V2500/V2600 System Upgrade Guide

HP 9000 Servers

First Edition

A5824-96004
Customer Order Number: A5824-90004
December 1999

Edition: First

A5824-96004
Remarks: Initial release. This document replaces the V2500 System Upgrade Guide. Updates include changes to ordering replacement parts, operating system requirements, and part numbers.

Notice

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Preface

The *V2500/V2600 System Upgrade Guide* is intended for Hewlett-Packard support engineers and Hewlett-Packard manufacturing personnel.

This document provides the procedures and information required to upgrade a Hewlett-Packard 9000 V22X0 server to a V2500 or V2600 server.

This document also serves as a general V2500/V2600 server upgrade guide.

NOTE

The customer and a Hewlett-Packard representative should review the site survey and site inspection checklists located in the *Site Preparation Guide: V2500/V2600 Server* to identify potential problems that may arise before, during, or after upgrading a V22X0 to a V2500/V2600 computer system.

How to use this book

Upgrading to the V2500/V2600 system is a complicated and detailed process. Be sure to read the entire upgrade guide and plan your upgrade thoroughly before you begin.

For a V22X0 to V2500/V2600 system upgrade, all steps must be completed in the order described in the “Upgrade procedure summary” on page 2. Any deviation from these steps could render the system inoperable or cause internal damage to the system.

For V2500/V2600 component upgrades use the “Upgrade procedure summary” on page 2 as general guide and consult the appropriate sections in each chapter.

Use this book in the following manner:

Chapter 1, “Overview,” on page 1

Follow the “Upgrade procedure summary” on page 2, that outlines the entire system upgrade process and references detailed procedures contained in the remainder of the book.

Chapter 2, “Prerequisites,” on page 5

Complete the pre-upgrade checklist and review the minimum HP-UX and Extension Pack revision requirements for the V2500/V2600.

Chapter 3, “Planning the upgrade,” on page 13

Analyze your existing configuration and plan the placement of upgrade components. Learn about V2500/V2600 memory, processor and I/O configurations.

Chapter 4, “Preliminary procedures,” on page 37

Review the steps necessary to load teststation software and firmware. Follow the detailed instructions on shutting down the system and removing the panels, covers, and filters in preparation for the removal and replacement of the upgrade components.

Chapter 5, “Component removal and installation,” on page 51

Use the detailed instructions to remove and replace each of the upgrade components.

Chapter 6, “Configuration and verification,” on page 99

Use the procedures in this chapter to configure the system, run V2500/V2600 diagnostics, and verify the upgrade.

Chapter 7, “Troubleshooting,” on page 113

Use the guidelines in this section to troubleshoot installation problems.

Chapter 8, “Finishing the upgrade,” on page 145

Follow the detailed instructions to install the filters, covers, panels, and the product number label.

Appendix A, “Memory configurations,” on page 153

Locate the desired memory configuration in Table 17 on page 154, and use the appropriate illustration to configure the DIMMs on the memory boards.

Appendix B, “Dual processors,” on page 183

Use the procedure in this chapter to install additional processors on V2500/V2600 processor boards.

Appendix C, “Checking Symbios FCODE revision levels,” on page 187

Use the procedure in this appendix to check Symbios FCODE revision levels using the `show-devs` and `.attributes` commands.

Notational conventions

This section describes notational conventions used in this book.

`bold monospace`	In command examples, **`bold monospace`** identifies input that must be typed exactly as shown.
`monospace`	In paragraph text, `monospace` identifies command names, system calls, and data structures and types. In command examples, `monospace` identifies command output, including error messages.
italic	In paragraph text, *italic* identifies titles of documents. In command syntax diagrams, *italic* identifies variables that you must provide. The following command example uses brackets to indicate that the variable *output_file* is optional: `command` *input_file* [*output_file*]
Brackets ([ ])	In command examples, square brackets designate optional entries.
Curly brackets ({}), Pipe (|)	In command syntax diagrams, text surrounded by curly brackets indicates a choice. The choices available are shown inside the curly brackets and separated by the pipe sign (|). The following command example indicates that you can enter either `a` or `b`: `command {a | b}`
Horizontal ellipses (...)	In command examples, horizontal ellipses show repetition of the preceding items.
Vertical ellipses	Vertical ellipses show that lines of code have been left out of an example.
Keycap	**Keycap** indicates the keyboard keys you must press to execute the command example.

NOTE	A note highlights important supplemental information.
CAUTION	Cautions highlight procedures or information necessary to avoid injury to personnel. The caution should tell the reader exactly what will result from what actions and how to avoid them.
WARNING	A warning highlights procedures or information necessary to avoid damage to equipment, damage to software, loss of data, or invalid test results.

Safety and regulatory information

For your protection, this product has been tested to various national and international regulations and standards. The scope of this regulatory testing includes electrical/mechanical safety, radio frequency interference, ergonomics, acoustics, and hazardous materials. Where required, approvals obtained from third-party test agencies are shown on the product label.

Safety in material handling

CAUTION Do not lift the node manually. To avoid physical injury you must use a mechanical lifting device.

USA radio frequency interference FCC Notice

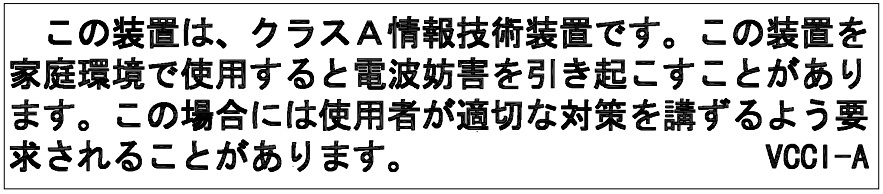
The Federal Communications Commission (in CFR Part 15) has specified that the following notice be brought to the attention of the users of this product.

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

The user is cautioned that changes or modifications not expressly approved by Hewlett-Packard could result in the equipment being noncompliant with FCC Class A requirements and void the user's authority to operate the equipment.

Japanese radio frequency interference VCCI

Figure 1 Japanese radio frequency notice



This equipment is a Class A category (Information Technology Equipment to be used in commercial and /or industrial areas) and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment aimed at preventing radio interference in commercial and/or industrial areas.

Consequently, when used in a residential area or in an adjacent area thereto, radio interference may be caused to radios and TV receivers, etc. Read the instructions for correct handling.

EMI statement (European Union only)

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

Digital apparatus statement (Canada)

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

BCIQ (Taiwan)

This product has been reviewed, evaluated by GesTek Taiwan and is fully compliant to CNS 13438 (CISPR 22: 1993) Class A.

Figure 2 **BCIQ (Taiwan)**

Acoustics (Germany)

Laermangabe (Schalldruckpregel LpA) gemessen am fiktiver Arbeitsplatz bei normalem Betrieb nach DIN 45635, Teil 19: LpA =65.3 dB.

Acoustic Noise (A-weighted Sound Pressure Level LpA) measured at the bystander position, normal operation, to ISO 7779: LpA = 65.3 dB.

IT power system

This product has not been evaluated for connection to an IT power system (an AC distribution system having no direct connection to earth according to IEC 950).

High leakage current

CAUTION High leakage current. Ground (earth) connection essential before connecting the supply.

Attention Forts courants de peretes. Connection a une borne de terre est essentielle avant tout raccord electrique.

Achtung Hoher ableitstrom. Vor inbetreiebnahme schutzleiterverbindung herstellen.

Installation conditions (U.S.)

See installation instructions before connecting to the supply.

Voir la notice d'installation avant de raccorder au réseau.

CAUTION

Please note the following conditions of installation:

An insulated earthing conductor that is identical in size, insulation material, and thickness to the earthed and unearthed branch-circuit supply conductors except that it is green with or without one or more yellow stripes is to be installed as part of the branch circuit that supplies the unit or system. The earthing conductor described is to be connected to earth that the service equipment or, if supplied by a separately derived system, at the supply transformer or motor-generator set.

The attachment-plug receptacles in the vicinity of the unit or system are all to be of an earthing type, and the earthing conductors serving these receptacles are to be connected to earth at the service equipment.

CAUTION

For supply connections, use wires suitable for at least 60 °C.

Utillser des fils convenant à une température de 60 °C pour les connexions d'allmenation.

Fuse cautions

CAUTION

Disconnect power before changing fuse.

Attention

Coupier le courant avant de remplacer le fusible.

CAUTION

For continued protection against risk of fire, replace fuses only with same type and rating.

Attention

Pour ne pas compromettre la protection contre les risques d'incendle, remplacer par un fusible de même type et de mêmes caractéristiques nominales.

Additional information

Make sure you have the current edition of this document by checking the Field Engineering Support (FES) V-Class Manuals and Training web page at:

http://fesweb.corp.hp.com/download/download/v_class.htm

Associated documents

Associated documents include:

- *V2500/V2600 Familiarization Guide*
- *V2500/V2600 Site Preparation Guide*, (A5845-90006)
- *V2500/V2600 Installation Guide*, (A5824-90001)
- *V2500/V2600 Service Guide*, (A5824-90003)
- *HP Diagnostic Guide: V2500/V2600 Servers*, (A5824-90002)
- *Operator's Guide HP 9000 V2500/V2600 SCA Server*, (A5845-90001)
- *V2500/V2600 Upgrade FAQ*, (http://fesweb.corp.hp.com/download/download/v_class.htm)

Technical assistance

If you have questions that are not answered in this book, contact the Hewlett-Packard Response Center at the following locations:

- Within the continental U.S., call 1 (800) 477-6222.
- All others, contact your local Hewlett-Packard Response Center or sales office for assistance.

For questions about missing or defective parts, installation warranty or other issues dealing with the shipment refer to the section, “Ordering replacement parts” on page 15.

Reader feedback

This document was produced by the System Supportability Lab Field Engineering Support organization (SSL/FES). If you have editorial suggestions or recommended improvements for this document, please write to us.

Please report any technical inaccuracies immediately.

You can reach us through email at:

fes_feedback@rsn.hp.com

Please include the following information with your email:

- Title and part number of the document
- Edition number

V2500/V2600 Upgrade FAQ

The *V2500/V2600 Upgrade FAQ*, along with answers to frequently asked questions about the V2500/V2600 upgrade process, provides supplementary information to the *V2500/V2600 System Upgrade Guide*. The latest version of the *V2500/V2600 Upgrade FAQ* can be retrieved from the FES V-Class Manuals and Training web page at:

http://fesweb.corp.hp.com/download/download/v_class.htm

V2500/V2600 Upgrade FAQ

1 Overview

Upgrading a V22X0 system to a V2500 or V2600 involves removing and replacing the major components in the system:

- The Mid-plane Interconnect Board (MIB)/Core Utilities Board (CUB) assembly
- All processor boards

NOTE The only hardware difference between the V2500 and the V2600 is the processor board. The V2500 operates at 440MHz and the V2600 at 552 MHz.

- All memory boards
- All power supplies
- All PCI cardcages
- All fan modules

IMPORTANT Processor and memory boards are not swapped one for one. Observe all V2500/V2600 loading order rules as described in Chapter 3, “Planning the upgrade”.

In addition to replacing existing components the system upgrade involves the installation of the following:

- HP-UX 11.0 and the 9812 (or later) Extension Pack for V2500
- HP-UX 11.0 and the 9905 (or later) Extension Pack for V2600
- New diagnostic software
- New firmware

Upgrade procedure summary

This list is intended for summary purposes only and does not represent all of the tasks and steps involved in the upgrade process. Track your progress with the checklist and use the detailed instructions referred to in each section to perform each task.

The V2500/V2600 system upgrade process includes updating the operating system and qualifying customer applications under the new OS. Be certain to plan enough time to accomplish this task prior to the actual hardware upgrade.

IMPORTANT Read this entire document before beginning the upgrade process.

NOTE As each assembly is removed from the chassis immediately place it in an anti-static bag and pack it for shipment in the appropriate container.

Table 1 Upgrade procedure checklist

	Task	Section	✔
1	Review the *Site Preparation Guide: V2500/V2600 Server*	"Site preparation" on page 6.	
2	Complete the site preparation checklist.	"Site preparation" on page 6.	
3	Make sure a system backup has been performed and/or a make_recovery tape created.		
4	Patch the Operating System.	"Upgrading the operating system" on page 8.	
5	Boot the Operating System.		
6	Verify customer applications under the new OS.	"Verifying customer applications" on page 12.	
7	Inspect and unpack shipping containers.	"Inspecting and unpacking material" on page 14.	
8	Check the contents of the upgrade kit.	"Inspecting and unpacking material" on page 14.	

	Task	Section	✔
9	Determine the loading order of memory and processor boards and memory board DIMM configuration.	Chapter 3, “Planning the upgrade”.	
10	Record the SWID, controller locations, and the primary/alt boot path.	“Recording important information” on page 38.	
11	Remove the V22X0 teststation software.	“Removing the V22X0 teststation software” on page 39.	
12	Load the teststation software.	“Installing the teststation software” on page 40.	
13	Set up a grounded work area.	“Electrostatic discharge protection” on page 41.	
14	Shut down the system.	“Powering down the system” on page 43	
15	Remove skins, filter, and covers.	“Removing the skins and panels” on page 45.	
16	Remove and replace the Mid-plane Interconnect Board (MIB) and Core Utilities Board (CUB).	“Mid-plane Interconnect Board (MIB)” on page 52.	
17	Remove and replace the processor boards.	“Processor boards” on page 58.	
18	For each memory board complete steps 18a through 18f.		
18 a	Remove the memory board.	“Removing the V22X0 memory board” on page 64.	
18 b	Remove the memory board power boards from the V22X0 and the V2500/V2600 memory boards.	“Removing the V22X0 memory board power board” on page 67 and “Removing the V2500/V2600 memory board power board” on page 69.	
18 c	Remove the DIMMs from the V22X0 memory board.	“Removing DIMMs from the V22X0 memory board” on page 71.	

	Task	Section	✔
18 d	Transfer the DIMMs to the V2500/ V2600 memory board.	"Installing DIMMs on the V2500/V2600 memory board" on page 73.	
18 e	Replace the memory board power boards on the V22X0 and the V2500/V2600 memory boards.	"Installing the V22X0 memory board power board" on page 75 and "Installing the V2500/V2600 memory board power board" on page 75.	
18 f	Install the V2500/V2600 memory board.	"Installing the V2500/V2600 memory board" on page 76.	
19	Remove and replace the node power supplies.	"Node Power Supply (NPS)" on page 77.	
20	Set the power supply redundancy switch in the DOWN position.	"Installing a V2500/V2600 power supply" on page 79.	
21	Remove and replace I/O cardcages.	"PCI cardcage" on page 81.	
22	Install additional I/O cardcages if necessary.		
23	Install EMI covers for proper airflow.	"Installing the EMI panels and circuit board restraint brackets" on page 89.	
24	Remove and replace fan modules.	"Fan assemblies" on page 90.	
25	Power up the system.	"Powering up the system" on page 100.	
26	Complete the V2500 teststation software installation instructions.	"Completing the V2500/V2600 teststation software installation instructions" on page 103.	
27	Run diagnostics.	"Running diagnostics" on page 108.	
28	Set the complex serial number and retain original SWID.	"Setting the complex serial number" on page 109.	
29	Run `ioscan`.	"Running ioscan" on page 112.	
30	Install covers, filter, and skins.	"Installing the skins and panels" on page 146.	
31	Install product number labels.	"Placing the new labels" on page 149.	
32	Return material to Hewlett-Packard.		

2 Prerequisites

This chapter describes tasks that must be performed prior to installing the V2500 or V2600 upgrade kit in Hewlett-Packard 9000 V-Class servers. The tasks covered in this chapter are:

Site preparation

The customer and a Hewlett-Packard representative should review the site survey and site inspection checklists located in the *Site Preparation Guide: V2500/V2600 Server* to identify potential problems that may arise before, during, or after upgrading a V22X0 to a V2500 or V2600 computer system.

In addition, review the following checklist in Table 2.

Table 2 **Pre-upgrade checklist**

	Task	✔
1	Ensure that the node power cord is rated at 50 amps.	
2	Ensure that the site's main AC circuit breaker is rated at 50 amps.	
3	Verify that the teststation has a 2-Gbyte disk drive.	
4	Verify that the teststation has at least 32 Mbytes of main memory.	
5	The teststation must be running version 10.20 of HP-UX.	
6	The installation requires a minimum of 700 Mbytes of free disk space.	
7	More than 16 processors require an increase to a 7.5 KVA of UPS capacity.	
8	Ensure that the system location and site air conditioning are set up for increased heat dissipation and air flow: 2200/2250 = 1600 cfm 2500/2600 = 2400 cfm.	

	Task	✔
9	Make sure that the *V2500/V2600 Familiarization Guide*, *V2500/V2600 Site Preparation Guide*, (A5845-90006), *V2500/V2600 Installation Guide*, (A5824-90001), *V2500 Service Guide*, (A5824-96003), *HP Diagnostic Guide: V2500/V2600 Servers*, (A5824-96002), 11.0 9905 (or greater) Extension Pack installation instructions (see "Upgrading the operating system" on page 8) and the latest *V2500/V2600 Test Station Software Release Notice* are on hand.	

Upgrading the operating system

This section describes the software requirements of the V2500 and V2600 upgrades. The minimum software revision levels are:

- V2500 software—HP-UX 11.0 and the *HP-UX 11.0 Extension Pack, December 1998* (9812 Extension Pack) or later.
- V2600 software—HP-UX 11.0 and the *HP-UX 11.0 Extension Pack, May 1999* (9905 Extension Pack) or later.

HP-UX 11.0 and the appropriate Extension Pack must be installed before the hardware upgrade begins. This is required to verify that the customer's applications work with the new operating system before the hardware is upgraded. It is also necessary to allow the system to boot as a V2500/V2600 after the hardware is installed.

Patching the OS is an involved and varied process that is beyond the scope of this document. Plan enough time to accomplish this task before beginning the actual hardware upgrade.

IMPORTANT Before shutting down the system and performing the upgrade, make sure the system administrator has performed a system backup, see the fbackup (1M) manpage for details. make_recovery is not supported on the V-Class at the time of this publication.

V2500 software

This section describes the software requirements of the V2500 upgrade.

Pre-upgrade patch

The following HP-UX patch must be installed before upgrading to HP-UX 11.0 Extension Pack, December 1998:

PHCO_16551

Installing this patch is fast and does not require a reboot. This patch is provided on the Extension Pack CD-ROM. The patch installation and upgrade procedure is described in Chapter 2 of *ReadMe Before Installing or Updating to HP-UX 11.0 Plus Extension Pack*.

Installation and Upgrade process

You can either install or upgrade to the HP-UX 11.0 Extension Pack, December 1998 release.

Upgrading preserves existing settings and configurations, and requires that HP-UX 11.0 and the patch PHCO_16551 be installed. You also can perform cold installation, which overwrites everything on the target disk.

The following document describes the process for upgrading to HP-UX 11.0 Extension Pack, December 1998:

ReadMe Before Installing or Updating to HP-UX 11.0 Plus Extension Pack (B3782-90708)

The booklet accompanying the HP-UX CD-ROM media gives detailed descriptions of the installation and upgrade process. This booklet is titled:

Installing and Updating HP-UX 11.0 Extension Pack, December 1998

Release notes

The book *Installing HP-UX 11.0 and Updating HP-UX 10.x to 11.0 Release Notes* (B2355-90153) also provides additional details on the installation process and tools. Some installation documentation is provided on the following Web site:

http://docs.hp.com/hpux/os/

The title for 9812 Release Notes is *Release Notes for HP-UX 11.0 Extension Pack, December 1998*. These release notes are installed on disk in the file:

/usr/share/doc/RelNotesExtPak

They are also an addendum to the core release notes, *Release Notes for HP-UX 11.0*. The core release notes are installed on disk in the file:

/usr/share/doc/1100RelNotes

V2600 software

This section describes the software requirements of the V2600 upgrade.

Pre-upgrade patch

The following HP-UX patch must be installed before upgrading HP-UX 11.0 to the HP-UX 11.0 Extension Pack, May 1999, release:

PHCO_18183

Installing this patch is fast and does not require a reboot. This patch is provided on the Install and Core OS Extension Pack CD-ROM. The patch install and operating system upgrade process is described in Chapter 4 of *Installing and Updating HP-UX 11.0 Extension Pack, May 1999*; refer to the "Updating from a Previous 11.0 Extension Pack or Original 11.0" section.

If you are Cold-Installing HP-UX, rather than upgrading a prior release of HP-UX 11.0, you do not need to install the patch. Instead refer to Chapter 5 of the Extension Pack installation document.

Installation and Upgrade process

You can either install or upgrade to the HP-UX 11.0 Extension Pack, May 1999 release.

Upgrading preserves existing settings and configurations, and requires that HP-UX 11.0 and the patch PHCO_181833 be installed. You also can perform cold installation, which overwrites everything on the target disk.

The following document describes the process for Cold-Installing or upgrading to HP-UX 11.0 Extension Pack, May 1999:

Installing and Updating HP-UX 11.0 Extension Pack, May 1999 (B5782-90728)

Before installing upgrading, refer to the following document:

ReadMe Before Installing or Updating to HP-UX 11.0 Plus Extension Pack (B3782-90724)

The above ReadMe document includes last-minute information that could seriously affect your system when you install, update to, or run HP-UX 11.0.

Release notes

The title for the HP-UX 11.0 9905 Extension Pack release notes is *Release Notes for HP-UX 11.0 Extension Pack, May 1999*. These release notes are installed on disk in the file:

/usr/share/doc/RelNotesExtPak

The Extension Pack release notes includes changes specific to the HP-UX 9905 release, including all changes since the base HP-UX 11.0 release. The base HP-UX 11.0 release notes also are available on disk as the following file:

/usr/share/doc/1100RelNotes

More HP-UX documentation and installation details are available at the following Web site:

http://docs.hp.com/hpux/os

Verifying customer applications

Verify that the customer's applications will run properly after the OS upgrade before proceeding with the teststation software and V-Class hardware upgrades.

3 Planning the upgrade

This chapter describes planning tasks that must be performed prior to installing the V2500/V2600 upgrade kit in Hewlett-Packard 9000 V-Class servers. The tasks covered in this chapter are:

Inspecting and unpacking material

All shipping containers are designed to protect their components under normal shipping conditions. Carefully inspect each carton for signs of shipping damage *before* it is unpacked. If damage is found after visual inspection, document the damage with photographs and contact the transport carrier immediately.

Unpacking

Your bill of materials lists all equipment shipped from Hewlett-Packard. Use it as a checklist to ensure that all equipment has arrived.

Use the following procedure to unpack the shipping container:

Step 1. Remove each item from its shipping container.

Step 2. Inspect each item as it is unpacked for any signs of shipping damage.

Step 3. If equipment damage is found, document the damage, and proceed to the next section.

NOTE Save all packing material until after operational checkout of the equipment. You are required to return all the components removed during the upgrade safely to Hewlett-Packard.

Making damage claims

If the equipment is damaged, complete a damage claim form and give it to the shipping representative. Claim forms are normally obtained from the shipping representative. Report the damage claim to the Post Shipment Hotline. Refer to “Ordering replacement parts” on page 15 for more details.

Returning material

All of the components removed during the upgrade should be returned to Hewlett-Packard. Pack each component as it is removed from the system in the appropriate container using the proper ESD precautions. Extra shipping boxes have been supplied for any additional material being returned.

WARNING Do not place system components on an ungrounded surface after removing them from the system. Always place each component in an anti-static bag and pack it in the appropriate shipping container immediately after it is removed from the system.

Ordering replacement parts

The factory provides an installation warranty that is effective from the time the customer receives the shipment until Field Services turns the system over to the customer.

Upon inspection of a received system and/or during installation of the system, if any parts or accessories are missing or defective, they will be replaced directly from the factory via a priority process. To request replacement parts, the CE must contact the local Order Fulfillment group which will coordinate the replacement with the factory.

Checking the existing configuration

Understanding the configuration of existing processors, memory and I/O cardcages is useful in planning the installation of additional components. This section describes how to use `dcm` and `xconfig` to check and record the existing system configuration.

Generating a `ksh` window

If a `ksh` window is not displayed on the teststation complete the following steps:

Step 1. Log on to the teststation as sppuser and enter the password. The factory default password is:

`spp user`

Step 2. Press and hold down the left mouse button over the root window. The root window is any part of your display that is not covered by a window. The Workspace Menu appears.

Step 3. Select shell menu, then ksh from the Workspace Menu. A window appears.

Making a record of the current configuration with `dcm`

`dcm` dumps the boot configuration map information for the specified node. Direct the output of `dcm` to a file by entering:

`$` **`dcm 0 >`** *filename*

Checking the existing configuration with `xconfig`

In addition to `dcm`, `xconfig` can be used to view the current configuration. `xconfig` is an X-based tool that allows the user to view and modify the system configuration. This tool gives the user the capability to view active and inactive components of a node.

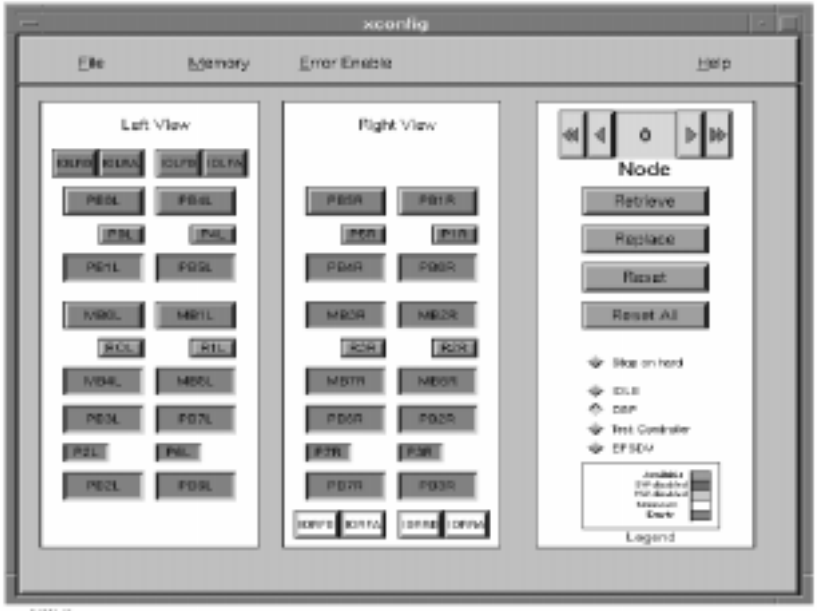
Step 1. Select the `ksh` window and enter:

`xconfig`

The `xconfig` window appears, as shown in Figure 3 on page 17.

There is a legend in the lower right of the screen. A green box indicates the component is present and enabled. A blue box means the component slot is empty.

Figure 3 **`xconfig` display**



Step 2. Determine which processor locations are occupied by examining the screen for green boxes containing the label “PB” followed by the location.

In Figure 3, “PB0L” refers to the processor board in position 0 on the left side. Position numbers range from 0 to 7 on both the right and left side of the system.

Step 3. Determine which memory locations are occupied by examining the screen for green boxes containing the label “MB” followed by the location.

In Figure 3, “MB0L” refers to the memory board in position 0 on the left side. Position numbers range from 0 to 7 on both the right and left side of the system.

You may also select “Memory” from the `xconfig` window menu bar to see the total amount of memory, displayed in megabytes.

Step 4. Determine which locations contain PCI cardcages by examining the screen for green boxes containing the label "IO" followed by the location.

In Figure 3, "IOLRB" and "IOLRA" refer to the cardcage in rear position on the left side.

Planning the processor board upgrade

If you are installing additional processors during the upgrade it is important to install them in the proper order for optimum performance and supportability.

NOTE

The only hardware difference between the V2500 and the V2600 is the processor board. The V2500 operates at 440MHz and the V2600 at 552 MHz.

The V2500 or V2600 processor module (board) can house two processors. The Single Processor Module can be converted to a Dual Processor Module in the field. See Appendix B, “Dual processors” for more information about this conversion.

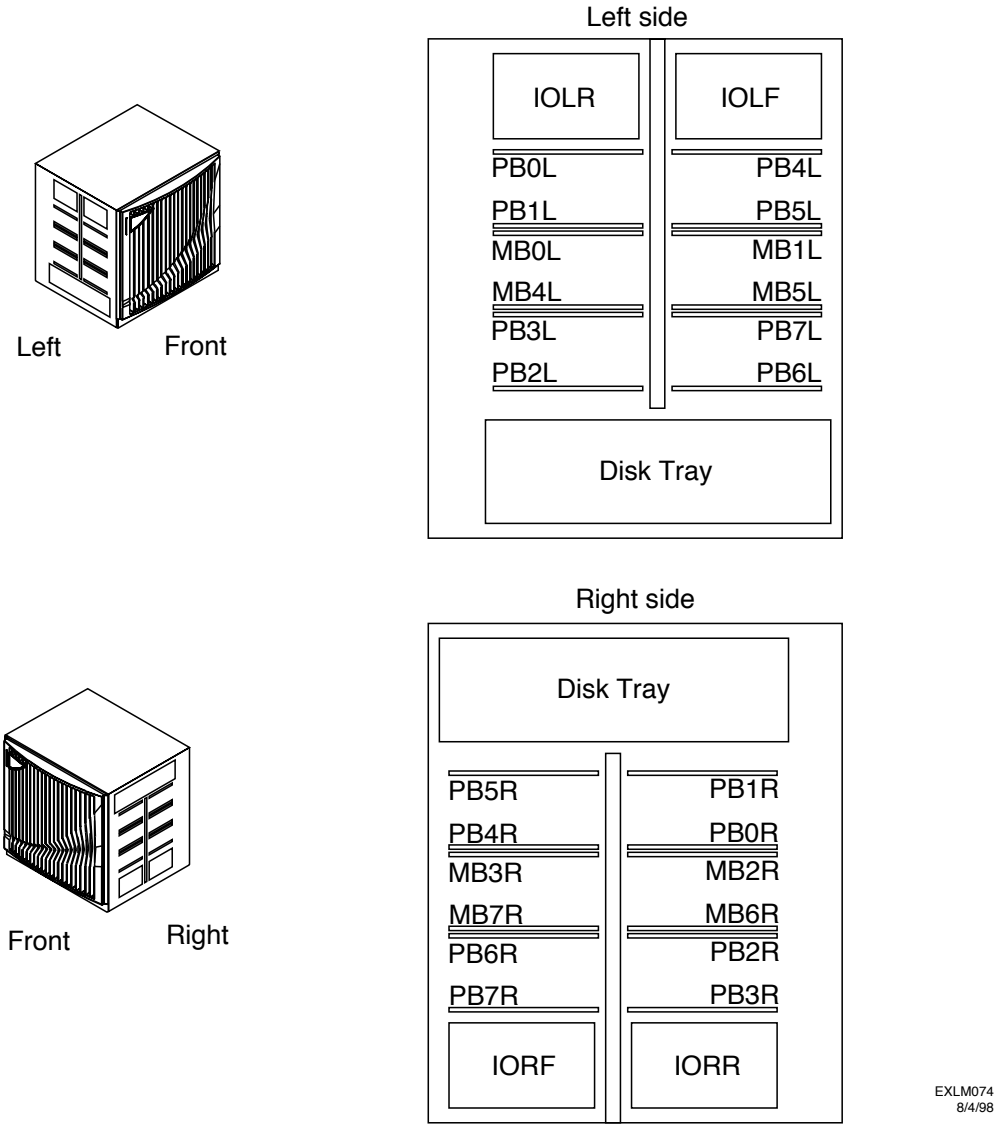
Populate the processor boards with one processor per board for the first 16 in the sequence shown in Table 3 on page 21. Add additional processors to each board to create dual processor boards in the order shown in Table 4 on page 22.

Figure 4 on page 20 shows where the processor boards are located in the server.

WARNING

Do not violate the V2500/V2600 processor board loading order. Components are not swapped one for one. Proper loading order must be followed for optimum performance. Only configurations adhering to the proper loading order will be supported.

Figure 4 Processor and memory board locations by reference designator



Single V2500/V2600 processor board configuration

Guidelines for single processor board configurations:

- The node may have 2 to 16 processors.
- There may be 2 to 16 processor boards.
- Every processor board must have exactly 1 processor.

Table 3 shows the order in which processor boards with a single processor are to be added to the system.

Table 3 Single processor board installation sequence

Order	Board slot	Processor location	Processor ID	SPAC ID	ERAC ID
1st	PB0L	A	0=0x00	P0L	R2R/R3R
2nd	PB4L	A	8=0x08	P4L	R0L/R1L
3rd	PB1R	A	2=0x02	P1R	R2R/R3R
4th	PB5R	A	10=0x0a	P5R	R0L/R1L
5th	PB2R	A	5=0x05	P2L	R2R/R3R
6th	PB6R	A	13=0x0d	P6L	R0L/R1L
7th	PB3L	A	7=0x07	P3R	R2R/R3R
8th	PB7L	A	15=0x0f	P7R	R0L/R1L
9th	PB0R	A	1=0x01	P0L	R2R/R3R
10th	PB4R	A	9=0x09	P4L	R0L/R1L
11th	PB1L	A	3=0x03	P1R	R2R/R3R
12th	PB5L	A	11=0x0b	P5R	R0L/R1L
13th	PB2L	A	4=0x04	P2L	R2R/R3R

Order	Board slot	Processor location	Processor ID	SPAC ID	ERAC ID
14th	PB6L	A	12=0x0c	P6L	R0L/R1L
15th	PB3R	A	6=0x06	P3R	R2R/R3R
16th	PB7R	A	14=0x0e	P7R	R0L/R1L

Mixed V2500/V2600 processor board configuration

Guidelines for the mixed configuration of single processor board and dual processor board configurations:

- The node may have 17 to 32 processors.
- There must be exactly 16 processor boards.
- Dual processor boards are loaded in the first slots. All remaining slots are filled with single processor boards.

Table 4 shows the order in which processor boards of a mixed configuration are to be added to the system.

Table 4 Mixed processor board installation sequence

Order	Board slot	Processor location	Processor ID	SPAC ID	ERAC ID
17th	PB0L	B	16=0x10	P0L	R2R/R3R
18th	PB4L	B	24=0x18	P4L	R0L/R1L
19th	PB1R	B	18=0x12	P1R	R2R/R3R
20th	PB5R	B	26=0x1a	P5R	R0L/R1L
21st	PB2R	B	21=0x15	P2L	R2R/R3R
22nd	PB6R	B	29=0x1d	P6L	R0L/R1L
23rd	PB3L	B	23=0x17	P3R	R2R/R3R
24th	PB7L	B	31=0x1f	P7R	R0L/R1L

Order	Board slot	Processor location	Processor ID	SPAC ID	ERAC ID
25th	PB0R	B	17=0x11	P0L	R2R/R3R
26th	PB4R	B	25=0x19	P4L	R0L/R1L
27th	PB1L	B	19=0x13	P1R	R2R/R3R
28th	PB5L	B	27=0x1b	P5R	R0L/R1L
29th	PB2L	B	20=0x14	P2L	R2R/R3R
30th	PB6L	B	28=0x1c	P6L	R0L/R1L
31th	PB3R	B	22=0x16	P3R	R2R/R3R
32nd	PB7R	B	30=0x1e	P7R	R0L/R1L

Dual V2500/V2600 processor board configuration

Guidelines for dual processor board configurations:

- The node may have 2 to 32 processors.
- There may be 1 to 16 processor boards.
- Every processor board must have exactly 2 processors.

Table 5 shows the order in which processor boards with 2 processors are to be added to the system.

Table 5 **Dual processor board installation sequence**

Order	Board slot	Processor location	Processor ID	SPAC ID	ERAC ID
1st & 2nd	PB0L	A/B	0=0x00 & 16=0x10	P6L	R2R/R3R
3rd & 4th	PB4L	A/B	8=0x08 & 24=0x18	P3R	R0L/R1L

Order	Board slot	Processor location	Processor ID	SPAC ID	ERAC ID
5th & 6th	PB1R	A/B	2=0x02 & 18=0x12	P7R	R2R/R3R
7th & 8th	PB5R	A/B	10=0x0a & 26=0x1a	P6L	R0L/R1L
9th & 10th	PB2R	A/B	5=0x05 & 21=0x15	P2L	R2R/R3R
11th & 12th	PB6R	A/B	13=0x0d & 29=0x1d	P6L	R0L/R1L
13th & 14th	PB3L	A/B	7=0x07 & 23=0x17	P3R	R2R/R3R
15th & 16th	PB7L	A/B	15=0x0f & 31=0x1f	P7R	R0L/R1L
17th & 18th	PB0R	A/B	1=0x01 & 17=0x11	P0L	R2R/R3R
19th & 20th	PB4R	A/B	9=0x09 & 25=0x19	P4L	R0L/R1L
21st & 22nd	PB1L	A/B	3=0x03 & 19=0x13	P1R	R2R/R3R
23rd & 24th	PB5L	A/B	11=0x0b & 27=0x1b	P5R	R0L/R1L

Order	Board slot	Processor location	Processor ID	SPAC ID	ERAC ID
25th & 26th	PB2L	A/B	4=0x04 & 20=0x14	P2L	R2R/R3R
27th & 28th	PB6L	A/B	12=0x0c & 28=0x1c	P6L	R0L/R1L
29th & 30th	PB3R	A/B	6=0x06 & 22=0x16	P3R	R2R/R3R
31st & 32nd	PB7R	A/B	14=0x0e & 30=0x1e	P7R	R0L/R1L

Planning the memory board upgrade

There are several ways to upgrade memory during this upgrade:

- Exchange the existing memory boards by upgrading to V2500/2600
- Install additional memory boards to a V2500/2600 system
- Add DIMMs to a V2500/2600 system

The V2500/V2600 memory configuration is different from the existing V22X0 memory configuration in several ways. This section discusses those differences and how to plan the installation of the V2500/V2600 memory boards.

WARNING **Do not violate the V2500/V2600 memory board loading order. Components are not swapped one for one. Proper loading order must be followed for optimum performance. Only configurations adhering to the proper loading order will be supported.**

IMPORTANT All memory boards in the system must be configured identically for the upgrade to be successful.

V2500/V2600 memory configurations

In the V2500/V2600 server, Excalibur Pluggable Memory Boards (EPMBs) are installed in 16 Dual In-line Memory Module (DIMM) connectors on Excalibur W Memory Boards (EWMBs).

NOTE For the remainder of this document EPMBs will be referred to as DIMMs and the EWMB will be referred to as the memory board.

This section contains information about DIMMs and their positioning on memory boards. See Appendix A, “Memory configurations” for a complete list of supported DIMM configurations with detailed illustrations.

A V2500/V2600 memory board is organized by quadrants, rows, and buses. Each memory board has four quadrants, four rows and eight buses.

The following terms are used to describe a V2500/V2600 memory board, as shown in Figure 5 on page 29:

Slot	The physical location into which DIMMs are installed. There are 16 DIMM slots, each with a unique designator which denotes the slot's quadrant and bus.
Quadrant	A group of four DIMM slots staggered across the memory board.
Buses	Each DIMM in a quadrant is on a different bus and eight buses span the four rows.
Rows	Each DIMM has SDRAMs on each side and represents two rows. For instance, the first DIMM installed in the system would represent row 0 bus 0 and row 1 bus 0. All DIMMs have the same SDRAMs on both sides. Therefore, rows 0 and 1 will have the same SDRAM size. Rows 2 and 3 will have the same SDRAM size. Bus interleaving can be configured to either four way or eight way bus interleaving with eight way providing the best performance.

IMPORTANT

To achieve eight way bus interleaving, all buses on a row must be populated with DIMMs having the same SDRAM size.

Table 6 shows the correlation between a DIMM slot and a row bus intersection. The first DIMM to be installed in a memory board, Q0B0, occupies row 0 bus 0 and row 1 bus 0 in quadrant 0.

Table 6 DIMM row/bus table

Rows	Buses							
	0	1	2	3	4	5	6	7
0	Q0B0	Q0B1	Q0B2	Q0B3	Q1B4	Q1B5	Q1B6	Q1B7
1								
2	Q2B0	Q2B1	Q2B2	Q2B3	Q3B4	Q3B5	Q3B6	Q3B7
3								

V2500/V2600 DIMM quadrant designations

Memory boards can be populated in increments of 4 DIMMs called quadrants.

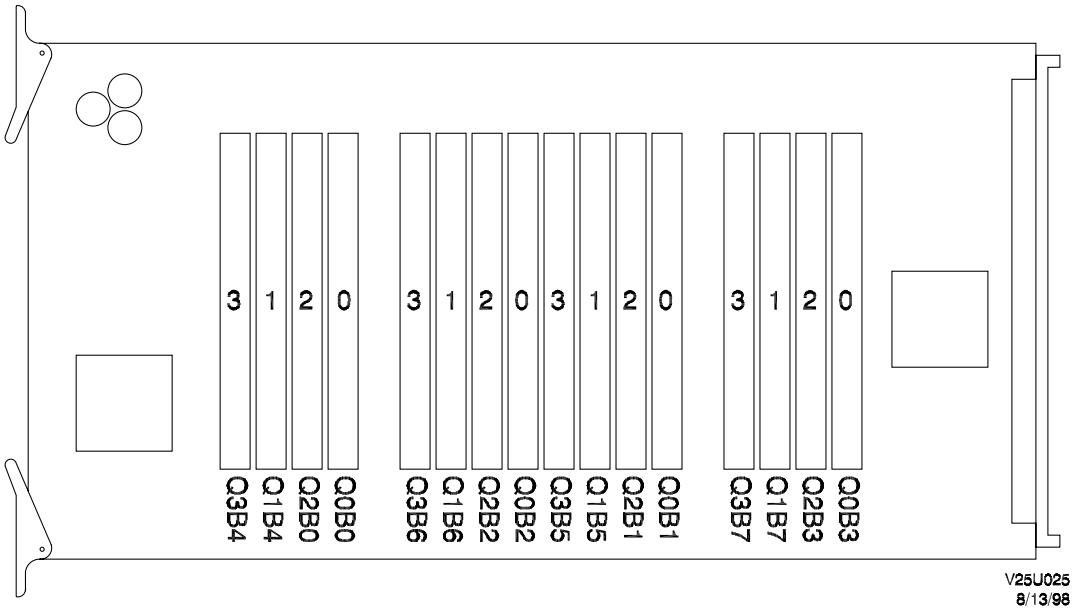
- 4 DIMMs provides 1/4 population
- 8 DIMMs provides 1/2 population
- 12 DIMMs provides 3/4 population
- 16 DIMMs provides full population

Table 7 shows the rows and buses associated with each quadrant ID and Figure 5 illustrates how these are laid out on the memory board.

Table 7 Quadrant assignments

Rows	Buses							
	0	1	2	3	4	5	6	7
0	Quadrant 0				Quadrant 1			
1								
2	Quadrant 2				Quadrant 3			
3								

Figure 5 V2500/V2600 DIMM locations



Example:

Q2B3: Quadrant 2, Bus 3

V2500/V2600 DIMM configuration rules

Use the following rules to plan the memory board DIMM configuration:

- All memory boards must be populated identically.
- Single-node memory boards may be populated in 1/4, 1/2, 3/4, or full increments.
- SCA memory boards may be populated in only 1/4, 1/2, or full increments. See "SCA (Scalable Computer Architecture) considerations" on page 31 for other SCA restrictions.
- All DIMMs within a quadrant must be of the same size: 32 Mbyte, 128 Mbyte or 256 Mbyte.
- DIMMs in quadrant 0 can be of a different size than DIMMs in quadrant 2 or 3 without degrading performance.
- DIMMs in quadrant 1 can be of a different size than DIMMs in quadrant 2 or 3 without degrading performance.
- DIMMs in quadrant 0 and 1 should be the same size for maximum performance.
- DIMMs in quadrant 2 and 3 should be the same size for maximum performance.
- DIMMs in quadrant 0 can be of a different size than DIMMs in quadrant 1. To allow this memory to be fully utilized, the bus interleave span is reduced to 4-way bus interleaving. This degrades performance.
- DIMMs in quadrant 2 can be of a different size than DIMMs in quadrant 3. To allow this memory to be fully utilized, the bus interleave span is reduced to 4-way bus interleaving. This degrades performance.
- Mixing of 32-Mbyte DIMMs and 256-Mbyte DIMMs is not supported.
- All quadrants on a given memory board do not have to be populated with DIMMs.

Appendix A, "Memory configurations" contains diagrams of all possible DIMM configurations for the V2500/V2600. Find the DIMM configuration that applies to your particular upgrade before you continue.

SCA (Scalable Computer Architecture) considerations

SCA (multinode) ready memory subsystems come with memory boards with 88-bit DIMMs installed. TACs may also be installed subject to availability.

SCA systems assign a portion of each node's memory space as a CTI cache. Therefore, it is necessary to restrict the SCA memory to specific configurations to allow the network cache address aliasing to work correctly.

NOTE

SCA upgrades are not covered in this document. See the *V2500/V2600 Installation Guide*, for instructions on how to add additional nodes.

Use the following rules to plan the memory board DIMM configuration for a SCA or SCA ready system:

- SCA or SCA-ready memory configurations require 88-bit memory DIMMs. These DIMMs contain eight extra bits that are used to implement hardware network cache coherency algorithms.
- All SCA memory configurations require eight memory boards to be installed in all nodes of the system.
- Nodes that are configured with full or with 1/2 DIMM populations can be connected to each other with no restrictions.
- If any node in a system has a 1/4-populated DIMM configuration, all nodes in the system must also be 1/4 populated. This configuration compromises memory performance.
- SCA systems do not support 3/4-populated DIMMs.
- There are only two valid mixed DIMM size configurations for the SCA:
  - 8x32 Mbyte DIMMs and 8x128 Mbyte DIMMs. See Figure 66 on page 170.
  - 8x128 Mbyte DIMMs and 8x256 Mbyte DIMMs. See Figure 76 on page 180.
- As in single-node configurations, all configurations of memory boards within a given node in a SCA system must be identical.

Appendix A, “Memory configurations” contains diagrams of all possible DIMM configurations for the V2500/V2600. Find the DIMM configuration that applies to your particular upgrade before you continue.

V2500/V2600 memory board part numbers

With the introduction of the SCA, V2500/V2600 memory boards are now manufactured under two different part numbers. One part number for Non-SCA boards and the other for SCA-Ready or SCA boards.

A single FRU part number covers Non-SCA, SCA-Ready, and SCA boards. The memory board must be copped after installation to reflect the part number of boards already in the system.

Use the `sppdsh` command `copmod` to set the part number if needed. Run `est -Y` to force `est_config` to build the proper configuration and verify the cop after modifications are made.

Table 8 shows the part number strategy.

Table 8 V2500/V2600 memory board cop part numbers

Memory type	Fab. part number	COP part number	FRU part number	STAC installed?	SCA tested?
Non-SCA	A5078-60003	A5078-60003	A5517-60001	No	No
SCA-Ready	A5517-60002	A5517-60001	A5517-60001	No[ab]	Yes
FRU	A5517-69002	A5517-60001	A5517-60001	No	Yes
SCA	A5517-60001	A5517-60001	A5517-60001	Yes[b]	Yes

a. The SCA-Ready board may have TACs installed subject to availability.
b. Use 88-bit DIMMs only.

V2500/V2600 memory board configuration rules

The V-Class system supports up to eight memory boards. Valid configurations include two, four, and eight memory boards. A six memory board configuration is not supported. The first two memory boards, as shown in Table 9, are located in slots MB0L and MB1L. Figure 4 on page 20, shows the locations of all memory boards in the system.

Table 9 Memory board configurations

Order	Slot locations
Minimum system configuration	MB0L MB1L
Upgrade to four memory boards	MB6R MB7R
Upgrade to eight memory boards	MB2R MB3R MB4L MB5L

Planning the I/O cardcage upgrade

IMPORTANT The V2500/V2600 upgrade requires that all four PCI cardcages be installed in the chassis.

Figure 6 on page 35 shows the differences between the V22X0 and V2500/V2600 PCI cardcage slot configurations.

See Figure 7 on page 36 for the locations of the PCI cardcages in the server.

I/O cardcage slot configuration

Each V2500/V2600 PCI cardcage houses a 4-slot 64-bit PCI SCSI bus and a 3-slot 64-bit PCI SCSI bus for a maximum of seven controller cards per chassis.

NOTE It is important to take into account the position of the extra slot in the V2500/V2600 cardcage when planning the transfer of controllers from the V22X0 cardcage.

Figure 6 V22X0 and V2500/V2600 PCI cardcage slot differences

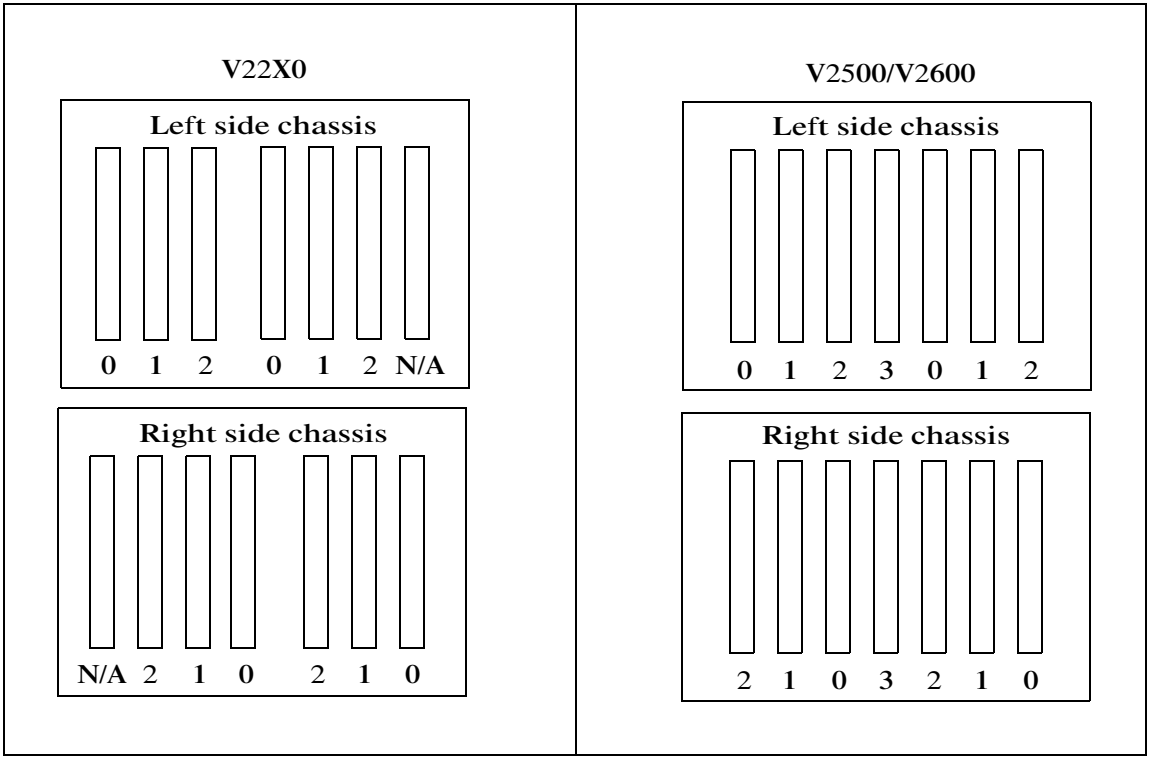
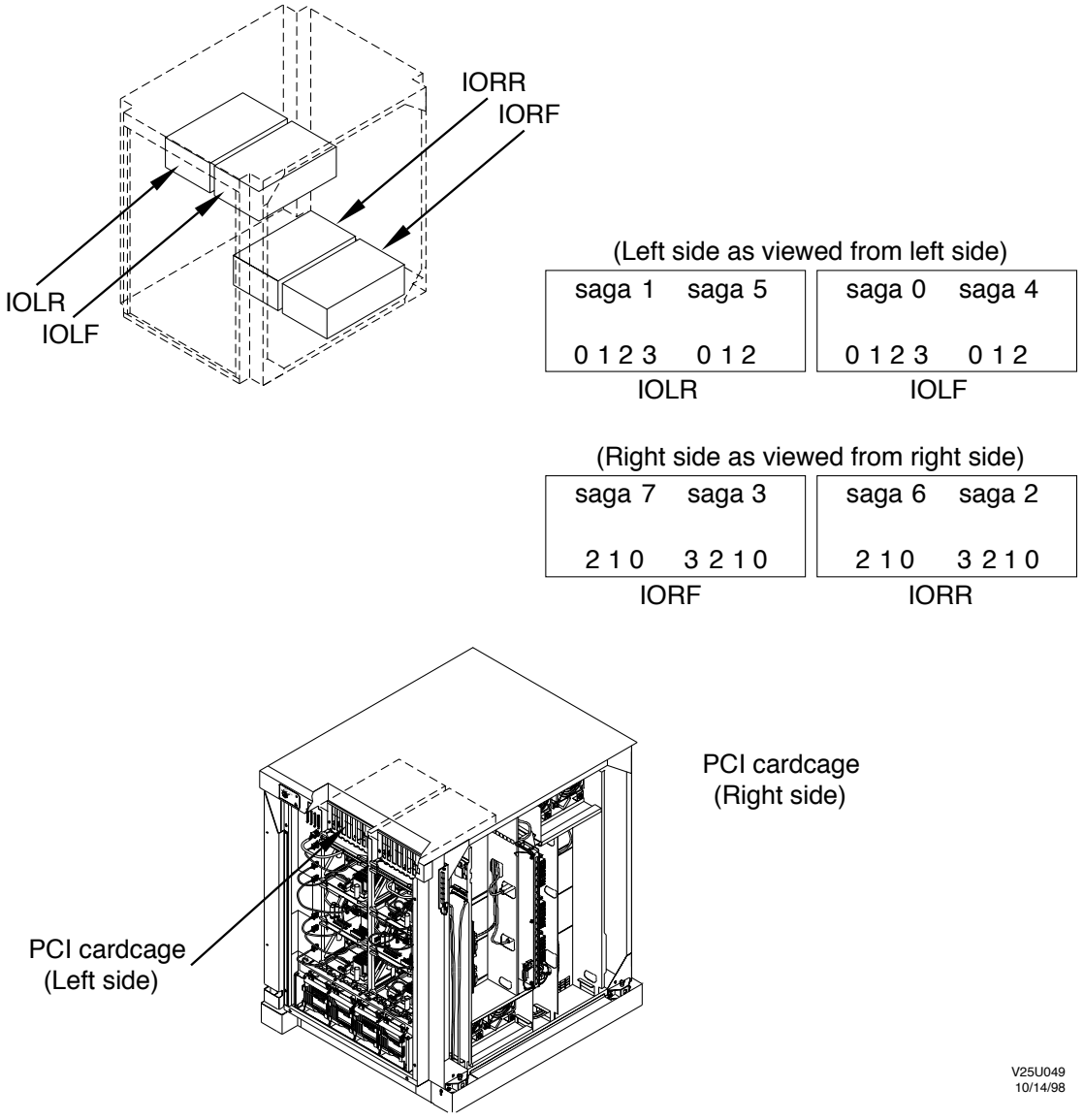


Figure 7 **V2500/V2600 PCI cardcages**



4 Preliminary procedures

This chapter describes tasks required to prepare the node to receive the V2500 or V2600 upgrade kit. These tasks are:

Recording important information

Record the SWID (Software identification), Symbios controller slot locations, and primary/alt boot path before beginning the software upgrade.

Recording the SWID

Record the SWID here for use with the `assign` command after the V22X0 NRB has been replaced by the V2500/V2600 MIB. Refer to "Retaining the original SWID" on page 109 for further information about how this information will be used.

Step 1. Boot to the OS. At the Command prompt enter:

```
Command: boot
```

Step 2. Login in as root and enter the password.

Step 3. Display the SWID number by using the `uname` command. Enter:

```
uname -i
```

Step 4. Record the SWID for later use.

SWID _____

Recording controller slot locations

Record the slot location of each of your Symbios 875 (Ultra) and Symbios 895 (Ultra2) controllers. Display this information by using the `ioscan` command on the V-Class server. Enter:

```
# ioscan -kCext_bus
```

Recording primary/alt boot path

Record the primary/alt boot path using the PAth command at the command prompt on the teststation. Enter:

```
Command: PAth
```

Updating teststation software

Before the hardware is upgraded teststation software must be updated and SCSI controller FCODE must be at Revision 7.0 or above.

Consult the latest *V2500/V2600 Test Station Release Notice* for the most current information on V2500/V2600 firmware, diagnostic, and teststation software.

All products in the following /spp subdirectories are overwritten when the teststation software is installed: bin, data, est, etc, firmware, man, scripts, and unsupported items. If any files in these directories have been customized, they must first be saved and then restored after completion of the install.

Shutting down the Operating System

Shut down the system with the `/etc/shutdown` command.

The `time` argument can be used to schedule a timed shutdown or the keyword "`now`" can be used to shut down the system immediately. Enter:

```
/etc/shutdown -h now
```

Refer to the shutdown(1M) man page for more information on `/etc/shutdown`.

Removing the V22X0 teststation software

Use the `swremove` utility to remove the V22X0 software by completing the following steps:

Step 1. Login as root at the teststation:

```
# su root

Password: serialbus
```

Step 2. Check to see if `swagentd` daemon is running by entering the following command:

```
# ps -ef | grep swagentd
```

The following is an example of what should be displayed if the daemon is running:

```
root   372     1  0 15:51:21 ?          0:00 /usr/sbin/swagentd
```

Step 3. If `swagentd` is not running, then start it by entering the following command:

```
# /usr/.sbin/swagentd
```

Step 4. Start the `swremove` utility by entering the following command:

```
# swremove
```

Step 5. Select and remove the V-Class teststation software.

Step 6. Exit the `swremove` utility.

Installing the teststation software

Install the latest version of V2500/V2600 teststation software by following the *V2500/V2600 Test Station Software Release Notice* up to the point where `swinstall` has completed and you have rebooted the teststation using the `/etc/reboot` command.

NOTE This point is "Step 7" of the *V2500 Test Station Software V1.0 Release Notice*. This may change as the Release Notice is updated.

Safety considerations

Protect personnel and equipment when installing any Hewlett-Packard Company product by always taking proper safety precautions.

Personal safety

Always ensure that both the operator panel and the power controller are turned off before removing or installing any components in the V-Class server.

Remove the operator panel key after shutting the system down to prevent inadvertent power-on during installation.

CAUTION Hazardous voltages are present inside the server cabinet while the site ac circuit breakers are set to **ON**. Ensure that the site ac circuit breakers are set to **OFF** before servicing the system.

Electrostatic discharge protection

Electrostatic discharge can damage components in the V2500/V2600 server. Although some devices such as metal-oxide semiconductors are extremely sensitive, all semiconductors, as well as some resistors and capacitors, may be damaged or degraded by exposure to static electricity.

Electrostatic damage to electronic devices may be caused by the direct discharge of a charged conductor or by exposure to the static fields surrounding charged objects. To prevent such damage from occurring, be sure to observe the following precautions when handling and installing boards:

- Prepare an ESD safe work surface large enough to accommodate the various assemblies handled during the upgrade. Use a grounding mat and an anti-static wrist strap, such as those included in the ESD Field Service Kit (A3024-80004).
- Connect yourself to ground with a wrist strap. Connection may be made to any grounded metal assembly in the cabinet. You and the electronic devices must both be grounded to avoid static discharges that can cause damage.

- Keep circuit boards in their anti-static bags until you are ready to install them.
- Place circuits boards in an anti-static bag immediately after they have been removed from the chassis.
- The anti-static bag can not function as a static dissipating mat. Do not use the anti-static bag for any other purpose than to enclose a product.
- Holes in the anti-static bag render it useless as an anti-static measure. Therefore, it should always be completely closed and sealed when it contains a product. Any bag that shows damage or wear should immediately be discarded and replaced.

Powering down the system

This procedure assumes that the OS has been shutdown.

Step 1. Remove power to the system by turning the keyswitch on the operator panel to the **DC OFF** position.

Step 2. Set the main circuit breaker to **OFF**. The main circuit breaker is located at the right of the cabinet as shown in Figure 8 on page 44.

NOTE

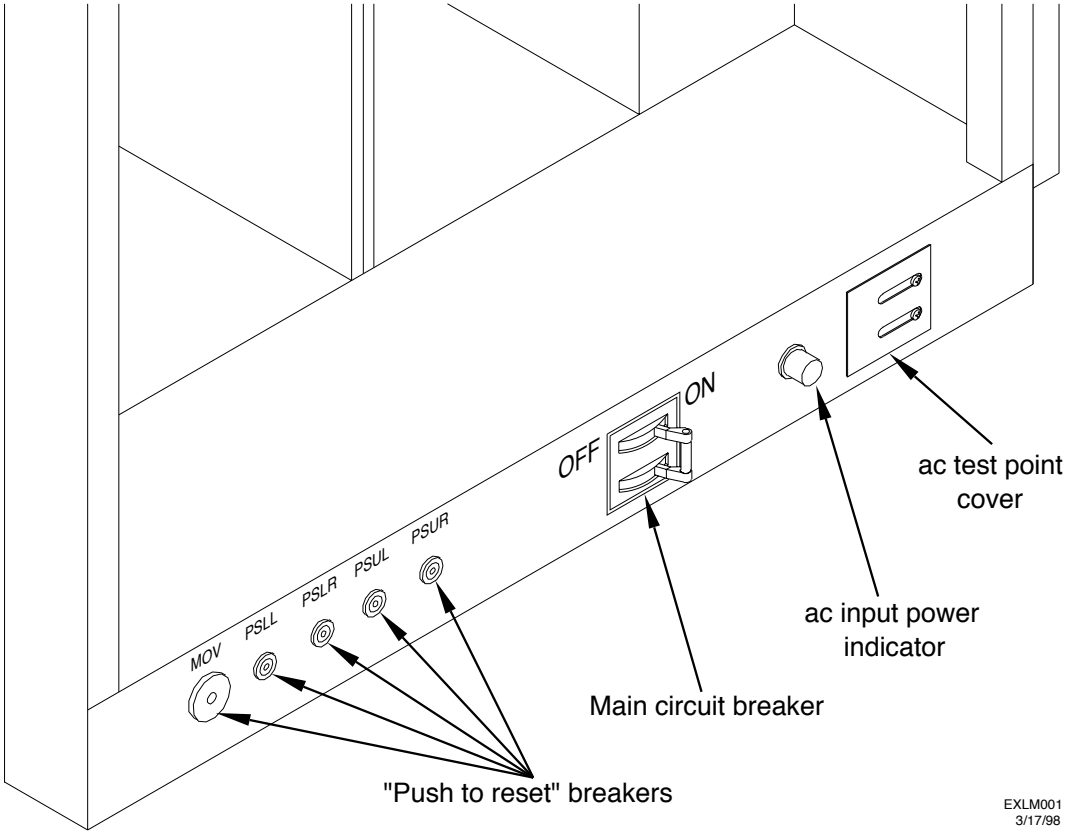
The green light next to the circuit breaker indicates that power is present at the power plug and will remain on after the main circuit breaker on the system is set to **OFF**.

Step 3. Set the site ac circuit breakers to **OFF** or unplug the server from the main power supply.

CAUTION

Hazardous voltages are present inside the server cabinet while the site ac circuit breakers are set to **ON**. Ensure that the site ac circuit breakers are set to **OFF** before servicing the system.

Figure 8 Main circuit breaker



Removing the skins and panels

All of the systems skins and EMI panels must be removed.

Removing the front skin

The front skin can be attached to the chassis using one of two different methods:

- Retaining screws and ball pins
- Ball pins only

CAUTION

The front skin is heavy (25 lbs. 12kg). If not properly supported during removal and installation it can slip and fall. The skin is secured to the chassis by four retaining pins. When the pins are separated from the chassis the weight of the skin must be supported by your grasp. To prevent injury, ensure you have a firm grasp of the skin during removal and installation.

Removing a front skin with retaining screws

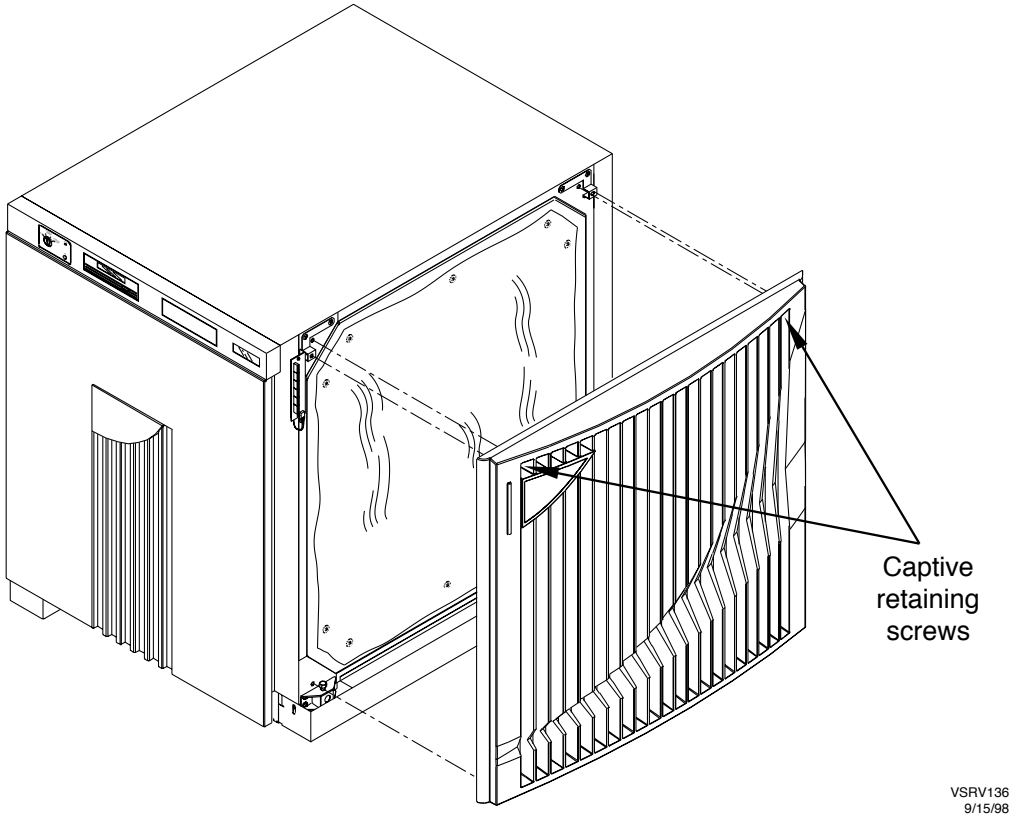
Step 1. Inspect the top corners of the front skin. If the front skin is equipped with retaining screws, loosen the captive screws using a #2 phillips screwdriver.

CAUTION

The front skin may still be attached to the chassis by the four retaining pins. However, after the captive screws are loosened, the front skin may be unsupported. Retain your grasp of the front skin until it is completely removed.

Step 2. Release the front cabinet skin bottom pins by pulling from the bottom recessed areas of the skin until the pins pop out.

Figure 9 **Removing front skin with retaining screws**

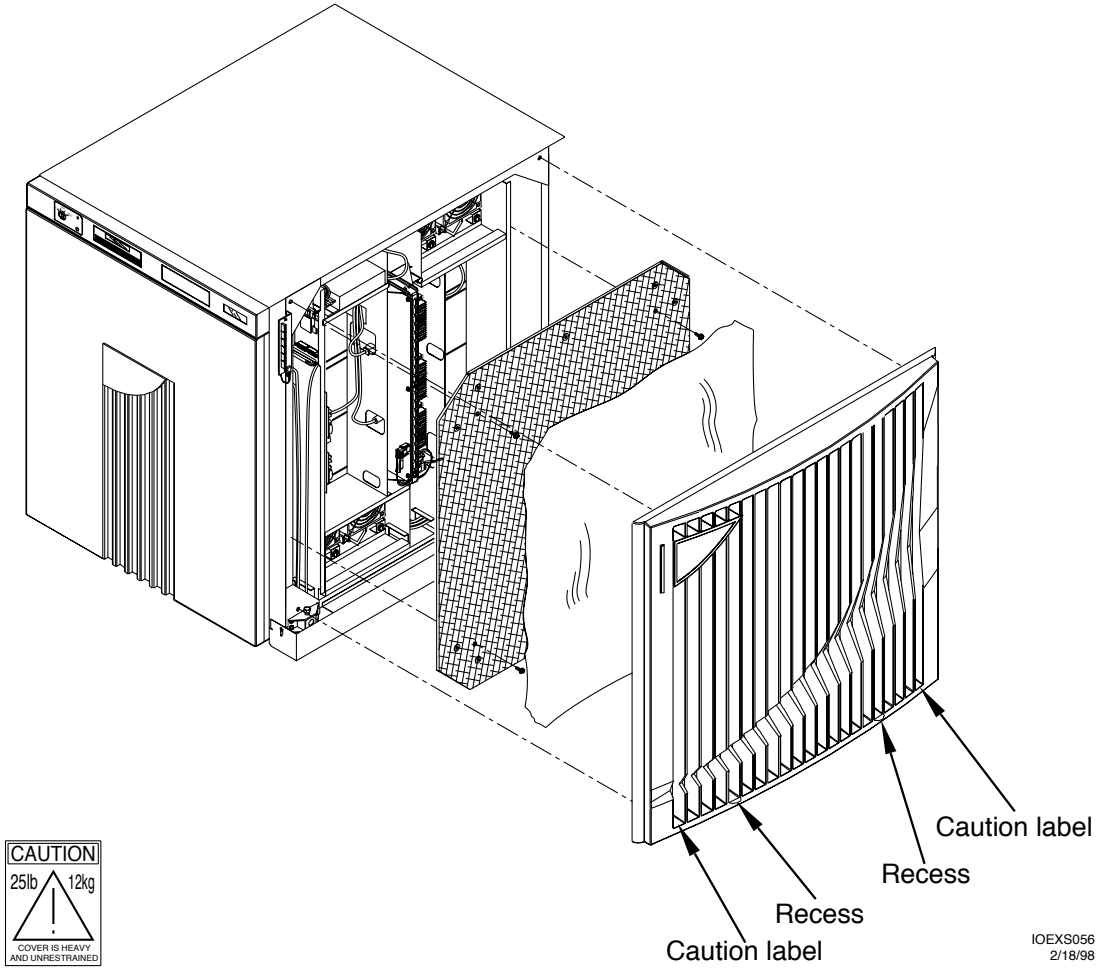


Step 3. Pull the top of the skin away from the chassis until the skin can be grasped from the sides by both hands.

Removing a front skin without retaining screws

Step 1. Release the front cabinet skin bottom pins by pulling from the bottom recessed areas of the skin until the pins pop out.

Figure 10 Removing front skin, filter and EMI panel



Step 2. Pull the bottom of the skin away from the chassis until the skin can be grasped from the sides by both hands.

Step 3. Remove the front cabinet skin by pulling away from the chassis until the top pins pop out.

Removing the front filter and EMI panel

Step 1. Remove the filter from the front of the chassis by carefully pulling the velcro tabs loose.

Step 2. Remove the front EMI panel by removing the screws securing it to the chassis.

Removing the side skins, EMI panels, and circuit board restraint brackets

For each side of the chassis:

Step 1. Release the side cabinet skin bottom pins by pulling from the bottom recessed areas of the skin until the pins pop out.

Step 2. Pull the bottom of the skin away from the chassis until the skin can be grasped from the sides by both hands.

Step 3. Remove the side cabinet skin by pulling away from the chassis until the top pins pop out.

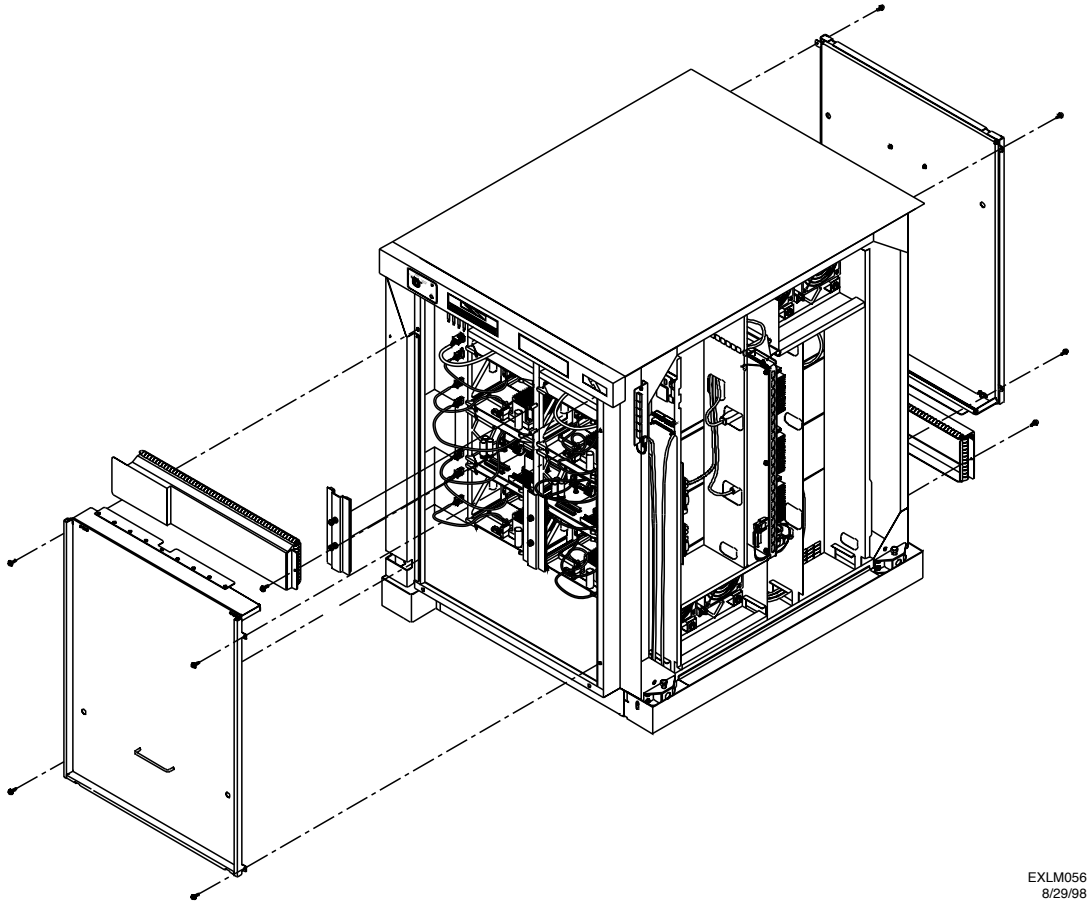
Step 4. Remove the smaller EMI panel by removing the screw that fastens the panel to the chassis, as shown in Figure 11 on page 49.

NOTE These EMI panels will be replaced by new EMI panels that are open at both ends. See Figure 33 on page 89 for details.

Step 5. Remove the larger EMI panel by removing the four screws that fasten the panel to the chassis.

Step 6. Remove the two board restraint brackets from both sides of the chassis by unscrewing two thumbscrews.

Figure 11 Removing side skins and EMI panels



5 Component removal and installation

This chapter describes the removal and replacement of the following Field Replaceable Units (FRU). The following procedures describe the step-by-step process required to safely remove and replace each component.

IMPORTANT

Processor and memory boards are not swapped one for one. Observe all V2500/V2600 loading order rules as described in Chapter 3, "Planning the upgrade".

This chapter assumes that you have completed:

1. Chapter 1, "Overview"
2. Chapter 2, "Prerequisites"
3. Chapter 3, "Planning the upgrade"
4. Chapter 4, "Preliminary procedures"

All steps must be completed in the order described. Any deviation from these steps could render the system inoperable or cause internal damage to the system. For a summary of the entire system upgrade procedure refer to "Upgrade procedure summary" on page 2.

WARNING

Do not place system components on an ungrounded surface after removing them from the system. Always place each component in an anti-static bag and pack it in the appropriate shipping container immediately after it is removed from the system.

Mid-plane Interconnect Board (MIB)

The following sections provide instructions for the removal and replacement of the NRB with the MIB.

Read this entire section before beginning the procedure.

Removing the V22X0 Node Routing Board (NRB)

Step 1. Unpack the V2500/V2600 MIB from its container, remove it from the anti-static bag, and place it on the static-free work surface.

Step 2. Prepare the MIB shipping container to receive the V22X0 NRB.

Step 3. Back out but do not remove all memory and processor boards to a distance of at least two inches from the NRB.

For each board:

1. Unplug the board's power cable.
2. Pull the two extractor levers on the front of the board toward you until it unseats from the NRB.
3. Slide the board at least two inches away from the NRB.

Step 4. Back out but do not remove all PCI cardcages to a distance of at least two inches from the NRB.

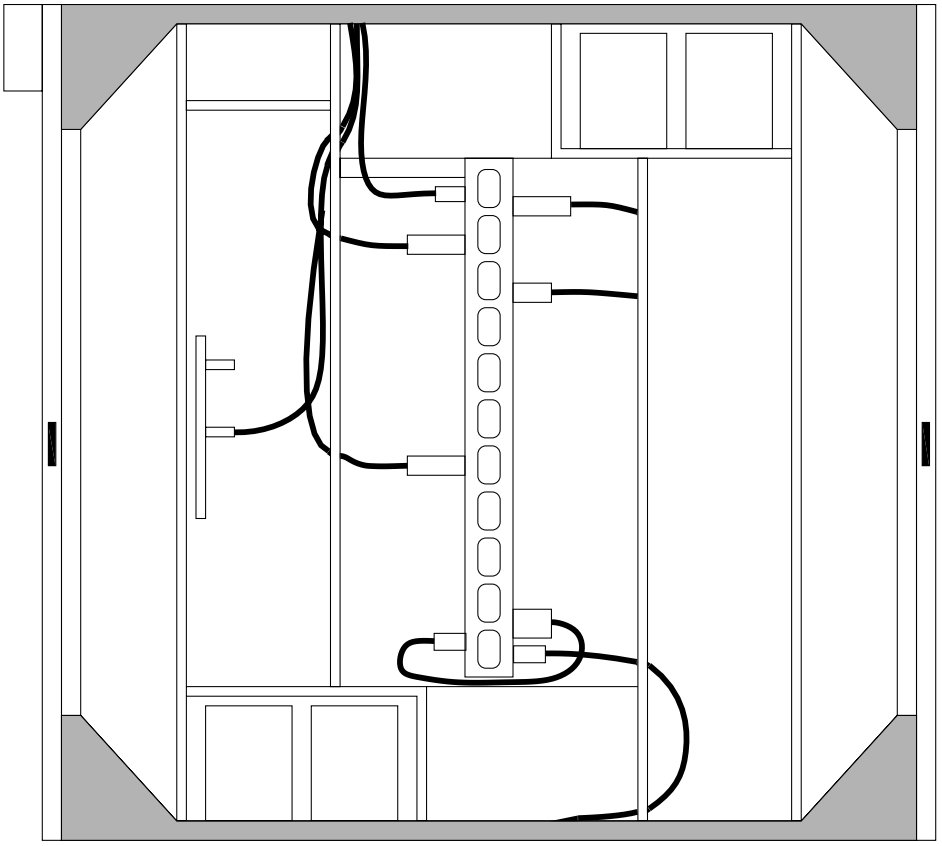
For each cardcage:

1. Tag and mark all SCSI and network cables attached to controllers in the PCI cardcage.
2. Make note of the existing SCSI controller configuration.
3. Disconnect each of the SCSI and network cables attached to controllers in the PCI cardcage.
4. Unplug the PCI cardcage's power cable.
5. Pull the two extractor levers on the front of the PCI cardcage toward you until the PCI cardcage is unseated from the NRB.

6. Slide the PCI cardcage from the chassis at least two inches away from the NRB.

Step 5. Tag and mark the six cables connected to the core utility board and the NRB. See Figure 12 for the cable locations.

Figure 12 NRB/ MIB cabling



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Step 6. Disconnect the three cables connected to the core utility board. Pull the lower two disconnected cables back through the holes in the bulkhead.

Step 7. Remove the two power cables from the NRB power board and pull them back through the holes in the bulkhead.

Step 8. Loosen the four captive screws and carefully pull the NRB from the chassis approximately three-quarters of an inch.

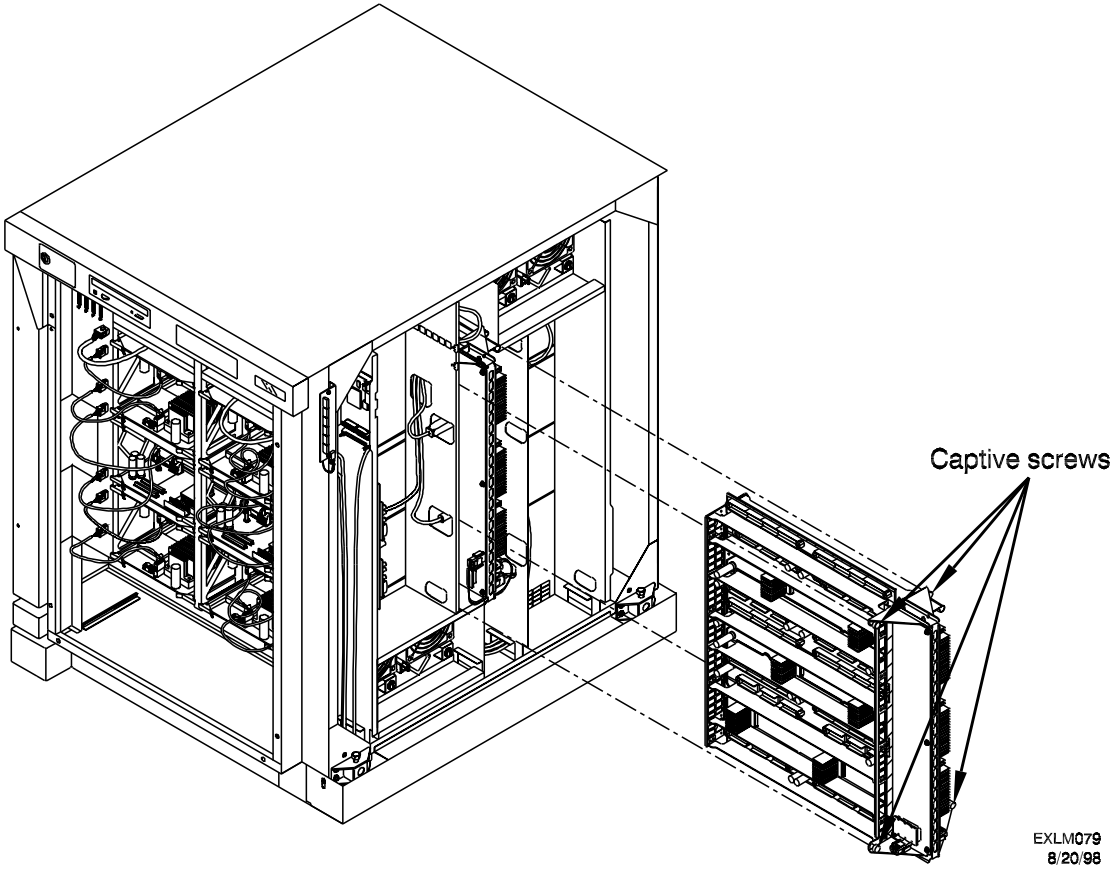
CAUTION Damage to the next connector may cause errors on power up.

Step 9. The remaining connector on the top of the power board is secured in place by two locking tabs. Depress the locking tabs and carefully remove this connector and pull it back through the hole.

Step 10. Carefully remove the NRB from the chassis, as shown in Figure 13 on page 55.

Step 11. Immediately place the NRB in the anti-static bag and pack it in the V2500/V2600 MIB's shipping container.

Figure 13 Removing the V22X0 NRB



Installing the V2500/V2600 Mid-plane Interconnect Board (MIB)

Step 1. Check that all memory boards, processor boards and PCI cardcages are removed far enough to allow ample clearance for the MIB.

Step 2. Ensure that all the delay lines on the V2500/V2600 MIB are seated properly.

Step 3. Carefully align the MIB in the chassis.

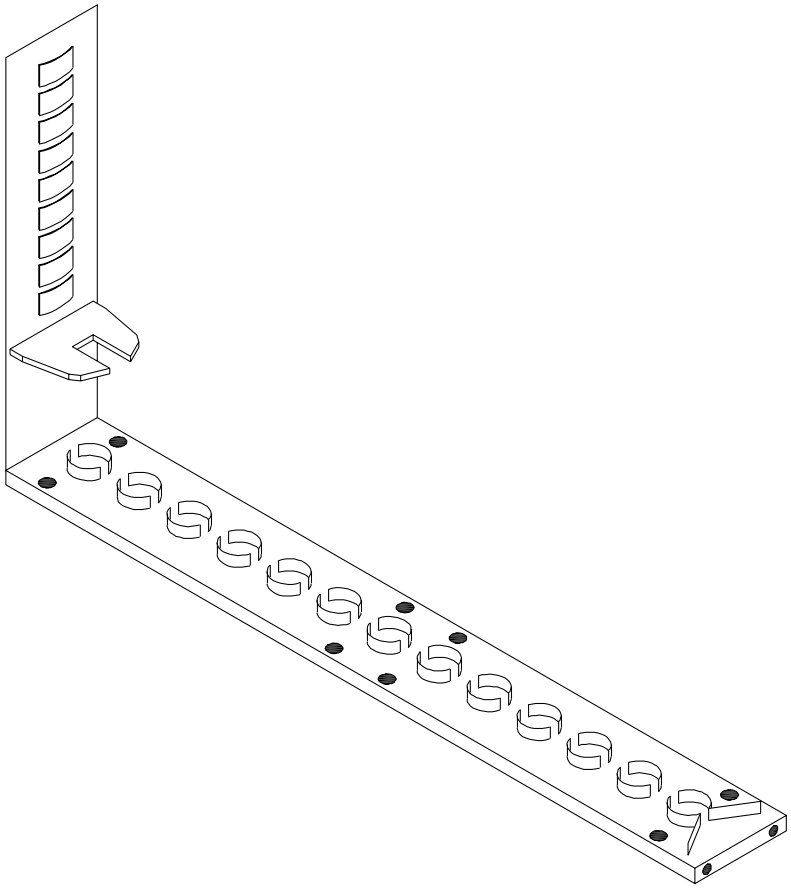
WARNING **Do not allow the MIB to damage the guide rail as it is being inserted into the chassis. The guide rail, designed to provide electrical ground connections for the MIB, is delicate and easily damaged.**

Step 4. Carefully slide the MIB into the chassis ensuring that it is straight in the guide rails shown in Figure 14 on page 57.

Step 5. Locate and connect the six cables to the core utility board and the MIB power board. See Figure 12 on page 53.

Step 6. Tighten the four captive screws shown in Figure 13 on page 55.

Figure 14 Mid-Plane guide rails



Processor boards

The following sections provide instructions for the removal and replacement the processor boards. Perform the procedure for each processor board in the system.

Read this entire section before beginning the procedure.

NOTE Ensure that you have included any additional processor boards that may be installed during this upgrade in the planning process as described in the "Planning the processor board upgrade" on page 19.

Removing a V22X0 processor board

Step 1. Unpack the V2500/V2600 processor board from its container, remove it from the anti-static bag, and place it on the static-free work surface.

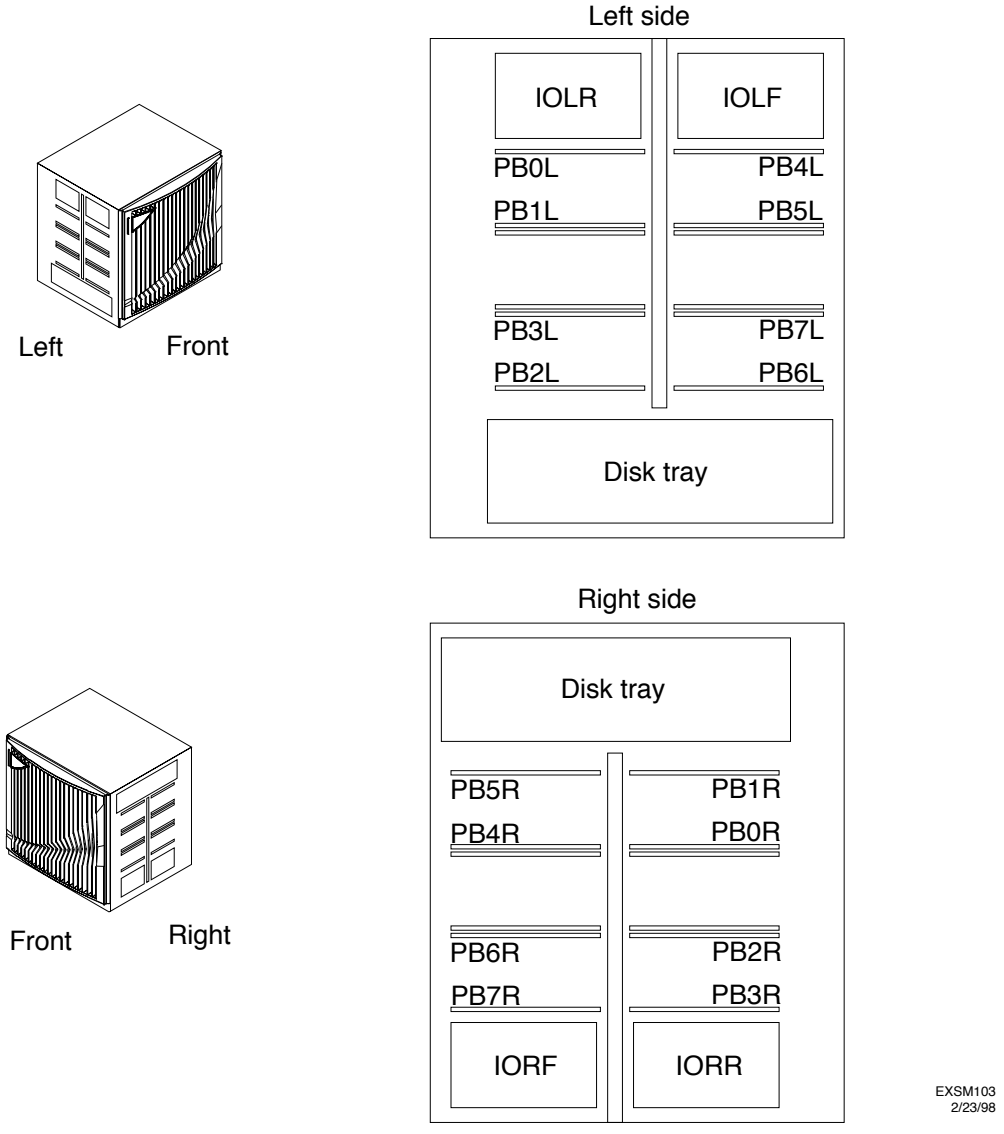
Step 2. Prepare the processor board shipping container to receive the V22X0 processor board.

NOTE All processor boards have their power cables unplugged and are unseated from the MIB. Refer to "Removing the V22X0 Node Routing Board (NRB)" on page 52.

Step 3. Select the processor board you intend to remove. Use the appropriate table from the "Planning the processor board upgrade" on page 19 and Figure 15 on page 59, to systematically remove and replace every processor board in the system.

WARNING **Do not violate the V2500/V2600 processor board loading order. Components are not swapped one for one. Proper loading order must be followed for optimum performance. Only configurations adhering to the proper loading order will be supported.**

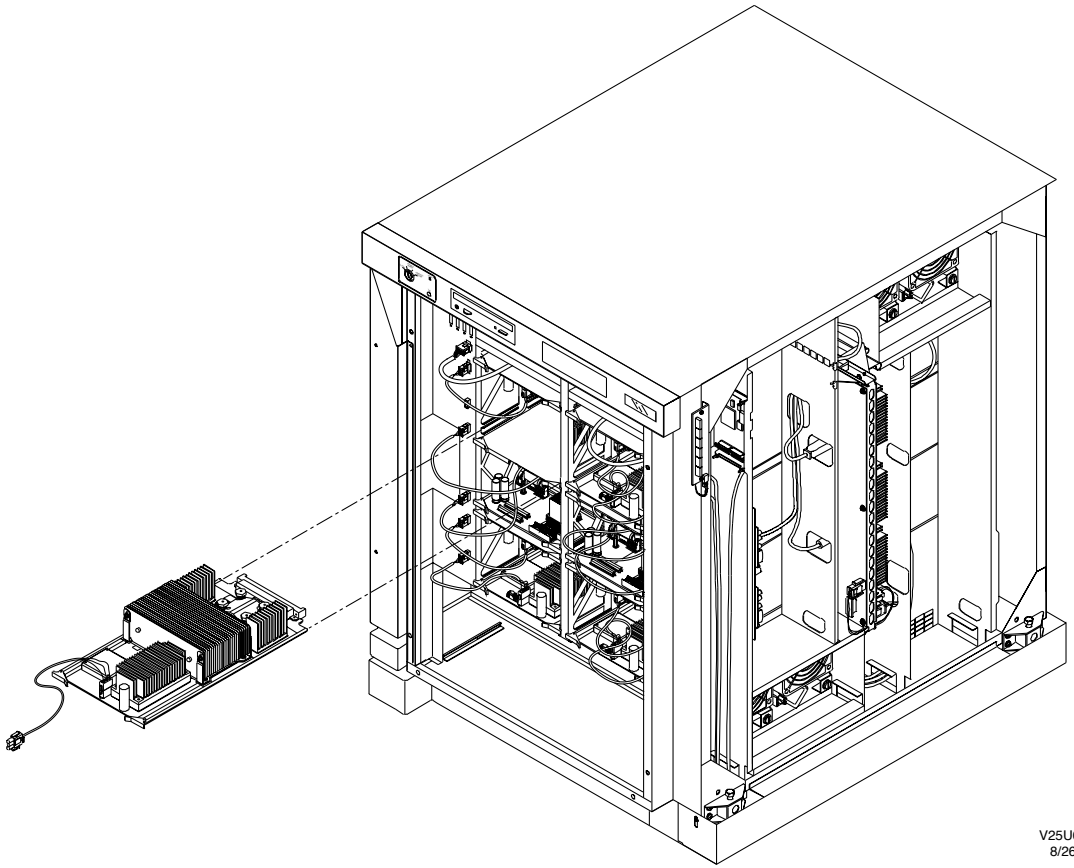
Figure 15 Processor board locations by reference designator



Step 4. Slide the processor board all the way out of the chassis, taking care to support it underneath. See Figure 16 below.

Step 5. Immediately place the processor board in the anti-static bag and pack it in the V2500/V2600 processor's shipping container.

Figure 16 Removing the V22X0 processor board



Installing a V2500/V2600 processor board

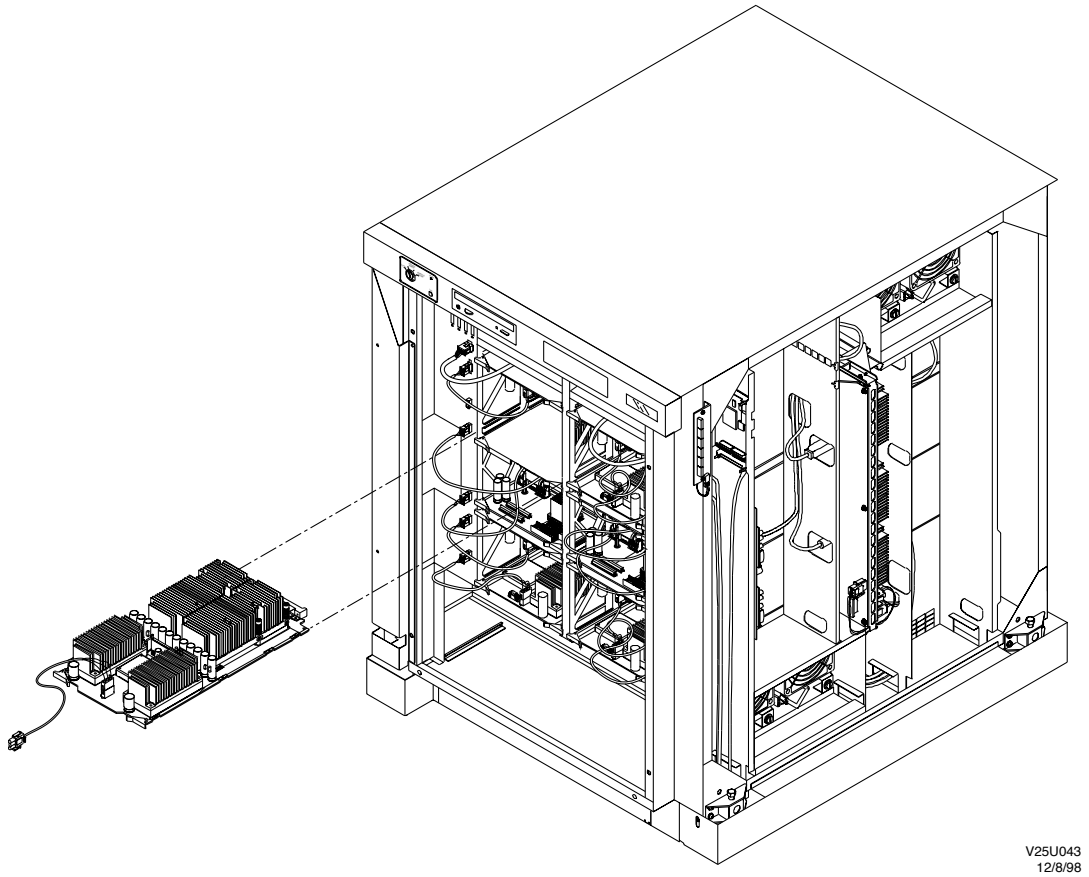
WARNING **Do not install processor cards in memory card slots. Plugging a processor card in a memory card slot can result in damage to the processor board and the MIB. See Figure 15 on page 59 for processor board locations.**

Step 1. Install the V2500/V2600 processor board into the chassis by lining up the processor board with the guide rails. Continue sliding the processor board into the chassis and secure it using the two extractor levers. See Figure 17 on page 62.

WARNING **Do not violate the V2500/V2600 processor board loading order. Components are not swapped one for one. Proper loading order must be followed for optimum performance. Only configurations adhering to the proper loading order will be supported.**

Step 2. Connect the processor board power cable to the chassis.

Figure 17 Installing the V2500/V2600 processor board



Memory board

The following sections provide instructions for the removal and replacement the memory boards. Complete the following procedure on each memory board before removing another one from the system.

Read this entire section before beginning the procedure.

NOTE

Ensure that you have included any additional memory boards or DIMMs that may be installed during this upgrade in the planning process as described in "Planning the memory board upgrade" on page 26.

IMPORTANT

All memory boards in the system must be configured identically for the upgrade to be successful.

WARNING

Do not violate the V2500/V2600 memory board loading order. Components are not swapped one for one. Proper loading order must be followed for optimum performance. Only configurations adhering to the proper loading order will be supported.

Overview

This list is only intended as a summary; detailed installation instructions are presented in the sections that follow.

For each memory board in the system:

Step 1. Remove the V22X0 memory board from the system.

Step 2. Remove the memory power board from the V22X0 memory board.

Step 3. Remove the memory power board from the V2500/V2600 memory board.

Step 4. Transfer DIMMS to the V2500/V2600 memory board.

Step 5. Install the memory power board on the V22X0 memory board.

Step 6. Install the memory power board on the V2500/V2600 memory board.

Step 7. Pack the V22X0 memory board for return.

Step 8. Install the V2500/V2600 memory board.

Removing the V22X0 memory board

Step 1. Unpack the V2500/V2600 memory board from its container, remove it from the anti-static bag, and place it on the static-free work surface.

Step 2. Prepare the memory board shipping container to receive the V22X0 memory board.

NOTE All memory boards have their power cables unplugged and are unseated from the MIB. Refer to "Removing the V22X0 Node Routing Board (NRB)" on page 52.

Step 3. Select the memory board you intend to remove. Use Table 10 and Figure 18 on page 65 to systematically remove and replace every memory board in the system.

Table 10 Memory board configurations

Order	Slot locations
Minimum system configuration	MB0L MB1L
Upgrade to four memory boards	MB6R MB7R
Upgrade to eight memory boards	MB2R MB3R MB4L MB5L

Step 4. Remove the memory board from the chassis by sliding the memory board all the way out, taking care to support it underneath. See Figure 19 on page 66.

Figure 18 Memory board location by reference designator

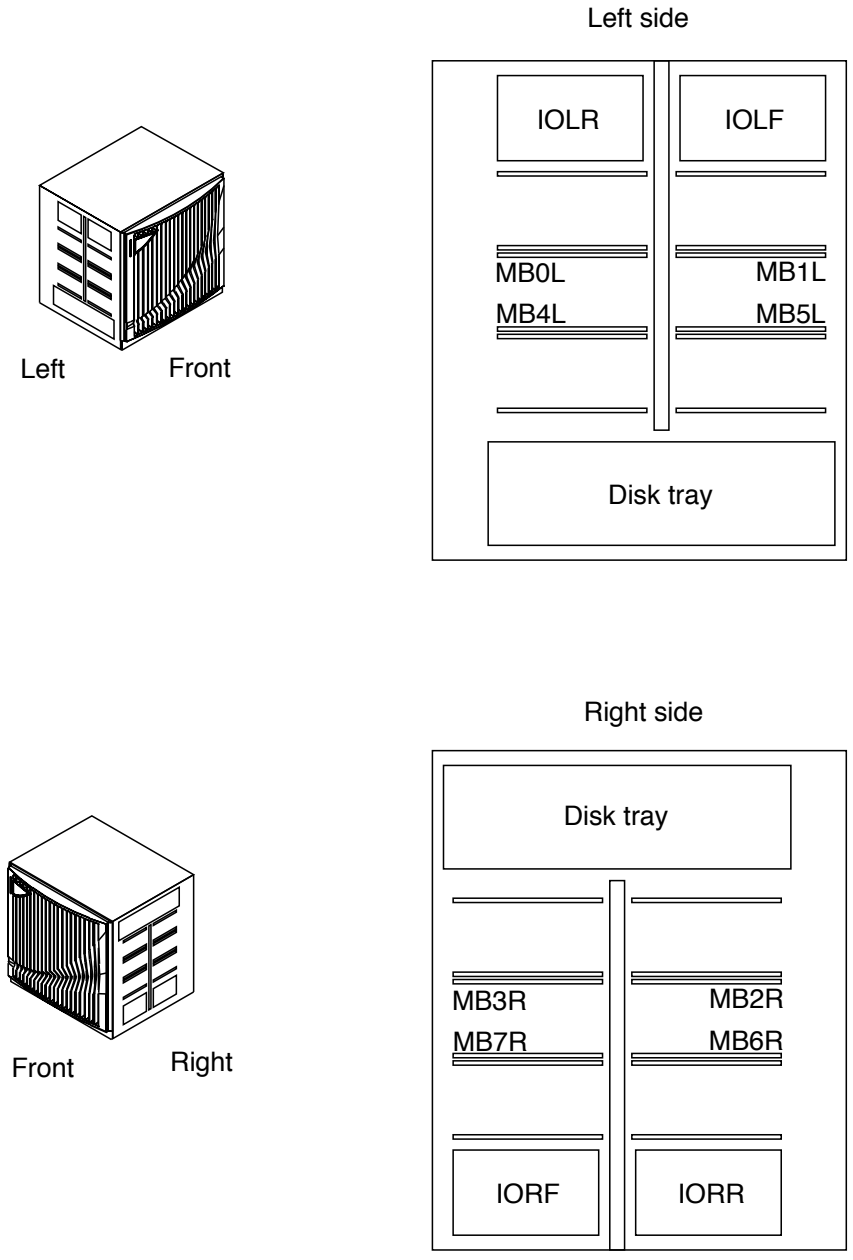
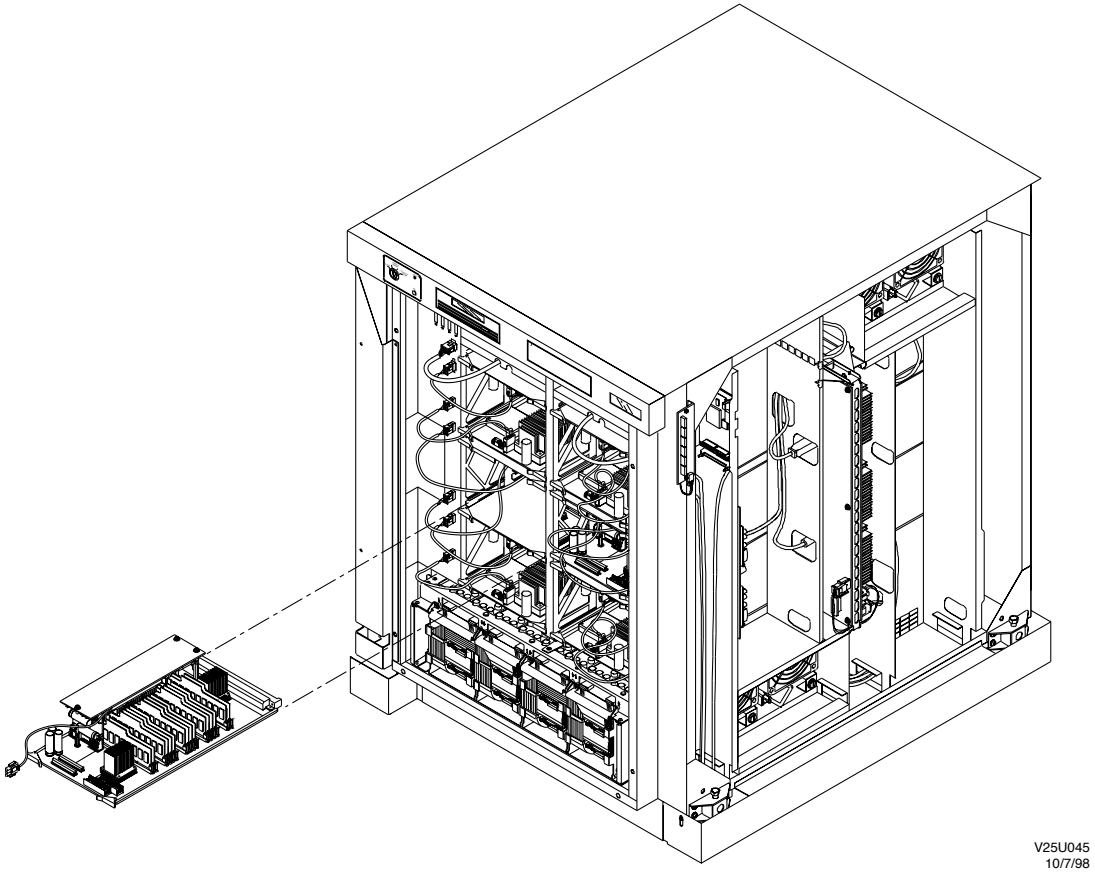


Figure 19 **Removing the V22X0 memory board**

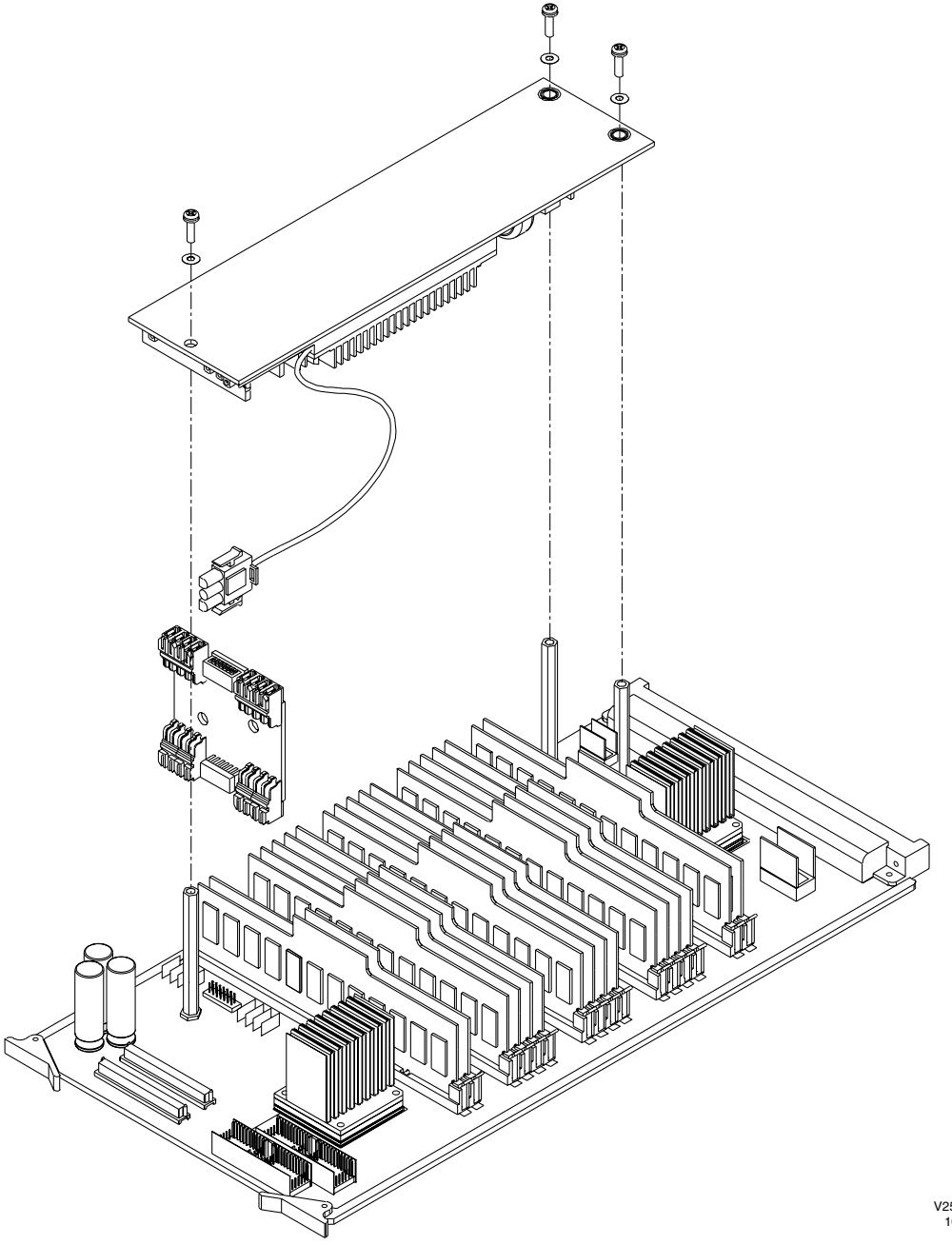


Removing the V22X0 memory board power board

Step 1. Remove one screw from the front of the power board and two screws from the rear of the power board. See Figure 20 on page 68.

Step 2. Gently lift the power board, unplugging the interconnect board from the memory board.

Figure 20 Removing the V22X0 memory board power board



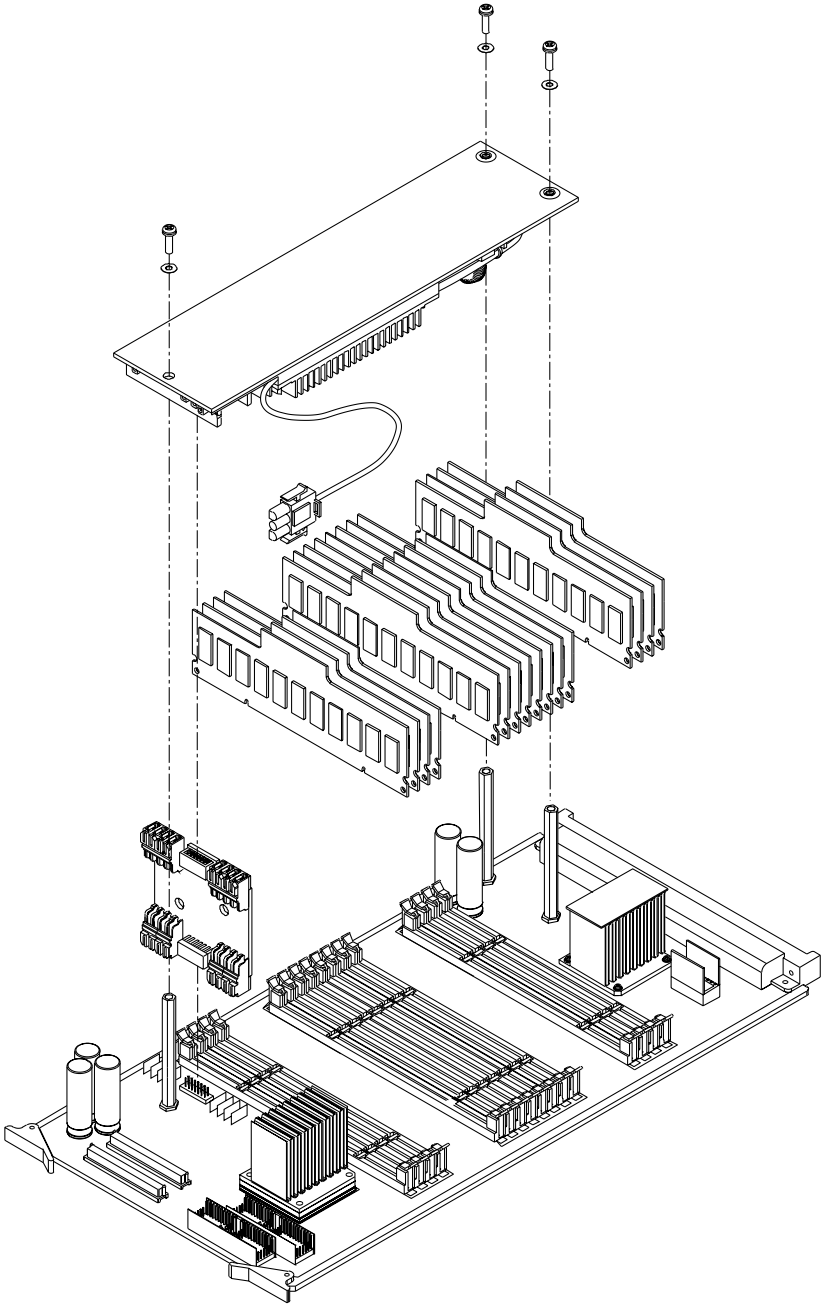
Removing the V2500/V2600 memory board power board

Step 1. Remove one screw from the front of the power board and two screws from the rear of the power board. See Figure 21 on page 70.

Step 2. Gently lift the power board, unplugging the interconnect board from the memory board.

NOTE Some V2500/V2600 memory board power boards may be hinged.

Figure 21 Removing the V2500/V2600 memory board power board



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Removing DIMMs from the V22X0 memory board

Step 1. Make note of the existing memory configuration. The DIMMs can be identified by their part numbers shown in Table 11.

Table 11 DIMM sizes and part numbers

Size	New	Exchange
32-Mbytes	A4777-67001	A4777-69001
128-Mbytes	A4828-67001	A4828-69001
256-Mbytes	A5087-60001-S	A5087-69001

WARNING **Do not simultaneously depress the tabs on the ends of the DIMM when removing them. This may allow the board to fall damaging some attached components.**

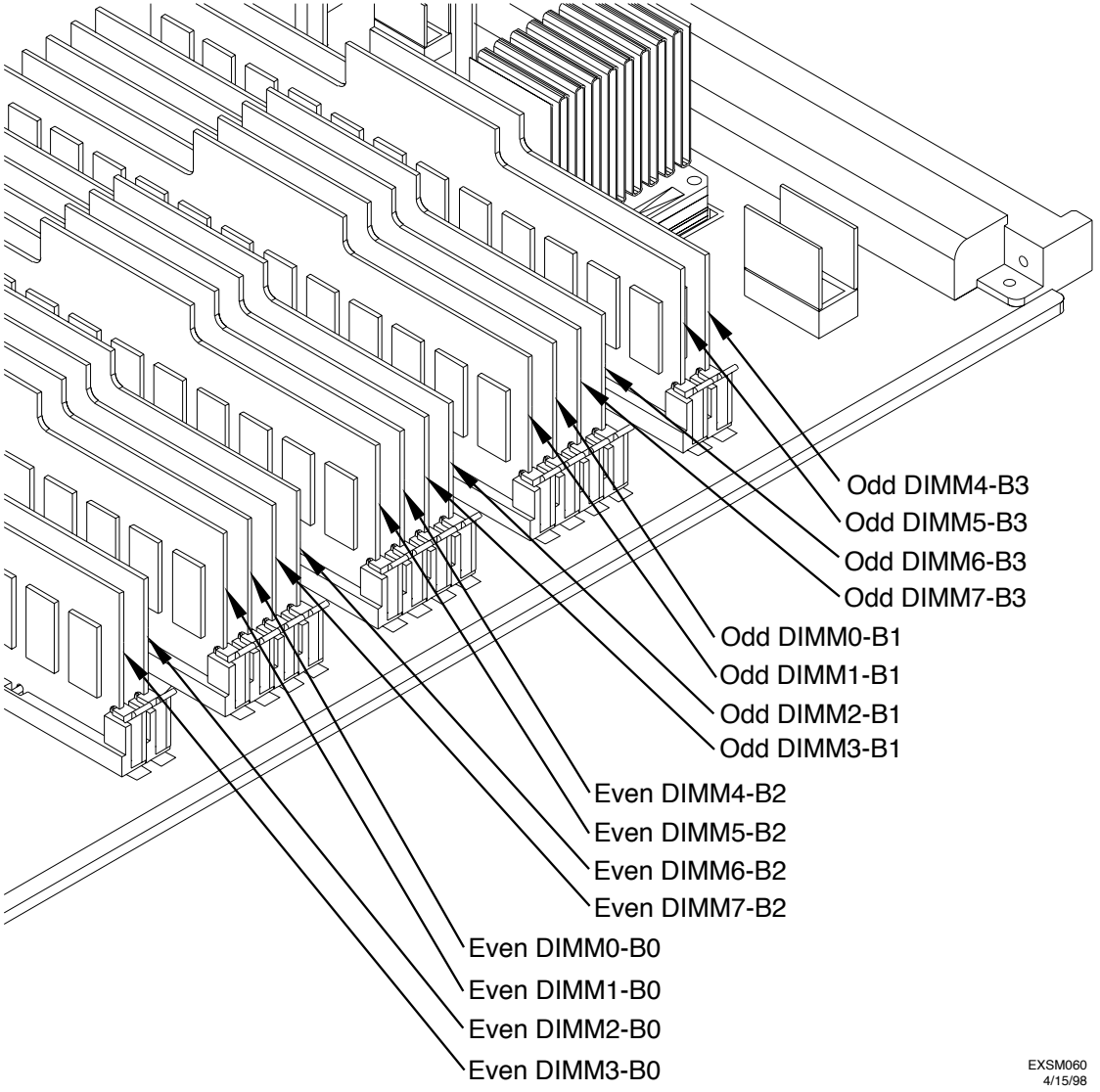
Step 2. Sequentially depress the tabs on each end of the DIMM socket.

Step 3. Remove the DIMM.

Step 4. See “Installing DIMMs on the V2500/V2600 memory board” on page 73 for special installation instructions.

NOTE V22X0 memory configurations differ greatly from V2500/V2600 memory configurations. See “Planning the memory board upgrade” on page 26 and Appendix A, “Memory configurations” .

Figure 22 Removing DIMMs from the V22X0 memory board



Installing DIMMs on the V2500/V2600 memory board

It is required that the DIMM connectors and memory board slots be cleaned before installation. A kit containing cleaning materials is provided. Table 12 shows the contents of the kit.

Table 12 Kit, Memory Board & DIMM Cleaning, Part Number A5078-70013

Description	Part number
Endust Instant Wipes	9300-2419
Endust Compressed Gas Duster 8 oz.	8710-2176

Step 1. Refer to Appendix A, "Memory configurations" to find the DIMM configuration corresponding to the upgrade you are performing.

IMPORTANT All memory boards in the system must be configured identically for the upgrade to be successful.

Step 2. Ensure that all the delay lines on the V2500/V2600 memory board are seated properly.

Step 3. Use compressed air to clean the slots where the DIMMs are to be installed.

Step 4. Depress the tabs on each end of the DIMM socket so that they are in the open position.

Step 5. Clean the new DIMM edge connector using the wipes provided.

Step 6. Use compressed air to clean any lint on DIMM edge connector.

Step 7. Position the DIMM so that the corners of the DIMM slips into the slots located in the tabs on each end of the DIMM socket on the memory board.

Step 8. Insert the DIMM into the slot. Rock the DIMM from side to side about an 1/8-inch approximately five times as it is being inserted to ensure good contact.

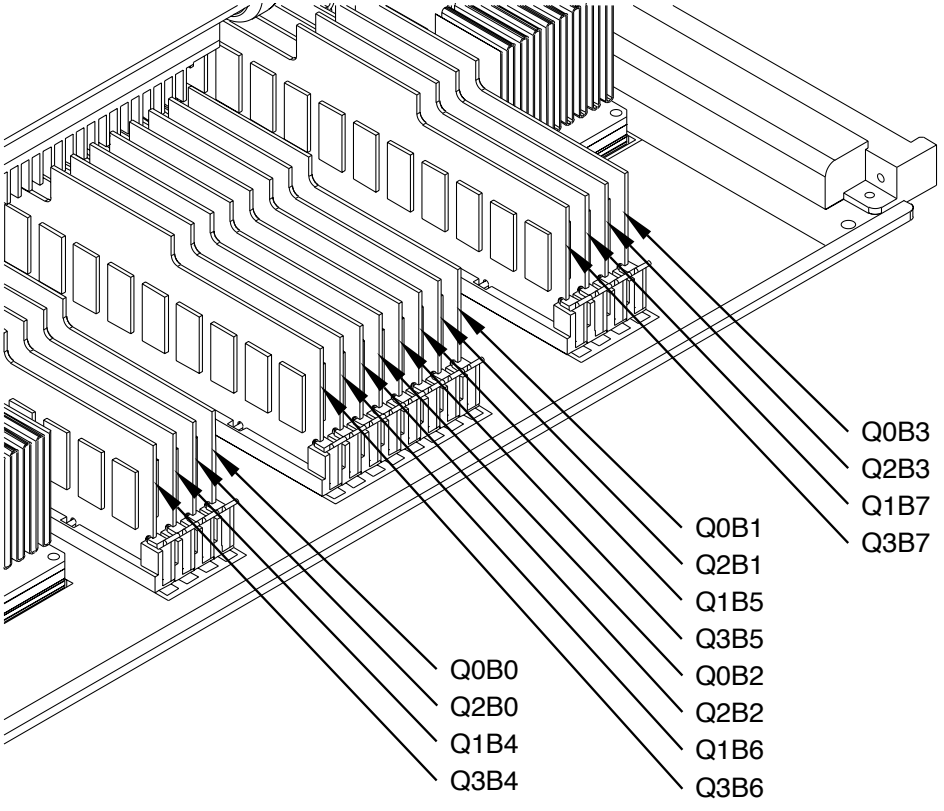
Step 9. Use the compressed air to generally remove loose debris from the board.

NOTE The DIMM is installed properly when the tabs lock into their upright positions.

Step 10. Transfer the DIMMs as needed from the V22X0 memory board to the V2500/V2600 memory board, installing any new DIMMs if appropriate.

NOTE Due to the more robust memory probe of the V2500/V2600, DIMMs transferred from a V22X0 may fail POST. If this occurs then the failing DIMMs should be replaced.

Figure 23 Installing DIMMS on the V2500/V2600 memory board



Installing the V22X0 memory board power board

Step 1. Ensure that the interconnect board is installed on the memory power board.

WARNING **Do not install the interconnect board incorrectly. Ensure that the connectors on the interconnect board are properly aligned with the connector on the memory board and memory power board. The interconnect board is not keyed and it is possible to install it incorrectly resulting in memory board failure.**

Step 2. Position the power board above the three standoffs and connect the interconnect board to the memory board.

Step 3. Attach the memory board power board to the standoffs using three screws.

Step 4. Immediately place the memory board in the anti-static bag and pack it in the V2500/V2600 memory board's shipping container.

Installing the V2500/V2600 memory board power board

Step 1. Ensure that the interconnect board is installed on the memory power board.

WARNING **Do not install the interconnect board incorrectly. Ensure that the connectors on the interconnect board are properly aligned with the connector on the memory board and memory power board. The interconnect board is not keyed and it is possible to install it incorrectly resulting in memory board failure.**

Step 2. Position memory board power board on the memory board and install three screws to secure the board to the standoffs.

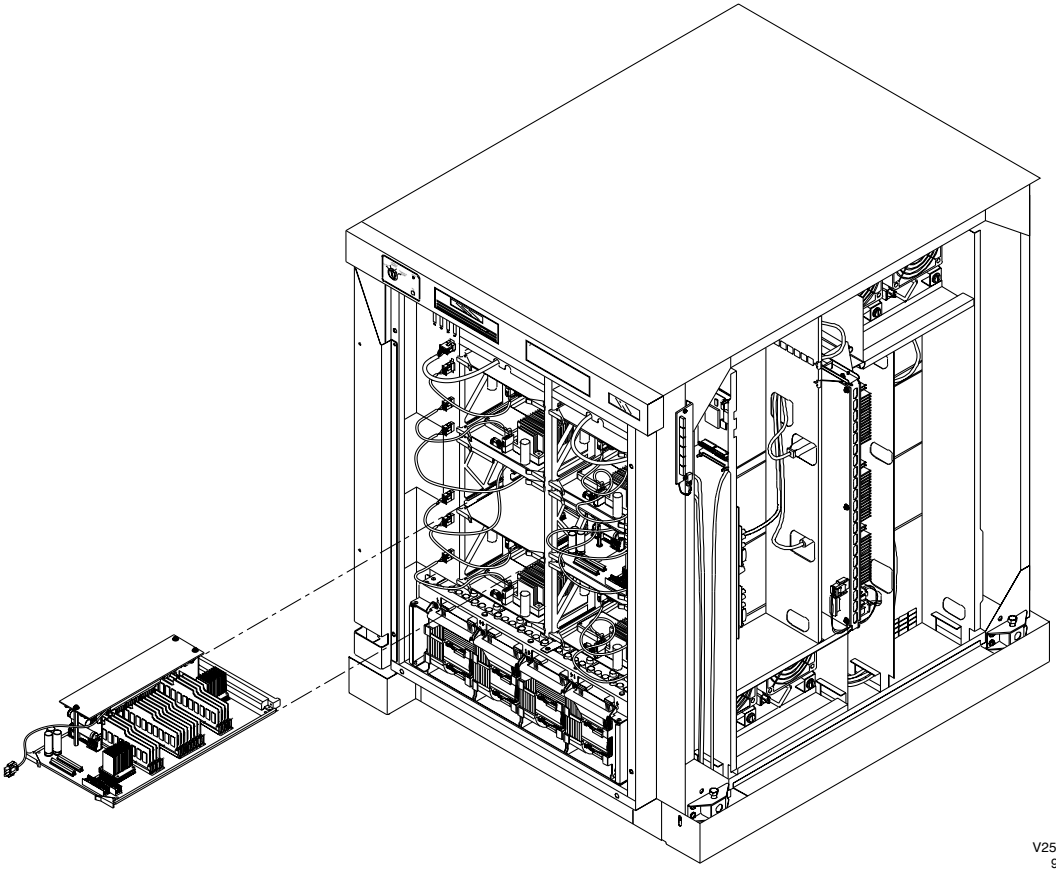
Installing the V2500/V2600 memory board

Step 1. Install the memory board into the chassis by lining up the memory board with the guide rails. Continue sliding the memory board into the chassis and secure it using the two extractor levers. See Figure 24.

WARNING **Do not violate the V2500/V2600 memory board loading order. Components are not swapped one for one. Proper loading order must be followed for optimum performance. Only configurations adhering to the proper loading order will be supported.**

Step 2. Connect the power cable from the memory board to the chassis.

Figure 24 Installing the V2500/V2600 memory board



Node Power Supply (NPS)

The following sections provide the information required to remove and replace the Node Power Supplies.

The V2500/V2600 configuration requires four Node Power Supplies in the system.

The Node Power Supplies are color coded.

- V22X0 Node Power Supplies are gold.
- V2500/V2600 Node Power Supplies are silver.

Read this entire section before beginning the procedure.

Complete the following procedure for each power supply before removing another one from the system.

Removing a V22X0 power supply

Step 1. Unpack the V2500/V2600 power supply from its container, remove it from the anti-static bag, and place it on the static-free work surface.

Step 2. Prepare the power supply shipping container to receive the V22X0 power supply.

Step 3. Locate the power supply using Figure 25 on page 78.

Step 4. Rotate the retaining screw in a clockwise direction until the retaining tab rotates free from the chassis.

Step 5. Remove the power supply by pulling it straight out, as shown in Figure 26 on page 79.

Step 6. Immediately place the power supply in the anti-static bag and pack it in the V2500/V2600 power supply's shipping container.

Figure 25 Node power supply locations

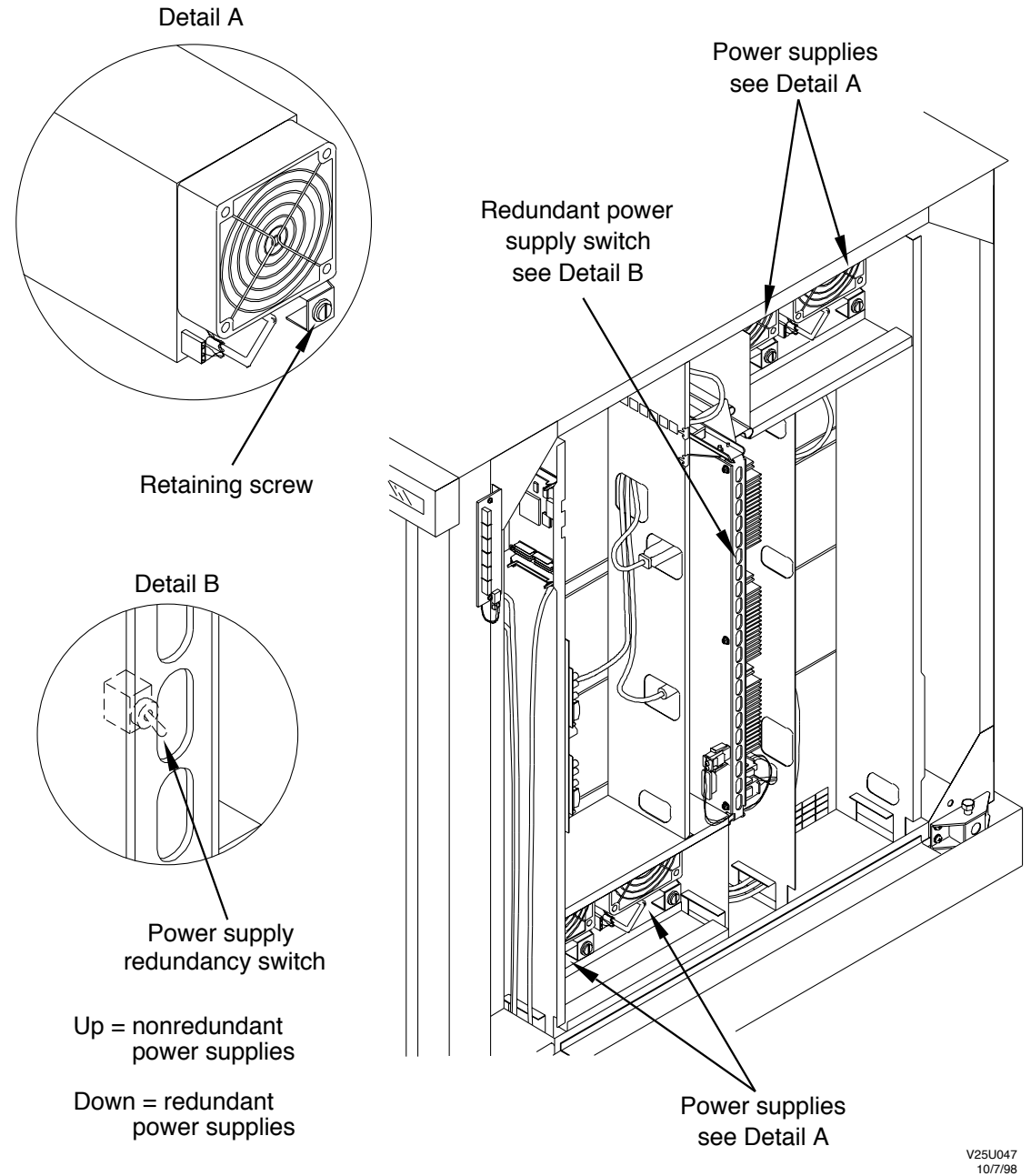
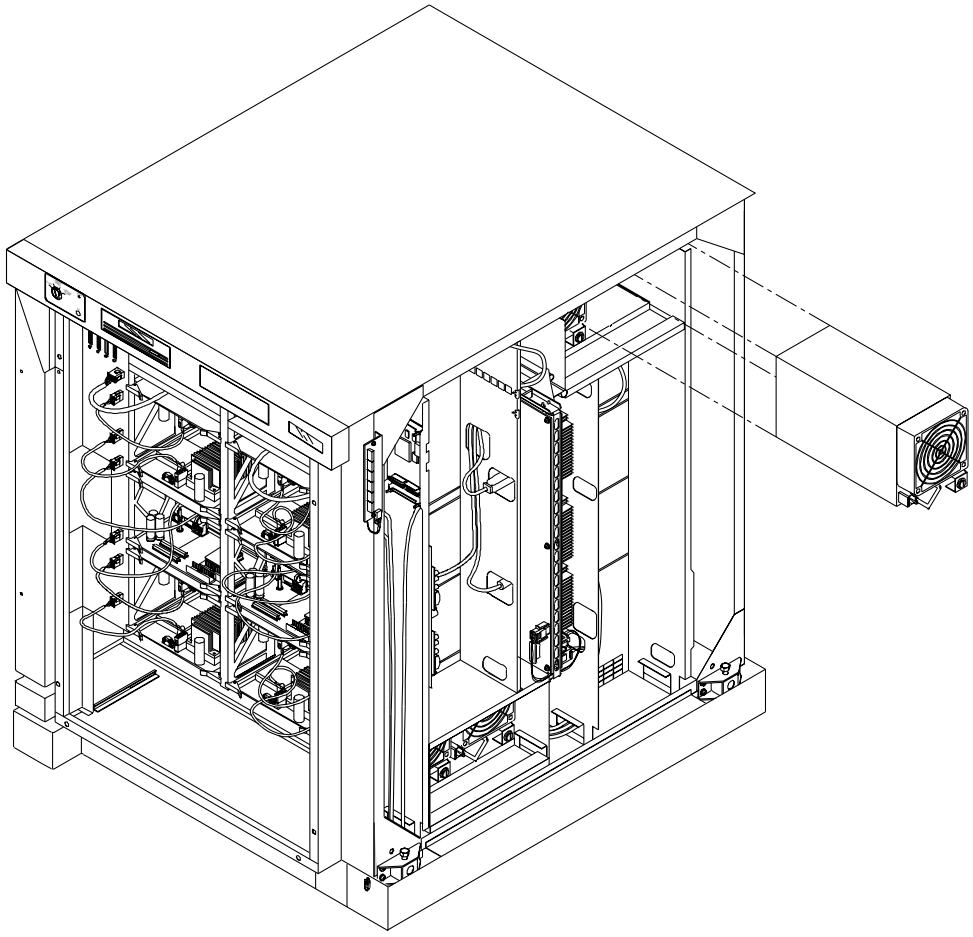


Figure 26 Removing a power supply



Installing a V2500/V2600 power supply

Step 1. Position the V2500/V2600 power supply in the chassis.

Step 2. Slide the power supply into the chassis taking care to seat the power connector.

Step 3. Rotate the retainer in a counterclockwise direction until the retaining tab engages the slot in the chassis.

Step 4. Place the power supply power switch to the **ON** position.

Step 5. Place the redundant power supply switch on the SCUB in the **DOWN** position. See Figure 25 on page 78 for the location of the redundant power supply switch.

NOTE Once the node is powered up the redundant power supply switch setting can be checked using the `sppdsh` command `pswitch 0`.

PCI cardcage

The V22X0 chassis can contain from one to four PCI cardcages, depending on system configuration. The V2500/V2600 configuration requires that all four PCI cardcages be installed.

The following sections provide the information required to remove the PCI cardcage, transfer the PCI controllers, and install the V2500/V2600 PCI cardcage into the chassis.

NOTE Ensure that you have included any additional controllers that may be installed during this upgrade in the planning process. Refer to "Planning the I/O cardcage upgrade" on page 34.

Overview

See Figure 27 on page 83 for possible locations of PCI cardcages in the chassis.

For each set of PCI cardcages in the server:

Step 1. Select a V22X0 PCI cardcage.

Step 2. Remove the V22X0 PCI cardcage.

Step 3. Transfer the PCI controllers to the V2500/V2600 PCI cardcage.

Step 4. Install the V2500/V2600 PCI cardcage in the chassis.

Step 5. Connect the SCSI and network cables to the controllers in the PCI cardcage.

Step 6. Install the remaining V2500/V2600 PCI cardcages in the chassis.

Removing the V22X0 PCI cardcage

Step 1. Select the V22X0 PCI cardcage intended for removal.

NOTE All PCI cardcages have their cables unplugged and are unseated from the MIB. Refer to "Removing the V22X0 Node Routing Board (NRB)" on page 52.

Step 2. Remove the PCI cardcage by sliding the PCI cardcage all the way out of the chassis, taking care to support it underneath. See Figure 28 on page 84 for PCI cardcage removal details.

Step 3. Place the cardcage on a static free, level work surface.

NOTE Tighten any loose screws in surrounding bulkheads and panels while you have the PCI cardcages out of the machine.

Figure 27 PCI cardcage locations and V2500/V2600 slot designations

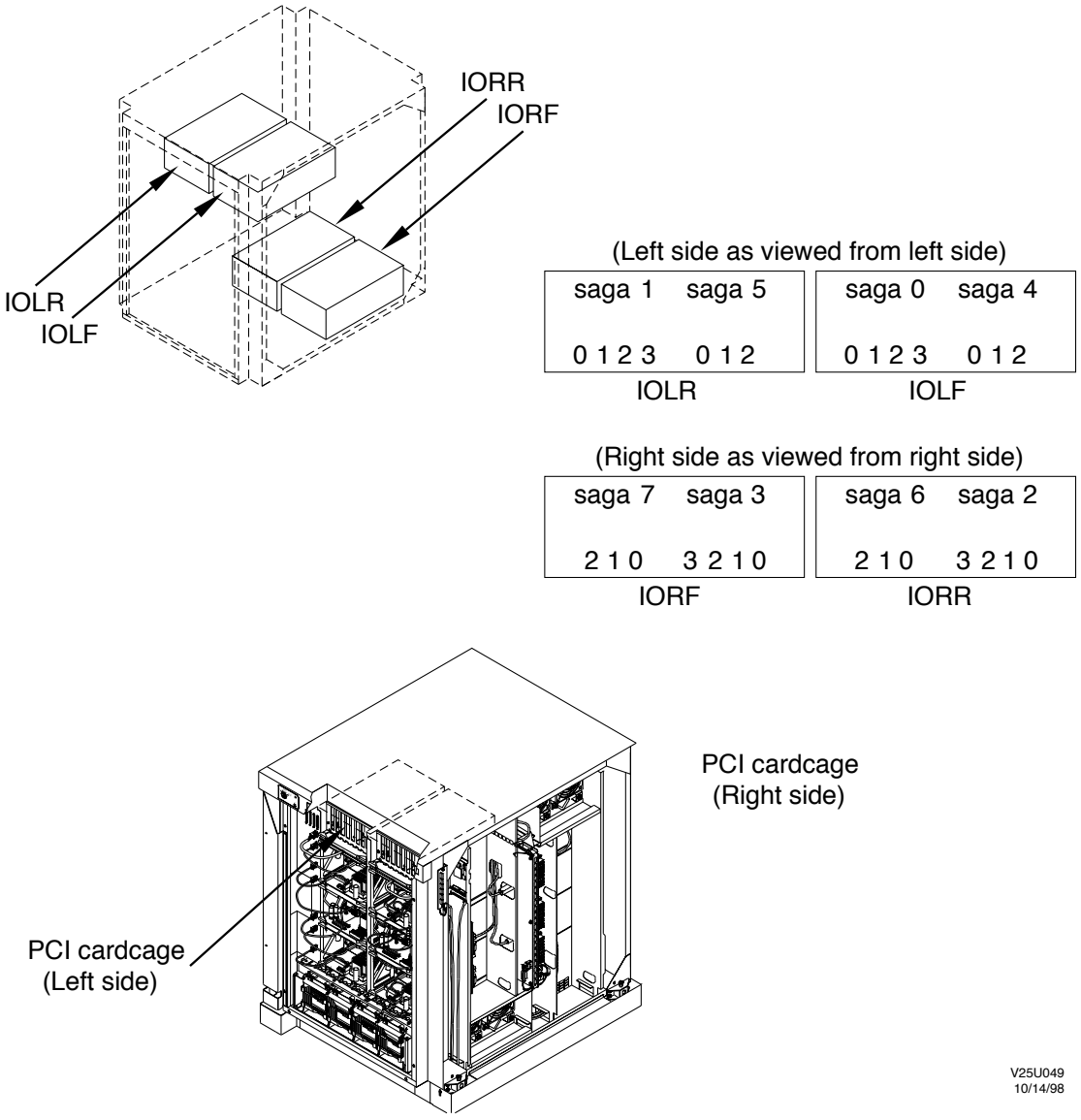
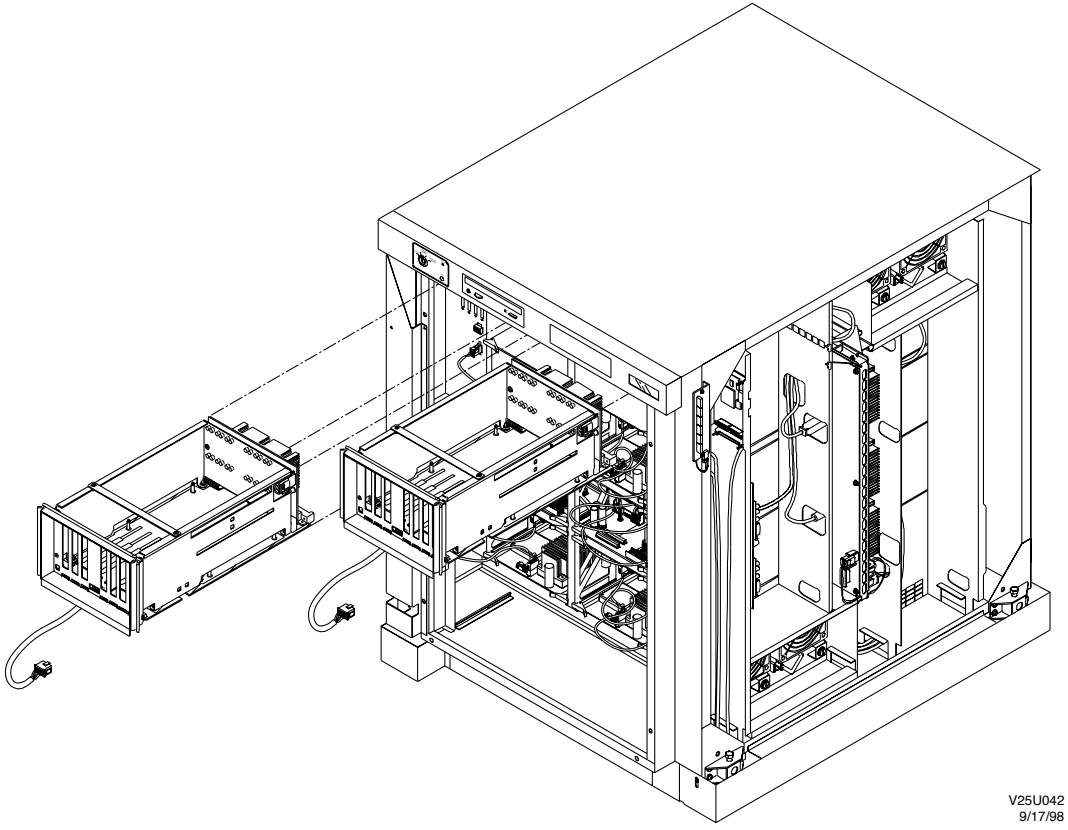


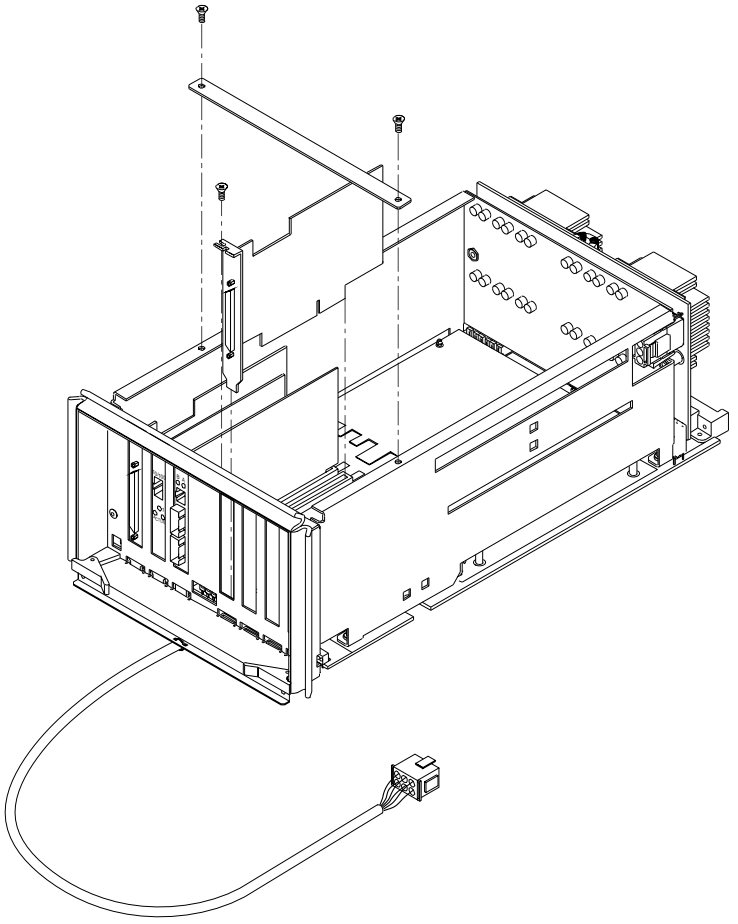
Figure 28 Removing the V22X0 PCI cardcages



Removing the controllers

Figure 29 shows a PCI controller and the PCI cardcage.

Figure 29 Removing a PCI controller from a V22X0 PCI cardcage



For each controller in the PCI cardcage:

Step 1. Remove the two screws that secure the bracket to the top of the cardcage.

Step 2. Remove the screw on the faceplate of each PCI controller. Retain the screws for later use.

Step 3. Remove the controllers by grabbing the edges of the boards and pulling upward until the controllers are free from the PCI connectors.

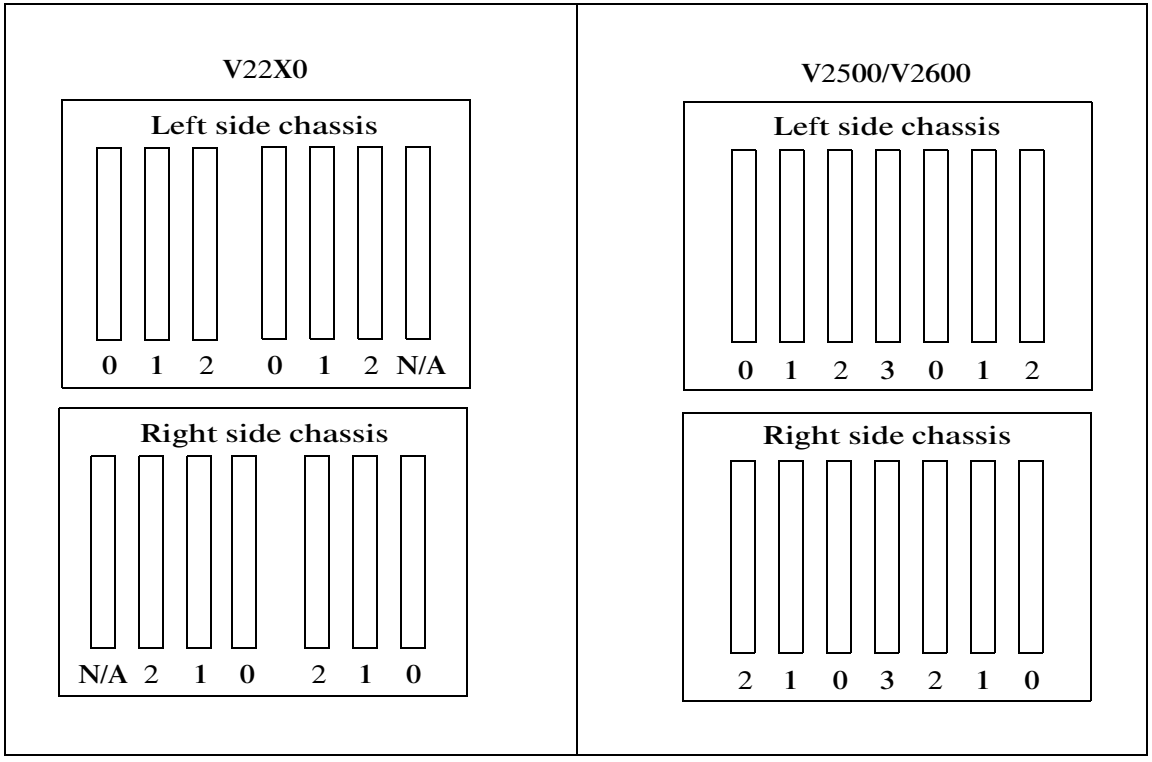
Step 4. Transfer the PCI controllers to the V2500/V2600 PCI cardcage, see "Installing the controllers."

Installing the controllers

NOTE It is important to take into account the position of the extra slot in the V2500/V2600 cardcage when planning the transfer of controllers from the V22X0 cardcage.

Figure 30 shows the differences between the V22X0 and V2500/V2600 PCI cardcage slot configurations.

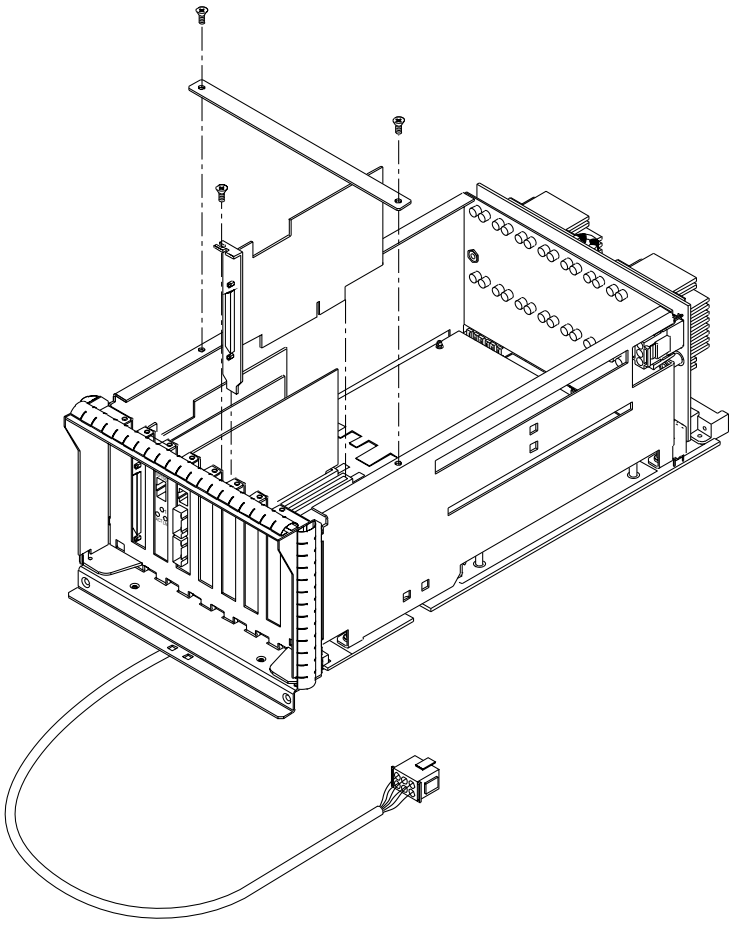
Figure 30 **V22X0 and V2500/V2600 PCI cardcage slot differences**



Step 1. Insert the controllers in the corresponding slots in the V2500/V2600 PCI cardcage. Secure each controller in position by installing the screw in its faceplate.

NOTE Verify that the faceplate of each card to be installed is centered in the chassis opening and secure against the front of the chassis gasket before installing the screw in the faceplate.

Figure 31 Installing a PCI controller in a V2500/V2600 PCI cardcage



Step 2. After all controllers have been transferred install the bracket on the top of the PCI cardcage. Attach with two screws.

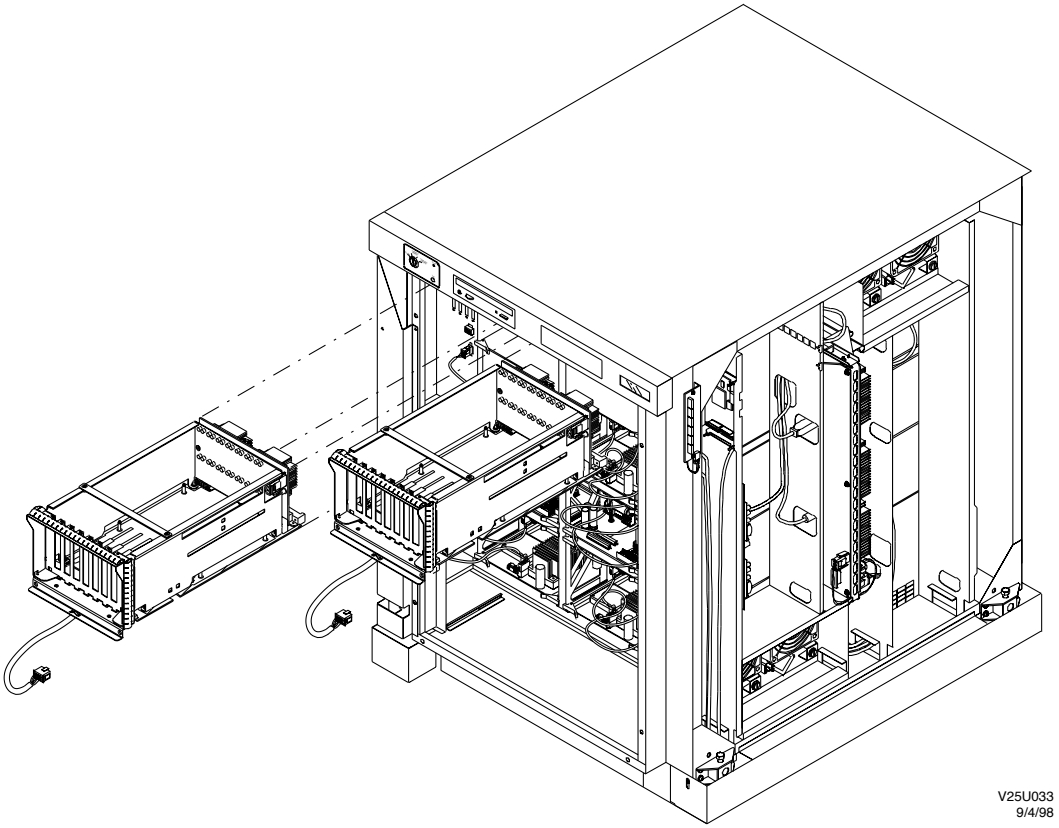
Installing the PCI cardcages

Step 1. Install each PCI cardcage into the chassis by lining up the PCI cardcage with the guide rails. Continue sliding the PCI cardcage into the chassis and secure it using the two extractor levers.

Step 2. Connect the power cable from each PCI cardcage to the chassis.

Step 3. Attach any cables disconnected during removal to their proper locations.

Figure 32 Installing the PCI cardcages



Installing the EMI panels and circuit board restraint brackets

See Figure 33 on page 89 for details. For each side of the chassis:

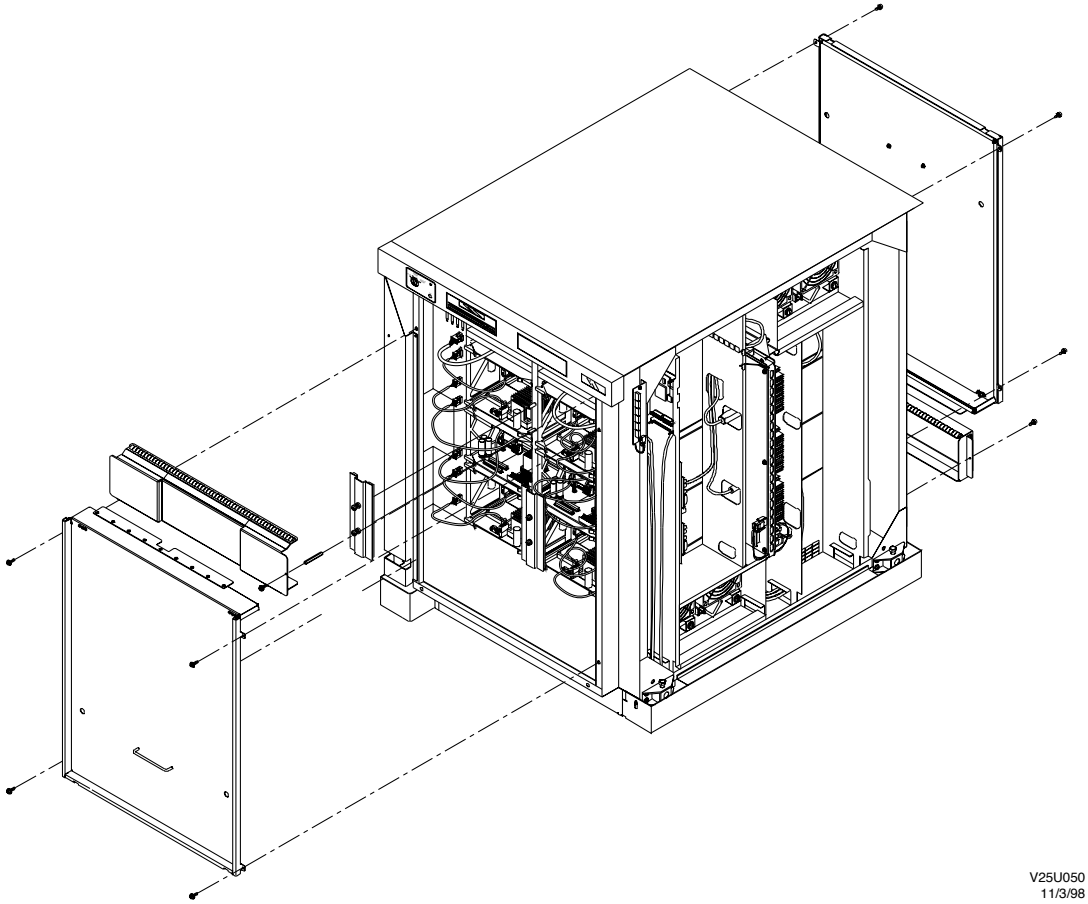
Step 1. Unpack the new PCI area EMI panels from their containers.

Step 2. Fasten the two board restraint brackets on both sides of the chassis by using two thumbscrews.

Step 3. Fasten the larger EMI panel to the chassis by using four screws.

Step 4. Install the new smaller EMI panel by installing the screw and standoff that fastens the panel to the chassis.

Figure 33 Installing side skin and EMI panels



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Fan assemblies

The following sections provide instructions for the removal and replacement of the fan assemblies.

Read this entire section before beginning the procedure.

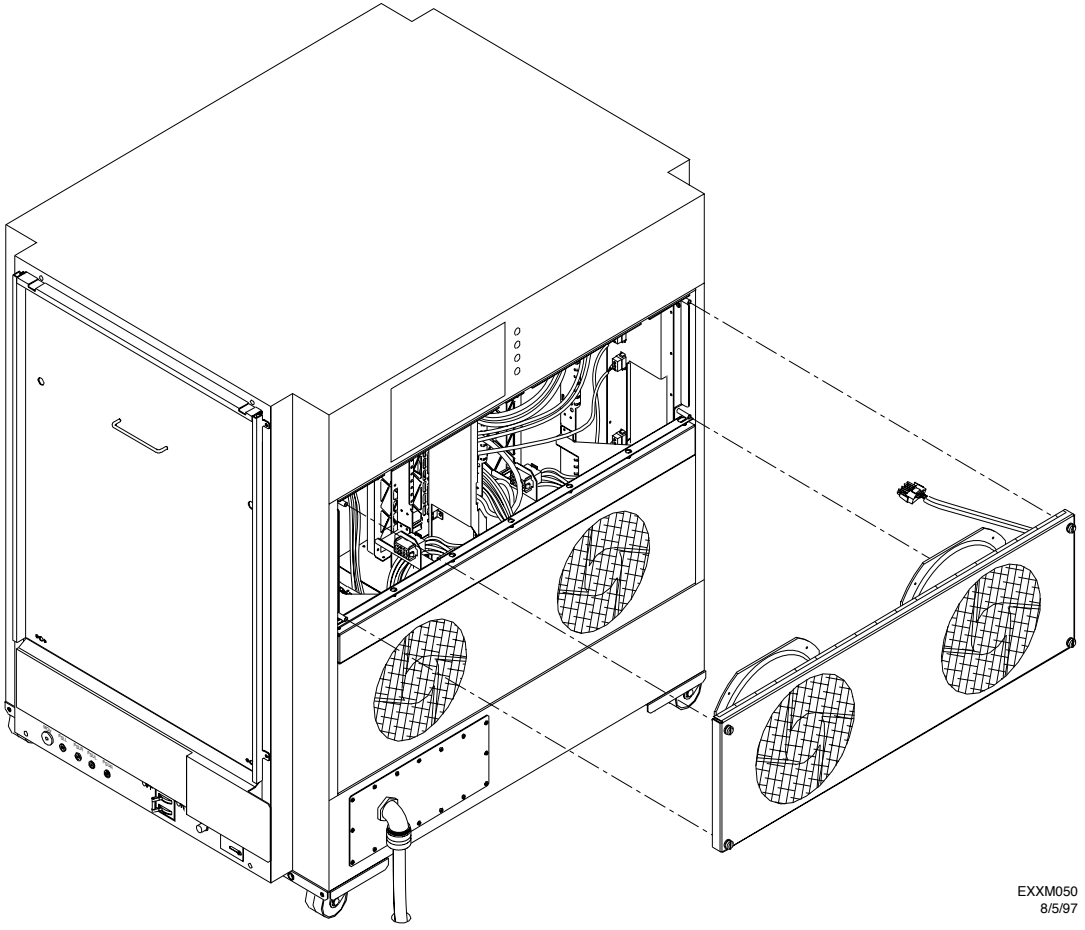
Removing the V22X0 fan assembly

Perform the following procedure on both fan assemblies. Figure 34 shows the fan assembles.

Step 1. Loosen the four captive screws securing the fan assembly.

Step 2. Disconnect the fan assembly power cable from the chassis.

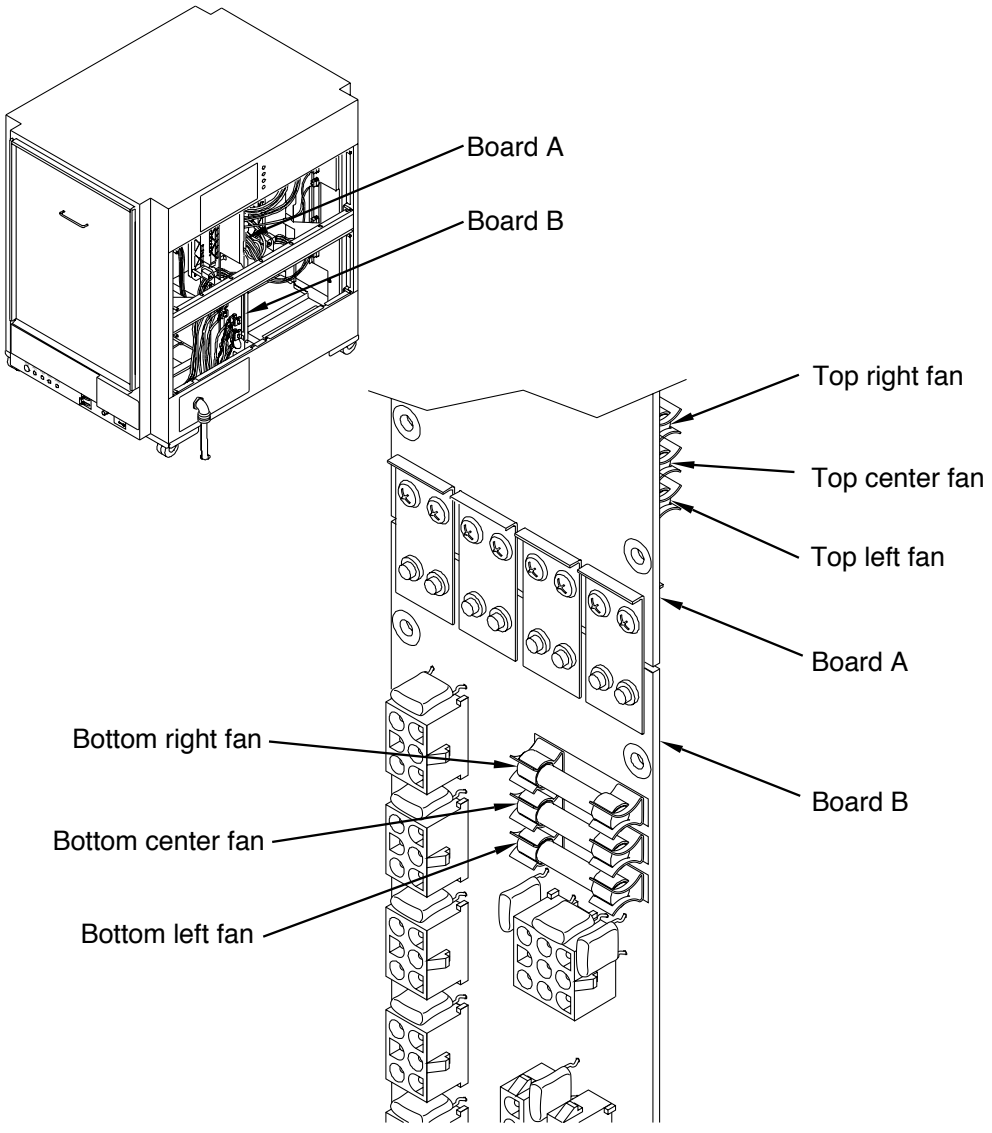
Figure 34 Removing the fan assembly



Checking the fan fuses

Ensure that all the fan fuses are installed. See Figure 35 for fan fuse locations.

Figure 35 Checking the fan fuses



Installing the V2500/V2600 fan assembly

The upper and lower fan assemblies are oriented differently. See Figure 36 on page 94 for proper orientation.

Installing a fan frame

Complete the following procedure for each of the two fan frames:

Step 1. Orient the fan frame according to its position in the chassis.

NOTE

Each fan frame has a flange on three sides. The fan frames mate on the side without the flange. See Figure 36 on page 94.

Step 2. Position the fan frame with the lower lip in the chassis.

Step 3. Connect the fan power cable to the appropriate chassis receptacle as shown in Figure 37 on page 95.

Step 4. Carefully position the fan frame in the chassis.

Step 5. Secure with four screws.

Figure 36 **Fan and fan frame orientation**

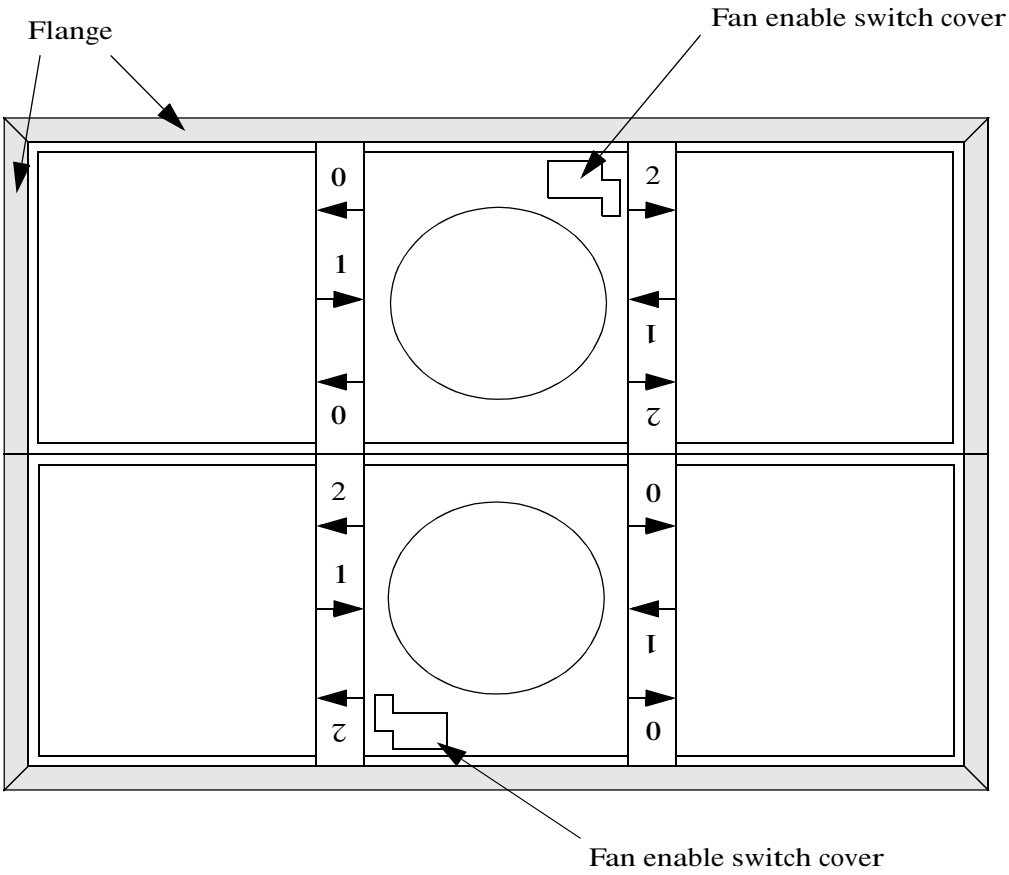
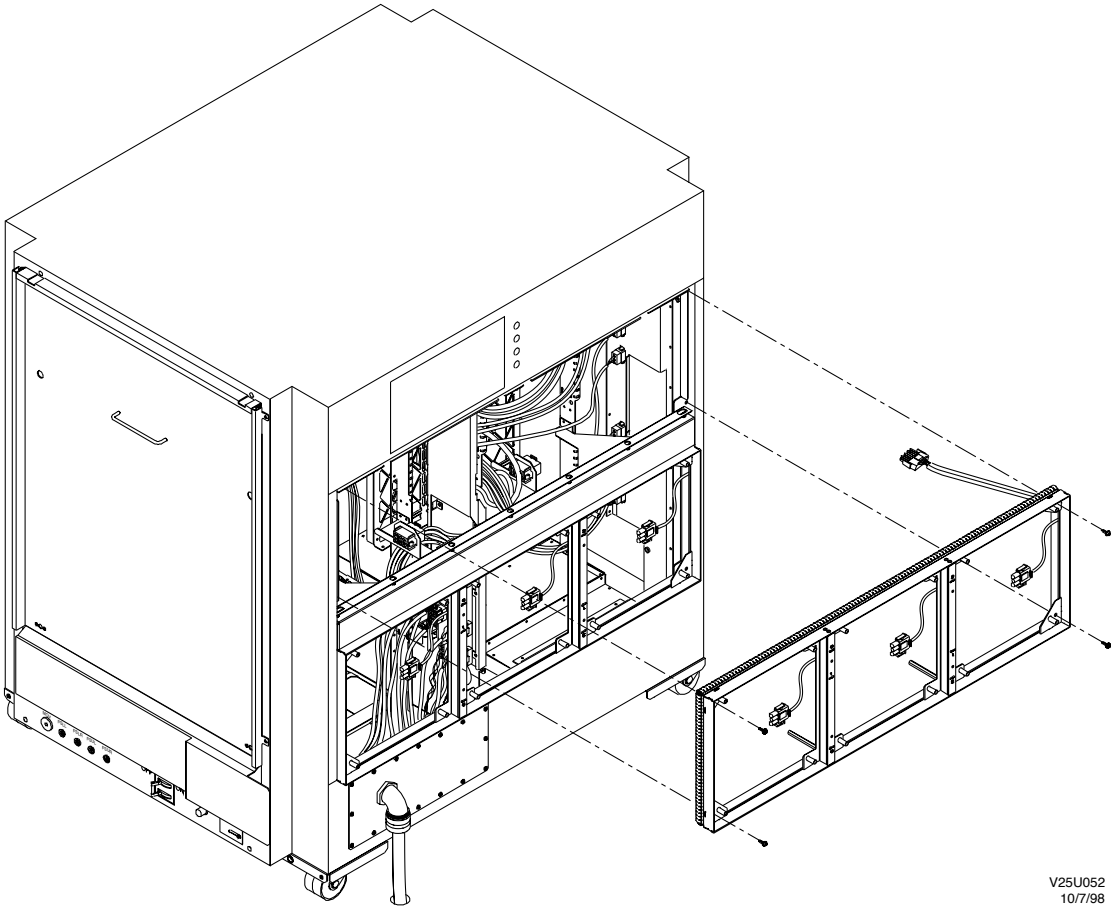


Figure 37 Installing the V2500/V2600 fan frame



Installing a fan panel in the fan frame

Complete the following procedure for each of the fan panels:

NOTE For each fan frame, install the center fan panel first.

Step 1. Detach the fan switch cover from the fan panel by removing the phillips head screw. Retain the cover and screw for later use.

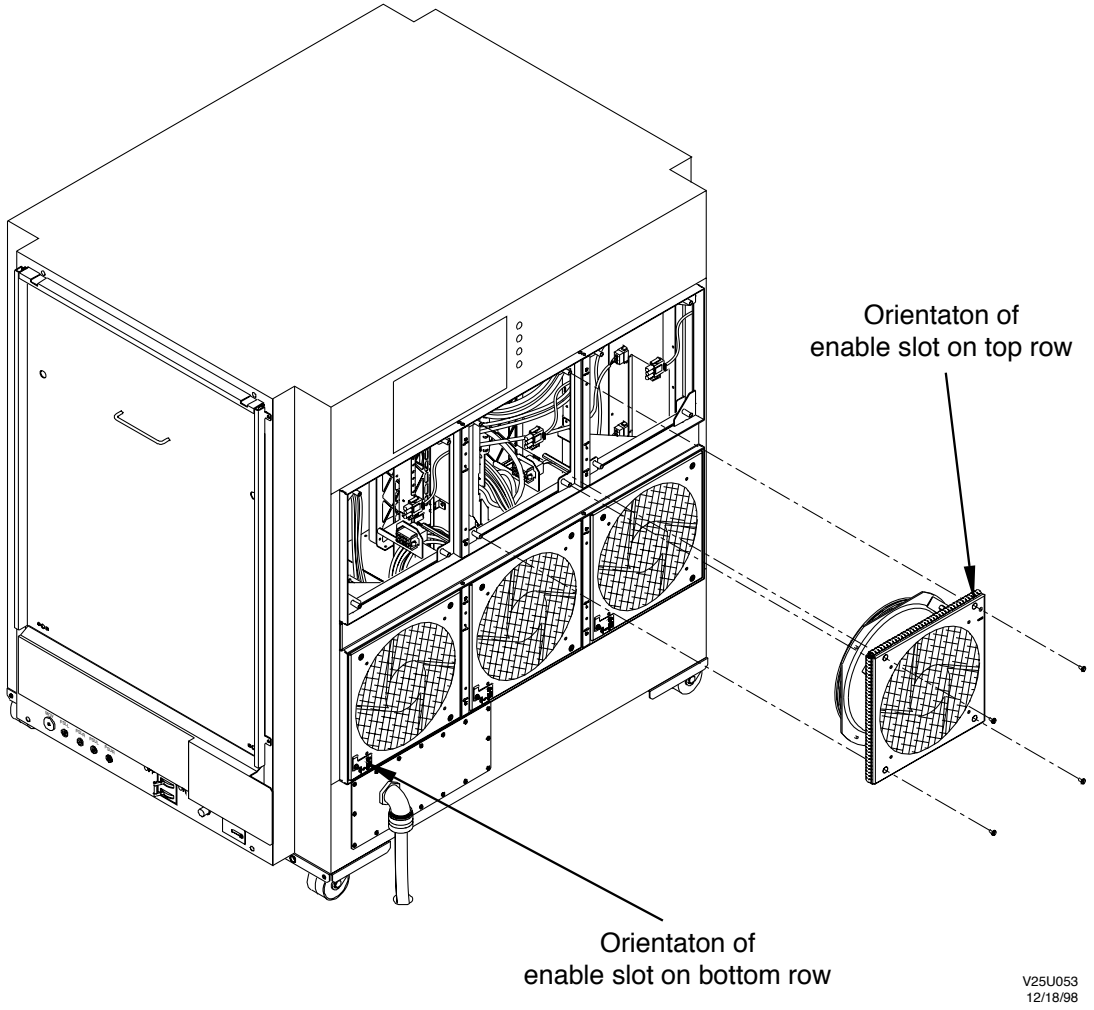
Step 2. Orient the fan panel according to its position in chassis. See Figure 38 on page 97 for the proper orientation.

Step 3. Connect the fan panel power cable to the fan frame power cable.

Step 4. Carefully align and insert the fan panel in the fan frame.

Step 5. Secure with four screws.

Figure 38 Installing a V2500/V2600 fan panel

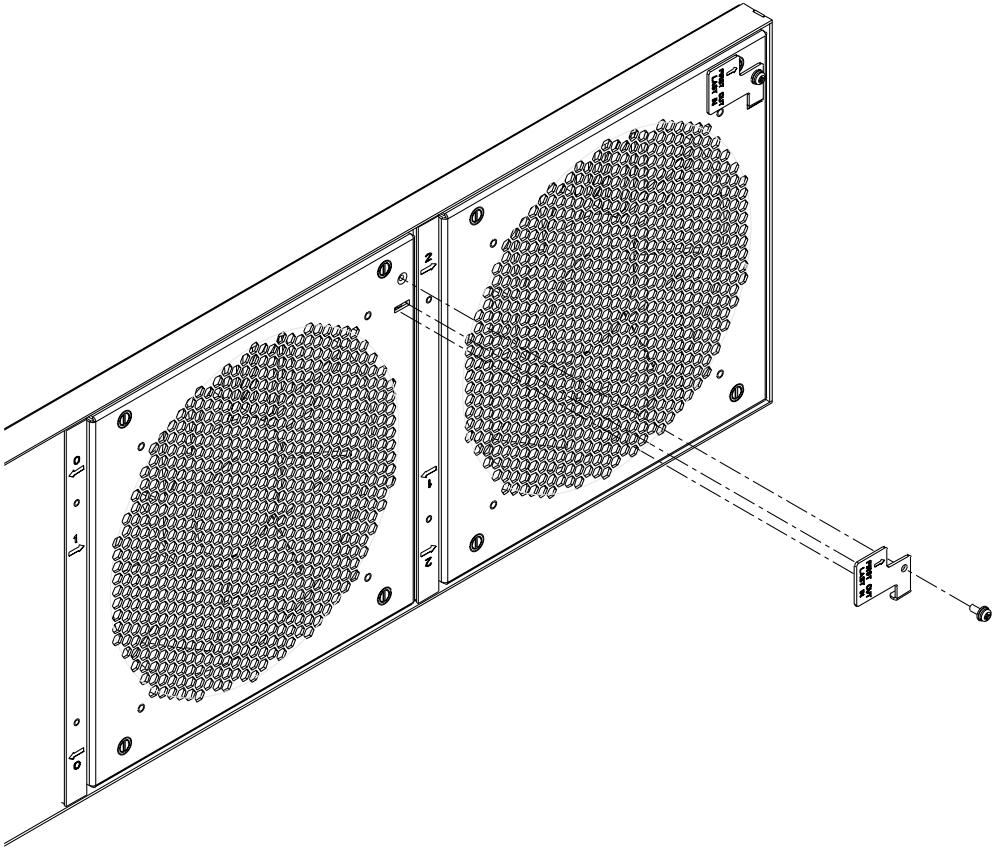


Installing a fan switch cover

Step 1. Orient the fan switch cover on the fan panel so that the switch cover tab is inserted in the slot as shown in Figure 39.

Step 2. Secure the fan switch cover to the fan panel using a phillips head screw.

Figure 39 Installing a fan switch cover



Packing the V22X0 fan assemblies for return

Pack the V22X0 fan assemblies in the V2500/V2600 fan assemblies' shipping containers.

6 Configuration and verification

This chapter contains the procedures used to configure the system and verify its functionality following the upgrade process.

Powering up the system

Step 1. Ensure that the keyswitch on the operator panel is in the **DC OFF** position.

Step 2. Set the site ac circuit breakers to **ON** or plug the server back into the main power supply.

CAUTION Hazardous voltages are present inside the server cabinet while the site ac circuit breakers are set to **ON**.

Step 3. Set the main circuit breaker to **ON**. The main circuit breaker is located at the right of the cabinet as shown in Figure 40 on page 101.

NOTE The green light next to the circuit breaker indicates that power is present at the power plug and will remain on after the main circuit breaker on the system is set to **OFF**.

Step 4. Verify that the AC power (amber) LED on each of the newly installed power supplies is on. See Figure 41 on page 102 for LED locations.

Step 5. Set keyswitch on the operator panel to the **DC ON** position.

Step 6. Verify that the DC power (green) LED on each of the newly installed power supplies is on.

Step 7. Verify that the attention indicator on the front of the cabinet is not flashing and is on. See "Attention light bar" on page 116 for more information.

Step 8. At the sppconsole window, press a key if the following message appears:

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

This message appears only if autoboot is enabled, otherwise the command prompt appears.

Figure 40 Main circuit breaker

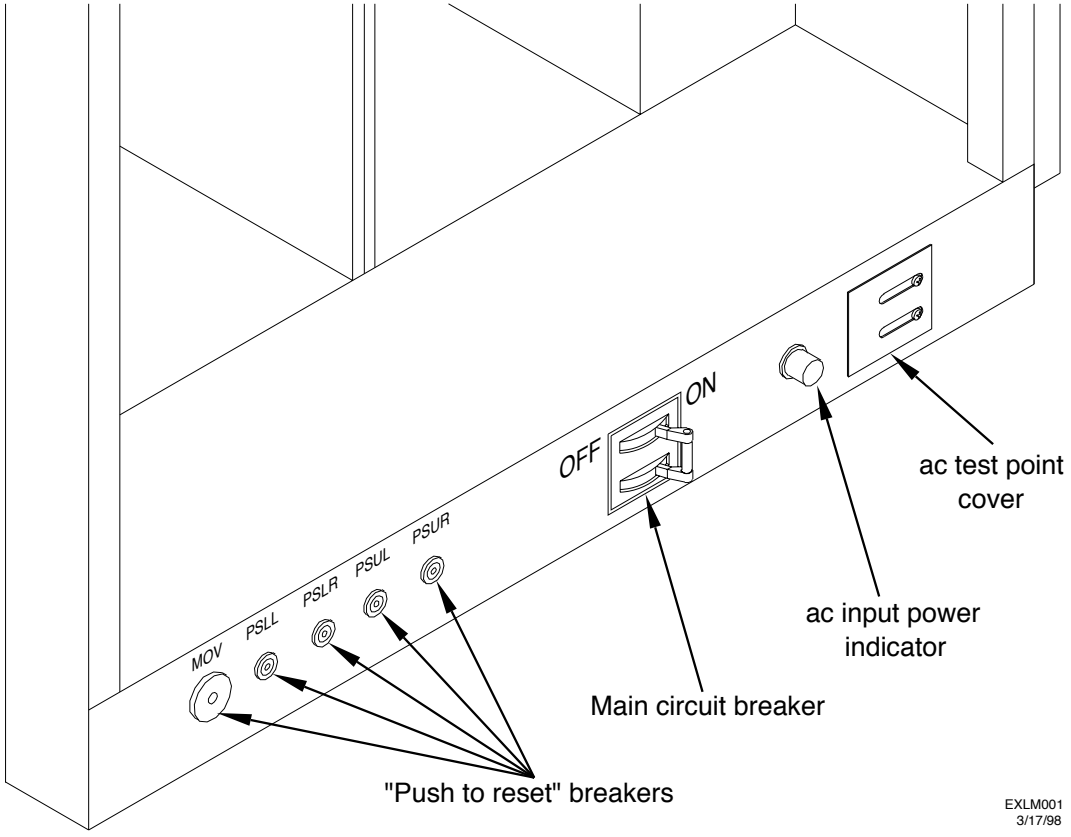
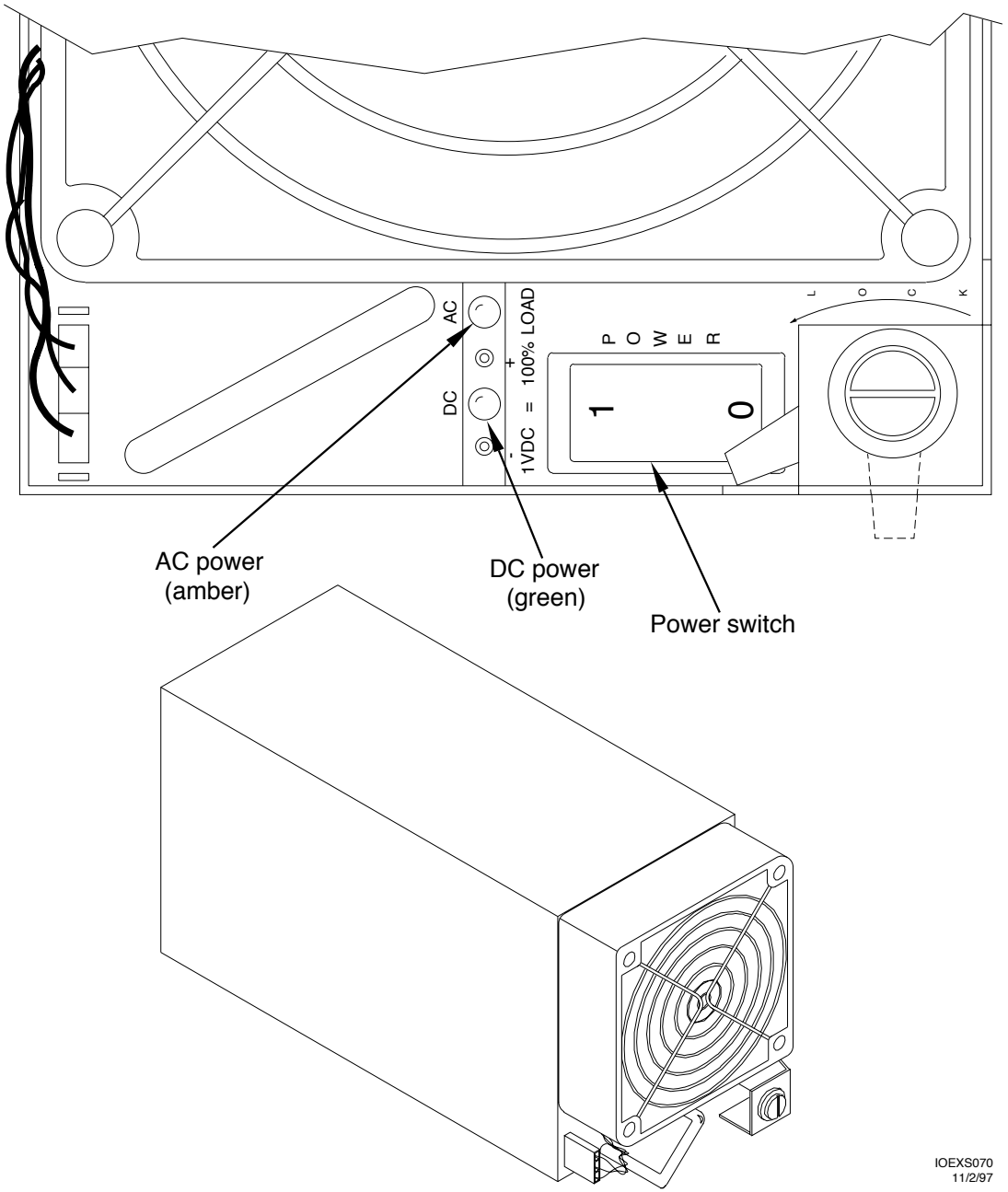


Figure 41 **Power supply LEDs**



Completing the V2500/V2600 teststation software installation instructions

Complete the remainder of the V2500/V2600 teststation software installation instructions contained in the *V2500/V2600 Test Station Software Release Notice*.

Resume the procedure at the point where `swinstall` has completed and you have rebooted the teststation using the `/etc/reboot` command. Refer to "Updating teststation software" on page 39.

NOTE

This point is "Step 8" of the *V2500 Test Station Software V1.0 Release Notice*. This may change as the Release Notice is updated.

The following tasks will be completed by following the remaining instructions in the *V2500/V2600 Test Station Software Release Notice*.

- Configuring the V2500/V2600 server—Running `ts_config`
- Updating the EPROM
- Updating the Symbios FCODE

  See Appendix C, "Checking Symbios FCODE revision levels" for additional information.
- Checking the firmware and diagnostic revision levels

Using `xconfig`

`xconfig` is an X-based tool that allows the user to view and modify the system configuration. This tool gives the user the capability to view active and inactive components of a node.

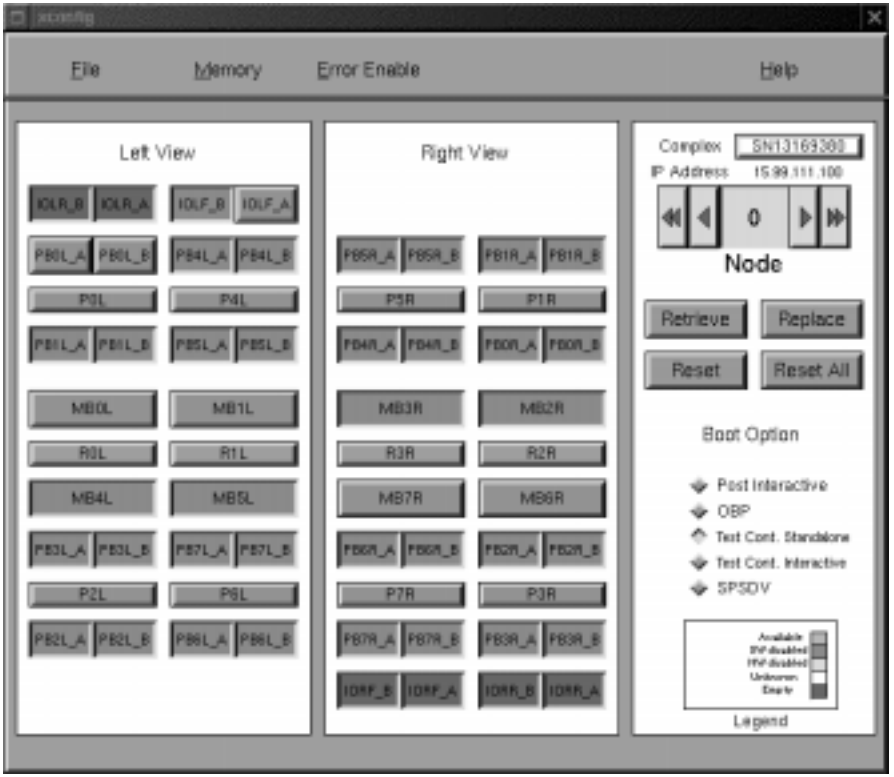
Step 1. Select the ksh window and enter:

```
xconfig
```

The `xconfig` window appears, as shown in Figure 42.

There is a legend in the lower right of the screen. A green box indicates the component is present and enabled. A blue box means the component slot is empty.

Figure 42 **V2500/V2600 xconfig display**



Step 2. Ensure that all the processor cards are recognized by examining the screen for green boxes containing the label “PB” followed by the location.

In Figure 42 on page 104, “P0L” refers to the processor board in position 0 on the left side. Position numbers range from 0 to 7 on both the right and left side of the system. "PB0L_A" and "PB0L_B" refer to individual processor locations on a dual processor board.

Step 3. Ensure that all the memory boards are recognized by examining the screen for green boxes containing the label “MB” followed by the location.

In Figure 42 on page 104, “MB0L” refers to the memory board in position 0 on the left side. Position numbers range from 0 to 7 on both the right and left side of the system.

You may also select “Memory” from the `xconfig` window menu bar to see the total amount of memory displayed in megabytes.

Step 4. Ensure that all the PCI cardcages you installed are recognized by examining the screen for green boxes containing the label “IO” followed by the location.

In Figure 42 on page 104, “IOLRB” and “IOLRA” refer to the cardcage in rear position on the left side.

Checking the current V2500/V2600 memory configuration using **dcm**

Use dcm to check the existing memory configuration.

Step 1. Run dcm by entering:

```
$ dcm 0
```

Figure 43 is an example of the part of a dcm output showing the memory configuration of a system.

Figure 43 Example V2500/V2600 **dcm** script, partial listing

```
Physical: L=128MB, M=64MB, S=16MB     Logical: 1=18MB, m=64MB, s=16MB

(If logical memory not specified, then it matches physical memory size)

* = Software Deconfigured       - = Not In Use

EWMB0:
======
EWMB0: Q0B0 L/L        Q1B4 L/L        Q2B0 -/-       Q3B4 -/-
EWMB0: Q0B1 L/L        Q1B5 L/L        Q2B1 -/-       Q3B5 -/-
EWMB0: Q0B2 L/L        Q1B6 L/L        Q2B2 -/-       Q3B6 -/-
EWMB0: Q0B3 L/L        Q1B7 L/L        Q2B3 -/-       Q3B7 -/-

EWMB1:
======
EWMB1: Q0B0 L/L        Q1B4 L/L        Q2B0 -/-       Q3B4 -/-
EWMB1: Q0B1 L/L        Q1B5 L/L        Q2B1 -/-       Q3B5 -/-
EWMB1: Q0B2 L/L        Q1B6 L/L        Q2B2 -/-       Q3B6 -/-
EWMB1: Q0B3 L/L        Q1B7 L/L        Q2B3 -/-       Q3B7 -/-
```

DIMM size / DIMM size

Memory board location

Row 0 / Row 1 **Row 0 / Row 1** **Row 2 / Row 3** **Row 2 / Row 3**

Bus

Quadrant

The memory board location is displayed in the upper left corner of the detailed board data. In Figure 43, two boards are shown, EWMB0 and EWMB1.

A quadrant is depicted as a vertical list of quadrant and bus numbers. In Figure 43, for example, Q0B0, Q0B1, Q0B2, and Q0B3 are the DIMMS in quadrant 0. Q1B0, Q1B1, Q1B2, and Q1B3 are the DIMMS in quadrant 1, and so on. The first two characters indicate the quadrant number and the last two characters indicate the bus number. For example, Q0B0 refers to the DIMM in quadrant 0, bus 0.

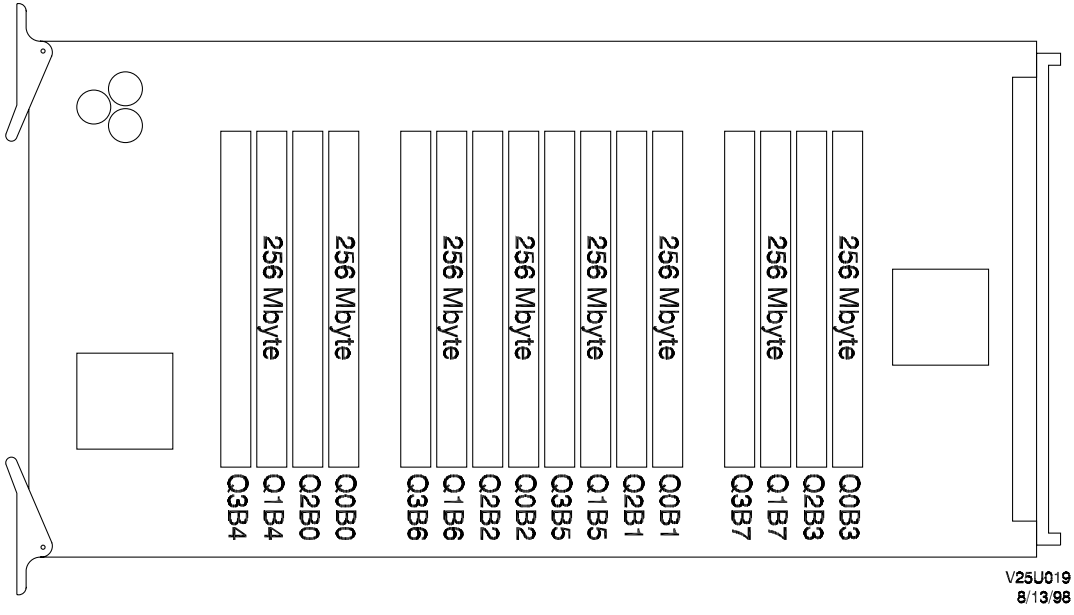
Located to the right of each quadrant and bus number are the letters representing the size of the DIMM installed in that slot. Because these are Dual In-line Memory Modules, a 256-Mbyte DIMM is represented as L/L, 128 Mbytes on each side of the DIMM. A 32-Mbyte DIMM would be listed as S/S.

Physical memory, represented by an uppercase L, M, or S, is memory that has not been deconfigured by hardware or software. Logical memory, designated by a lowercase l, m, or s, is memory that has been altered by hardware or software to meet the memory configuration rules.

In Figure 43, two rows are designated - / -. This indicates that these two rows have no DIMMs installed.

Figure 44 shows a V2500/V2600 memory board configured as reported by this `dcm` example.

Figure 44 DIMM Locations for example dcm script



Running diagnostics

Run the following diagnostics. Refer to the *HP Diagnostic Guide: V2500/ V2600 Servers* for specific information about each diagnostic.

`est`

`r` (Scan ring test)

`d` (Board level dc tests)

`a` (Board level ac tests)

`mem3000`

`cpu3000`

If a problem occurs refer to Chapter 7, “Troubleshooting” for troubleshooting guidelines.

Setting the complex serial number

This section contains the procedure that allows you to set the complex serial number and retain your original software identification number (SWID).

Customer applications will *not* have to be relicensed following this procedure. The SWID should only be retained in cases where a V22X0 is upgraded to a V2500/V2600 on site.

NOTE Both the V2500 and V2600 use the same SSKey program selections.

Retaining the original SWID

Step 1. Bring up the sppdsh prompt at a teststation window by entering:

hostname(complex):working_directory$ **sppdsh**

Step 2. Display the Mid-plane Interconnect Board (MIB) serial number. At the sspdsh prompt enter:

sppdsh(complex)**: cop 0 mib**

Step 3. Record the MIB serial number minus any leading zeros.

MIB serial number _____

Step 4. Start the SSKey program.

Step 5. Enter the appropriate SSKey passwords. SSKey displays the following menu:

```
Available Functions:

  I : SS_CONFIG & Diagnostic Password (I)nformation
  K : Compute SS_CONFIG Password (K)ey
  S : (S)oftware ID -> Product#/Serial#
  P : (P)roduct#/Serial# -> Software ID
  C : (C)lock Calibration
  D : (D)iagnostic Passwords
  2 : V2(2)X0 Activation Key
  U : V22X0 to V2500 Field (U)pgrade Activation Key
  5 : V2(5)00 Activation Key
  Q : (Q)uit Program

Enter your selection (i/k/s/p/c/d/2/u/5/q):
```

Step 6. Select the V2500 Activation Key by entering **U**, as shown in the following output example:

```
Enter your selection (i/k/s/p/c/d/2/5/q):U
```

SSKey will display the following output.

NOTE

Figure 45, "SSKEY output example", shows the SSKEY program's self-documenting output and is not part of the instructions in this procedure. Proceed to Step 7 immediately following Figure 45.

Figure 45 SSKey output example

```
Function: V22X0 to V2500 Field upgrade Activation Key

This process enables you to retain the original SWID after the hardware upgrade.

The single node's 10-digit cabinet serial number, located on the rear of the
cabinet, becomes the complex serial number. The V22X0 5-digit complex serial
number is retained as the SWID.

The serial number format is "ccnnnnnnnn" where
cc is the manufacturer country code
nnnnnnnn is a numeric sequence
Valid country codes are: US for all but Europe and DE for Europe.

Generate the activation key by entering the complex serial number below. The key
is later used with the sppdsh's assign command on the Service Support Processor.

When using the assign command, backplane # is the MIB serial number. Enter the
two parameters: SWID upper and SWID lower to retain the V22X0 SWID as the V2500
SWID. The SWID upper value will always be 0. The SWID lower value is the V22X0 5-
digit complex serial number.

assign command format:

sppdsh> assign <node id> <backplane #> [<complex serial  #> [<swid upper> <swid
lower>] <key>]

Example: assign 0 2014982 US01234567 0 34567 0x1234567
```

Step 7. Enter the 10-digit serial number on the back of the cabinet as the complex serial number:

```
Enter Complex Serial number (or <Enter> for Main Menu)? 10-digit_serial_number
```

Example output:

```
Assignment Key ID = 0x000b1cd04a94ddba
Assignment Key = 0xfc23a121
```

Step 8. Record the hexadecimal value of the Assignment Key returned by the `SSKey` program.

Assignment Key _____

Step 9. Exit the `SSKey` program.

Step 10. Assign the complex serial number and set the SWID using the `assign` command at the `sppdsh` prompt.

`assign` *`Node_id MIB_serial_number complex_serial_number swid_upper swid_lower Assignment_Key`*

Node id	The node number is 0
MIB_serial_number	See Step 3 on page 109.
complex_serial_number	See Step 7.
swid_upper	This value is always 0.
swid_lower	See "Recording important information" on page 38.
Assignment_Key	See Step 8.

Step 11. Power cycle the node by toggling the keyswitch on the node's operator panel.

WARNING **Do not allow the system to boot to OS.**

Step 12. Verify that the database generation completed by looking in the message output window for the following message:

`Database Generation is complete.`

Step 13. Boot to the OS. At the Command prompt enter:

`Command:` **`boot`**

Step 14. Login in as root and enter the password.

Step 15. Verify the SWID number by using the `uname` command. Enter:

`uname -i`

Running `ioscan`

Run the online utility, `ioscan`, by entering `ioscan` at the HP-UX prompt in the sppconsole window.

If a problem occurs refer to Chapter 7, “Troubleshooting” for troubleshooting guidelines.

7 Troubleshooting

This chapter is a general troubleshooting guide. For more detailed troubleshooting information refer to the *V2500/V2600 Familiarization Guide*, the *HP Diagnostics Guide: V2500/V2600 Servers*, and the *Troubleshooting V2500 HPMCs* web page at:

http://fesweb.corp.hp.com/dewold/v2500/v-2500.htm

NOTE The procedures in this section assume that all the skins, covers, and panels have already been removed.

Subjects covered in this chapter are:

General troubleshooting

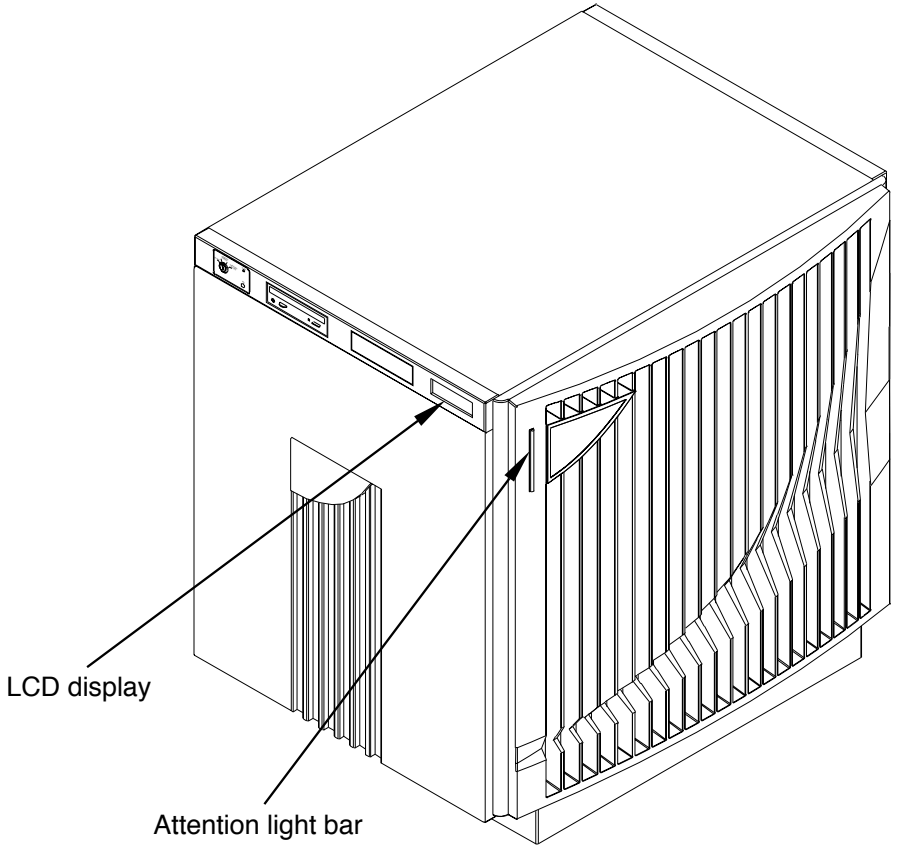
Use these general guidelines to troubleshoot problems resulting from the upgrade:

- Check indicators.
  - Attention light bar
  - LCD panel
  - Node power supply LEDs
- Observe POST LCD and console messages.
- Confirm that all installed boards and cardcages are recognized by:
  - `xconfig`
  - `dcm`
  - `ioscan`
- Check that connectors and boards are installed properly.
- Verify that the new processor boards conform to the recommended configuration sequence shown in “Planning the processor board upgrade” on page 19.
- Verify that the new memory boards conform to the recommended configuration sequence shown in “Planning the memory board upgrade” on page 26.
- Verify that all memory boards are configured correctly and identically. Refer to Appendix A, “Memory configurations” for configuration information.

Checking indicators

The V-Class servers provide three means of displaying status and error reporting: an LCD, an Attention light bar, and the CUB environmental LEDs.

Figure 46 System displays



Attention light bar

The Attention light bar is located at the top left corner on the front of the V2500/V2600 server as shown in Figure 46 on page 115. The light bar displays system status in three ways:

- OFF—dc power is turned off. Either the key switch or the side circuit breaker is in the off position.
- ON—Both the side circuit breaker and the keyswitch are in the on position and no environmental warning, error, or hard error exists.
- Flashing—There is an environmental error, warning, or hard error condition. Also indicates scanning during diagnostic execution.

NOTE The light bar flashing during initial start up does not indicate a fault.

The types of environmental conditions that are monitored include:

- ASIC installation error sensing
- ASIC configuration or status
- 48V failure

NOTE 48V failures are cleared only after a power cycle.

- Power failure sensing
- Fan sensing
- Thermal sensing

Types of environmental control functions monitored include:

- Power-on
- Voltage margining (SSP interface)

Environmental errors

Environmental errors are detected by two basic systems in the V2500/V2600 server: Power-On and Environmental Monitor Utility Chip (MUC).

Power-On detected errors such as ASIC install or ASIC not OK are detected immediately and will not allow dc power to turn on until that condition is resolved.

MUC detected errors such as Ambient Air Hot will allow the dc power to turn on for approximately 1.2 seconds before the dc power is turned off. If two or more fans fail simultaneously, the MUC will shut off dc power. Other MUC detected errors such as Ambient Air Warm will flash the LED and not turn off dc power.

Error codes may be viewed by using the SSP `sppdsh` command `pce` to read the status of the CUB LEDs. However, this feature will only work after database generation is complete, not before.

The current environmental temperature set-points are:

- Warm = 32 degrees Celsius (89.6 degrees Fahrenheit)
- Hot = 37 degrees Celsius (98.6 degrees Fahrenheit)

Displaying the CUB LED values using pce

Use the `sppdsh` command `pce` to display the value of the LEDs on the CUB.

Step 1. Bring up the `sppdsh` prompt at a sppuser window by entering:

```
$ sppdsh
```

Step 2. Use the `pce` command to display the LED values for all nodes, enter:

```
sppdsh: pce all
```

```
Node     IP address Clocks      LEDS   @C U SHPT Supply1 Supply2 Supply3 Supply4
------------------ ------ --------- ---- ------ ------- ------- ------- -------
  0   15.99.111.116 Normal   0x00      25 1 0000 Nominal Nominal Nominal Nominal
  2   15.99.111.117 Normal   0x00      25 1 0000 Nominal Nominal Nominal Nominal
```

For more information about the `pce` command see the sppdsh man page.

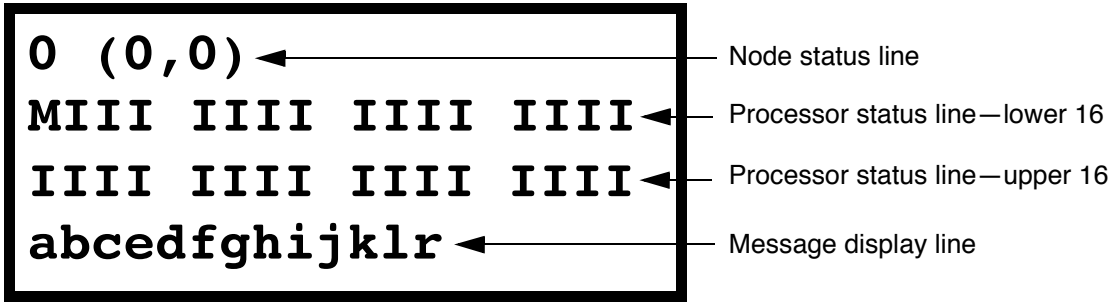
Step 3. Decode the LED values using LED man page.

Refer to the *V2500/V2600 Service Guide* for more information about the CUB environmental LEDs.

LCD (Liquid Crystal Display)

The LCD display is located on the right of the operator panel, as shown in Figure 46 on page 115. The LCD is a 20-character by 4-line liquid crystal display. Figure 47 shows the display and indicates what each line on the display means.

Figure 47 Front panel LCD



When the operator panel key switch is turned on, the LCD powers up, but is initially blank.

Power-On Self Test (POST) takes about 20 seconds to start displaying output to the LCD. POST is described in the *HP Diagnostics Guide: V2500/V2600 Servers*. The following explains the output shown in Figure 47:

Node status line

The Node Status Line shows the node ID in both decimal and X, Y topology formats.

Processor status line

The processor status line shows the current run state for each processor in the node. Table 13 shows the initialization step code definitions and Table 14 shows the run-time status codes. The M in the first processor status line stands for the monarch processor.

Table 13 **Processor initialization steps**

Step	Description
0	Processor internal diagnostic register initialization
1	Processor early data cache initialization.
2	Processor stack SRAM test.(optional)
3	Processor stack SRAM initialization.
4	Processor BIST-based instruction cache initialization.
5	Processor BIST-based data cache initialization.
6	Processor internal register final initialization.
7	Processor basic instruction set testing. (optional)
8	Processor basic instruction cache testing. (optional)
9	Processor basic data cache testing. (optional)
a	Processor basic TLB testing. (optional)
b	Processor post-selftest internal register cleanup. (optional)

Table 14 **Processor run-time status codes**

Status	Description
R	RUN: Performing system initialization operations.
I	IDLE: Processor is in an idle loop, awaiting a command.
M	MONARCH: The main POST initialization processor.
H	HPMC: processor has detected a high priority machine check.
T	TOC: processor has detected a transfer of control.
S	SOFT_RESET: processor has detected a soft RESET.
D	DEAD: processor has failed initialization or selftest.

Status	Description
d	DECONFIG: processor has been deconfigured by POST or the user.
-	EMPTY: Empty processor slot.
?	UNKNOWN: processor slot status in unknown.

Message display line

The message display line shows the POST initialization progress. This is updated by the monarch processor. The system console also shows detail for some of these steps. Table 15 shows the code definitions.

Table 15 Message display line

Message display code	Description
a	Utilities board (SCUB) hardware initialization.
b	Processor initialization/selftest rendezvous.
c	Utilities board (SCUB) SRAM test. (optional)
d	Utilities board (SCUB) SRAM initialization.
e	Reading Node ID and serial number.
f	Verifying non-volatile RAM (NVRAM) data structures.
g	Probing system hardware (ASICs).
h	Initializing system hardware (ASICs).
i	Probing processors.
j	Initialing, and optionally testing, remaining SCUB SRAM.
k	Probing main memory.
l	Initializing main memory.
r	Enabling system error hardware.

Power supply indicators

When the keyswitch on the operator panel is in the **DC ON** position both the AC power (amber) LED and the DC power (green) LED on each of the power supplies should be on. See Figure 41 on page 102 for LED locations.

Checking POST console messages

POST has three types of messages: LCD, console, and error. This section discusses console and error messages. LCD messages are covered in “LCD (Liquid Crystal Display)” on page 118..

Console messages

POST provides several messages that are displayed on the SSP console. This section describes these console messages.

Type-of-boot

This message reports the type of boot for the current POST execution, and the node ID and monarch processor.

Typical message:

```
POST Hard Boot on [0:PB1R_A]
```

Version and build

This message reports the version and build information for POST.

Typical message:

```
HP9000/V2500_V2600 POST Release 2.0, compiled 1998/11/04 14:33:12
```

Processor probe

This message reports where the processors are in the system. Only available processors are reported; any failing or deconfigured processors are not listed. Processors in this list may be deconfigured if they share a Runway bus with a processors that fails the probe or is deconfigured.

Typical message:

```
Probing CPUs:    PB0L_A PB0R_A PB1R_A PB1L_A PB2L_A PB2R_A PB3R_A PB3L_A
                 PB4L_A PB4R_A PB5R_A PB5L_A PB6L_A PB6R_A PB7R_A PB7L_A
                 PB0L_B PB0R_B PB1R_B PB1L_B PB2L_B PB2R_B PB3R_B PB3L_B
                 PB4L_B PB4R_B PB5R_B PB5L_B PB6L_B PB6R_B PB7R_B PB7L_B
```

Utility board initialization

This message reports that the Utilities board SRAM reserved for missing or unavailable processors is being initialized. The SRAM is tested prior to initialization if `scuba_test_enable` is true.

Typical message:

```
Completing core logic SRAM initialization.
```

Main memory initialization

This message reports that main memory initialization has started.

Typical message:

```
Starting main memory initialization.
```

Memory probe

This message reports the status of the memory boards as they are detected and probed for DIMMs

Typical message:

```
Probing memory: MB0L MB1L MB2R MB3R MB4L MB5L MB6R MB7R
```

Installed memory

This message reports the total memory installed and available, in megabytes.

Typical message:

```
Installed memory: 2048 MBs, available memory: 2048 MBs
```

Main memory initialization started

This message marks the beginning of main memory initialization.

Typical message:

```
Initializing main memory.
```

Parallel memory initialization

This message reports that main memory initialization will be done with multiple processors in parallel. Only printed if more than one processor is available for memory initialization.

Typical message:

```
Parallel memory initialization in progress.
```

Memory initialization progress

This message reports the results of the initialization, the initializing processor, and the memory board for each board available in the node. Each character indicates the physical location of the DIMM and the logical size of the DIMM. The memory information is encoded as follows:

Value	Memory Type
.	16 MBytes
:	64 MBytes
I	128 MBytes
_	Empty
#	Hardware deconfigured
$	Software (user) deconfigured

Typical message:

```
                r0        r1        r2        r3
PB0L_A MB0L [.... ....][.... ....][____ ____][____ ____]
PB1R_A MB1L [.... ....][.... ....][____ ____][____ ____]
PB2L_A MB2R [.... ....][.... ....][____ ____][____ ____]
PB3R_A MB3R [.... ....][.... ....][____ ____][____ ____]
PB4L_A MB4L [.... ....][.... ....][____ ____][____ ____]
PB5R_A MB5L [.... ....][.... ....][____ ____][____ ____]
PB6L_A MB6R [.... ....][.... ....][____ ____][____ ____]
PB7R_A MB7R [.... ....][.... ....][____ ____][____ ____]
```

Building main memory map

This message indicates that a map in SCUB SRAM is being generated to report main memory population to OBP.

Typical message:

```
Building main memory map.
```

Main memory initialization complete

This message indicates that main memory initialization is complete.

Typical message:

```
Main memory initialization complete.
```

Multinode memory initialization

This message indicates that the node is configured in a multinode system and is starting the multinode initialization and synchronization process.

Typical message:

```
Starting multinode initialization.
```

Multinode memory configuration determination

Each node broadcasts to and receives from other nodes memory configuration information used to perform cross-node configuration checking for the system.

This message indicates that this internode configuration broadcasting is in progress.

Typical message:

```
Collecting memory configuration from nodes: 0,6,4,2
```

Memory could be deconfigured in one node, based on the configuration in one of the other nodes.

ERI ring initialization

This message indicates that multinode hardware initialization has started. POST is currently waiting for all rings to achieve the Run state.

Typical message:

```
Initializing ERI rings.
```

The following message indicates when a node has verified that all ERI Rings have achieved the Run state and broadcasted its status. The list of synchronized nodes indicates which nodes have successfully initialized their rings.

Typical message:

Synchronizing nodes: 0,4,2,6

CTI cache initialization

This message marks the beginning of CTI cache initialization.

Typical message:

```
Initializing CTI cache.
```

Parallel CTI cache initialization

This message reports that CTI cache initialization will be done with multiple processors in parallel. It is printed only if more than one processor is available for CTI cache initialization.

Typical message:

```
Parallel CTI cache initialization in progress.
```

Memory and CTI cache initialization progress

This message reports the results of the initialization, the initializing processor, and the memory board for each board available in the node. Each character indicates the logical location of the DIMM and the type (or state) of the memory region inhabiting the particular DIMM.

The cache information is encoded as follows:

Value	Memory Type
L	Set up as all local memory
C	Set up as all CTI cache
M	Set up as a mixture of local memory and CTI cache
_	Empty

#	Hardware deconfigured
$	Software (user) deconfigured

Typical message:

```
                  r0          r1          r2          r3
PB0L_A MB0L [LLLL ____][MMMM ____][____ ____][____ ____]
PB1R_A MB1L [LLLL ____][MMMM ____][____ ____][____ ____]
PB2L_A MB2R [LLLL ____][MMMM ____][____ ____][____ ____]
PB3R_A MB3R [LLLL ____][MMMM ____][____ ____][____ ____]
PB4L_A MB4L [LLLL ____][MMMM ____][____ ____][____ ____]
PB5R_A MB5L [LLLL ____][MMMM ____][____ ____][____ ____]
PB6L_A MB6R [LLLL ____][MMMM ____][____ ____][____ ____]
PB7R_A MB7R [LLLL ____][MMMM ____][____ ____][____ ____]
```

Remote memory testing

This message indicates the start of the remote memory test using coherent reads and writes.

Typical message:

```
Verifying remote memory access.
```

The following message indicates when each node listed has successfully completed the remote memory access test.

Typical message:

```
Synchronizing nodes: 0,6,4,2
```

TOC routing

This message indicates the start of Time Of Century routing procedure.

Typical message:

```
Enabling Time of Century synchronization routing.
```

The following message indicates when each node listed has successfully completed the TOC routing test.

Typical message:

```
Synchronizing nodes: 0,6,4,2
```

System control to boot client

This message indicates that system control is being handed off to the

specified boot client.

For example, one of the following:

```
Booting OBP
Booting DIAG
Booting SPSDV
Booting RDR dumper
Booting Boombox
```

Interactive boot

This message indicates that POST is entering its interactive mode. POST provides a console interface for system configuration and debug.

Typical message:

```
Booting Interactive
```

The following is the POST interactive prompt and is only seen if `boot_module` is set to interactive.

Typical message:

```
[0:PB0L_A] POST>
```

Chassis codes

The processor initialization and selftest functions in POST report status and error information with chassis codes. These chassis codes are shared with `cpu3000` and are documented in the man page with the exception of the following POST-specific codes:

0x6103C	The processor is executing it's processor initialization code
0x22025	The processor encountered a data error while loading the processor Icache
0x22026	The processor encountered a tag error while loading the processor Icache.

Error messages

POST provides error messages that are printed to the console. This section describes these error messages.

SSP parameters failure

This message reports the that SSP parameters structure failed the checksum and was rebuilt to the default structure.

Typical message:

```
Teststation Parameters checksum FAILED, rebuilding...
```

This node may be forced with the `sppdsh reboot <node>` default command.

Configuration map failure

This message indicates that the configuration map structure failed the checksum and was rebuilt to defaults. Any user deconfigured hardware state is lost.

Typical message:

```
Configuration Map checksum FAILED, rebuilding...
```

Configuration parameters failure

This message indicates that the configuration parameters structure failed the checksum and was rebuilt to the default structure. Any user overrides from the default value, for parameters that have a default, is lost. Some parameters have no default and retain the value in NVRAM. Since NVRAM could be corrupt, these values could be invalid.

Typical message:

```
Configuration Parameters checksum FAILED, rebuilding...
```

ASIC probe failure

This message indicates that the specified ASIC failed the probe. The status of any components that must be accessed through this component are unknown, and they are not available if installed.

Typical message:

```
Failed probe of P1R
Unable to determine status of PB1R_A PB1L_A PB1L_B PB1L_A IOLR_B
```

Memory board deconfiguration

This message indicates that the specified memory board is deconfigured. This can be due to a memory board being found on one side of memory without a corresponding pair, since boards must be used in pairs of even/odd boards. This can also occur when a memory board has no usable memory.

Typical message:

```
Deconfiguring: MB5L
```

Illegal memory board configuration

This message indicates that there is an unallowed memory board configuration. Memory boards can only be used in two-, four-, or eight-board configurations. In the following example, a six-board configuration was detected, and two boards will be deconfigured.

Typical message:

```
Illegal 6 memory board configuration.
```

Processor initialization failure

This message indicates that the specified processor failed to perform the step described during parallel main memory initialization. The monarch processor completes the initialization assigned the failing processor.

Typical message:

```
PB1R_A timed out during encache memory init code
PB1R_A timed out during memory initialization
PB1R_A timed out during idle request after memory init
PB0L_B failed to go idle after memory init
Unable to force CPU PB2L_A into idle loop
```

Monarch completing memory initialization

This message indicates that the monarch processor is completing the memory initialization assigned to the specified processor.

Typical message:

```
Using Monarch to initialize memory assigned to PB2L_A
```

PDT checksum failure

This message indicates that the page deallocation table structure failed the checksum and was rebuilt to defaults. All bad page information is lost.

Typical message:

```
Page Deallocation Table (PDT) checksum FAILED, rebuilding...
```

Memory hardware change detected

This message indicates that POST detected a change in memory hardware and cleared all entries in the PDT.

Typical message:

```
Detected a hardware change, clearing the Page Deallocation Table (PDT).
```

Memory remapped

This message indicates that POST remapped memory to achieve HP-UX good memory region. This occurs when a bad page is marked within the good memory region.

Typical message:

```
Memory was re-mapped to achieve HP/UX good memory region.
```

Contiguous memory block not found

This message indicates that POST could not find a block of contiguous memory to place at address zero to achieve good memory. POST will report no main memory to the OBP for this failure.

Typical message:

```
HP/UX good memory region could not be achieved.
```

Processor not reported

This message indicates that a processor failed to mark itself in the system report register.

Reporting happens early in the sequence, and this failure usually indicates the processor has failed to execute any instructions.

Typical message:

```
Failed probe of PB1R_B, CPU failed to report in.
```

Processor initialization/selftest failure

This message indicates that a processor failed at some point during initialization or selftest. The chassis code for the module that failed is reported.

Typical message:

```
Failed probe of PB1R_B
chassis code 0x6103C
```

Processor not responding to interrupt

This message indicates that a processor properly initialized itself but did not respond to an external interrupt

Typical message:

```
Failed probe of PB1R_B
cpu PB1R_B did not respond to an interrupt
```

Shared Runway bus failure

This message indicates that an available processor has been deconfigured because it shares a Runway bus with a processor that failed to probe

Typical message:

```
cpu PB1R_A deconfigured due to PB1R_B shutdown.
```

New monarch processor selected

This message indicates that the previous monarch processor was deconfigured and a new one was selected. The new monarch continues the initialization of the rest of the system

Typical message:

```
INFO: New monarch selected: PB0R_A
```

New monarch processor not found

This message indicates that the other processor on the Runway bus with the monarch processor was deconfigured or failed and another suitable processor could not be found to replace the monarch.

Typical message:

```
WARNING: The monarch shares a Runway bus with a failed
cpu.
```

Multinode console error messages

The following multinode error messages could be printed to the console as POST executes the multinode initialization procedure. The field values shown are for example purposes only.

80-bit DIMM mode set

This message indicates that there are one or more 80-Bit DIMMs in the node. 80-Bit DIMMs can not be used in a multinode system because there are too few bits to hold the multinode tag data. 88-Bits DIMMs are needed.

Use `dcm -d all <node>` to locate and replace these DIMMs.

Typical message:

```
80-bit DIMM mode is set.
```

Invalid CTI cache state

The parameter `cti_cache_size` is set to an invalid value. Use `setenv` to correct this problem.

Typical message:

```
CTI cache is disabled
```

Invalid local node size

The parameter `node_local_size` is set to an invalid value. Use `setenv` to correct this problem.

Typical message:

```
Force node ID region size is disabled
```

Corrupt multinode parameter

This message indicates that one of the parameters vital to multinode initialization is corrupt. Use nodemap to correct this problem.

Typical message:

```
Invalid multinode configuration database entry (0x02)
```

POST may still attempt to boot multinode, in which case the following message appears:

```
Forcing to maximum multinode configuration.
```

```
POST is enabling all possible nodes in a complex and will
deconfigure non-existent or non-working nodes as the
timeout is reached.
```

Invalid memory configurations

The following statements refer to possible problems with the current memory configuration(s).

Typical message:

```
No main memory available
```

```
Invalid multi-node memory configuration
```

```
Re-configuring memory to a valid multinode configuration
```

```
Unable to achieve a valid multinode memory configuration
```

POST may attempt to deconfigure a node's memory so that it can work with the other nodes in its complex. If POST is successful, the new memory configuration is used and multinode initialization proceeds normally. If not, the dcm command may need to be invoked to assess the current state of memory on each node. A good rule of thumb is to identically populate all memory boards in the entire complex

STAC deconfigured

The following message indicates that the STAC chip has been deconfigured either by hardware or software.

Typical message:

```
The STAC on MB0l is deconfigured
```

STAC initialization failure

The following message indicates that the STAC chip did not pass ASIC probing or initialization.

Typical message:

```
MB0l does not have a working STAC installed
```

CTI cache initialization failure

The following message indicates that the current memory configuration is too small to allocate any of it for CTI cache.

Typical message:

```
Unable to configure CTI cache for current memory configuration
```

Memory board mismatch

The following message indicates that the memory board configuration of the indicated node is not identical to the other nodes. This is not a supported configuration. Valid multinode memory configurations are available in the Configuration Guide.

Typical message:

```
Memory board config mismatch on node 2
```

Invalid CTI cache size

The following message indicates that the parameter `cti_cache_size` is set to an invalid value for the current memory configuration. The largest valid size less than the value specified will be used, and the `cti_cache_size` parameter will be changed in NVRAM.

The CTI cache size cannot exceed 1/2 of the total memory in each node.

Typical message:

```
INFO: Invalid CTI cache size for current memory configuration (4096MB), resetting
cti_cache_size to 1024 MB
```

Interleave mismatch

The following message indicates that POST discovered an interleave mismatch or that a DIMM did not pass the memory probe. A good rule of thumb is to identically populate all memory boards in the entire complex. It may be necessary to use the `dcm` command to assess the current state of memory on each node.

Typical message:

```
Found mixed 4 and 8 bus interleave span
Found mixed 8 and 4 bus interleave span
Found mixed 2 and 4 bank interleave span
Found mixed 4 and 2 bank interleave span
```

ERI ring failures

Several typical error messages relating to the ERI rings are presented in this section.

The following messages are typical of those received for a particular failure mode of an ERI ring. The bit missing in the "act:" field indicates the failing ring on this node. The bits are ordered from right to left from 0 to 7.

Typical messages:

```
Unable to RESET rings: (exp: x=0x00 y=0xff, act: x=0x00 y=0xfd)
Unable to clear RESET: (exp: x=0x00 y=0xff, act: x=0x00 y=0xfd)
Unable to achieve RUN state: (exp: x=0x00 y=0xff, act: x=0x00 y=0xfd)
Unable to enable rings: (exp: x=0x00 y=0xff, act: x=0x00 y=0xfd)
Unable to disable rings: (exp: x=0x0 y=0xff, act: x=0x00 y=0xfd)
Unable to enable global errors: (exp: x=0x00 y=0xff, act: x=0x00 y=0xfd)
```

In these examples, the failure is on ring 1 in the Y direction.

The following message indicates that an HPMC was trapped while performing the actions indicated in the example on an off-node CSR or memory location indicated.

Typical messages:

```
MB0l cable pattern test failed: HPMC while writing 0x000000fc.00050000
MB0l cable pattern test failed: HPMC while reading 0x000000fc.00050000
Store/flush/read test failed: HPMC while reading address 0x00000010.00000020
Store/flush/read test failed: HPMC while clearing address 0x00000010.00000020

Store/flush/read test failed: address 0x10.00000020, expected 0xaa55aa01, actual
0xaa51aa01
```

POST cannot continue booting multinode. The ERI cables may be misrouted or broken or one (or more) of the System Configuration CSRs is corrupt. Another possibility is that the tag state for this memory line is corrupt.

The following message indicates that one of the ERI cables connected to MB0l is broken. It is impossible to know which one, because the error could have occurred during the write (output port) or the read (input port).

Typical messages:

```
MB0l cable pattern test failed: expected 0xaaaaaaaa, actual 0xaa2aaaaa
```

The following message indicates that MB0l cable connection test failed: the test expected MB0l, actual received MB4l.

Typical messages:

```
MB0l cable connection test failed: expected node 0, actual node 4
```

The cable routing is probably incorrect. Check that all ERI cables are connected to and from their designated ports.

Ethernet packet error

The following message indicates that an ethernet packet error has occurred. As a result, nodes in the complex may not synchronize properly.

Typical message:

```
Ethernet packet error
```

Communications time-out

The following message indicates that the nodes listed are not responding. These nodes will be removed from the expected node mask. Multinode initialization will continue normally if possible.

Typical message:

```
Node communication time-out for nodes: 4 6
```

Troubleshooting processor configuration error symptoms

This section discusses the tests and procedures to troubleshoot a processor board installation.

Troubleshooting strategy

If, after running `xconfig`, as shown in "Using xconfig" on page 104, the system fails to recognize the new processors, use the following strategy to troubleshoot the upgrade:

Step 1. Power down the system.

Step 2. Make sure you are grounded.

Step 3. Check that connectors and boards are installed properly.

Step 4. Verify that the new processor boards conform to the recommended configuration sequence shown in "Planning the processor board upgrade" on page 19.

Step 5. Power up the system.

Step 6. Rerun `xconfig`.

If the system still fails to recognize the new processor board, you may want to run `dcm` as shown in the following section. Otherwise, return the board to Hewlett-Packard. Materials to return the boards are included in the upgrade kit.

Running `dcm`

`dcm` reads, parses, and prints to the screen the boot configuration map in NVRAM.

To run `dcm`:

Step 1. Run `dcm` by entering:

```
$ dcm 0
```

Output similar to the following example will be displayed:

```
 1 Nodes found
    Acquiring Boot Configuration Map...
    Stingray Configuration Map Dump:         Node: 0
    ========================================================
    VERSION: 0.6.0.0     compiled: 1998/07/09 11:28:02
    CheckSum:              0xeb3c8e71
Boot Config Map Size:  164 words
POST Revision:         6.1.0.0
CPUs (Rev, ICache, DCache Size in MegaBytes)
==========================================
PB0L_A PASS (1.0.0, 0.50, 1.00)         PB0L_B PASS (1.0.0, 0.50, 1.00)
PB0R_A PASS (1.0.0, 0.50, 1.00)         PB0R_B PASS (1.0.0, 0.50, 1.00)
PB1R_A PASS (1.0.0, 0.50, 1.00)         PB1R_B PASS (1.0.0, 0.50, 1.00)
PB1L_A PASS (1.0.0, 0.50, 1.00)         PB1L_B PASS (1.0.0, 0.50, 1.00)
PB2L_A PASS (1.0.0, 0.50, 1.00)         PB2L_B PASS (1.0.0, 0.50, 1.00)
PB2R_A PASS (1.0.0, 0.50, 1.00)         PB2R_B PASS (1.0.0, 0.50, 1.00)
PB3R_A PASS (1.0.0, 0.50, 1.00)         PB3R_B PASS (1.0.0, 0.50, 1.00)
PB3L_A PASS (1.0.0, 0.50, 1.00)         PB3L_B PASS (1.0.0, 0.50, 1.00)
PB4L_A PASS (1.0.0, 0.50, 1.00)         PB4L_B PASS (1.0.0, 0.50, 1.00)
PB4R_A PASS (1.0.0, 0.50, 1.00)         PB4R_B PASS (1.0.0, 0.50, 1.00)
PB5R_A PASS (1.0.0, 0.50, 1.00)         PB5R_B PASS (1.0.0, 0.50, 1.00)
PB5L_A PASS (1.0.0, 0.50, 1.00)         PB5L_B PASS (1.0.0, 0.50, 1.00)
PB6L_A PASS (1.0.0, 0.50, 1.00)         PB6L_B PASS (1.0.0, 0.50, 1.00)
PB6R_A PASS (1.0.0, 0.50, 1.00)         PB6R_B PASS (1.0.0, 0.50, 1.00)
PB7R_A PASS (1.0.0, 0.50, 1.00)         PB7R_B PASS (1.0.0, 0.50, 1.00)
PB7L_A PASS (1.0.0, 0.50, 1.00)         PB7L_B PASS (1.0.0, 0.50, 1.00)
```

If dcm fails to show the new processor board, return the board to Hewlett-Packard.

For more information about dcm, refer to the *HP Diagnostics Guide: V2500/V2600*.

Troubleshooting memory configuration error symptoms

This section discusses one way to troubleshoot a memory board or DIMM installation.

NOTE

Due to the more robust memory probe of the V2500/V2600, DIMMs transferred from a V22X0 may fail POST. If this occurs then the failing DIMMs should be replaced.

Interpreting POST messages

POST reports the results of the initialization of the memory board for each one available in the node. Each character indicates the physical location of the DIMM and the logical size of the DIMM. This section provides the information necessary to interpret this report.

Table 16 shows the definitions of the POST memory row status symbols.

Table 16 POST memory row status symbols

Symbol	Description
-	Empty slot
#	Hardware deconfigured to 0 Mbyte
$	Software deconfigured to 0 Mbyte
.	16 Mbyte configured
:	64 Mbyte configured
I	128 Mbyte configured

POST error

In the following example a failing DIMM has caused the system to reconfigure memory. Because all of the memory boards must be configured identically, POST also deallocates the equivalent amount of memory from every other memory board installed in this system leaving Q1B4, Q1B5, Q1B6, and Q1B7 deallocated. The "#" character indicates memory has been deconfigured.

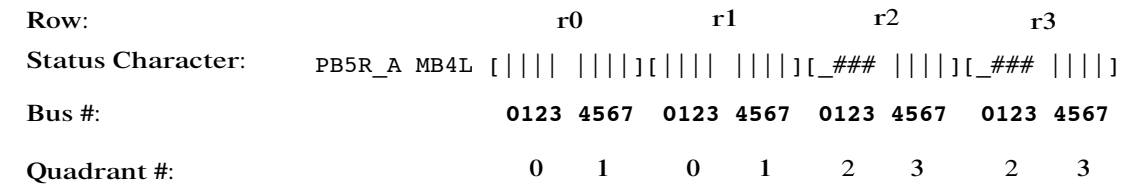
Figure 48 shows an example a POST error output.

Figure 48 POST error output

```
PB2L_A MB0L [|||| ||||][|||| ||||][#### ||||][#### ||||]
PB1R_A MB1L [|||| ||||][|||| ||||][#### ||||][#### ||||]
PB0L_A MB2R [|||| ||||][|||| ||||][#### ||||][#### ||||]
PB4L_A MB3R [|||| ||||][|||| ||||][#### ||||][#### ||||]
PB5R_A MB4L [|||| ||||][|||| ||||][_### ||||][_### ||||]
PB6L_A MB5L [|||| ||||][|||| ||||][#### ||||][#### ||||]
PB0L_B MB6R [|||| ||||][|||| ||||][#### ||||][#### ||||]
PB4L_B MB7R [|||| ||||][|||| ||||][#### ||||][#### ||||]
```

Figure 49 shows how a row maps to the quadrant and bus associated with each one of the status characters displayed in the POST message.

Figure 49 POST memory mapping



Run `dcm` to determine which DIMM (or DIMMs) may be faulty. See "Troubleshooting memory with dcm" on page 142.

Troubleshooting memory with **dcm**

dcm dumps the boot configuration map information for the specified node. There are two main reporting modes: one for general hardware configuration and one for the DIMM type.

dcm -d all *node id* dumps the status of all installed DIMMs, 80- or 88-bit. *node id* may be a node number or IP name. Use dcm to troubleshoot memory configuration errors by completing the following steps:

Running **dcm**

Step 1. Run dcm by entering:

```
$ dcm -d all 0
```

Output similar to the following example will be displayed:

Figure 50 **Example V2500/V2600 dcm, partial listing**

```
Memory Type:
============

     Physical: 88=Multi node 88-bit DIMM, 80=Single node 80-bit DIMM
            (Only physical DIMM type is reported.)

          * = Software Deconfigured      - = Not In Use

EWMB3:
======
EWMB3: Q0B0 88/88        Q1B4 88/88        Q2B0 88-/88-      Q3B4 88/88
EWMB3: Q0B1 88/88        Q1B5 88/88        Q2B1 88-/88-      Q3B5 88/88
EWMB3: Q0B2 88/88        Q1B6 88/88        Q2B2 88-/88-      Q3B6 88/88
EWMB3: Q0B3 88/88        Q1B7 88/88        Q2B3 88-/88-      Q3B7 88/88

EWMB4:                                          Unrecognized DIMM
======                                          /
EWMB4: Q0B0 88/88        Q1B4 88/88        Q2B0 -/-          Q3B4 88/88
EWMB4: Q0B1 88/88        Q1B5 88/88        Q2B1 88-/88-      Q3B5 88/88
EWMB4: Q0B2 88/88        Q1B6 88/88        Q2B2 88-/88-      Q3B6 88/88
EWMB4: Q0B3 88/88        Q1B7 88/88        Q2B3 88-/88-      Q3B7 88/88
```

Step 2. Review the dcm output.

Figure 50 shows a DIMM labeled -/-. This indicates that the DIMM has not been recognized during the boot process. POST typically marks only one DIMM at a time as -/-. Because of the failure in Q2B0 on EWMB4,

POST automatically deconfigured the DIMMs in Q2B1, Q2B2, and Q2B3. The code 88-/88- indicates that the DIMMs have been deconfigured. See Figure 51 on page 144 for DIMM locations.

Troubleshooting the problem

Step 1. Shutdown the system.

Step 2. Remove the board.

Step 3. Reseat the DIMM.

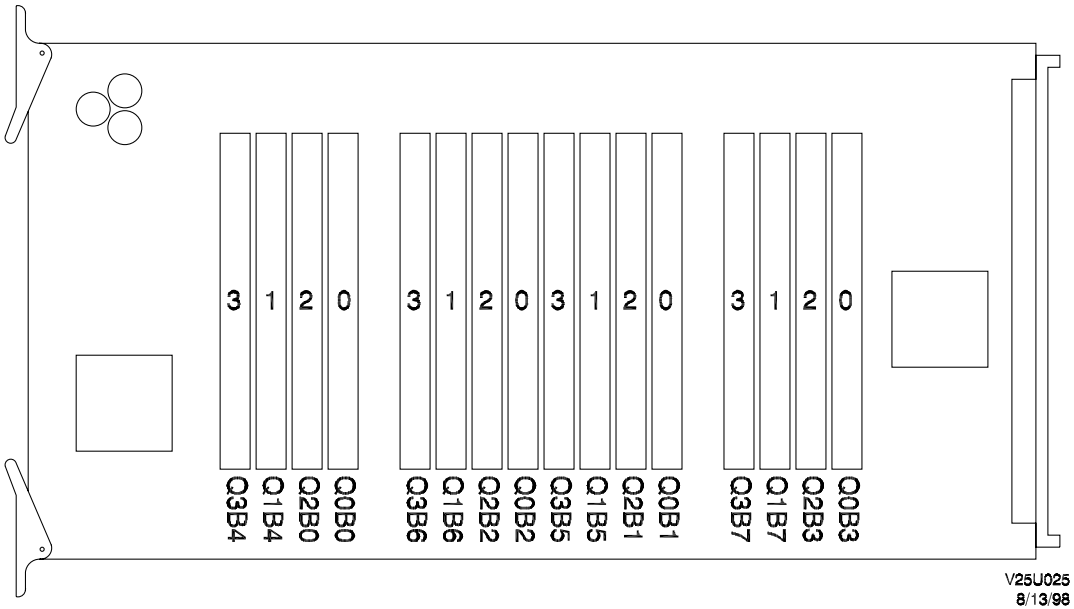
IMPORTANT Refer to "Installing DIMMs on the V2500/V2600 memory board" on page 73 for the proper memory board and DIMM cleaning procedures.

Step 4. Reinstall the memory board.

Step 5. Repeat steps 1 and 2 of "Troubleshooting memory with dcm" on page 142.

Step 6. If the problem persists, move the DIMM to a another quadrant on the same memory board. If, when you recheck the memory, `dcm` indicates that the problem appears at the new position, the DIMM is defective and should be replaced. If the problem does not appear at the new DIMM location, the memory board may be defective.

Figure 51 V2500/V2600 DIMM locations



8 Finishing the upgrade

This chapter describes the tasks required to complete the installation of the V2500/V2600 upgrade kit in the Hewlett-Packard 9000 V-Class server. These tasks are:

Installing the skins and panels

The following sections provide the instructions for the installation of the brackets, panels, and outer skins.

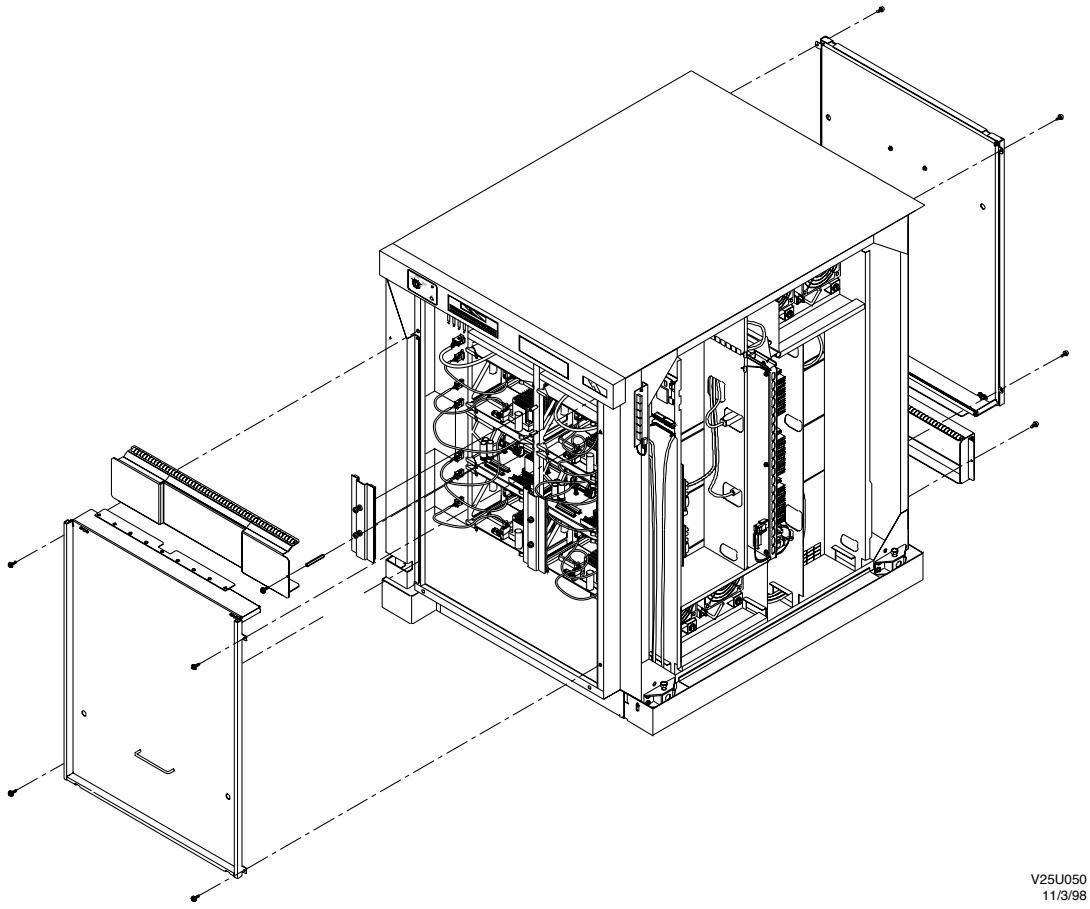
Installing the side skins, EMI panels, and circuit board restraint brackets

For each side of the chassis:

Step 1. Unpack the new PCI area EMI panels from their containers.

Step 2. Fasten the two board restraint brackets on both sides of the chassis by using two thumbscrews, as shown in Figure 52 on page 147.

Figure 52 Installing left side skin and EMI panels



Step 3. Fasten the larger EMI panel to the chassis by using four screws, as shown in Figure 52.

Step 4. Install the new smaller EMI panel by installing the screw and standoff that fastens the panel to the chassis, as shown in Figure 52.

Step 5. Turn on the main circuit breaker at the lower right side of the system before installing the right side cabinet skin.

Step 6. Install the side cabinet skin by inserting the four pins in the chassis.

Installing the skins, filter, and front EMI panel

Refer to Figure 52 on page 147 for skin and panel details.

Step 1. Turn on the main circuit breaker at the lower right side of the system before installing the right side cabinet skin.

Step 2. Install the two side cabinet skins by inserting the four pins in the chassis.

Step 3. Fasten the front EMI panel to the chassis using four screws.

Step 4. Fasten the filter of the front of the chassis by using the velcro tabs.

CAUTION

The front skin is heavy (25 lbs. 12kg). If not properly supported it can slip and fall during removal and installation. The skin is secured to the chassis by four retaining pins. When the pins are separated from the chassis the weight of the skin must be supported by your grasp. To prevent injury, ensure you have a firm grasp of the skin during removal and installation.

Step 5. Align the front skin insertion pins with the receptacles provided on the chassis.

Step 6. Carefully push the front skin until the insertion pins seat in their respective receptacles.

NOTE

The next two steps assume the front skin is equipped with retaining screws.

Step 7. Use a phillips screwdriver to secure the captive retaining screws located at the upper corners of the skin into the receptacles provided.

Step 8. Firmly grasp the sides of the front skin and gently tug outward. If the skin is properly installed, it will not come loose.

Placing the new labels

The product number and power cord labels must be replaced after the system upgrade. The new product number label is designed to be placed over the existing label to allow the original serial number to remain visible.

Placing the product number label

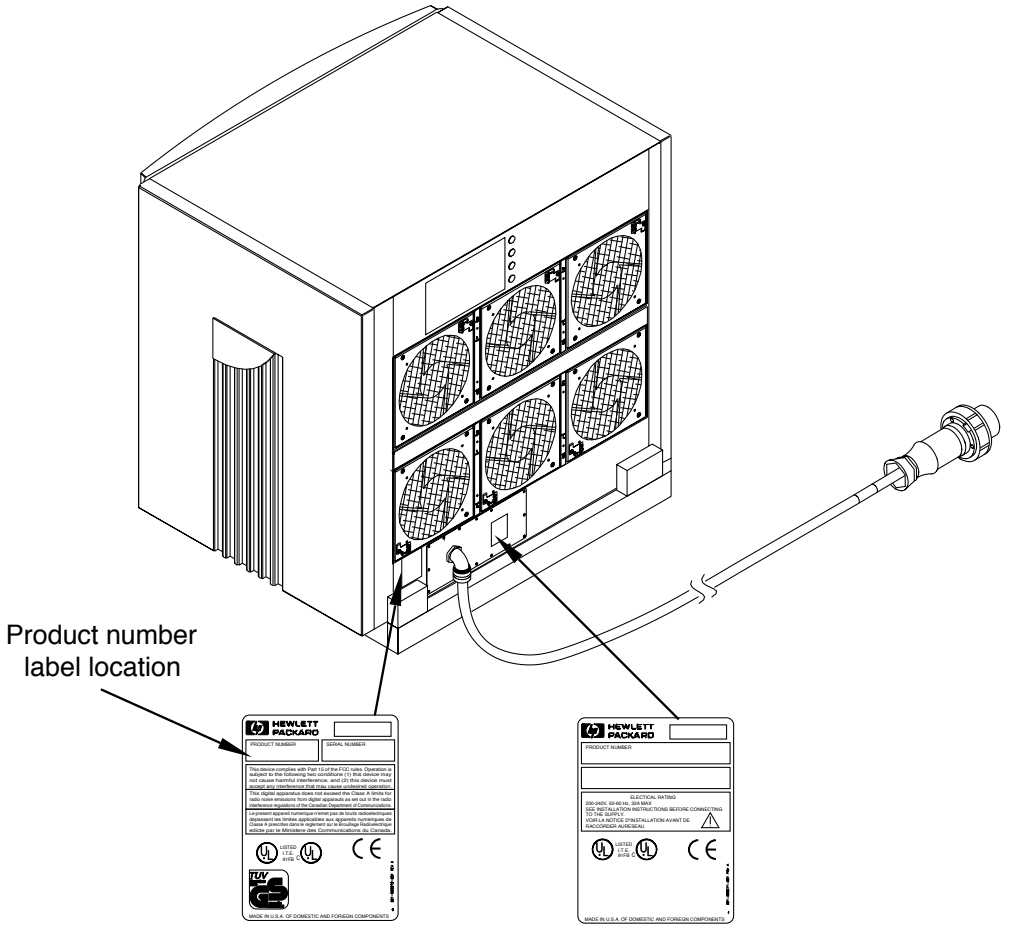
See Figure 53 on page 150 for the location of the product number label. Place the new product number label over the existing one using the following procedure:

Step 1. Locate the label sheet included in the upgrade kit.

Step 2. Select one of the product number labels based on the original configuration of the node prior to the upgrade.

Step 3. Align the upgrade label so that the original serial number is visible through the pane and apply the label over the existing one.

Figure 53 **Adding upgrade labels**



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Placing the power cord label

Replace the power cord label using the following procedure. See Figure 53 on page 150 for the location of the power cord label.

Step 1. Select one power cord labels based on the currently installed power cord.

Step 2. Remove the existing power cord label.

Step 3. Place the new power cord label as shown in Figure 53 on page 150.

A Memory configurations

This appendix contains information on where to install DIMMs when upgrading memory on a V-Class system. Each illustration of a memory board in this appendix corresponds to a different DIMM configuration. Since all memory boards in the system must be configured in the same way, only one illustration is necessary for each possible configuration.

V2500/V2600 DIMM configurations

Table 17 contains all of the supported V2500/V2600 memory configurations. To use it properly, the following information is required:

- The total number of memory boards the system will have after the upgrade.
- The total memory in Mbytes the system will have after the upgrade.
- The size of the DIMMs available 32-Mbyte, 128-Mbyte, or 256-Mbyte.

Find the desired configuration in the table below and refer to the figure specified to see an illustration of how the DIMMs should be installed on the memory board.

NOTE Multinode configurations have special requirements. Refer to "SCA (Scalable Computer Architecture) considerations" on page 31 for a listing of these.

Table 17 V2500/V2600 DIMM configurations

Total boards	Total memory in Mbytes	32-Mbyte DIMMs	128-Mbyte DIMMs	256-Mbyte DIMMs	Figure
2	256	4			Figure 54 on page 158
2	512	8			Figure 55 on page 159
2	1024	12			Figure 56 on page 160
2	2048	16			Figure 57 on page 161
4	512	4			Figure 54 on page 158
4	1,024	8			Figure 55 on page 159
4	2,048	12			Figure 56 on page 160
4	4,096	16			Figure 57 on page 161
8	1,024	4			Figure 54 on page 158
8	2,048	8			Figure 55 on page 159

Total boards	Total memory in Mbytes	32-Mbyte DIMMs	128-Mbyte DIMMs	256-Mbyte DIMMs	Figure
8	4,096	12			Figure 56 on page 160
8	8,192	16			Figure 57 on page 161
2	1,024		4		Figure 58 on page 162
2	2,048		8		Figure 59 on page 163
2	3,072		12		Figure 60 on page 164
2	4,096		16		Figure 61 on page 165
4	2,048		4		Figure 58 on page 162
4	4,096		8		Figure 59 on page 163
4	6,144		12		Figure 60 on page 164
4	8,192		16		Figure 61 on page 165
8	4,096		4		Figure 58 on page 162
8	8,192		8		Figure 59 on page 163
8	12,288		12		Figure 60 on page 164
8	16,384		16		Figure 61 on page 165
2	1,280	4	4		Figure 62 on page 166
2	1,536	8	4		Figure 63 on page 167
2	1,792	12	4		Figure 64 on page 168
2	2,304	4	8		Figure 65 on page 169
2	2,560	8	8		Figure 66 on page 170
2	3,250	4	12		Figure 67 on page 171
4	2,560	4	4		Figure 62 on page 166
4	3,072	8	4		Figure 63 on page 167
4	3,584	12	4		Figure 64 on page 168

Total boards	Total memory in Mbytes	32-Mbyte DIMMs	128-Mbyte DIMMs	256-Mbyte DIMMs	Figure
4	4,608	4	8		Figure 65 on page 169
4	5,120	8	8		Figure 66 on page 170
4	6,656	4	12		Figure 67 on page 171
8	5,120	4	4		Figure 62 on page 166
8	6,144	8	4		Figure 63 on page 167
8	7,168	12	4		Figure 64 on page 168
8	9,216	4	8		Figure 65 on page 169
8	10,240	8	8		Figure 66 on page 170
8	13,312	4	12		Figure 67 on page 171
2	2,048			4	Figure 68 on page 172
2	4,096			8	Figure 69 on page 173
2	6,144			12	Figure 70 on page 174
2	8,192			16	Figure 71 on page 175
4	4,096			4	Figure 68 on page 172
4	8,192			8	Figure 69 on page 173
4	12,288			12	Figure 70 on page 174
4	16,384			16	Figure 71 on page 175
8	8,192			4	Figure 68 on page 172
8	16,384			8	Figure 69 on page 173
8	24,576			12	Figure 70 on page 174
8	32,768			16	Figure 71 on page 175
2	3,072		4	4	Figure 72 on page 176
2	5,120		4	8	Figure 73 on page 177

Total boards	Total memory in Mbytes	32-Mbyte DIMMs	128-Mbyte DIMMs	256-Mbyte DIMMs	Figure
2	4,096		8	4	Figure 74 on page 178
2	5,120		12	4	Figure 75 on page 179
2	6,144		8	8	Figure 76 on page 180
2	7,176		4	12	Figure 77 on page 181
4	6,144		4	4	Figure 72 on page 176
4	10,240		4	8	Figure 73 on page 177
4	8,192		8	4	Figure 74 on page 178
4	10,240		12	4	Figure 75 on page 179
4	12,288		8	8	Figure 76 on page 180
4	14,352		4	12	Figure 77 on page 181
8	12,288		4	4	Figure 72 on page 176
8	20,480		4	8	Figure 73 on page 177
8	16,384		8	4	Figure 74 on page 178
8	20,480		12	4	Figure 75 on page 179
8	24,576		8	8	Figure 76 on page 180
8	28,704		4	12	Figure 77 on page 181

Figure 54 4x32 Mbyte DIMMs per board

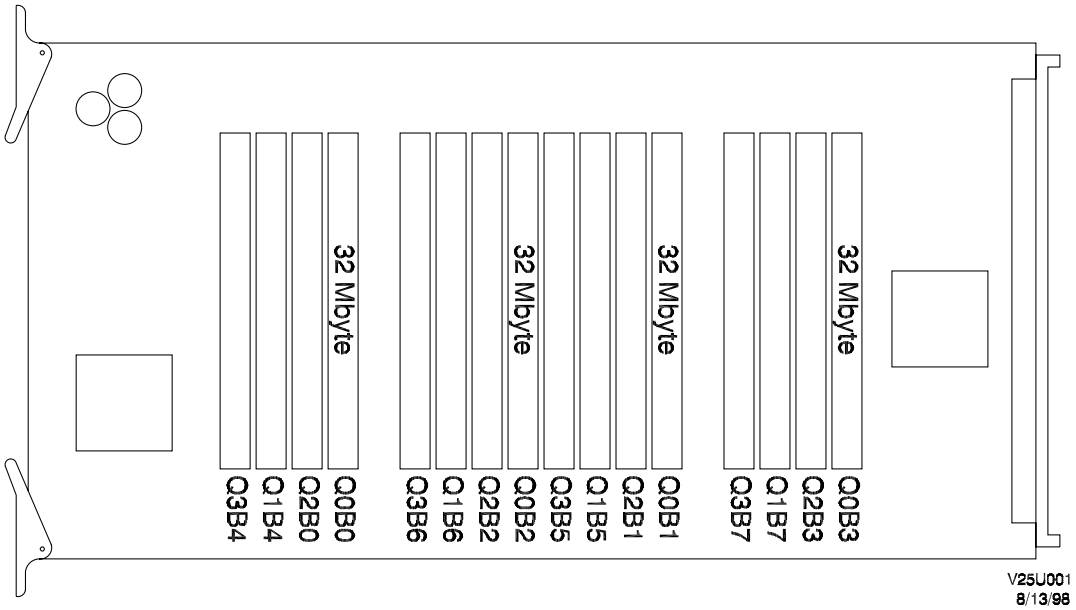


Table 18 4x32 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	256	8x32 Mbyte
4	512	16x32 Mbyte
8	1024	32x32 Mbyte

Figure 55 8x32 Mbyte DIMMs per board

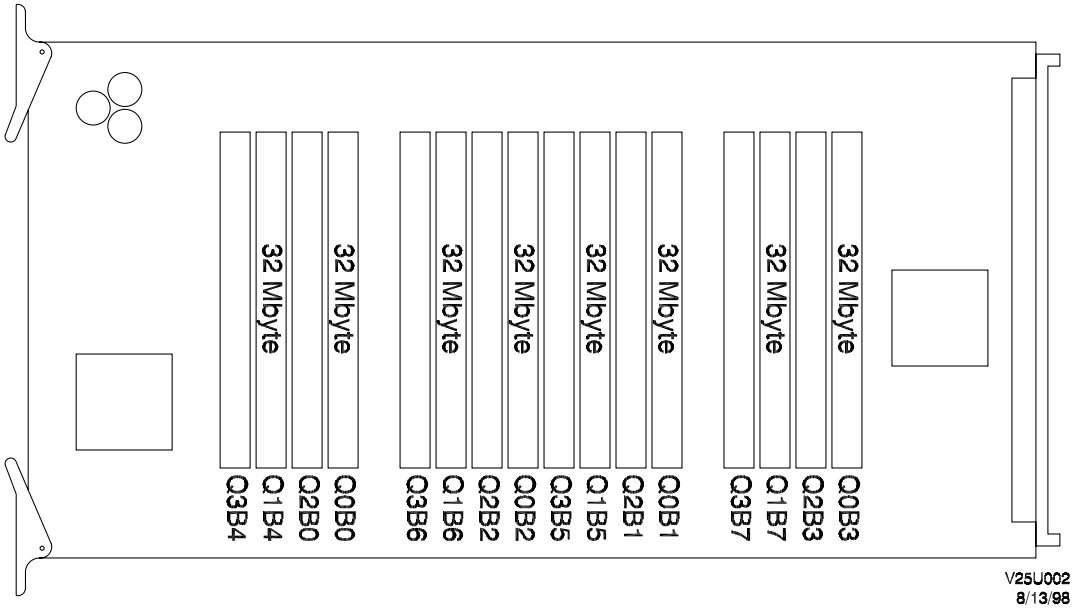


Table 19 8x32 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	512	16x32 Mbyte
4	1,024	32x32 Mbyte
8	2,048	64x32 Mbyte

Figure 56 12x32 Mbyte DIMMs per board

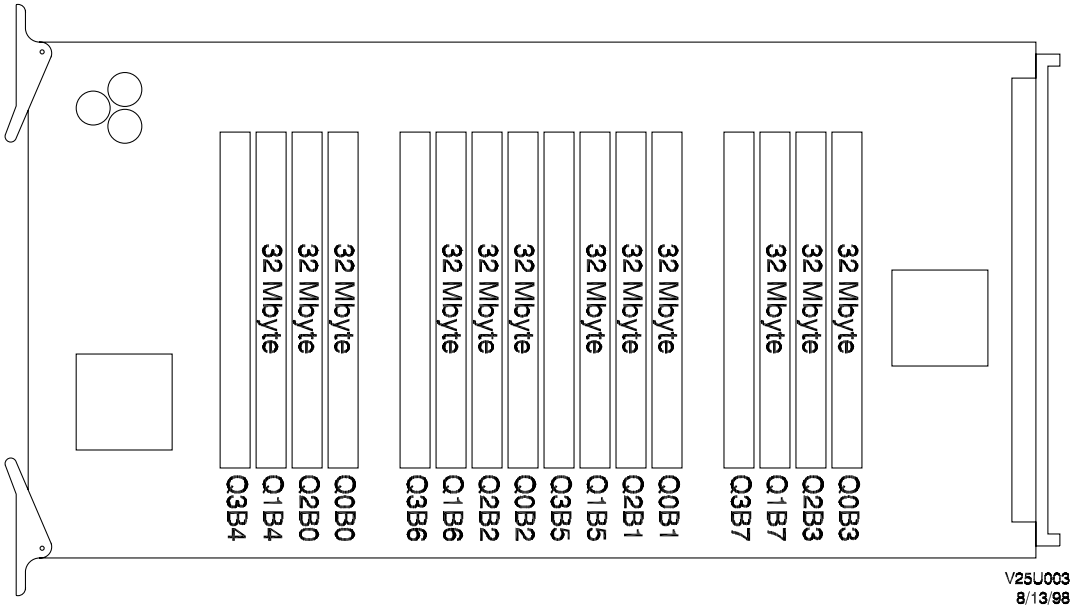


Table 20 12x32 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	1,024	12x32 Mbyte
4	2,048	48x32 Mbyte
8	4,096	96x32 Mbyte

Figure 57 16x32 Mbyte DIMMs per board

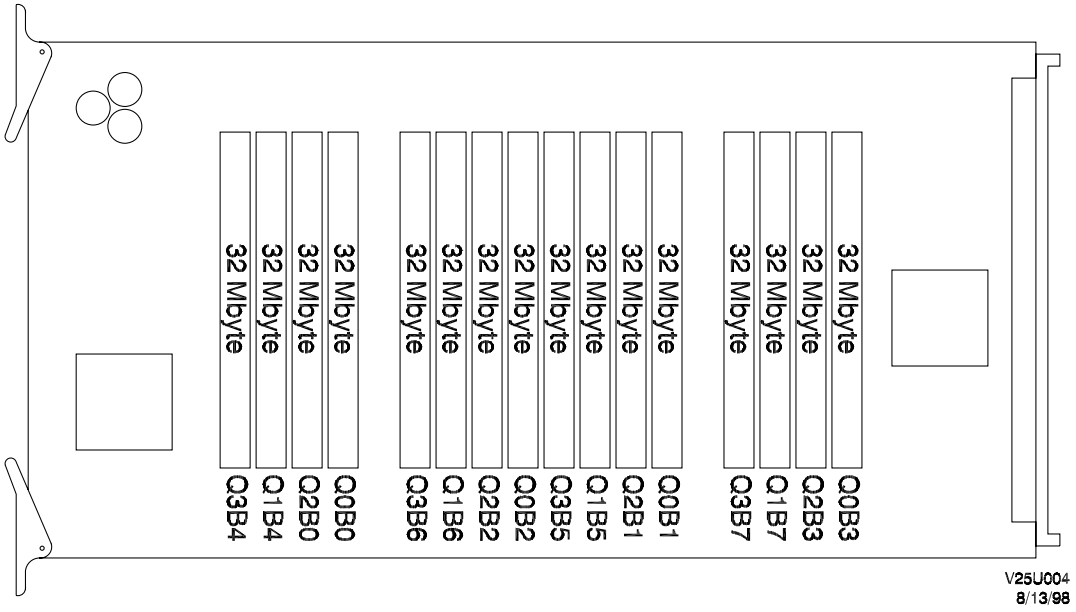


Table 21 16x32 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	2,048	32x32 Mbyte
4	4,096	64x32 Mbyte
8	8,192	128x32 Mbyte

Figure 58 4x128 Mbyte DIMMs per board

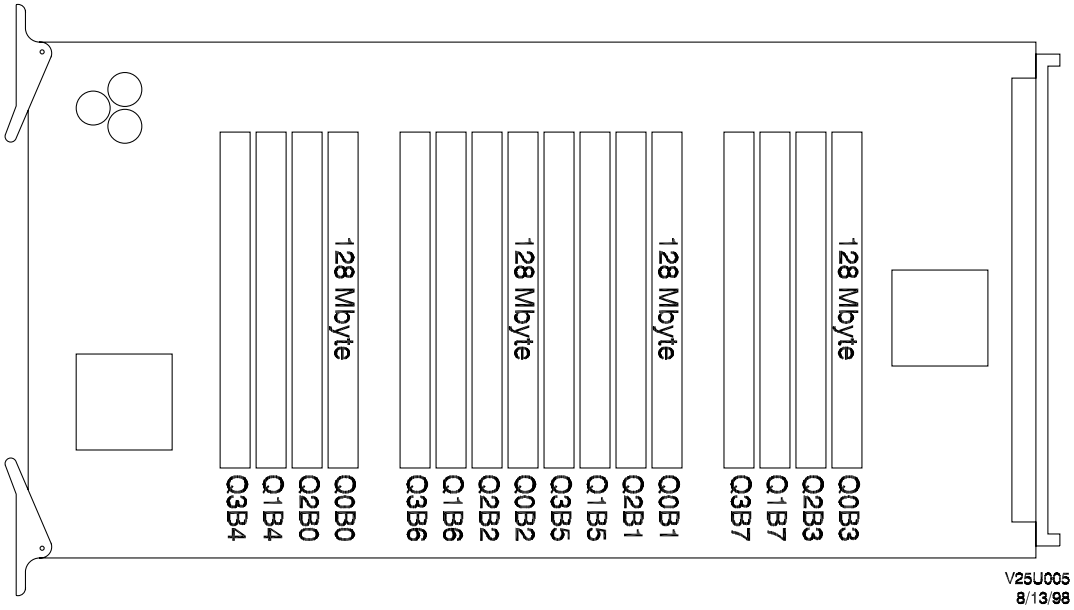


Table 22 4x128 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	1,024	8x128 Mbyte
4	2,048	16x128 Mbyte
8	4,096	32x128 Mbyte

Figure 59 8x128 Mbyte DIMMs per board

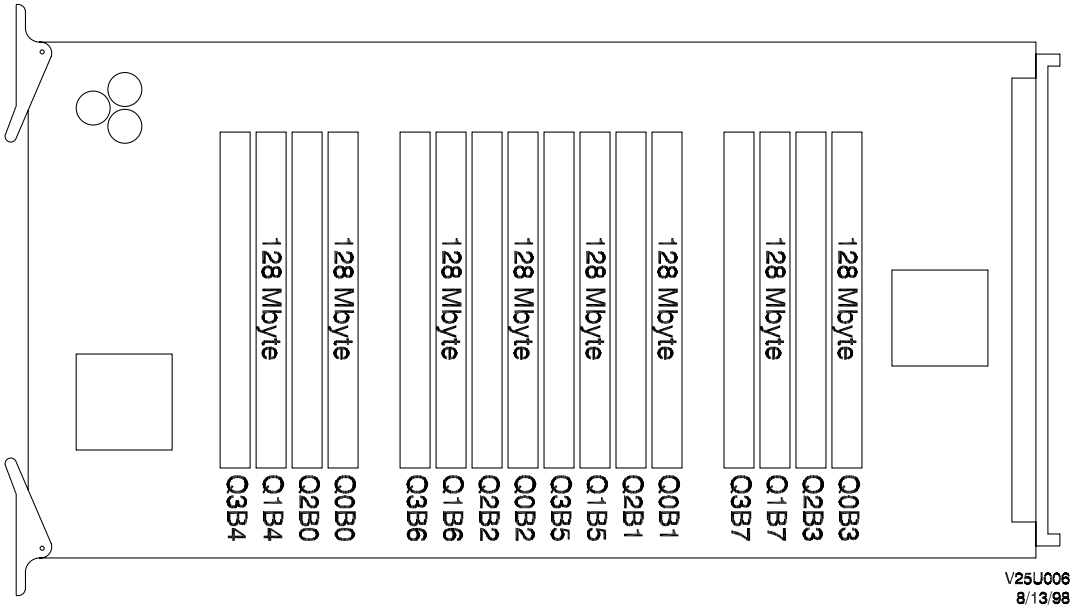


Table 23 8x128 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	2,048	16x128 Mbyte
4	4,096	32x128 Mbyte
8	8,192	64x128 Mbyte

Figure 60 12x128 Mbyte DIMMs per board

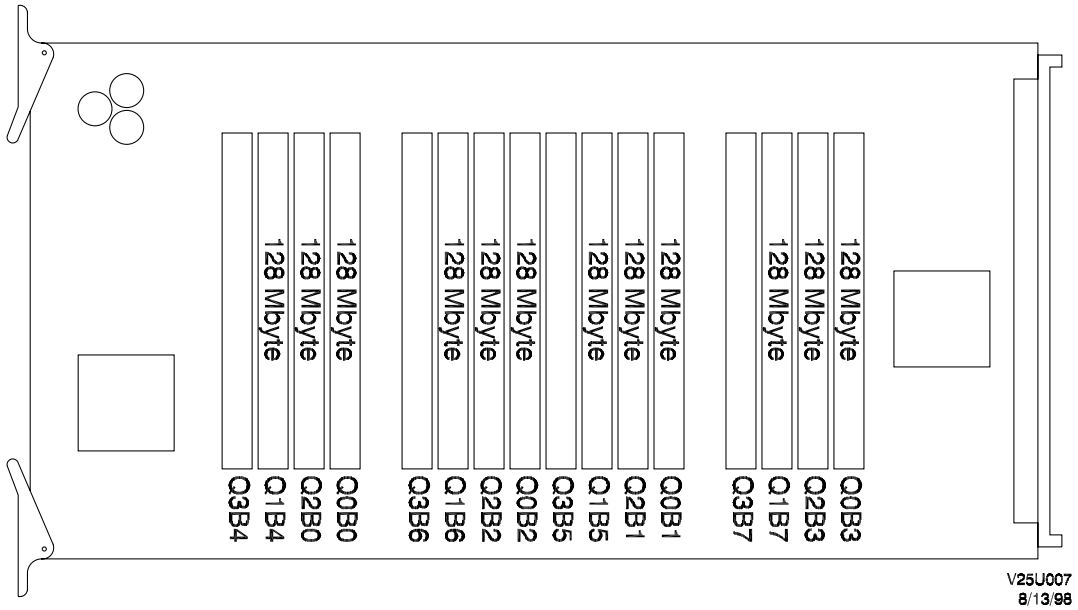


Table 24 12x128 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	3,072	24x128 Mbyte
4	6,144	48x128 Mbyte
8	12,288	96x128 Mbyte

Figure 61 16x128 Mbyte DIMMs per board

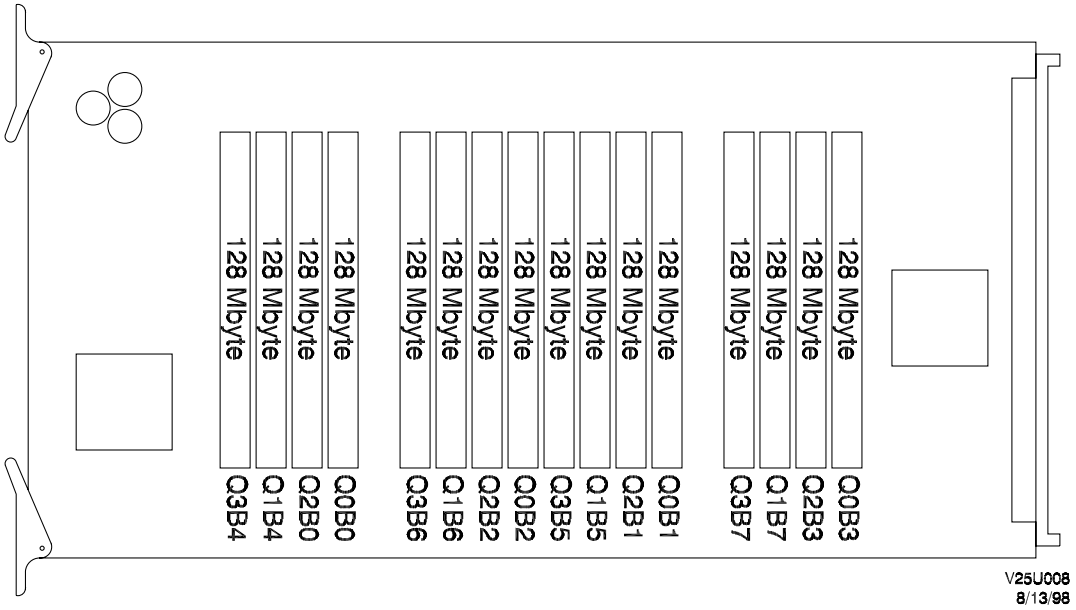


Table 25 16x128 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	4,096	32x128 Mbyte
4	8,192	64x128 Mbyte
8	12,288	128x128 Mbyte

Figure 62 4x32 Mbyte and 4x128 Mbyte DIMMs per board

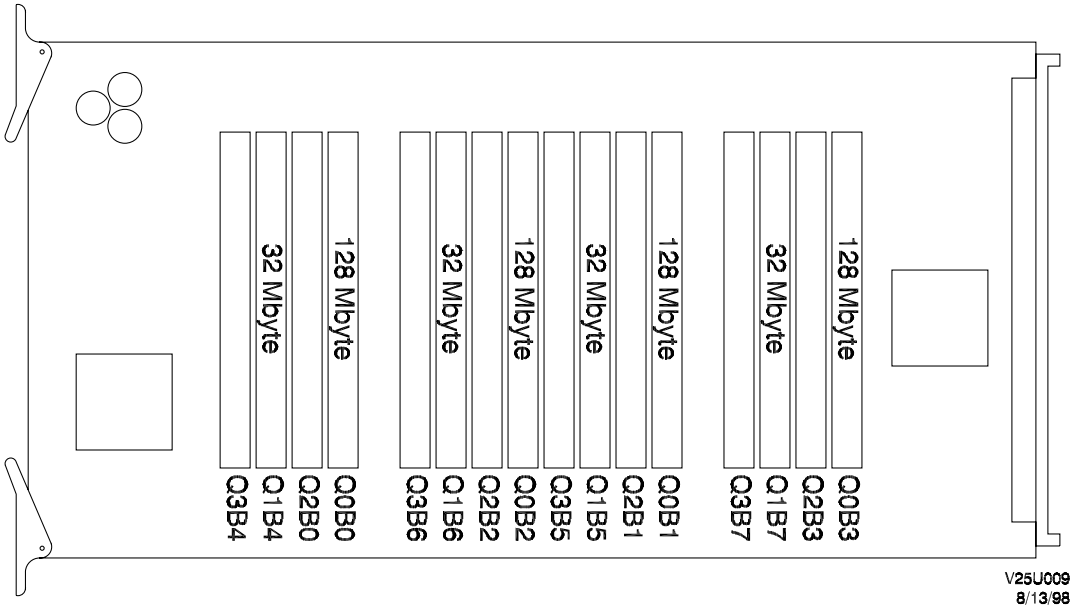


Table 26 4x32 Mbyte and 4x128 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	1,280	8x32 Mbyte, 8x128 Mbyte
4	2,560	16x32 Mbyte, 16x128 Mbyte
8	5,120	32x32 Mbyte, 32x128 Mbyte

Figure 63 8x32 Mbyte and 4x128 Mbyte DIMMs per board

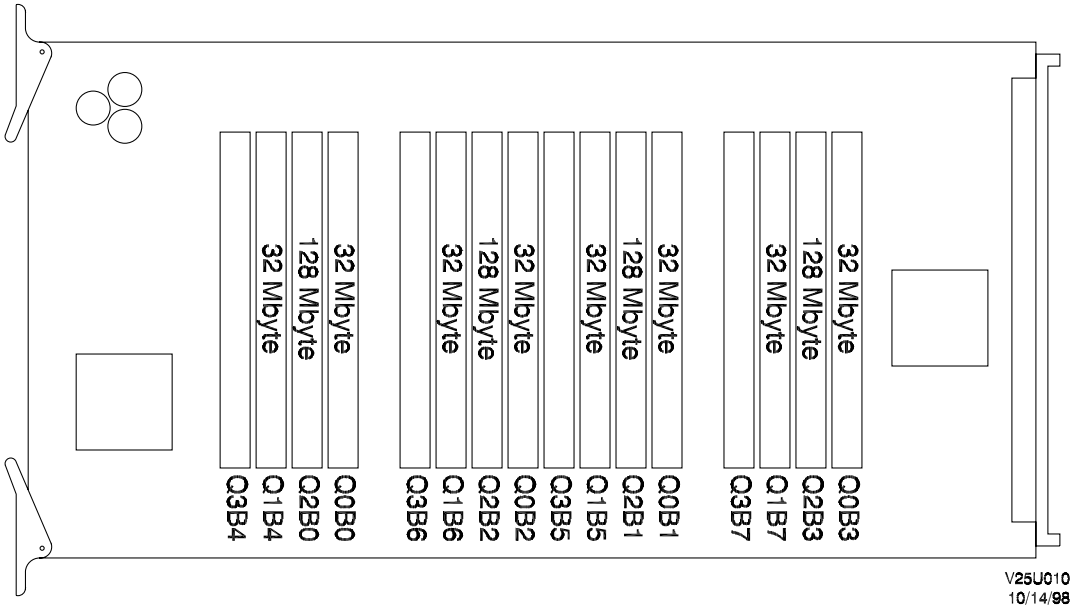


Table 27 8x32 Mbyte and 4x128 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	1,536	16x32, 8x128 Mbyte
4	3,072	32x32 Mbyte, 16x128 Mbyte
8	6,144	64x32 Mbyte, 32x128 Mbyte

NOTE DIMMs in quadrant 2 and 3 should be the same size for maximum performance.

Figure 64 12x32 Mbyte and 4x128 Mbyte DIMMs per board

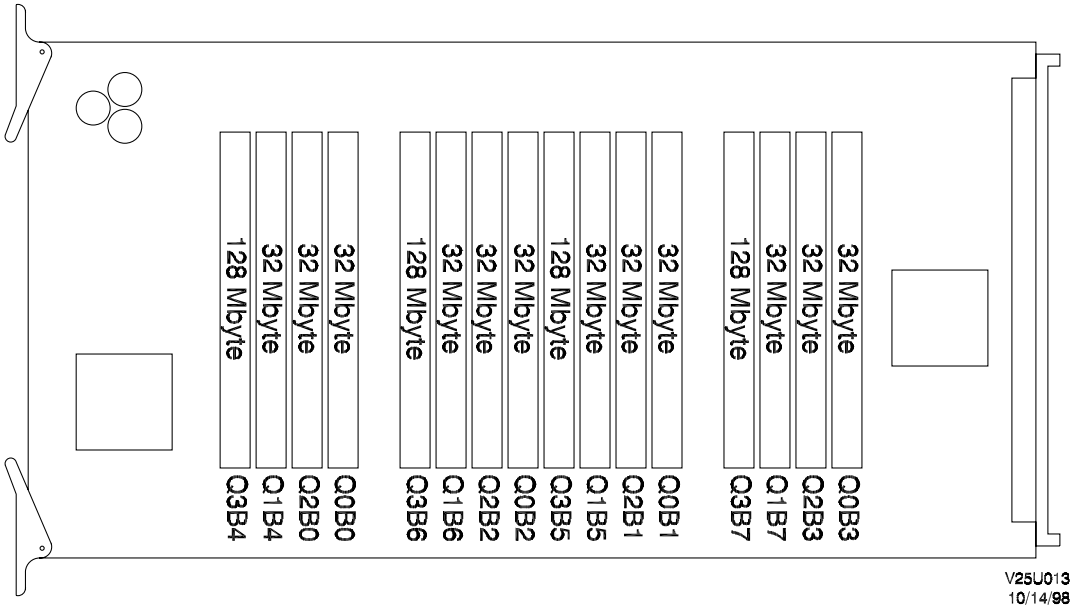


Table 28 12x32 Mbyte and 4x128 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	1,792	24x32 Mbyte, 8x128 Mbyte
4	3,584	48x32 Mbyte, 32x128 Mbyte
8	7,168	96x32 Mbyte, 64x128 Mbyte

Figure 65 4x32 Mbyte and 8x128 Mbyte DIMMs per board

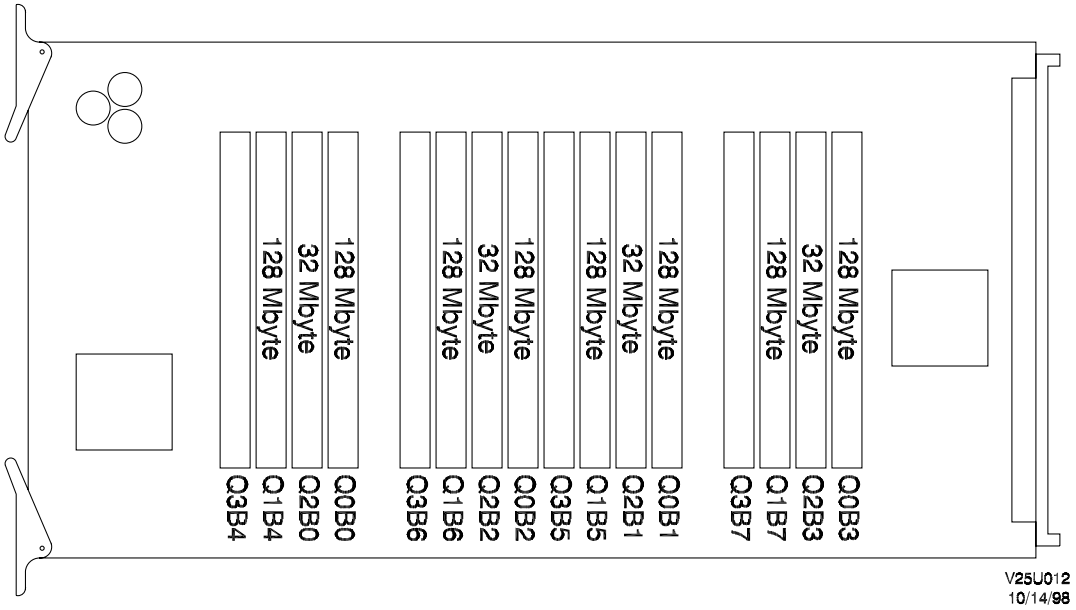


Table 29 4x32 Mbyte and 8x128 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	2.,304	8x32 Mbyte, 16x128 Mbyte
4	4,608	16x32 Mbyte, 32x128 Mbyte
8	9,216	32x32Mbyte, 64x128 Mbyte

NOTE DIMMs in quadrant 2 and 3 should be the same size for maximum performance.

Figure 66 8x32 Mbyte and 8x128 Mbyte DIMMs per board

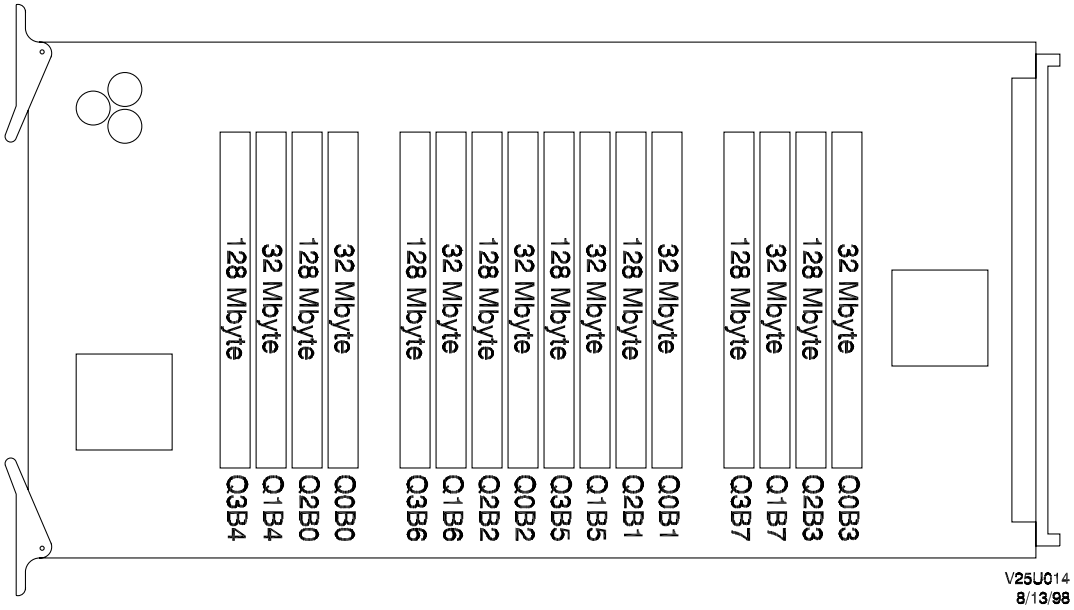


Table 30 8x32 Mbyte and 8x128 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	2,560	16x32 Mbyte, 16x128 Mbyte
4	5,120	32x32 Mbyte, 32x128 Mbyte
8	10,240	64x32 Mbyte, 64x32 Mbyte

Figure 67 4x32 Mbyte and 12x128 Mbyte DIMMs per board

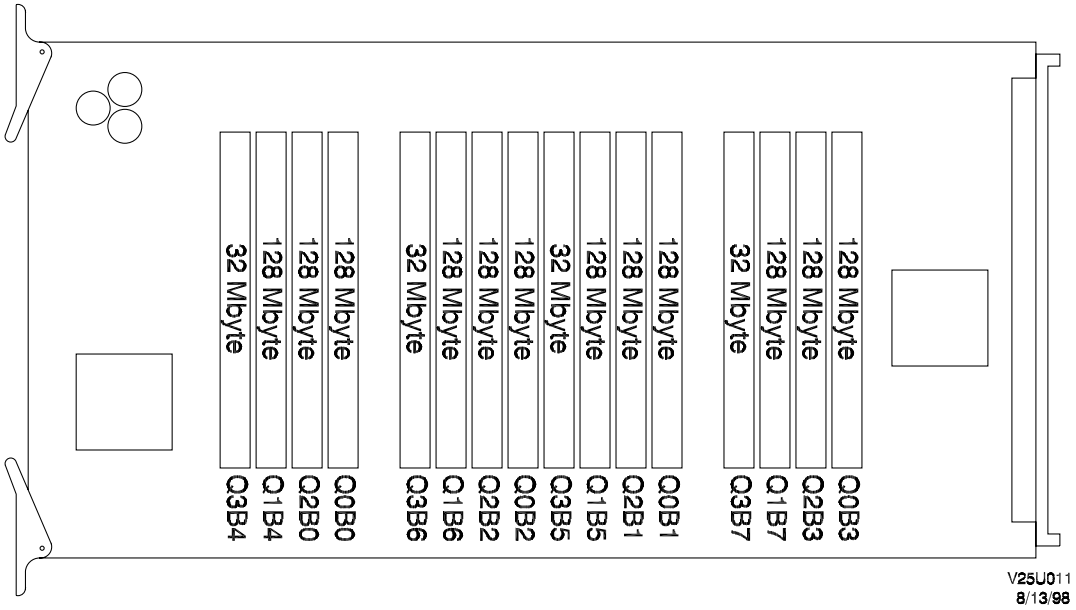


Table 31 4x32 Mbyte and 12x128 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	3,250	8x32 Mbyte, 24x128 Mbyte
4	6,656	16x32 Mbyte, 48x128 Mbyte
8	13,312	32x32 Mbyte, 96x128 Mbyte

Figure 68 4x256 Mbyte DIMMs per board

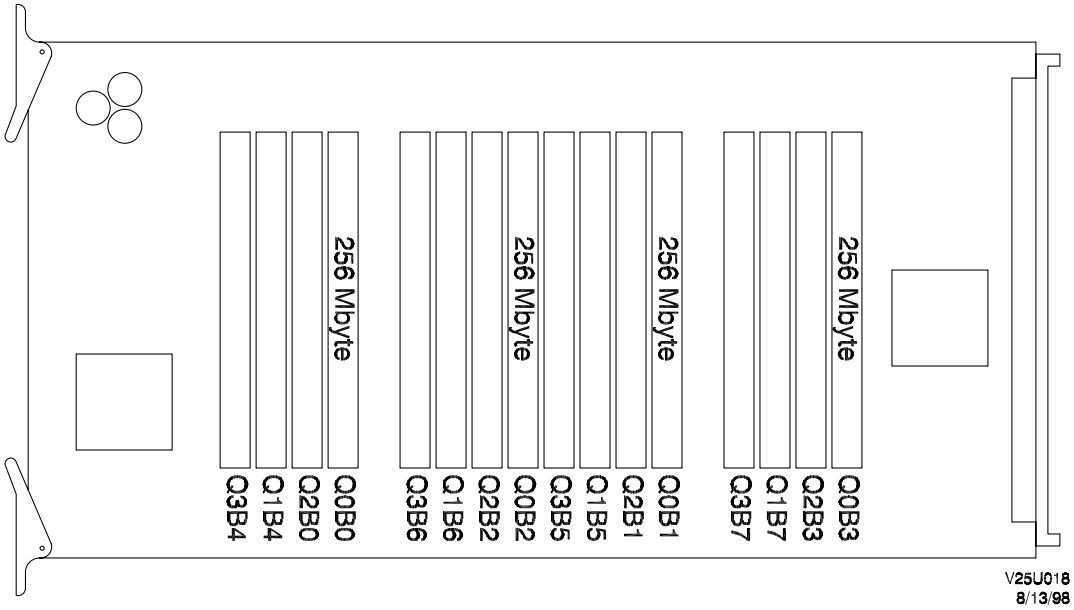


Table 32 4x256 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	2,048	4x256 Mbyte
4	4,096	8x256 Mbyte
8	8,192	16x256 Mbyte

Figure 69 8x256 Mbyte DIMMs per board

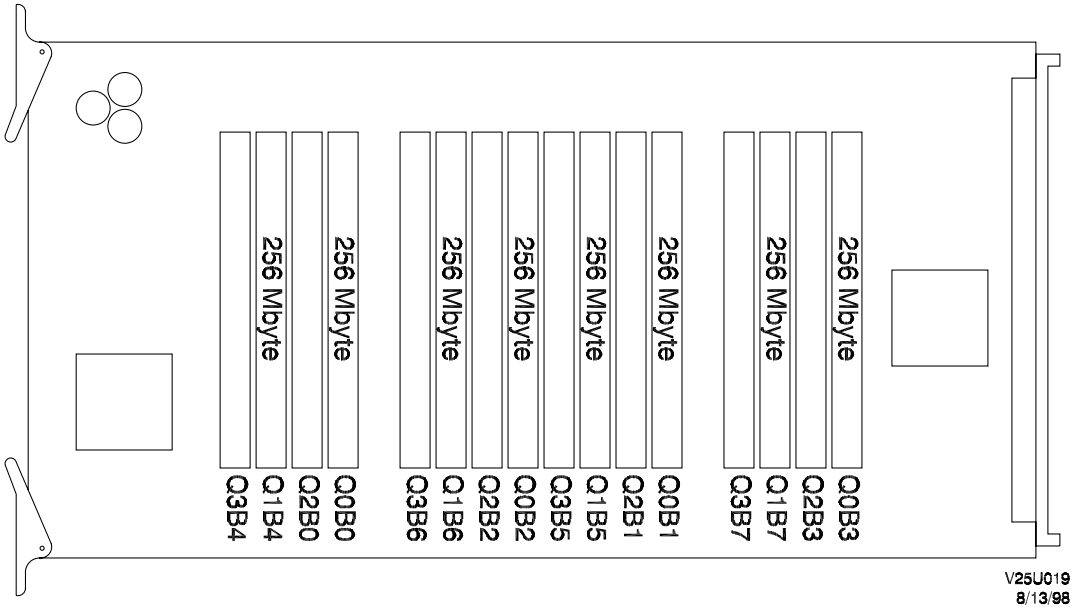


Table 33 8x256 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	4,096	16x256 Mbyte
4	8,192	32x256 Mbyte
8	16,384	64x256 Mbyte

Figure 70 12x256 Mbyte DIMMs per board

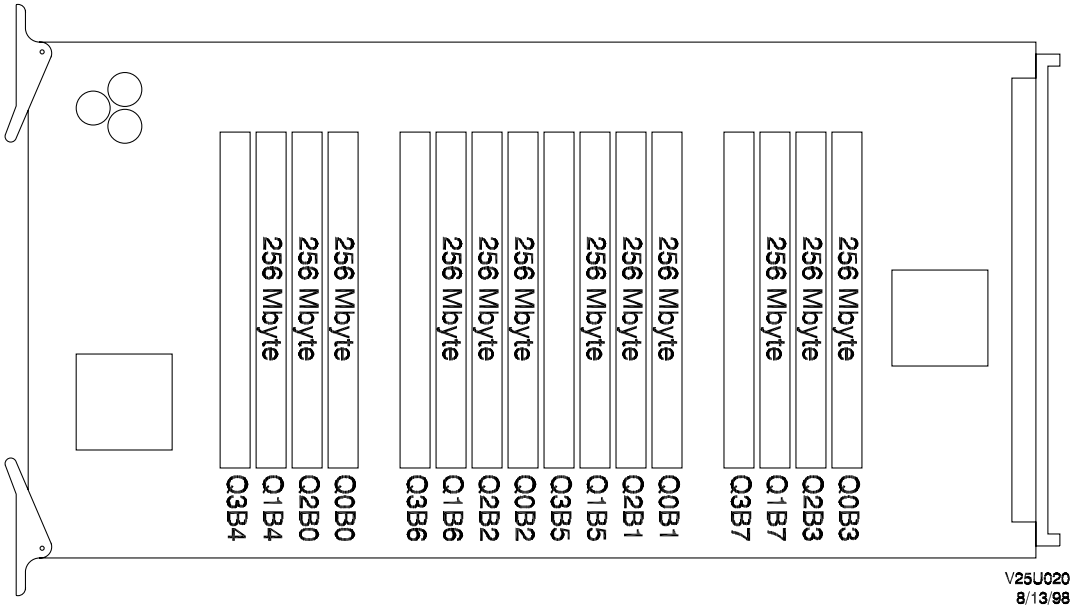


Table 34 12x256 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	6,144	24x256 Mbyte
4	12,288	48x256 Mbyte
8	24,576	96x128 Mbyte

Figure 71 16x256 Mbyte DIMMs per board

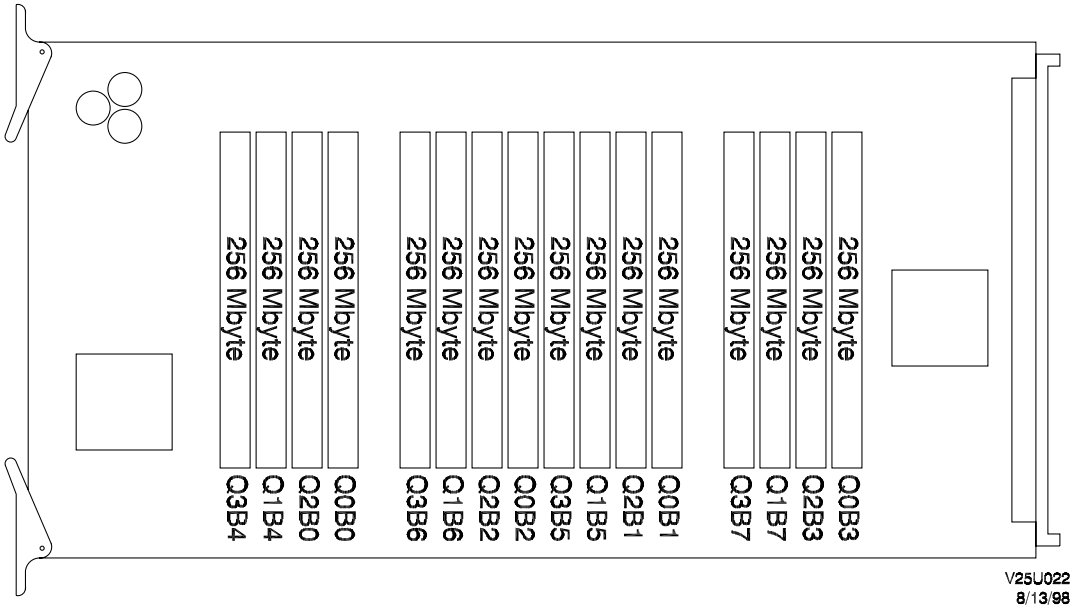


Table 35 16x256 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	8,192	32x256 Mbyte
4	16,384	64x256 Mbyte
8	32,768	128x256 Mbyte

Figure 72 4x128 Mbyte and 4x256 Mbyte DIMMs per board

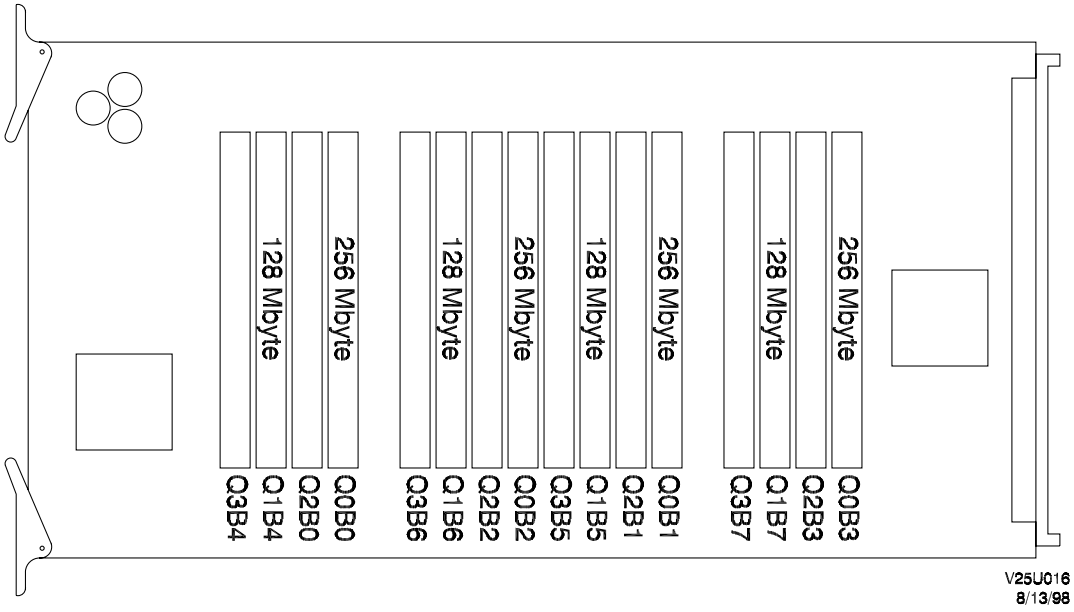


Table 36 4x128 Mbyte and 4x256 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	3,072	8x128 Mbyte, 8x256 Mbyte
4	6,144	16x128 Mbyte, 16x256 Mbyte
8	12,288	32x128 Mbyte, 32x256 Mbyte

Figure 73 4x128 Mbyte and 8x256 Mbyte DIMMs per board

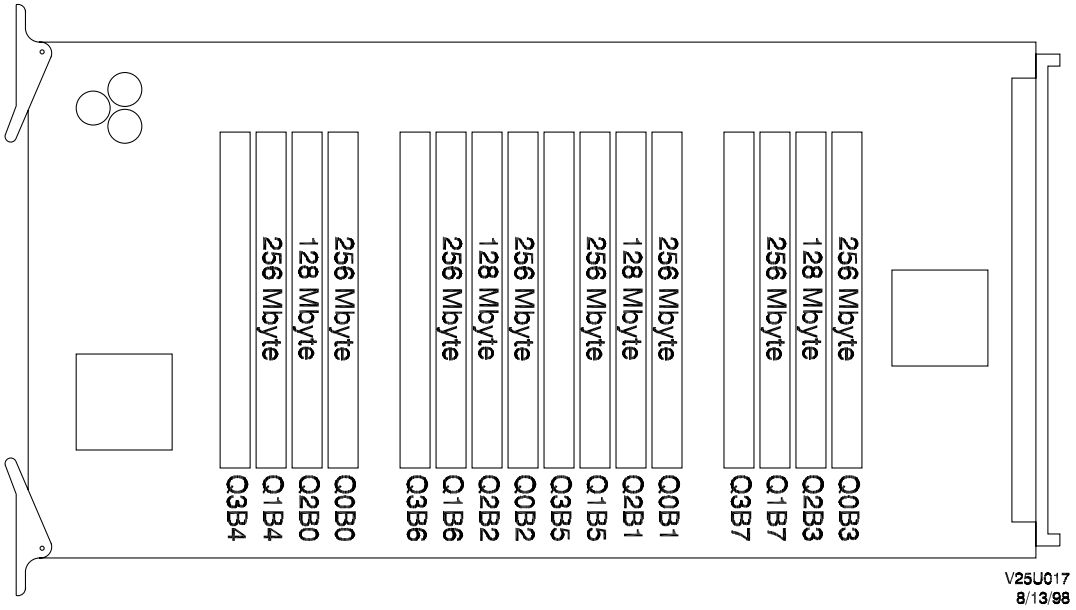


Table 37 4x128 Mbyte and 8x256 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	5,120	8x128 Mbyte, 16x256 Mbyte
4	10,240	16x128 Mbyte, 32x256 Mbyte
8	20,480	32x128 Mbyte, 64x256 Mbyte

Figure 74 8x128 Mbyte and 4x256 Mbyte DIMMs per board

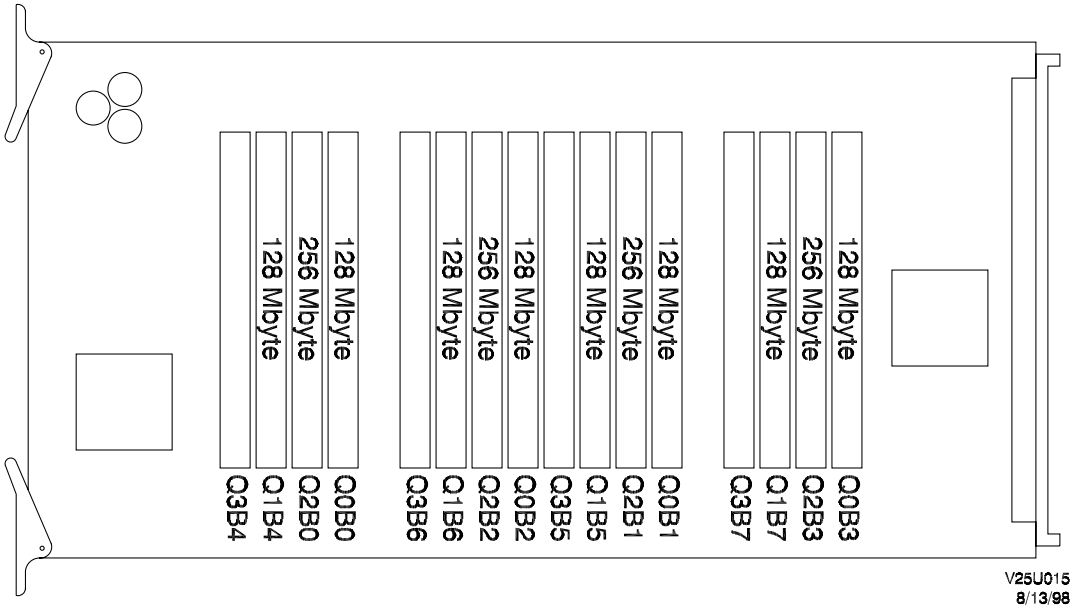


Table 38 8x128 Mbyte and 4x256 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	4,096	16x128 Mbytes, 8 x256 Mbytes
4	8,192	32x128 Mbytes, 16 x256 Mbytes
8	16,384	64x128 Mbytes, 32 x256 Mbytes

Figure 75 12x128 Mbyte and 4x256 Mbyte DIMMs per board

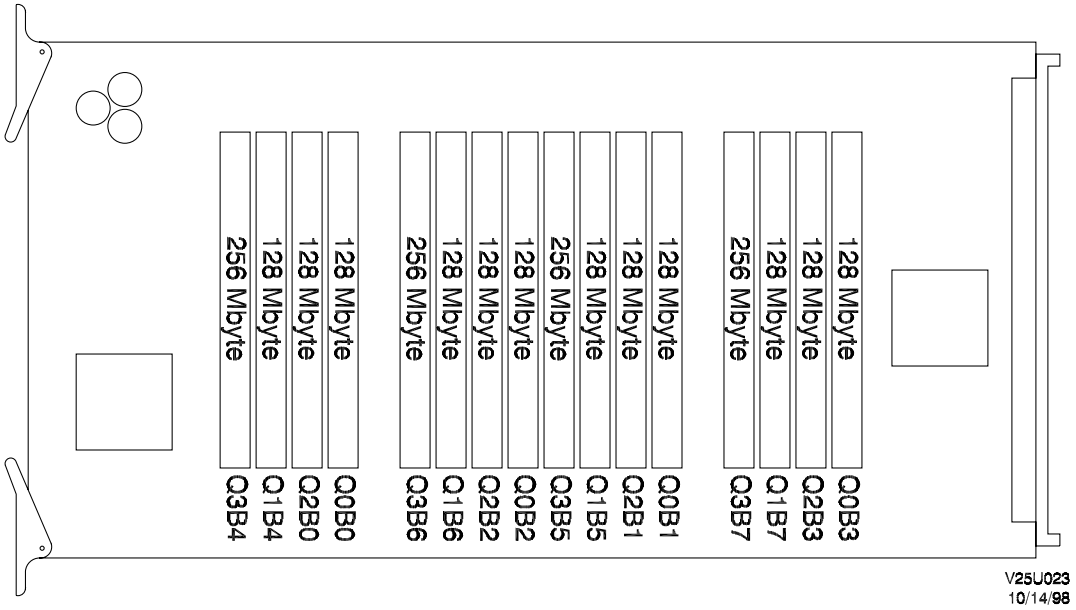


Table 39 12x128 Mbyte and 4x256 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	5,120	24x128 Mbyte, 8x256 Mbyte
4	10,240	48x128 Mbyte, 16x256 Mbyte
8	20,480	96x128 Mbyte, 32x256 Mbyte

Figure 76 8x128 Mbyte and 8x256 Mbyte DIMMs per board

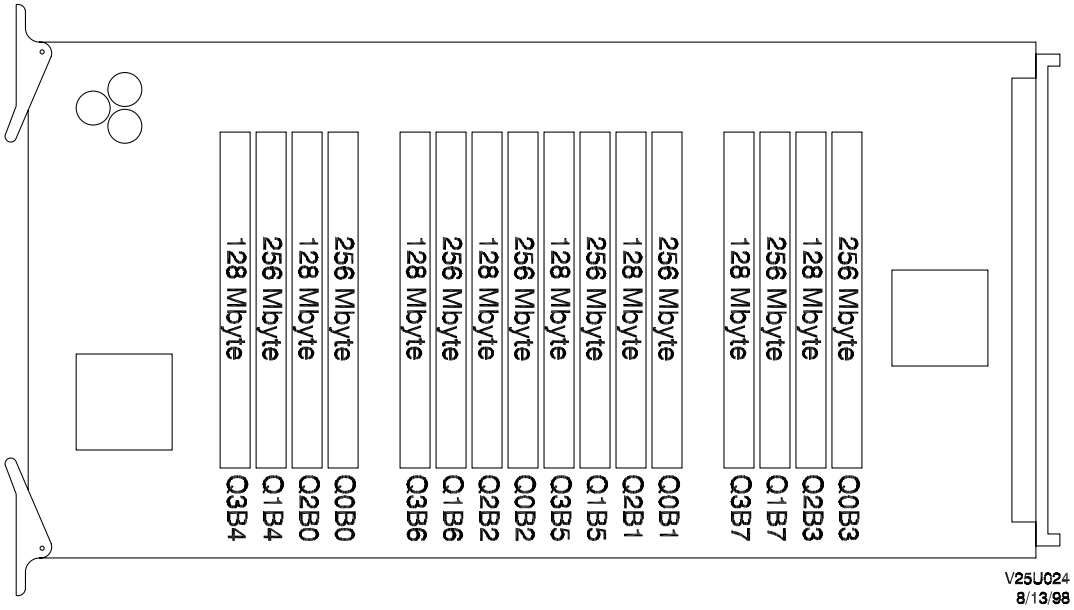


Table 40 8x128 Mbyte and 8x256 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	6,144	16x128 Mbyte, 16x256 Mbyte
4	12,288	32x128 Mbyte, 32x256 Mbyte
8	24,576	64x128 Mbyte, 32x256 Mbyte

Figure 77 4x128 Mbyte and 12x256 Mbyte DIMMs per board

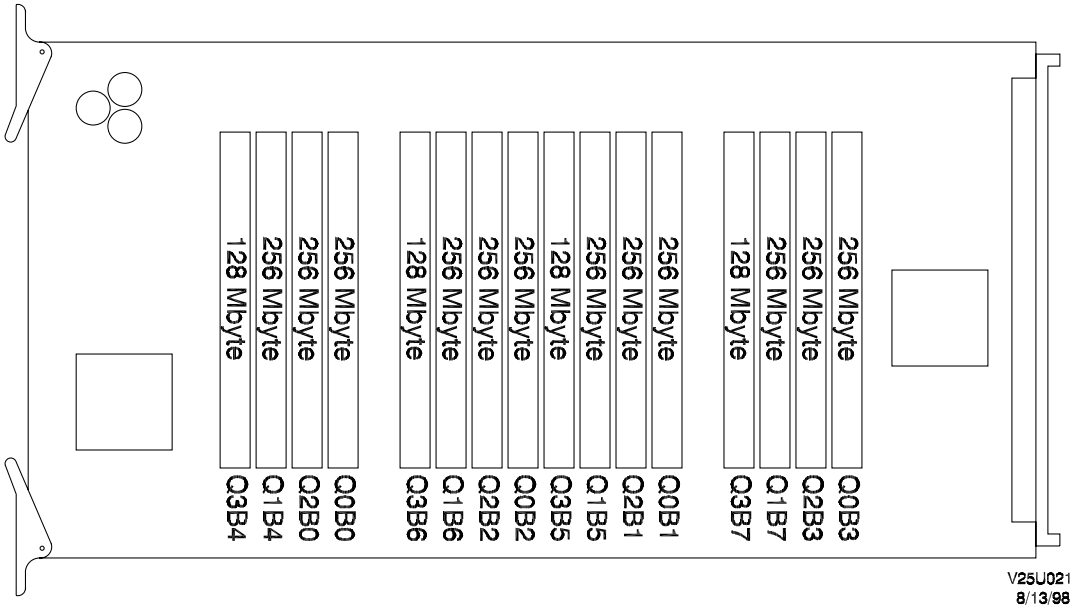


Table 41 4x128 Mbyte and 12x256 Mbyte DIMMs per board

Total number of memory boards	Total memory in Mbytes	Total number of DIMMs
2	7,176	8x128 Mbyte, 24x256 Mbyte
4	14,352	16x128 Mbyte, 48x256 Mbyte
8	28,704	32x128 Mbyte, 96x256 Mbyte

B Dual processors

This section provides the necessary procedures for converting a Single Processor Module to a Dual Processor Module in the field.

- V2500 Single Processor Module (A5491-60001)
- V2500 Dual Processor Module (A5492-60001)

- V2600 Single Processor Module (A5825-60001)
- V2600 Dual Processor Module (A5826-60001)

Installing a second processor on a V2500/V2600 processor board

This procedure assumes that the processor board has been removed from the server. Refer to "Processor boards" on page 58 for removal instructions. To convert a single processor board to a dual processor board complete the following steps:

Installing the second processor/heat sink assembly

Step 1. Place the processor board on the static-free work surface.

Step 2. Unpack the new processor/heat sink assembly from its container, remove it from the anti-static bag, and place it on the static-free work surface with the heat sink down.

Step 3. Remove the dust cover from the board's gate array socket.

Step 4. Remove the socket cover from the bottom of the processor/heat sink assembly.

Step 5. Carefully, using two hands, mate the processor/heat sink assembly to the socket on the processor board.

Step 6. Secure the processor/heat sink assembly to the board by tightening the four spring loaded self-torquing screws in a crisscross pattern.

a. Begin threading each screw into the slot about 5 turns.

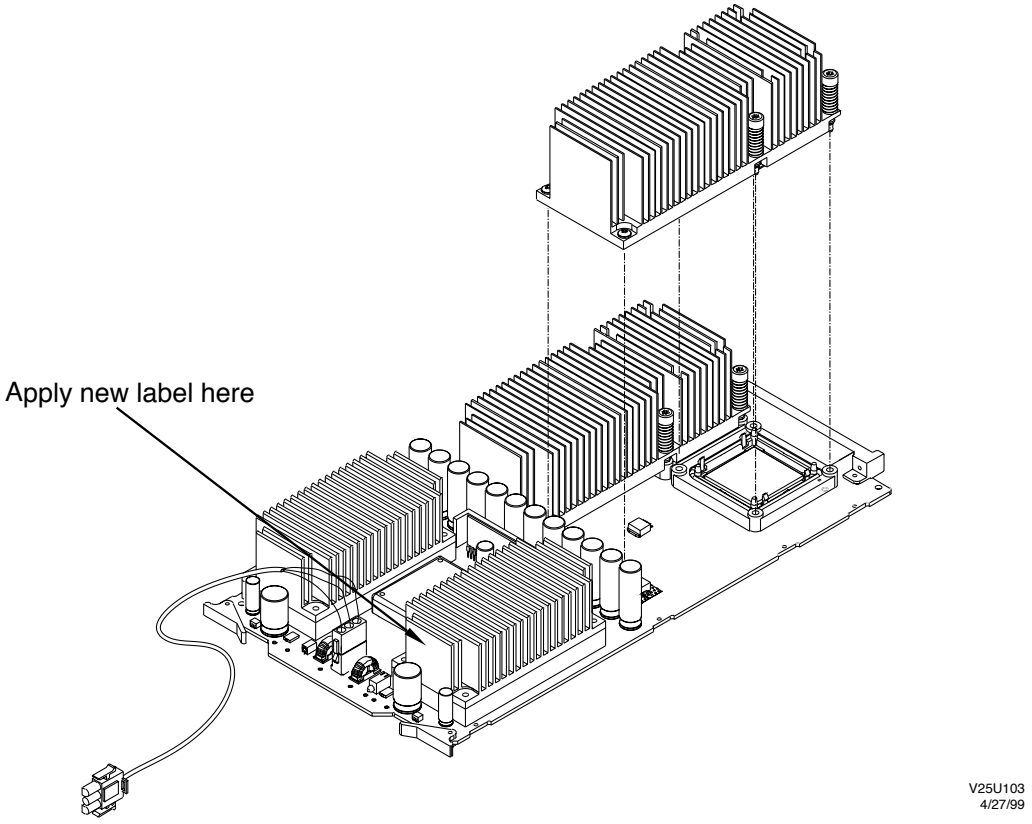
b. When all screws are in place, then completely tighten all the screws in a diagonal sequence to minimize uneven forces on the socket.

Step 7. Complete the installation by tightening the two remaining short screws securing the processor/heatsink to the heatsink mount.

Labeling

Step 1. Apply the new upgrade label to the outside fin of the DC-DC converter heatsink. Do not cover any existing labels. You may cover heatsink part number markings. See Figure 78 on page 185.

Figure 78 Installing a second processor



Updating the cop

After the processor board has been installed in the cabinet it must be re-copped with the new part number.

Step 1. Bring up the sppdsh prompt at a sppuser window by entering:

```
hostname(complex):working_directory$ sppdsh
```

Step 2. Use the cop utility to read the cop information for the boards in the node. For example:

```
sppdsh(complex): cop 0
```

NOTE This is an example of a V2500 cop printout.

```
 Node  Device   Part Number      Board Serial Number  EDC  Scan Artwork Rev
-------------------------------------------------------------------------
    0    scub   A5074-60003                2016187 00XD    00   b
    0     mib   A5074-60002                2016232 00XB    00   a
    0    pb0l   A5492-60001           A56102908100 00XC    00   b
    0    pb1r   A5492-60001           A56200978795 00XE    00   b
    0    pb4l   A5492-60001           A56102908142 00XC    00   b
    0    pb5r   A5492-60001           A56200975053 00XC    00   b
    0    mb0l   A5517-60001           A56301429140 00XD    01   a
    0    mb1l   A5517-60001           A56301429127 00XD    01   a
    0    mb2r   A5517-60001           A56301424662 00XD    01   a
    0    mb3r   A5517-60001           A56301429239 00XD    01   a
    0    mb4l   A5517-60001           A56301429216 00XD    01   a
    0    mb5l   A5517-60001           A56301429167 00XD    01   a
    0    mb6r   A5517-60001           A56301429151 00XD    01   a
    0    mb7r   A5517-60001           A56301429214 00XD    01   a
    0    iolf   A5080-60001                1400163 00XC    00   a
    0    iolr   A5080-60001                1400204 00XC    00   a
```

For more information about the cop utility see the sppdsh man page.

Step 3. Change the part number using the copmod utility.

For the V2500

sppdsh(complex)**: copmod 0** *device* **-p A5492-60001**

OR

For the V2600

sppdsh(complex)**: copmod 0** *device* **-p A5826-60001**

Step 4. Review the changes using the cop utility.

sppdsh(complex)**: cop 0**

C Checking Symbios FCODE revision levels

This appendix contains the procedure for checking the FCODE revision level of each of the Symbios PCI SCSI controllers. V2500/V2600 requires Symbios FCODE revision 7.0 or greater. If the controllers do not have Symbios FCODE revision 7.0 or greater, use the latest *V2500/V2600 Test Station Release Notice* to update each one.

NOTE

Always refer to the latest *V2500/V2600 Test Station Release Notice* for the most current information regarding FCODE revision levels.

Checking the FCODE revision level

Table 42 shows the SAGA physical path information and Table 43 contains the controller identification information you will need in the following procedure.

Table 42 SAGA physical paths

Location of SAGA	SAGA	SAGA Physical Path
Left front SIOB, rear SAGA	0	pci@fe,10000
Left front SIOB, front SAGA	4	pci@fe,210000
Left rear SIOB, rear SAGA	1	pci@fe,90000
Left rear SIOB, front SAGA	5	pci@fe,290000
Right front SIOB, rear SAGA	3	pci@fe,190000
Right front SIOB, front SAGA	7	pci@fe,390000
Right rear SIOB, rear SAGA	2	pci@fe,110000
Right rear SIOB, front SAGA	6	pci@fe,310000

Table 43 Controller Identification

Slot Number	Controller Identification
0	symbios@0
1	symbios@800
2	symbios@1000

Check the revision level of Symbios firmware by completing the following steps:

Step 1. Bring up the OBP prompt. At the Command prompt enter:

```
Command: fm
```

Step 2. Use the showdevs command to display a list of devices by entering:

```
[0:0] ok show-devs
```

Figure 79 shows an example `show-devs` output.

Figure 79 **`show-devs`** output

```
/pci@fe,390000
/pci@fe,290000
/pci@fe,190000
/pci@fe,90000
...

/pci@fe,390000/pci107e,4@1000,0
/pci@fe,290000/symbios@1000,0      <-- f/w controller at slot 2, SAGA 5
/pci@fe,290000/pci1011,19@800,0
/pci@fe,290000/symbios@1000,0/cd
/pci@fe,290000/symbios@1000,0/st
/pci@fe,290000/symbios@1000,0/sd
/pci@fe,90000/symbios@0,0          <-- f/w controller at slot 0, SAGA 1
/pci@fe,90000/symbios@0,0/cd
/pci@fe,90000/symbios@0,0/st
/pci@fe,90000/symbios@0,0/sd
```

Step 3. Change the directory to the corresponding directory of one of the controllers you have identified.

```
[0:0] ok cd /pci@fe,90000/symbios@0,0
```

Step 4. Identify the FCODE revision level of the controller by displaying the controllers attributes using the `.attributes` command:

```
[0:0] ok .attributes
```

Figure 80 shows an example `.attributes` output.

Figure 80 **`.attributes` output**

```
targets                 06 00 00 00 02 00 01 0f 59 47 00 00 02 02 8b 00
assigned-addresses      81000010  00000000  00001000  00000000  00001000
                        82000014  00000000  fc000000  00000000  00001000
                        82000018  00000000  fc001000  00000000  00001000
reg                     00000000  00000000  00000000  00000000  00000000
                        02000018  00000000  00000000  00000000  00001000
device_type             scsi-2
fcode-version           7.0  <-------------  FCODE version
created                 98/03/27 10:05:38
#size-cells             00000002
#address-cells          00000003
revision                00000001
model                   Symbios 8751D
name                    symbios
has-fcode
```

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