



Sun Enterprise™ 10000 System Hardware Installation and De-Installation Guide

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Preface

The *Sun Enterprise 10000 System Hardware Installation and De-Installation Guide* provides the procedures for installing and configuring the Sun Enterprise™ host hardware and software. The procedures used are dependent upon the task at hand.

Some procedures, such as the Sun Enterprise 10000 alternate pathing software installation, are not provided in this document. Those procedures can be located in other readily available Sun Microsystems™ documents.

This document is for service personnel as well as customers who may be servicing their Sun Enterprise 10000 system.

Using UNIX Commands

This document may not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook™ online documentation for the Solaris™ software environment
- Other software documentation that you received with your system

Typographic Conventions

Typeface	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output	% su Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type <code>rm filename</code> .

Shell Prompts

Shell	Prompt
C shell	<i>machine_name%</i>
C shell superuser	<i>machine_name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

Related Documentation

The following documents contain topics that relate to the information in the *Sun Enterprise 10000 System Hardware Installation and De-Installation Guide*.

Application	Title	Part Number
Service	<i>Sun Enterprise™ 10000 System Read Me First</i>	805-2913
Service	<i>Sun Enterprise™ 10000 System Unpacking Guide</i>	805-2915
Service	<i>Sun Enterprise™ 10000 System Overview</i>	805-0310
Service	<i>Sun Enterprise™ 10000 System Site Planning Guide</i>	805-2914
Service	<i>Sun Enterprise™ 10000 Hardware Installation and De-Installation Guide</i>	805-4651
Service	<i>Sun Enterprise™ 10000 System Service Guide</i>	805-2917
Service	<i>Sun Enterprise™ 10000 System Service Reference I</i>	805-3622
Service	<i>Sun Enterprise™ 10000 System Service Reference II</i>	805-3623
User	<i>Sun Enterprise™ Server Alternate Pathing User Guide</i>	
User	<i>Sun Enterprise™ 10000 SSP User Guide</i>	
User	<i>Sun Enterprise™ 10000 SSP Installation Guide and Release Notes</i>	
User	<i>Solaris on Sun Hardware Platform Guide</i>	

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<http://www.sun.com/products-n-solutions/hardware/docs>

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Installing the SSP Hardware

1.1 Safety and Tools Requirements

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions, warnings, and instructions marked on the equipment.
- Ensure that the voltage and frequency rating of the power source you use matches the electrical rating label on the equipment.
- Use only properly grounded power outlets.
- Never push objects of any kind through openings in the equipment because they can touch dangerous voltage points or short out components that can result in fire or electric shock.
- Use only qualified personnel to service the equipment.

To protect both yourself and the equipment, observe the precautions listed in TABLE 1-1:

TABLE 1-1 Safety Precautions

Item	Problem	Precaution
AC/DC power	Electric shock	Verify that all AC and DC power has been properly neutralized prior to servicing. Keep AC ground connected during servicing to provide a cabinet ground for ESD protection.
ESD kit	Static	An approved ESD mat provides protection from static damage when used with a wrist strap or foot strap. Use the Sun Microsystems provided ESD kit when handling Sun Enterprise components.

TABLE 1-1 Safety Precautions (Continued)

Item	Problem	Precaution
Wrist strap or foot strap	Static	Wear a conductive wrist strap or foot strap when handling printed circuit boards.
Cover panels	System damage and overheating	Attach all cabinet cover panels after performing any service work on the system.
Filler panels	System damage and overheating	Install card cage filler panels in all unused card cage slots. Open slots severely reduce the cooling capability of the system.
SBus slot covers	System damage and overheating	Install SBus slot covers in all unused system board SBus slots. Openings on the backs of system boards reduce the cooling capability of the system.
Springfingers	Personal injury	The springfingers have sharp edges. Use care when handling springfinger-equipped cabinet screens and system boards.
	RFI leakage	Keep springfinger-equipped screens and panels in place when the system is running. These assemblies suppress radio frequency interference (RFI) and are required by law in many localities.

The following symbols mean:

TABLE 1-2 Symbols




	CAUTION	This equipment contains lethal voltage. Accidental contact with the centerplane, card cage, and drive areas can result in serious injury or death.
	CAUTION	Risk of personal injury and equipment damage. To reduce the risk, follow the instructions.
	AC	A terminal to which alternating current or voltage can be applied.

TABLE 1-2 Symbols (Continued)

	Protective earth	Protective earth conductor.
	Chassis	Frame or chassis terminal
	Fuse replacement marking	For continued protection against risk of fire and electric shock, replace ONLY with same type and rating of fuse.



Caution – Improper handling by unqualified personnel can cause serious damage to this equipment. Unqualified personnel who tamper with this equipment can be held liable for any resulting damage to the equipment.

All procedures contained in this document must be performed by *qualified service-trained maintenance providers*.



Caution – Before you begin, carefully read each of the procedures in this manual. If you have not performed similar operations on comparable equipment, *do not attempt* to perform these procedures.

1.2 Preparing for System Installation

Note – Site preparation is detailed in the *Sun Enterprise 10000 System Site Planning Guide*.

It is the customer's responsibility to prepare the site. Sun Microsystems Customer Service or an authorized distributor will assist with the site-planning process and will install the equipment upon notification of delivery from the customer.

Prior to the installation of the system, verify the following items:

1. The installation checklist and report have been located and are available.
2. Installation of the necessary electrical equipment is complete and sufficient power is provided as stated in the *Sun Enterprise 10000 System Site Planning Guide*.
3. Adequate air conditioning is provided as stated in the *Sun Enterprise 10000 System Site Planning Guide*.
4. A network is available (Ethernet and/or FDDI) as stated in the *Sun Enterprise 10000 System Site Planning Guide*.
5. If the customer has noted problems or peculiarities at the site that require special equipment, it is the responsibility of the customer to obtain such equipment.
6. The air-conditioning system has been operational and running for 48 hours to bring the room to the appropriate temperature as stated in the *Sun Enterprise 10000 System Site Planning Guide*.
7. The area for the system has been thoroughly cleaned and vacuumed in preparation for installation.
8. The shipper and Sun Microsystems have been notified of all missing or damaged items.
9. The system is unpacked and moved into the installation area as stated in the *Sun Enterprise 10000 System Site Planning Guide* and/or the *Sun Enterprise 10000 System Unpacking Guide*.

The *Sun Enterprise 10000 System Site Planning Guide* provides the necessary information to complete and/or verify these tasks.

1.3 Connecting the Power Cables

The system requires an electrical circuit that is grounded to earth. The American standards group, Underwriters Laboratories, Inc., specifies:

An insulated earth-ground 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 at 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.¹



Caution – The AC power connections provide a ground path that will protect the components (boards and drives) in the cabinet from static electricity damage.

Complete the following connections with the power cables provided.

1. **Unpack and place the SSP on the customer-supplied table.**
2. **Verify the power switch is in the off position.**
3. **Verify with a digital voltmeter (DVM) that the incoming AC voltage is correct.**
Refer to the *Sun Enterprise 10000 System Site Planning Guide* for further information.
4. **Using the power cables provided, connect the SSP to the customer-supplied power receptacles.**
5. **Secure all cables to improve overall appearance and prevent damage.**

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1.4 Connecting the Network Hardware

To prevent general-purpose Ethernet traffic from negatively affecting the SSP to Sun Enterprise 10000 host communication, the following configuration rules should be observed:

- Connect the SSP and control boards through a private 10BASE-T network. This will connect the one (or two) SSPs with the one (or two) control boards.
- Connect the SSP and each of the host domains through a second network. This network may be private. To facilitate net-booting, a domain from the SSP, the network between the domain and the SSP, must be either 10BASE-T or 100BASE-T Ethernet.

FIGURE 1-1, FIGURE 1-2, and FIGURE 1-3 illustrate three possible network configurations. These configurations use the hubs that are packaged in manufacturing with the control boards and an SSP that is configured in manufacturing with an additional quad Ethernet card. Customer networks and their hubs, however, are site dependent and, therefore, not supplied by Sun Microsystems.

FIGURE 1-1 consists of two subnets: a primary subnet, `dom_subnet`, comprised of the SSP and the domains and a secondary subnet, `cb_subnet`, comprised of the SSP and the control board.

FIGURE 1-2 and FIGURE 1-3 consist of three subnets, a primary subnet, `dom_subnet`, comprised of both SSPs and domains, a second subnet, `cb_subnet`, comprised of both SSPs and the first control board, and the third subnet, `cb_subnet1`, comprised of both SSPs and the second control board.

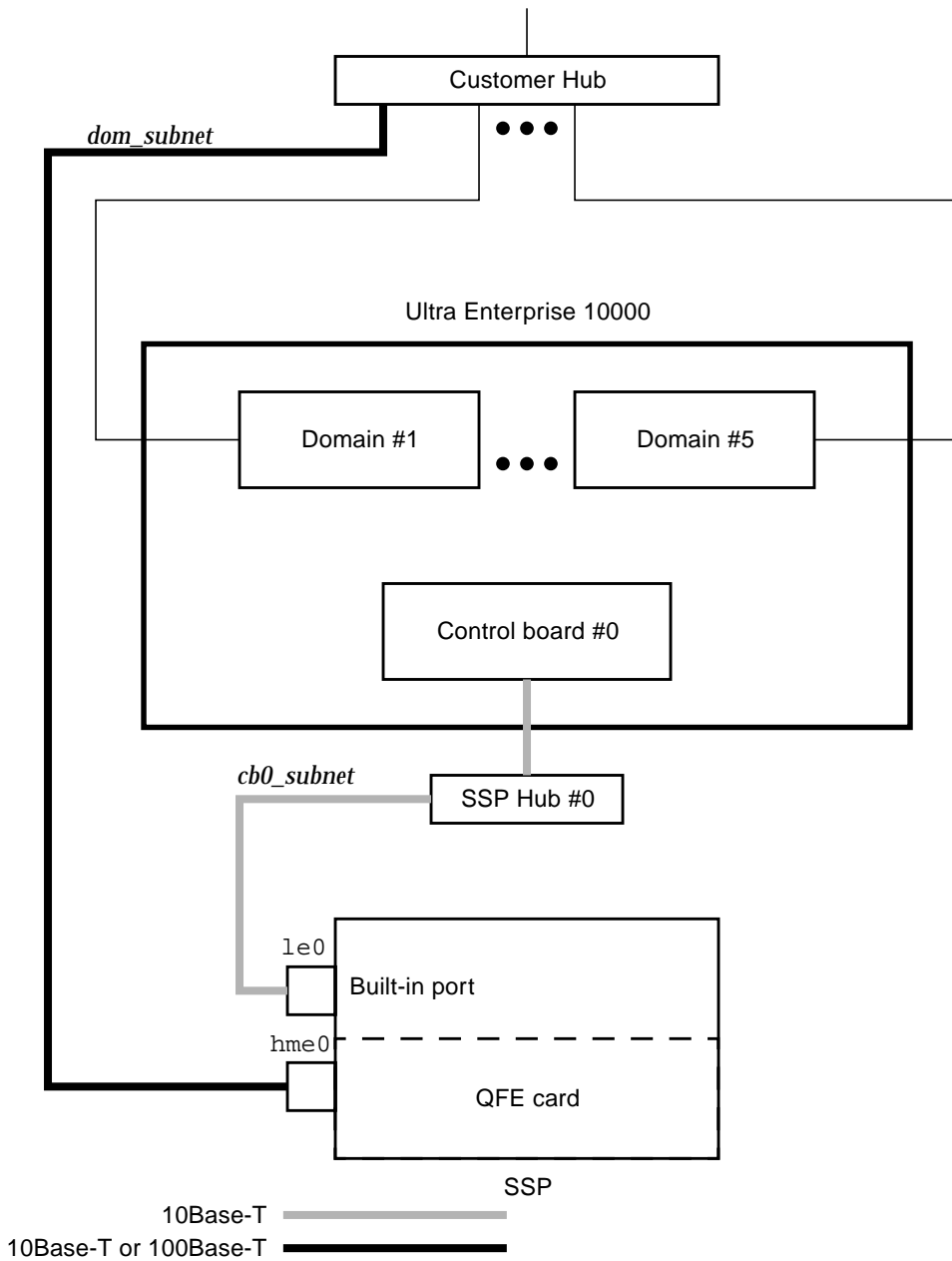


FIGURE 1-1 Network Configuration—Base Case

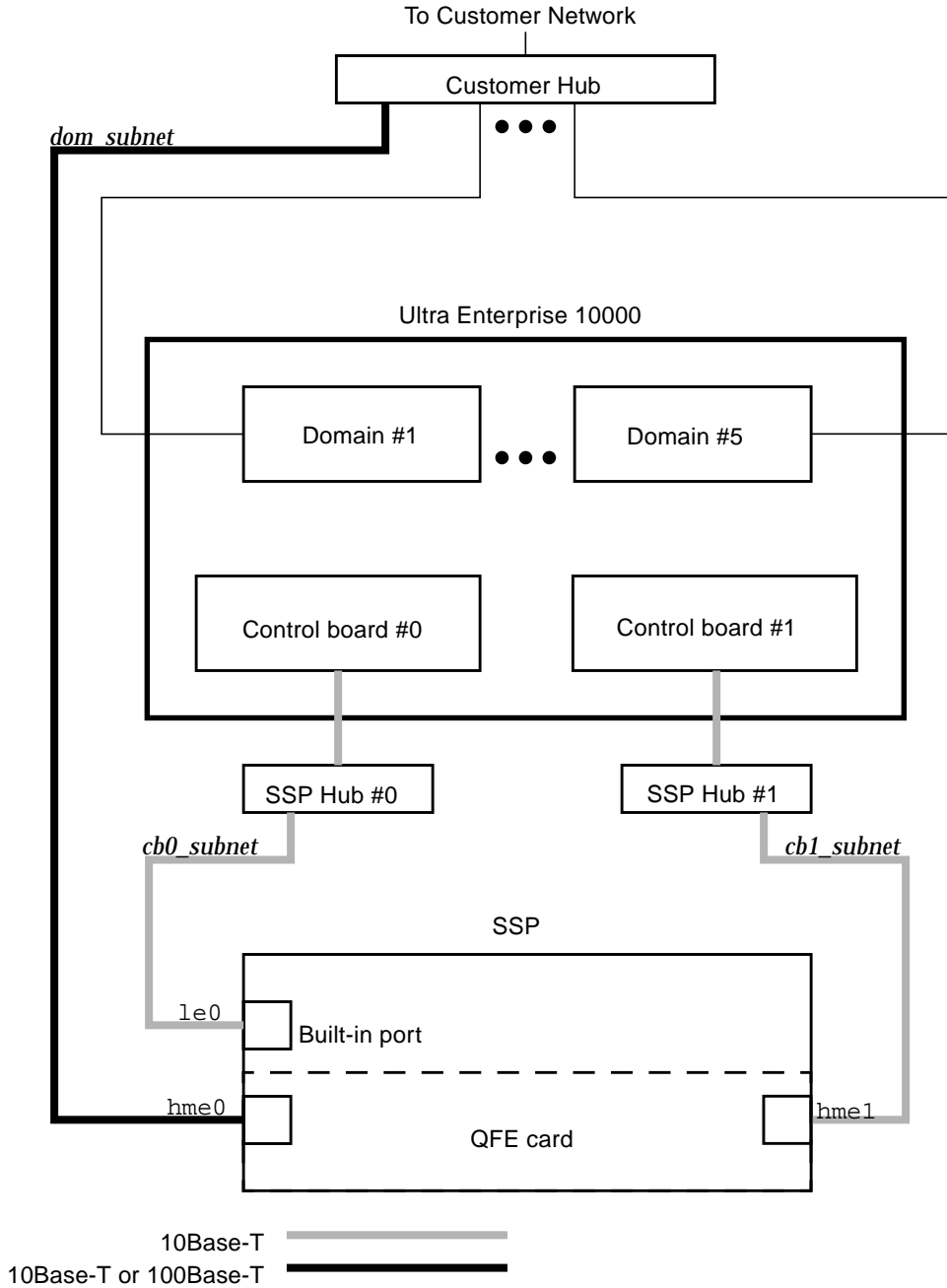


FIGURE 1-2 Network Configuration With Redundant Control Boards

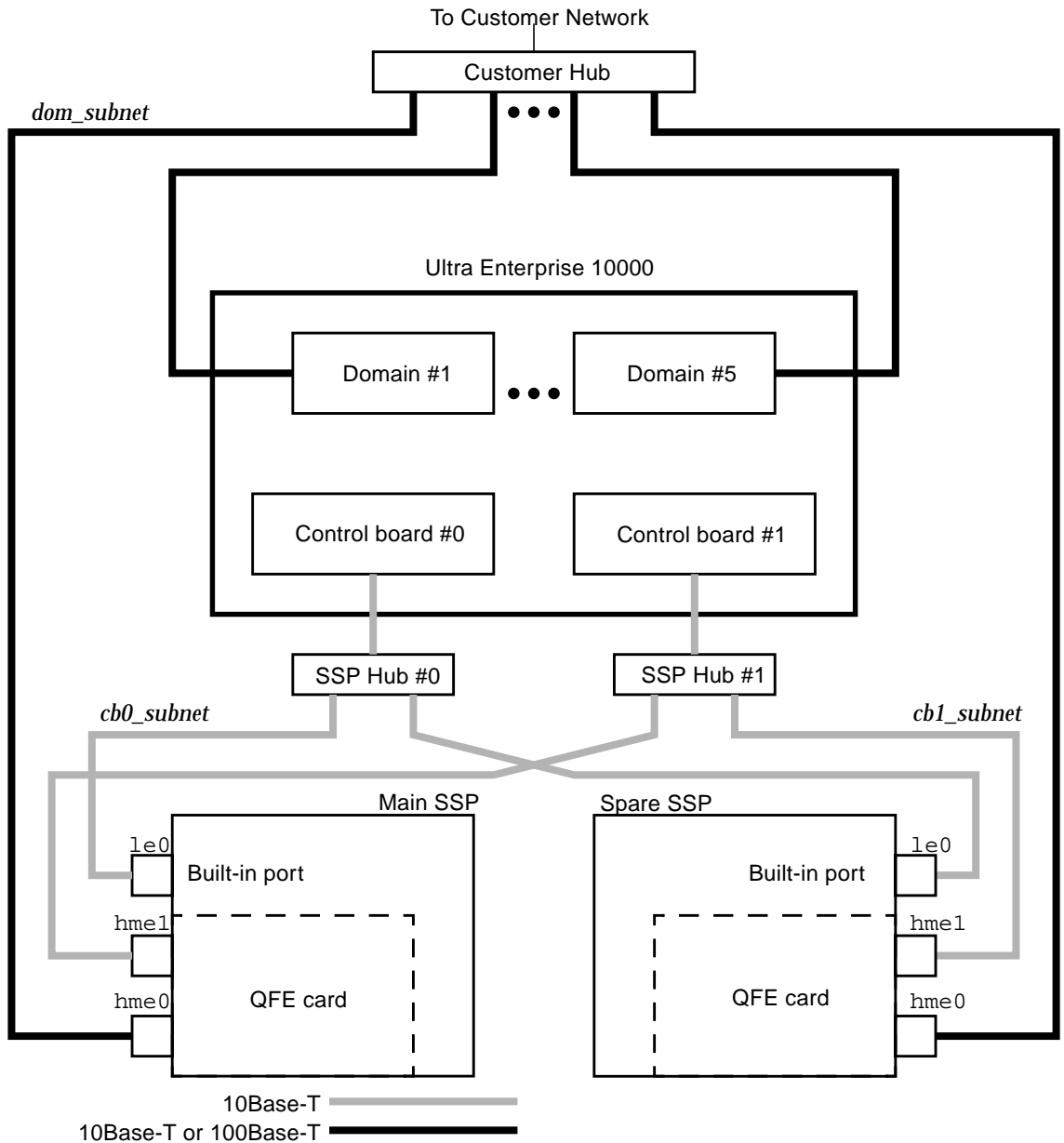


FIGURE 1-3 Network Configuration with Redundant Control Board and a Spare SSP

After connecting the network hardware, refer to the *Sun Enterprise 10000 Installation Guide and Release Notes*.

Installing the Sun Enterprise 10000 System Hardware

2.1 Tools Required

The following list represents the minimum of tools and test equipment that you need to install the processor cabinet:

- Screwdriver, common (flat-bladed), 1/8-inch, 3/16-inch
- Screwdriver, Phillips, #2
- Digital voltmeter (DVM)
- Open-ended wrench (11/16-inch for feet, 5/8-inch for skid bolts)

2.2 Installation Task List for the Host

1. Position the system components.

See Section 2.3 “Positioning the System Components” on page 2-3.

2. Locate the installation manuals for all peripherals and perform necessary installation tasks.



Caution – Failure to remove shipping brackets from peripherals can result in equipment damage.

3. Cable the system.

See the following sections:

- Section 2.4 “Grounding the Cabinet” on page 2-5
- Section 2.6 “Connecting Power Cables” on page 2-8
- Section 2.7 “I/O Cable Labeling” on page 2-10
- Section 2.8 “Connecting an External SCSI Device” on page 2-13
- Section 2.9 “Configuring Remote Power Control” on page 2-14
- Section 2.10 “Connecting Remote Power Control Cables” on page 2-17

4. Apply power to the AC components.

See Section 2.12 “Applying Power to the AC Input Units and AC Sequencers” on page 2-18.

5. Verify the hardware.

See Section 2.13 “Testing the Processor Cabinet Hardware” on page 2-19.

6. Create the initial domain on the SSP.

See Chapter 3 “Configuring a Preloaded Domain Delivered From the Factory”

7. Add additional domains, if necessary.

Install the Solaris software on the new domains.

8. Verify the system.

See Chapter 4 “Completing the Sun Enterprise 10000 System Installation”.

2.3 Positioning the System Components

The shipping straps on the optional power shelves (if installed) must be disconnected from the horizontal rails while access to the side of the processor cabinet is available. The screws can not be reached from the front or back of the cabinet for removal of the power shelves for maintenance.



Caution – Power off the cabinet and all equipment connected to it before performing component replacement procedures. The system chassis power must be turned off, and the AC power connector must remain connected to ensure a proper ground.



Caution – Do not make mechanical or electrical modifications to the processor or I/O cabinets. Sun Microsystems is not responsible for the regulatory compliance if the cabinets are modified.



Caution – The shipping brackets on the standard power shelves serve as ground straps also. Do not remove any of the screws as this may disconnect the ground path for the power shelves.

1. **Perform the following steps if the dual power option power shelves are installed. Begin with Step 2 if the dual power option power shelves are not installed.**
 - a. **Remove the side panel and remove the screws that fasten the shipping straps to the horizontal rails as shown in FIGURE 2-1.**

There are two shipping straps attached to each power shelf. Each shipping strap is fastened to the rail with one screw. Save the screws for use if the cabinet is shipped again.
 - b. **Reinstall the side panel.**
2. **If a raised floor is installed, locate the cable cutouts.**
3. **Verify proper air flow floor panels are used and move the cabinets to facilitate cable installation.**
4. **Place the processor and I/O cabinets in the designated area.**

Place the processor cabinet in the customer-supplied space. Confirm the doors can open for servicing.

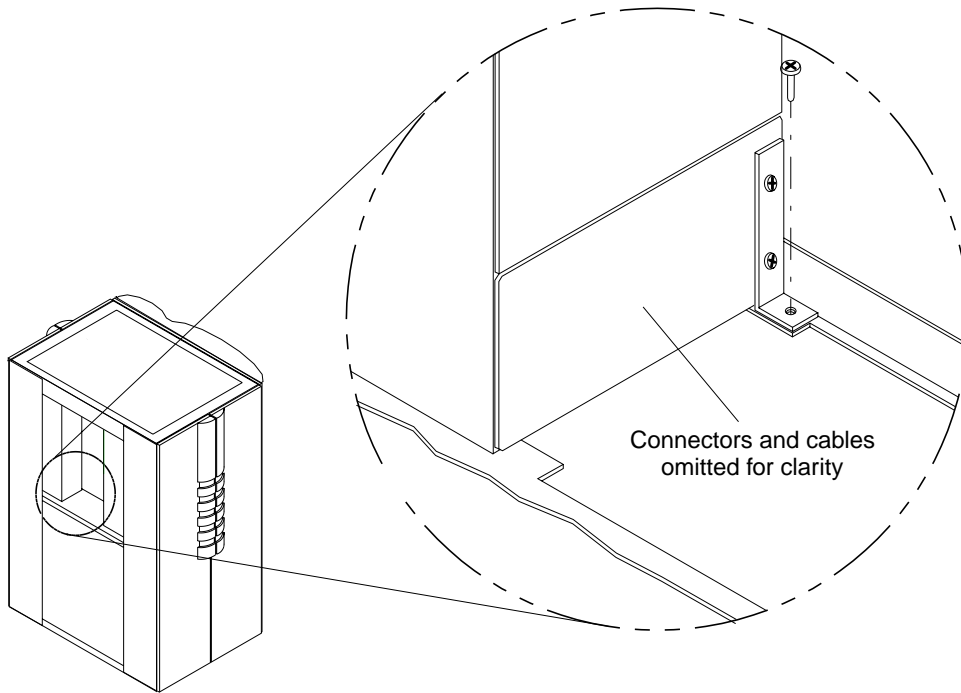


FIGURE 2-1 Removing the Optional Power Shelf Shipping Strap Attachment Screws

- 5. Verify all breakers are in the off position.**
- 6. Place all REMOTE ON/OFF switches on the AC sequencers to REMOTE.**

2.4 Grounding the Cabinet

Connect the ground strap from an adjacent I/O cabinet to the Sun Enterprise 10000 internal frame at the attachment point noted in FIGURE 2-2. If the Sun Enterprise 10000 processor cabinet is not located adjacent to the peripheral cabinet, connect each cabinet individually, with the shortest possible path, to a common ground. This common ground must reference the same ground as the power receptacles.

Note – If each cabinet is connected to a common ground, then a cabinet can be disconnected without disturbing the grounding of other cabinets.

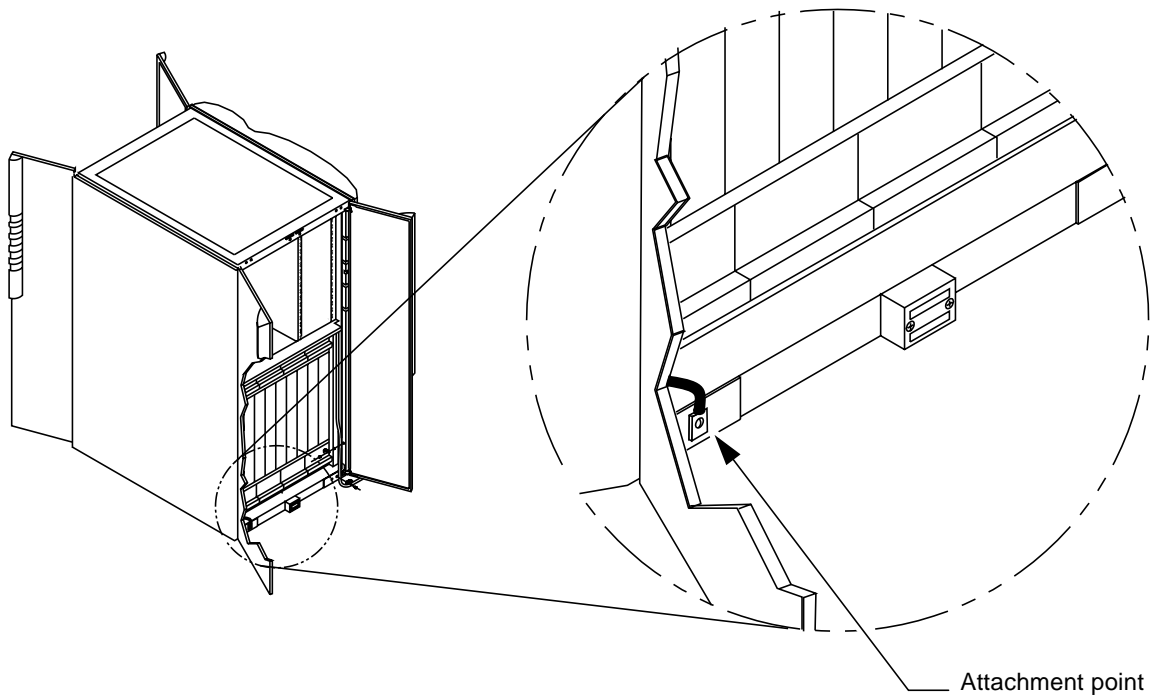


FIGURE 2-2 Ground Strap Attachment Points

2.5 Configuration Rules

The following rules apply when configuring components on the Sun Enterprise 10000 system:

- When installing peripherals into the Sun Enterprise 10000 cabinet:
 - RSM trays are the only peripherals used in the Sun Enterprise 10000 cabinet.
 - Only three RSM trays can be used in the Sun Enterprise 10000 cabinet.
- When configuring memory on a system board:
 - All sockets within a bank must be fully populated.
 - All DIMM sizes must be equal.
 - For increased performance on partially populated memory boards, do not use banks 0 and 2 together or banks 1 and 3 together.
 - For a single bank of memory, populate bank 0.
 - For two banks of memory, populate banks 0 and 1.
 - Configuring with three banks of memory is not permitted at this time.

FIGURE 2-3 and FIGURE 2-4 shows the memory bank and DIMM locations.

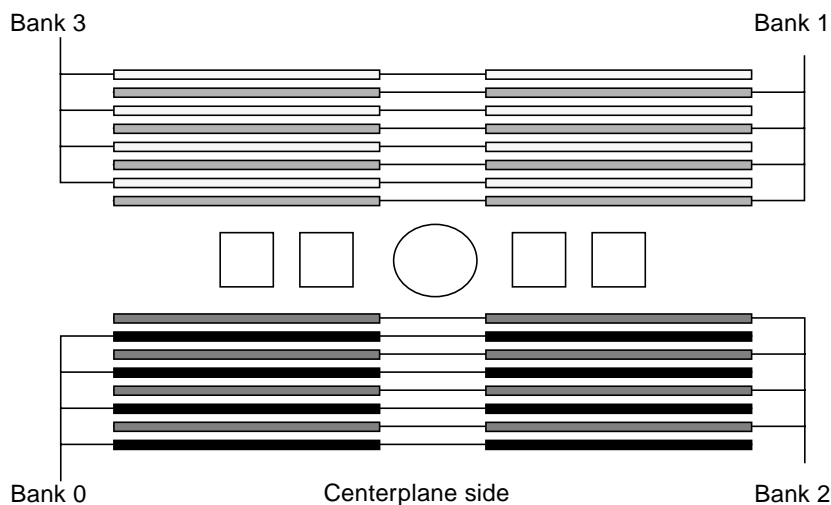


FIGURE 2-3 Memory Bank Locations

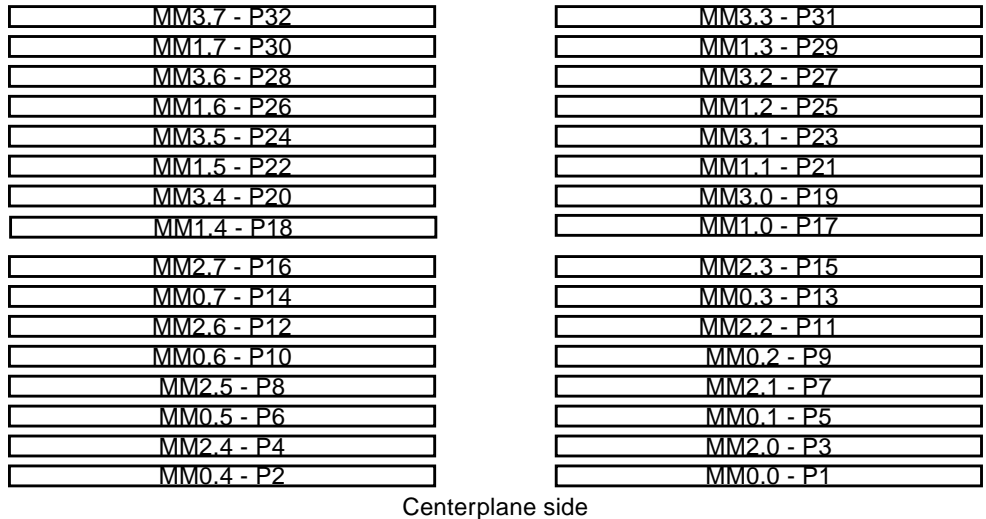


FIGURE 2-4 Memory DIMM Locations

- All supported peripherals are listed in the Computer Systems pricelist and International Configuration Guide.
- For increased I/O performance, avoid populating SBus 00 and 01 together and SBus 10 and 11 together.
- A second control board is optional.
- Two centerplane support boards are required to utilize a 144-bit data bus and four address buses.
- The system is shipped with two centerplane support boards. Should one fail, the system will function with only a 72-bit data bus and two address buses.
- Systems ordered with eight or less system boards are configured with fans, power supplies, AC input modules, and with all boards on the same side (back), *plus* a centerplane support board, AC input module, power supply, and two fans in the front.
- All processor modules in the system must be the same speed.
- All processor modules on a system board must have the same cache size.

2.6 Connecting Power Cables



Caution – Do not make mechanical or electrical modifications to the processor or I/O cabinets. Sun Microsystems is not responsible for the regulatory compliance if the cabinets are modified.

The system requires an electrical circuit that is grounded to earth. The American standards group, Underwriters Laboratories, Inc., specifies:

An insulated earth-ground 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 at 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 – The AC power connections provide a ground path that will protect the components (boards and drives) in the cabinet from static electricity damage.

Components exterior to the Sun Enterprise 10000 cabinet require separate AC power connections; refer to their respective installation manuals for additional information. The Sun Enterprise 10000 cabinet requires four to five AC power connections. This is determined by the number of AC input modules and AC sequencers installed in the cabinet. For maintenance isolation, verify a single AC source is used for each AC input module.

FIGURE 2-5 shows the suggested power connection configurations.

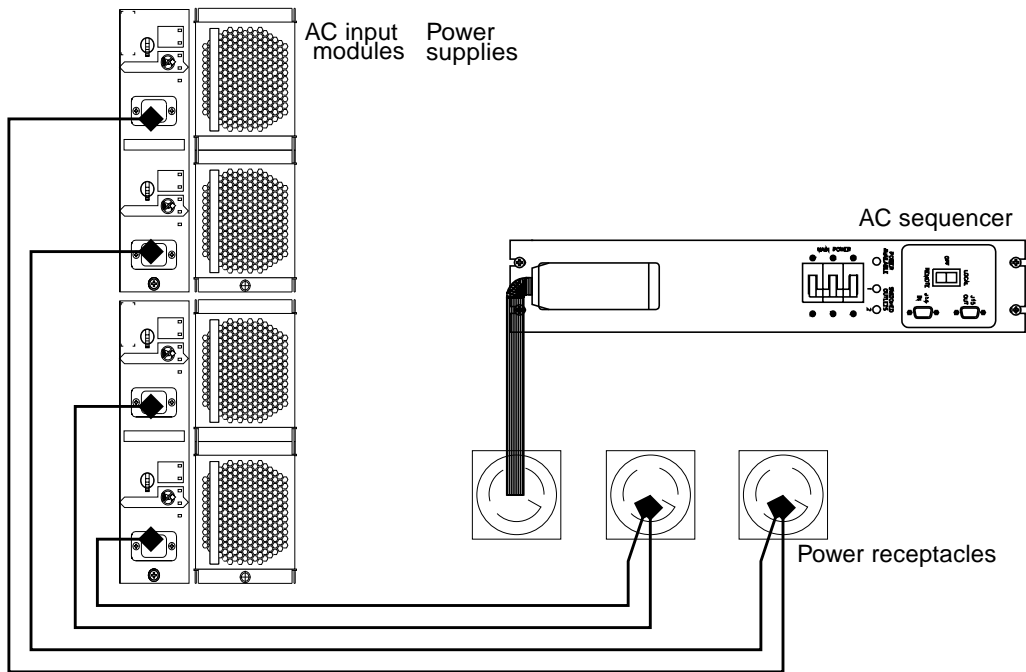


FIGURE 2-5 Suggested Power Connection Configuration

Complete the following connections with the cables provided:

1. Verify **ALL** of the breakers are in the **OFF** position prior to connecting any power cords.
2. Verify with a digital voltmeter (DVM) that the incoming AC voltage is correct for the customer site.
Refer to the *Sun Enterprise 10000 System Site Planning Guide* for further information.
3. Using the power cables provided, connect all of the AC input modules and the AC sequencers to the customer-supplied power receptacles.
4. Secure all of the cables to improve overall appearance and prevent damage.

2.7 I/O Cable Labeling

Once you have verified the site according to the *Sun Enterprise 10000 System Site Planning Guide*, and the system is in place, as detailed in Section 2.3 “Positioning the System Components” on page 2-3,” then the system cabling can be installed and connected. The following sections describe connecting the signal cables in the Sun Enterprise 10000 system.

TABLE 2-1 shows the list of connections that can be made in the Sun Enterprise 10000 system in addition to the power and I/O connections:

TABLE 2-1 System Cable Connections

Processor Cabinet	SSP	Ethernet	Remote Power
CB0-PORT0			
CB0-ETHERNET		Ethernet	
CB0-RPC0			RPC0-CB0
CB0-RPC1			RPC1-CB0
CB0-RPC2			RPC2-CB0
CB0-RPC3			RPC3-CB0
CB0-RPC4			RPC4-CB0
CB1-PORT0			
CB1-ETHERNET		Ethernet	
CB1-RPC0			RPC0-CB1
CB1-RPC1			RPC1-CB1
CB1-RPC2			RPC2-CB1
CB1-RPC3			RPC3-CB1
CB1-RPC4			RPC4-CB1
SB0.1.1 ENET-LE0			
	SSP0-<...>	Ethernet	
	SSP0-SERIAL A		
	SSP1-<...>	Ethernet	
	SSP1-SERIAL A		

When configured in the factory, all signal and power cables are clearly labeled for ease of installation (FIGURE 2-6). An additional set of these labels is delivered with the system to facilitate labeling new and replaced parts. The set consists of multiple sheets of labels that are used to identify point-to-point connections. Label all new cables as you install them and relabel any cables that you reconfigured.

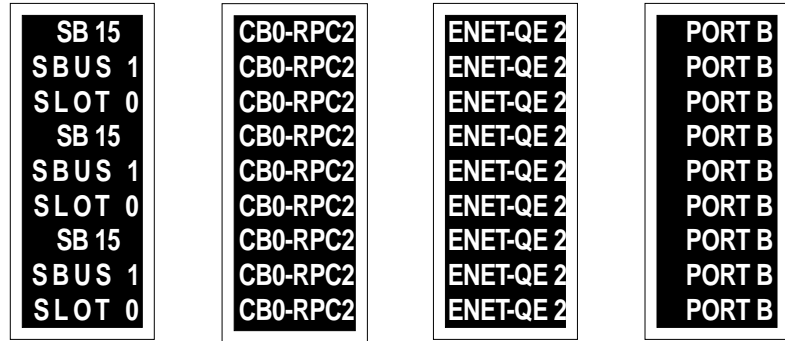
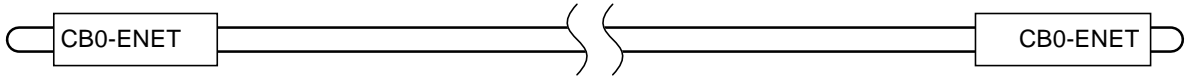


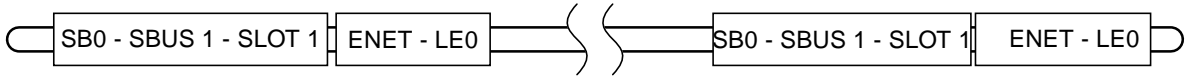
FIGURE 2-6 Cable Label Examples

Labels are installed in the manner noted in FIGURE 2-7.

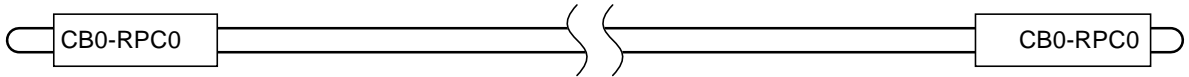
Connection Between Control Board 0/Ethernet and Ethernet Hub



Connection Between System Board 0-SBUS 1/SLOT 1/LE0 and Ethernet Hub



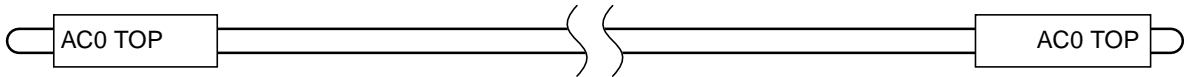
Connection Between Control Board 0/RPC 0 and Remote Power Control 0/CB0



Connection Between System Board 0/PCI 0.0 and I/O cabinet 0, Tray 0



Connection Between AC controller 0 top receptacle and the power plug



Connection Between AC power sequencer in I/O cabinet 1 and the power plug

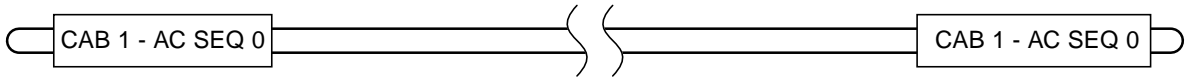


FIGURE 2-7 Cable Label Usage

2.8 Connecting an External SCSI Device

Supported peripherals are listed in the Computer Systems pricelist and International Configuration Guide.



Caution – Risk of equipment damage. Do not assign the same SCSI address to two devices that share the same SCSI bus or SBus card.



Caution – Failure to remove shipping brackets from peripherals can result in equipment damage.

1. **Locate the installation manuals for all peripherals and perform necessary installation tasks.**
2. **Connect the cable for the external SCSI device to the SCSI controller card located in the SBus slots on a system board. Tighten any attachment hardware if applicable.**
3. **In the processor cabinet, route all cables from the system boards down the front of the system board and secure near the bottom of the system cabinet. Use reusable tie wraps to secure the cables to a strain relief bar.**

Tip – Secure the I/O cables in front of the system board to which they are attached. This makes it easier to remove other system boards.

4. **In the I/O cabinet, use the reusable tie wraps to secure the cable to a strain relief bar.**
5. **Connect the cable to the SCSI device tray. Tighten any attachment hardware if applicable.**
6. **Secure all of the cables to improve overall appearance and prevent damage.**

2.9 Configuring Remote Power Control

I/O cabinets can be controlled remotely from the control board using the `power(1M)` command. To do this, the control board must be connected to the AC sequencer. To facilitate multiple control boards, this connection is done with remote power cables and a remote power control module.

The control board has five remote power control connections, RPC0-RPC4 (FIGURE 2-8). These are connected from both control board 0 (CB0) and control board 1 (CB1) to the remote power control modules located in the processor cabinet I/O space. The output of a remote power control module is then connected to AC sequencer located either in the processor cabinet I/O space or an I/O expansion cabinet.

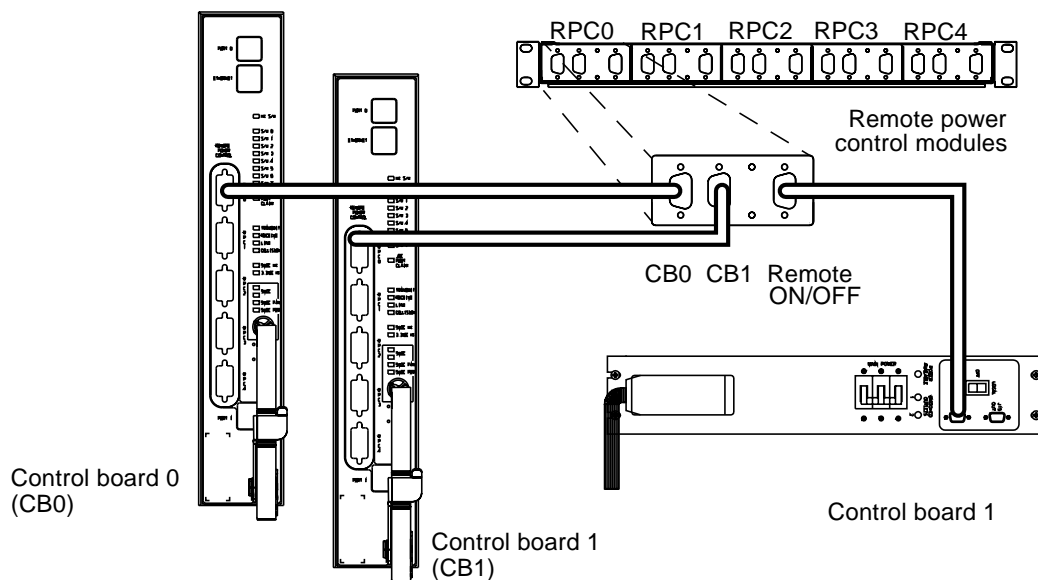


FIGURE 2-8 Remote Power Control

Remote power control modules can be programmed to addresses 0–5. When the control board issues a command and address, each remote power control module programmed for that address will respond.

You can connect a remote power control module address to a single AC power sequencer or to a string of AC power sequencers (FIGURE 2-9). When the command `power -p 3 -off` is issued, the remote power control module or modules that are

programmed for address 3 will power off. Subsequently, all AC power sequencers attached to those remote power control modules and their associated peripherals will also turn off. FIGURE 2-10 illustrates the basic remote power cabling.

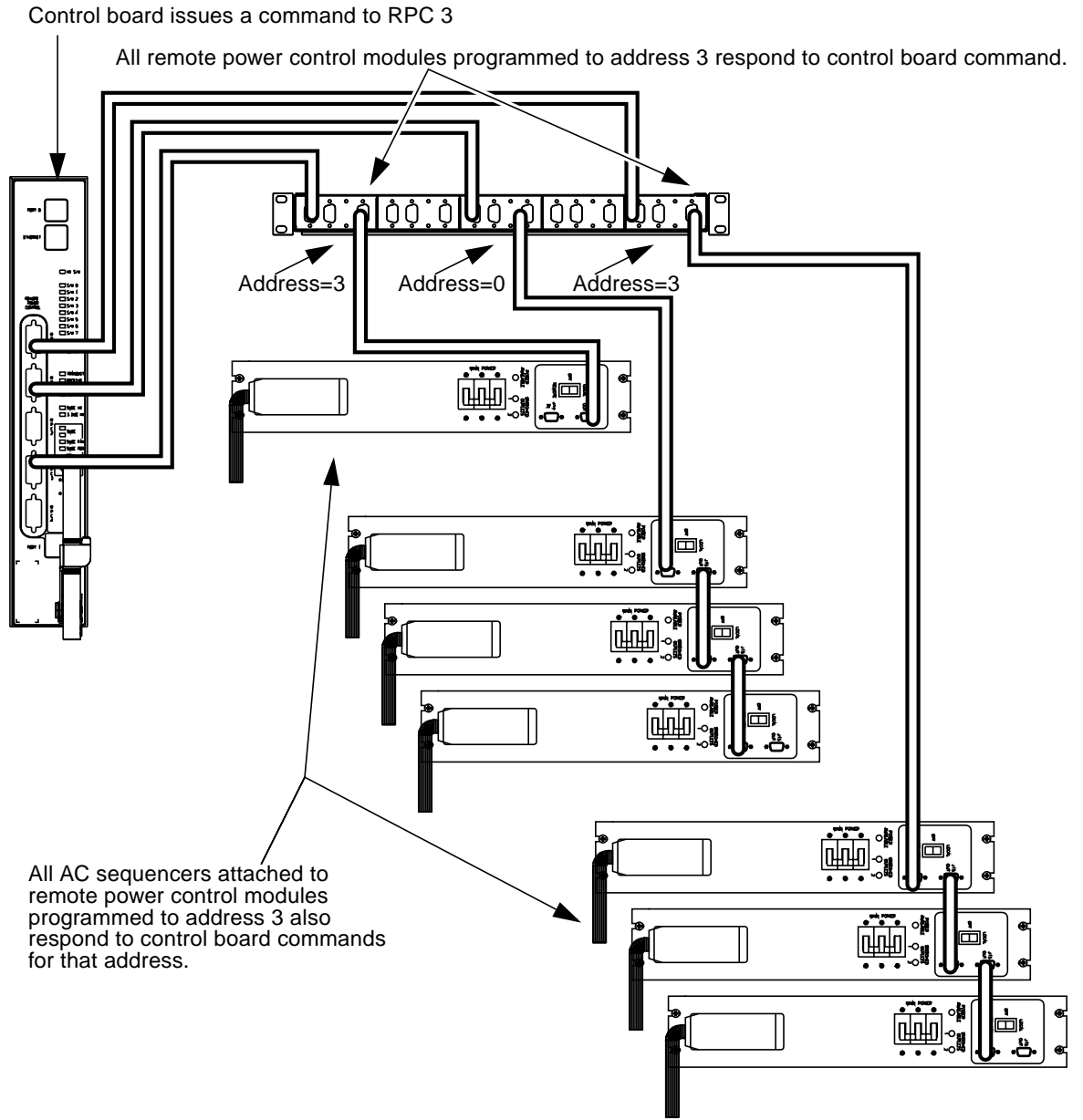


FIGURE 2-9 Remote Power Control Addressing

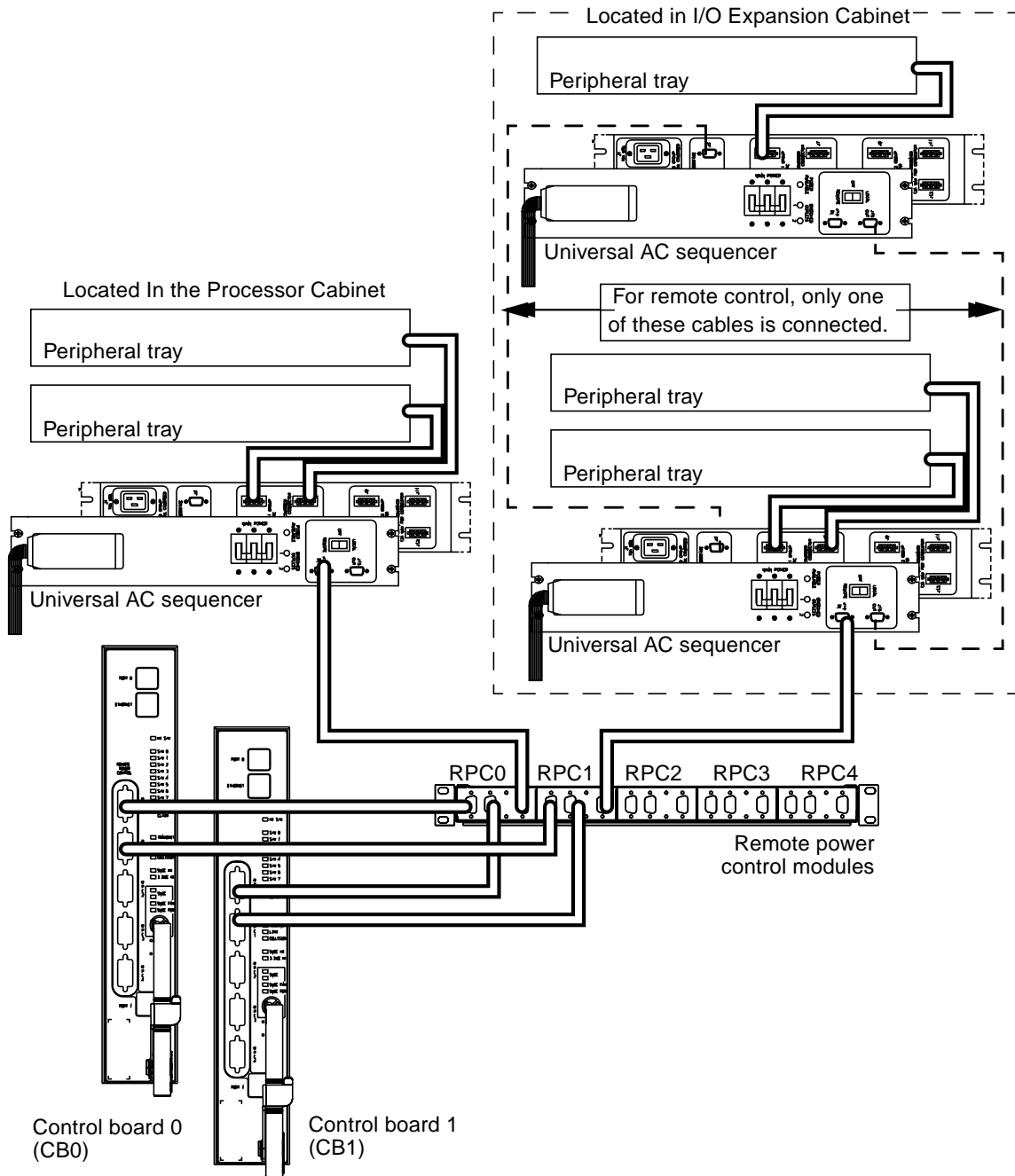


FIGURE 2-10 Basic Remote Power Connection

2.10 Connecting Remote Power Control Cables

The following procedure connects the remote power control cables and configures the remote switches. Power-on procedures are covered in Section 2.12 “Applying Power to the AC Input Units and AC Sequencers” on page 2-18.”

- 1. Using the remote power control cables, connect control board 0 (CB0) to the remote power control module.**
Refer to the labels on the cables for proper configuration.
- 2. If installed, connect control board 1 (CB1) to the same remote power control module used in Step 1.**
- 3. Using the remote power control cables, connect the remote power control module to the AC sequencers in the processor cabinet and I/O cabinet(s).**
 - a. To remotely control an AC sequencer in the Sun Enterprise 10000 cabinet, set the REMOTE switch to the REMOTE position.**
 - b. To remotely control AC sequencers in the I/O expansion cabinet that have system interface cables connecting them, set all the REMOTE switches to the REMOTE position, and turn the key switch in the front of the I/O expansion cabinet to the OFF position.**
 - c. To remotely control AC sequencers in the I/O expansion cabinet that DO NOT have system interface cables connecting them, set all the REMOTE switches to the REMOTE position, daisy-chain the AC sequencers, and turn the key switch in the front of the I/O expansion cabinet to the OFF position.**
- 4. Secure all of the cables to improve overall appearance and prevent damage.**

2.11 Alternate Pathing Note

To configure systems to use the alternate pathing features, refer to the *Sun Enterprise Server Alternate Pathing User Guide* for additional information.

2.12 Applying Power to the AC Input Units and AC Sequencers

The following procedure must be performed *after* the SSP is installed and configured:



Caution – Do not disconnect the AC power cable when you work on or in the processor cabinet. This connection provides ground paths that prevent damage from electrostatic discharge (ESD).



Caution – Never move the processor or I/O cabinets when system power is on. Excessive movement can cause catastrophic disk drive failure. Always power the system OFF before you move it.

1. Verify ALL breakers are in the OFF position.

2. On each AC input module, verify the four AC PWR IN LEDs are lit.

If one LED from one of the pairs of LEDs is extinguished, the AC input module is damaged and requires replacement. If both LEDs from a pair of the AC PWR IN LEDs are extinguished, check the cable or the AC source.

3. Power on each of the AC input modules using both breakers; verify the AC ON LEDs are lit.

If any of the AC ON LEDs are extinguished, either the AC input module, cable, or the breaker is damaged and requires replacement. Power off the breaker and re-seat the AC input module. Power the breaker on and observe the LEDs. If they remain extinguished, try a different AC input module.

4. Power on the breaker for each component installed.

All other breakers can remain in the OFF position.

5. Verify all LEDs are lit on each of the fan trays.

On a fan tray, if one LED is extinguished, the fan tray is damaged and requires replacement. If both LEDs are extinguished, verify the breaker for that fan tray is in the on position. If the breaker is on, either the fan tray, fan centerplane, cable, or breaker is faulty and requires replacement. Power off the breaker and re-seat the fan tray. Power the breaker on and observe the LEDs. If they remain extinguished, try a different fan tray.

6. **Power on the control board breaker.**
 - a. **Where power supplies are installed, verify the DC ON LED on each of the AC input modules is lit.**
 - b. **Verify that the housekeeping voltage LEDs (5VDC HK, 3.3VDC HK) are illuminated on the control board.**
7. **Place the AC sequencer switches in the processor cabinet in the ON position.**
8. **Confirm all tray breakers in the processor cabinet are in the ON position.**

Trays will be powered on through the SSP during the testing portion of these procedures.
9. **Place the AC sequencer switches in the I/O cabinet(s) to the ON position.**
10. **Confirm all tray breakers in the I/O cabinet(s) are in the ON position.**

Trays will be powered on through the SSP during the testing portion of these procedures.

2.13 Testing the Processor Cabinet Hardware

2.13.1 Creating a Test Domain

1. **Log in to the SSP as `ssp`.**

When prompted for the `SUNW_HOSTNAME`, use the platform name.
2. **Create a domain by typing:**

```
ssp% domain_create -d test -b board_numbers -o OS_version -p platform_name
ssp% domain_switch test
```

Where *board_numbers* is a list of *all* of the system boards in the system, *OS_version* is the version of the operating system, and *platform_name* is the name of the platform as defined during the SSP package configuration.

In this step, the domain `test` automatically uses the first available `eeprom.image` file that has an `_x` as an extension, where `x` is a numeric digit. In this case, because the system was just shipped from the factory, `test` will change `eeprom.image_0` to `eeprom.image.test`.

Refer to the *Sun Enterprise 10000 SSP User Guide* for additional information.

3. Power on the system by typing:

```
ssp% power -on -all -p I/O_cab_list -on
```

Where *I/O_cab_list* refers to the remotely powered I/O cabinets 0-4. Refer to the `power(1M)` man page for more information.

2.13.2 Using `bringup` to Test the Processor Cabinet Components

This procedure should be completed prior to re-torquing and/or reseating any components.

1. From the same SSP window, run `HPOST`:

```
ssp% bringup -A off -l64
```

Answer `y` if prompted to configure centerplane. The `bringup` process may take up to 90–180 minutes depending on system configuration. Refer to the `bringup(1M)` or `hpost(1M)` man page for more detail.



Caution – Be careful to strictly adhere to the `bringup` command syntax. Do not precede the `off` option with a `happen`.

- a. **If an error occurs on a mezzanine module (for example, the processor, memory, or I/O module) remove only the system board that contains the failed component and check for connector torquing and contaminant issues on the failed mezzanine.**

To check for debris, remove the FRU side cover of the system board. Place the board flat on an ESD mat with the FRU side facing upwards. Carefully examine the board for any debris. Debris large enough to be noticed should be removed by using tweezers or a brush. Smaller debris particles may be removed using a

brush, cloth or compressed air by standing the system board on its top edge (with the HANDLE DOWN) in order to avoid having debris fall and attach itself to the CPU module foam heat sink tape.

The use of powered tools during FRU replacement or system board cover removal and installation is discouraged. Special attention must be given to avoid cross threading of screws during insertion.

Do not remove or re-torque nonfailing components. To determine if the failures have been cleared, re-run HPOST as previously stated.

If failures still occur, replace the appropriate failing FRU.

- b. If an error occurs that is indicative of a system board-to-centerplane connection (for example, the global data or address interconnect) do not reseal the system board, instead run the interconnect test by typing:**

```
ssp% edd_cmd -x stop
ssp% interconnect_test_cp
ssp% edd_cmd -x start
```

This test requires no command line options. The execution time is dependent upon configuration. A system with four system boards will take about 16 minutes, eight system board will take about 30 minutes, and 16 system boards will take about an hour.

- If the interconnect test passes, reseating the system board will not clear the HPOST failure.

To attempt to clear the HPOST failures, power cycle the failing system board and centerplane. Re-run HPOST as previously stated. If failures still occur, replace the appropriate failing FRU and test using HPOST.

- If the interconnect test fails, reseal the failing system board and re-run interconnect test.

Powering down all non-failing system boards will reduce execution time of the interconnect test. If interconnect failures still occur, replace the appropriate failing FRU.

- c. To determine if all failures have been cleared, rerun HPOST as previously stated.**

If failures still occur, replace the appropriate failing FRU.

2. After HPOST has successfully completed, from the same SSP window, type:

```
ssp% power -off -all
ssp% domain_remove -d test
...
Keep directories (y/n)? n
ssp% power -on -all
```

The use of the `power` command is required to fully deconfigure the `test` domain.

3. From the same SSP window, to restore the `eeeprom.image_0` file, type:

```
ssp% cd $SSPVAR/.ssp_private/eeeprom_save
ssp% mv eeeprom.image.test eeeprom.image_0
```

Configuring a Preloaded Domain Delivered From the Factory

The procedures in this chapter are to install customer network parameters on the first domain of the Sun Enterprise 10000 system. These procedures assume that you have opened both an SSP Window and a `netcon(1M)` Window.



Caution – You must know the version of the preloaded operating system in order to perform the steps in the following sections.

3.1 Configuring the Preloaded Solaris Domain Software

This configuration is performed on the preloaded domain when the host arrives at the site from the factory. Do not perform this procedure if you are recovering from a crash or installing a new domain.

1. **Log out of the SSP.**
2. **Log in to the SSP as user `ssp` (The default password is `ssp`).**
3. **When prompted, specify the name of the domain that you wish to create.**

Ensure that the domain name corresponds with the domain in which the operating system is to be installed. Currently, domain names cannot be greater than 14 characters.

4. Create a domain by typing:

```
ssp% domain_create -d domain_name -b board_numbers -o OS_version -p platform_name
```

where:

domain_name must be the same as the domain name used in Step 3 and must include system board 0 (SB0), which has the operating system disk attached to an SBus board.

board_numbers is a list of all of the system boards to be included in the domain.

OS_version is the version of operating system (for example, 2.5.1 or 2.6).

platform_name is the name of the platform as defined during the SSP package configuration.

5. Bring up the domain by typing:

```
% bringup -A off  
This bringup will configure the Centerplane. Please confirm (y/n)? y
```



Caution – Be careful to strictly adhere to the `bringup` command syntax. Do not precede the `off` option with a hyphen. This will cause problems in later steps of this procedure.

6. After the bringup process is complete, type:

```
ssp% netcon
```

After a few minutes, the `ok>` prompt is displayed.

7. Boot the domain by typing:

```
ok> boot
```


Completing the Sun Enterprise 10000 System Installation

Once the system has been booted and properly configured on the network, it is recommended to run diagnostics.

4.1 Running SunVTS on the Host

To run SunVTS, the host must first be booted and the local and network variables configured.

SunVTS can test the overall functionality of all parts (processor and I/O) of the system. While an overnight SunVTS run is considered ideal, anywhere between 4 to 24 hours is appropriate as a system test.

1. **Log in to an SSP window as user `ssp`, specify the name of the domain to be tested and type:**

```
ssp% xhost +
```

2. Start SunVTS by logging in to the domain as `root`:

```
# csh
# setenv DISPLAY ssp_hostname:0.0
# setenv LD_LIBRARY_PATH /usr/openwin/lib
# setenv OPENWINHOME /usr/openwin
# /opt/SUNWvts/bin/sunvts -l
```

If SunVTS fails to initialize, you may need to install SunVTS . Refer to the SunVTS AnswerBook documentation for more information.

3. Display the SunVTS window and check the devices shown in the control panel against the devices you know to be physically present in the system.

Refer to the “control panel” section of the SunVTS documentation if there is a discrepancy.

Starting SunVTS often serves as a quick check for most hardware devices. If you have just installed a device and reconfigured your machine accordingly, the SunVTS test for that device can confirm proper installation.

Likewise, if SunVTS fails to display a device that you know is physically present in your system, there is a problem, and you should recheck your installation carefully.

4. Click the Start Button.

Or, if you have enabled the Auto Start option from the Set SunVTS Options menu and saved an options file, you can start SunVTS by typing:

```
# /opt/SUNWvts/bin/sunvts -l -o options_filename
```

5. Monitor the status of SunVTS. Verify that the system is running and that no test failures are occurring.

6. Repeat Step 2 through Step 5 for each domain to be tested.

4.2 Completing the Installation

1. Install and configure all purchased software packages and alternate pathing software.

2. Obtain a hardware status of the domain by typing:

```
% /usr/platform/sun4ul/sbin/prtdiag -v
```

Repeat this for each domain.

3. Confirm all cables are firmly seated and the attachment hardware is tight.

4. Position all cables in the cable troughs and secure with cables ties.

Tip – Secure I/O cables in front of the system board to which they are attached to make it easier to remove other system boards.

5. Close all of the interior doors.

6. Close all of the access doors.

7. Verify the styling panel and end panel are positioned correctly on the cabinet.

8. Verify the cabinets are positioned according to the site plan.

9. Lower the leveling pads on all four corners of the processor cabinet until they touch the floor.

10. Adjust the leveling pads down one additional half turn.

11. Visually inspect where the two access panels meet. Adjust the leveling pads until the access panels are even and straight.

Repeat this step for both sides.



Caution – Do not enable the leveling pads to support the cabinet's entire weight. Confirm this by visually inspecting the casters to verify that they are in contact with the floor.

12. Remove all evidence of servicing.

13. Following the installation of the Sun Enterprise 10000 system, complete and return the Installation Report that was shipped with the system.

The installation is now complete. In the event of a failure, refer to the following documents:

- *Sun Enterprise 10000 System Service Guide*
- *Sun Enterprise 10000 System Overview Manual*

Moving a Sun Enterprise 10000 Cabinet

The procedures in this chapter describe how to prepare and crate the Sun Enterprise 10000 system cabinet to permit moving.

5.1 Preparing to Move the Cabinet

1. Obtain a shipping kit.

Because shipping foam compresses in transit, Sun Enterprise 10000 cabinets cannot be shipped with previously used shipping pallets. Obtaining a new shipping kit will not only provide a new pallet, but also all brackets, labels, shipping documents, and attachment hardware.

2. Determine if customer has strapping material and tools.

Strapping material and tools are usually available from the customer's shipping department.

3. Obtain the required tools.

- 9/16-inch and 5/8-inch combination wrenches are required but may be replaced with an adjustable open-end wrench. Power tools help considerably.
- Phillips screwdriver

5.2 Shutting Down the Sun Enterprise 10000 System

Before you shut down the Sun Enterprise 10000 system, perform the following:

1. Back up the system.

2. Deconfigure the host.

Refer to the *Sun Enterprise 10000 SSP User Guide*.

3. Save the SSP configuration files.

Refer to the *Sun Enterprise 10000 SSP Installation Guide and Release Notes*.

4. Deconfigure the `eeeprom.image` files.

Refer to the *Sun Enterprise 10000 SSP User Guide*.

5. Power off the host.

6. Deconfigure the SSP.

Refer to the *Sun Enterprise 10000 SSP User Guide*.

5.3 Preparing the Cabinet

1. Open the access doors and inspect the cabinet components.

Confirm all of the components are fully seated and all of the hardware is tightened.

2. Attach the upper fan tray retaining brackets to both the front and rear upper fan trays (FIGURE 5-1).

a. Remove the four M4 Phillips screws directly above the upper fan trays.

b. Place the bracket over the screw holes.

c. Replace the four screws.

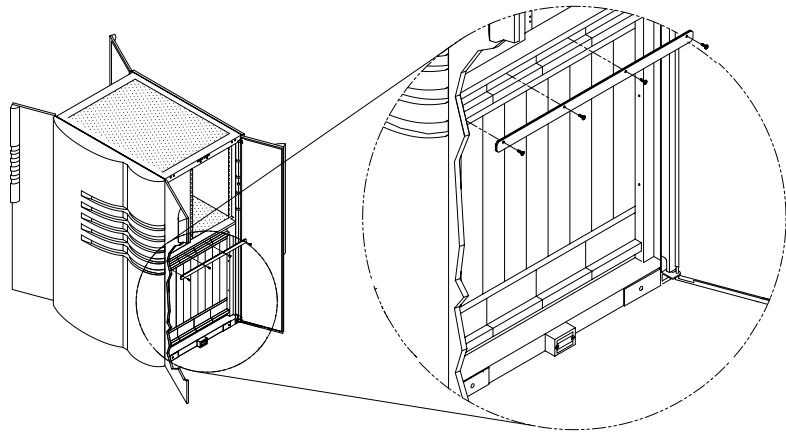


FIGURE 5-1 Installing the Upper Fan Tray Retaining Brackets

- 3. Attach the lower fan tray retaining brackets (P/N 340-4352-01) to both the front and rear lower fan trays (FIGURE 5-2).**
 - a. Remove the black trim strip directly below the fan trays by unscrewing the captive thumb screws.**
 - b. Place the bracket over the screw holes.**
 - c. Attach using the four M4 x 12 phillips pan head screws (P/N 240-2862-01) included in the shipping kit.**
 - d. Retain the trim strip for use in Step 9.**

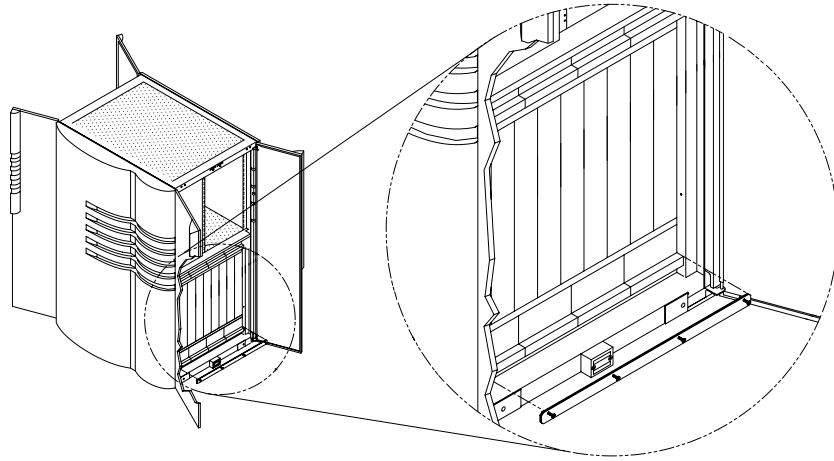


FIGURE 5-2 Installing the Lower Fan Tray Retaining Brackets

- 4. Install the right and left side brackets (P/N 340-4349-01 and 340-4350-01) as shown in FIGURE 5-3.**
 - a. Remove the two M4 Phillips screws on the card cage side trims (adjacent to the system board modules located on the vertical trim strip in all four corners of the card cage assembly).**
 - b. Place the right (P/N 340-4349-01) bracket over the holes on the right vertical trim strip.**
 - c. Replace two of the screws.**
 - d. Place the left (P/N 340-4350-01) bracket over the holes on the left vertical trim strip.**
 - e. Replace the remaining two screws.**

Note – The right and left side brackets should mount into the corner created by the vertical trim strips and the system board modules.

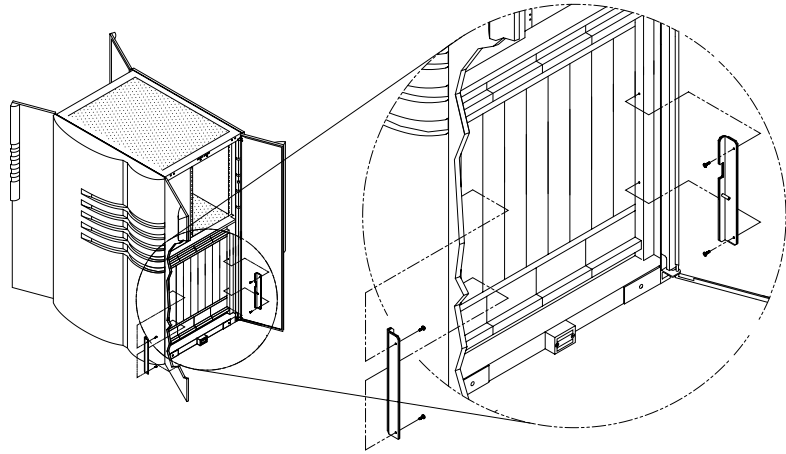


FIGURE 5-3 Installing the Right and Left Side Brackets

- 5. Attach the system board retaining bracket (P/N 340-4348-01) to the right and left side brackets with the two M5 x 12 Phillips pan head screws (P/N 240-2864-01) provided in the packing kit (FIGURE 5-4).**

For systems with PCI components, use the lower attachment points on the right and left side brackets.

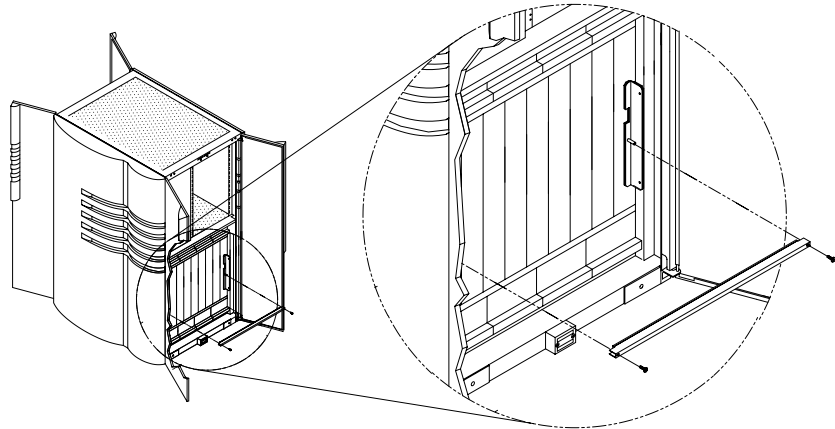


FIGURE 5-4 Installing the System Board Retaining Bracket

- 6. If the system contains RSM trays in the I/O area, reinstall the RSM-specific shipping brackets that arrived with the trays.**

Refer to the RSM installation manual for additional information.

- 7. Attach the two desiccant bags (P/N 411-1601-01) to the card cage by tying them to the frame in the upper peripheral bay section.**

- 8. Move the screw that secures the AC sequencer power cord to another attachment point (FIGURE 5-5).**

This will provide a mounting hole for the hold-down brackets that will be installed in Section 5.4 “Crating the Cabinet” on page 5-10.”

- a. Remove the M5 screw that retains the lowest cable clamp and power cable to the cabinet frame bottom.**
- b. Leave the cable clamp on the cable.**
- c. Install the M5 screw into the adjacent hole in the frame (of the two available holes, place it into the left-most hole) and tighten.**

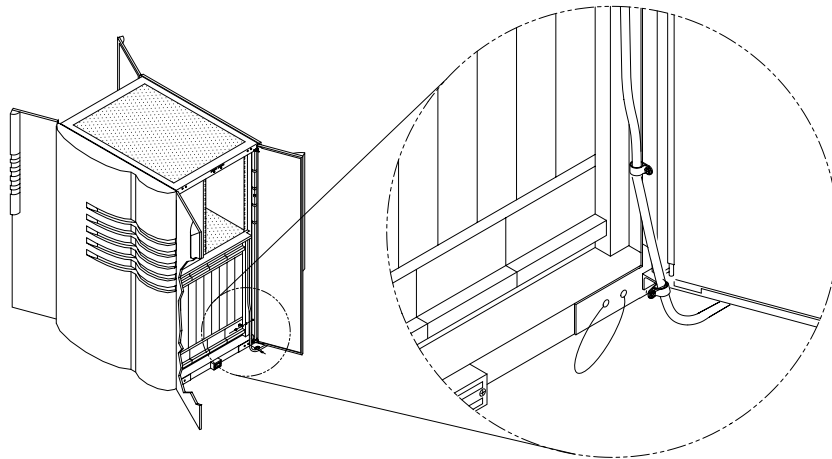


FIGURE 5-5 Moving the AC Sequencer Power Cord Screw

- 9. Install the two cardboard dividers (P/N 408-1270-01) into the bottom of the cabinet (FIGURE 5-6).**

- a. Fold the divider and place it in the bottom of the cabinet as shown.**
- b. Place the trim strip from Step 3 into the bottom of the divider for re-installation at the next site.**
- c. Place the power cords neatly into the divider and close the divider.**

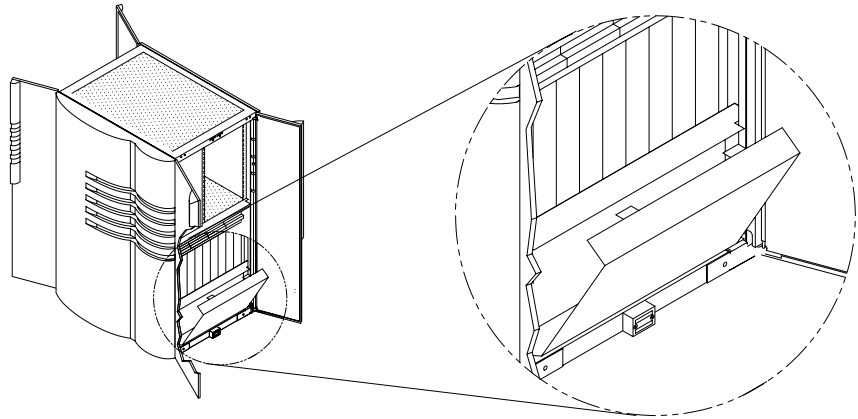


FIGURE 5-6 Installing the Cardboard Divider

10. **Raise the leveler feet and ensure that they are fully retracted into the cabinet frame (FIGURE 5-7).**

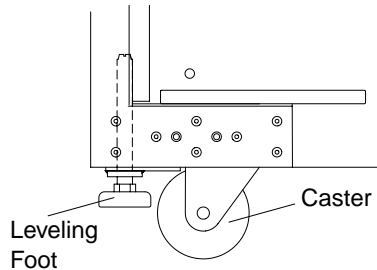


FIGURE 5-7 Retracting the Leveling Feet

Note – The shipping straps located on the dual power option power shelves (if installed) must have the screws installed that fasten them to the horizontal rails before the cabinet is shipped. The standard power shelves have these screws always installed because those shipping straps also serve as a ground connection.

11. **Remove the side panel of the processor cabinet to get access to the shipping straps on the dual power option power shelves (if installed). Install M4x10 pan head screws in each of the shipping straps that attach to the horizontal rails as shown in FIGURE 5-8.**

It may be necessary to move the cabinet to an open area on its casters so that the side panels can be removed.

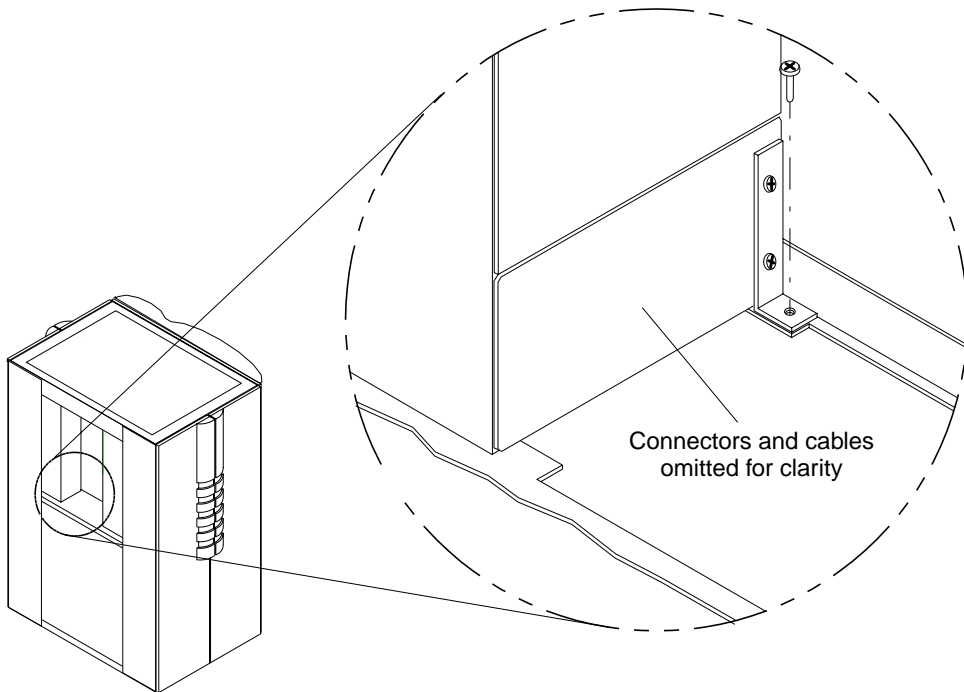


FIGURE 5-8 Installing the Optional Power Shelf Shipping Strap Attachment Screws

- 12. Inspect the cabinet for any loose hardware or other debris.**
- 13. Close the side panel and access doors and ensure that no cords or components are sticking out of the gap at the bottom of the doors below the bottom of the cabinet.**
- 14. Temporarily wrap the cabinet with the cloth strap to hold the side panels and access doors firmly in place while moving.**
- 15. Move the system to the crating area, which should be as close as possible to the where the system was installed.**

The entire access route to your computer room should be free of raised patterns that can cause vibration and it must meet the following requirements:

TABLE 5-1 Access Route Clearance

	With Styling Panel	Without Styling Panel
Minimum door height	71.00 in. (1803 mm)	71.00 in. (1803 mm)
Minimum hallway and door width	42.0 in. (1066.8 mm)	36.0 in. (914.4 mm)
Maximum incline	15°	15°

5.4 Crating the Cabinet

1. Position the shipping pallet on a flat level surface and orient with access to all sides.
2. Install ramps.
 - a. Place ramps into the appropriate notches in the pallet base as shown.
 - b. Ensure that the ramp's side walls are to the outside of the pallets.
 - c. Place the support block under the ramps in the notched area.

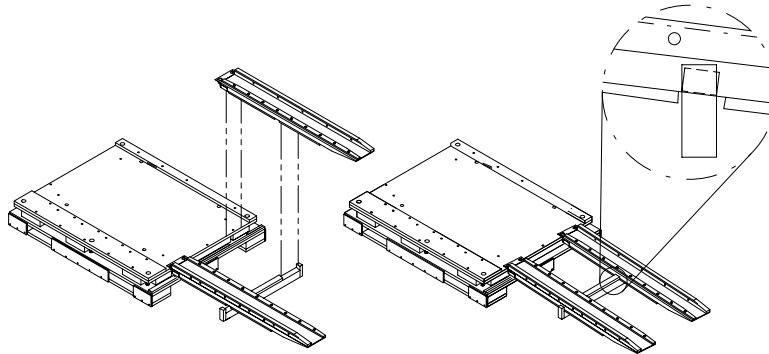


FIGURE 5-9 Installing the Ramp and Support Block

Note – Confirm the support block's internal angle is properly positioned.

- d. Verify the ramps are flat and stable on both the pallet end and the floor end of the ramps.
3. Verify the vertical alignment of the pallet and ramps.

Verify placement of the ramps for clearance and alignment.
 4. Install the rear chock (P/N 411-1622-01) in on the pallet deck to ensure that the cabinet does not roll off the far end of the pallet and to aid in alignment of the cabinet to the deck (FIGURE 5-10).

Bolt the chock to the deck using the 3/8-16-inch x 2-inch hex bolts provided.

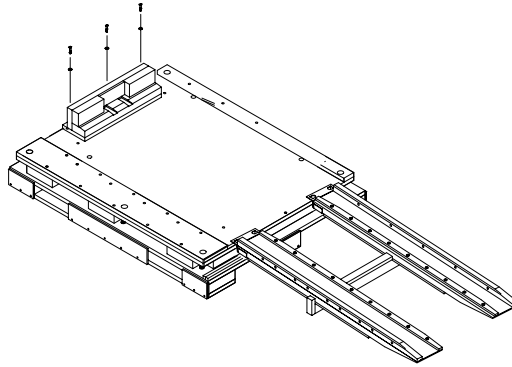


FIGURE 5-10 Installing the Rear Chock

5. Verify that the cabinet leveler feet are fully retracted into the frame.

6. Move the cabinet onto the pallet (FIGURE 5-11).

a. Align the cabinet to the ramps.

Note the orientation of the styling panel which must be toward the larger attachment panel on the pallet.

b. Move the cabinet up the ramps and onto the center of the pallet.

One person should guide the cabinet from the rear, while two others push the cabinet onto the pallet.

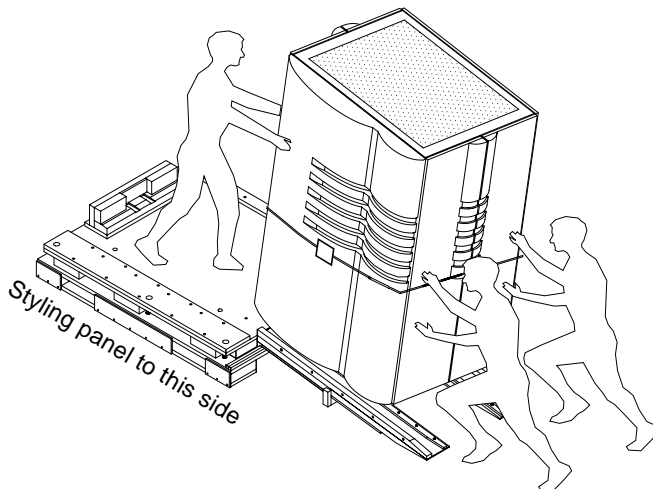


FIGURE 5-11 Moving the Cabinet onto the Pallet

7. **Align the cabinet on the pallet (FIGURE 5-12).**
 - a. **Attach the right side ramp (P/N 411-1597-01) to the pallet using the 3/8-16 x 3-1/2-inch hex bolts provided in the shipping kit.**
 - b. **Align the outer edge of the ramp to the outer edge of the pallet deck, and lightly tighten the hex bolts.**
 - c. **Push the cabinet snugly into the corner created by the attached chock and ramp to properly locate the cabinet to the pallet deck.**

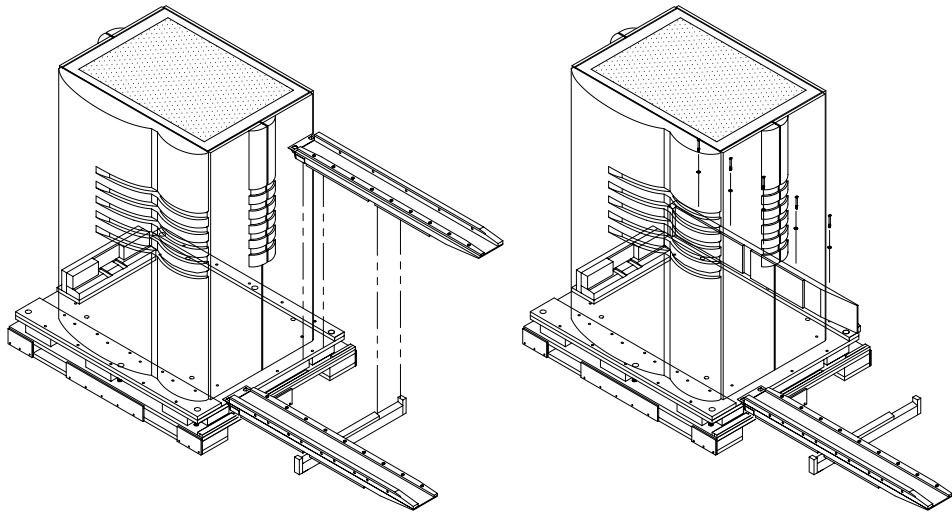


FIGURE 5-12 Aligning the Cabinet on the Pallet

- d. **Lower the three exposed leveler feet to contact the pallet deck.**
- e. **Without re-positioning the cabinet, remove the rear chock and the right side ramp to gain access to the fourth leveler screw and lower it to lightly contact the pallet deck.**

Do not re-install the rear chock or side ramp.
- f. **Rotate the four leveler screws an additional one-half turn using a 5/8-inch wrench, being careful to maintain the cabinet position on the pallet.**

8. Install the cabinet mounting brackets (FIGURE 5-13).

a. Remove the cloth strap and open the access doors.

b. Attach the four cabinet mounting brackets (P/N 411-1623-01) to the cabinet and bolt to the pallet as shown using the supplied 3/8 x 1.25-inch hex bolts (P/N 240-2854-01), 3/8-inch lock washers (P/N 240-2855-01), and the 3/8-inch flat washers (P/N 240-2776-01).

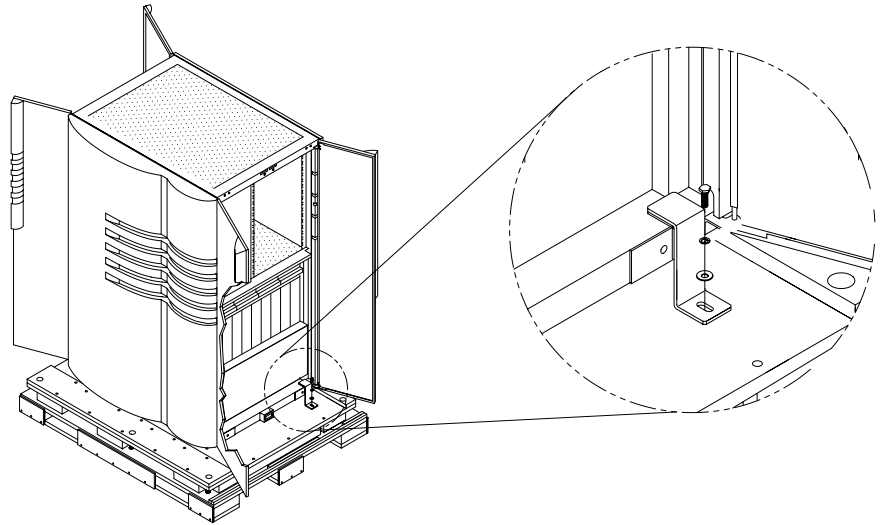


FIGURE 5-13 Installing the Mounting Brackets

9. Inspect the cabinet for any loose hardware or other debris, then close the access doors.

Ensure that no cords or components are sticking out the gap at the bottom of the doors below the bottom of the cabinet.

10. Cover the cabinet with the antistatic bag (P/N 403-1227-01).

11. Secure the cabinet to the pallet using the plastic banding, the banding seals, and the plastic corner protectors (FIGURE 5-15).

- a. Place two small slits in the static bag on the top of the cabinet where the notches the cabinet styling panel meet the frame.**

These slits should be just large enough to insert the plastic corner protectors.

- b. Insert the plastic corner protectors.**

- c. Run the banding through the slit in the bag down between the cabinet frame and the styling panel.**

One person should feed the banding from the top while another reaches underneath the cabinet, pulling the bottom of the styling panel loose from the frame, just enough to grab the banding, and feed it through the hole in the pallet.

- d. Re-attach the styling panel to the cabinet frame by securing against the magnetic catches.**

- e. Feed the banding between the upper and lower pallet decks to the far side and up through the remaining holes in the pallet, and up the side of the cabinet on the outside of the plastic.**

- f. Place a corner protector at the two remaining upper corners of the cabinet under the banding.**

- g. Tension the banding and seal tight using the adjustable banding tensioner, and clamp with the banding seals.**

The banding seals should be located on the top of the unit to avoid scratching the side panels.

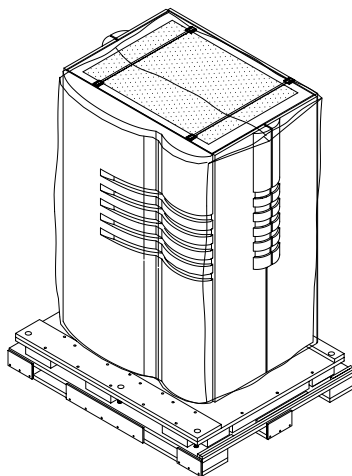


FIGURE 5-14 Securing the Cabinet to the Pallet

12. Secure the plastic cover.

- a. Place the cloth strap around the cabinet just below the plastic access door handles, secure, and tie off the loose end.**
- b. Place the “Do not remove this strap until...” labels P/N 411-1633-01 on the cloth strap centered over the styling panel and the opposite flat panel.**

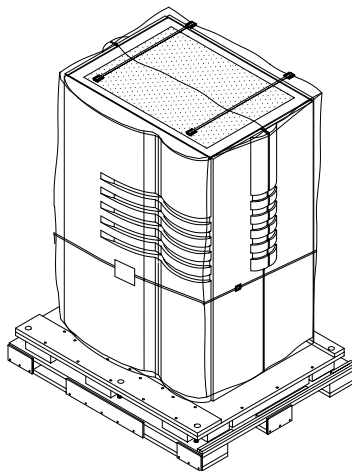


FIGURE 5-15 Securing the Plastic Cover

13. Attach the front and rear chocks using the 3/8-16 x 2-inch hex bolts.

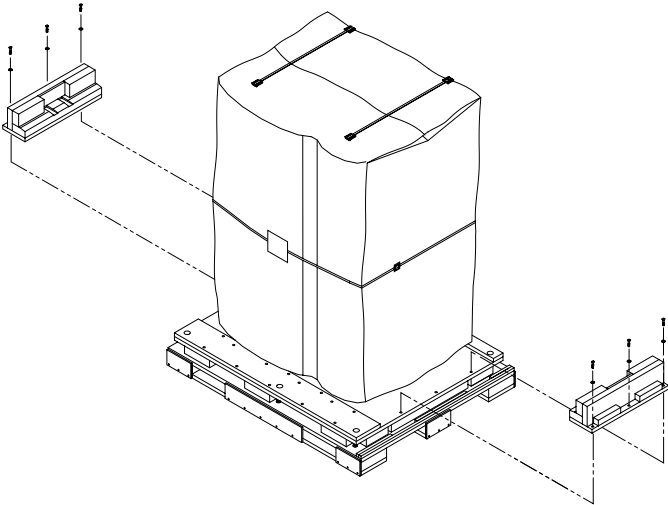


FIGURE 5-16 Attaching the Chocks

14. Attach the left side ramp and styling panel support using the 3/8-16 x 3-1/2" hex bolts (FIGURE 5-17).

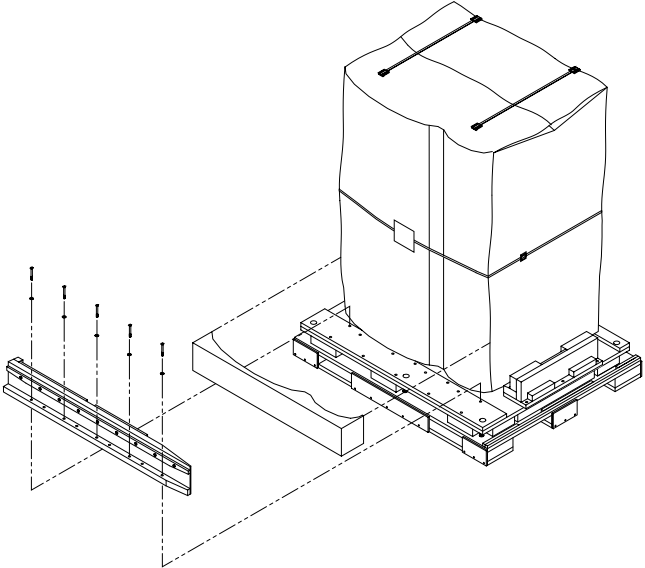


FIGURE 5-17 Attaching the Left Side Ramp and Styling Panel Support for Shipping

15. Attach the right side ramp using the 3/8-16 x 3-1/2" hex bolts (FIGURE 5-18).

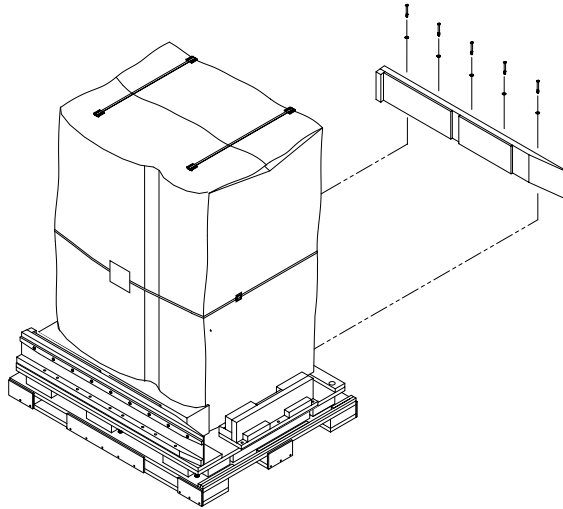


FIGURE 5-18 Attaching the Right Side Ramps for Shipping

16. Tighten all of the hex bolts firmly in place.

17. Attach the support block (P/N 414-1110-01) to the front chock where the Velcro strips align. (FIGURE 5-19).

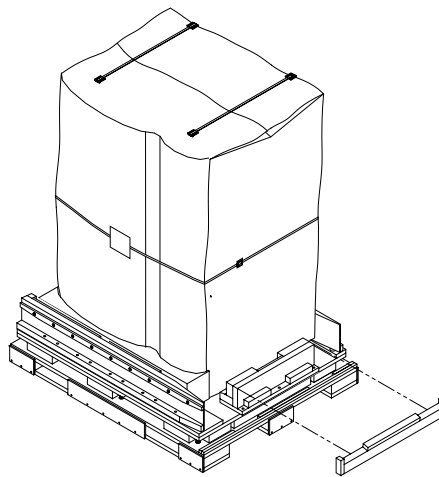


FIGURE 5-19 Attaching the Ramp Support for Shipping

18. Insert the service documentation set (P/N 855-3651) and Solaris Media box into the provided ride-along box and place as noted in FIGURE 5-20. Add one of the clear envelopes with the READ ME FIRST document and the clear envelope with the customer documentation.

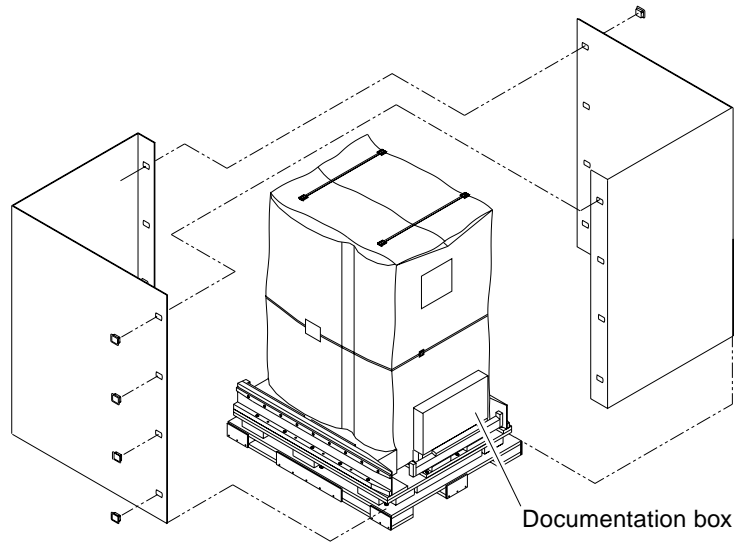


FIGURE 5-20 Adding the Ride-Along Box

19. Install the outer cardboard wraps using plastic locking clips to join ends
(FIGURE 5-21).

Verify that the outer wrap marked with “Ramps Attach Here” marking is installed at the ramp end.

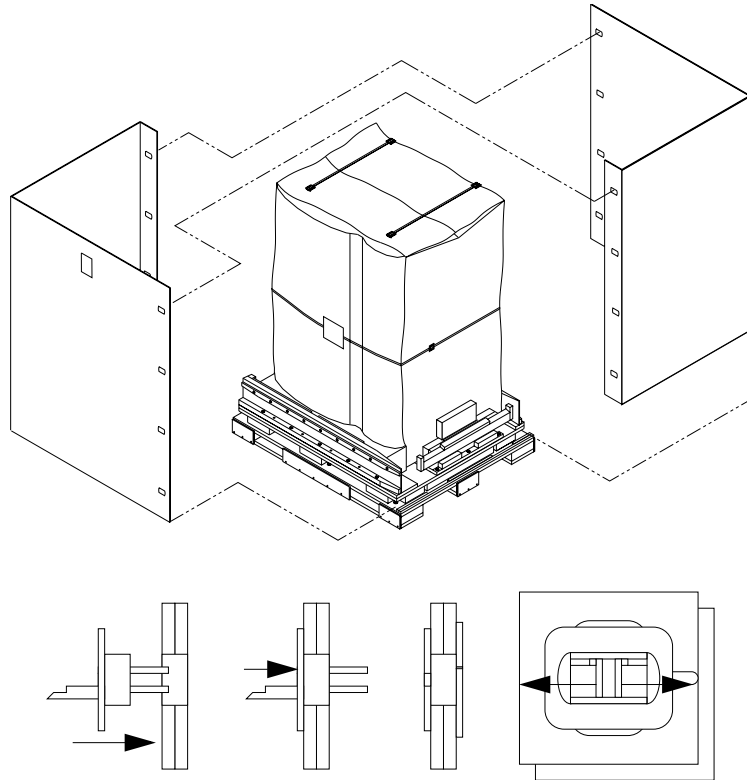


FIGURE 5-21 Installing the Cardboard Wraps

20. Install and secure the top cover (FIGURE 5-22).

- a. Place the cover on the cardboard wraps.**
- b. Place the long fiberboard edge protectors on the top.**
- c. Secure with strapping material.**

The strapping must wrap around the top cover and outer wraps, then pass through the area between the pallet base and floor, between the pallet skids.

- d. Verify that the strapping is tight, straight, and properly positioned on the fiberboard edge protectors on the container top.**

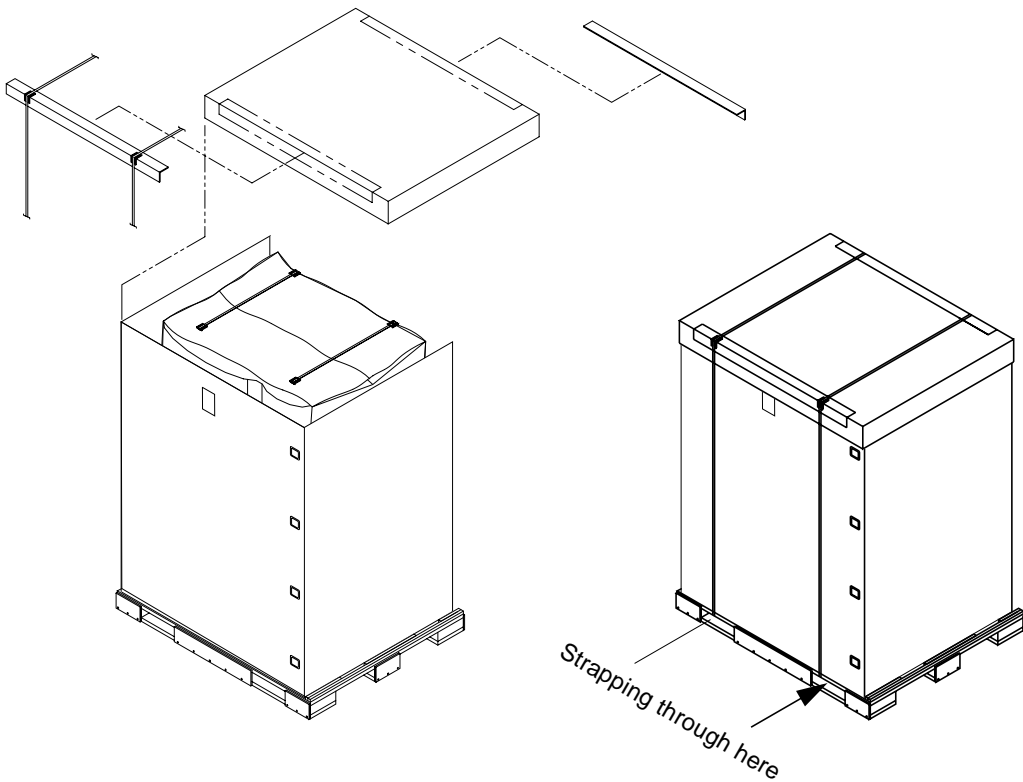


FIGURE 5-22 Securing the Top Cover

21. Apply Tip-N-Tell devices and labels, address labels, shock watches, and Top-Heavy labels where indicated.

- 22. Place the mini-ramps (P/N 411-16001), the *Unpacking Instructions* (806-4588), the *Sun Enterprise 10000 System Unpacking Guide* (P/N 805-2915), and the *Sun Enterprise 10000 System Read Me First* document (P/N 805-2913) into the shipping pouch (P/N 403-1257) along with any other required documents.**

Place the *Unpacking Instructions* document inside against the front face of the shipping pouch window so that the words “Unpacking Instructions” are visible after the pouch is placed and sealed.

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