Avaya Call Management System

Sun Blade 100/150 Workstation
Hardware Installation, Maintenance, and Troubleshooting

07-600964
May 2006

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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 Support Web site:

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E-mail:	totalware@gwsmail.com
Order:	Document No. 07-600964 May 2006

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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 Blade 100/150 Workstation Hardware Installation, Maintenance, and Troubleshooting is written for technicians who install and maintain call center applications such as Avaya Call Management System (CMS).

Note:
The Sun Blade 100 workstation is compatible with CMS R3V9 and later. The Sun Blade 150 workstation is compatible with CMS R3V11 and later.

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 includes the following topics:

- Installation on page 21 - Describes how to assemble the workstation, connect external devices, and turn on power.
- Maintenance on page 49 - Describes how to maintain the workstation.
- Troubleshooting on page 127 - Describes how to troubleshoot the workstation.
- Glossary on page 163
- Index on page 165

Conventions and terminology

Unless noted otherwise, the phrase "Sun Blade" used in this document applies to both the Sun Blade 100 workstation and the Sun Blade 150 workstation.

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

The May 2006 version of this document was changed for the following reasons:

- To add information about CMS R13.1.
- To add information about mirrored systems with 40-GB disk drives that require replacement with 80-GB disk drives. For more information, see Disk drive compatibility with CMS loads on page 75.
- To add information about RAM minimums (see Determining the workstation model on page 29).
- To make general wording and format corrections.

Issue 5.0 of this document was changed for the following reasons:

- To note that the DAT-72 tape drive is not supported on the Sun Blade 100. It is only supported on the Sun Blade 150.
- To add information about CMS R13.
- To add information about RAM minimums and module sizes (see Determining the workstation model on page 29 and Adding memory and replacing the CPU on page 121).
- To note that Network Terminal Server (NTS) connections are no longer supported (see Connecting to external interfaces on page 37).
- To add information about the single Gigabit Ethernet card (see Maintaining PCI cards on page 55).
- To make general wording and format corrections.

Issue 4.0 of this document was changed for the following reasons:

- To add information about the DAT-72 tape drive.
- To note that X.25 switch links are not supported for CMS R12 and later (see Connecting the switch link on page 37).
- To note that the SAI/P card is not supported for CMS R12 and later (see Connecting the serial port expander box on page 38 and Maintaining SAI/P cards on page 63).
- To note that external SCSI disk drives are not being offered for CMS R12 and later (see Connecting external SCSI devices on page 39 and Adding or replacing external SCSI disk drives on page 91).
- To update length limits for SCSI cables (see Connecting external SCSI devices on page 39 and Adding or replacing external SCSI disk drives on page 91).
- To update the remote console setup procedure (see Setting the remote console modem options on page 46).
- To add information about the 80-GB internal disk drive (see Partitioning disk drives on page 98).
- To update the tape ordering procedures (see Ordering tapes on page 112).
- To make general wording and format corrections.

Issue 3.2 of this document was changed for the following reasons:

- To add information about the new GigaSwift single ethernet card and the new UltraSCSI single SCSI card. These cards are replacing the SunSwift combination ethernet and SCSI card. See the following sections:
  - Peripheral connectivity on page 33
  - Parts list on page 34
  - Connecting external SCSI devices on page 39
  - Identifying installed PCI cards on page 45.
- To make general wording and format corrections.

Issue 3.1 of this document was changed for the following reasons:

- To add partitioning information for the 36-GB external SCSI disk drive (see Partitioning disk drives on page 98).
- To update the tape ordering procedures (see Ordering tapes on page 112).
- To make general wording and format corrections.

Issue 3.0 of this document was changed for the following reasons:

- To add information about the Sun Blade 150 workstation. The Sun Blade 150 replaces the Sun Blade 100. For differences between the two models, see Determining the workstation model on page 29.
- To update the target addresses for external disk drives (see Peripheral connectivity on page 33, Connecting external SCSI devices on page 39, Connecting SCSI disk drives on page 92, and Connecting SCSI tape drives on page 115).
- To update the procedures used to set options on the remote console modem (see Setting the remote console modem options on page 46).
- To update the procedures for installing PCI cards (see Maintaining PCI cards on page 55).
- To update the procedures for maintaining disk drives (see Maintaining disk drives on page 75).
- To update the OpenBoot procedures (see OpenBoot PROM firmware tests on page 139, OpenBoot diagnostic tests on page 144, and OpenBoot initialization commands on page 148).
- To update the procedure reassigning tape devices (see Reassigning device instance numbers for tape devices on page 155).
- To make general wording and format corrections.

Issue 2.0 of this document was changed for the following reasons:

- 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*.
- To correct the target address switch settings for external SCSI disk drives (see Peripheral connectivity on page 33 and Connecting external SCSI devices on page 39).
- To update the procedures used to set options on the remote console modem (see Setting the remote console modem options on page 46).
- To update the procedures for maintaining disk drives (see Maintaining disk drives on page 75).
- To add information about how to identify the IDE cable used with the secondary internal disk drive (see Adding or replacing the internal IDE mirror boot disk drive on page 83).
- To make general wording and format corrections.

Related documentation

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

Change descriptions

For information about recent changes made in Avaya CMS and Avaya Call Center, see:

- *Avaya Call Management System (CMS) Release 13.1 Change Description*, 07-600955
- *Avaya Call Center Release 3.1 Change Description*, 07-300560
- *Avaya Call Center 3.0 and Call Management System Release 13 Change Description*, 07-300304

Administration documents

For more information about Avaya CMS administration, see:

- *Avaya Call Management System Release 13 Administration,* 07-600956
- *Avaya Call Management System (CMS) Release 13 Database Items and Calculations,* 07-300330
- *Avaya Call Management System Supervisor Release 13 Reports*, 07-300334
- *Avaya Call Management System (CMS) Supervisor Release 13 Installation and Getting Started*, 07-300333
- *Avaya Call Management System High Availability User Guide*, 07-300066
- *Avaya Call Management System High Availability Connectivity, Upgrade and Administration*, 07-600957

Software documents

For more information about Avaya CMS software, see:

- *Avaya Call Management System Release 13 Software Installation, Maintenance, and Troubleshooting Guide,* 07-600954
- *Avaya CMS Open Database Connectivity Version 4.2,* 585-780-701
- *Avaya Call Management System Release 13 LAN Backup User Guide,* 07-600953
- *Avaya Call Management System Release 13 External Call History Interface,* 07-300737
- *Avaya CMS Custom Reports,* 585-215-822
- *Avaya CMS Forecast User Guide,* 585-215-825
- *Avaya Visual Vectors Release 13 Installation and Getting Started*, 07-300353
- *Avaya Visual Vectors Release 13 User Guide*, 07-300354
- *Avaya Call Management System (CMS) Supervisor Release 13 Report Designer*, 07-300743

Hardware documents

For more information about Avaya CMS hardware, see:

- *Avaya Call Management System Sun Netra 210 Computer Hardware Installation, Maintenance, and Troubleshooting,* 07-600963
- *Avaya Call Management System Sun Fire V880/V890 Computer Hardware Installation, Maintenance, and Troubleshooting,* 07-600965
- *Avaya Call Management System Sun Blade 100/150 Workstation Hardware Installation, Maintenance, and Troubleshooting,* 07-600964
- *Avaya Call Management System Terminals, Printers, and Modems,* 585-215-874

Call Center documents

For more information about Avaya Call Center documents, see:

- *Avaya Communication Manager Call Center Software Basic Call Management System (BCMS) Operations,* 07-300061
- *Avaya Call Center Call Vectoring and Expert Agent Selection (EAS) Guide*, 07-300477
- *Avaya Call Center Automatic Call Distribution (ACD) Guide*, 07-300478
- *Avaya Business Advocate User Guide*, 07-300653
- *Avaya Call Management System Switch Connections, Administration*, and *Troubleshooting*, 07-300739

Avaya CMS upgrade documents

There are several upgrade paths supported with Avaya CMS. There is a document designed to support each upgrade.

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, r13ak.g to r13al.k). A specific set of instructions is written for the upgrade. The instructions are shipped to the customer site with the CMS software CD-ROM as part of a Product Correction Notice (PCN).

For more information about base load upgrades, see:

- *Avaya Call Management System Release 13 Base Load Upgrade*

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 Netra 210). 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 R13).

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

- *Avaya Call Management System Release 13 Platform Upgrade and Data Migration*, 07-600968

Avaya Call Management System Upgrade Express (CUE)

Use CUE when CMS is being upgraded from an earlier version (for example, R3V9) to the latest version (for example, R13).

A specific set of upgrade instructions is written for the upgrade. These instructions are included on the CUE software CD-ROM that is shipped to the customer site with the CUE kit.

For information about customer requirements for CUE upgrades, see:

- *Avaya Call Management System Release 13 CMS Upgrade Express (CUE) Customer Requirements,* 700356744

For information about CUE upgrade procedures, see:

- *Avaya Call Management System Release 13.1 Sun Blade 100/150 Workstation Mirrored and Nonmirrored Systems CMS Upgrade Express (CUE)*, 07-600763
- *Avaya Call Management System Release 13.1 Sun Fire V880/V890 Computer CMS Upgrade Express (CUE),* 07-600764

Documentation Web sites

For Avaya product 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
- 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 workstation and related peripheral equipment. Use the following table to check off each required procedure after completion.

Procedure	Completed
Preparing for installation on page 22	
Unpacking and inventorying the equipment on page 27	
Setting up power on page 32	
Peripheral connectivity on page 33	
Connecting the monitor, keyboard, and mouse on page 35	
Connecting the remote console modem on page 36	
Connecting to external interfaces:	
• Connecting the switch link on page 37	
• Connecting to the customer network on page 38	
• Connecting the serial port expander box on page 38	
• Connecting external SCSI devices on page 39	
Turning on the system and verifying POST on page 42	
Identifying installed PCI cards on page 45	
Setting the remote console modem options on page 46	
Turning the system over for provisioning on page 48	

Preparing for installation

This section contains the following information that will help you prepare for the workstation 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. This 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.

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

System precautions

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

Wear antistatic wrist straps when handling any magnetic storage devices and printed circuit boards.

The workstation uses nominal input voltages of 90-264 V AC at 47-63 Hz. The workstation should be powered by an Uninterruptible Power Supply (UPS) or a non-switched, dedicated, 15-amp circuit. Sun products are designed to work with single-phase power systems having a grounded neutral conductor. To reduce the risk of electrical shock, do not plug Sun products into another type of power source. Contact your facilities manager or qualified electrician if you are unsure what type of power is supplied to your building.

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.

Each of the following items requires a separate power cord:

- Workstation
- External peripherals
- Monitor

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

Required tools

You need the following tools to do the installation:

- Phillips #2 screwdriver
- ESD grounding wrist strap
- Antistatic mat

Electrical specifications

Note:
For power integrity, a UPS is recommended for all installations.

Parameter	Value
Input current - Voltage range - Current, frequency range - Current, maximum	 100-240 V AC, autosensing 50-60 Hz 5A@120 V
Input power rating (total continuous power)	200 W
Volt-ampere rating	300 VA
BTU rating	967 BTU
Wall plug type - United States - Non-United States	 NEMA 5-15P Power cords must be obtained locally
CPU plug type	IEC 320

Physical specifications

Parameter	English value	Metric value
Height	4.65 inches	11.8 centimeters
Width	17.56 inches	44.6 centimeters
Depth	18.0 inches	45.7 centimeters
Weight	25.22 pounds	11.43 kilograms
Power cord	6.0 feet	1.8 meters

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.

See 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	4°F to 95°F (-15°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	95% RH at 140°F (60°C)
Altitude (max)	10,000 feet (3 kilometers)	40,000 feet (12 kilometers)

Miscellaneous specifications

Parameter	Value
Operating acoustic noise	5.2 decibels
Idling acoustic noise	5.1 decibels
Declared noise emissions in accordance with ISO 9296, measured at 23°C.	
Safety	UL 1950, CSA C22.2 No. 950, TUV EN 60950, CB Scheme with Nordic deviations, EMKO-TSE (74-SEC) 203, ZH1/618
RFI/EMI	FCC Class A and Class B DOC Class A and Class B ICES-003 BSMI Class A VCCI Class 2 EMC Directive 89/336/EEC
Immunity	EN 50082-1
X-ray	DHHS 21 Subchapter J; PTB German X-ray Decree
Power Management	Energy Star Compliant

Unpacking and inventorying the equipment

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

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

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

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.

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

In the United States, contact Avaya technical support if any parts are defective on arrival. Contact Avaya customer service if any parts are missing.

Outside of the United States, contact your Avaya representative or distributor if any parts are missing or defective.

This section includes the following topics:

Parts list

Verify that you have the following components before you begin installation:

Important:
DO NOT install internal hardware shipped loose with the Sun machine at this time. This will be done under the direction of the CMS Provisioning Engineer at a scheduled appointment time.

- Workstation (including installed PCI cards) and power cord
- Tape drive, power cord, and SCSI cable
- Monitor, cable, and monitor AC power cord
- USB keyboard and cable
- USB mouse and cable
- A package of blank tapes for backups
- One tape that contains the Avaya factory configuration CMSADM filesystem backup
- Category 5 LAN cable
- Modem and cables
- Sun and CMS software

Note:
CMS computers do not ship with tape drive cleaning tapes. Avaya recommends that customers purchase at least one cleaning tape as soon as the computer is installed and in service.

Determining the workstation model

This book is written for both the Sun Blade 100 and Sun Blade 150 workstations. Besides the name on the front panel, the differences between the models are few. This section describes how you can tell what model you have.

Features

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

- Sun Blade 100
  - 500 MHz CPU
  - 20-GB, 40-GB, or 80-GB internal boot disk (2 if mirrored)
  - 256-MB RAM minimum (1-GB maximum); Sun Blade 100 workstations require 1-GB of RAM
  - DDS-4 tape drive (the DAT 72 tape drive is not supported on the Sun Blade 100)
- Sun Blade 150
  - 650-MHz CPU
  - 40-GB or 80-GB internal boot disk (2 if mirrored)
  - 1-GB RAM minimum (2-GB maximum)
  - DDS-4 or DAT 72 tape drive (DAT 72 starting in June 2004)

Software check

Once the workstation is operational, you can log in as root and enter the following command to identify the model:

```
prtconf -vp | grep banner-name
```

The name of the workstation is displayed:

- Sun Blade 100

```
banner-name:  'Sun Blade 100 (UltraSPARC-IIe)'
```

- Sun Blade 150

```
banner-name:  'Sun Blade 150 (UltraSPARC-IIe 650MHz)'
```

Workstation layout

Familiarize yourself with the layout of the workstation.

Front panel

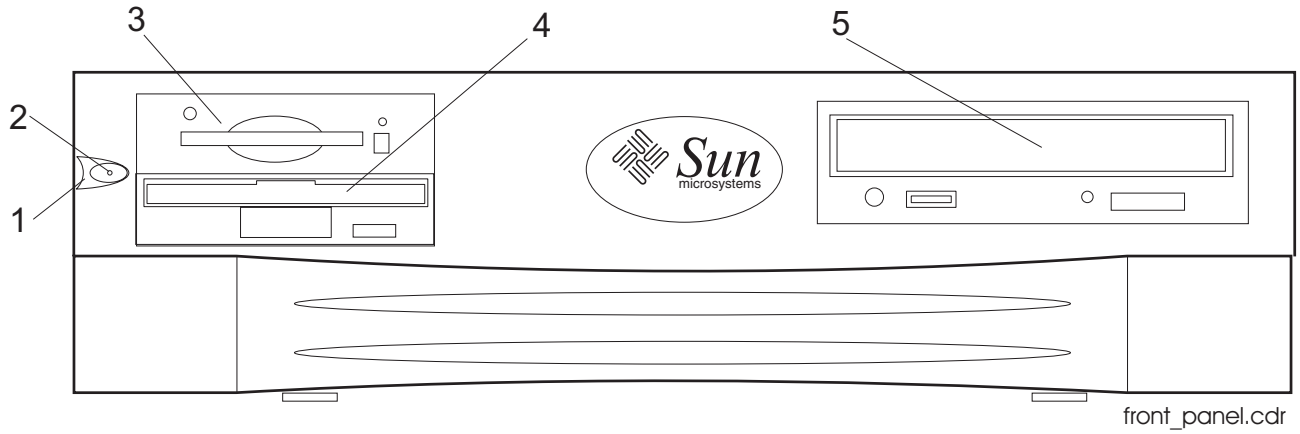


Figure notes:

1. Power switch
2. Power indicator LED
3. Smart card reader (not used)
4. Diskette drive (not used)
5. CD-ROM drive

Rear panel

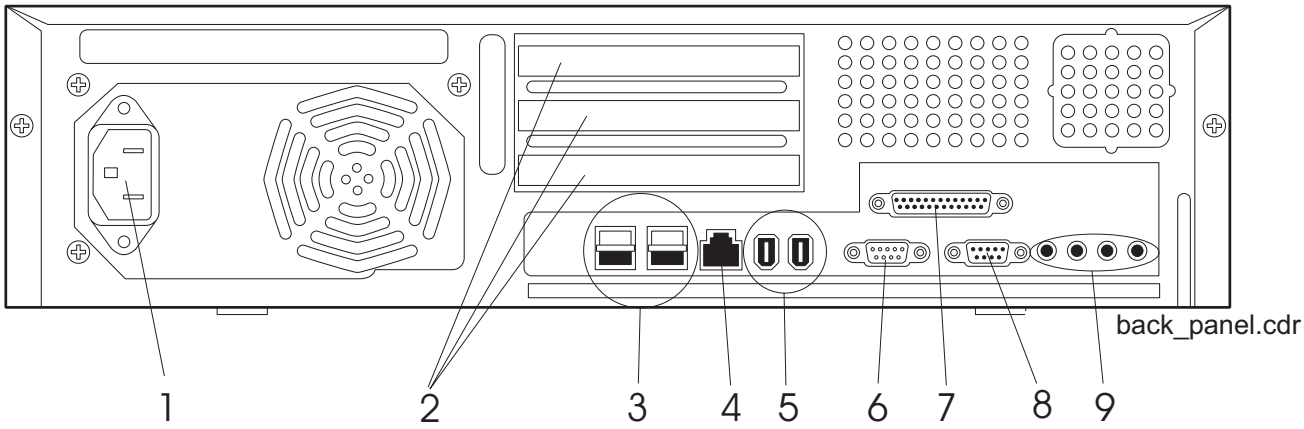


Figure notes:

1. Power connector
2. PCI slots (33 MHz)
3. USB connectors for keyboard and mouse (four - two used)
4. Twisted-pair ethernet (TPE) connector for LAN
5. IEEE 1394 connectors (two - not used)
6. VGA video connector
7. Parallel connector, DB-25
8. Serial connector, DB-9, RS-232 for remote console modem
9. Audio connectors (four - not used)

Setting up power

To set up the AC power:

1. Plug the IEC 320 end of the power cord into the AC connector.

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

2. Plug the power cord from the workstation into an outlet on the UPS.

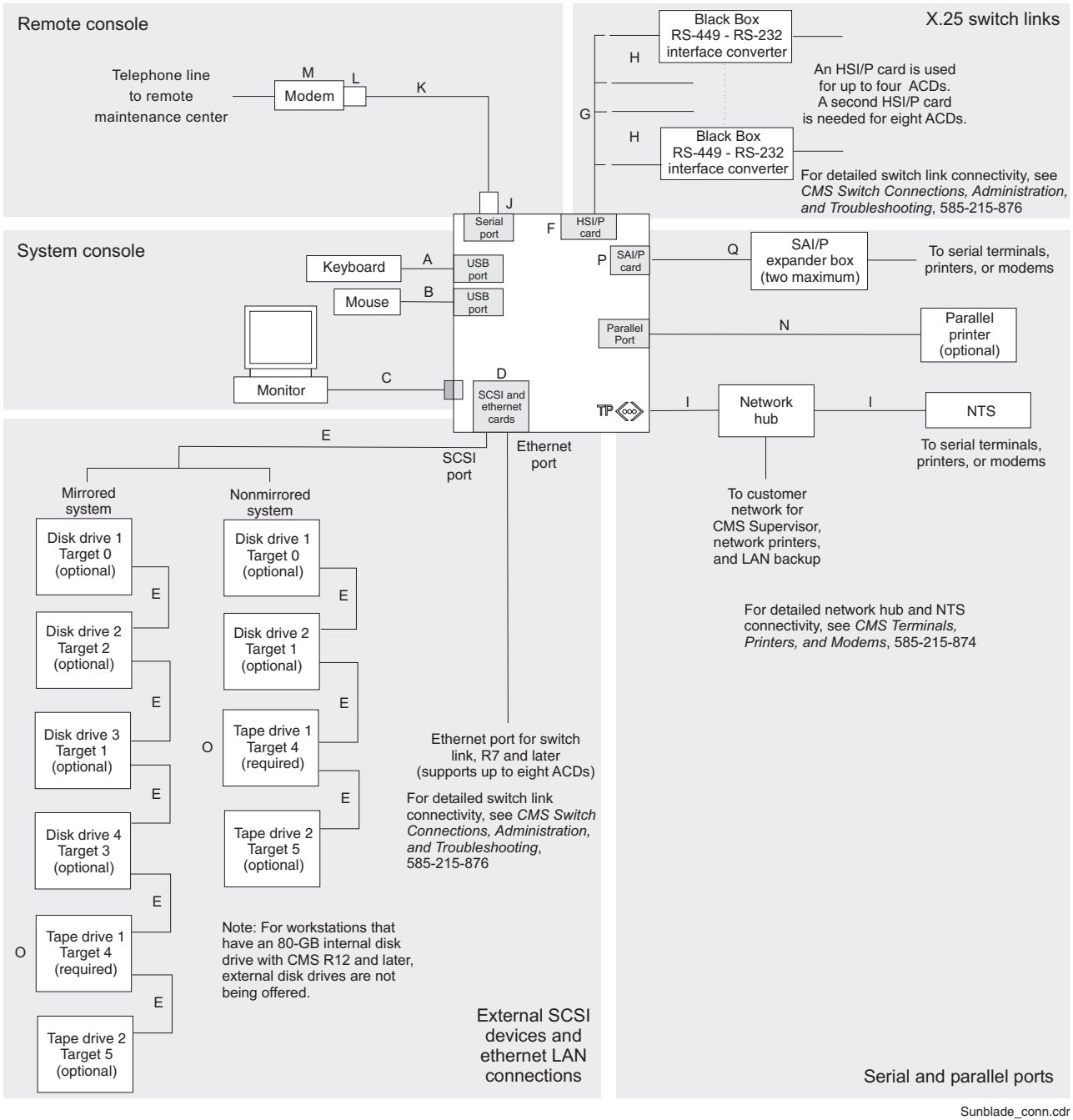
   A UPS provides a temporary electrical supply to a computer for several minutes, depending on the number of components connected to the UPS. For a CMS computer, a 2KVA minimum UPS is required for all installations. See your UPS documentation to determine the projected amount of backup battery time for 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.

   Important:
   Do not turn on power at this time.

Peripheral connectivity

The following diagram shows in general how equipment connects to the workstation. The callouts are described in Parts list on page 34.



Sunblade_conn.cdr

Parts list

The following table lists parts that are required to connect most of the external devices to the workstation. For information about switch connections for CMS, see *Avaya Call Management System Switch Connections, Administration, and Troubleshooting*.

Connectivity diagram call out	Comcode or part of comcode	Description
A[1]	N/A[2]	USB keyboard with cable
B[1]		USB mouse with cable
C[1]		Monitor cable
D[1]	Varies	SunSwift, GigaSwift, or UltraSCSI card
E[1]	407934470	68-to-68 pin SCSI cable and AC power cord
F[1]	408128288	HSI/P card (up to two may be installed)
G[1]		Quad cable (one per HSI/P card)
H	407086818	RS-449 cable (10 feet, 3 meters)
I	407086826	Category 5 UTP cord (10 feet, 3 meters)
J	846373413	DB9-to-RJ45 straight-through modem adapter
K	846983039	10-wire modular cable (10 feet, 3 meters)
L	846362770	RJ45-to-DB25 remote console adapter
M	407633999 Varies	Sportster 33.6 Model 839 remote console modem Comsphere 3910 remote console modem
N	408045326	Parallel printer cable
O[1]	N/A[2]	Tape drive
P[1]	408128247	SAI/P card (up to two may be installed with CMS R3V9 and R3V11 only; not supported in CMS R12)
Q[1]		SAI/P expander box (one per SAI/P card)

1. Sun Microsystems provides maintenance spares 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, keyboard, and mouse

The following figure shows how to connect the monitor, keyboard, and mouse to the workstation.

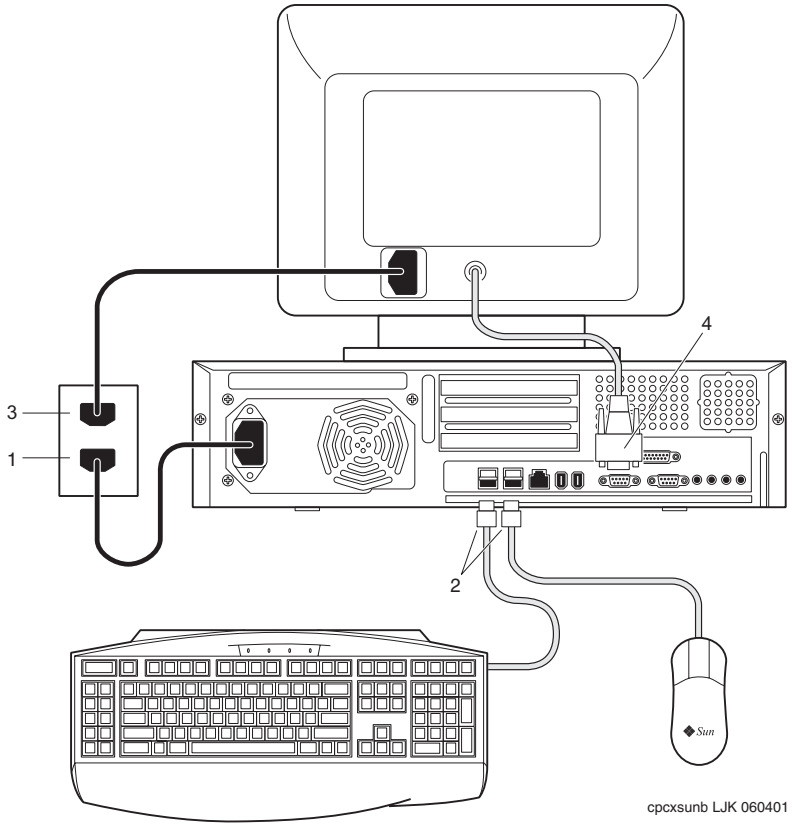


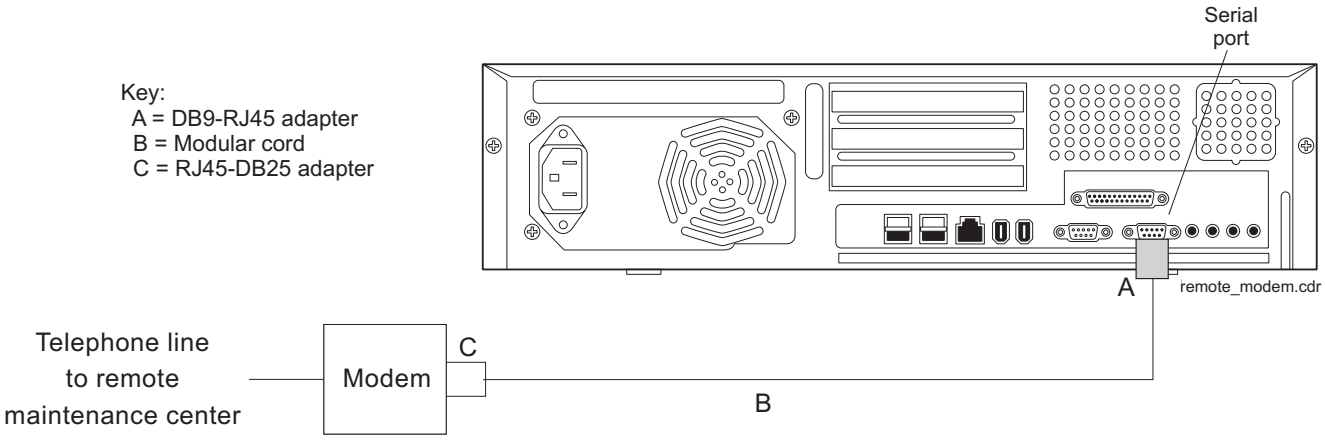
Figure notes:

1. Connect as described in Setting up power on page 32.
2. Connect the keyboard to one USB port and the mouse to another USB port.
3. Connect the power cord from the monitor to the UPS or wall outlet.
4. Connect the video cable from the monitor to the workstation. There may be a video port extender that can be installed.

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 do maintenance. The modem is a U.S. Robotics Sportster 33.6 Faxmodem in the U.S. and Canada or a modem provided locally for installations outside of the U.S. and Canada.

The following figure shows remote console modem connectivity.



To connect the remote console modem:

1. Connect the DB9-to-RJ45 straight-through adapter (A) to the serial port on the back of the workstation. There may be a serial port extender that can be installed.
2. Connect the modular cord (B) to the RJ45 end of the adapter (A).
3. Connect the other end of the modular cord (B) to the RJ45 end of the RJ45-to-DB25 remote console adapter (C).
4. Connect the remote console adapter (C) 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 cord and transformer to the modem and plug the power cord into an AC wall outlet. Each modem comes with a power cord and transformer.

Do not turn on the power yet. Instructions for powering on the modem are given in Setting the remote console modem options on page 46.

Connecting to external interfaces

This section describes the external interfaces connected to the computer. This section includes the following topics:

Connecting the switch link

Use either of the following two ways to connect a CMS computer to a switch:

- TCP/IP over a local area network (LAN) at 10/100 Mbps
- X.25 protocol over a hard-wired or switched link (not supported for CMS R12 and later)

One CMS computer can collect data from several switches. To the CMS computer, each switch represents one ACD. You can have all switches connected using TCP/IP, all switches connected using X.25 protocol (not supported for CMS R12 and later), or some combination of the two protocols.

For detailed information about how to connect and administer the switch link, see *Avaya Call Management System Switch Connections, Administration, and Troubleshooting*.

Connecting to the customer network

The Sun Blade workstation supports ethernet cards that support network speeds of 10/100 Mbps and 1 Gbps. However, for CMS installations, Avaya recommends that you only use speeds at the 10/100 Mbps speed range.

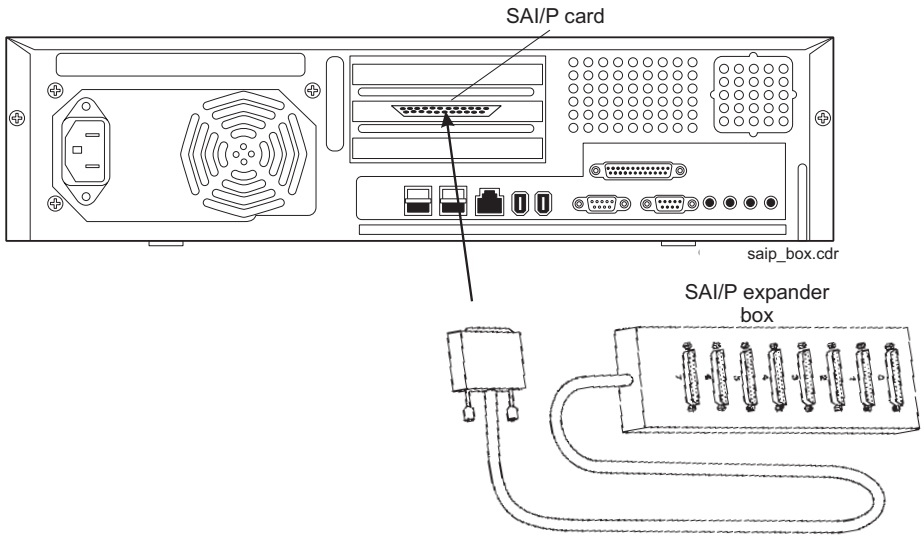
Procedures for connecting a network hub unit and an NTS to a customer network are found in *Avaya CMS Terminals, Printers, and Modems*. Procedures for installing NTS software are found in the CMS software installation, maintenance, and troubleshooting document that applies to your CMS version.

For general release, Avaya CMS R12 and later does not support serial connections on an NTS. Customers that previously used an NTS for serial connections must convert to network connections.

Note:
In certain permissive-use cases, customers can continue to use an NTS for serial connectivity. Contact Avaya support for information about Avaya's permissive use policy and using an NTS with CMS R12 and later.

Connecting the serial port expander box

To connect serial devices to the workstation, you can use a Serial Asynchronous Interface/PCI (SAI/P) expander box (not supported for CMS R12 and later). The SAI/P card is used to connect terminals, printers, and modems to the workstation. Each SAI/P card is shipped with an expander box that attaches to the SAI/P card and breaks out eight RS232 serial ports (see the figure below). There can be up to two SAI/P cards and two expander boxes on each workstation.



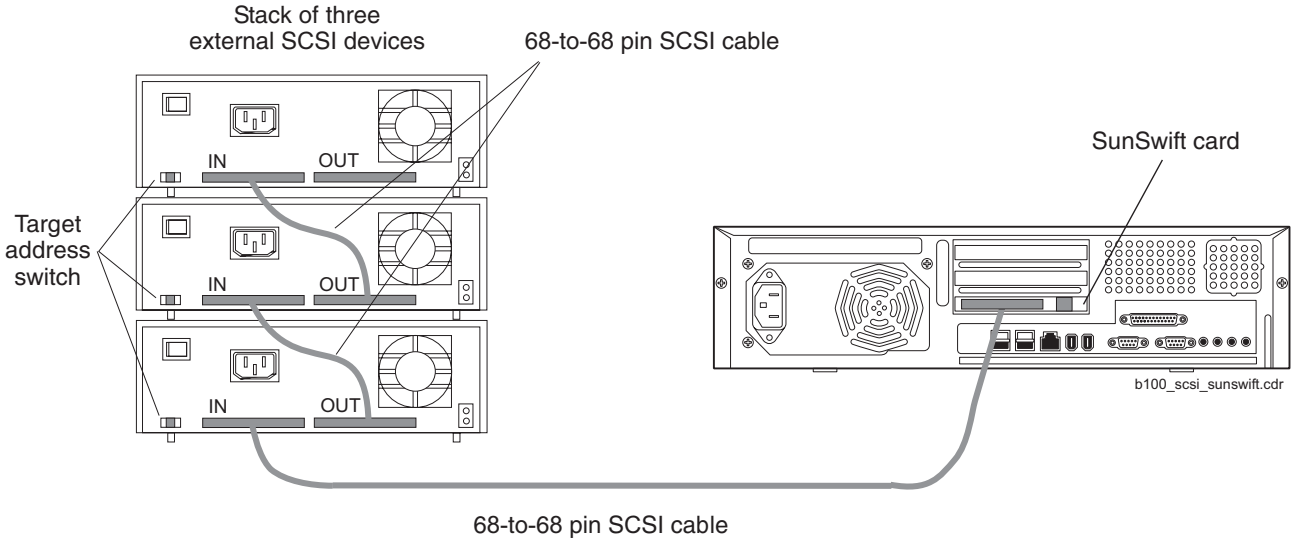
Connecting external SCSI devices

This section describes how to connect the SCSI devices (tape drives and disk drives) to the workstation. SCSI devices connect to either a SunSwift card or to an UltraSCSI card.

Note:
For workstations that have an 80-GB internal disk drive with CMS R12 and later, external disk drives are not being offered.

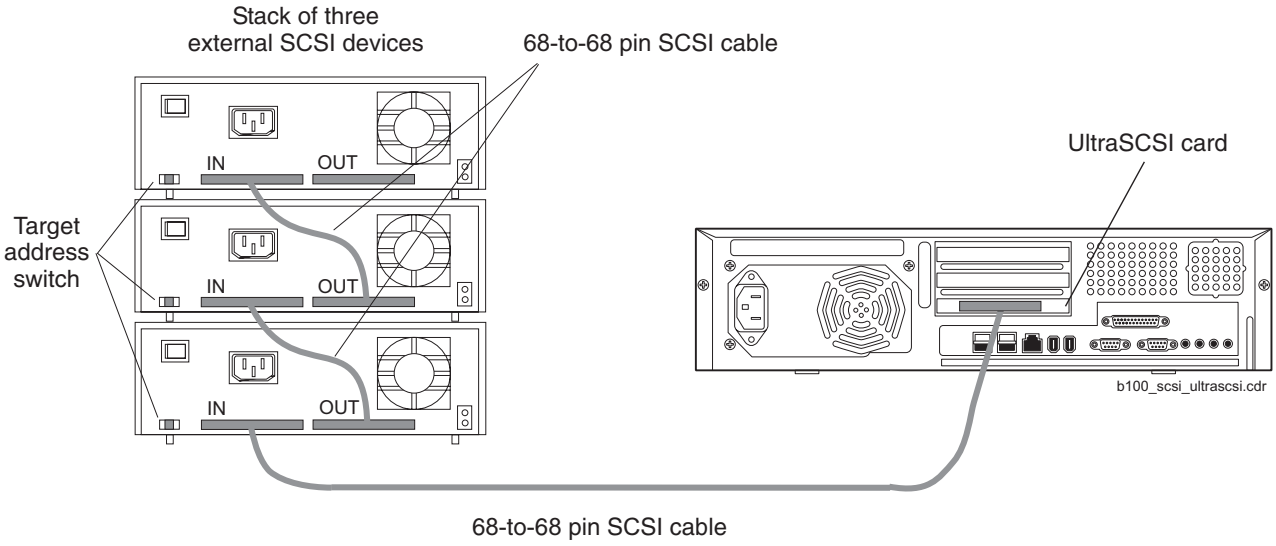
The following figure shows how to connect SCSI disk drives and tape drives to a SunSwift card. A 68-to-68-pin SCSI cable connects from the SunSwift PCI card on the back of the workstation to the IN connector on the back of the SCSI device that is closest to the workstation. If you have more than one SunSwift card, connect the drives to the card in the lowest slot number.
A 68-to-68 pin SCSI cable connects from the OUT connector of that device to the IN connector of the next device. Continue this process until all assigned devices are connected in the SCSI chain.

CAUTION:
There are limits to the length of cables you can use with SCSI devices. If you only have one SCSI device, the cable can be 6m (20 ft) long. If you have up to four SCSI devices, each cable can be 3m (10 ft) long. If you have more than four SCSI devices, each cable can be 1.5m (5 ft) long. If you use cables that are too long, you will get SCSI bus errors.



The following figure shows how to connect SCSI disk drives and tape drives to an UltraSCSI card. A 68-to-68-pin SCSI cable connects from the UltraSCSI PCI card on the back of the workstation to the IN connector on the back of the SCSI device that is closest to the workstation. A 68-to-68 pin SCSI cable connects from the OUT connector of that device to the IN connector of the next device. Continue this process until all assigned devices are connected in the SCSI chain.

CAUTION:
There are limits to the length of cables you can use with SCSI devices. If you only have one SCSI device, the cable can be 6m (20 ft) long. If you have up to four SCSI devices, each cable can be 3m (10 ft) long. If you have more than four SCSI devices, each cable can be 1.5m (5 ft) long. If you use cables that are too long, you will get SCSI bus errors.



When connecting SCSI devices, the last device in the chain MUST be terminated, either via an auto-terminated device or with a manual terminator.

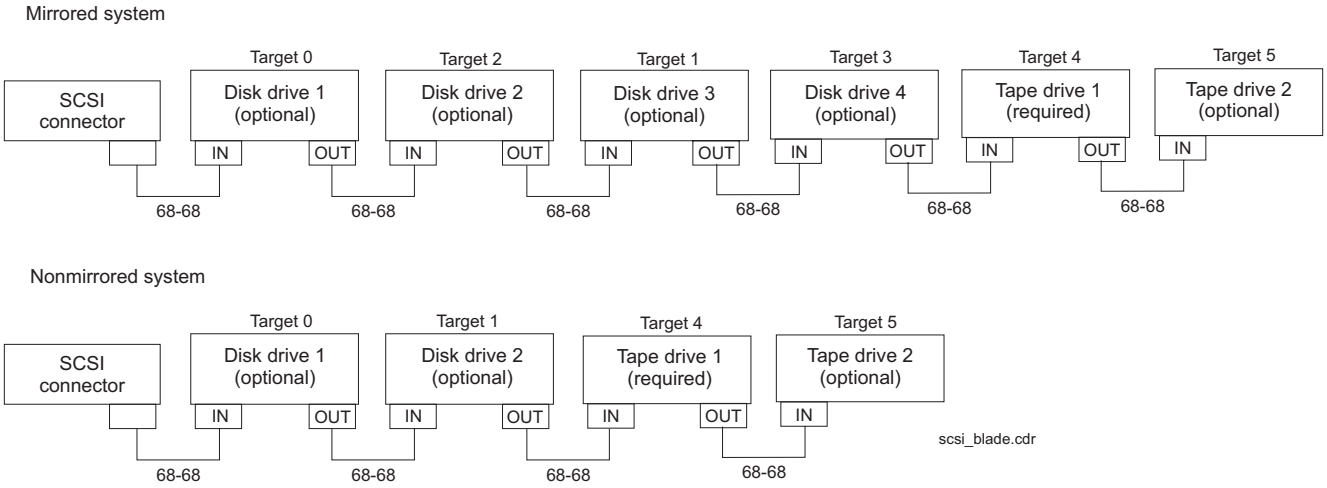
When using an auto-terminated SCSI device, you do not need to connect a SCSI terminator to the OUT connector of the last SCSI device in the chain. To verify that the last device is auto-terminated, check the LEDs labeled Auto Term High and Auto Term Low on the back panel of the device. In a CMS configuration, both LEDs are lit on the last device in the SCSI chain. If a device in the SCSI chain is not the last device, neither termination LED is lit.

When using a manually-terminated device, you must connect a SCSI terminator to the OUT connector of the last SCSI device in the chain. When you connect the SCSI terminator to the OUT connector, the LED on the terminator is lit.

The OUT connector of the DAT 72 tape drive must have a termination plug installed. The DAT 72 tape drive does not auto terminate. All DAT 72 tape drives delivered from the factory have termination plugs installed.

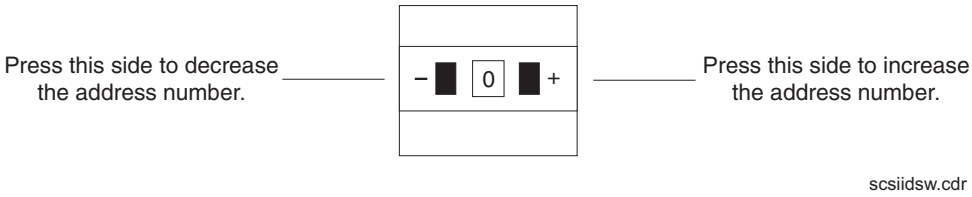
The following figure shows the SCSI cabling. The target addresses are different for mirrored and nonmirrored systems. Nonmirrored systems support only two external disk drives.

CAUTION:
There are limits to the length of cables you can use with SCSI devices. If you only have one SCSI device, the cable can be 6m (20 ft) long. If you have up to four SCSI devices, each cable can be 3m (10 ft) long. If you have more than four SCSI devices, each cable can be 1.5m (5 ft) long. If you use cables that are too long, you will get SCSI bus errors.



Important:
Each pair of SCSI disk drives in a mirrored system must be the same size.

The addresses are set using the target address switches on the back of each SCSI device. Before setting the target address, make sure that the power is off on the SCSI device.



Turning on the system and verifying POST

Once you assemble the system, including the loose hardware that is shipped with the system that you installed with help from CMS Provisioning, turn on the system and verify the results of the Power-On Self Test (POST).

To turn on the system and verify POST:

1. Plug the power cord of the UPS into an AC outlet.
2. Turn on the power to the UPS.
3. Turn on all external SCSI devices, starting with the device farthest from the system and working toward the system.
4. Turn on the system monitor.
5. Turn on the system.

   The system beeps, the power button LED will blink six times, and turns solid after OpenBoot PROM (OBP) initialization. POST diagnostics begin.

   Note:
   The POST diagnostics will occur each time you turn on the system. The POST tests the basic system components. This may take several minutes.
6. While the system is first booting up, press **Stop**+**A** simultaneously to put the system in the monitor mode.

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

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

   ```
   reset-all
   ```

   The system resets to the **`ok`** prompt.

8. Enter:

   probe-ide

   This verifies that the system sees all integrated drive electronics (IDE) devices. A message similar to the following is displayed:

```
Device 0  ( Primary Master )
        ATA Model: ST320420A

Device 1  ( Primary Slave )
       Removable ATAPI Model: LTN4855

Device 2  ( Secondary Master )
        ATA Model: ST320420A

Device 3  ( Secondary Slave )
       Not Present
```

   In this example, the devices listed are as follows:

   - Device 0 is the primary internal hard drive.
   - Device 1 is the CD-ROM drive.
   - Device 2 is the optional second internal hard drive, if present for mirroring.
   - Device 3 is not present.

   Note:
   The actual devices listed depends on the devices installed on the IDE busses.

9. Enter:

   reset-all

   The system resets to the **ok** prompt.

10. Enter:

    probe-scsi-all

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

```
/pci@1f,0/pci@5/pci@2/SUNW,isptwo@4
Target 0
  Unit 0  Disk      SEAGATE ST318203LSUN18G 034A
Target 4
  Unit 0  Removeable Tape     HP      C5683A        C005
```

    In this example, the devices listed are as follows:

    - Target 0 is an external 18-GB hard drive.
    - Target 4 is an external tape drive.

    Note:
    The actual devices listed depends on the devices installed on the SCSI bus.

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

    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.

    setenv auto-boot? true

    boot

    The system reboots.

Identifying installed PCI cards

If there are problems with the PCI cards, do the following to troubleshoot the problem. If all cards are operational, you can skip this section.

At the command prompt, enter:

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

In the section **IO Devices**, 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 Devices ================================
Bus   Freq      Slot +  Name +
Type  MHz       Status  Path                          Model
----  ----  ----------  ----------------------------  --------------------
pci    33   +s/system-board  isa/isadma (dma) okay  /pci@1f,0/isa@7/dma
pci    33   +s/system-board  isa/su (serial) okay  /pci@1f,0/isa@7/serial@0,3f8
pci    33   +s/system-board  isa/su (serial) okay  /pci@1f,0/isa@7/serial@0,2e8
pci    33   +s/system-board  pci108e,1101 (network)        SUNW,pci-eri okay  /pci@1f,0/network@c,1
pci    33   +s/system-board  firewire (firewire) okay  /pci@1f,0/firewire
pci    33   +s/system-board  pci10b9,5451 (sound) okay  /pci@1f,0/sound
pci    33   +s/system-board  pci10b9,5229 (ide) okay  /pci@1f,0/ide@d
pci    33   +s/system-board  SUNW,m64B (display)           ATY,RageXL okay  /pci@1f,0/SUNW,m64B@13
pci    33   +tem-board/PCI1  scsi-pci1000,f (scsi-2) okay  /pci@1f,0/pci/scsi
   .
   .
```

In this example, Slot 1 (the bottom slot) has an UltraSCSI card. All other devices listed are on the system board.

Setting the remote console modem options

The computer uses a modem for remote console access. The U.S. Robotics Sportster 33.6 Faxmodem is used in the U.S. and Canada. Outside of the U.S. and Canada, modems are purchased and set up according to local practices.

For instructions for connecting the modem, see Connecting the remote console modem on page 36.

New Sportster 33.6 faxmodems that come from the factory usually work with the CMS without any special option settings. All you have to do is set DIP switches 4 and 8 on the back panel of the modem to the down (ON) position and set all other DIP switches to the up (OFF) position. After doing this, test the modem for a connection. You may not have to do the procedure in this section.

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:

   /cms/install/bin/abcadm -r ttya

   The following message is displayed:

```
ttya is currently set to be incoming

Are you sure you want to change it? [y,n,?]
```

5. Enter: **y**

   The following message is displayed:

```
ttya administration removed
```

6. Enter:

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

   The following message is displayed:

```
Connected
```

7. Enter the following commands:

   AT

   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.

8. After you enter the options, disconnect from the modem by entering a tilde and a period (~.).

   The following message is displayed:

```
Disconnected
```

9. 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.
10. Reset the modem by turning the power off and back on.
11. Enter:

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

    The following message is displayed:

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

12. Verify that the AA (auto-answer), TR (terminal ready), and CS (clear-to-send) LEDS are lit on the modem.
13. Have the provisioning team dial in to the modem for testing.

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

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:

Precautions

DANGER:
Hazardous energy levels are present inside the system when the system remains connected to a power source. Be sure to follow the safety procedures in the owner's guide or service manual.

WARNING:
Before replacing any component in the system, you must turn off the computer and disconnect the AC power cord.

CAUTION:
Printed circuit boards and hard disk drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static from your clothes or the work environment can destroy components. Do not touch the components or any metal parts without taking proper antistatic precautions. See Using an ESD wrist strap on page 54 for more information.

CAUTION:
Avoid keeping the cover off for extended periods of time while the system is operating. The cover must be installed to prevent automatic thermal shutdown.

Workstation layout

The following figures identify the basic hardware components of the workstation:

- Front panel on page 51
- Rear panel on page 52

Front panel

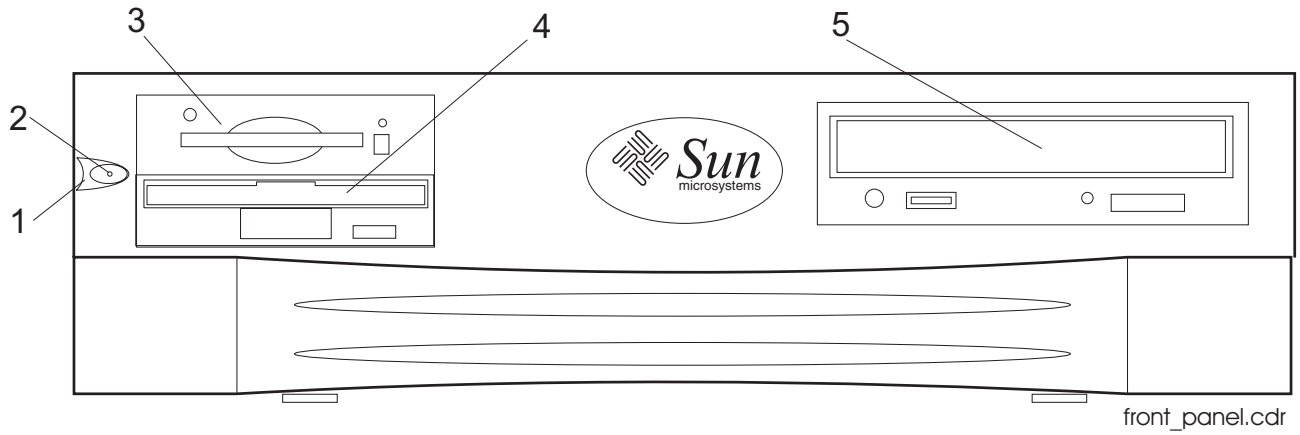


Figure notes:

1. Power switch
2. Power indicator LED
3. Smart card reader (not used)
4. Diskette drive (not used)
5. CD-ROM drive

Rear panel

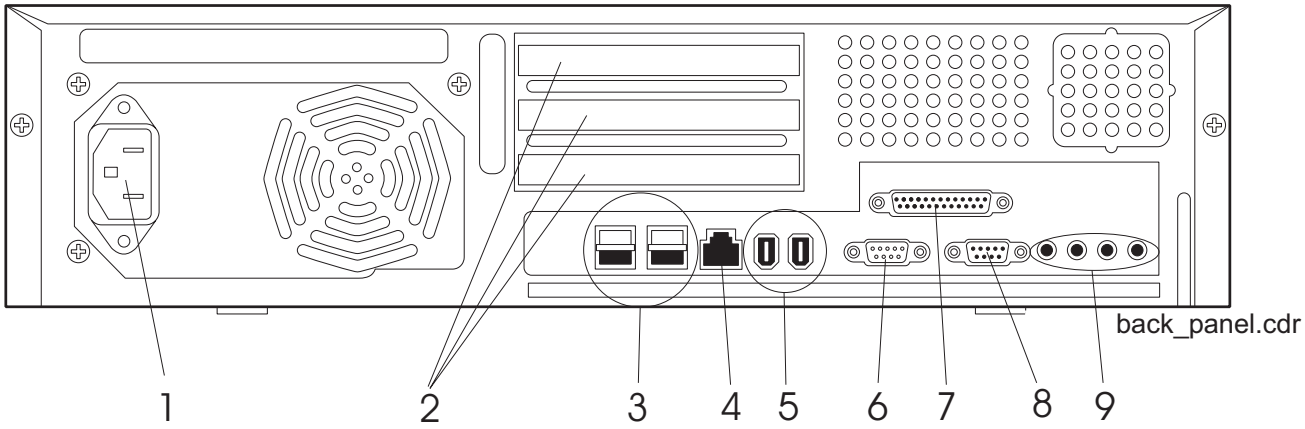


Figure notes:

1. Power connector
2. PCI slots (33 MHz)
3. USB connectors for keyboard and mouse (four - two used)
4. Twisted-pair ethernet (TPE) connector for LAN
5. IEEE 1394 connectors (two - not used)
6. VGA video connector
7. Parallel connector, DB-25
8. Serial connector, DB-9, RS-232 for remote console modem
9. Audio connectors (four - not used)

Turning the computer off and on

Use the following procedures to turn the computer off and on.

To turn off the computer:

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

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

   This shuts down the system. The **`ok`** prompt is displayed at the local console.
3. Press and hold the front panel power switch for 5 seconds to power off the system.
4. Turn off the system monitor.
5. Turn off any external SCSI devices, starting with the device that is closest to the system and working toward the farthest device.

To turn on the computer:

1. Turn on any 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. Press and release the power button to turn on the system.

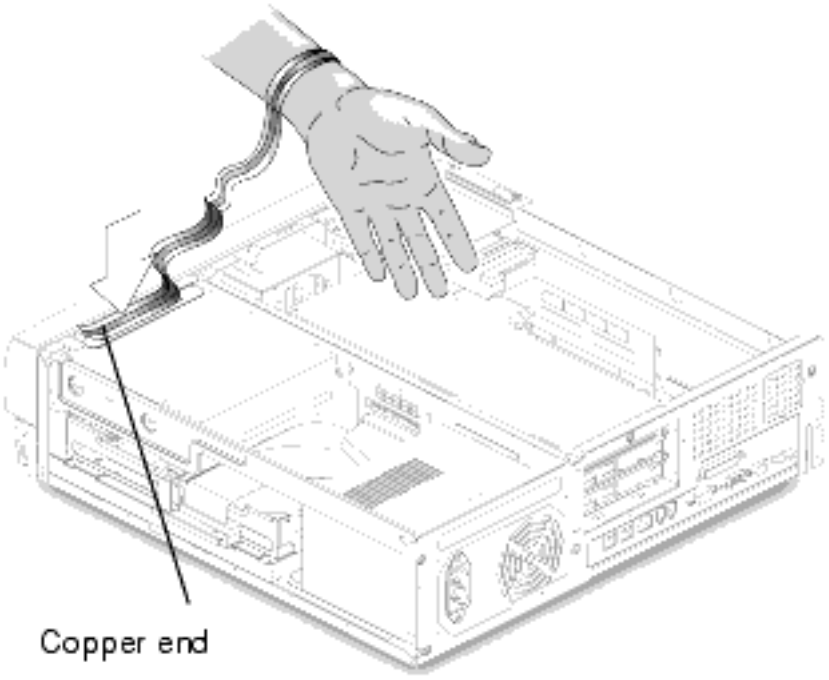
   Note:
   The POST diagnostics occurs each time that you turn on the system. The POST tests the basic system components. This may take several minutes.

   If the system is operating properly, a banner screen is displayed within about 5 minutes after it is turned on.
4. Log in to the system as root.

Using an ESD wrist strap

Before you work on components inside the workstation:

1. Make sure that the workstation is plugged in to AC power.
2. Make sure that the power is off.
3. Attach the Electro-Static Discharge (ESD) wrist strap to the chassis frame and to your wrist. See the following figure.



4. Unplug the AC power cord.

Maintaining PCI cards

This section includes the following topics:

Required references

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

- *Sun Blade 100 Service Manual* or *Sun Blade 150 Service Manual* at the Sun documentation Web site:

  http://docs.sun.com

- The CMS software installation, maintenance, and troubleshooting document for your CMS release
- Avaya Call Management System Switch Connections, Administration, and Troubleshooting

Identifying free card slots

There are three PCI slots on the back of the workstation. Empty slots are covered by filler panels. Every workstation will have a SunSwift SCSI/Ethernet card or an UltraSCSI card installed in the bottom slot.

PCI card configuration

Depending on your configuration, the PCI cards will be installed in the slots shown below. See PCI card compatibility with CMS loads on page 57 for compatibility issues.

PCI card	PCI slot	Device name	Comments
SunSwift or UltraSCSI	Bottom, middle, or top	hme0	Required. Either a SunSwift card or an UltraSCSI card is installed in the bottom slot of every workstation to provide a SCSI interface to external tape and disk drives. The SunSwift card also provides an ethernet connection that can be used for a link to the switch.
GigaSwift (single), GigaSwift (quad), or Gigabit (single) ethernet	Middle or top	ce0 to ce*N*	Required when using the UltraSCSI card; optional otherwise. A GigaSwift or Gigabit card provides one or more ethernet connections that can be used for a link to the switch and connections to the customer network.
HSI/P X.25 interface	Middle or top	N/A	Optional. HSI/P cards are not required when using ethernet for switch link connectivity. Use the middle slot for the first card, which supports four ACDs. Use the middle and top slots for two cards, which support eight ACDs.
SAI/P serial interface	Middle or top	N/A	Optional. SAI/P cards provide serial port connectivity for printers and terminals. Use the middle slot for the first card, which supports eight serial devices. Use the middle and top slots for two cards, which support 16 serial ports.

PCI card compatibility with CMS loads

There are software compatibility issues with the following PCI cards.

HSI/P X.25 interface card

The HSI/P X.25 interface card is supported with CMS R3V9 and R3V11. It is not supported on CMS R12 or later.

SAI/P serial port interface card

The SAI/P serial port interface card is supported with CMS R3V9 and R3V11. It is not supported on CMS R12 or later.

GigaSwift four port ethernet card

The GigaSwift 4444A four port ethernet card requires the following loads:

- CMS r3v12ca.d or later
- Any CMS R13 load

The GigaSwift 4445A four port ethernet card requires the following loads:

- CMS R3V11ai.b or later
- CMS r3v12ca.d or later
- CMS r13aa.k or later

GigaSwift single port ethernet card

The GigaSwift single port ethernet cards are supported by all CMS R3V11, R12, and R13 software loads. For CMS R3V9, the original factory installation of Solaris 8 did not include the drivers and patches needed to support the X4150A model of the GigaSwift cards. Use the following procedure to install the required drivers and patches for that model of the card.

Important:
You must install the GigaSwift ethernet software packages before upgrading to CMS load r3v9ak.*x* or a more recent CMS R3V9 load. If the system is already on the CMS r3v9ak.*x* load, or a more recent R3V9 load, and you install the drivers and the card, you must reinstall the spatches from the CMS software CD-ROM.

Installing the GigaSwift ethernet software packages: To install the GigaSwift ethernet software packages on a CMS R3V9 Sun Blade 100 platform using the X4150A model of the card:

1. Verify that your CMS system is running a CMS R3V9 version older than r3v9ak.*x* by entering:

   `pkginfo -x cms`

2. Load the CD-ROM, *Sun GigaSwift Ethernet Driver* into the CD-ROM drive.
3. Enter:

   `cd /cdrom/cdrom0/GigaSwiftEthernet/Solaris_8/Packages`

4. Enter:

   `/usr/sbin/pkgadd -d .`

   The system displays a list of packages that can be installed.

5. Enter the numbers that are associated with the **`SUNWced`** and **`SUNWcedx`** (or **`SUNWced.u`** and **`SUNWcedx.u`**) packages.
6. Verify that the correct packages are selected and press **Enter**. Answer yes to any questions that are displayed.

   The system installs the packages.

7. Enter: **`q`**
8. Enter:

   `eject cdrom`

9. Do a base load upgrade to CMS load r3v9ak.*x* or a later CMS R3V9 load. See *CentreVu Call Management System Release 3 Version 9 Base Load Upgrade Procedures* for more information.
10. Shut down the system and install the GigaSwift single port ethernet card. See Installing or removing PCI cards on page 59.
11. Turn on the system.
12. Press **Stop**+**A** simultaneously after the console banner is displayed, but before the system starts booting.

    The **`ok`** prompt is displayed.

13. Enter:

    `boot -r`

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

14. Set the network parameters for the new card.
15. 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 or removing PCI cards

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

Note:
If you plan to install an optional second internal hard drive, install it before you install any cards.

Note:
If you are installing a GigaSwift ethernet card, you may have to install the card software before you install the card. See Installing the GigaSwift ethernet software packages on page 58 for more information.

This section includes the following topics:

Shutting down the system

To shut down the system before installing, moving, or removing a card:

1. For a system currently in operation, verify that you have a recent CMSADM file system backup before you change card configurations.
2. Enter:

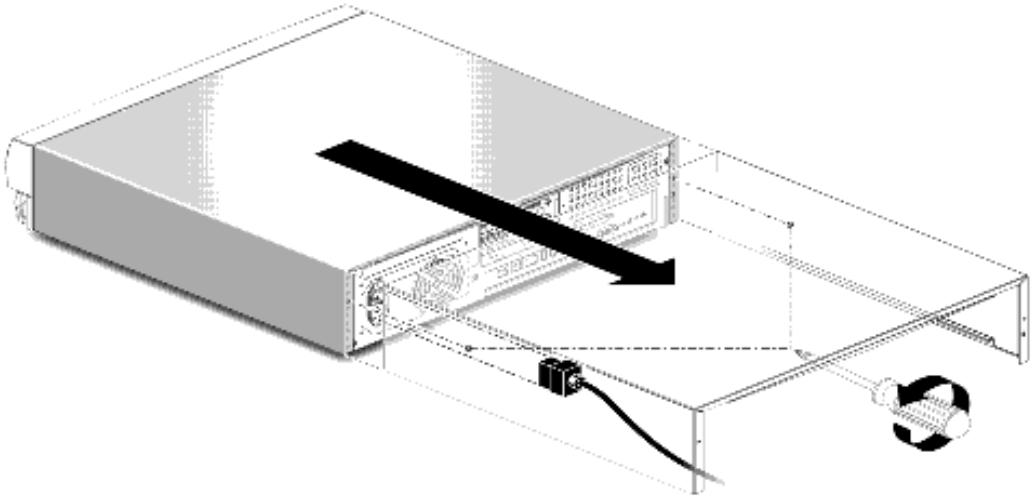
   ```
   /usr/sbin/shutdown -y -i0 -g0
   ```

   This shuts down the system.
3. Press and hold the front panel power switch for 5 seconds to power off the system.
4. Turn off the system monitor.
5. Turn off all external SCSI devices, starting with the device closest to the system and working toward the farthest device.

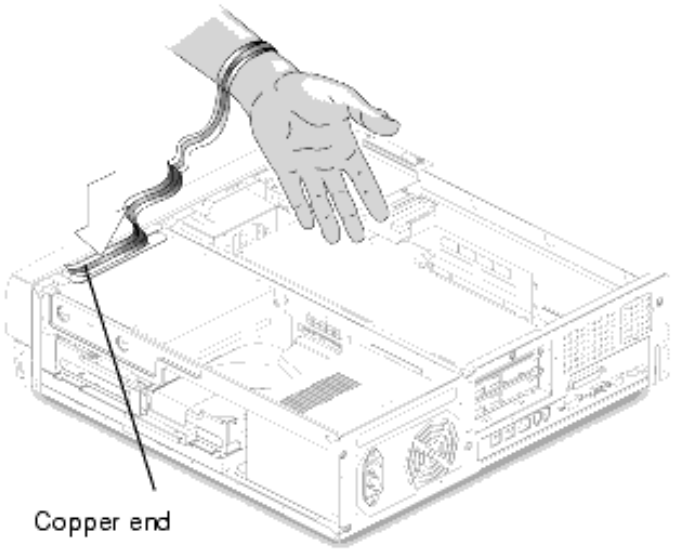
Opening the workstation

To open the workstation:

1. Remove the two screws on the back of the unit that secure the cover to the chassis. See the following figure.



2. Slide the cover toward the rear of the system until the cover tabs release.
3. Lift the system cover straight up. Set it aside in a safe place.
4. Attach an antistatic wrist strap to the metal chassis of the workstation and to your wrist. See the following figure.

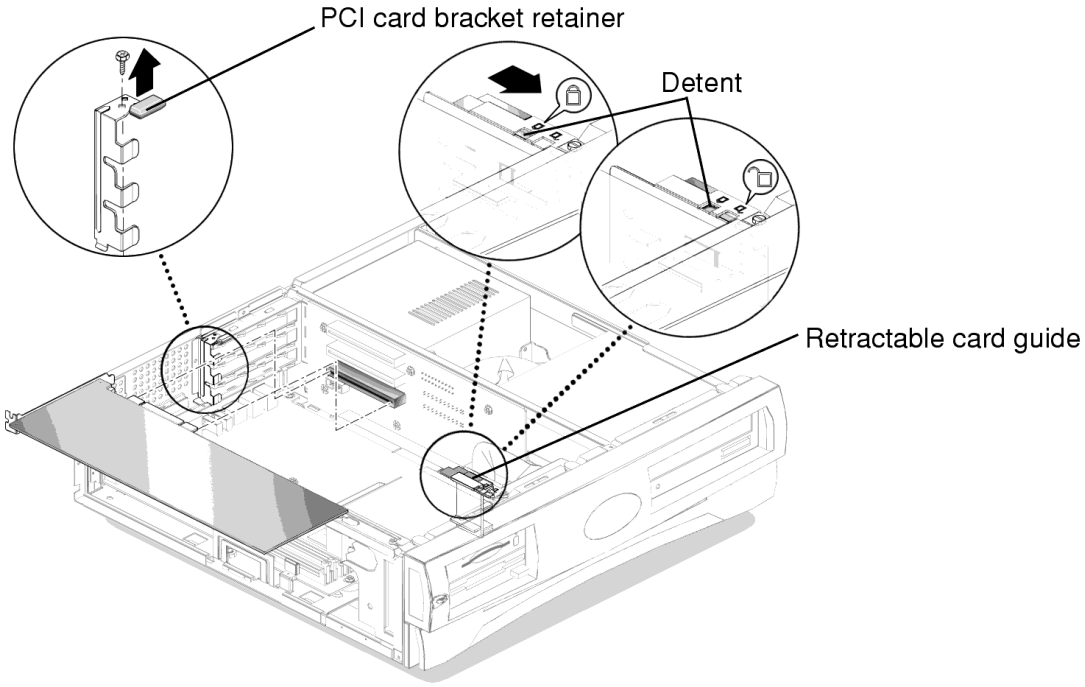


5. Disconnect the AC power cord.
6. Continue with Removing a card on page 61 or Installing a card on page 62.

Removing a card

To remove a card:

1. Disconnect any cables connected to that card.
2. Remove the screw securing the PCI card bracket retainer to the chassis. See the following figure.



3. If you are removing a long card, slide back the retractable card guide to release the card.
4. Grasp the two corners of the card and pull the card straight out from the riser board connector.
5. Place the card on an antistatic mat or in an antistatic bag.

Installing a card

To install a card:

1. Remove the cover plate from the slot where the card is being installed.
2. Position the card into the chassis.
3. Insert the card connector so that it touches the associated riser board connector.
4. Guide the PCI card bracket tab into the back panel slot of the chassis. Ensure that the card bracket tab fits under the retaining tab on the back of the chassis.
5. At the two corners of the card, push the card into the riser board connector until the card is fully seated.
6. If you are installing a long card, depress the detent and slide the retractable card guide forward to secure the rear of the card.
7. Position the PCI card bracket retainer onto the chassis.
8. Replace the screw securing the PCI card bracket retainer to the system chassis.
9. Remove the ESD wrist strap.
10. Reattach the cover.
11. Connect all external cables to the card.
12. Reconnect the AC power cord.
13. Turn on all external SCSI devices, starting with the device farthest from the system and working toward the system.
14. Turn on the system monitor.
15. Turn on the system.
16. Press **Stop**+**A** simultaneously after the console banner is displayed, but before the system starts booting.

    The **`ok`** prompt is displayed.
17. Enter:

    `boot -r`

    This reboots the system so that it recognizes the new card.
18. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Maintaining SAI/P cards

The Serial Asynchronous Interface/PCI (SAI/P) card connects terminals, printers, and modems to the workstation. The workstation can accommodate two SAI/P cards. Each SAI/P card is associated with an external, 8-port expander box.

Note:
SAI/P cards are supported only on CMS R3V9 and R3V11. SAI/P cards are not supported on CMS R12 and later.

This section includes the following topics:

Identifying device entry names for ports on an SAI/P card

When the SAI/P card driver is installed, device entries are created to access the physical ports on the expander box. The device name that is created is **/dev/term/*N***, where ***N*** represents SAI/P slot and expander box port entries. For example, when two SAI/P cards are installed, the card in the lowest numbered slot is associated with physical ports a000 a007, while ports for the second card are denoted by b000-b007.

To display the port designations for each SAI/P card, use the **/cms/toolsbin/display_ports** command. A message similar to the following is displayed:

```
SAIP 8 port card in PCI slot 0:
/dev/term devices: a000 a001 a002 a003 a004 a005 a006 a007

SAIP 8 port card in PCI slot 1:
/dev/term devices: b000 b001 b002 b003 b004 b005 b006 b007


* NOTE: THE PCI SLOTS MAY BE MISLABELED ON THE SUNBLADE 100. The slots are
0, 1 and 2 from top to bottom.
#
```

In this example, the first SAI/P card is installed in the top PCI slot, and the second SAI/P card is installed in the middle PCI slot.

Adding, moving, or removing an SAI/P card

This section describes how to add, remove, or move an SAI/P card.

Adding an SAI/P card: To add an SAI/P card:

1. Identify the existing SAI/P cards installed in the system.
2. Verify that you have a recent CMSADM file system backup before you change card configurations.
3. Enter:

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

   This shuts down the system.
4. Press and hold the front panel power switch for 5 seconds to power 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.
7. Decide where you will install the new SAI/P card. Insert the SAI/P card into the workstation. See Installing or removing PCI cards on page 59 for more information.
8. Connect the expander box to the new SAI/P card.
9. Turn on all external SCSI devices, starting with the device that is farthest from the system and working toward the system.
10. Turn on the system monitor.
11. Turn on the system.
12. Press **Stop**+**A** simultaneously after the console banner is displayed, but before the system starts booting.

    The **`ok`** prompt is displayed.
13. Enter:

    `boot -r`

    This reboots the system so that it recognizes the new card.
14. Log on as root.
15. Enter the following commands:

    `sacadm -l`

    `pmadm -l`

    These commands display existing administration information. Record this information for later use.

16. Enter:

    pmadm -r -p ttysaipslot -r ttyportdesignator

    This removes port administration for all SAI/P cards, where ***slot*** indicates slot a or slot b, and ***portdesignator*** is the full SAI/P port designation (a000, a001, and so on).

17. Remove the SAI/P Software drivers. Refer to Removing SAI/P drivers and utilities on page 67.
18. Install the SAI/P software driver. See your CMS software installation, maintenance, and troubleshooting document for details.
19. Administer all SAI/P ports cards.
20. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Moving an SAI/P card: When moving SAI/P cards, remember to preserve the original sequence of the cards. To do this, you many need to move more than one card. See Identifying device entry names for ports on an SAI/P card on page 63 to determine the ordering sequence.

To move a SAI/P card to a different PCI slot location.

1. Verify that you have a recent CMSADM file system backup before you change PCI card configurations.
2. Remove the SAI/P software drivers. Refer to Removing SAI/P drivers and utilities on page 67.
3. Enter:

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

    This shuts down the system.

4. Press and hold the front panel power switch for 5 seconds to power 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.
7. Remove the SAI/P card from the PCI slot.
8. Install the SAI/P card into a different PCI slot. See Installing or removing PCI cards on page 59 for more information.

    CAUTION:
    Remember to preserve the original ordering sequence of the SAI/P cards.

9. Turn on all external SCSI devices, starting with the device that is farthest from the system and working toward the system.
10. Turn on the system monitor.
11. Turn on the system.

12. Press **Stop**+**A** simultaneously after the console banner is displayed, but before the system starts booting.

    The **ok** prompt is displayed.

13. Enter:

    boot -r

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

14. Log on as root.
15. Install the SAI/P software driver. See your CMS software installation, maintenance, and troubleshooting document for details.
16. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Removing an SAI/P card: To remove an SAI/P card:

1. Verify that you have a recent CMSADM file system backup before you change PCI card configurations.
2. Enter the following commands:

   sacadm -l

   pmadm -l

   These commands display existing administration information. Record this information for later use.

3. Enter:

   pmadm -r -p ttysaip*slot* -r ttyportdesignator

   This removes port administration for all SAI/P cards, where ***slot*** indicates slot a or slot b, and ***portdesignator*** is the full SAI/P port designation (a000, a001, and so on).

4. Remove the SAI/P software drivers. Refer to Removing SAI/P drivers and utilities on page 67.
5. Enter:

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

   This shuts down the system.

6. Press and hold the front panel power switch for 5 seconds to power 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. Remove the SAI/P card from the system. See Installing or removing PCI cards on page 59 for more information.

10. Turn on all external SCSI devices, starting with the device that is farthest from the system and working toward the system.
11. Turn on the system monitor.
12. Turn on the system.
13. Press **Stop**+**A** simultaneously after the console banner is displayed, but before the system starts booting.

    The **ok** prompt is displayed.
14. Enter:

    boot -r

    This reboots the system so that it recognizes the new card.
15. Log on as root.
16. Readminister all terminals, modems, and printers connected to the SAI/P expander box.
17. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Removing SAI/P drivers and utilities

To remove the SAI/P software drivers and utilities:

1. Enter:

   pkgrm SUNWsaip

   This removes the SAI/P software drivers. The following message is displayed:

```
# The following package is currently installed:
     SUNWsaip         Serial Asynchronous Interface Driver (PCI)
                    (sparc) X.0.0

Do you want to remove this package?
```

2. Enter: **y**

   This starts the removal of the SAI/P software driver. The following message is displayed:

```
## Removing installed package instance <SUNWsaip>

   This package contains scripts which will be executed with
   super-user permission during the process of removing this
   package.

Do you want to continue with the removal of this package [y,n,q,?]
```

3. Enter: **y**

   The following message is displayed:

```
## Verifying package dependencies.
## Processing package information.
## Executing preremove script.
```

   If the removal is successful, the following message is displayed:

```
Removal of <SUNWsaip> was successful.
#
```

   If removal is not successful, escalate through the normal channels.

4. Enter:

   pkgrm SUNWsaipu

   This removes the SAI/P software utilities. The following message is displayed:

```
# The following package is currently installed:
     SUNWsaipu      Serial Asynchronous Interface Utilities (PCI)
                    (sparc) X.0.0

Do you want to remove this package?
```

5. Enter: **y**

   This starts the removal of the SAI/P software utilities. The following message is displayed:

```
## Removing installed package instance <SUNWsaipu>

   This package contains scripts which will be executed with
   super-user permission during the process of removing this
   package.

Do you want to continue with the removal of this package [y,n,q,?]
```

6. Enter: **y**

   The following message is displayed:

```
## Verifying package dependencies.
## Processing package information.
## Executing preremove script.
```

   If the removal is successful, the following message is displayed:

```
Removal of <SUNWsaipu> was successful.
#
```

   If removal is not successful, escalate through the normal channels.

Maintaining HSI/P cards

An HSI/P card supports X.25 switch links. For eight links, two HSI/P cards and two quad cables are needed. If the system uses TCP/IP signaling for all ACDs, HSI/P cards are not needed. HSI/P cards are not supported beginning with CMS R12.

This section includes the following topics:

If you are replacing a defective HSI/P card, see Replacing an HSI/P card on page 70. If this is the initial installation of one or two HSI/P cards, start with Installing the first HSI/P card or a pair of HSI/P cards. If a second HSI/P card is being added to a system already in operation, see Adding a second HSI/P card on page 73.

Replacing an HSI/P card

To replace an HSI/P card:

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

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

   This shuts down the system.
3. Press and hold the front panel power switch for 5 seconds to power 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.
6. Disconnect the HSI/P quad cable connected to the card.
7. Remove and replace the defective HSI/P card. See Installing or removing PCI cards on page 59 for detailed instructions.
8. Reattach the HSI/P quad cable.
9. Turn on all external SCSI devices, starting with the device that is farthest from the system and working toward the system.
10. Turn on the system monitor.
11. Turn on the system.

Installing the first HSI/P card or a pair of HSI/P cards

To install the first HSI/P card or a pair of HSI/P cards:

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

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

   This shuts down the system.
4. Press and hold the front panel power switch for 5 seconds to power 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.
7. Install the HSI/P cards. See Installing or removing PCI cards on page 59 for detailed instructions.
8. Attach the HSI/P quad cables, and connect the switch links to the quad cables by following the instructions described in *Avaya Call Management System Switch Connections, Administration, and Troubleshooting*.
9. Turn on all external SCSI devices, starting with the device that is farthest from the system and working toward the system.
10. Turn on the system monitor.
11. Turn on the system.
12. Press **Stop**+**A** simultaneously after the console banner is displayed, but before the system starts booting.

    The **`ok`** prompt is displayed.
13. Enter:

    `boot -r`

    This reboots the system so that it recognizes the new HSI/P cards.

    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 Call Management System Switch Connections, Administration, and Troubleshooting* for information about troubleshooting HSI/P cards.
14. When the system comes back up, log in as root.
15. Continue with Installing HSI/P software and patches on page 72.

Installing HSI/P software and patches

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

- Install the HSI/P software
- Reinstall the Solaris patches

After installing the software and patches, continue with Setting up the switch link for each ACD on page 72.

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 **`run_cms`** option.
3. Turn off CMS.
4. Enter:

   `cmssvc`

   The CMS Services menu is displayed.
5. Select the **`swsetup`** option.
6. Select the ACD that you want to set up.
7. Accept the existing defaults for the following:
   - Switch name
   - Switch model (release)
   - Vectoring
   - Expert agent
   - Central office disconnect supervision
   - Local port
   - Remote port
8. Select "X.25" and a specific link number when prompted for the link information.
9. Repeat Steps 4 through 8 for each ACD that will use the HSI card.

10. Enter:

    cmssvc

    The CMS Services menu is displayed.

11. Select the **run_cms** option.
12. Turn on CMS.
13. Test and troubleshoot each switch connection using the procedures in *Avaya Call Management System Switch Connections, Administration, and Troubleshooting*.
14. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

Adding a second HSI/P card

Use the following procedure to add a second HSI/P card to a system that is already in operation.

To add a second HSI/P card:

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

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

    This shuts down the system.

4. Press and hold the front panel power switch for 5 seconds to power 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.
7. Install the second HSI/P card. See Installing or removing PCI cards on page 59 for detailed instructions.
8. Attach the HSI/P quad cable, and connect the switch links to the quad cable by following the instructions described in *Avaya Call Management System Switch Connections, Administration, and Troubleshooting*.
9. Turn on all external SCSI devices, starting with the device that is farthest from the system and working toward the system.
10. Turn on the system monitor.
11. Turn on the system.

12. Press **Stop**+**A** simultaneously after the console banner is displayed, but before the system starts booting.

    The **ok** prompt is displayed.

13. Enter:

    boot -r

    This reboots the system so that it recognizes the new HSI/P 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 Call Management System Switch Connections, Administration, and Troubleshooting* for information about troubleshooting HSI/P cards.

14. When the system comes back up, log in as root.
15. Administer the switch links as shown in Setting up the switch link for each ACD on page 72.

Maintaining disk drives

This section includes the following topics:

Prerequisites

If possible, do a CMSADM backup 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 (nonboot) disks, try to print the current setup for all ACDs. This information must be readministered after you install replacement disks.

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 to add the correct information or must be replaced with files that contain the correct information. Contact the Avaya technical support organization for assistance.

For workstations that use CMS R3V11 and mirrored 40-GB disk drives, if one of the 40-GB disk drives become defective, you must replace both disk drives with 80-GB disk drives. Contact Avaya support for more information.

For workstations that have an 80-GB internal disk drive with CMS R12, external disk drives are not being offered.

Required references

The following references are required when doing procedures in this section:

- The CMS software installation, maintenance, and troubleshooting document for your CMS release
- *Sun Blade 100 Service Manual* or *Sun Blade 150 Service Manual* at the Sun documentation Web site:

  http://docs.sun.com

Replacing the primary internal IDE boot disk drive

This procedure describes how to replace the primary internal IDE boot disk drive. If you are also adding or replacing the mirror boot internal IDE disk drive, use these procedures in concert with Adding or replacing the internal IDE mirror boot disk drive on page 83 while you have the workstation open.

This section includes the following topics:

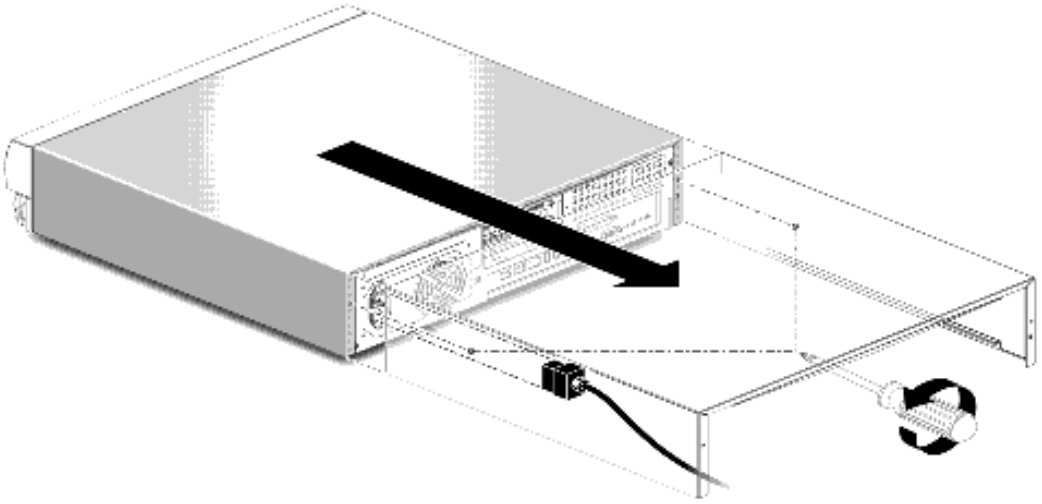
Opening the workstation

To open the workstation:

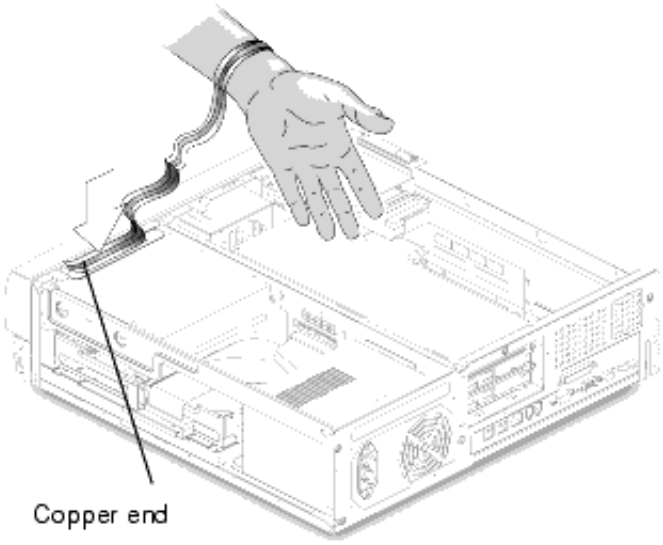
1. If you have not already done so, use the following command to shut down the workstation:

   `/usr/sbin/shutdown -y -i0 -g0`
2. Press and hold the front panel power switch for 5 seconds to power off the system.

3. Remove the two screws on the back of the unit that secure the cover to the chassis. See the following figure.



4. Slide the cover toward the rear of the system until the cover tabs release.
5. Lift the system cover straight up. Set it aside in a safe place.
6. Attach an antistatic wrist strap to the metal chassis of the workstation and to your wrist. See the following figure.

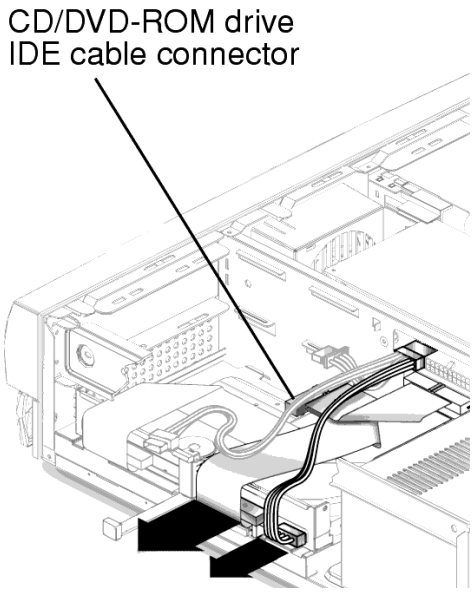


7. Disconnect the AC power cord.

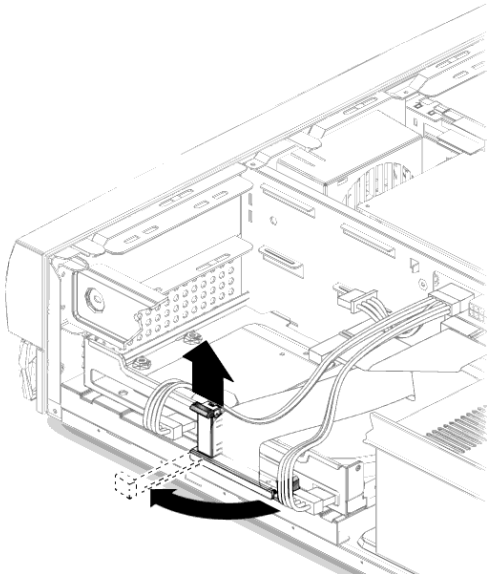
Removing the primary internal boot disk drive

To remove the primary internal boot disk drive:

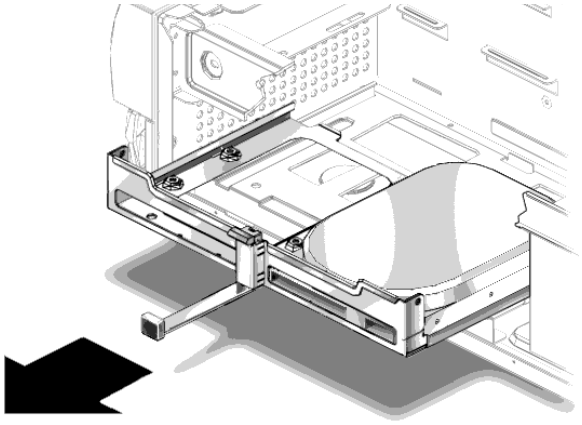
1. Disconnect the disk drive IDE cable and the power cable connectors from the primary disk drive and the secondary disk drive (if installed). Move the cables out of the way. See the following figure.



2. Lift and hold the spring-loaded latch upward to release the disk drive tray from the chassis. See the following figure.



3. While holding the latch up, pull the disk-drive-tray ejection lever away from the chassis.
4. Slide the disk drive tray out of the chassis. See the following figure.

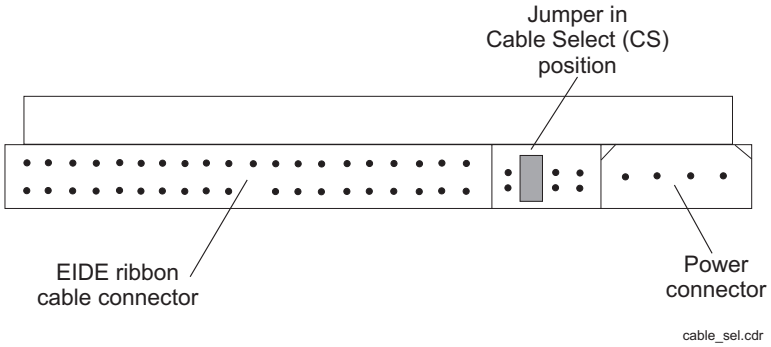


5. Turn the disk drive tray over and place it on an antistatic mat.
6. Remove the four screws securing the disk drive to the disk drive tray.
7. Lift the disk drive tray from the disk drive.
8. Save the screws and mounting bracket for the new primary boot disk drive. Label the disk drive as the original "Master Disk," and save it in case you have to reinstall the original configuration.

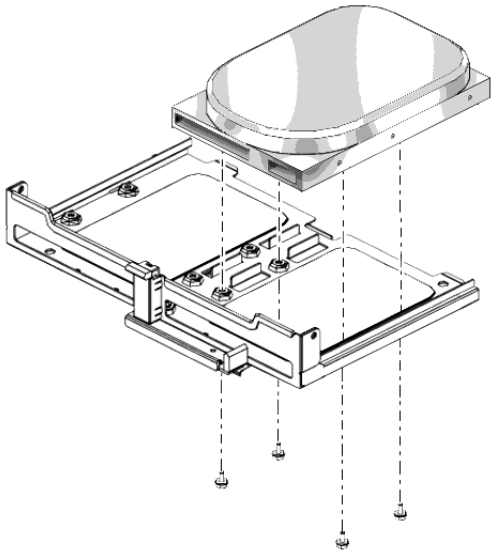
Installing the new primary internal disk drive

To install the new primary internal boot disk drive:

1. Ensure that the jumpers on the primary internal disk drive are set to the Cable Select (CS) setting. See the following figure.



2. Position the new disk drive into the hard drive tray. See the following figure.

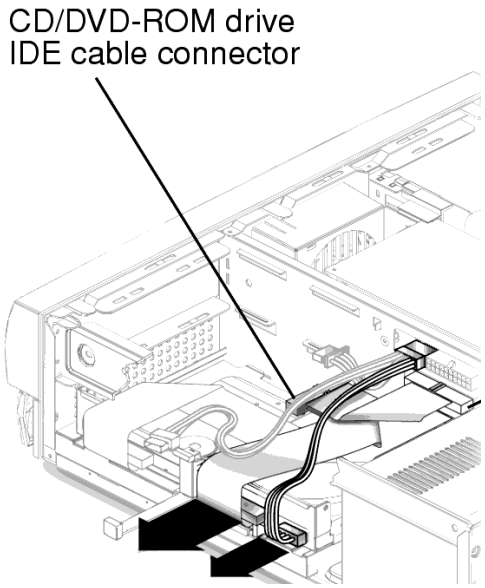


3. Turn the tray upside down on an antistatic mat.
4. Replace the four screws securing the disk drive to the disk drive tray.

Tip:
Install each screw with just a few turns before you tighten all four screws.

5. Position the disk drive tray into the chassis.
6. While ensuring that the cables are not binding or being damaged, slide the disk drive tray into the chassis until the spring-loaded latch clicks into place.

7. Connect the disk drive IDE cable connector labeled PRIMARY HDD to the primary disk drive. If a secondary disk drive is installed, connect the disk drive IDE cable connector labeled SECONDARY HDD to the secondary disk drive. Ensure that the cables are properly oriented by aligning the connector keys. See the following figure.



8. Connect the power cable to both disk drives.
9. Do one of the following:
   - If you are adding or replacing the mirror boot disk drive, continue with Adding or replacing the internal IDE mirror boot disk drive on page 83.
   - If you are not adding or replacing the mirror boot disk drive, continue with Closing the workstation on page 81.

Closing the workstation

To close the workstation:

1. Reconnect the AC power cord to the workstation.
2. Detach the ESD wrist strap.
3. Replace the cover on the workstation. Slide the cover forward until it fits snugly around the chassis.
4. Replace the two cover screws.

Tip:
Install each screw with just a few turns before you tighten both screws.

5. Do one of the following:
   - If you are adding or replacing external SCSI disk drives, continue with Adding or replacing external SCSI disk drives on page 91.
   - If you are not adding or replacing the mirror boot disk drive or external SCSI disk drives, continue with Turning on the system on page 82.

Turning on the system

To turn on 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**+**A** simultaneously after the console banner is displayed, but before the system starts booting.
5. Enter the following commands:

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

   ```
   reset-all
   ```

   This resets the system and the `ok` prompt is displayed.
6. Enter:

   ```
   probe-ide
   ```

   This checks to see that the system recognizes the new disk drive. If the new drive is not listed, make sure there is a secure connection between the motherboard and the new drive.
7. Reboot the system by entering the following commands:

   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.

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

   ```
   boot -r
   ```

   The system reboots.
8. Continue with Setting up the disk drives on page 96.

Adding or replacing the internal IDE mirror boot disk drive

This section describes how to add or replace the internal IDE mirror boot disk drive in the workstation. This disk drive and a new ribbon cable is packaged separately from the workstation.

Note:
In the following procedures, the boot disk drive is referred to as the *primary* boot disk drive, and the mirror boot disk drive is referred to as the *secondary* boot disk drive. This procedure is only done on mirrored systems.

This section includes the following topics:

Unpacking the disk drive

Remove the following items from the box that contains the secondary boot disk drive and place them in a convenient location:

- IDE disk drive
- Four pan-head screws
- New IDE Secondary HDD ribbon cable

Note:
The new disk drive may come with two ribbon cables. The cable used with the Sun Blade has two connectors labeled SECONDARY HDD and RISER BOARD IDE 2. Any other cable may be discarded.

Opening the workstation

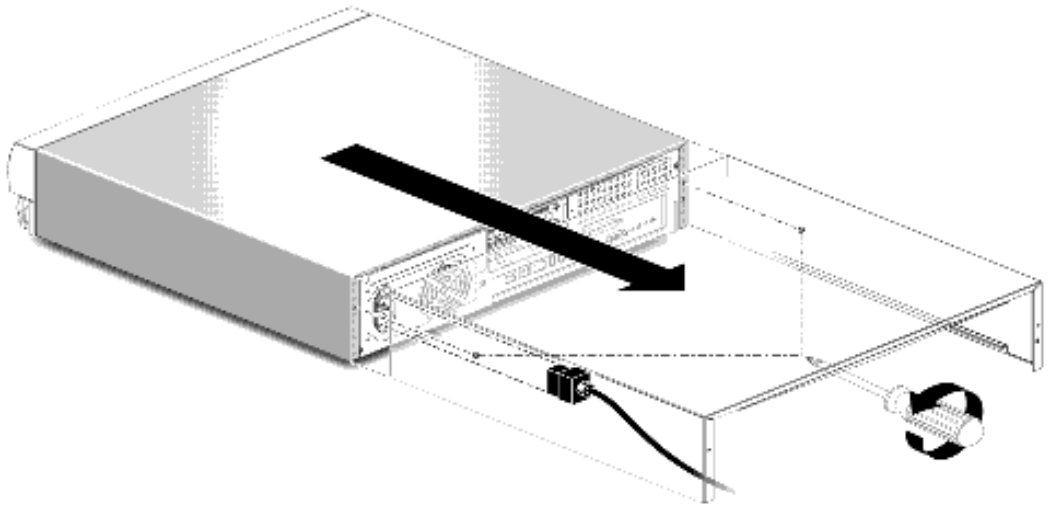
To open the workstation:

1. If you have not already done so, use the following command to shut down the workstation:

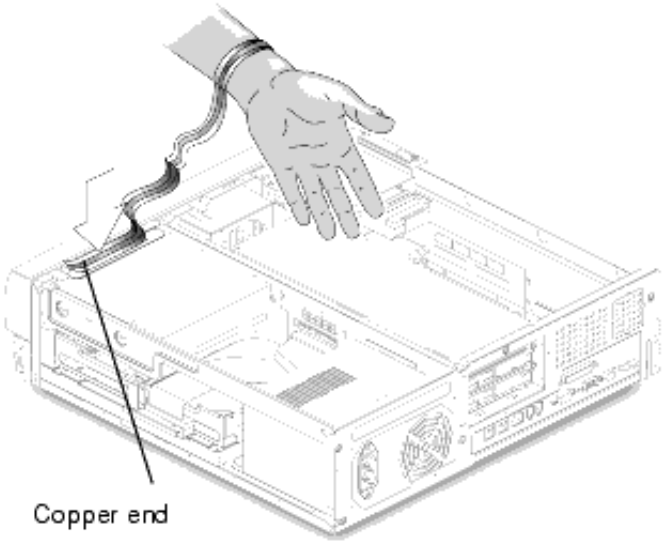
   ```
   /usr/sbin/shutdown -y -i0 -g0
   ```

2. Press and hold the front panel power switch for 5 seconds to power off the system.

3. Remove the two screws on the back of the unit that secure the cover to the chassis. See the following figure.



4. Slide the cover toward the rear of the system until the cover tabs release.
5. Lift the system cover straight up. Set it aside in a safe place.
6. Attach an antistatic wrist strap to the metal chassis of the workstation and to your wrist. See the following figure.

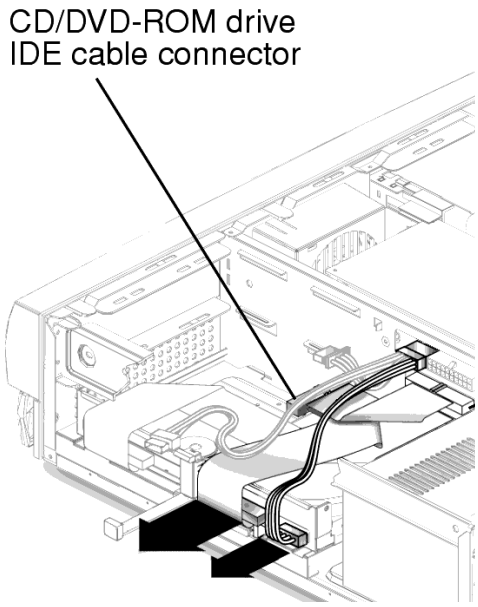


7. Disconnect the AC power cord.
8. Continue with one of the following:
   - Removing the secondary internal disk drive on page 85.
   - Installing the secondary internal disk drive on page 87

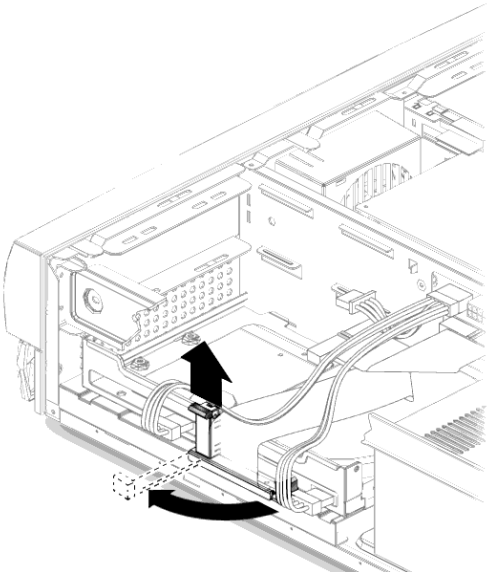
Removing the secondary internal disk drive

To remove the secondary internal disk drive, or to remove the disk drive tray to install a secondary disk drive:

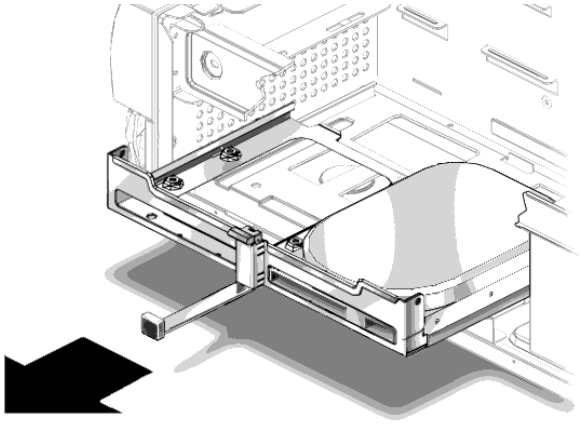
1. Disconnect the disk drive IDE cable and the power cable connectors from the primary and secondary disk drive, if installed. Move the cables out of the way. See the following figure.



2. Lift and hold the spring-loaded latch upward to release the disk drive tray from the chassis. See the following figure.



3. While holding the latch up, pull the disk-drive-tray ejection lever away from the chassis.
4. Slide the disk drive tray out of the chassis. See the following figure.

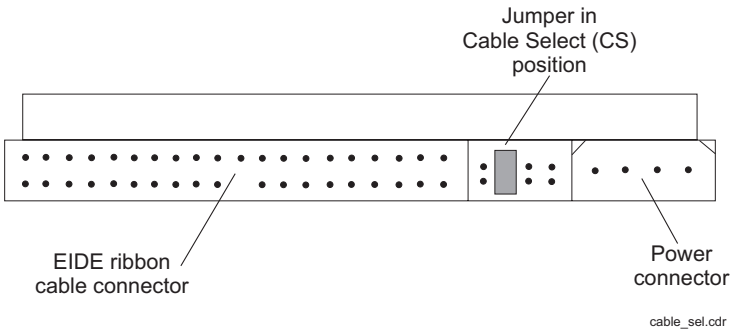


5. Turn the disk drive tray over and place it on an antistatic mat.
6. Remove the four screws securing the secondary disk drive to the disk drive tray, if installed.
7. Lift the disk drive tray from the disk drive.
8. Save the screws and mounting bracket for the new secondary disk drive. Label the disk drive as the original "Secondary Disk," and save it in case you have to reinstall the original configuration.
9. Continue with Installing the secondary internal disk drive on page 87.

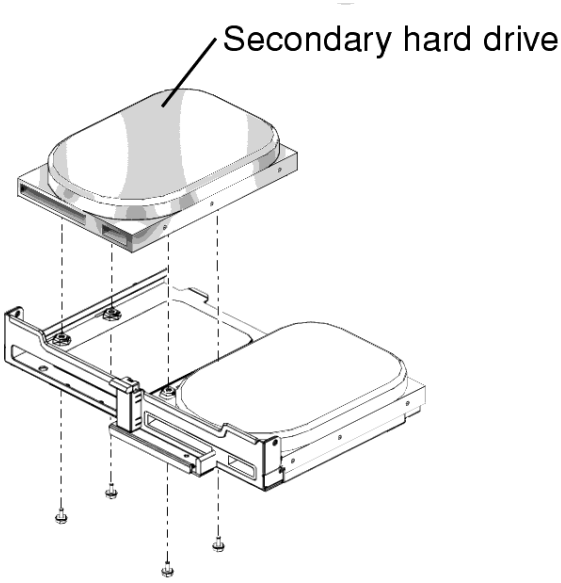
Installing the secondary internal disk drive

To install the new secondary internal disk drive:

1. Ensure that the jumpers on the secondary internal disk drive are set to the Cable Select (CS) setting. See the following figure



2. Position the new disk drive into the hard drive tray. See the following figure.

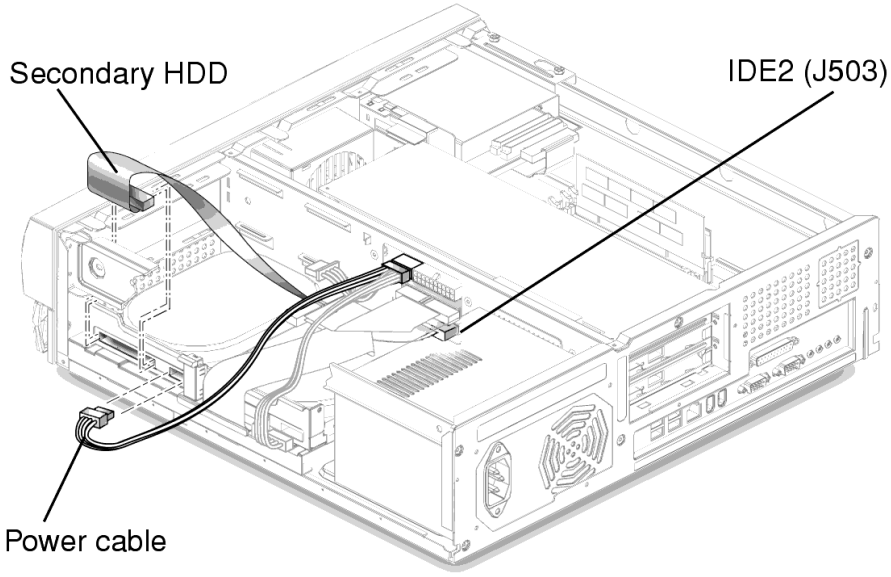


3. Turn the tray upside down on an antistatic mat.
4. Replace the four screws securing the disk drive to the disk drive tray.

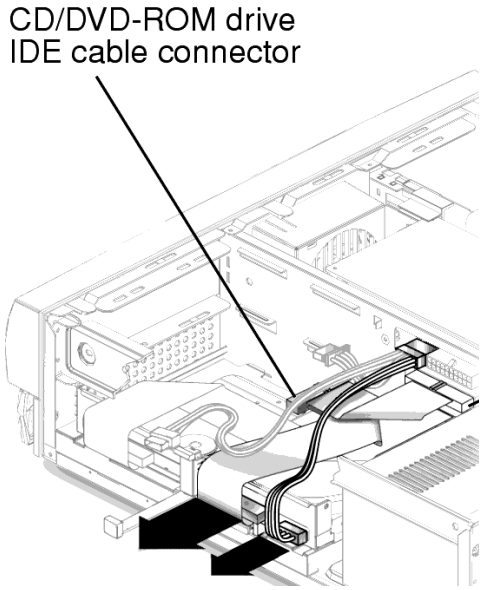
Tip:
Install each screw with just a few turns before you tighten all four screws.

5. Position the disk drive tray into the chassis.
6. While ensuring that the cables are not binding or being damaged, slide the disk drive tray into the chassis until the spring-loaded latch clicks into place.

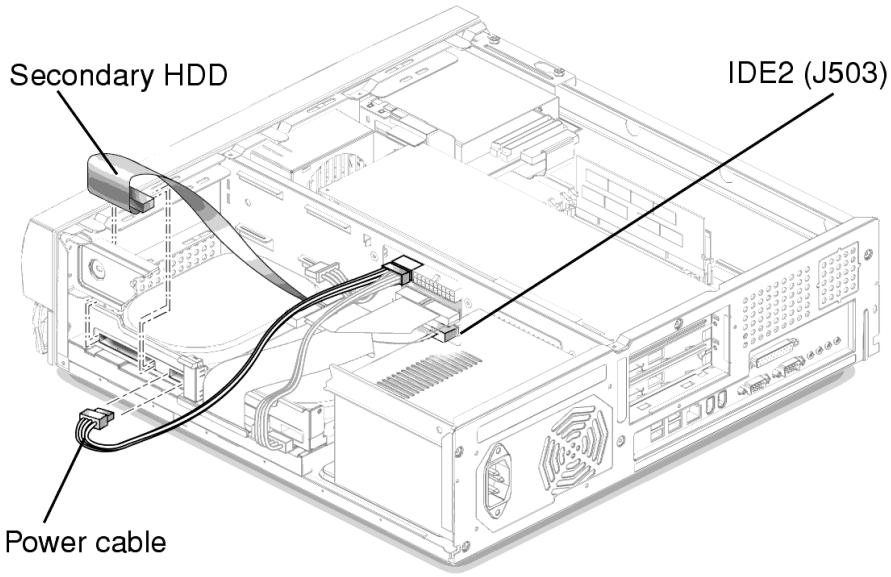
7. Verify that the secondary IDE cable connector is connected to riser board connector IDE2 (J503). The top connector is IDE1 (J504) and the lower connector is IDE2 (J503). See the following figure.



8. Connect the disk drive IDE cable connector labeled PRIMARY HDD to the primary disk drive. Ensure that the cables are properly oriented by aligning the connector keys. See the following figure.



9. Connect the disk drive IDE cable connector labeled SECONDARY HDD to the secondary disk drive. See the following figure.



10. Connect the power cables to both disk drives.
11. Continue with Closing the workstation on page 89.

Closing the workstation

To close the workstation:

1. Reconnect the AC power cord to the workstation.
2. Detach the ESD wrist strap.
3. Replace the cover on the workstation. Slide the cover forward until it fits snugly around the chassis.
4. Replace the two cover screws.

Tip:
Install each screw with just a few turns before you tighten both screws.

5. Do one of the following:
   - If you are adding or replacing external SCSI disk drives, continue with Adding or replacing external SCSI disk drives on page 91.
   - If you are not adding or replacing any external SCSI disk drives, continue with Turning on the system on page 90.

Turning on the system

If you are also adding or replacing secondary external disk drives, do not power-up the system. Continue with Adding or replacing external SCSI disk drives on page 91.

To turn on 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**+**A** simultaneously after the console banner is displayed, but before the system starts booting.
5. Enter the following commands:

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

   ```
   reset-all
   ```

   This resets the system and the `ok` prompt is displayed.
6. Enter:

   ```
   probe-ide
   ```

   This checks to see that the system recognizes the new disk drives. If the new drives are not listed, make sure there is a secure connection between the motherboard and the new drives.
7. Reboot the system by entering the following commands:

   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.

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

   ```
   boot -r
   ```

   The system reboots.
8. Continue with Setting up the disk drives on page 96.

Adding or replacing external SCSI disk drives

This section describes how to add or replace an external SCSI disk drive on an existing system.

Note:
For workstations that have an 80-GB internal disk drive with CMS R12, external disk drives are not being offered.

This section includes the following topics:

Adding or replacing a disk drive

To add or replace an external disk drive:

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

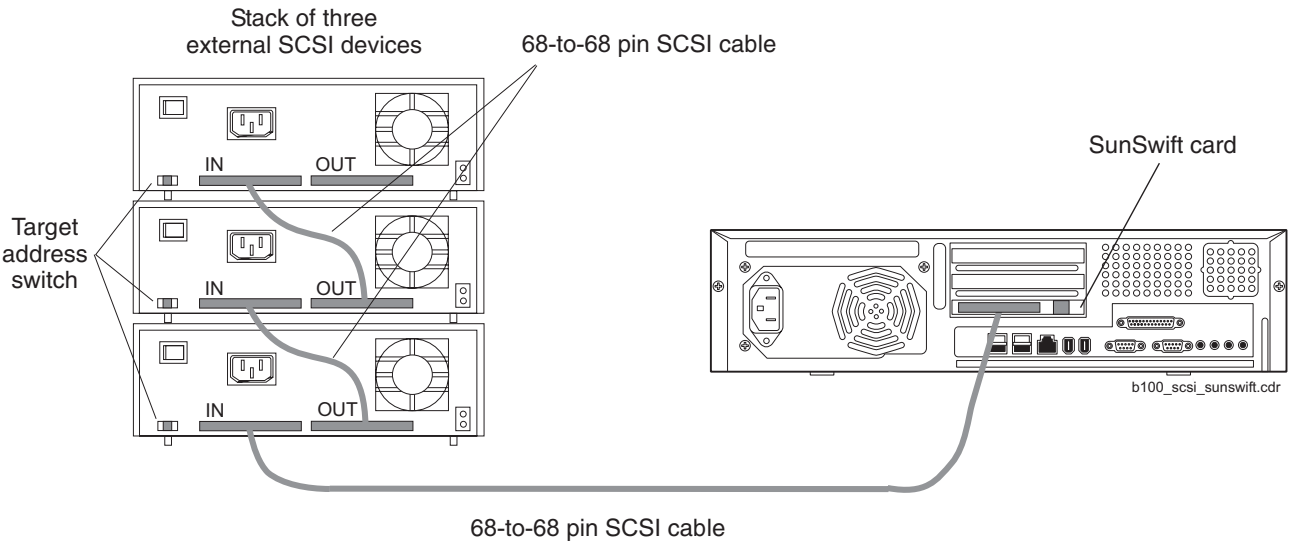
   `/usr/sbin/shutdown -y -i0 -g0`

   The system shuts down and the **`ok`** prompt is displayed.
3. Press and hold the front panel power switch for 5 seconds to power 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.
6. Connect the disk drive to the existing SCSI devices as shown in Connecting SCSI disk drives on page 92.

Connecting SCSI disk drives

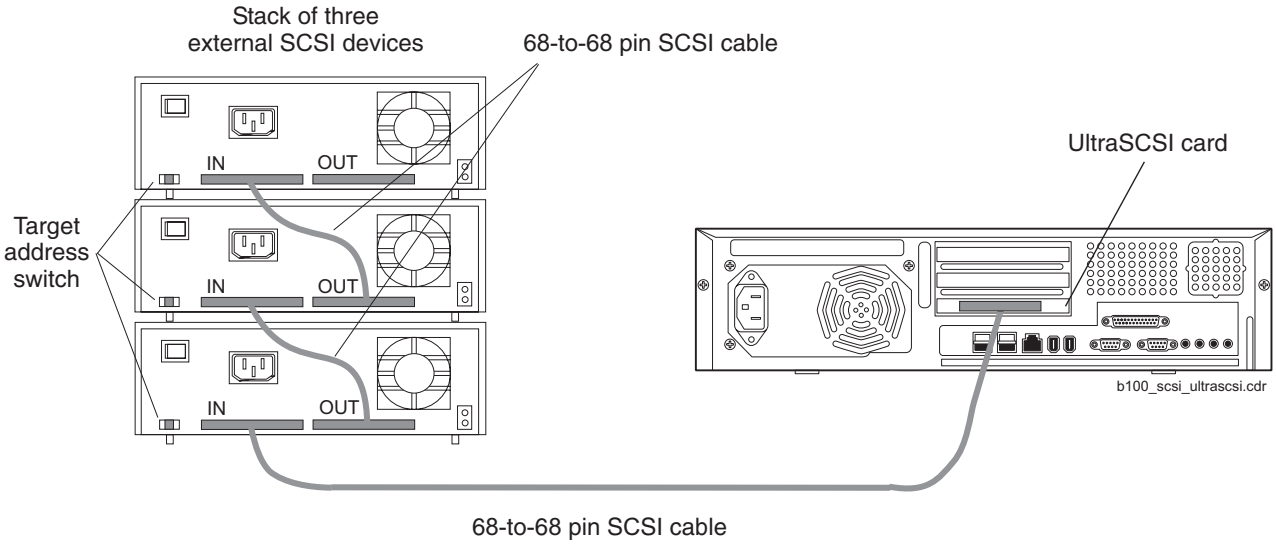
The following figure shows how to connect SCSI disk drives and tape drives to a SunSwift card. A 68-to-68-pin SCSI cable connects from the SunSwift PCI card on the back of the workstation to the IN connector on the back of the SCSI device that is closest to the workstation. If you have more than one SunSwift card, connect the drives to the card in the lowest slot number. A 68-to-68 pin SCSI cable connects from the OUT connector of that device to the IN connector of the next device. Continue this process until all assigned devices are connected in the SCSI chain.

CAUTION:
There are limits to the length of cables you can use with SCSI devices. If you only have one SCSI device, the cable can be 6m (20 ft) long. If you have up to four SCSI devices, each cable can be 3m (10 ft) long. If you have more than four SCSI devices, each cable can be 1.5m (5 ft) long. If you use cables that are too long, you will get SCSI bus errors.



The following figure shows how to connect SCSI disk drives and tape drives to an UltraSCSI card. A 68-to-68-pin SCSI cable connects from the UltraSCSI PCI card on the back of the workstation to the IN connector on the back of the SCSI device that is closest to the workstation. A 68-to-68 pin SCSI cable connects from the OUT connector of that device to the IN connector of the next device. Continue this process until all assigned devices are connected in the SCSI chain.

CAUTION:
There are limits to the length of cables you can use with SCSI devices. If you only have one SCSI device, the cable can be 6m (20 ft) long. If you have up to four SCSI devices, each cable can be 3m (10 ft) long. If you have more than four SCSI devices, each cable can be 1.5m (5 ft) long. If you use cables that are too long, you will get SCSI bus errors.



When connecting SCSI devices, the last device in the chain MUST be terminated, either via an auto-terminated device or with a manual terminator.

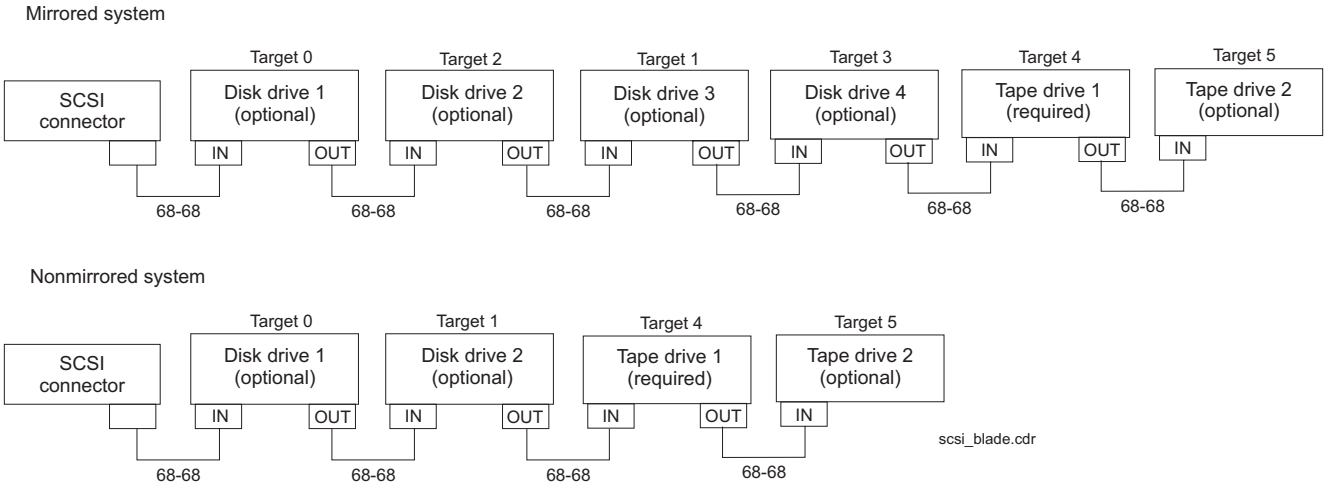
When using an auto-terminated SCSI device, you do not need to connect a SCSI terminator to the OUT connector of the last SCSI device in the chain. To verify that the last device is auto-terminated, check the LEDs labeled Auto Term High and Auto Term Low on the back panel of the device. In a CMS configuration, both LEDs are lit on the last device in the SCSI chain. If a device in the SCSI chain is not the last device, neither termination LED is lit.

When using a manually-terminated device, you must connect a SCSI terminator to the OUT connector of the last SCSI device in the chain. When you connect the SCSI terminator to the OUT connector, the LED on the terminator is lit.

The OUT connector of the DAT 72 tape drive must have a termination plug installed. The DAT 72 tape drive does not auto terminate. All DAT 72 tape drives delivered from the factory have termination plugs installed.

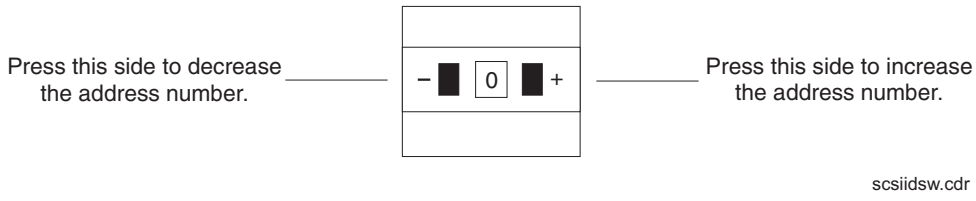
The following figure shows the SCSI cabling. The target addresses are different for mirrored and nonmirrored systems. Nonmirrored systems support only two external disk drives.

CAUTION:
There are limits to the length of cables you can use with SCSI devices. If you only have one SCSI device, the cable can be 6m (20 ft) long. If you have up to four SCSI devices, each cable can be 3m (10 ft) long. If you have more than four SCSI devices, each cable can be 1.5m (5 ft) long. If you use cables that are too long, you will get SCSI bus errors.



Important:
Each pair of SCSI disk drives in a mirrored system must be the same size.

The addresses are set using the target address switches on the back of each SCSI device. Before setting the target address, make sure that the power is off on the SCSI device.



Continue with Turning on the system on page 95.

Turning on the system

To turn on the system:

1. Connect the power cord from the disk drive to a power source.
2. Turn on all external SCSI devices, starting with the device that is farthest from the system and working toward the system.

   Note:
   For most SCSI devices, the power LED will light as soon as you power-on the device. For some disk drives, the power LED will not light until the system begins POST.
3. Turn on the system monitor.
4. Turn on the system.
5. Press **Stop**+**A** simultaneously after the console banner is displayed, but before the system starts booting.
6. Enter the following commands:

   `setenv auto-boot? false`

   `reset-all`

   This resets the system and the **`ok`** prompt is displayed.
7. Enter:

   `probe-scsi-all`

   This checks to see that the system recognizes the new external disk drives. The resulting display should list the new drives as Target 0-3. If the new drives are not listed, make sure there is a secure connection between the SCSI port and the new drives.
8. Enter:

   `reset-all`

   This resets the system and the **`ok`** prompt is displayed.
9. Enter:

   `probe-ide`

   This checks to see that the system recognizes the new internal IDE disk drives. If the new drives are not listed, make sure there is a secure connection between the motherboard and the new drives.
10. Reboot the system by entering the following commands:

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.

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

```
boot -r
```

The system reboots.

11. Continue with Setting up the disk drives on page 96.

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 procedures in "Performing a CMSADM restore procedure of a mirrored or non mirrored 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 procedures in "Performing a CMSADM restore procedure of a mirrored or nonmirrored system" in the maintenance chapter of the software installation, maintenance, and troubleshooting document for your version of CMS.
One boot disk[1]	Mirrored	Partition the new boot disk drive (see Partitioning disk drives on page 98). 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 98 and Administering data disk drives on page 105). 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 98 and Administering data disk drives on page 105). 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.

1. For workstations that use CMS R3V11 and mirrored 40-GB disk drives, if one of the 40-GB disk drives become defective, you must replace both disk drives with 80-GB disk drives. Contact Avaya support for more information.

After you add new data 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 98 and Administering data disk drives on page 105).

Partitioning disk drives

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 105.

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

- Disk partitioning values on page 98
- Partitioning and formatting a disk on page 101

Disk partitioning values

During the disk partitioning procedure used when restoring a system, you must enter the size of each partition. Since disk models change often, see the software installation document for your current CMS release to verify the correct disk partitioning values.

R3V11 and later boot disks: The following table lists the boot disk drives that are currently used with the workstation for R#v11 and later. These partition sizes are entered in Gigabytes (gb).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
80-GB IDE	0	root	wm	0	4gb
	1	swap	wu	2057	1gb
	2	backup	wm	Use the default values for partition 2.	
	3	un	wm	2572	3gb
	4	un	wm	4115	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.	

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
40-GB IDE	0	root	wm	0	4gb
	1	swap	wu	2057	1gb
	2	backup	wm	Use the default values for partition 2.	
	3	un	wm	2572	3gb
	4	un	wm	4115	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.	
20-GB IDE	0	root	wm	0	4gb
	1	swap	wu	8323	1gb
	2	backup	wm	Use the default values for partition 2.	
	3	un	wm	10404	3gb
	4	un	wm	16646	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.	

R3V9 boot disks: The following table lists the boot disk drives that are used with the workstation for R3V9. These partition sizes are entered in Gigabytes (gb) and cylinders (c).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
20-GB IDE	0	root	wm	0	4gb
	1	swap	wu	8323	1gb
	2	backup	wm	Use the default values for partition 2.	
	3	un	wm	10404	3gb
	4	un	wm	16646	2gb
	5	un	wm	20808	2gb
	6	un	wm	24970	2gb
	7	un	wm	29132	9658c

R3V9 and R3V11 data disks: The following table lists the data disk drives that are currently used with the workstation for CMS R3V9 and R3V11. These partition sizes are entered in Gigabytes (gb) and cylinders (c).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
36-GB SCSI	0	un	wm	0	2gb
	1	un	wm	1452	2gb
	2[1]	backup	wm	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 SCSI	0	un	wm	0	2gb
	1	un	wm	891	2gb
	2[1]	backup	wm	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 backup value indicates the size of the data disk drive models used with the workstation. 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.

Partitioning and formatting a disk

To partition and format a disk:

1. At the system prompt, enter:

   `format`

   A message similar to the following is displayed:

```
AVAILABLE DISK SELECTIONS:
       0. c0t0d0 <ST320420A cyl 39533 alt 2 hd 16 sec 63>
          /pci@1f,0/ide@d/dad@0,0
       1. c0t2d0 <ST320420A cyl 39533 alt 2 hd 16 sec 63>
          /pci@1f,0/ide@d/dad@2,0
       2. c1t0d0 <SUN18G cyl 7506 alt 2 hd 19 sec 248>
          /pci@1f,0/pci@5/pci@2/SUNW,isptwo@4/sd@0,0
       3. c1t1d0 <SUN18G cyl 7506 alt 2 hd 19 sec 248>
          /pci@1f,0/pci@5/pci@2/SUNW,isptwo@4/sd@1,0
Specify disk (enter its number):
```

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

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

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

```
selecting c1t0d0
[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 partition table currently assigned to the disk drive is displayed. The table for an 18-GB SCSI data disk after partitioning will look similar to the following example:

```
Current partition table (original):
Total disk cylinders available: 7506 + 2 (reserved cylinders)

Part      Tag    Flag     Cylinders        Size            Blocks
  0 unassigned    wm       0 - 890        2.00GB    (891/0/0)    4198392
  1 unassigned    wm     891 - 1781       2.00GB    (891/0/0)    4198392
  2     backup    wm       0 - 7505      16.86GB    (7506/0/0) 35368272
  3 unassigned    wm    1782 - 2672       2.00GB    (891/0/0)    4198392
  4 unassigned    wm    2673 - 3563       2.00GB    (891/0/0)    4198392
  5 unassigned    wm    3564 - 4454       2.00GB    (891/0/0)    4198392
  6 unassigned    wm    4455 - 5345       2.00GB    (891/0/0)    4198392
  7 unassigned    wm    5346 - 7505       4.85GB    (2160/0/0) 10177920

partition>
```

5. Partition the disk by completing the following Steps a through e for all partitions as specified in the Disk partitioning values on page 98.

   a. At the **partition>** prompt, enter the partition number from the table. For example, for partition 0, enter **0**.

      The system prompts for the partition ID tag.

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

   b. Enter the partition ID tag from the table. For all partitions except 2, press **Enter** to accept the default (**unassigned**). Partition 2 is set to **backup**.

      The system prompts for permission flags.

```
Enter partition permission flags[wm]:
```

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

      The system prompts for the starting cylinder.

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

   d. Enter the number of the starting cylinder from the table. For example, for partition 0, enter **0**.

      The system prompts for the partition size.

```
Enter partition size[XXb, XXc, XXmb, XXgb]:
```

e. Enter the partition size from the table. For example, for partition 0 on an 18-GB SCSI disk, enter **2gb**.

The **partition>** prompt is displayed.

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

   print

7. Compare the displayed partition table to the Disk partitioning values on page 98. If there are any discrepancies, correct them by repeating the disk partitioning.
8. When you determine that the disk partitioning is correct, enter:

   label

   Important:
   Do *not* forget to label the disk drive.

   The following message is displayed:

```
Ready to label disk, continue?
```

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?
```

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 105.

Administering data disk drives

After the data disk drives have been installed, partitioned, and formatted, you must administer the disk drives.

The procedures in this section include:

- Administering new data disks on page 105
- Administering replacement data disks on page 106

Administering new data disks

Administration of new data disks is automated using commands on the CMS Services menu.

Note:
For workstations that have an 80-GB internal disk drive with CMS R12, external data disk drives are not being offered.

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 following message is displayed, you must first turn on IDS before continuing with Step 2.

```
cmssvc: Warning IDS off-line. It will take approx 30 seconds to start cmssvc. IDS can
be turned on with the run_ids command on the cmssvc menu.
```

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 are displayed.
4. Enter the number that corresponds to the disks 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:
Depending on the size of the disks, the system may run slowly until all disks are synchronized.

Administering replacement data disks

If a data disk drive 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 nonmirrored system after data disk failure"
- "Recovering a mirrored system after disk failure"

Replacing the CD-ROM drive

This section describes how to replace the internal CD-ROM drive using the following procedures:

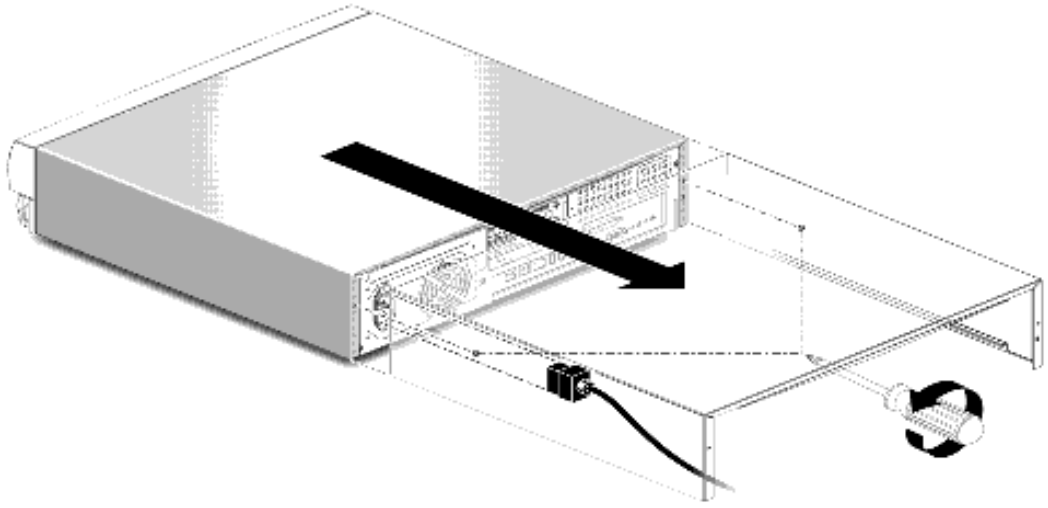
Opening the workstation

To open the workstation:

1. Remove any CD-ROMs from the drive.
2. Use the following command to shut down the workstation:

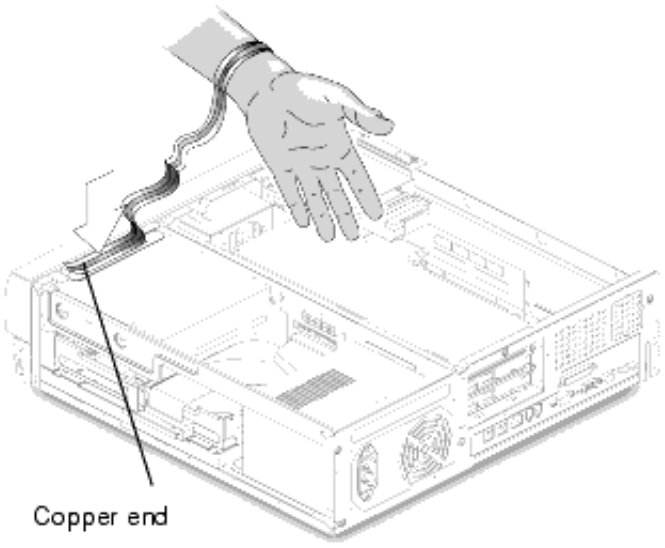
   ```
   /usr/sbin/shutdown -y -i0 -g0
   ```

3. Press and hold the front panel power switch for 5 seconds to power off the system.
4. Remove the two screws on the back of the unit that secure the cover to the chassis. See the following figure.



5. Slide the cover toward the rear of the system until the cover tabs release.
6. Lift the system cover straight up. Set it aside in a safe place.

7. Attach an antistatic wrist strap to the metal chassis of the workstation and to your wrist. See the following figure.

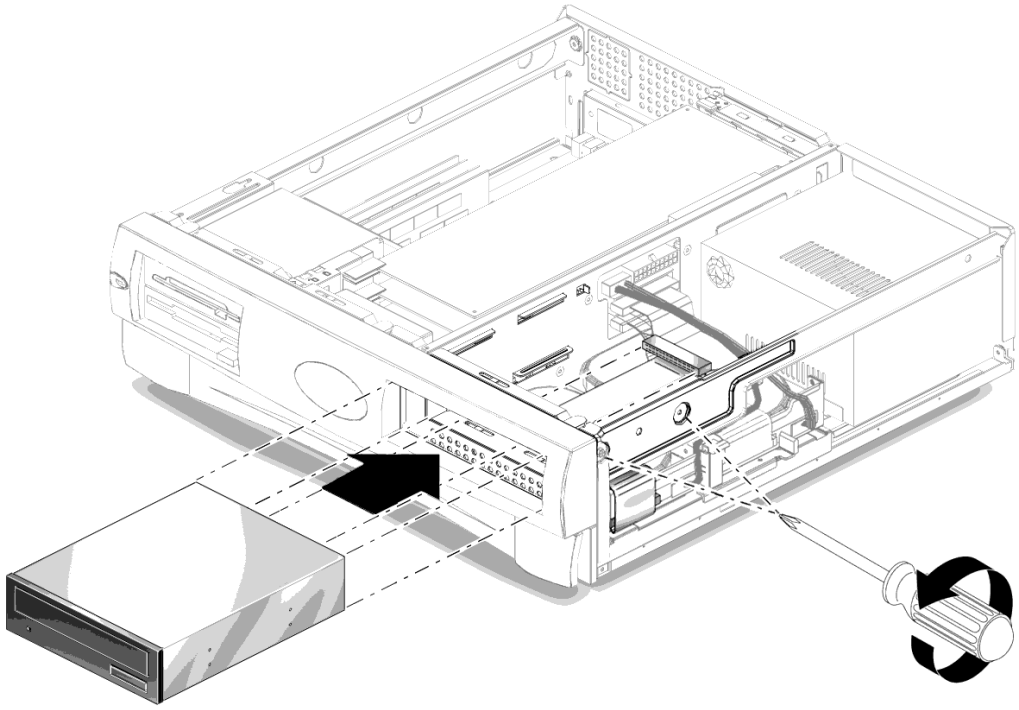


8. Disconnect the AC power cord.

Removing and replacing the CD-ROM drive

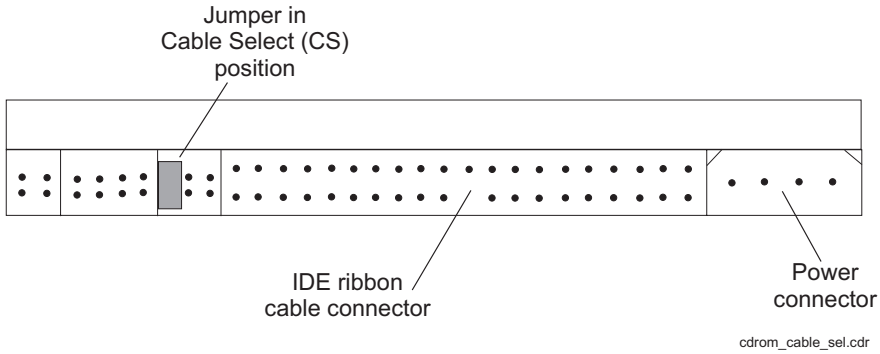
To remove and replace the CD-ROM drive:

1. Remove the following from the back of the CD-ROM drive:
   - CD-ROM drive IDE cable connector
   - Power cable connector
2. Remove the two screws securing the CD-ROM drive to the chassis. See the following figure.



3. Place your fingers on the back of the CD-ROM drive. Push the CD-ROM drive toward the chassis front and remove it.
4. Place the CD-ROM drive on an antistatic mat.

5. On the new CD-ROM drive, verify that the drive back panel mode-select jumper is set to "CS," "Enable Cable Select," or "Cable Select." See the following figure.



6. Position the CD-ROM drive in the chassis.
7. Push the CD-ROM drive toward the rear of the chassis.
8. Connect the CD-ROM drive cable connector labeled CD to the new CD-ROM drive.
9. Connect the power cable to the CD-ROM drive.
10. Replace the two screws securing the CD-ROM drive to the chassis.

Tip:
Install each screw with just a few turns before you tighten both screws.

Closing the workstation

To close the workstation:

1. Reconnect the AC power cord to the workstation.
2. Detach the ESD wrist strap.
3. Replace the cover on the workstation. Slide the cover forward until it fits snugly around the chassis.
4. Replace the two cover screws.

Tip:
Install each screw with just a few turns before you tighten both screws.

Turning on the system

To turn on 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**+**A** simultaneously after the console banner is displayed, but before the system starts booting.
5. Enter the following commands:

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

   ```
   reset-all
   ```

   This resets the system and the `ok` prompt is displayed.
6. Enter:

   ```
   probe-ide
   ```

   This checks to see that the system recognizes the new CD-ROM drive. If the new CD-ROM is not listed, make sure there is a secure connection between the motherboard and the CD-ROM drive.
7. Reboot the system by entering the following commands:

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

   ```
   boot
   ```

   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.

Maintaining tape drives

This section include the following topics:

Ordering tapes

Replacement backup data and tape drive cleaning cartridge tapes can be ordered from your local computer supply or office supply store. Depending on your tape drive model, order the following cartridge tapes:

Description	Tape drive
DAT 72 36/72-GB, 4mm, 170m	DAT 72
DDS-4 20/40-GB, 4mm, 150-155m	DDS-4
DDS 4mm cleaning cartridge	DDS-4 and DAT 72

Important:
If you are using the CMS High Availability feature and one of your systems uses a DDS-4 tape drive while the other uses a DAT 72 tape drive, you must use DDS-4 tape cartridges in both systems. Using the same size backup tapes allows you to do manual data restores on both systems, no matter which one may need the restore.

Cleaning the tape drive

This section describes how you clean the tape drive.

Note:
CMS computers do not ship with tape drive cleaning tapes. Avaya recommends that customers purchase at least one cleaning tape as soon as the computer is installed and in service.

The number of cleaning cycles available on a cleaning cartridge depends on the manufacturer of the cartridge. Regular cleaning is recommended to maximize tape drive performance. Avaya recommends that you clean the tape drive once a week or every five (5) data backups, whichever comes first.

The LEDs on the tape drives will indicate when the tape drives need cleaning. See Tape drive status indicators on page 149. 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. If the cleaning cartridge does not eject automatically, it may be defective and may need replacing.

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.

Adding, removing, or replacing tape drives

This section describes how to add, remove, or replace an external tape drive on an existing workstation.

Note:
External tape drives are pre-installed and required at all times on a workstation. Adding a second tape drive is usually only a temporary measure during the migration process.

Adding or replacing a tape drive

When adding a newer model tape drive to a system, you may have to edit the **`/kernel/drv/st.conf`** file to add information about the new tape drive. If editing the file is required, you will receive a Design Change Letter (DCL) instructing you how to change the file.

To add or replace a tape drive:

1. Remove any tapes from the tape drive.
2. Log in to the system as root.
3. Enter:

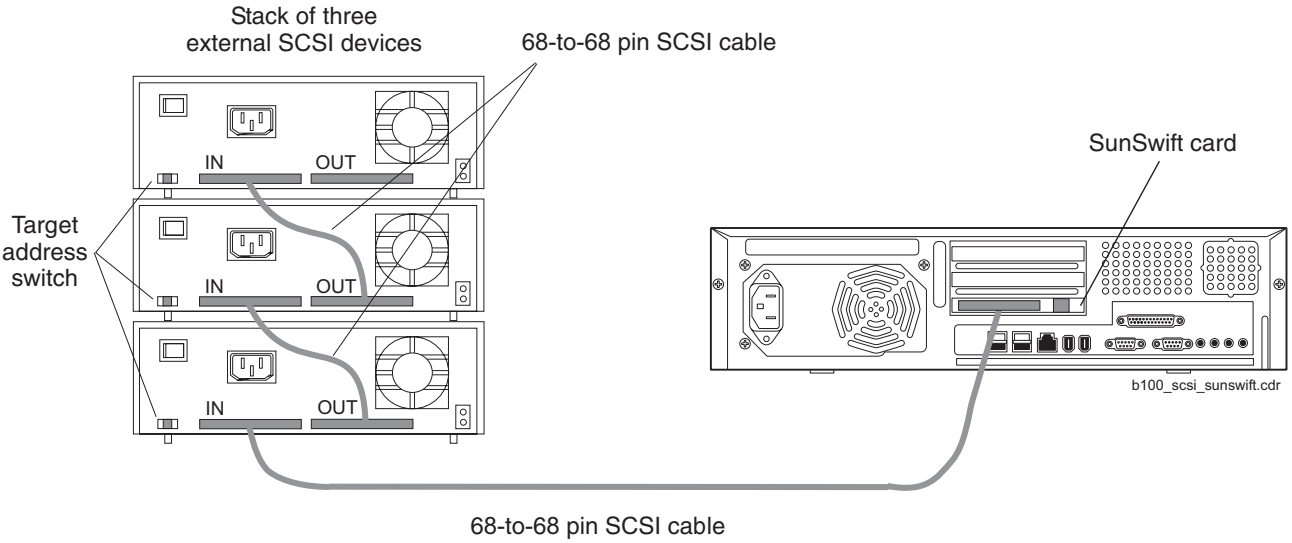
   `/usr/sbin/shutdown -y -i0 -g0`

   This shuts down the system.
4. Press and hold the front panel power switch for 5 seconds to power 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.
7. If replacing a defective tape drive, disconnect the SCSI cables and power cables.
8. Connect the tape drive to the other SCSI devices as shown in Connecting SCSI tape drives on page 115.

Connecting SCSI tape drives

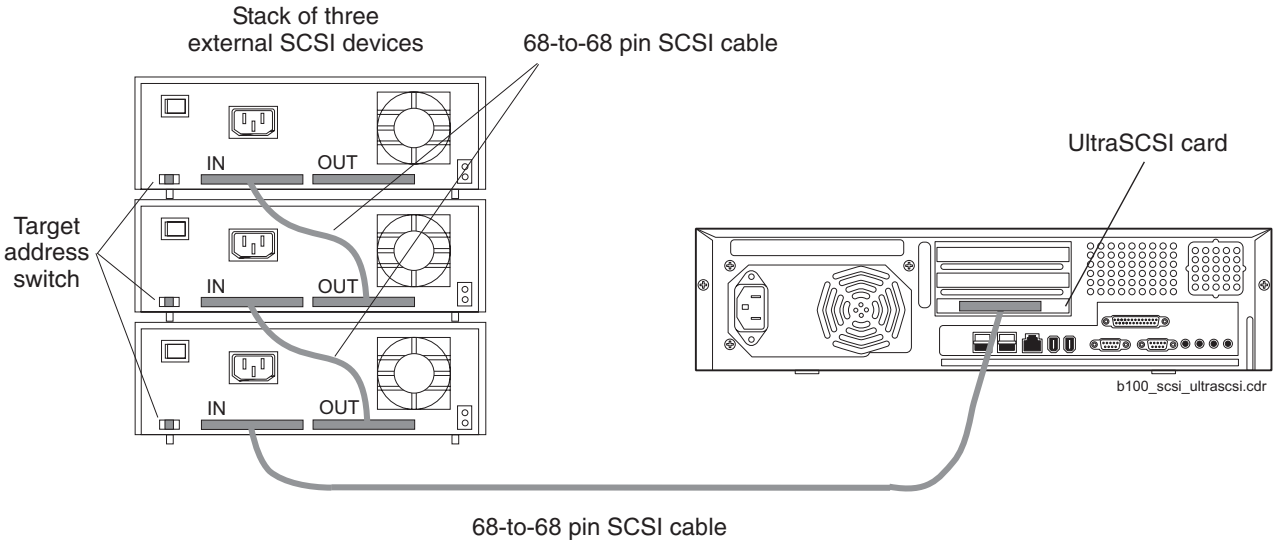
The following figure shows how to connect SCSI disk drives and tape drives to a SunSwift card. A 68-to-68-pin SCSI cable connects from the SunSwift PCI card on the back of the workstation to the IN connector on the back of the SCSI device that is closest to the workstation. If you have more than one SunSwift card, connect the drives to the card in the lowest slot number. A 68-to-68 pin SCSI cable connects from the OUT connector of that device to the IN connector of the next device. Continue this process until all assigned devices are connected in the SCSI chain.

CAUTION:
There are limits to the length of cables you can use with SCSI devices. If you only have one SCSI device, the cable can be 6m (20 ft) long. If you have up to four SCSI devices, each cable can be 3m (10 ft) long. If you have more than four SCSI devices, each cable can be 1.5m (5 ft) long. If you use cables that are too long, you will get SCSI bus errors.



The following figure shows how to connect SCSI disk drives and tape drives to an UltraSCSI card. A 68-to-68-pin SCSI cable connects from the UltraSCSI PCI card on the back of the workstation to the IN connector on the back of the SCSI device that is closest to the workstation. A 68-to-68 pin SCSI cable connects from the OUT connector of that device to the IN connector of the next device. Continue this process until all assigned devices are connected in the SCSI chain.

CAUTION:
There are limits to the length of cables you can use with SCSI devices. If you only have one SCSI device, the cable can be 6m (20 ft) long. If you have up to four SCSI devices, each cable can be 3m (10 ft) long. If you have more than four SCSI devices, each cable can be 1.5m (5 ft) long. If you use cables that are too long, you will get SCSI bus errors.



When connecting SCSI devices, the last device in the chain MUST be terminated, either via an auto-terminated device or with a manual terminator.

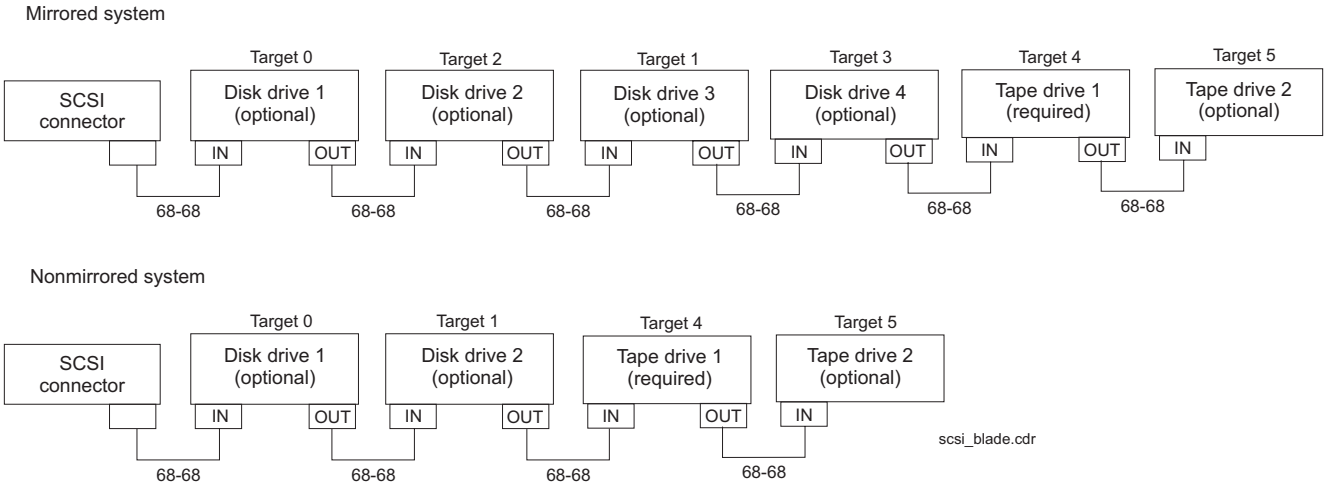
When using an auto-terminated SCSI device, you do not need to connect a SCSI terminator to the OUT connector of the last SCSI device in the chain. To verify that the last device is auto-terminated, check the LEDs labeled Auto Term High and Auto Term Low on the back panel of the device. In a CMS configuration, both LEDs are lit on the last device in the SCSI chain. If a device in the SCSI chain is not the last device, neither termination LED is lit.

When using a manually-terminated device, you must connect a SCSI terminator to the OUT connector of the last SCSI device in the chain. When you connect the SCSI terminator to the OUT connector, the LED on the terminator is lit.

The OUT connector of the DAT 72 tape drive must have a termination plug installed. The DAT 72 tape drive does not auto terminate. All DAT 72 tape drives delivered from the factory have termination plugs installed.

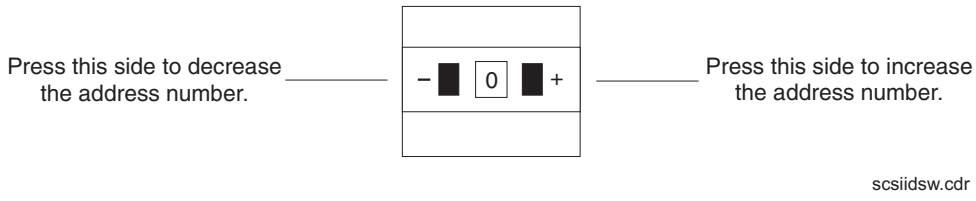
The following figure shows the SCSI cabling. The target addresses are different for mirrored and nonmirrored systems. Nonmirrored systems support only two external disk drives.

CAUTION:
There are limits to the length of cables you can use with SCSI devices. If you only have one SCSI device, the cable can be 6m (20 ft) long. If you have up to four SCSI devices, each cable can be 3m (10 ft) long. If you have more than four SCSI devices, each cable can be 1.5m (5 ft) long. If you use cables that are too long, you will get SCSI bus errors.



Important:
Each pair of SCSI disk drives in a mirrored system must be the same size.

The addresses are set using the target address switches on the back of each SCSI device. Before setting the target address, make sure that the power is off on the SCSI device.



Continue with Turning on the system on page 118.

Turning on the system

To turn on the system:

1. Connect the power cord from the tape drive to a power source.
2. Turn on all external SCSI devices, starting with the device that is farthest from the system and working toward the system.
3. Turn on the system monitor.
4. Turn on the system.
5. Press **Stop**+**A** simultaneously after the console banner is displayed, but before the system starts booting.

   The **ok** prompt is displayed.
6. Enter the following commands:

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

   ```
   reset-all
   ```

   This resets the system.
7. 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 or Target 5. If the new drive is not listed, make sure there is a secure connection between the SCSI port and the new drive.
8. Reboot the system by entering the following commands:

   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.

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

   ```
   boot -r
   ```

   The system reboots.

Removing an external SCSI tape drive

To remove an external tape drive:

1. Remove any tapes in the tape drive.
2. Log in to the system as root.
3. Enter the following commands:

   cd /dev/rmt

   pwd

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

   rm *

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

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

   This shuts down the system.
6. Press and hold the front panel power switch for 5 seconds to power 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. Disconnect the tape drive from the SCSI port or SCSI chain.
10. Turn on all external SCSI devices, starting with the device that is farthest from the system and working toward the system.
11. Turn on the system monitor.
12. Turn on the system.
13. Press **Stop**+**A** simultaneously after the console banner is displayed, but before the system starts booting.

    The **ok** prompt is displayed.
14. Enter the following commands:

    setenv auto-boot? false

    reset-all

    This resets the system.

15. Enter:

    probe-scsi-all

    The current SCSI devices are displayed. The removed tape drive should not be listed.

16. Reboot the system by entering the following commands:

    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.

    setenv auto-boot? true

    boot -r

    The system reboots.

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

Adding memory and replacing the CPU

The workstation comes equipped with a minimum amount of RAM depending on when the workstation was originally purchased. This minimum amount of RAM can range from 256-MB up to 1-GB. For the Sun Blade 100, up to three additional DIMMs (256 or 512-MB) may be installed, for a maximum memory of 1-GB. For the Sun Blade 150, up to three additional DIMMs (256-MB or 512-MB) may be installed, for a maximum memory of 2-GB.

The workstation comes equipped with one CPU. If the CPU fails, it should be replaced by a qualified Sun technician. Contact your Avaya representative for more information.

This section includes the following topics:

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

Checking the current memory size

To check the current memory size:

1. Enter:

   `prtconf | grep Memory`

   The current memory size is displayed.

```
Memory size: xxx Megabytes
```

2. Record the current memory size.

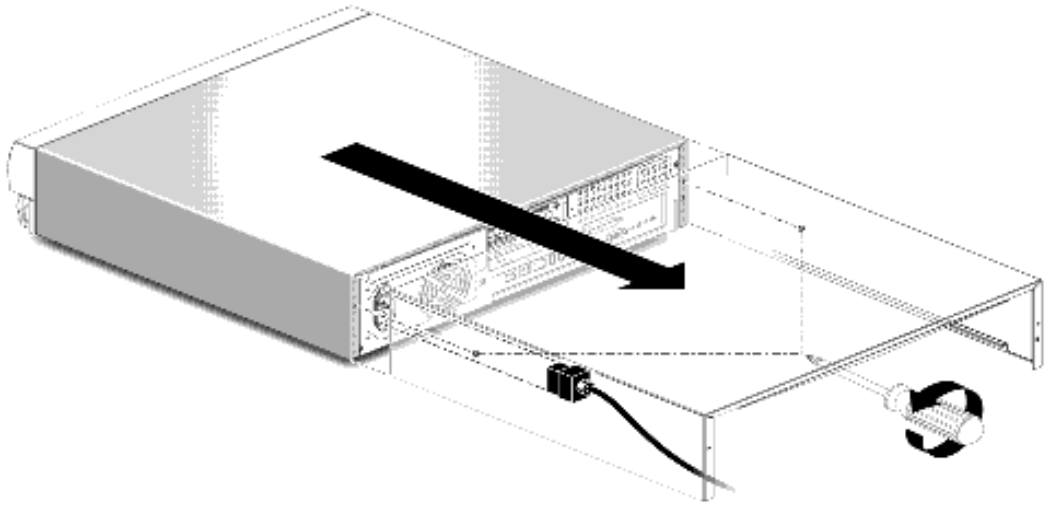
Opening the workstation

To open the workstation:

1. If you have not already done so, use the following command to shut down the workstation:

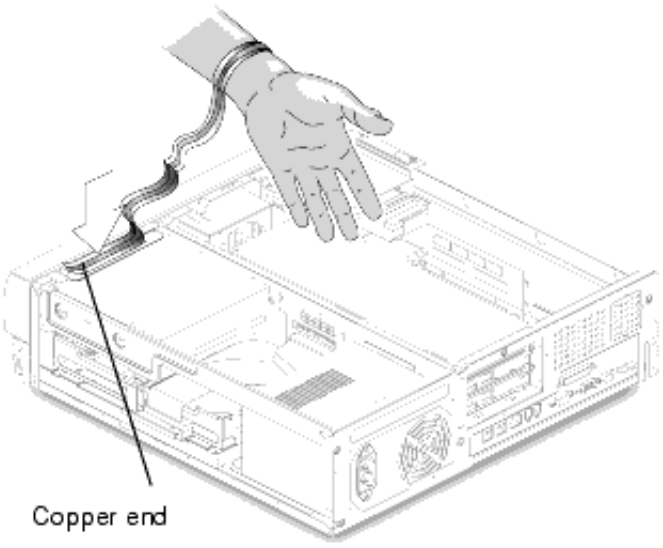
   `/usr/sbin/shutdown -y -i0 -g0`

2. Press and hold the front panel power switch for 5 seconds to power off the system.
3. Turn off the system monitor.
4. Turn off all external SCSI devices, starting with the device that is closest to the system and working toward the farthest device.
5. Remove the two screws on the back of the unit that secure the cover to the chassis. See the following figure.



6. Slide the cover toward the rear of the system until the cover tabs release.
7. Lift the system cover straight up. Set it aside in a safe place.

8. Attach an antistatic wrist strap to the metal chassis of the workstation and to your wrist. See the following figure.

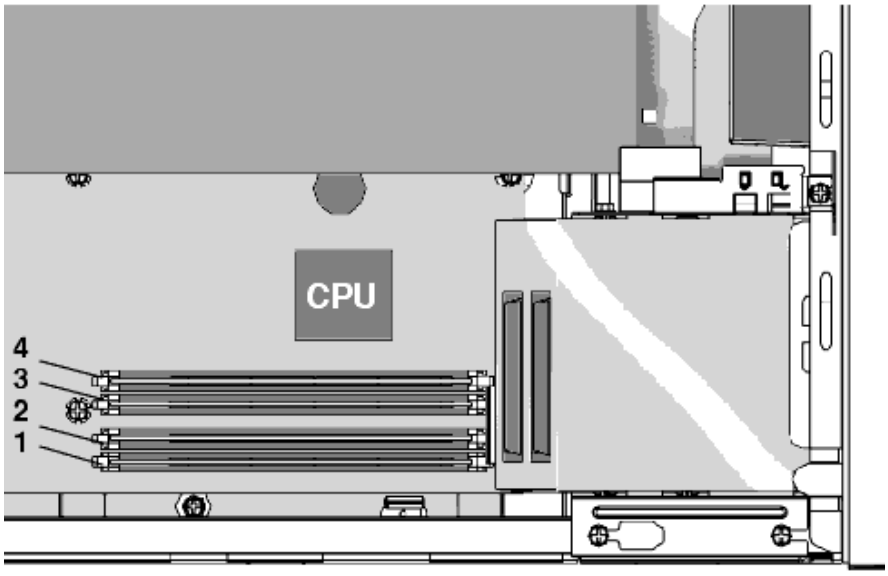


9. Disconnect the AC power cord.

Adding the DIMMs

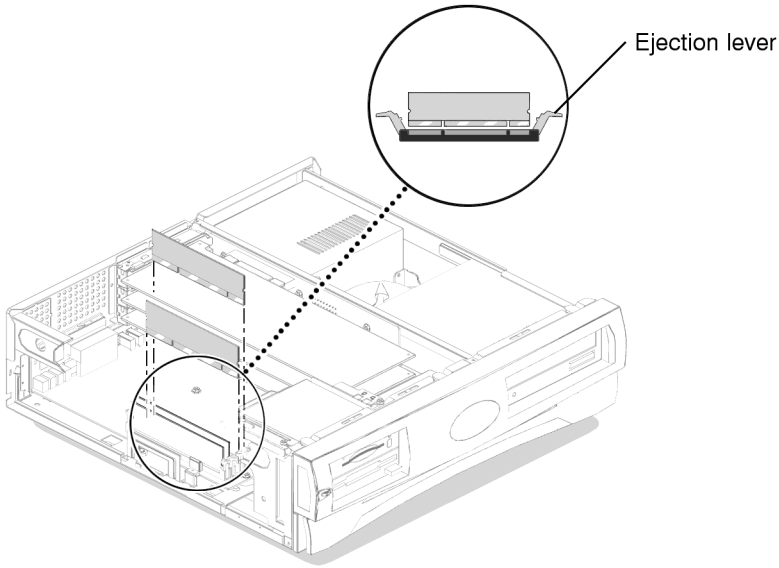
To add the DIMMs:

1. Locate the DIMM connectors as shown in the following figure.



Note:
The DIMM connectors are labeled U2, U3, U4, and U5. The DIMMs are installed in the order shown in the figure.

2. Remove the DIMM from the antistatic container.
3. Starting with the first empty slot, unlock (press down) the ejector levers at both ends of the connectors. See the following figure.



4. Position the DIMM in the connector, ensuring that the notches on the bottom of the DIMM are aligned with the connector alignment keys.
5. Press firmly on both of the top ends of the DIMM at the same time until the DIMM is properly seated.
6. Verify that the ejection levers are closed toward the DIMM.
7. Repeat this procedure for each DIMM.

Closing the workstation

To close the workstation:

1. Reconnect the AC power cord to the workstation.
2. Detach the ESD wrist strap.
3. Replace the cover on the workstation. Slide the cover forward until it fits snugly around the chassis.
4. Replace the two cover screws.

Tip:
Install each screw with just a few turns before you tighten both screws.

Checking the new memory size

To check the new memory size:

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 up, log in as root.
5. Enter:

   `prtconf | grep Memory`

   The new memory size is displayed.

```
Memory size: xxx Megabytes
```

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

Troubleshooting

This section describes the following troubleshooting procedures:

Additional troubleshooting: See the *Sun Blade 100 Service Manual* or *Sun Blade 150 Service Manual* at the Sun documentation Web site for additional troubleshooting procedures:

http://docs.sun.com

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 160 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.
   - 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.

6. Log in to the remote console as root.

Redirecting the remote console back to the local 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.

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.
   - 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+A** simultaneously after 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.
   - 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.

Redirecting the remote console back to the local 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.

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

- Method 1: from the remote console on page 133 (recommended)
- Method 2: from the local site on page 134 (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 are displayed 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 workstation.
2. As the workstation 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
```

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, enter:

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

The following is an example of the results for a Sun Blade 150 workstation. The Sun Blade 100 will look similar except for the CPU specifications and PROM revisions.

```
System Configuration: Sun Microsystems  sun4u Sun Blade 150 (UltraSPARC-IIe 650MHz)
System clock frequency: 93 MHZ
Memory size:

=================================== CPUs ===================================
               E$          CPU                  CPU     Temperature
CPU  Freq      Size        Implementation       Mask    Die   Amb.  Status
Location
---  --------  ----------  -------------------  -----   ----  ----  ------
--------
  0   650 MHz  512KB       SUNW,UltraSPARC-IIe    3.3     46C   33C  online
 +-board/cpu0

================================ IO Devices ================================
Bus   Freq      Slot +  Name +
Type  MHz       Status  Path                          Model
----  ----  ----------  ----------------------------  --------------------
pci     33   +s/system-board  isa/isadma (dma) okay  /pci@1f,0/isa@7/dma
pci     33   +s/system-board  isa/su (serial) okay  /pci@1f,0/isa@7/serial@0,3f8
pci     33   +s/system-board  isa/su (serial) okay  /pci@1f,0/isa@7/serial@0,2e8
pci     33   +s/system-board  pci108e,1101 (network)        SUNW,pci-eri okay  /pci@1f,0/network@c,1
pci     33   +s/system-board  firewire (firewire) okay  /pci@1f,0/firewire
pci     33   +s/system-board  pci10b9,5451 (sound) okay  /pci@1f,0/sound
pci     33   +s/system-board  pci10b9,5229 (ide) okay  /pci@1f,0/ide@d
pci     33   +s/system-board  SUNW,m64B (display)           ATY,RageXL okay  /pci@1f,0/SUNW,m64B@13
pci     33   +tem-board/PCI3  scsi-pci1000,f (scsi-2) okay  /pci@1f,0/pci/scsi


========================== Memory Configuration ============================
Segment Table:
------------------------------------------------------------------------
Base Address       Size       Interleave Factor  Contains
------------------------------------------------------------------------
0x0                256MB             1           chassis/system-board/DIMM0

============================== usb Devices ==============================

Name          Port#
------------  -----
keyboard        3
mouse           4
```

```
============================ Environmental Status ============================
Fan Speeds:
-------------------------------------------
Location       Sensor          Status   Speed
-------------------------------------------
+stem-fan-slot system-fan      okay     100%

Temperature sensors:
-------------------------------------------------------------------------------
Location       Sensor         Temperature  Lo   LoWarn  HiWarn    Hi   Status
-------------------------------------------------------------------------------
+em-board/cpu0 Die              46C       -10C    0C     85C     90C   okay
+em-board/cpu0 Ambient          33C       -10C    0C     40C     60C   okay

================================ HW Revisions ================================
ASIC Revisions:
-------------------------------------------------------------------
Path                   Device           Status             Revision
-------------------------------------------------------------------
/pci@1f,0/ebus@c       ebus             okay               1

System PROM revisions:
----------------------
OBP 4.6.5 2002/06/03 16:49
POST 2.0.1 2001/08/23 17:13
```

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.

This section includes the following topics:

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 the **`ok`** prompt is displayed.
4. Use the commands that are shown in Test descriptions on page 140.
5. When you finish testing, enter the following commands:

   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.

   `setenv auto-boot? true`

   `boot -r`

   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.

<table>
<tr><th>Command</th><th colspan="2">Description</th></tr>
<tr><td>probe-ide</td><td colspan="2">Displays the devices attached to the IDE bus.</td></tr>
<tr><td>probe-scsi-all</td><td colspan="2">Displays the devices attached to the SCSI bus.</td></tr>
<tr><td>show-devs</td><td colspan="2">Displays all the devices known to the system directly beneath a given device in the device hierarchy. When using show-devs by itself, the command shows the entire device tree.</td></tr>
<tr><td>show-disks</td><td colspan="2">Displays all disk devices.</td></tr>
<tr><td>test-all</td><td colspan="2">Runs a series of tests on the network and on hardware components. The test may take several minutes to complete. Use Stop+A to stop this test.</td></tr>
<tr><td rowspan="8">test [alias]</td><td colspan="2">Runs the self-test method of the specified device. Possible values for device-specifier are listed in the Alias column:</td></tr>
<tr><td>Alias</td><td>Description</td></tr>
<tr><td>net</td><td>network</td></tr>
<tr><td>ide</td><td>IDE bus</td></tr>
<tr><td>dload</td><td>devices (Sun Blade 100 only)</td></tr>
<tr><td>floppy</td><td>floppy</td></tr>
<tr><td>screen</td><td>video</td></tr>
<tr><td>keyboard</td><td>keyboard</td></tr>
<tr><td>watch-clock</td><td colspan="2">Tests the clock function.</td></tr>
<tr><td>watch-net
watch-net-all</td><td colspan="2">Runs a loopback test, a transceiver test, and a packet transmission test.</td></tr>
</table>

Additional references: See *Sun OpenBoot 4.x Command Reference Manual* at the Sun documentation Web site for more information:

http://docs.sun.com

Probing IDE devices

Symptom: The internal IDE disk drives are reporting errors.

Solution: Check the status of the IDE disk 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 and the **ok** prompt is displayed.

3. Enter:

   probe-ide

   A message similar to the following is displayed:

```
Device 0  ( Primary Master )
        ATA Model: ST320420A

Device 1  ( Primary Slave )
       Removable ATAPI Model: LTN4855

Device 2  ( Secondary Master )
        ATA Model: ST320420A

Device 3  ( Secondary Slave )
       Not Present
```

Note:
The actual message (devices listed) depends on the devices installed on the IDE controller. This example shows the primary internal disk drive, the CD-ROM drive, and the diskette drive.

4. If there are disk drives other than what was shown in the message, shut down the system and check the disk drive cabling.

5. When finished with testing, enter the following commands:

   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.

   setenv auto-boot? true

   boot -r

   The system reboots.

Probing SCSI devices

Symptom: The SCSI tape, CD-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

   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-scsi-all

   A message similar to the following is displayed:

```
/pci@1f,0/pci@5/pci@2/SUNW,isptwo@4
Target 0
  Unit 0  Disk      SEAGATE ST318203LSUN18G 034A
Target 4
  Unit 0  Removeable Tape     HP      C5683A        C005
```

   Note:
   The actual message (devices listed) depends on the devices installed on the SCSI bus. This example shows an external 18-GB disk drive and an external tape drive.

4. If there are drives other than what was shown in the message, shut down the system and check the drive cabling.

5. When finished with testing, enter the following commands:

   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.

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

   ```
   boot -r
   ```

   The system reboots.

Symptom: The SCSI tape, CD-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 message, 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:

   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.

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

   ```
   boot -r
   ```

   The system reboots.

OpenBoot diagnostic tests

OpenBoot Diagnostics (OBDiag) is a menu-driven tool that diagnoses system hardware. OBDiag performs root-cause failure analysis on the referenced devices by testing internal registers, confirming subsystem integrity, and verifying device functionality.

To use the OpenBoot diagnostic tests:

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

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

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

   `setenv auto-boot? false`

   `reset-all`

   The system resets.
4. Enter:

   `obdiag`

   This loads the test program and the test menu is displayed.
5. Enter:

   `test <command number>`

   See Test descriptions on page 145 for a description of each command.
6. Enter the following commands:

   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.

   `setenv auto-boot? true`

   `boot`

   The system reboots.

Test descriptions

See the following table for a summary of OpenBoot Diagnostic test commands. The command numbers are not shown since they vary for the different computers.

Command name	Description
SUNW,hme@0,1	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
SUNW,isptwo@4	This command tests the external SCSI interfaces.
SUNW,m64B@13	This command tests the video monitor port.
ebus@c	This command: • Performs a walking ones bit test • Verifies that the status register is properly set • Validates the DMA capabilities and FIFOs
firewire@c,2	This command tests the 1394 interfaces.
flashprom@0,0	This command verifies the NVRAM operation by performing a write and read to the NVRAM.
floppy@0,3f0	This command verifies the diskette drive controller initialization. You must have a formatted floppy in the diskette drive.
ide@d	This command validates both the IDE chip and IDE bus subsystem. This takes several minutes.
keyboard@4	This command tests the keyboard.
network@c,1	This command tests the network port.
parallel@0,378	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.
pmu@3	This command tests the mouse.

Command name	Description
serial@0,2e8	This command invokes the uart_loopback test for serial port A. The serial port A diagnostic will stall if the TIP line is installed on serial port A.
serial@0,3f8	Not used.
usb@c,3	This command tests the USB ports.
exit	This command exits from the OpenBoot diagnostics.

Additional references: See *Sun OpenBoot 4.x Command Reference Manual* at the Sun documentation Web site for more information:

http://docs.sun.com

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.

Memory failure

The operating system, diagnostic program, or POST may not display a DIMM location (U number) as part of a memory error message. In this situation, the only available information is a physical memory address and failing byte. The following table lists physical memory addresses to locate a defective DIMM.

DIMM slot	DIMM starting address (Hex)
DIMM0 (U2)	0X 00000000
DIMM1 (U3)	0X 20000000
DIMM2 (U4)	0X 40000000
DIMM3 (U5)	0X 60000000

If a DIMM slot has been skipped, you may see one or more of the following messages during OpenBoot diagnostics:

```
Invalid memory configuration

First  Memory DIMM must be placed in DIMM1 slot
Second Memory DIMM must be placed in DIMM2 slot
Third  Memory DIMM must be placed in DIMM3 slot
Fourth Memory DIMM must be placed in DIMM4 slot
```

OpenBoot initialization commands

The following table describes OpenBoot initialization commands that are provided by the system. These commands are useful in some situations in which the system fails to boot.

Command	Description
Press **Stop**	Bypass POST. This command does not depend on the security mode. **Note:** Some systems bypass POST as a default. In such cases, use the **Stop**+**A** key combination to start POST.
Press **Stop**+**A**	Abort. This command does not work during the first few seconds after the system is reset.

Diagnosing status indicators

Many hardware components of the workstation have LEDs that can be used to diagnose problems. This section describes the following status indicators:

- Power switch status indicators on page 148
- Tape drive status indicators on page 149

Power switch status indicators

During POST, the LED on the power switch blinks 6 times while OpenBoot PROM (OBP) is in progress, and lights steadily while POST is running.

Tape drive status indicators

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 is turned 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 is displayed (flashing amber), clean the tape drive.
- If the signal remains 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 tape drive is turned off and turned back on.

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`

   This bypasses 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 drives and CD-ROM drives

This section provides hard drive and CD-ROM drive failure symptoms and suggested actions.

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

Solution: Replace the drive indicated by 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 drive, target 6

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

Solution: When the hard drive or CD-ROM drive fails to respond to commands:

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-ide`

   A message similar to the following is displayed:

```
Device 0  ( Primary Master )
        ATA Model: ST320420A

Device 1  ( Primary Slave )
       Removable ATAPI Model: LTN4855

Device 2  ( Secondary Master )
        ATA Model: ST320420A

Device 3  ( Secondary Slave )
       Not Present
```

4. Verify that all the disk drives are recognized. This example indicates that the system primary disk is on Device 0, the CD-ROM is on Device 1, and the secondary internal disk drive is on Device 2.

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

5. When finished with testing, enter the following commands:

   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.

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

   ```
   boot -r
   ```

   The system reboots.

Troubleshooting tape drives

Use the following procedures to troubleshoot tape drives:

- Checking tape status
- Reassigning device instance numbers for tape devices on page 155

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 letter *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 and there is a tape in the tape drive, a message similar to the following is displayed:

```
HP DDS-4 DAT (Sun) tape drive:
   sense key(0x0)= No Additional Sense   residual= 0   retries= 0
   file no= 0   block no= 0
```

   If there is no tape in the tape drive, a message similar to the following is displayed:

```
/dev/rmt/0c: No tape loaded or drive offline
```

   If the device path is incorrect, a message similar to the following is displayed:

```
/dev/rmt/0c: No such file or directory
```

   If the tape drive is busy, a message similar to the following is displayed:

```
/dev/rmt/0c: Device busy
```

Reassigning device instance numbers for tape devices

As tape drives are added to and removed from a system, the device instance numbers 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 reassign device instance numbers for tape devices:

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 internal tape drive is SCSI address 5, and an external tape drive is SCSI address 4. If you change the SCSI address, you must turn the tape drive power off and back on.
3. Insert the Solaris CD-ROM into the CD-ROM drive.
4. After about 15 seconds, enter the following commands:

   ```
   boot cdrom -sw
   fsck -y /dev/dsk/c1t0d0s0
   mount /dev/dsk/c1t0d0s0 /a
   devfsadm -vCc tape -r /a -p /a/etc/path_to_inst
   ```

   This reassigns the device instance numbers for the tape devices.
5. Enter:

   ```
   eject cdrom
   ```
6. Remove the Solaris CD-ROM.

Recovery procedures

This section provides solutions for the following 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**+**A**.

Loss of power

If the system loses power, it is recommended (but not required) that you empty the CD-ROM and tape drives. The system boots from the disk by default.

To turn on the workstation:

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 turned on.

```
|------| <Product Name>, Keyboard Present
|      | Copyright 1998-2000 Sun Microsystems, Inc. All rights reserved.
|      | OpenBoot 4.6 build_10, XXX MB memory installed, Serial #XXXXXXXXX
|------| Ethernet address X:X:XX:XX:XX:XX, Host ID: XXXXXXXX
```

To turn off the workstation:

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

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

   This shuts down the system.
3. Press and hold the front panel power switch for 5 seconds to power 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.

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:

   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.

   setenv auto-boot? true

   boot -r

   The system reboots.

Reseating HSI/P cards

The HSI/P cards may appear to be faulty when they just need to be reseated in the PCI slot. Before you replace the card, try reseating the card.

To reseat an HSI/P card:

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

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

   This shuts down the system.
3. Press and hold the front panel power switch for 5 seconds to power 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.
6. Disconnect the HSI/P quad cable connected to the card.
7. Remove and replace the suspect HSI/P card. See Installing or removing PCI cards on page 59 for detailed instructions.
8. Reattach the HSI/P quad cable.
9. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
10. Turn on the system monitor.
11. Turn on the system.
12. When the system comes back up, log in as root.
13. Test the card to see if it is now working. If the card is still not working, see Replacing an HSI/P card on page 70.

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

   The following message should be displayed:

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

   If this message is not displayed, continue with Step 3.

3. Enter:

   /cms/install/bin/abcadm -r ttya

   The following message is displayed:

```
ttya is currently set to be incoming

Are you sure you want to change it? [y,n,?]
```

4. Enter: **y**

   The following message is displayed:

```
ttya administration removed
```

   The port monitor turns off.

5. Enter:

   ps -ef | grep sac

   This finds any SAC processes that are running. If any processes are found, continue with Step 6. Otherwise, continue with Step 7.

6. Enter:

   kill -9 *<pid>*

   Use this command to kill any SAC processes still running. Process numbers are represented by ***<pid>***.

7. Enter:

   /usr/lib/saf/sac -t 300

   This restarts SAC.

8. Enter:

   sacadm -l

   Confirm that SAC is running. The system should report the port status as **ENABLED**.

9. Enter:

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

   The following message should be displayed:

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

   If this message is not displayed, escalate the problem using the normal channels.

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 4 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

   The AOM log file is displayed.

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.

SCSI bus errors

Symptom: You receive error messages indicating there are SCSI bus errors.

Solution: There are limits to the length of cables you can use with SCSI devices. If you only have one SCSI device, the cable can be 6m (20 ft) long. If you have up to four SCSI devices, each cable can be 3m (10 ft) long. If you have more than four SCSI devices, each cable can be 1.5m (5 ft) long.

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 either the agent talking to the caller or the call waiting on hold).
Boot	To load the system software into memory and start it running.
Boot disk	A disk that contains the Solaris operating system and customer data.
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 nonbootable disk. A data disk contains only customer data.
DIMM	Dual In-line Memory Module. A narrow printed circuit board that holds memory chips. It plugs into a DIMM socket on the motherboard or memory board.
High Speed Serial Interface/PCI (HSI/P)	The HSI/P controller card is a 4-port serial communications PCI 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.
IDE	Integrated Drive Electronics
Non-Volatile Random Access Memory (NVRAM)	A random access memory (RAM) system that holds its contents when external power is lost.
PCI	Peripheral Component Interconnect
PCI Bus	The interface bus for the workstation. 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 workstation. 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 workstation 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 push button located on each device.
SCSI Single-Ended Bus	A version of the SCSI bus designed to minimize cost and space. Cable lengths up to 6 meters are supported. A SCSI single-ended bus is not compatible with the differential version of the SCSI bus.

Small Computer System Interface (SCSI)	A hardware interface that allows the connection of peripheral devices (such as hard disks, tape drives and CD-ROM drives) to a computer system.
Solaris	The operating system package on the Sun workstation. Solaris is a version of the UNIX System V Release 4. CMS requires Solaris to run on the Sun workstations.
SSO	Services Support Organization. The Avaya organization that provides technical support for Avaya products.
TPE	Twisted-pair Ethernet

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