Avaya Call Management System

Sun Enterprise 3500 Computer Hardware Installation, Maintenance, and Troubleshooting

585-215-873
Issue 6.0
May 2005

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Preventing toll fraud

"Toll fraud" is the unauthorized use of your telecommunications system by an unauthorized party (for example, anyone who is not a corporate employee, agent, subcontractor, or person working on your company's behalf). Be aware that there may be a risk of toll fraud associated with your system and that, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

Avaya fraud intervention

If you suspect that you are being victimized by toll fraud and you need technical assistance or support, call Technical Service Center Toll Fraud Intervention Hotline at +1-800-643-2353 for the United States and Canada. For additional support telephone numbers, see the Avaya Web site:

http://www.avaya.com/support

Providing telecommunications security

Telecommunications security (of voice, data, and video communications) is the prevention of any type of intrusion to (that is, either unauthorized or malicious access to or use of) your company's telecommunications equipment by some party.

Your company's "telecommunications equipment" includes both this Avaya product and any other voice/data/video equipment that could be accessed via this Avaya product (that is, "networked equipment").

An "outside party" is anyone who is not a corporate employee, agent, subcontractor, or person working on your company's behalf. Whereas, a "malicious party" is anyone (including someone who may be otherwise authorized) who accesses your telecommunications equipment with either malicious or mischievous intent.

Such intrusions may be either to/through synchronous (time-multiplexed and/or circuit-based) or asynchronous (character-, message-, or packet-based) equipment or interfaces for reasons of:

- Use (of capabilities special to the accessed equipment)
- Theft (such as, of intellectual property, financial assets, or toll-facility access)
- Eavesdropping (privacy invasions to humans)
- Mischief (troubling, but apparently innocuous, tampering)
- Harm (such as harmful tampering, data loss or alteration, regardless of motive or intent)

Be aware that there may be a risk of unauthorized intrusions associated with your system and/or its networked equipment. Also realize that, if such an intrusion should occur, it could result in a variety of losses to your company (including, but not limited to, human and data privacy, intellectual property, material assets, financial resources, labor costs, and legal costs).

Your responsibility for your company's telecommunications security

The final responsibility for securing both this system and its networked equipment rests with you, an Avaya customer's system administrator, your telecommunications peers, and your managers. Base the fulfillment of your responsibility on acquired knowledge and resources from a variety of sources, including, but not limited to:

- Installation documents
- System administration documents
- Security documents
- Hardware-/software-based security tools
- Shared information between you and your peers
- Telecommunications security experts

To prevent intrusions to your telecommunications equipment, you and your peers should carefully program and configure:

- Your Avaya-provided telecommunications systems and their interfaces
- Your Avaya-provided software applications, as well as their underlying hardware/software platforms and interfaces
- Any other equipment networked to your Avaya products.

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For the most current versions of documentation, go to the Avaya support Web site:

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COMPAS

This document is also available from the COMPAS database. The COMPAS ID for this document is 79854.

Avaya support

Avaya provides a telephone number for you to use to report problems or to ask questions about your contact center. The support telephone number is 1-800-242-2121 in the United States. For additional support telephone numbers, see the Avaya Web site:

http://www.avaya.com/support

Avaya Call Management System
Sun Enterprise 3500 Computer
Hardware Installation, Maintenance, and Troubleshooting

Contents

Preface

Avaya Call Management System (CMS) is an application for businesses and organizations that use Avaya communication servers to process large volumes of telephone calls using the Automatic Call Distribution (ACD) feature. Avaya CMS supports solutions for routing and agent selection, multi-site contact centers, remote agents, reporting, interfaces to other systems, workforce management, desktop applications, system recovery, and quality monitoring.

Avaya CMS is part of the Operational Effectiveness solution of the Avaya Customer Interaction Suite.

This section includes the following topics:

Purpose

Avaya Call Management System (CMS) Sun Enterprise 3500 Computer Hardware Installation, Maintenance, and Troubleshooting, 585-215-873, is written for technicians who install and maintain call center applications such as Avaya CMS.

The Sun Enterprise 3500 computer provides a hardware platform that supports call center software applications, and is designed to do the following:

- Improve performance, input/output capacity, and reliability over previous computers
- Provide faster processing with multiple processors
- Improve reliability through the use of redundant power supplies, redundant cooling fans, and an enhanced Automatic Recovery System (ARS)
- Allow for cost-effective upgrades to disk storage and memory

Intended users

This document is written for:

- Avaya support personnel
- Avaya factory personnel

Users of this document must be familiar with Avaya CMS and the Solaris operating system.

Overview

This document is organized as follows:

- Installation **on page 19** – Describes how to assemble the Enterprise 3500 computer, connect external devices, and power-up the computer.
- Maintenance **on page 59** – Describes how to maintain the Enterprise 3500 computer. –
- Troubleshooting on page 127 – Describes how to troubleshoot the Enterprise 3500 computer.
- Appendix A: Factory hardware installation on page 173 – Describes how to configure the Enterprise 3500 computer to Avaya factory specifications.
- Glossary on page 199
- Index on page 201

Conventions and terminology

If you see any of the following safety labels in this document, take careful note of the information presented.

CAUTION:
Caution statements call attention to situations that can result in harm to software, loss of data, or an interruption in service.

WARNING:
Warning statements call attention to situations that can result in harm to hardware or equipment.

DANGER:
Danger statements call attention to situations that can result in harm to personnel.

SECURITY ALERT:
Security alert statements call attention to situations that can increase the potential for unauthorized use of a telecommunications system.

Reasons for reissue

Issue 6.0 of this document was issued for the following changes:

- To update the model feature information (see Determining the computer model on page 26)
- To update the modem options (Setting the remote console modem options on page 51)
- To add information about the SunSwift card (see Maintaining I/O cards on page 69)
- To add information about R3V11 and R12 disk partitioning (see Partitioning disk drives on page 84)
- To update the tape ordering information (Ordering tapes on page 110)
- To make general wording and format corrections to the document.

Issue 5.0 of this document was issued for the following changes:

- To transition from the CentreVu® CMS name to the Avaya CMS name.
- To remove information about installing, maintaining, and troubleshooting network hubs and Network Terminal Servers (NTS). This information is now contained in *Avaya CMS Terminals, Printers, and Modems*, 585-215-874.
- To add information about checking and resetting EEPROM settings after replacing a system board (see Resetting the EEPROM settings on page 64).
- To update the procedures for maintaining disk drives (see Maintaining disk drives on page 78).
- To make general wording and format corrections to the document.

Issue 4.0 of this document was issued for the following changes:

- To add information about partitioning the 36-GB disk drive (see Partitioning disk drives on page 84).
- To add information about tape drive compatibility (see Tape drive compatibility on page 109).
- To add information about readministering system tunables when adding a CPU (see Installing a CPU on page 124).

Issue 3.0 of this document was issued for the following changes:

- To add information about installing, partitioning, and administering disk drives for CMS R3V9 (see Maintaining disk drives on page 78).
- To add information about ordering tapes (see Ordering tapes on page 110).
- To add information about updating the kernel with 400 MHz CPUs (see Applying the kernel update to 400 MHz CPUs on page 192).
- To make general wording corrections to the document.

Issue 2.2 of this document was issued for the following changes:

- To add information about the new Digital Data Storage (DDS) model DDS4 tape drive (see Parts list on page 25, Determining the computer model on page 26, Hardware options on page 29, Cleaning the tape drive on page 110, and Tape drive LED status patterns on page 151).
- To update the installation instructions for the I/O cards, including information about the new SunFastEthernet card (see Maintaining I/O cards on page 69 and Installing I/O cards on page 192).
- To update the installation instructions for HSI cards (see Installing HSI/S cards on page 73).
- To make the organization of this book consistent with *Avaya Call Management System Sun Ultra™ 5 Computer Hardware Installation, Maintenance, and Troubleshooting*, 585-215-871.
- To make general wording corrections to the document.

Issue 2.1 of this document was issued for the following changes:

- To move the hardware maintenance and troubleshooting information into this document. This information was previously found in *CentreVu Call Management System Sun Enterprise 3500 Computer Maintenance and Troubleshooting*, 585-215-875.
- To change references from Lucent Technologies to Avaya.
- To remove information about specific uninterruptible power supply (UPS) models. A UPS is still required, but must be provided locally.
- To update the installation instructions for the I/O cards (see Maintaining I/O cards on page 69).
- To update the disk drive maintenance procedures (see Maintaining disk drives on page 78).
- To make general wording corrections to the document.

Related documentation

You might find the following Avaya CMS documentation useful. This section includes the following topics:

Change description

For information about the changes made in Avaya CMS R12, see:

- *Avaya Call Center 2.1 and CMS Release 12 Change Description*, 07-300197

Software documents

For more information about Avaya CMS software, see:

- *Avaya Call Management System Release 12 Software Installation, Maintenance, and Troubleshooting Guide,* 585-215-117
- *Avaya CMS Open Database Connectivity,* 585-780-701
- *Avaya Call Management System Release 12 LAN Backup User Guide,* 585-215-721
- *Avaya Call Management System Release 12 External Call History Interface,* 07-300064
- *Avaya CMS Custom Reports,* 585-215-822
- *Avaya CMS Forecast,* 585-215-825
- *Avaya Visual Vectors Release 12 Installation and Getting Started*, 07-300069
- *Avaya Visual Vectors Release 12 User Guide*, 07-300200
- *Avaya Business Advocate Release 12 User Guide*, 07-300063
- *Avaya CMS Release 12 Report Designer User Guide*, 07-300068

Administration documents

For more information about Avaya CMS administration, see:

- *Avaya Call Management System Release 12 Administration,* 07-300062
- *Avaya Call Management System Database Items and Calculations,* 07-300011
- *Avaya CMS Supervisor Release 12 Reports*, 07-300012
- *Avaya CMS Supervisor Release 12 Installation and Getting Started*, 07-300009
- *Avaya Call Management System High Availability User Guide*, 07-300065
- *Avaya Call Management System High Availability Connectivity, Upgrade and Administration*, 07-300065

Avaya CMS upgrade documents

There are several upgrade paths supported with Avaya CMS. There is a document designed to support each upgrade. None of the following upgrade documents are available from the publications center.

This section includes the following topics:

Base load upgrades

Use a base load upgrade when upgrading CMS to the latest load of the same version (for example, R3V9 ak.g to R3V9 al.k). A specific set of instructions is written for the upgrade and is shipped to the customer site with the CMS software CD-ROM as part of a Quality Protection Plan Change Notice (QPPCN).

For more information about base load upgrades, see:

- *Avaya CMS R12 Base Load Upgrades*

Platform upgrades and data migration

Use a platform upgrade when upgrading to a new hardware platform (for example, upgrading from a SPARCserver 5 to a Sun Blade 150). The new hardware platform is shipped from the Avaya factory with the latest CMS load. Therefore, as part of the upgrade you will have the latest CMS load (for example, R3V9 to R12 or the latest load of the same CMS version). For R12, a specific set of instructions is written for the upgrade and is shipped to the customer site with the new hardware.

For more information about platform upgrades and data migration, see:

- *Avaya Call Management System Release 12 Platform Upgrade and Data Migration*, 07-300067

Avaya Call Management System Upgrade Express (CUE)

Use CUE in the following conditions:

- CMS is being upgraded from an earlier version (for example R3V6) to the latest version (for example, R12).
- The hardware platform is not changing.

A specific set of upgrade instructions is written for the upgrade and is shipped to the customer site with the CUE kit.

For more information about CUE upgrades, see:

- *Avaya Call Management System (CMS) Release 12 CMS Upgrade Express (CUE) Customer Requirements,* 07-300010
- *Avaya Call Management System Release 12 Sun Blade 100 Workstation CMS Upgrade Express*
- *Avaya Call Management System Release 12 Sun Blade 100 Workstation Mirrored System CMS Upgrade Express*
- *Avaya Call Management System Release 12 Sun Enterprise 3500 Computer CMS Upgrade Express*
- *Avaya Call Management System Release 12 Sun Enterprise 3500 Computer Mirrored System CMS Upgrade Express*
- *Avaya Call Management System Release 12 Sun Fire V880 Computer CMS Upgrade Express*

Hardware documents

For more information about Avaya CMS hardware, see:

- *Avaya Call Management System Sun Fire V880 Computer Hardware Installation, Maintenance, and Troubleshooting,* 585-215-116
- *Avaya Call Management System Sun Fire V880 Computer Connectivity Diagram,* 585-215-612
- *Avaya Call Management System Sun Blade 100/150 Computer Hardware Installation, Maintenance, and Troubleshooting,* 585-310-783
- *Call Management System Sun Blade 100/150 Computer Connectivity Diagram,* 585-310-782
- *Avaya Call Management System Sun Enterprise 3500 Computer Hardware Installation, Maintenance, and Troubleshooting,* 585-215-873
- *Call Management System Sun Enterprise 3500 Computer Connectivity Diagram,* 585-215-877
- *Avaya Call Management System Terminals, Printers, and Modems,* 585-215-874

Communication Manager documents

For more information about Avaya CMS communication servers, see:

- *Avaya Call Management System Switch Connections, Administration*, and Troubleshooting, 585-215-876
- *Avaya Communication Manager Call Center Software - Call Vectoring and Expert Agent Selection (EAS) Guide*, 07-300186
- *Avaya Communication Manager Call Center Software - Automatic Call Distribution (ACD) Guide*, 07-300185
- *Avaya Communication Manager Call Center Software - Basic Call Management System (BCMS) Operations*, 07-300061

Documentation Web sites

For product documentation for all Avaya products and related documentation, go to http://www.avayadocs.com. Additional information about new software or hardware updates will be contained in future issues of this book. New issues of this book will be placed on the Web site when available.

Use the following Web sites to view related support documentation:

- Information about Avaya products and service

  http://www.avaya.com

- Sun hardware documentation

  http://docs.sun.com

- Okidata printer documentation

  http://www.okidata.com

- Informix documentation

  http://www.informix.com

- Tivoli Storage Manager documentation

  http://www.tivoli.com

Support

Contacting Avaya technical support

Avaya provides support telephone numbers for you to report problems or ask questions about your product.

For United States support:

1- 800- 242-2121

For international support:

See the 1-800 Support Directory listings on the Avaya Web site.

Escalating a technical support issue

Avaya Global Services Escalation Management provides the means to escalate urgent service issues. For more information, see the Escalation Management listings on the Avaya Web site.

Installation

This section describes how to install the Enterprise 3500 computer and related peripheral equipment. Use the following table to check off each required procedure after completion.

Procedure	Completed
Preparing for installation on page 20	
Unpacking and inventorying the equipment on page 24	
Assembling the Enterprise 3500 computer:	
- Installing the fiber-cable organizer on page 30	
- Connecting the AC power cord on page 32	
- Fiber channel disk cabling on page 34	
- Attaching the SCSI terminator on page 39	
Connecting the monitor and keyboard on page 42	
Connecting the remote console modem on page 44	
Connecting the switch link on page 45	
Powering up the system and verifying POST on page 46	
Identifying installed I/O cards on page 49	
Setting the remote console modem options on page 51	
Turning the system over for provisioning on page 57	

Preparing for installation

This section contains information that will help you prepare for the Enterprise 3500 computer installation:

Safety precautions

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

- Follow all cautions, warnings, and instructions that are marked on the equipment.
- Never push objects of any kind through openings in the equipment. They could touch dangerous voltage points or short out components that could result in fire or electric shock.
- Refer servicing of equipment to qualified personnel.
- To protect both yourself and the equipment, observe the following precautions.

Item	Problem	Precaution
Wrist or foot strap	ESD	Wear a conductive wrist strap or foot strap when handling printed circuit boards.
Cover panels	System damage and overheating	Reinstall all cabinet cover panels after you perform any service work on the system.
Board slot filler panels	System damage and overheating	Make sure that a filler panel is installed on all empty board slots.

System precautions

Ensure that the voltage and frequency of the power outlet that is used matches the electrical rating labels on the equipment.

Wear antistatic wrist straps when handling any magnetic storage devices, CPU/Memory+ boards, or other printed circuit boards.

The Enterprise 3500 computer has an autosensing power supply using nominal input voltages of 100 to 240 V AC at 47 to 63 Hz. The Enterprise 3500 must be powered by a nonswitched, dedicated, 15-amp circuit. Sun products are designed to work with single-phase power systems with a grounded neutral conductor. To reduce the risk of electric shock, do not plug Sun products into another type of power source. Contact your facilities manager or qualified electrician if you are unsure of what type of power is supplied to your building.

Each of the following items requires access by way of a separate power cord:

- Enterprise 3500 computer
- External peripherals
- Monitor

WARNING:
DO NOT make mechanical or electrical modifications to the cabinet. Sun Microsystems is not responsible for regulatory compliance of modified cabinets.

Required tools

You need the following tools to do the installation:

- Phillips® #2 screwdriver
- Needle-nose pliers
- ESD grounding wrist strap
- Antistatic mat

Electrical specifications

Note:

For power integrity, an Uninterruptible Power Supply (UPS) is recommended for all installations.

Parameter	Value
Input current • Voltage range • Current, maximum • Current, frequency range	 • 100-240 V AC, autosensing • 9.5A@100 V • 47-63 Hz
Input power rating (total continuous power)	875 W
Volt-ampere rating	950 VA
BTU rating	3000 BTU
Power factor	0.92 - 0.96
Wall plug type • U.S. • Non-U.S.	 • NEMA 5-15P • Power cords must be obtained locally
CPU plug type	IEC 320

Physical specifications

Parameter	English value	Metric value
Height	25.5 inches	64.5 centimeters
Width	17 inches	43.2 centimeters
Depth	23.5 inches	59.7 centimeters
Weight	185 pounds	84 kilograms
Power cord	6.0 feet	1.8 meters

Service access specifications

Parameter	English value	Metric value
Front	18 inches	45 centimeters
Rear	18 inches	45 centimeters
Left	6 inches	15 centimeters
Right	6 inches	15 centimeters

Environmental specifications

For the most reliable system operation:

- The room must have sufficient air conditioning capacity to support the cooling needs of the entire system.
- The air conditioning system must have controls that prevent excessive temperature changes.

Follow the guidelines in the table below for temperature, humidity, and altitude limits for units in operation and for units that are not in operation (that is, units that are in transit or in storage).

Parameter	Operating	Nonoperating
Temperature	41°F to 95°F (5°C to 35°C)	-4°F to 140°F (-20°C to 60°C)
Humidity (max)	20% to 80% RH noncondensing 27°C max wb	93% RH
Altitude (max)	10,000 feet (3 kilometers)	40,000 feet (12 kilometers)

Unpacking and inventorying the equipment

WARNING:
Never move the system when the power is on. Excessive movement can cause catastrophic disk drive failure. Always turn the power off before moving cabinets.

WARNING:
Always wear an electrostatic discharge (ESD) wrist strap when handling internal components.

Note:
Always have up-to-date system backups before turning the computer off and moving the computer.

Unpack the computer and the associated peripheral equipment. Compare the contents of the carton to the shipping inventory list to verify that all equipment was delivered.

Inspect all shipping cartons for evidence of physical damage. If a shipping carton is damaged, request that the carrier representative be present before the carton is opened.

In the United States (U.S.), contact the Technical Service Center (TSC) if any computer parts are defective on arrival. Contact Avaya customer service if any computer parts are missing.

Outside of the U.S., contact your Avaya representative or distributor if any computer parts are missing or defective.

As you unpack the system, find the high-speed serial interface (HSI/S) loopback plugs. The plugs are normally in the box with the HSI/S cables and patch panels. You may need the plugs for future troubleshooting. For instructions on how to use the loopback plugs on a CMS computer, see *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876.

This section includes the following topics:

Parts list

Verify that you have the following components of the Enterprise 3500 computer:

- Enterprise 3500 cabinet (including installed boards, cards, and disk drives)
- Fiber cable organizer and mounting hardware
- Power cord
- Fiber cables:
  - One for a CMS nonmirrored system
  - Two for a CMS mirrored system
  - One or two for an Explorer II/NICE Analyzer system
- Gigabit interface converter (GBIC) modules:
  - Two for a CMS nonmirrored system
  - Four for a CMS mirrored system
  - Two or four for an Explorer II/NICE Analyzer system
- Monitor and power cord
- Monitor cable
- Keyboard and cable
- Mouse and cable
- SCSI terminator (usually located in a plastic bag with the fiber cable)
- For the 4-millimeter DDS4 tape drive:
  - One blank DDS4 tape for backups
  - One DDS4 tape that contains the Avaya factory configuration CMSADM filesystem backup
  - One DDS4 tape drive cleaning cartridge
- For the 8-millimeter Mammoth tape drive:
  - One blank 170-meter, AME Mammoth tape for backups
  - One 170-meter AME Mammoth tape that contains the Avaya factory configuration CMSADM filesystem backup
  - One Exabyte 8-millimeter Mammoth tape drive cleaning cartridge

Determining the computer model

This book is written for use with several different models of the Enterprise 3500 computer. The differences between the models are few. This section shows how to identify the different models.

Features

Each of the different models have distinctive features that will also assist you in determining what model you have.

- Model 3500
  - SBus+ I/O board with a Turbo GX video card
  - 7200 RPM, 9.1-GB, 1.6-inch wide disk drives
- Model 3501
  - New Clock+ board (supports faster processors)
  - Graphics+ I/O board with a Creator video card
  - 10000 RPM, 9.1-GB, 1-inch wide disk drives
- Model 3503
  - 1-GB memory (minimum)
  - 18-GB or larger disk drives
  - DVD-ROM drive
  - On older models, the 8-millimeter Exabyte tape drive is used. On newer models, the 4-millimeter DDS4 tape drive is used.
  - Newer models have CPUs with a 400 or 500 MHz clock

Physical labeling

All models are labeled as Enterprise 3500.

Software check

To determine the model of the computer once the computer is operational:

1. Log in as root.
2. Enter the following commands to determine if the computer has a Turbo GX video card (3500) or a Creator video card (3501/3503):

   grep cgsix /etc/path_to_inst

   grep ffb /etc/path_to_inst

   - If the computer is a Model 3500, the following message is displayed:

     "/sbus@3,0/cgsix@0" 0 "cgsix"

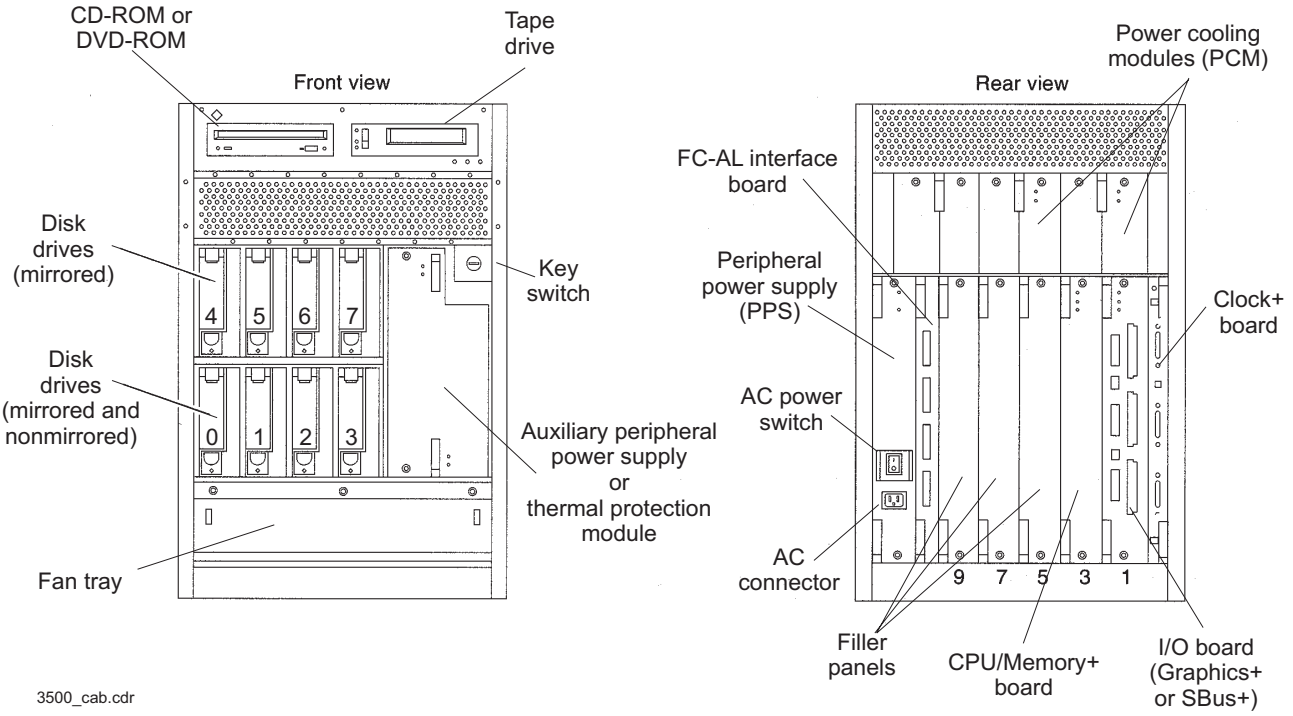
   - If the computer is a Model 3501 or 3503, the following message is displayed:

     "/SUNW,ffb@2,0" 0 "ffb"

Computer layout

Familiarize yourself with the layout of the Enterprise 3500. The minimum configuration for the computer is as follows:

- One power/cooling module (PCMs) and two PCM filler panels
- Fan tray
- One Clock+ board
- One CPU/Memory+ board (with two UltraSPARC II CPU modules and memory modules)
- One I/O board, either a Graphics+ I/O board or an SBus+ I/O board
- One Fiber Channel-Arbitrated Loop (FC-AL) interface board
- One disk drive (nonmirrored, in slot 0); two disk drives (mirrored, in slots 0 and 4)
- Filler panels for any unpopulated board slots
- One peripheral power supply (PPS) with an AC power sequencer
- One auxiliary PPS or one thermal protection module (TPM)
- Media tray for removable media, including CD-ROM or DVD-ROM drive and tape drive



Hardware options

The following table lists the hardware options for the Enterprise 3500 computer.

Option	Maximum Quantity	Comments
CPU/Memory+ board and I/O boards	5 total per system	Each slot can accept a CPU/Memory+ or I/O board (Graphics+ or SBus+). Combinations can vary. Since slot 1 connects to the onboard SCSI devices, this slot should be reserved for the first I/O board. One system board becomes the system master automatically. Jumper changes are not needed.
UltraSPARC II CPU modules	8 per system	There may be 0, 1, or 2 modules on each CPU/Memory+ board. The first CPU/Memory+ board has 2 modules.
Memory modules	0, 8, or 16 SIMMs per CPU/Memory+ board	SIMM sizes are 32 or 128 MBytes. Do not mix sizes within the same bank. Add 8 SIMMs at a time. Install SIMMs in all bank 0 sockets first on each CPU/Memory+ board, from the lowest slot to the highest. Once bank 0 is full, install the remaining SIMMs in bank 1 sockets in the same order.
SBus cards	6 per system	There may be up to 3 cards per SBus+ I/O board, or up to 2 cards per Graphics+ I/O board.
Media tray	CD-ROM or DVD-ROM drive and tape drive	The media tray holds removable-media drives only. One CD-ROM drive or one DVD-ROM drive, and one tape drive is standard equipment. On older models, the 8-millimeter Exabyte tape drive is used. On newer models, the 4-millimeter DDS4 tape drive is used.
FC-AL interface board	1 per system	The FC-AL interface board has one or two GBIC modules installed.
Disk drives	For CMS, 4 disks maximum in a nonmirrored system and 8 disks maximum in a mirrored system For Explorer II or NICE Analyzer, 8 disks maximum	Each bank can hold 4 disk drives. For a nonmirrored CMS system, install disks in the bottom bank only from left to right, starting with slot 0. Install disks in the top bank from left to right only when using disk mirroring (CMS) or Explorer II/NICE Analyzer. NOTE: Slot 0 is reserved for the boot disk in all systems, and slot 4 is reserved for the mirror boot disk for CMS.

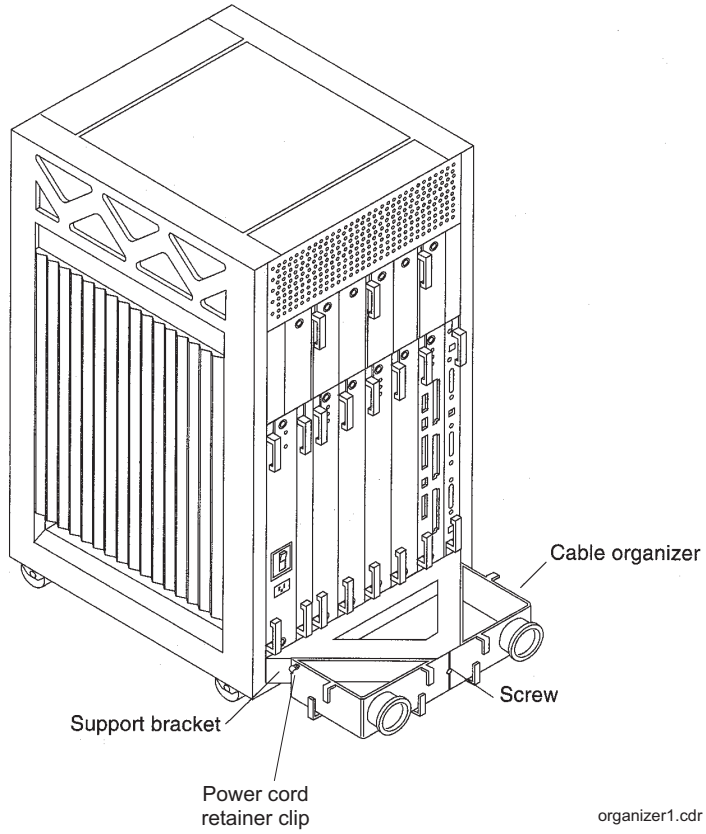
Assembling the Enterprise 3500 computer

The following section describes how you assemble the different parts of the Enterprise 3500 computer, including the following:

Installing the fiber-cable organizer

Use the fiber-cable organizer to route the 2-meter fiber-optic cables to connect the FC-AL interface board and the I/O board. The cable organizer can prevent damage to the fiber-optic cable by ensuring that the 1.0-inch minimum bend radius rule is observed. The

fiber cable organizer kit includes two organizer sections and one screw. See the following figure.



To install the cable organizer:

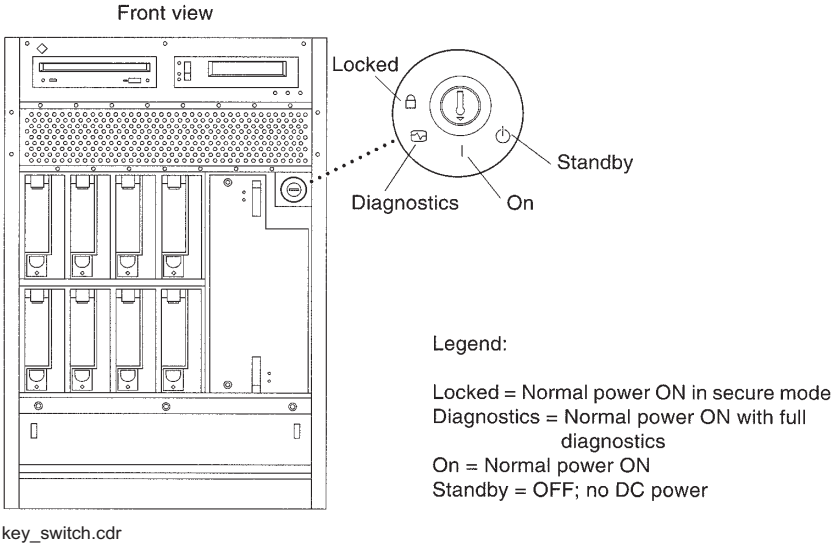
1. Remove the screw that secures the power cord retainer clip to the support bracket at the rear of the system.
2. Position one of the fiber cable organizer sections with the spool facing toward you. Set the hooks on the back of the organizer into the corresponding cutouts on the right side of the support bracket.

   The top of the brace should be flush with the top of the support bracket. The organizer extends below the bracket.
3. Secure the organizer by pushing it outward along the support bracket until the snap at the rear of the organizer clicks audibly into place.
4. Install the other spool brace by repeating Steps 2 and 3.
5. Using the screw that is included in the kit, fasten the spool braces to the support bracket through the center-front cutout that is formed when both braces are in place.
6. Remount the retainer clip through the hex nut at the notch on the side of the organizer.
7. Set the retainer clip screw into the hex nut.

Connecting the AC power cord

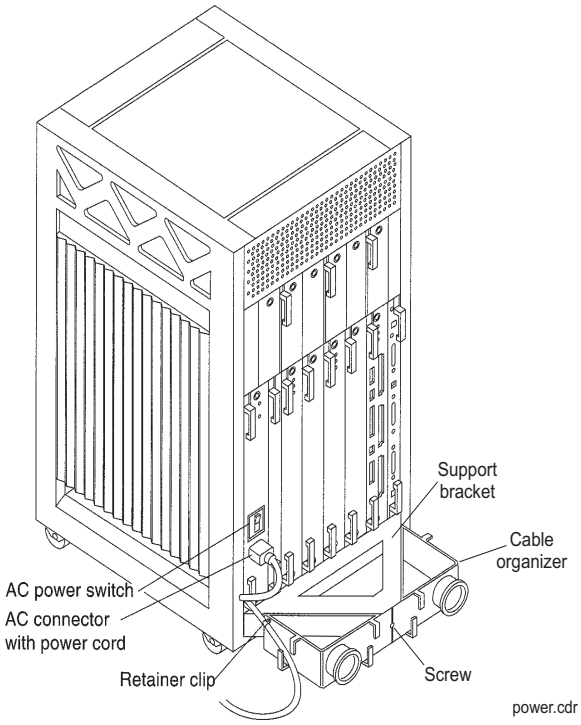
To connect the AC power cord:

1. Unlock and open the front door of the computer.
2. Locate the key switch in the upper-right corner, insert the key, and turn the key switch to the standby position.



key_switch.cdr

3. Turn off the AC power switch on the back of the computer.



4. Connect the IEC 320 end of the power cord to the AC connector.

   For installations outside of the U.S. and Canada, obtain a power cord for your local configuration.

5. Route the power cord through the power cord retainer clip on the cable organizer.

6. Plug the power cord from the computer into an outlet on the UPS.

   A UPS provides a temporary electrical supply to a computer for several minutes, depending on the number of components connected to the UPS. For a CMS computer, a 2KVA minimum UPS is required for all installations. See your UPS documentation to determine the projected amount of backup battery time for your model. If the system is without power for longer than the backup time, the system may shut down improperly, and the customer could lose data.

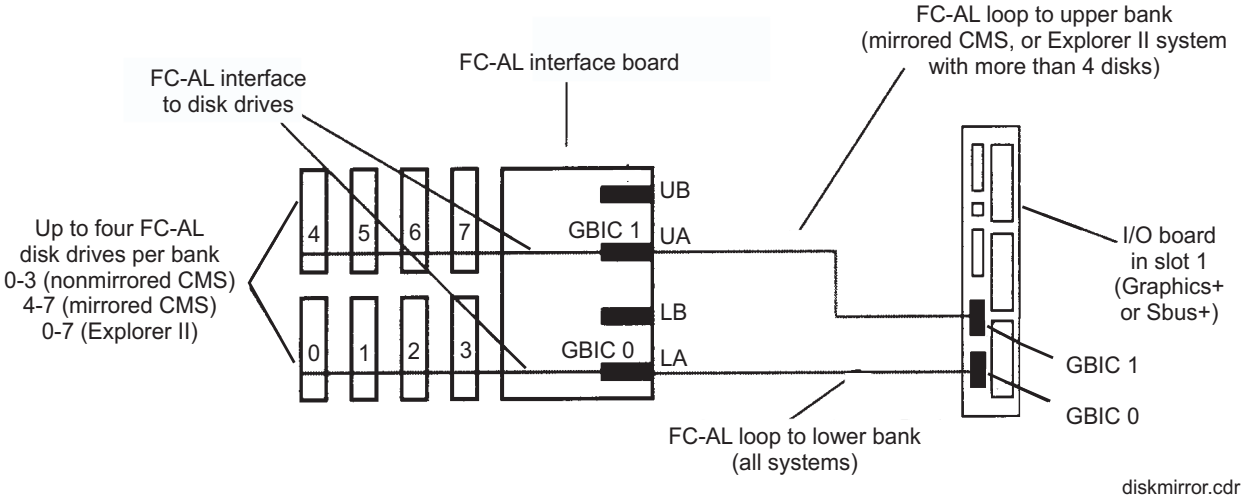
   If a UPS is not being used, you must use a grounded outlet on a dedicated 15-amp circuit.

Fiber channel disk cabling

WARNING:

The plastic dust caps that are on the ends of the fiber cables must remain intact until you are ready to install the cables. Ensure that you observe the fiber-optic cable minimum bend radius rule when you handle the cables.

The following figure shows the overall fiber channel cable connectivity between the FC-AL interface board and an I/O board. Use this figure when installing the fiber channel cables. For a CMS nonmirrored system, you install only the lower cable. For a CMS mirrored system, or an Explorer II/NICE Analyzer system with more than four disk drives, you install both cables.

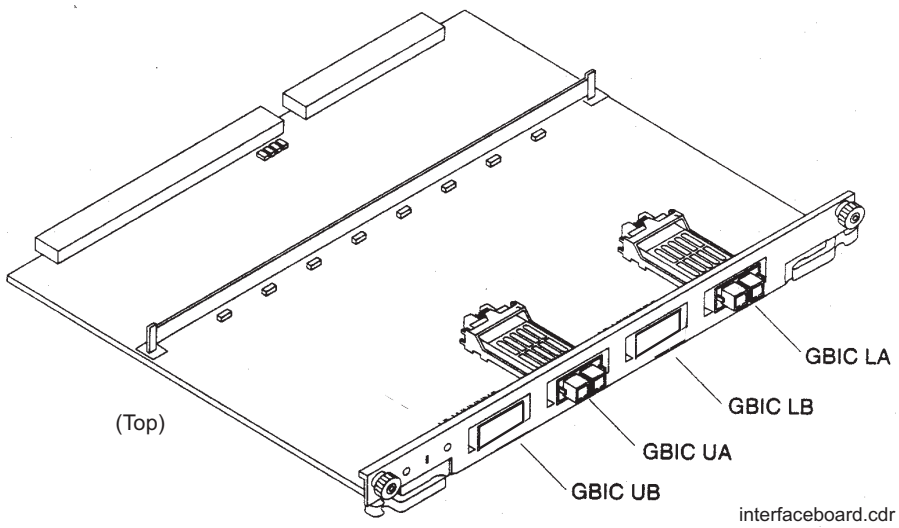


Connecting the fiber cable to the FC-AL interface board

Internal FC-AL disk drives require an interface board to communicate to an I/O board. This figure identifies the GBIC modules on the FC-AL interface board, and the table identifies the GBIC that is associated with each disk drive. The GBIC modules are preinstalled at the factory. Only GBIC modules in positions LA and UA are used.

WARNING:

The plastic dust caps that are on the ends of the fiber cables must remain intact until you are ready to install the cables. Ensure that you observe the fiber-optic cable minimum bend radius rule when you handle the cables.



Disk drives	Drive port	GBIC name and location
0[1], 1, 2, 3	A	GBIC LA (lower bank); default for all systems
N/A	B	GBIC LB (lower bank); not used
4[2], 5, 6, 7	A	GBIC UA (upper bank); used for CMS mirrored systems, or Explorer II/NICE Analyzer systems with more than four disk drives
N/A	B	GBIC UB (upper bank); not used

1. Disk slot 0 must be reserved for the boot disk on all systems.
2. Disk slot 4 must be reserved for the mirror boot disk with CMS.

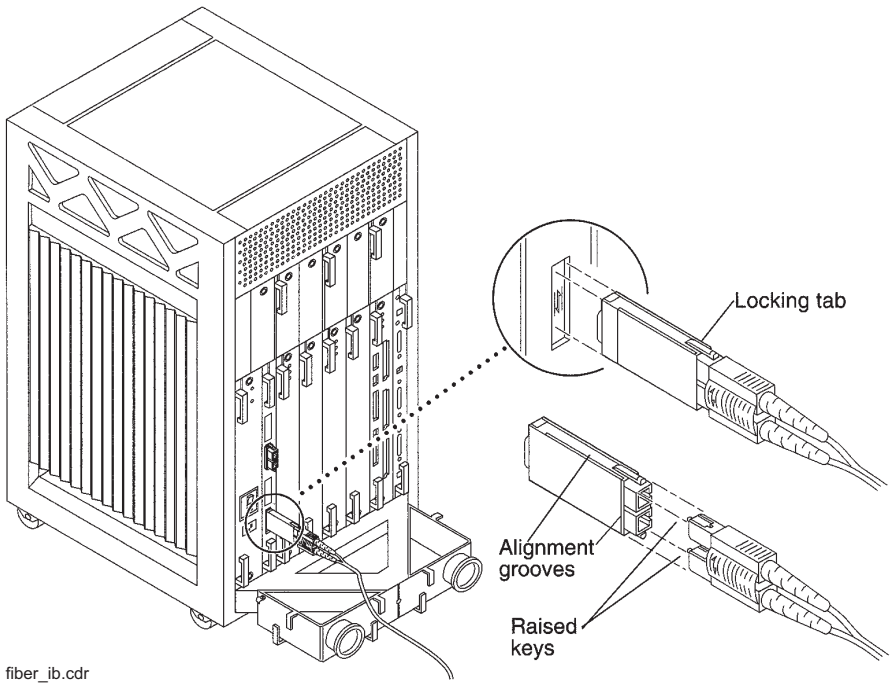
Wrapping the fiber cable on the organizer

Use the fiber-cable organizer to route the 2-meter fiber-optic cables to connect the FC-AL interface board and the I/O board. The cable organizer can prevent damage to the fiber-optic cable by ensuring that the 1.0-inch minimum bend radius rule is observed. On a CMS mirrored system, or an Explorer II/NICE Analyzer system with more than four disk drives, you will install two fiber cables.

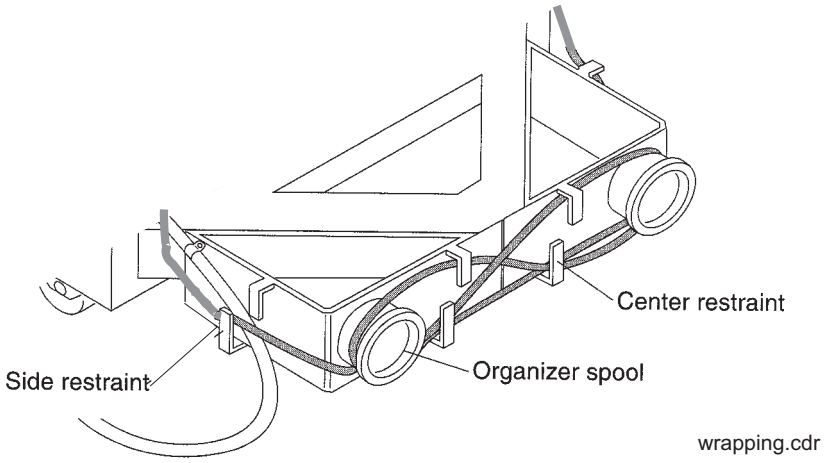
WARNING:
The plastic dust caps that are on the ends of the fiber cables must remain intact until you are ready to install the cables. Ensure that you observe the fiber-optic cable minimum bend radius rule when you handle the cables.

To wrap the fiber cable:

1. Remove the two plastic caps that cover the cable connector on the GBIC modules. The GBIC modules are preinstalled at the factory.
2. Remove the plastic cap that covers one end of the fiber cable.
3. Connect that end of the fiber cable into the GBIC module that is installed on the FC-AL interface board.



4. Route the fiber cable down toward the bottom of the system, placing it through the left side restraints on the organizer.



5. Using a “figure 8” pattern, wrap the cable around the bottom of the left spool, then up and around the right spool threading the cable through the center restraints on the organizer.
6. Repeat Step 5 until the cable ends up on the right side with enough cable to reach the I/O board. Thread the cable through the right side restraints and connect it to the I/O board as described in the next section.

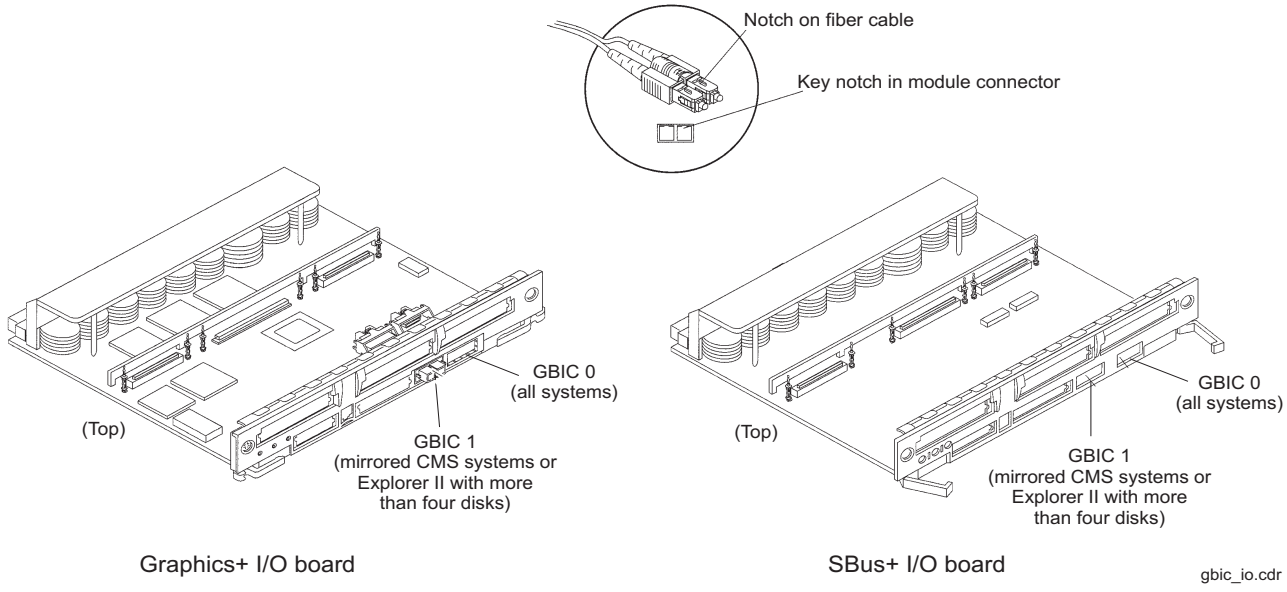
Connecting the fiber cable to the I/O board

To connect the fiber cable to the I/O board:

WARNING:

The plastic dust caps that are on the ends of the fiber cables must remain intact until you are ready to install the cables. Ensure that you observe the fiber-optic cable minimum bend radius rule when you handle the cables.

1. Remove the two plastic caps that cover the cable connector on the GBIC module.
2. Remove the plastic cap that covers the other end of the fiber cable.
3. Connect that end of the fiber cable into the GBIC module that is installed on the I/O board. Align the notch in the cable connector with the key notch in the module connector.



Attaching the SCSI terminator

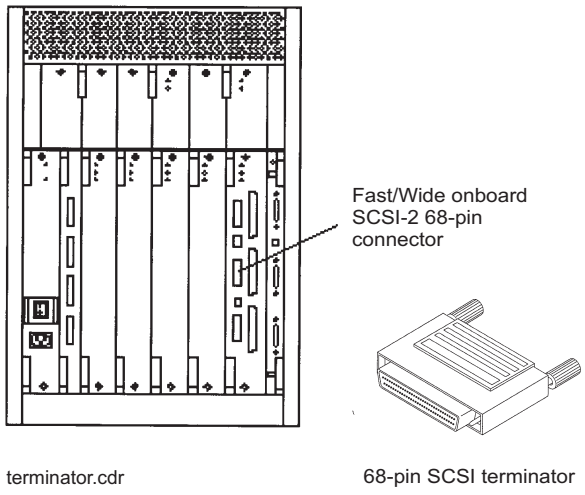
The built-in SCSI connector on the I/O board in slot 1 of any Enterprise 3500 computer must be terminated if not used for another purpose. This SCSI bus connects to the internal CD-ROM or DVD-ROM drive and the internal tape drive. The SCSI bus on an I/O board in any other slot must be terminated only if SCSI devices are connected to that board. A SCSI port can be used to connect an external tape drive for data migration.

Note:

The SCSI terminator is packaged in a plastic bag with the fiber channel cable.

To connect the SCSI terminator:

1. Remove the SCSI terminator from the packaging.
2. Attach the SCSI terminator to the SCSI connector on the first I/O board. See the following figure.



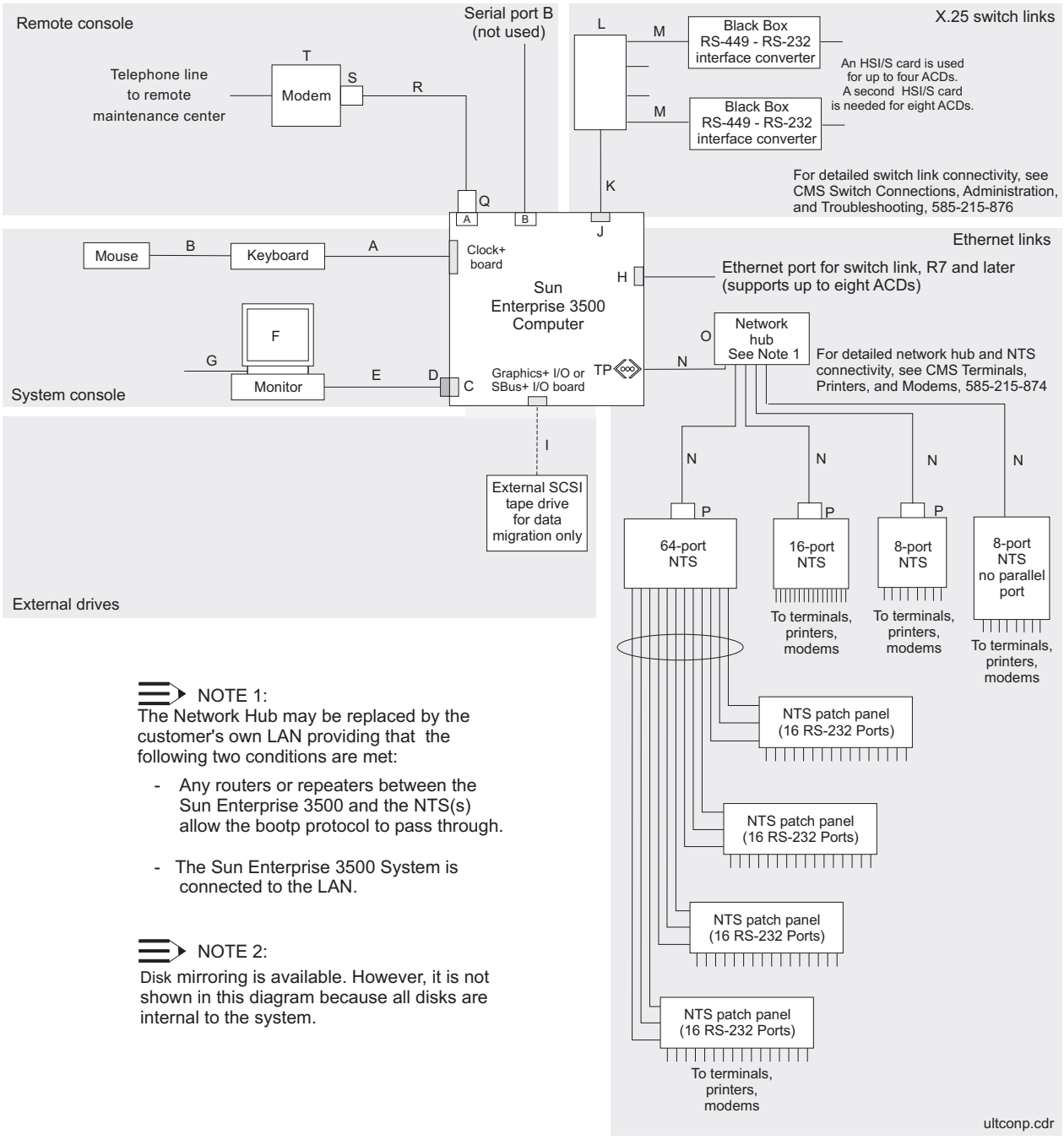
terminator.cdr

68-pin SCSI terminator

3. Tighten the screws on the SCSI terminator.

Peripheral connectivity and parts list

The following diagram shows in general how equipment is connected to the Enterprise 3500 computer.



NOTE 1:
The Network Hub may be replaced by the customer's own LAN providing that the following two conditions are met:

- Any routers or repeaters between the Sun Enterprise 3500 and the NTS(s) allow the bootp protocol to pass through.
- The Sun Enterprise 3500 System is connected to the LAN.

NOTE 2:
Disk mirroring is available. However, it is not shown in this diagram because all disks are internal to the system.

The following table lists the parts that are required to connect most of the external devices to the Enterprise 3500 computer. For information about connecting terminals, printers, and modems to the Enterprise 3500 computer, see *Avaya CMS Terminals, Printers, and Modems*, 585-215-874. For information about switch connections for CMS, see *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876.

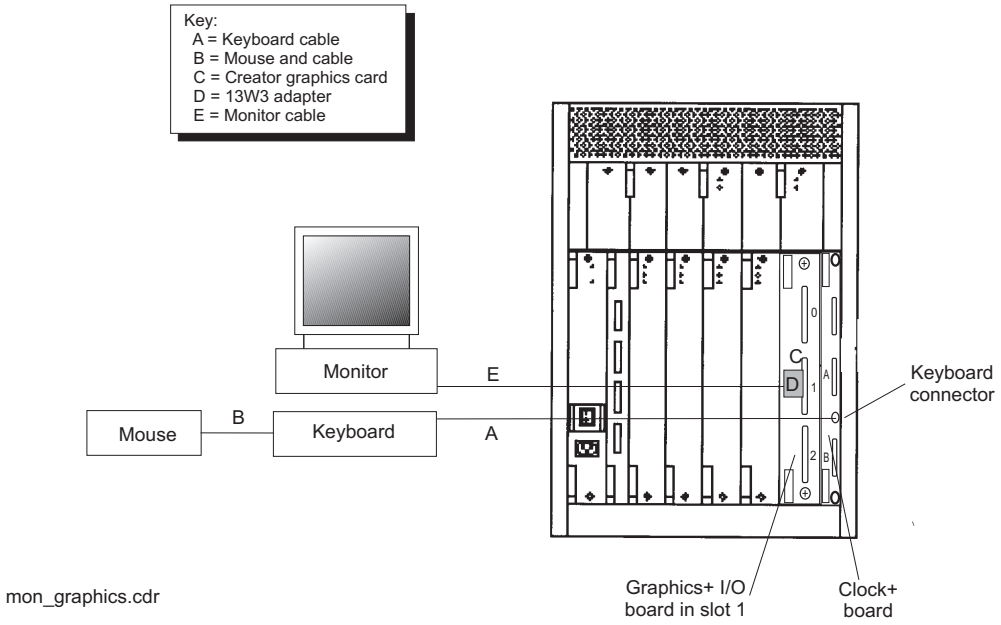
Connectivity diagram call out	Comcode, or part of comcode	Description
A[1]	N/A[2]	Keyboard with cable
B[1]		Mouse with cable
C[1]	N/A[2]	Creator video card (Graphics+ I/O card slot 1), or Turbo GX+ video card (SBus+ I/O card slot 0)
D[1]	N/A[2]	13W3 9-pin to 25-pin adapter
E[1]	N/A[2]	Monitor cable
F[1]	N/A[2]	Monitor
G[1]	N/A[2]	Monitor AC power cord
H[1]	Varies	FSBE SBus SCSI/Ethernet card, or SunFastEthernet 10/100 Mbps ethernet card, or SunSwift 10/100 Mbps ethernet card
I[1]	407579986 407934470	SCSI cable, 50-pin to 68-pin, or SCSI cable, 68-pin to 68-pin
J[1]	408128239	HSI/S card
K[1]		HSI/S cable (10 feet, 3 meters)
L[1]		HSI/S patch panel
M	407086818	RS-449 cable (10 feet, 3 meters)
N	407086826	Category 5 UTP cable (10 feet, 3 meters)
O	407086735	CentreCOM LAN hub
P	407086859	CentreCOM transceiver
Q	846362754	DB25-to-RJ45 ACU modem adapter
R	846983039	10-wire modular cord (10 feet, 3 meters)
S	846362770	RJ45-to-DB25 remote console adapter
T	407633999 Varies	Sportster Model 839 33.6 remote console modem Comsphere 3910 remote console modem

1. Sun Microsystems provides maintenance sparing for these parts.
2. The comcode for this bundle changes regularly and may not be ordered for maintenance spares, so it is not listed in the table. This bundle includes the processor, peripherals, and other equipment.

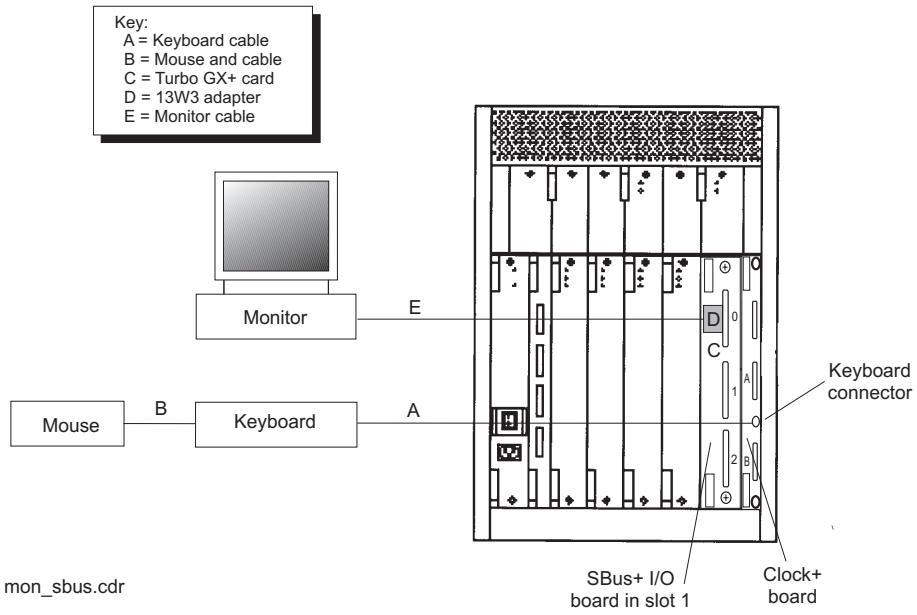
Connecting the monitor and keyboard

The keyboard connects to the Clock+ board. The monitor connects to either the first SBus+ I/O board or the Graphics+ I/O board.

The following figure shows how to connect the monitor and keyboard to the Enterprise 3500 computer using the Graphics+ I/O board in slot 1.



The following figure shows how to connect the monitor and keyboard to the Enterprise 3500 computer using the SBus+ I/O board in slot 1.



To connect the monitor and keyboard:

1. Make sure that the computer power switch is set to off.
2. Connect the following components:
   - Keyboard (connects to the Clock+ board)
   - Mouse (connects to the keyboard)
   - Monitor (connects to card slot 1 of the Graphics+ I/O board in slot 1, or to card slot 0 of the SBus+ I/O board in slot 1)
   - Power cord (connects to the UPS or wall outlet)

This basic configuration represents the system console terminal.

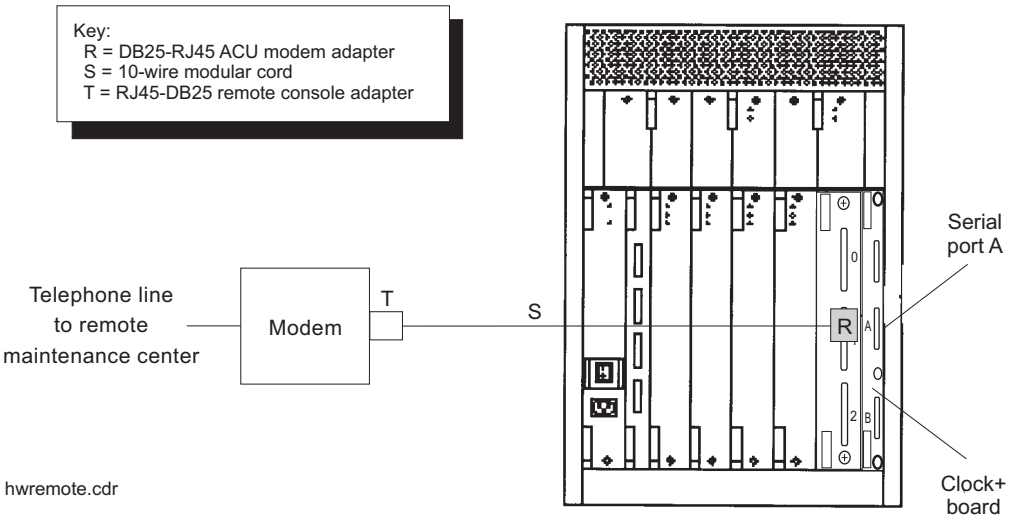
CAUTION:

Once you have connected the keyboard and power-up the system, DO NOT disconnect the keyboard while the system is in operation. If the keyboard becomes unplugged, see Keyboard becomes unplugged on page 162 for recovery procedures.

Connecting the remote console modem

This section describes how to connect the remote console modem to the computer. This modem allows personnel at a remote support center to dial in and perform maintenance on the computer. The modem is a U.S. Robotics Sportster 33.6 Faxmodem, a Paradyne Comsphere 3910 modem, or a modem provided locally.

The following figure shows remote console modem connectivity.



To connect the remote console modem:

1. Connect the DB25-to-RJ45 ACU modem adapter (R) to serial port A on the Clock+ board on the back of the computer.
2. Connect the 10-wire modular cord (S) to the modular end of the ACU modem adapter (R).
3. Connect the other end of the 10-wire modular cord (S) to the modular end of the RJ45-to-DB25 remote console adapter (T).
4. Connect the remote console adapter (T) to the RS-232C port on the modem. The RS-232C port on the Comsphere 3910 is labeled “DTE1.”
5. Connect the telephone line to the jack labeled “LINE” on the Sportster modem, or labeled “DIAL” on the Comsphere 3910 modem.
6. Connect the power cable to the modem and plug it into a socket.

Do not turn on the power yet. Instructions for powering on the modem are given in Setting the remote console modem options on page 51.

Connecting the switch link

There are two ways to connect the CMS computer to a switch:

- using TCP/IP over a local area network (LAN), or
- using X.25 protocol over a hard-wired or switched link

One CMS computer can collect data from up to eight different switches. To the CMS computer, each switch represents one ACD. Depending on the release of the switch and the release of the CMS software, you can have all switches connected using TCP/IP, all switches connected using X.25 protocol, or some combination of the two protocols.

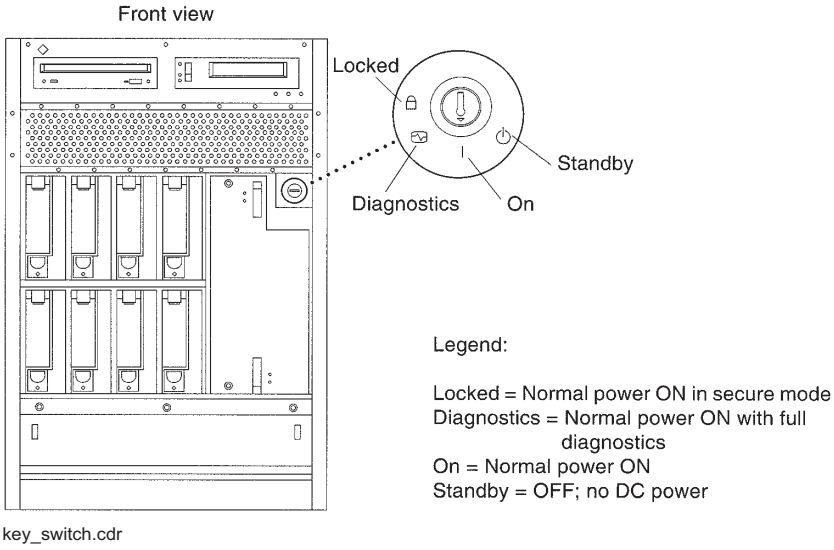
For detailed information about how to connect and administer the switch link, see *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876.

Powering up the system and verifying POST

Once you assemble the system, including the external devices that are shipped with the system, power up the system and verify the results of the Power-On Self Test (POST).

To power up the system and verify POST:

1. Verify that the key switch is in the standby position.



key_switch.cdr

2. Plug the power cord of the UPS into an AC outlet.
3. Turn on the power to the UPS.
4. Turn on the system monitor.
5. Turn on the AC power switch at the back of the cabinet.
6. Turn the key switch to the On position.

   Note:

   The POST diagnostics occurs each time that you turn on the system. The POST tests the basic system components. This may take several minutes.

7. While the system is booting up, press **Stop** plus **A** simultaneously to put the system in the monitor mode.

   The `ok` prompt is displayed.

8. Enter the following commands:

   setenv auto-boot? false

   reset-all

   The system resets to the ok prompt.

9. Enter:

   probe-fcal-all

   This verifies that the system sees all of the fiber channel disk drives. A message that is similar to the following is displayed:

```
/sbus@2,0/SUNW,socal@d,10000/sf@0,0
WWN 20050800209a80fe  Loopid 1
WWN 21000020370e7255  Loopid ef
  Disk     SEAGATE ST19171FCSUN9.06117E9822U939
```

10. Verify that all of the fiber channel disk drives are recognized. If the disk drives are still not recognized, see Troubleshooting on page 127 for more information.

11. Enter:

    reset-all

    The system resets to the ok prompt.

12. Enter:

    probe-scsi-all

    This verifies that the system sees all SCSI devices. A message that is similar to the following is displayed:

```
/sbus@3,0/SUNW,fas@3,8800000
Target 5
  Unit 0   Removeable Tape    EXABYTE EXB-89008E030203V37f

                                          0060055614
Target 6
  Unit 0   Removeable Read Only device            TOSHIBA
                                  XM6201TASUN32XCD110312/12/97
```

13. Verify that all of the SCSI devices are recognized. If the devices are still not recognized, see Troubleshooting on page 127 for more information.

14. When you have verified that the system recognizes all of its devices, enter the following commands:

    ```
    setenv auto-boot? true
    ```

    ```
    boot -r
    ```

    CAUTION:

    If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

    The system reboots.

Identifying installed I/O cards

The hardware inventory form that you received with the system contains a list of the I/O cards that are installed in the system. Use this form to determine where the I/O cards are installed. If you do not have the hardware inventory form, use the procedures below to determine what I/O cards are installed in your system.

At the command prompt, enter:

/usr/platform/`uname -m`/sbin/prtdiag -v | pg

In the section called `IO Cards`, there is a listing of the cards. The following are examples of some of the entries you may see. The display you see depends on your specific configuration.

```
    .
    .
========================= IO Cards =========================

     Bus   Freq
Brd  Type  MHz   Slot  Name                                Model
---  ----  ----  ----  ----------------------------------  ----------------------
 1   SBus   25     0   cgsix                               SUNW,501-2325
 1   SBus   25     1   dma/esp (scsi)                      SUNW,500-2015
 1   SBus   25     1   lebuffer/le (network)               SUNW,500-2015
 1   SBus   25     2   HSI                                 SUNW,501-1725-01
 1   SBus   25     3   SUNW,hme
 1   SBus   25     3   SUNW,fas/sd (block)
 1   SBus   25    13   SUNW,socal/sf (scsi-3)              501-3060
    .
    .
```

In this example:

- `cgsix` shows the Turbo GX video card.
- `dma/esp (scsi)` and `lebuffer/le (network)` show an FSBE card, which has a SCSI port and an ethernet port.
- `HSI` shows an HSI card.
- `SUNW,hme` shows the built-in ethernet port.

The system provides a specific name for each I/O card used in the Enterprise 3500 computer. The names for each of the cards are as follows:

I/O card name	Description
ffb	Creator video card (used only with Graphics+ I/O boards)
cgsix	Turbo GX video card (used only with SBus+ I/O boards)
HSI	HSI/S card
lebuffer, le, ledma, esp	Fast SCSI-Bus Ethernet (FSBE) card or SunFastEthernet card
tr	Token Ring interface card

The display you see depends on the equipment and configuration of your system. Use this information to help you connect external equipment to the computer.

Setting the remote console modem options

The computer uses the U.S. Robotics Sportster 33.6 Faxmodem and the Paradyne Comsphere 3910 modem for remote console access. The options for any other modems must be set based on local instructions.

For instructions for connecting the modem, see Connecting the remote console modem on page 44.

This section includes the following topics:

Sportster 33.6 faxmodem

To set the options on the Sportster 33.6 faxmodem:

1. Set DIP switches 1, 3, 7, and 8 on the back panel of the Sportster modem to the down (ON) position, and switches 2, 4, 5, and 6 to the up (OFF) position.
2. Turn on the remote console modem.
3. At the system console, log in as root.
4. Enter:

   `cu -s 9600 -b 8 -l cua/a`

   The following message is displayed:

   ```
   Connected
   ```

5. Enter the following commands:

   `at&f1` (loads the factory default configuration into active memory)

   `at&w0` (writes the current configuration to NVRAM template Y0)

   Note:

   Use numerical ones and zeros when entering the options.

6. After you enter the options, disconnect from the modem by entering a tilde and a period (~.).
7. Set DIP switches 4 and 8 on the back panel of the Sportster modem to the down (ON) position. Set all other DIP switches to the up (OFF) position.
8. Reset the modem by turning the power off and back on.

9. If the TR LED is not lit, enter:

   ps -ef | grep sac

   A message similar to the following should be displayed:

```
root   377     1  0 14:39:30 ?        0:00 /usr/lib/saf/sac -t 300
root  9723  9666  0 09:16:26 pts/9    0:00 grep sac
```

Additional references - For additional information, see the *U.S. Robotics Sportster Modems Users Guide*.

Paradyne Comsphere 3910 modem

The Paradyne Comsphere 3910 modem is used for many locations outside of the United States. These modems are *not* optioned at the factory.

Recommended options

The recommended options for the Comsphere 3910 modem include selecting the factory-preset defaults for “UNIX_Dial” with the following two changes:

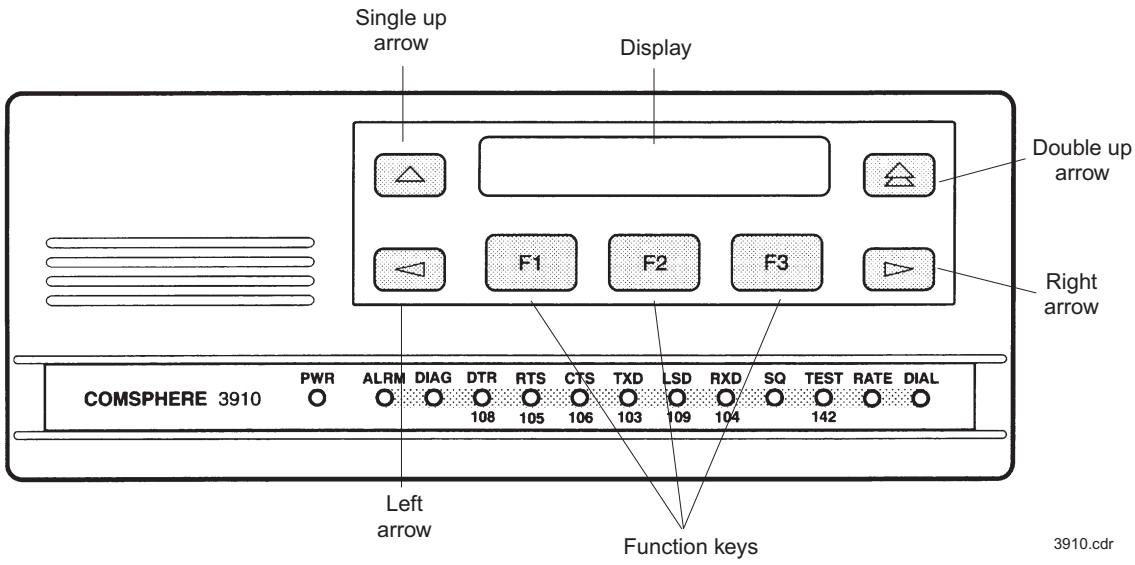
- Asynchronous DTE Rate is changed to 9600
- Dial Line Rate is changed to 9600 (V32b)

Option buttons

The seven buttons that are used to set the modem options include:

- Single up arrow – Move up one level in the menu tree.
- Double up arrow – Move to the top-level menu.
- Left arrow – Move to the previous choice for the current level in the menu tree.
- Right arrow – Move to subsequent choice for the current level in the menu tree.
- Function 1 (**F1**) – Select the choice, if any, that is currently displayed above **F1**.
- Function 2 (**F2**) – Select the choice, if any, that is currently displayed above **F2**.

- Function 3 (**F3**) – Select the choice, if any, that is currently displayed above **F3**.



Setting the options

To set the options on the Comsphere 3910, use the following procedures:

Configuring Factory/Async_Dial

1. Press **F2** to select “Configure.”

   “Ld EditArea frm” is displayed.

2. Press the **Right Arrow** four times.

   “Factory” is displayed.

3. Press **F1** to select “Factory.”

   “Ld Fact Preset:” is displayed.

4. Press **Right Arrow** four times.

5. Press **F1** to select “UNIX_Dial.”

6. Press **F3** to select “Save.”

   “Sav EditArea to” is displayed.

7. Press **F1** to save to “Active(Saved).”

   Since you are changing the active area to a new set of options (that is, “Factory/Async_Dial”), the modem automatically performs another Power-On-Self-Test (POST). Since the new options match the way the modem is connected, the ALRM LED does not turn red. “Idle: 19.2” and “Status Configure” are displayed. To return to the top-level menu, press the **Double Up Arrow**.

Setting the data rate

1. Press **F2** to select “Configure.”
   “Ld EditArea frm” is displayed.
2. Press the **Right Arrow** once.
   “Active(Saved)” is displayed.
3. Press **F1**.
   “Choose Function” is displayed.
4. Press **F1** to select “Edit.”
   “Edit StrapGroup” is displayed.
5. Press **F1** to select “DTE_Interface.”
   “Async/Sync Mode” is displayed.
6. Press **F1** to select “Nxt.”
   “Async DTE Rate” is displayed.
7. Press the **Right Arrow** five times to display “9600.”
8. Press **F2** to select “9600.”

Setting the handshake options

1. Press **F1** for “Nxt.”
   “Asyn #Data Bits (8)” is displayed.
2. Press **F1** for “Nxt.”
   “Asyn Parity Bit (None)” is displayed.
3. Press **F1** for “Nxt.”
   “Asyn #Stop Bits (1)” is displayed.
4. Press **F1** for “Nxt.”
   “DTR Action (Ignore)” is displayed.
5. Press **F1** for “Nxt.”
   “DSR Control (Forced_On)” is displayed.
6. Press **F1** for “Nxt.”
   “RTS Action (Ignore)” is displayed.
7. Press **F1** for “Nxt.”
   “CTS Control (WinkWhenDisc)” is displayed.
8. Press **F1** for “Nxt.”
   “RTS/CTS Delay (0 msec)” is displayed.

9. Press **F1** for “Nxt.”

   “LSD Control (WinkWhenDisc)” is displayed.

10. Press **F1** for “Nxt.”

    “CT111_Rate Cntl (Disable)” is displayed.

11. Press **F1** for “Nxt.”

    “DTE_Rate=VF (Disable)” is displayed.

12. Press **F1** for “Nxt.”

    “Extend Main Ch. (Disable)” is displayed.

13. Press **F1** for “End.”

    “Edit StrapGroup” is displayed.

Setting the Dial_Line strap group

1. Press the **Right Arrow** three times to get to the “Dial_Line” strap group. Nothing needs to be changed for CMS in the “DTE_Dialer” or “Line_Dialer” strap groups, so you can skip them.
2. Press **F1** to edit the “Dial_Line” strap group.

   “Dial Line Rate” is displayed.

3. Press the **Right Arrow** four times for “9600(V32b).”
4. Press **F2** to select “9600(V32b).”
5. Press **F1** for “Nxt.”

   “V32bis Automode (Enable)” is displayed.

6. Press **F1** for “Nxt.”

   “V32bis Autorate (Enable)” is displayed.

7. Press **F1** for “Nxt.”

   “Dial Tx Level (Permissv (-9))” is displayed.

8. Press **F1** for “Nxt.”

   “V22b Guard Tone (Disable)” is displayed.

9. Press **F1** for “Nxt.”

   “V32bis Train (Long)” is displayed.

10. Press **F1** for “End.”

    “Edit StrapGroup” is displayed. The other strap groups (“V42/MNP/Buffer,” “Test,” “Misc,” and “Security”) are not changed for CMS.

Saving your settings

1. Press the **Single Up Arrow** to display “Choose Function” and “Edit Save.”
2. Press **F3** to select “Save.”

   “Save EditArea to” is displayed.
3. Press **F1** to select “Active(Saved).”

   “Command Complete” is displayed.
4. Press the **Single Up Arrow** again to display “Save EditArea to.”
5. Press the **Right Arrow** once to select “Customer 1.”
6. Press **F1** to save to “Customer 1.”

   “Command Complete” is displayed.
7. Press the **Double Up Arrow**.

   “Idle: 9600” and “Status Configure” are displayed. If the modem is powered off, it should return to this state when it is powered on.
8. To check the status of the Comsphere 3910 modem, use the “Status” choice in the top-level menu, or use the Right and Left Arrow buttons to view other top-level menu choices.

Turning the system over for provisioning

After completing the physical installation of the system, the installation continues with software provisioning. This is often done with the support of the Avaya CMS Provisioning group. Provisioning the system consists of the following:

- Setting up CMS
- Authorizing features
- Adding logins and passwords
- Testing the software

To continue with provisioning, see the chapter "Turning the system over to the customer" in the CMS software installation, maintenance, and troubleshooting document for your CMS release.

Maintenance

This section describes the following maintenance procedures:

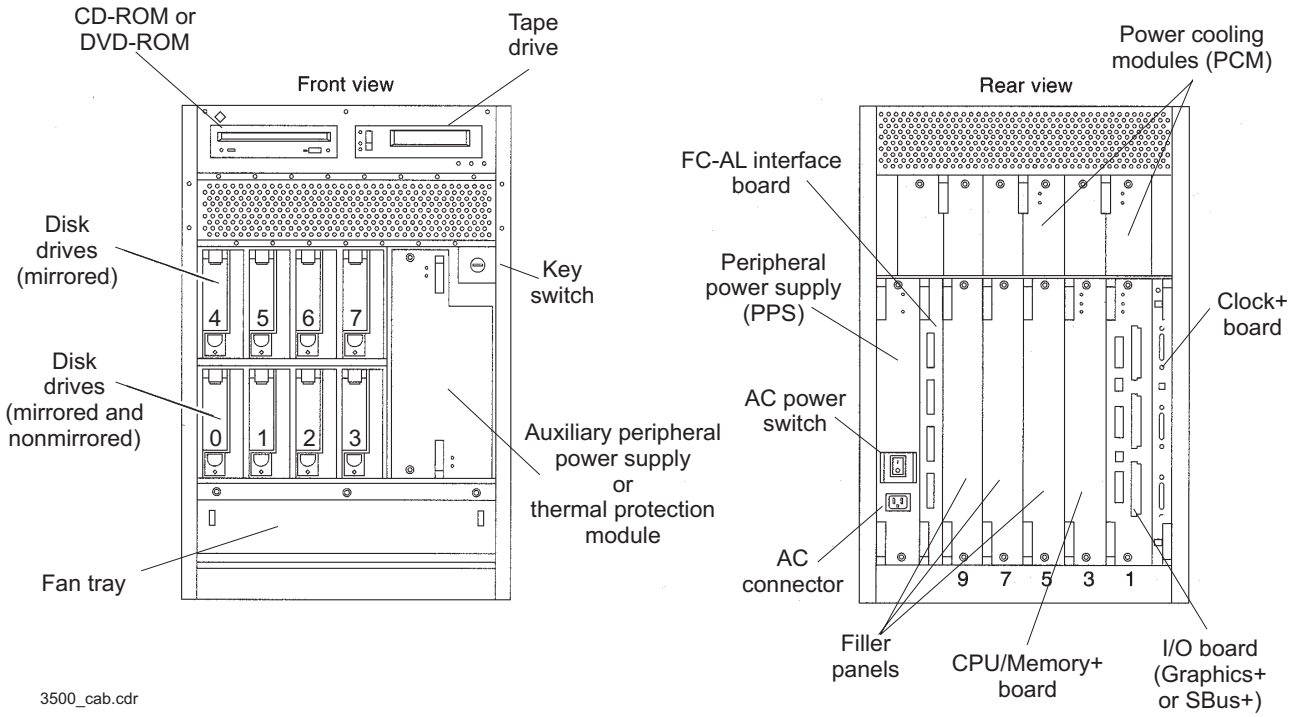
ESD precautions

Before you work on components inside the Enterprise 3500 computer:

1. Make sure that the computer is plugged in to AC power.
2. Make sure that the power is off.
3. Attach the ESD wrist strap to the chassis frame and to your wrist.

Computer layout

The following figure identifies the basic hardware components of the Enterprise 3500 system.

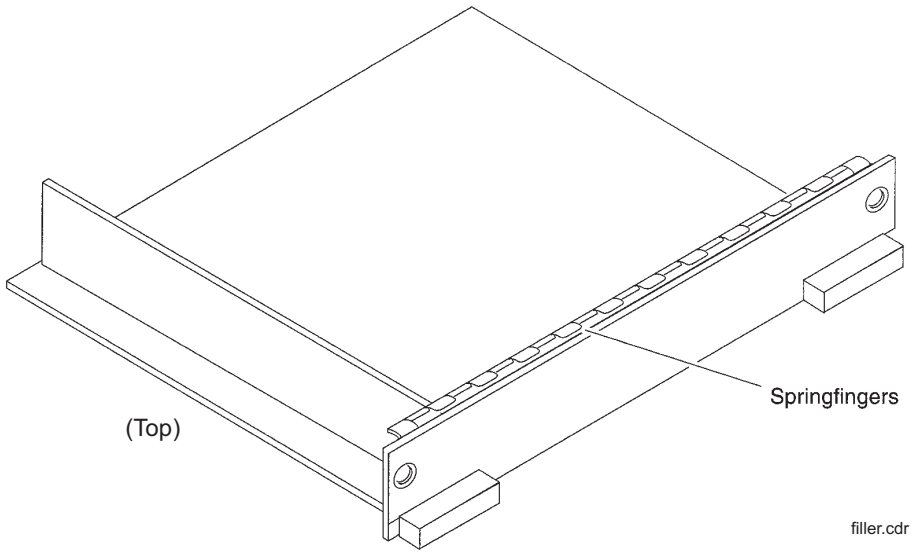


Maintaining boards

Procedures in this section include the following:

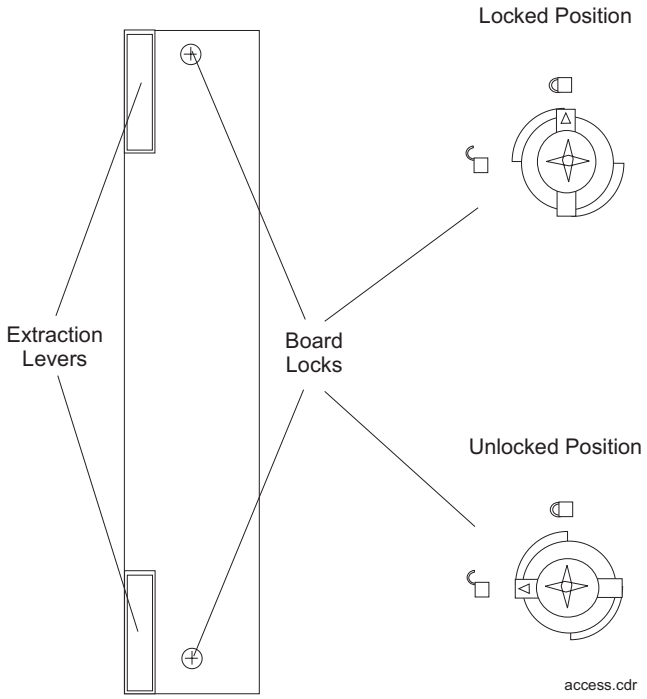
Identifying free board slots

Free board slots are covered by filler panels, which have rectangular plastic knobs instead of extraction levers. The following figure shows a filler panel.



Removing and installing boards

This section describes general procedures for removing and installing boards. Boards are accessed from the rear of the system. Each board is locked into place by a combination of extraction levers and board locks that help to seat the board in the centerplane receptacles. These centerplane receptacles and board locks align and attach the board to the system. The following figure shows the board-locking mechanisms.



Precautions for handling boards

To minimize the amount of board flexing, observe the following precautions:

WARNING:
You must wear an ESD wrist strap when installing or removing hardware components to prevent electrical discharge that can damage the system.

WARNING:
The CPU/Memory+ and I/O boards, and their modules and cards, have surface-mounted components that can break if you flex the boards.

- Hold the board only by the edges near the middle of the board, where the board stiffener is located. Do not hold the board only at the ends.
- When you remove the board from an antistatic bag, keep the board vertical until you lay it on an ESD mat.
- Do not place the board on a hard surface. Use a cushioned antistatic mat. The board connectors and components have very thin pins that bend easily.
- Transport the board in an antistatic bag.
- Be careful of the small parts that are located on the component side of the board.

Removing a board

To remove a board:

CAUTION:
A board should be removed from a powered-on system only after the Automatic System Reconfiguration (ASR) software has disabled that board. Otherwise, the operating system must be stopped and the system powered off prior to board removal.

1. Check to see that the board is in a “low-power mode.” A board is in low-power mode when:
   - All three LEDs on the board rear panel are unlit (power is turned off), or
   - The two outer green LEDs are unlit and the yellow LED in the middle is lit.
2. If the board is not in a low-power mode, stop the system and turn off the power.
3. Using a Phillips screwdriver, turn the two board locks to the unlocked position.
4. Pull outward on the ends of both extraction levers simultaneously.
5. Slide the board out of the computer.
6. Place the board on a padded ESD mat or store the board in an antistatic bag.

Installing a board

To install a board:

1. Open the extraction levers by pulling outward on the ends of both levers.
2. Insert the board part of the way into the slot, with the component side of the board on your right.
3. Slide the board into the computer, and push in on the extraction levers until they lock.

   WARNING:
   Do not push on the panel. if you do, you will damage the connector pins.

4. Using a Phillips screwdriver, rotate the board locks into the locked position.
5. Turn on power to the system, or reboot.

Note:

Adding a board may require that you also add a PCM. There must be one PCM for every two boards that are installed in the system. The PCMs must be installed adjacent to populated board slots to ensure that the fan in the PCM can cool the associated boards.

Resetting the EEPROM settings

If you replace a system board, you must check and reset the EEPROM settings. For a listing of the correct settings, see “Displaying and setting the EEPROM parameters” in the CMS software installation, maintenance, and troubleshooting document for your CMS version.

Synchronizing the clocks

Each I/O board has its own clock that must be synchronized with the system clock board for proper system operation. After adding, removing, or replacing an I/O board or the system clock board, the clock on the I/O board might become unsynchronized with the clock on the system clock board.

If the clocks need resynchronizing, the following message is displayed when you reboot:

```
Clock board TOD does not match TOD on any IO board
```

To synchronize the clocks:

1. If CMS is running, turn it off.
2. Enter:

   /usr/sbin/shutdown -y -g0 -i0

   The system shuts down and displays the `ok` prompt.
3. Enter:

   copy-clock-tod-to-io-boards

   This synchronizes the clocks.
4. Enter:

   boot -r

   This reboots the system and resynchronizes the clocks.
5. Turn CMS on.

Maintaining the system clock board

These procedures should be performed by or with the assistance of a Sun Microsystems Inc. technician.

Replacing the system clock board

To replace the system clock board:

1. Shut down the system
2. Remove the faulty clock board.
3. Remove the nonvolatile random access memory (NVRAM) chip from the old clock board and insert it into the new clock board.
4. Install the new clock board in the system.
5. Power up the system.

If this does not solve the problem, you must replace the NVRAM chip. When the NVRAM chip is replaced, all EEPROM settings are reset to the Sun factory default values. Some of the settings must be changed to the EEPROM parameter values required by CMS. For a listing of the correct CMS settings, see “Displaying and setting the EEPROM parameters” in the CMS software installation, maintenance, and troubleshooting document for your CMS version.

If you replace the NVRAM chip on an older system that is using X.25 software, you will need to call Sun Microsystems Inc. to obtain a new license key. On newer systems, you may not have to reinstall the license.

Setting the boot device on a new NVRAM chip

If the NVRAM chip has been replaced, use the following procedure to insure that the boot device is set correctly.

To display and set the boot device:

1. At the UNIX prompt, enter:

   eeprom | grep boot-device

   On a non-mirrored system, the system should display a message similar to the following:

   ```
     boot-device=disk
   #
   ```

   On a mirrored system, the system should display a message similar to the following:

   ```
     boot-device=disk bootdevice2
   #
   ```

2. If the first device displayed on a nonmirrored system is not `disk`, enter:

   eeprom boot-device=disk

   If the first and second devices displayed on a mirrored system are not `disk` and `bootdevice2`, enter:

   eeprom boot-device=disk bootdevice2

3. Enter:

   /usr/sbin/shutdown -y -g0 -i6

   This reboots the system so that is recognizes the new configuration.

If the system still does not boot, but reports that it is trying to boot up from the network:

1. Enter:

   printenv boot-device

2. Check the first parameter. If it is not `disk`, enter:

   setenv boot-device disk

   If you have a mirrored system, enter:

   setenv boot-device disk bootdevice2

3. Enter:

   /usr/sbin/shutdown -y -g0 -i6

   This reboots the system so that is recognizes the new configuration.

If the system still does not boot, see the procedures given in Resetting a device alias on page 167.

Synchronizing the clocks

Each I/O board has its own clock that must be synchronized with the system clock board for proper system operation. After adding, removing, or replacing an I/O board or the system clock board, the clock on the I/O board might become unsynchronized with the clock on the system clock board.

If the clocks need resynchronizing, the following message is displayed when you reboot:

```
Clock board TOD does not match TOD on any IO board
```

To synchronize the clocks:

1. If CMS is running, turn it off.
2. Enter:

   /usr/sbin/shutdown -y -g0 -i0

   The system shuts down and displays the `ok` prompt.
3. Enter:

   copy-clock-tod-to-io-boards

   This synchronizes the clocks.
4. Enter:

   boot -r

   This reboots the system and resynchronizes the clocks.
5. Turn CMS on.

Maintaining I/O cards

This section includes the following topics:

Required references

You need access to the following documents to do the procedures in this section:

- *Sun Enterprise 3500 System Reference Manual*
- *CMS R12 Software Installation, Maintenance, and Troubleshooting,* 585-215-117
- *CMS R3V11 Software Installation, Maintenance, and Troubleshooting,* 585-215-115
- *CMS R3V9 Software Installation, Maintenance, and Troubleshooting,* 585-215-956
- *CMS R3V8 Software Installation, Maintenance, and Troubleshooting,* 585-210-941
- *CMS Software Installation and Setup* (R3V5 and R3V6), 585-215-866
- *CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876

I/O card compatibility with CMS loads

New I/O cards are not compatible with all releases of CMS. This section describes the compatibility of newer I/O cards.

SunFastEthernet I/O card

The SunFastEthernet card is compatible with the following releases of CMS:

- r3v6au.k and later (or any CMS R3V6 load with Solaris patch 104212-15)
- r3v8al.k with Solaris patch 108263-06, or r3v8am.X and later
- all R3V9 loads

Solaris patches can be downloaded from:

http://drdtl.dr.avaya.com/docs/patches/

Installing or removing I/O cards

The I/O cards you may have to install or remove include the following:

- Creator video card (installed in card slot 1 of the Graphics+ I/O board in board slot 1)
- TurboGX+ video card (installed in card slot 0 of the SBus+ I/O board in board slot 1)
- SunFastEthernet card (optional) – This card has an ethernet port and a Media Independent Interface (MII) port. CMS uses only the ethernet port.
- FSBE card (optional) – This card has a SCSI port and an ethernet port.
- SunSwift card (optional) – This card has an ethernet port.
- HSI card (optional)
- Token Ring card (optional, installed by the factory and provisioned by Professional Services)

As noted above, the video cards are installed in specific card slot locations depending on the board type. Only one video card is installed per system. The other I/O cards can be installed in any other available SBus card slots.

Use the following general instructions when installing, moving, and removing I/O cards. Other sections in this section describe specific I/O card maintenance instructions. Use those instructions as appropriate.

To install or remove an I/O card:

1. For a system that is currently in operation, verify that you have a recent CMSADM file system backup before you change I/O card configurations.

2. Enter:

   `/cms/toolsbin/rmSBusdev`

   The system queries whether you want to continue with the shutdown.

3. Enter: **`y`**

   This command removes the current I/O card configuration, and shuts down the system. When finished, the `ok` prompt displays.

4. Turn off the system.

5. Turn off the system monitor.

6. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

   WARNING:

   You must wear an ESD wrist strap when installing or removing hardware components to prevent electrical discharge that can damage the system.

7. Remove the I/O board from the computer.

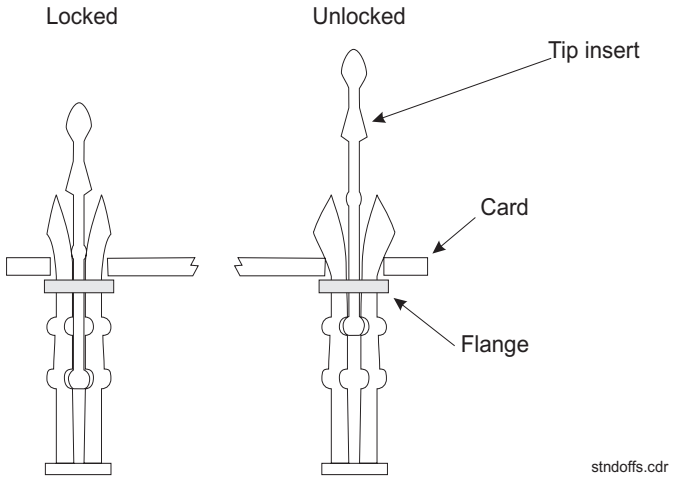
8. Remove the filler panel from the slot where you are installing the new card.

9. Unpack the I/O card and prepare it for installation.

   Note:

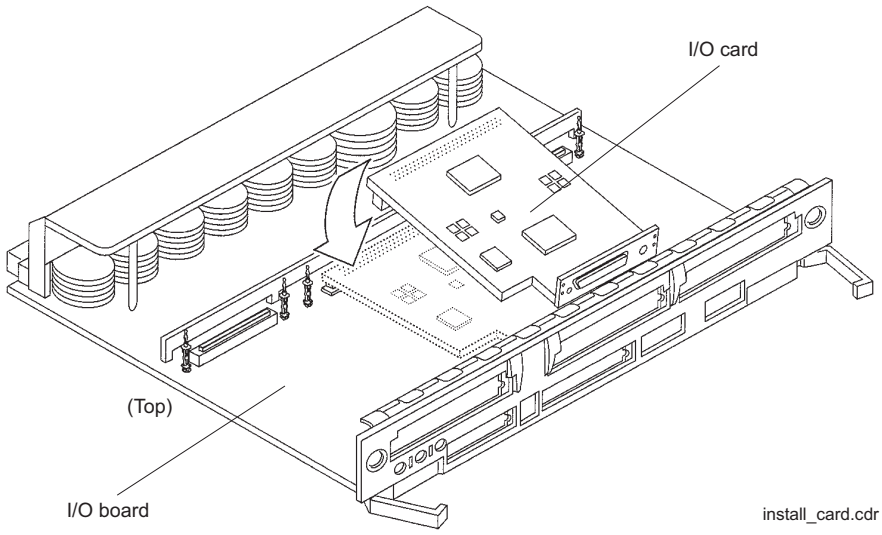
   Depending on the card and packaging, some card preparation may be required. See the *Sun Enterprise 3500 System Reference Manual* for more information.

10. If the plastic standoffs for the I/O card slot are locked (that is, if they are in the down position), gently but firmly lift up on the tip inserts until they move to the unlocked position.



11. Holding the I/O card by the edges, place the I/O card faceplate under the spring finger and against the rear face of the I/O board front panel.

    The I/O connectors of the I/O card should be visible through the slot opening in the I/O board front panel.



12. Align the mounting holes in the rear of the I/O card with the unlocked plastic standoffs.
13. Gently but firmly press down on the rear corners of the I/O card until the connector is fully seated.
14. Gently but firmly press down on the tip insert of each plastic standoff until it seats into the locked position.
15. Replace the face plate screws through the front of the I/O board to secure the I/O card to the I/O board front panel.
16. Replace the I/O board in the slot from which you removed it in Step 1.
17. Remove the ESD wrist strap.
18. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
19. Turn on the system monitor.
20. Turn on the system.
21. Press **Stop** plus **A** simultaneously after the console banner is displayed, but before the system starts booting.
22. Enter:

    ```
    boot -r
    ```

    This reboots the system so that it recognizes the new configuration.

23. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Installing HSI/S cards

An HSI/S card supports X.25 switch links. For eight ACDs, two HSI/S cards are needed. If the system uses TCP/IP signaling for all ACDs, HSI/S cards are not needed.

If this is the initial installation of one or two HSI/S cards, start with Installing the first HSI/S card. If a second HSI/S card is being added to a system that already has one HSI/S card, see Adding a second HSI/S card on page 76.

Installing the first HSI/S card

To install the first HSI/S card in the system:

1. Verify that you have a recent CMSADM file system backup before you change I/O card configurations.
2. Log in to the system as root.
3. Enter:

   cmssvc

   The CMS Services menu is displayed.
4. Enter **3** to select the **run_cms** option.
5. Enter **2** to turn off CMS
6. Before you remove CMS, you must first save the CMS tools in a temporary save directory. Enter the following two commands:

   if [! -d /save]; then mkdir /save; fi

   cp -p /cms/toolsbin/rmSBusdev /cms/toolsbin/lnSBusdev /save
7. Enter:

   pkgrm cms

   This removes the CMS software.

   The system runs the **pkgrm** command and displays the following message:

   ```
   Do you want to preserve CMS data? [y,n,?]
   ```

   Important:
   Enter: **y**

8. After you remove CMS, you must copy the CMS tools back in to their working directory. Enter the following two commands:

   ```
   if [ ! -d /cms/toolsbin ]; then mkdir /cms/toolsbin; fi
   ```

   ```
   cp -p /save/rmSBusdev /save/lnSBusdev /cms/toolsbin/
   ```

9. Enter:

   ```
   /cms/toolsbin/rmSBusdev
   ```

   The system queries whether you want to continue with the shutdown.

10. Enter: **y**

    This removes the current I/O card configuration, and shuts down the system. When finished, the ok prompt is displayed.

11. Turn off the system.
12. Turn off the system monitor.
13. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.
14. Install the HSI/S card in an available port on the first-available I/O board. See Installing or removing I/O cards on page 70 for more information.
15. Attach the HSI/S patch panel, and connect the switch links to the patch panel by following the instructions described in *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876.
16. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
17. Turn on the system monitor.
18. Turn on the system.
19. Press **Stop** plus **A** simultaneously after the console banner is displayed, but before the system starts booting.
20. Enter:

    ```
    boot -r
    ```

    This reboots the system so that it recognizes the new HSI/S card.

    Note:

    Sometimes the system fails to recognize a newly installed HSI card. If this happens, the command **show-devs** does not show the HSI card and **/var/adm/messages** fails to recognize the card upon bootup. See the troubleshooting chapter of *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876, for information about troubleshooting HSI/S cards.

21. When the system comes back up, log in as root.

Installing HSI/S software and patches

Using the procedures in the CMS software installation, maintenance, and troubleshooting document:

- Install the HSI/S software
- Install the X.25 drivers and license
- Reinstall the Solaris patches
- Reinstall the CMS software

Setting up the switch link for each ACD

To change the switch link administration for each ACD:

1. Enter:

   cmssvc

   The CMS Services menu is displayed.
2. Select the **swsetup** option.
3. Select the ACD that you want to set up.
4. Accept the existing defaults for the following:
   - Switch name
   - Switch model (release)
   - Vectoring
   - Expert agent
   - Central office disconnect supervision
   - Local port
   - Remote port
5. Select “X.25” and a specific link number when prompted for the link information.
6. Repeat Step 2 through Step 5 for each ACD that will use the HSI card.
7. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.
8. Turn on CMS using the **run_cms** option of the **cmssvc** command.

Adding a second HSI/S card

Use the following procedures if you are adding a second HSI/S card to a system that is currently in operation. Before you do this procedure, verify that CMS is installed.

To add a second HSI/S card:

1. Verify that you have a recent CMSADM file system backup before you change I/O card configurations.
2. Log in to the system as root.
3. Edit the **/etc/path_to_inst** file and search for HSI. Remove all such lines.
4. Enter the following commands:

   ```
   rm /dev/hih*
   ```

   ```
   rm /devices/sbus*/HSI*
   ```

5. Enter:

   ```
   /usr/sbin/shutdown -y -i0 -g0
   ```

   This shuts down the system.
6. Turn off the system.
7. Turn off the system monitor.
8. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.
9. Install the second HSI/S card in an available port on the first-available I/O board. See Installing or removing I/O cards on page 70 for more information.
10. Attach the HSI/S patch panel, and connect the switch links to the patch panel by following the instructions in *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876.
11. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
12. Turn on the system monitor.
13. Turn on the system.
14. Press **Stop** plus **A** simultaneously after the console banner is displayed, but before the system starts booting.

15. Enter:

    boot -r

    This reboots the system so that it recognizes the new HSI/S card.

    Note:

    Sometimes the system fails to recognize a newly installed HSI card. If this happens, the command **show-devs** does not show the HSI card and **/var/adm/messages** fails to recognize the card upon bootup. See the troubleshooting chapter of *Avaya CMS Switch Connections, Administration, and Troubleshooting*, 585-215-876, for information about troubleshooting HSI/S cards.

16. When the system comes back up, log in as root.
17. Enter:

    /cms/toolsbin/lnSBusdev

18. Administer the switch links as shown in Setting up the switch link for each ACD on page 75.

Maintaining disk drives

This section includes the following topics:

Disk drive compatibility with CMS loads

When a new or replacement disk drive is installed in an older system, the CMS load may not be compatible with the disk drive if the CMS configuration files have not been updated. These configuration files (`/olds/disk.conf` and `/olds/olds-funcs`) must be edited or replaced with the correct information. Contact the Avaya technical support organization for assistance.

Prerequisites

Do a CMSADM backup, if possible, before you add or replace a disk drive. See your CMS software installation, maintenance, and troubleshooting document for this procedure.

Before you attempt to replace defective data disks, try to print the current setup for all ACDs. This information must be readministered after you install replacement disks.

Required references

You need access to the following documents to do the procedures in this section:

- *CMS R12 Software Installation, Maintenance, and Troubleshooting,* 585-215-117
- *CMS R3V11 Software Installation, Maintenance, and Troubleshooting,* 585-215-115
- *CMS R3V9 Software Installation, Maintenance, and Troubleshooting,* 585-215-956
- *CMS R3V8 Software Installation, Maintenance, and Troubleshooting,* 585-210-941
- *CMS Software Installation and Setup* (R3V5 and R3V6), 585-215-866
- *CMS R3V8 Disk-Mirrored Systems*, 585-210-940
- *CMS Disk-Mirrored Systems* (for R3V6), 585-215-841
- *Sun Enterprise 3500 System Reference Manual*

Adding or replacing disk drives

To add a hard disk drive to a system that is currently in operation, or to replace a defective disk drive, follow the procedures in this section.

Powering down the system

To power down the system

1. Enter:

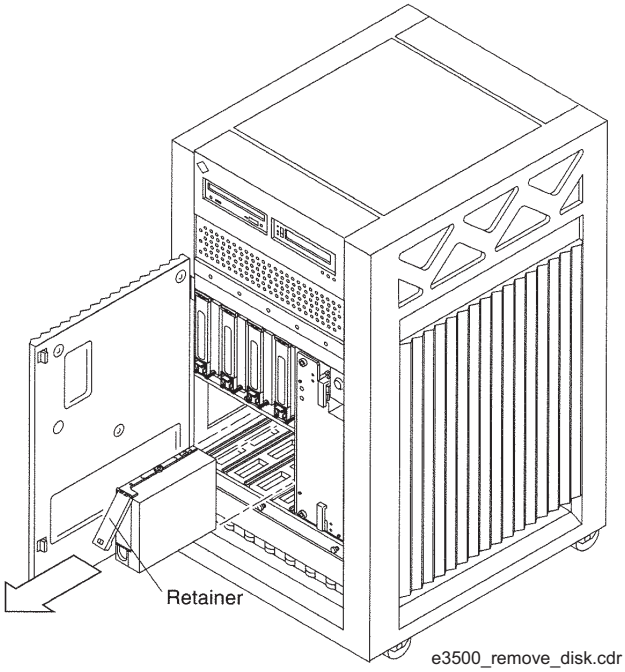
   `/usr/sbin/shutdown -y -i0 -g0`

   The system shuts down and displays the `ok` prompt.
2. Turn off the system.
3. Turn off the system monitor.
4. If any external SCSI devices are installed, turn off the SCSI devices starting with the device that is closest to the system and working toward the farthest device.
5. Wait 30-60 seconds after removing power to allow the disk drives to spin down.

Installing the new drives

You install the internal hard disk drives in the front of the system. To expose the disk drive bays, open the front access door.

WARNING:
You must wear an ESD wrist strap when installing or removing disk drives to prevent electrical discharge that can harm system components.



For a CMS computer, you can install as many as four disk drives in a nonmirrored system, and eight in a mirrored system. For an Explorer II/NICE Analyzer computer, you can install as many as eight disk drives. The drive bays are numbered 0 through 3 on the lower level and 4 through 7 on the upper level.

In a CMS mirrored system, disk drives must be installed in pairs, and each pair must be the same size. For example, if you have disks in positions 0 and 1, the mirrored disks must be located in positions 4 and 5.

WARNING:
Do not use excessive force to seat the connector or to close the retainer latch. Using excessive force can damage the disk drive and computer.

Each disk drive has a retainer latch/drive handle on the front of the drive. To install a drive, unlatch and extend the retainer and slide the drive carefully into the appropriate drive bay. When the drive stops, gently apply pressure to the face of the drive until the connectors engage. Lower the retainer latch and snap it in place, making certain that the drive is secure and does not extend beyond the front of the chassis.

Powering up the system

To power up the system:

1. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
2. Turn on the system monitor.
3. Turn on the system.
4. Press **Stop** plus **A** simultaneously after the console banner is displayed, but before the system starts booting.

   The `ok` prompt is displayed.
5. Enter the following commands:

   `setenv auto-boot? false`

   `reset-all`

   The system reboots to the `ok` prompt.
6. Enter:

   `probe-fcal-all`

   This verifies that the system recognizes all of the disk devices, including the newly installed ones. A message that is similar to the following example is displayed:

```
WWN 20050800209a80fe Loopid 1
WWN 21000020370e7255 Loopid ef
 Disk SEAGATE ST19171FCSUN9.0G117E9822U939

ok
```

   The devices listed depends on the number of disks that are installed in the system.

7. Enter the following commands:

```
setenv auto-boot? true
boot -r
```

CAUTION:
If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

The system reboots.

8. Log in as root.
9. Continue with Setting up the disk drives on page 82.

Setting up the disk drives

After you replace defective disk drives, do one of the following:

Drive replaced	System	Procedure
Boot disk	Nonmirrored	Continue with the CMSADM restore procedure for a nonmirrored system in the Maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS.
Both boot disks	Mirrored	Continue with the CMSADM restore procedure for a mirrored system in the Maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS.
One boot disk	Mirrored	Partition the new boot disk drive (see Partitioning disk drives on page 84). Continue with the procedures in “Recovering a mirrored system after disk failure” in the Maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS.

Drive replaced	System	Procedure
Data disk	Mirrored	Partition and administer the drive so that it works with the existing disk drives (see Partitioning disk drives on page 84 and Administering data disk drives on page 94). Continue with the procedures in "Recovering a mirrored system after disk failure" in the Maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS.
Data disk	Nonmirrored	Partition and administer the drive so that it works with the existing disk drives (see Partitioning disk drives on page 84 and Administering data disk drives on page 94). Continue with the procedures in "Recovering a nonmirrored system after data disk failure" in the Maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS.

After you add new disk drives, do the following:

Drive added	System	Procedure
Data disk	Mirrored or nonmirrored	Partition and administer the drive so that it works with the existing disk drives (see Partitioning disk drives on page 84 and Administering data disk drives on page 94).

Partitioning disk drives

Requirements for partitioning disk drives differs for the releases of CMS.

R3V11 and R12

If you are adding new disk drives to a system where CMS is operational, partitioning is done automatically using CMS commands. Skip manual partitioning and continue with Administering data disk drives on page 94.

If you are replacing a defective data disk drive in a system and CMS is not operational, or if you are replacing a single defective boot disk in a mirrored system, you must manually partition the disk drive. Use the following information:

- Disk partition values, R3V11 and R12 boot disks on page 85 or R3V11 and R12 data disks on page 87
- Partitioning and formatting a disk on page 90

R3V9

If you are adding new disk drives to a system where CMS is operational, partitioning is done automatically using CMS commands. Skip manual partitioning and continue with Administering data disk drives on page 94.

If you are replacing a defective data disk drive in a system and CMS is not operational, or if you are replacing a defective boot disk in a mirrored system, you must manually partition the disk drive. Use the following information:

- Disk partition values, R3V9 boot disks on page 86 or R3V9 data disks on page 87
- Partitioning and formatting a disk on page 90

R3V8 and earlier

For R3V8 and earlier systems, you must partition and format the new or replacement disk drives. Use the following information:

- Disk partition values, R3V8 and earlier data disks on page 89
- Partitioning and formatting a disk on page 90

Disk partition values

During the disk partitioning procedure, you must enter the size of each partition. Since disk models change often, see the software installation, maintenance, and troubleshooting document for your current CMS release to verify the correct disk partitioning values.

R3V11 and R12 boot disks - The following table lists the boot disk drives for R3V11 and R12. These partition sizes are entered in Gigabytes (gb).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
36-GB	0	root	wm	0	4gb
	1	swap	wu	2904	1gb
	2[1]	backup	wm	Use the default values for partition 2.	
	3	un	wm	3630	3gb
	4	un	wm	5808	2gb
	5-7	un	wm	Do not enter a value for partitions 5 through 7. These values are populated automatically when the boot disks resynchronize during the restore procedure.	

1. The value that is displayed for the backup partition shows the size of the disk drive. If the disk drive you are partitioning does not closely match the size of the disk you are partitioning (for example, 26-GB for a 36-GB disk), you have a nonstandard disk. Escalate the issue to Avaya technical support.

R3V9 boot disks - The following table lists the boot disk drives that are currently used with R3V9 and later. These partition sizes are entered in gigabytes (gb) and cylinders (c).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
36-GB	0	root	wm	0	4gb
	1	swap	wu	2904	1gb
	2	backup	wm	Use the default values for partition 2.	
	3	un	wm	3630	3gb
	4	un	wm	5808	2gb
	5	un	wm	7260	2gb
	6	un	wm	8712	2gb
	7	un	wm	10164	14456c
18-GB	0	root	wm	0	4gb
	1	swap	wu	1781	1gb
	2	backup	wm	Use the default values for partition 2.	
	3	un	wm	2227	3gb
	4	un	wm	3563	2gb
	5	un	wm	4454	2gb
	6	un	wm	5345	2gb
	7	un	wm	6236	1270c

R3V11 and R12 data disks - The following table lists the data disk drives. These partition sizes are entered in Gigabytes (gb) and cylinders (c).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
36-GB	0	un	wm	0	2gb
	1	un	wm	891	2gb
	2[1]	backup	Do not enter a value for partition 2.		
	3	un	wm	1782	2gb
	4	un	wm	2673	2gb
	5	un	wm	3564	2gb
	6	un	wm	4455	2gb
	7	un	wm	5346	2160c

1. The value that is displayed for the backup partition shows the size of the disk drive. If the disk drive you are partitioning does not closely match the size of the disk you are partitioning (for example, 26-GB for a 36-GB disk), you have a nonstandard disk. Escalate the issue to Avaya technical support.

R3V9 data disks - The following table lists the data disk drives that are currently supported with R3V9 and later. These partition sizes are entered in gigabytes (gb) and cylinders (c).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
36-GB	0	un	wm	0	2gb
	1	un	wm	1452	2gb
	2[1]	backup	Do not enter a value for partition 2.		
	3	un	wm	2904	2gb
	4	un	wm	4356	2gb
	5	un	wm	5808	2gb
	6	un	wm	7260	2gb
	7	un	wm	8712	15908c

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
18-GB	0	un	wm	0	2gb
	1	un	wm	891	2gb
	2[1]	backup	Do not enter a value for partition 2.		
	3	un	wm	1782	2gb
	4	un	wm	2673	2gb
	5	un	wm	3564	2gb
	6	un	wm	4455	2gb
	7	un	wm	5346	2160c
9.1-GB	0	un	wm	0	2gb
	1	un	wm	1169	2gb
	2[1]	backup	Do not enter a value for partition 2.		
	3	un	wm	2338	2gb
	4	un	wm	3507	2gb
	5	un	wm	4676	248c
	6	un	wm	0	0c
	7	un	wm	0	0c

1. The backup value indicates the size of the data disk drives. If the disk drive you are partitioning does not closely match the size of the disk you are partitioning, you have a nonstandard disk. Escalate the issue to Avaya technical support.

R3V8 and earlier data disks - The following table lists the data disk drives that are currently supported with R3V8 and earlier. These partition sizes are entered in number of cylinders (c).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
36-GB[1]	0	un	wm	0	2c
	1	un	wm	2	24618c
	2[2]	backup	wm	0	24620c
	3-7	un	wm	0	0c
18-GB[3]	0	un	wm	0	2c
	1	un	wm	2	7504c
	2[2]	backup	wm	0	7506c
	3-7	un	wm	0	0c
9.1-GB[4]	0	un	wm	0	2c
	1	un	wm	2	4922c
	2[2]	backup	wm	0	4924c
	3-7	un	wm	0	0c

1. The 36-GB disk is compatible with loads r3v8am.X or later, or any R3V8 load with Solaris patch 107469-01. The 36-GB disk is not compatible with R3V6 and earlier. See Disk drive compatibility with CMS loads on page 78 for more information.
2. The backup value indicates the size of the data disk drives. If the disk drive you are partitioning does not closely match the size of the disk you are partitioning, you have a nonstandard disk. Escalate the issue to Avaya technical support.
3. The 18-GB disk is compatible with loads r3v6be.h or later, and r3v8ak.g (with CMS Patch 2) or later. See Disk drive compatibility with CMS loads on page 78 for more information.
4. The 9.1-GB, 10K rpm disk is compatible with loads r3v6at.e or later, and r3v8af.d (with CMS Patch 2) or later. See Disk drive compatibility with CMS loads on page 78 for more information.

Partitioning and formatting a disk

To partition and format a disk:

1. At the system prompt, enter:

   format

   A message that is similar to the following example is displayed:

```
Searching for disks...done

AVAILABLE DISK SELECTIONS:
       0. c0t0d0 <SUN36G cyl 24620 alt 2 hd 27 sec 107>
          /sbus@2,0/SUNW,socal@d,10000/sf@0,0/ssd@w210000203713a911,0
       1. c0t1d0 <SUN18G cyl 7506 alt 2 hd 19 sec 248>
          /sbus@2,0/SUNW,socal@d,10000/sf@0,0/ssd@w210000203713bbf9,0
       2. c0t2d0 <SUN9.0G cyl 4924 alt 2 hd 27 sec 133>
          /sbus@2,0/SUNW,socal@d,10000/sf@0,0/ssd@w21000020370a8a5f,0
Specify disk (enter its number):
```

2. Enter the disk number that corresponds to the disk that you added. Be sure to specify the number that *exactly* matches the disk added.

```
Specify disk (enter its number): 1
```

   The device number of the disk that you are partitioning, for example, `c0t1d0`, and the Format Menu is displayed:

```
selecting c0t1d0
[disk formatted]
FORMAT MENU:
        disk       - select a disk
        type       - select (define) a disk type
        partition  - select (define) a partition table
        current    - describe the current disk
        format     - format and analyze the disk
        repair     - repair a defective sector
        label      - write label to the disk
        analyze    - surface analysis
        defect     - defect list management
        backup     - search for backup labels
        verify     - read and display labels
        save       - save new disk/partition definitions
        inquiry    - show vendor, product and revision
        volname    - set 8-character volume name
        !<cmd>     - execute <cmd>, then return
        quit
format>
```

3. Enter:

   partition

   The partition menu is displayed:

```
PARTITION MENU:
        0      - change `0' partition
        1      - change `1' partition
        2      - change `2' partition
        3      - change `3' partition
        4      - change `4' partition
        5      - change `5' partition
        6      - change `6' partition
        7      - change `7' partition
        select - select a predefined table
        modify - modify a predefined partition table
        name   - name the current table
        print  - display the current table
        label  - write partition map and label to the disk
        !<cmd> - execute <cmd>, then return
        quit
partition>
```

4. At the `partition>` prompt, enter:

   print

   The default partition table is displayed. The table for a 9.1-GB FC-AL data disk might look like the following example:

```
Current partition table (original):
Total disk cylinders available: 4922 + 2 (reserved cylinders)

Part      Tag    Flag     Cylinders        Size            Blocks
  0 unassigned    wm       0 -    1        2.11MB    (2/0/0)       4320
  1 unassigned    wm       2 - 4923        9.00GB    (4922/0/0) 8376480
  2     backup    wm       0 - 4923        9.10GB    (4924/0/0) 8380800
  3 unassigned    wm       0               0         (0/0/0)          0
  4 unassigned    wm       0               0         (0/0/0)          0
  5 unassigned    wm       0               0         (0/0/0)          0
  6 unassigned    wm       0               0         (0/0/0)          0
  7 unassigned    wm       0               0         (0/0/0)          0

partition>
```

5. Partition the disk by completing the following Steps a through e for all partitions specified in the Disk partition values on page 85.

   a. At the `partition>` prompt, enter the partition number from the table. For example:

   ```
   partition> 0
   ```

   The system prompts for the partition ID tag.

   b. Enter the partition ID tag from the table. For partition 0, press **Enter** to accept the default of unassigned.

   ```
   Enter partition id tag [unassigned]:
   ```

   The system prompts for permission flags.

   c. Press **Enter** to accept the default (`wm`). That indicates that the partition is writable and mountable.

   The system prompts for the starting cylinder.

   d. Enter the number of the starting cylinder from the table. For example:

   ```
   Enter new starting cyl [0]:  0
   ```

   The system prompts for the partition size.

   e. Enter the partition size from the table. For example:

   ```
   Enter partition size [0b, 0c, 0mb]:  2c
   ```

   The `partition>` prompt is displayed.

6. When you have sized all of the partitions, enter:

   `print`

7. Compare the partition table that is now displayed to the Disk partition values on page 85. If there are any discrepancies, correct them by repeating the disk partitioning.

8. When you determine that the disk partitioning is correct, enter:

   `label`

   The system prompts you to continue.

   Important:
   Do not forget to label the disk drive.

9. Enter: **`y`**

   The `partition>` prompt is displayed.

10. Enter: **q**

    The format> prompt is displayed.

11. Enter:

    format

    The following message is displayed:

```
Ready to format. Formatting cannot be interrupted
and takes XX minutes (estimated). Continue? (y or n)
```

12. Enter: **y**

    A message similar to the following is displayed:

```
Begin format. The current time is <timestamp>

Formatting...
done

Verifying media...
        pass 0 - pattern = 0xc6dec6de
   4923/26/7

        pass 1 - pattern = 0x6db6db6d
   4923/26/7

Total of 0 defective blocks repaired.
format>
```

13. If you added more than one disk drive, enter **disk**, and repeat Step 2 through Step 12 for each drive.
14. After you have partitioned each drive, enter: **q**
15. Continue with Administering data disk drives on page 94.

Administering data disk drives

After the data disk drives have been installed, partitioned, and formatted, you must administer the disk drives. The procedures are different for CMS releases and whether the system is mirrored or nonmirrored.

This section includes the following topics:

Administering new data disks, R3V9 and later

Administration of new disks in R3V9 has been automated using commands on the CMS Services menu.

To administer one or more new disks to a nonmirrored system, or to administer one or more pairs of disks to a mirrored system:

1. Enter:

   cmssvc

   The CMS Services menu is displayed.

   Note:

   If the system also displays the following message, you must first turn on IDS before continuing with Step 2.

   ```
   cmssvc: warning IDS off-line it will take approx 30 seconds to start
   ```

2. Enter the number that corresponds to the `disk_space` option.
3. Enter the number that corresponds to the `Add new disks` option.

   The disks to be added is displayed.

4. Enter the number that corresponds to the disk you want to add.

   The system administers the new disks, which may take several minutes depending on the number and size of the disks. The following message is displayed:

   ```
   added new disk cXtXd0
   disk_space command completed.
   ```

Note:

On a mirrored system, if more than one set of 36-GB disks are being added, the system will run slowly until all disks are synchronized.

Administering replacement data disks, R3V9 and later

If a data disk drives fails, you must follow the recovery procedures as outlined in the Maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS. The appropriate sections to refer include:

- "Recovering a non-mirrored system after data disk failure"
- "Recovering a mirrored system after disk failure"

Administering a new data disk, R3V8 and earlier, nonmirrored

To administer a new data disk that you have added to a nonmirrored system:

1. Turn off CMS. It is important that CMS remain off while you perform this procedure.
2. Verify that the disk has been partitioned.
3. Enter:

   df -k /cms

   The percentage of total space that CMS is currently occupying is displayed, as in the following example:

   ```
   Filesystem            kbytes    used   avail capacity  Mounted on
   /dev/md/dsk/d19      6569538   670411 5899127     11%    /cms
   #
   ```

   Note the capacity percentage (in this example, 11%). The capacity used by **/cms** will be smaller after a new disk is added.

4. Enter the following commands to set the path variables:

   PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

   export PATH

5. Check the disk partitioning by entering the following commands:

   olds -check_disks cxtydz

   where ***cxtydz*** is the device name of the disk that you added (for example, c0t1d0).

6. Create a new **md.tab** file by entering the following command:

   olds -metadbs

   Ignore any error messages about failures while activating new replicas.

7. Enter:

   olds -mk_files cxtydz

8. Enter:

   pg /olds/md.tab.new

   This verifies that all the disk drives on your system have been recognized.

   A message that is similar to the following example is displayed, which shows three disk drives on the system:

```
    .
    .
    .
#/cms
d19 3 1 /dev/dsk/c0t1d0s1 1 /dev/dsk/c0t3d0s3 1 /dev/dsk/c0t2d0s2
```

9. Depending on what is displayed, perform one of the following actions:

   - If the file shows the exact number of drives that are on the system, continue with Step 10.
   - If the file does not show the exact number of drives on the system, complete the following steps:

     i. Enter:

        /usr/sbin/shutdown -y -i0 -g0

        The system shuts down and displays the ok prompt.

     ii. Turn off the system.

     iii. Turn off the system monitor.

     iv. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

     v. Check all disk drive connections to make sure that they are secure.

     vi. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.

     vii. Turn on the system monitor.

     viii. Turn on the system.

     ix. The system begins to boot. Interrupt the boot by pressing **Stop** plus **A**.

        The ok prompt displays.

     x. Enter the following commands:

        setenv auto-boot? false

        reset-all

        The system reboots to the ok prompt.

xi. To verify that the system recognizes all the disk devices, including the newly installed ones, enter:

probe-fcal-all

A message that is similar to the following example is displayed:

```
/sbus@2,0/SUNW,socal@d,10000/sf@0,0
WWN 20050800209a80fe  Loopid 1
WWN 21000020370e7255  Loopid ef
  Disk     SEAGATE ST19171FCSUN9.06117E9822U939
```

The devices that are listed depends on the number of disk drives that are installed in the system. Check to make certain that all of the disk drives are listed.

xii. Enter the following commands:

setenv auto-boot? true

boot -r

CAUTION:

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

The system reboots and the login window is displayed.

xiii. Log in as root.

xiv. Enter the following commands to set the path variables:

PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

export PATH

10. Enter:

    olds -setup *cxtydz*

    This attaches the new disk and grow the **/cms** file system, where ***cxtydz*** is the device name of the disk that you added.

    A series of messages similar to the following are displayed that reflect the disk drive setup process. The system eventually reports success.

```
valid disks are <device>
    .
    .
super-block backups (for fsck -F ufs -o b=#) at:
32, 16240, 32448, 48656, 64864, 81072, 97280, 113488,
     .
     .
1854992, 1871200, 1887408, 1903616, 1919824, 1936032

re-adding swap files

Success, activating or growing /cms metadevice.
#
```

11. Enter:

    df -k /cms

    The percentage of total space that CMS is currently occupying is displayed, as in the following example:

```
Filesystem            kbytes    used   avail capacity  Mounted on
/dev/md/dsk/d19      15271904  670412 14601492     5%    /cms
#
```

    Compare the capacity figure now with what was displayed in Step 3. In this example, the capacity percentage went down from 11% to 5% because the system has more disk space. This shows that the new disk drive was indeed added successfully to the system.

12. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

13. Turn on CMS when finished adding disks.

Administering a new pair of data disks, R3V8 and earlier, mirrored

To administer a new pair of data disks that you have added to a mirrored system:

1. Turn off CMS. It is important that CMS remain off while you perform this procedure.
2. Verify that the disk has been partitioned.
3. Enter:

   df -k /cms

   The percentage of total space that CMS is currently occupying is displayed, as in the following example:

```
Filesystem            kbytes    used   avail capacity  Mounted on
/dev/md/dsk/d21      6569538   670411 5899127     11%    /cms
#
```

   Note the capacity percentage (in this example, 11%). The capacity used by **/cms** will be smaller after a new disk is added.

4. Enter the following commands to set the path variables:

   PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

   export PATH

5. Check the disk partitioning by entering the following commands:

   olds -mirrored -check_disks

6. Create a new **md.tab** file by entering the following command:

   olds -mirrored -metadbs

   Ignore any error messages about failures while activating new replicas.

7. Enter:

   olds -mirrored -mk_files

8. Enter:

   pg /olds/md.tab.new

   This verifies that all the disk drives on your system have been recognized.

   A message that is similar to the following example is displayed, which shows four disk drives on the system:

```
   .
   .
   .
#/cms
d21 3 1 /dev/dsk/c0t0d0s1 1 /dev/dsk/c0t1d0s3 1 /dev/dsk/c1t4d0s2 1 /
dev/dsk/c1t5d0s2
```

9. Depending on what is displayed, perform one of the following actions:
   - If the file shows the exact number of drives that are on the system, continue with Step 10.
   - If the file does not show the exact number of drives on the system, complete the following steps:
     i. Enter:

        /usr/sbin/shutdown -y -i0 -g0

        The system shuts down and displays the ok prompt.

     ii. Turn off the system.

     iii. Turn off the system monitor.

     iv. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

     v. Check all disk drive connections to make sure that they are secure.

     vi. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.

     vii. Turn on the system monitor.

     viii. Turn on the system.

     ix. The system begins to boot. Interrupt the boot by pressing **Stop** plus **A**.

        The ok prompt displays.

     x. Enter the following commands:

        setenv auto-boot? false

        reset-all

        The system reboots to the ok prompt.

     xi. To verify that the system recognizes all the disk devices, including the newly installed ones, enter:

        probe-fcal-all

        A message that is similar to the following example is displayed:

```
/sbus@2,0/SUNW,socal@d,10000/sf@0,0
WWN 20050800209a80fe  Loopid 1
WWN 21000020370e7255  Loopid ef
  Disk     SEAGATE ST19171FCSUN9.06117E9822U939
```

        The devices that are listed depends on the number of disk drives that are installed in the system. Check to make certain that all of the disk drives are listed.

xii. Enter the following commands:

setenv auto-boot? true

boot -r

⚠ CAUTION:

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

The system reboots and the login window is displayed.

xiii. Log in as root.

xiv. Enter the following commands to set the path variables:

PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

export PATH

10. Enter:

olds -mirrored -setup *cxtydz cxtydz*

where the first disk is the primary data disk and the second disk is the mirrored data disk. This attaches the new disks and grows the **/cms** file system.

A series of messages similar to the following are displayed that reflect the disk drive setup process. The system eventually reports success.

```
valid disks are <device>
    .
    .
super-block backups (for fsck -F ufs -o b=#) at:
32, 16240, 32448, 48656, 64864, 81072, 97280, 113488,
     .
     .
1854992, 1871200, 1887408, 1903616, 1919824, 1936032

re-adding swap files

Success, activating or growing /cms metadevice.
#
```

11. Enter:

    df -k /cms

    The percentage of total space that CMS is currently occupying is displayed, as in the following example:

```
Filesystem             kbytes    used   avail capacity  Mounted on
/dev/md/dsk/d21      15271904  670412 14601492     5%    /cms
#
```

    Compare the capacity figure now with what was displayed in Step 3. In this example, the capacity percentage went down from 11% to 5% because the system has more disk space. This shows that the new disk drive was indeed added successfully to the system.

12. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.
13. Turn on CMS when finished adding disks.

Administering a replacement data disk, R3V8 and earlier, nonmirrored

To administer a new disk drive that is a replacement for a defective disk drive on a nonmirrored system:

1. Verify that the disk has been partitioned.
2. Enter the following commands to set the path variables:

   PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds

   export PATH

3. Enter:

   olds -check_disks

   This checks the disk partitioning.

   A message similar to the following is displayed:

```
disk:cot0d0 is partitioned ok
disk:cot1d0 is partitioned ok
disk:cot2d0 is partitioned ok
Warning: Current Disk has mounted partitions
disk:cot0d0 is partitioned ok
Success, checking disks
#
```

4. Enter:

   olds -mk_files

   The following message is displayed:

```
Success, creating md.tab.new and/or vfstab.new
#
```

5. Enter:

   olds -metadbs

   This sets up the metadevices. Ignore any error messages about failures while activating new replicas.

6. Enter:

   nohup olds -setup | tee

   This sets up the **/cms** metadevice.

   The following message is displayed:

```
     .  .  .
prtvtoc:  c0t6d0s0:  device busy
device:  c0t0d0 will not be used
valid disks are c0t0d0  c0t1d0  c0t2d0  c0t3d0
     .  .  .
super-block backups (for fsck -F ufs -o b=#) at:
32, 16240, 32448, 48656, 64864, 81072, 97280, 113488,
     .  .  .
10532656, 10548864, 10565072, 10580000, 10596208
ufs fsck: sanity check: /dev/md/rdsk/d19 okay
Success, activating or growing /cms metadevice
#
```

7. Enter:

   mount /cms

   This mounts the **/cms** file system.

8. Enter:

   df -k /cms

   The system information for **/cms** is displayed. For example:

```
Filesystem            kbytes    used   avail capacity  Mounted on
/dev/md/dsk/d19      15271904  670412 14601492     5%    /cms
#
```

   The `kbytes` figure should be somewhat smaller than the total disk space on the entire system. In this example, the filesystem space is 15-GB for a system that has

two 9-GB disk drives. This implies that the replacement disk drive has been successfully administered.

9. For an R3V6 or earlier system, install the swap file by entering:

   ```
   olds -addswapfile /cms
   ```

10. Enter:

    ```
    /usr/sbin/shutdown -y -i6 -g0
    ```

    The system reboots.

11. Continue with one of the following:

    - Restoring the /cms filesystem (R3V8) on page 104
    - Restoring the /cms filesystem (R3V6 and earlier) on page 105

Restoring the /cms filesystem (R3V8) - After administering the replacement disk, you must now restore the **/cms** filesystem. This procedure is for CMS R3V8.

To restore the **/cms** filesystem on the replacement disk drive:

1. Restore the most recent CMSADM backup by loading the backup tape into the tape drive and entering the following command on a single line at the command prompt:

   ```
   nohup cpio -icmudv -C 10240 -I /dev/rmt/<dev#> -M "Insert
     tape number %d" "cms" "cms/*" | tee
   ```

   The device number (*<dev#>*) is usually 0c, but could be 0, 1, or 1c.

   Note:

   You may get four error messages concerning the **/home** directory. These errors are displayed when the directory is already present, so you can ignore them.

2. You must run CMS setup to reinstall the data tables before you do a maintenance restore. Use the information you collected before you installed the replacement disk. See the software installation, maintenance, and troubleshooting document for CMS setup procedures.
3. Turn on CMS.
4. Restore any CMS maintenance backups you have that are dated *after* the latest CMSADM backup. See the CMS Administration document for more information.
5. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Restoring the /cms filesystem (R3V6 and earlier) - After administering the replacement disk, you must now restore the **/cms** filesystem. This procedure is for CMS R3V6 and earlier.

To restore the **/cms** filesystem on the replacement disk drive:

1. Enter:

   ```
   ulimit unlimited
   ```

2. Restore the most recent CMSADM backup by loading the backup tape into the tape drive and entering the following command on a single line at the command prompt:

   ```
   nohup cpio -icmudv -C 10240 -I /dev/rmt/<dev#> -M "Insert
     tape number %d" "/cms" "/cms/*" | tee
   ```

   The device number (*<dev#>*) is usually 0c, but could be 0, 1, or 1c.

   Note:

   You may get four error messages concerning the **/home** directory. These errors are displayed when the directory is already present, so you can ignore them.

3. Turn on CMS.
4. Restore any CMS maintenance backups you have that are dated *after* the latest CMSADM backup. See the CMS Administration document for more information.
5. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Administering a replacement disk, R3V8 and earlier, mirrored

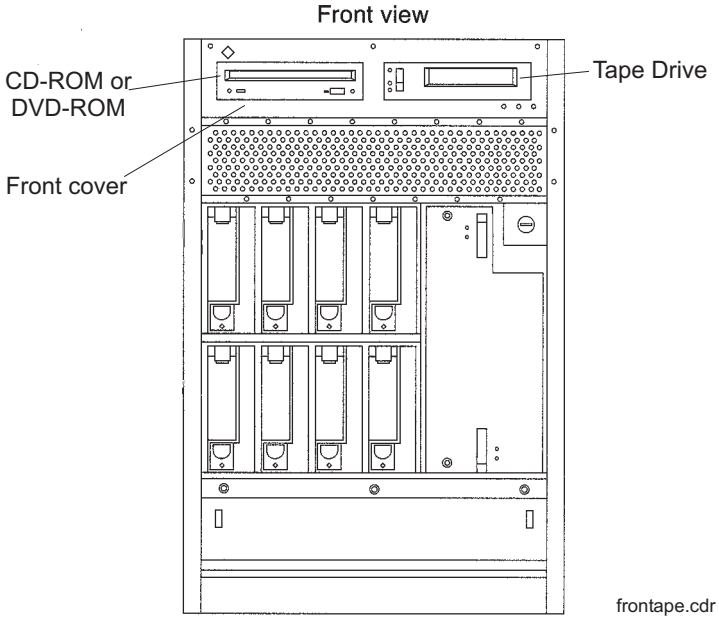
To administer a new disk drive that is a replacement for a defective disk drive on a mirrored system, see *Replacing a faulty disk* in Chapter 3 of the following documents:

- *CentreVu CMS R3V8 Disk-Mirrored Systems*, 585-210-940
- *CentreVu CMS Disk-Mirrored Systems* (for R3V6), 585-215-841

Replacing the CD-ROM or DVD-ROM drive

This section describes the procedure that is used to replace the internal tape drive, the CD-ROM drive, or the DVD-ROM drive.

The basic configuration for the Enterprise 3500 system includes an internal tape drive and a CD-ROM or DVD-ROM drive. The drives are installed in the SCSI media tray, which is mounted from the front of the system.



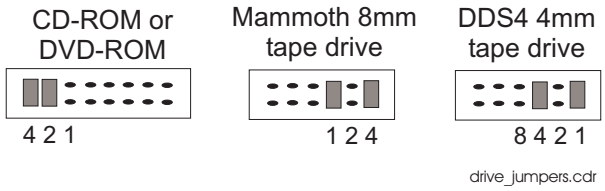
To replace a tape drive, CD-ROM drive, or DVD-ROM drive:

1. Remove any CD-ROMs from the CD-ROM drive.
2. Shut down the system and turn off the power.
3. Attach an ESD wrist strap to the chassis of the computer and to your wrist.
4. Remove the front cover. Grasp the cover on both sides near the center. Place your thumbs on top of the cover and place your fingers at the slight indentations under the cover for leverage.

   WARNING:
   When you loosen or tighten the captive screws, use your thumb and fingers only. The screws have thin shafts that may break if too much pressure is applied.

5. Loosen the two captive screws that secure the media tray to the chassis tray.

6. Remove the media tray. To access the devices that are in the media tray, turn the tray over and place it upside-down on the top of the cabinet.
7. Disconnect the drive data and power connectors from the socket in the media tray.
8. Remove the screws that secure the drive to the media tray.
9. Slide the drive out through the front of the tray.
10. Set the SCSI address on the new drive using the jumpers on the back of the drive. Set the tape drive to 5. Set the CD-ROM drive or DVD-ROM drive to 6.



11. Slide the replacement drive into the media tray and secure it with the screws that were removed earlier.

    Tip:

    Install each screw with just a few turns before you tighten all the screws.

12. Connect the data and power connector on the drive to the socket in the media tray.
13. Replace the media tray. Take care not to crimp the cables as you slide the tray into the cabinet.

    WARNING:

    When you loosen or tighten the captive screws, use your thumb and fingers only. The screws have thin shafts that may break if too much pressure is applied.

14. Tighten the captive screws that you loosened earlier.
15. Replace the front cover.
16. Remove the ESD wrist strap.
17. Power-up the system.
18. Press **Stop** plus **A** simultaneously after the console banner is displayed, but before the system starts booting.
19. Enter the following commands:

    ```
    setenv auto-boot? false
    ```

    ```
    reset-all
    ```

    This resets the system and the `ok` prompt is displayed.

20. Enter:

    ```
    probe-scsi-all
    ```

    This checks to see that the system recognizes the new drive. If the new drive is not listed, make sure there is a secure cable connection.

21. Reboot the system by entering the following commands:

    ```
    setenv auto-boot? true
    ```

    ```
    boot -r
    ```

    CAUTION:

    If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

    This reboots the system so that it recognizes the new configuration.

Maintaining tape drives

This section includes the following topics:

WARNING:
The Enterprise 3500 8-mm Mammoth tape drive is not compatible with all 8-mm tapes. You should only use the 170-meter AME Mammoth tapes in this tape drive. If you use other 8-mm tapes (110-, 120- or 160-meter), you may damage the tape drive and make it unusable.

Tape drive compatibility

Not all new tape drives are compatible with older releases of CMS. This section describes the compatibility of newer tape drives.

DDS4 tape drive

The DDS4 tape drive is compatible with the following releases of CMS:

- r3v6be.i and later (or any CMS R3V6 load with Solaris 2.5.1 patch 103857-17)
- R3V8 and later

Solaris patches can be downloaded from:

http://drdtl.dr.avaya.com/docs/patches/

The DDS-4 tape drive used with the Sun Enterprise 3500 is *not* the same model used with the Sun Fire V880. When replacing a DDS-4 tape drive in the Enterprise 3500, make sure you order the correct replacement.

Ordering tapes

Replacement backup data and tape drive cleaning cartridge tapes can be ordered from your local computer or office supply store. You cannot order tapes from Avaya. Depending on your tape drive model, order the following cartridge tapes:

Description	Tape drive
Mammoth 20/40-GB, 8mm	Mammoth 8mm
Mammoth cleaning cartridge	Mammoth 8mm
DDS-4 20/40-GB, 4mm, 150-155m	DDS-4
DDS 4mm cleaning cartridge	DDS-4

Cleaning the tape drive

This section describes how to clean the following tape drives:

- DDS4, 4-millimeter, 20/40-GB
- Exabyte Mammoth 8-millimeter, 20/40-GB

The LEDs on the tape drives will indicate when the tape drives need cleaning. See Tape drive LED status patterns on page 151.

DDS4 tape drive

The DDS4 tape drive uses a dry cleaning cartridge. Each cartridge is good for about 50 cleaning cycles. Regular cleaning is recommended to maximize tape drive performance. The cleaning schedule depends on the number of DDS tape cartridges used each day for backups. Use the following table to determine a cleaning schedule.

Number of cartridges used each day	Cleaning interval
1 or less	8 weeks
2	4 weeks
3	3 weeks
4 or more	Weekly

In addition, if the Clean LED flashes, either the tape drive heads need cleaning, or the backup tape needs replacing.

To clean the tape drive:

1. Load the cleaning cartridge into the tape drive.

   The cleaning cycle begins automatically, and the Tape LED flashes. When the cleaning cycle is complete, the cleaning cartridge is ejected automatically.

2. The first time you use the cleaning cartridge, record the date on the cleaning cartridge. Each time you clean the tape drive, mark an X in the box. After all boxes are filled, replace the cleaning cartridge.

3. Return the cleaning cartridge to the plastic protection box.

If the Clean LED continues to flash, repeat the cleaning procedure using a different cleaning cartridge. If the Clean LED is still flashing, repeat the backup operation with a different tape. If this clears the signal, the first backup tape is nearing the end of its life. Discard the old tape.

Exabyte Mammoth tape drive

Clean the tape drive on a regular basis to ensure optimum performance, or if any of the following occur:

- When the amber light on the top left side of the tape drive faceplate is on solid.
- After reading a low-density 14-GB tape. Reading a 14-GB tape alters certain flags in the system software, and those altered flags prevent the drive from reading 40-GB tapes. The cleaning process resets the flags and allows the drive to read and write 40-GB tapes once again.

It is recommended that you clean the tape drive five times after reading a low-density tape. If, after several cleanings, the amber light remains on. try shutting down the system and rebooting the system. This sometimes resets the tape flags.

To clean the tape drive:

1. Load the cleaning cartridge into the drive as you would any tape.

   The cleaning process starts automatically. The cartridge is automatically unloaded and ejected when the process is complete.

   If the cartridge is ejected without going through a cleaning cycle, it means the cartridge is exhausted and must be replaced with a new cleaning cartridge.

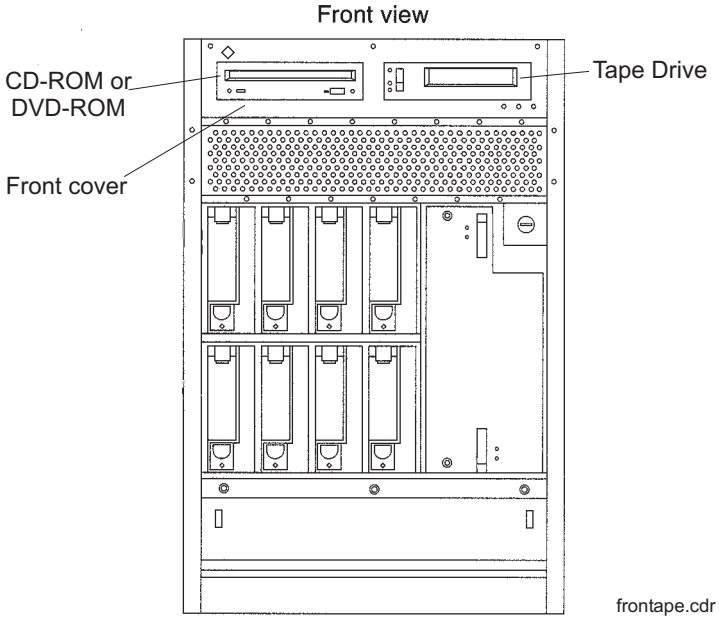
2. The first time you use the cleaning cartridge, record the date on the cleaning cartridge. Each time you clean the tape drive, mark an X in the box. After all boxes are filled, replace the cleaning cartridge.

3. Return the cleaning cartridge to the plastic protection box.

Replacing the internal SCSI tape drive

This section describes the procedure that is used to replace the internal tape drive, the CD-ROM drive, or the DVD-ROM drive.

The basic configuration for the Enterprise 3500 system includes an internal tape drive and a CD-ROM or DVD-ROM drive. The drives are installed in the SCSI media tray, which is mounted from the front of the system.



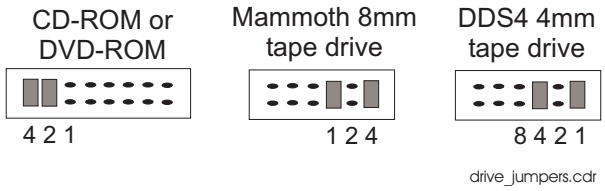
To replace a tape drive, CD-ROM drive, or DVD-ROM drive:

1. Remove any tapes from the tape drive.
2. Shut down the system and turn off the power.
3. Attach an ESD wrist strap to the chassis of the computer and to your wrist.
4. Remove the front cover. Grasp the cover on both sides near the center. Place your thumbs on top of the cover and place your fingers at the slight indentations under the cover for leverage.

   WARNING:
   When you loosen or tighten the captive screws, use your thumb and fingers only. The screws have thin shafts that may break if too much pressure is applied.

5. Loosen the two captive screws that secure the media tray to the chassis tray.

6. Remove the media tray. To access the devices that are in the media tray, turn the tray over and place it upside-down on the top of the cabinet.
7. Disconnect the drive data and power connectors from the socket in the media tray.
8. Remove the screws that secure the drive to the media tray.
9. Slide the drive out through the front of the tray.
10. Set the SCSI address on the new drive using the jumpers on the back of the drive. Set the tape drive to 5. Set the CD-ROM drive or DVD-ROM drive to 6.



11. Slide the replacement drive into the media tray and secure it with the screws that were removed earlier.

    Tip:

    Install each screw with just a few turns before you tighten all the screws.

12. Connect the data and power connector on the drive to the socket in the media tray.
13. Replace the media tray. Take care not to crimp the cables as you slide the tray into the cabinet.

    WARNING:

    When you loosen or tighten the captive screws, use your thumb and fingers only. The screws have thin shafts that may break if too much pressure is applied.

14. Tighten the captive screws that you loosened earlier.
15. Replace the front cover.
16. Remove the ESD wrist strap.
17. Power-up the system.
18. Press **Stop** plus **A** simultaneously after the console banner is displayed, but before the system starts booting.
19. Enter the following commands:

    ```
    setenv auto-boot? false
    ```

    ```
    reset-all
    ```

    This resets the system and the `ok` prompt is displayed.

20. Enter:

    probe-scsi-all

    This checks to see that the system recognizes the new drive. If the new drive is not listed, make sure there is a secure cable connection.

21. Reboot the system by entering the following commands:

    setenv auto-boot? true

    boot -r

    CAUTION:

    If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

    This reboots the system so that it recognizes the new configuration.

Adding an external SCSI tape drive

To add an external SCSI tape drive:

1. Log in to the system as root.
2. Enter the following commands:

   cd /dev/rmt

   pwd

   The **pwd** command verifies that you are in the **/dev/rmt** directory.

3. Enter:

   rm *

   This removes SCSI tape drive device files. If you do not remove the tape drive device files before rebooting the system, the SCSI tape drive device files may not match the hardware configuration.

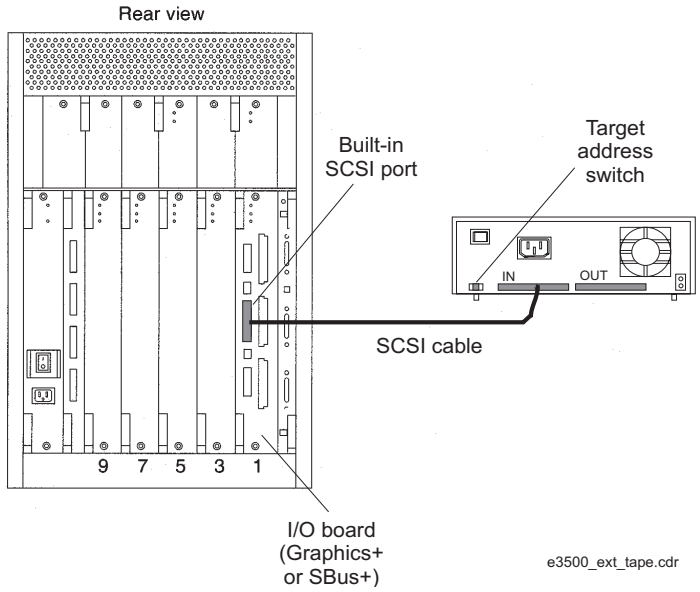
4. Enter:

   /usr/sbin/shutdown -y -i0 -g0

   The system shuts down.

5. Turn off the system.
6. Turn off the system monitor.
7. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

8. Using the Target Address Switch on the back of the external SCSI tape drive, set the SCSI ID to 4.
9. Remove the SCSI terminator from the built-in SCSI port on the I/O board in slot 1.
10. Connect the tape drive to the built-in SCSI port. The following figure shows SCSI cabling.



11. Connect the power cord from the tape drive to a power source.
12. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
13. Turn on the system monitor.
14. Turn on the system.
15. Press **Stop** plus **A** simultaneously after the console banner is displayed, but before the system starts booting.
16. Enter the following commands:

    `setenv auto-boot? false`

    `reset-all`

    The system resets and displays the `ok` prompt.
17. Enter:

    `probe-scsi-all`

    This checks to see that the system recognizes the new tape drive. The resulting display should list the new drive as Target 4. If the new drive is not listed, check for a secure connection between the SCSI port and the new drive.

18. Reboot the system by entering the following commands:

    ```
    setenv auto-boot? true
    boot -r
    ```

    CAUTION:
    If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

    This reboots the system so that it recognizes the new configuration.

Removing an external SCSI tape drive

To remove an external tape drive:

1. Log in to the system as root.
2. Enter the following commands:

   ```
   cd /dev/rmt
   pwd
   ```

   The **pwd** command verifies that you are in the **/dev/rmt** directory.
3. Enter:

   ```
   rm *
   ```

   This removes SCSI tape drive device files. If you do not remove the tape drive device files before rebooting the system, the SCSI tape drive device files may not match the hardware configuration.
4. Enter:

   ```
   /usr/sbin/shutdown -y -i0 -g0
   ```

   The system shuts down.
5. Turn off the system.
6. Turn off the system monitor.
7. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.
8. Disconnect the tape drive from the SCSI port.
9. Replace the SCSI terminator on the built-in SCSI port on the I/O board in slot 1.
10. Turn on all external SCSI devices starting with the device farthest from the system and working toward the system.
11. Turn on the system monitor.

12. Turn on the system.
13. Press **Stop** plus **A** simultaneously after the console banner is displayed, but before the system starts booting.
14. Enter the following commands:

    ```
    setenv auto-boot? false
    ```

    ```
    reset-all
    ```

    The system resets.
15. Enter:

    ```
    probe-scsi-all
    ```

    In its default configuration, the computer should list out two SCSI devices: the internal tape drive (Target 5), and the CD-ROM or DVD-ROM drive (Target 6).
16. Reboot the system by entering the following commands:

    ```
    setenv auto-boot? true
    ```

    ```
    boot -r
    ```

    CAUTION:

    If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

    This reboots the system so that it recognizes the new configuration.

Adding memory and installing CPUs

The current minimum memory configuration of the Enterprise 3500 computer is equipped with one CPU/Memory board. The board has one bank of eight 128-MB single in-line memory modules (SIMMs) for a base memory configuration of 1-GB. Older systems use 32-MB SIMMs for a base memory configuration of 256-MB.

If you need more memory, you can install a second bank of SIMMs, upgrade to larger SIMMs, install a second CPU/Memory board, or any combination of the three. All SIMMs in a bank must be of the same type.

To install a second CPU/Memory board, remove the filler panel from the slot that you are going to use for the new board and install the new board as described in Removing and installing boards on page 62. For additional information, see the documentation that was distributed with the computer.

This section includes the following topics:

Installing memory

This section describes the procedures used to add more memory to an Enterprise 3500 system that is currently in operation.

WARNING:
You must wear an ESD wrist strap when installing or removing hardware components to prevent electrical discharge that can damage the system.

Preparing the system

To prepare the system to add memory:

1. Enter:

   `prtconf | grep Memory`

   The current memory size is displayed.

   ```
   Memory size: xx Megabytes
   ```

2. Record the current memory size.
3. Enter:

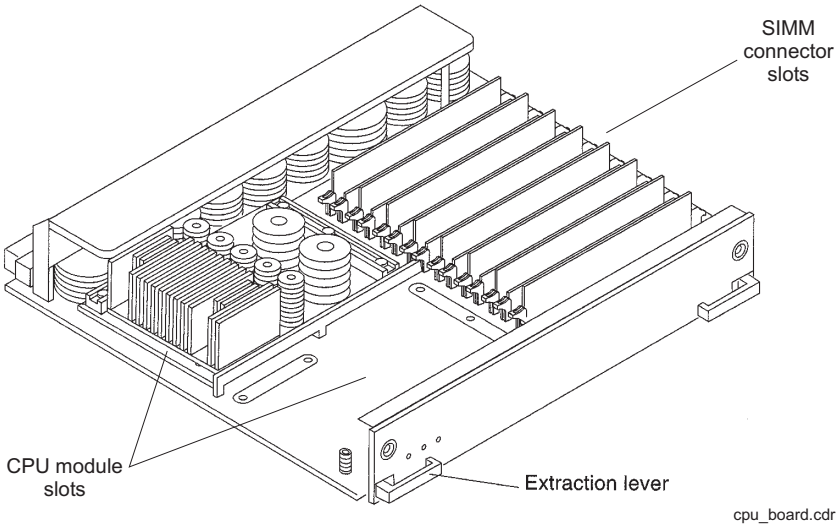
   `/usr/sbin/shutdown -y -i0 -g0`

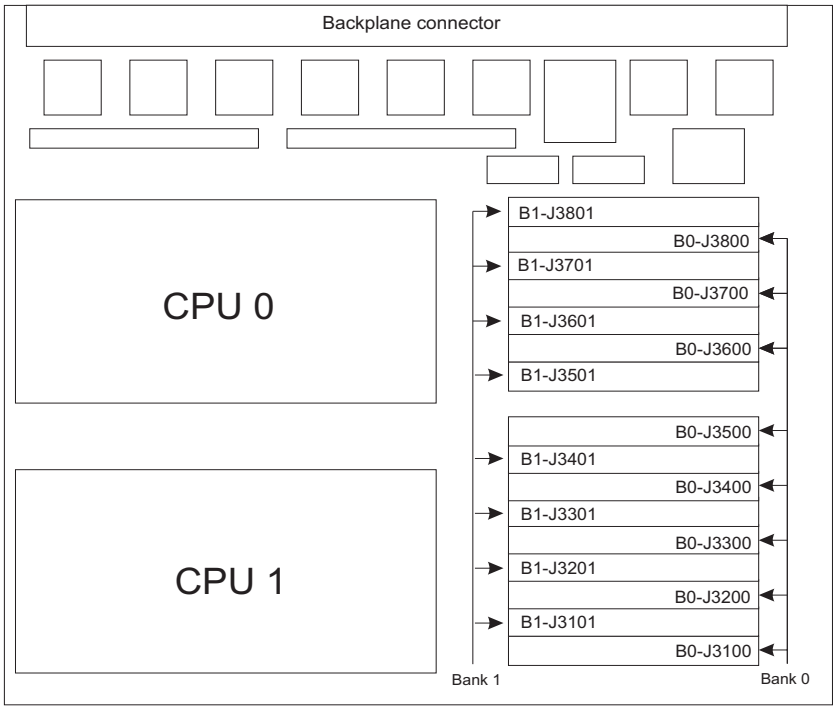
   The system shuts down.
4. Turn off the system.
5. Turn off the system monitor.
6. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

Installing the SIMMs

To install the SIMMS, you must remove the CPU/Memory board from the computer, install the SIMMs, and replace the board.

CPU/Memory+ board and layout - The following figure shows the CPU/Memory+ board and component layout. The CPU/Memory+ board is usually found in slots 3, 5, 7, or 9 of the computer.





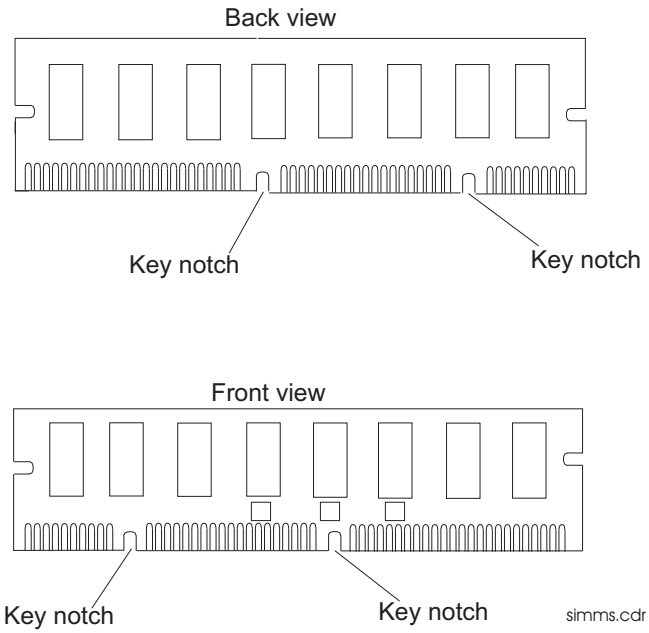
SIMM installation sequence - Fill the slots in the order that is shown in the following table. All eight slots in each bank must be filled.

	Installation Sequence	Slot Number
Bank 0	1	B0J3100
	2	B0J3200
	3	B0J3300
	4	B0J3400
	5	B0J3500
	6	B0J3600
	7	B0J3700
	8	B0J3800
Bank 1	9	B1J3101
	10	B1J3201
	11	B1J3301
	12	B1J3401
	13	B1J3501
	14	B1J3601
	15	B1J3701
	16	B1J3801

Inserting the SIMMs - The Enterprise 3500 is equipped with at least one bank of SIMMs installed. The current minimum configuration for an Enterprise 3500 is 1024 MB (1-GB). If you need to install additional SIMMs, they must be installed in full banks. The SIMMs that are delivered with your system could be 32-MB or 128-MB SIMMs. Each bank of SIMMs must be the same size. You cannot mix SIMMs of different sizes in the same bank.

To install a SIMM, you need to identify the front and back of the SIMM and align it in the connector on the CPU/Memory board.

This figure shows back and front views of a 32-MB SIMM. The 128-MB SIMMs have a similar appearance.



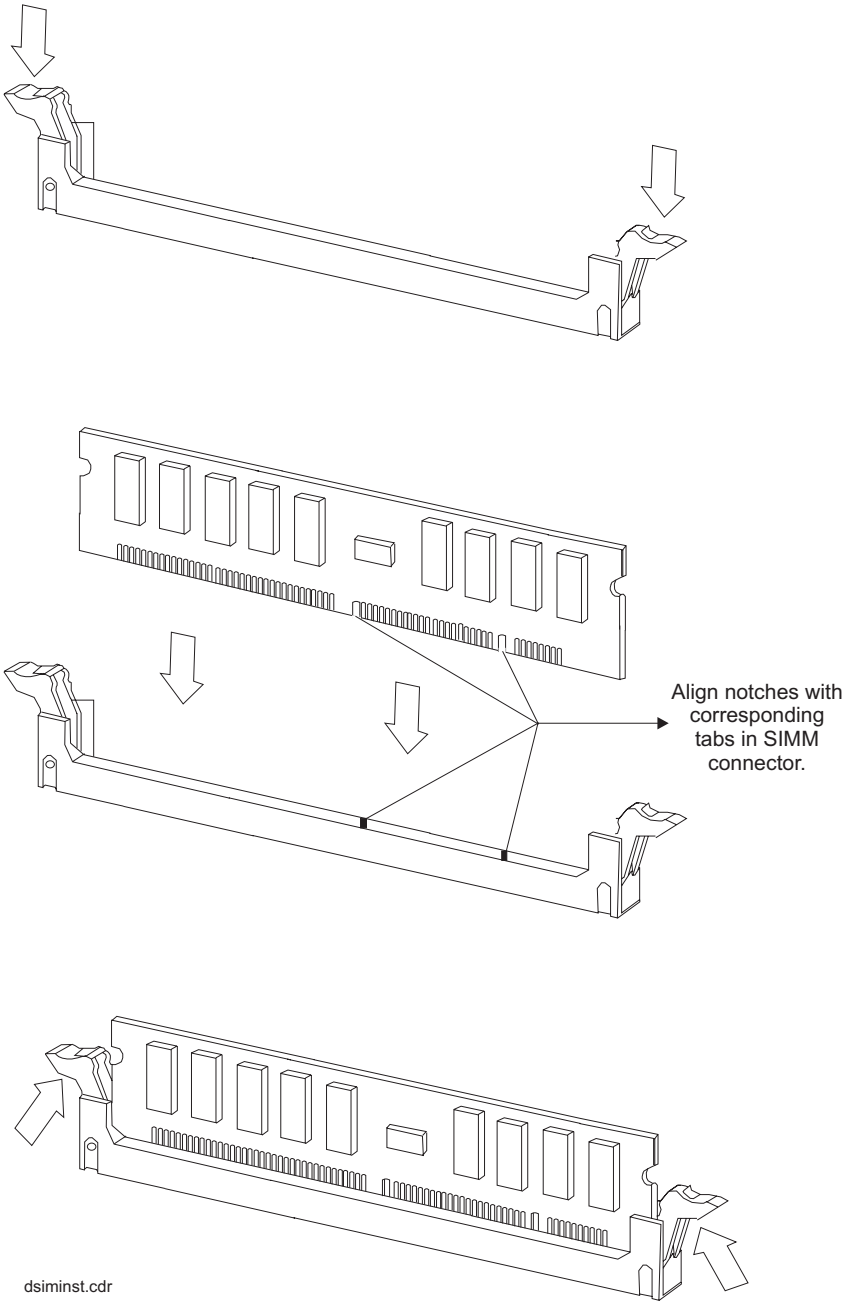
Locate the SIMM slots on the CPU/Memory board and install the appropriate SIMMs. All slots must contain the same speed and capacity SIMMs.

Fill one entire bank at a time. You will add memory in blocks of 256-MB or 1024-MB.

To install a SIMM:

1. Unlock (that is, press down on) the ejector levers at both ends of the connectors.
2. Insert the SIMM into the slot.

3. Relock the ejector levers.



Restarting the system

To restart the system:

1. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
2. Turn on the system monitor.
3. Turn on the system.
4. When the system comes back up, log in as root.
5. Enter:

   prtconf | grep Memory

   The new memory size is displayed:

   ```
   Memory size: xx Megabytes
   ```

6. Verify that the memory size that is displayed is correct, and compare it to the value that you recorded before you added the new memory. If the new memory size is not correct, power down the system and check that all the memory modules are properly seated.

Adding swap space (R3V6 or earlier)

After adding memory to a system that is running CMS R3V6 or earlier, the system must be administered to allow the swap function to use the additional memory.

To add swap space:

1. Enter:

   swap -a /cms/swap

2. Enter:

   swap -l

Installing a CPU

Installing a CPU is a critical procedure that requires special tools and should be done only by a qualified Sun Microsystems, Inc. technician. Contact your Avaya representative for more information.

If a CPU is added to a CMS R3V9 or later system, readminister the Informix® IDS tunables as described in the software installation, maintenance, and troubleshooting document.

Adding or replacing a power/cooling module

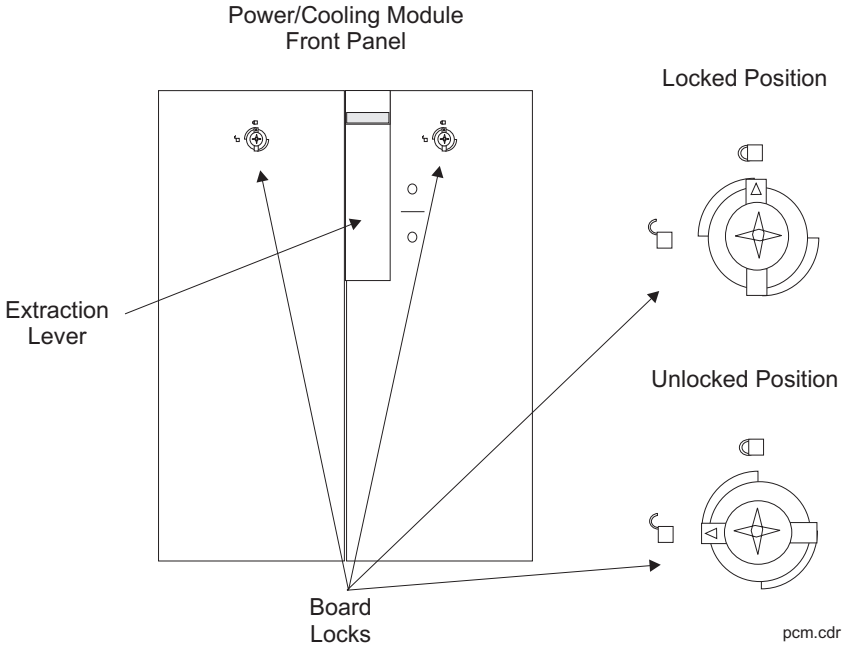
One power/cooling module (PCM) is needed for every two boards that are installed in the system. The PCM provides power and cooling.

The following table shows the PCM requirements for an Enterprise 3500 computer. A redundant PCM can be installed. If a redundant PCM is present and one PCM fails, the redundant PCM provides necessary power and cooling for the boards that were supported by the failed PCM.

Number of boards	Minimum number of working PCMs	Redundant working PCMs
1 to 2	1	2
3 to 4	2	3
5	3	3 plus an auxiliary peripheral power supply

A PCM is installed or removed in much the same manner as an I/O board.

The following figure shows a PCM faceplate.



Troubleshooting

This section describes the following troubleshooting procedures:

References - See the *Sun Enterprise 3500 Service Manual* for additional troubleshooting procedures.

Using the remote console

If your system does not boot, or if the system cannot be diagnosed locally, remote support personnel might want to redirect control of the console port from the local console to a dialed-in remote console. Redirecting the console allows support personnel to do remote maintenance as if they were at the local console. You can redirect the console using *either*:

- The Solaris operating system
- OpenBoot diagnostics

This section consists of the following procedures:

- Redirecting the console using Solaris on page 128. Use this procedure when the system will boot up to the Solaris operating system.
- Redirecting the console using OpenBoot mode on page 131. Use this procedure when the system will not boot up to the Solaris operating system.

Redirecting the console using Solaris

This procedure describes how to use the Solaris operating system to redirect the local console to the serial port. This procedure is usually done from the remote console that has dialed in to the system. Should you encounter any problems setting up the remote console, see Remote console port problems on page 169 for troubleshooting procedures.

⚠ CAUTION:

Use this procedure only when absolutely necessary. If the console redirects and the modem line drops, you may not be able to get back into the system.

Redirecting the local console to the remote console

To redirect control of the console port from the local console to a dialed-in remote console:

1. Dial in from the remote console to the remote console modem, and log in as root.
2. At the remote console, enter:

   /cms/install/bin/abcadm -r ttya

   The following message is displayed at the remote console:

   ```
   ttya is currently set to be incoming
   Are you sure you want to change it? [y,n,?]
   ```

3. At the remote console, enter: **y**

   The following message is displayed at the remote console:

   ```
   ttya administration removed
   ```

4. At the remote console, enter:

   /cms/install/bin/abcadm -c -b 9600 ttya

   The following message is displayed at the remote console:

   ```
   This change requires a reboot to take affect
   Are you ready to reboot? [y,n,?]
   ```

5. At the remote console, enter: **y**

   The following message is displayed at the remote console:

   ```
   done
   desktop auto-start disabled
   Proceeding to reboot.
   ```

   The following occurs:

   - The system begins to shut down.
   - The shutdown, reset, and reboot messages are displayed on the local console.
   - When the system starts to come back up, the local console goes blank.
   - The system boot diagnostics are displayed on the remote console.
   - After the system reboots, a `console login:` prompt is displayed on the remote console.

CAUTION:

Do not enter **Ctrl+D** from the remote console to exit the system without first redirecting control back to the local console. If you do, you may lock yourself from using the console locally or remotely.

6. Log in to the remote console as root.

Redirecting the remote console back to the local console

To redirect control of the console port from the remote console back to the local console:

1. At the remote console, enter:

   `/cms/install/bin/abcadm -c local`

   The following message is displayed at the remote console:

```
Console set to local

This change requires a reboot to take affect

Are you ready to reboot? [y,n,?]
```

2. At the remote console, enter: **`y`**

   The following occurs:

   - The system begins to shut down.
   - The shutdown, reset, and reboot messages are displayed on the local console.
   - When the system starts to come back up, the system boot diagnostics are displayed on the local console.
   - After the system reboots, the `console login:` prompt is displayed on the remote console.
   - The login screen is displayed on the local console.

3. Log in to the local console as root.
4. Log in to the remote console as root.

   Control of the console port is redirected from the remote console back to the local console.

Redirecting the console using OpenBoot mode

This procedure describes how to use the OpenBoot mode to redirect the local console to serial port A. Use the OpenBoot mode to redirect the remote console port when the Solaris method does not work. This typically occurs when the system will not boot.

Redirecting the local console to the remote console

To redirect control of the console port from the local console to a dialed-in remote console:

1. If the system is not already at the `ok` prompt, enter:

   `/usr/sbin/shutdown -y -i0 -g0`

   The system shuts down to the `ok` prompt.

   CAUTION:

   If the shutdown command fails, press **Stop** plus **A** simultaneously after the the console banner is displayed, but before the operating system starts booting.

2. At the local console, enter the following commands to set the remote console configuration parameters:

   `setenv input-device ttya`

   `setenv output-device ttya`

   `setenv ttya-rts-dtr-off true`

   `setenv ttya-ignore-cd true`

   `setenv ttya-mode 9600,8,n,1,-`

3. To verify the parameter changes, enter:

   `printenv`

   The following message is displayed:

```
Parameter Name        Value          Default Value
output-device         ttya           screen
input-device          ttya           keyboard
   .
   .
   .
```

4. If not already dialed in, dial in to the system from the remote console.
5. Log in to the system as root.

6. At the local console, enter:

   boot

   The following occurs:

   - The system begins to shut down.
   - The shutdown, reset, and reboot messages are displayed on the local console.
   - When the system starts to come back up, the local console goes blank.
   - The system boot diagnostics are displayed on the remote console.
   - After the system reboots, a `console login:` prompt is displayed on the remote console.

7. Log in to the remote console as root.

   CAUTION:
   Do not enter **Ctrl+D** from the remote console to exit the system without first redirecting control back to the local console. If you do, you may lock yourself from using the console locally or remotely.

Redirecting the remote console back to the local console

Using OpenBoot mode, there are two ways to redirect control of the console port from the remote console back to the local console:

- From the remote console (recommended)
- From the local site (not recommended)

Method 1: from the remote console - To redirect control of the console port from the remote console back to the local console:

1. Do one of the following:
   - If the system is in UNIX, enter the following commands at the remote console:

     eeprom output-device=screen

     eeprom input-device=keyboard

     eeprom ttya-rts-dtr-off=true

     eeprom ttya-ignore-cd=false

     /usr/sbin/shutdown -y -i6 -g0

- If the system is in OpenBoot mode, enter the following commands at the remote console:

  ```
  setenv output-device screen
  setenv input-device keyboard
  setenv ttya-rts-dtr-off true
  setenv ttya-ignore-cd false
  reset
  ```

  The following occurs:

  - The system begins to shut down.
  - Shutdown, reset, and reboot messages display on the remote console.
  - When the system starts to come back up, the system boot diagnostics are displayed on the local console.
  - The login screen is displayed on the local console.

2. At the remote console, hang up the modem connection.
3. Log in to the system as root at the local console.
4. To see what is on the ttya port, enter:

   ```
   /cms/install/bin/abcadm -k
   ```

5. To start a port monitor on ttya, enter:

   ```
   /cms/install/bin/abcadm -i -b 9600 ttya
   ```

Method 2: from the local site - The onsite technician will use this procedure from the local site**.** Use this method only when Method 1 will not work.

> **⚠ CAUTION:**
>
> This method of redirecting the console port should be done only as a last resort. This procedure resets the NVRAM defaults to the Sun factory settings.

To redirect control of the console port from the remote console back to the local console:

1. Turn the power off and back on for the CMS computer.
2. As the computer begins to boot up, double-click the power switch on the front of the system.

   The prompt is displayed on the local console.

3. At the `ok` prompt, enter:

   ```
   boot
   ```

4. When the system boots up, log in to the system as root at the local console.

5. To see what is on the ttya port, enter:

   /cms/install/bin/abcadm -k

6. To start a port monitor on ttya, enter:

   /cms/install/bin/abcadm -i -b 9600 ttya

   The following message is displayed:

   ```
   ttya set to incoming port 9600 baud
   ```

7. See Resetting a device alias on page 167 for information on how to reset the NVRAM to the correct factory defaults.

Tools

There are several tools available to help diagnose hardware problems:

Using the prtdiag command

The **prtdiag** command displays system diagnostic information.

To display this diagnostic information:

1. Enter:

   /usr/platform/`uname -m`/sbin/prtdiag -v | pg

   The following screens show an example of the results for an Enterprise 3500 computer.

```
System Configuration:  Sun Microsystems  sun4u 5-slot Sun Enterprise E3500
System clock frequency: 84 MHz
Memory size:  256Mb

========================= CPUs =========================

                     Run   Ecache   CPU    CPU
Brd  CPU   Module    MHz     MB    Impl.   Mask
---  ---  -------  -----  ------  ------  ----
 3     6      0      336     4.0   US-II    2.0
 3     7      1      336     4.0   US-II    2.0

========================= Memory =========================
                                            Intrlv.  Intrlv.
Brd   Bank   MB    Status   Condition  Speed   Factor   With
---  -----  ----  -------  ----------  -----  -------  -------
 3     0     256   Active      OK       60ns    1-way

========================= IO Cards =========================

     Bus   Freq
Brd  Type  MHz   Slot  Name                            Model
---  ----  ----  ----  --------------------------------  --------------------
 1   SBus   25     0   cgsix                             SUNW,501-2325
 1   SBus   25     2   HSI                               SUNW,501-1725-01
 1   SBus   25     3   SUNW,hme
 1   SBus   25     3   SUNW,fas/sd (block)
 1   SBus   25    13   SUNW,socal/sf (scsi-3)            501-3060

No failures found in System
===========================

No System Faults found
======================

Most recent AC Power Failure:
=============================
Tue Aug 22 03:47:12 2000
```

```
========================= Environmental Status ========================
Keyswitch position is in Normal Mode
System Power Status: Minimum Available
System Power Status: Minimum Available
System LED Status:    GREEN     YELLOW     GREEN
Normal                 ON        OFF       BLINKING

Fans:
-----
Unit   Status
----   ------
Disk    OK
PPS     OK

System Temperatures (Celsius):
------------------------------
Brd   State   Current  Min  Max  Trend
---  -------  -------  ---  ---  -----
 1      OK       42     42   46  stable
 3      OK       50     50   54  stable
CLK     OK       37     37   41  stable

Power Supplies:
---------------
Supply                        Status
---------                     ------
1                                OK
PPS                              OK
    System 3.3v                  OK
    System 5.0v                  OK
    Peripheral 5.0v              OK
    Peripheral 12v               OK
    Auxilary 5.0v                OK
    Peripheral 5.0v precharge    OK
    Peripheral 12v precharge     OK
    System 3.3v precharge        OK
    System 5.0v precharge        OK
AC Power                         OK

========================= HW Revisions ========================

ASIC Revisions:
---------------
Brd  FHC  AC  SBus0  SBus1  PCI0  PCI1  FEPS  Board Type      Attributes
---  ---  --  -----  -----  ----  ----  ----  ----------      ----------
 1    1    5    1      1                 22   Dual-SBus-SOC+  100MHz Capable
 3    1    5                                 CPU             100MHz Capable

System Board PROM revisions:
----------------------------
Board  1:   FCODE 1.8.26 2000/05/09 19:05   iPOST 3.4.26 2000/05/09 19:11
Board  3:   OBP   3.2.26 2000/05/09 19:07   POST  3.9.26 2000/05/09 19:13
```

System messages

System messages can alert you to system problems, such as a device that is about to fail. By default, many of the messages are displayed on the system console and are stored in **/var/adm**.

You can display system messages with the **dmesg** command. Here are some factors to keep in mind:

- A list of the most recent messages is displayed.
- The **/var/adm** directory contains several message files. The most recent messages are in **/var/adm/messages** and in **/var/adm/messages.0**. The oldest are in **/var/adm/messages.3**.
- Periodically, a new file is created, and the **/var/adm/messages.3** file is deleted, **/var/adm/messages.2** is renamed **/var/adm/messages.3**, **/var/adm/messages.1** is renamed **/var/adm/messages.2**, and **/var/adm/messages.0** is renamed **/var/adm/messages.1**.

The message files may contain not only system messages, but also core dumps and other data, which can cause **/var/adm** to grow quite large. To keep the directory to a reasonable size and ensure that future core dumps can be saved, you should remove unneeded files periodically. You can automate the task by using **crontab**. See your Sun system documentation for information on **crontab**.

OpenBoot PROM firmware tests

The OpenBoot PROM (OBP) On-Board firmware performs a routine set of firmware and hardware tests.

Note:

Different versions of Solaris have different versions of the OpenBoot commands. Not all commands are available with every version.

Using the OpenBoot PROM tests

To use the OpenBoot PROM tests:

1. From the root login, turn off CMS.
2. Enter:

   `/usr/sbin/shutdown -y -i0 -g0`

   The system shuts down.
3. At the `ok` prompt, enter the following commands:

   `setenv auto-boot? false`

   `reset-all`

   The system resets and displays the `ok` prompt.
4. Use the commands that are shown in Test descriptions on page 140.
5. When you finish testing, enter the following commands:

   `setenv auto-boot? true`

   `boot -r`

   CAUTION:

   If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

   The system reboots.

Test descriptions

The following table lists some of the OpenBoot PROM On-Board firmware test commands. Note that some commands give responses for the tests. Other tests just display the `ok` prompt when the test passes.

Command	Description	
`probe-ide-all`	This command identifies the devices attached to the IDE bus.	
`probe-scsi-all`	This command identifies the devices attached to the SCSI bus.	
`probe-fcal-all`	This command identifies the devices attached to the FC-AL bus.	
`test-all`	This command runs a series of tests on the network and on hardware components. It may take several minutes to complete.	
`test [alias]`	This command executes the specified device self-test. Possible values for device-specifier are listed in the Alias column:	
	Alias	**Description**
	memory	memory
	cdrom	cdrom
	tape0-1	tape drives
	disk0-5	SCSI drives
	floppy	floppy
	screen	video
	keyboard	keyboard
`watch-clock`	This command tests the clock function.	
`watch-net` `watch-net-all`	This command runs a loopback test, a transceiver test, and a packet transmission test.	

Additional references

See the *Sun OpenBoot Command Reference Manual* for more information.

Probing FC-AL devices

This test checks all devices on the fiber channel bus.

Symptom - The internal FC-AL disk drives are reporting errors.

Solution - To check the status of the FC-AL drives:

1. Enter:

   /usr/sbin/shutdown -y -i0 -g0

   This shuts down the system.

2. At the ok prompt, enter the following commands:

   setenv auto-boot? false

   reset-all

   The system resets.

3. Enter:

   probe-fcal-all

   The program displays a message that is similar to the following:

```
/sbus@2,0/SUNW,socal@d,10000/sf@0,0
WWN 20050800209a80fe  Loopid 1
WWN 21000020370e7255  Loopid ef
  Disk     SEAGATE ST19171FCSUN9.06117E9822U939
```

   Note:

   The actual response depends on the number of disk drives that are installed in the system. This example shows one FC-AL disk drive.

4. Fix any obvious errors, such as disconnected fiber cables or disk drives not completely inserted.

5. When you finish testing, enter the following commands:

   setenv auto-boot? true

   boot -r

   CAUTION:

   If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

   The system reboots.

Probing SCSI devices

This test checks all devices on the SCSI bus.

Symptom - The SCSI tape, CD-ROM, DVD-ROM, or external disk drives are reporting errors.

Solution - To check the status of the SCSI devices:

1. Enter:

   /usr/sbin/shutdown -y -i0 -g0

   to shut down the system.

2. At the ok prompt, enter the following commands:

   setenv auto-boot? false

   reset-all

   The system resets.

3. Enter:

   probe-scsi-all

   The program displays a message that is similar to the following:

```
/sbus@3,0/SUNW,fas@3,8800000
Target 5
  Unit 0   Removeable Tape    EXABYTE EXB-89008E030203V37f

                                          0060055614
Target 6
  Unit 0   Removeable Read Only device            TOSHIBA
                                  XM6201TASUN32XCD110312/12/97
```

   Note:

   The actual devices that are listed depends on the devices that are installed on the SCSI bus. This example shows the default SCSI devices, the tape drive (target 5), and the CD-ROM or DVD-ROM drive (target 6).

4. Fix any obvious errors, such as disconnected cables or external drives without power.

5. When you finish testing, enter the following commands:

   setenv auto-boot? true

   boot -r

CAUTION:

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

The system reboots.

Symptom - The SCSI tape, CD-ROM, DVD-ROM, or external disk drives are reporting errors.

Solution - The system might have duplicate SCSI target addresses on one bus.

Note:

Two targets may have the same target number if they are on different SCSI busses.

To check for duplicate SCSI target addresses:

1. Unplug all but one of the disks.
2. Enter:

   ```
   probe-scsi-all
   ```

   Record the target number and its corresponding unit number.
3. Plug in another disk, and perform Step 2 again.
4. If you get an error, change the target number of this disk to one of the unused target numbers.
5. Repeat Steps 2 through 4 until all the disks are plugged back in.
6. When you finish testing, enter the following commands:

   ```
   setenv auto-boot? true
   boot -r
   ```

   CAUTION:

   If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

   The system reboots.

OpenBoot diagnostic tests

The OpenBoot firmware serves two purposes:

- Boots the operating system from either a mass storage device or from a network
- Provides extensive features for testing hardware and software interactively

OpenBoot Diagnostics (OBDiag) is a menu-driven diagnostic tool that verifies the following:

- Internal I/O system
- Ethernet
- IDE
- Keyboard
- Mouse
- Video
- Serial ports
- Parallel port
- Audio
- Diskette drive (floppy)
- NVRAM
- PCIO ASICs

OBDiag performs root-cause failure analysis on the referenced devices by testing internal registers, confirming subsystem integrity, and verifying device functionality.

Using OpenBoot firmware

To use OpenBoot Firmware:

1. From the root login, turn off CMS.
2. Enter:

   `/usr/sbin/shutdown -y -i0 -g0`

   The system shuts down.
3. Enter:

   `obdiag`

   This loads the test program.

4. Enter:

   obtest <command number>

   See the following table for a summary of OpenBoot Diagnostic test commands.

Command number	Command name	Description
0	PCI/PCIO	This command: • Verifies the PCIO ASIC vender ID and the PCIO ASIC device ID • Verifies that the PCI configuration space is accessible as half-word bytes • Verifies the address class code • Performs a walking ones bit test on the status register, latency timer, and interrupt line • Verifies that the interrupt pin is logic-level high (1) after reset
1	EBUS DMA/ TCR Registers	This command: • Performs a walking ones bit test • Verifies that the status register is properly set • Validates the DMA capabilities and FIFOs
2	Ethernet	This command: • Resets the ethernet channel • Performs ethernet channel engine internal loopback • Enables the LAN data to be routed back to the receive MII data outputs • Enables MII transmit data to be routed to the MII receive data path • Forces the twisted-pair transceiver into loopback mode
3	Keyboard	This command performs an external and internal loopback.
4	Mouse	This command performs a keyboard-to-mouse loopback.
5	Floppy	This command verifies the diskette drive controller initialization. You must have a formatted floppy in the diskette drive.

Command number	Command name	Description
6	Parallel Port	This command: • Sets up the SuperIO configuration register to enable extended/compatible parallel port select • Enables ECP mode and ECP DMA configuration, and FIFO test mode.
7	Serial Port A	This command invokes the uart_loopback test for serial port A. **Note:** The serial port A diagnostic will stall if the TIP line is installed on serial port A.
8	Serial Port B	This command invokes the uart_loopback test for serial port B. **Note:** The serial port B diagnostic will stall if the TIP line is installed on serial port B.
9	NVRAM	This command verifies the NVRAM operation by performing a write and read to the NVRAM.
10	Audio	This command: • Verifies the cs4231 internal registers • Performs a line-in to line-out external loopback • Performs a microphone-to-headphone external loopback
11	EIDE	This command validates both the EIDE chip and EIDE bus subsystem. This takes several minutes.
12	Video	This command tests the video monitor port.
13	All Above	This command validates the system unit. **Note:** The “All Above” diagnostic will stall if the TIP line is installed on serial port A or serial port B.
14	Quit	This command exits from the OpenBoot diagnostics.
15	Display this Menu	This command displays the command options.

Command number	Command name	Description
16	Toggle script-debug	This command moves you in and out of the debug area.
17	Enable External Loopback Tests	This command enables the external loopback tests.
18	Disable External Loopback Tests	This command disables the external loopback tests.

Additional references

See the *Sun OpenBoot 3.x Command Reference Manual* for more information.

POST diagnostic messages

To use the Power On Self Test (POST) messages (during a reboot) to diagnose remote hardware problems:

1. At the `ok` prompt, enter:

   `boot`

2. Scan the displayed messages on the screen. Watch for error messages.

You can identify problems more accurately if you are familiar with the system power-on initialization messages. These messages show you the types of functions the system performs at various stages of system start-up. These messages can also show the transfer of control from OpenBoot firmware to POST.

Keyboard commands

The following table describes the OpenBoot initialization command sequences that are provided by the system. These commands are useful in situations when the system fails to boot. To use the commands, hold down the keys after turning on the power to your system. Keep the keys pressed until the keyboard lights flash and the screen displays the `ok` prompt.

Command	Description
Stop	Bypass POST. This command does not depend on the security mode. **Note:** Some systems bypass POST as a default. In such cases, use **Stop** plus **A** to start POST.
Stop plus **A**	Abort.
Stop plus **D**	Enter diagnostic mode (set `diag-switch?` to `true`).
Stop plus **F**	Enter Forth on TTYB instead of probing. Use `exit` to continue with the initialization sequence. This is useful if hardware is broken.
Stop plus **N**	Reset NVRAM contents to default values. If this is done, you must readminister the NVRAM options. **CAUTION:** Do not use this command under normal operation. Running this command causes a system to lose the Avaya factory NVRAM settings and the system will not boot properly.

Diagnosing LED patterns

Many hardware components of the computer have LEDs that can be used to diagnose problems. This section describes those LED patterns.

Front panel and clock+ board LED status patterns

The LEDs on the front panel of the Enterprise 3500 and on the Clock+ board display the patterns that are shown in the following table.

Left LED (green)	Middle LED (yellow)	Right LED (green)	Condition
Off	Off	Off	System has no power.
Off	On	Off	Failure mode.
Off	Off	On	Failure mode.
Off	On	On	Failure mode.
On	Off	Off	System is hung, either in POST/OpenBoot (OBP) or in the OS.
On	Off	On	System is hung in OS. This status occurs early during the boot process.
On	On	Off	System is hung in POST/OBP, or hung in OS and failed component on board.
On	On	On	System is hung in POST/OBP, or hung in OS and failed component on board.
On	Off	Flashing	OS running.
On	On	Flashing	OS running and failed component on board.
On	Flashing	Off	Slow flash = POST. Fast flash = OBP.

CPU/Memory+ and I/O+ board LED status patterns

The LEDs on the CPU/Memory+ board and on the I/O+ board display the patterns that are shown in the following table.

Left LED (green)	Middle LED (yellow)	Right LED (green)	Condition
Off	Off	Off	Board has no electrical power.
Off	On	Off	Board is in low power mode, can be unplugged.
On	Off	Off	System is hung, either in POST/OpenBoot (OBP) or in the OS.
On	Off	On	System is hung in OS.
On	On	Off	System is hung in POST/OBP, or hung in OS and failed component on board.
On	On	On	System is hung in POST/OBP, or hung in OS and failed component on board.
On	Off	Flashing	OS running.
On	On	Flashing	OS running and failed component on board.
On	Flashing	Off	Slow flash = POST. Fast flash = OBP.

Keyboard LED patterns

During POST, LEDs on the keyboard light in patterns that show the progress of the tests and if any failures have been detected. The following table describes these patterns.

Caps lock	Compose	Scroll lock	Num lock	Meaning
Blink	Off	Off	Off	POST in progress
Off	Off	Off	Off	POST successfully completed
On	Off	Off	On	System board failed
On	Off	On	Off	No memory found
On	On	On	Off	Faulty CPU

Tape drive LED status patterns

This section describes the LED status patterns for the following tape drives:

- DDS4, 4-millimeter, 20/40-GB
- Exabyte Mammoth 8-millimeter, 20/40-GB

DDS4 tape drive - The tape drive LEDs show the following status:

- Tape LED (green) — The LED flashes to show activity (loading, unloading, reading, and writing). The LED is steady when a cartridge is loaded and the tape drive is ready to begin operation.
- Clean LED (amber) — The LED flashes to indicate that a cartridge is near the end of its life, or that the heads need cleaning.

The following table describes the LED combinations that occur during normal tape drive operation.

	Tape drive state					
	Activity (load or unload)	**Activity (read or write)**	**Cartridge loaded**	**Media Caution Signal**	**Fault**	**Power-on (starts with two steady lights)**
Tape LED (green)	Flashing	Flashing Fast	On	Any	Any	Flashing
Clean LED (amber)	Off	Off	Off	Flashing	On	Off

The tape drive monitors the number of correctable errors that occur during reading and writing. If the number of errors becomes excessive, the tape may be nearing the end of its useful life, or the tape heads may need cleaning.

- If the media caution signal displays (flashing amber), clean the tape drive.
- If the signal still displays after cleaning the heads, repeat the operation with a different tape. If this clears the signal, the first tape is nearing the end of its life. Copy the data onto a new tape and discard the old one.

The media caution signal is cleared when a new tape is loaded or when the drive is power-cycled.

Exabyte Mammoth tape drive - The Exabyte Mammoth tape drive LEDs have the following general meaning:

- Top LED (amber) — When this LED is flashing, an error has occurred. When this LED is on solid, the tape drive needs to be cleaned.
- Middle LED (green) — When this LED is on, a tape is loaded and the tape drive is ready for operation.
- Bottom LED (green) — When this LED is flashing, tape motion is occurring.

The following table describes the LED combinations that occur during normal tape drive operation.

	Tape drive state							
	POST or reset	**Error or failed POST**	**Ready (no tape loaded)**	**Ready (tape loaded)**	**Normal tape motion**	**High speed motion**	**Time to clean**	**Cleaning in progress**
Top LED (Error/Clean)	On	Flashing	N/A	N/A	N/A	N/A	On	On
Middle LED (Tape ready)	On	Off	Off	On	On	On	N/A	On
Bottom LED (Tape motion)	On	Off	Off	Off	Flashing	Flashing Fast	N/A	Flashing

Power supply LED status patterns

The peripheral power supply (PPS) and auxiliary PPS have two LEDs:

- Green. Lit when the power supply is operating, but does not necessarily indicate that the DC outputs are fully within specification.
- Yellow. Lit when a DC power output failed, or a voltage level is out of specification.

PCM LED status patterns

The power/cooling modules (PCMs) display the patterns that are shown in the following table.

Green LED	Yellow LED	Condition
Off	Off	No AC input.
On	Off	Normal operation.
On	On	A fan has failed.
Off	On	One or more DC outputs have failed, or the voltages are out of specification.

Sun Validation Test Suite (VTS)

The SunVTS™ supports diagnostics in the following areas:

- Connection test. Minimal access of device to verify its accessibility and availability.
- Functional test (default). Detailed tests to thoroughly test the device or system when offline the system is offline (CMS must be turned off). A stress mode in the system or test option can be set only within the offline mode. The stress mode is an extension of offline.
- Functional test (from system monitor). Safe tests that can be executed on the device or system when it is online (CMS can be on, but testing is safer when it is turned off).

There are two ways to run SunVTS. We recommend that you use either local access through the Common Desktop Environment (CDE) interface, or remote access using an ASCII interface.

Prerequisites

CMS must be turned off.

Using SunVTS

To use SunVTS:

1. Enter:

   `BYPASS_FS_PROBE=1; export BYPASS_FS_PROBE`

   to bypass the file system probe.

2. Do one of the following:

   - Enter:

     `/opt/SUNWvts/bin/sunvts`

     This accesses the CDE interface.

   - Enter:

     `/opt/SUNWvts/bin/sunvts -t`

     This accesses the TTY mode (ASCII interface).

Additional references

For more information about using VTS, see **`/opt/SUNWvts/README`** and **`/opt/SUNWvts/bin/vtstty.help`**.

Troubleshooting disk, CD-ROM, and DVD-ROM drives

This section describes the symptoms of hard drive, CD-ROM drive, and DVD-ROM drive failures and suggests solutions to correct the problem.

Symptom - A hard drive read, write, or parity error is reported by the operating system. A CD-ROM or DVD-ROM drive read error or parity error is reported by the operating system.

Solution - Replace the drive that is indicated in the failure message. The operating system identifies the internal drives as indicated in the following table.

Operating system address	Drive physical location and target
c0t<*X*>d0s0, or c1t<*X*>d0s0	Hard drive, target <*X*> (<*X*> represents the target number 0 to 7)
c0t6d0s0	CD-ROM or DVD-ROM drive, target 6

Symptom - The hard drive fails to respond to commands.

Solution - To test the FC-AL disk drives:

1. Enter:

   `/usr/sbin/shutdown -y -i0 -g0`

   The system shuts down.

2. At the `ok` prompt, enter the following commands:

   `setenv auto-boot? false`

   `reset-all`

   The system resets.

3. Enter:

   `probe-fcal-all`

   The program displays a message that is similar to the following:

```
/sbus@2,0/SUNW,socal@d,10000/sf@0,0
WWN 20050800209a80fe  Loopid 1
WWN 21000020370e7255  Loopid ef
  Disk     SEAGATE ST19171FCSUN9.06117E9822U939
```

4. Verify that all of the fiber channel disk drives are recognized. This example indicates that the system FC-AL controller has successfully probed the device and that the motherboard is operating correctly.

   If the **probe-fcal** test fails to show all of the installed disk drives, you may have to replace the disk drive.

5. When you finish testing, enter the following commands:

   setenv auto-boot? true

   boot -r

   CAUTION:

   If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

   The system reboots.

Symptom - The CD-ROM drive or DVD-ROM drive fails to respond to commands.

Solution - To test the CD-ROM or DVD-ROM drive:

1. Enter:

   /usr/sbin/shutdown -y -i0 -g0

   The system shuts down.

2. At the `ok` prompt, enter the following commands:

   setenv auto-boot? false

   reset-all

   The system resets.

3. Enter:

   probe-scsi-all

   The program displays a message that is similar to the following:

```
/sbus@3,0/SUNW,fas@3,8800000
Target 5
  Unit 0   Removeable Tape    EXABYTE EXB-89008E030203V37f

                                          0060055614
Target 6
  Unit 0   Removeable Read Only device          TOSHIBA DVD-ROM SO-M140 1100 706/22/00
```

4. Verify that the CD-ROM or DVD-ROM drive is recognized. This example shows the default SCSI devices, the tape drive (target 5), and the CD-ROM or DVD-ROM drive (target 6).

   If the test fails to show all of the installed SCSI drives, you may have to replace the drive.

5. When you finish testing, enter the following commands:

   ```
   setenv auto-boot? true
   ```

   ```
   boot -r
   ```

   CAUTION:

   If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

   The system reboots.

Troubleshooting tape drives

Use the following procedures to troubleshoot tape drives:

- Checking tape status on page 158
- Rebuilding tape device drivers on page 159

Checking tape status

For many procedures, you must identify what tape drive, by device path, you will use for the procedure. Tape drives are assigned to particular device paths, usually one of the following:

- `/dev/rmt/0`
- `/dev/rmt/0c`
- `/dev/rmt/1`
- `/dev/rmt/1c`

Note:

The “c” at the end of the device name indicates that the tape device can operate in compressed mode. We recommend that you use compressed mode at all times.

To determine what device paths are available on your system:

1. Insert a tape into the tape drive.

2. Enter the following commands:

   mt -f /dev/rmt/0 status

   mt -f /dev/rmt/1 status

   If the device path is correct, a message that is similar to the following is displayed:

```
Vendor 'HP      ' Product 'C5683A      ' tape drive:
   sense key(0x6)= Unit Attention       residual= 0   retries= 0
   file no= 0   block no= 0
```

   If the device path is incorrect, a message that is similar to the following is displayed:

```
/dev/rmt/1c: No such file or directory
```

   If there is no tape in the tape drive, a message that is similar to the following is displayed:

```
/dev/rmt/1c: No tape loaded or drive offline
```

Rebuilding tape device drivers

As tape drives are added to and removed from a system, the device drivers can get out of sequence with the number of tape drives. For example, if a system has two tape drives, and one is removed, the system may accidentally try to use a tape drive that no longer exists.

To rebuild the device drivers for the tape drives:

1. Log in to the system as root.
2. Make sure that the target addresses for any SCSI tape drives are set correctly.

   Typically, the first tape drive is SCSI address 4, and the second tape drive is SCSI address 5. If you change the SCSI address, you must power-cycle the tape drive.

3. Enter the following commands:

   cd /dev/rmt

   pwd

   The **pwd** command verifies that you are in the **/dev/rmt** directory.

4. Enter the following commands:

   rm *

   drvconfig

   tapes -r /

Troubleshooting GBIC modules and fiber cables

There is little troubleshooting available for the GBIC modules and the fiber cables. Contact your Sun representative for assistance.

Symptom - The `probe-fcal-all` command shows a failure in the FC-AL link.

Solution - Check the version number of the GBIC module. The model “#VIXEL 02/50” has been faulty in the past. Try the model “#IBM 03REV.”

Once a GBIC module has been installed in one location, you cannot swap that GBIC with another location. You can only replace the GBIC with a new unit.

Recovery procedures

This section contains recovery procedures for a variety of problems:

Preserving data after a system failure

Enter the **sync** command at the ok prompt to force any information on its way to the hard disk to be written out immediately. This is useful if the operating system fails or is interrupted before preserving all data.

The **sync** command returns control to the operating system and performs the data-saving operations. After the disk data is synchronized, the operating system begins to save a core image of itself. If you do not need this core dump, you can interrupt the operation by pressing **Stop** plus **A**.

Loss of power

If the system loses power, it is recommended (but not required) that you empty the CD-ROM or DVD-ROM and tape drives. The system boots from the disk by default.

Power-on sequence - To turn the power back on:

1. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
2. Turn on the system monitor.

3. Turn on the system.

   If the system is operating properly, a banner screen is displayed up to 3 minutes after it is powered on.

```
|------| <Product Name>, Keyboard Present
|      | OpenBoot 3.xx, XXX MB memory installed, Serial #XXXXXXXXX
|      | Copyright 2000 Sun Microsystems, Inc. All rights reserved.
|------| Ethernet address X:X:XX:XX:XX:XX, Host ID: XXXXXXXX
```

Power-off sequence - To turn off the power:

1. Log in to the system as root.
2. Enter:

   /usr/sbin/shutdown -y -i0 -g0

   This shuts down the system.
3. Turn off the system.
4. Turn off the system monitor.
5. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

Keyboard becomes unplugged

If the console keyboard cable becomes unplugged during normal operation, the system stops running and no ACD data is collected from the switch.

To recover from this problem:

1. Plug in the keyboard cable.

   The system beeps and the current display “freezes” on the monitor. A small window that shows the following is displayed:

```
Type ‘go’ to resume
ok
```

2. Enter:

   go

   The system resumes normal operation.
3. Refresh the terminal screen.

   Note:

   If the system is rebooted, instead of entering **go**, you may be prompted to use the **fsck** command to repair the Solaris file systems.

Probe command warnings

Symptom

When using any of the “probe” commands, the following message is displayed:

```
This command may hang the system if a Stop-A or halt command has
been executed. Please type reset-all to reset the system before
executing this command. Do you wish to continue [Y/N].
```

CAUTION:
Do not continue. Answer **n**. Do not answer **y**.

Solution

To recover from this condition:

1. Enter: **n**

   This stops the probe command.

2. Enter the following commands:

   setenv auto-boot? false

   reset-all

3. Now it is acceptable to execute any of the “probe” commands and perform any other boot PROM-level diagnostics.

4. After you finish probing the system devices, enter the following commands:

   setenv auto-boot? true

   boot -r

   CAUTION:
   If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

   The system reboots.

System cannot read a 40-GB tape

Symptom

The system does not recognize the Exabyte Mammoth 40-GB internal tape drive, or the tape appears to be bad.

Solution

First, check the amber LED on the tape drive. If the LED is lit, you must clean the drive before it will read or write a tape. If, after several cleanings, the amber LED remains on, shut down the system and reboot. This sometimes resets the tape flags.

If the drive does not need cleaning, the **/kernel/drv/st.conf** file may be missing or corrupted. That is almost certainly true when the problem occurs immediately following a system failure.

To modify the file:

1. Enter the following commands to the edit the **/kernel/drv/st.conf** file:

   ```
   cd /kernel/drv
   cp st.conf st.conf.orig
   vi st.conf
   ```

2. Find the existing tape configuration list by searching on `tape-config-list=`.
3. Add the following lines immediately preceding the existing list:

```
# Begin CMS tape configuration list.
tape-config-list=
“EXABYTE EXB-8900”, “Mammoth EXB-8900 8mm Helical Scan”, “EXB-8900”,
“TANDBERG TDC 4200”, “Tandberg 2.5 Gig QIC”, “TAND-25G-FIXED”,
“TANDBERG SLR5”, “Tandberg 8 Gig QIC”, “TAND-8G-FIXED”;
EXB-8900 = 1,0x29,0,0xce39,4,0x7f,0x7f,0x7f,0x7f,0;
TAND-25G-FIXED = 1,0x37,512,0x867a,1,0x00,0;
TAND-8G-FIXED = 1,0x37,512,0x963a,4,0xA0,0xD0,0xD0,0xD0,3;
# End CMS Tape configuration list.
```

4. Make certain that the original “tape-config-list” lines are all commented out. When properly modified, the tape configuration lines of the **st.conf** file should look similar to the following example:

```
# Begin CMS tape configuration list.
tape-config-list=
“EXABYTE EXB-8900”, “Mammoth EXB-8900 8mm Helical Scan”, “EXB-8900”,
“TANDBERG TDC 4200”, “Tandberg 2.5 Gig QIC”, “TAND-25G-FIXED”,
“TANDBERG SLR5”, “Tandberg 8 Gig QIC”, “TAND-8G-FIXED”;
EXB-8900 = 1,0x29,0,0xce39,4,0x7f,0x7f,0x7f,0x7f,0;
TAND-25G-FIXED = 1,0x37,512,0x867a,1,0x00,0;
TAND-8G-FIXED = 1,0x37,512,0x963a,4,0xA0,0xD0,0xD0,0xD0,3;
# End CMS Tape configuration list.
#tape-config-list=
#  “”,  “Emulex MT02 QIC-11/QIC-24”,“MT02”,
#  “ANRITSU DMT2120”,“Unisys 1/2\” Reel”,“ANRITSU”,
        .
    (all lines begin with a pound sign)
        .
#  WangDAT = 1,0x34,0,0x0679,1,0x00,0;
#  WtQIC = 1,0x32,512,0x0624,1,0x00,0;
#

name=”st” class=”scsi”
     target=0 lun=0;
        .
    (remainder of file)
        .
```

5. Write and quit the file.

   The system should now recognize the tape.

Synchronizing the system clocks

Each I/O board has its own clock that must be synchronized with the system clock board for proper system operation. After adding, removing, or replacing an I/O board or the system clock board, the clock on the I/O board might become unsynchronized with the clock on the system clock board.

If the clocks need resynchronizing, the following message is displayed when you reboot:

```
Clock board TOD does not match TOD on any IO board
```

To synchronize the clocks:

1. If CMS is running, turn it off.
2. Enter:

   /usr/sbin/shutdown -y -g0 -i0

   The system shuts down and displays the `ok` prompt.
3. Enter:

   copy-clock-tod-to-io-boards

   This synchronizes the clocks.
4. Enter:

   boot -r

   This reboots the system and resynchronizes the clocks.
5. Turn CMS on.

Resetting a device alias

If a boot disk is replaced, or if the NVRAM chip is ever reset to the Sun factory defaults, the boot disk and EEPROM values must be reset to the Avaya factory defaults. This can happen when any of the following occurs:

- The boot disk (primary or alternate) is defective and is replaced with a new disk
- The NVRAM chip on the system clock board is replaced
- The **`set-defaults`** or **`setenv use-nvramrc? false`** command is run
- A PROM patch is applied
- A **Stop** plus **N** was used to reset the system

To reset the NVRAM to bootable options for the boot disks:

1. At the `ok` prompt, enter:

   `show-disks`

   The disk devices are displayed.

2. Select the letter for the proper boot device. For example:

   `/sbus@3,0/SUNW,socal@d,10000/sf@0,0/ssd`

   This copies the boot device string into the editor clipboard.

   To decode this path, first look at `/sbus@3` and divide the number (3) found after the `@` symbol by two, and throw away the remainder, which gives you one. This represents the first slot on your system. An SBus+ I/O or Graphics+ I/O board will be in your first slot. Next, look at `sf@0`. The zero represents what controller that drive is attached to. You should look for `sf@0` for your primary boot device and `sf@1` for your secondary boot device if you are working on a mirrored system. After looking at the paths offered, select the letter representing that path.

3. Enter:

   `nvalias disk Ctrl-y` (that is, press and hold the **Ctrl** key and the **y** key)

4. Add **`@0,0`** at the end of the line as shown in the following example:

   `nvalias disk /sbus@3,0/SUNW,socal@d,10000/sf@0,0/ssd@0,0`

   Adding the `@0,0` gives the command the target and slice of the primary boot device.

5. If needed, repeat the above procedure for the boot drive on a mirrored system using *bootdevice2* as your mirror boot device alias, as shown in the following example:

   `nvalias bootdevice2 /sbus@3,0/SUNW,socal@d,10000/sf@1,0/ssd@4,0`

   Adding the `@4,0` gives the command the target and slice of the mirror boot device.

6. Enter:

   devalias

   The device aliases are displayed. Verify that `disk` and `bootdevice2` are set to the correct alias values.

7. Do one of the following:

   - Enter:

     setenv boot-device disk

     This sets the boot environment for a nonmirrored system.

   - Enter:

     setenv boot-device disk bootdevice2

     This sets the boot environment for a mirrored system.

8. Enter:

   reset-all

   The system resets and boots up to the operating system.

9. After setting the disk device alias, check the EEPROM values as described in "Displaying and setting the EEPROM parameters" of your CMS software installation, maintenance, and troubleshooting document. Reset any values that do no match the values described in that section.

Remote console port problems

This section contains problems you may encounter with the remote console port.

Symptom

The remote console port will not initialize for dialing in or dialing out.

Solution

To correct this problem:

1. Enter:

   sacadm -l

   If the system status reports NO_SAC, the port is not working properly.

2. Enter:

   /cms/install/bin/abcadm -i -b 9600 ttya

   This should initialize the port. If the port does not initialize, continue with Step 3.

3. Enter:

   /cms/install/bin/abcadm -r ttya

   This removes the port administration.

4. Enter:

   ps -ef | grep sac

   This finds any SAC processes that are running. If any processes are found, continue with Step 5. Otherwise, continue with Step 6.

5. Enter:

   kill -9 *<pid>*

   Use this command to kill any SAC processes still running. Process numbers are represented by ***<pid>***.

6. Enter:

   /usr/lib/saf/sac -t 300

   This restarts SAC.

7. Enter:

   sacadm -l

   Confirm that SAC is running. The system should show ENABLED.

8. Enter:

   /cms/install/bin/abcadm -i -b 9600 ttya

   This should initialize the port.

Symptom

The system cannot dial out to report alarms using the Alarm Origination Manager (AOM).

Solution

To correct this problem:

1. Enter:

   tail /etc/uucp/Devices

   The system should display the following:

   ```
   ACU cua/b - Any Hayes
   Direct cua/a - Any Direct
   Direct cua/b - Any Direct
   ```

2. Check the settings on the remote console modem. For the U.S. Robotics modem, make sure that DIP switches 1 and 8 are down (ON). If these switches are not set correctly, you may still be able to dial in, but it may not dial out.
3. Enter:

   /opt/cc/install/aot/r1v*Xxx.x*/bin/setup

   This restarts AOM. The release number ***Xxx.x*** depends on your installation.

To send a test alarm:

1. Enter the following commands to set up the test environment:

   . /opt/cc/aot/bin/aom_env

   cd /opt/cc/aot/bin

   aom start

   export PRODUCT_TYPE=TEST

2. Enter:

   ./log_error -e 30001 -d "test alarm"

   This sends a test alarm.
3. Enter:

   ./alarm_view -p TEST -a TEST_ALARM

   This will display the test alarm.

4. Enter:

   ./alarm_resolve -p TEST -a TEST_ALARM

   This resolves the test alarm.

5. Enter:

   tail -f aom_log

   This displays the AOM log file.

6. If you change an AOM parameter, such as the product ID or the telephone number, you must turn AOM off and back on again to recognize the new parameters. These parameters are in **/opt/cc/aot/data/admin/sysSetup.cfg** file. Be sure to set the port to value 1 for ttya.

7. If the **/opt/cc/aom/data/log** file has the message "aom cms alarm is disabled", enter:

   export PRODUCT_TYPE=TEST

   This enables the alarm.

Appendix A: Factory hardware installation

This section describes the hardware installation procedures that are done at the Avaya factory for a Sun Enterprise 3500 computer. You can use these procedures to configure an Enterprise 3500 computer to factory specifications.

The factory hardware installation procedures are divided into two main areas:

- General procedures on page 174
- Installing specific components on page 185

After you complete these factory hardware installation procedures, you must continue with Installation **on page 19** to finish assembling the Enterprise 3500 computer. After you assemble all of the parts on the computer, you must install the software using the appropriate software installation, maintenance, and troubleshooting document.

General procedures

This section describes the general procedures that are used for factory installation of system hardware components.

The following general procedures are included:

After you finish with these procedures, you should continue installing specific components:

ESD precautions

Before you work on components inside the Enterprise 3500 computer:

1. Make sure that the computer is plugged in to AC power.
2. Make sure that the power is off.
3. Attach the ESD wrist strap to the chassis frame and to your wrist.

Taking inventory of the parts

Before you begin the factory hardware installation, inventory the parts you received. In some cases, some parts are already installed in the correct locations. The parts include the following:

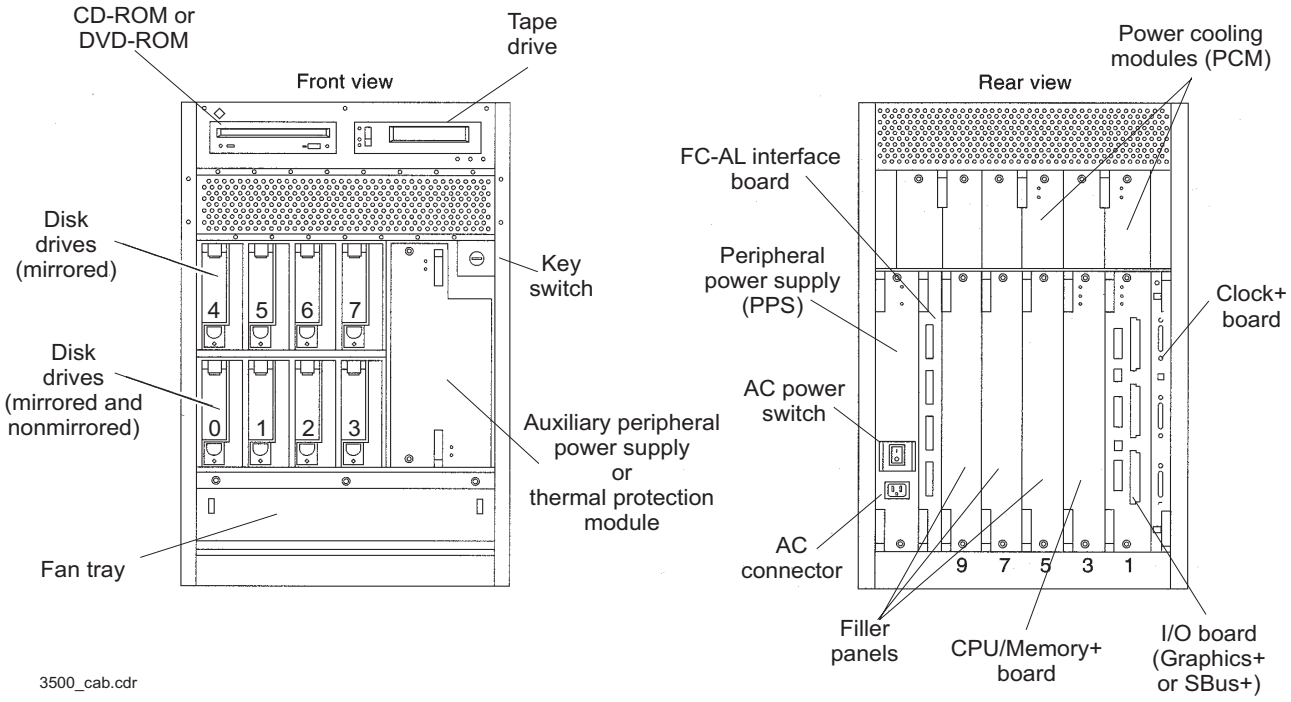
- Enterprise 3500 cabinet

- Power cords
- Monitor, keyboard, and mouse
- Monitor cable
- Keyboard cable
- Disk drives:
  - Minimum of one
  - Maximum of four for a CMS nonmirrored system
  - Maximum of eight for a CMS mirrored system
  - Maximum of eight for an Explorer II/NICE Analyzer system
- Power cooling modules (PCMs) (minimum one, maximum three)
- Peripheral power supply (PPS) and auxiliary PPS
- I/O boards (minimum one, maximum four)
- Fiber cables (minimum one, maximum two)

  WARNING:
  The plastic dust caps that are on the ends of the fiber cables must remain intact until you are ready to install the cables. Ensure that you observe the fiber-optic cable minimum bend radius rule when you handle the cables.
- GBIC modules
  - Two for a CMS nonmirrored system
  - Four for a CMS mirrored system
  - Two or four for an Explorer II/NICE Analyzer system
- I/O cards
  - Creator video card (monitor interface used with Graphics+ I/O boards)
  - Turbo GX video card (monitor interface used with SBus+ I/O boards)
  - SunFastEthernet card (optional)
  - Fast SCSI-Bus Ethernet (FSBE) card (optional)
  - High-Speed Serial Interface (HSI) card (optional)
  - Token Ring card (optional)
- CPU/Memory+ boards (minimum one, maximum four)
- UltraSPARC II CPU modules (minimum two, maximum eight)
- Memory modules (minimum 1-GB per system, maximum 2-GB per CPU/Memory+ board)

Computer layout

The following figure identifies the layout of the major components in an Enterprise 3500 computer.



Setting up the cabinet

To set up the cabinet for component installation:

1. Remove the front door key, which is also the power switch key, from the shipping container.
2. Open the front door of the cabinet.
3. Locate the key switch. Insert the key and verify that the key switch is turned to the standby position.
4. Verify that the AC power switch is in the Off position.
5. Connect the AC power cord to the cabinet and to an approved outlet.
6. Do *not* turn on the power yet. The power cord *must* be connected to a power outlet to provide the ground path that is necessary to remove and install the boards and other components safely.

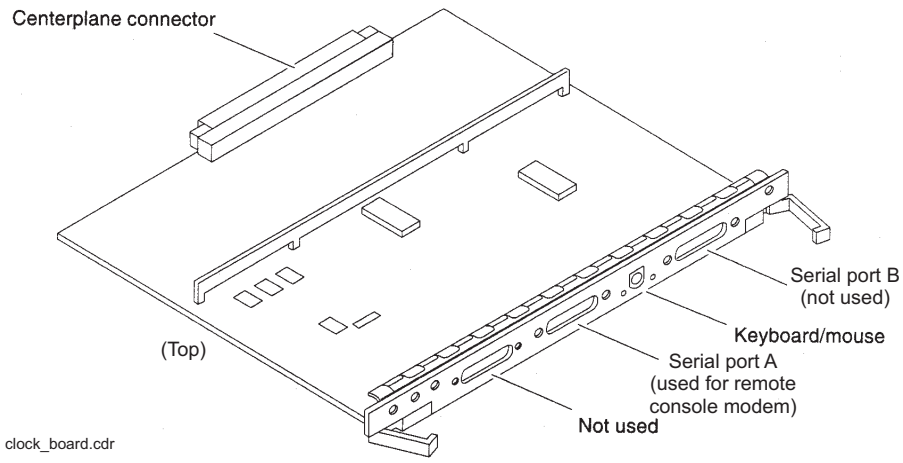
Identifying system boards

These sections illustrate the following system boards:

- Clock+ board
- CPU/Memory+ board
- Graphics+ I/O board
- SBus+ I/O board
- FC-AL interface board
- Filler panels

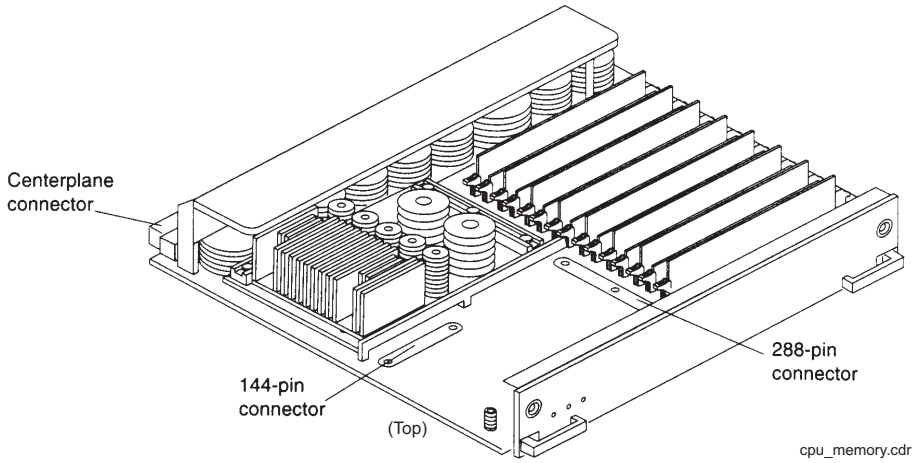
Clock+ board

The following figure shows the layout of the Clock+ board.



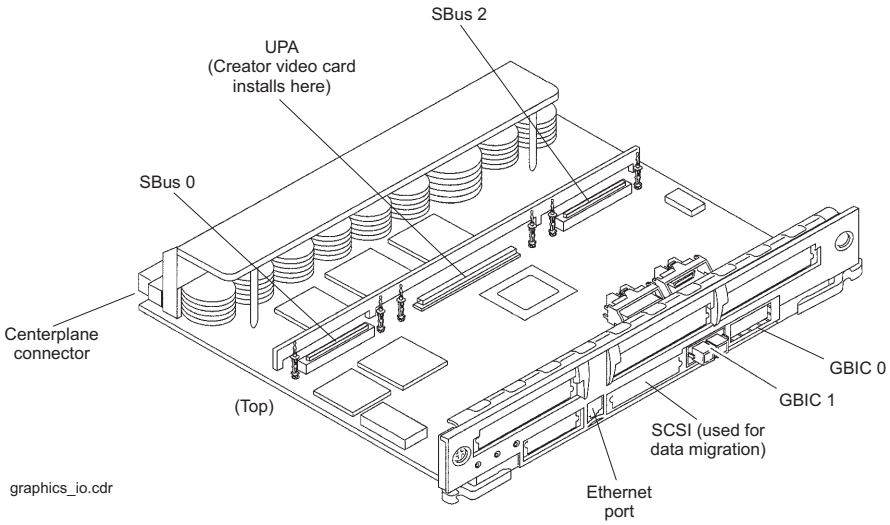
CPU/Memory+ board

The following figure shows the layout of the CPU/Memory+ board.



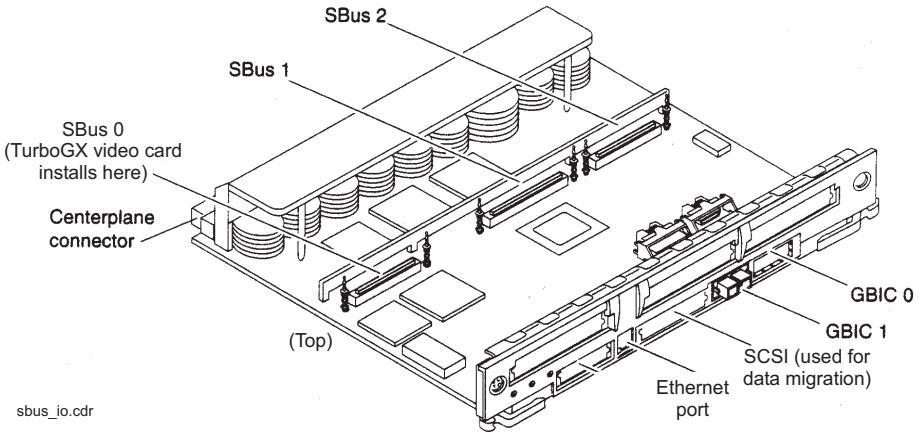
Graphics+ I/O board

The following figure shows the layout of the Graphics+ I/O board.



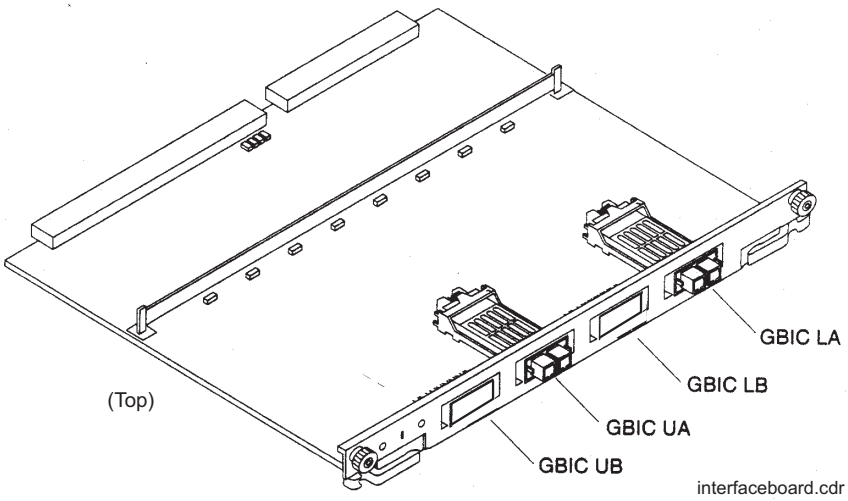
SBus+ I/O board

The following figure shows the layout of the SBus+ I/O board.



FC-AL interface board

The following figure shows the layout of the FC-AL interface board.

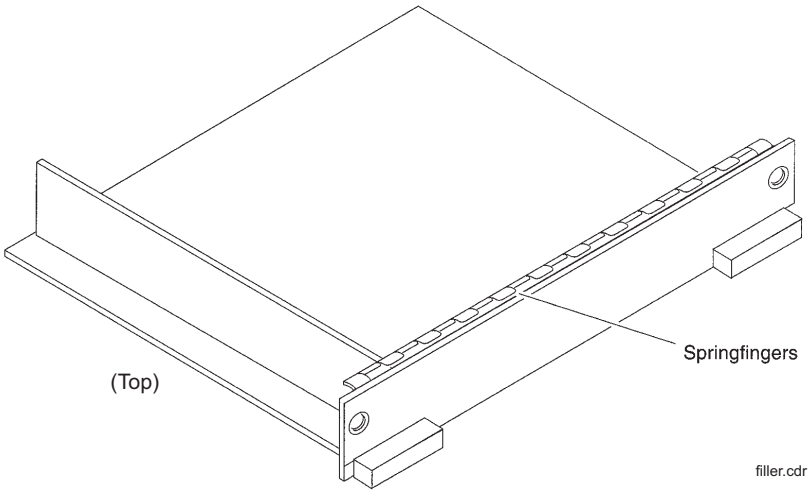


Filler panels

WARNING:

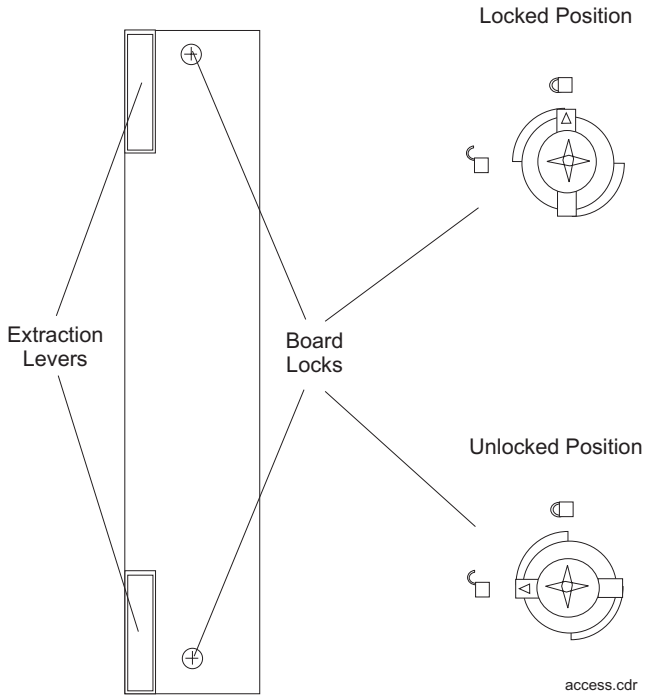
For proper cooling, all slots must have a functional board or a filler panel installed.

The free board slots are easily recognized because they are covered by filler panels. These panels have rectangular plastic knobs instead of extraction levers. You may need to remove the filler panels to install I/O boards or CPU/Memory+ boards. The following figure shows a filler panel.



Removing and installing boards

This section describes general procedures for removing and installing boards. Boards are accessed from the rear of the system. Each board is locked into place by a combination of extraction levers and board locks that help to seat the board in the centerplane receptacles. These centerplane receptacles and board locks align and attach the board to the system. The following figure shows the board-locking mechanisms.



Precautions for handling boards

To minimize the amount of board flexing, observe the following precautions:

WARNING:
You must wear an ESD wrist strap when installing or removing hardware components to prevent electrical discharge that can damage the system.

WARNING:
The CPU/Memory+ and I/O boards, and their modules and cards, have surface-mounted components that can break if you flex the boards.

- Hold the board only by the edges near the middle of the board, where the board stiffener is located. Do not hold the board only at the ends.
- When you remove the board from an antistatic bag, keep the board vertical until you lay it on an ESD mat.
- Do not place the board on a hard surface. Use a cushioned antistatic mat. The board connectors and components have very thin pins that bend easily.
- Transport the board in an antistatic bag.
- Be careful of the small parts that are located on the component side of the board.

Removing a board

To remove a board:

CAUTION:
A board should be removed from a powered-on system only after the Automatic System Reconfiguration (ASR) software has disabled that board. Otherwise, the operating system must be stopped and the system powered off prior to board removal.

1. Check to see that the board is in a “low-power mode.” A board is in low-power mode when:
   - All three LEDs on the board rear panel are unlit (power is turned off), or
   - The two outer green LEDs are unlit and the yellow LED in the middle is lit.
2. If the board is not in a low-power mode, stop the system and turn off the power.
3. Using a Phillips screwdriver, turn the two board locks to the unlocked position.
4. Pull outward on the ends of both extraction levers simultaneously.
5. Slide the board out of the computer.
6. Place the board on a padded ESD mat or store the board in an antistatic bag.

Installing a board

To install a board:

1. Open the extraction levers by pulling outward on the ends of both levers.
2. Insert the board part of the way into the slot, with the component side of the board on your right.
3. Slide the board into the computer, and push in on the extraction levers until they lock.

   WARNING:
   Do not push on the panel. if you do, you will damage the connector pins.
4. Using a Phillips screwdriver, rotate the board locks into the locked position.
5. Turn on power to the system, or reboot.

Note:

Adding a board may require that you also add a PCM. There must be one PCM for every two boards that are installed in the system. The PCMs must be installed adjacent to populated board slots to ensure that the fan in the PCM can cool the associated boards.

Synchronizing the clocks

Each I/O board has its own clock that must be synchronized with the system clock board for proper system operation. After adding, removing, or replacing an I/O board or the system clock board, the clock on the I/O board might become unsynchronized with the clock on the system clock board.

If the clocks need resynchronizing, the following message is displayed when you reboot:

```
Clock board TOD does not match TOD on any IO board
```

To synchronize the clocks:

1. If CMS is running, turn it off.
2. Enter:

   `/usr/sbin/shutdown -y -g0 -i0`

   The system shuts down and displays the `ok` prompt.
3. Enter:

   `copy-clock-tod-to-io-boards`

   This synchronizes the clocks.

4. Enter:

   boot -r

   This reboots the system and resynchronizes the clocks.

5. Turn on CMS.

Installing specific components

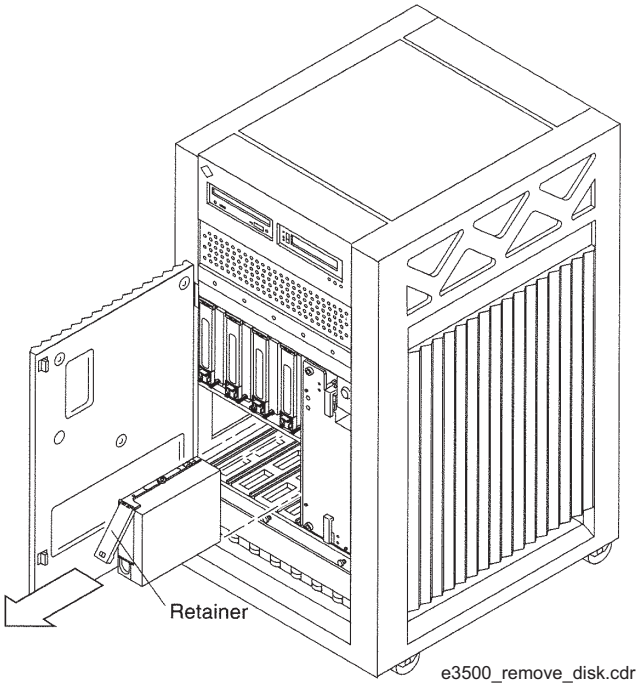
This section describes procedures used for factory installation of specific components. The following information is included:

After installing components, continue with Installation **on page 19**.

Installing disk drives

You install the internal hard disk drives in the front of the system. To expose the disk drive bays, open the front access door.

WARNING:
You must wear an ESD wrist strap when installing or removing disk drives to prevent electrical discharge that can harm system components.



For a CMS computer, you can install as many as four disk drives in a nonmirrored system, and eight in a mirrored system. For an Explorer II/NICE Analyzer computer, you can install as many as eight disk drives. The drive bays are numbered 0 through 3 on the lower level and 4 through 7 on the upper level.

In a CMS mirrored system, disk drives must be installed in pairs, and each pair must be the same size. For example, if you have disks in positions 0 and 1, the mirrored disks must be located in positions 4 and 5. For more information on disk mirroring, see:

- *CMS R12 Software Installation, Maintenance, and Troubleshooting,* 585-215-117
- *CMS R3V11 Software Installation, Maintenance, and Troubleshooting,* 585-215-115
- *CMS R3V9 Software Installation, Maintenance, and Troubleshooting,* 585-215-956
- *CMS R3V8 Disk-Mirrored Systems*, 585-210-940
- *CMS Disk-Mirrored Systems* for R3V6, 585-215-841

WARNING:
Do not use excessive force to seat the connector or to close the retainer latch. Using excessive force can damage the disk drive and computer.

Each disk drive has a retainer latch/drive handle on the front of the drive. To install a drive, unlatch and extend the retainer and slide the drive carefully into the appropriate drive bay. When the drive stops, gently apply pressure to the face of the drive until the connectors engage. Lower the retainer latch and snap it in place, making certain that the drive is secure and does not extend beyond the front of the chassis.

Installing memory

Depending on the configuration that was delivered from the factory, you may have to install memory modules. There can be as many as four CPU/Memory+ boards in the system.

Configuration rules

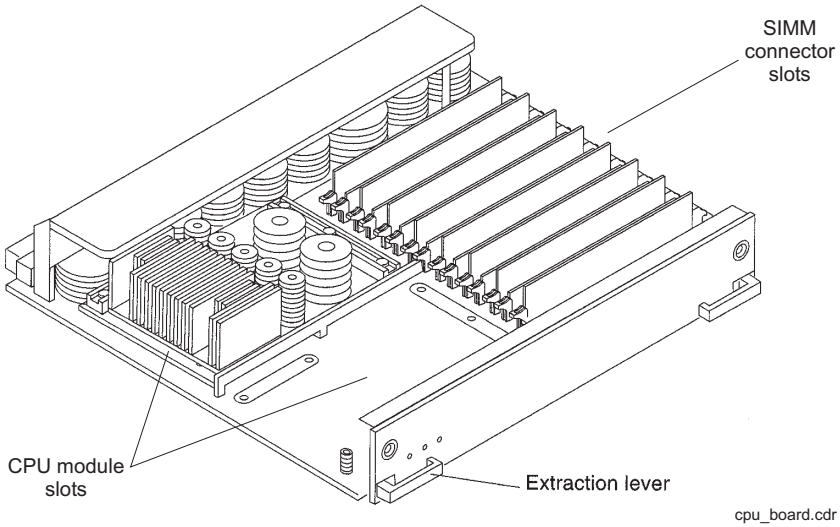
When installing memory in an Enterprise 3500, follow these rules:

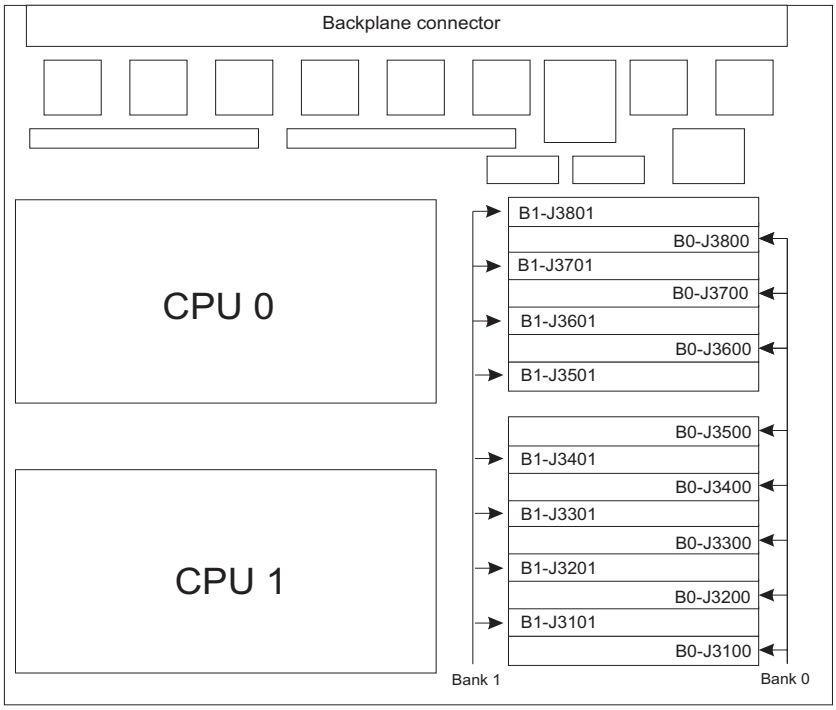
- All memory chips within one bank of eight must be the same size (32-MByte or 128-MByte).
- Bank 0 must be filled first.
- All eight slots in a bank must be filled.
- Both banks of memory chips on the first CPU/Memory+ board must be filled before you add a second CPU/Memory+ board.

Installing the SIMMs

To install the SIMMS, you must remove the CPU/Memory board from the computer, install the SIMMs, and replace the board.

CPU/Memory+ board and layout - The following figure shows the CPU/Memory+ board and component layout. The CPU/Memory+ board is usually found in slots 3, 5, 7, or 9 of the computer.





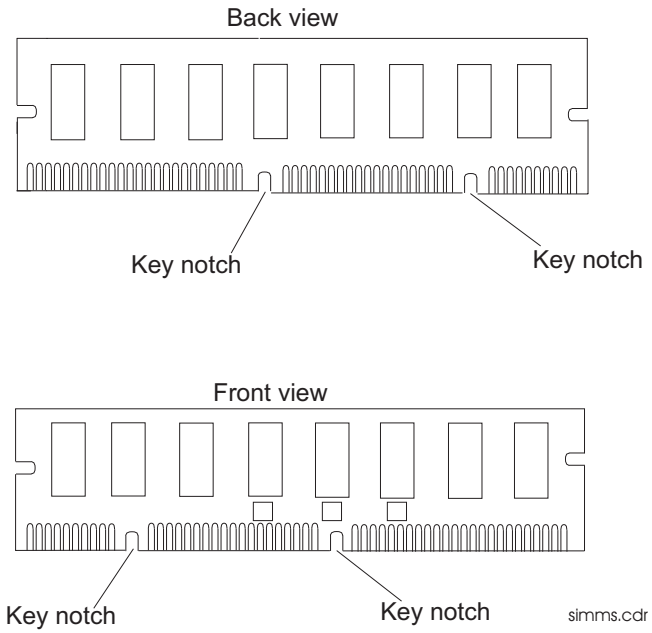
SIMM installation sequence - Fill the slots in the order that is shown in the following table. All eight slots in each bank must be filled.

	Installation Sequence	Slot Number
Bank 0	1	B0J3100
	2	B0J3200
	3	B0J3300
	4	B0J3400
	5	B0J3500
	6	B0J3600
	7	B0J3700
	8	B0J3800
Bank 1	9	B1J3101
	10	B1J3201
	11	B1J3301
	12	B1J3401
	13	B1J3501
	14	B1J3601
	15	B1J3701
	16	B1J3801

Inserting the SIMMs - The Enterprise 3500 is equipped with at least one bank of SIMMs installed. The current minimum configuration for an Enterprise 3500 is 1024 MB (1-GB). If you need to install additional SIMMs, they must be installed in full banks. The SIMMs that are delivered with your system could be 32-MB or 128-MB SIMMs. Each bank of SIMMs must be the same size. You cannot mix SIMMs of different sizes in the same bank.

To install a SIMM, you need to identify the front and back of the SIMM and align it in the connector on the CPU/Memory board.

This figure shows back and front views of a 32-MB SIMM. The 128-MB SIMMs have a similar appearance.



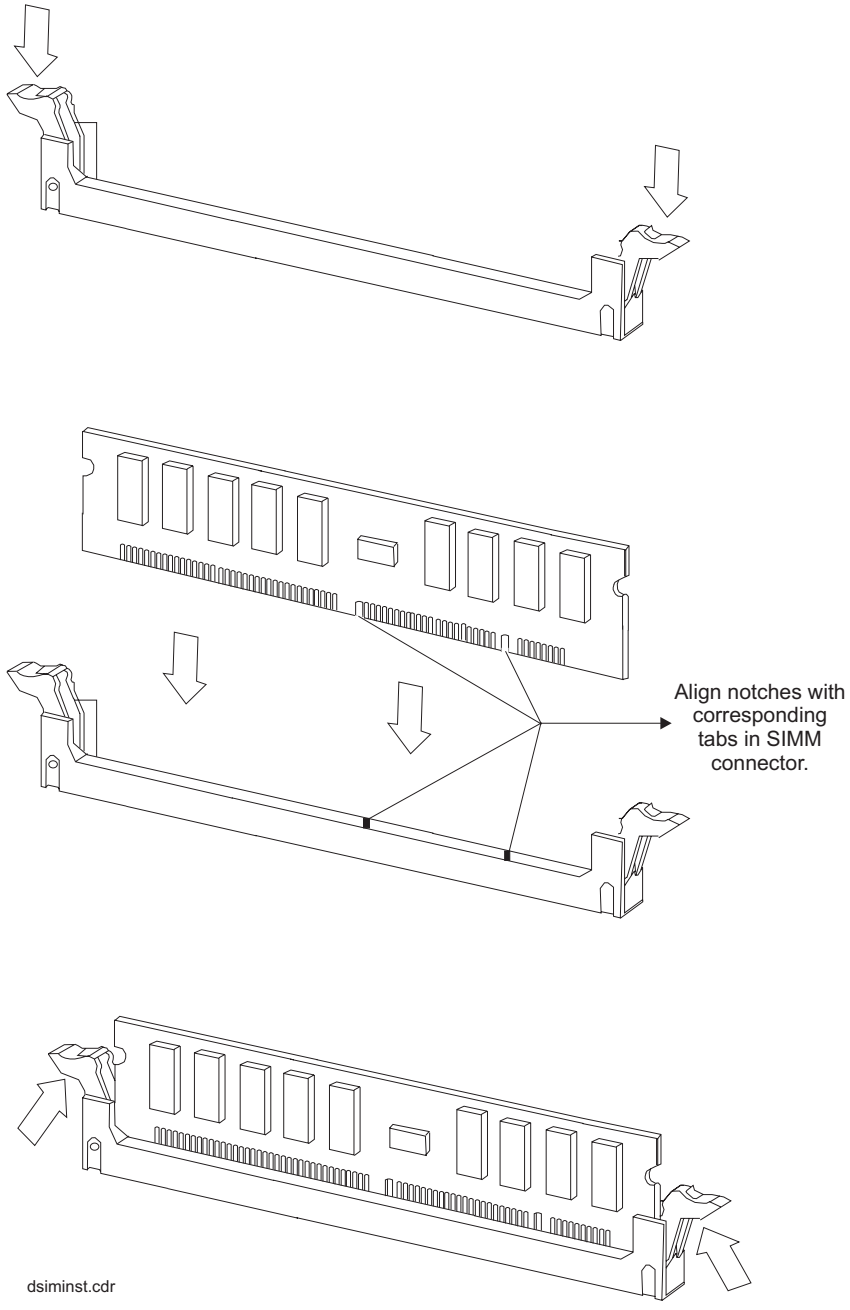
Locate the SIMM slots on the CPU/Memory board and install the appropriate SIMMs. All slots must contain the same speed and capacity SIMMs.

Fill one entire bank at a time. You will add memory in blocks of 256-MB or 1024-MB.

To install a SIMM:

1. Unlock (that is, press down on) the ejector levers at both ends of the connectors.
2. Insert the SIMM into the slot.

3. Relock the ejector levers.



Applying the kernel update to 400 MHz CPUs

When installing 400 MHz CPUs in an Enterprise 3500, installation of the kernel update (KU) patch is required to access the various improvements such as kernel level ecache scrubber and improved error messaging.

Install the following patch depending on your current Solaris release. These patches may be obtained from Sun Microsystems, Inc.

Solaris release	KU patch number
2.5.1	103640-34 or greater
2.6	105181-26 or greater
7 (5.7)	106541-14 or greater
8 (5.8)	108528-05 or greater

You must also edit the **`/etc/system`** file and insert the following lines:

```
* START OF MIRRORED SET STATEMENTS
set ecache_calls_a_sec=1
set ecache_scan_rate=1
set ecache_is_mirrored=1
* END OF MIRRORED SET STATEMENTS
```

Installing I/O cards

The I/O cards you may have to install or remove include the following:

- Creator video card (installed in card slot 1 of the Graphics+ I/O board in board slot 1)
- TurboGX+ video card (installed in card slot 0 of the SBus+ I/O board in board slot 1)
- SunFastEthernet card (optional) – This card has an ethernet port and a Media Independent Interface (MII) port. CMS uses only the ethernet port.
- FSBE card (optional) – This card has a SCSI port and an ethernet port.
- HSI card (optional)
- Token Ring card (optional, installed by the factory and provisioned by Professional Services)

As noted above, the video cards are installed in specific card slot locations depending on the board type. Only one video card is installed per system. The other I/O cards can be installed in any other available SBus card slots.

Use the following general instructions when installing, moving, and removing I/O cards. Other sections in this section describe specific I/O card maintenance instructions. Use those instructions as appropriate.

To install or remove an I/O card:

1. For a system that is currently in operation, verify that you have a recent CMSADM file system backup before you change I/O card configurations.
2. Enter:

   `/cms/toolsbin/rmSBusdev`

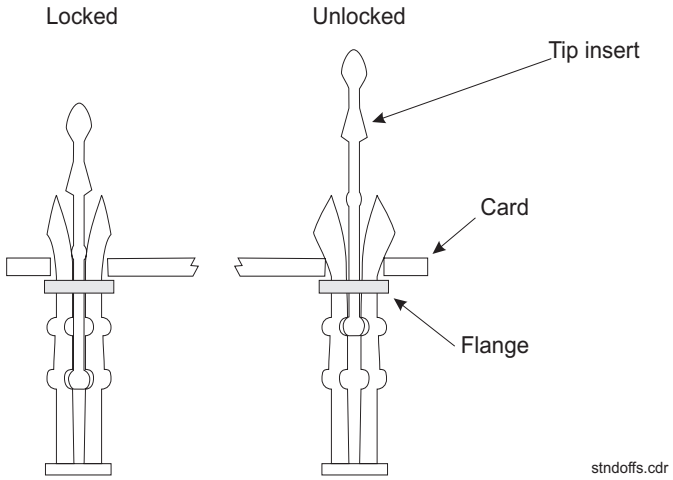
   The system queries whether you want to continue with the shutdown.
3. Enter: **`y`**

   This command removes the current I/O card configuration, and shuts down the system. When finished, the `ok` prompt displays.
4. Turn off the system.
5. Turn off the system monitor.
6. Turn off all external SCSI devices starting with the device that is closest to the system and working toward the farthest device.

   WARNING:
   You must wear an ESD wrist strap when installing or removing hardware components to prevent electrical discharge that can damage the system.
7. Remove the I/O board from the computer.
8. Remove the filler panel from the slot where you are installing the new card.
9. Unpack the I/O card and prepare it for installation.

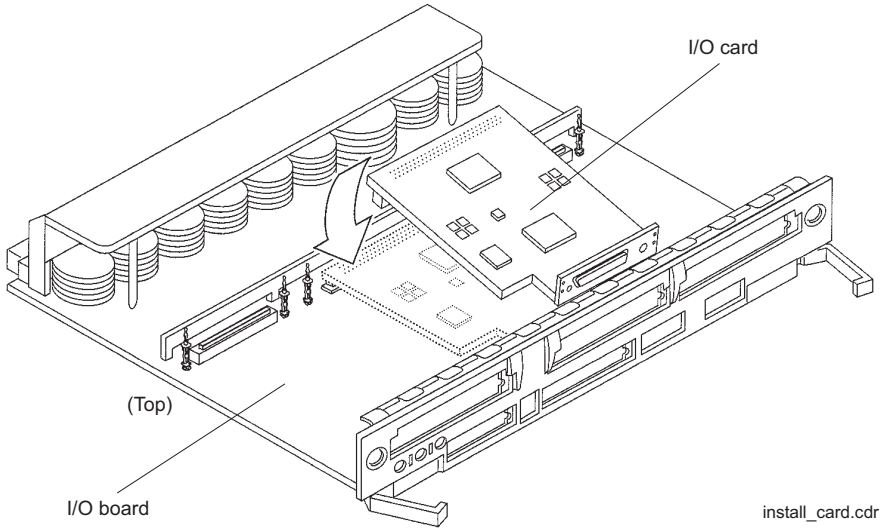
   Note:
   Depending on the card and packaging, some card preparation may be required. See the *Sun Enterprise 3500 System Reference Manual* for more information.

10. If the plastic standoffs for the I/O card slot are locked (that is, if they are in the down position), gently but firmly lift up on the tip inserts until they move to the unlocked position.



11. Holding the I/O card by the edges, place the I/O card faceplate under the spring finger and against the rear face of the I/O board front panel.

    The I/O connectors of the I/O card should be visible through the slot opening in the I/O board front panel.



12. Align the mounting holes in the rear of the I/O card with the unlocked plastic standoffs.
13. Gently but firmly press down on the rear corners of the I/O card until the connector is fully seated.
14. Gently but firmly press down on the tip insert of each plastic standoff until it seats into the locked position.

15. Replace the face plate screws through the front of the I/O board to secure the I/O card to the I/O board front panel.
16. Replace the I/O board in the slot from which you removed it in Step 1.
17. Remove the ESD wrist strap.
18. Turn on all external SCSI devices starting with the device that is farthest from the system and working toward the system.
19. Turn on the system monitor.
20. Turn on the system.
21. Press **Stop** plus **A** simultaneously after the console banner is displayed, but before the system starts booting.
22. Enter:

    ```
    boot -r
    ```

    This reboots the system so that it recognizes the new configuration.
23. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

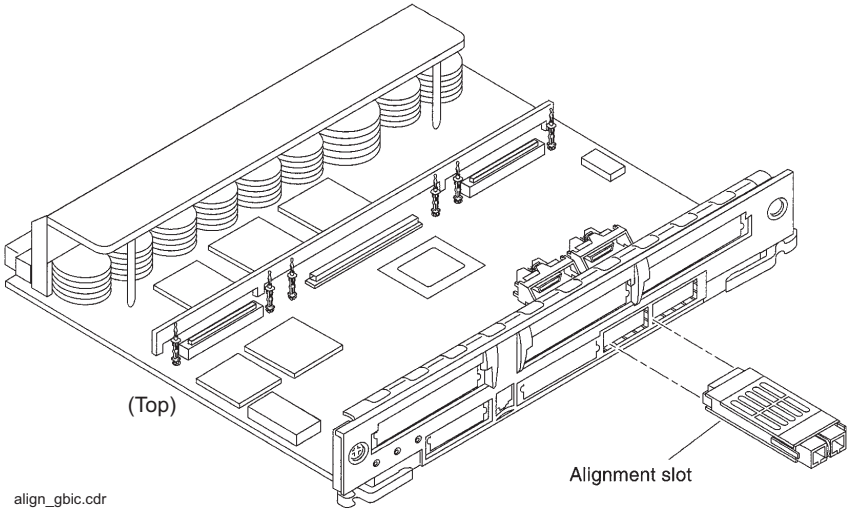
Installing GBIC modules

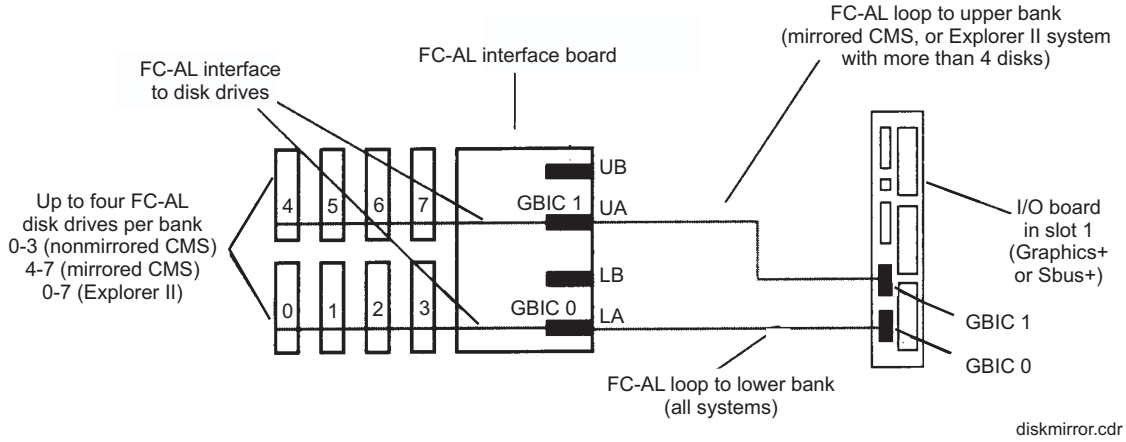
GBIC modules are required to connect a fiber cable from the FC-AL interface board to the first I/O board on the computer. For a nonmirrored system, one GBIC is preinstalled for each board from the Sun factory. For a mirrored system, you must install a second pair of GBIC modules to support a second fiber cable.

⚠ CAUTION:

Once you have installed a GBIC module in one slot, do not exchange with a GBIC module in another slot.

The following figure shows how a GBIC module is inserted into a GBIC slot on an I/O board. Use the same procedure when inserting a GBIC module in an FC-AL interface board.





Installing a power/cooling module (PCM)

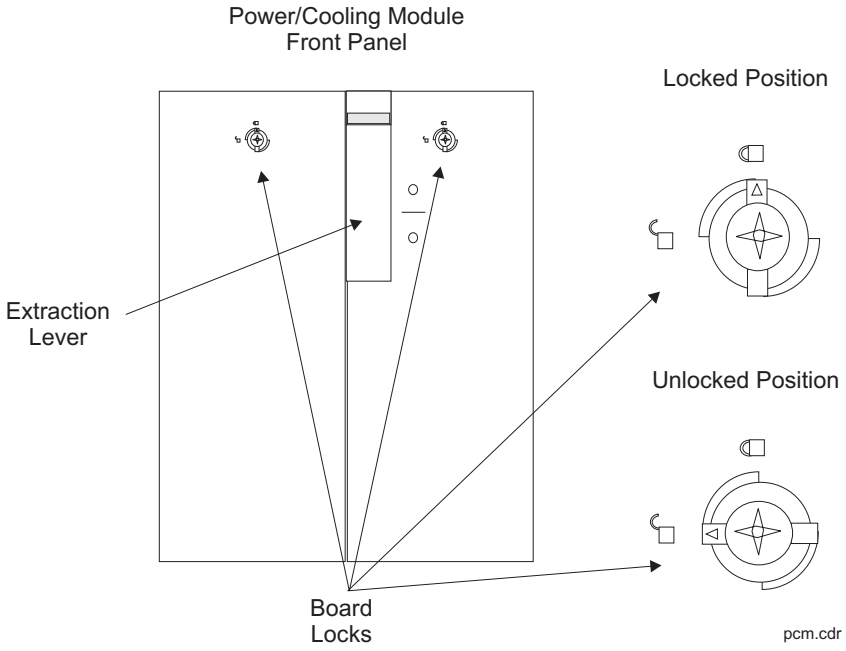
One power/cooling module (PCM) is needed for every two boards that are installed in the system. The PCM provides power and cooling.

The following table shows the PCM requirements for an Enterprise 3500 computer. A redundant PCM can be installed. If a redundant PCM is present and one PCM fails, the redundant PCM provides necessary power and cooling for the boards that were supported by the failed PCM.

Number of boards	Minimum number of working PCMs	Redundant working PCMs
1 to 2	1	2
3 to 4	2	3
5	3	3 plus an auxiliary peripheral power supply

A PCM is installed or removed in much the same manner as an I/O board.

The following figure shows a PCM faceplate.



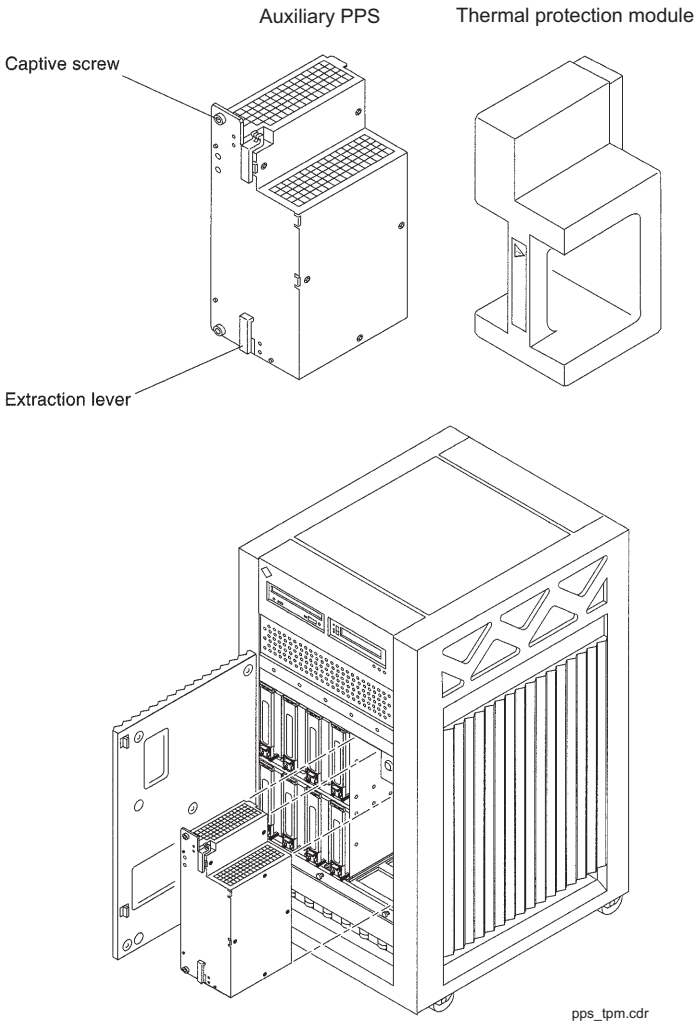
Installing an auxiliary peripheral power supply

The minimum configuration for an Enterprise 3500 computer includes the standard peripheral power supply (PPS). The standard PPS is located in the rear of the cabinet.

If required, you can also install an auxiliary PPS in place of the thermal protection module (TPM). The TPM is a piece of formed styrofoam that is located in the front of the cabinet. The auxiliary PPS is installed in the front of the cabinet in the area to the right of the disk drives. The auxiliary PPS is installed like the other boards in the computer.

⚠ CAUTION:

Do not throw away the TPM. If you ever remove the auxiliary PPS, you must replace it with the TPM.



Glossary

Automatic call distribution (ACD)	A switch feature. ACD is software that channels high-volume incoming call traffic to agent groups (splits or skills). Also an agent state where the extension is engaged in an ACD call (with the agent either talking to the caller or the call waiting on hold).
Boot	To load the system software into memory and start it running.
CMS	Call Management System (CMS). A software product used by business customers that have an Avaya telecommunications switch and receive a large volume of telephone calls that are processed through the Automatic Call Distribution (ACD) feature of the switch.
Data disk	A nonboot disk.
FC-AL	Fiber channel arbitrated loop.
FSBE	Fast SCSI bus ethernet
GBIC	Gigabit interface converters.
High Speed Serial Interface/SBus (HSI/S)	The HSI/S controller card is a 4-port serial communications SBus card. Each of the four ports is used for a single physical X.25 link. It is an add-on package that is needed by CMS for multiple ACDs.
Non-volatile random access memory (NVRAM)	A random access memory (RAM) system that holds its contents when external power is lost.
PCM	Power cooling module
PPS	Peripheral power supply
SBus	The input/output bus for the Sun computer. Provides slots for additional cards (for example, HSI Controller Card).

SCSI	See Small computer system interface (SCSI).
SCSI Bus	An industry standard peripheral bus that is used to connect intelligent peripherals to a computer. It uses a daisy-chained cabling arrangement that originates at the Host Adapter to interconnect up to seven intelligent peripheral controllers on the bus. The Sun computer uses a fast SCSI-2 implementation.
SCSI ID	Each tap on the SCSI bus is required to have a unique identification or address, which is the SCSI ID. The ID is set by a switch located on each controller.
SCSI single-ended bus	A version of the SCSI bus designed to minimize cost and space. Cable lengths up to 6 meters are supported. It is not compatible with the differential version of the SCSI bus.
SIMM	Single In-line Memory Module. A narrow printed circuit board that holds memory chips. It plugs into a SIMM socket on the motherboard or memory board.
Small computer system interface (SCSI)	A hardware interface that allows the connection of peripheral devices (such as hard disks, tape drives, CD-ROM drives, and DVD-ROM drives) to a computer system.
Solaris	The operating system package on the Sun computer. Solaris is a version of the UNIX System V Release 4. CMS and Explorer II/NICE Analyzer require Solaris to run on the Sun computers.
TPM	Thermal protection module
TSC	Technical service center. The Avaya organization that provides technical support for Avaya products.

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