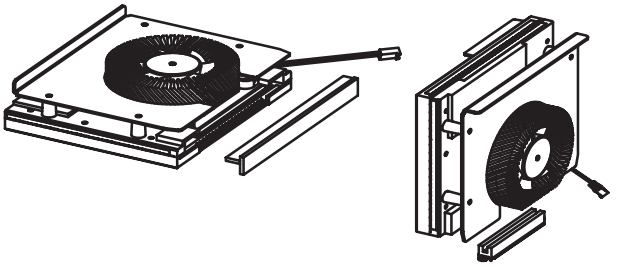


Figure 5–22. J282 Processor Modules

Changing the Crystal Oscillator

NOTICE: This procedure does not apply to the Model J280.

To install the new crystal oscillator, perform the following steps:

1. Orient the board as shown in .
2. Remove the Crystal Oscillator located at UT20 on the system board as shown in Figure 5–23, from the system board.
3. Install the new Crystal Oscillator into location UT20 on the system board.

CAUTION: Match pin 1 on the crystal oscillator to pin 1 on the crystal oscillator socket at UT20. Failure to do so will cause system problems.

DEMO( ) Different manufactures use different methods, for example, a black dot, square corner, notched corner etc., to designate pin 1 on the component.

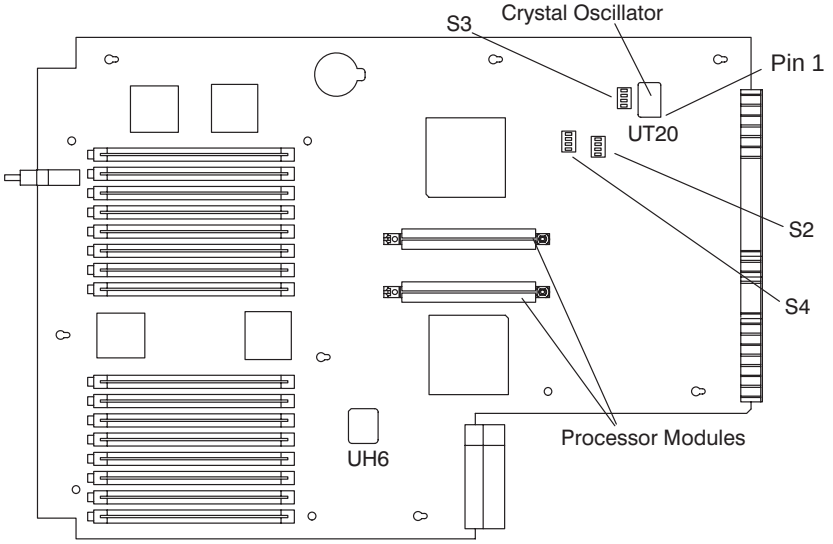


Figure 5–23. Crystal Oscillator Location

DIP Switch Settings (Reference Only)

Before placing the CPU assembly back in the sytem, ensure that the following DIP switches are set correctly. Use Figure 5–23 to locate these switches.

- Switch S2 — Sets the SCSI host adapter address (always set to 7).
  1 always ON
  2 always OFF
  3 always OFF
  4 always OFF

- Switch S3 — Controls the configuration modes of the main clock generation circuit.

	J200/210	J280/282
1	normally OFF	normally OFF
2	normally OFF	normally ON
3	normally OFF	normally ON
4	normally OFF	normally ON

- Switch S4 — See separate functions.
  1 normally OFF — Oscillator selector. When ON, selects the second UV20 oscillator that's mainly used for lab work or debugging.
  2 normally OFF — Thermal shutdown override. When ON, prevents the power supply from automatically shutting down the system when the power supply temperature exceeds 45° C.
  3 Unused
  4 Unused

For model J200, make sure that the 50 MHz crystal oscillator, part number 1813–1018, is installed in location UT20.

For models J210, make sure that the 60 MHz crystal oscillator, part number 1813–1017, is installed in location UT20.

For models J280 and J282, make sure that the 45 MHz crystal oscillator, part number 1813–1167, is installed in location UT20.

System Motherboard

To remove the system motherboard, perform the following procedures:

- Open the system unit.
- Remove the CPU assembly.
- Disconnect the cables from the system motherboard.

Perform the following steps to remove and replace the system motherboard:

1. Remove the shroud cover.
2. Remove the processor module(s).
3. Remove the memory DIMMs.
4. Remove the screws securing the processor module to the support bracket.
5. Remove the screws securing the motherboard to the carrier and slide themotherboard on the keyhole posts to remove it from the carrier. See Figure 5–24 for the Model J280 and Figure 5–25 for all other models.

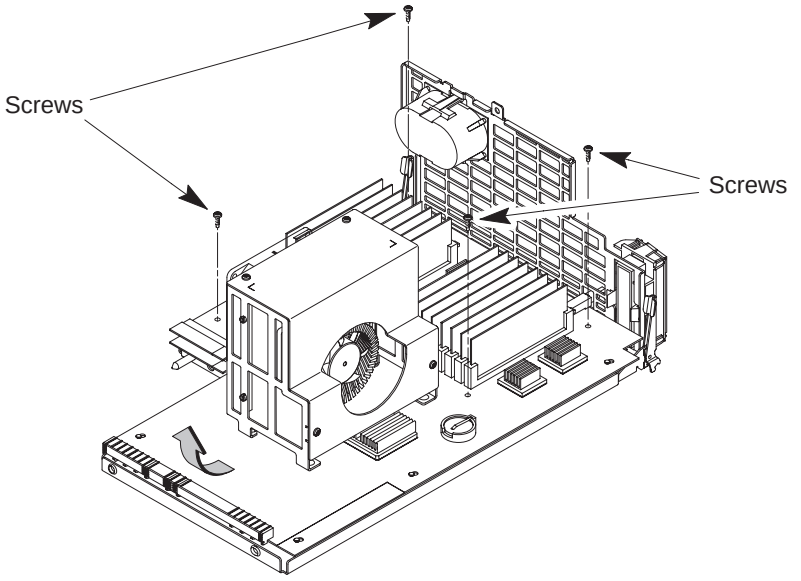


Figure 5–24. Removing the System Motherboard (J280)

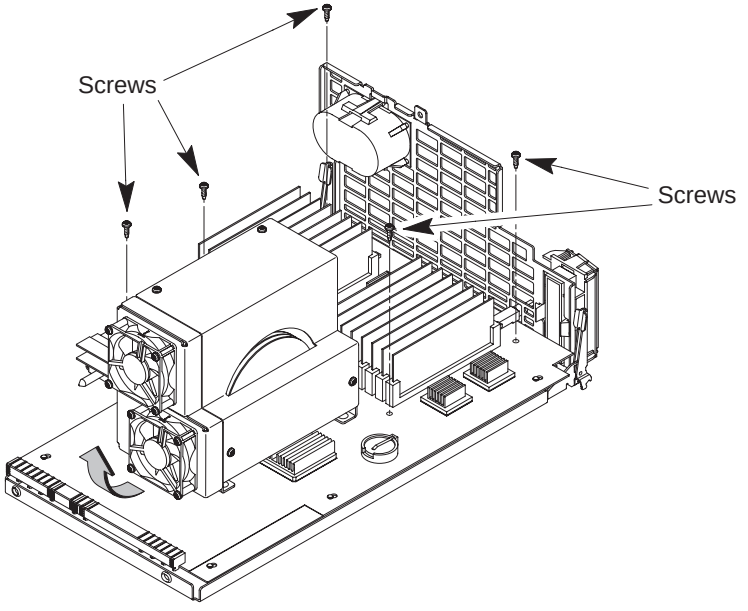


Figure 5–25. Removing the System Motherboard

6. Swap the EEPROM from the old system motherboard to the new one.

   The EEPROM is located at Reference Designator UH6 on the motherboard. The third line on the PROM is the LANIC ID. See Figure 5–26 for the location of the PROM on the system motherboard.

   NOTICE: If the EEPROM is replaced, note the LANIC ID on the EEPROM being removed and use ss_config to restore the original LANIC ID. This is crucial for maintaining the unique SW_ID for the system.

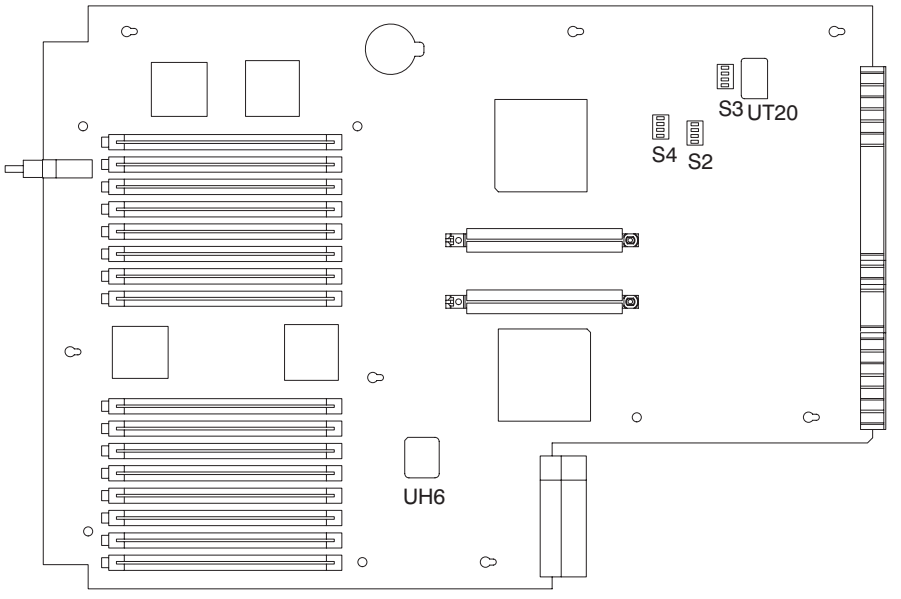


Figure 5–26. System Motherboard

Use a prom extraction tool to remove the EEPROM from the motherboard. A new tool recommended for this is vendor part number 560PR291, available through HP's Support Materials Organization.

7. Reverse this procedure to install the new system motherboard.

Battery

Before removing the battery, open the system unit and remove the CPU assembly.

To remove the battery, lift the clip and slip the battery out of its holder, as shown in Figure 5–27 for the Model J280 and Figure 5–28 for all other models.

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

ATTENTION: Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

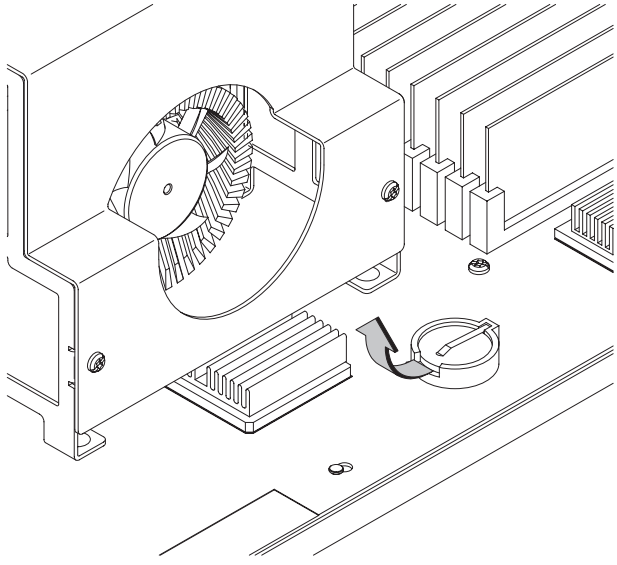


Figure 5–27. Removing the Calendar Battery (Model J280)

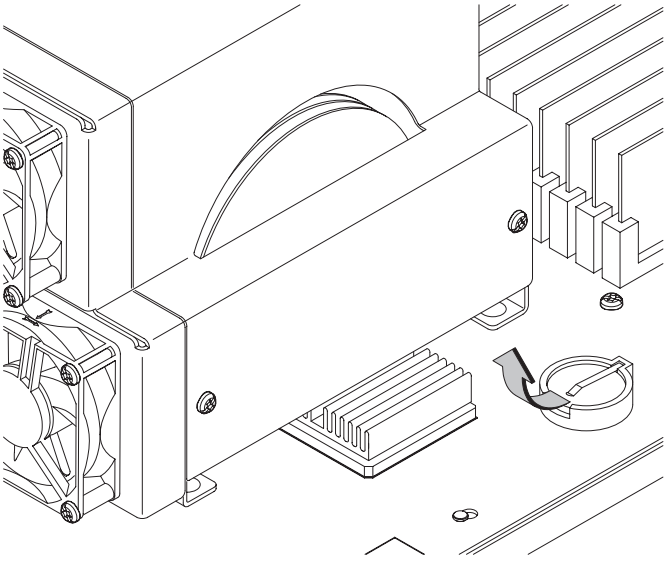


Figure 5–28. Removing the Calendar Battery

LCD Unit

Before removing the LCD (Liquid Crystal Display) unit, perform the following steps:

- Open the system unit
- Remove the CPU assembly
- Disconnect the LCD cable from the CPU board

Push in the retainer clips and pull out the LCD display unit, as shown in Figure 5–29.

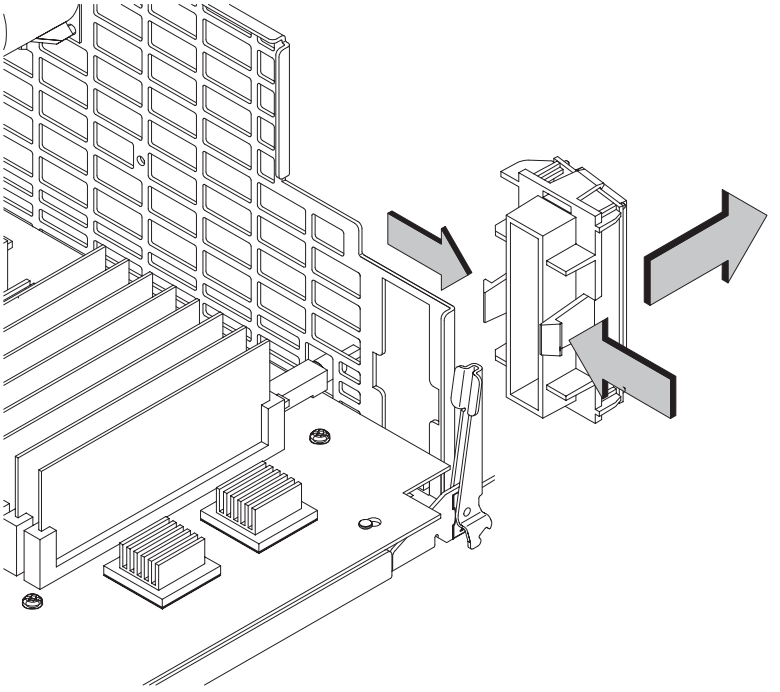


Figure 5–29. Removing the LCD Unit

NOTICE: The LCD unit can be placed in the workstation upside down. To prevent this, when installing the unit, hold it with the word TOP showing on the top of the unit as you place it in the workstation.

Speaker

Before removing the speaker, perform the following steps:

- Open the system unit
- Remove the CPU assembly
- Disconnect the speaker cable from the CPU board

Push in the speaker retainer clips and lift out the speaker, as shown in Figure 5–30.

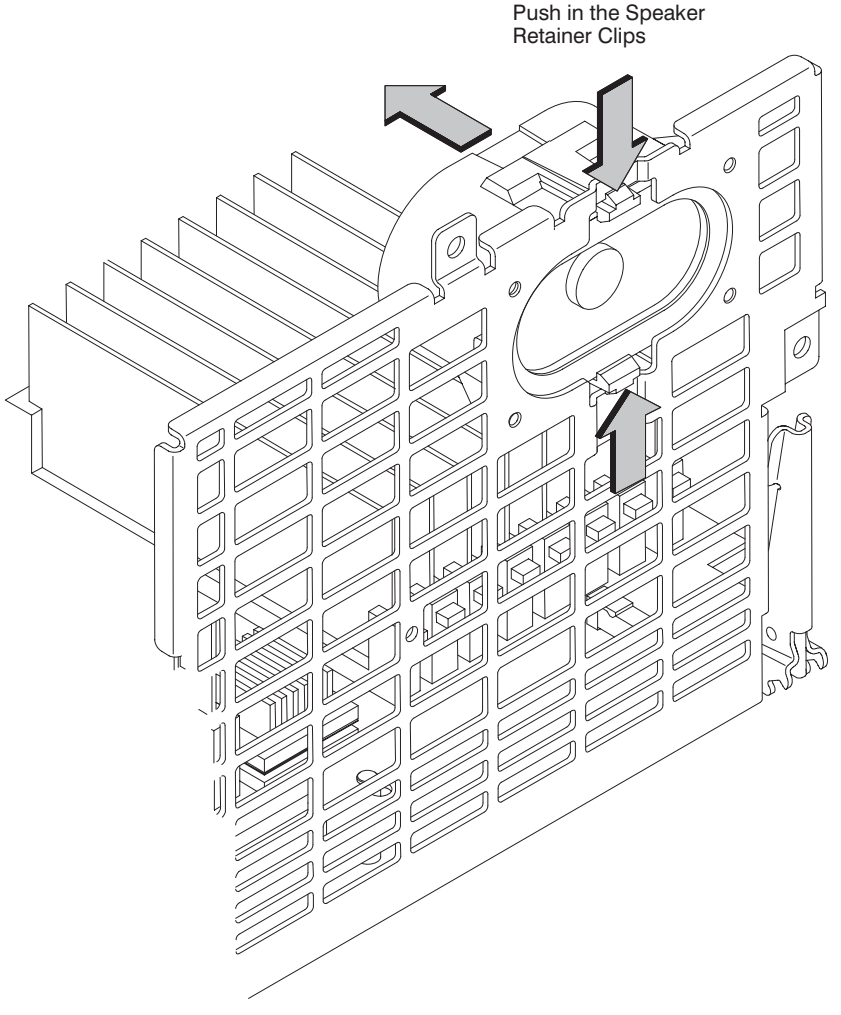


Figure 5–30. Removing the Speaker

PCI, EISA or GSC Boards

Follow these steps to remove or replace a PCI, EISA or GSC board:

1. Working from the rear of the workstation, unscrew the four captive screws and pull the EISA Assembly straight out using the handle. See Figure 5–31.

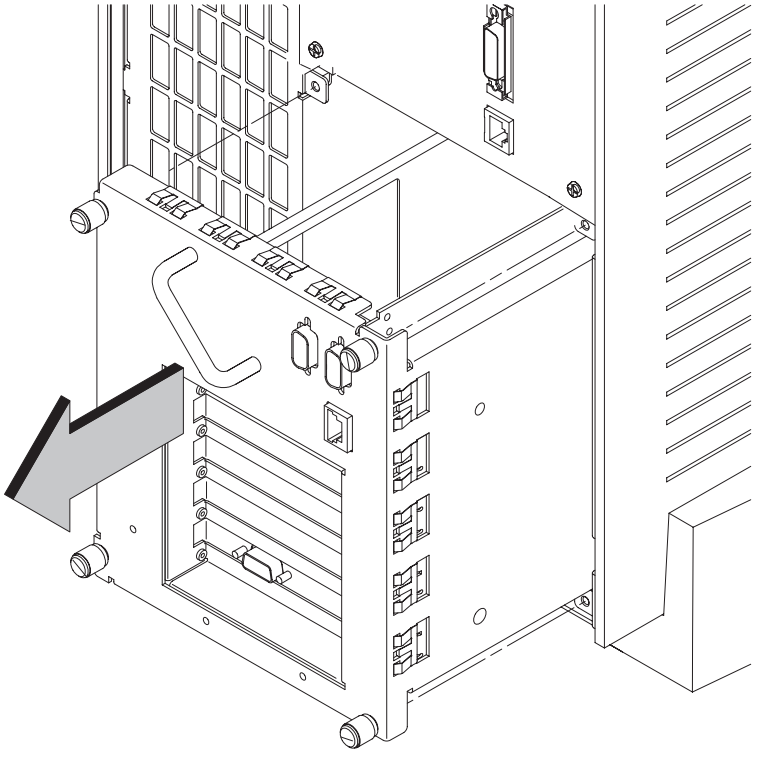


Figure 5–31. Removing the EISA Assembly

NOTICE: On the J282 EISA assembly, you must disconnect the fan interconnect cable shown in Figure 5–32.

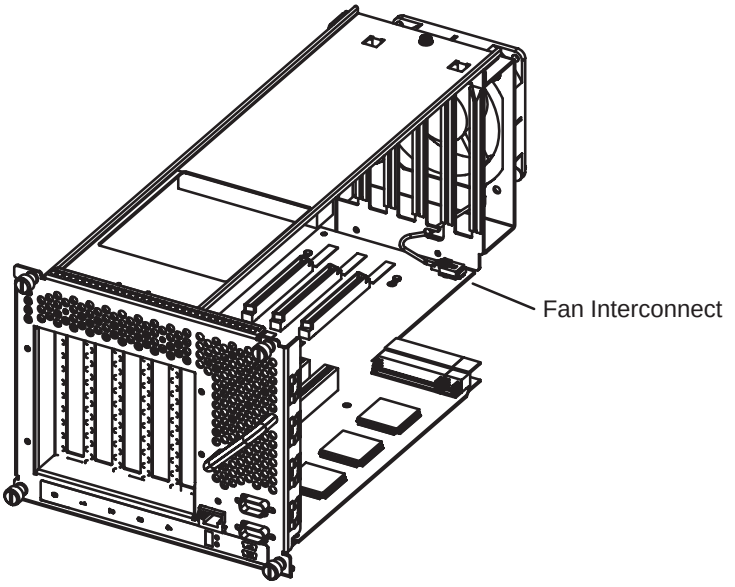


Figure 5–32. J282 EISA Assembly

2. Rotate the unit 90 degrees clockwise and place on a flat surface, as shown in Figure 5–33.

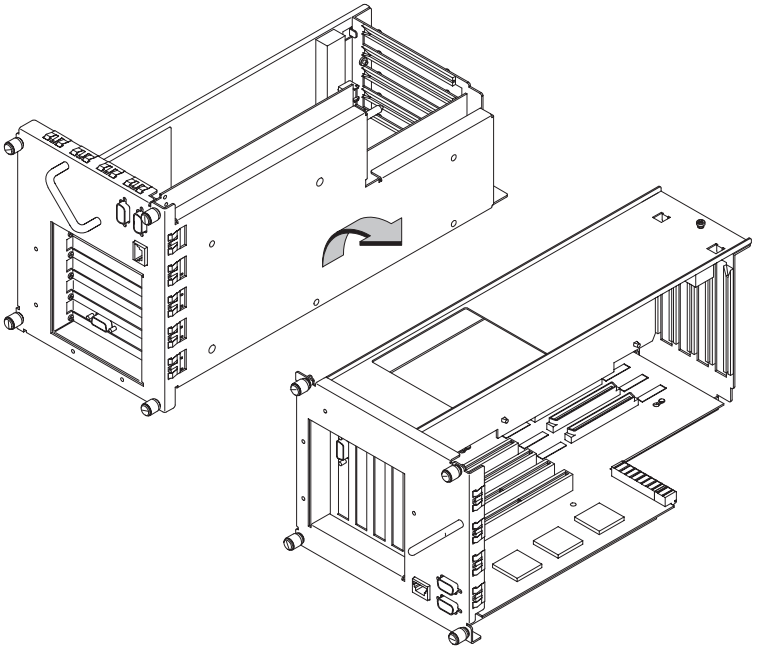


Figure 5–33. Rotating the EISA Assembly for Option Board Access

3. Unscrew one screw at the back of the cover and lift the cover up and out to remove it from the EISA Assembly. See Figure 5–34.

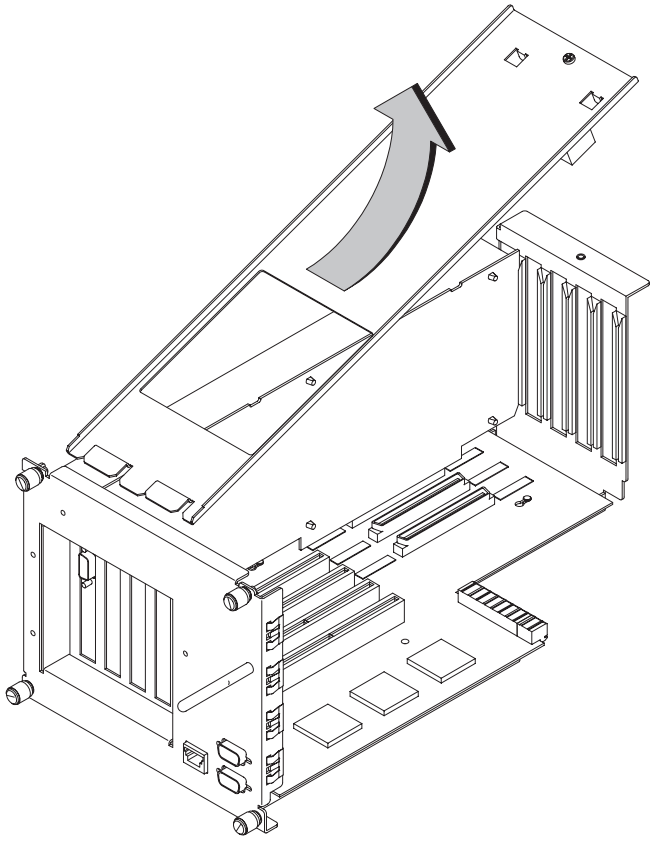


Figure 5–34. Removing the EISA Assembly Cover

4. If you are removing a board, unscrew one screw holding the board connector in place and pull it straight up. See Figure 5–35.

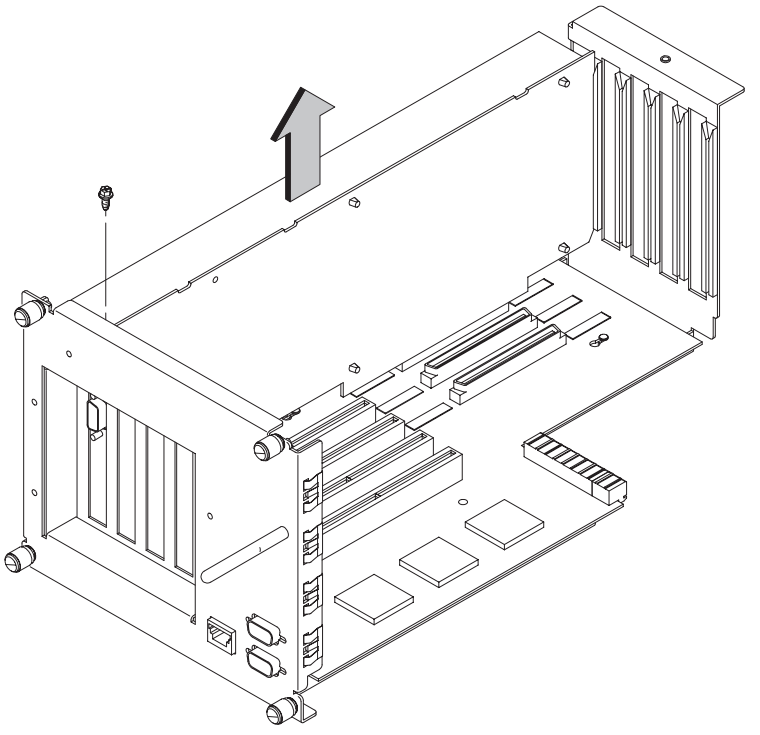


Figure 5–35. Removing an EISA or GSC Board

5. To install an EISA or GSC board in an empty slot, unscrew one screw at the top of the slot cover and pull the cover straight up to remove it. See Figure 5–36.

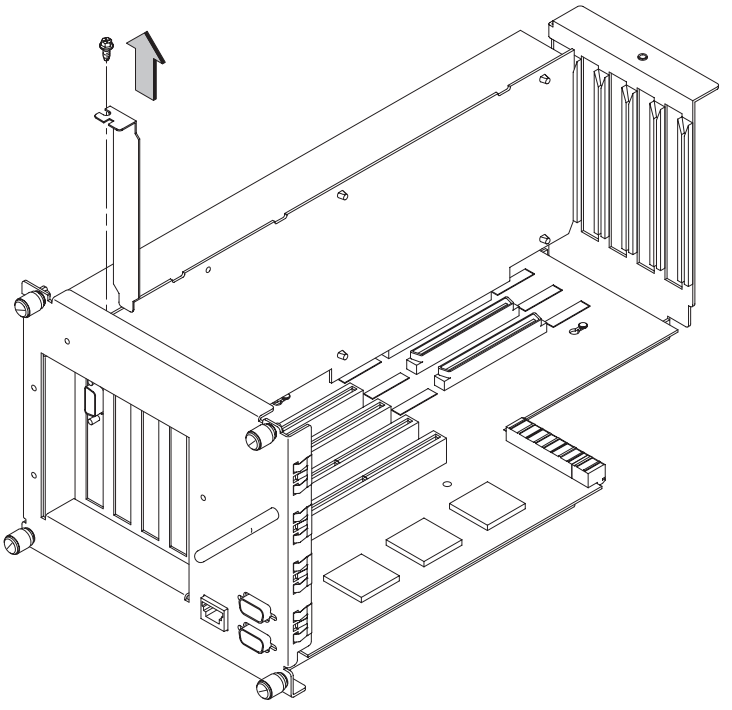


Figure 5–36. Removing the EISA Slot Cover

6. Place new board in the board guides and slide firmly into the connector. Check to see the board is evenly inserted to seat properly. See Figure 5–37.

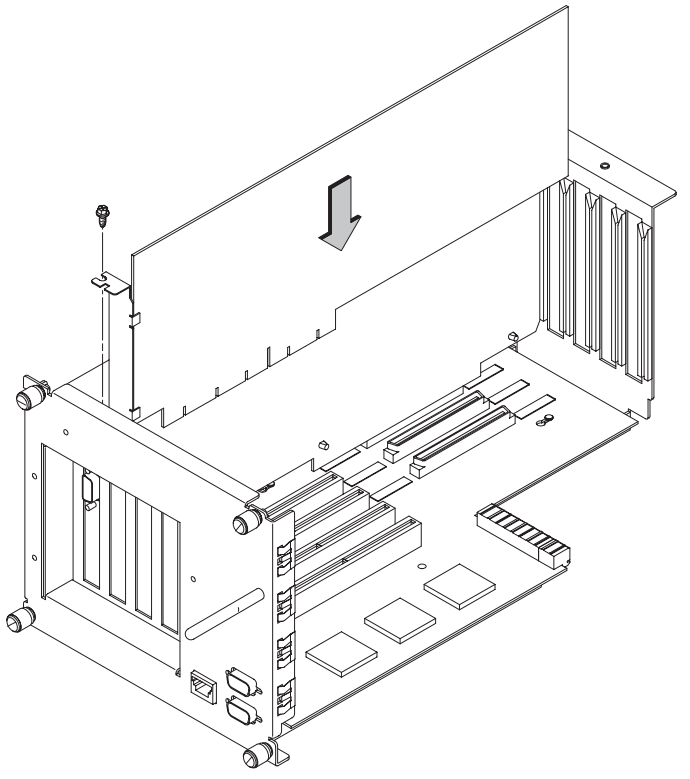


Figure 5–37. Installing an EISA or Graphics Board in the EISA Assembly

7. Secure board with one screw in top of board connector bracket.

8. (J2240 Only) Before installing cover, if you installed an EISA, or graphics board that is taller than a PCI card remove the small break–off block from the cover that corresponds to that slot. Refer to Figure 5–38.

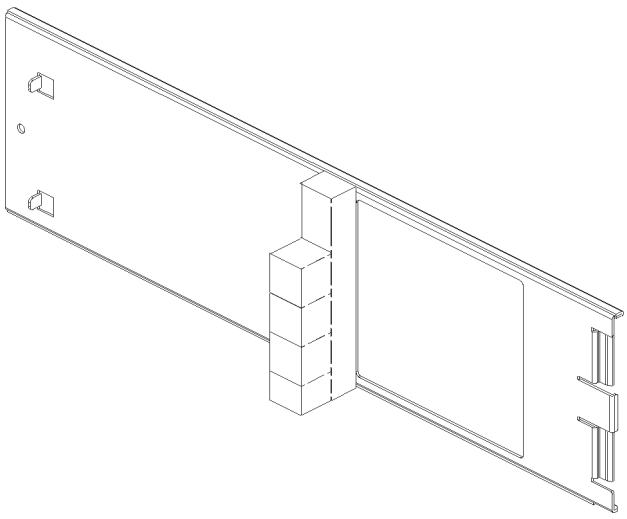


Figure 5–38. Remove Block from PCI Assembly Cover

9. Insert cover in guide and secure with screw. See Figure 5–39.

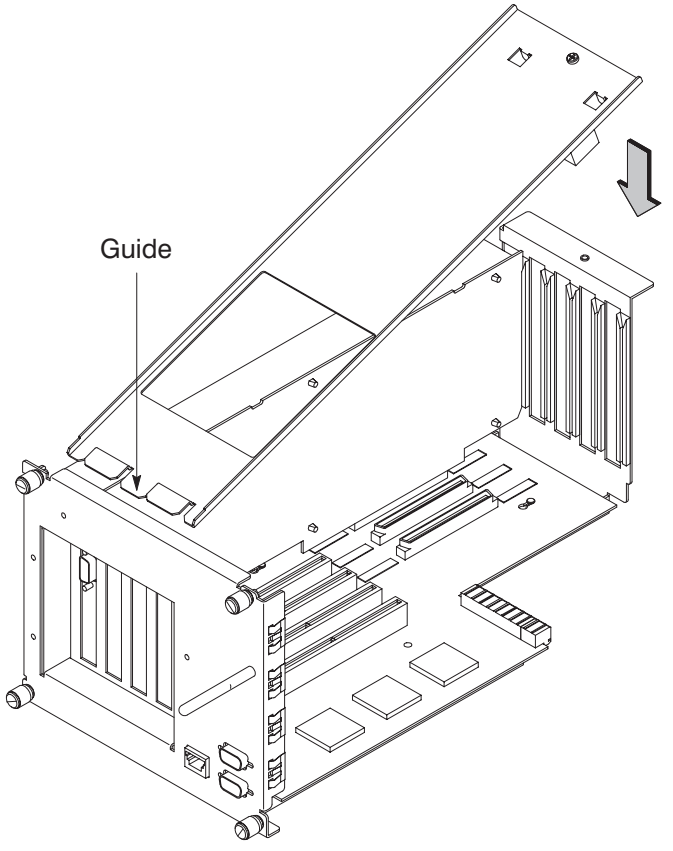


Figure 5–39. Replacing EISA Assembly Cover

10. Rotate the unit back 90 degrees and grasp handle. See Figure 5–40.

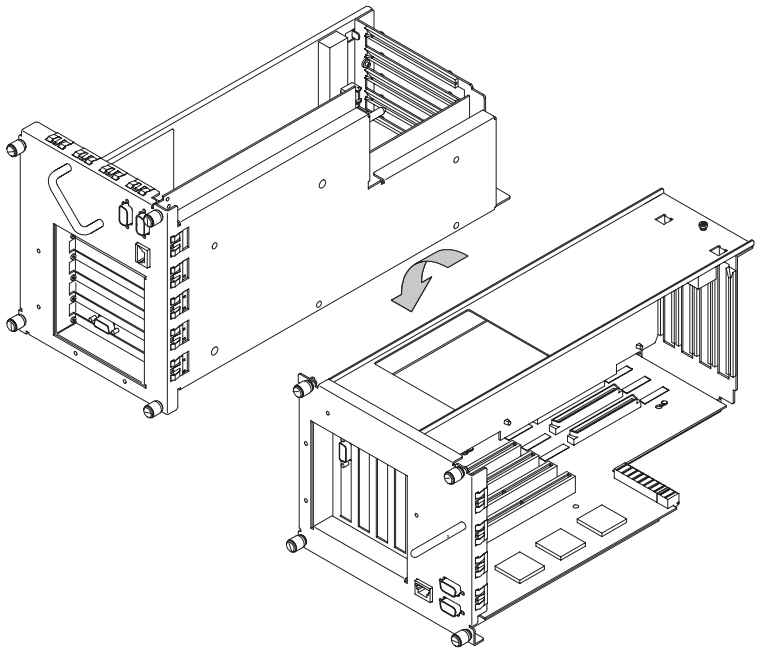


Figure 5–40. Rotating the EISA Assembly Back

11. Slide EISA Assembly into system unit and secure with the four captive screws. See Figure 5–41.

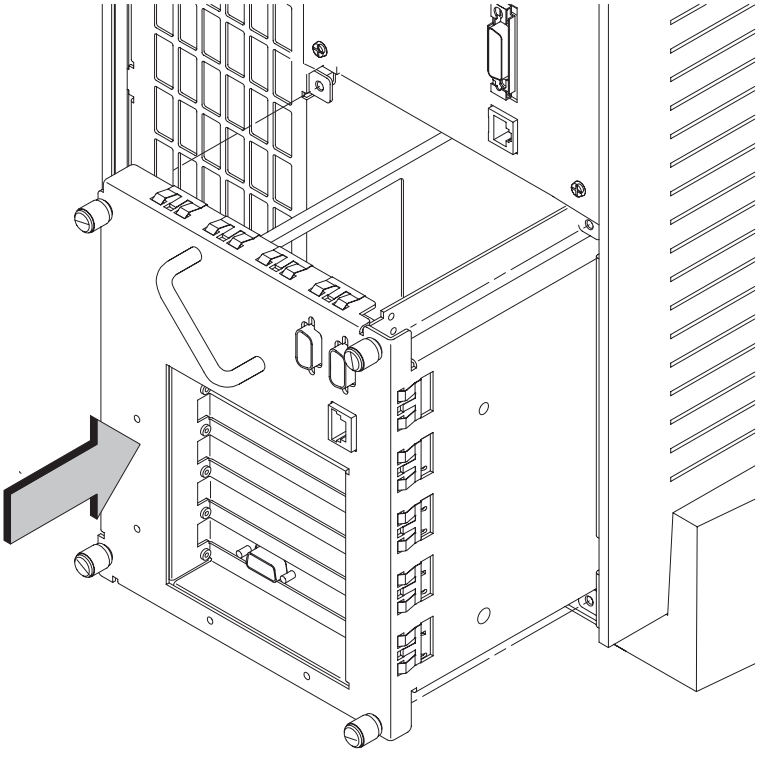


Figure 5–41. Replacing EISA Assembly

I/O Assembly

Remove the four screws holding the I/O Assembly in the workstation. Grasp the handle and pull the assembly out, as shown in Figure 5–42.

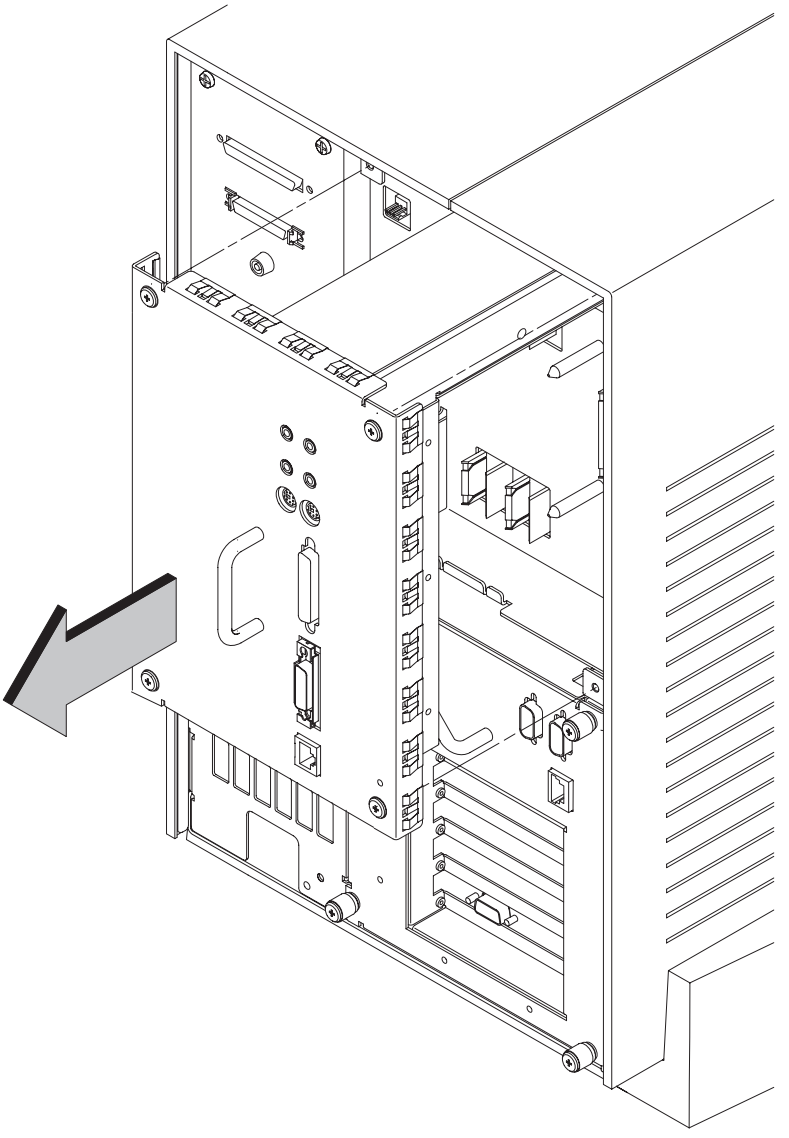


Figure 5–42. Removing the I/O Assembly

Removable Storage Device

Before removing a storage device, open the system unit.

Perform the following steps to remove any of the removable storage devices:

1. Unscrew the two captive screws on the left side of the Storage Assembly and pull down the drawer latch on the right side of the Storage Assembly, as shown in Figure 5–43.

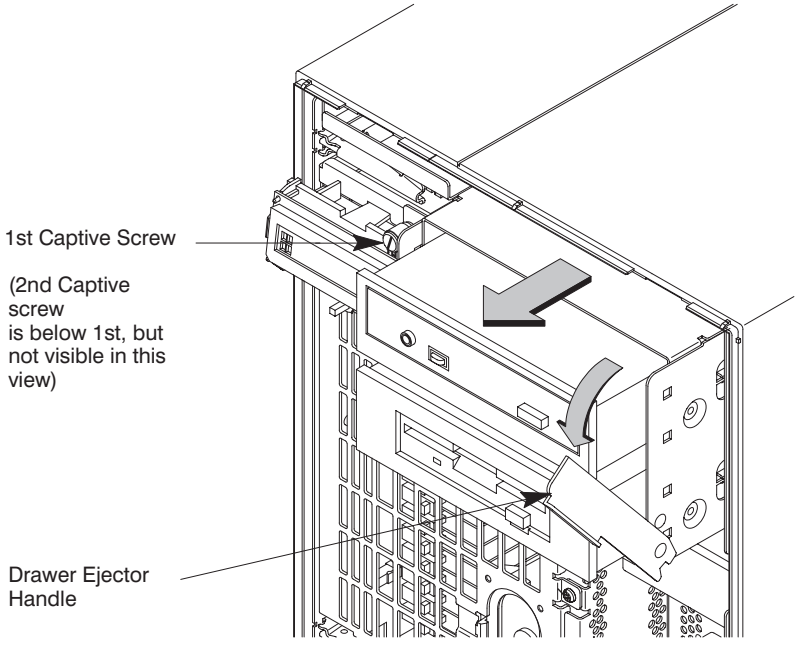


Figure 5–43. Removing Storage Drawer from System Unit

The Storage Assembly slides partway out of the drawer.

2. Pull the Storage Assembly out as far as it will go. (A safety catch on the left side prevents the drawer from coming all the way out.)

   NOTICE: When sliding the Storage Assembly out of the system unit, move the drawer ejector handle to prevent the Storage Assembly from hitting it.

3. Push in on the safety catch and continue pulling the drawer out. Be sure to support the assembly from the bottom.

4. Set the drawer on a flat surface.

   NOTICE: The EMI plate may have a fan attached to it. If it does go to step 7.

EMI Plate with no Fan Attached

5. Unscrew the captive screw holding the EMI plate at the back of the removable drives and lift the plate up and out of the drawer, as shown in Figure 5–44.

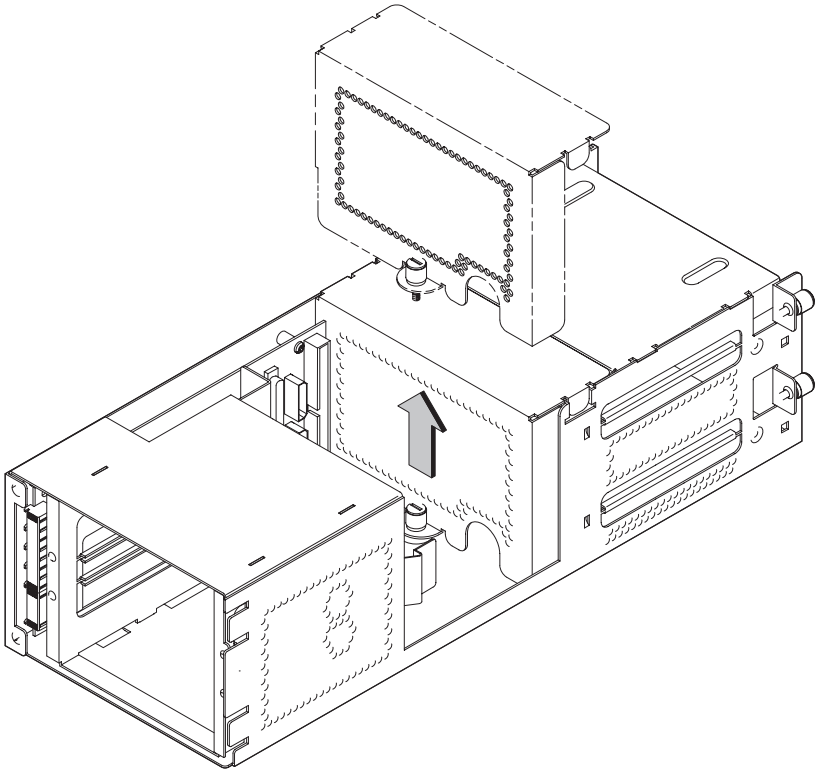


Figure 5–44. Removing EMI Plate

6. Disconnect the SCSI and power cables from the drive.

7. Go to step 13.

EMI Plate with Fan Attached

8. Unscrew the two M3 screws holding the fan to the EMI divider as shown in Figure 5–45.

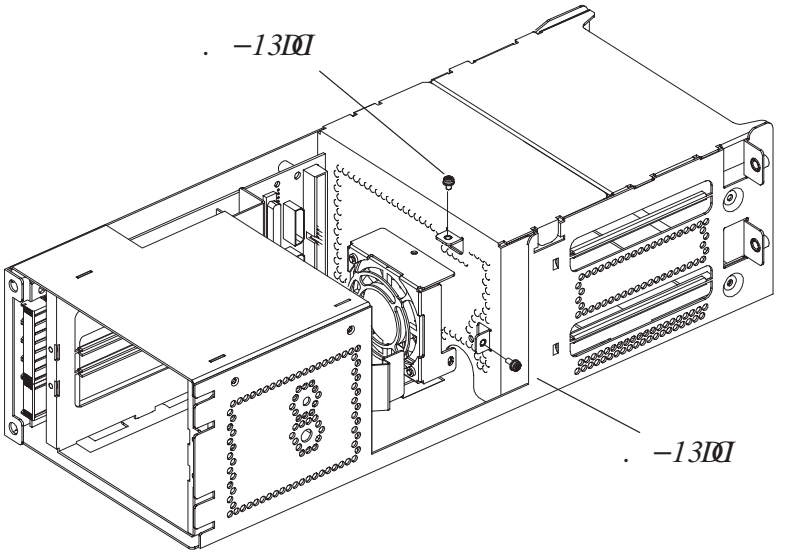


Figure 5–45. Removing the Storage Assembly Fan

9. Disconnect the power distribution cable from the SCSI Disk PCA as shown in Figure 5–46.

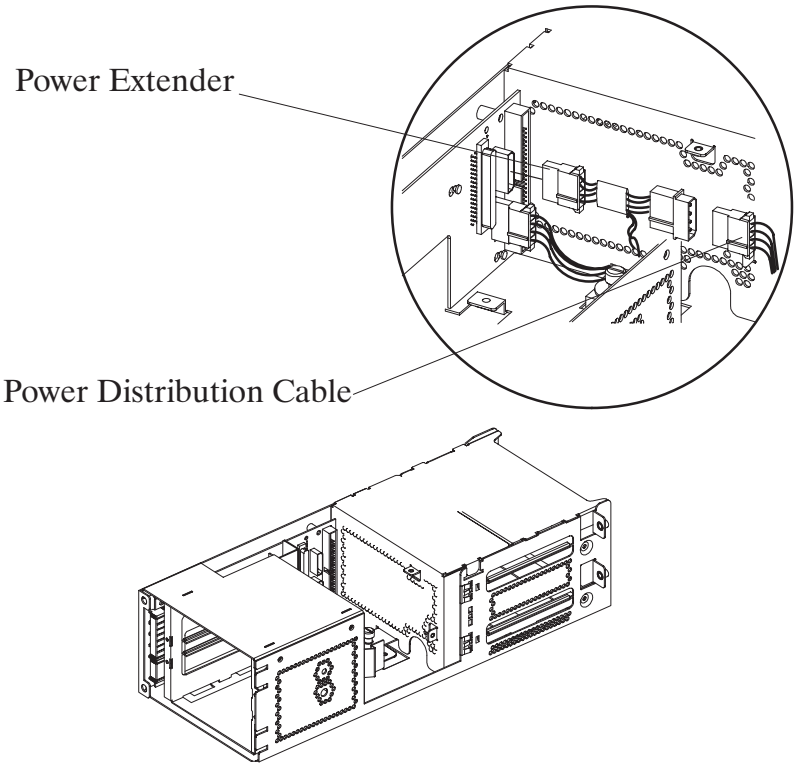


Figure 5–46. Disconnecting the Power Distribution Cable

10. Reverse these steps to reinstall the storage assembly fan on the EMI plate.

11. Unscrew the captive screw holding the EMI plate at the back of the removable drives and lift the plate up and out of the drawer.

12. Disconnect the SCSI and power cables from the drive.

13. Unscrew the two screws holding the drive in the storage drawer, and slide the drive out of the drawer. See Figure 5–47.

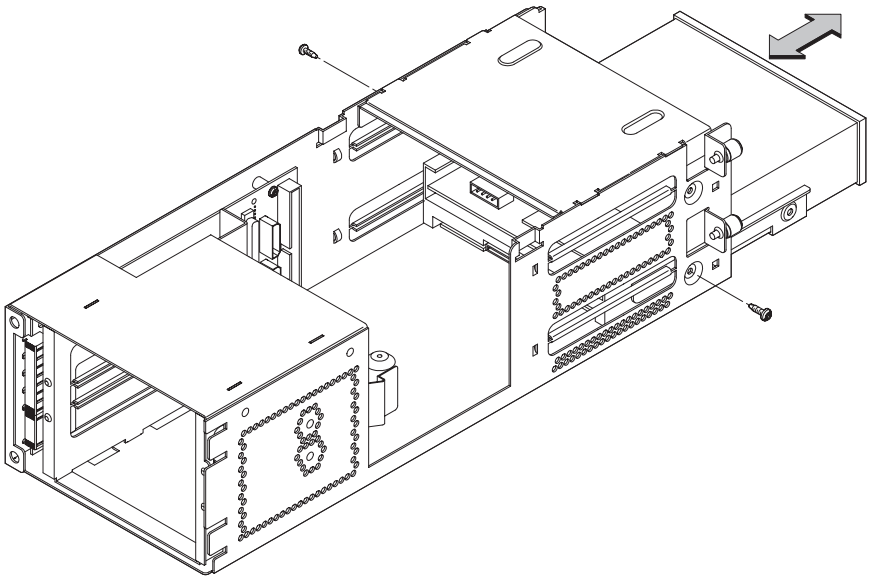


Figure 5–47. Removing Drive Screws

14. Check the SCSI address/jumper settings on the replacement drive, as shown in Chapter 3 of this handbook.

Reverse these steps to replace a drive.

Do not over-tighten the screws holding the drive in the storage drawer.

Hard Disk

Before removing a hard disk, open the system unit.

Perform the following steps to remove any of the removable storage devices:

> **NOTICE:** To install a second hard disk or replace an existing hard disk, check the SCSI ID of that disk before installing it. See Chapter 3 of this handbook for information on checking SCSI IDs.

1. Unscrew the two captive screws on the left side of the Storage Assembly and pull down the drawer latch on the right side of the Storage Assembly, as shown in Figure 5–48.

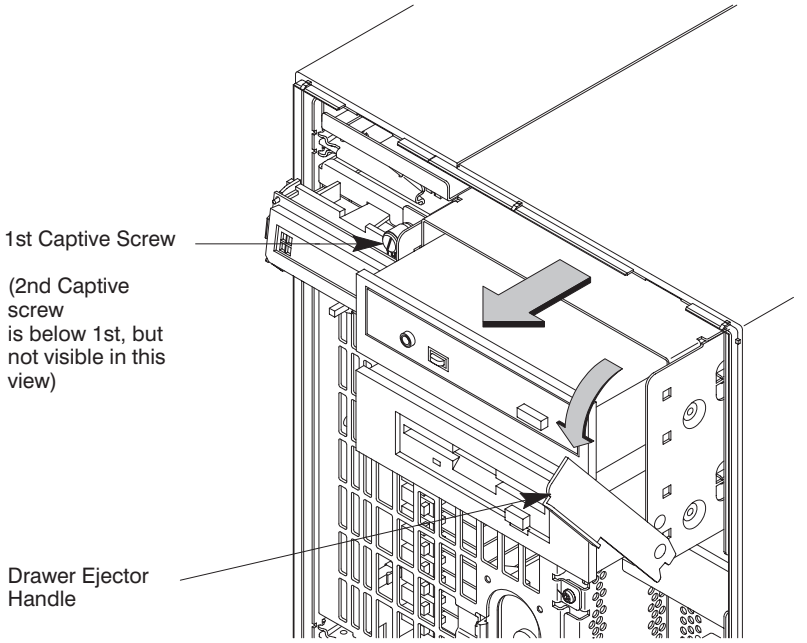


Figure 5–48. Removing Storage Drawer from System Unit

   The Storage Assembly slides partway out of the drawer.

2. Pull the Storage Assembly out as far as it will go. (A safety catch on the left side prevents the drawer from coming all the way out.)

3. Push in on the safety catch and continue pulling the drawer out.

4. Set the drawer on a flat surface.

5. Disconnect the SCSI and power cables from the back of the drive.

6. Remove the two screws holding the drive mounting bracket in place and slide the drive and bracket out. See Figure 5–49.

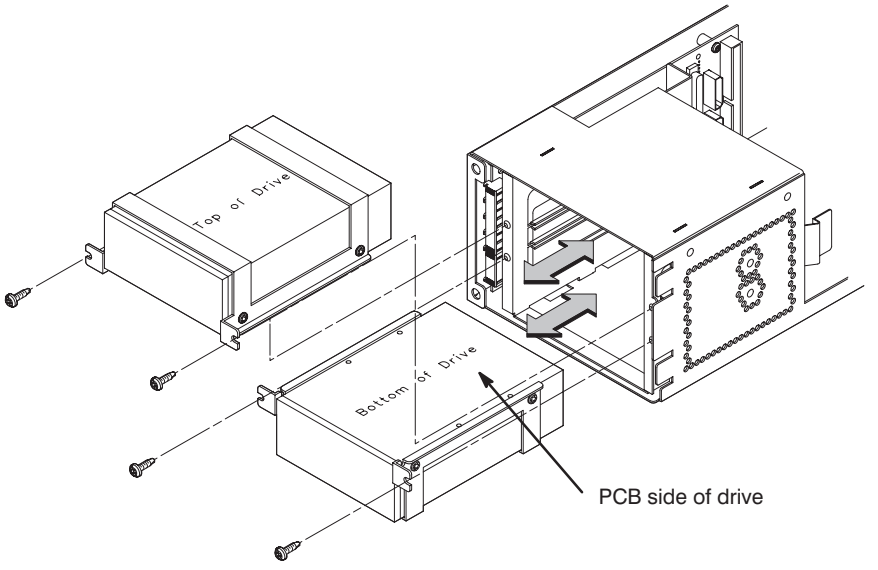


Figure 5–49. Removing the Drives from the Storage Assembly

To replace a hard drive, follow these steps:

1. If the drive that's being installed doesn't already have drive brackets attached, do this now, using Figure 5–50 as a guide.

   Do not over-tighten the screws holding the drive in the storage drawer.

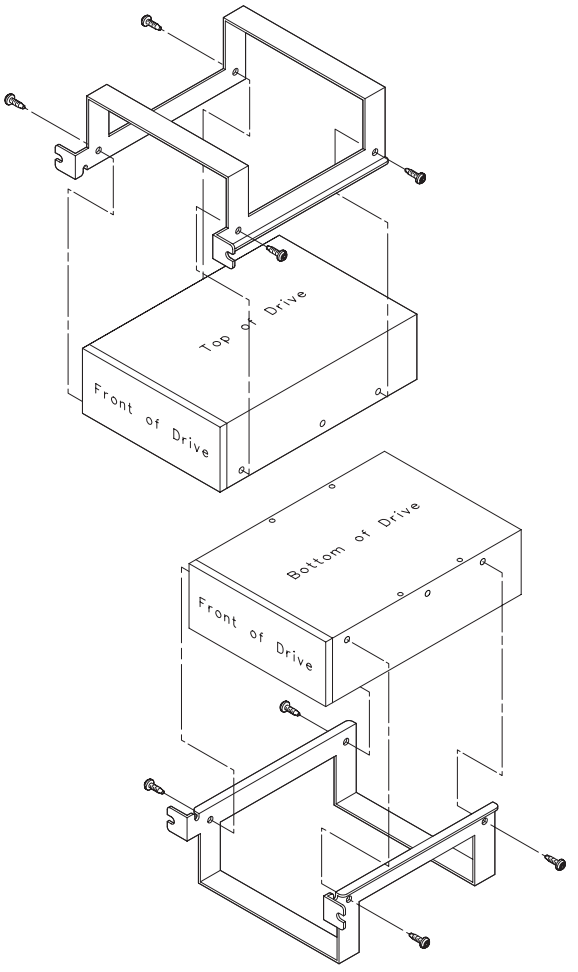


Figure 5–50. Replacing Hard Drive Mounting Bracket and Drive Orientation

2. Figure 5–51 shows two drives and their orientation in the Storage Assembly. The drives are installed with the bottom of each drive (the part of the drive that shows the printed circuits) facing towards the middle.

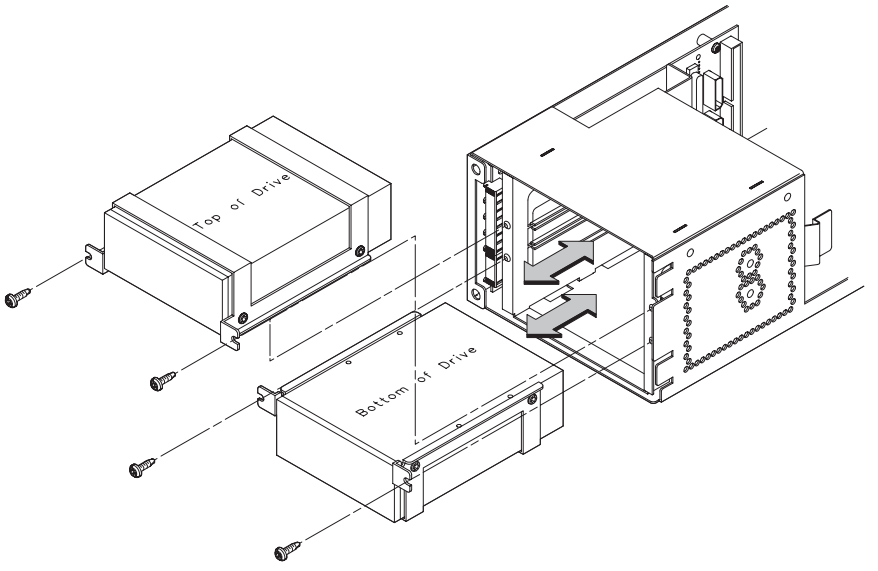


Figure 5–51. Placing Hard Drives in Storage Drawer

3. With the disk mounting bracket between the guides on each side of the Storage Assembly, slide the disk into the Storage Assembly, securing it to the drawer with two side screws. See Figure 5–51.

4. Connect the SCSI and power cables to the back of the drive.

5. Slide the drawer back in and secure.

SCSI Disk PCA

Before removing the SCSI Disk PCA, open the system unit and remove the Storage Assembly

Perform the following steps to remove the SCSI Disk PCA:

1. Unscrew the captive screw holding the EMI divider at the back of the removable drives and lift the plate up and out of the drawer as shown in Figure 5–51

2. Remove the screw holding the peripheral baffle in place as shown in Figure 5–52.

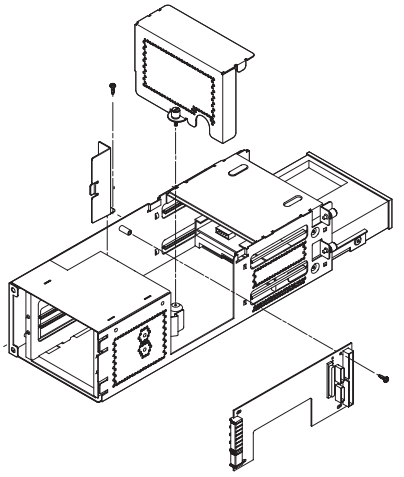


Figure 5–52. Removing the SCSI Disk PCA

3. Disconnect the SCSI signal and power cables from the SCSI Disk PCA.

4. Remove the screw holding the SCSI Disk PCA in the storage assembly and lift the SCSI Disk PCA out of the storage assembly.

Reverse these steps to replace the SCSI Disk PCA.

Power Supply

Perform the following steps to remove and replace the power supply assembly:

1. Disconnect the AC power cable from the rear of the system.

2. Open the system unit.

3. Unscrew the screw in the center of the power supply extractor and lift the extractor up. The power supply assembly slides partway out, disconnecting from the internal connectors. See Figure 5–53.

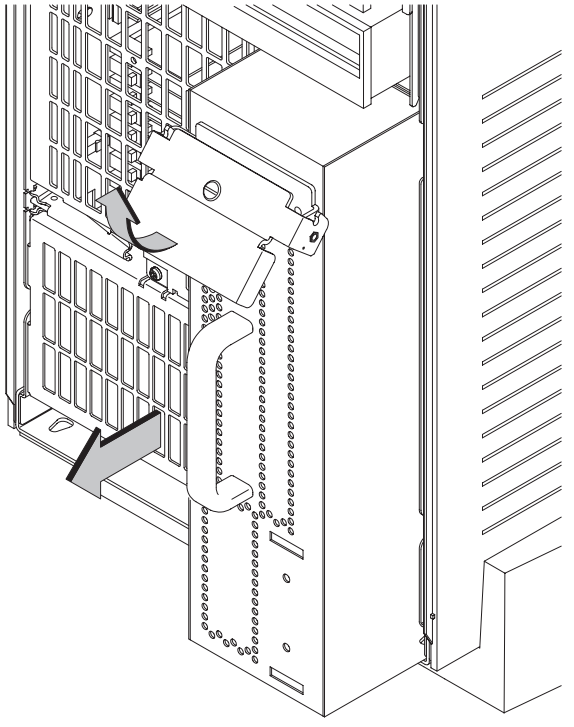


Figure 5–53. Removing the Power Supply

4. Grasp the power supply assembly handle and pull the power supply assembly straight out.

5. Remove the extractor handle from the old power supply and install it on the new power supply.

To replace the power supply assembly, follow these steps:

1. Slide the power supply assembly into the system unit as far as it will go.

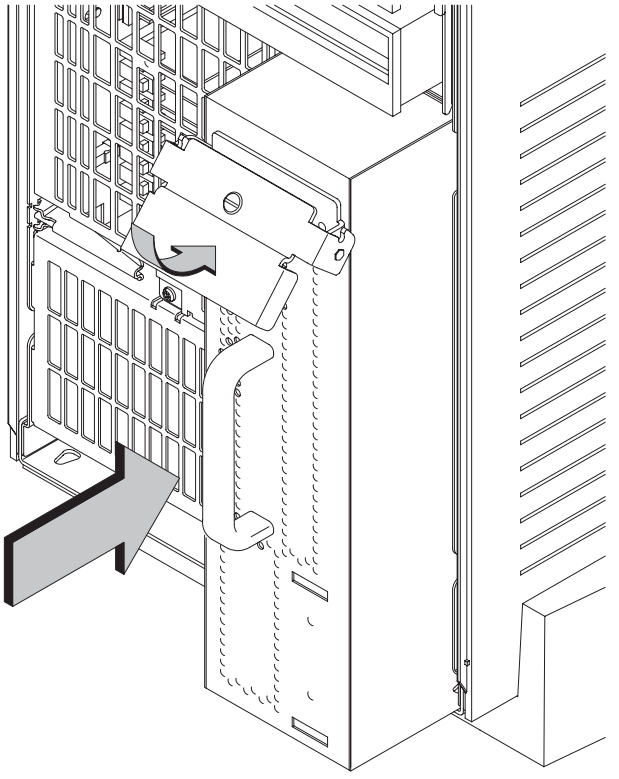


Figure 5–54. Replacing the Power Supply

2. Press down on the the power supply extractor to ensure the connections are made and secure the extractor with the center screw. See Figure 5–54.

Diagrams 6

This chapter provides functional information about the system.

System Power

Figure 6–1 shows the system power distribution.

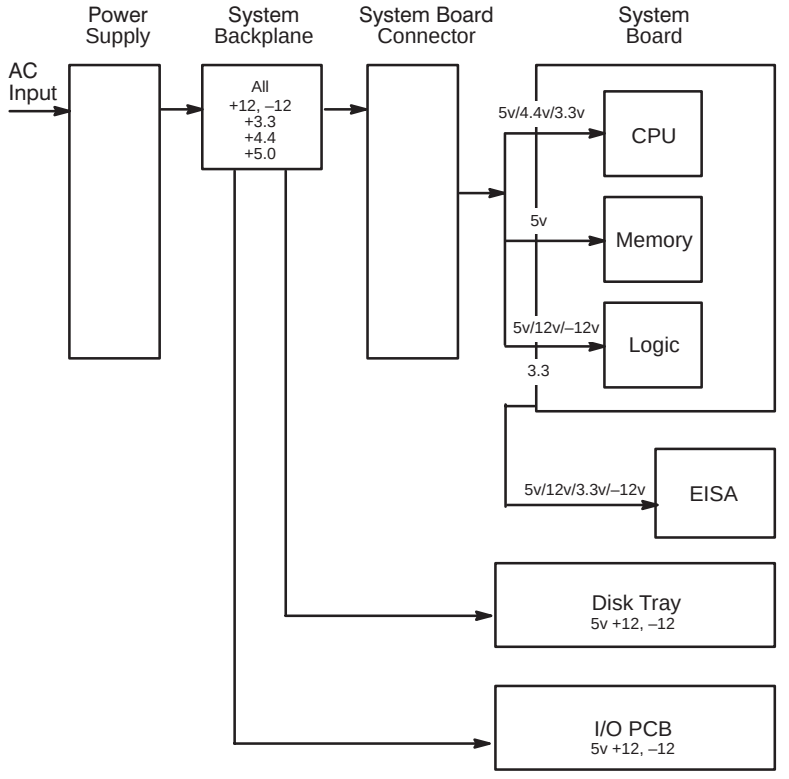


Figure 6–1. Power Distribution Diagram

The power supply distributes power through the following connectors:

CPU Board Connector (11-pin)
Floppy Drive Connector (2-pin)
Hard Disk Drive Connector (4-pin)
Fan Connector on CPU board (2-pin)

Table 6–1 lists the pinouts for the power supply connector to the CPU board:

Table 6–1. CPU Board Power Pinouts

Pin Number	Description	Wire Color
1	START_PWR_DOWN_L	white
2	POWER_ON_L	blue
3	+5V	orange
4	GROUND	black
5	+12V	red
6	GROUND	black
7	+5V	orange
8	+3.3V	yellow
9	+5V (SCSI)	violet
10	GROUND	black
11	+5V	orange

Table 6–2 lists the pinouts for floppy drive power:

Table 6–2. Floppy Drive Power Pinouts

Pin Number	Description	Wire Color
1	+5V	orange
2	GROUND	black

Table 6–3 lists the pinouts for hard disk drive power:

Table 6–3. Hard Disk Drive Power Pinouts

Pin Number	Description	Wire Color
1	+12V	red
2	GROUND	black
3	GROUND	black
4	+5V	orange

Table 6–4 lists the pinouts for fan power:

Table 6–4. Fan Power Pinouts

Pin Number	Description	Wire Color
1	+12V	N/A
2	GROUND	N/A

Table 6–5 lists the pinouts for the LED connector:

Table 6–5. LED Power Pinouts

Pin Number	Description	Wire Color
1	Cathode (–)	N/A
2	Anode (–)	N/A

System Block Diagram

Figure 6–2 and Figure 6–3 show the system unit block diagrams.

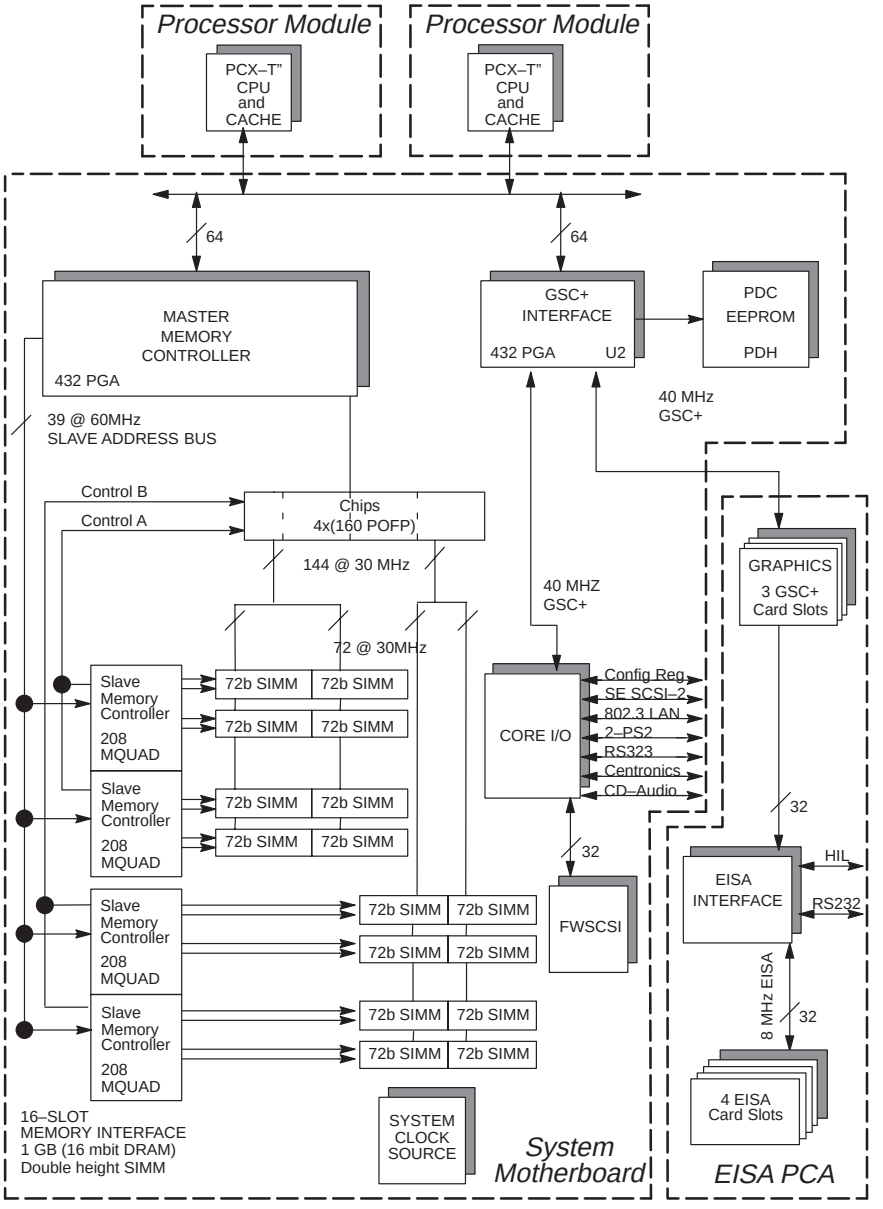


Figure 6–2. System Unit Functional Block Diagram

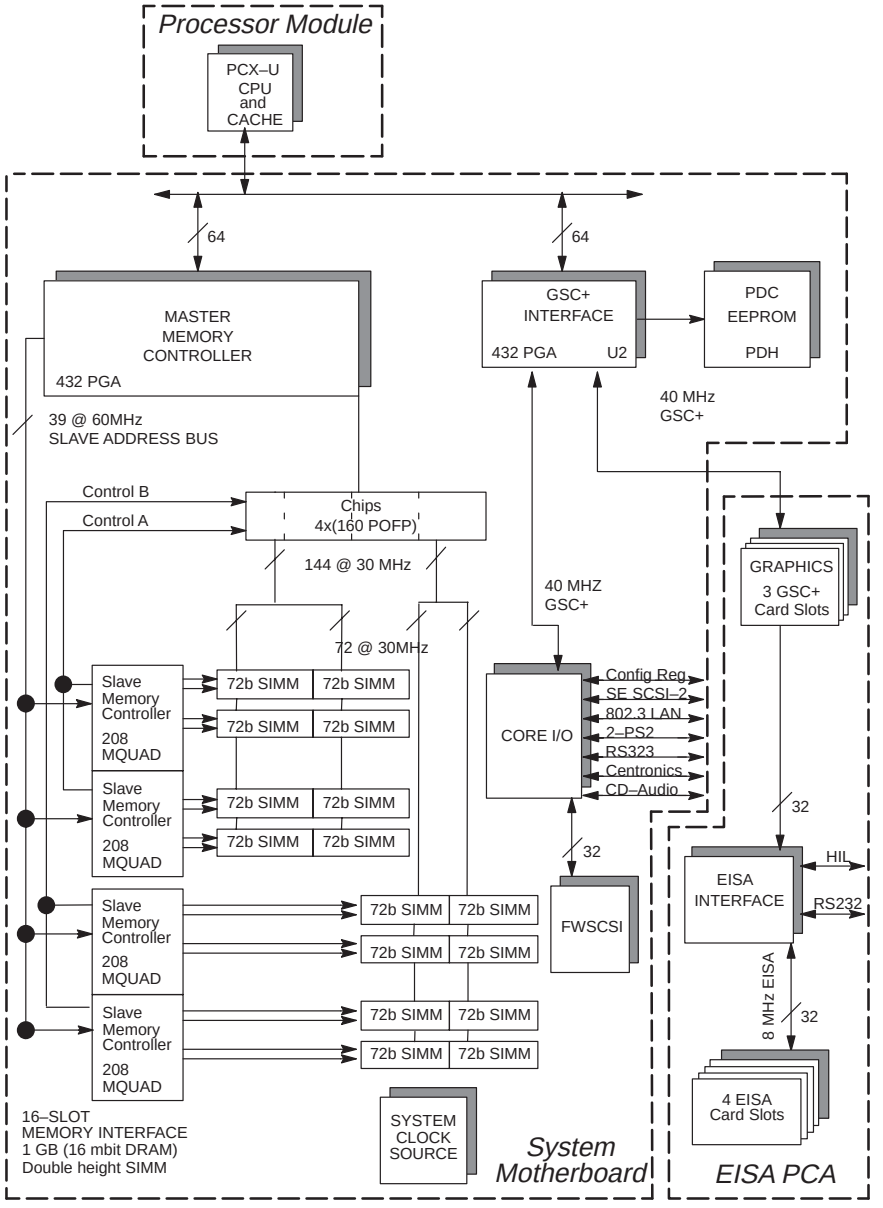


Figure 6–3. J280 System Unit Functional Block Diagram

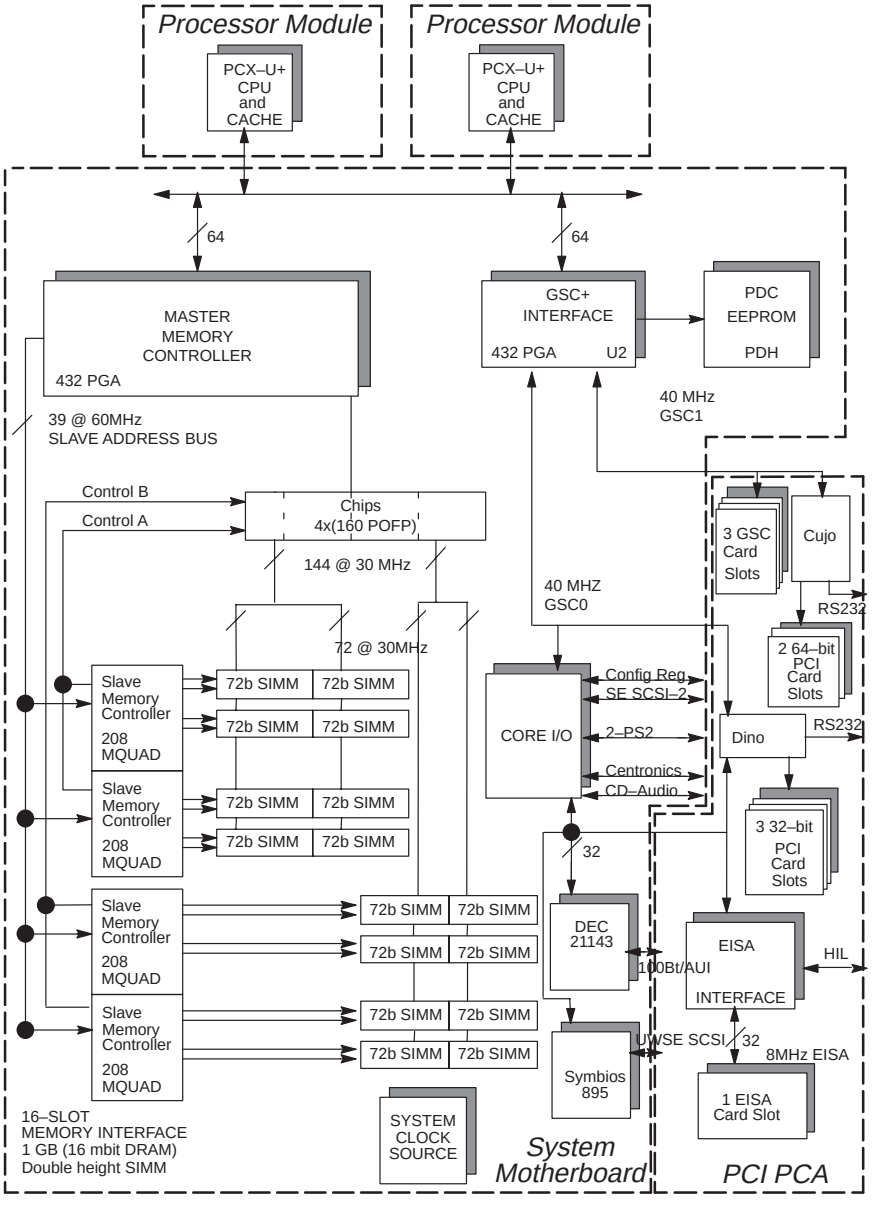


Figure 6–4. J2240 System Unit Functional Block Diagram

Reference 7

This chapter provides part numbers and titles to reference documents.

Installation Manual

A2876–90010 *Hardware Installation Guide*

Service Manuals

92453–90010 *Precision Architecture RISC: HP 9000 Series 700 Diagnostics Manual*
B2355–90040 *System Administration Tasks Manual HP Apollo 9000 Series 700*
A2876–90041 *Service Handbook J Class Workstations (this handbook)*
A4033–90099 *HP A4032/A4033 Color Monitors CE Handbook*
A4081–90605 Sevice *Handbook* J Class *Workstation Change Page Package*

Reference Manuals

A2876–90013 *J280 Owner's Guide*
A2876–90015 *J282/2240 Owner's Guide*
A4081–90603 *HP 9000 J Class Workstations Technical Reference Manual*
A4476–90013 J Class Owners Guide

Service Notes 8

Place service notes here.

Boot Console Interface Models J200/210/210XC 9

The Boot Console Interface provides an “interactive” environment after the power-on sequence.

Accessing the Boot Console Interface

To access the boot console interface, follow these steps:

1. Close any files and applications on your workstation.

2. Follow your normal shutdown procedure. For more information on shutting down your workstation, see *Using your HP Workstation*.

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

   If Autoboot is turned on, you will see the following messages:

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

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

```
Boot terminated
```

   The Main Menu of the boot console appears.

Boot Console Menus

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

The shortened version of all commands is indicated by the upper case letters.

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

```
------ 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 menu                 Displays or sets boot values
INformation menu                   Displays hardware information
SERvice menu                       Displays service commands

DIsplay                            Redisplay the current menu
HElp [<menu>|<command>]            Display help for menu or command
RESET                              Restart the system
------
Main Menu: Enter a command or a menu >
```

```
------ Configuration Menu -----------------------------------------
Command                          Description
-------                          -----------

AUto [BOot|SEArch] [ON|OFF]      Display or set specified flag
BootInfo                         Display boot-related information
DEfault                          Set the system to predefined values
FastBoot [ON|OFF]                Display or set boot tests execution
LanAddress [<option>]            Display Core LAN station address
MOnitor [<option>]               Display or set monitor type in EEPROM
PAth [PRI|ALT|CON|KEY] [<path>]  Display or modify a path
PRocessor [<proc>] [ON|OFF]      Config/Deconfig processor
SEArch [DIsplay|IPL] [<path>]    Search for boot devices
TIme [c:y:m:d:h:m:[s]            Read or set the real time clock in GMT

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

```
------ Information Menu ------------------------------------------
Command                          Description
-------                          -----------

ALL                              Display all system information
BootInfo                         Display boot-related information
CAche                            Display cache information
COprocessor                      Display coprocessor information
EIsa                             Display EISA slot information
FWrVersion                       Display firmware version
MEmory                           Display memory information
MOnitor                          Display monitor type in EEPROM
PRocessor                        Display processor information

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

```
------ Service Menu ------------------------------------------------
Command                          Description
-------                          -----------

MemRead <address> [<len>]        Read memory and I/O locations
PIM [<proc>][HPMC|LPMC|TOC]      Display PIM information
PDT [CLEAR]                      Display or clear the Page Deallocation
                                 Table
ChassisCodes [<proc>]            Display chassis codes

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

Searching for Bootable Media

To list all devices that may contain bootable media, follow the directions in "Accessing the Boot Console Interface" earlier in this chapter, and then type the following at the prompt:

```
Main Menu: Enter a command or a menu >  search ipl Enter
```

The search may turn up more devices than there are lines on your display. If you are using a text terminal, you may control the progress of the search from your terminal's keyboard by performing the following steps:

- To hold the display temporarily, press Ctrl S
- To continue the display, press Ctrl Q
- To halt the search, press any 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, follow the directions in "Accessing the Boot Console Interface" earlier in this chapter, and then type the following at the prompt:

```
Main Menu: Enter a command or a menu >  search ipl device_type
Enter
```

where *device_type* is one of the following:

fwscsi is the built-in fast, wide SCSI bus
scsi is the built-in single-ended SCSI bus
lan is all connections to the built-in LAN

Resetting the Workstation

Hard Reset

To hard reset your workstation, follow the directions in “Accessing the Boot Console Interface” earlier in this chapter, and then type the following at the prompt:

```
Main Menu: Enter a command or a menu >  reset  Enter
```

Soft Reset

To soft reset your workstation (to reset without destroying data in memory, for example), press the “TOC” button below the SCSI connectors on the rear of the I/O bulkhead.

Displaying and Setting Paths

A **path** is the hardware address of a device that is attached to the I/O system of your workstation. The **path** command sets the system paths shown in Table 9–1:

Table 9–1. System Paths

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

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

```
Main Menu: Enter a command or a menu > path
```
Enter

The boot paths are displayed in **Mnemonic Style Notation,** as shown in Table 9–2.

Table 9–2. Mnemonic Style Notation for Boot Paths

I/O Type	Specification Format
Built-in FWSCSI	**core.fwscsi**.*scsi_address.logical_unit_number*
Expansion FWSCSI	**slot***n***.fwscsi**.*scsi_address.logical_unit_number*
Built-in SCSI	**core.scsi**.*scsi_address.logical_unit_number*
Built-in LAN	**core.lan**.*server_address.init_timeout.io_time-out*

To display the current setting for a particular system path, follow the directions in "Accessing the Boot Console Interface" earlier in this chapter, and then type the following at the prompt:

```
Main Menu: Enter a command or a menu >  path path_type  Enter
```

where *path_type* is one of the path types listed in Table 9–1.

For example, to get the path to the primary boot device, follow the directions in "Accessing the Boot Console Interface" earlier in this chapter, and then type the following at the prompt:

```
Main Menu: Enter a command or a menu >  path primary  Enter
```

To set a system path to a new value, follow the directions in "Accessing the Boot Console Interface" earlier in this chapter, and then type the following at the prompt:

```
Main Menu: Enter a command or a menu >  path path_type path  Enter
```

where *path_type* is one of the path types listed in Table 9–1 and *path* is the specification of the path in Mnemonic Style Notation (as described in Table 9–2). 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 Interface" earlier in this chapter, and then type the following at the prompt:

```
Main Menu: Enter a command or a menu >  path pri scsi.6.0  Enter
```

Displaying and Setting the Monitor Type

Your system ships from the factory preset to use a monitor with a specific resolution and frequency. If you replace your workstation's monitor with a different type of monitor, you must reconfigure your workstation to support the new monitor.

The Monitor Command

The **monitor** command lets you change your workstation's graphics configuration. This command is available in both the Information and Configuration Menus of the boot console interface, however when you use it in the Information Menu, **monitor** only displays the current graphics and console information. You must use **monitor** in the Configuration Menu to set a monitor type.

The correct usage for this command is:

monitor <*graphics_path*>

where valid graphics_path parameters are:

graphics0 Graphics device in slot0. If using a Dual Graphics Card, this is the port to the right on the card when facing the back of the workstation.

graphics1 Graphics device in slot1. If using a Dual Graphics Card, this is the port to the right on the card when facing the back of the workstation.

graphics2 Graphics device in slot2. If there is a Dual Graphics Card in slot1, this is the port to the left on the card when facing the back of the workstation.

graphics3 This is a logical slot, and can only be reached by using the left port of a Dual Graphics Card in physical slot0.

NOTICE: We do **not** recommend using a Dual Graphics Card in slot2, other than the CRX/HCRX. If using the dual graphics card, it must be the only card in the system and be physically located in slot0

The following illustrations show the physical layout of the EISA/GSC slots, first from inside the EISA Assembly (Figure 9–1), then from outside the system unit (Figure 9–2).

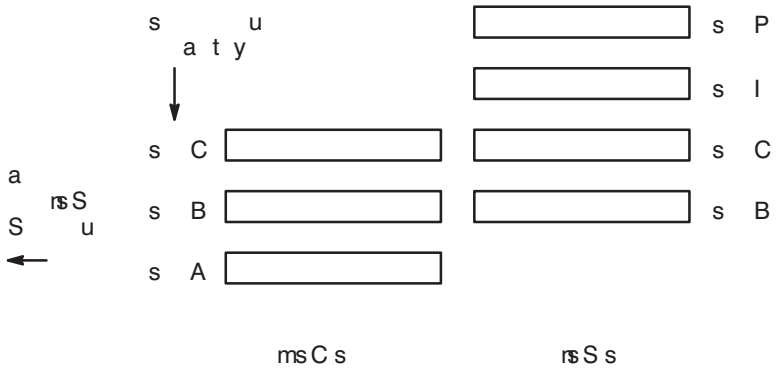


Figure 9–1. EISA/GSC Slots from Inside the EISA Assembly

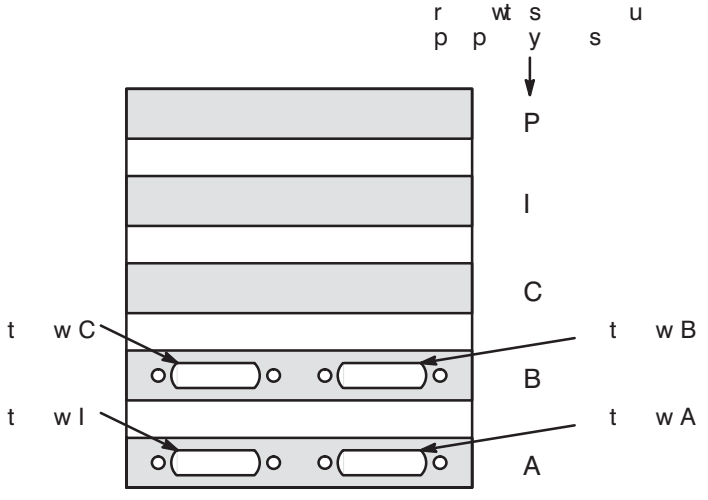


Figure 9–2. EISA/GSC Slots from Outside the System Unit

Physical slot 0 is always reserved for graphics cards only.

monitor lets you change your workstation's graphics configuration *before* you replace your monitor. For information about changing the configuration *after* you replace your monitor, see "Changing Your Monitor Type" in Appendix B of this book.

Displaying the Current Monitor Configuration

To display the current monitor configuration for your system from the Configuration Menu of the boot console interface, follow the directions in “Accessing the Boot Console Interface” earlier in this chapter. Once you are in the Boot Console Interface Main Menu, type:

```
Main Menu: Enter a command or a menu >  configuration  Enter
```

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

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

The screen displays a list of monitors, similar to the following.

NOTICE: The J Class workstation currently supports only a 1280x1024, 72 Hz color monitor in either 17–inch or 20–inch size.

```
MONITOR INFORMATION

Slot #        HPA       State     Resolution  Frequency   Class
---------   --------   -------    ----------  ---------   -----
graphics0   f8000000   Present    1280x1024   75Hz        VESA
graphics1   f4000000   Empty
graphics2   f6000000   Empty
graphics3   fa000000   Present    1024x1024   72Hz

Current Console Path:             GRAPHICS0
Stable Store Console Path:        GRAPHICS0
```

In this example, the graphics cards are configured as follows

- Graphics slot 0 Dual Graphics Card
- Graphics slot 1 Empty
- Graphics slot 2 Empty

Setting the Monitor Type

Using the list in the example above, you can set the monitor type for graphics slot0 by typing the following:

```
Configuration Menu: Enter command > monitor graphics0
```

Enter

NOTICE: You can exit at this point by entering **x**, and the monitor type will not be changed.

The screen displays the choice of supported monitors, similar to the following. Follow the directions in the screen prompts and enter the monitor type you want to configure (in this example, number 1).

```
MONITOR INFORMATION

Type      Resolution     Frequency
----      ----------     ---------
1         1280x1024      72Hz
2         1024x768       75Hz
3         1024x768       70Hz
4         1024x768       75Hz     Flat Panel
5         1280x1024      60Hz
6         1024X768       60Hz
7          640X480       60Hz
8         1280X1024      75Hz     VESA
9         1024X768       75Hz     VESA
10         800X600       75Hz     VESA
11         640X480       75Hz     VESA
12        1280X1024      72HZ     GrayScale
13        1280X1024      50HZ

Enter monitor type selection from list above (or 'x' to exit): 1
  1       1280x1024      72Hz

Press <y> to save this monitor type or <x> to exit monitor selection: y
```

The MONITOR INFORMATION table reappears with the new monitor shown in slot0.

```
Slot #          HPA          State    Resolution    Frequency   Class
---------     ----------    -------   ----------    ---------   -------
graphics0     f8000000      Present   1280x1024     72Hz
graphics1     f4000000      Empty
graphics2     f6000000      Empty
graphics3     fa000000      Present   1024x1024     72Hz

Current Console Path: GRAPHICS0
Stable Store Console Path: GRAPHICS0
```

Displaying the Status of the EISA Slots

The **eisa** command lets you identify all EISA cards currently installed on your workstation by showing you the current status of your workstation's four EISA slots. It is available only in the Information Menu.

To use the **eisa** command, from the Information Menu of the boot console interface, type:

```
Information Menu: Enter command > eisa
```

Enter

The following table appears:

```
Slot #        Slot State    Device Information
-------       ------------  --------------------
   1          Empty         Empty
   2          Unconfigured  HWP1850
   3          Empty         Empty
   4          Configured    INP0100
```

In the table above, "Slot #" is the slot number as seen on the back of your workstation; "Slot State" is the current state of any card in each slot; and "Device Information" is the compressed EISA ID, read from the EISA card itself.

Setting the Auto Boot and Auto Search Flags

auto boot and **auto search** are variables stored in your workstation's non-volatile memory. (Non-volatile memory retains its contents even after power is turned off.) If you reset these flags to new value, 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 at the prompt:

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

If **auto boot** is set to **on**, your workstation automatically attempts to boot the operating system when turned on. If **auto boot** is set to **off**, your workstation enters the boot administration mode of the boot console user interface.

The state of the **auto search** flag determines how your workstation seeks a boot device during autoboot. If **auto search** is set to **on**, your workstation will search for other boot devices if the primary boot device is not available. If **auto search** is **off**, your 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 the following at the prompt:

```
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 Fastboot Mode

When **fastboot** is enabled (set to **on**), your workstation does a quick check of the memory and skips I/O interface testing during its power-on self tests. This enables your workstation to complete its boot process quicker. The default factory setting is for **fastboot** to be enabled (**on**).

When **fastboot** is disabled (set to **off**), more extensive memory testing and I/O interface testing is performed during the self tests, causing the boot process to take longer.

If you are experiencing difficulty in booting your 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 at the prompt:

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

To disable **fastboot**, type the following at the prompt:

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

To enable **fastboot**, type the following at the prompt:

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

Displaying the LAN Station Address

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

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

```
Configuration 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:      123456–789abc
```

Displaying System Information

The **all** command allows you to display all the information shown by the individual Information Menu commands, such as 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 at the prompt:

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

This information is paged to allow you to view it as necessary.

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 at the prompt:

```
Service Menu: Enter command > pim processor_number  Enter
```

You can use **pim** in the following ways:

pim – gives all processors/all fault types

pim *processor_number* – HPMC information on given processor

pim *processor_number fault_type* – fault type information on given processor

Stable Storage

Stable storage is nonvolatile memory associated with each 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 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 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 O/S after power-on or reset.

Invoking ISL from the Boot Console Interface

Perform the following steps to invoke ISL from the **boot console interface**:

1. Follow the directions in "Accessing the Boot Console Interface" earlier in this chapter, and then type the following at the prompt:

```
Main Menu: Enter a command or a menu >  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 your 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 your root disk (**fwscsi.6.0**) has become corrupted, and you wish to boot your 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 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 byte address 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.

Updating System Firmware with ODE

The Offline Diagnostic Environment (ODE) consists of diagnostic modules for testing and verifying system operation. The **update** utility of ODE provides the capability of updating the PDC/IODC firmware from the LIF directory onto the EEPROM.

ode is an ISL utility. To invoke ODE and bring up the **update** utility:

1. Invoke the ISL environment from the system disk.

2. Type **ode** Enter after the `ISL>` prompt to invoke **ode** from the LIF directory on the system disk. The prompt changes to `ODE>`.

3. At the `ODE>` prompt, type **update** Enter to bring up the update utility. The prompt changes to `UPDATE>`.

The following commands may be entered at the `UPDATE>` prompt:

- **help** – prints a one line description of each of the available commands in the update utility.
- **info** – prints information on how to use the update utility.
- **run** – updates the PDC of the workstation from the LIF directory.
- **image** – allows you to specify which LIF images to use.
- **stable** – allows stable storage to be updated when you issue the RUN command.
- **expert** – enables/disables exit pausing and run confirmation for expert users.
- **exit** – resets the workstation so the new PDC can run.

To run the **update** utility, type **run** Enter at the `UPDATE>` prompt. After **update** loads the new images into memory, it asks you if you want to continue the update process, and displays the PDC version of the currently running PDC as well as that of the images that were loaded. If you wish to continue, type **y** Enter.

When the update process has completed, the machine reboots automatically.

If you are using a graphics monitor for the updating procedure characters may not be printed to the screen correctly because the character set for graphics printing is stored in the machine ROM that is overwritten. We recommend that you use a monitor connected to an RS-232 port for updating your workstation.

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The Boot Console Interface provides an ”interactive” environment after the power–on sequence.

Accessing the Boot Console Interface

To access the boot console interface, follow these steps:

1. Close any files and applications on your workstation.
2. Press the power switch on the front panel of the system unit.

NOTICE: There is no need to manually shut down the HP–opeating system on your workstation before powering it off. When you turn off the power switch, your workstation automatically shuts down the operating system before terminating the power.

Make sure that you do not unplug the system’s power cord or otherwise interrupt power to the system unit at this time.

3. When the system has completely shut down, power on your workstation.

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

If Autoboot is turned on, you will see the following messages:

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

If Autoboot and Autosearch are both turned on, you will see the following messages:

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

> **NOTICE**: 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 message:

```
Boot terminated
```

The Main Menu of the boot console appears.

Boot Console Menus

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

The shortened version of all commands 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 you want help on.

```
------ 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>|<command>]          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                         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
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

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
------
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                               Dispay I/O interface information
LanAddress                       Display built–in system LAN address
MEmory                           Display memory information
PRocessor                        Display processor information
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>]            Display chassis codes
CLEARPIM                         Clear (zero) the contents of PIM
EepromRead [<addr>] {<len>]      Read EEPROM locations
MemRead <addr> [<len>] [a]       Read memory locations
PDT [CLEAR]                      Display or clear the Page Deallocation
Table
PIM [<proc> [HPMC|LPMC|TOC]]     Display PIM information

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 >
Searching for Bootable Media
```

To list devices that contain bootable media, follow the directions in ”Accessing the Boot Console Interface” earlier in this appendix, 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 your display. If you are using a text terminal, you may control the progress of the search from your terminal’s keyboard by performing the following steps:

- To hold the display temporarily, press Ctrl S Enter
- To continue the display, press Ctrl Q Enter
- 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, follow the directions in ”Accessing the Boot Console Interface” earlier in this appendix, 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 fast, wide SCSI bus
sescsi is the built–in single–ended SCSI bus
lan is all connections to the built–in LAN
gsc*n* is a fast, wide SCSI interface in slot number *n*

Resetting Your Workstation

To reset your workstation, follow the directions in ”Accessing the Boot Console Interface” earlier in this appendix, and then type the following at the prompt:

```
Main Menu: Enter command >  reset Enter
```

To reset your workstation to its predefined values, follow the directions in ”Accessing the Boot Console Interface” earlier in this appendix, 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
```

Displaying and Setting Paths

A path is the hardware address of a device that is attached to the I/O system of your workstation. The path command sets the system paths shown in Table 10– 1.

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

Table 10– 1 System Paths

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

The paths are displayed in Mnemonic Style Notation, as shown in Table 10– 2.

Table 10– 2 Mnemonic Style Notation

I/O Type	**Specification Format**
Built–in FWSCSI	**fwsci.***scsi_address.logical_unit_number*
Built–in SCSI	**sescsi**.*scsi_address.logical_unit_number*
Optional	**gsc*n*.***scsi_address.logical_unit_number*
Built–in LAN	**lan**.*server_address.init_timeout.io_timeout*

To display the current setting for a particular system path, follow the directions in ”Accessing the Boot Console Interface” earlier in this appendix, 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 .

For example, to get the path to the primary boot device, follow the directions in ”Accessing the Boot Console Interface” earlier in this chapter, and then type the following at the prompt:

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

To set a system path to a new value, follow the directions in ”Accessing the Boot Console Interface” earlier in this chapter, and then type the following at the prompt:

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

where *path_type* is one of the path types listed in Table 10– 1 and path is the specification of the path in Mnemonic Style Notation (as described in Table 10– 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 Interface” earlier in this appendix, and then type the following at the prompt:

```
Main Menu: Enter command >  path pri sescsi.6.0 Enter
```

Displaying and Setting the Monitor Type

Your system ships from the factory preset to use a monitor with a specific resolution and frequency. If you replace your workstation's monitor with a different type of monitor, you must reconfigure your workstation to support the new monitor.

The Monitor Command

The **monitor** command lets you change your workstation's graphics configuration. This command is available in Configuration Menu of the boot console interface.

> **NOTICE:** The **monitor** command lets you change your workstation's graphics configuration before you replace your monitor. For information about changing the configuration after you replace your monitor, go to Chapter 3.

To display the current graphics and console information, enter the following command;

monitor

The correct usage for setting the graphics configuration is:

monitor *graphics_path type*

where valid *graphics_path* parameters are:

graphics(0) – The built–in 8–plane graphics adapter.
graphics(1) through graphics(4) – Graphics adapters installed in option slots 1 through 4.

and *type* is the numerical monitor type.

When a dual display graphics adapter (an adapter which has two video output connectors) is installed, the video connector on the left (when looking at the system from the rear) is graphics(NA) and the video connector on the right is graphics(NB). **N** is the slot number in which the graphics adapter is installed.

For example, a Dual Visualize Enhanced Graphics Card (A4451A) installed in option slot 2 would be graphics(2A) and graphics(2B).

> **NOTICE**: There are graphics configuration restrictions of which you must be aware when adding graphics adapters or reconfiguring your graphics devices. For details on graphics configuration restrictions the different model workstations, see the appropriate subsection under "Graphics Configurations" in Chapter 3.

Displaying the Current Monitor Configuration

To display the current monitor configuration for your system from the Configuration Menu of the boot console interface, follow the directions in ”Accessing the Boot Console Interface” earlier in this appendix. Once you are in the Boot Console Interface 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
```

The screen displays a list of the current graphics adapters and there monitor types configured for your workstation.

```
MONITOR INFORMATION

   Path        Slot  Head    HPA      Resolution  Freq  Type  Class
-----------    ----  ----  --------   ----------  ----  ----  -----
GRAPHICS(0)       0     1  f8000000    1280x1024  72Hz    12

Configuration Menu: Enter command >
```

In this example, only the built–in graphic adapter graphics(0) is configured. The monitor type for graphics(0) is set to type 12, which is a 1280 by 1024 monitor that uses a frequency of 72 Hz.

Setting the Monitor Type

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, enter the following command;

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

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

```
MONITOR INFORMATION

Path         Slot Head Type   Size     Freq  Class
----         ---- ---- ---- ---------  ----  -----
GRAPHICS(0)     0    1    1 1280x1024  75Hz  VESA
GRAPHICS(0)     0    1    2 1280x1024  75Hz  VESA,Double buffered
GRAPHICS(0)     0    1    3 1280x1024  75Hz  VESA,Greyscale
GRAPHICS(0)     0    1    4 1280x1024  75Hz  VESA,Double buffered,Greys-
cale
GRAPHICS(0)     0    1    5  1024x768  75Hz  VESA
GRAPHICS(0)     0    1    6   800x600  75Hz  VESA
GRAPHICS(0)     0    1    7   640x480  75Hz  VESA
GRAPHICS(0)     0    1    8 1600x1200  75Hz  VESA
GRAPHICS(0)     0    1    9 1600x1200  75Hz  VESA,Greyscale
GRAPHICS(0)     0    1   10 1200x1600  75Hz  VESA
GRAPHICS(0)     0    1   11 1200x1600  75Hz  VESA,Greyscale
GRAPHICS(0)     0    1   12 1280x1024  72Hz
GRAPHICS(0)     0    1   13 1280x1024  72Hz  Double buffered
GRAPHICS(0)     0    1   14   640x480  60Hz
GRAPHICS(0)     0    1   15 --------user defined-------

Configuration Menu: Enter command >
```

To set the monitor type for graphics(0) to monitor type 2 you would enter the following;

```
Configuration Menu: Enter command > monitor graphics(0) 2 Enter
```

```
Configuration Menu: Enter command > monitor graphics(0) 2 Enter
```

This will take effect on the next reboot.

```
MONITOR INFORMATION

   Path        Slot  Head    HPA      Resolution  Freq  Type  Class
-----------    ----  ----  --------   ----------  ----  ----  -----
GRAPHICS(0)       0     1  f8000000    1280x1024  72Hz    2
```

The boot console displays a message that tells you that your new monitor selection will take affect the next time you reboot your system. The boot console also displays the new monitor information. Where N is the slot number in which the graphics adapter is installed.

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)
```

Trying to change the monitor type on an empty slot fails and gives you the following warning message:

```
No such graphics card.
```

Setting the Monitor Type at Power On

If you replace your 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 need to perform the following:

If your keyboard connects to the PS/2 connector on your system, wait 2 seconds after the Num Lock light flashes near the end of the boot sequence, then press Tab to initiate the automatic monitor selection process.

> **NOTICE:** It takes approximately one to two minutes after powering on the workstation before the Num Lock light flashes.

If you have a keyboard that connects to the HIL connector on your system, press Tab every three seconds during the boot sequence to initiate the automatic monitor selection process.

The system cycles through all of the available monitor types one at a time. When you can see a message similar to the following clearly and legigbly, select that monitor type by pressing Enter.

```
MONITOR INFORMATION

   Path        Slot  Head   Type      Size     Freq  Class
-----------    ----  ----   ----   ----------  ----  -----
GRAPHICS(0)      0     1     n     nnnnxnnnn   nnHz
Press [RETURN] to select this monitor type (type n of n types).
```

The system queries you to confirm your selection. Press **Y** 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 didn't save the monitor type, the next time you reboot the system 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**.

Displaying the Status of the System I/O

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 interface, type:

```
Information Menu: Enter command > IO  Enter
```

Information about the built–in and optional I/O devices is displayed.

```
I/O MODULE INFORMATION


IODC IODC   Path         Decimal Type      Location   HVER SVER Vers Dep
------------ -------- ------------------------ ---------- ---- ---- ----
----
   8/0          8/0     Bus Bridge        built–in   6800 0a00 0x00 0x00
   FWSCSI       8/12    A DMA I/O         built–in   03b0 8980 0x96 0x00
   8/16         8/16    Bus Adapter        built–in   03b0 8100 0x00 0x00
   8/16/0       8/16/0  Parallel           built–in   03b0 7400 0x00 0x00
   8/16/1       8/16/1  Audio              built–in   03b4 7b00 0x00 0x00
   SERIAL_1     8/16/4  RS232              built–in   03b0 8c00 0x01 0x00
   SESCSI       8/16/5  SE SCSI            built–in   03b0 8200 0x96 0x00
   LAN          8/16/6  LAN                built–in   03b0 8a00 0x02 0x00
   PS2          8/16/7  Keyboard           built–in   03b0 8400 0x00 0x00
   8/16/8       8/16/8  Mouse              built–in   03b0 8400 0x00 0x00
   8/16/10      8/16/10 Flopp              built–in   03b0 8300 0x00 0x00
   8/20         8/20    Bus Adapter        built–in   0170 8e00 0x00 0x00
   HIL          8/20/1  HIL                built–in   0170 7300 0x00 0x00
   SERIAL_2     8/20/2  RS232 Port         built–in   0170 8c00 0x00 0x00
   EISA         8/20/5  Bus Adapter        built–in   0170 9000 0x00 0x00
   GRAPHICS(0)  8/24    INTERNAL_EG_X128   built–in   0160 8500 0x01 0x00
   8/63         8/63    Bus Converter      built–in   5011 0c00 0x00 0x00
   10/63        10/63   Bus Converter      built–in   5011 0c00 0x00 0x00

   EISA Cards

   Path         Type                       EISA ID
   ----         ----                       -------
   8/20/5/1     EISA slot is empty
   8/20/5/2     EISA slot is empty
   8/20/5/3     EISA slot is empty

   PCI Cards

   Slot   Path                              Bus   Class
   ----   --------------------------------  ---   ------------------
```

Setting the Auto Boot and Auto Search Flags

auto boot and **auto search** are variables stored in your workstation's nonvolatile memory. (Nonvolatile memory retains its contents even after power is turned off.) If you reset these flags to new value, the change takes effect the next time you reboot the workstation.

auto boot boots the operating system whenever your workstation is turned on. To examine the state of the auto boot and auto search flags, type the following at the prompt:

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

If **auto boot** is set to **on**, your workstation automatically attempts to boot the operating system when turned on. If **auto boot** is set to **off**, your workstation enters the boot administration mode of the boot console user interface.

The state of the **auto search** flag determines how your workstation seeks a boot device during autoboot. If **auto search** is set to **on**, your workstation will search for other boot devices if the primary boot device is not available. If **auto search** is **off,** your 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 the following at the prompt:

auto boot *state* Enter

or

auto search *state* Enter

where *state* is **on** or **off**.

Autosearch searches for devices in the following order:

Primary Boot Path
Alternate Boot Path
Built–in Fast, Wide SCSI Devices
Built–in Single–Ended SCSI Devices
Built–in LAN bootp servers

NOTICE: Fast Wide SCSI adapter option cards installed in the option slots are not searched unless they are referenced by the primary or alternate boot paths. EISA cards are not searched.

Displaying and Setting the Fastboot Mode

Access **fastboot** from the configuration menu.

When **fastboot** is enabled (set to **on**), your workstation does a quick check of the memory and skips I/O interface testing during its power–on self tests. This enables your workstation to complete its boot process quicker. The default factory setting is for fastboot to be enabled (**on**).

The **fastboot** mode allows your workstation to boot quickly by performing a less extensive check of the system's memory.

When **fastboot** is disabled (set to **off**), more extensive memory testing and I/O interface testing is performed during the self tests, causing the boot process to take longer.

If you are experiencing difficulty in booting your 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 at the configuration menu prompt:

fastboot Enter

To disable **fastboot**, type the following at the prompt:

fastboot off Enter

To enable **fastboo**t, type the following at the prompt:

fastboot on Enter

Displaying the LAN Station Address

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

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

To display your workstation's LAN station addresses, type the following at the information menu prompt:

lanaddress Enter

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

```
LAN Station Addresses:    080009–789abc
```

The address is for the system's built–in LAN.

Configure and Display LAN Settings (J2240 Only)

The **LanConfig** command configures and displays the current LAN settings. The hardware system supports 10Base–T, 100Base–T and AUI standards.

To automatically select the network speed (100 Mbits/sec) and data transfer operation (full or half duplex), operating in compliance with IEEE 802.3u, (this is the default and recommended setting) type the following at the prompt:

```
Configuration Menu: Enter command > LanConfig AUTO Enter
```

To select 10 Mbits/sec network speed and half duplex mode, type the following at the prompt:

```
Configuration Menu: Enter command > LanConfig 10/Half_dx Enter
```

To select 10 Mbits/sec network speed and full duplex mode, type the following at the prompt:

```
Configuration Menu: Enter command > LanConfig 10/Full_dx Enter
```

To select 100 Mbits/sec network speed and half duplex mode, type the following at the prompt:

```
Configuration Menu: Enter command > LanConfig 100/Half_dx Enter
```

To select 100 Mbits/sec network speed and full duplex mode, type the following at the prompt:

```
Configuration Menu: Enter command > LanConfig 100/Full_dx Enter
```

To select the AUI port (10 Mbits/sec, half duplex only), type the following at the prompt:

```
Configuration Menu: Enter command > LanConfig AUI Enter
```

NOTICE: The LAN setting defaults to LAN–TP(RJ45). If that setting fails, the system tries the LAN–AUI setting. Also note that the new lan configuration settings take effect at the next BOot or SEArch command.

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 at the information menu prompt:

all Enter

This information is paged to allow you to view it as necessary.

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 at the service menu prompt:

pim *processor_number* Enter

You can use **pim** in the following ways:

pim – gives all fault types

pim 0 – HPMC information on processor

pim 0 *fault_type* – fault type information on processor

Stable Storage

Stable storage is nonvolatile memory associated with each PA–RISC processor module. Stable storage is used by the processor (CPU) to store the following:

- 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 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 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 O/S after power–on or reset

Invoking ISL from the Boot Console Interface

Perform the following steps to invoke ISL from the boot console interface:

1. Follow the directions in ”Accessing the Boot Console Interface” earlier in this chapter, and then type the following at the prompt:

boot *device* Enter

You are prompted:

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

2. Answering yes (**y**) causes the ISL to be loaded from the specified device. After a short time, the following prompt appears on your 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 your root disk (fwscsi.6.0) has become corrupted, and you wish to boot your workstation from the backup kernel (**/stand/vmunix.prev**), type the following at the ISL> prompt:

ISL> **hpux /stand/vmunix.prev** Enter

ISL **User Commands** Enter

The following commands 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 byte address 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.

Updating System Firmware with ODE

The Offline Diagnostic Environment (ODE) consists of diagnostic modules for testing and verifying system operation. The **update** utility of ODE provides the capability of updating the PDC/IODC firmware from the LIF directory onto the EEPROM.

ODE is an ISL utility. To invoke **ODE** and bring up the **update** utility:

1. Invoke the ISL environment from the system disk.
2. Type **ode** after the ISL> prompt to invoke **ode** from the LIF directory on the system disk. The prompt changes to ODE>.
3. At the ODE> prompt, type **update** to bring up the update utility. The prompt changes to UPDATE>.

The following commands may be entered at the UPDATE> prompt:

- **help** – prints a one line description of each of the available commands in the update utility.
- **info** – prints information on how to use the update utility.
- **run** – updates the PDC of the workstation from the LIF directory.
- **image** – allows you to specify which LIF images to use.
- **expert** – enables/disables exit pausing and run confirmation for expert users.
- **exit** – resets the workstation so the new PDC can run.

To run the update utility, type **run** at the UPDATE> prompt. After update loads the new images into memory, it asks if you want to continue the update process. It displays the PDC version of the currently running PDC as well as that of the images that were loaded. If you want to continue, type **y**.

When the update process has completed, the machine reboots automatically.
If you are using a graphics monitor for the updating procedure, characters may not be printed to the screen correctly because the character set for graphics printing is stored in the machine ROM that is overwritten. Hewlett Packard recommends that you use a terminal connected to the first serial port, serial 1, for updating your workstation.