

# Sun Enterprise™ 5000 Systems Centerplane Upgrade Guide

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## *100 MHz Gigaplane Upgrade*



THE NETWORK IS THE COMPUTER™

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# Preface

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The *Sun Enterprise 5000 Centerplane Upgrade Guide* provides procedures for 100 MHz gigaplane upgrade for Sun Enterprise™ 5000 server systems. As part of this upgrade, the SCSI tray, CD-ROM drive and the keyswitch adapter cable are replaced. The procedures include making modifications to the cabinet enclosure in order to accommodate the replacement items. These instructions are designed to be performed only by an experienced service provider.

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## Using UNIX Commands

This document may not contain information on basic UNIX® commands and procedures such as shutting down or 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

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# Typographic Conventions

TABLE P-1 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	% <b>su</b> Password:
AaBbCc123	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

TABLE P-2 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

TABLE P-3 Related Documentation

Application	Title	Part Number
Installation	<i>Ultra™ Enterprise™ 6000/5000/4000 Systems Installation Guide</i>	802-3844
	<i>Sun™ Enterprise™ 6500/5500/4500 Systems Installation Guide</i>	805-2631
Service	<i>Ultra™ Enterprise™ 6000/5000/4000 Systems Manual</i>	802-3845
	<i>Sun™ Enterprise™ 6500/5500/4500 Systems Reference Manual</i>	805-2632

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# Sun Enterprise 5000 System Centerplane Upgrade Procedure

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This chapter gives procedures for upgrading the Sun Enterprise 5000 centerplane. As part of this upgrade, the clock board, CD-ROM and SCSI tray are replaced. In order to install the new SCSI tray, it is necessary to remove the shelf support in the side of the cabinet, to replace the SCSI tray bracket and the fan tray brackets, and to install an air baffle in the cabinet pillar.

These procedures are designed to be performed only by an experienced service provider.

---

**Note** – Perform these procedures in the order presented.

---

The procedure includes:

- Powering off the system—page 1-2
- Removing all boards and assemblies in the front and rear of the system—page 1-3
- Removing the system chassis from the cabinet—page 1-6
- Replacing the centerplane—page 1-8
- Installing the chassis into the cabinet—page 1-10
- Reassembling the system—page 1-11
- Replacing the CD-ROM and SCSI tray—page 1-28
- Powering on the system—page 1-26
- Updating the system flash PROM—page 1-27

---

# 1.1 Powering Off the System

1. **Halt the system using the appropriate commands and wait for the system-halted message and the boot monitor prompt.**

Refer to the *Solaris Handbook for SMCC Peripherals* that corresponds to your operating system.

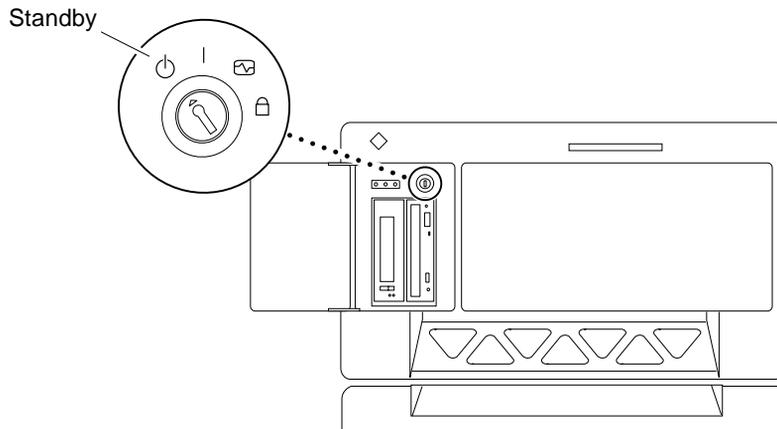


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**Caution** – Failure to halt the operating system properly can result in a loss of disk drive data.

---

2. **Turn off the system power in this order:**
  - a. **External drives and expansion cabinets (if any)**
  - b. **System cabinet**
  - c. **Terminal**
3. **Turn the front panel keyswitch to the Standby position.**



**FIGURE 1-1** Keyswitch in Standby Position

#### 4. Turn the AC power sequencer power switch to off

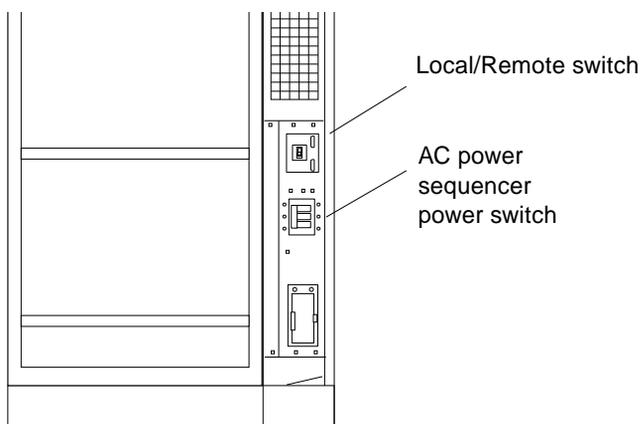


FIGURE 1-2 AC Power Sequencer—Rear View

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## 1.2 Removing the Boards and Assemblies

Refer to your system reference manual for detailed procedures.



---

**Caution** – Use a grounding wrist strap to prevent static damage.

---

1. Remove the top front bezel, front door and rear screen panel:
  - a. To remove the bezel, grasp the bezel on both sides and pull out far enough to disengage the ball studs.
  - b. To remove the front door, open the door wide, past the side bracket, and lift it off the hinge.
  - c. To remove the rear screen panel, remove the two #10 Phillips screws at the top of the panel. Tilt the panel top out from the cabinet and lift it free of the cabinet.
  - d. Remove the left side panel by loosening the two slotted-head screws near the base of the panel, then lifting the panel at an angle off of the tabs at the top of the system.

**2. Remove any assemblies in the cabinet above and below the system chassis.**

Refer to the respective service manuals for further information.

**3. Disconnect all cables from the boards.**

Squeeze the locking tabs on the sides of the connector body, or loosen any retaining screws (if provided), and pull the connectors out.

---

**Note** – Label all cables for reconnection.

---

**4. With a wrist strap attached, remove all boards and power supplies from the front of the system and place them on a padded ESD mat.**

---

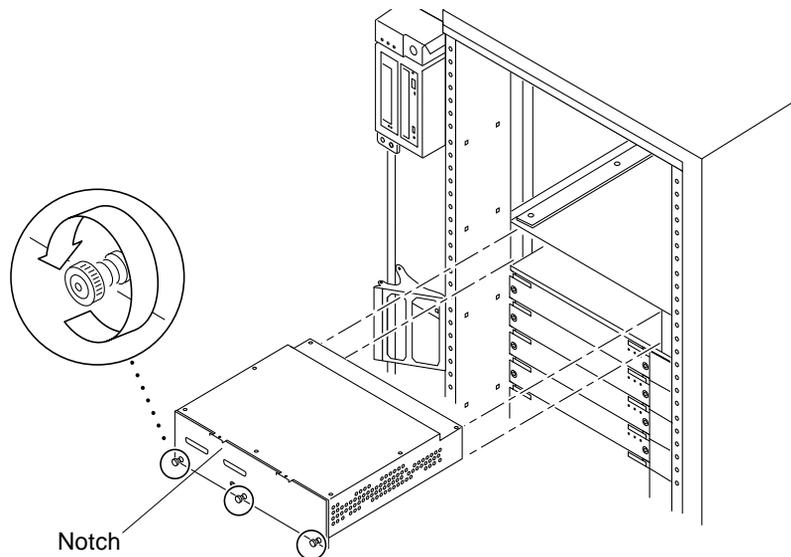
**Note** – Label each board with its respective slot number, or otherwise record the sequence in which each board is removed.

---

**5. Remove the SCSI adapter assembly from the front of the system.**

**a. Loosen the bottom three captive screws securing the tray to the enclosure.**

**b. Insert a flat-bladed screwdriver in the notch at the top of the tray to pull out the tray and separate it from the rear connectors.**



**FIGURE 1-3** SCSI Tray Adapter in Sun Enterprise 5000 System

6. Loosen the two captive screws securing the keyswitch adapter assembly to the system, and carefully pull the assembly from the enclosure.

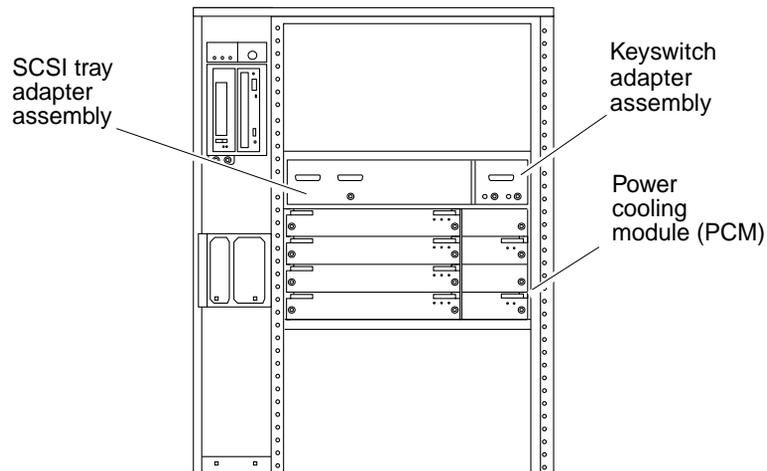


FIGURE 1-4 Sun Enterprise 5000—Front View

7. Remove the boards and power supplies from the rear of the system and place them on a padded ESD mat.

---

**Note** – Label each board with its respective slot number, or otherwise record the sequence in which each board is removed.

---

8. Remove the fan tray assembly from the rear of the system (FIGURE 1-5).

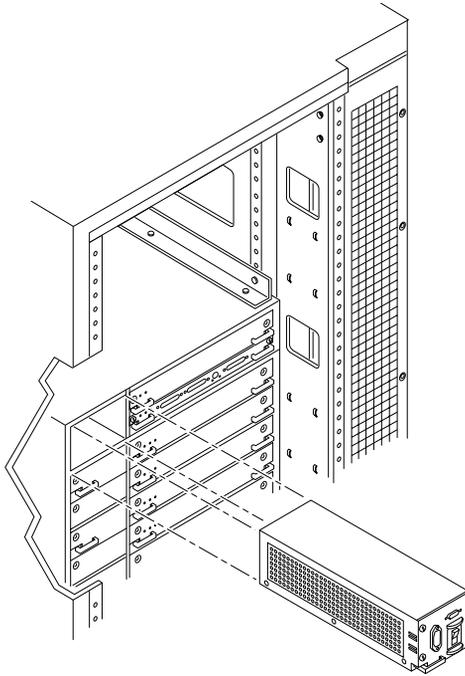


FIGURE 1-5 Fan Tray Assembly—System Rear

9. Disconnect any remaining cables from the Enterprise system.

---

## 1.3 Removing the Chassis from the Cabinet

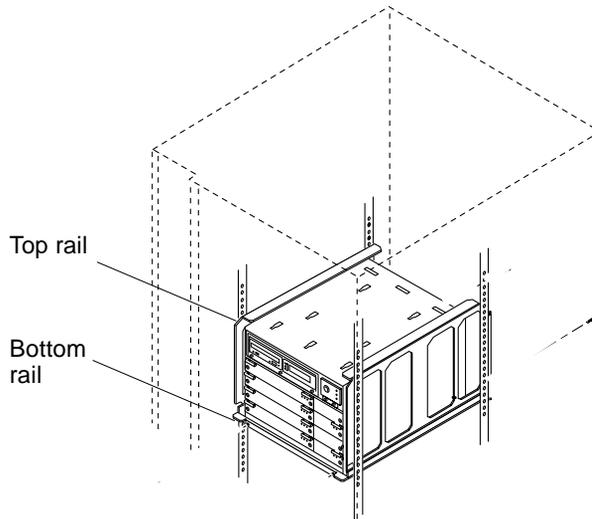
1. Remove the two screws on each side of the system cabinet that attach the top rails to the system cabinet.
2. Loosen the four screws on each side of the system cabinet that attach the top rails to the main chassis.
3. Remove the top rails by guiding the screws through the respective key slots. Set the top rails aside.
4. Remove the four screws on each side of the system cabinet that attach the bottom rails to the main chassis.



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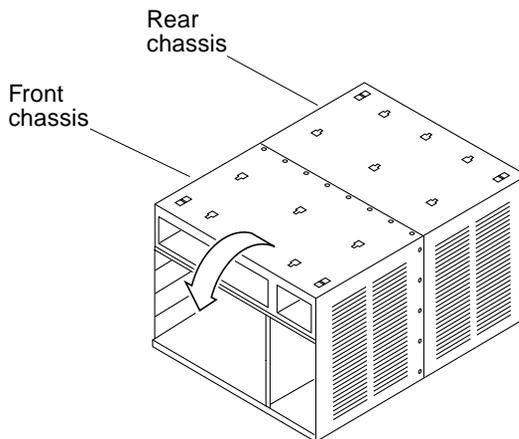
**Caution** – Use care when removing the system chassis. It weighs approximately 100 pounds (45 kilograms).

---



**FIGURE 1-6** Top and Bottom Rails in System Cabinet

5. Carefully slide the system chassis out of the cabinet and place it front side down.



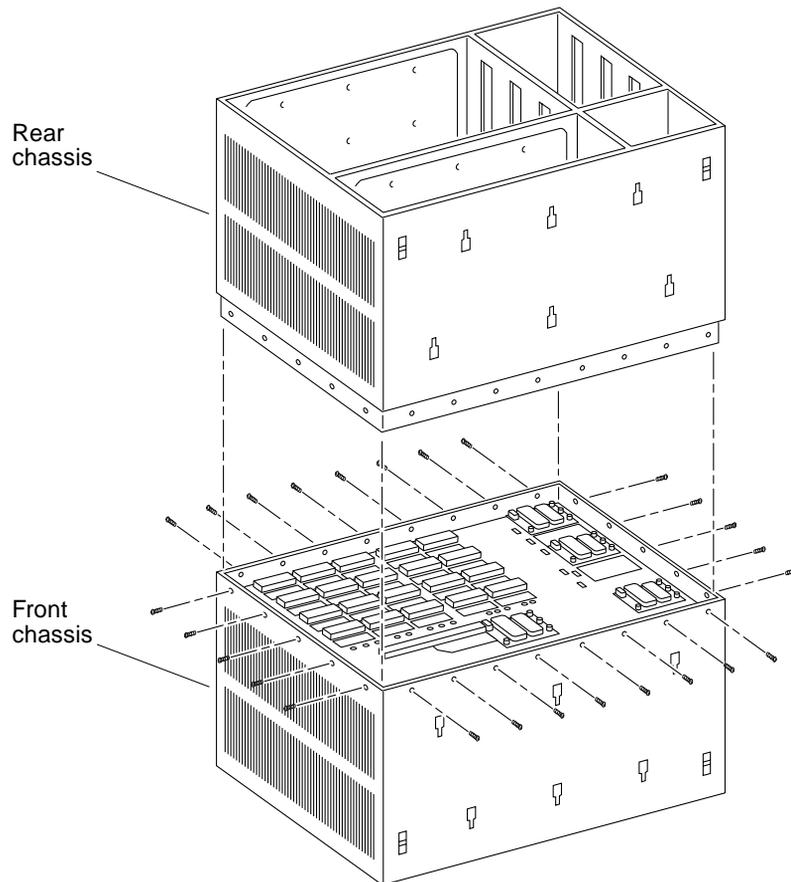
**FIGURE 1-7** Orientation of Empty System Chassis

---

## 1.4 Replacing the Centerplane

The system chassis is in two sections consisting of a front chassis and a rear chassis. The centerplane is located between the two sections of the chassis and is fastened to the front chassis.

1. Remove the 26 screws that surround the center seam of the system chassis.
2. Lift and remove the rear chassis section and set it aside (FIGURE 1-8).



**FIGURE 1-8** Front and Rear of System Chassis

3. Remove the 20 screws that hold the centerplane to the front chassis (FIGURE 1-9).

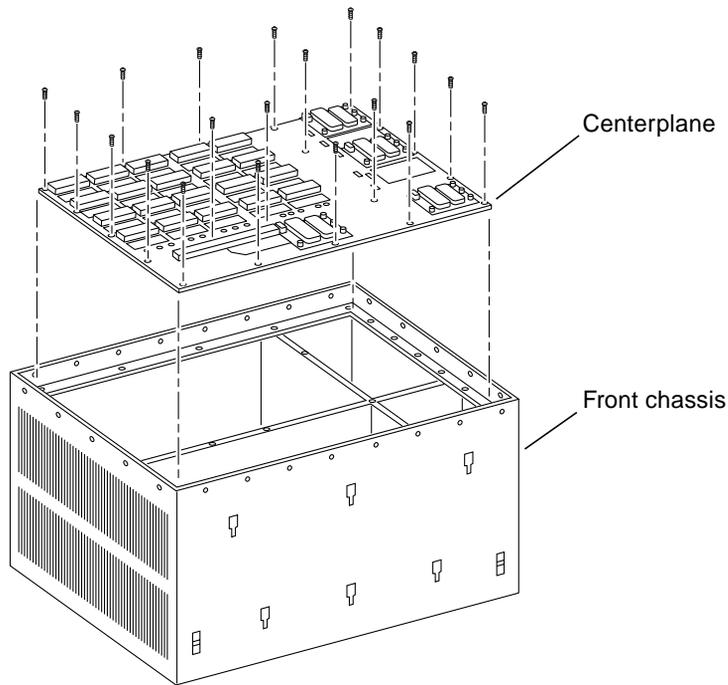


FIGURE 1-9 Centerplane Replacement Detail



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**Caution** – Use a grounding wrist strap to prevent static damage.

---

4. With the wrist strap attached, lift the centerplane out and set it aside.

---

**Note** – Remember the proper orientation of the centerplane when removing it from the front chassis.

---

5. Place the new centerplane into the front chassis.

Be sure the centerplane has the proper orientation when placed in the front chassis.

6. Replace the 20 screws that hold the centerplane to the front chassis.

## 1.5 Installing the Chassis in the Cabinet

1. Disconnect the keyswitch cable from the keyswitch assembly and remove the cable.
1. Route the new keyswitch cable included in the upgrade kit through the opening in the cabinet pillar below the SCSI tray (FIGURE 1-10). Do not connect the cable to the keyswitch at this time.

The cable will be connected after the new SCSI tray has been installed.

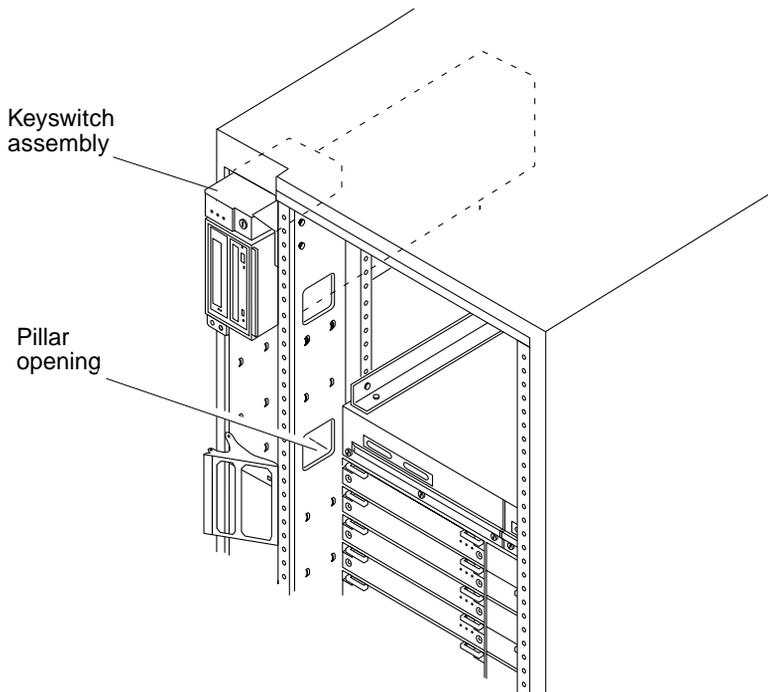


FIGURE 1-10 Pillar Opening for Cable Routing

2. Place the rear chassis on the front chassis, as shown in FIGURE 1-8, and replace the 26 screws around the center of the system chassis



---

**Caution** – Use care when lifting the system chassis. It is very heavy.

---

3. Lift and slide the system chassis into the system cabinet using the bottom rails as a guide (FIGURE 1-6).

4. Replace the four screws on each side of the system cabinet that attach the bottom rails to the main chassis.
5. Replace the top rails by guiding the four screws on each side of the system chassis through the key slots in each top rail and then tighten the screws.
6. Replace the two screws on each side of the system chassis attaching the top rail to the system cabinet.

---

## 1.6 Reassembling the System

Reassembling the system includes:

- Installing the boards and assemblies in the front of the system
- Installing a new clock board
- Installing the boards and assemblies in the rear of the system



---

**Caution** – Use a grounding wrist strap to prevent static damage.

---

### 1.6.1 Installing Boards and Assemblies - System Front

Refer to your system reference manual for detailed procedures.

1. Place the SCSI tray adapter assembly (FIGURE 1-3) and the keyswitch adapter assembly (FIGURE 1-4) in the front of the system.
2. Replace all the boards and power supplies in the front of the system in the same order that they were removed.

---

**Note** – Insert boards component side *down* in the front of the system.

---

### 1.6.2 Installing the New Clock Board

The clock board is located at the top rear of the system, below the peripheral power supply. The TOD/NVRAM chip *must be removed from the old clock board* and installed on the upgrade clock board in order to maintain the same host ID and Ethernet ID.

1. Loosen the two captive screws securing the clock board to the system chassis, then pull the ends of both extraction levers outward simultaneously to release the board from the centerplane (FIGURE 1-11).
2. Place the clock board on a padded ESD mat.



---

**Caution** – Use a grounding wrist strap when handling the TOD/NVRAM chip.

---

3. Attach a wrist strap and locate the TOD/NVRAM chip on the clock board (FIGURE 1-11).
4. Use a small, blunt instrument, such as a flat-blade screwdriver, to remove the TOD/NVRAM chip:  
Place the instrument between the TOD chip and the board connector, and pry gently on each end until the chip is released from the connector.
5. Place the upgrade clock board on the padded ESD mat, and follow steps 3 and 4 to remove that TOD/NVRAM chip.  
Set the chip aside.

---

**Note** – *Do not mix up the TOD/NVRAM chips.* You must install the chip from the original clock board on the upgrade clock board in order to maintain the same ethernet ID and host ID.

---

6. Install the TOD/NVRAM chip on the upgrade clock board
  - a. Ensure that pin 1 on the chip is aligned with pin 1 on the board. A small round indentation on the corner of the chip denotes pin 1
  - b. Mate the small crescent-shape indentation on both the chip and the connector.

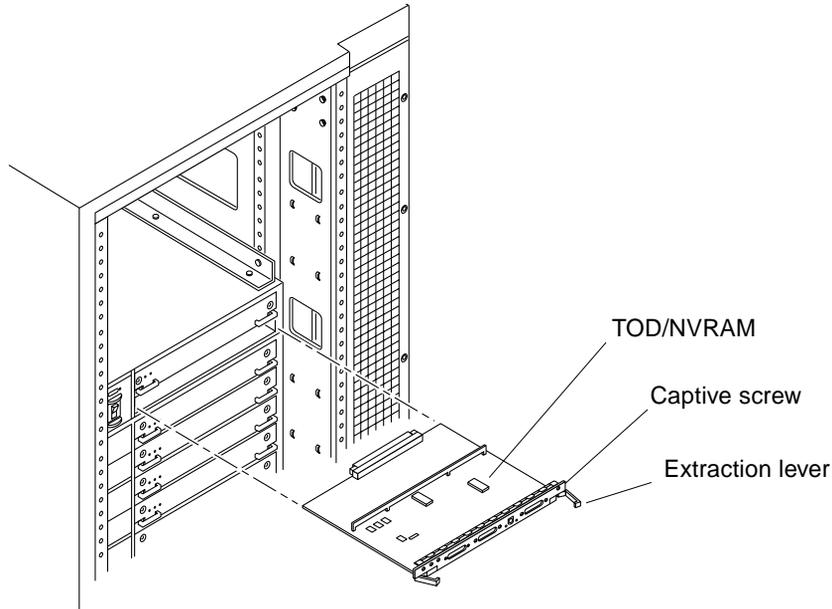


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**Caution** – To avoid system damage, make sure that you connect pin 1 on the TOD/NVRAM chip into pin 1 on the board connector.

---

- c. Gently press on the chip to seat it.  
If you press on the chip and pins are not properly aligned, you can bend the pins.



**FIGURE 1-11** Clock Board and TOD NVRAM Location

- 7. Insert the board component side up in the clock board slot.**
- 8. Use the open extraction levers to seat the board. Push the board into the card cage, then simultaneously press both extraction levers to seat the board on the centerplane.**  
Do not press on the board front panel to seat it.
- 9. Tighten the two captive screws.**
- 10. Connect any applicable interface cables to the front panel of the board.**

## 1.6.3 Installing Boards and Assemblies - System Rear

- 1. Replace the fan tray assembly in the rear of the system (FIGURE 1-5).**

---

**Note** – Insert boards component-side *up* in the rear of the system.

---

- 2. Replace all the boards and power supplies in the rear of the system in the same order that they were removed.**

---

**Note** – Insert boards component side *down* in the front of the system.

---

## 1.7 Installing the New SCSI Tray and CD-ROM Drive

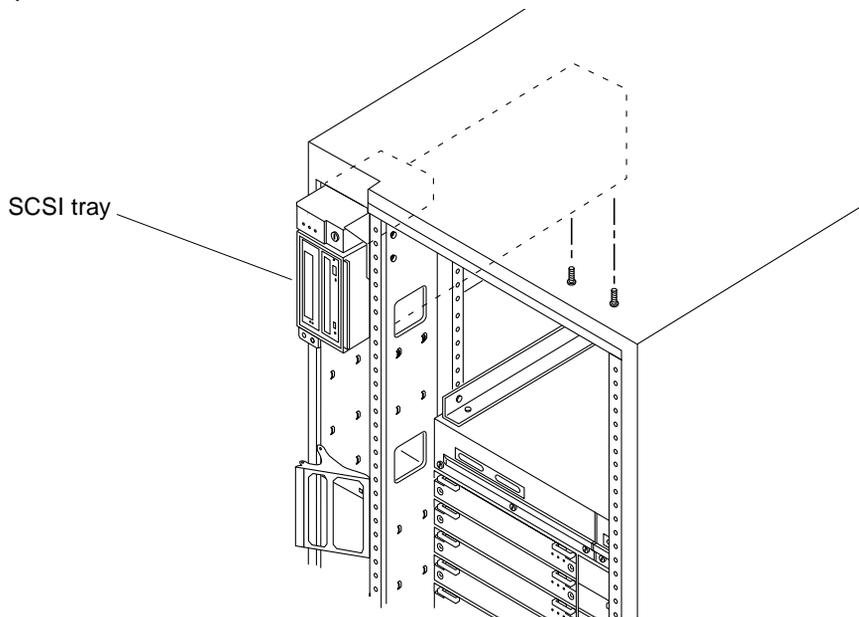
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**Note** – Perform this procedure in the sequence specified.

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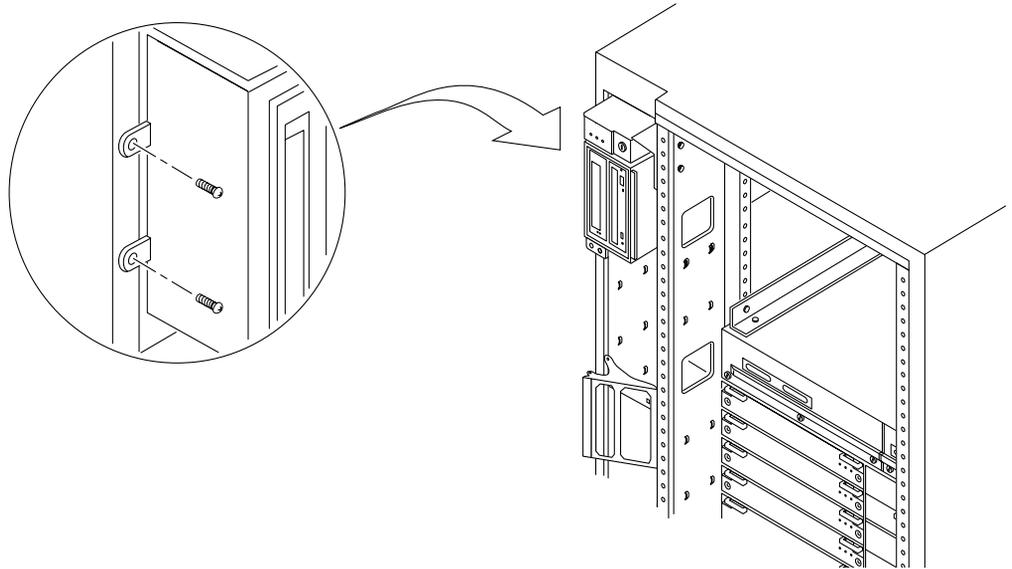
### 1.7.1 Removing the SCSI Tray

1. Disconnect the power and data cable assemblies from the back of the SCSI tray.
2. Remove the two screws that attach the rear of the SCSI tray to the side bracket



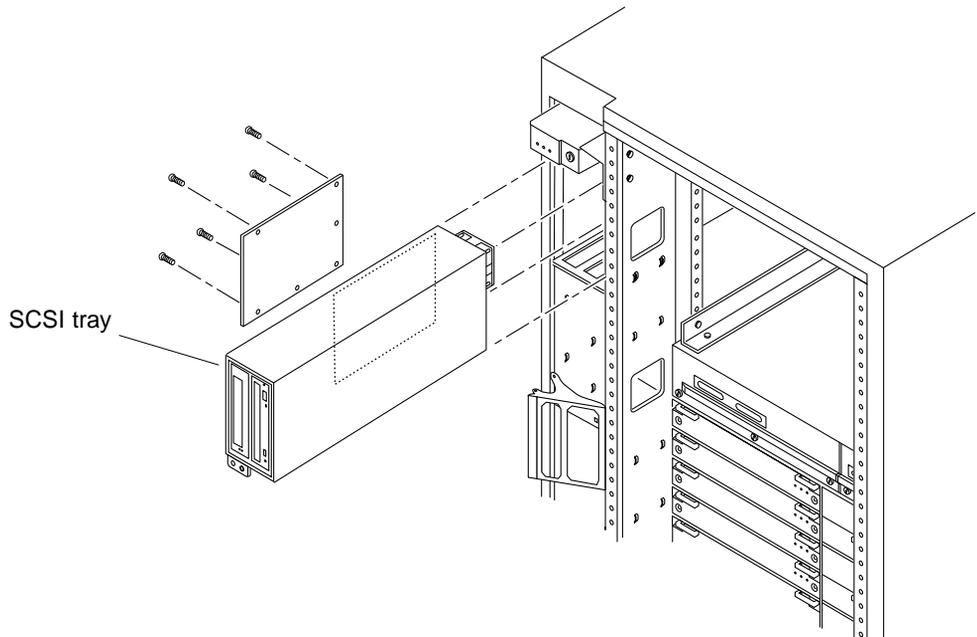
**FIGURE 1-12** Cabling and Screws at Rear of SCSI Tray

**3. Remove the two screws that attach the front of the SCSI tray to the cabinet pillar.**



**FIGURE 1-13** Screws at Front of SCSI Tray

**4. Pull the SCSI tray out of the cabinet.**



**FIGURE 1-14** Removing the SCSI Tray

## 1.7.2 Removing the CD-ROM Drive and Tape Drive

1. Remove the seven screws holding the access panel to the SCSI tray (FIGURE 1-15).
2. Release the data and power cables from the rear of each device by reaching through the access panel.
3. Release the device enclosure from the SCSI tray by removing three screws on the left-hand side. Pull the device enclosure out from the SCSI tray (FIGURE 1-15).

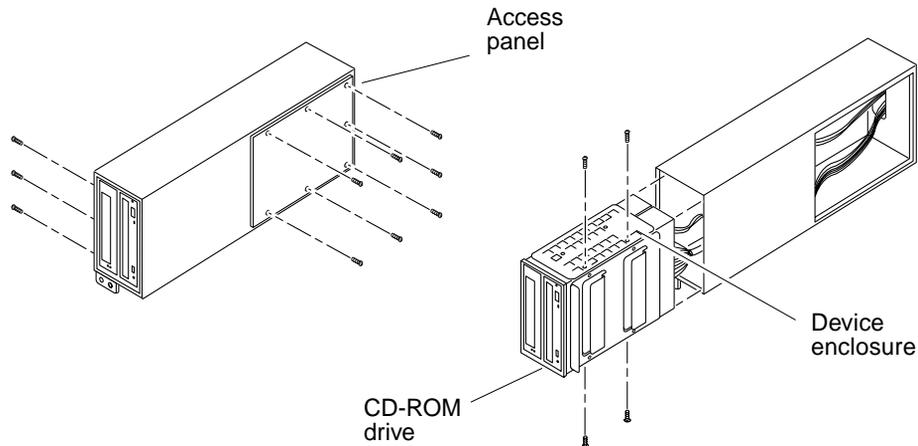


FIGURE 1-15 Removing the SCSI Tray Access Panel and Device Enclosure

4. Remove the CD-ROM drive by removing the four screws securing the drive to the device enclosure, two at the top and two at the bottom (FIGURE 1-15) and then pull the drive free of the enclosure (FIGURE 1-16).

- d. Remove the four screws fastening the mounting plate to the CD-ROM drive and then use the same screws to attach it to the replacement CD-ROM drive (FIGURE 1-16).

For detailed procedures refer to your system reference manual.

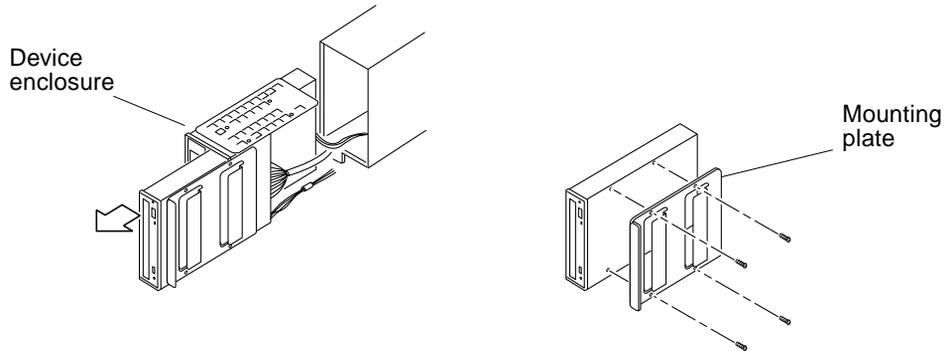


FIGURE 1-16 Removing the CD-ROM drive and Mounting Plate

### 1.7.3 Installing the New CD-ROM Drive in the New SCSI Tray

1. Set the new CD-ROM drive SCSI ID address to 6.
2. Place the new CD-ROM drive into the device enclosure and replace the four screws (FIGURE 1-15).
3. Remove the seven screws securing the access panel cover to the new SCSI tray (FIGURE 1-17).

4. Place the enclosure into the new SCSI tray and secure with the three screws removed in Step 3 (FIGURE 1-15)

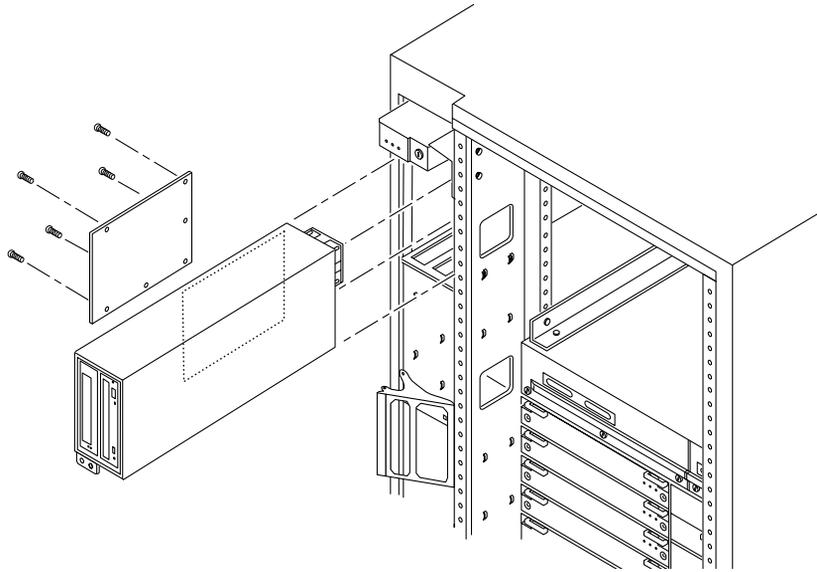


FIGURE 1-17 New SCSI Tray with Access Panel

5. Connect the data and power cables to the rear of each device.
6. Secure the access panel to the SCSI tray using the seven screws removed in Step 3.

## 1.7.4 Removing the Shelf Support Cover

1. Remove the 10 screws securing the shelf support cover to the shelf support.

2. Lift the cover to disengage the upper and lower tabs, and discard.

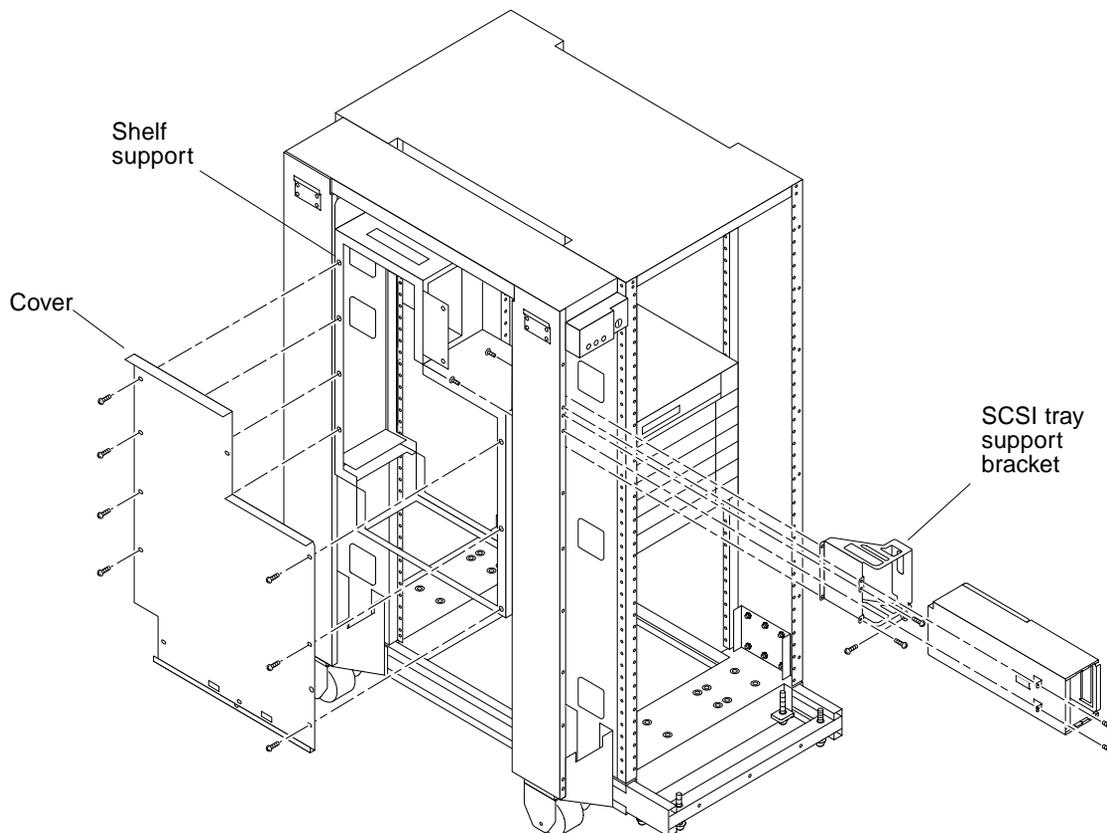


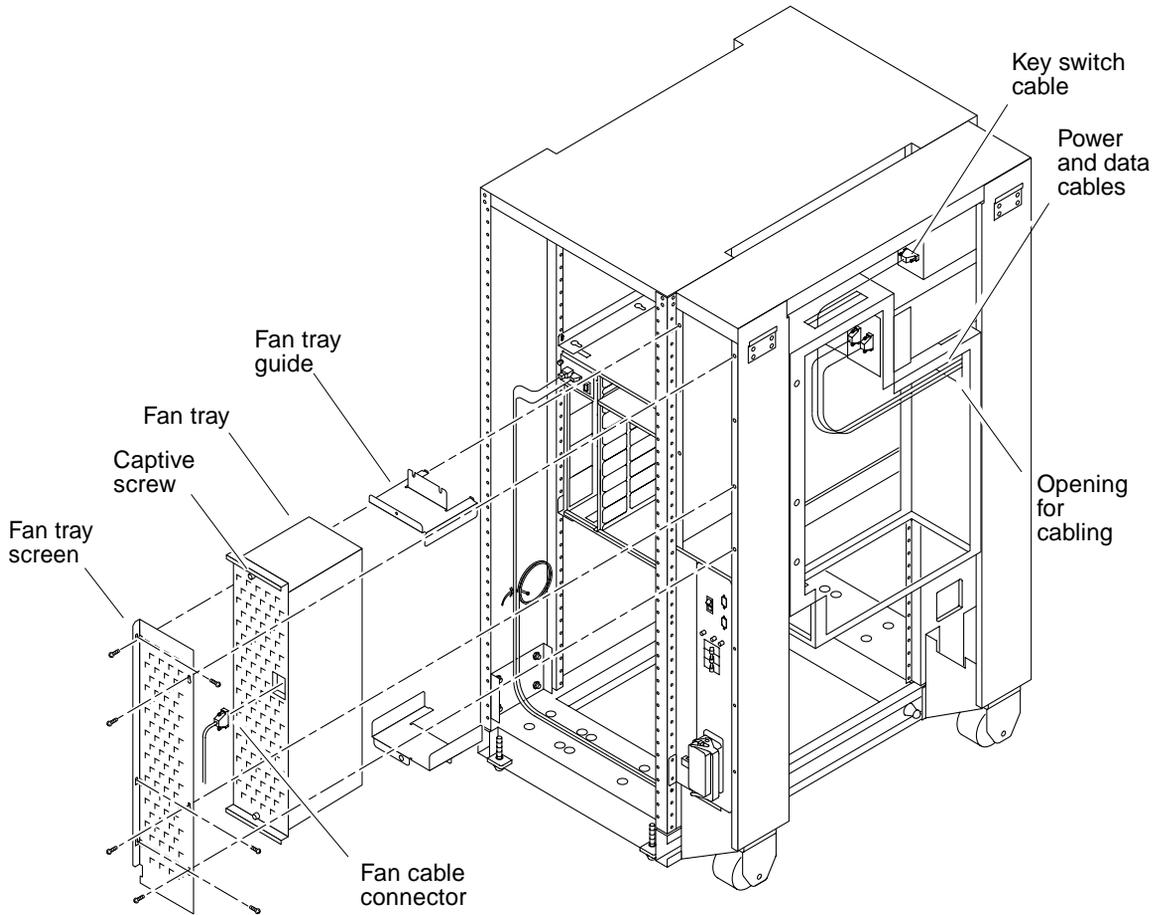
FIGURE 1-18 Removing Shelf Support Cover and SCSI Tray Bracket

## 1.7.5 Removing the Rack Fan Tray Assembly

1. Remove the fan tray screen at the right rear of the chassis (FIGURE 1-19).
  - a. Loosen the top screw on the left of the fan tray screen and the three screws on the right of the fan tray screen.

It is not necessary to remove these four screws since the screen has keyholes.
  - b. Remove the two bottom screws on the left of the fan tray screen.

Removing these screws will ensure adequate clearance.
  - c. Lift the screen up until the keyholes clear the screw heads.



**FIGURE 1-19** Rack Fan Tray Assembly

- 2. Disconnect the cables from the connectors on the front of the fan tray assembly.**
- 3. Loosen the captive screws at the top and bottom of the fan tray. (FIGURE 1-19).**
- 4. Tilt the fan tray assembly slightly to remove it from the cabinet.**
- 5. Remove the two screws securing each top and bottom fan tray guide to the cabinet pillar. Pull them out of the cabinet and discard (FIGURE 1-19).**

## 1.7.6 Removing the Shelf Support

1. Thread the key switch cable and power and data cables through the opening in the shelf support.
2. Remove the screws at the rear flange of the shelf support (FIGURE 1-20).
3. Pull out the shelf support and discard.

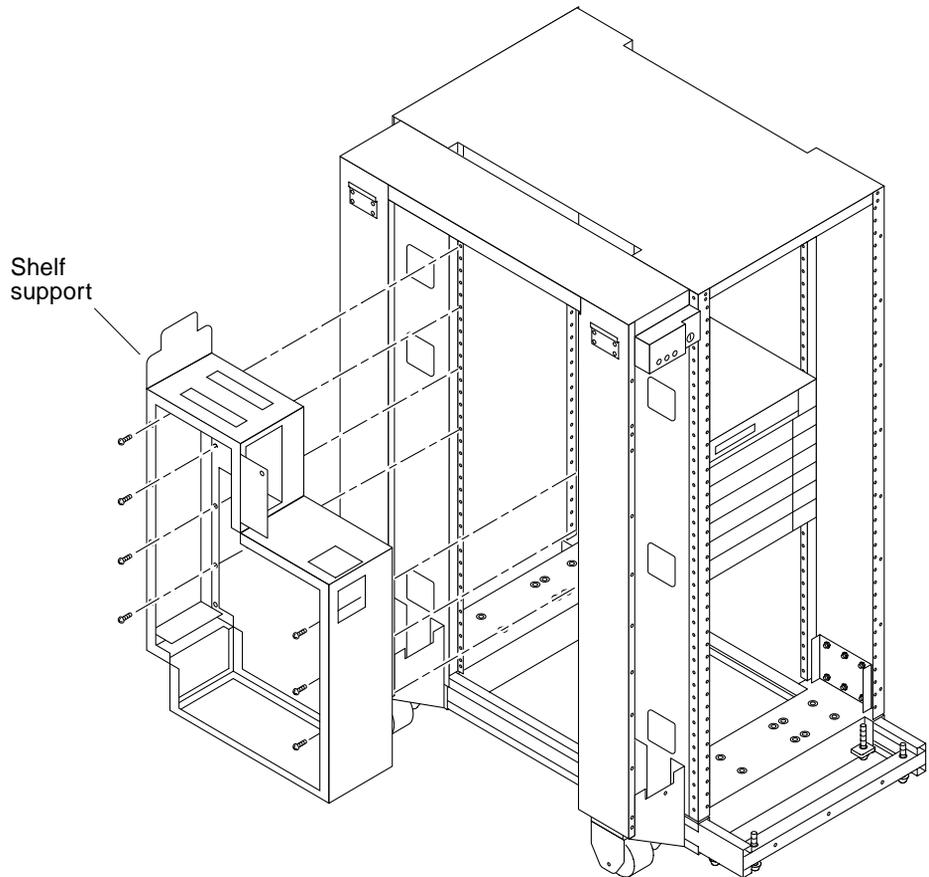


FIGURE 1-20 Removing the Shelf Support

## 1.7.7 Installing the New SCSI Tray Support Bracket

1. Remove the four screws at the front of the bracket, two on the left and two on the right (FIGURE 1-18).

2. Remove the two screws at the rear of the bracket.
3. Pull the bracket out of the cabinet pillar.
4. Set the replacement SCSI tray support bracket into the cabinet pillar.
5. Use the four screws removed in Step 1 to secure the front of the replacement bracket to the cabinet pillar (FIGURE 1-18).

There are no screws securing the rear of the replacement bracket.

## 1.7.8 Installing the Rack Fan Tray Assembly

1. Install the top and bottom fan tray brackets using the placement of the fan tray guides to determine the placement.
2. Secure the brackets to the pillar using two screw.
3. Tilt the bottom of the fan tray assembly inward, then push the fan tray all the way back into its slot in the enclosure.
4. Tighten the captive screws at the top and bottom of the fan tray (FIGURE 1-19).
5. Connect the fan cable to the front of the fan tray assembly.
6. Replace the fan tray screen.
7. Tighten the top screw on the left and the three screws on the right.
8. Replace the two bottom screws on the left.

## 1.7.9 Installing the New SCSI Tray

1. Push the SCSI tray into the cabinet and replace the two screws that attach the front of the SCSI tray to the left of the cabinet pillar (FIGURE 1-13 and FIGURE 1-18).

2. Connect the power and data cables to the back of the SCSI tray (FIGURE 1-19).

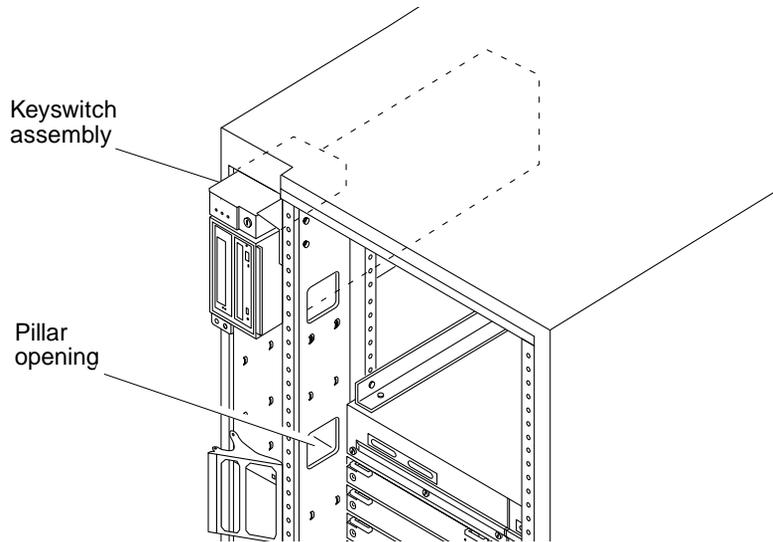


FIGURE 1-21 Cabinet Keyswitch Assembly and Pillar Opening

3. Attach the male end of the cable included in the upgrade kit to the keyswitch adapter assembly.

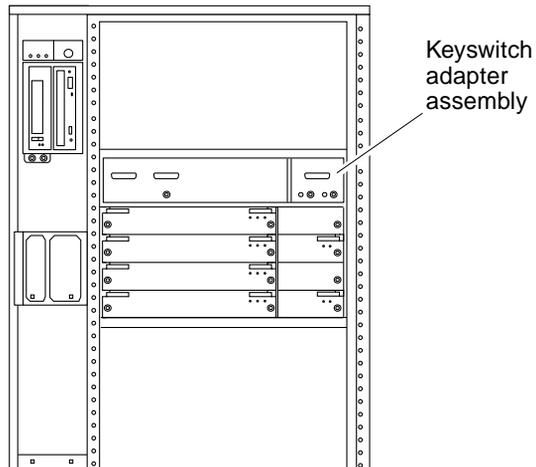


FIGURE 1-22 Keyswitch Adapter Assembly

4. Thread the cable through the opening in the cabinet pillar directly below the SCSI tray and around to the back of the SCSI tray, then connect the female end of the cable to the connector at the back of the cabinet keyswitch (FIGURE 1-21). Connect the SCSI tray fan power cord to its connector at the rear of the keyswitch assembly.

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## 1.8 Installing the Air Baffle

1. Remove the door hinges by loosening the screws securing them to the cabinet pillar.

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**Note** – Mark or otherwise record the placement of the hinges.

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2. Align the screw holes at the bottom of the baffle with the holes in the bracket at the base of the left cabinet pillar.
3. Insert one 10-32 screw at the bottom to hold the baffle in place.
4. With a #2 Phillips screwdriver, secure the baffle to the cabinet pillar using nine screws: two 6-32 screws on the left flange, four 10-32 screws on the right, and three 10-32 screws at the bottom.

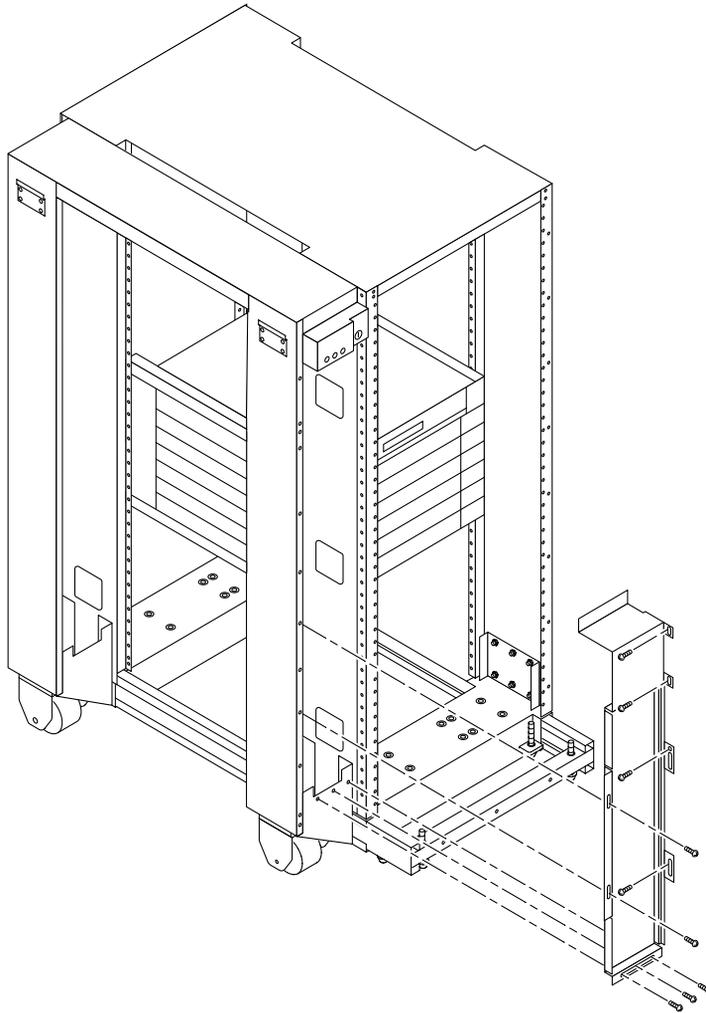


FIGURE 1-23 Air Baffle Installation

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## 1.9 Completing the Assembly

1. Replace the left side panel.
  - a. Place the panel against the cabinet so that the notches at the top align with the tabs on the cabinet, then lower the panel into place.

- b. **Tighten the two captive screws at the panel base.**
2. **Place the front bezel against the against the chassis so that the ball studs align with the catches. Tap or press the bezel into place.**
3. **Replace any assemblies above and below the system chassis.**  
Refer to the respective service manuals for further information.
4. **Push the front bezel into place until the ball studs engage.**
5. **Replace the door hinges with the screws removed previously, aligning them with the marks made when they were removed.**
6. **Align the front door with the front of the cabinet and then place it on the hinge.**
7. **Align the rear screen panel against the cabinet and replace the two #10 Phillips screws at both sides of the top.**

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## 1.10 Powering On the System

Refer to Chapter 12 in your system reference manual for additional information on restarting your Sun Enterprise system.

1. **Ensure that the keyswitch is in the Standby position (FIGURE 1-24).**

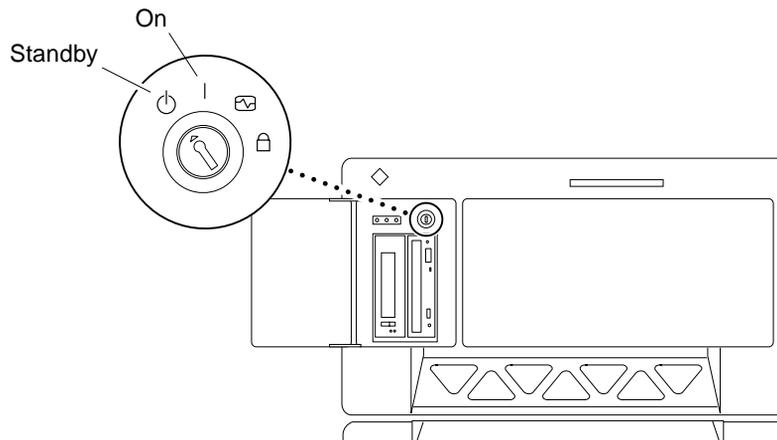


FIGURE 1-24 Keyswitch Standby and On Positions

2. **Reattach the I/O cables and power cables.**
3. **Turn the Local/Remote switch to Local (FIGURE 1-25).**

4. Turn on the AC power sequencer power switch (FIGURE 1-25).

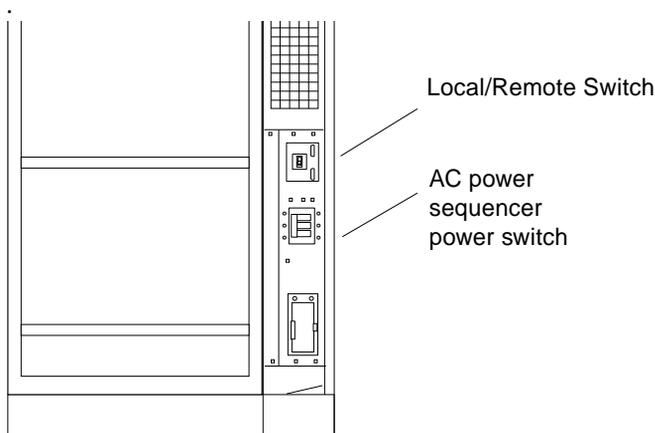


FIGURE 1-25 AC Power Sequencer—Rear View of System

5. Turn on power to the terminal to view system messages.
6. Turn the keyswitch to the on position (FIGURE 1-24).
7. Watch the terminal screen for any POST error messages.

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## 1.11 Updating the System Flash PROM

After replacing the clock board, you need to update the system flash PROM. If you have Internet access, the patch can be downloaded from the Internet. If you do not have access to the Internet, obtain the PROM patch software from your local Sun service provider.

After the system flash PROM is reprogrammed, the flash utility attempts to reboot the system. If the system fails to reboot automatically, power cycle or press the reset button to reset the system.



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**Caution** – Some combinations of old and new PROM versions are incompatible, and flash programming may cause default NVRAM values to overwrite customized NVRAM variables. Be sure to record the custom and default values displayed so that you can restore them afterward if necessary.

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1. Through your web browser, go to <http://sunsolve.sun.com>.

2. On the SunSolve Online web page, select these links in order:
  - a. Public Patches
  - b. Security and Recommended Patches
  - c. Detailed List (in the Hardware category)
  - d. 103346-11

The last link downloads a compressed tar file into your working directory.

3. Uncompress and untar the `103346-11.tar.Z` file.
4. Change to the `103346-11` directory.
5. Read the *README* file in this directory for further instructions for reprogramming the flash PROM.