

Lucent Technologies
Bell Labs Innovations



***CentreVu*[™] Call Management System**
Release 3 Version 5
Sun[®] *SPARCserver*[™] Computers
Installation and Maintenance
Volume 1

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CentreVu Call Management System

Release 3 Version 5

Sun SPARCserver Computers

Installation and Maintenance

Volume 1

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CentreVu Call Management System

Release 3 Version 5

Sun SPARCserver Computers

Installation and Maintenance

Volume 2

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Overview

The *CentreVu™ Call Management System Release 3 Version 5 Sun® SPARCserver™ Computers Installation and Maintenance*, Issue 1 (585-215-827) document is written for technicians and Lucent Technologies call center customers who install and maintain the *CentreVu* Call Management System (CMS). This document addresses *Sun* SPARCserver†* computers using the *Solaris‡* 2.4 operating system.

Organization

This document is organized into two volumes, as follows:

Volume 1

- **Chapter 1 — Introduction**

Provides an overview of the supported *CentreVu* CMS software, supported hardware platforms, required software, and supported switch releases. It also includes the purpose of the *Sun SPARCserver* computer, roles and responsibilities, and helpline information.

- **Chapter 2 — CMSSVC and CMSADM Menus**

Provides an overview of the CMSSVC and CMSADM menu options.

- **Chapter 3 — Installing the *Sun SPARCserver* Computer**

Describes how to set up the *Sun SPARCserver* computer at the customer's location.

- **Chapter 4 — Installing Terminals, Printers, and Modems**

Describes how to install terminals, printers, and modems for the *CentreVu* CMS application.

- **Chapter 5 — Connecting the *Sun SPARCserver* Computer to the Switch**

Describes how to connect the *Sun SPARCserver* computer to Lucent Technologies switches. In addition, it discusses multi-ACD connectivity.

- **Chapter 6 — Setting Up *CentreVu* CMS and Installing Feature Packages**

*Sun is a registered trademark of Sun Microsystems, Inc.

†SPARCserver is a trademark of SPARC International Inc.

‡Solaris is a registered trademark of Sun Microsystems, Inc.

Explains how to set up the *CentreVu* CMS application and install additional *CentreVu* CMS feature packages.

- **Chapter 7— Turning the System Over to the Customer**

Provides the procedures that a technician performs before system cutover and a worksheet that the technician fills out for the customer.

- **Chapter 8 — Troubleshooting**

Discusses how to fix various software, hardware (including terminals, printers, and modems), power, and installation problems.

Volume 2

- **Chapter 9— Maintenance**

Discusses the CMSADM file system backup, recovering from a disk corruption or crash, recovering system space, and other maintenance procedures.

- **Appendix A — Generic 3i and Generic 1 Administration**

Describes how to administer the *CentreVu* CMS application for Generic 3i and Generic 1 switches.

- **Appendix B — Generic 2 and System 85 Administration**

Describes how to administer the *CentreVu* CMS application for Generic 2 and System 85 R2V4 switches.

- **Appendix C — Generic 3r Administration**

Describes how to administer the *CentreVu* CMS application for Generic 3r switches.

- **Appendix D — *Sun SPARCserver* Computer Factory Installation Procedures**

Outlines the factory hardware and software installation procedures for the *Sun SPARCserver* computer. A technician would also use these procedures at a customer site if problems occurred.

CentreVu CMS Documents

The following documents are available for the *CentreVu* CMS R3V5 product:

- *CentreVu™ Call Management System Release 3 Version 5 Administration* (Volumes 1 and 2), *Issue 1* (585-215-820)
- *CentreVu™ Call Management System Release 3 Version 5 Real-Time and Historical Reports, Issue 1* (585-215-821)
- *CentreVu™ Call Management System Release 3 Version 5 Custom Reports, Issue 1* (585-215-822)
- *CentreVu™ Call Management System Release 3 Version 5 Change Description* — request the most current issue (585-215-823)
- *CentreVu™ Call Management System Release 3 Version 5 External Call History Interface, Issue 1* (585-215-824)
- *CentreVu™ Call Management System Release 3 Version 5 Forecast* (585-215-825)
- *CentreVu™ Call Management System Release 3 Version 5 Upgrades and Migration, Issue 1* (585-215-826)
- *CentreVu™ Call Management System Release 3 Version 5 Sun® SPARCserver™ Computers Installation and Maintenance* (Volumes 1 and 2), *Issue 1* (585-215-827)
- *CentreVu™ Call Management System Release 3 Version 5 Sun® SPARCserver™ Computers Connectivity Diagram, Issue 1* (585-215-828)
- *CentreVu™ Call Management System Release 3 Version 5 Documentation CD-ROM, Issue 1* (585-215-891).

To order, call the BCS Publication Center at **1-800-457-1235**.

Other *CentreVu* Documents

The following documents are available for the *CentreVu* Supervisor product:

- *CentreVu™ Supervisor Version 5 User Guide, Issue 1* (585-215-829)
- *CentreVu™ Supervisor Version 5 Installation and Getting Started, Issue 1* (585-215-830).
- *CentreVu™ Report Designer Version 5 User Guide, Issue 1* (585-215-831).

To order, call the BCS Publication Center at **1-800-457-1235**.

Chapter 1

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Overview

The *CentreVu*™ Call Management System Release 3 Version 5 (*CentreVu* CMS R3V5) is a software application offered in association with the Automatic Call Distribution (ACD) feature of Lucent Technologies switches. The *CentreVu* CMS application provides monitoring and recording of ACD calls, agents handling these calls, and the use of Vector Directory Numbers (VDNs) for these calls to measure system and agent performance.

The *CentreVu* CMS software supports the following features, which Lucent Technologies can enable at installation:

- Expert Agent Selection (EAS) (switch feature)
- Call Vectoring (switch feature and *CentreVu* CMS feature package)
- Forecasting Feature Package (*CentreVu* CMS)
- Graphics Package (*CentreVu* CMS)
- External Call History Package (*CentreVu* CMS)
- Multiple ACDs (*CentreVu* CMS).

Supported Hardware Platforms

The *CentreVu* CMS R3V5 is certified to run on the following computers:

- *Sun** *SPARCserver*† 20
- *Sun* *SPARCserver* 10‡
- *Sun* *SPARCserver* 5
- 3332‡
- *StarServer*® S‡
- 6386 WGS 33/S‡
- 6386 WGS 25/S.‡

Note

This manual addresses the following *Sun* *SPARCserver* computers:

- *Sun* *SPARCserver* 5 and 20 (new installs only)
- *Sun* *SPARCserver* 10 (existing).

*Sun is a registered trademark of Sun Microsystems, Inc.

†SPARCserver is a trademark of SPARC International Inc.

‡Supports *CentreVu* CMS R3V5 only as a bug fix.

Required Software

To operate properly, the *CentreVu* CMS R3V5 requires the following software packages:

- HSI/S 2.0 (for all *Sun SPARCserver* computers having multiple ACDs)
 - *INFORMIX*^{*}-SE 5.04
 - 1.0 Network Terminal Server
 - *Solaris*[†] 2.4
 - *SunLink*[‡] X.25 Network Interface Software Version 8.02.
 - *Solstice DiskSuite*^{**} (for all *Sun SPARCserver* installations intended to support more than 5200 agents)
-

Supported Switch Releases

The *CentreVu* CMS R3V5 is certified to run with the following Lucent Technologies switches:

- *DEFINITY*[®] Communications System Generic 2.1 Release 3.3 (QPPCN 629DR) and later.
- *DEFINITY* Communications System Generic 2.2 Release 3.0 and later (QPPCN 696DR)
- *DEFINITY* Communications System Generic 3i Release 13.3 and later (QPPCN 576)
- *DEFINITY* Communications System Generic 3r Release 8.5 and later
- *DEFINITY* Communications System Generic 3s Release 14.2 and later
- *DEFINITY* Communications System Generic 3 Version 1
- *DEFINITY* Communications System Generic 3 Version 2 Load 82 and later
- *DEFINITY* Communications System Generic 3 Version 3
- *DEFINITY* Communications System Generic 3 Version 4
- *DEFINITY* Enterprise Communications Server Release 5

^{*}INFORMIX is a registered trademark of Informix Software, Inc.

[†]Solaris is a registered trademark of Sun Microsystems, Inc.

[‡]SunLink is a registered trademark of Sun Microsystems, Inc.

^{**}Solstice DiskSuite is a trademark of Sun Microsystems, Inc.

Purpose of the *Sun SPARCserver* Computer

The *Sun SPARCserver* computer provides a hardware/software platform that enhances and supports the current *CentreVu* Call Management System R3V5 software application and is designed to do the following:

- Improve performance, input/output capacity, and reliability.
- Meet the needs of any call center customer by providing support for a varying number of devices typically configured for printers, terminals, and modems (up to 252 serial ports and 4 parallel ports).
- Provide multiprocessor capabilities for performance (two CPUs, 150-MHz clock).
- Enhance system availability by using error-correcting memory which protects customer's system and data from single-bit soft errors that can occur frequently depending on the environment.
- Improve real-time report refresh rate.
- Increase processor power using Reduced Instruction Set Computer (RISC) technology.
- Include up to two 2-GB internal disks and ten 2-GB external disks for a total of twelve hard disks (see Table 1-1).

Table 1-1: *Sun SPARCserver* Disk Capacity

<i>Sun SPARCserver 5</i> Computer	<i>Sun SPARCserver 10</i> Computer	<i>Sun SPARCserver 20</i> Computer
One or two 2-GB internal disks	Two 1-GB internal disks	Two 2-GB internal disks
Up to ten 2-GB external disks	Up to ten 2-GB external disks	Up to ten 2-GB external disks

- Allow for cost-effective upgrades (for example, disk storage, memory, processor power, etc.).
- Provide on-line help via *AnswerBook** software package

*AnswerBook is a trademark of Sun Microsystems, Inc.

AnswerBook Software Package

The *AnswerBook* software package is on-line documentation provided by Sun Microsystems, Inc. To access the *AnswerBook* software package, you must be at the local system console (monitor) and have the *OpenWindows** interface running. The *AnswerBook* software package uses the following pair of windows for browsing, searching, bookmarking, and printing on-line document collections:

- *AnswerBook Navigator* v3.4
- *AnswerBook Viewer* v3.4.

The *Solaris 2.4 AnswerBook* software package should be installed on your system.

If the *Solaris 2.4 AnswerBook* software package is not installed on your system, see the “Installing the *Solaris 2.4 AnswerBook* Software” section in Appendix D, “Sun SPARCserver Computer Factory Installation Procedures,” for details.

To reduce the amount of disk space used, the data for *Solaris 2.4 System AnswerBook* software package are not stored on the hard disk. To access the data, you must insert the *Solaris 2.4 System AnswerBook* CD-ROM software into the CD-ROM drive.

See the *Solaris 2.4 AnswerBook Administration Guide* for more details.

Starting AnswerBook Software

To start the *AnswerBook* software, do the following:

1. Start the *OpenWindows* interface.

If the *OpenWindows* interface is not displayed, do the following:

- a. Log off the system console.
- b. Log back on the system console.
- c. Answer yes to the question: Open Windows? y/n.

Note

When in the *OpenWindows* interface, if you get a window that says “xterm” at the top of the screen, then the TERM should be set to xterm. If the window says “Sun command window,” then the TERM should be set to sun - cmd.

2. Remove the “*Solaris 2.4 System AnswerBook*” CD-ROM from its case. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 3.

*OpenWindows is a trademark of Sun Microsystems, Inc.

- a. Place the CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.
 - c. Go to Step 6.
3. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
4. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.
5. Push the CD-ROM drive tray in (towards the system unit) until it closes.
6. Select **one** of the following ways to access the *AnswerBook* software:

- From a command window:

- a. Enter the following command:

```
# answerbook
```

- From the desktop:

- a. Click somewhere on the desktop (outside of an open window) to display the menu and menu options.
- b. Use the Right Mouse Button (Menu) to display the menus and make menu selections:

From the Workspace menu, select the Programs option.

From the Programs menu, select the AnswerBook option.

The *AnswerBook* Navigator v3.4 window appears. This window allows you to locate the information you want and then display it in the *AnswerBook* Viewer v3.4 window.

Navigating Through *AnswerBook* Software

1. To browse the contents of an *AnswerBook* software package, click on **Contents**, and continue to double click on areas you want to see.

Note To access the sections of the document you want to see, you can either double click or single click on the topic, and click the **View** button.

2. To search for an item of interest:
 - a. Click on the **Search** button.
 - b. Enter the item to search for at the prompt.
 - c. Press **Back Space** to search for a different item.
3. To delete the *AnswerBook* Viewer window:
 - a. Select **Quit** at the Window menu.
4. To get the Window menu:
 - a. Click the cursor in the bar at the top of the window.
 - b. Press the right mouse button.
 - c. While holding down the right mouse button, select **Quit**.
5. To view a topic, select the **View** option to access the *AnswerBook* Viewer v3.4 window.

The *AnswerBook* Viewer v3.4 window appears. This window allows you to read the documents you select in the *AnswerBook* Navigator window and to print them.

Exiting *AnswerBook* Software

To exit the *AnswerBook* software package, do the following:

1. Close each window by selecting **Close** from its window menu or by pressing the **Open** key on the keyboard (which toggles Open/Close).
2. Exit each window or icon by selecting **Quit** from its window menu.

When you quit both the *AnswerBook* Navigator v3.4 window and the *AnswerBook* Viewer v3.4 window, you quit both the Navigator and the Viewer; quitting the *AnswerBook* Viewer v3.4 window exits **only** the Viewer.

Note You can also use the keyboard equivalents that apply to all Desk Set applications to close or quit the Navigator and the Viewer.

3. At the system prompt, enter the `eject cdrom` command.

Roles and Responsibilities

This document was written for Lucent Technologies Technical Service Center (TSC) technicians, and *CentreVu* CMS administrators who want to install, set up, and maintain *CentreVu* CMS on a *Sun SPARCserver* computer.

The installation of the prerequisite hardware/software should have been completed by the factory before the computer was shipped to the customer.

Note

The factory hardware/software installation procedures can be found in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.”

Table 1-2 on the next page lists the major tasks, who is responsible for performing each task, and the chapter where the task is described.

Table 1-2: Task Responsibility

Chapter	Task	Tech	TSC	Customer
3	Installing the <i>Sun SPARCserver</i> computer and network peripherals	X		
4	Installing terminals, printers, and modems	X		
4	Administering the ports	X	X	
5	Connecting <i>CentreVu</i> CMS to the switch	X		
5	Multiple ACD connectivity (adding an ACD)	X	X	X
6	Setting authorizations		X	
6	Setting up data storage parameters		X	
6	Setting up the <i>CentreVu</i> CMS application		X	
6	Installing the Forecasting feature package			X
6	Installing the External Call History package			X
7	Verifying the system date and time	X		
7	Testing the <i>CentreVu</i> CMS connection to the TSC		X	
7	Testing the <i>CentreVu</i> CMS R3V5 software	X		
7	Turning the system over to the customer	X		
8	Solving <i>CentreVu</i> CMS-related problems	X	X	X
8	Solving hardware-related problems	X	X	
8	Solving terminal-related problems	X	X	X
8	Solving printer-related problems	X	X	X
8	Solving modem-related problems	X	X	X
8	Solving power-related problems	X	X	X
8	Solving installation-related problems	X	X	
8	Checking error logs	X	X	
9	Performing backups and restores			X
9	Recovering from a disk crash	X	X	
9	Checking installed software packages	X	X	

***CentreVu* CMS Helplines**

If an installation problem arises that requires assistance, Lucent Technologies technicians or the customer may call the following numbers:

Customer Number 1-800-242-2121

By calling this number, the customer reports the problem and generates a trouble ticket so the problem can be escalated through the services organization.

The customer will be prompted to identify the type of problem (ACD, hardware, or R3V5 *CentreVu* CMS) and will be connected to the appropriate service organization.

Technician Number 1-800-248-1234

The technician should provide the TSC personnel with the customer's name, the password for the *root* login ID on the *Sun SPARCserver* computer, the phone number of the dial-in port, and a description of the problem.

If the TSC engineers cannot solve the problem, they will escalate it to the Customer Support Organization of Lucent Technologies.

International Support

For international support contact your Lucent Technologies Representative/Distributor for more information.

Chapter 2

CMSADM and CMSSVC Menus

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CentreVu CMS Administration Menu (CMSADM)

The Call Management System (CMS) Administration (CMSADM) menu is intended for use primarily by the *CentreVu*™ CMS Administrator (see Figure 2-1).

```

Lucent Technologies CentreVu(TM) Call Management System
Administration Menu
Select a command from the list below.
  1) acd_create   Define a new ACD
  2) acd_remove  Remove all administration and data for an ACD
  3) backup      Filesystem backup
  4) diskmap     Estimate disk requirements
  5) memory      Estimate memory requirements
  6) realtime    Estimate real-time report refresh rate
  7) pkg_install Install a feature package
  8) pkg_remove  Remove a feature package
  9) run_cms     Turn CentreVu CMS on or off
Enter choice (1-9) or q to quit:

```

Figure 2-1: CMSADM Menu Example

The *CentreVu* CMS Administrator can do the following from this menu:

- Define a new Automatic Call Distribution (ACD).
- Remove an ACD.
- Back up the file systems to tape.
- Estimate *CentreVu* CMS disk requirements, memory requirements, and real-time refresh rate.
- Install or remove a feature package.
- Turn *CentreVu* CMS on or off.

Note

You must log in as *root* to access this menu. To access the *cmsadm* menu, enter *cmsadm* at the prompt. Select from the options on the *CentreVu* CMS Administration menu.

The following sections explain the options on the *CentreVu* CMS Administration menu.

acd_create

The `acd_create` option on the *CentreVu* CMS Administration menu allows you to define a new ACD.

Note

The ACD must be authorized, and therefore purchased, before it can be added to the *CentreVu* CMS. See the “Setting Authorizations” section in Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages,” for details.

1. Access the *CentreVu* CMS Administration menu by entering:

```
# cmsadm
```

The *CentreVu* CMS Administration menu appears.

```
Lucent Technologies CentreVu(TM) Call Management System
Administration Menu
Select a command from the list below.
  1) acd_create   Define a new ACD
  2) acd_remove  Remove all administration and data for an ACD
  3) backup      Filesystem backup
  4) diskmap     Estimate disk requirements
  5) memory      Estimate memory requirements
  6) realtime    Estimate real-time report refresh rate
  7) pkg_install Install a feature package
  8) pkg_remove  Remove a feature package
  9) run_cms     Turn CentreVu CMS on or off
Enter choice (1-9) or q to quit:
```

Note

Before you define a new ACD, you must turn off the *CentreVu* CMS.

2. To turn off *CentreVu* CMS, do the following:
 - a. Enter 9 to select `run_cms` on the *CentreVu* CMS Administration menu.
 - b. Enter 2 to turn off the *CentreVu* CMS. You will see the system prompt.
 - c. Enter `cmsadm`. The *CentreVu* CMS Administration menu appears.

3. Enter 1 to choose `acd_create`.
4. At the prompts, you need to enter the following information:
 - Switch name for the new ACD
 - Switch model (release)
 - Vectoring enabled on the switch (if authorized)
 - Expert Agent Selection Enabled (if authorized)
 - Does Central Office have disconnect supervision? (Y/N)
 - Local port assigned to the switch
 - Remote port assigned to the switch
 - Device used for x.25 connectivity
 - Number of splits/skills
 - Total split/skill members, summed over all splits/skills
 - Number of shifts
 - Start and stop times of all shifts
 - Number of agents logged into all splits/skills during all shifts
 - Number of trunk groups
 - Number of trunks
 - Number of unmeasured (trunk) facilities
 - Number of call work codes
 - Number of vectors (if “Y” is answered to Vectoring enabled on the switch)
 - Number of VDNs (if “Y” is answered to Vectoring enabled on the switch).

After you have entered all the required information, the message `Updating database` appears, followed by `ACD created successfully`.

5. Turn the *CentreVu* CMS back on by doing the following:
 - a. Enter `cmsadm`. The *CentreVu* CMS Administration menu appears.
 - b. Enter 9 to select `run_cms` on the *CentreVu* CMS Administration menu.
 - c. Enter 1 to turn on the *CentreVu* CMS.

A message appears telling you that *CentreVu* CMS is running.

acd_remove

The `acd_remove` option on the *CentreVu* CMS Administration menu allows you to remove an ACD.

Note

1. An ACD must be created before it can be removed.
2. To remove the master ACD, you must first designate some other ACD as the master. Use this procedure:
 - a. From the main CMS menu, select `System Setup - CMS State`.
 - b. Tab to the `Master ACD` field and type in a new name.
 - c. Access the action list and select `Modify`.
 - d. Return to the main menu and select `Logout`.

You are now free to use the procedure below to remove the ACD formerly designated the master.

1. Access the `cmsadm` (*CentreVu* CMS Administration) menu by entering `cmsadm`. The *CentreVu* CMS Administration menu appears.
2. Before you can remove an ACD, you must turn off the *CentreVu* CMS. Do the following:
 - a. Enter 9 to select `run_cms` on the *CentreVu* CMS Administration menu.
 - b. Enter 2 to turn off the *CentreVu* CMS. You will see the system prompt.
 - c. Enter `cmsadm`. The *CentreVu* CMS Administration menu appears.
3. Enter 2 to select the `acd_remove` option.
4. To select the ACD you want to remove, enter your choice (1-3).

A message appears telling you that all administration and historical data for this ACD will be deleted.
5. Answer `y` at the following prompt: "Do you want to continue and delete all data for this ACD?"

The ACD will be removed in the background. A message appears telling you where you can find the complete message confirming the removal (for example, `/cms/install/logdir/admin.log`).
6. Since the ACD is removed in the background, you can turn CMS back on before the removal is complete. See the previous procedure "`acd_create`" to turn on the *CentreVu* CMS.

backup

The backup option on the *CentreVu* CMS Administration menu allows you to back up your file systems.

Note

You do not need to turn off *CentreVu* CMS to start the backup. If *CentreVu* CMS is on, then the system automatically turns off *CentreVu* CMS during the portion of the backup which needs *CentreVu* CMS off. After that portion is completed, the system automatically turns *CentreVu* CMS back on.

See the “Performing a CMSADM File System Backup” section in Chapter 9, “Maintenance,” for more information about this option.

diskmap

The diskmap option on the *CentreVu* CMS Administration menu allows you to estimate *CentreVu* CMS disk requirements.

1. Access the *CentreVu* CMS Administration menu by entering `cmsadm` at the system prompt. The *CentreVu* CMS Administration menu appears.
2. Enter 4 to select the diskmap option.
3. Answer the prompts that appear on the screen to estimate *CentreVu* CMS disk requirements.

Note

You may back up one prompt at a time by entering any negative number (for example, -1).

You need the following information:

- Customer name
- *CentreVu* CMS host computer type
- Total amount of Random Access Memory (RAM) equipped.

<If you answer “y” to go to the table allocation part of the program, then you must enter the following information (in megabytes):>

- Total amount of disk space
- Amount of agent, split, and trunk data
- Amount of trunk group, vector, and VDN data
- Amount of call work code, exception, agent trace, and call history data

- Amount of forecast, agent login/logout, and non-CMS customer data.

<You are asked if you want to run another case? (y/n)>

<If you answer “n” not to go to the table allocation part of the program, then you must enter the following information:>

- Will pseudo-ACD data be added? (y/n)
- Number of ACDs (1-4)
- Number of minutes in one interval (15, 30, 60)
- Start and stop times for data collection
- Number of shifts

<You must enter the following information for each shift:>

- Number of agents
- Start time
- Stop time

- Number of splits
- Number of trunk groups
- Number of trunks
- Number of vectors
- Number of VDNs
- Number of call work codes (CWCs)
- Internal or external call history enabled?

<If you answer “n” to internal call history enabled, you will be asked if external call history is enabled (y/n).>

- Number of exception records
- Number of agent trace records
- Number of call history records
- Number of days of intrahour data saved for, number of days of daily data saved for, number of weeks of weekly data saved for, and number of months of monthly data saved for:
 - splits
 - agents
 - trunk groups
 - trunks

- vectors
- VDNs
- CWCs.

- Number of times an agent logs out during a shift
- Forecasting enabled?

<If you answer “y” to forecasting enabled, then you must enter the following information:>

- Number of days of intrahour data for splits
- Number of days of intrahour data for trunk groups
- Number of days of daily data for splits
- Number of special days (average per split)
- Number of days that current day reports will be saved (average per split)
- Extra non-CMS disk space specified by the customer
- Total recommended disk space.

<You are asked if you want to do disk allocations now (y/n).>

<You are asked if you want to run another case (y/n).>

memory

The memory option on the *CentreVu* CMS Administration menu allows you to estimate your memory requirements.

1. Access the *CentreVu* CMS Administration menu by entering `cmsadm` at the system prompt. The *CentreVu* CMS Administration menu appears.
2. Enter 5 to select the memory option.
3. At the prompts, enter the requested information.

Note

You may back up one prompt at a time by entering any negative number (for example, -1).

You need the following information:

- Customer name
- *CentreVu* CMS host computer type
- Number of ACDs

- Switch model
- Maximum number of agents simultaneously logged in

Note

If an agent logs in to multiple splits or skills, count that agent multiple times.

- Number of splits/skills
- Number of trunk groups
- Number of trunks
- Number of VDNs
- Number of call work codes
- Agent trace enabled?
- Internal or external call history enabled?

<If you answer “n” to internal call history enabled, you will be asked if external call history is enabled (y/n).>

- Number of terminals simultaneously logged into *CentreVu* CMS
- Number of real-time reports running per terminal
- Number of agent group reports
- Number of agents per group
- Number of agent, split-status, event-count-summary, or queue/agent status reports
- Number of trunk group reports
- Number of split reports
- Number of splits per split report
- Number of VDN reports
- Number of VDNs per VDN report
- Number of VDN skill preference reports
- Number of VDNs per VDN skill preference report
- Number of vector reports
- Number of vectors per vector report
- Number of call profile reports
- Number of graphical reports (excluding the graph-call-profile report)
- Number of queue/agent summary reports

- Number of historical and forecasting reports running simultaneously during the busy hour
- Number of real-time exception reports running simultaneously during the busy hour
- Will custom reports be created or edited during busy hour?
- If yes, number of windows running administration screens simultaneously during the busy hour?

<If you answer “y” to custom reports being created or edited during the busy hour, then you must enter the following information:>

- Number of windows doing custom report creation or editing during busy hour

<If you answer “y” to internal call history or agent trace reports to run during the busy hour, then you must enter the following information.>

- Number of windows running call history or agent trace reports during busy hour.
- Will backups be done during the busy hour?
- Do you want to run another case?

<If you answer “y” to running another case, you are returned to entering a *CentreVu* CMS host computer type.>

realtime

The `realtime` option on the *CentreVu* CMS Administration menu allows you to estimate the real-time report refresh rate your system needs.

1. Access the *CentreVu* CMS Administration menu by entering `cmsadm` at the system prompt. The *CentreVu* CMS Administration menu appears.
2. Enter 6 to select the `realtime` option.
3. Answer the prompts that appear on the screen.

Note

You may back up one prompt at a time by entering any negative number (for example, -1).

You need the following information:

- Customer name
- *CentreVu* CMS host computer type

- Number of ACDs
- Number of agents per split
- Number of trunks per trunk group
- Number of agents per group report
- Number of splits per split report
- Number of vectors per vector report
- Number of VDNs per VDN report
- Number of VDNs per VDN skill preference report
- Is vectoring enabled?
- Archiving intervals in minutes (15, 30, or 60)
- Will either of the following be used?
 - Agents in multiple splits, without EAS
 - Generic 2.2 EAS
 - G3V4 with Expected Wait Time, rolling Average Speed of Answer, ii-digits, and ANI.
- Will most calls be complex? (For example, will they involve either a hold, transfer, conference, or supervisor assist?)
- Exceptions enabled?
- Internal call history enabled?
- External call history enabled?
- Call rate in calls per hour
- Agent trace enabled?

<If you answered “y” to the agent trace enabled, then you must enter the following information:>

 - Approximate average agent service time, in minutes
 - Number of agents traced simultaneously.
- Number of terminals
- Number of COW sessions simultaneously logged in to CMS.
- Number of internal call history or agent trace reports that will be run per hour (during prime time)
- Number of historical plus forecasting reports that will be run per hour while real-time reports are running

<If you enter “1” to get different periods for different types of reports, then you must enter the following information:>

- Number of real-time reports running per session

<You can answer “y” to give preferential treatment to running some reports faster at the expense of other reports.>

- Do you want to change the number of the reports?

<If you answer “n” to changing the number of reports, do you want to see the list of cpu times (the tau's) so that you can do completely general tradeoffs?>

<If you answer “y” to changing the number of reports, you are returned to choose either “1” or “2”.>

<If you enter “2” to get a single period, you need to enter the number of each type of report that is running.>

- Split/Skill Report
- Split Report Status
- Split Call Profile Report
- Agent Report
- Group Report
- Queue/Agent Status Report
- Queue/Agent Summary Report
- Trunk Group Report
- Event Count Summary Report
- Multi-ACD Report
- Graph Split Report
- Graph Queue Report
- Graph Split Call Profile Report
- Graph VDN Call Profile Report
- Vector Report
- VDN Report
- VDN Call Profile Report
- VDN Skill Preference Report.

Do you want to change the number of reports?

Do you want to analyze another case?

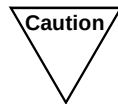
pkg_install

The `pkg_install` option on the *CentreVu* CMS Administration menu allows you to install a feature package.

For more information on this option, see Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages.”

pkg_remove

The `pkg_remove` option on the *CentreVu* CMS Administration menu allows you to remove a feature package. This procedure removes all files and database items associated with the feature package.



Care should be taken when removing a package as all features and data associated with that package will be lost.

1. Access the *CentreVu* CMS Administration menu by entering `cmsadm` at the system prompt. The *CentreVu* CMS Administration menu appears.
 2. Enter 8 to select the `pkg_remove` option.
A list of *CentreVu* CMS features that can be removed is displayed.
 3. Enter the number corresponding to the feature package that you want to remove.
A message is displayed telling you when the feature is removed.
-

run_cms

The `run_cms` option on the *CentreVu* CMS Administration menu allows you to turn *CentreVu* CMS on or off.

1. Access the *CentreVu* CMS Administration menu by entering `cmsadm` at the system prompt. The *CentreVu* CMS Administration menu appears.
2. Enter 9 to select the `run_cms` option.
3. Enter 1 to turn on *CentreVu* CMS or 2 to turn off *CentreVu* CMS.

CentreVu CMS Services Menu (CMSSVC)

The *CentreVu* CMS Services (CMSSVC) menu is intended for use primarily by Lucent Technologies services personnel (see Figure 2-2).

```
Lucent Technologies CentreVu(TM) Call Management System Services
Menu

Select a command from the list below.
  1) auth_display  Display feature authorizations
  2) auth_set      Authorize capabilities/capacities
  3) run_cms       Turn CentreVu CMS on or off
  4) setup         Set up the initial configuration
  5) swinfo        Display switch information
  6) swsetup       Change switch information
  7) patch_inst    Install a single CMS patch from CD
  8) patch_rmv     Backout an installed CMS patch
  9) load_all      Install all CMS patches found on CD
 10) back_all      Backout all installed CMS patches from machine
Enter choice (1-10) or q to quit:
```

Figure 2-2: CMSSVC Menu Example

This menu allows services personnel to do the following:

- Display *CentreVu* CMS authorizations.
- Authorize *CentreVu* CMS feature packages and capacities.
- Turn *CentreVu* CMS on and off.
- Set up the initial *CentreVu* CMS configuration.
- Display switch information.
- Change switch information.
- Install a *CentreVu* CMS patch.
- Back out an installed *CentreVu* CMS patch.
- Install all *CentreVu* CMS patches.
- Back out all installed *CentreVu* CMS patches.

Note

You must log in as *root* to access this menu.

The following sections explain the options on the *CentreVu* CMS Services menu.

auth_display

From the `auth_display` option on the *CentreVu* CMS Services menu, you can display *CentreVu* CMS authorizations.

1. Access the *CentreVu* CMS Services menu by entering:

```
# cmssvc
```

The *CentreVu* CMS Services menu appears.

```
Lucent Technologies CentreVu(TM) Call Management System Services
Menu
```

```
Select a command from the list below.
```

```
1) auth_display Display feature authorizations
2) auth_set      Authorize capabilities/capacities
3) run_cms       Turn CentreVu CMS on or off
4) setup         Set up the initial configuration
5) swinfo        Display switch information
6) swsetup       Change switch information
7) patch_inst    Install a single CMS patch from CD
8) patch_rmv     Backout an installed CMS patch
9) load_all       Install all CMS patches found on CD
10) back_all     Backout all installed CMS patches from machine
Enter choice (1-10) or q to quit:
```

2. Enter 1 to select the `auth_display` option.

The purchased version of *CentreVu* CMS and the current authorization status for CMS features and capacities are displayed.

The possibilities for authorization status are as follows:

- Authorized – The feature has been paid for, and authorization has been turned on.
- Not authorized – The feature has not been paid for, or authorization has not been turned on.
- Installed – The feature is authorized, and the software to support the feature has been installed.

For more information on this option, see Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages.”

auth_set

From the `auth_set` option on the *CentreVu* CMS Services menu, you can authorize *CentreVu* CMS features and capacities.

See the “Setting Authorizations” section in Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages,” for more information.

run_cms

From the `run_cms` option on the *CentreVu* CMS Services menu, you can turn *CentreVu* CMS on and off.

1. Access the *CentreVu* CMS Services menu by entering `cmssvc` at the system prompt. The *CentreVu* CMS Services menu appears.
 2. Enter 3 to select the `run_cms` option.
 3. Enter 1 to turn on *CentreVu* CMS or 2 to turn off *CentreVu* CMS.
-

setup

From the `setup` option on the *CentreVu* CMS Services menu, you can set up the initial *CentreVu* CMS configuration. For example, you can set up the type of backup device you want to use (QIC 2.5-GB, 14-GB, etc.).

Note

Do not confuse this option with the `swsetup` which is for changing the switch information.

Caution

If you run `setup` on an operating system, you will lose all customer data on that system.

See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages,” for more information about this option.

swinfo

From the `swinfo` option on the *CentreVu* CMS Services menu, you can display the switch parameters.

1. Access the *CentreVu* CMS Services menu by entering `cmssvc` at the system prompt. *CentreVu* CMS Services menu appears.
2. Enter 5 to select the `swinfo` option.
3. Select the ACD you want to show information for.

The following switch information is displayed:

- Switch name
- Switch model (release)
- Vectoring
- Expert Agent Selection
- Central Office disconnect supervision
- Local port
- Remote port
- Device for the x.25 link.

swsetup

From the `swsetup` option on the *CentreVu* CMS Services menu, you can change the switch parameters.

Note Do not confuse this option with the `setup` option which is for setting up *CentreVu* CMS.

Note When you change switch parameters, you should also check the parameters in the *CentreVu* CMS System Setup: Data Storage Allocation window. In particular, if you enable vectoring, you will need to allocate space for VDNs and vectors. Changing the switch release may change the number of measured entities allowed and may also have an impact on the storage allocation for each entity.

1. Access the *CentreVu* CMS Services menu by entering `cmssvc` at the system prompt. The *CentreVu* CMS Services menu appears.
2. Turn *CentreVu* CMS off. See the “`run_cms`” section of this chapter for details.
3. After the *CentreVu* CMS is turned off, enter `cmssvc` again.
4. Enter 6 to select the `swsetup` option.

5. Answer the prompts that appear on the screen.

You need the following information:

- Switch name
- Switch model (release)
- Vectoring
- Expert Agent Selection
- Central Office disconnect supervision
- Local port
- Remote port
- Device for the x.25 link.

The link number represents the port that is connected to the switch.

Note

- 1) Serial Port B
- 2) Corresponds to HSI/S Port 0
- 3) Corresponds to HSI/S Port 1
- 4) Corresponds to HSI/S Port 2
- 5) Corresponds to HSI/S Port 3
- 6) Software loopback link 0
- 7) Software loopback link 1

A display of the information is shown. The system will then ask if the above switch administration is correct.

6. Answer y or n.

patch_inst

From the `patch_inst` option on the *CentreVu* CMS Services menu, you can install a *CentreVu* CMS patch from the CD-ROM.

See the *CentreVu™ CMS R3V5 Upgrades and Migrations* document (585-215-826) for more information on `patch_inst`.

patch_rmv

From the `patch_rmv` option on the *CentreVu* CMS Services menu, you can back out a *CentreVu* CMS patch installed on the machine.

See the *CentreVu™ CMS R3V5 Upgrades and Migrations* document (585-215-826) for more information about `patch_rmv`.

load_all

From the `load_all` option on the *CentreVu* CMS Services menu, you can install all *CentreVu* CMS patches from the CD-ROM.

See the *CentreVu™ CMS R3V5 Upgrades and Migrations* document (585-215-826) for more information on `load_all`.

back_all

From the `back_all` option on the *CentreVu* CMS Services menu, you can back out all *CentreVu* CMS patches installed on the machine.

See the *CentreVu™ CMS R3V5 Upgrades and Migrations* document (585-215-826) for more information on `back_all`.

Chapter 3

Installing the *Sun SPARCserver* Computer

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Overview

This chapter describes how to install the *Sun*^{*} *SPARCserver*[†] computers and related peripheral equipment, including:

- *Sun SPARCserver* computer and system console
- External SCSI devices
- *SunLink*[‡] HSI/S (High-Speed Serial Interface/SBus) patch panel
- Black Box RS-232/RS-422 interface converter
- Network hub unit
- 8-,16- and 64-port Network Terminal Servers (NTSs) and 16-port NTS patch panel(s)
- 8- and 16-port SBus cards
- Uninterruptible Power Supply (UPS) (optional)
- Remote Console modem.

Figures 3-1 through 3-3 show the rear panels of the different *Sun SPARCserver* computers and the locations of peripheral connections.

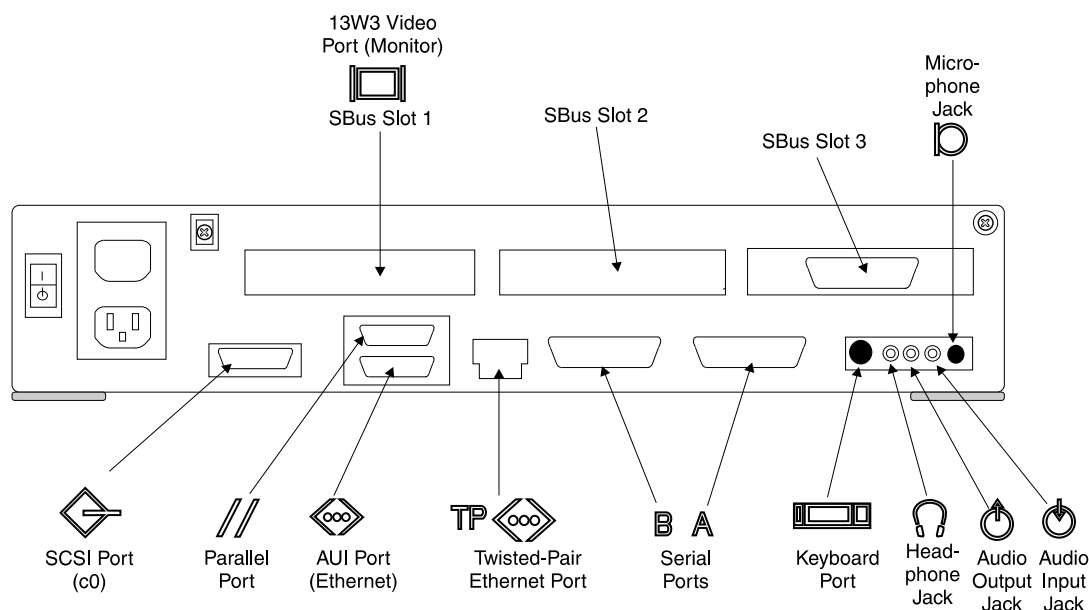


Figure 3-1: Rear Panel of the *Sun SPARCserver 5* Computer

*Sun is a registered trademark of Sun Microsystems, Inc.

†SPARCserver is a trademark of SPARC International, Inc.

‡SunLink is a registered trademark of Sun Microsystems, Inc.

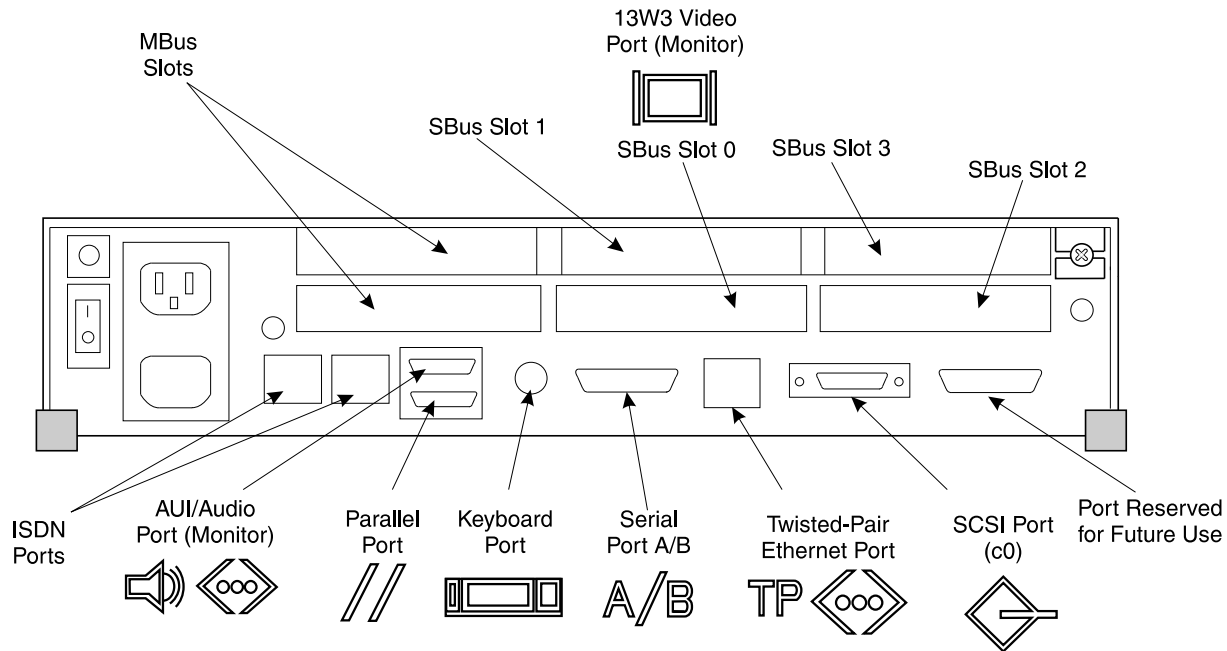


Figure 3-2: Rear Panel of the *Sun SPARCserver 10* Computer

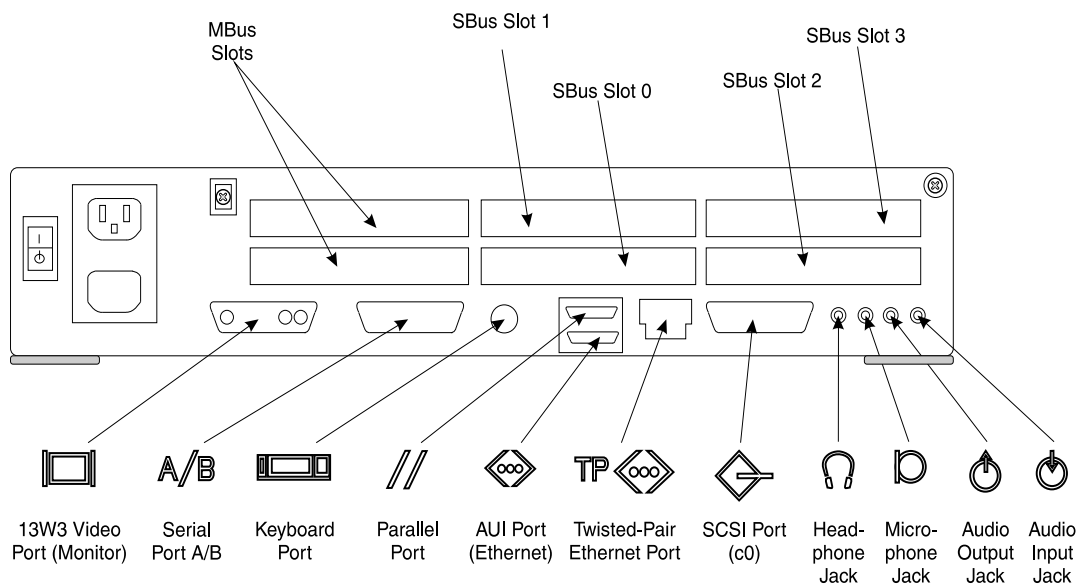


Figure 3-3: Rear Panel of the *Sun SPARCserver 20* Computer

Figure 3-4 shows how the peripheral equipment is connected to the *Sun SPARCserver 5* computer. Note the example of terminal, printer, and modem connectivity. This example shows the different hardware that you can use to connect peripherals.

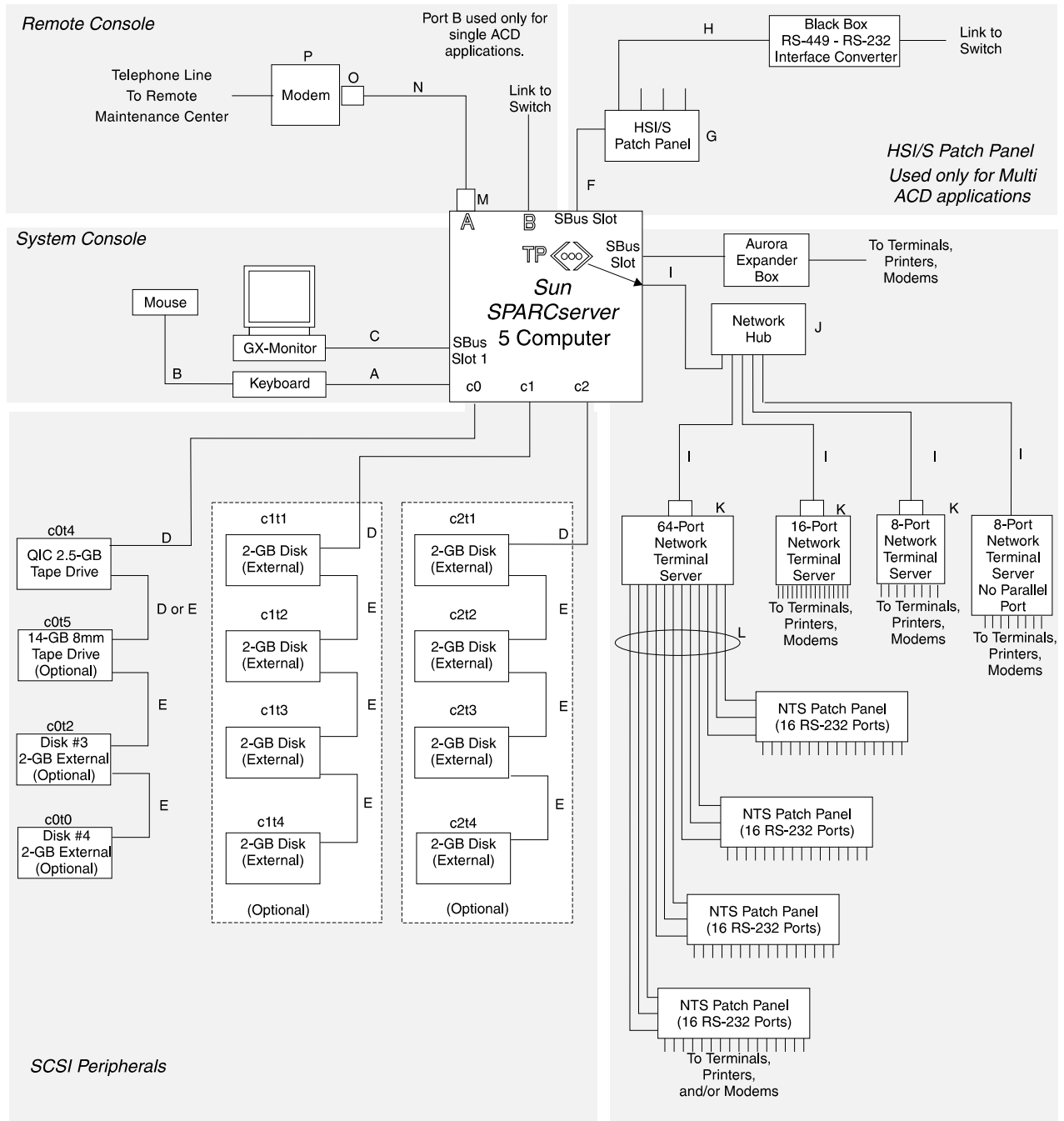


Figure 3-4: *Sun SPARCserver 5* Computer — Peripheral Connectivity

Figure 3-5 shows how the peripheral equipment is connected to the *Sun SPARCserver 10* computer.

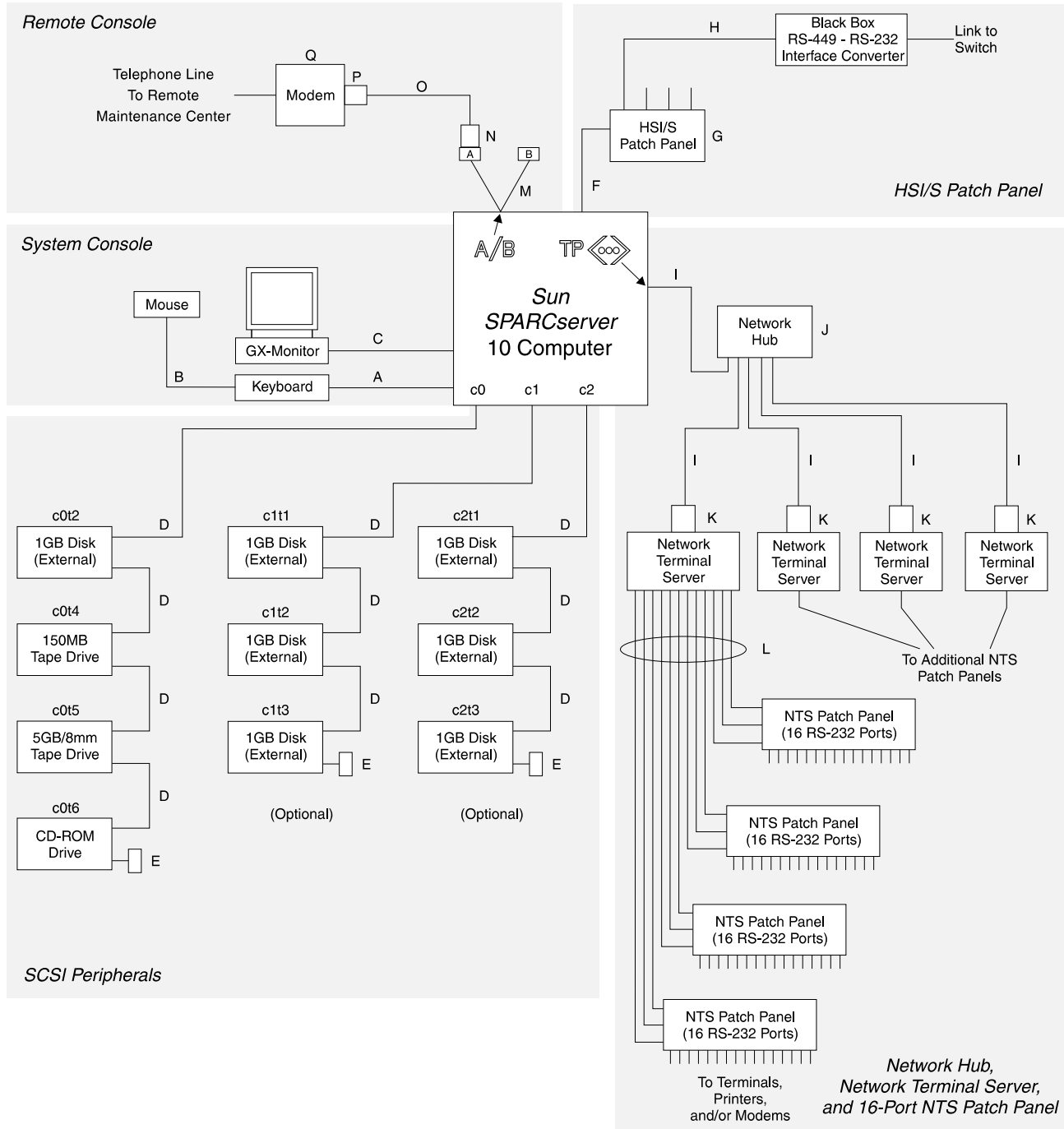


Figure 3-5: Sun SPARCserver 10 Computer— Peripheral Connectivity

Figure 3-6 shows how the peripheral equipment is connected to the *Sun SPARCserver 20* computer. Note the example of terminal, printer, and modem connectivity. This example shows the different hardware that you can use to connect peripherals.

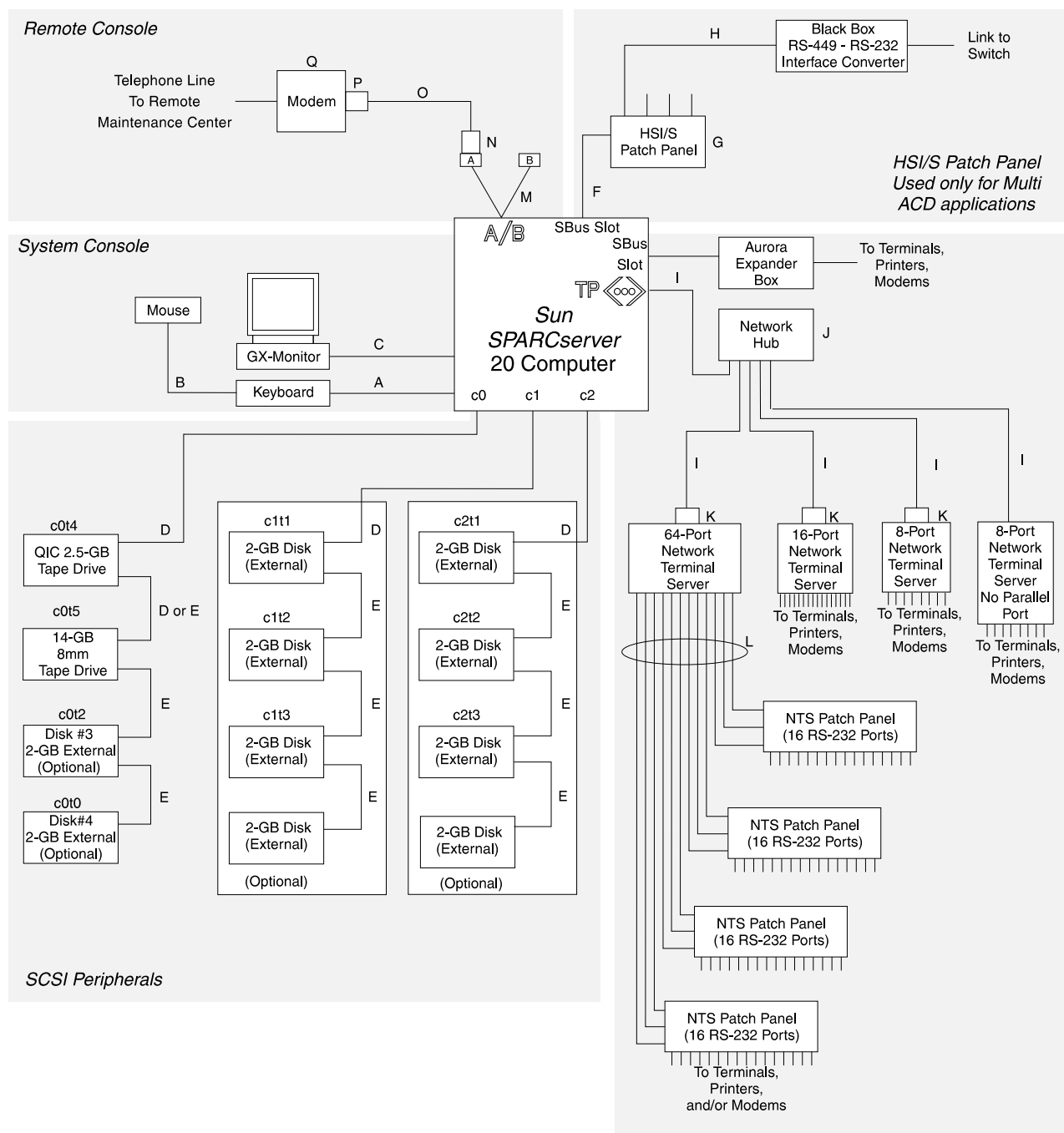


Figure 3-6: Sun SPARCserver 20 Computer — Peripheral Connectivity

Table 3-1 lists all the parts required to connect the peripherals to the *Sun SPARCserver 5* computer.

Table 3-1: *Sun SPARCserver 5* Computer Connectivity References

Figure 3-4 Call Out	Part of Comcode	Vendor Part Number	Description
A	407283415	530-1442-02 Rev C	Keyboard Cable - 2.5' Note: 15' keyboard extension cable available through PEC 12093, Comcode 407361815
B		370-1398-02	Mouse with Cable
C	407272574	9330	Monitor Cable - 2.5' Note: 4-meter monitor extension cable available through PEC 12093, Comcode 407361807 In some instances, the monitor cable is permanently attached to the monitor, so it is not a separate item.
D	407537802	530-2115-02 Rev 50	SCSI Cable, 50-to-68 pin (2.5-GB Tape Drive)
	407512144		SCSI Cable, 50-to-68 pin (14-GB Tape Drive)
	407579986		SCSI Cable, 50-to-68 pin
E	407579978	530-1884-03 Rev 50	SCSI Cable, 68-to-68 pin (2.1-GB Disk Drive)
	407557859		SCSI Cable, 68-to-68 pin
F	407066794	530-1685-02 Rev 52	HSI/S Cable - 10'
G		540-2191	HSI/S Patch Panel
H	407086818	EDN37K-MM	RS-449 Cable - 10'
I	407338334	180-1529-01 Rev A	Unshielded Twisted Pair (UTP) Cable - 4 meters
	407086826	ANIXTER* Part # - 143987	Category 5 UTP Cable - 10'
	407086842	ANIXTER Part # - 143992	Category 5 UTP Cable - 25'
	407086834	ANIXTER Part # - A111714-C	Category 5 UTP Cable - 50'
J	407086735	IBM [†] Part # - 60G0625	IBM 8222 Network Hub Unit
		Allied Part # - AT-MR820T-15	Allied Telesis CentreCOM [‡] Network Hub Unit

Table 3-1: Sun SPARCserver 5 Computer Connectivity References (Contd)

Figure 3-4 Call Out	Part of Comcode	Vendor Part Number	Description
K	407086859	LDI-10T	10Base-T transceiver
		<i>CentreCOM</i> 210TS	
L	407068329	460-093-900 Rev 2	PBX Champ Cable for 64-Port NTS - 1 meter
M	846362754	ED3P00170G-1306	ACU Modem Adapter
N	846983039		10-Wire Shielded Modular Cable - 10'
O	846362770	ED3P00170G-1308	Remote Console Adapter
P		Sportster 14.4 Faxmodem	Remote Console Modem
		<i>DataPort</i> ® Express Model 3715	
		<i>Comsphere</i> ® 3830	
		<i>Comsphere</i> 3910	
see note		4261-1002-0600	StarLAN 10 Network Fiber Hub
see note			LDI 10Base-FL Transceiver
see note			Fiber-Optic Cable (62.5 mm 2-strand cable)

*ANIXTER is a registered trademark of ANIXTER BROS., Inc.

†IBM is a registered trademark of International Business Machines, Corp.

‡CentreCOM is a registered trademark of Allied Telesis

Note

These parts are for the optional fiber-optic network configurations.

Table 3-2 lists all the parts required to connect the peripherals to the *Sun SPARCserver 10* computer.

Table 3-2: Sun SPARCserver 10 Computer Connectivity References

Figure 3-5 Call Out	Part of Comcode	Vendor Part Number	Description
A	407065853	530-1442-02 Rev C	Keyboard Cable - 2.5' Note: 15' keyboard extension cable available through PEC 12093, Comcode 407361815
B		401162-035/D	Mouse with Cable
C	407272574	9330	Monitor Cable - 2.5' Note: 4-meter monitor extension cable available through PEC 12093, Comcode 407361807 The monitor cable may be attached to the monitor, so it is not a separate item.
D	407195585	530-1793-02 Rev 50	SCSI Cable, 50-to-50 pin
E		150-1785-02	SCSI Terminator
F	407066794	530-1685-02 Rev 52	HSI/S Cable - 10'
G		540-2191	HSI/S Patch Panel
H	407086818	EDN37K-MM	RS-449 Cable - 10'
I	407338334	180-1529-01 Rev A	Unshielded Twisted Pair (UTP) Cable - 4 meters
	407086826	ANIXTER Part # - 143987	Category 5 UTP Cable - 10'
	407086842	ANIXTER Part # - 143992	Category 5 UTP Cable - 25'
	407086834	ANIXTER Part # - A111714-C	Category 5 UTP Cable - 50'
J	407086735	IBM Part # - 60G0625	IBM 8222 Network Hub Unit
K	407086859	LDI-10T	10Base-T Transceiver
L	407068329	460-093-900 Rev 2	PBX Champ Cable for 64-Port NTS - 1 meter
M	407086594	530-1869-02 Rev 50	Splitter Cable
N	846362754	ED3P00170G-1306	ACU Modem Adapter
O	846983039		10-Wire Shielded Modular Cable - 10'

Table 3-2: Sun SPARCserver 10 Computer Connectivity References (Contd)

Figure 3-5 Call Out	Part of Comcode	Vendor Part Number	Description
P	846362770	ED3P00170G-1308	Remote Console Adapter
Q		Sportster 14.4 Faxmodem	Remote Console Modem
		<i>DataPort</i> ® Express Model 3715	
		<i>Comsphere</i> ® 3830	
		<i>Comsphere</i> 3910	
See Note		4261-1002-0600	StarLAN 10 Network Fiber Hub
		LDI-10FL	10Base-FL Transceiver
			Fiber-Optic Cable (62.5 mm 2-strand cable)

Note

These parts are for the optional fiber-optic network configurations.

Table 3-3 lists all the parts required to connect the peripherals to the *Sun SPARCserver 20* computer.

Table 3-3: Sun SPARCserver 20 Computer Connectivity References

Figure 3-6 Call Out	Part of Comcode	Vendor Part Number	Description
A	407283415	530-1442-02 Rev C	Keyboard Cable - 2.5' Note: 15' keyboard extension cable available through PEC 12093, Comcode 407361815
B		370-1398-02	Mouse with Cable
C	407272574	9330	Monitor Cable - 2.5' Note: 4-meter monitor extension cable available through PEC 12093, Comcode 407361807 The monitor cable may be attached to the monitor, so it is not a separate item.
D	407537802	530-2115-02 Rev 50	SCSI Cable, 50-to-68 pin (2.5-GB Tape Drive)
	407512144		SCSI Cable, 50-to-68 pin (14-GB Tape Drive)
	407579986		SCSI Cable, 50-to-68 pin
E	407579978	530-1884-03 Rev 50	SCSI Cable, 68-to-68 pin (2.1-GB Disk Drive)
	407557859		SCSI Cable, 68-to-68 pin
F	407066794	530-1685-02 Rev 52	HSI/S Cable - 10'
G		540-2191	HSI/S Patch Panel
H	407086818	EDN37K-MM	RS-449 Cable - 10'
I	407338334	180-1529-01 Rev A	Unshielded Twisted Pair (UTP) Cable - 4 meters
	407086826	ANIXTER Part # - 143987	Category 5 UTP Cable - 10'
	407086842	ANIXTER Part # - 143992	Category 5 UTP Cable - 25'
	407086834	ANIXTER Part # - A111714-C	Category 5 UTP Cable - 50'
J	407086735	IBM Part # - 60G0625	IBM 8222 Network Hub Unit
		Allied Part # - AT-MR820T-15	Allied Telesis CentreCOM Network Hub Unit

Table 3-3: Sun SPARCserver 20 Computer Connectivity References (Contd)

Figure 3-6 Call Out	Part of Comcode	Vendor Part Number	Description
K	407086859	LDI-10T	10Base-T Transceiver
		<i>CentreCOM</i> 210TS	
L	407068329	460-093-900 Rev 2	PBX Champ Cable for 64-Port NTS - 1 meter
M		530-1869-02 Rev 50	Splitter Cable
N	846362754	ED3P00170G-1306	ACU Modem Adapter
O	846983039		10-Wire Shielded Modular Cable - 10'
P	846362770	ED3P00170G-1308	Remote Console Adapter
Q		Sportster 14.4 Faxmodem	Remote Console Modem
		<i>DataPort</i> ® Express Model 3715	
		<i>Comsphere</i> ® 3830	
		<i>Comsphere</i> 3910	
See Note		4261-1002-0600	StarLAN 10 Network Fiber Hub
		LDI-10FL	10Base-FL Transceiver
			Fiber-Optic Cable (62.5 mm 2-strand cable)

Note

These parts are for the optional fiber-optic network configurations.

Installing the *Sun SPARCserver* Computer

Unpacking and Inventorying the Equipment

Unpack the *Sun SPARCserver* computer and associated peripheral equipment (for example, external disks, tape drive, etc.). Verify the equipment delivered using the shipping papers.

Note You should wear an electrostatic discharge (ESD) strap when handling internal components.

Contact the Technical Service Center (TSC) for any *Sun SPARCserver* computer parts that are missing or defective on arrival (DOA). For International Support, contact your Lucent Technologies Representative or Distributor for more information.

As you unpack the system, find the HSI/S loop back plug. It is normally in the box with the HSI/S controller card. You may need the plug for future troubleshooting. For use of the loop back plug, see the “Testing HSI Card for Problems” section in Chapter 8, “Troubleshooting,” for details.

Assembling the Computer and System Console

This section describes how to connect the system console peripherals to the *Sun SPARCserver* computer (see Figure 3-7).

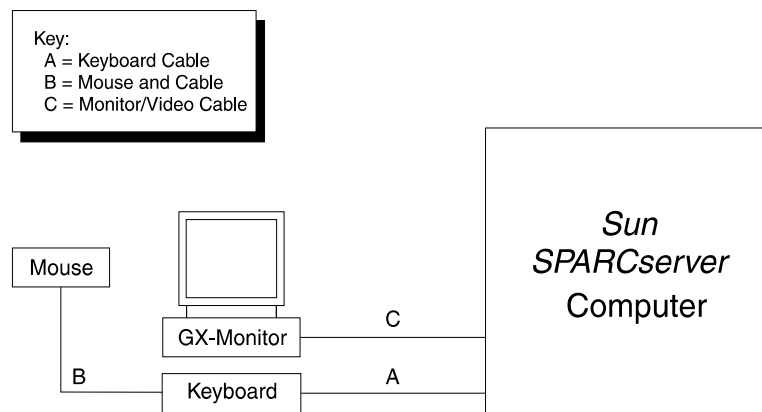


Figure 3-7: *Sun SPARCserver* Computer and System Console Connectivity

To assemble the *Sun SPARCserver* computer and system console, do the following:

1. Place the computer in the location selected by the customer. Make sure the power switch is set to *Off*.
2. Connect the following components (see Figure 3-7):
 - Keyboard
 - Mouse
 - Monitor
 - Power cord (to a wall outlet or to a UPS [Uninterruptible Power Supply], if equipped).

This basic configuration represents the system console terminal. This may also be referred to as the *CentreVu* CMS console terminal.

Additional References

For additional information, refer to the following documentation:

Sun SPARCstation 5 Installation Guide.

Sun SPARCstation 10 Installation Guide.

Sun SPARCstation 20 Installation Guide.

Identifying Installed SBus Cards

This section describes how to identify SBus cards and their locations within the *Sun SPARCserver* computer.

The Hardware Inventory form received with your system contains a list of the SBus cards installed in your system. Use this form to reassemble your hardware. If the Hardware Inventory form has been misplaced, use the procedures described below to determine which SBus cards are installed in your system.

The system provides a specific name for each SBus card used in either the *Sun SPARCserver* computer. These names are:

- cgsix (Turbo GX Video card)
- HSI (HSI/S card)
- lebuffer le dma esp (FSBE/S card in *Sun SPARCserver* computer)
- tr (Token Ring Interface card)
- cseight..... (8-Port Aurora SBus *Multiport** card)
- si016..... (16-Port Aurora SBus *Multitport* card)

*Multiport is a trademark of Aurora Technologies, Inc.

To identify SBus cards in the *Sun SPARCserver* computer, do the following:

1. Assemble your computer (keyboard, mouse, monitor, and power cord).
2. Enter the OpenBoot environment by doing one of the following:

<i>If You Have Already Booted the Sun SPARCserver Computer...</i>	<i>If You Have Not Yet Powered Up the Sun SPARCserver Computer...</i>
<i>then</i> stop the operating system by executing the shutdown command: shutdown -y -i0 -g0.	power it on, and <i>then</i> press the Stop and A keys simultaneously on the keyboard after the display console banner appears but before the system starts booting the operating system.

After you are in the OpenBoot environment, the following prompt appears:

ok>

3. Enter the following command at the ok prompt:

show-sbus

See Table 3-4 for an example of what you would see after entering the show-sbus command.

Table 3-4: Example of the Show-Sbus Command (No SBus Expansion Subsystem)

<u>For a Sun SPARCserver 5</u>	<u>For a Sun SPARCserver 10</u>
SBus Slot 5	SBus Slot f
SBus Slot 4	SBus Slot 0 HSI
SBus Slot 1 cgsix	SBus Slot 1 lebuffer le dma esp
SBus Slot 2 lebuffer le dma esp	SBus Slot 2 cgsix
SBus Slot 3 cseight	SBus Slot 3
SBus Slot 0	
 <u>For a Sun SPARCserver 20</u>	
SBus Slot f	
SBus Slot e	
SBus Slot 0 HSI	
SBus Slot 1 lebuffer le dma esp	
SBus Slot 2	
SBus Slot 3	

The example in Table 3-4 tells you the following information:

- The *Sun SPARCserver 5* computer has a Turbo GX video card in SBus slot 1, an FSBE/S card in SBus slot 2, and an 8-Port Aurora SBus *Multiport* card in SBus slot 3.
- The *Sun SPARCserver 10* computer has an HSI/S card in SBus slot 0, an FSBE/S card in SBus slot 1, and a Turbo GX video card in SBus slot 2.
- The *Sun SPARCserver 20* computer has an HSI/S card in SBus slot 0 and an FSBE/S card in SBus Slot 1.

Note

Disregard SBus slots 5, 4, and 0 on the *Sun SPARCserver 5*, SBus slot f on the *Sun SPARCserver 10*, and SBus slots f and e on the *Sun SPARCserver 20*. These slots are already being used by devices directly integrated into the system board.

Connecting External SCSI Devices

This section describes how to connect the SCSI devices (tape drives, hard disks, etc.) to the *Sun SPARCserver* computer.

Connecting UniPack Devices

Figure 3-8 shows how to connect UniPack SCSI devices. A SCSI cable is connected from the controller card port on the back of the *Sun SPARCserver* to the in-connector on the back of the UniPack device that is closest to the *SPARCserver* in the chain. Another SCSI cable is then connected from the out-connector of that device to the in-connector of the next device. You continue this process until all assigned devices are connected in the SCSI chain.

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

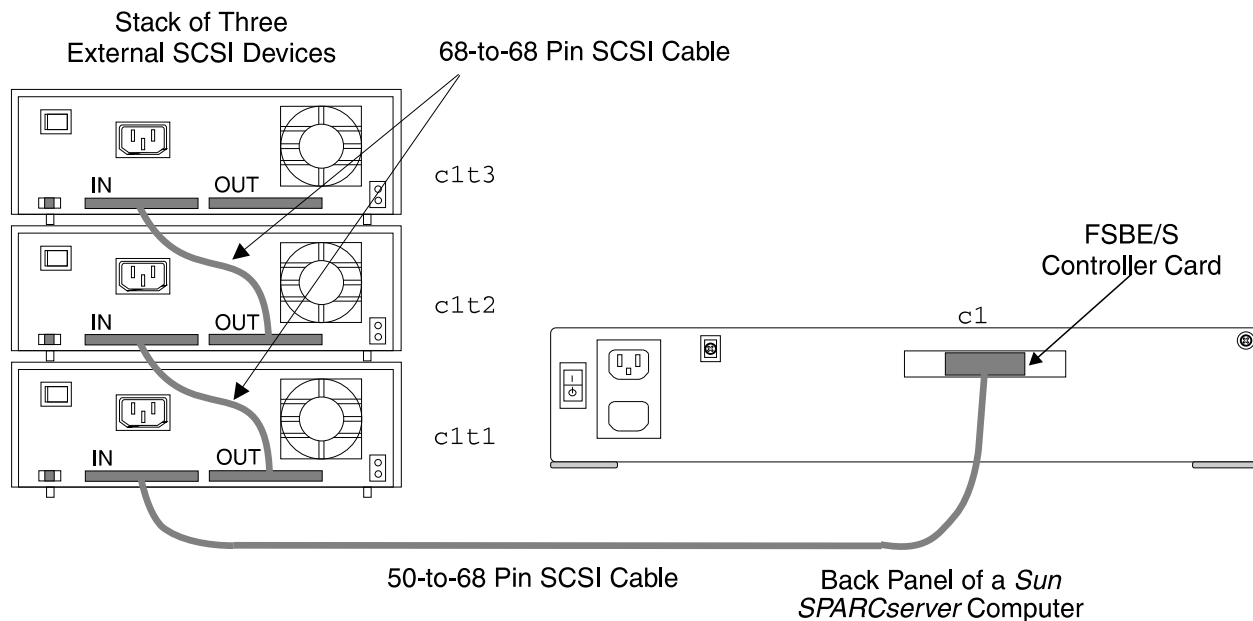


Figure 3-8: Daisy-Chaining Example of UniPack Devices

SCSI Cabling Schemes

Figure 3-9 shows the SCSI cabling schemes possible with *Sun SPARCserver* computers.

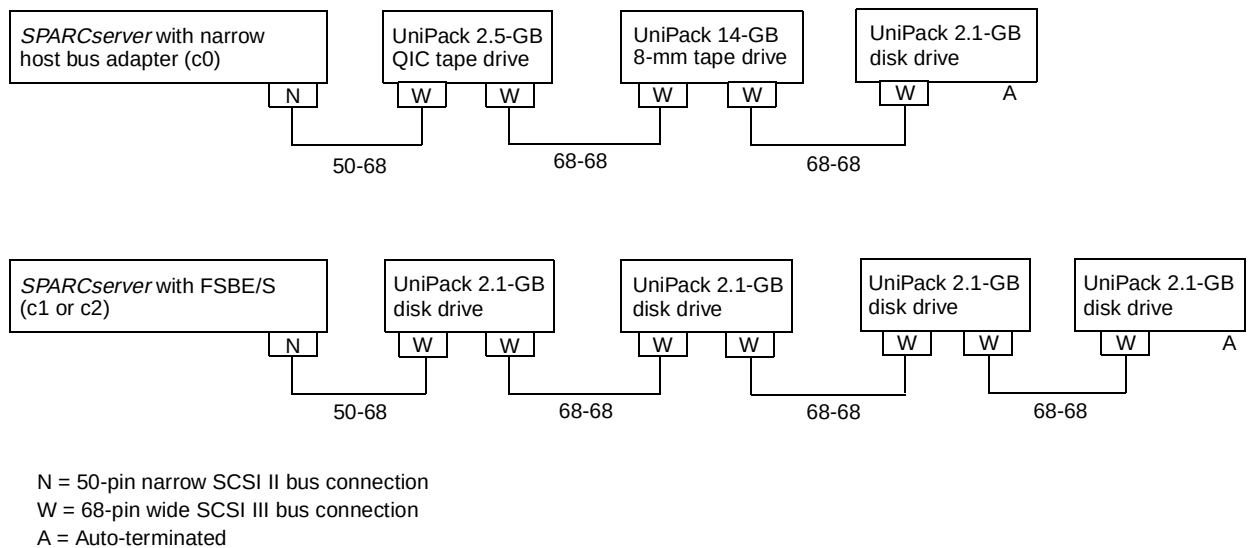


Figure 3-9: SCSI Cabling Schemes

The external hard disk drives (shipped from the factory) have already been partitioned and assigned logical addresses. The logical address format is as follows:

cXtXdXsX

- Slice Partition
- Drive ID Number
- Physical Target ID Number (SCSI Device ID)
- Logical Controller ID Number (Controller Card Number).

You must connect the disk drives to the same controller card that they were connected to when they were partitioned at the factory. To ensure that the drives are connected properly, a label has been attached to each disk drive. This label uses the first four characters of the address format (for example, c1t2) to identify the drive. Figure 3-8 shows three external disks connected to the FSBE/S controller card c1. Therefore, the external disks are labeled c1t1, c1t2, and c1t3, respectively.

You can have up to three SCSI controllers on your system. One is built into the *Sun SPARCserver* computer and the other two are provided through FSBE/S controller cards. Controller c1 is the first FSBE/S card and controller c2 is the second. The system determines which FSBE/S card is first (c1) by searching the SBus slots in the order they are listed in Table 3-4.

For example: the *Sun SPARCserver 10* computer, listed in Table 3-4, has controller c1 in SBus slot 1 and controller c2 in SBus slot 2.

Connect all external SCSI devices to the computer. Figure 3-10 shows how to daisy chain the SCSI bus through these devices. In addition, you need to make the power connections for the drives. Since these devices are UniPack devices, a SCSI terminator is not required on the last device in a chain.

Figure 3-10 shows the maximum number of external drives configured for a *Sun SPARCserver 5* or *20* computer. (The *Sun SPARCserver 10* computer can have a maximum of ten external drives.) If the customer's external configuration is less than maximum, then the number of devices in each chain may vary.

If you need additional information about installing SCSI devices, refer to Appendix D, "Sun *SPARCserver* Computer Factory Installation Procedures," and the "Additional References" section on the next page.

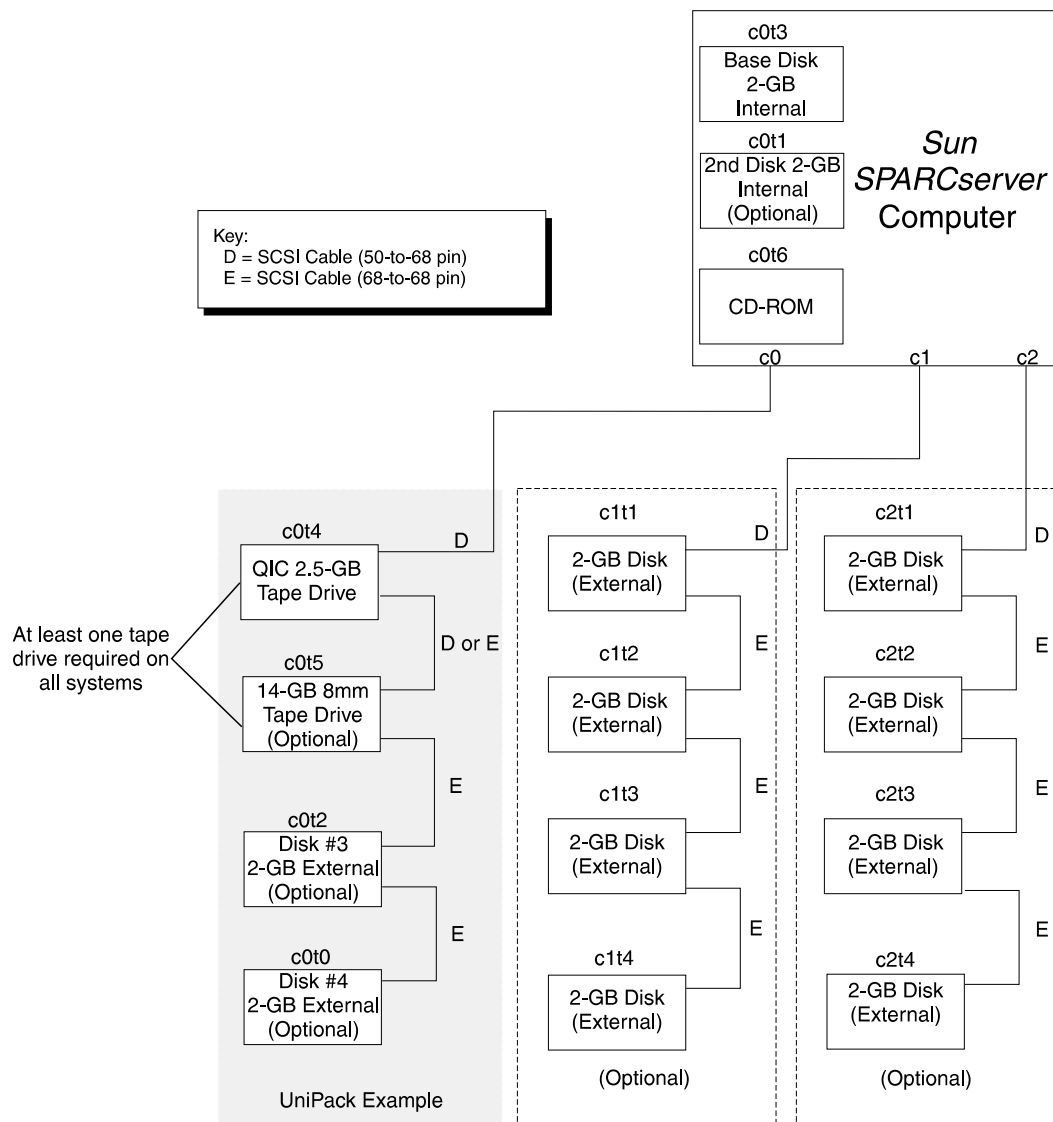


Figure 3-10: External SCSI Device Connectivity

Additional References For additional information, refer to the following documentation:

SPARCstorage UniPack User's Guide

Chapter 3: "Tape Drives"

Chapter 6: "8mm Tape Drive."

Sun Solaris 2.x Handbook for SMCC Peripherals,*

Chapter 2: "Setting Up Disk Drives"

Chapter 3: "Setting Up Tape Drives"

Chapter 4: "Setting Up CD-ROM Drives."

Desktop Storage Pack Installation and Operation Manual,

Appendix B: "Small Computer Serial Interface Information."

*Solaris is a registered trademark of Sun Microsystems, Inc.

Connecting the SunLink HSI/S Patch Panel

This section describes how to connect the HSI/S patch panel to the HSI/S controller card (previously installed in the *Sun SPARCserver* computer) using a 96-pin cable (see Figure 3-11, shaded portion).

Note The *Sun SPARCserver 5* needs a *SunLink* HSI/S patch panel **only** if you have an HSI/S card installed.

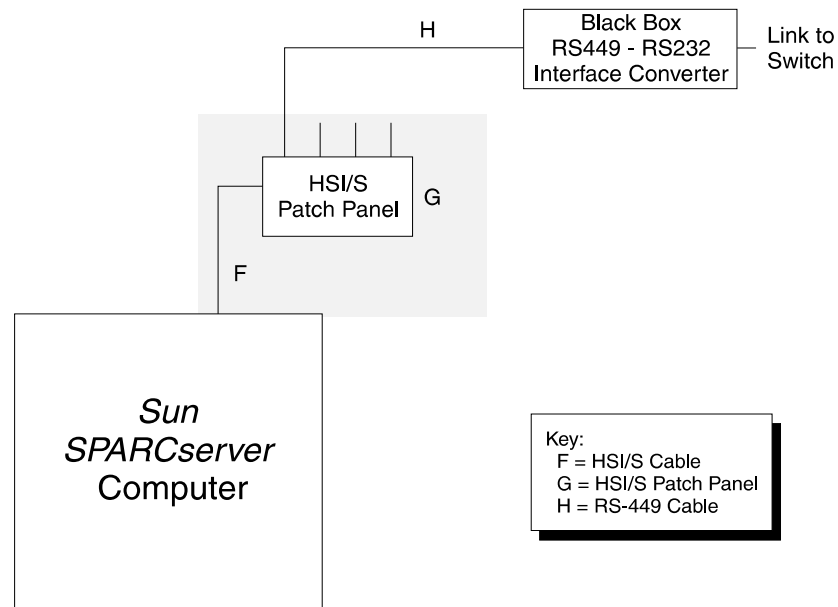


Figure 3-11: SunLink HSI/S Patch Panel Connectivity

To connect the HSI/S patch panel to the HSI/S controller card, do the following:

1. Connect one end of the 96-pin cable to the 96-pin connector on the HSI/S patch panel.
2. Connect the other end of the 96-pin cable to the 96-pin connector on the HSI/S controller card.
3. Make sure the locking mechanisms on each end of the 96-pin cable click closed.

Additional References

For additional information, refer to the following documentation:

SunLink HSI/S 2.0 Installation and Administration Guide,
 Chapter 2: "Installing the HSI/S Controller Card and
 Patch Panel" (Sections 2.11 and 2.12).

Setting the Black Box DTE/DCE DIP Shunts

This section describes how to set the Dual In-Line Package (DIP) shunts inside the interface converter to assign the RS-422/RS-449 input port for the Data Communication Equipment (DCE) operation and the RS-232 output port for the Data Terminal Equipment (DTE) operation (see Table 3-5 and Figure 3-12).

Table 3-5: DTE/DCE DIP - Shunt Settings

Move DIP shunts	
From	To
XW1A	XW1B
XW2A	XW2B
XW3A	XW3B
XW4B	XW4A
XW5B	XW5A

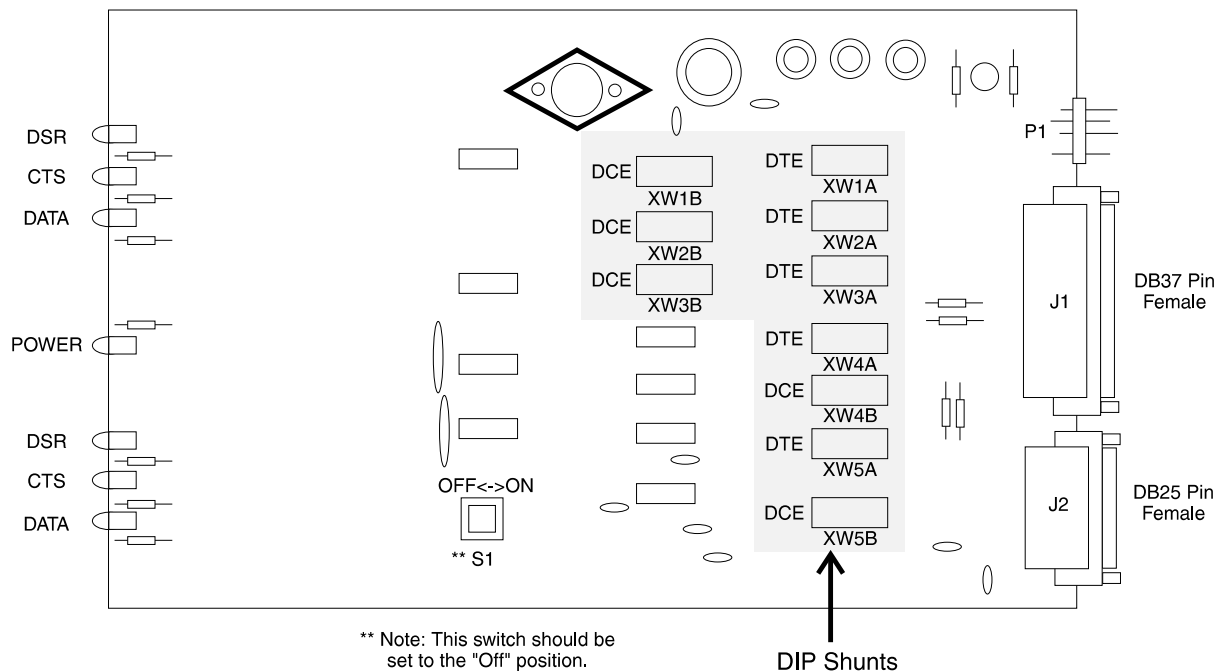
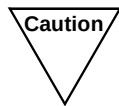


Figure 3-12: Black Box Component Layout — DTE/DCE DIP-Shunt Locations

To reassign these ports:

1. Disconnect all power and cables from the black box converter.
2. Open the interface converter.
3. Move the DIP shunts to the appropriate DIP-shunt sockets by doing the following:
 - a. Carefully slide the tip of a common screwdriver between the DIP-shunt jumper and the DIP-shunt socket.



Be very careful when moving the DIP shunts.
The DIP-shunt pins are fragile and could easily be bent or broken.

- b. Gently pry/wiggle the DIP-shunt jumper free from the socket.
 - c. Move the DIP-shunt jumper to the appropriate socket (see Table 3-5).
 - d. Carefully align the pins, and gently press the DIP-shunt jumper into place.

Additional References

For additional information, refer to the following documentation:

*RS-232 ↔ RS-422 Interface Converter
Installation and Operation Manual,
Section 2.0: "Introduction"
Section 3.0: "Installation"
Section 4.0: "Configuration."*

Connecting the HSI/S Patch Panel to the Interface Converter

This section describes how to connect an RS-449 port on the HSI/S patch panel to the RS-422/RS-449 DCE port on the black box interface converter (see Figure 3-13, shaded portion).

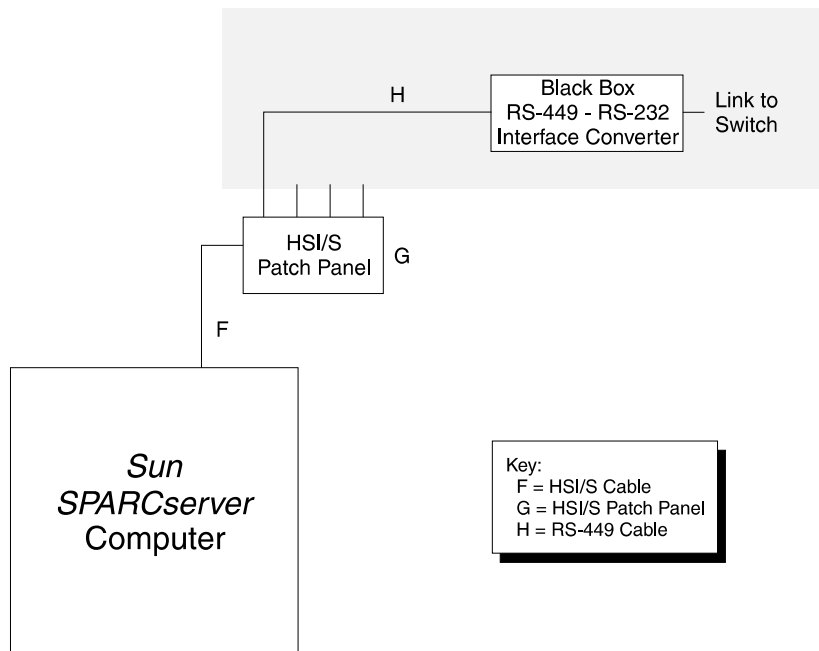


Figure 3-13: Black Box Interface Converter Connectivity

To connect the RS-449 port on the HSI/S patch panel to the DCE input port on the black box interface converter, do the following:

1. Connect the EDN37K-MM (RS-449) cable to the 37-pin port on the rear panel of the interface converter.
2. Connect the other end of the EDN37K-MM (RS-449) cable to the RS-449 port on the HSI/S patch panel.

Note

If you connect more than one switch to the system, connect the switches in the following order:

- First switch to HSI/S Port 0
- Second switch to HSI/S Port 1
- Third switch to HSI/S Port 2
- Fourth switch to HSI/S Port 3.

Additional References

For additional information, refer to the following documentation:

Sun SPARCstation 20 Installation Guide.

Sun SPARCstation 10 Installation Guide.

Sun SPARCstation 5 Installation Guide.

Connecting the Network Hub Unit

This section describes how to connect the network hub unit(s) to the *Sun SPARCserver* computer using Unshielded Twisted-Pair (UTP) cables in a Twisted-Pair Ethernet (TPE) configuration.

Note

Do **not** use telephone extension cables in 10Base-T networks. The telephone extension cable wire pairs are not twisted and do not meet the requirements for use in a 10Base-T network.

Three different types of network hub units can be used:

- *IBM 8222* network hub unit (uses standard UTP network cables)
- Allied Telesis *CentreCOM* - MR820T network hub unit (used standard UTP network cables)
- StarLAN fiber-optic hub unit (uses fiber-optic network cables).

The standard *CentreVu* CMS configuration uses the *IBM 8222* network hub unit or the Allied Telesis *CentreCOM* - MR820T network hub unit. The StarLAN fiber-optic hub can be used when you need more distance between the hub unit and the NTS(s). Table 3-6 outlines the maximum distances associated with each type of network cables being used.

Table 3-6: Maximum Network Cable Distances

Type of Cable	Maximum Cable Distance
UTP (Unshielded Twisted Pair) (Category 3 or 5)	100 meters / 328 feet
15-pin AUI	100 meters / 328 feet
Fiber-optic cable (62.5 mm dual strand cable)	3000 feet

If you need more distance between the network hub unit and the NTS(s), refer to the “Optional Fiber-Optic Network Configurations” section in this chapter.

Optional
Fiber-Optic
Network
Configurations

This section briefly describes additional network configurations which can be used to increase the distance between the network hub unit and the NTS(s). These configurations use fiber-optic cables and/or fiber-optic hubs.

The configuration shown in Figure 3-14 illustrates two network hubs connected through a fiber-optic network hub. This configuration allows the network to be spread across multiple buildings. For example, this would be useful in a situation where the *Sun SPARCserver* computer, network hub, and one NTS are located in one building, the fiber-optic hub and another NTS are located in an adjacent building, and another network hub with two additional NTSSs are located in another adjacent building.

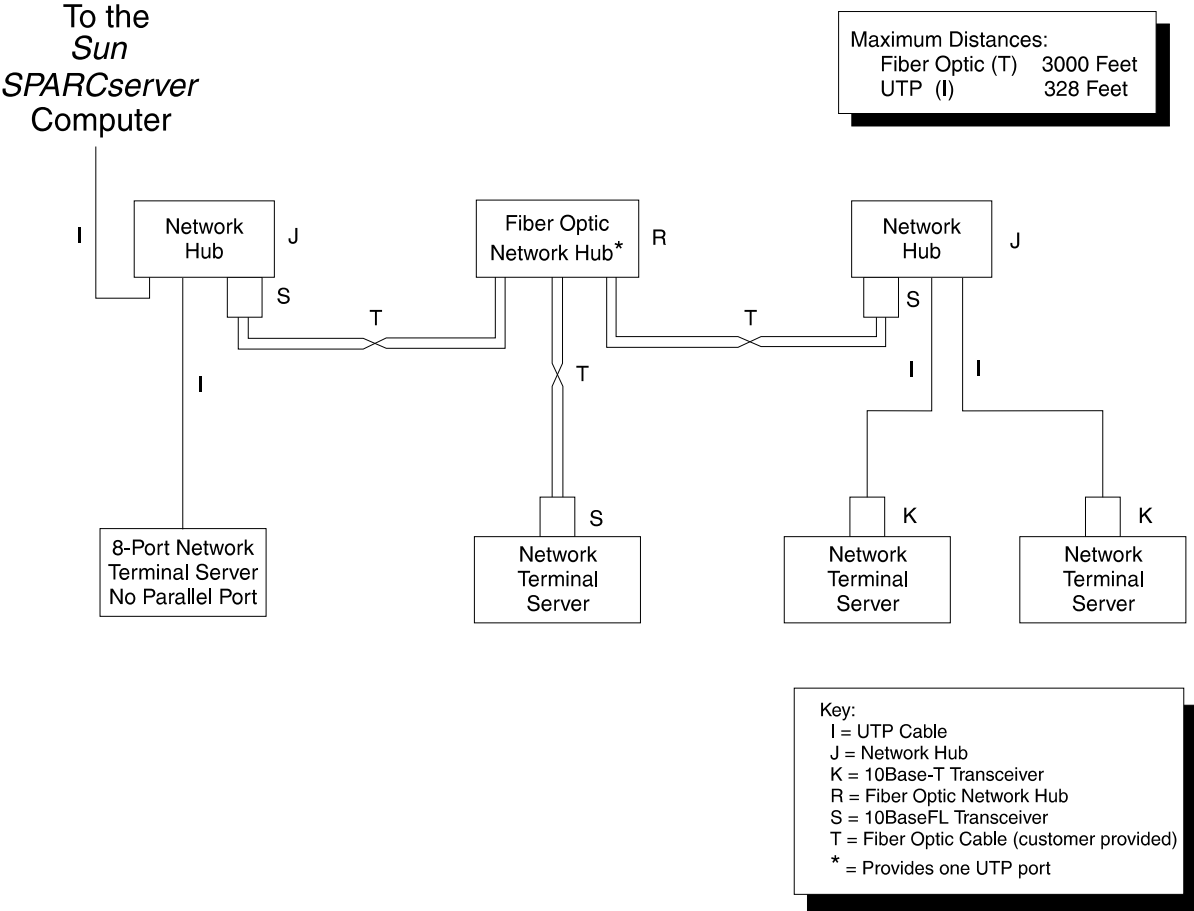


Figure 3-14: Optional/Sample Fiber-Optic Configuration

The configuration shown in Figure 3-15 illustrates two network hubs connected with a fiber-optic cable. This configuration allows the network to be spread across two adjacent buildings. For example, this would be useful in a situation where the *Sun SPARCserver* computer, network hub, and two NTSSs are located in one building, while the other network hub and remaining two NTSSs are located in an adjacent building.

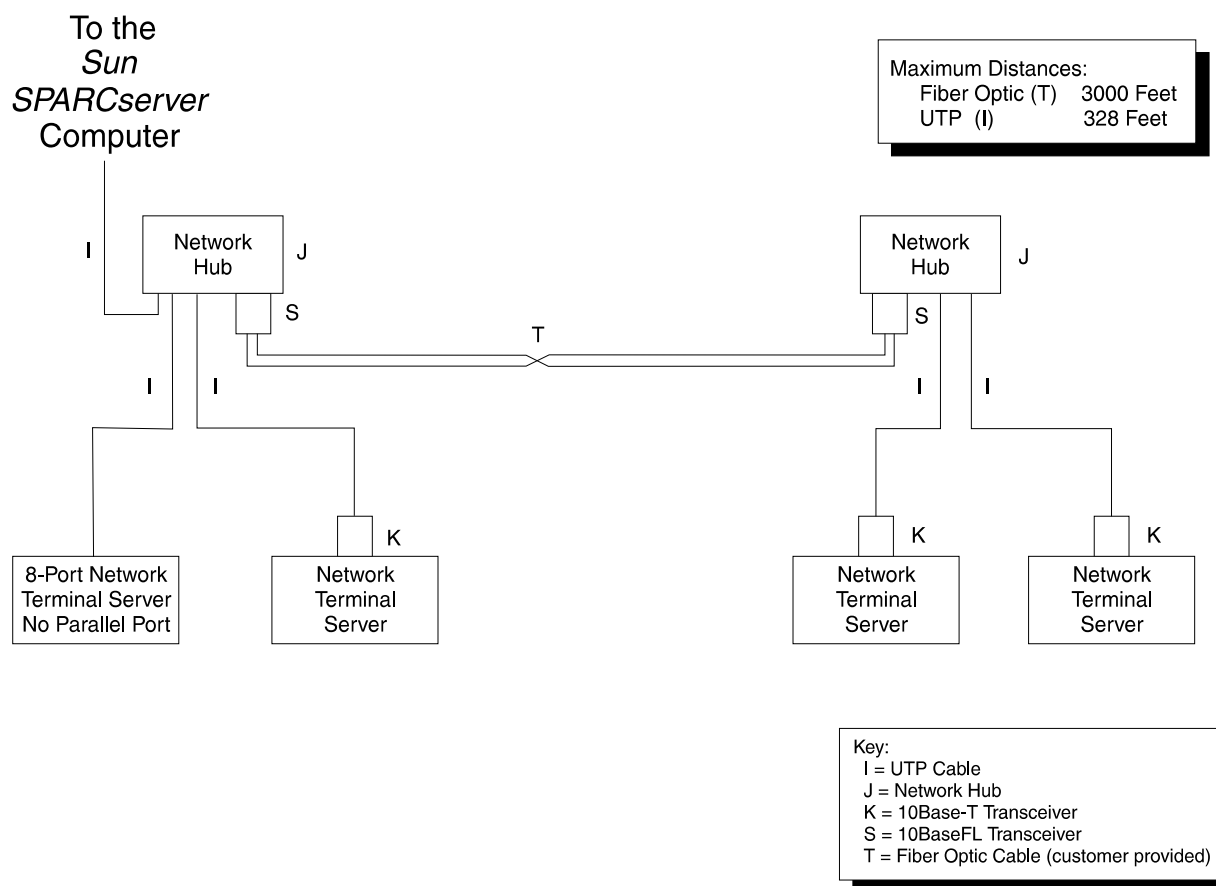


Figure 3-15: Optional/Sample Fiber-Optic Configuration

The configuration shown in Figure 3-16 illustrates a network hub connected to four NTSSs. This configuration allows the network to be spread across multiple buildings. For example, this would be useful in a situation where the *Sun SPARCserver* computer, network hub, and three NTSSs are located in one building, while an additional NTSS is located in an adjacent building.

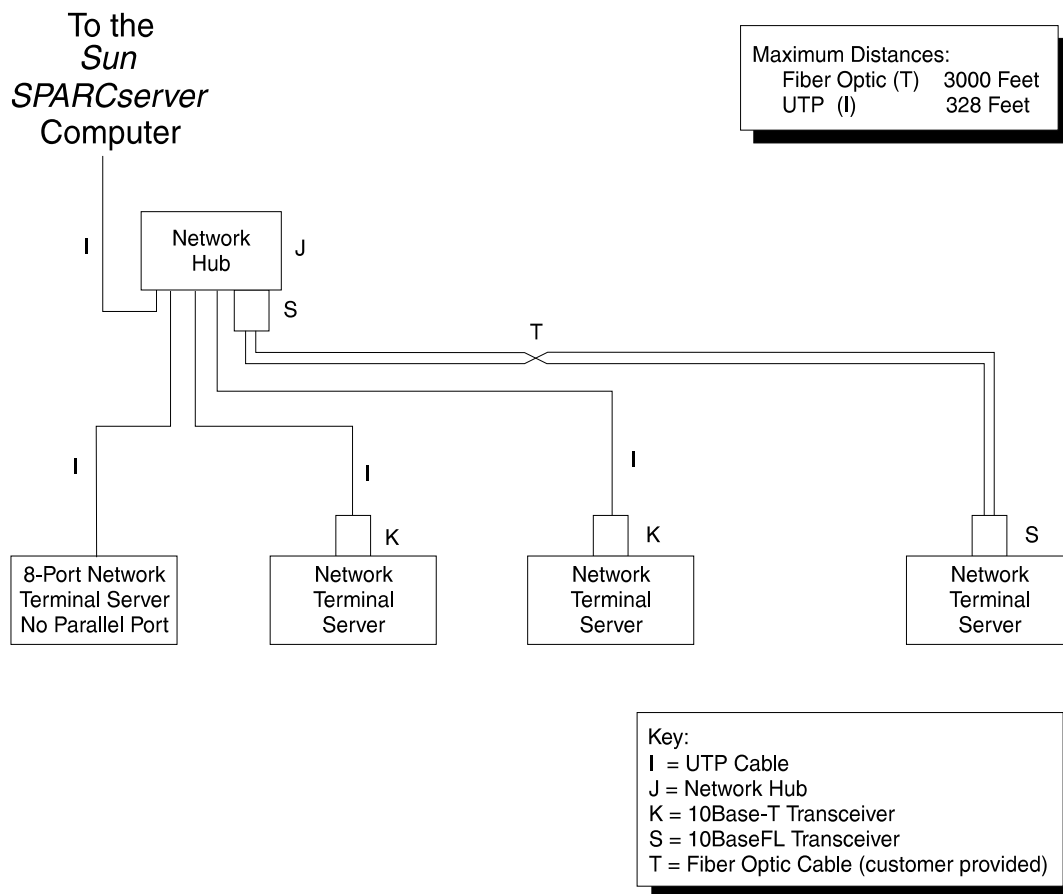


Figure 3-16: Optional/Sample Fiber-Optic Configuration

Installing the *IBM* 8222 or the Allied Telesis *CentreCOM* Network Hub Unit

This section describes how to connect the *IBM* 8222 or the Allied Telesis *CentreCOM* network hub unit to the *Sun SPARCserver* computer. These hub units may be used in conjunction with other network hub units.

To connect the network hub unit to the *Sun SPARCserver* computer, do the following (see Figure 3-17):

1. Position the network hub unit in the location selected by the customer. Make sure the power switch is set to *Off*.
2. Plug the power cord into a wall outlet or to a UPS (if equipped).
3. Plug one end of the UTP cable into the twisted-pair connector on the back of the *Sun SPARCserver* computer.

Use the UTP cable that came with your *Sun SPARCserver* computer (part number 180-1529-01).

4. Plug the other end of the UTP cable into Port 1 of the 10Base-T ports on the network hub unit (see Figure 3-17).

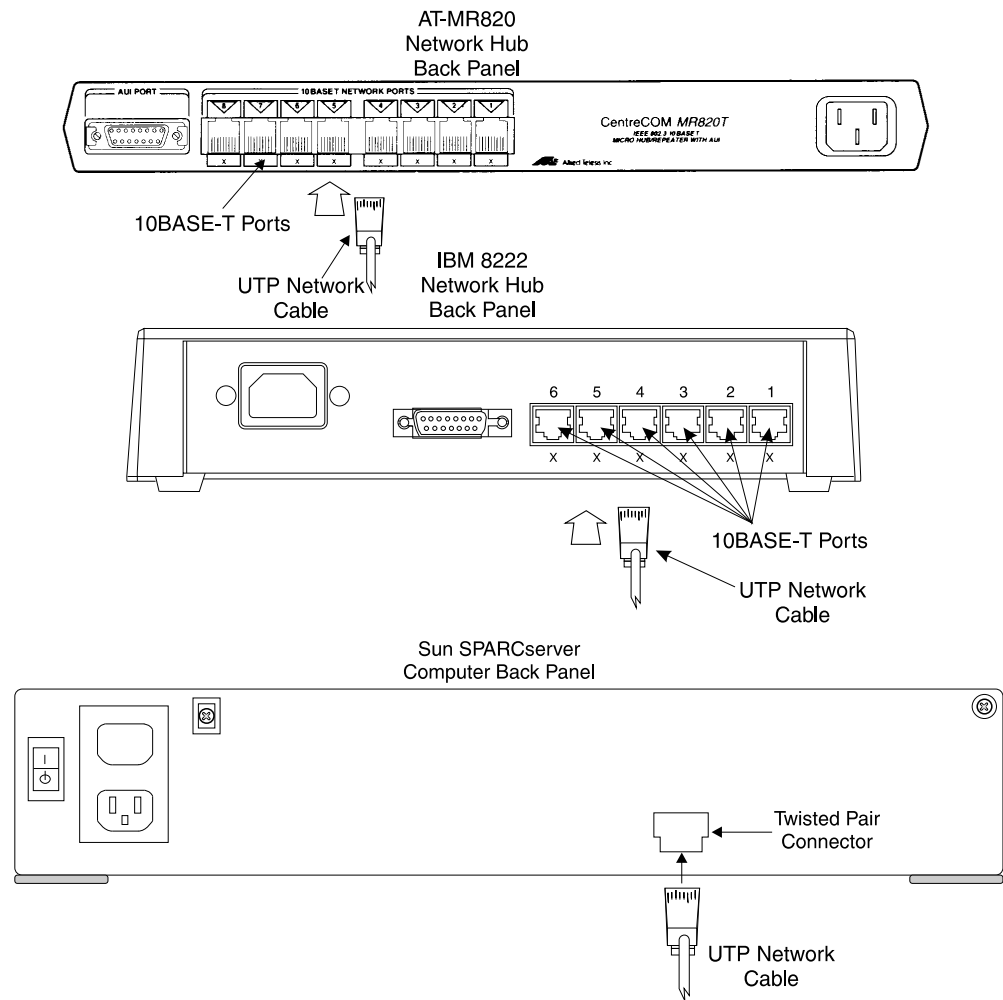


Figure 3-17: Network Hub Units — Back Panel

Additional References For additional information, refer to the following documentation:

IBM 8222 6-Port 10Base-T Workgroup Hub Installation and Planning Guide,

Chapter 2: "Installing the IBM 8222."

Allied Telesis CentreCOM AT-820T Multiport 10BASE-T Micro Repeaters Users Manual,

Chapter 2: "Installation."

Installing the StarLAN 10 Network Fiber-Optic Hub Unit

This section describes how to connect the StarLAN 10 network fiber-optic hub unit to the *Sun SPARCserver* computer. This hub unit may be used in conjunction with other network hub units.

To connect the StarLAN 10 network fiber-optic hub unit to the network, do the following (see Figure 3-18):

1. Position the network fiber-optic hub unit in the location selected by the customer. Make sure the power switch is set to *Off*.
2. Plug the power cord into a wall outlet or to a UPS (if equipped).
3. Plug one end of the fiber-optic cable into the transmit (Tx) and receive (Rx) connectors on the front of the network fiber-optic hub unit (see Figure 3-18).

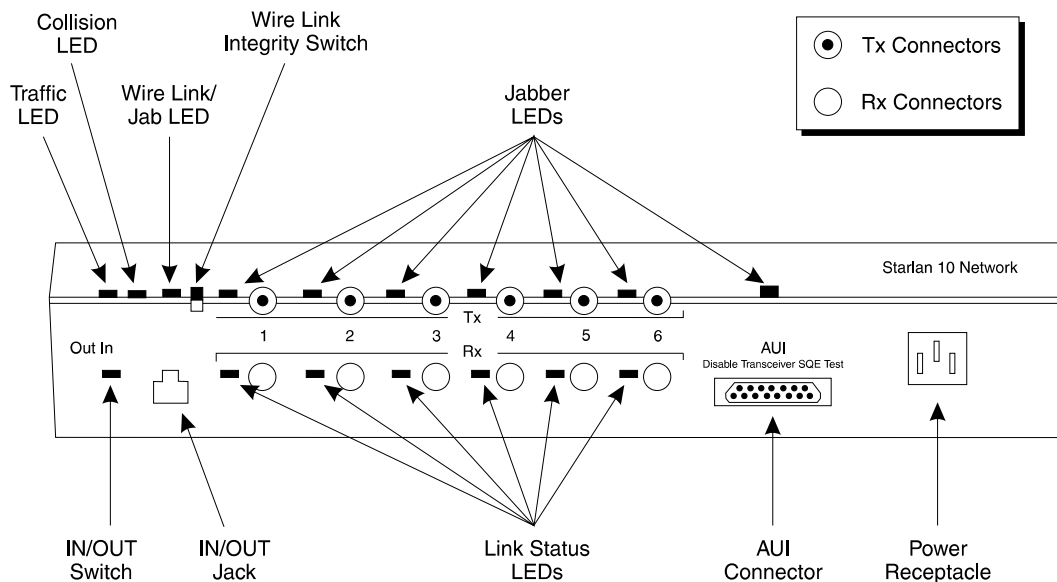


Figure 3-18: StarLAN 10 Network Fiber-Optic Hub Unit

The fiber-optic cable has two plugs on each end. Generally, the two plugs are color-coded or identified in some other manner. Make a note of which plug is attached to the Tx and Rx ports on the hub unit.

4. Plug the other end of the fiber-optic cable into the 10Base-FL transceiver connected to either the network hub unit or NTS.

Connect the plugs the opposite of how they were connected at the other end (that is, the plug that was connected to the Tx port at the other end should be connected to the Rx port at this end, and the plug that was attached to the Rx port at the other end should be connected to the Tx port at this end).

Additional References

For additional information, refer to the *StarLAN 10 Network Fiber-Optic Hub Installation Guide* (999-100-458).

Connecting the NTS(s) to the Network Hub Unit

This section describes how to connect an 8-, 16-, and 64-port NTS to the network hub unit, and the four 16-port NTS patch panels to the 64-port NTS.

Note

Do **not** use telephone extension cables in 10Base-T networks. The telephone extension cable wire pairs are not twisted and do not meet the requirements for use in a 10Base-T network.

The 64-port NTS provides twelve 50-pin PBX-champ connectors used to attach 64 serial devices using the patch panel cables and patch panels. These serial devices are accessed via the local ethernet network.

Note

If the NTS needs to be administered (for example, the NTS has not been administered or if you are adding an NTS to your system), follow the procedure outlined in the “Administering the Network Terminal Servers” section of Appendix D, “Sun *SPARCserver* Computer Installation Procedures.”

Figure 3-19 shows the back panels of the 8-, 16-, and 64-ports NTSSs.

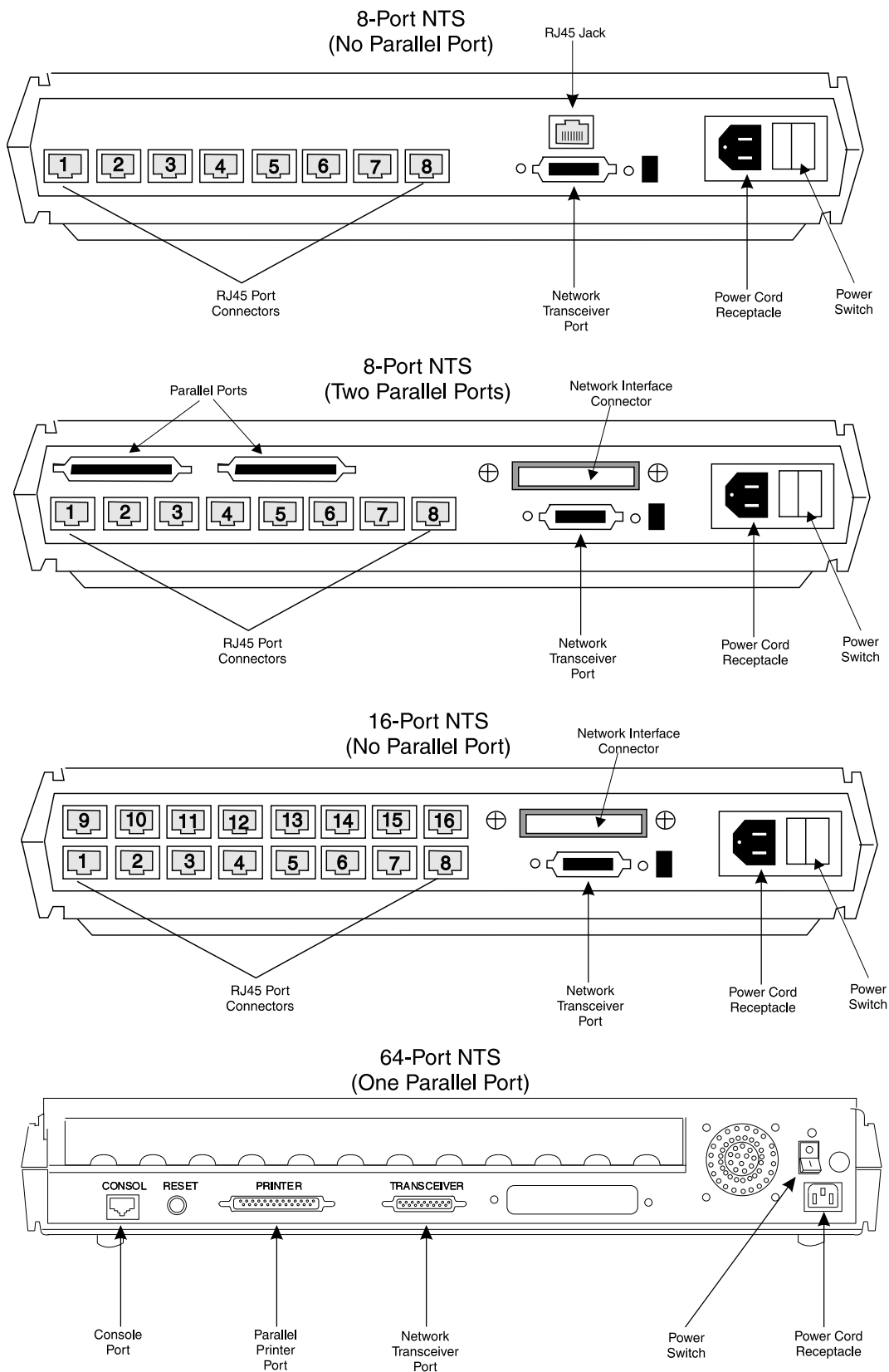


Figure 3-19: 8-, 16-, and 64-Port NTSs — Back Panels

If you are connecting more than one NTS to the network hub unit, use Table 3-7 to determine how to connect the UTP cable between the network hub unit and the NTS.

Table 3-7: Network Hub Port Connectivity

NTS	NTS Name	Network Hub Port
First	cmsterm1	2
Second	cmsterm 2	3
Third	cmsterm3	4
Fourth	cmsterm4	5
Fifth	cmsterm5	6
Sixth	cmsterm6	7
Seventh	cmsterm7	8

To connect the NTS(s) to the network hub unit, do the following:

1. Position the NTS(s) in the location selected by the customer. Make sure each power switch is set to *Off*.
2. Plug each power cord into a wall outlet or to a UPS (if equipped).
3. Plug one end of the UTP cable into the next available port on the 10Base-T ports on the network hub unit.
4. Use the following table to determine what to do next:

IF you are connecting. . .	THEN. . .
an 8-port NTS without a parallel port	do Step 5 and skip Steps 6 and 7
an 8-port NTS with two parallel ports, a 16-port NTS without a parallel port, or a 64-port NTS with one parallel port	skip Step 5 and do Steps 6 and 7

5. Plug the other end of the UTP cable into the RJ45 jack located on the back of the NTS.

6. Connect the 10Base-T transceiver to the transceiver port on the back of the NTS. Verify that the 10Base-T transceiver switch setting is set to SQE = Off.

Note

You may have an older version of a 10Base-T transceiver which allows you to physically change three switch settings: SQE, Link, and LRT. If you have this older version, verify that the switch settings are set to the following:

- SQE = Off
- Link = On
- LRT = Off.

7. Plug the other end of the UTP cable into the transceiver previously connected to the back of the NTS.

See Figure 3-20 to see how the NTSS are connected to the network hub unit. Figure 3-20 shows how to connect the 8-, 16-, or 64-port NTS to the network hub unit.

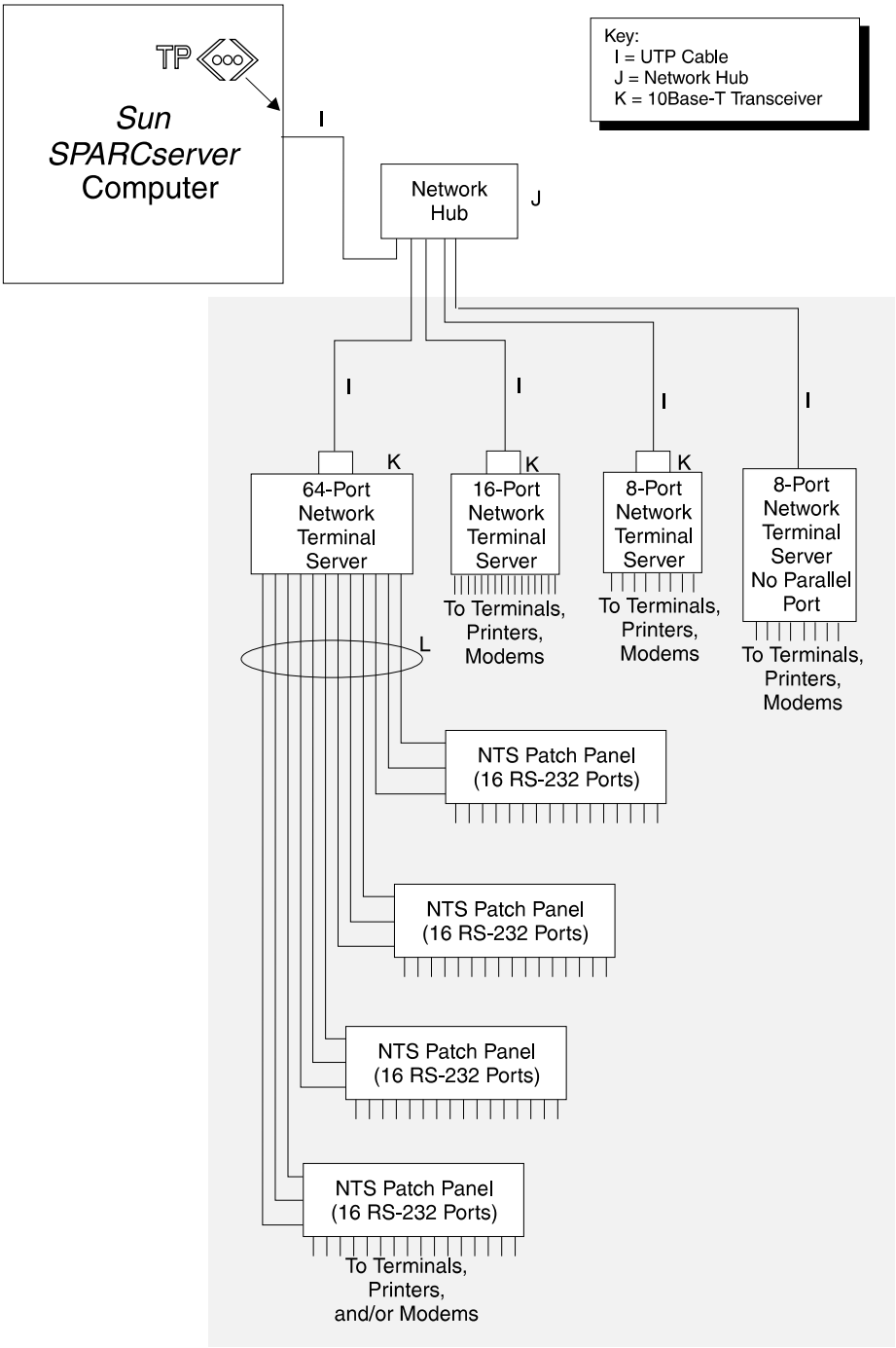


Figure 3-20: Sun SPARCserver Computer NTS Connectivity

Connecting the NTS Patch Panel(s) to the 64-Port NTS

This section describes how to connect the 16-port patch panel(s) to the 64-port NTS (see Figure 3-21 and Figure 3-22).

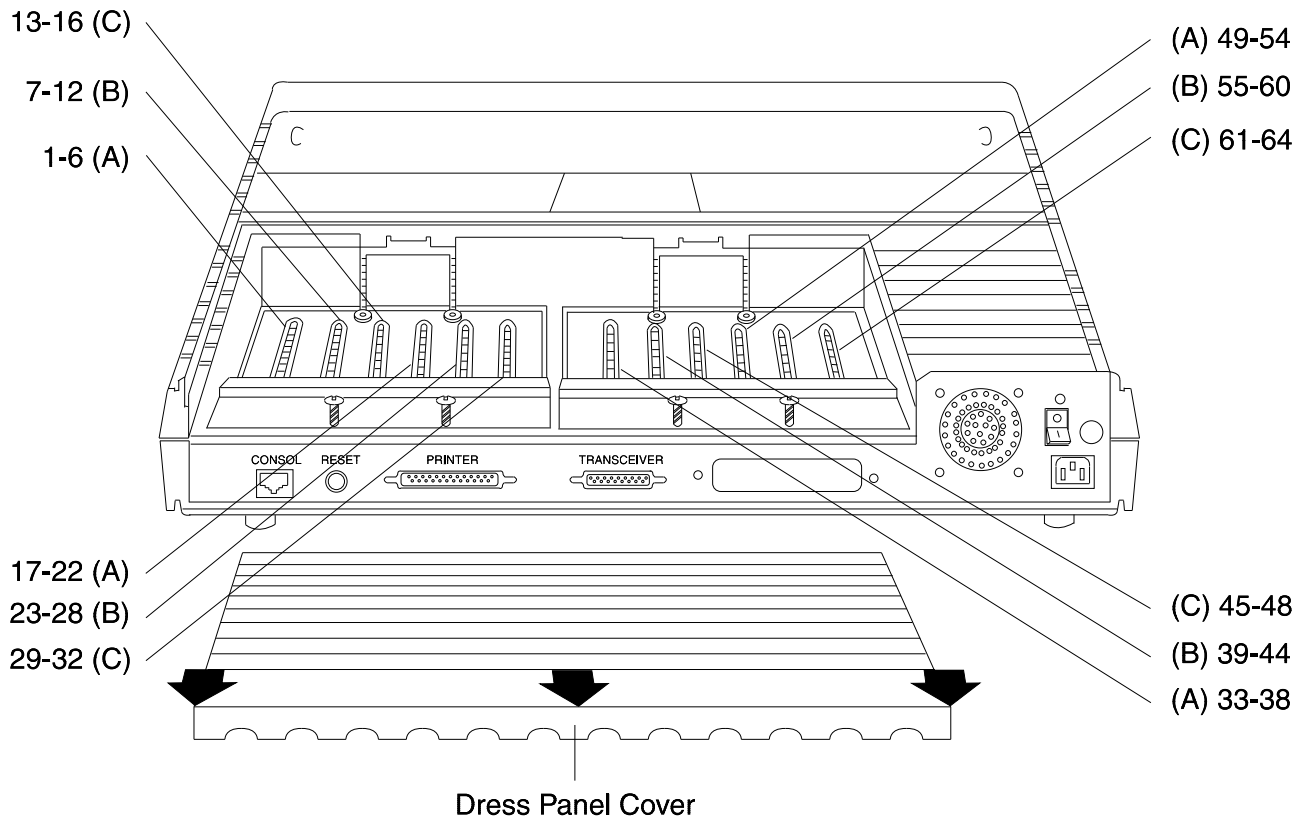


Figure 3-21: 64-Port Network Terminal Server — PBX-Champ Connectors and Port Definitions

To connect a 16-port NTS patch panel (see Figure 3-22) to the 64-Port NTS (see Figure 3-21) do the following:

1. Remove the back panel of the NTS by sliding it toward the back of the NTS. (This cover is located on the top back corner of the NTS.)
2. Slide the cable retainer back to allow room for the cable(s).
3. Position the 16-port patch panel in the location selected by the customer.
4. Connect the PBX ends of the patch panel cable to the PBX-champ connector.

Each 16-port patch panel has three connectors (see Figure 3-22) which connect to the PBX-champ connectors located inside the NTS (see Figure 3-21). The PBX-champ connectors are also labeled A, B, and C, respectively.

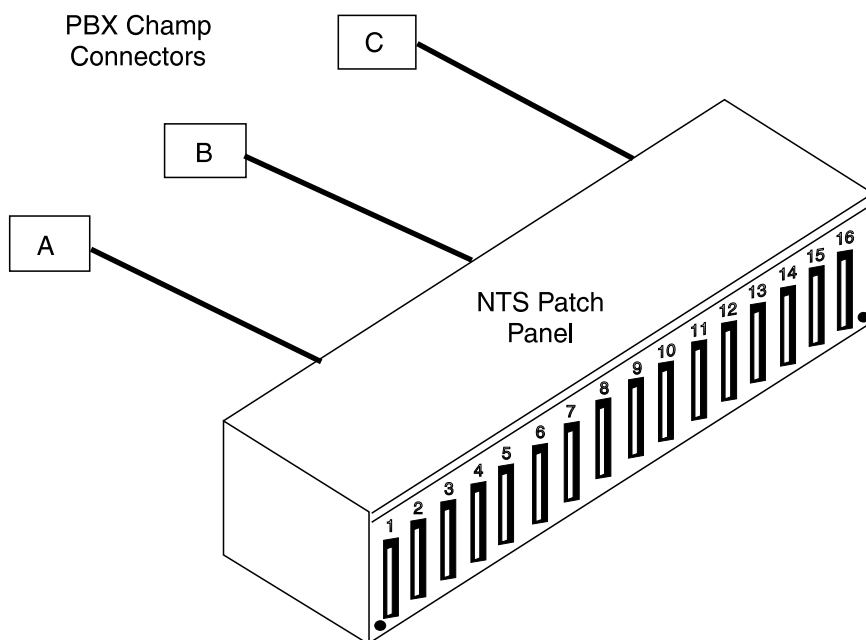


Figure 3-22: NTS Patch Panel

5. Tighten the screw on the PBX end of the cable.
6. Slide the cable retainer forward. Make sure that the lip of the retainer secures the connector.

Repeat Steps 3 through 6 for each NTS patch panel being installed.

7. Replace the back panel of the 64-Port NTS (to its original position) by sliding it toward the front of the NTS.

Additional References

For additional information, refer to the following documentation:

Network Terminal Server: Hardware Installation Guide,
Chapter 2: "Installing the NTS."

*Xylogics Micro Annex^{*} Communications Server Hardware
Installation Guide*,
Chapter 2: "Installing the Micro Annex."

*Micro Annex is a registered trademark of Xylogics, Inc.

Connecting the 8- or 16-Port Expander Box

The Aurora SBus *Multiport* card is used to connect terminals, printers, and modems to your *Sun SPARCserver* computer. Each SBus *Multiport* card is shipped with an expander box that attaches to the *Multiport* card and breaks out the new ports (see Figure 3-23). In order to connect the 8- and 16-port expander box to the *Sun SPARCserver* computer, you must first identify the installed SBus *Multiport* card(s). See the “Identifying Installed SBus Cards” section in this chapter.

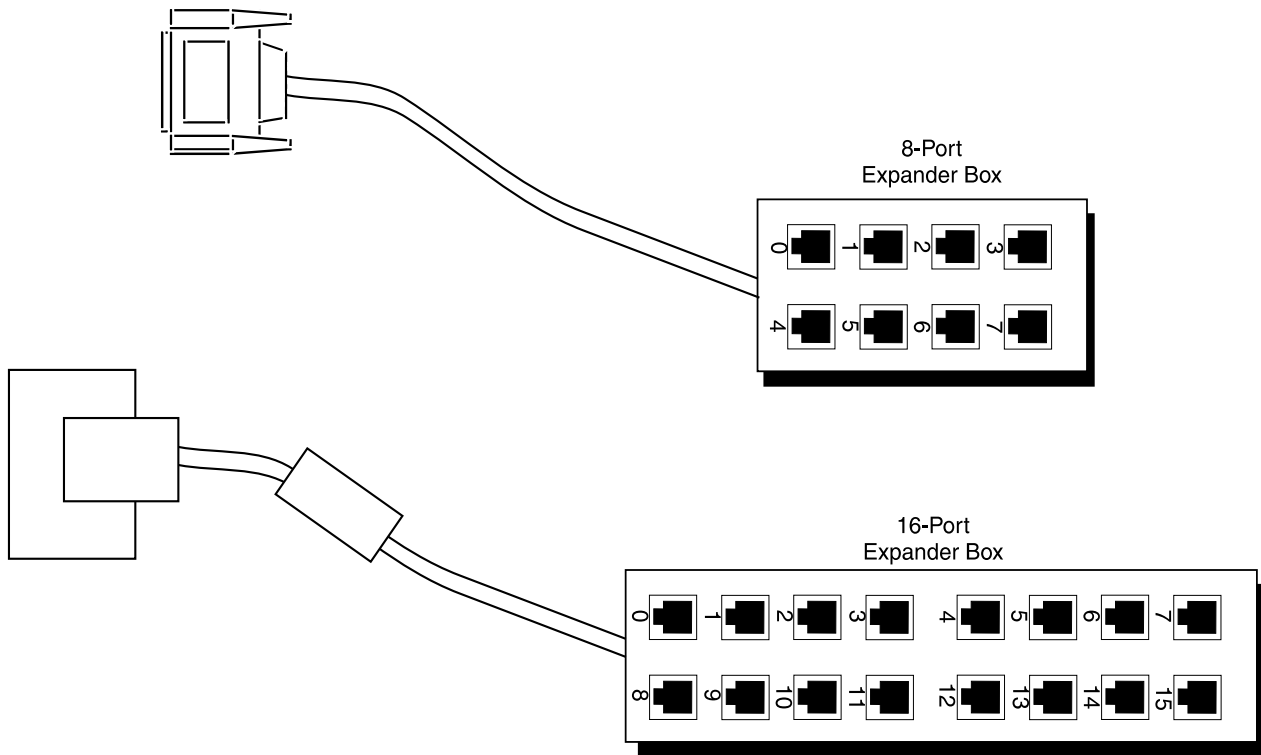


Figure 3-23: 8- and 16-Port Expander Box for the Aurora SBus *Multiport* Card

Note Ports 12-15 on the 16-port expander box can not be used to connect modems.

To connect a peripheral device to the expander box, do the following:

1. Attach the expander box cable to the SBus *Multiport* card. Tighten the thumbscrews securely. See Figure 3-24.

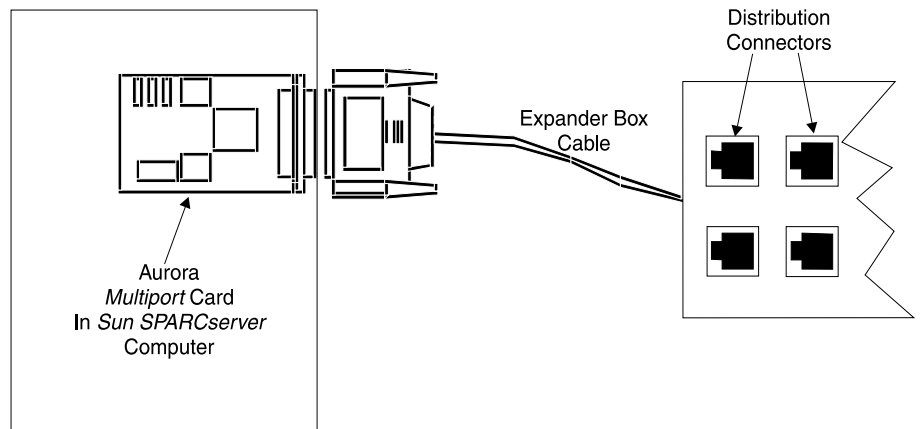


Figure 3-24: Expander Box Connection to Aurora *Multiport* Card

2. Choose the correct peripheral cable.
3. Attach one end of the cable to the peripheral, and the other to one of the distribution connectors (see Figure 3-25).

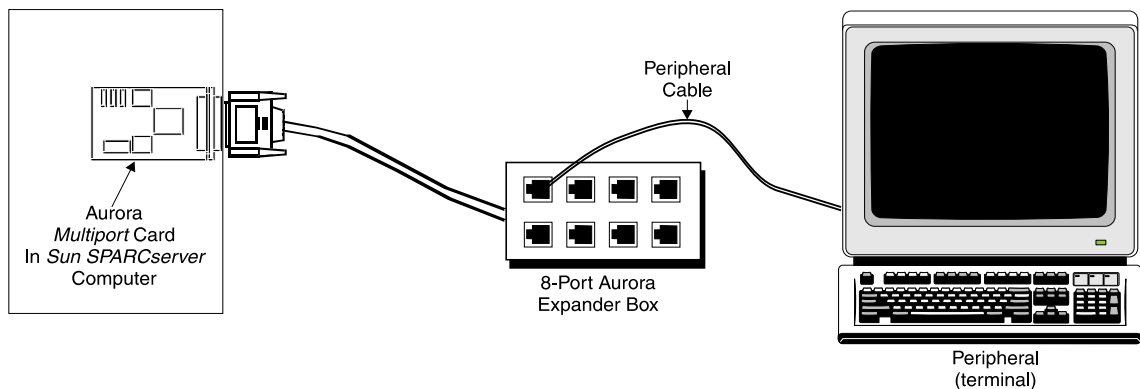


Figure 3-25: Connecting an Aurora Expander Box to a Peripheral

4. Record the slot number of the SBus *Multiport* card and the port number the peripheral is connected to. If only one Aurora SBus *Multiport* card is installed in the system, the breakout connectors are numbered to match the device names that will be created when the driver software is installed. You will need to know which port the peripheral was connected to when you set up port services for it.

Note

If you have more than one Aurora SBus *Multiport* card installed, see Chapter 9, "Maintenance," for a discussion of how devices are numbered and how to match them to the physical ports on an expander box.

Connecting the UPS

The Uninterruptible Power Source (UPS) provides a temporary electrical supply to the *Sun SPARCserver* computer for about 7 minutes. If the computer is without power for longer than 7 minutes, the system may shut down and you could lose data. Use the procedures in this section to connect the UPS to the *Sun SPARCserver* computer.

Note

These procedures apply to an Lucent Technologies UPS. If another UPS is used, see the documentation for that UPS.

Required Parts

Obtain the following parts:

- UPS (see Table 3-8)
- Appropriate power supply and outlet strip(s).

Table 3-8: UPS(s) and Part Numbers

UPS Model	PEC	Comcode
1KVA	2403-405	407195379
2KVA	2403-420	407336098
3KVA	2403-123	406672345
4.5KVA	2403-245	406929620
6KVA	2403-206	406974071
8KVA	2403-208	406929638
10KVA	2403-220	406974089
12KVA	2403-222	406974097
14KVA	2403-314	406687616
18KVA	2403-318	406672352

Procedure

To connect the UPS, do the following:

1. Plug the power cord of the UPS into a 120 V AC outlet.
2. Turn on the power to the UPS.

Connecting the Remote Console Modem

This section describes how to connect the remote console modem to the *Sun SPARCserver* computer which allows the TSC to dial in and do remote maintenance.

If you need additional information, refer to the Remote Console section(s) of Appendix D, “Sun *SPARCserver* Computer Factory Installation Procedures.”

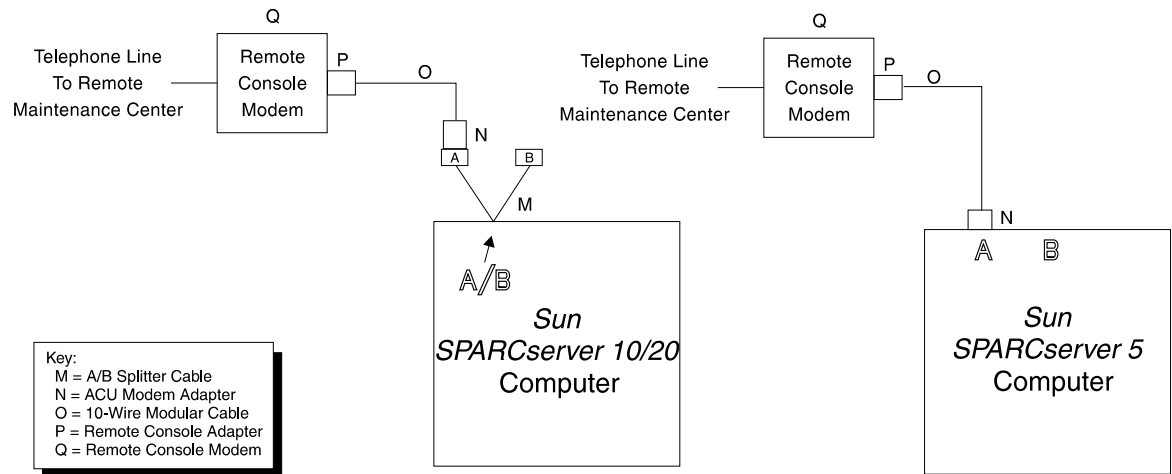


Figure 3-26: Remote Console Connectivity

To connect the Remote Console modem to the *Sun SPARCserver*, do the following (see Figure 3-26):

Note

If you have a *Sun SPARCserver* 10 or 20, use Steps 1 through 7. For a *Sun SPARCserver* 5, use Steps 2 through 7.

1. Connect the male end of the serial interface (A/B splitter) cable to the serial connector on the back panel of the *Sun SPARCserver* CPU.
2. Connect the ACU Modem adapter to the “A” serial port interface.
3. Connect one end of the 10-conductor cable to the ACU Modem adapter installed in the previous step.
4. Connect the other end of the 10-conductor cable to the Remote Console adapter.
5. Connect the Remote Console adapter to the RS-232C port on the modem.
6. Connect the telephone line to the jack labeled “LINE” on the modem.
7. Make the necessary power connections to the modem.

Powering Up the Computer and Verifying POST

Once you have assembled the computer, including the peripheral devices shipped with your system, power up the system, verify POST (Power On Self Test), and verify the connectivity of the SCSI peripherals.

1. Do the following in sequential order:
 - a. Turn on the devices connected to the SBus Expansion Subsystem.

Note

Remember to power on the SCSI devices starting with the device at the end of the SCSI chain, and work your way down to the *Sun SPARCserver* computer.

- b. Turn on the devices attached to the *Sun SPARCserver*.
 - c. Turn on the *Sun* SBus Expansion Subsystem.
 - d. Turn on the *Sun SPARCserver* computer.
 - e. Turn on the system monitor.

Note

The **power-on diagnostics** will occur each time you turn on the computer. The power-on diagnostics program tests the basic system components.

2. While the system is booting up, press the **Stop** and **A** keys simultaneously to put the system in the monitor mode. The system should respond with the following prompt:

```
ok
```

3. At the prompt, enter the following command:

```
ok probe-scsi-all
```

The program responds:

```

/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991

. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok

```

Note

The actual response (devices listed) depends on the devices installed on the SCSI bus.

4. Verify that the system recognizes all of the SCSI peripherals attached to your system.
5. Reboot the system by entering the following command:

```
ok boot
```

The system reboots.

Additional References For additional information, refer to the following documentation:

Sun Desktop SPARC Hardware Owner's Guide,
Chapter 3: "Turning the System Power On and Off."

Setting the Remote Console Modem Options

The *Sun SPARCserver* computer supports the following modems:

- *Paradyne[®] Comsphere[®] 3830*
- *Paradyne Comsphere 3910*
- *Paradyne DataPort Express Model 3710*
- *Paradyne DataPort Express Model 3715*
- *U.S. Robotics^{*} Sportster[†] 14.4 Faxmodem.*

For all models except the *Comsphere 3910*, complete the steps below. The *Comsphere 3910* modem options are set via the front panel. See the “*Paradyne Comsphere 3910*” section in Chapter 4 to set the options for this modem.

1. Skip this step if you are using a modem other than the *U.S. Robotics Sportster*; otherwise, continue. Set DIP switches 1, 3, 7, and 8 on the back panel of the *Sportster* to the down (ON) position, and switches 2, 4, 5, and 6 to the up (OFF) position. See the “*U.S. Robotics Sportster 14.4 Faxmodem*” section in Chapter 4 for more information.
2. Turn on the Remote Console modem.
3. At the system console, log in as *root*.
4. Enter the following command:

```
# cu -s 9600 -l cua/a
```

The message Connected should display.

5. At the system console, enter the options. Use the following table to decide what options to enter:

IF the Remote Console modem is a . .	THEN enter the options shown in. . .
<i>Comsphere 3830</i>	Figure 3-27
<i>DataPort Express Model 3710</i>	Figure 3-28
<i>DataPort Express Model 3715</i>	Figure 3-29
<i>U.S. Robotics Sportster 14.4 Faxmodem</i>	Figure 3-30

*U.S. Robotics is a registered trademark of U.S. Robotics, Inc.
†Sportster is a registered trademark of U.S. Robotics, Inc.

Note

Use numerical ones and zeros when entering the options.

AT&F3	(loads factory default configuration options into active memory)
ATS41=3	[sets Dial-Line Rate to 9600 (V.32bis)]
AT&S1&W0	[Data Set Ready (DSR) control follows standard RS-232 operation, save current Active(Operating) to Active (Save)]

Figure 3-27: Options for the *Comsphere 3830*

AT&F	(loads factory default configuration options into active memory)
ATS41=3	[sets Dial-Line Rate to 9600 (V.32bis/V.32)]
AT&T5	(denies request for Remote Digital Loopback test)
AT&C1	[Carrier Detect (CD) control follows standard RS-232 operation]
ATE0Q1&S1&W0	[disables echo, disables result codes, Data Set Ready (DSR) control follows standard RS-232 operation, save to profile 0]

Figure 3-28: Options for the *DataPort Express 3710*

AT&F	(loads factory default configuration options into active memory)
AT%B9600	(sets modulation/data rate to V.32bis/V.32, maximum rate 9600 bps)
AT&T5	(denies request for Remote Digital Loopback test)
ATE0Q1&S1&W0	[disables echo, disables result codes, Data Set Ready (DSR) control follows standard RS-232 operation, save to profile 0]

Figure 3-29: Options for the *DataPort Express 3715*

AT&F1	(loads factory default configuration options into active memory)
AT&N6	(sets forced connect speed to 9600 bps)
AT&W0	[writes the current configuration to NVRAM 0 template (Y0)]

Figure 3-30: Options for the *U.S. Robotics Sportster*

6. After you have entered the options, you can disconnect from the modem by entering a tilde and a period.

~.

7. Skip this step if you are using a modem other than the *U.S. Robotics Sportster*; otherwise, continue. Set all the DIP switches on the back panel of the *Sportster* to the up (OFF) position except switches 4 and 8, which are set to the down (ON) position. See the “*U.S. Robotics Sportster 14.4 Faxmodem*” section in Chapter 4 for more information.
8. If needed, reset the modem using the power switch.

Connecting to Another Network

This section describes how to change the Internet Protocol (IP) addresses on the *Sun SPARCserver* computer and the NTS(s) **remotely**. This should be done only if you are connecting your system to another network.

Note

Connecting to another network represents a nonstandard configuration. Support for nonstandard configurations is handled on a time-and-materials basis. Contact the *CentreVu* CMS Helpline for more information.

To connect to another network, the IP address on the *Sun SPARCserver* and on each NTS needs to be changed so it can be recognized by the new network.

Prerequisite Information:

Answer the following questions before connecting to another network:

- *For Servers*: What is the internet address assigned to the CMS?
- *For Servers*: What is the internet address assigned to each network terminal server?

Note

You may have more than one network terminal server. Each network terminal server must have its own internet address for communication with the CMS.

- *For Servers*: What is the name and IP address of the router (if any) on the CMS segment?
- *For Servers*: What subnet mask is used on this network?

To change the TCP/IP address of the *Sun SPARCserver* computer or the NTS, do the following:

1. Make sure you are in *root*.
2. At the system prompt, enter the *na* command to access the NTS administration software.

```
# na
```

3. The following appears (this is an example; the response may differ depending on what type of NTS you have):

```
# Annex network administrator R7.0 October 13, 1992
command:
```

To determine which NTS(s) has been provisioned, look at the `etc/hosts` and ping each NTS.

Follow Steps 4-12 for each NTS that has been provisioned.

4. Enter the following command (where x equals the number of the network terminal server):

```
command: annex cmsterm(x)
```

The system responds (this is an example; the response may differ depending on what type of NTS you have):

```
cmsterm(x): Annex-3UXR7, 64 ports
```

```
command:
```

5. At the command: prompt, enter the following:

```
command: write cmsterm(x) /etc/local.admin/nts(x)info
.
.
.
writing.....
```

The system returns to the command: prompt.

6. At the command: prompt, enter the following:

```
command: set annex inet_addr <NTS_IP_addr>
```

The system responds:

Change will take effect at next annex boot.

The system returns to the command : prompt.

7. At the command : prompt, enter the following:

```
command: set annex subnet_mask 255.255.0.0 (or other netmask as
appropriate)
```

The system returns to the command : prompt.

8. At the command : prompt, enter the following:

```
command: set annex pref_load_addr <SUN_IP_addr>
```

The system returns to the command : prompt.

9. At the command : prompt, enter the following:

```
command: set annex pref_dump_addr <SUN_IP_addr>
```

The system returns to the command : prompt.

10. At the command : prompt, enter the following:

```
command: set port=1-64 dedicated_address <SUN_IP_addr>
```

Change will take effect at next annex boot or reset.

Note

The set port=1-64 dedicated_address <SUN_IP_addr> line that you entered in Step 10 may differ depending on what type of NTS you have. For example, if you have an 8-port NTS, you would enter the following at the command : prompt:

```
set port=1-8 dedicated_address <SUN_IP_addr>
```

The system returns to the `command:` prompt.

11. At the `command:` prompt, enter the boot command.

```
command: boot
```

12. The system responds. Enter return (default) for all four questions.

```
time (return for 'now'):  
annex list (return for default):  
filename (return for default):  
warning (return for default):
```

```
booting annex cmsterm(x)
```

The annex is performing self diagnostics, and will not respond to administration operations for a short period.

```
command:
```

13. At the `command:` prompt, enter `q` to exit.

Note

You will not be able to communicate with the network terminal server again until the IP address that was changed for each NTS is changed for the *Sun SPARCserver* (Steps 14-25).

14. Edit the `/etc/hosts` file by entering:

```
# vi /etc/hosts
```



If you change the IP address of the *Sun SPARCserver* you must reboot the system within 12 hours. If you do not reboot the system within 12 hours, `x.25` will stop.

15. Add the new address(es) for the NTS(s) and the *Sun SPARCserver* computer in the `etc/hosts` file that corresponds to the new addresses.
16. Add the router IP and name in the `etc/hosts` file.

17. Remove or comment out old entries in the `etc/hosts` file.
18. Write and quit the file.
19. Create the `/etc/defaultrouter` file by entering:

```
# vi /etc/defaultrouter
```

20. Add the router node name given in the `etc/hosts` file.
21. Write and quit the file.
22. Edit the `/etc/netmasks` file by entering:

```
# vi /etc/netmasks
```

23. Modify the subnet mask if it is different from the default for the IP address that you are using (an example is provided in the file).
24. Write and quit the file.
25. Reboot the system by entering:

```
# shutdown -i6 -y -g0
```

26. Edit the following programs with the new IP address just assigned to the CMS (the programs are located in the `/etc/local.admin` file):

```
-rwxr-xr-x 1 root other 2291 May 16 18:11 12outmodem
-rwxr-xr-x 1 root other 2266 May 16 18:11 12print
-rwxr-xr-x 1 root other 2273 May 16 18:11 12term
-rwxr-xr-x 1 root other 2293 May 16 18:11 192outmodem
-rwxr-xr-x 1 root other 2268 May 16 18:11 192print
-rwxr-xr-x 1 root other 2275 May 16 18:11 192term
-rwxr-xr-x 1 root other 2291 May 16 18:11 24outmodem
-rwxr-xr-x 1 root other 2266 May 16 18:11 24print
-rwxr-xr-x 1 root other 2273 May 16 18:11 24term
-rwxr-xr-x 1 root other 2291 May 16 18:11 48outmodem
-rwxr-xr-x 1 root other 2266 May 16 18:12 48print
-rwxr-xr-x 1 root other 2273 May 16 18:12 48term
-rwxr-xr-x 1 root other 2291 May 16 18:12 96outmodem
-rwxr-xr-x 1 root other 2266 May 16 18:12 96print
-rwxr-xr-x 1 root other 2273 May 16 18:12 96term
-rwxr-xr-x 1 root other 2294 May 16 18:12 inmodem
```

Note

Each one of these programs has a line located at the bottom that says "set port dedicated_address 129.200.9.1." The 129.200.9.1 address needs to be changed to the new IP address. This is the CMS *SPARC* address, not the network terminal server address.

Connecting to Another Network (Via Dumb Terminal)

This section describes how to change the Internet Protocol (IP) addresses on the *Sun SPARCserver* computer and the NTS(s) when you **cannot talk to the network terminal server remotely**. This should be done only if you are connecting your system to another network.

Note

Connecting to another network represents a nonstandard configuration. Support for nonstandard configurations is handled on a Time-and-Materials basis. Contact the *CentreVu* CMS Helpline for more information.

To connect to another network, the IP address on the *Sun SPARCserver* and on each NTS needs to be changed so it can be recognized by the new network.

Note

The administration process needs to be completed on each NTS being installed.

If you administer more than one NTS for this system, the IP addresses must be unique.

To connect to another network and change the IP addresses for your system, do the following:

1. Obtain the following information from the network administrator of the network you are connecting to:
 - *Sun SPARCserver* computer IP address (use Table 3-9 to record this information)
 - NTS IP address for each NTS (use Table 3-9 to record this information).

Table 3-9: CentreVu CMS Standard Network IP Addresses

Device	Network Name	IP Address
<i>SPARCserver</i> Computer		
First NTS		
Second NTS		
Third NTS		
Fourth NTS		
Fifth NTS		
Sixth NTS		
Seventh NTS		

2. Edit the */etc/hosts* file by entering:

```
# vi /etc/hosts
```

3. Locate the lines (in the */etc/hosts* file) that contain the IP addresses for the *Sun SPARCserver* Computer and the NTS(s).
4. Change the existing IP addresses (in the file) to the new addresses recorded in Table 3-9.
5. Write and quit the file.
6. Check with the network administrator for additional routing functions in the */etc/netmasks* and */etc/networks* files.
7. Connect a dumb terminal to the **CONSOLE** port on the rear of the NTS using the console cable that came with the NTS. On the 8- and 16-port NTSs, the **CONSOLE** port is port #1 (see Figure 3-31).

You will need the following for the 8- and 16-port NTS(s):

- Console cable
- Adapter - comcode 407361823
- Null Modem - comcode 407122043.

You will need the following for the 64-port NTS(s):

- Console cable
- Adapter - part number 06-988-260-20.

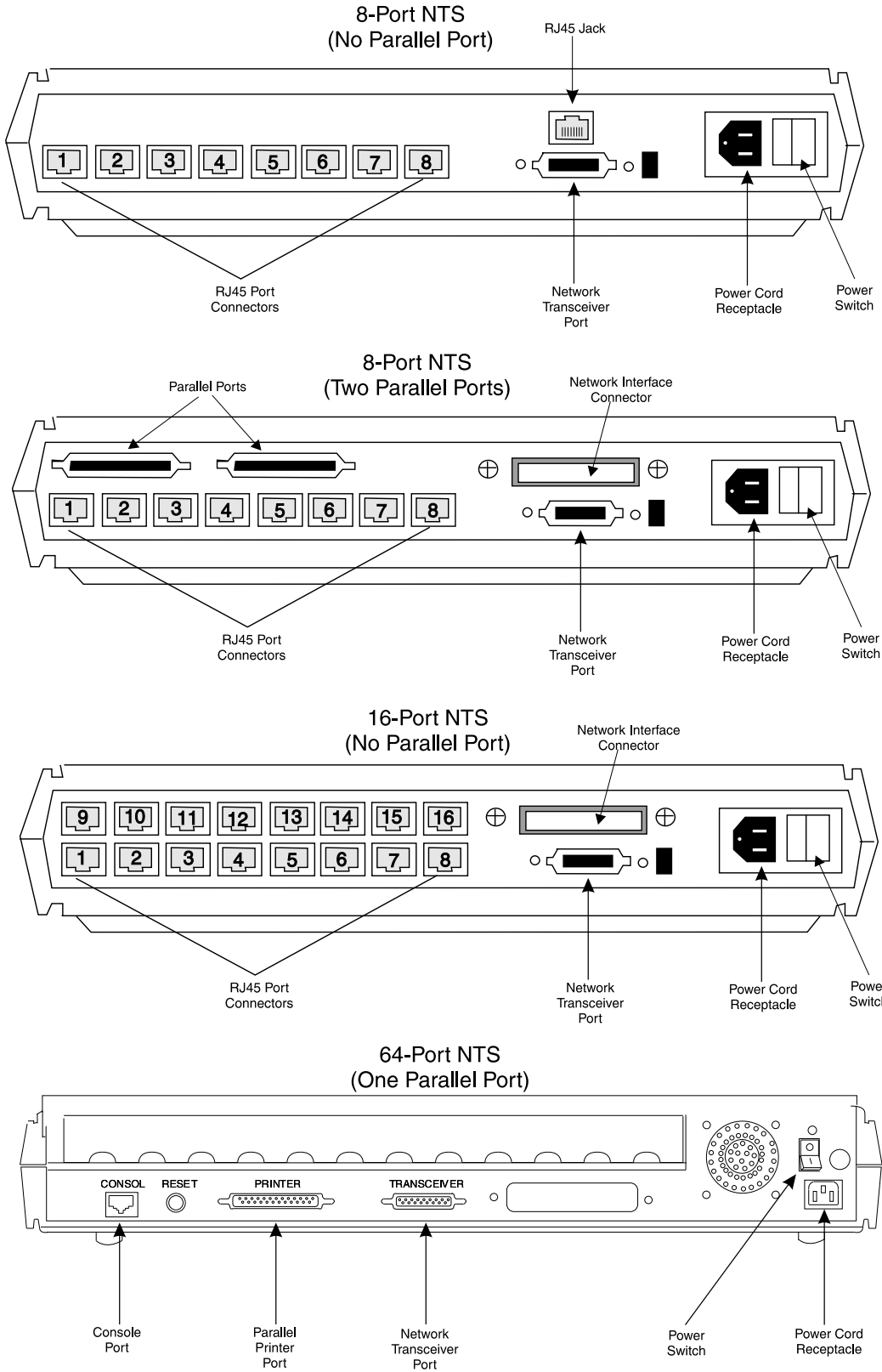


Figure 3-31: Network Terminal Servers — Back Panel

8. Turn the NTS off and on again. Within 15 seconds, push the **TEST** button on the front of the NTS (see Figure 3-32).

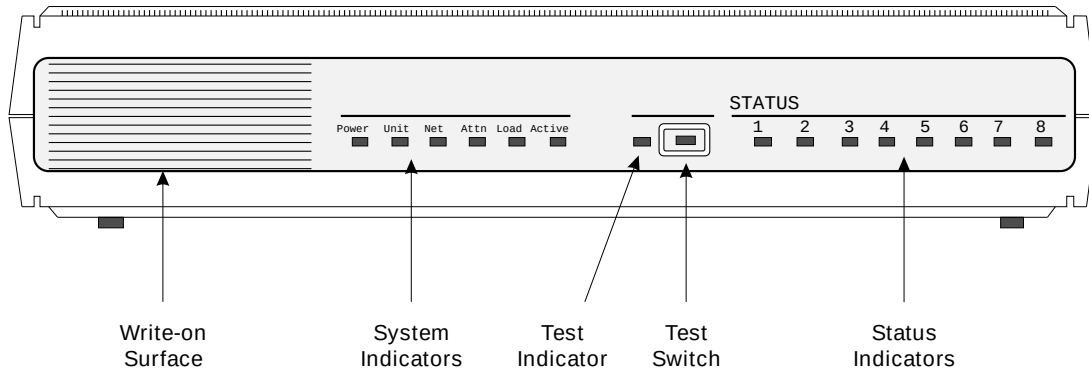


Figure 3-32: Network Terminal Server — Front Panel

9. The NTS goes through its hardware diagnostics, and the following prompt should appear:

```
Monitor:
```

10. Enter the following command at the `monitor::` prompt:

```
Monitor:: erase
```

Note

The following two types of information can be erased:

- EEPROM (configuration information)
- FLASH (self-boot image)

If just one type of information is present, the program begins to erase it. If there are two types of information, the program prompts you to select what you want to erase. Erase both the EEPROM and the FLASH information.

The program responds:

```
Erase
  1) EEPROM (i.e., Configuration Information)
  2) FLASH (i.e., Self Boot Image)
Enter 1 or 2::
```

11. Enter 1 to erase EEPROM. The program responds:

```
Erase all non-volatile EEPROM memory? (y/n) [n]::
```

12. Enter Y. The program responds:

```
Erasing xxxx bytes of non-volatile memory. Please wait....
.....
Erased xxxx bytes of non-volatile memory complete.
```

13. The program returns to the monitor:: prompt. Repeat steps 11-14 to erase the FLASH information.
14. After you have completed the erase command, enter the following command at the monitor prompt:

```
Monitor:: addr
```

15. The program responds:

```
Enter Internet address [<uninitialized>]::
```

16. Enter the IP address for this NTS. This should follow the IP address structure outlined in Table 3-9 on page 3-53.

The program responds:

Internet address : XXX.XXX.XXX.XXX

Enter Subnet mask [255.255.0.0]::

17. Press **Return** to accept the default subnet mask. The program responds:

Subnet mask: 255.255.0.0

Enter preferred load host Internet address [<any host>]::

18. Enter the IP address of the *Sun SPARCserver* computer.
The program responds:

Preferred load host address XXX.XXX.XXX.XXX

Enter Broadcast address [0.0.0.0]::

19. Press **Return** to accept the default broadcast message address. The program responds:

Enter Preferred dump address [0.0.0.0]::)

20. Enter the IP address of the *Sun SPARCserver* computer. The program responds:

Preferred dump address: xxx.xx.x.x

Select type of IP packet encapsulation (ieee802/ethernet)
[<ethernet>] ::

21. Press **Return** to accept the default IP packet encapsulation. The program responds with the following question if you have an 8- or 16-port NTS. The program returns to the monitor : : prompt if you have a 64-port NTS.

```
Type of IP packet encapsulation: <ethernet>
```

```
Load Broadcast Y/N [Y]::
```

22. Enter N. The program returns to the monitor:: prompt.
23. Enter the following command at the monitor prompt to reinitialize the NTS with the new parameters:

```
monitor:: boot
```

The program responds:

```
Enter boot file name [oper.42.enet]::
```

Note

The boot file name differs depending on the type of NTS. For the 8- and 16-port NTS, the boot file name is [(ip) "oper.52.enet", (mop) "OPER_52_ENET.SYS"]:: . For the 64- port NTS, the boot file name is oper.42.enet.

24. Press **Return** to accept the default boot file name. The program continues with:

```
Requesting boot file "oper.42.enet".
Unanswered requests shown as '?',
                                transmission errors as '*'.

```

```
Booting file: oper.42.enet from 129.200.9.1
```

```
Loading image from 129.200.9.1
```

```
.....
```

The periods (dots) continue to appear as the NTS is initialized and set up.

Note

If the program displays “SELF” instead of the IP address (129.200.9.1), it means that you did not erase EEPROM. Go back to step 11 to erase EEPROM.

When the initialization finishes, the following appears:

```
annex::
```

25. Disconnect the dumb terminal from the NTS.

The NTS has been administered.

Additional References

For additional information, refer to the following documentation:

*Network Terminal Server Guide,
Quick Installation Guide for the Sun Network Terminal Server
Leaflet.*

Chapter 4

Installing Terminals, Printers, and Modems

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Overview

This chapter describes how to connect terminals, printers, and modems to a *Sun*^{*} *SPARCserver*[†] computer.

Refer to Chapter 3, “Installing the *Sun SPARCserver* Computer,” before connecting to terminals, printers, and modems.

You can use a Network Terminal Server (NTS) or Aurora SBus *Multiport*[‡] card to connect to the terminals, printers, and modems.

You can also use the parallel ports on the back of the NTS and on the back of the *Sun SPARCserver* to connect parallel printers. One parallel printer can be connected directly to the *Sun SPARCserver*. Additional parallel printers can be connected to the parallel ports on an NTS when provided.

See the “Connecting Terminals, Printers, and Modems to the NTS” section in this chapter for details on how to use cables and adapters to connect the NTS to terminals, printers, and modems.

The following sections describe how to administer approved terminals, printers, and modems:

- “Administering Terminals”
- “Administering Printers”
- “Administering Modems.”

^{*}Sun is a registered trademark of Sun Microsystems, Inc.

[†]SPARCserver is a trademark of SPARC International, Inc.

[‡]Multiport is a trademark of Aurora Technologies, Inc.

Supported Communications, Terminal and Printer Equipment

Use scenario 1 or 2 depending on whether you are connecting a terminal or printer (see Figure 4-1). Scenario 1 provides you three options for connecting a terminal, and scenario 2 provides two options for connecting a printer. The different options are explained in this section.

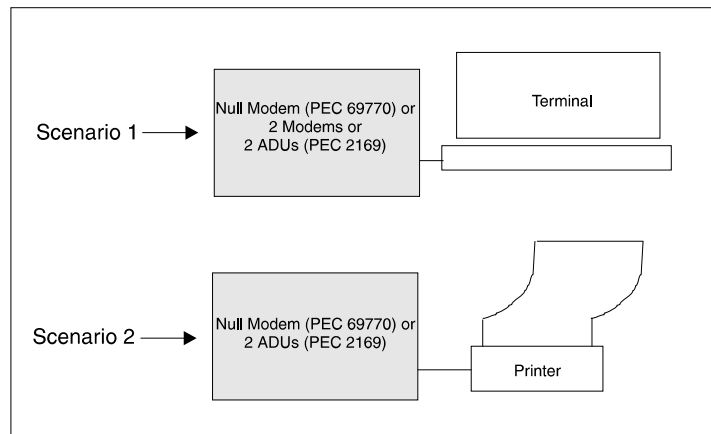


Figure 4-1: Supported Communications, Terminal and Printer Equipment

Option 1 — Null-Modem connection (see Figure 4-2).

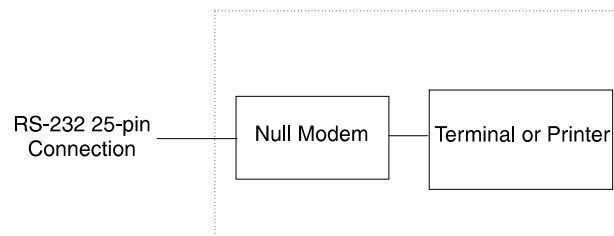


Figure 4-2: Sample Connection Using a Null Modem

An example of a null modem is shown in Figure 4-3.

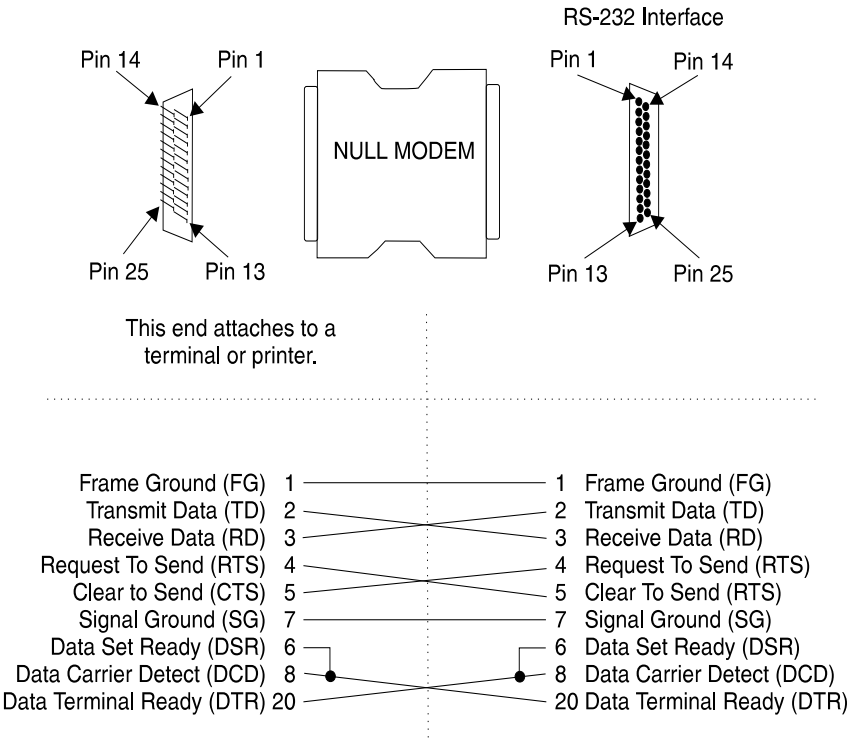


Figure 4-3: Null Modem

Option 2 — Two-Modem connection (see Figure 4-4).

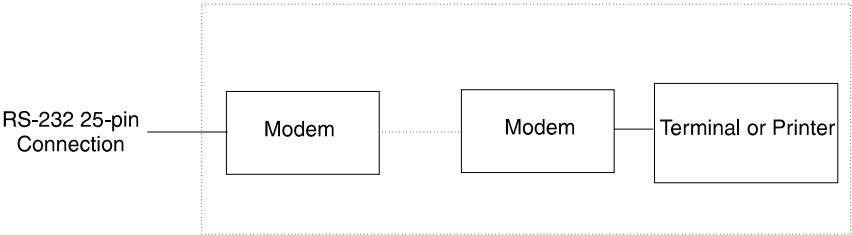


Figure 4-4: Sample Connection Using Modems

Option 3 — Two-Asynchronous Data Units (ADUs) connection (see Figure 4-5).

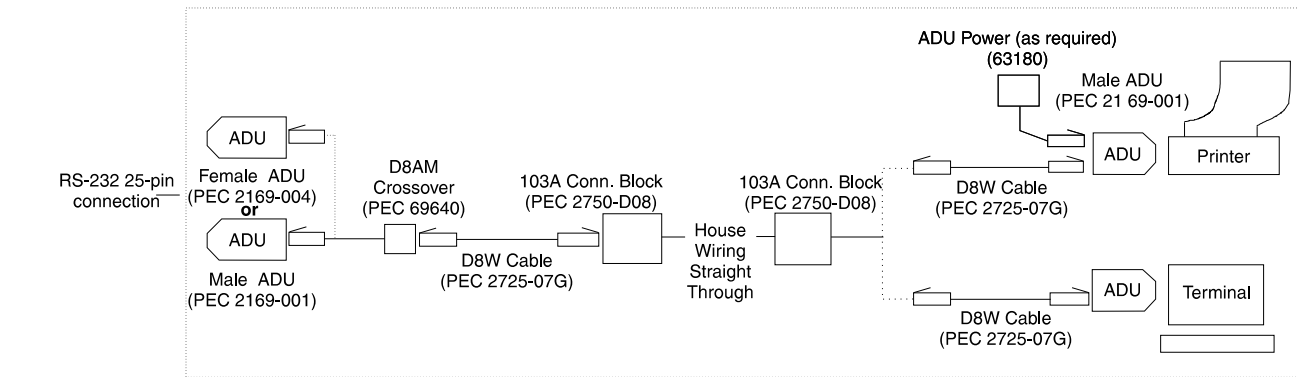


Figure 4-5: Sample Connection Between the ADU and the Terminal or Printer

When using ADUs with the 64-port NTS, one male ADU (Price Element Code [PEC] 2169-001) plugs directly into the NTS and one male ADU (PEC 2169-004) plugs into the terminal or printer. Optionally, an 8- or 10-wire cable with two NTS serial port adapters (PEC 69771, attribute ADP20 for 64-port or attribute ADP19 for 8- and 16-port) may be connected between the NTS and a female ADU rather than plugging the male ADU directly into the NTS. For the 64-port NTS you can connect terminals and printers directly without using NTS serial ports adaptors if it is convenient.

Supported Terminals

This section describes terminals that can be connected to the *Sun SPARCserver* computer for use with the *CentreVu™* Call Management System (CMS) R3V5 software application. See Table 4-1 for a list of the approved and supported terminals.

Note The *Sun SPARCserver* computer currently supports up to 252 peripherals (terminals, printers, and modems).

Table 4-1: Approved Terminals

Model	Description	Offered	Discontinued	PEC
605 MT	Multi-Tasking Terminal		X	NA
615 CMT	Color Multi-Tasking Terminal (color controller, color monitor, 6000 series 98-key keyboard)		X	NA
615 MT	Multi-Tasking Terminal		X	NA
620 MTG	Multi-Tasking Graphics Terminal		X	NA
705 MTG	Multi-Tasking Terminal (controller, monitor, and keyboard)	X		69643 (Amber or White)
715 BCT	Business Communications Terminal (controller, monitor, and keyboard)		X	6950-ET6 (Amber) 6950-ET7 (White)
2900/AWTC	Color Terminal		X	NA
4000/AWTC	Color Terminal		X	NA
2900/260lfc	Small Footprint Color Terminal	X		69779 (Monitor) 69780 (Controller) 69781 (Keyboard)

Supported Printers

This section describes printers that can be connected to the *Sun SPARCserver* computer for use with the *CentreVu* CMS R3V5 software application. See Table 4-2 for a list of the approved and supported printers.

Table 4-2: Approved and Supported Printers

Type of Printer	Offered	Discontinued	PEC
321 <i>Okidata</i> [*] 120-Column Dot Matrix Printer	X		69765
475 Dot Matrix Printer		X	NA
476 Dot Matrix Printer		X	NA
477 Dot Matrix Printer		X	NA
495 Laser Printer		X	NA
570 Parallel Dot Matrix Printer		X	NA
571 Parallel Dot Matrix Printer		X	NA
572 Serial Dot Matrix (Narrow Platen) Printer	X		6950-EP5
573 Serial Dot Matrix (Wide Platen) Printer	X		69646
580 Parallel Dot Matrix		X	NA
583 Dot Matrix Printer		X	NA
593 Laser Printer		X	NA
595 Laser Printer		X	NA
6417 GIS Parallel Dot Matrix Printer	X		6951-417
OL810e <i>Okidata</i> LED Page Printer	X		12129
OL830 Plus <i>Okidata</i> LED Page Printer		X	NA

^{*}Okidata is a registered trademark of Oki Electronic Industry Co., Ltd.

Note	After the printer has been connected to the computer, the printer port must be administered so that the computer can recognize the new printer.

Supported Modems

This section describes modems that can be connected to the *Sun SPARCserver* computer for use with the *CentreVu* CMS R3V5 software application.

Table 4-3 lists the approved and supported modems for use with the *Sun SPARCserver* computer and the *CentreVu* CMS R3V5 software application.

Table 4-3: Approved Modems

Type of Modem	Offered	Discontinued	PECs
<i>U.S. Robotics</i> [*] <i>Sportster</i> [†] 14.4 Faxmodem, External Version, (Model 000268-0)	X		2569-268
<i>Paradyne</i> [®] <i>DataPort</i> [®] Express (Model 3710/3715)		X	2271-GEI
<i>Paradyne Comsphere</i> [®] 3830	X		63184
<i>Paradyne Comsphere</i> 3910 (international)	X		2177-401 [‡] 2177-402 2177-403 2177-404

*U.S. Robotics is a registered trademark of U.S. Robotics, Inc.

†Sportster is a registered trademark of U.S. Robotics, Inc.

‡There are four PECs for the *Comsphere* 3910 because each PEC is associated with one or more countries. Contact your Lucent Technologies Account Executive for the PEC that is applicable for your region.

Note

After the modem is connected to the computer, the modem port must be administered so that the computer can recognize the new modem.

In the following figures, starting on page 4-9, the shaded portion corresponds to the shaded portion of Figure 4-1 on page 4-2. You can use Figure 4-1 to determine what type of connections you need between your terminal and/or printer.

Connecting Terminals, Printers, and Modems

This section describes how to connect printers, terminals, and modems to the *CentreVu* CMS using NTS(s) or Aurora SBus *Multiport* cards.

You can connect terminals and printers directly to the serial ports to meet RS-232 specifications (up to a recommended distance of 300 feet). You can use new or existing 8- or 10-wire straight-through modular cables, house wiring, or ADUs and house wiring to extend the distance between the serial ports and the terminal, printer, or modem.

Note If the system is being upgraded and connected to an existing printer/terminal configuration, you must replace the old adapters with the new adapters. See the “Upgrade Installation Procedures,” section in this chapter for more information.

New Installation Procedures

Connect a terminal, printer, modem, or ADU to an NTS patch panel (16-port RS-232), 8- or 16-port NTS using new 8- or 10-wire straight-through cabling. You can extend up to 50 feet using 10-wire straight-through cabling or up to 25 feet using 8-wire straight-through cabling scenarios.

Note To extend cabling beyond the 25 or 50 feet described in Figure 4-6, Figure 4-8, or Figure 4-10, you can use house wiring that will extend up to 300 feet, or see the “Sample Connection Between ADU and Terminal or Printer” figure in this chapter for an additional option. If you are using ADUs or modems, you do **not** need to use a null modem (see Figure 4-4 on page 4-3 or Figure 4-5 on page 4-4).

To connect terminals or printers to serial ports on the NTS(s) you need **one** of the following:

1. Null-modem adapter
2. Pair of modems
3. Pair of ADUs.

Connecting Communications Equipment, Terminals, and Printers to a 64-Port NTS

Each 64-port Network Terminal Server requires four NTS patch panels (16-port RS-232) to reach a total of 64 serial ports. The NTS patch panel (16-port RS-232) is a serial asynchronous connector that is used to convert Private Branch Exchange (PBX) Champ-pin/signal allocations to RS-232 data signal specifications. Each NTS patch panel (16-port RS-232) has 16 DB-25 connector ports. The first port must be set aside for service personnel.

Note

Each 64-port NTS has one parallel port. This port can be used to connect parallel printers. See the “Parallel Printers” section in this chapter for more information.

The 64-port NTS has four NTS patch panels which provide sixteen 25-pin RS-232 connections each.

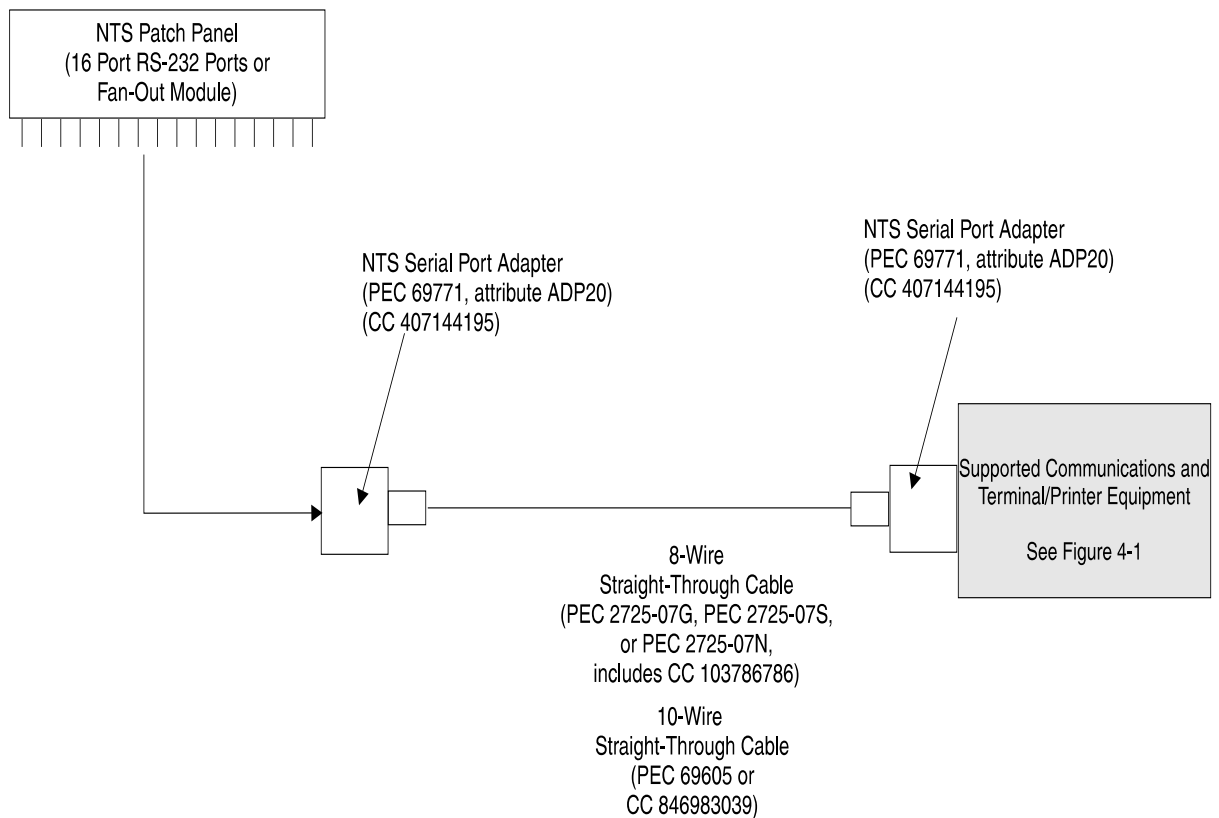


Figure 4-6: New Installation Cabling Scenarios — Terminals and Printers

Note

For 10-wire straight-through upgrade scenarios, you can substitute an ACU/Modem adapter for an NTS serial port adapter.

Do not forget to connect your null modem, two modems, or two ADUs depending on which scenario you are using.

Using 8- or 10-Wire
Straight-Through
Cabling for 64-Port
NTS

You can connect supported communications, terminal, and printer equipment to an *CentreVu* CMS R3V5 using 8- or 10-wire modular straight-through cables. In this case, you will need the following parts for each terminal or printer connected to the NTS patch panel (16-port RS-232):

- Two NTS serial port adapters
- One 8- or 10-wire cable.

Refer to Figure 4-6 and do the following steps to connect a terminal, printer, or modem to an NTS patch panel (16-port RS-232):

1. Connect the NTS serial port adapter to either end of a 8- or 10-wire modular straight-through cable.
2. Connect the other end of the 8- or 10-wire modular straight-through cable to the second NTS serial port adapter.
3. Connect one NTS serial port adapter to the NTS patch panel, the other to a modem, ADU, or null-modem adapter.

Figure 4-7 shows the adapters used to connect 8- and 10-wire straight-through cabling to the NTS patch panel.

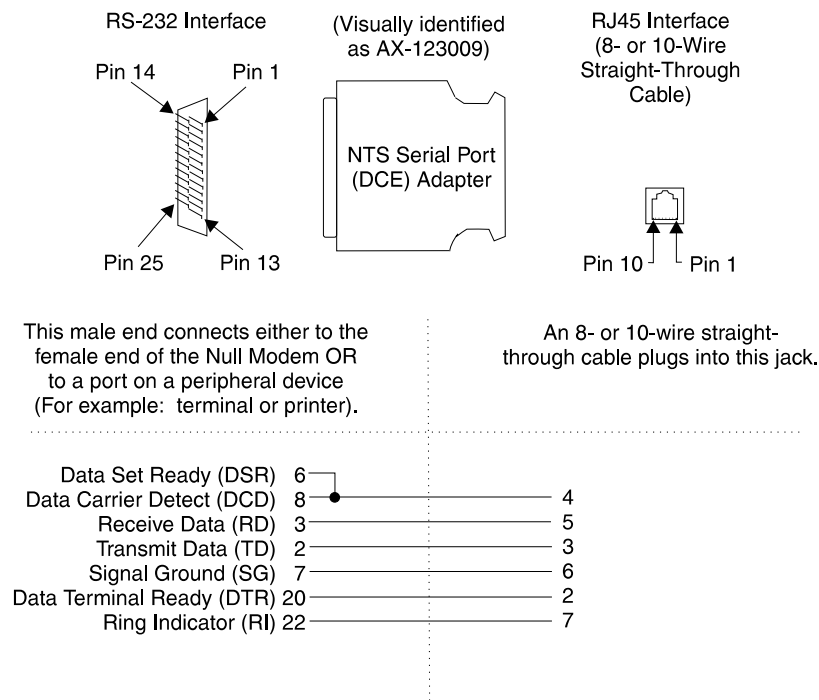


Figure 4-7: NTS Serial Port Adapter (64-Port NTS)

Connecting Communications Equipment, Terminals, and Printers to an 8- and 16-port NTS

Neither an 8- nor a 16-port NTS have NTS patch panels. Terminals and printers connect directly to the NTS.

Note

The 8-port NTS can have either two parallel ports or none. These ports can be used to connect parallel printers. See the “Parallel Printers” section in this chapter for more information.

Both the 8- and 16-port NTS provide RJ45 jacks and need an adapter (*ANIXTER*® RJ45-DB25) to convert to a 25-pin RS-232 connection (see Figure 4-9).

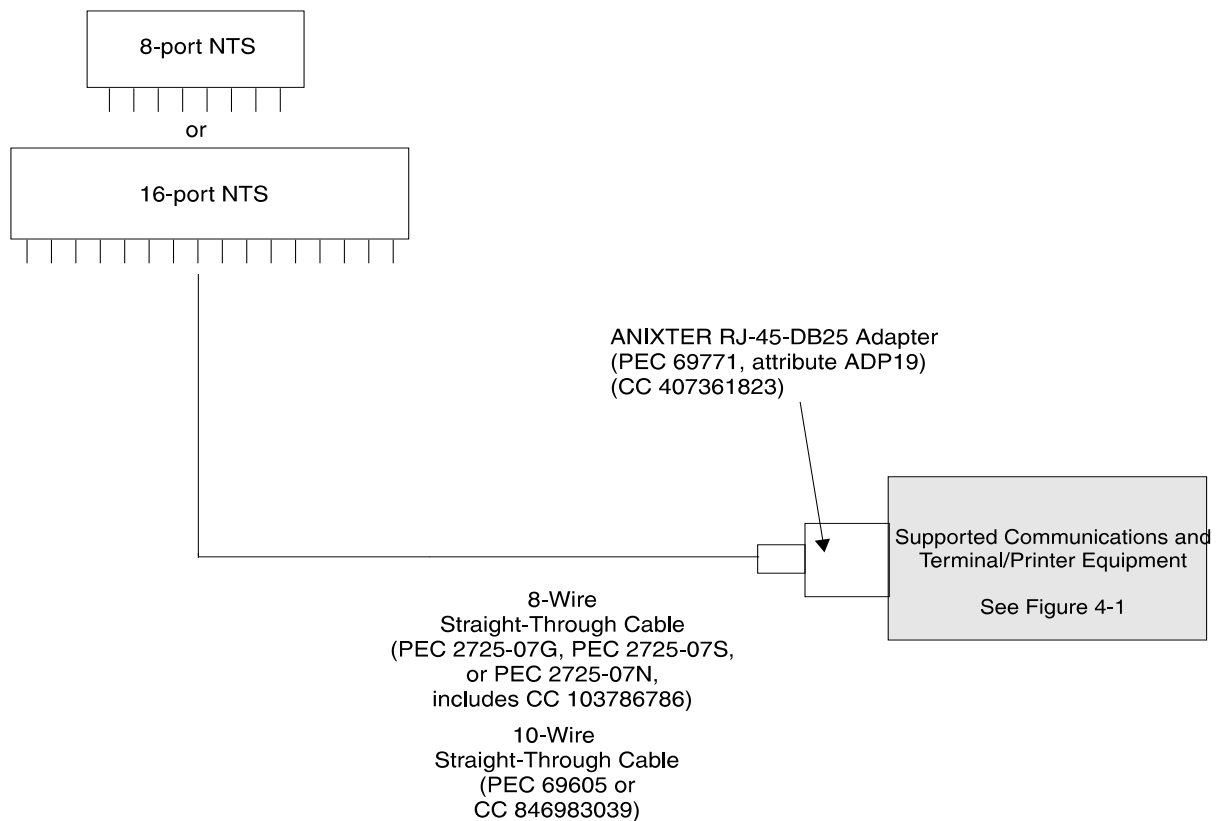


Figure 4-8: New Installation and Cabling Scenarios — Terminals and Printers

Note

If you are using ADUs, a female ADU will connect to the *ANIXTER* adapter. See the Supported Communications, Terminal, and Printer Equipment section for more information.

Do not forget to connect your null modem, two modems, or two ADUs depending on which scenario you are using.

*ANIXTER is a registered trademark of ANIXTER Bros., Inc.

Using 8- or 10-Wire
Straight-Through
Cabling for an 8- or
16-Port NTS

You can connect the supported communications, terminal, and printer equipment to an *CentreVu* CMS R3V5 using 8- or 10-wire modular straight-through cables. In this case, you will need the following required parts for each terminal or printer connected to the NTS:

- *ANIXTER* RJ45-DB25 adapter (see Figure 4-9)
- One 8- or 10-wire cable.

Refer to Figure 4-8 and do the following steps to connect a terminal, printer, or modem to an 8- or 16-port NTS:

1. Plug 8- or 10-wire cable into the NTS.
2. Connect the *ANIXTER* adapter to the other end of cable.
3. Connect the *ANIXTER* adapter to the modem, ADU, or null-modem adapter.
4. The null-modem adapter can be connected directly to the terminal or printer.

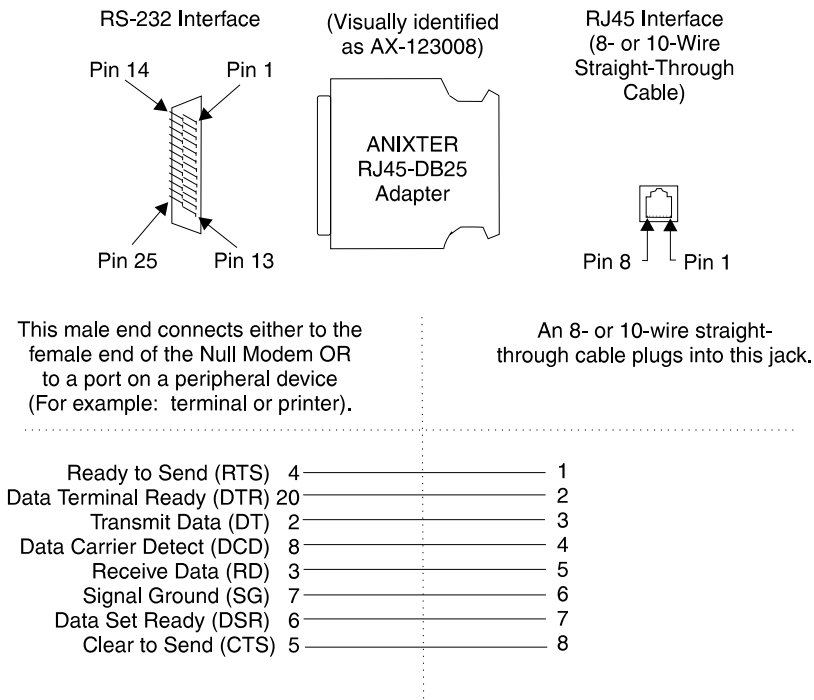


Figure 4-9: *ANIXTER* RJ45-DB25 Adapter (8- and 16-Port NTS)

Connecting Communications Equipment, Terminals, and Printers to Aurora SBus *Multiport* Cards

The 8- and 16-port Aurora SBus *Multiport* cards provide RJ45 jacks and need an adapter (*ANIXTER* RJ45-DB25) to convert to a 25-pin RS-232 connection (see Figure 4-10).

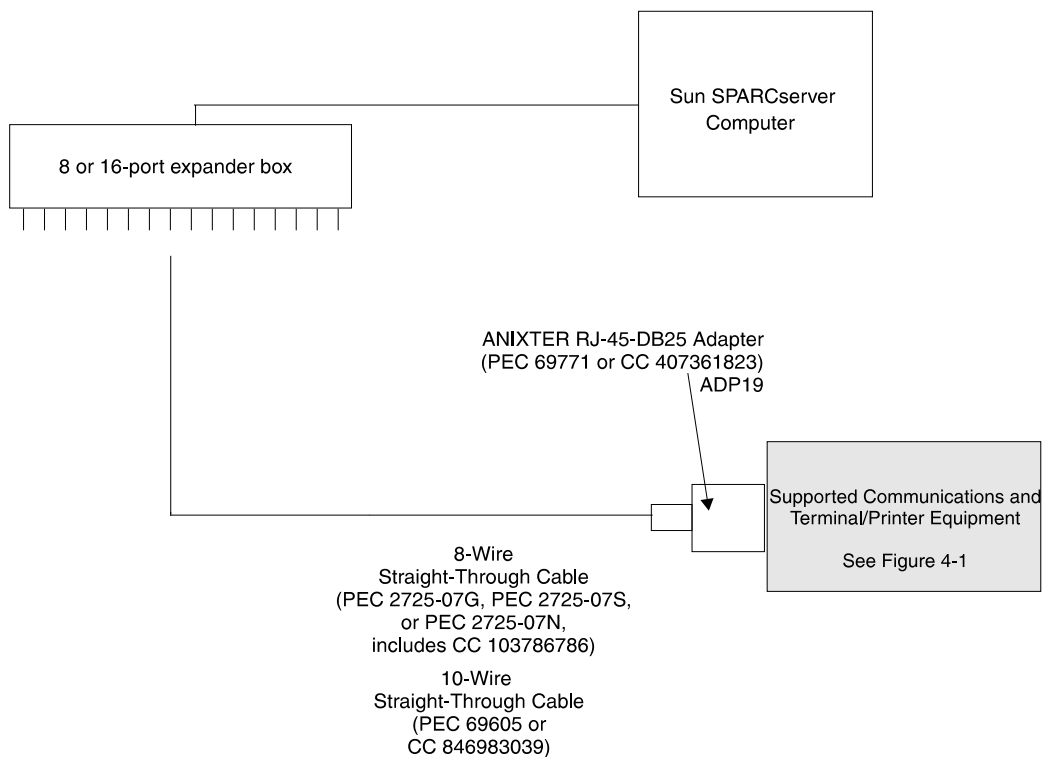


Figure 4-10: New Installation and Cabling Scenarios — Terminals and Printers

Note

If you are using ADUs, a female ADU will connect to the *ANIXTER* adapter. See the "Supported Communications, Terminal, and Printer Equipment" section for more information.

Do not forget to connect your null modem, two modems, or two ADUs depending on which scenario you are using.

Using 8- or 10-Wire Straight-Through Cabling for an 8- or 16-Port Aurora SBus Multiport Card

You can connect the supported communications, terminal, and printer equipment to a *CentreVu* CMS R3V5 using 8- or 10-wire modular straight-through cables. In this case, you need the following required parts for each terminal or printer connected to the 8- or 16-port expander box:

- *ANIXTER* RJ45-DB25 adapter (see Figure 4-9)
- One 8- or 10-wire cable.

Refer to Figure 4-10 and do the following steps to connect a terminal, printer, or modem to an 8- or 16-port expander box:

1. Plug the 8- or 10-wire cable into the 8- or 16-port expander box.
2. Connect the *ANIXTER* adapter to the other end of cable.
3. Connect the *ANIXTER* adapter to the modem, ADU or null-modem adapter.
4. The null-modem adapter can be connected directly to the terminal or printer.

Upgrade Installation Procedures

To upgrade the connection of a terminal, printer, modem, or ADU to an NTS, use new 8- or 10-wire straight-through cabling and new adapters.

Using Existing Cabling

The network terminal servers offer serial connectivity cabling. You can have three possible connectivity upgrade scenarios to the NTS for the existing *CentreVu* CMS platforms.

If you are upgrading to a new *Sun SPARCserver* computer, you may have one of the following cable schemes (see Table 4-4):

Table 4-4: Cabling Upgrade Scenarios

Platform	Serial Card	Cabling	Color of Cable
3B2	EPORTS	8-wire flipped	black
<i>INTEL</i> *	IPC-1600	10-wire straight-through	gray
3332	<i>EQUINOX</i> †	8-wire flipped	black

*INTEL is a registered trademark of Intel Corp.

†EQUINOX is a registered trademark of Equinox Systems, Inc.

Note

The 8-wire cabling used with the earlier platforms is flipped (for example, pin 1 RS-232 signals at one end of the cable are present at pin 8 of the other end). See “Adapter” figures in this chapter for details of each adapter’s pin connectivity. With the NTS, both the 8- and 10-wire cables must have straight-through RS-232 signals.

If you are upgrading the cabling for a 3B2 or a 3332, you must replace the cables and adapters with new cables and adapters. See Figures 4-11 through 4-13 (on pages 4-16 and 4-16) for upgrade scenarios with a 64-port NTS and Figures 4-14 through 4-16 (on pages 4-17 and 4-17) for upgrade scenarios with an 8- or 16-port NTS.

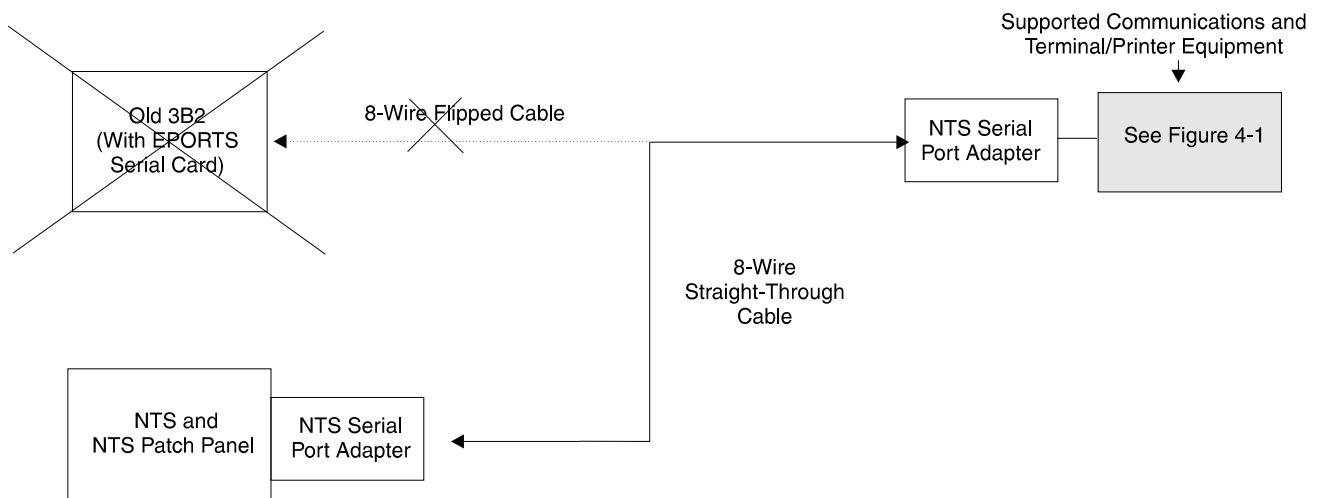


Figure 4-11: Upgrade Existing 3B2 Cabling to a 64-Port NTS

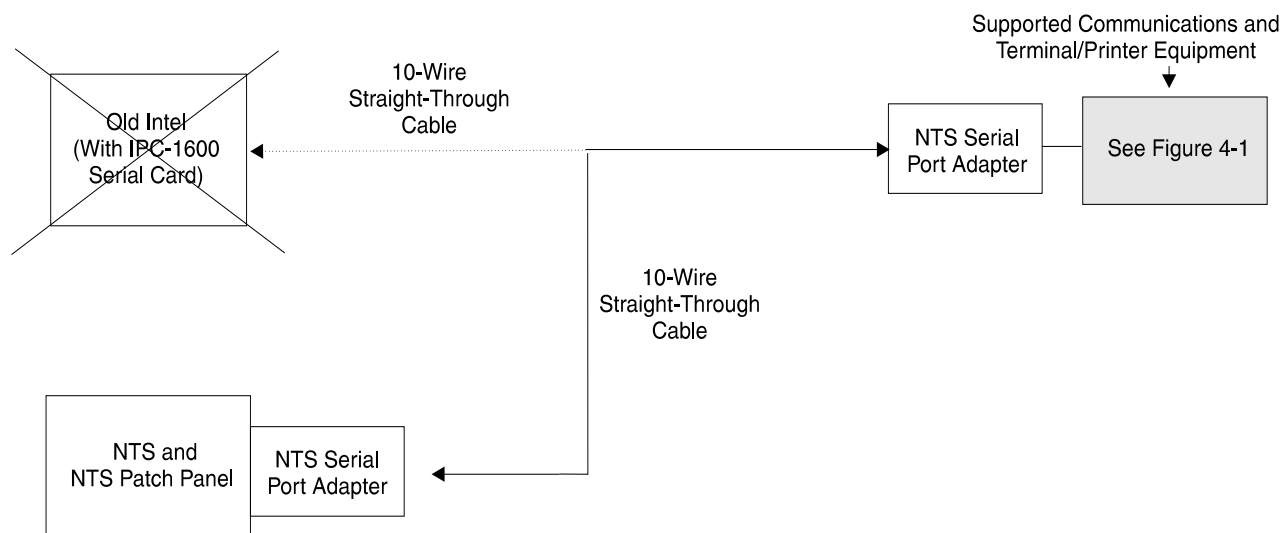


Figure 4-12: Upgrade Existing *INTEL* Cabling to a 64-Port NTS

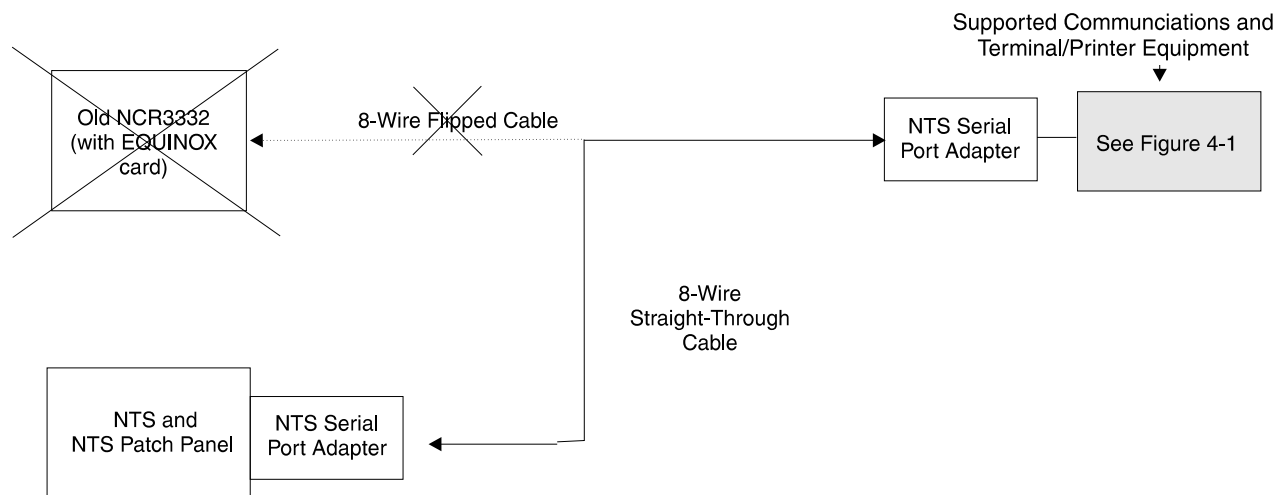


Figure 4-13: Upgrade Existing 3332 Cabling to a 64-Port NTS

See the "Using 8- or 10-Wire Cabling" sections in this chapter for more details.

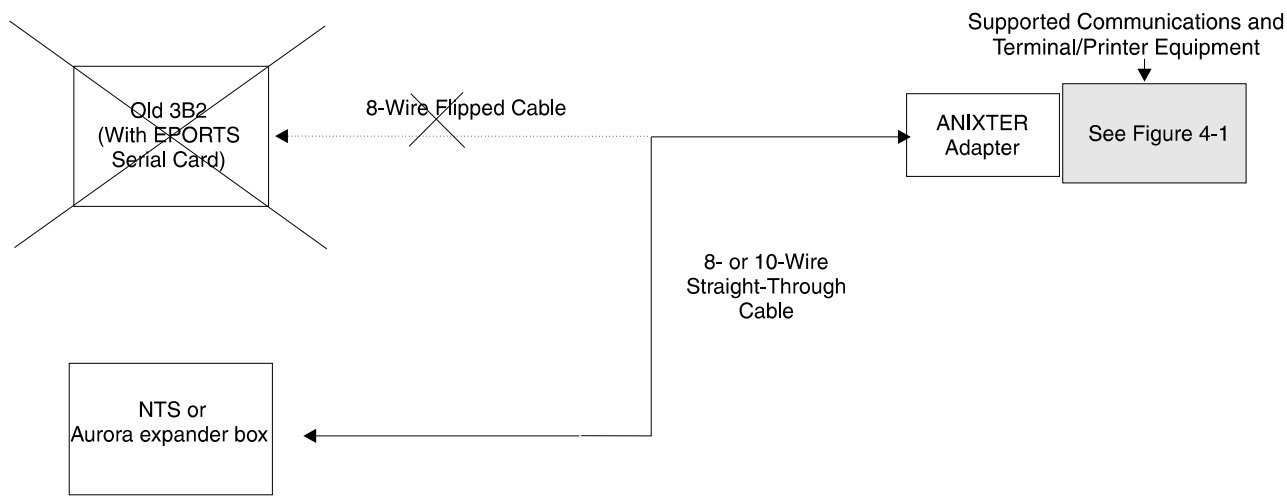


Figure 4-14: Upgrade Existing 3B2 Cabling to 8- and 16-Port NTSs or Aurora SBus *Multiport* Cards

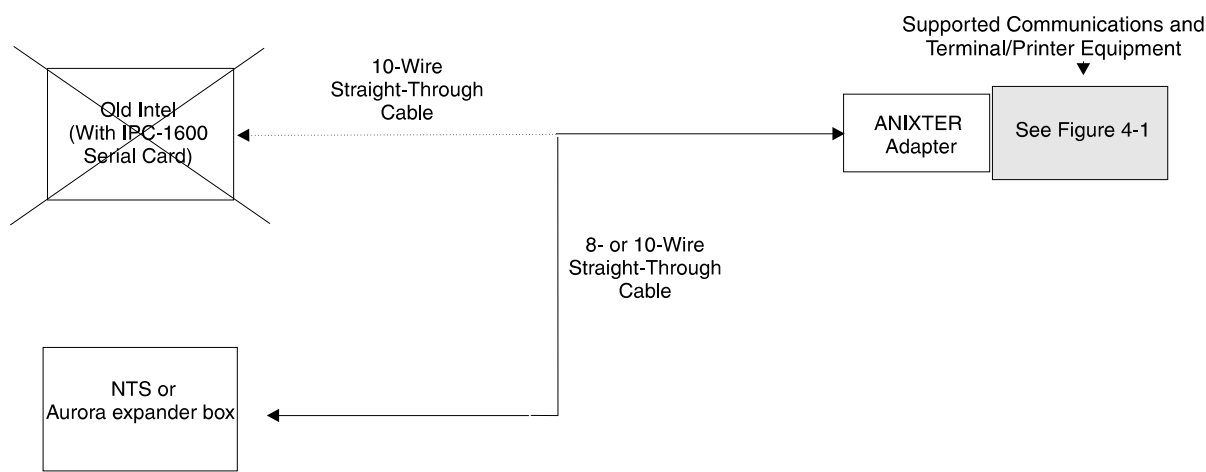


Figure 4-15: Upgrade Existing *INTEL* Cabling to 8- and 16-Port NTSs or Aurora SBus *Multiport* cards

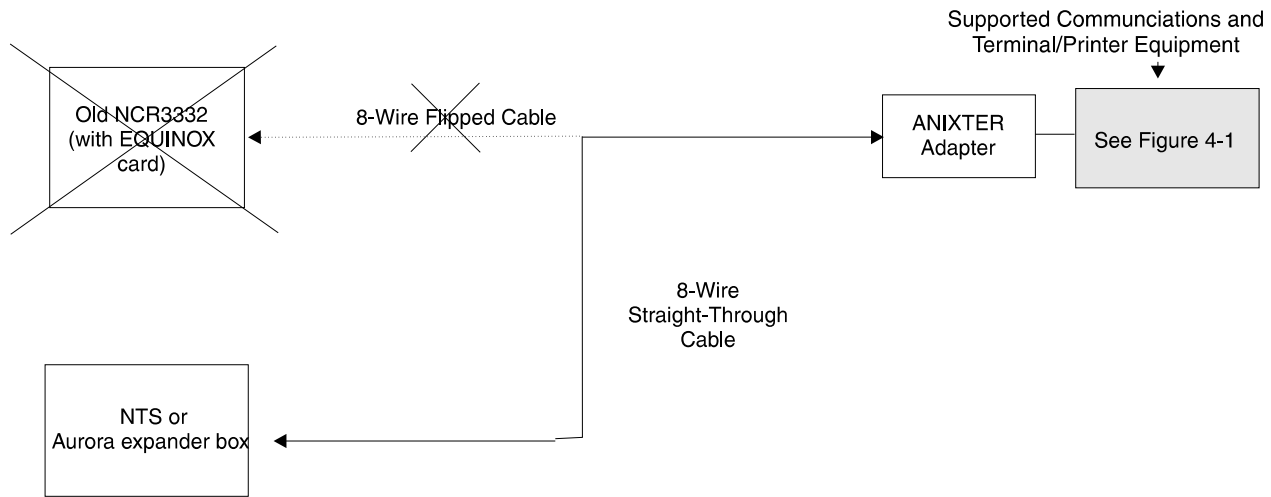


Figure 4-16: Upgrade Existing 3332 Cabling to 8- and 16-Port NTSs or Aurora SBus *Multiport* Cards

Administering Terminals

This section describes how to set port parameters for terminals connected to:

- an NTS patch panel
- an 8- and 16-port NTS
- an 8- and 16-port Aurora SBus *Multiport* cards.

Administering Terminals on NTS

After the terminals are connected, you must complete the na administration for the *Sun SPARCserver* computer to recognize the new terminal(s).

Note

For terminals that have different configurations and parameters, see the *Network Terminal Server Administration Guide* for details.

Procedure

To address and configure the NTS ports for terminals, complete the following steps:

1. Log in as *root*.
2. At the system prompt, enter the na command to access the NTS administration software.

```
# na
```

The system responds:

```
Annex network administrator R7.0 October 13, 1992
command:
```

3. To associate all subsequent administration with a specific network terminal server, enter `annex cmsterm1` at the command prompt.

```
command: annex cmsterm1
```


Note

When you enter `annex cmsterm1` (or `annex 129.200.9.11`), `cmsterm1` becomes the default NTS until another NTS is selected using the `annex` command. The default setting for the NTS ports is 9600 bps, 8 bits, no parity, and 1 stop bit.

You can specify one NTS or multiple NTSs. See Table 4-5 for the recommended NTS names and addresses found in the `/etc/hosts` file.

Table 4-5: Configuration Information

Device	IP Address	Terminal	File Name
<i>Sun SPARCserver</i> computer	129.200.9.1	host_computer	NA
NTS (#1)	129.200.9.11	cmsterm1	nts1info
NTS (#2)	129.200.9.12	cmsterm2	nts2info
NTS (#3)	129.200.9.13	cmsterm3	nts3info
NTS (#4)	129.200.9.14	cmsterm4	nts4info
NTS (#5)	129.200.9.15	cmsterm5	nts5info
NTS (#6)	129.200.9.16	cmsterm6	nts6info
NTS (#7)	129.200.9.17	cmsterm7	nts7info

The system responds:

```
cmsterm1: Annex-3-UXR7, 64 ports
```

```
command:
```

- For terminals, enter the `set port` command string (include all the parameters you want to change).

```
command: set port=x-y mode dedicated type hardwired
dedicated_address <SUNaddress> control_lines modem_control
location "<a location>" user_name "<a user>" speed <9600>
```

Note

- The `set port` command string sets the parameters for the serial line ports. The `x-y` values you enter are the port numbers on the NTS. You can specify a range of ports in the above command string, but the `location` and `user_name` attributes should be port-specific.
- Be sure to set `location` and `user - name`, and keep them populated, to facilitate troubleshooting.

For more details about using the `set port` command string, use Table 4-6. You do not have to set any parameters if the default parameters are correct.

Table 4-6: Terminal Configuration Guidelines

Port Generic Parameter	Default Parameter	Recommended Setting	Comments
<code>mode</code>	<code>cli</code>	<code>dedicated</code>	NA
<code>type</code>	<code>hard-wired</code>	<code>hard-wired</code>	NA
<code>dedicated_address</code>	<code>0.0.0.0</code>	Set to <code>129.200.9.1</code> (<i>Sun SPARCserver</i> computer address)	Set to your <i>Sun SPARCserver</i> computer internet address.
<code>control_lines</code>	<code>none</code>	<code>modem_control</code>	NA
<code>location</code>	<code>""</code>	<code>"a location"</code>	It is important to set this parameter so port problems can be traced.
<code>user_name</code>	<code>""</code>	<code>"a user"</code>	It is important to set this parameter so port problems can be traced.
<code>speed</code>	<code>9600</code>	Match the baud rate of your terminal (for example, <code>9600</code>).	Speed may be changed to your baud rate.
<code>data_bits</code>	<code>8</code>	<code>8</code>	Can be set to match the terminal settings.
<code>parity</code>	<code>none</code>	<code>none</code>	Can be set to match the terminal settings.
<code>stop_bits</code>	<code>1</code>	<code>1</code>	Can be set to match the terminal settings.



You can use the `show port` command to review your changes.

5. To initialize the port with the new options, use the following command to reset the terminal ports:

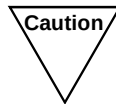
```
command: reset <port number>
```



The options will not take effect until the port is reset.

The system responds:

```
resetting serial port <port number> of <annex cmsterm1>
```



You can also use the `reset all@cmsterm1` command to terminate all active sessions on the NTS. Use the `reset all@cmsterm1` command only if no one is logged in.

6. To store the configuration information to a file (For example, `nts1info`), enter the following command:

```
command: write cmsterm1 /etc/local.admin/nts1info
```

The system responds:

```
cmsterm1: Annex-3-UX R7.0, 64 ports
        writing...
command:
```

You can store configuration information on multiple files to use as a backup in the event that your NTS loses translation. Use a corresponding file name for each NTS. See Table 4-5 on page 4-20 for examples.

Note

You can use these files (for example, */etc/local.admin/nts1info*) to readminister the NTS in case of failure, or these files can be used with the text editor to search for and diagnose port problems. For example, you can search by name to find the port location. See the “NTS Port Problems” section in Chapter 8, “Troubleshooting,” for details.

7. To quit, enter the following command:

```
command: quit
```

The system responds:

```
#
```

8. If this is the initial installation, reboot the *Sun SPARCserver* computer.

Note

You can wait to reboot your system after you complete all the terminal, printer, and modem administration, if desired.

Overview of *Sun* Port Administration Used for Aurora SBus *Multiport* Cards

Each Aurora SBus *Multiport* card needs to have a port monitor administered. To find out which port monitors are running, type `sacadm -l`. There will be one entry for each Aurora SBus *Multiport* card installed and administered.

Each port on an Aurora SBus *Multiport* card used by terminals or incoming modems needs to have a port administered. To see the administration for each port monitor, enter `pmadm -l`. There will be one entry for each port on that Aurora SBus *Multiport* card that is used for

logging in from a terminal or a modem. Ports used by printers or outgoing modems will not appear.

Figure 4-17 shows the process involved in port administration.

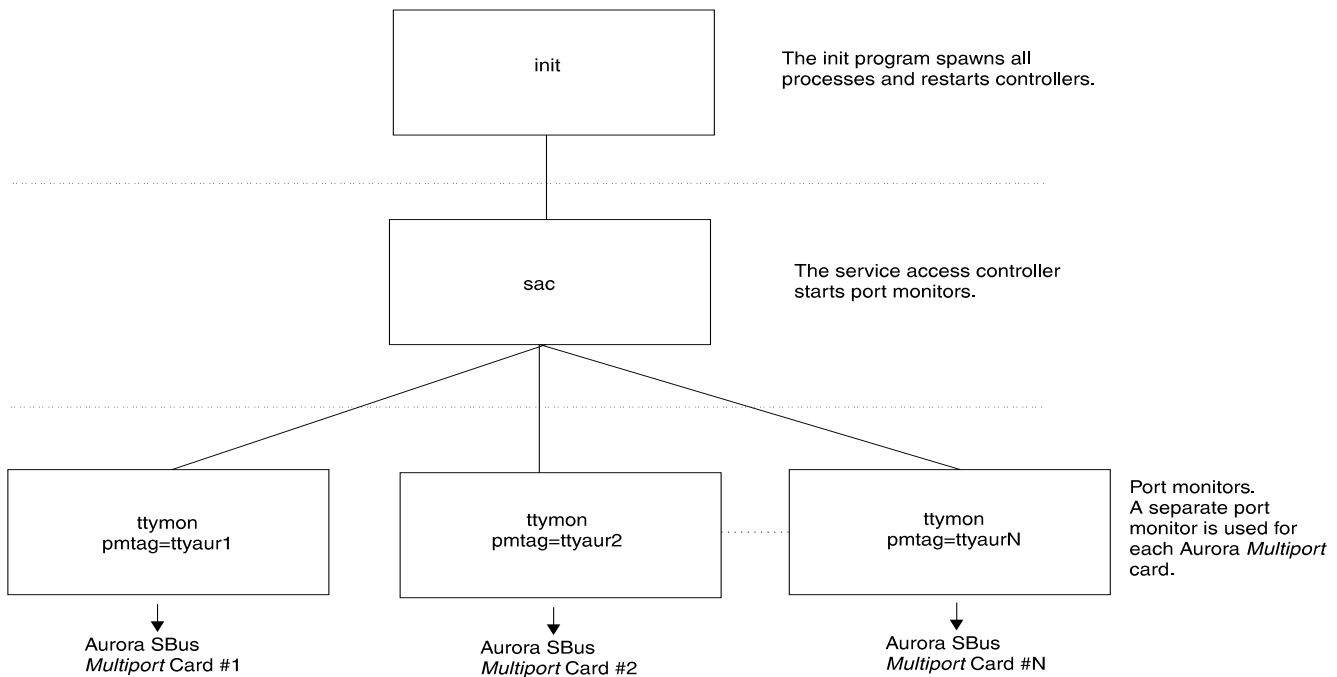


Figure 4-17: Port Administration

Administering Terminals on the Aurora SBus Multiport Cards

Setting up a terminal requires that you use either:

- the **sacadm** and **pmadm** commands, or
- the **admintool&** command.

Administering Terminals Using **sacadm** and **pmadm**

Setting up a terminal with **sacadm** and **pmadm** requires that you execute the **sacadm** command followed by the **pmadm** command. For each serial ports card, execute the following **sacadm** command (system response is in **bold**):

```
# sacadm -a -p ttyaaur<card number> -t ttymon -c /usr/lib/saf/ttymon -v 1 -y "aurports"
```

The <card number> represents the serial ports card number. Start at one for the first card, two for the second, and so on. Enter `sacadm -l` and verify that there is one entry for each Aurora SBus *Multiport* card on the system. If there are any entries that are not needed or if there is one administered incorrectly, it can be removed by entering

```
sacadm -r -p <pmtag>
```

For each terminal and incoming modem connected to the expander box (that is, connected to the serial ports card), execute the following command:

```
# pmadm -a -p ttyaur<card number> -s <port number> -i root
-f u -v 1 -m "'ttyadm -d /dev/term/<port number> -l n9600
-s /usr/bin/login -m ldterm -S n'"
```

If a port is administered incorrectly, the administration can be removed by entering `pmadm -r -p <pmtag> -s <svctag>`. The value for `pmtag` and `svctag` can be obtained from the `pmadm -l` command.

To remove the port administration for an entire ports card, enter:

```
# sacadm -r -p <pmtag>
```

For example, to administer two terminals connected to ports 2 and 7 on the first Aurora SBus *Multiport* card, you would enter the following:

```
# sacadm -a -p ttyaur1 -t ttymon -c /usr/lib/saf/ttymon -v 1
-y "aurports"
# pmadm -a -p ttyaur1 -s 2 -i root -f u -v 1 -m "'ttyadm
-d /dev/term/2 -l n9600 -s /usr/bin/login -m ldterm -S n'"
# pmadm -a -p ttyaur1 -s 7 -i root -f u -v 1 -m "'ttyadm
-d /dev/term/7 -l n9600 -s /usr/bin/login -m ldterm -S n'"
```

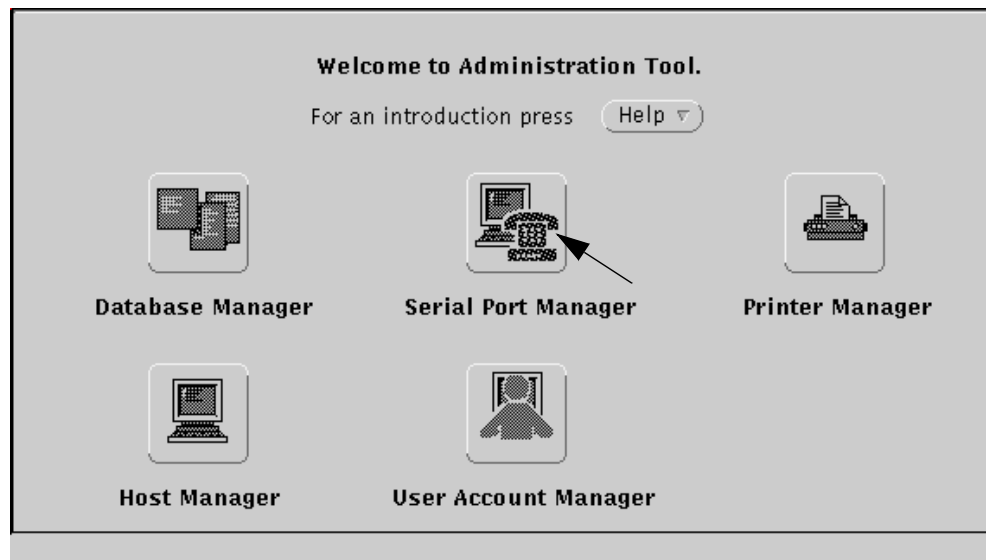
Administering Terminals Using the Administration Tool

To administer terminals on the Aurora SBus *Multiport* cards (8- and 16-ports) using the `admintool&` command, do the following:

1. Enter the following command:

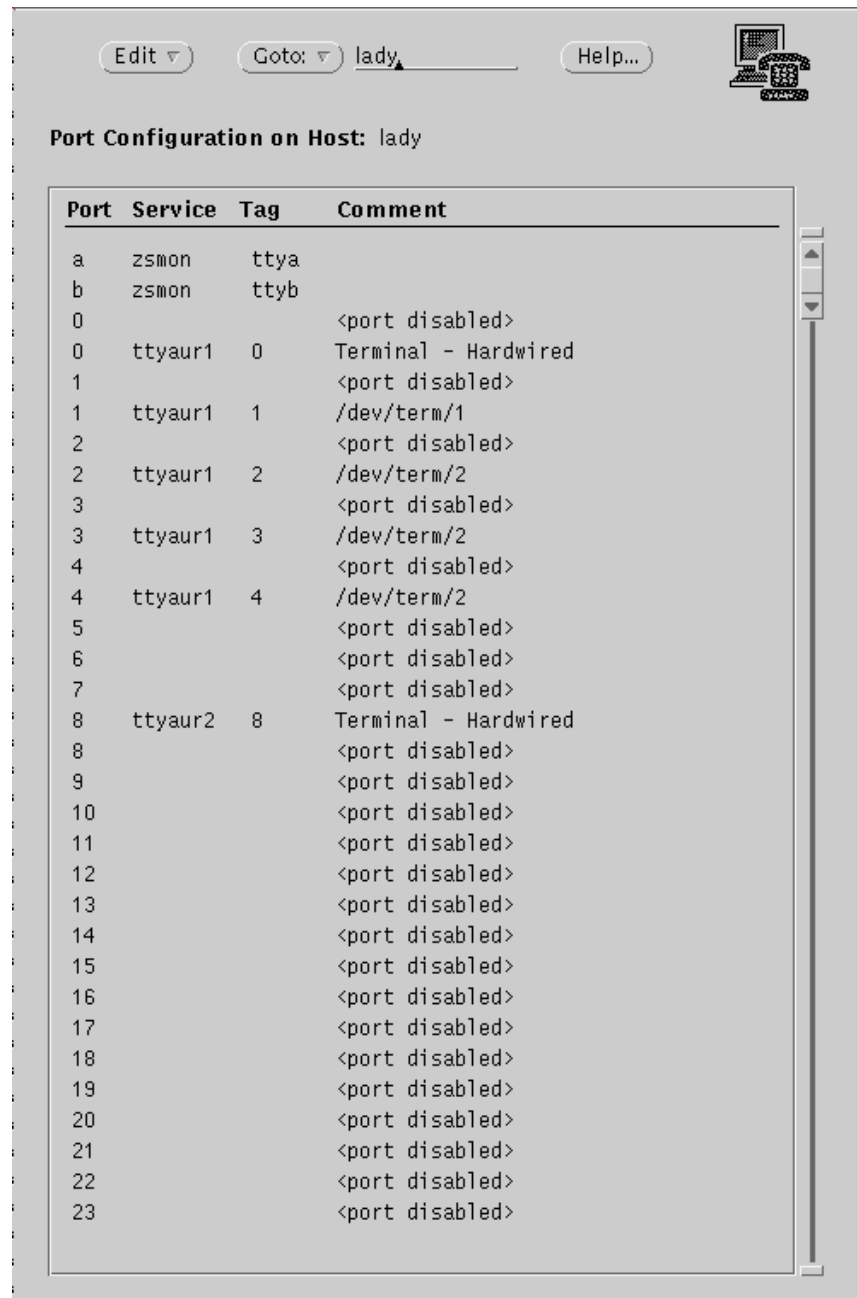
```
# admintool&
```

The Administration Tool window appears:

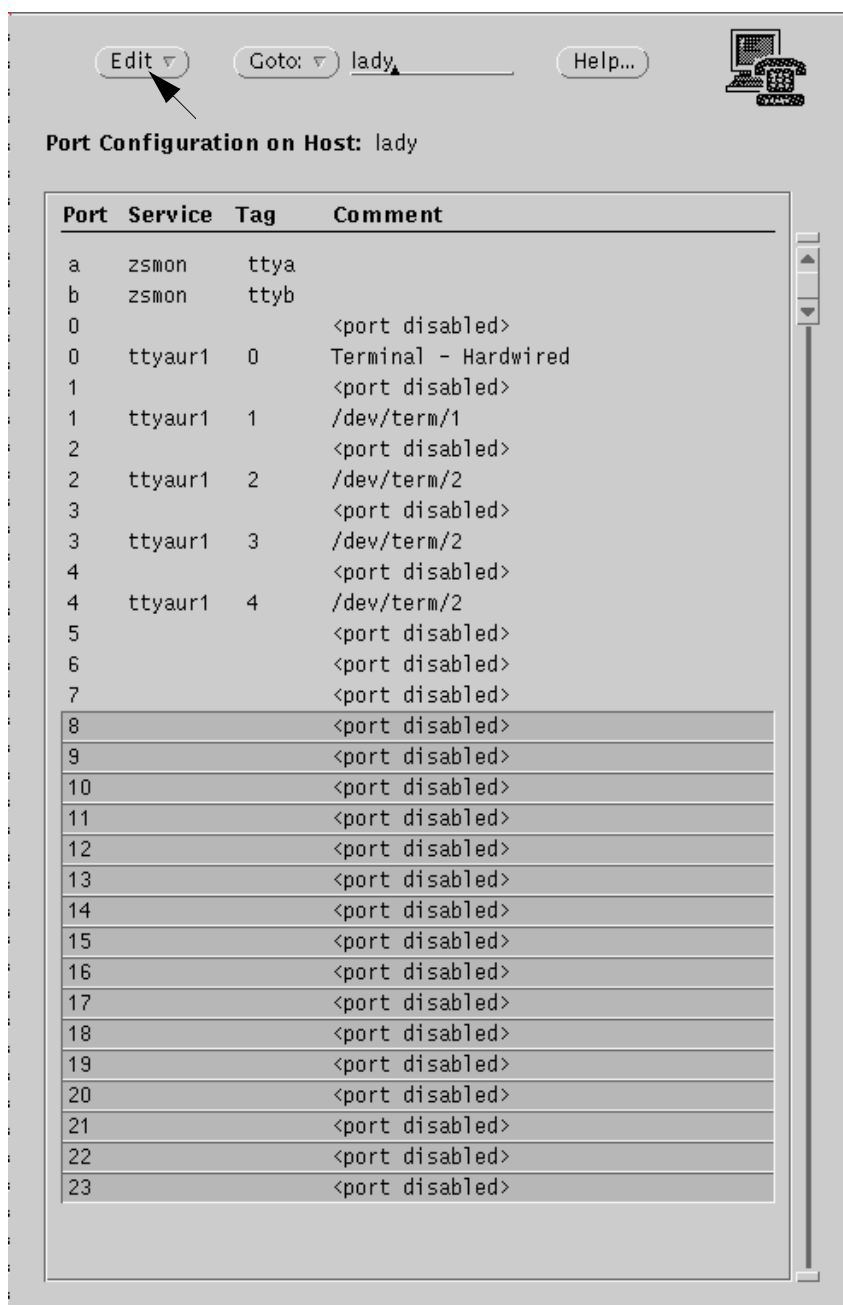


2. Click on the **Serial Port Manager** icon.

The following window appears. The information in the window will differ depending upon your configuration.



- Highlight the port(s) you want to administer. In the example below, all ports on the second Aurora card are selected.



- Click on the **Edit** button located on the top of the window.
- Click on **Modify Service**.

The Modify Service window appears:

The screenshot shows the 'Modify Service' window with the 'Basic' tab selected. At the top left is a 'Use Template' button with a dropdown arrow. To the right, under 'Detail:', are three tabs: 'Basic', 'More', and 'Expert'. An arrow points to the 'Expert' tab. Below the tabs, the 'Port' is set to 'multiple'. The 'Service' has two buttons: 'Disabled' and 'Enabled'. The 'Baud Rate' is a dropdown menu showing '9600'. The 'Terminal type' is an empty text field. At the bottom are three buttons: 'Apply', 'Reset', and 'Dismiss'. The hostname 'lady' is displayed at the bottom right.

6. Click on the **Expert** button.

The following window appears:

The screenshot shows the 'Modify Service' window with the 'Expert' tab selected. The 'Port' is 'multiple' and 'Service' has 'Disabled' and 'Enabled' buttons, with an arrow pointing to 'Enabled'. The 'Baud Rate' dropdown shows '9600' with an arrow pointing to it. The 'Terminal type' is an empty text field. Below these are 'Options' with three checkboxes: 'Initialize Only', 'Bidirectional', and 'Software Carrier'. To the right are 'Login Prompt' (set to 'login'), 'Comment' (set to '/dev/term/3'), 'Service Tag' (set to 'multiple'), and 'Port Monitor Tag' (set to 'ttyp-0n0'). The 'Expert Options' section has two checkboxes: 'Create utmp entry' (checked) and 'Connection Carrier'. To the right are 'Service' (set to '/usr/bin/login'), 'Streams Modules' (empty), and 'Timeout (secs)' (set to 'Never'). At the bottom are 'Apply', 'Reset', and 'Dismiss' buttons. The hostname 'lady' is at the bottom right.

7. Click on the **Enabled** button.

8. Click on the down arrow to the right of **Baud Rate:** and click on **other**.

The Baud Rate window appears:

The Baud Rate window is a small dialog box with a light gray background. It contains a text field labeled "/etc/ttydefs Entry:" with the value "n9600" entered. Below the text field are two buttons: "Apply" and "Dismiss".

9. Type `n<baud rate>` in the `/etc/ttydefs Entry:` text line.
10. Click on the **Apply** button.
The Baud Rate window disappears.
11. Click on the down arrow to the right of **Port Monitor Tag:**, and type `ttyaur2`. ("2" represents SBus card number 2.)
12. In the **Streams Modules:** text line, type `ldterm`.
13. In the **Comments:** text line, type `aurora # 2 ports 8-23`.
14. In the **Expert Options:** area, click on both options (Create utmp entry and Connection on Carrier).

When you have completed Steps 7-14, the window will look like the following:

The Terminal configuration window is a larger dialog box with a light gray background. It has a "Use Template" button with a dropdown arrow in the top left. In the top right, there are three tabs: "Detail", "Basic", and "Expert", with "Detail" currently selected. The window is divided into several sections:

- Port:** multiple
- Service:** Disabled (selected) and Enabled
- Baud Rate:** n9600 (selected from a dropdown)
- Terminal type:** (empty text field)
- Options:**
 - ☐ Initialize Only
 - ☐ Bidirectional
 - ☐ Software Carrier
- Login Prompt:** login:
- Comment:** aurora #2 ports 8-23
- Service Tag:** multiple
- Port Monitor Tag:** ttyaur2 (selected from a dropdown)
- Expert Options:**
 - ☒ Create utmp entry
 - ☐ Connect on Carrier
- Service:** /usr/bin/login
- Streams Modules:** ldterm
- Timeout (secs):** Never (selected from a dropdown)

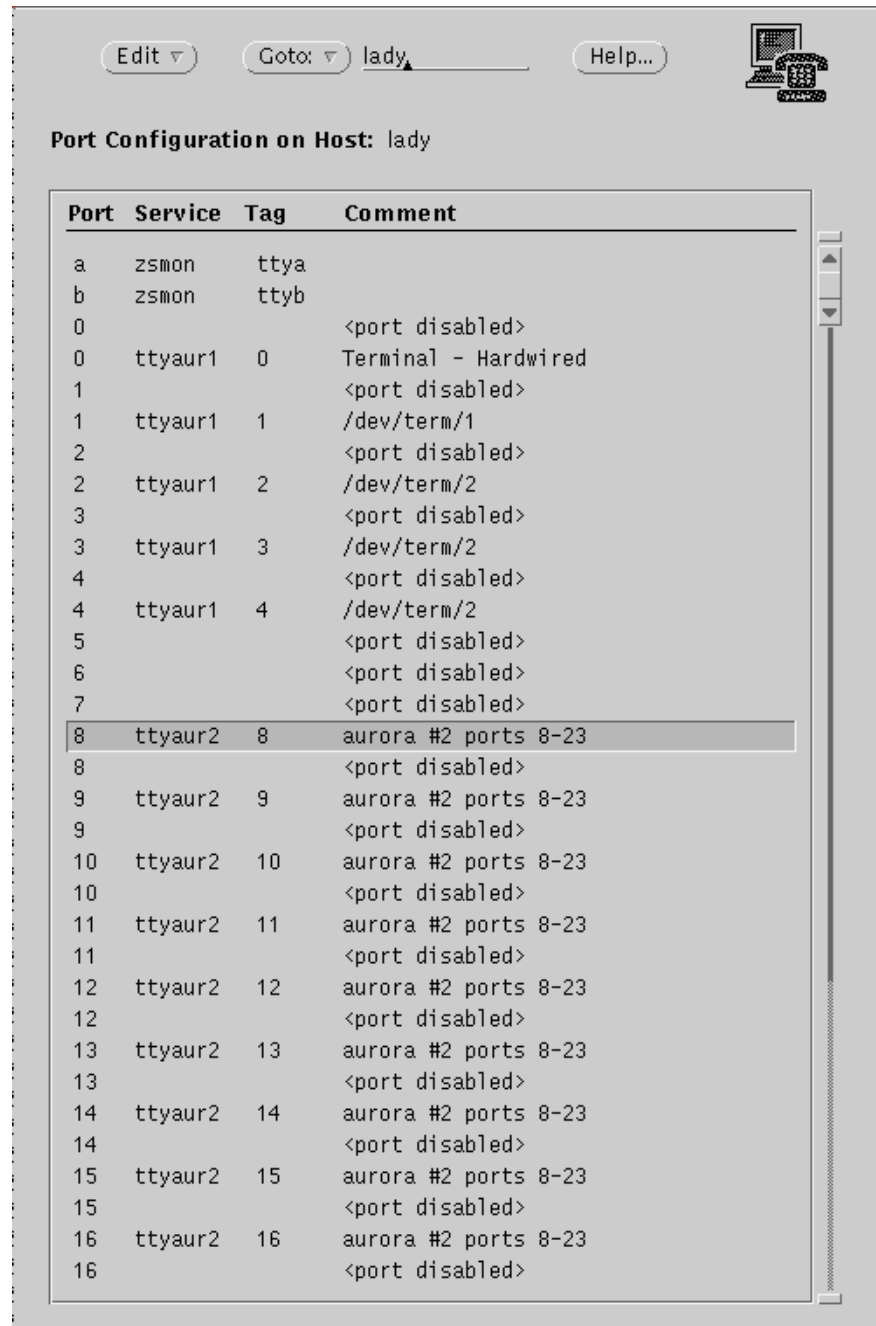
 At the bottom, there are three buttons: "Apply", "Reset", and "Dismiss". In the bottom right corner, it says "Hostname: lady".

15. Click on the **Apply** button.

The status line at the bottom of the window displays what port the system is administering.

16. Click on **Dismiss**.

The system brings you back to the Serial Port Manager window with the changes you made.

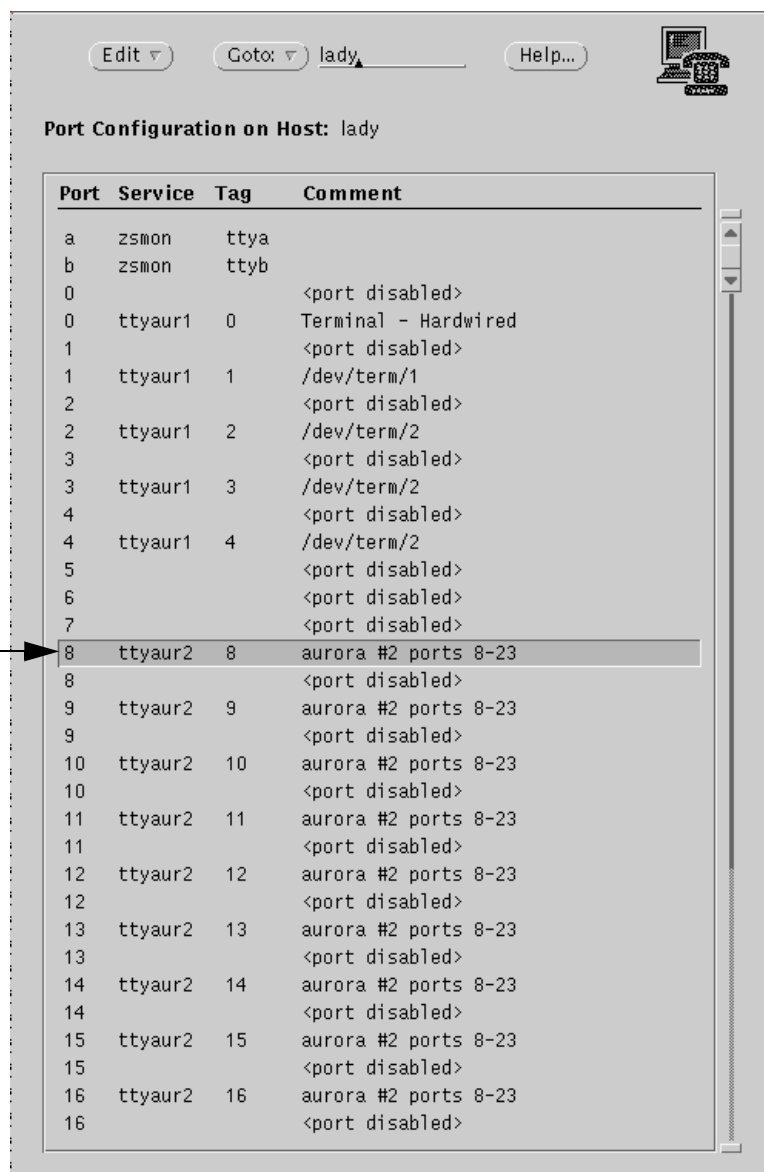


The ports you selected in the beginning of this procedure are now administered for terminals. Follow these procedures for each Aurora SBus *Multiport* card needing administration.

Note

If you want to readminister ports that you just administered, use the same procedures (Steps 1-16) with one exception. In Step 3, highlight only the **administered ports** that you want to readminister. For example, see the figure below.

Only select
administered ports -
not disabled ports.



Terminal Options

After you connect the terminal to the computer, you need to set the options for the terminal. This section contains the following samples of option settings for some of the *CentreVu* CMS supported terminals:

- 715 BCS (Business Communications Terminal)
- 705 MT (Multi-Tasking Terminal)
- 615 CMT (Color Multi-Tasking Terminal)
- 605 BCT (Business Communications Terminal)
- 620 MTG (Multi-Tasking Graphics Terminal)
- 2900/AWTC (Color Multi-Tasking Terminal)
- 4000/AWTC (Color Multi-Tasking Terminal)
- 2900/260lf (Small Footprint Terminal).

Note

Although the 605 BCT, 615 CMT, 615 MT, 620 MTG, 2900/AWTC, and 4000/AWTC terminals are *CentreVu* CMS approved, they have been discontinued.

715 BCS (Business Communications Terminal)

The 715 BCS Terminal replaces or emulates the 705 MT Terminal. To properly set up the terminal, you may need to change some of the options on the Terminal Setup screen. Also, port 2 is used as the main port. Therefore, connect the communications cable to port 2 and when logging into *CentreVu* CMS, identify the terminal type as a 705.

The default options are correct with the exception of the “Emulation Mode” option. This should be set to “705” so that it will emulate the 705 MT terminal. Refer to the *715 Business Communications Terminal User’s Guide* (999-300-733) for instructions on how to change the options.

After making the change, you should set the 715 BCS options to the values shown below.

User Preferences Window

Figure 4-18 shows the recommended user preference option.

USER PREFERENCES		
Language		English
Lines		24
Columns		80
Reverse Video		no
Screen Saver		30 min.
Scrolling		jump
Scroll Speed		medium
Labels		on
Key Click		off
Warning Bell		on
Font Size		normal

Figure 4-18: User Preferences Options for a 715 BCS

Communications Options Window

Figure 4-19 shows the recommended communications options.

COMMUNICATIONS OPTIONS		
MAIN		AUX
port 1	Port Mapping	port 2
host	Port Service	printer
9600	Speed	9600
1 bit	Stop Bits	1 bit
8 bits	Data Bits	8 bits
none	Send Parity	space
no	Check Parity	no
off	Local Echo	-
off	Encoding	-
XON/XOFF	Generate Flow	XON/XOFF
XON/XOFF	Receive Flow	XON/XOFF
240	XOFF at	240
no	Transmit Limit	-
no	Answerback on Connect	-
Main	Clear Communication Port	Aux

Figure 4-19: Communications Options for a 715 BCS

General Options Window

Figure 4-20 shows the recommended general options.

GENERAL OPTIONS		
PRIMARY/WINDOW 1		WINDOW 2
715	Emulation	705
715	Terminal ID	705
no	Newline on LF	no
8 bits	Transmit Controls	8 bits
normal	Backspace Mode	normal
unlocked	User Features	locked
no	Conceal Answerback	no
(blank)	Answerback	(blank)

Figure 4-20: General Options for a 715 BCS

Display Options Window

Figure 4-21 shows the recommended display options.

DISPLAY OPTIONS		
PRIMARY/WINDOW 1		WINDOW 2
off	Monitor Mode	off
block	Cursor Type	block
off	Cursor Blink	off
yes	Display Cursor	yes
bottom	Status Line Position	bottom
host	Status Line Type	host
multnatl	Character Mode	multnatl
ISO Latn	International Font	ISO Latn
on	Autowrap	on

Figure 4-21: Display Options for a 715 BCS

Keyboard Options Window

Figure 4-22 shows the recommended keyboard options.

KEYBOARD OPTIONS		
PRIMARY/WINDOW 1		WINDOW 2
Caps Lck	Caps/Shift Lock Key	Caps Lck
CR	<--	CR
<--	Enter Key	<--
yes	Autorepeat	yes
yes	Margin Bell	yes
enabled	Compose Key	enabled
enabled	Break Key	enabled
US	Keyboard Language	US
numeric	Numeric Pad	numeric
normal	Cursor Keys	normal
no	Swap Delete	no
none	Control Key Swapping	none
-	Legends	-
-	User Defined Keys	-
BS	Backspace Keys	BS

Figure 4-22: Keyboard Options for a 715 BCS

Printer Options Window

Figure 4-23 shows the recommended printer options.

PRINTER OPTIONS		
PRIMARY/WINDOW 1		WINDOW 2
page	Select Print Region	page
normal	Print Mode	normal
none	Printer Terminator	none
National	Printer Font Restriction	National
no	Printer Alarm	no
yes	Printer to Host	yes

Figure 4-23: Printer Options for a 715 BCS

705 MT (Multi-Tasking Terminal)

The 705 MT Terminal replaces or emulates the 605 BCT Terminal. To properly set up the terminal, you may need to change some of the options on the Terminal Setup screen.

The default options are correct with the exception of the "Port Mapping" option. This should be set so that it will read port 2 for Main and port 1 for AUX. Refer to the *705 Multi-Tasking Terminal User's Guide* (999-300-733) for instructions on how to change the options.

After making the change, you should set the 705 MT options to the values shown below.

User Preferences Window

Figure 4-24 shows the recommended user preference options.

USER PREFERENCES	
Language	English
Lines	24
Columns	80
Reverse Video	no
Screen Saver	30 min.
Scrolling	jump
Scroll Speed	medium
Labels	on
Key Click	off
Warning Bell	on
Font Size	normal

Figure 4-24: User Preferences Options for a 705 MT

Communications Options Window

Figure 4-25 shows the recommended communications options.

COMMUNICATIONS OPTIONS		
MAIN		AUX
port 1	Port Mapping	port 2
host	Port Service	printer
9600	Speed	9600
1 bit	Stop Bits	1 bit
8 bits	Data Bits	8 bits
none	Send Parity	space
no	Check Parity	no
off	Local Echo	-
off	Encoding	-
XON/XOFF	Generate Flow	XON/XOFF
XON/XOFF	Receive Flow	XON/XOFF
240	XOFF at	240
no	Transmit Limit	-
no	Answerback on Connect	-
Main	Clear Communication Port	Aux

Figure 4-25: Communications Options for a 705 MT

General Options Window

Figure 4-26 shows the recommended general options.

GENERAL OPTIONS		
PRIMARY/WINDOW 1		WINDOW 2
705	Emulation	705
705	Terminal ID	705
no	Newline on LF	no
8 bits	Transmit Controls	8 bits
normal	Backspace Mode	normal
unlocked	User Features	locked
no	Conceal Answerback	no
(blank)	Answerback	(blank)

Figure 4-26: General Options for a 705 MT

Display Options Window

Figure 4-27 shows the recommended display options.

DISPLAY OPTIONS			
PRIMARY/WINDOW 1		WINDOW 2	
off	Monitor Mode	off	
block	Cursor Type	block	
off	Cursor Blank	off	
yes	Display Cursor	yes	
bottom	Status Line Position	bottom	
host	Status Line Type	host	
multnatl	Character Mode	multnatl	
ISO Latn	International Font	ISO Latn	
on	Autowrap	on	

Figure 4-27: Display Options for a 705 MT

Keyboard Options Window

Figure 4-28 shows the recommended keyboard options.

KEYBOARD OPTIONS			
PRIMARY/WINDOW 1		WINDOW 2	
Caps Lck	Caps/Shift Lock Key	caps Lck	
CR	<--	CR	
<--	Enter Key	<--	
yes	Autorepeat	yes	
yes	Margin Bell	yes	
enabled	Compose Key	enabled	
enabled	Break Key	enabled	
US	Keyboard Language	US	
numeric	Numeric Pad	numeric	
normal	Cursor Keys	normal	
no	Swap Delete	no	
none	Control Key Swapping	none	
-	Legends	-	
-	User Defined Keys	-	
BS	Backspace Keys	BS	

Figure 4-28: Keyboard Options for a 705 MT

Printer Options Window

Figure 4-29 shows the recommended printer options.

PRINTER OPTIONS

PRIMARY/WINDOW 1		WINDOW 2
page	Select Print Region	page
normal	Print Mode	normal
none	Printer Terminator	none
National	Printer Font Restriction	National
no	Printer Alarm	no
yes	Printer to Host	yes

Figure 4-29: Printer Options for a 705 MT

615 CMT (Color Multi-Tasking Terminal)

Figure 4-30 shows the recommended 615 CMT Terminal options.

OPTIONS SETUP

COMMUNICATIONS		USER PREFERENCES	
Speed	_9600_	Columns	_80_
Send Parity	_none_	Reverse Video	_no_
Check Parity	_no_	Volume	_4_
Local Echo	_off_	Key Click	_off_
Encoding	_off_	Scrolling	_jump_
Flow Control	DC1/DC3	Scroll Speed	medium
Generate Flow	_on_	Alternate Keypad	_off_
Receive Flow	_off_	Swap Delete/Del	_no_
Pass Flow	_yes_		
Monitor Mode	_off_	Cursor Type	_block_
Autowrap	_on_	Cursor Blink	_no_
Newline on LF	_no_	Labels	_off_
Return Key	_CR_	Foreground	
Enter Key		Background	

CHANGE OPTION

DEFAULT VALUES

SAVED VALUES

SAVE

NEXT SETUP

CLEAR TO END

Figure 4-30: Terminal Options for a 615 CMT

If any of the 615 CMT options are incorrect, refer to the *615 Color Multi-Tasking Terminal User's Guide* (999-300-570) for instructions on how to change the options.

Note

When you are prompted to enter the terminal type, you need to enter 615c to get the colors to appear. The "c" part of the terminal type enables the colors to be seen.

615 MT (Multi-Tasking Terminal)

Figure 4-31 shows the recommended 615 MT Terminal options.

OPTIONS SETUP			
COMMUNICATIONS		USER PREFERENCES	
I/O Card	idle	Cartridge	idle
Speed	9600	Columns	_80_
Send Parity	spac	Reverse Video	_no_
Check Parity	_no_	Volume	_1_
Local Echo	_off_	Key Click	_off_
Encoding	_off_	Scrolling	_jump_
Generate Flow	_off_	Scroll Speed	_med_
Receive Flow	_off_		
Pass Flow	_off_		
Monitor Mode	_off_	Cursor Type	_blck_
Autowrap	_on_	Cursor Blink	_no_
Newline on LF	_no_	Labels	_off_
Return Key	_CR_		
Enter Key	<- -		

DONE 615MT 1.1

Figure 4-31: Terminal Options for a 615 MT

If any of the 615 MT options are incorrect, refer to the *615 Multi-Tasking Terminal User's Guide* (999-300-302 IS) for instructions on how to change the options.

605 BCT
(Business
Communications
Terminal)

Figure 4-32 shows the recommended 605 BCT Terminal options.

OPTIONS SETUP

Communications

User Preferences

Speed	9600	Columns	__80__
Send Parity	spac	Reverse Video	__no__
Check Parity	__no__	Bell	__on__
Local Echo	__off__	Key Click	__off__
Monitor Mode	__off__	Scrolling	__jump__
Auto Wrap	__on__	Scroll Speed	__med__
Newline on LF	__no__	Cursor Type	__blk__
Return Key	__CR__	Cursor Blink	__no__
Enter Key	<--	Labels	__on__
Terminal Mode	norm	Swap Delete/Del	__no__

DONE605 BMT - 1.0

CHANGE
OPTION

DEFAULT
VALUES

SAVED
VALUES

SAVE

NEXT
SETUP

CLEAR
TO END

Figure 4-32: Terminal Options for a 605 BCT

If any of the 605 BCT options are incorrect, refer to the *605 Business Communications Terminal User's Guide* (999-300-299 IS) for instructions on how to change the options.

620 MTG (Multi-Tasking Graphics Terminal)

Figure 4-33 shows the recommended 620 MTG Terminal options.

OPTIONS SETUP			
Communications		User Preferences	
Speed	9600	Reverse Video	<u>no</u>
Send Parity	spac	Volume	<u>jump</u>
Check Parity	<u>no</u>	Key Click	<u>no</u>
Local Echo	<u>off</u>		
Generate Flow	<u>off</u>	Mouse Movement	<u>1:1</u>
Receive Flow	<u>on</u>	Mouse Button 3	<u>right</u>
Pass Flow	<u>off</u>		
		Printer Type	5320
		Printer Alarm	<u>no</u>
		Printer Speed	1200
		Printer Parity	none
Monitor Mode	<u>no</u>	Cursor Type	blck
Auto Wrap	<u>on</u>	Cursor Blink	<u>no</u>
Newline on LF	<u>no</u>	Labels	<u>on</u>
Return Key	<u>CR</u>		
Enter Key	<u><--</u>		
DONE		620/Basic - 1.1	
		CHANGE
OPTION	DEFAULT
VALUES
		SAVED
VALUES	SAVE
		NEXT
SETUP	CLEAR
TO END

Figure 4-33: Terminal Options for a 620 MTG

If any of the 620 MTG options are incorrect, refer to the *620 Multi-Tasking Graphics Terminal User's Guide* (999-300-211 IS) for instructions on how to change the options.

2900/AWTC
Display Terminal

The AWTC terminals may be labeled either NCR 2900 or ADDS 4000. For both you need to enter 615c for the terminal type in the **term info file**. To properly set up the terminal, you may need to change some of the options on the Setup menu.

User Preferences
Window

Figure 4-34 shows the recommended user preference options.

USER PREFERENCES

Screen Lines	27
Screen Columns	80
Reverse Video	no
Relative Reverse Video	yes
Screen Saver	30 min
Scrolling	jump
Scroll Speed	
Labels	on
Key Click	off
Warning Bell	on
Font Size	large
Keyboard language	US
Mouse Hand	right
Parallel Port	printer
Enhanced Function Keys	off
Status Line Position	bottom
Control Graphics	ASCII
Background Pattern	default

SETUP
MENU

PREVIOUS
SCREEN

NEXT
SCREEN

CHANGE
OPTION

Figure 4-34: User Preference Options for a 2900/AWTC

Communications Options Windows

There are two communications options submenus - one for each port.

SES 1 Communications Options

The default options are correct with the exception of the Data Bits option. This should be set so that it will read 8 bits.

Figure 4-35 shows the recommended SES 1 communications options.

SES 1 COMMUNICATIONS OPTIONS
(EIA port)

Power-up Port	SES 1
Port Service	host
Speed	9600
Stop Bits	1 bit
Data Bits	8 bits
Send Parity	space
Check Parity	no
Local Echo	off
Generate Flow	XON/XOFF
Receive Flow	XON/XOFF
XOFF at	240
Transmit Limit	500 cps
Answerback on Connect	no
Line Break	280 ms
Clear Communications	SES 1

SETUP
MENU

PREVIOUS
SCREEN

NEXT
SCREEN

CHANGE
OPTION

Figure 4-35: SES 1 Communications Options for a 2900/AWTC

SES 2
Communications
Options

The default options are correct with the exception of the Speed option (should read 9600) and the Data Bits option (should read 8 bits).

Figure 4-36 shows the recommended SES 2 communications options.

SES 2 COMMUNICATIONS OPTIONS
(AUX port)

Power-up Port	SES 1
Port Service	mouse
Speed	9600
Stop Bits	1 bit
Data Bits	8 bits
Send Parity	none
Check Parity	no
Local Echo	
Generate Flow	
Receive Flow	
XOFF at	
Transmit Limit	
Answerback on Connect	
Line Break	
Clear Communications	SES 2

SETUP
MENU

PREVIOUS
SCREEN

NEXT
SCREEN

CHANGE
OPTION

Figure 4-36: SES 2 Communications Options for a 2900/AWTC

General Options Window

Figure 4-37 shows the recommended general options.

GENERAL OPTIONS

WINDOW TITLE (VT #)

Emulation	705
Terminal ID	track
Newline on LF	no
Newline on CR	no
Transmit Controls	8 bits
Backspace Mode	normal
User Features	unlocked
Conceal Answerback	no
Answerback	

SETUP
MENU

PREVIOUS
SCREEN

NEXT
SCREEN

CHANGE
OPTION

CLEAR
TO END

Figure 4-37: General Options for a 2900/AWTC

Display Options Window

Figure 4-38 shows the recommended display options.

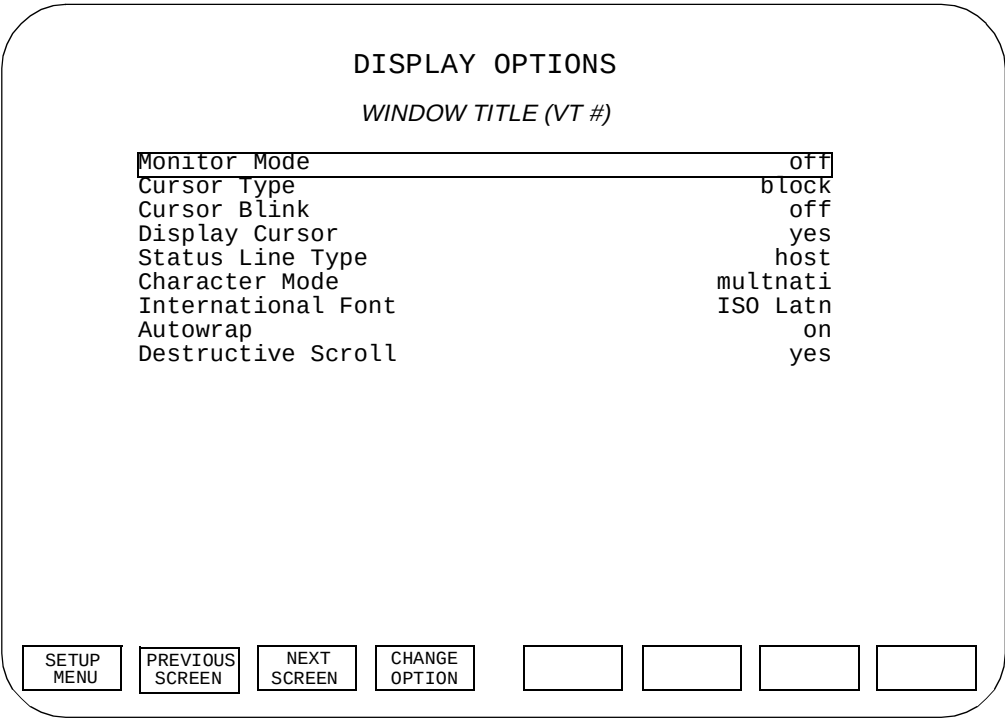


Figure 4-38: Display Options for a 2900/AWTC

Keyboard Options Window

Figure 4-39 shows the recommended keyboard options.

KEYBOARD OPTIONS

WINDOW TITLE (VT #)

Caps/Shift Lock Key	caps lck
<--	CR
Enter Key	<--
Autorepeat	yes
Margin Bell	no
Compose Key	enabled
Break Key	enabled
Numeric Pad	numeric
Cursor Keys	normal
Swap Delete	no
Control Key Swapping	none
Legends	
User Defined Keys	
Backspace key	BS
ESC Key	ESC

SETUP
MENU

PREVIOUS
SCREEN

NEXT
SCREEN

CHANGE
OPTION

CLEAR
TO END

Figure 4-39: Keyboard Options for a 2900/AWTC

Printer Options Window

Figure 4-40 shows the recommended printer options.

PRINTER OPTIONS

WINDOW TITLE (VT #)

Select Print Region	page
Print mode	normal
Print Terminator	none
Printer Type/Driver	Propmtr
Printer Alarm	no
Printer To host	no

SETUP
MENU

PREVIOUS
SCREEN

NEXT
SCREEN

CHANGE
OPTION

Figure 4-40: Printer Options for a 2900/AWTC

If any of the 2900/AWTC terminal options are incorrect, refer to the *2900/AWT Color Guide to Operations* for instructions on how to change the terminal options.

4000/AWTC Display Terminal

To properly set up the terminal, you may need to change some of the options on the Setup menu.

User Preferences Window

Figure 4-41 shows the recommended user preference options.

USER PREFERENCES	
Screen Lines	27
Screen Columns	80
Reverse Video	no
Relative Reverse Video	yes
Screen Saver	30 min
Scrolling	jump
Scroll Speed	
Labels	on
Key Click	off
Warning Bell	on
Font Size	large
Keyboard language	US
Mouse Hand	right
Parallel Port	printer
Enhanced Function Keys	off
Status Line Position	bottom
Control Graphics	ASCII
Background Pattern	default

SETUP MENU PREVIOUS SCREEN NEXT SCREEN CHANGE OPTION

Figure 4-41: User Preference Options for a 4000/AWTC

Communications
Options Windows

There are two communications options submenus, one for each port.

SES 1
Communications
Options

The default options are correct with the exception of the Data Bits option. This should be set so that it will read 8 bits.

Figure 4-42 shows the recommended SES 1 communications options.

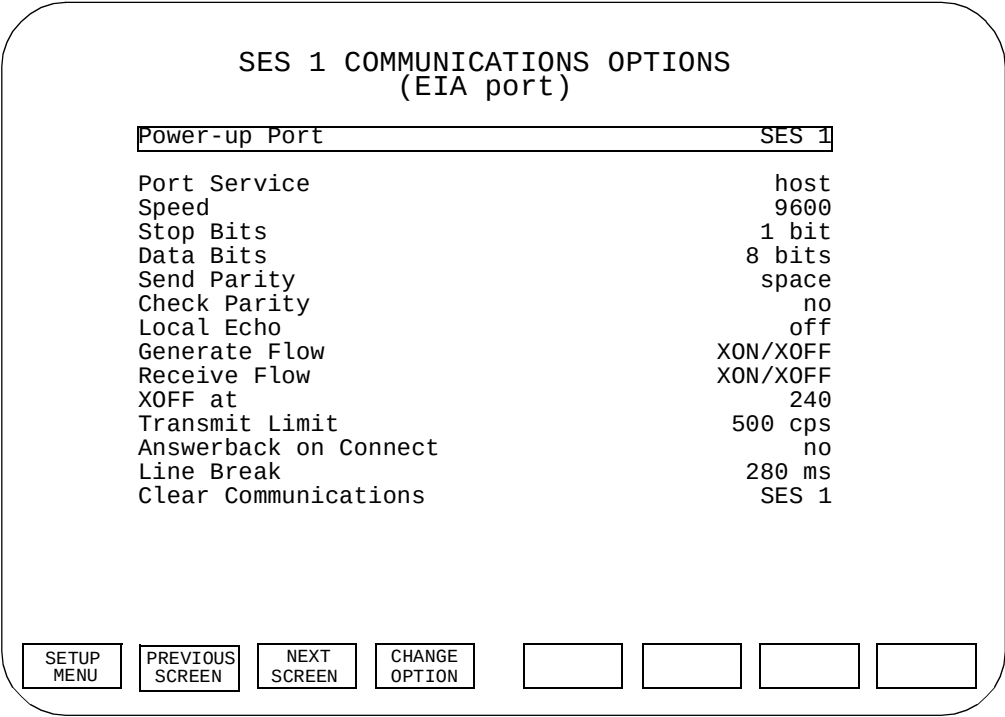


Figure 4-42: SES 1 Communications Options for a 4000/AWTC

SES 2 Communications Options

The default options are correct with the exception of the Speed option (should read 9600) and the Data Bits option (should read 8 bits).

Figure 4-43 shows the recommended SES 2 communications options.

**SES 2 COMMUNICATIONS OPTIONS
(AUX port)**

Power-up Port	SES 1
Port Service	mouse
Speed	9600
Stop Bits	1 bit
Data Bits	8 bits
Send Parity	none
Check Parity	no
Local Echo	
Generate Flow	
Receive Flow	
XOFF at	
Transmit Limit	
Answerback on Connect	
Line Break	
Clear Communications	SES 2

SETUP
MENU

PREVIOUS
SCREEN

NEXT
SCREEN

CHANGE
OPTION

Figure 4-43: SES 2 Communications Options for a 4000/AWTC

General Options Window

Figure 4-44 shows the recommended general options.

GENERAL OPTIONS

WINDOW TITLE (VT #)

Emulation	705
Terminal ID	track
Newline on LF	no
Newline on CR	no
Transmit Controls	8 bits
Backspace Mode	normal
User Features	unlocked
Conceal Answerback	no
Answerback	

.....

.....

.....

SETUP MENU

PREVIOUS SCREEN

NEXT SCREEN

CHANGE OPTION

CLEAR TO END

Figure 4-44: General Options for a 4000/AWTC

Display Options Window

Figure 4-45 shows the recommended display options.

DISPLAY OPTIONS

WINDOW TITLE (VT #)

Monitor Mode	off
Cursor Type	block
Cursor Blink	off
Display Cursor	yes
Status Line Type	host
Character Mode	multnati
International Font	ISO Latn
Autowrap	on
Destructive Scroll	yes

SETUP
MENU

PREVIOUS
SCREEN

NEXT
SCREEN

CHANGE
OPTION

Figure 4-45: Display Options for a 4000/AWTC

Keyboard Options Window

Figure 4-46 shows the recommended keyboard options.

KEYBOARD OPTIONS

WINDOW TITLE (VT #)

Caps/Shift Lock Key	caps lck
<--	CR
Enter Key	<--
Autorepeat	yes
Margin Bell	no
Compose Key	enabled
Break Key	enabled
Numeric Pad	numeric
Cursor Keys	normal
Swap Delete	no
Control Key Swapping	none
Legends	
User Defined Keys	
Backspace key	BS
ESC Key	ESC

SETUP MENU

PREVIOUS SCREEN

NEXT SCREEN

CHANGE OPTION

CLEAR TO END

Figure 4-46: Keyboard Options for a 4000/AWTC

Printer Options Window

Figure 4-47 shows the recommended printer options.

The screenshot shows a terminal window titled "PRINTER OPTIONS" with a subtitle "WINDOW TITLE (VT #)". Inside the window, there is a table of printer settings. The first row is highlighted with a box around the text "Select Print Region" and "page". Below this, several other settings are listed: "Print mode" (normal), "Print Terminator" (none), "Printer Type/Driver" (Propmtr), "Printer Alarm" (no), and "Printer To host" (no). At the bottom of the window, there are four buttons: "SETUP MENU", "PREVIOUS SCREEN", "NEXT SCREEN", and "CHANGE OPTION", followed by four empty rectangular boxes.

PRINTER OPTIONS	
WINDOW TITLE (VT #)	
Select Print Region	page
Print mode	normal
Print Terminator	none
Printer Type/Driver	Propmtr
Printer Alarm	no
Printer To host	no

SETUP MENU PREVIOUS SCREEN NEXT SCREEN CHANGE OPTION

Figure 4-47: Printer Options for a 4000/AWTC

If any of the 4000/AWTC terminal options are incorrect, refer to the *4000/AWT Color Guide to Operations* for instructions on how to change the terminal options.

2900/260lf Small Footprint Terminal

The recommended 2900/260lf Terminal values are shown on Figures 4-48 through 4-60. Twelve of the menus are accessed by the function keys F1 through F12. The thirteenth menu is accessed by the Print Screen key and provides terminal operations which may be executed.

In order to enter the terminal Setup mode, press **Ctrl** **Scroll Lock**. To exit Setup, press **Pause** and y or n.

F1 Quick Window

Figure 4-48 shows the F1 Quick Values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec	
Emulation=VT-300-7 Comm Mode=Full Duplex Enhanced=0n Host/Printer=EIA/Para				Parameters EIA Baud Rate=9600 Aux Baud Rate=9600 Lanuguage=U.S.				EIA Data Format=8/1/N Aux Data Format=8/1/N Sessions=One					
Choices													
ADDS-VP		Wyse-60		Wyse-325		Wyse-50+		Wyse-350		PC-Term		TVI-925	
VT-300-7		VT-300-8		Intecolor		VT-200-7		VT-200-8		VT-100			
SCO Console		AT386											
↑ > ↓ < : Parameter				Select				Enter/S-Enter: Next/Prev Choice				Exit : PauseKey	

Figure 4-48: F1 Quick Values for a 2900/260lf

You must change the EIA Data Format parameter manually in Window F1 because the default is 7/1/N.

F2 Genrl (General) Window

Figure 4-49 shows the F2 General Window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec																				
Emulation=VT-300-7 Auto Font Load=0n Monitor Mode=Off Warning Bell=0n Sessions=0ne				Parameters Enhanced=0n Auto Page=Off Screen Saver=5-min Bell Length=350 ms Color Mode=Direct				Auto Wrap=Off Auto Scroll=0n Bell Volume=06 Host Printer=EIA/Para																								
Choices <table> <tr> <td>ADDS-VP</td><td>Wyse-60</td><td>Wyse-325</td><td>Wyse-50+</td><td>Wyse-350</td><td>PC-Term</td><td>TVI-925</td></tr> <tr> <td>VT-300-7</td><td>VT-300-8</td><td>Intecolor</td><td>VT-200-7</td><td>VT-200-8</td><td>VT-100</td><td></td></tr> <tr> <td>SCO Console</td><td>AT386</td><td></td><td></td><td></td><td></td><td></td></tr> </table>												ADDS-VP	Wyse-60	Wyse-325	Wyse-50+	Wyse-350	PC-Term	TVI-925	VT-300-7	VT-300-8	Intecolor	VT-200-7	VT-200-8	VT-100		SCO Console	AT386					
ADDS-VP	Wyse-60	Wyse-325	Wyse-50+	Wyse-350	PC-Term	TVI-925																										
VT-300-7	VT-300-8	Intecolor	VT-200-7	VT-200-8	VT-100																											
SCO Console	AT386																															
↑>↓< : Parameter				Select Enter/S-Enter: Next/Prev Choice				Exit : PauseKey																								

Figure 4-49: F2 General Values for a 2900/260lf

F3 Displ (Display) Window

Figure 4-50 shows the F3 Display Window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Page Length=25 Display Cursor=0n Columns=80 Scroll=Jump				Parameters Screen Length=26 Lines Cursor=Blink Block Erase Color=Black				Screen Video=Normal Auto Adjust Cursor=0n Speed=Fast				
				Choices 24 25 42 43 48 50 84 86 96 100 168 172 192 200 *24 *25 *42 *43								
↑ → ↓ ← : Parameter				Select Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 4-50: F3 Display Values for a 2900/260lf

F4 Kybd (Keyboard) Window

Figure 4-51 shows the F4 Keyboard Window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Language=U.S. Keyclick=Off Margin Bell=Off Num Lock=Toggle				Parameters Char Set Mode=ANSI Key Repeat=On Key Lock=Caps				Key Mode=ASCII Key Rate=20 cps Caps Lock=Toggle				
Choices U.S. U.K. Danish Finnish French German Norwegian Portuguese Spanish Swedish Dutch Belgian-Flemsh Fr-Canadian Italian Latin-American Swiss-German Swiss-French												
↑ → ↓ ← : Parameter				Select Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 4-51: F4 Keyboard Values for a 2900/260lf

F5 Keys Window

Figure 4-52 shows the F5 Keys Window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Enter Key=<CR> Alt Key=Compose Pound Key=U.S.				Parameters Return Key=<CR> Disconnect=Pause Return Key Repeat=Off				Backspace=<BS>/<DEL> Desk Acc=Ctrl+ UDKs=Emul Dependent				
					Choices <CR> <CR><LF> <TAB>							
↑⇒↓⇐ : Parameter				Select Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 4-52: F5 Keys Values for a 2900/260lf

F6 Ports Window

Figure 4-53 shows the F6 Ports Window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
				Parameters								
EIA Baud Rate=9600 AUX Baud Rate=9600 EIA Xmt=No Protocol AUX Xmt=No Protocol EIA Break=250 ms AUX Break=250 ms				EIA Data Format=8/1/N AUX Data Format=8/1/N EIA Recv=Xany-Xoff(XPC) AUX Recv=Xany-Xoff(XPC) EIA Modem Control=Off AUX Modem Control=Off				EIA Parity Check=Off AUX Parity Check=Off EIA Xmt Pace=Baud AUX Xmt Pace=Baud EIA Disconnect=2 sec AUX Disconnect=2 sec				
				Choices								
110 150 300 600 1200 2000 2400 4800 9600												
19200 38400 57600 76800 115200												
				Select								
↑ → ↓ ← : Parameter				Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 4-53: F6 Ports Values for a 2900/260lf

You must change the EIA Data Format parameter manually in Window F6 because the default is 7/1/N.

F7 Host Window

Figure 4-54 shows the F7 Host Window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Comm Mode=Full Duplex Recv <DEL>=Ignore Send Region=Screen Alt Input Data=On				Parameters Local=Off Send ACK=On Send End=Region				Recv <CR>=<CR> Send Block Term=None Null Supress=Off				
Choices Full Duplex Half Duplex Full Block Half Block												
↑ → ↓ ← : Parameter				Select Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 4-54: F7 Host Values for a 2900/260If

F8 Print Window

Figure 4-55 shows the F8 Print Window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Prnt Mode=Normal Secondary Recv=On				Parameters Prnt Region=Screen				Prnt Block Term=None				
Choices Normal Auto Controller												
↑ → ↓ ← : Parameter				Select Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 4-55: F8 Print Values for a 2900/260lf

F9 Emul
(Emulation)
Window

Figure 4-56 shows the F9 Emulation Window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Numeric Kpd=Numeric Print=National UPSS=ANSI-Supplemental				Parameters Cursor Kpd=Cursor ANSI-ID=VT320 Feature Lock=Off				Send Data=All Function Key Lock=Off Status Line=Off				
Choices Numeric Application												
↑→↓← : Parameter				Select Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 4-56: F9 Emulation Values for a 2900/260lf

F10 Tabs Window

Figure 4-57 shows the F10 Tabs Window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Parameters												
Auto Init Tabs=Off				Default Tabs								
<pre> . . . : . . . 10 20 30 40 50 60 T T T T T T T T T T T T . . . 70 . . . T 80 90 100 110 120 130 . . </pre>												
Choices												
Off On												
Select												
↑>↓<				: Parameter				Enter/S-Enter: Next/Prev Choice			Exit : PauseKey	

Figure 4-57: F10 Tabs Values for a 2900/260lf

F11 AnsBk
(Answer Back)
Window

Figure 4-58 shows the F11 Answer Back Window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Parameters												
Answerback Mode=Off				Answerback Conceal								
Answerback Message:												
Bytes Remaining:												
Choices												
Off On												
Select												
↑ > ↓ <				: Parameter				Enter/S-Enter: Next/Prev Choice				Exit : PauseKey

Figure 4-58: F11 Answer Back Values for a 2900/260lf

F12 Prog (Program) Window

Figure 4-59 shows the F12 Program Window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Parameters												
Key=F1				Program=F/Key				Key Dir=Comm Dependent				
Text:												
Label:												
Bytes Remaining:												
Choices												
F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	
↑ > ↓ <				Select								
: Parameter				Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 4-59: F12 Program Values for a 2900/260lf

PrtSc Exec (Print
Screen Execute)
Window

Figure 4-60 shows the Print Screen Execute Window values.

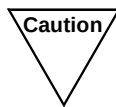
F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Save Terminal Save Session Reset Terminal Clear Screen				Parameters Recall Terminal Recall Session Reset Session Default Session UDKs				Default Terminal Default Session Reset Ports				
Choices Use Enter Key to Execute Action												
Select				Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 4-60: Print Screen Execute Values for a 2900/260If

Administering Printers

This section describes how to configure port parameters for printers used in the following scenarios:

- Serial Printers — connected to ports on the NTS patch panel.
- Parallel Printers — connected to a back-panel port on an NTS (an NTS can have 0, 1, or 2 parallel ports).
- Parallel Printers — connected to the parallel port on the *Sun SPARCserver* computer.
- Serial Printers connected to the Aurora SBus *Multiport* cards.



If a power outage occurs while you are printing, you may need to resubmit your job.

Serial Printers on the NTS

Set up the serial printers by connecting a serial printer to one of the NTS serial ports. After the serial printers are connected, you must complete the `na`, `rtnet`, and `lpadm` administration for the *Sun SPARCserver* computer to recognize the new serial printer(s).



For printers that have different configurations and parameters, see the *Network Terminal Server Administration Guide* for details.

Procedure

To address and configure the NTS ports for serial printers, complete the following steps:

1. Log in as *root*.
2. At the system prompt, enter the `na` command to access the NTS administration software.

```
# na
```

The following appears:

Annex network administrator R7.0 October 13, 1992
command:

3. To associate all subsequent administration with a specific network terminal server, enter `annex cmsterm1` at the command prompt.

command: `annex cmsterm1`

Note When you enter `annex cmsterm1` (or `annex 129.200.9.11`), `cmsterm1` becomes the default NTS until another NTS is selected using the `annex` command. The default setting for the NTS ports is 9600 bps, 8 data bits, no parity, and 1 stop bit.

You can specify one NTS or multiple NTSs. Use the recommended NTS names and addresses in the `/etc/hosts` file.

See Table 4-5 “Configuration Information,” on page 4-20 for specific devices, IP addresses, terminals, and file names. The system responds:

`cmsterm1: Annex-3-UXR7, 64 ports`

command:

4. For serial printers, enter the following `set port` command string to administer the printer:

command: `set port=x-y mode slave type hardwired
control_lines none input_flow_control start/stop
output_flow_control start/stop location "<name>" speed <9600
or whatever printer speed is>`

Note Be sure to set location and user-name, and keep them populated, to facilitate troubleshooting.

See Table 4-7 for more details about using the `set port` command string. You do not have to set any parameters if the default parameters are correct.

Table 4-7: Serial Printer Configuration Guidelines

Port Generic Parameter	Default Parameter	Recommended Setting	Comment
mode	cli	slave	NA
type	hardwired	hardwired	NA
dedicated_address	0.0.0.0	Set to 129.200.9.1 (<i>Sun SPARCserver</i> computer).	Set to your <i>Sun SPARCserver</i> computer internet address.
control_lines	none	Set to none.	NA
input_flow_control	bell	Set to start/stop.	NA
output_flow_control	none	Set to start/stop.	NA
location	""	"a location"	It is important to set this parameter so port problems can be traced.
user_name	""	"a user"	It is important to set this parameter so port problems can be traced.
speed	9600	Set to match the speed of the printer. Do not use autobaud.	Speed can be changed to match your printer's baud rate.
data_bits	8	Set to match the requirements of the printer.	Can be set to match the printer settings.
parity	none	Set to none.	Can be set to match the printer settings.
stop_bits	1	Set to match the requirements of the printer.	Can be set to match the printer settings.

Note

You can use the `show port` command to review your changes.

The system responds:

Changes will take effect at next annex boot or port reset.
command:

5. Use the following command to reset the printer ports:

command: `reset <port number>`

The system responds:

resetting serial port `<port number>` of annex `<cmsterm1>`

Caution

You can also use the `reset all@cmsterm1` command to terminate all active sessions on the NTS. Use the `reset all@cmsterm1` command **only** if no one else is logged in.

6. To store the new port configurations to a file (for example, `nts1info`), enter the following:

command: `write cmsterm1 /etc/local.admin/nts1info`

Note

At the end of provisioning, the `write` command downloads the port(s) and settings you selected to a flat file for use at a later date (for example, when you want to do a search or use the editor).

The system responds:

```
cmsterm1: Annex-3-UX R7.0, 64 ports
        writing...
command:
```

7. To check the new port configurations, enter the following command:

```
command: show port=<number(s)>
```

8. To quit, enter the following command:

```
command: quit
```

The system responds:

```
#
```

RTELNET Administration

Serial printers require some additional administration:

- You must place the command in a file (as specified below).
- You must run the command — enter the command as described below or reboot the *Sun SPARCserver* computer.

To place the command for serial printers in a file, continue with the following:

9. Place the `Speripherals` file into the `/etc/rc2.d` directory:
 - a. To change from the `root` directory, at the system prompt, enter the following command:

```
# cd /etc/rc2.d
```


- b. Access the `Speripherals` file using an editor (for example, `vi`).

```
# vi Speripherals
```

- c. Enter the name(s) of the character special device(s) into the file. For example:

```
rtelnet -brao cmsterm1 16 /dev/s_pdev116
rtelnet -brao cmsterm1 15 /dev/s_pdev115
rtelnet -brao cmsterm1 17 /dev/s_pdev117
```

- d. To exit the file and return to the system prompt, press **Shift** and **Z** **Z**.

- e. To return to the *root* directory, enter the following command:

```
# cd /
```

10. At the *Sun SPARCserver* console, enter the following system command (one line per each serial printer):

```
# rtelnet -brao cmsterm1 16 /dev/s_pdev116
```

Note

116, in the device name, indicates the first NTS and port 16 (as does the parameter 16). You can choose your own names, but it is recommended that the device name reflect the terminal server and port names (for example, `rtelnet -brao cmsterm2 64 /dev/s_pdev264`).

**LPADMIN
Administration**

To run the command to administer serial printers, continue with the following steps:

11. For serial printers connected to the NTS, enter the following command at the system prompt:

```
# lpadmin -p <printername> -D "comment about printer location"
-i /usr/spool/lp/cmstermutf -o <no>banner -v/dev/s_pdev116 -
A mail -T <type> -o "stty=<baud rate>"
```

12. For serial printers **not** connected to the NTS, enter the following command at the system prompt:

```
# lpadmin -p <printername> -D "comment about printer location"
-o <no>banner -v/dev/term/xxx -A mail -T <type> -o "stty=<baud
rate>"
```

Note

Where the printer name is your choice, use the banner or nobanner command according to your preference. If the *Sun SPARCserver* is replacing an existing *INTEL*-based product, check the *CentreVu* CMS: Maintenance: Printer Administration window to match settings. Use the device name from the `rte1net` command (see step 8). If the speed is **not** 9600, use `-o "stty=<baud rate>."`

See Table 4-8 to identify the correct `lpadmin` type.

Table 4-8: Printer Device Types

Printer	"lpadmin" Type	Emulation Mode	Product Status
475 Dot Matrix	475	—	Discontinued
476 Dot Matrix	476	—	Discontinued
477 Dot Matrix	477	—	—
495 Laser	495hp	<i>HP</i> *	Discontinued
570 Parallel Dot Matrix	570ibm	<i>IBM</i> †	Discontinued
571 Parallel Dot Matrix	571libm	<i>IBM</i>	Discontinued

Table 4-8: Printer Device Types (Contd)

Printer	"lpadmin" Type	Emulation Mode	Product Status
572 Serial Dot Matrix (Narrow Platen)	572	—	—
573 Serial Dot Matrix (Wide Platen)	573	—	—
580 Parallel Dot Matrix	580ibm	<i>IBM</i>	Discontinued
581	581ibm	<i>IBM</i>	—
583 Dot Matrix	583ibm	<i>IBM</i>	Discontinued
593 Laser	593hp	<i>HP</i>	Discontinued
595 Laser	hplaserjet	<i>HP</i>	Discontinued
5310 Dot Matrix	5310	—	Discontinued
5320 Dot Matrix	5320	—	Discontinued
6417 GIS Parallel Dot Matrix	ibmproprinter	<i>IBM</i>	—
<i>Okidata</i> 183	ibmproprinter	<i>IBM</i>	—
<i>Okidata</i> 320	ibmproprinter	<i>IBM</i>	—
<i>Okidata</i> 321	ibmproprinter	<i>IBM</i>	—
<i>Okidata</i> OL810e	hplaserjet	<i>HP</i>	—
<i>Okidata</i> OL830 Plus	hplaserjet	<i>HP</i>	Discontinued

*HP is a registered trademark of Hewlett-Packard Co.

†IBM is a registered trademark of International Business Machines, Corp.

13. To make a printer the default destination, enter the following command at the system prompt:

```
# lpadmin -d <printername>
```

14. To enable the printer, enter the following command:

```
# enable <printername>
```

The system responds:

```
<printername> enabled
```

15. To complete the printer default destination and put the printer into service, enter the following command:

```
# accept <printername>
```

The system responds:

```
<printername> accepted
```

16. If this is the initial installation, reboot the *Sun SPARCserver* computer.

Note

You can wait to reboot your system until after you complete all the terminal, printer, and modem administration, if desired.

Parallel Printers Connected to the NTS

Set up the printers by connecting the printer to the NTS parallel port. The port used to connect parallel printers is found on the back panel of the network terminal server (see Figure 4-61 and Figure 4-62). This NTS parallel port supports either a Centronics- or *Dataproducts**-compatible printer.

*Dataproducts is a registered trademark of Dataproducts Corp.

Note After the parallel printers are connected, you must complete the `na` and `lpadmin` administration for the *Sun SPARCserver* computer to recognize the new parallel printer(s).

To connect your printer to the 64-port NTS, see Figure 4-61.

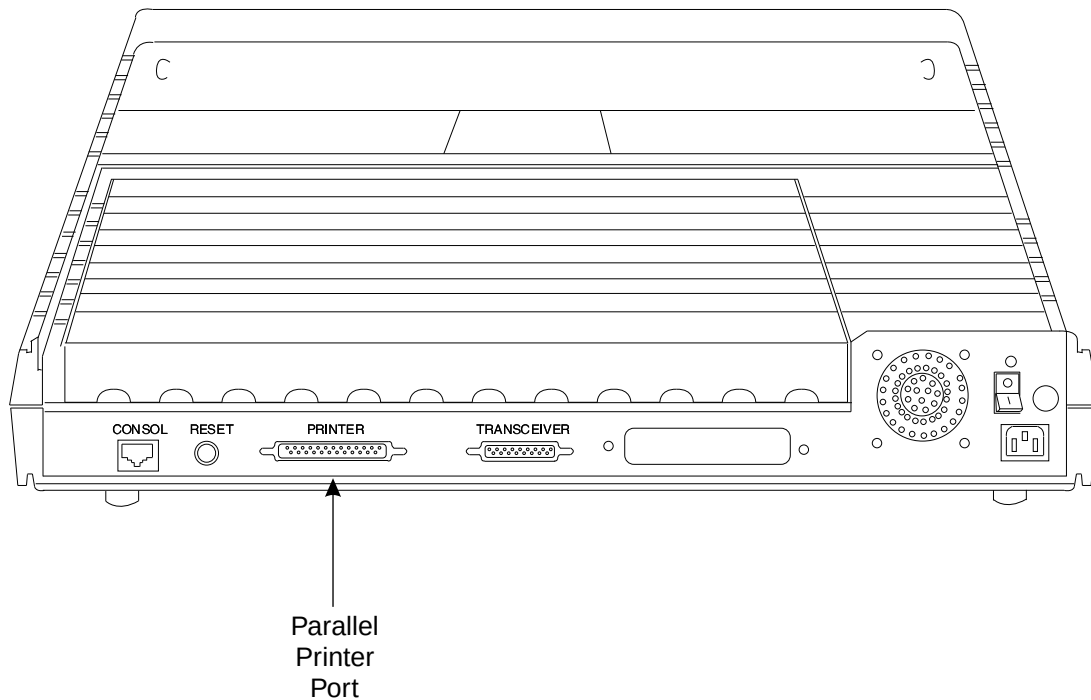


Figure 4-61: 64-Port NTS Parallel Printer Port Connection

Note If your parallel printer has a Centronics interface, no administration is required. If your parallel printer has a *Dataproducts* interface, you must continue with the following administration procedure. Check your printer manual to determine if your printer has a Centronics or *Dataproducts* interface.

To connect your printer to the 8-port NTS, see Figure 4-62.

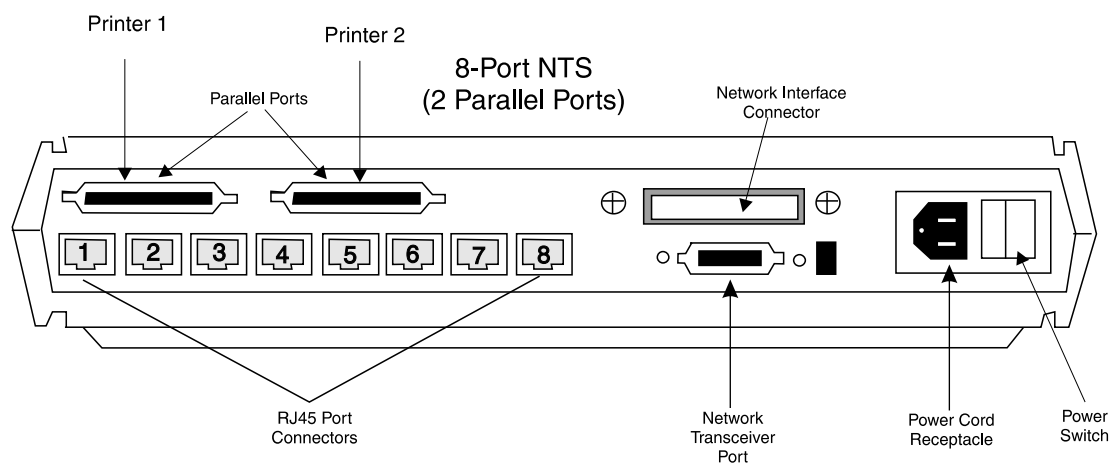


Figure 4-62: 8-Port Parallel Printer Port Connection

Procedure

Complete the na administration to set the NTS parallel printer up as *Dataproducts*. Do the following:

1. Log in as *root*.
2. At the system prompt, enter the na command to access the NTS administration software.

```
# na
```

The system responds:

```
Annex network administrator R7.0 October 13, 1992
command:
```

3. To associate all subsequent administration with a specific network terminal server, enter `annex cmsterm1` at the command prompt.

```
command: annex cmsterm1
```

Note

When you enter `annex cmsterm1` (or `annex 129.200.9.11`), `cmsterm1` becomes the default NTS until another NTS is selected using the `annex` command. The default setting for the NTS ports is 9600 bps, 8 data bits, no parity, and 1 stop bit.

You can specify one NTS or multiple NTSs. Use the recommended NTS names and addresses in the `/etc/hosts` file.

See Table 4-5 on page 4-20 for specific devices, IP addresses, terminals, and file names.

The system responds:

```
cmsterm1: Annex-3-UXR7, 64 ports
```

```
command:
```

4. Depending on your terminal type, you must do the following:
 - a. For a Centronics interface, use the default value.
 - b. For a *Dataproducts* interface, use the following command:

```
command: set printer type dataproducts
```

Note

The `set printer` command sets parameters for the parallel printer port that you attach to a printer. Use the `set printer` command to configure the following parallel printer port parameters: `hardware_tabs`, `map_to_upper`, `printer_width`, `type`, and `printer_speed`.

For a Centronics interface, set the `type` parameter to the supplied default, `centronics`. For a *Dataproducts* interface, set the `type` to `dataproducts`.

You can use the `show printer` command to review your changes.

5. To reset the parallel printer when you are done, enter the following command:

```
command: reset printer
```

Note

To reset printer 1, enter `reset printer 1`, and to reset printer 2, enter `reset printer 2`.

The system responds:

```
resetting printer 1
```

Caution

You can also use the `reset all@cmsterm1` command to terminate all active sessions on the NTS. Use the `reset all@cmsterm1` command **only** if no one else is logged in.

6. To quit, enter the following command:

```
command: quit
```


The system responds:

```
#
```

LPADMIN Administration

Continue with the following for parallel printers:

7. For a parallel printer on the first NTS, issue the following command on the *Sun SPARCserver* console at the system prompt:

```
# lpadmin -p <printername> -D "comment about printer location"  
-v /dev/lpnull -A mail -i /usr/spool/lp/cmsterm1pr -T <type>
```

Note

The first parallel printer ports on the three other NTSs will use `cmsterm2pr`, `cmsterm3pr`, and `cmsterm4pr` instead of `cmsterm1pr`. If the speed is not 9600, add the `-o stty=<baud>` to the command string. The second parallel printer ports will use `cmsterm1pr2` on the first NTS, `cmsterm2pr2` on the second, `cmsterm3pr2` on the third, and `cmsterm4pr2` on the fourth.

Note

Also, if your NTS has a different name (for example, `newnts`), use the following steps (from the system prompt) to create a printer interface program for your NTS: file.

- a. Copy the `/usr/spool/lp/cmsterm1pr` file to the `/usr/spool/lp/newntspr` file.
- b. Edit the `/usr/spool/lp/newntspr` file and replace the `ANNEX=cmsterm1` line with `ANNEX=newnts`.

See Table 4-8 on page 4-77 to identify the correct `lpadmin` type.

8. To make a printer the default destination, enter the following command from the *Sun SPARCserver* console:

```
# lpadmin -d <printername>
```

9. To enable the printer, enter the following command:

```
# enable <printername>
```

The system responds:

```
<printername> enabled
```

10. To complete the printer default destination, enter the following command:

```
# accept <printername>
```

The system responds:

```
<printername> accepted
```

11. If this is the initial installation, reboot the *Sun SPARCserver* computer.

Note

You can wait to reboot your system until after you complete all the terminal, printer, and modem administration, if desired.

See Table 4-8 on page 4-77 to identify the correct lpdadmin type.

Parallel Printers
Connected to the
Built-in Port on
the Sun
SPARCserver
Computer

A parallel printer may be connected to a *CentreVu* CMS system by using the parallel port on the *Sun SPARCserver* computer. There are two types of cables that can be used to connect the parallel printer to the *Sun SPARCserver* computer. These cables are Centronics and *IBM*-type (also called *Dataproducts*). One or the other is needed depending on what type of printer is being used. All the supported printers use Centronics. For the correct cable to use in connecting the printer to the parallel port, see Table 4-9. (See Figures 4-63 through 4-65 for the location of the parallel port.)

Table 4-9: Parallel Printer Connections

Connector type	PEC	Comcode
Centronics	12105	407361856
<i>IBM</i> -type (<i>Dataproducts</i>)	12106	407361831

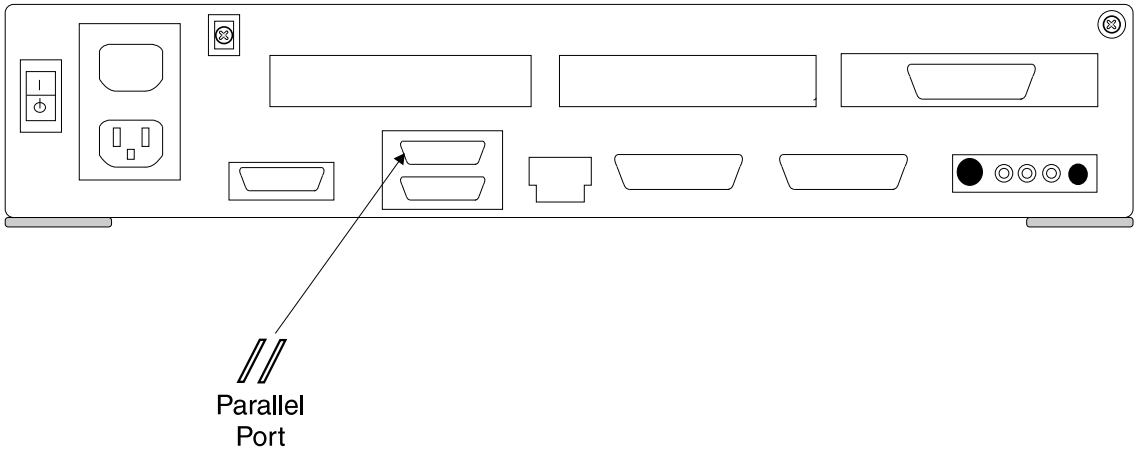


Figure 4-63: Sun SPARCserver 5 Parallel Port

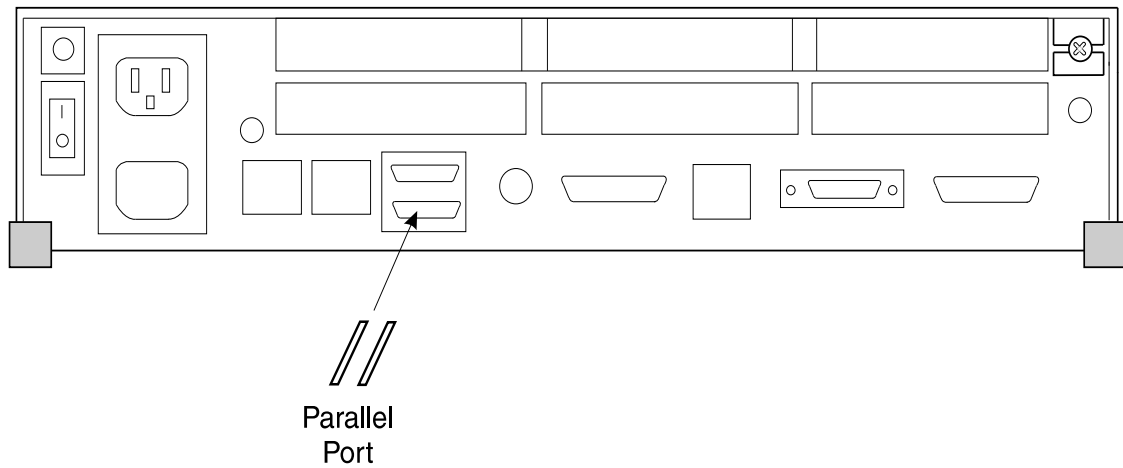


Figure 4-64: Sun SPARCserver 10 Parallel Port

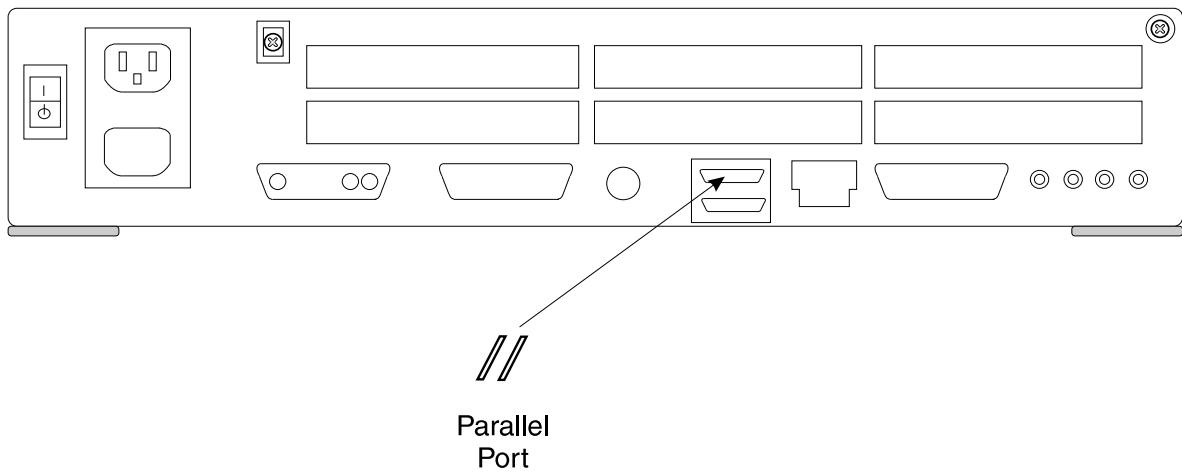


Figure 4-65: Sun SPARCserver 20 Parallel Port

To administer a printer using the built-in port on the *Sun SPARCserver* computer, use the following steps:

1. For the built-in *Sun SPARCserver* parallel port, issue the following command on the console at the system prompt:

```
# lpadmin -p <printername> -D "comment" -v /dev/bpp0 -A mail
-i /usr/spool/lp/cmsppr -T <type>
```

2. To make a printer the default destination, enter the following command from the *Sun SPARCserver* console:

```
# lpadmin -d <printername>
```

3. To enable the printer, enter the following command:

```
# enable <printername>
```

The system responds:

```
<printername> enabled
```

4. To allow the lp subsystem to accept print jobs for this printer, enter the following command:

```
# accept <printername>
```

The system responds:

```
<printername> accepted
```

5. If this is the initial installation, reboot the *Sun SPARCserver* computer.

Note

You can wait to reboot your system after you complete all the terminal, printer, and modem administration, if desired.

Serial Printers Connected to the Aurora SBus Multiport Cards

First verify that a port monitor is not using the desired port. Type `pmadm -l` and see if there are any entries that use the same device (`/dev/term/<port number>`). If there is one, it needs to be removed. Type `pmadm -r -p <pmtag> -s <svctag>` where `pmtag` and `svctag` is obtained from the `pmadm -l` command done earlier. To administer a serial printer, issue the following commands (the system prompts/responses are in **bold**):

```
# lpadmin -p <prINTERname> -D "comment" -v /dev/term/<port
number> -A mail -T <type> -o <no>banner -o "stty='9600 cs8
-parenb -cstopb -crtscs ixon tabs'"
# chown lp /dev/term/<port number>
# chmod 600 /dev/term/<port number>
# enable <prINTERname>
<prINTERname> enabled
# accept <prINTERname>
<prINTERname> accepted
```

If you wish to make the printer the default destination, enter the following command from the *Sun SPARCserver* console:

```
# lpadmin -d <prINTERname>
```

If your printer has options that can be set, then set your printer to the correct baud rate, 8 data bits, no parity, 1 stop bit and xon-xoff flow control.

If this is the initial installation, reboot the *Sun SPARCserver* computer.

Note

You can wait to reboot your system after you complete all the terminal, printer, and modem administration, if desired.

See Table 4-8 on page 4-77 to identify the correct `lpadmin` type.

Administering Modems

This section describes how to configure port parameters for modems and devices that behave like modems (for example, serial line switches).

Note If you are using the Aurora SBus *Multiport* card, then do not use ports 12-15 for modems. The last four ports cannot be used to connect modems.

Modems Connected to the NTS

A modem connected to an NTS can be configured in one of two ways:

- Outbound — initiates only outgoing calls.

Note After the outbound modems are connected, you must complete the `na` and `rte lnet` administration for the *Sun SPARCserver* computer to recognize the new outbound modem(s).

- Inbound — accepts only incoming calls.

Note After the inbound modems are connected, you must complete the `na` administration for the *Sun SPARCserver* computer to recognize the new inbound modem(s).

You can complete `na` administration for modems using the following method:

- Complete NA Administration — provides in-depth, step-by-step procedures for completing modem administration.

Note For modems that have different configurations and parameters, see the *Network Terminal Server Administration Guide* for details.

Outbound Modems

This section provides examples for configuring and administering port parameters for outbound modems.

Complete NA Administration Method

The Complete NA Administration Method provides in-depth, step-by-step procedures for administering outbound modems.

To address and configure the NTS ports for outbound modems, complete the following steps:

1. Log in as *root*.
2. At the system prompt, enter the *na* command to access the NTS administration software.

```
# na
```

The system responds:

```
Annex network administrator R7.0 October 13, 1992  
command:
```

3. To associate all subsequent administration with a specific network terminal server, enter *annex cmsterm1* at the command prompt.

```
command: annex cmsterm1
```

Note

When you enter *annex cmsterm1* (or *annex 129.200.9.11*), *cmsterm1* becomes the default NTS until another NTS is selected using the *annex* command. The default setting for the NTS ports is 9600 bps, 8 data bits, no parity, and 1 stop bit.

You can specify one NTS or multiple NTSS. Use the recommended NTS names and addresses in the */etc/hosts* file.

See Table 4-5, "Configuration Information," on page 4-20 for specific devices, IP addresses, terminals, and file names.

The system responds:

cmsterm1: Annex-3-UXR7, 64 ports

command:

4. For outbound modems, you can use one of the following set port command strings depending on which modem you have. You must include all the parameters you want to change.

For the **DataPort Express Model 3710/3715** or the **U.S. Robotics Sportster Faxmodem**, use this string:

```
command: set port=x-y mode slave type dial_in
dedicated_address <Sunaddress> control_lines flow_control
input_flow_control eia output_flow_control eia
location "<a location>" user_name "<a user>" speed <9600>
```

For the **Comsphere 3830** or **3910**, use this string:

```
command: set port=x-y mode slave type dial_in
dedicated_address <Sunaddress> control_lines modem_control
location "<a location>" user_name "<a user>" speed <9600>
```

Note

The set port command string sets the parameters for the serial line ports. The x-y values you enter are the port numbers on the NTS. You can specify a range of ports in the above command string, but the location and user_name attributes should be port-specific. Set the location and user_name so that any user-reported problems can be traced to the correct port.

See Tables 4-10 and 4-11 for more details about entering the set port command string. You do not have to set any parameters if the default parameters are correct.

Table 4-10: Outbound Modem Configuration Guidelines for a *DataPort* Express Model 3710/3715 or *U.S. Robotics Sportster* Faxmodem

Port Generic Parameter	Default Parameters	Recommended Setting	Comments
mode	cli	slave	NA
type	hardwired	dial_in	NA
dedicated_address	0.0.0.0	Set to 129.200.9.1 (<i>Sun SPARCserver</i> computer).	Set to your <i>SunSPARCserver</i> computer internet address.
control_lines	none	flow_control	When using a Model 3715 as an outgoing modem, the NTS port must be administered for hardware flow control with both input flow control and output flow control set to eia.
input_flow_control	bell	eia	
output_flow_control	start/stop	eia	
location	""	"a location"	It is important to set this parameter so port problems can be traced.
user_name	""	"a user"	It is important to set this parameter so port problems can be traced.
speed	9600	Match the baud rate of your outbound modem (for example, 9600).	The speed may be changed to your modem's baud rate. It is important to set this parameter so port problems can be traced.
data_bits	8	8	Can be set to match the modem settings.
parity	none	none	Can be set to match the modem settings.
stop_bit	1	1	Can be set to match the modem settings.

Table 4-11: Outbound Modem Configuration Guidelines for *Comsphere* 3830 and 3910

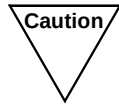
Port Generic Parameter	Default Parameters	Recommended Setting	Comments
mode	cli	slave	NA
type	hardwired	dial_in	NA
dedicated_address	0.0.0.0	Set to 129.200.9.1 (<i>Sun SPARCserver</i> computer).	Set to your <i>SunSPARCserver</i> computer internet address.
control_lines	none	modem_control	NA
location	""	"a location"	It is important to set this parameter so port problems can be traced.
user_name	""	"a user"	It is important to set this parameter so port problems can be traced.
speed	9600	Match the baud rate of your outbound modem (for example, 9600).	The speed may be changed to your modem's baud rate. It is important to set this parameter so port problems can be traced.
data_bits	8	8	Can be set to match the modem settings.
parity	none	none	Can be set to match the modem settings.
stop_bit	1	1	Can be set to match the modem settings.

- When you are done, use the following command to reset the modem ports:

```
command: reset <port number>
```

The system responds:

```
resetting serial port <number>
```



You can also use the `reset all@cmsterm1` command to terminate all active sessions on the NTS. Use the `reset all@cmsterm1` command only if no one is logged in.

6. To quit, enter the following command:

```
command: quit
```

RTELNET Administration

Outbound modems require the following administration:

- You must place the command in a file (as specified below).
- You must run the command — enter the command as described below, or reboot the *Sun SPARCserver* computer.

To place the command for outbound modems in a file, continue with the following:

7. Place the `Speripherals` file into the `/etc/rc2.d` directory by doing the following:
 - a. To change from the *root* directory, at the system prompt, enter the following command:

```
# cd /etc/rc2.d
```

- b. Access the `Speripherals` file using an editor (for example, `vi`).

```
# vi Speripherals
```

- c. Enter the name(s) of the character special device(s) into the file. For example:

```
rtelnet -fmrt cmsterm2 20 /dev/s_pdev220
```

- d. To exit the file and return to the system prompt, press **Shift** and **Z**.

- e. To return to the *root* directory, enter the following command:

```
# cd /
```

8. At the *Sun SPARCserver* console, enter the following system command (one line for each outbound modem):

```
# rtelnet -fmrt cmsterm2 20 /dev/s_pdev220
```

Note

220, in the device name, indicates the second NTS and port 20 (as does the parameter 20). You can choose your own names, but it is recommended that the device name reflect the terminal server and port names (for example, `rtelnet -fmrt cmsterm2 20 /dev/s_pdev220`).

9. If this is the initial installation, you must reboot the *SunSPARCserver* computer.

Note

You can wait to reboot your system after you complete all the terminal, printer, and modem administration, if desired.

Inbound Modems

This section provides examples for configuring and administering port parameters for inbound modems connected to the NTS.

Complete NA Administration Method

The Complete NA Administration Method provides in-depth, step-by-step procedures for administering inbound modems.

To address and configure the NTS ports for inbound modems, complete the following steps:

1. Log in as *root*.
2. At the system prompt, enter the *na* command to access the NTS administration software.

```
# na
```

The system responds:

```
Annex network administrator R7.0 October 13, 1992
command:
```

3. To associate all subsequent administration with a specific network terminal server, enter *annex cmsterm1* at the command prompt.

```
command: annex cmsterm1
```

Note

When you enter *annex cmsterm1* (or *annex 129.200.9.11*), *cmsterm1* becomes the default NTS until another NTS is selected using the *annex* command. The default setting for the NTS ports is 9600 bps, 8 data bits, no parity, and 1 stop bit.

You can specify one NTS or multiple NTSS. Use the recommended NTS names and addresses in the */etc/hosts* file.

See Table 4-5 on page 4-20 for specific devices, IP addresses, terminals, and file names.

The system responds:

```
cmsterm1: Annex-3-UXR7, 64 ports
```

```
command:
```

4. You must include all the parameters you want to change. For inbound modems, use the following `set port` command string:

```
command: set port=x-y mode dedicated type dial_in
dedicated_address <SUNaddress> control_lines modem_control
location "<a location>" user_name "<a user>" speed autobaud
```

Note

The `set port` command string sets the parameters for the serial line ports. The `x-y` values you enter are the port numbers on the NTS. You can specify a range of ports in the above command string, but the `location` and `user_name` attributes should be port-specific. Set the `location` and `user_name` so that any user-reported problems can be traced to the correct port.

See Table 4-12 for more details about entering the `set port` command string.

Table 4-12: Inbound Modem Configuration Guidelines

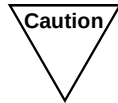
Port Generic Parameter	Default Parameter	Recommended Setting	Comments
mode	cli	dedicated	NA
type	hardwired	dial_in	NA
dedicated_address	0.0.0.0	Set to 129.200.9.1 (<i>Sun SPARCserver</i> computer)	Set to your <i>Sun SPARCserver</i> computer's internet address.
control_lines	none	modem_control	NA
location	""	"a location"	It is important to set this parameter so port problems can be traced.
user_name	""	"a user"	It is important to set this parameter so port problems can be traced.
speed	9600	Set the speed to autobaud.	Do not use a specific speed.
data_bits	8	8	Can be set to match the modem settings.
parity	none	none	Can be set to match the modem settings.
stop_bits	1	1	Can be set to match the modem settings.

5. When you are done, use the following command to reset the modem ports:

```
command: reset <port number>
```


The following appears:

```
resetting serial port <number>
```



You can also use the `reset all@cmsterm1` command to terminate all active sessions on the NTS. Use the `reset all@cmsterm1` command only if no one is logged in.

6. To quit, enter the following command:

```
command: quit
```

The system responds:

```
#
```

7. If this is the initial installation, reboot the *Sun SPARCserver* computer.



You can wait to reboot your system after you complete all the terminal, printer, and modem administration, if desired.

Modems Connected to the Aurora SBus Multiport Cards

Inbound Modem — For an inbound modem, administer the port the same way as for a terminal (see page 4-24).

Outbound Modem — For an outbound modem, no port-specific administration is required. Make sure that existing administration is removed from that port by entering the following command:

```
# pmadm -r -p ttyaur<card number> -s <port number>
```



Ports 12-15 on the 16-port expander box cannot be used to connect modems.

Modem Options

After you connect the modem to the computer, you need to set the options for the terminal and modem. This section describes how to set the modem options. The modem port must be administered so that the computer can recognize the new modem.

The sections that follow describe how to set options for the following modems:

- *Paradyne DataPort Express Model 3710*
- *Paradyne DataPort Express Model 3715*
- *U.S. Robotics Sportster Faxmodem*
- *Paradyne Comsphere 3830*
- *Paradyne Comsphere 3910 (international only).*

Paradyne DataPort Express Model 3710

Do these steps to set the options for the *Paradyne DataPort Express Model 3710* modem:

1. Connect a dumb terminal to the 25-pin connector located at the back of the modem. For information on connecting the terminal to the modem, refer to the modem's user documentation.

Note

- The terminal speed must be set to 9600 baud before connecting the modem to the terminal.
 - You can also set the options via port A on the *Sun SPARCserver* computer as described on pages 3-44 through 3-46 in Chapter 3.
2. Make the necessary power connections to the modem and to the terminal.
 3. Turn on the modem and the terminal.
 4. At the terminal, enter the following soft options (use numerical ones and zeros in the commands):

AT&F	(loads factory default configuration options into active memory)
ATS41=3	[sets Dial-Line Rate to 9600 (V.32bis/V.32)]
AT&T5	(denies request for Remote Digital Loopback test)
AT&C1	[Carrier Detect (CD) control follows standard RS-232 operation]
ATE0Q1&S1&W0	[disables echo, disables result codes, Data Set Ready (DSR) control follows standard RS-232 operation, save to profile 0]

If needed, reset the modem using the power switch on the back.

Paradyne DataPort Express Model 3715

Do these steps to set the options for the *Paradyne DataPort Express* Model 3715 modem:

1. Connect a dumb terminal to the 25-pin connector located at the back of the modem. For information on connecting the terminal to the modem, refer to the modem's user documentation.

Note

- The terminal speed must be set to 9600 baud before connecting the modem to the terminal.
- You can also set the options via port A on the *Sun SPARCserver* computer as described on pages 3-44 through 3-46 in Chapter 3.

2. Make the necessary power connections to the modem and to the terminal.
3. Turn on the modem and the terminal.
4. At the terminal, enter the following soft options (use numerical ones and zeros in the commands):

AT&F	(loads factory default configuration options into active memory)
AT%B9600	(sets modulation/data rate to V.32bis/V.32, maximum rate 9600 bps)
AT&T5	(denies request for Remote Digital Loopback test)
ATE0Q1&S1&W0	[disables echo, disables result codes, Data Set Ready (DSR) control follows standard RS-232 operation, save to profile 0]

If needed, reset the modem using the power switch on the back.

U.S. Robotics Sportster 14.4 Faxmodem

The *U.S. Robotics Sportster* has eight DIP switches in the middle of the back panel. You need to reset these DIP switches from their factory defaults; once so the modem can accept the soft options and again so the modem will work with CMS (see Figure 4-66).

Complete these steps to option the *U.S. Robotics Sportster* modem for CMS:

1. Connect a dumb terminal to the 25-pin connector at the back of the modem. For information on connecting the terminal to the modem, refer to the modem's user documentation.

Note

- The terminal speed must be set to 9600 baud before connecting the modem to the terminal.
- You can also set the options via port A on the *Sun SPARCserver* computer as described on pages 3-44 through 3-46 in Chapter 3.

2. Make the necessary power connections to the modem and to the terminal.
3. Set DIP switches 1, 3, 7, and 8 to the down (ON) position and DIP switches 2, 4, 5, and 6 to the up (OFF) position.
4. Turn on the modem and the terminal.
5. At the terminal, enter the following soft options (use numerical ones and zeros in the commands):

AT&F1	(loads factory default configuration options into active memory)
AT&N6	(sets forced connect speed to 9600 bps)
AT&W0	[writes the current configuration to NVRAM 0 template (Y0)]

6. Next, set all DIP switches to the up (OFF) position except switches 4 and 8, which are set to the down (ON) position. Figure 4-66 shows the final DIP switch settings for CMS, and Table 4-13 explains the settings.
7. Finally, reset the modem using the power switch on the front.

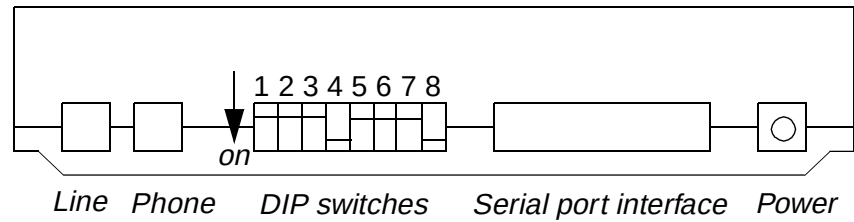


Figure 4-66: U.S. Robotics Sportster Backpanel

Table 4-13: U.S. Robotics Sportster Switch Settings for CMS

Switch	CMS Setting	CMS Function
1	OFF (up)	OFF=normal DTR operation
2	OFF (up)	OFF=verbal (word) result codes
3	OFF (up)	OFF=disable result codes
4	ON (down)	ON=suppress echo of keyboard commands
5	OFF (up)	OFF=enable auto answer
6	OFF (up)	OFF=send CD signal on connect, drop on disconnect
7	OFF (up)	OFF=load stored software options on power up
8	ON (down)	ON=enable AT command set recognition

**Paradyne
Comsphere 3830**

Do these steps to set the options for the *Paradyne Comsphere 3830* modem:

1. Connect a dumb terminal to the 25-pin connector located at the back of the modem. For information on connecting the terminal to the modem, refer to the modem’s user documentation.

Note

- The terminal speed must be set to 9600 baud before connecting the modem to the terminal.
- You can also set the options via port A on the *Sun SPARCserver* computer as described on pages 3-44 and 3-46.

2. Make the necessary power connections to the modem and to the terminal.
3. Turn on the modem and the terminal.
4. At the terminal, enter the following soft options (use numerical ones and zeros and in the commands):

AT&F3	(loads factory default configuration options into active memory)
ATS41=3	[sets Dial-Line Rate to 9600 (V.32bis)]
AT&S1&W0	[Data Set Ready (DSR) control follows standard RS-232 operation, save current Active(Operating) to Active (Save)]

If needed, reset the modem using the power switch on the back.

Paradyne ***Comsphere 3910***

The *Paradyne Comsphere 3910* modem has been type-approved for sale to **international** customers in the countries where *CentreVu CMS* is sold. This modem may be used as the CMS Remote Console modem or as a device that provides serial connectivity to CMS through an NTS.

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

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

The seven buttons that are used to option the modem include (see Figure 4-67):

- Single Up Arrow - move up one level in the menu tree
- Double Up Arrow - move to the Top-Level menu
- Left Arrow (arrow pointing to the left) - move to the previous choice(s) for the current level in the menu tree
- Right Arrow (arrow pointing to the right) - move to subsequent choice(s) for the current level in the menu tree
- Function 1 (F1) - select the choice that is currently printed in the display above F1. (There may or may not be a choice printed in the F1 option.)

- Function 2 (F2) - select the choice that is currently printed in the display above F2. (There may or may not be a choice printed in the F2 option.)
- Function 3 (F3) - select the choice that is currently printed in the display above F3. (There may or may not be a choice printed in the F3 position.)

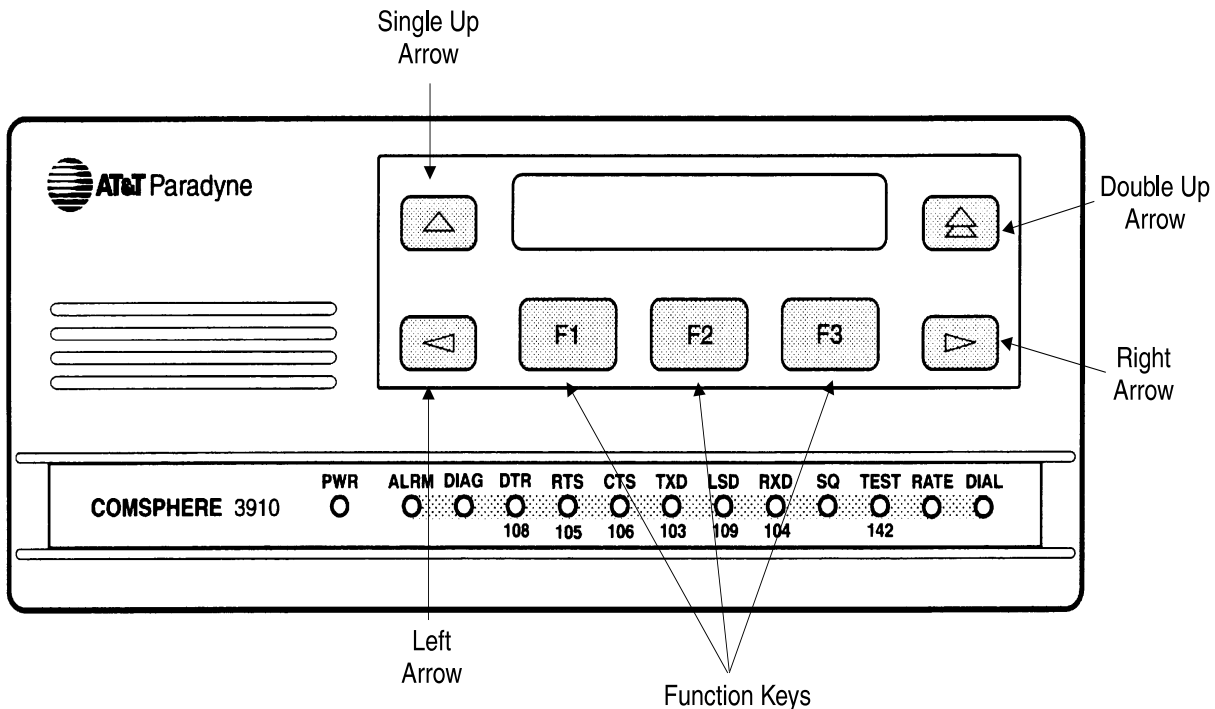


Figure 4-67: Comsphere 3910 Diagnostic Control Panel

To option the *Comsphere* 3910 for CMS, complete the following steps:

1. Press F2 for Configure. "Ld EditArea frm" is displayed.
2. Press the Right Arrow four times. "Factory" is displayed.
3. Press F1 to select "Factory." "Ld Fact Preset:" is displayed.
4. Press Right Arrow four times.
5. Press F1 for "UNIX_Dial."
6. Press F3 for "Save." "Sav EditArea to" is displayed.
7. Press F1 to save to "Active(Saved)." Since you are changing the active area to a new set of options (that is, "Factory/Async_Dial"), the modem will automatically do another Power-On-Self-Test (POST). Since the new options match the way the modem is

connected, the ALRM LED will not turn red. The display lines will be "Idle: 19.2" and "Status Configure." Any time you would like to return to this Top-Level Menu, press the Double Up Arrow.

8. Press F2 for Configure. "Ld EditArea frm" is displayed.
9. Press the Right Arrow once. "Active(Saved)" is displayed.
10. Press F1. "Choose Function" is displayed.
11. Press F1 for "Edit." "Edit StrapGroup" is displayed.
12. Press F1 for "DTE_Interface." "Async/Sync Mode" is displayed.
13. Press F1 for "Nxt." "Async DTE Rate" is displayed.
14. Press the Right Arrow five times for "9600."
15. Press F2 to select "9600."
16. Press F1 for "Nxt." "Asyn #Data Bits (8)" is displayed.
17. Press F1 for "Nxt." "Asyn Parity Bit (None)" is displayed.
18. Press F1 for "Nxt." "Asyn #Stop Bits (1)" is displayed.
19. Press F1 for "Nxt." "DTR Action (Ignore)" is displayed.
20. Press F1 for "Nxt." "DSR Control (Forced_On)" is displayed.
21. Press F1 for "Nxt." "RTS Action (Ignore)" is displayed.
22. Press F1 for "Nxt." "CTS Control (WinkWhenDisc)" is displayed.
23. Press F1 for "Nxt." "RTS/CTS Delay (0 msec)" is displayed.
24. Press F1 for "Nxt." "LSD Control (WinkWhenDisc)" is displayed.
25. Press F1 for "Nxt." "CT111_Rate Cntl (Disable)" is displayed.
26. Press F1 for "Nxt." "DTE_Rate=VF (Disable)" is displayed.
27. Press F1 for "Nxt." "Extend Main Ch. (Disable)" is displayed.
28. Press F1 for "End." "Edit StrapGroup" is displayed.
29. Press the Right Arrow three times to get to the "Dial_Line" strap group. Nothing needs to be changed for CMS in the "DTE_Dialer" or "Line_Dialer" strap groups, so you can skip them.
30. Press F1 to edit the "Dial_Line" strap group. "Dial Line Rate" is displayed.
31. Press the Right Arrow four times for "9600(V32b)."
32. Press F2 to select "9600(V32b)."
33. Press F1 for "Nxt." "V32bis Automode (Enable)" is displayed.
34. Press F1 for "Nxt." "V32bis Autorate (Enable)" is displayed.

35. Press F1 for "Nxt." "Dial Tx Level (Permissv (-9))" is displayed.
36. Press F1 for "Nxt." "V22b Guard Tone (Disable)" is displayed.
37. Press F1 for "Nxt." "V32bis Train (Long)" is displayed.
38. Press F1 for "End." "Edit StrapGroup" is displayed. The other strap groups ("V42/MNP/Buffer," "Test," "Misc," and "Security") will not be changed for CMS.
39. Press the Single Up Arrow to display "Choose Function" and "Edit Save."
40. Press F3 for "Save." "Save EditArea to" is displayed.
41. Press F1 to select "Active(Saved)." "Command Complete" is displayed.
42. Press the Single Up Arrow again to display "Save EditArea to."
43. Press the Right Arrow once to select "Customer 1."
44. Press F1 to save to "Customer 1." "Command Complete" is displayed.
45. Press the Double Up Arrow. "Idle: 9600" and "Status Configure" are displayed. If the modem is powered off, it should return to this state when it is powered on.
46. If you wish to check the status of the *Comsphere* 3910 modem, use the "Status" choice in the Top-Level menu, or use the Right and Left Arrow buttons to view other Top-Level Menu choices.

Chapter 5

Connecting the *Sun SPARCserver* Computer to the Switch

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Overview

Lucent Technologies technicians connect the *Sun*^{*} *SPARCserver*[†] computer to the Lucent Technologies switch. This connection allows the *CentreVu*[™] Call Management System (CMS) software on the *Sun SPARCserver* computer to receive, store, and format the Automatic Call Distribution (ACD) information it receives from the switch.

This chapter explains how to connect the *CentreVu* CMS to the following Lucent Technologies switches:

- *DEFINITY*[®] Communications System Generic 3r

Note

This includes the G3V2 (Generic 3r Version 2) and the G3V3 (Generic 3r Version 3) releases.

- *DEFINITY* Communications System Generic 3i
- *DEFINITY* Communications System Generic 2
- System 85, R2V2 (Release 2 Version 2)
- *DEFINITY* Communications System Generic 1.

Turn to one of these sections to connect the *CentreVu* CMS to the switch:

- “Connecting the *CentreVu* CMS to the Generic 3r” (see page 5-5).
- “Connecting the *CentreVu* CMS to the Generic 2 or System 85” (see page 5-16).
- “Connecting the *CentreVu* CMS to the Generic 3i or Generic 1” (see page 5-30).

Note

DEFINITY Communications System G3V4 (Generic 3 Version 4) can also be connected to the *CentreVu* CMS.

The configurations described in this chapter are for maintenance purposes only. The equipment described can no longer be ordered.

A switch technician should be on site to make the final connection from the *CentreVu* CMS to the switch and, if necessary, to administer the switch for the ACD/*CentreVu* CMS feature.

The *CenterVu* CMS software will not communicate with the switch if the ACD/*CentreVu* CMS feature or the PGATE/DCIU/PI hardware on the switch is not properly administered.

^{*}Sun is a registered trademark of Sun Microsystems, Inc.

[†]SPARCserver is a trademark of SPARC International, Inc.

An experienced switch technician can refer to the following appendices to administer the switch:

- **Appendix A** — contains reference material about the link administration for the Generic 3i and Generic 1 switches.
- **Appendix B** — contains reference material about the DCIU (Data Communications Interface Unit) link administration for the Generic 2 and System 85 switch.
- **Appendix C** — contains reference material about the link administration for the Generic 3r switch.

Note When using a Generic 3r, set the Number of Outstanding Frames (w): field to 4. See Figure C-4 in Appendix C, “Administering *CentreVu* CMS Interface on Generic 3r.”

***Sun SPARCserver* HSI/S Patch Panel**

There are two different methods for connecting the switch to a *Sun SPARCserver* computer. These methods are:

- *SunLink*^{*} High Speed Serial Interface/SBus (HSI/S) Patch Panel
- Serial Port B.

Note The *SunLink* HSI/S Patch Panel is used on the *Sun SPARCserver* 10 and 20. It is used on the *Sun SPARCserver* 5 only for multiple ACD systems (see Figure 5-1). The Serial Port B is only used on the *Sun SPARCserver* 5 for single ACD systems (see Figure 5-2).

^{*}SunLink is a registered trademark of Sun Microsystems, Inc.

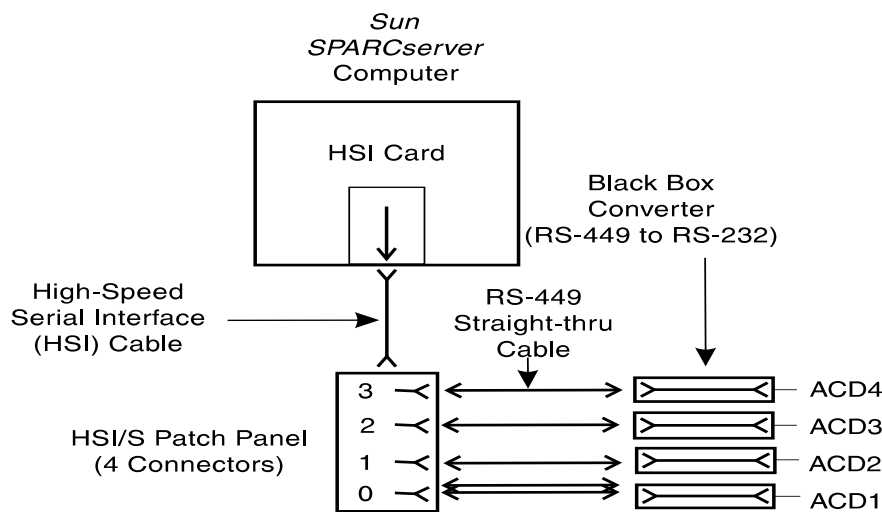


Figure 5-1: SunLink HSI/S Patch Panel

Note The black box converter is connected to the *Sun SPARCserver* computer via the HSI/S controller card and patch panel.



Use the black box converter when connecting the computer to the switch.

Bypassing the black box and connecting the HSI/S patch panel port directly to the switch will cause electrical damage to the *Sun SPARCserver* computer or switch components.

Verify that the *Sun SPARCserver* computer, HSI/S patch panel, and black box converter are connected properly (see Figure 5-1).



These connections should have been done when the HSI/S controller card was installed in the *Sun SPARCserver* computer. If these connections have not been made, see Chapter 3, "Installing the *Sun SPARCserver* Computer."

***Sun SPARCserver* Serial Port B**

The *Sun SPARCserver* serial port B is used only on the *Sun SPARCserver* 5. It is used on the *Sun SPARCserver* 5 for single ACD systems (see Figure 5-2). It cannot be used when an HSI/S card is installed in the *Sun SPARCserver* 5. The serial port B cannot be used for a switch connection with the *Sun SPARCserver* 10 and 20. See

Figure 3-1 in Chapter 3 for a detailed view of the *Sun SPARCserver 5* serial port B.

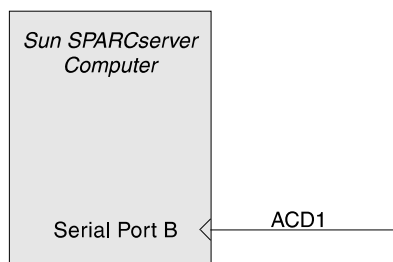


Figure 5-2: Serial Port B

Connecting the *CentreVu* CMS to the Generic 3r

To connect the *CentreVu* CMS to the Generic 3r, you will need to connect the Data Terminal Equipment (DTE) RS-232 port on the *Sun SPARCserver* to the Packet Gateway board (TN577) on the Generic 3r. This connection uses the RS-232C protocol.

You can connect the *CentreVu* CMS to the Generic 3r using one of the following methods:

- Isolating Data Interface (IDI). With this method, the maximum distance between the DTE (RS-232) output port of the *Sun SPARCserver* and the Generic 3r is 200 feet.
- 7400D Data Module (7400D). With this method, the maximum distance between the DTE (RS-232) output port of the *Sun SPARCserver* and the 7400D is 50 feet. The maximum distance between the 7400D and the Generic 3r is 5000 feet with 24-gauge wire and 4000 feet with 26-gauge wire.
- Private Line. This method uses two *Dataphone*® II modems in addition to the 7400D and is required when the customer's configuration exceeds the 7400D distance limitations.

Isolating Data Interface

This section describes how to connect the DTE (RS-232) port on the *Sun SPARCserver* to the Packet Gateway board on the Generic 3r via an IDI (see Figure 5-3). With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun SPARCserver* and the Generic 3r switch is 200 feet.

Required Parts

Obtain the following parts:

- DB25 M/M Direct Connect Link adapter
- H600-210, Group 1 (RS-232C to RS-449) cable
- IDI unit
- H600-210, Group 1, 2, 3, 4, or 5 (RS-232C to RS-449) cable

Note

The Group number determines the length of the cable as shown below:

Group 1 - 10 feet	Group 2 - 25 feet
Group 3 - 50 feet	Group 4 - 100 feet
Group 5 - 200 feet.	

- H600-347, Group 1 (RS-232C) cable.

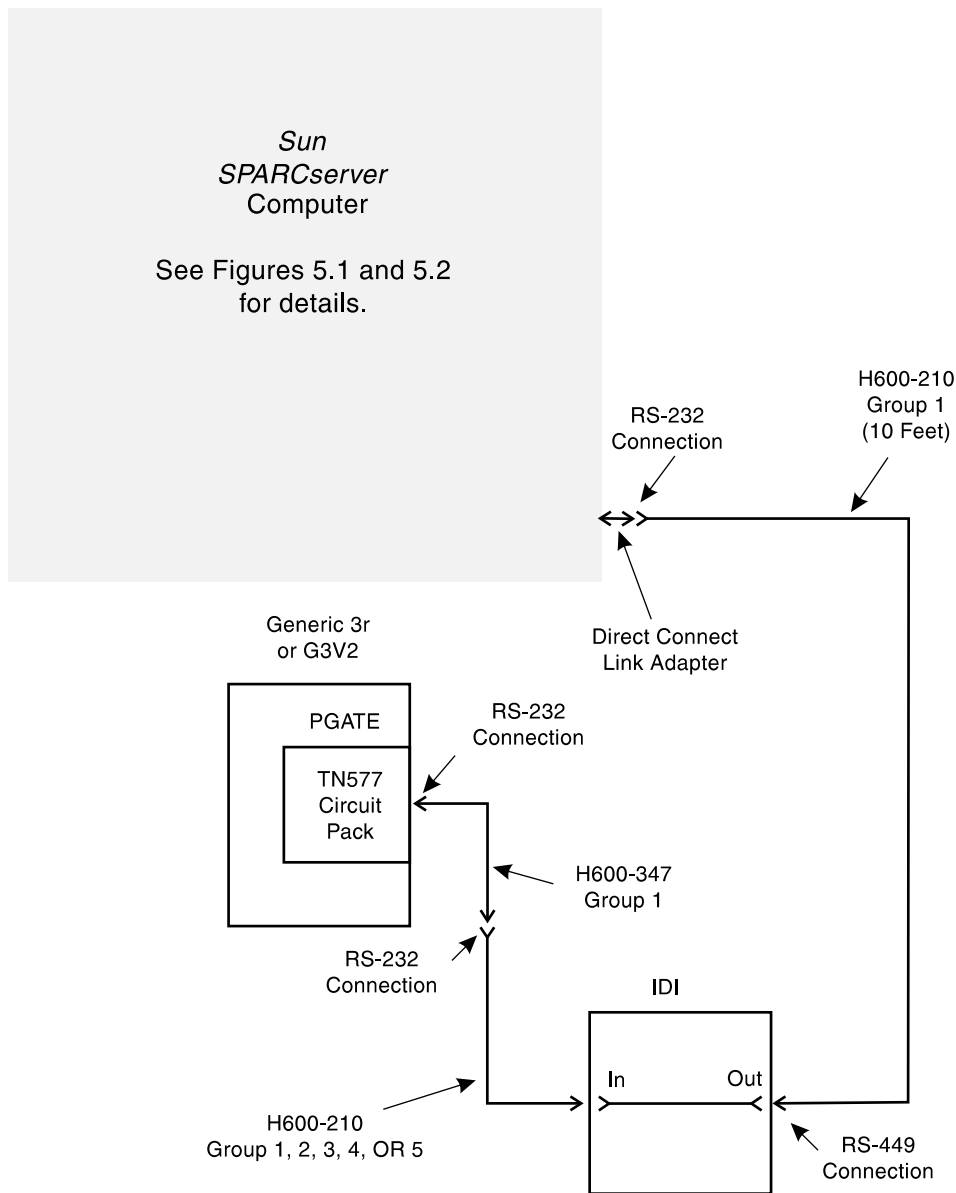


Figure 5-3: *Sun SPARCserver* Computer to Generic 3r Via the IDI

Procedure

Do these steps to connect the *Sun SPARCserver* computer to the Packet Gateway of a Generic 3r switch via an IDI unit (see Figure 5-3):

1. If an HSI/S card is installed, connect the direct-connect link adapter to the DTE (RS-232) output port on the black box converter. If **no** HSI/S card is installed, connect the direct-connect link adapter to the serial port B (*Sun SPARCserver* 5 only).
2. Connect the female end of the H600-210, Group 1 cable to the direct-connect link adapter.

3. Connect the male end of the H600-210, Group 1 cable to the **Out** connector on the IDI unit.
4. Connect the male end of the H600-210, Group 1 cable to the **In** connector on the IDI unit.
5. Connect the female end of the H600-210, Group 1 cable to the male end of the H600-347, Group 1 cable.

In the next step, the switch technician should make the final connection to the Packet Gateway board.

6. Connect the male end of the H600-347, Group 1 cable to the Packet Gateway board.
7. Verify with the switch technician that the ACD/*CentreVu* CMS feature is administered on the switch.

7400D Data Module

This section describes how to connect the DTE (RS-232) port on the *Sun SPARCserver* to the Packet Gateway board on the Generic 3r using 7400D Data Modules (see Figure 5-4).

With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun SPARCserver* and the 7400D is 50 feet. The maximum allowable distance between the 7400D and the Generic 3r is 5000 feet with 24-gauge wire and 4000 feet with 26-gauge wire.

Required Parts

Obtain the following parts:

- DB25 M/M Gender Changer

Note

If the M25A cable is not long enough to reach the 7400D, obtain an ED-1E434-11, Group 309 (RS-232C) cable to make the connection between the gender changer and the 7400D.

- Two 7400Ds with a stand-alone housing
- Two 7-foot D8W-87 modular plug telephone cords (included with the stand-alone housing)
- H600-347, Group 1 (RS-232C) cable
- Two M25A (RS-232C) cables
- Two B25A (RS-232C) cables.

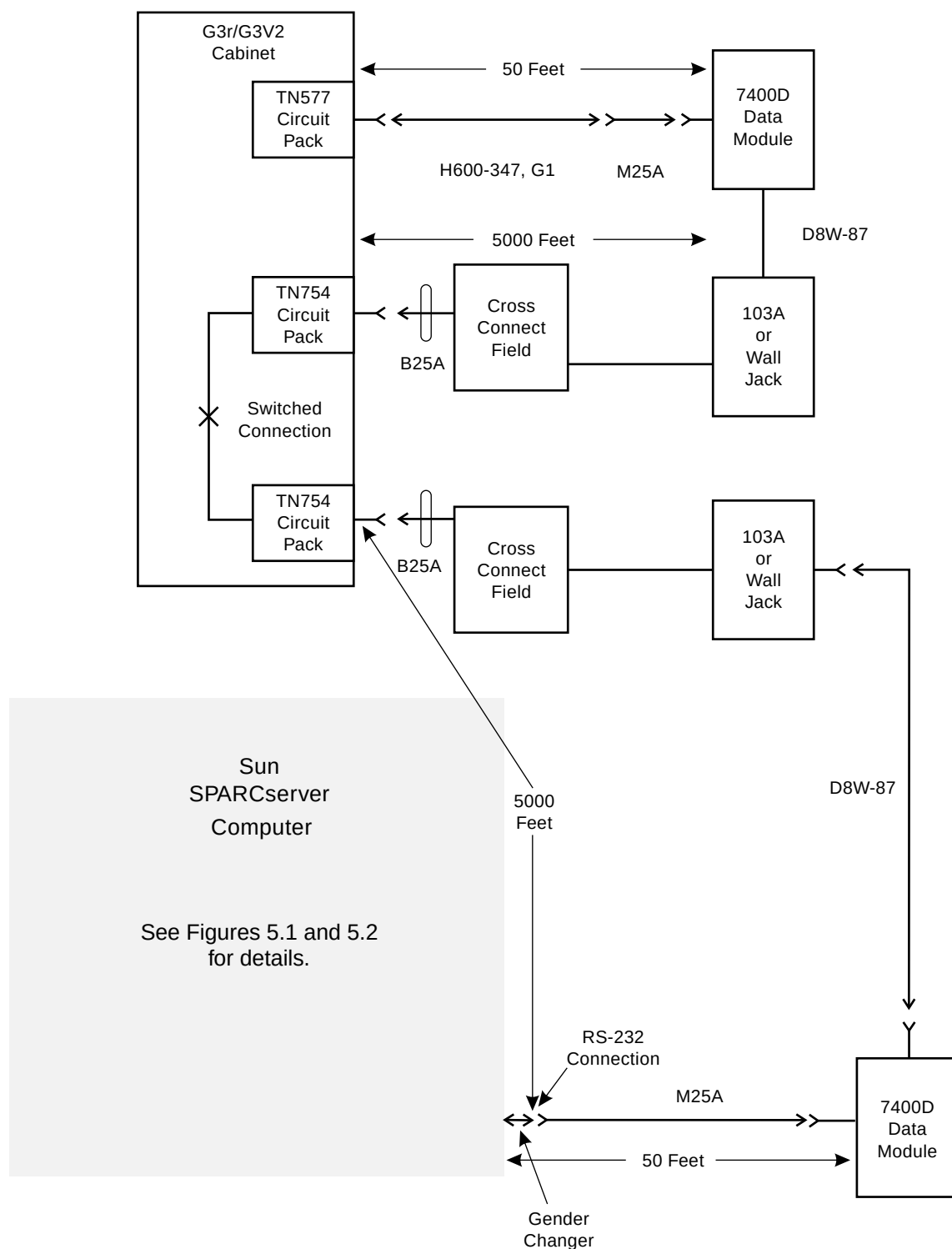


Figure 5-4: Sun SPARCserver Computer to Generic 3r Cabling with a 7400D

Procedure

Do these steps to connect the *Sun SPARCserver* computer to a Packet Gateway board on the Generic 3r switch (see Figure 5-4):

1. Connect the male end of the H600-347, Group 1 cable to the Packet Gateway. (Record the connector number on the cable for later use.)
2. Connect the other male end of the H600-347, Group 1 cable to the female end of the M25A cable.
3. Connect the male end of the M25A cable to the connector labeled "PORT 1" on the 7400D.
4. Connect the AC Power Converter to the 7400D and to an AC power outlet.
 - a. Plug the power supply cord plug into the connector labeled "POWER" on the 7400D.
 - b. Plug the power supply cord into an AC power outlet.

Note

When connecting the *CentreVu* CMS to a G3r, change the speed of the 7400Ds to 19200. The remaining default options are acceptable for *CentreVu* CMS. Refer to the *7400D Data Module User's Guide* (555-020-712) for information on options and setting options.

5. Connect one end of a D8W-87 modular plug telephone cord into the LINE jack on the 7400D.
6. Connect the other end of the D8W-87 cord to the Generic 3r cross-connect.

Note

If the D8W-87 cord is not long enough, you will have to locally engineer the cable between the 7400D and the cross-connect. This cable must have a modular plug on each end.

In the next step, the switch technician should make the final connection to the digital port.

7. Run a locally engineered cable from the cross-connect to a TN754 circuit pack on the Generic 3r. This cable also requires a modular plug on each end.
8. Run another locally engineered cable from the cross-connect to a TN754 circuit pack on the Generic 3r. This cable also requires a modular plug on each end.
9. Connect one end of the D8W-87 cord to the Generic 3r cross-connect.

10. Connect the other end of a D8W-87 modular plug telephone cord into the LINE jack on the 7400D.

Note

If the D8W-87 cord is not long enough, you will have to locally engineer the cable between the 7400D and the cross-connect. This cable must have a modular plug on each end.

11. Connect the AC Power Converter to the 7400D and to an AC power outlet.
 - a. Plug the power supply cord plug into the connector labeled "POWER" on the 7400D.
 - b. Plug the power supply cord into an AC power outlet.

Note

When connecting the *CentreVu* CMS to a G3r, change the speed of the 7400Ds to 19200. The remaining default options are acceptable for *CentreVu* CMS. Refer to the *7400D Data Module User's Guide* (555-020-712) for information on options and setting options.

12. Connect the male end of the M25A cable to port 1 (RS-232) on the 7400D.
13. Connect the female end of the M25A cable to the gender changer.
14. If an HSI/S card is installed, connect the gender changer to the DTE (RS-232) output port on the black box converter. If **no** HSI/S card is installed connect the gender changer to the serial port B (*Sun SPARCserver 5* only).
15. Verify with the switch technician that the ACD/*CentreVu* CMS feature on the switch is administered.

Private Line

This section describes how to connect the Generic 3r to a private line that connects to the DTE (RS-232) port on the *Sun SPARCserver* (see Figure 5-5).

This method uses two *Dataphone II* modems in addition to the 7400D and is required when the customer's configuration exceeds the 7400D distance limitations.

Required Parts

Obtain these parts to connect the *Sun SPARCserver* computer to a private line:

- 110-type cross-connect hardware
- 829 Channel Interface unit

Note

If the channel interface unit is not available on the customer's premises, order PEC 9200-030 which is a stand-alone replacement unit. You must order this unit through the Custom Systems organization via the CSAP (Custom Systems Automation Program).

- DB25 M/M Gender Changer
- M25A cable
- One 2096C *Dataphone* II modem.

Also, obtain these parts to connect the Generic 3r to a private line:

- 110-type cross-connect hardware
- 829 Channel Interface unit

Note

If the channel interface unit is not available on the customer's premises, order PEC 9200-030 which is a stand-alone replacement unit. You must order this unit through the Custom Systems organization via the CSAP.

- M25A cable
- One 2096C *Dataphone* II modem.

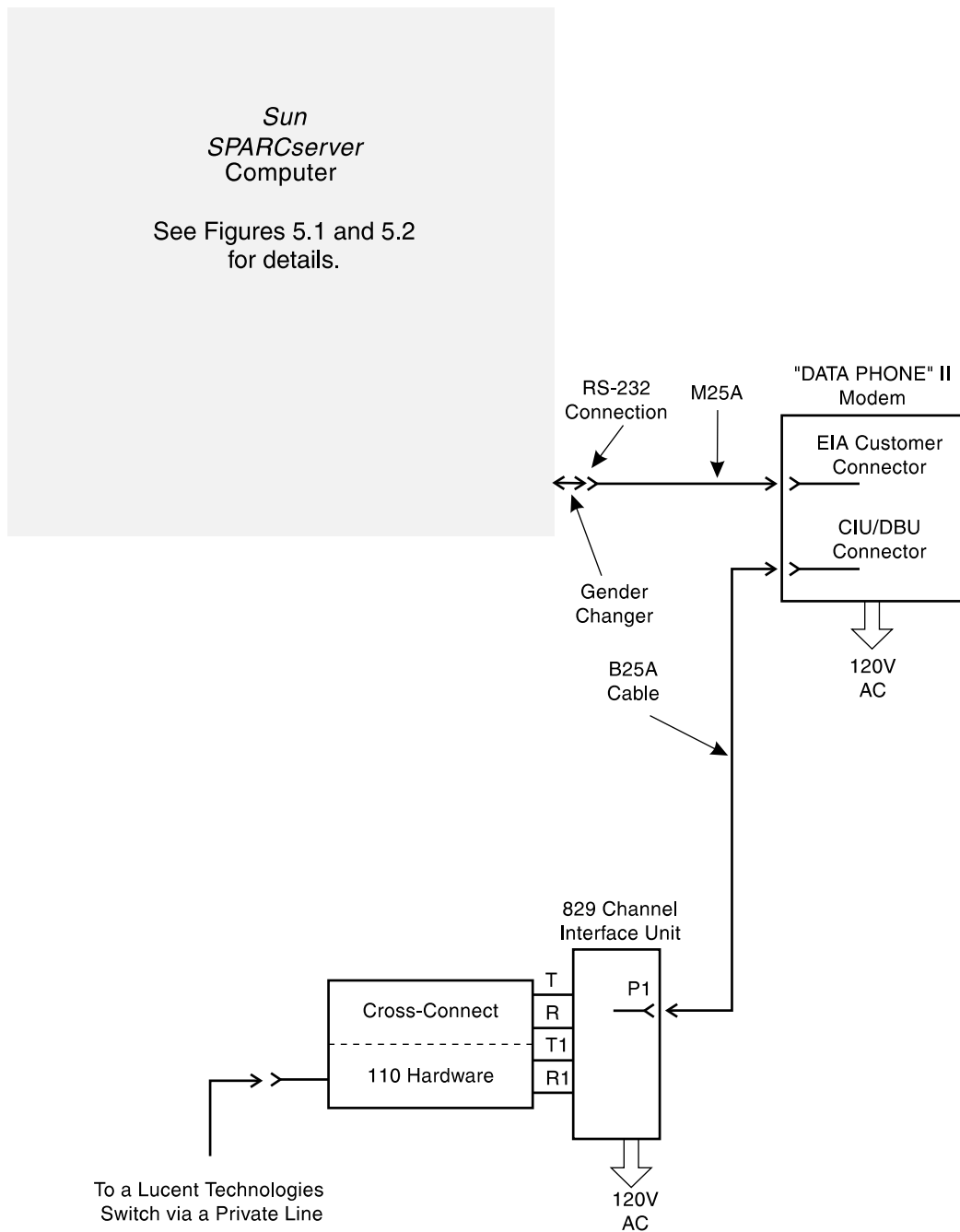


Figure 5-5: Sun SPARCserver Computer Cabling to a Private Line

Procedure for Connecting the *Sun SPARCserver* Computer to a Private Line

Do these steps to connect the *Sun SPARCserver* computer to a private line (see Figure 5-5):

1. If an HSI/S card is installed, connect the gender changer to the DTE (RS-232) output port on the black box converter. If **no** HSI/S card is installed connect the gender changer to the serial port B (*Sun SPARCserver* 5 only).
2. Connect the female end of the M25A cable to the gender changer.
3. Connect male end of the M25A cable to the EIA Customer Connector receptacle on the *Dataphone* II modem.
4. Connect male end of the B25A cable to the CIU/DBU Connector receptacle on the *Dataphone* II modem.
5. Connect the other end of the B25A cable to the P1 receptacle on the 829 Channel Interface unit.
6. Plug the *Dataphone* II modem into an AC power source.
7. Plug the 829 Channel Interface unit into an AC power source.
8. Connect the tip and ring from the 829 Channel Interface unit to the cross-connect hardware.

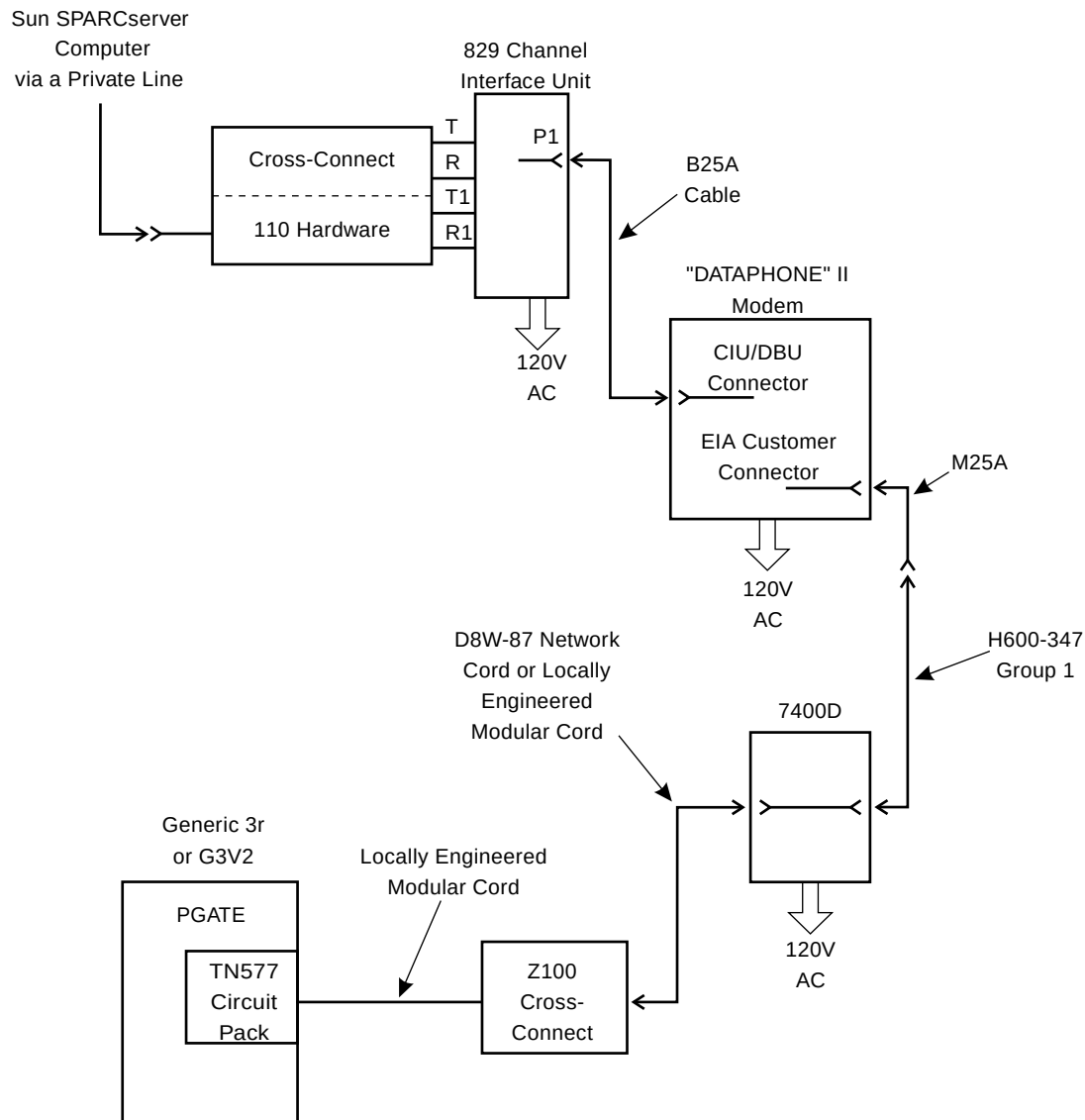


Figure 5-6: Generic 3r Cabling to a Private Line

Procedure for Connecting a Generic 3r to a Private Line

Do these steps to connect the Generic 3r to a private line (see Figure 5-6):

1. Connect the tip and ring from the 829 Channel Interface unit to the cross-connect hardware.
2. Plug the 829 Channel Interface unit into an AC power source.
3. Connect the other end of the B25A cable to the P1 receptacle on the 829 Channel Interface unit.
4. Connect the other end of the M25A cable to the CIU/DBU Connector receptacle on the *Dataphone* II modem.

5. Plug the *Dataphone* II modem into an AC power source.
6. Connect the male end of the M25A cable to the EIA Customer Connector receptacle on the *Dataphone* II modem.
7. Connect the female end of the M25A cable to the male end of the H600-347, Group 1 cable.
8. Connect the other male end of the H600-347, Group 1 cable to the Packet Gateway fanout cable.
9. Verify with the switch technician that the ACD/*CentreVu* CMS feature on the switch is administered.

Connecting the *CentreVu* CMS to the Generic 2 or System 85

To connect the *Sun SPARCserver* computer to the System 85 or Generic 2, you will need to connect the DTE (RS-232C) port on the *Sun SPARCserver* to the Data Communications Interface Unit (DCIU) on the Generic 2 or System 85. This connection uses the RS-232C protocol.

You can connect the *Sun SPARCserver* computer to the Generic 2 or System 85 switch by using one of the following methods:

- IDI (Isolating Data Interface)

With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun SPARCserver* and the Generic 2 or System 85 is 400 feet.

- LDSUs (Local Data Service Units)

With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun SPARCserver* and the Generic 2 or System 85 is 100 feet.

- RDSUs (Remote Data Service Units)

Use this method when the distance between the DTE (RS-232C) output port of the *Sun SPARCserver* and the Generic 2 or System 85 is over 100 feet.



For this method, 4-wire nonloaded metallic lines are required to interconnect the DSUs. When provided by the telephone company, these 4-wire nonloaded metallic lines are called Local Area Data Channels (LADCs).

- Analog Private Line.

Use this method when the distance of the DSUs has been exceeded.

Check the equipment and parts delivered to the customer's site to determine which method to use.

Isolating Data Interface

With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun SPARCserver* and Generic 2 or System 85 switch is 400 feet (see Figure 5-7).

Required Parts

Obtain the following parts:

- DB25 M/M Direct-Connect Link adapter
- ED-1E434-11, Group 175 cable (RS-232C to RS-449 transition cable)
- IDI unit
- ED-1E434-11, Group 304 (RS-449) cable (up to 400 feet long).

If the switch is equipped with duplicated common controls, obtain an ED-1E434-11, Group 342 Y-cable.



Procedure

Do these steps to connect the *Sun SPARCserver* computer to the DCIU on the Generic 2 or System 85 via an IDI (see Figure 5-7):

1. If an HSI/S card is installed, connect the direct-connect link adapter to the DTE (RS-232) output port on the black box converter. If **no** HSI/S card is installed connect the direct-connect link adapter to the serial port B (*Sun SPARCserver* 5 only).
2. Connect the female end of the ED-1E434-11, Group 175 cable to the direct-connect link adapter.
3. Connect the plug end of the ED-1E434-11, Group 304 cable to the **IN** connector on the IDI.

Note

In the next step, the switch technician should make the final connection to the DCIU port.

4. If the Generic 2 or System 85 is equipped with a single common control, connect the receptacle end of the ED-1E434-11, Group 304 cable to the switch at ports F0 through F7. Record the port number that you use, because it will be needed during switch administration.
5. If the Generic 2 or System 85 is equipped with duplicated common controls, connect the receptacle end of the ED-1E434-11, Group 304 cable to the plug end of the ED-1E434-11, Group 342 cable.
6. Next, connect the receptacle ends of the ED-1E434-11, Group 342 cable to the duplicated common controls at ports F0 through F7. You must select the same port on each of the common controls. Record the port number that you use, because it will be needed during switch administration.
7. Verify with the switch technician that the ACD/*CentreVu* CMS feature on the switch is administered.

Local Data Service Units

This section describes how to connect the DTE (RS-232) port on the *Sun SPARCserver* to the DCIU on the Generic 2 or System 85 using LDSUs (Local Data Service Units). See Figure 5-8 for details.

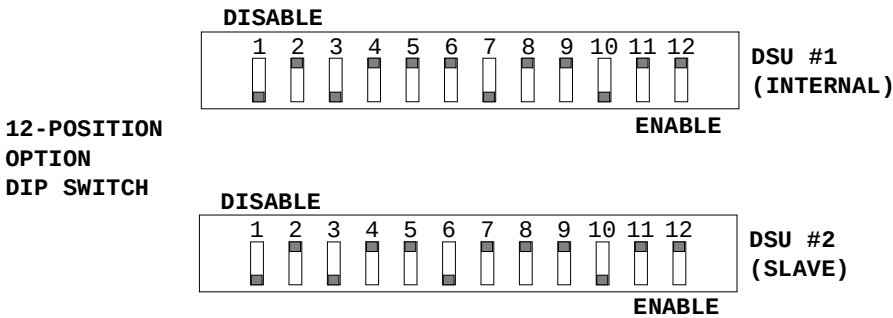
With this method, the maximum allowable distance between the DTE (RS-232C) output port of the *Sun SPARCserver* and the Generic 2 or System 85 switch is 100 feet.

Required Parts

Obtain the following parts:

- DB25 M/M Gender Changer
- One ED-1E434-11, Group 309 (RS-232) cable
- Two DSUs (Data Service Units)
- One D8W-87 Network cord (25 feet) — one cord is provided with each DSU
- ED-1E434-11, Group 13 transition (RS-449 to RS-232C) cable (3 inches)
- ED-1E434-11, Group 304 cable (RS-449) — for single or duplicated common controls
- ED-1E434-11, Group 342 Y-cable (9 feet) — for duplicated common controls only.

Refer to the *Dataphone II 2500-Series Data Service Units User's Manual* (999-100-188) to set the timing options and speed of operation (9.6 kbps) for the DSUs. One DSU must be set for “internal” timing, and the other DSU must be set for “slave” timing. You do this by setting the 12-position option dip switch located on the circuit pack inside the DSU (see example below). You can also use this document as a reference when doing the installation steps in this section.



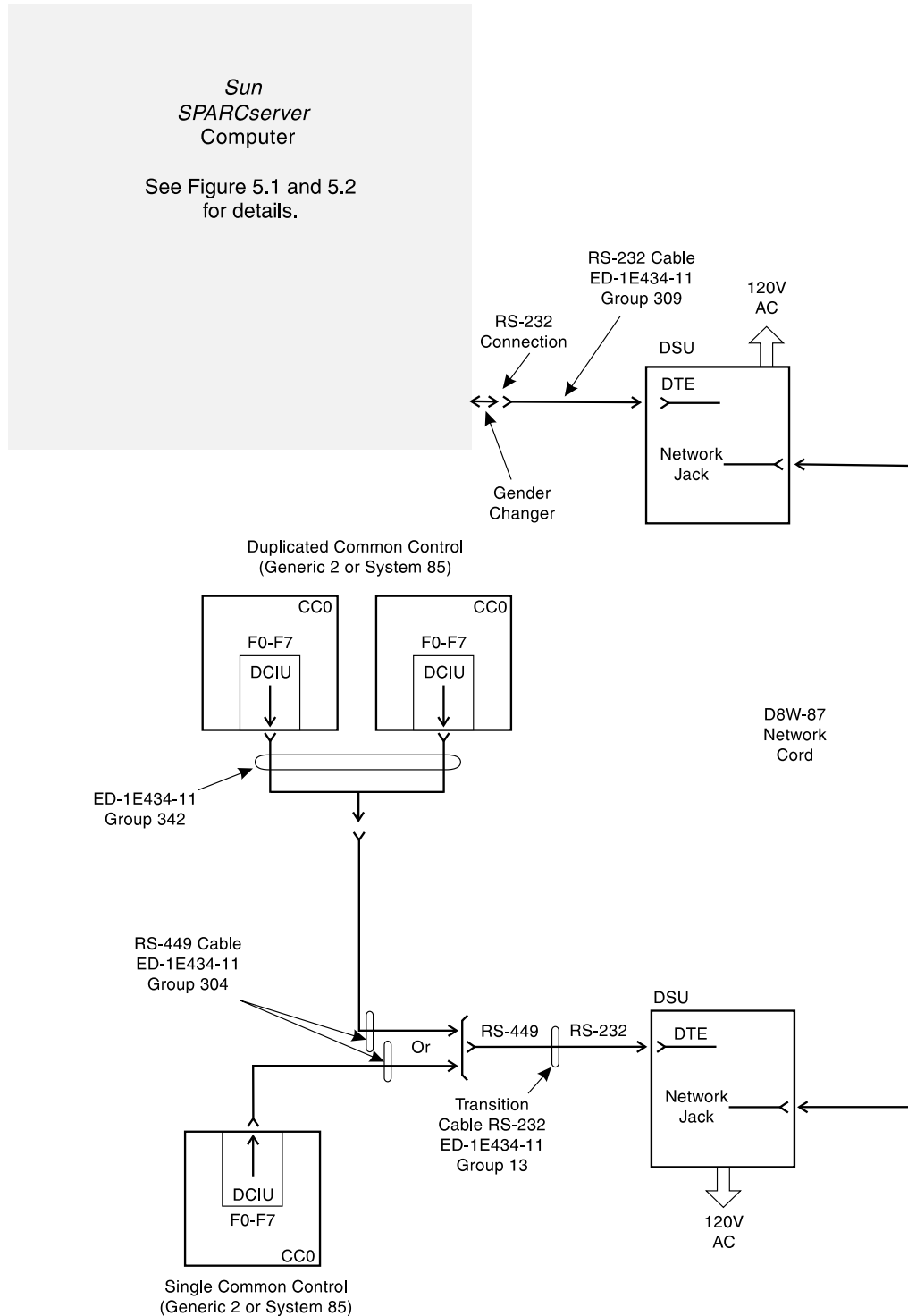


Figure 5-8: Sun SPARCserver Computer to Generic 2 or System 85 Cabling with Local DSUs

Procedure

Do these steps to connect the *Sun SPARCserver* computer to the DCIU on the Generic 2 or System 85 using LDSUs (see Figure 5-8):

1. If an HSI/S card is installed, connect the gender changer to the DTE (RS-232) output port on the black box converter. If **no** HSI/S card is installed connect the gender changer to the serial port B (*Sun SPARCserver* 5 only).
2. Connect the female end of ED-1E434-11, Group 309 (RS-232) cable to the gender changer.
3. Connect the male end of the ED-1E434-11, Group 309 (RS-232) cable to the receptacle labeled DTE on the back of the DSU.
4. Connect the two DSUs together by using a 25-foot D8W-87 network cord and connecting each end of the cord to the network jacks on the DSUs.
5. Connect each DSU to an AC power source by using the DSU power packs.
6. Connect the plug end of the Group 13 transition cable to the receptacle labeled DTE on the back of the DSU that will be used to connect to the switch.
7. Then, connect the receptacle end of the Group 13 transition cable to the plug end of the ED-1E434-11, Group 304 cable.



In the next step, the switch technician should make the final connection to the DCIU port.

8. If the Generic 2 or System 85 is equipped with single common control, connect the receptacle end of the Group 304 cable to the single common control at ports F0 through F7. Record the port number that you use, because it will be needed during switch administration.
9. If the Generic 2 or System 85 is equipped with duplicated common controls, connect the receptacle end of the Group 304 cable to the plug end of the ED-1E434-11, Group 342 Y-cable.
10. Connect the receptacle ends of the Y-cable to the duplicated common controls at ports F0 through F7. You must select the same ports on both common controls. Record the port number that you use, because it will be needed during switch administration.
11. Verify with the switch technician that the ACD/*CentreVu* CMS feature on the switch is administered.

Remote Data Service Units

This section describes how to connect the DTE (RS-232) port on the *Sun SPARCserver* to the DCIU on the Generic 2 or System 85 using RDSUs (Remote Data Service Units) (see Figure 5-9).

Use this method when the distance between the DTE (RS-232) output port of the *Sun SPARCserver* and the Generic 2 or System 85 switch is over 100 feet.

Required Parts

Obtain the following parts:

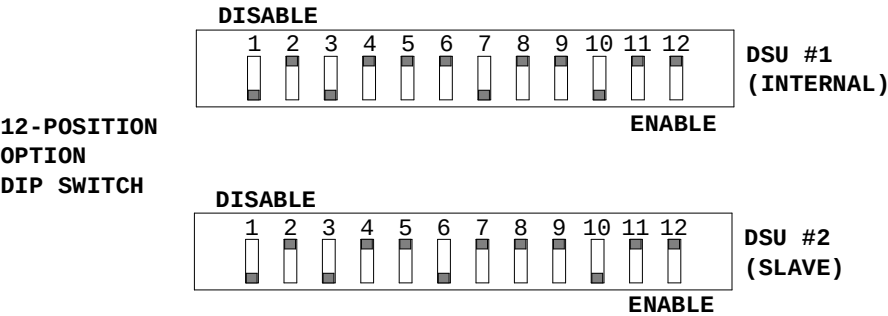
- DB25 M/M Gender Changer
- One ED-1E434-11, Group 309 (RS-232) cable
- Two DSUs
- Two D8W-87 network cords (25 feet) — one cord is provided with each DSU
- Two Network Interface adapters — one adapter is provided with each DSU
- ED-1E434-11, Group 13 transition (RS-449 to RS-232C) cable (3 inches)
- ED-1E434-11, Group 304 cable (RS-449) — for single or duplicated common controls
- ED-1E434-11, Group 342 Y-cable (9 feet) — for duplicated common controls only
- 110- or 66-type cross-connect hardware
- 4-wire nonloaded metallic lines (LADC equivalent) — use lengths as needed.

Table 5-1 shows the maximum allowable distances between the DSUs based on various wire sizes and a speed of 9.6 kbps.

Table 5-1: LADC Ranges

Wire Gauge (AWG)	DSU Speed (kbps)	Miles
19	9.6	15.2
22	9.6	9.7
24	9.6	7.3
26	9.6	5.6

Refer to the *Dataphone II 2500-Series Data Service Units User's Manual* (999-100-188) to set the timing options and speed of operation (9.6 kbps) for the DSUs. One DSU must be set for “internal” timing, and the other DSU must be set for “slave” timing. You do this by setting the 12-position option dip switch located on the circuit pack inside the DSU (see example below). You can also use this document as a reference when doing the installation steps in this section.



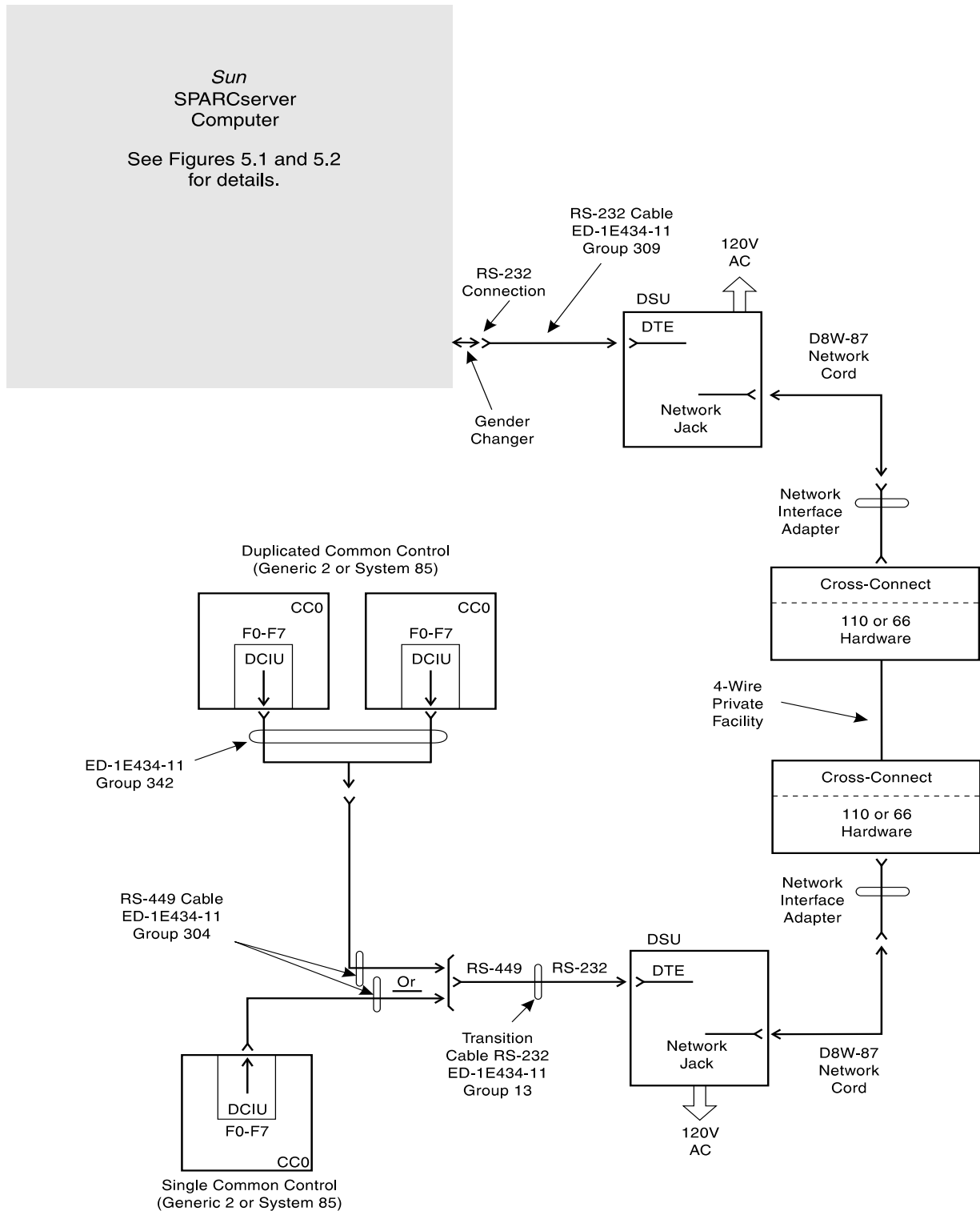


Figure 5-9: Sun SPARCserver Computer to Generic 2 or System 85 Cabling with Remote DSUs

Procedure

Do these steps to connect the *Sun SPARCserver* computer to the DCIU on the Generic 2 or System 85 using RSDUs (see Figure 5-9):

1. If an HSI/S card is installed, connect the gender changer to the DTE (RS-232) output port on the black box converter. If **no** HSI/S card is installed, connect the gender changer to the serial port B (*Sun SPARCserver* 5 only).
2. Connect the female end of ED-1E434-11, Group 309 (RS-232) cable to the gender changer.
3. Connect the male end of the ED-1E434-11, Group 309 (RS-232) cable to the receptacle labeled DTE on the back of the DSU.
4. Connect one end of a D8W-87 network cord to the network jack on the DSU.
5. Connect the other end of the D8W-87 network cord to the receptacle end of a network interface adapter.
6. Punch down the spade-tipped leads of the network Interface adapter to the *Sun SPARCserver* computer's cross-connect hardware.
7. Use 4-wire nonloaded metallic lines (LADC equivalent) to interconnect the cross-connect hardware.
8. Obtain another network interface adapter.
9. Punch down the spade-tipped leads of the network interface adapter to the switch's cross-connect hardware.
10. Connect the receptacle of the network interface adapter to one end of another D8W-87 network cord.
11. Connect the other end of a D8W-87 network cord to the network jack on the DSU that will be connected to the switch.
12. Connect each DSU to a 120-volt AC power source by using the DSU power packs.
13. Connect the plug end of the Group 13 transition cable to the receptacle labeled DTE or Port B on the DSU that will be connected to the switch.
14. Then connect the receptacle end of the Group 13 transition cable to the plug end of the ED-1E434-11, Group 304 cable. In the next step, the switch technician should make the final connection to the DCIU port.

15. If the Generic 2 or System 85 is equipped with single common control, connect the receptacle end of the Group 304 cable to the single common control at ports F0 through F7. Record the port number that you use, because it will be needed during switch administration.

If the Generic 2 or System 85 is equipped with duplicated common controls, connect the receptacle end of the Group 304 cable to the plug end of the ED-1E434-11, Group 342 Y-cable. Connect the receptacle ends of the Y-cable to the duplicated common controls at ports F0 through F7. You must select the same ports on both common controls. Record the port number that you use, because it will be needed during switch administration.

16. Verify with the switch technician that the ACD/*CentreVu* CMS feature on the switch is administered.

Analog Private Line

This section describes how to connect the Generic 2 or System 85 to the DTE (RS-232) port on the *Sun SPARCserver* using an analog private line.

This method is used when the distance of the DSUs has been exceeded.

Note To connect the *Sun SPARCserver* computer to an analog private line, refer to the previous section in this chapter entitled “*Connect the CentreVu CMS to an Analog Private Line*” on page 5-38.

Required Parts

Obtain the following parts to connect the System 85 to an analog private line:

- One ED-1E434-11, Group 304 (RS-232C) cable (50 feet) — for single and duplicated common controls
- One ED-1E434-11, Group 342 Y-cable — for duplicated common controls only
- One 2096C *Dataphone* II modem
- B25A cable
- 829 Channel Interface unit.

Note If the channel interface unit is not available on the customer's premises, order PEC 9200-030 which is a stand-alone replacement unit. You order this unit through the Custom Systems organization via the CSAP.

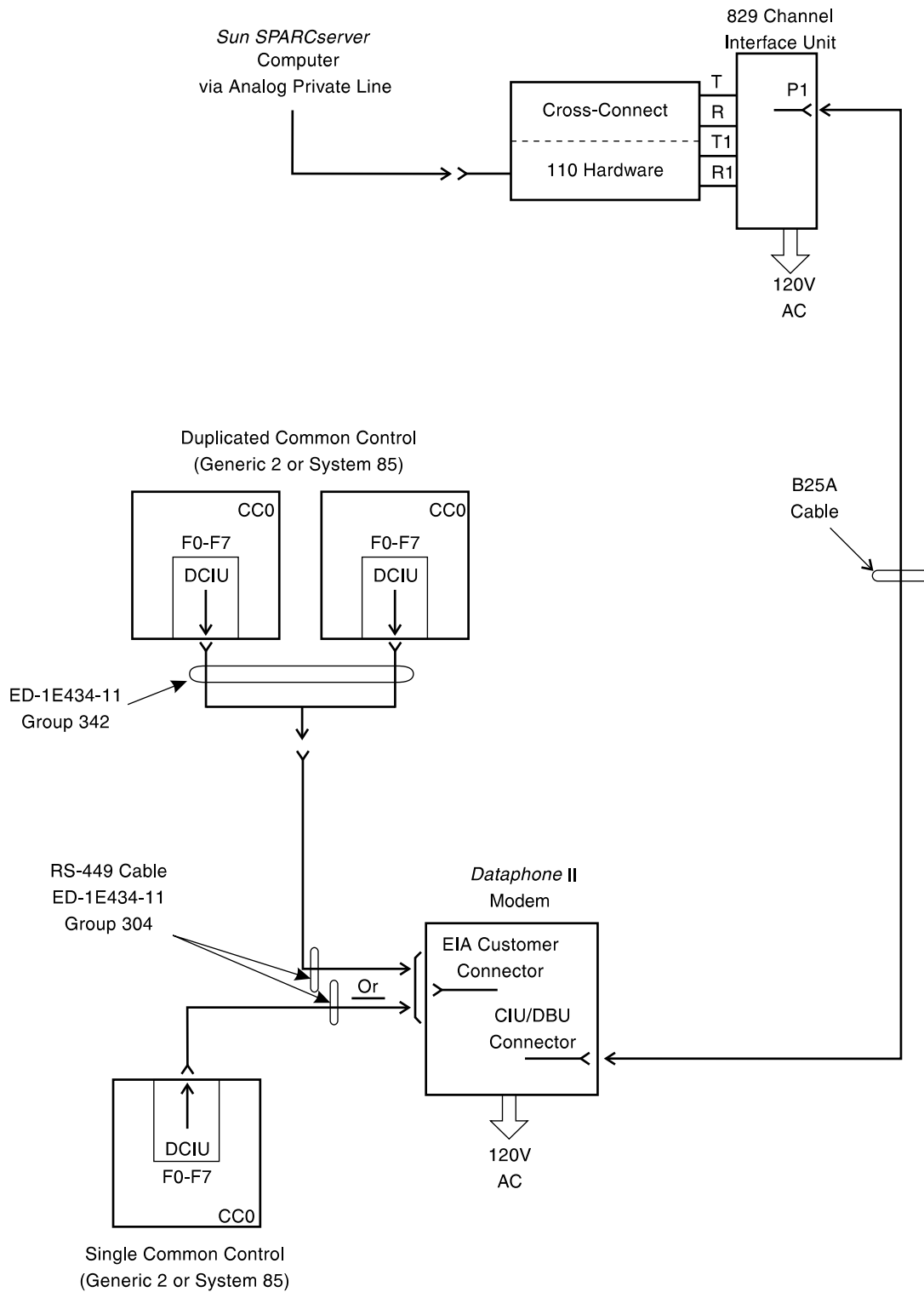


Figure 5-10: Generic 2 or System 85 Cabling to an Analog Private Line

Procedure

Do these steps to connect the Generic 2 or System 85 to an analog private line (see Figure 5-10):

1. Connect the tip and ring from the 829 Channel Interface unit to the cross-connect hardware.
2. Plug the 829 Channel Interface unit into a 120-volt AC power source.
3. Connect one end of the B25A cable to the CIU/DBU Connector receptacle on the *Dataphone* II modem. Connect the other end of the B25A cable to the P1 receptacle on the 829 Channel Interface unit.
4. Plug the *Dataphone* II modem into a 120-volt AC power source.
5. Connect the plug end of the ED-1E434-11, Group 304 cable to the EIA Customer Connector receptacle on the *Dataphone* II modem.

In the next step, the switch technician should make the final connection to the DCIU port.

6. If the Generic 2 or System 85 is equipped with single common control, connect the receptacle end of the Group 304 cable to the single common control at ports F0 through F7. Record the port number that you use, because it will be needed during switch administration.

If the Generic 2 or System 85 is equipped with duplicated common controls, connect the receptacle end of the Group 304 cable to the plug end of the ED-1E434-11, Group 342 Y-cable. Connect the receptacle ends of the Y-cable to the duplicated common controls at ports F0 through F7. You must select the same ports on both common controls. Record the port number that you use, because it will be needed during switch administration.

7. Verify with the switch technician that the ACD/*CentreVu* CMS feature on the switch is administered.

Connecting the *CentreVu* CMS to the Generic 3i or Generic 1

To connect the *Sun SPARCserver* computer to the Generic 3i or Generic 1, you will need to connect the DTE (RS-232) port on the *Sun SPARCserver* to a digital port on the Generic 3i or Generic 1 switch. This connection uses the RS-232C protocol.

You can connect the *Sun SPARCserver* computer to the Generic 3i or Generic 1 switch by using one of the following methods:

- EIA Connector on the Processor Interface

With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun SPARCserver* and the Generic 3i or Generic 1 is 50 feet.

- 7400D Data Module

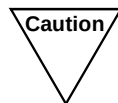
With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun SPARCserver* and the 7400D is 50 feet. The maximum allowable distance between the 7400D and the Generic 3i or Generic 1 is 5000 feet with 24-gauge wire and 4000 feet with 26-gauge wire.

- Analog Private Line.

This method uses two *Dataphone* II modems in addition to the 7400D and is required when the customer's configuration exceeds the 7400D distance limitations.

EIA Connector on the Processor Interface

This section describes how to connect the DTE (RS-232) port on the *Sun SPARCserver* to the EIA connector of a Processor Interface on the Generic 3i or Generic 1.



If the Generic 3i or Generic 1 has duplicated common controls, the EIA port on the Processor Interface cannot be used.

With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun SPARCserver* and the Generic 3i or Generic 1 switch is 50 feet.

Note

If the Generic 3i or Generic 1 switch and the DTE (RS-232) output port of the *Sun SPARCserver* are over 50 feet apart, refer to the section *Connecting the CentreVu CMS to the Generic 3i or Generic 1* for the proper cabling configuration.

Required Parts

Obtain the following parts:

- Isolating Data Interface (IDI) unit
- DB25 M/M Direct Connect Link adapter
- ED-1E434-11, Group 175 (RS-232C to RS-449) cable
- ED-1E434-11, Group 304 (RS-449) cable
- ED-H600-362, Group 1 (RS-232C to RS-449) cable.

Note

The Group number determines the length of the cable as shown below:

Group 1 - 10 feet
Group 2 - 25 feet
Group 3 - 50 feet
Group 4 - 100 feet
Group 5 - 200 feet.

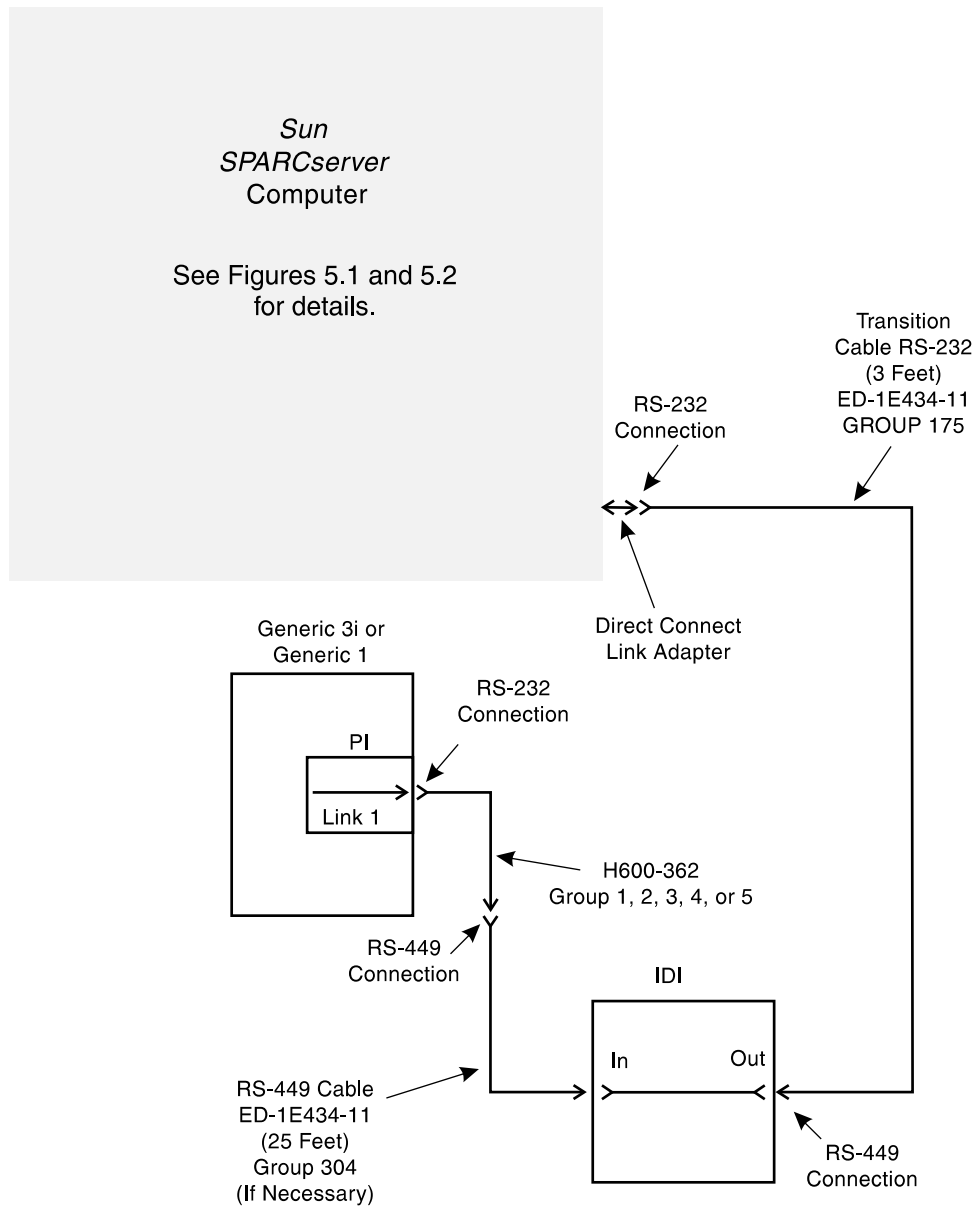


Figure 5-11: *Sun SPARCserver* Computer to Generic 3i or Generic 1 Cabling Via the IDI

Procedure

Do these steps to connect the *Sun SPARCserver* computer to the Processor Interface of a Generic 3i or Generic 1 switch (see Figure 5-11):

1. If an HSI/S card is installed, connect the direct-connect link adapter to the DTE (RS-232) output port on the black box converter. If **no** HSI/S card is installed, connect the direct-connect link adapter to the serial port B (*Sun SPARCserver* 5 only).

2. Connect the female end of the ED-1E434-11, Group 175 cable to the direct-connect link adapter.
3. Connect the male end of the ED-1E434-11, Group 175 cable to the **Out** connector on the Isolating Data Interface unit.
4. Connect the male end of the ED-1E434-11, Group 304 cable to the **In** connector on the Isolating Data Interface unit.
5. Connect the female end of the ED-1E434-11, Group 304 cable to the male end of the ED-H600-362 cable.

In the next step, the switch technician should make the final connection to Link 1 (EIA connector) of the Processor Interface.

6. Connect the female end of the ED-H600-362 cable to Link 1 (EIA connector) of the Processor Interface.
7. Ask the switch technician to verify that the ACD/*CentreVu* CMS feature on the switch has been administered.

7400D Data Module

This section describes how to connect the DTE (RS-232) port on the *Sun SPARCserver* to the Packet Gateway board on the Generic 3i or Generic 1 using 7400D Data Modules.

With this method, the maximum allowable distance between the *Sun SPARCserver* computer and the 7400D Data Module is 50 feet. The maximum allowable distance between the 7400D and the Generic 3i or Generic 1 is 5000 feet with 24-gauge wire and 4000 feet with 26-gauge wire.

Required Parts

Obtain the following parts:

- DB25 M/M Gender Changer
- ED-1E434-11, Group 309 (RS-232C) cable
- 7400D with a stand-alone housing
- D8W-87 modular plug telephone cord (7 feet — included with the stand-alone housing).

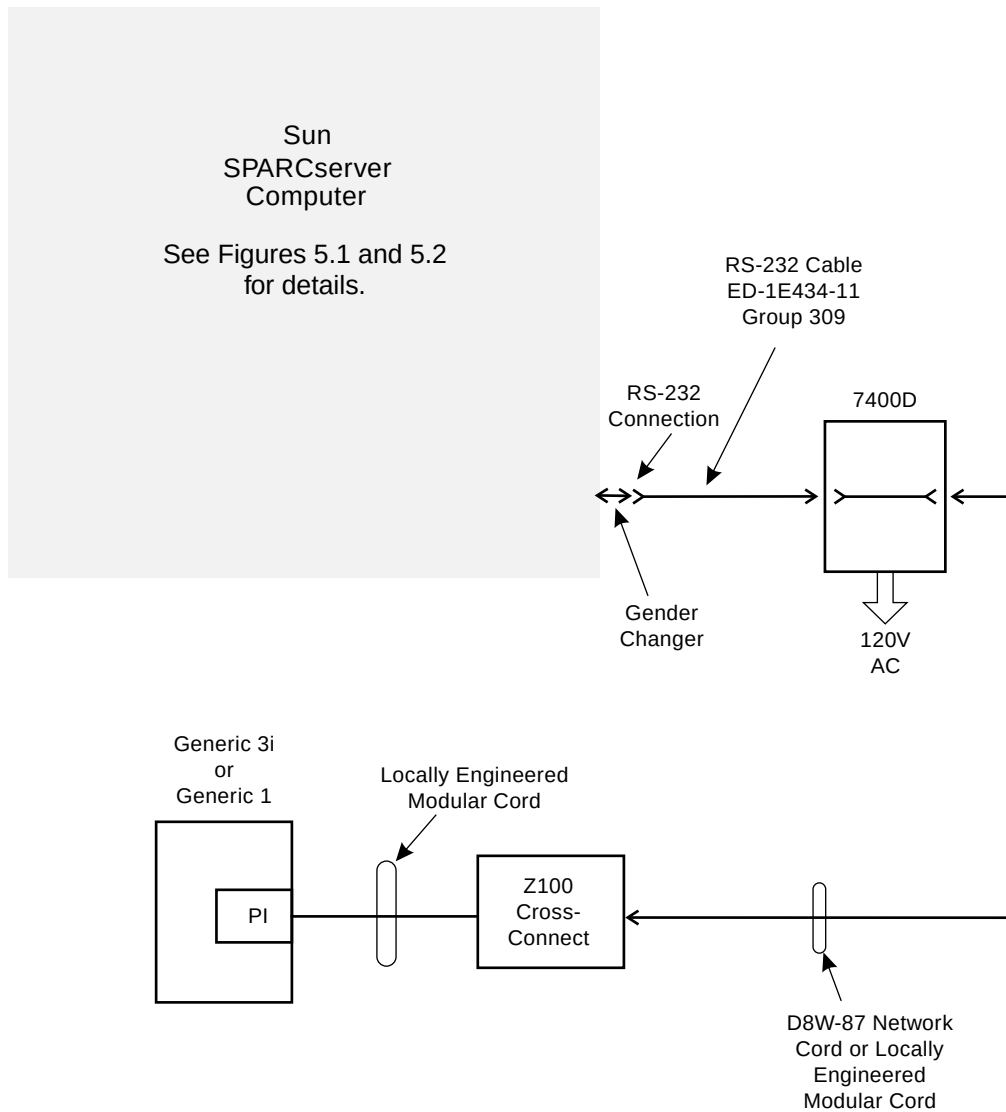


Figure 5-12: *Sun SPARCserver* Computer to Generic 3i or Generic 1 Cabling with a 7400D

Procedure

Do these steps to connect the *Sun SPARCserver* computer to a digital port on the Generic 3i or Generic 1 switch (see Figure 5-12):

1. If an HSI/S card is installed, connect the gender changer to the DTE (RS-232) output port on the black box converter. If **no** HSI/S card is installed, connect the gender changer to the serial port B (*Sun SPARCserver* 5 only).
2. Connect the female end of the ED-1E434-11, Group 309 (RS-232) cable to the gender changer.

3. Connect the AC Power Converter to the 7400D and to an AC power outlet.
 - a. Plug the power supply cord plug into the connector labeled "POWER" on the 7400D.
 - b. Plug the power supply cord into an AC power outlet.

Note

You do not have to set options for the 7400D, since the default options for the 7400D are acceptable for *CentreVu* CMS. Refer to the *7400D Data Module User's Guide* (555-020-712) for information on options and setting options.

4. Connect one end of a D8W-87 modular plug telephone cord to the LINE jack of the 7400D.

Connect the other end of the D8W-87 cord to the Generic 3i or Generic 1 cross-connect (Z100).

Note

If the D8W-87 cord is not long enough, you will have to locally engineer the cable between the 7400D and the cross-connect (Z100). This cable must have a modular plug on each end.

5. Make the necessary power connections to the 7400D.

In the next step, the switch technician should make the final connection to the digital port.

6. Run a locally engineered cable from the Z100 cross-connect to the digital port on the Generic 3i or Generic 1. This cable also requires a modular plug on each end.
7. Ask the switch technician to verify that the ACD/*CentreVu* CMS feature on the switch has been administered.

Analog Private Line

This section describes how to connect the Generic 3i or Generic 1 to an analog private line that connects to a *Sun SPARCserver* computer. This method uses two *Dataphone II* modems in addition to the 7400D Data Module and is required when the 7400D distance limitations have been exceeded.

Required Parts

Obtain the following parts to connect the *Sun SPARCserver* computer to an analog private line:

- DB25 M/M Gender Changer



If the M25A cable is not long enough to reach the *Dataphone* II modem, obtain an ED-1E434-11, Group 309 (RS-232C) cable to make the connection.

- One 2096C *Dataphone* II modem
- B25A cable
- 829 Channel Interface unit.



If the channel interface unit is not available on the customer's premises, order PEC 9200-030 which is a stand-alone replacement unit. You order this unit through the Custom Systems organization via the CSAP (Custom Systems Automation Program).

Also, obtain the following parts to connect the Generic 3i or Generic 1 to an analog private line:

- 110-type cross-connect hardware
- 829 Channel Interface unit



If the channel interface unit is not available on the customer's premises, order PEC 9200-030 which is a stand-alone replacement unit. You order this unit through the Custom Systems organization via the CSAP.

- B25A cable
- One 2096C *Dataphone* II modem
- RS-232C cable
- One 7400D Data Module
- D8W-87 cord.

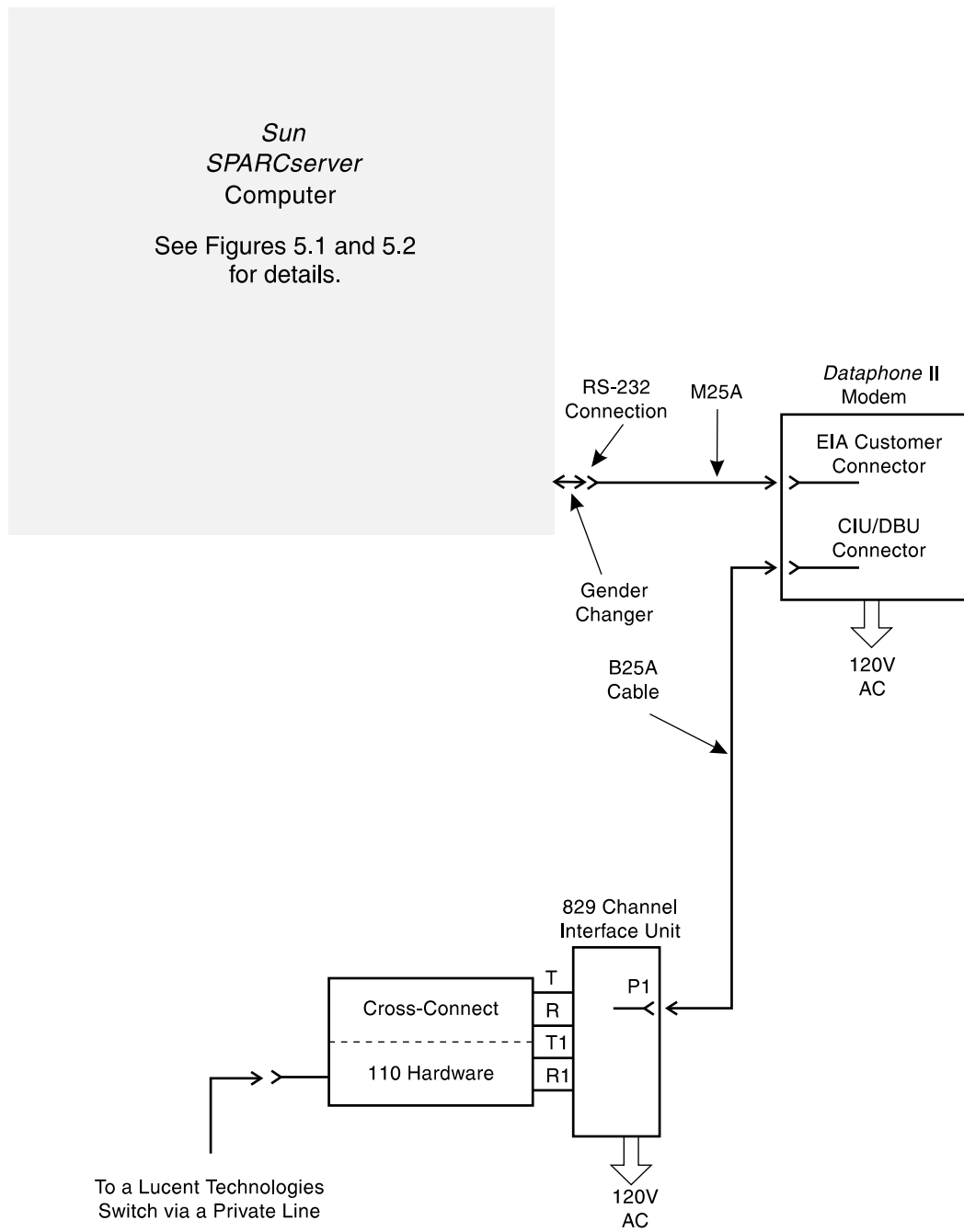


Figure 5-13: Sun SPARCserver Computer Cabling to an Analog Private Line

Procedure for the *Sun SPARCserver* Computer to an Analog Private Line

Do these steps to connect the *Sun SPARCserver* computer to an analog private line (see Figure 5-13):

1. If an HSI/S card is installed, connect the gender changer to the DTE (RS-232) output port on the black box converter. If **no** HSI/S card is installed, connect the gender changer to the serial port B (*Sun SPARCserver* 5 only).
2. Connect the female end of the M25A cable to the gender changer.
3. Connect the male end of the M25A cable to the EIA Customer Connector receptacle on the *Dataphone* II modem.



If the M25A cable is not long enough to reach the *Dataphone* II modem, obtain an ED-1E434-11, Group 309 cable to make the connection.

4. Plug the *Dataphone* II modem into a 120-volt AC power source.
5. Connect one end of the B25A cable to the CIU/DBU Connector receptacle on the *Dataphone* II modem. Connect the other end of the B25A cable to the P1 receptacle on the 829 Channel Interface unit.
6. Plug the 829 Channel Interface unit into a 120-volt AC power source.
7. Connect the tip and ring from the 829 Channel Interface unit to the cross-connect hardware.

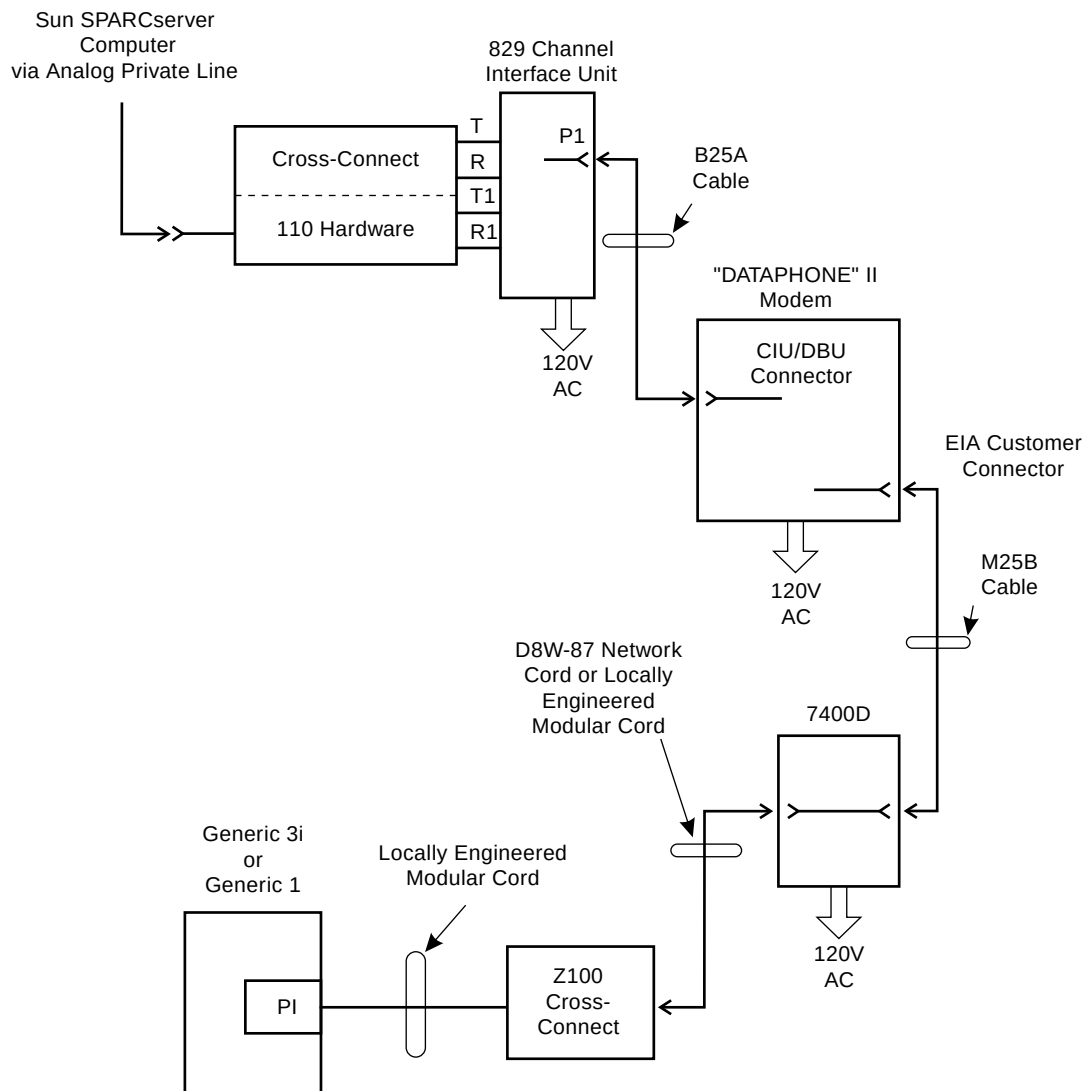


Figure 5-14: Generic 3i or Generic 1 Cabling to an Analog Private Line

Procedure for the Generic 3i or Generic 1 to an Analog Private Line

Do these steps to connect the Generic 3i or Generic 1 to an analog private line (see Figure 5-14):

1. Connect the tip and ring from the 829 Channel Interface unit to the cross-connect hardware.
2. Plug the 829 Channel Interface unit into a 120-volt AC power source.
3. Connect one end of the B25A cable to the CIU/DBU Connector receptacle on the *Dataphone* II modem. Connect the other end of the B25A cable to the P1 receptacle on the 829 Channel Interface unit.

4. Plug the *Dataphone* II modem into a 120-volt AC power source.
5. Connect the plug end of the M25B cable to the EIA Customer Connector receptacle on the *Dataphone* II modem.
6. Connect the other plug end of the M25B (RS-232C) cable to the receptacle on the 7400D.
7. Connect the AC Power Converter to the 7400D and to an AC power outlet.
 - a. Plug the power supply cord plug into the connector labeled "POWER" on the 7400D.
 - b. Plug the power supply cord into an AC power outlet.

Note You do not have to set options for the 7400D, since the default options for the 7400D are acceptable for *CentreVu* CMS. Refer to the *7400D Data Module User's Guide* (555-020-712) for information on options and setting options.

8. Connect one end of the D8W-87 modular plug telephone cord into the LINE jack on the 7400D.
9. Connect the other end of the D8W-87 cord to the Generic 3i or Generic 1 cross-connect (Z100).

Note If the D8W-87 cord is not long enough, you will have to locally engineer the cable between the 7400D and the cross-connect (Z100). This cable must have a modular plug on each end.

10. Make the necessary power connections to the 7400D.

In the next step, the switch technician should make the final connection to the digital port.
11. Run a locally engineered cable from the Z100 cross-connect to the digital port on the Generic 3i or Generic 1. This cable also requires a modular plug on each end.
12. Ask the switch technician to verify that the ACD/*CentreVu* CMS feature on the switch has been administered.

Multiple ACD Connectivity

Adding an ACD

This section describes how to add an additional ACD to the *CentreVu* CMS R3V5. The *CentreVu* CMS R3V5 can support up to four ACDs.

Note

An ACD can be added only if it has been purchased.

Before you begin the procedures in this section, do a CMSADM file system backup. See the “Performing a CMSADM File System Backup” section in Chapter 9, “Maintenance.”

In addition, confer with the customer's *CentreVu* CMS administrator. The *CentreVu* CMS administrator may want the new ACD added to the system after regular working hours.

Adding an ACD to the *CentreVu* CMS R3V5 consists of these tasks:

- Prepare for adding the ACD.
- Turn off *CentreVu* CMS.
- Execute the `acd_create` option.
- Perform tasks for adding a third ACD (if necessary).
- Connect the link.
- Turn on *CentreVu* CMS.

Prepare for Adding the ACD

You need to furnish certain information about the switch and the *CentreVu* CMS.

1. Make a copy of Table 5-2.

Table 5-2: Form for Adding a New ACD

ACD Entities	ACD 1	ACD 2	ACD 3	ACD 4	Sum of ACD Entities	<i>CentreVu</i> CMS-Supported Maximum Values
Switch name					n/a	n/a
Switch release					n/a	n/a
Local port number					n/a	n/a
Remote port number					n/a	n/a
Link number					n/a	n/a
Number of splits/skills						600
Total split/skill members, summed over all splits/skills						5200 (10,000 with <i>Solstice DiskSuite</i> software)
Number of shifts					n/a	n/a
1st shift start/stop times					n/a	n/a
2nd shift start/stop times					n/a	n/a
3rd shift start/stop times					n/a	n/a
4th shift start/stop times					n/a	n/a
Number of agents logged into all splits/skills during any shift						5200 (10,000 with <i>Solstice DiskSuite</i> software)
Number of trunk groups						665
Number of trunks						4000 (see note)
Number of unmeasured trunk facilities						400 minimum (4 X 100)
Number of vectors						2048
Number of VDNs						2000

Note

For Table 5-2, the sum of the ACD1, ACD2, ACD3, and ACD4 entities (splits, agents, trunk groups, trunks, vectors, and VDNs) cannot exceed the *CentreVu* CMS-supported maximum values.

A maximum of 100 unmeasured trunks is required by each ACD. If more than 100 unmeasured trunks are required, and the ACD is currently using the maximum number of trunks, then the measured trunks must be reduced accordingly.

You use the `swinfo` option on the *CentreVu* CMS Services menu to obtain information about existing ACDs.

2. Log in as *root*.
3. Access the *CentreVu* CMS Services menu by entering `cmssvc` at the `#` prompt. The *CentreVu* CMS Services menu appears:

```
Lucent Technologies CentreVu(TM) Call Management System Services
Menu
```

```
Select a command from the list below.
```

```
1) auth_display  Display feature authorizations
2) auth_set      Authorize capabilities/capacities
3) run_cms       Turn CentreVu CMS on or off
4) setup         Set up the initial configuration
5) swinfo        Display switch information
6) swsetup       Change switch information
7) patch_inst    Install a single CMS patch from CD
8) patch_rmv     Backout an installed CMS patch
9) load_all      Install all CMS patches found on CD
10) back_all     Backout all installed CMS patches from machine
Enter choice (1-10) or q to quit:
```

4. Enter 6 to select the `swinfo` option.

The following switch information is displayed:

- Switch name
- Switch model (release)
- Vectoring
- Expert Agent Selection
- Central Office disconnect supervision
- Local port
- Remote port

- Device for the x.25 link.
5. Enter the above entities into Table 5-2.
 6. Log into *CentreVu* CMS and access the Data Storage Allocation window. See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document.
 7. Use the **Commands** Screen Labeled Key (SLK) to print the Data Storage Allocation window.
 8. From the Data Storage Allocation printout, enter the values for the following entities into Table 5-2:
 - Number of splits/skills
 - Total split/skill members summed over all splits/skills
 - Number of shifts
 - Shift start and stop times
 - Number of agents logged into all splits/skills during all shifts
 - Number of trunk groups
 - Number of trunks
 - Number of unmeasured trunk facilities
 - Number of vectors
 - Number of VDNs.
 9. Repeat Steps 3 through 8 for each existing ACD.
 10. Enter the values for the entities associated with the new ACD into Table 5-2.
 11. Sum the values for each appropriate entity (for example, ACD1 + ACD2 + ACD3 etc.), and enter that value into the Sum of ACD Entities column of Table 5-2.
 12. Make sure that the summed value does not exceed the *CentreVu* CMS-supported maximum value. If a summed value exceeds a maximum value, you will have to change the value of that entity for either the existing ACDs or the new ACD.

Preparation for adding the new ACD is complete.

Turn Off *CentreVu* CMS

Access the CMSADM menu and turn off *CentreVu* CMS. See the “run_cms” section in Chapter 2, “CMSADM and CMSSVC Menus.”

Execute the “acd_create” Option

You execute the `acd_create` option on the CMSADM menu to add the new ACD to the *CentreVu* CMS R3V5.

Note

The ACD must be authorized before it can be added to the *CentreVu* CMS. See Chapter 6, “Setting Authorizations.”

1. Log in as *root*.
2. Access the *CentreVu* CMS Administration menu by entering `cmsadm` at the `#` prompt. The CMSADM menu appears:

```
Lucent Technologies CentreVu(TM) Call Management System
Administration Menu
Select a command from the list below.
  1) acd_create   Define a new ACD
  2) acd_remove  Remove all administration and data for an ACD
  3) backup      Filesystem backup
  4) diskmap     Estimate disk requirements
  5) memory      Estimate memory requirements
  6) realtime    Estimate real-time report refresh rate
  7) pkg_install Install a feature package
  8) pkg_remove  Remove a feature package
  9) run_cms     Turn CMS on or off
Enter choice (1-9) or q to quit:
```

3. Enter 1 to choose the `acd_create` option.
4. At the prompts, enter the information for the new ACD from Table 5-2.

After you have entered all the required information, the message `Updating` appears, followed by `ACD created successfully`.

Connect the Link

Lucent Technologies field technicians connect the link from the switch where the new ACD resides to the *Sun SPARCserver* computer.

Each HSI/S supports four RS-232C ports.

Turn On *CentreVu* CMS

Access the CMSADM menu and turn on *CentreVu* CMS application. See the “`run_cms`” section in Chapter 2, “CMSADM and CMSSVC Menus.”

Chapter 6

Setting Up *CentreVu* CMS and Installing Feature Packages

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Overview

Once the on-site technicians have finished the hardware installation, Technical Service Center (TSC) engineers set up the *CentreVu*™ Call Management System (CMS) application to work with the customer's configuration. If the customer had ordered additional *CentreVu* CMS feature packages, these need to be installed as well.

This chapter describes how to do the following:

- Set authorizations.
- Set up data storage parameters.
- Set up the *CentreVu* CMS application.
- Install the External Call History and Forecasting feature packages.

TSC engineers verify authorizations, set up data storage parameters, and set up the *CentreVu* CMS application remotely. On-site technicians should call the TSC to coordinate this process. Customers can install additional *CentreVu* CMS feature packages if these packages have been authorized.

Things to Do Before You Start

The TSC should check that the on-site technicians have completed the following tasks:

- Connected the console terminal to the *Sun** *SPARCserver*† computer
- Connected the *Sun SPARCserver* computer to the TSC's Remote Maintenance Center (remote console)
- Connected additional terminals and printers to the network terminal server(s) (NTS)
- Connected the link between the *Sun SPARCserver* computer and the switch

Note

If the hardware link or the Automatic Call Distribution (ACD)/CMS feature is not properly administered, the *CentreVu* CMS software cannot communicate with the switch. Refer to the appropriate appendix for switch administration procedures.

- Connected the network terminal server(s) and the *Sun SPARCserver* computer to the network hub unit.

*Sun is a registered trademark of Sun Microsystems, Inc.

†SPARCserver is a trademark of SPARC International, Inc.

Things to Know Before You Start

Throughout the setup, you will be prompted to enter values specific to the system being installed. For each question, an appropriate range is displayed in the format of (XX-XX). The individual values represented by XX specify the limits of each range.

The *CentreVu* CMS application must be installed before you can install the Forecasting or External Call History feature packages.

Setting Authorizations

Before TSC engineers can set up *CentreVu* CMS, they need to set authorizations for *CentreVu* CMS features purchased by the customer. Authorizations apply to all administered ACDs.

You can use the `auth_set` option in the *CentreVu* CMS Services (CMSSVC) menu to do the following:

- Set the purchased version of *CentreVu* CMS.
- Add authorizations to features.
- Increase the number of agents, ACDs, or Supervisor logins.
- Remove authorizations from the following:
 - Forecasting (if the package is not installed)
 - Vectoring (if no administered ACDs use vectoring)
 - Graphics
 - External Call History (if the package is not installed)
 - Expert Agent Selection (if no administered ACDs use Expert Agent Selection)
 - External Application
 - *CentreVu* Supervisor
 - *CentreVu* Report Designer.
- Reduce the maximum number of agents provided the total number of agents across all administered ACDs does not exceed the reduced number.
- Reduce the maximum number of ACDs provided the total number of all administered ACDs does not exceed the reduced number.
- Reduce the number of Supervisor logins.

Do the following steps to run the `auth_set` option:

1. Access the *CentreVu* CMS Services menu by entering:

```
# cmssvc
```

The program responds:

Lucent Technologies CentreVu(TM) Call Management System Services
Menu

Select a command from the list below.

- 1) auth_display Display feature authorizations
 - 2) auth_set Authorize capabilities/capacities
 - 3) run_cms Turn CentreVu CMS on or off
 - 4) setup Set up the initial configuration
 - 5) swinfo Display switch information
 - 6) swsetup Change switch information
 - 7) patch_inst Install a single CMS patch from CD
 - 8) patch_rmv Backout an installed CMS patch
 - 9) load_all Install all CMS patches found on CD
 - 10) back_all Backout all installed CMS patches from machine
- Enter choice (1-10) or q to quit:

2. Enter 2 to select the auth_set option. The program responds:

Password:

3. Enter the appropriate password.

Note Some of the following questions may not appear if the authorization cannot be changed at this time.

The program responds:

Is this an upgrade? (y/n):
(default n)

Note This response only occurs the first time you run auth_set on the machine.

If you answer yes, the program responds (for example):

```
What version has the customer purchased?  
1) R3V1  
2) R3V2  
3) Lucent Technologies CentreVu(TM) CMS R3V4  
4) Lucent Technologies CentreVu(TM) CMS R3V5  
Enter choice (1-4):
```

4. Enter the option number of the version the customer originally purchased. *If this is a bugfix load, do not select the r3v5 option.*

Note

The program uses the above information to populate the "Purchased CMS Release" field of the *System Setup:Switch Setup* screen.

The program continues with the following questions:

```
Authorize installation of forecasting package? (y/n):  
                                         (default: n)
```

5. Enter y if the customer purchased Forecasting; otherwise, press **Return**.

The program responds:

```
Authorize installation of vectoring package? (y/n): (default: n)
```

6. Enter y if the customer purchased vectoring; otherwise, press **Return**. The program responds:

```
Authorize use of graphics feature? (y/n): (default: n)
```

7. Enter y if the customer purchased Graphics; otherwise, press **Return**. The program responds:

```
Authorize use of external call history feature? (y/n):  
                                         (default: n)
```

8. Enter y if the customer purchased the External Call History feature; otherwise, press **Return**. The program responds:

```
Authorize use of expert agent selection feature? (y/n):  
                                         (default: n)
```

9. Enter y if the customer purchased the Expert Agent Selection feature; otherwise, press **Return**. The program responds:

```
Authorize use of external application feature? (y/n):  
                                         (default: n)
```

10. Enter y if the customer purchased the External Application feature; otherwise, press **Return**. The program responds:

```
Enter the number of simultaneous Lucent Technologies  
CentreVu(TM) Supervisor logins the customer has purchased  
(0-250): (default: 0)
```

11. Enter the number of simultaneous logins purchased: The system responds:

```
Has the customer purchased Lucent Technologies CentreVu(TM)  
Report Designer? (y/n): (default: n)
```

12. Enter y if the customer purchased report designer; otherwise, press **Return**. The program responds:

Enter the maximum number of split/skill members that can be administered
(1-xxxx):

The number represented by “xxxx” will be either 5200 (for *Intel* machines and *Sun* machines without *Solstice DiskSuite** software) or 10000 (for *Sun* machines with *Solstice DiskSuite* software installed).

13. Enter the maximum possible number of split/skill members that the customer might use based on the switch agent size purchased. “Split/skill members” are defined as the number of CMS-measured agent-split and agent-skill combinations logged in at the same time. Each split an agent logs into is an agent-split combination. Each skill assigned to an agent while logged in is an agent-skill combination. The numbers recommended are those in the following table:

Switch Agent Size Range Purchased	Provisioning for ACD Members (split/skill pairs)			
	Non-EAS		EAS	
	<i>INTEL / Sun without Solstice DiskSuite</i>	<i>Sun with Solstice DiskSuite</i>	<i>INTEL / Sun without Solstice DiskSuite</i>	<i>Sun with Solstice DiskSuite</i>
0-12	100	100	500	500
0-25	100	100	500	500
0-50	200	200	1000	1000
0-100	400	400	2,000	2,000
0-300	1,200	1,200	5,200	6,000
0-600	2,400	2,400	5,200	10,000
0-max. agents	5,200	10,000	5,200	10,000

Note that the minimum size configuration for CMS is 0-25; that's the reason groups 0-12 and 0-25 have the save provisioning. You

*Solstice DiskSuite is a trademark of Sun Microsystems, Inc.

should also note that the customer will be able to limit the split/skill RAM memory allocation to the size actually needed for the current configuration of agents and splits/skills. That is accomplished via the “Total split/skill members summed over all splits/skills” field, which is accessed through the set up option of the CMS Services menu.

The program responds:

```
Enter the maximum number of ACDs that can be installed (1-4):  
(default: 1)
```

14. Enter the number of ACDs the customer purchased.

15. Verify that authorizations were set by entering:

```
# tail /cms/install/logdir/admin.log
```

The *admin.log* file contains information relating to *CentreVu* CMS administration procedures. The file should display the following message:

```
Capabilities/capacities authorized <date/time>
```

Setting Up Data Storage Parameters

TSC engineers modify specific data storage parameters on the *Sun SPARCserver* computer so the *CentreVu* CMS R3V5 application can operate properly. The *storage.def* file contains these data storage parameters which are default values.

The default values may not correspond to the system you are installing. Use the values determined by the Account Executive, System Consultant, and Design Center based on the customer configuration.

Do the following steps to set up the data storage parameters in the *storage.def* file:

1. Change to the */cms/install/cms_install* directory by entering:

```
cd /cms/install/cms_install
```

Note

If you delete or damage the *storage.def* file, you can find a copy of this file (*storage.skf*) in the same directory.

2. Edit the *storage.def* file, and enter the appropriate values for each question. Place the answer to each question on the line below the question.

The *storage.def* file looks like the following screens:

```
# Information for ACD 1 and any ACDs created using acd_create
# command
# Intrahour interval (15, 30, 60 minutes):
30
# Week start day (Sunday, Monday, Tuesday, Wednesday, Thursday,
  Friday, Saturday):
Sunday
# Week end day (Sunday, Monday, Tuesday, Wednesday, Thursday,
  Friday, Saturday):
Saturday
# Daily start time (regular time):
12:00 AM
# Daily stop time (data will be collected for seconds of last
  minute):
11:59 PM
# Number of agent login/logout records (0-999999):
10000
# Number of agent trace records:
10000
# Number of call records (0-5000 internal or 0-99999 external):
0
# Number of exceptions records (1-2000):
500
# Days of intrahour for splits (1-62):
31
# Days of daily splits (1-1825):
387
# Weeks of weekly splits (1-520):
0
# Months of monthly splits (1-120):
0
# Days of intrahour for agents (1-62):
31
# Days of daily agents (1-1825):
387
# Weeks of weekly agents (1-520):
0
# Months of monthly agents (1-120):
0
# Days of intrahour for trunk groups (1-62):
31
# Days of daily trunk groups (1-1825):
387
# Weeks of weekly trunk groups (1-520):
0
```

```

# Months of monthly trunk groups (1-120):
0
# Days of intrahour for trunks (1-62):
31
# Days of daily trunks (1-1825):
387
# Weeks of weekly trunks (1-520):
0
# Months of monthly trunks (1-120):
0
# Days of intrahour for call work codes (1-62):
0
# Days of daily call work codes (1-1825):
0
# Weeks of weekly call work codes (1-520):
0
# Months of monthly call work codes (1-120):
0
# Days of intrahour for vectors (1-62):
31
# Days of daily vectors (1-1825):
387
# Weeks of weekly vectors (1-520):
0
# Months of monthly vectors (1-120):
0
# Days of intrahour for VDNs (1-62):
31
# Days of daily VDNs (1-1825):
387
# Weeks of weekly VDNs (1-520):
0
# Months of monthly VDNs (1-120):
0
# Information for ACD 2
.
.
.

```

The file repeats the previous statements for ACDs 2 through 4.

3. After entering the appropriate values, write and quit the file.

After the *CentreVu* CMS application is running, the System Administrator can change the data storage parameters using the Data Storage Allocation window in the System Setup subsystem. See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document.

Setting Up the *CentreVu* CMS Application

Prerequisites: You must be logged in as *root*, the computer must be in run-level 2 or 3, and all file systems must be mounted.

You can set up the *CentreVu* CMS feature package using one of two methods:

- a. **Interactively from a Terminal** — Using the interactive option, the program prompts you for the necessary information to set up the *CentreVu* CMS application (for example, system type, number of agents, trunks, vectors, VDNs, etc.).

To set up the *CentreVu* CMS application using this option, see the “Setting Up *CentreVu* CMS Interactively from a Terminal” section in this chapter.

- b. **UNIX^{*} System Flat File** — Using the flat file option, you edit a *UNIX* System flat file which contains the necessary information (for example, system type, number of agents, trunks, vectors, VDNs, etc.) to set up the *CentreVu* CMS application. When you execute the program, it runs in the background and uses the *UNIX* System flat file data to set up the *CentreVu* CMS application.

To set up the *CentreVu* CMS application using this option, see the “Setting Up *CentreVu* CMS Using a *UNIX* System Flat File” section in this chapter.

Setting Up *CentreVu* CMS Interactively from a Terminal

Perform the following steps to set up *CentreVu* CMS interactively from a terminal:

1. Access the *CentreVu* CMS Services menu by entering:

```
# cmssvc
```

The program responds:

^{*}UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company, Ltd.


```
Lucent Technologies CentreVu(TM) Call Management System Services
Menu
```

```
Select a command from the list below.
```

```
1) auth_display  Display feature authorizations
2) auth_set      Authorize capabilities/capacities
3) run_cms       Turn CentreVu CMS on or off
4) setup         Set up the initial configuration
5) swinfo        Display switch information
6) swsetup       Change switch information
7) patch_inst    Install a single CMS patch from CD
8) patch_rmv     Backout an installed CMS patch
9) load_all      Install all CMS patches found on CD
10) back_all     Backout all installed CMS patches from machine
Enter choice (1-10) or q to quit:
```

2. Enter 5 to select the *setup* option.

The program responds:

```
Enter a name for this UNIX system (up to 256 characters):
(default: XXXXXX)
```

3. Enter the host name of the computer. This name was assigned during the factory installation procedures and is used by the TSC to maintain and identify this specific *CentreVu* CMS.

The program responds:

```
Select the type of backup device you are using
1) SCSI QIC-150 cartridge tape - 150MB tape
2) SCSI QIC-60 cartridge tape - 60MB tape
3) 14.0 Gbyte 8mm tape
4) 5.0 Gbyte 8mm tape
5) SCSI QIC-2.5 cartridge tape - 2.5GB tape
Enter choice (1-5):
```

4. Enter the appropriate number to specify the type of cartridge tape you are using as the backup device. The program responds:

Enter the default backup device path:
(default: /dev/rmt/0 or /dev/rmt/0c)

5. Press **Return** to select the default, or enter your choice for the backup device path.

Note

All systems are shipped with one or more tape drives (QIC-150, QIC 2.5-GB, 5-GB, and/or 14-GB). For systems with multiple tape drives, either the QIC-150 or the QIC 2.5-GB is the first drive in the SCSI chain. Valid device paths are as follows:

/dev/rmt/0 Indicates the tape drive with the lowest target number in the SCSI chain. (See Table 9-23 in Chapter 9, "Maintenance," for a list of SCSI target numbers.)

/dev/rmt/1 Indicates the tape drive with the second lowest target number in the SCSI chain.

/dev/rmt/0c Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

/dev/rmt/1c Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

The program responds:

Enter number of ACDs being administered (1-4):

6. Enter the number of ACDs to be administered. (This number may be less than the number of ACDs authorized.)

The program responds:

Information for ACD 1

Enter switch name (up to 20 characters):

7. Enter the name for the switch associated with ACD1. Include "R3" in the name to indicate R3 CMS. The program responds:

Select the model of switch for this ACD

- 1) Definity-G2.1
- 2) Definity-G2.2
- 3) Definity-G3i
- 4) Definity-G3r
- 5) Definity-G3V2
- 6) Definity-G3V3
- 7) Definity-G3V4
- 8) Definity-G3V5

Enter choice (1-8):

8. Enter the number that represents the switch model associated with this ACD.

If the switch supports vectoring and vectoring is authorized, this message appears; otherwise, go to Step 11.

Is Vectoring enabled on the switch? (y/n):

9. Enter y if vectoring is enabled on this switch; otherwise, enter n.

The following message appears if vectoring is enabled, the switch supports EAS, and EAS is authorized. If the message does not appear, go to Step 11.

Is Expert Agent Selection enabled on the switch? (y/n):

10. Enter y if Expert Agent Selection is enabled on this switch; otherwise, enter n. The program responds:

Does the Central Office have disconnect supervision? (y/n):

11. Enter y if the CentreVu CMS is located in the U.S., then go to Step 13. If you answer n, the system responds with the following:

ACD calls shorter than the Phantom Abandon Call Timer value will be counted as abandoned.

Enter the Phantom Abandon Call Timer value in seconds (1-10):
(default:10)

12. Enter the Phantom Abandon Call Timer value.

Note The Phantom Abandon Call Timer value can be changed through the cmssvc: swsetup menu.

The program responds:

Enter the local port assigned to the switch. (1-XX):

13. Enter the local port or channel number on the switch. The program responds:

Enter the remote port assigned to switch (1-XX):

14. Enter the remote port or channel number on the switch. The program responds:

Select the device used for x.25 connectivity to the switch:

- 1) Serial Port B
- 2) HSI link 0
- 3) HSI link 1
- 4) HSI link 2
- 5) HSI link 3
- 6) Software loopback link 0
- 7) Software loopback link 1

Enter choice (1-7):

Note

These numbers correspond to the different hardware connections that can be made between the *CentreVu* CMS and the switch, except for 6 and 7 which are only for testing.

1 corresponds to Serial Port B

2 corresponds to HSI/S link 0

3 corresponds to HSI/S link 1

4 corresponds to HSI/S link 2

5 corresponds to HSI/S link 3

6 corresponds to testing via software loopback link 0

7 corresponds to testing via software loopback link 1.

Note

If you choose 2 through 5 but do not have an HSI/S card, you will get the following error message:

Without an HSI card you must use serial port B for your x.25 connectivity.

Re-enter your selection.

If you choose 1 and you have an HSI/S card, you will get the following error message:

Choose one of the HSI links for your x.25 connectivity. Re-enter your selection.

If you choose either 6 or 7, the program responds with the following message:

This choice is used for testing only. If you make this selection, you will not be able to collect data from your ACD. Is this what you want do (y/n)?

If you choose y, then the selection takes effect. If you choose n, then the system displays the initial selection command again.

15. Enter the number that corresponds to the device used for x.25 connectivity. The program responds:

Number of splits/skills (0-XXX):

16. Enter the number of splits/skills in this ACD. The program responds:

Total split/skill members, summed over all splits/skills
(0-XXXX):

17. Enter the maximum number of split/skill members that will be logged into this ACD simultaneously, considering shift overlap.

For non-EAS, sum all agent-split combinations, counting each split an agent will log into (max: 4) as a split member.

For EAS, sum all agent-skill combinations that will be logged in at the same time, counting the maximum number of skills the supervisors expect to assign to each agent (up to 20) during a shift.

If it is not possible to sum the number of splits/skills for each agent, you can determine the capacity needed by multiplying the total number of agents times the average number of splits/skills per agent.

The program responds:

Number of shifts (1-4):

18. Enter the number of shifts. The program responds:

Enter the start time for shift 1 (hh:mmXM):

19. Enter the start time for shift 1; for example, 8:00AM. The program responds:

Enter the stop time for shift 1 (hh:mmXM):

20. Enter the stop time for shift 1; for example, 5:00PM.

The program responds:

Number of agents logged into all splits/skills during shift 1
(0-XXX):

21. Enter the number of agents logged in during the shift.

Note

Steps 19 through 21 will repeat for the number of shifts entered in Step 18.

The program continues:

Number of trunk groups (0-XXX):

22. Enter the number of trunk groups associated with this ACD. The program responds:

Number of trunks (0-XXXX):

23. Enter the number of trunks associated with this ACD. The program responds:

Number of unmeasured facilities (0-XXXX):

24. Enter the number of unmeasured facilities associated with this ACD.

- If the switch supports call work codes, you will see a message to enter the number of codes.
- If vectoring is enabled on the switch (you entered y for Step 9), you will see this message:

Creating database tables.

Then, you will be prompted to enter the number of vectors and VDNs.
- The program repeats Steps 7 through 23 for each ACD entered in Step 6. After you define the last ACD, the program continues:

Updating database

Computing space requirements and file system space availability.

Setup completed successfully.

25. If the setup completes with warnings, you will get the following warning message:

You do not currently have sufficient file space for your existing CMS data. At this point you should turn on CMS, go to the "Data Storage Allocation" screen, and verify/modify the administration, or go to the "Free Allocation" screen and verify/modify your existing free space.

26. Verify the installation completed successfully by entering:

```
# tail /cms/install/logdir/admin.log
```

The *CentreVu* CMS software is successfully set up when you see a message similar to the following:


```
File systems/space available:
```

```
/cms XXXXXXXX
```

```
File systems/current blocks free:
```

```
/cms XXXXXXXX
```

```
/cms: AGENT, SPLIT, VDN, TRUNK, TKGRP, VECTOR, AGENT_LOG_REC,  
      AGENT_TRACE_REC, EXCEPTIONS_REC, WORKCODE, CALL_REC,
```

```
Setup completed successfully <date/time>
```

You may edit this file for additional information.

If you need to install additional *CentreVu* CMS-related feature packages (Forecasting or External Call History), go to the appropriate section and follow the procedures.

Now, you can turn on the *CentreVu* CMS software. See the “run_cms” section in Chapter 2, “CMSADM and CMSSVC Menus,” for details.

Setting Up CentreVu CMS Using a *UNIX* System Flat File

Setting up the *CentreVu* CMS feature package using a *UNIX* System flat file consists of editing the *cms.inst.skl* file (the flat file) and starting the install program.

1. Change to the following directory by entering:

```
# cd /cms/install/cms_install
```

2. Copy the *cms.inst.skl* file by entering:

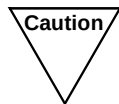
```
# cp cms.inst.skl cms.install
```

3. Edit the *cms.install* file by entering:

```
# vi cms.install
```

The flat file contains a series of questions and value ranges that pertain to the ACD/switch configuration.

4. Enter the appropriate values for your configuration.



Make sure you use the computer's host name for the *UNIX* system name. The computer's host name should have been assigned during the factory installation.

A sample flat file might look like this:

```
# Enter a name for this UNIX system (up to 256 characters):
# Select the type of backup device you are using
#   1) SCSI QIC-150 cartridge tape - 150MB tape
#   2) SCSI QIC-60 cartridge tape - 60MB tape
#   3) 14.0 Gbyte 8mm tape
#   4) 5.0 Gbyte 8mm tape
#   5) SCSI QIC-2.5 cartridge tape - 2.5GB tape
# Enter choice (1-5):
# Default backup device paths based on device type:
# Device                                Default backup path
# SCSI QIC-150 cartridge tape - 150MB tape /dev/rmt/0
# SCSI QIC-60 cartridge tape - 60MB tape /dev/rmt/0
# 14.0 Gbyte 8mm tape /dev/rmt/0c
# 5.0 Gbyte 8mm tape /dev/rmt/0
# SCSI QIC-2.5 cartridge tape - 2.5GB tape /dev/rmt/0c
# Enter the default backup device path:
# Enter number of ACDs being administered (1-4):
# The following information is required per ACD:
# Information for ACD 1:
# Enter switch name (up to 20 characters):
# Select the model of switch for this ACD
#   1) System85-R2V4
#   2) Definity-G1.1
#   3) Definity-G2.1
#   4) Definity-G2.2
#   5) Definity-G3i
#   6) Definity-G3r
#   7) Definity-G3V2
#   8) Definity-G3V3
#   9) Definity-G3V4
#  10) Definity-G3V5
# Enter choice (1-10):
# Is Vectoring enabled on the switch? (y/n):
# Is Expert Agent Selection enabled on the switch? (y/n):
# Does the Central Office have disconnect supervision? (y/n):
# If the Central Office has disconnect supervision, enter 0. Otherwise,
# ACD calls shorter than the Phantom Abandon Call Timer
# value will be counted as abandoned.
# Enter the Phantom Abandon Call Timer value in seconds (0-10):
# Enter the local port assigned to switch (1-64):
# Enter the remote port assigned to switch (1-64):
# Select the device used for x.25 connectivity to the switch
#   1) Serial port B
#   2) HSI link 0
#   3) HSI link 1
#   4) HSI link 2585
#   5) HSI link 3
#   6) Software loopback link 0
#   7) Software loopback link 1
# Enter choice (1-7):
```

```

# Maximum number of splits/skills based on switch type:
# Release(s)                                     Value
# System85-R2V4/Definity-G2.1/Definity-G2.2      60
# Definity-G1.1/Definity-G3i/Definity-G3r        99
# Definity-G3V2/Definity-G3V3/Definity-G3V4      255
# Definity-G3V5/Definity-G2.2(EAS)               600
# Number of splits/skills (0-Maximum):
# Maximum number of split/skill members based on switch type:
# Release(s)                                     Value
# Definity-G1.1                                  400
# Definity-G3i                                    500
# System85-R2V4/Definity-G2.1/Definity-G2.2/Definity-G3r 1023
# Definity-G2.2(EAS)                             5115
# Definity-G3V2/Definity-G3V3/Definity-G3V4      5200
# Definity-G3V5                                   10000
# Total split/skill members, summed over all splits/skills (0-Maximum):
# Number of shifts (0-4):
# Enter the start time for shift 1 (hh:mmXM):
# Enter the stop time for shift 1 (hh:mmXM):
# Number of agents logged into all splits/skills during shift 1 (1-Maximum):
# Enter the start time for shift 2 (hh:mmXM):
# Enter the stop time for shift 2 (hh:mmXM):
# Number of agents logged into all splits/skills during shift 2 (1-Maximum):
# Enter the start time for shift 3 (hh:mmXM):
# Enter the stop time for shift 3 (hh:mmXM):
# Number of agents logged into all splits/skills during shift 3 (1-Maximum):
# Enter the start time for shift 4 (hh:mmXM):
# Enter the stop time for shift 4 (hh:mmXM):
# Number of agents logged into all splits/skills during shift 4 (1-Maximum):
# Maximum number of trunk groups based on switch type:
# Release(s)                                     Value
# Definity-G1.1/Definity-G3i                     99
# System85-R2V4/Definity-G2.1/Definity-G2.2/Definity-G3r 255
# Definity-G3V2/Definity-G3V3/Definity-G3V4/Definity-G3V5 666
# Number of trunk groups (0-Maximum):
# Maximum number of trunks based on switch type:
# Release(s)                                     Value
# Definity-G1.1/Definity-G3i                     400
# System85-R2V4/Definity-G2.1/Definity-G2.2/Definity-G3r/
#   Definity-G3V2/Definity-G3V3/Definity-G3V4/Definity-G3V5 4000
# Number of trunks (0-Maximum):
# Number of unmeasured facilities (0 to (Maximum trunks - Number of trunks)):
# Minimum number of call work codes based on switch type:
# Release(s)                                     Value
# System85-R2V4/Definity-G1.1/Definity-G2.1      0
# Definity-G2.2/Definity-G3i/Definity-G3r/Definity-G3V2/
#   Definity-G3V3/Definity-G3V4/Definity-G3V5      1
# Maximum number of call work codes based on switch type:
# Release(s)                                     Value
# System85-R2V4/Definity-G1.1/Definity-G2.1      0
# Definity-G2.2/Definity-G3i/Definity-G3r/Definity-G3V2/
#   Definity-G3V3/Definity-G3V4/Definity-G3V5      1999
# Number of call work codes (Minimum-Maximum):

```

```

# Maximum number of vectors based on switch type:
# Release(s)                                     Value
# Definity-G1.1                                  0
# System85-R2V4/Definity-G2.1                    128
# Definity-G3i                                    256
# Definity-G2.2                                  511
# Definity-G3r/Definity-G3V2/Definity-G3V3/Definity-G3V4/
  Definity-G3V5                                  512
# Enter number of vectors (0-Maximum):
# Maximum number of VDNs based on switch type:
# Release(s)                                     Value
# Definity-G1.1                                  0
# Definity-G3i                                    500
# System85-R2V4/Definity-G2.1/Definity-G2.2/Definity-G3r/
  Definity-G3V2/Definity-G3V3/Definity-G3V4/Definity-G3V5  2000
# Enter number of VDNs (0-Maximum):
# Information for ACD 2:

```

The flat file repeats the previous statements for ACDs 2 through 4.

5. After you have entered all the appropriate values, write and quit the file.
6. Change to the root directory by entering:

```
# cd /
```

7. Access the *CentreVu* CMS Services menu by entering:

```
# cmssvc
```

The program responds:

```
Lucent Technologies CentreVu(TM) Call Management System Services
Menu

Select a command from the list below.
 1) auth_display Display feature authorizations
 2) auth_set     Authorize capabilities/capacities
 3) run_cms      Turn CentreVu CMS on or off
 4) setup        Set up the initial configuration
 5) swinfo       Display switch information
 6) swsetup      Change switch information
 7) patch_inst   Install a single CMS patch from CD
 8) patch_rmv    Backout an installed CMS patch
 9) load_all     Install all CMS patches found on CD
10) back_all     Backout all installed CMS patches from machine
Enter choice (1-10) or q to quit:
```

8. Select the setup option. The program responds:

```
The input will be read from
 1) the terminal
 2) a flat file
Enter choice (1-2):
```

9. Enter 2 to specify that the setup will use the flat file. The program responds:

```
*** The rest of this command is running in the background ***
```

10. Verify that the installation completed successfully by entering:

```
# tail -f /cms/install/logdir/admin.log
```

The `-f` option in the previous command updates the console terminal as messages are written to the `admin.log` file.

The *CentreVu* CMS software is successfully set up when you see a message similar to the following:

```
File systems/space available:
/cms      XXXXXXXXX

File systems/current block free:
/cms      XXXXXXXXX
/cms: AGENT, SPLIT, VDN, TRUNK, TKGRP, VECTOR, AGENT_LOG_REC,
      AGENT_TRACE_REC, EXCEPTIONS_REC, WORKCODE, CALL_REC,
Setup completed successfully <date/time>
```

Press **Del** to break out of the `tail -f` command.

Installing the Forecasting Feature Package

Prerequisites: You must be logged in as *root*, the computer must be in run-level 2 or 3, all file systems must be mounted, and *CentreVu* CMS must be turned off.

Do these steps to install the Forecasting feature package:

1. Access the *CentreVu* CMS Services menu by entering:

```
# cmssvc
```

The program responds:

```
Lucent Technologies CentreVu(TM) Call Management System Services
Menu
```

```
Select a command from the list below.
```

```
1) auth_display Display feature authorizations
2) auth_set     Authorize capabilities/capacities
3) run_cms      Turn CentreVu CMS on or off
4) setup        Set up the initial configuration
5) swinfo       Display switch information
6) swsetup      Change switch information
7) patch_inst   Install a single CMS patch from CD
8) patch_rmv    Backout an installed CMS patch
9) load_all     Install all CMS patches found on CD
10) back_all    Backout all installed CMS patches from machine
Enter choice (1-10) or q to quit:
```

2. Select `auth_display`, and verify that the system is authorized to install the Forecasting package.

Sample response:

Capability/Capacity	Authorization
-----	-----
vectoring	authorized
forecasting	authorized
graphics	authorized
external call history	authorized
expert agent selection	authorized
external application	authorized
CentreVu(TM) Supervisor	not authorized
Report Designer	authorized
Maximum number of agents	5200
Maximum number of ACDs	4
Simultaneous CentreVu logins	5

Note

If Forecasting has not been authorized but should be, go to the “Setting Authorizations” section and follow the procedures outlined in that section.

3. Access the *CentreVu* CMS Administration menu by entering:

```
# cmsadm
```

The program responds:

```
Lucent Technologies CentreVu(TM) Call Management System
Administration Menu
Select a command from the list below.
 1) acd_create   Define a new ACD
 2) acd_remove  Remove all administration and data for an ACD
 3) backup      Filesystem backup
 4) diskmap     Estimate disk requirements
 5) memory      Estimate memory requirements
 6) realtime    Estimate real-time report refresh rate
 7) pkg_install Install a feature package
 8) pkg_remove  Remove a feature package
 9) run_cms     Turn CentreVu CMS on or off
Enter choice (1-9) or q to quit:
```

4. Enter 7 to select the `pkg_install` option.

The program responds:

```
The CMS Features that can be installed are
1) forecasting
2) external call history
Enter choice (1-2) or q to quit:
```

Note

The program displays only feature packages that are authorized and not yet installed.

5. Enter the number that corresponds to Forecasting. The program responds:

```
Creating database tables . . . . .
```

The dots continue to appear as the program sets up the Forecasting tables. After the Forecasting tables are completed, these messages appear:

```
Computing space requirements and file system space availability.
```

```
Forecasting package installed
```

6. Verify that the installation completed successfully by entering:

```
# tail /cms/install/logdir/admin.log
```

The Forecasting package is successfully installed when you see this message:

```
.  
.   
.   
Forecasting package installed <date/time>
```

You may edit this file for additional information.

If you need to install the External Call History package, go to the next section and follow the procedures.

Installing the External Call History Package

Prerequisites: The customer must have a separate computer for the storage and reporting of call records. Both the storage machine and the *CentreVu* CMS machine must be administered in *uucp*. If the storage machine is not running the *UNIX* System, a DOS version of *uucp* must be used.

You must be logged in as *root*, the computer must be in run-level 2 or 3, all file systems must be mounted, and *CentreVu* CMS must be turned off.

Note

Once the External Call History package is installed, you will no longer be able to access any call record data from *CentreVu* CMS. For more information, see the *CentreVu™ CMS R3V5 External Call History Interface* (585-215-824) document. It explains how to administer the UUCP link port on network terminal servers.

Do these steps to install the External Call History feature package:

1. Access the *CentreVu* CMS Services menu by entering:

```
# cmssvc
```

The program responds:

```
Lucent Technologies CentreVu(TM) Call Management System Services
Menu

Select a command from the list below.
 1) auth_display Display feature authorizations
 2) auth_set     Authorize capabilities/capacities
 3) run_cms      Turn CentreVu CMS on or off
 4) setup        Set up the initial configuration
 5) swinfo       Display switch information
 6) swsetup      Change switch information
 7) patch_inst   Install a single CMS patch from CD
 8) patch_rmv    Backout an installed CMS patch
 9) load_all     Install all CMS patches found on CD
10) back_all     Backout all installed CMS patches from machine
Enter choice (1-10) or q to quit:
```

2. Select `auth_display`, and verify that the system is authorized to install the External Call History package.

Sample response:

Capability/Capacity	Authorization
-----	-----
vectoring	authorized
forecasting	authorized
graphics	authorized
external call history	authorized
expert agent selection	authorized
external application	authorized
CentreVu(TM) Supervisor	not authorized
Report Designer	authorized
Maximum number of agents	5200
Maximum number of ACDs	4
Simultaneous CentreVu logins	5

Note

If External Call History is not authorized but should be, go to the “Setting Authorizations” section in this chapter and follow the procedures.

3. Access the *CentreVu* CMS Administration menu by entering:

```
# cmsadm
```

The program responds:

```
Lucent Technologies CentreVu(TM) Call Management System
Administration Menu
Select a command from the list below.
  1) acd_create   Define a new ACD
  2) acd_remove  Remove all administration and data for an ACD
  3) backup       Filesystem backup
  4) diskmap     Estimate disk requirements
  5) memory       Estimate memory requirements
  6) realtime    Estimate real-time report refresh rate
  7) pkg_install  Install a feature package
  8) pkg_remove  Remove a feature package
  9) run_cms     Turn CentreVu CMS on or off
Enter choice (1-9) or q to quit:
```

4. Enter 7 to select the `pkg_install` option.

The program responds:

```
The CMS Features that can be installed are
  1) forecasting
  2) external call history
Enter choice (1-2) or q to quit:
```

Note

The system displays only feature packages that are authorized and not yet installed.

5. Enter the number that corresponds to External Call History. The program responds:

```
Enter the name of computer to which to send call records
(up to 256 characters):
```

6. Enter the name of the Call History Reporting machine that was administered in *uucp*. The program responds:

Enter password for nuucp login on xxxxxxxx (up to 8 characters)

7. Enter the password for *nuucp* of the Call History Reporting machine that was administered in *uucp*. The program responds:

Enter CMS port for connection to xxxxxxxx (s_pdevxxx):

8. Enter the *CentreVu* CMS port administered for the Call History Reporting machine. This port can either be on one of the NTS patch panels or on one of the 8- or 16-port NTSs. For more information on administering the ports on the NTS, see Chapter 4, "Administering Terminals, Printers, and Modems."

The program responds:

Select a speed for this connection

- 1) 19200
- 2) 38400

9. Enter the speed that the connection between the *CentreVu* CMS and Call History Reporting machine will be using. The program responds:

Number of call segments to buffer for ACD xxxxxxxx (0-99999):

10. Enter the number of call records to be held in the buffer if the Call History machine cannot accept the data. (This step reserves disk space; therefore, sufficient disk space must be available.)

Note

Step 10 is repeated for each administered ACD.

The program responds:

```
Computing space requirements and file system space availability.
```

```
External Call History package installed
```

11. Verify that the installation completed successfully by entering:

```
# tail /cms/install/logdir/admin.log
```

The External Call History package is installed successfully when you see this message:

```
. . . . .  
. . . . .  
External Call History package installed <date/time>
```

You may edit this file for additional information on packages which were installed or authorized.

Chapter 7

Turning the System Over to the Customer

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Overview

This chapter describes how to test the *CentreVu*™ Call Management System Release 3 Version 5 (CMS R3V5) software to ensure that the application is working properly. In addition, a worksheet is provided at the end of this chapter for turning the system over to the customer. You should do these tests after:

- Completing the initial *Sun** *SPARCserver*† computer installation and *CentreVu* CMS setup
- Completing a *CentreVu* CMS software package upgrade
- Completing a *CentreVu* CMS software package update.

Before you begin the procedures described in this chapter, the switch technicians must complete the following:

- Connect the *Sun SPARCserver* computer to the switch.
- Translate the switch with the *CentreVu* CMS feature enabled.
- Connect the switch to an active link.

The procedures in this chapter comprise the following:

- Testing the operating system parameters
- Testing the connection between the *Sun SPARCserver* computer and the Technical Service Center (TSC)

Note

Do this test only after initially installing the *CentreVu* CMS R3V5 software, not after installing a new base load or field update.

- Testing the sanity of the *CentreVu* CMS feature package

Note

Do this test after initially installing or upgrading the *CentreVu* CMS R3V5 software.

- Testing the sanity of any *CentreVu* CMS-related feature packages (Vectoring, Graphics, and Forecasting)

Note

Do this test after initially installing or upgrading the *CentreVu* CMS R3V5 software.

- Testing the link configuration between the *Sun SPARCserver* computer and the switch.

If you encounter a problem that you cannot solve, escalate the problem through normal procedures.

*Sun is a registered trademark of Sun Microsystems, Inc.

†SPARCserver is a trademark of SPARC International, Inc.

Verifying the System Date and Time

This section describes how to verify that the *Solaris*^{*} 2.4 system time and the current local time are the same.

Checking the *Solaris* System Date and Time

Verify that the system time is correct by entering:

```
# date
```

If the system time is correct, go to the “Testing the Connection to the Technical Service Center” section in this chapter. Otherwise, continue with the “Setting the System Date and Time” section.

Setting the System Date and Time

Do these steps to set the system time:

1. Log in as *root*.
2. Change to an OpenBoot mode with the following command:

```
# shutdown -i0 -g0 -y
```

Note

The `-i0` portion of the shutdown command string changes the system to an OpenBoot mode.

^{*}Solaris is a registered trademark of Sun Microsystems, Inc.

3. At the ok prompt, execute the following command:

```
boot -s
.
.
Resetting.....
Type Ctrl-d to proceed with normal startup
(or give root password for system maintenance):
```

4. Enter the *root* password

The system responds:

```
Entering System Maintenance Mode
Enter Terminal Type: (default is 6300+):
```

5. At the prompt, enter the type of terminal, and press **Return**.

6. As *root*, enter the date command to set the time and date.

```
# date mmddHHMM[yy]
```

For example:

- **mm (month):** Enter the month (numeric). Range: 01-12 (01=January, 02=February, etc.).
 - **dd (day):** Enter the day of the month. Range: 01-31.
 - **HH (Hour):** Enter the current hour of the day, military time. Range: 00-23.
 - **MM (minute):** Enter the minute of the hour. Range: 00-59.
 - **yy (year):** Enter the last two digits of the current year (96, for example, for “1996”).
7. Set the time zone environment variable in the */etc/default/init* file by doing the following:
- a. Examine the */usr/share/lib/zoneinfo* directory for time zones. For more information about time zones, see the next section, “Setting the System Country and Time Zones.”
 - b. Edit the */etc/default/init* file with a text editor (for example, vi).

- c. Change the `/etc/default/init` file by using the `w!` command to overwrite the file.

Note

For additional information, enter the `man date` command at the system prompt, or see *AnswerBook*^{*} on-line software package.

^{*} AnswerBook is a trademark of Sun Microsystems, Inc.

8. Return to a multi-user state with the following command:

```
# shutdown -i6 -g0 -y
```

Note

The `-i6` portion of the shutdown command string changes the system to multi-user state.

Setting the System Country and Time Zones

To set the country and time zone, do the following:

1. At the console, exit *OpenWindows*^{*} interface, if currently running.
2. To initiate an OpenBoot mode, enter the following command:

```
# shutdown -i0 -g0 -y
```

Note

The `-i0` portion of the shutdown command string changes the system to a OpenBoot mode.

3. At the ok prompt, execute the following command:

```
boot -s
.
.
Resetting.....
Type Ctrl -d to proceed with normal startup
(or give root password for system maintenance):
```

4. Enter the *root* password.

^{*}OpenWindows is a trademark of Sun Microsystems, Inc.

The system responds:

```
Entering System Maintenance Mode
Enter Terminal Type: (default is 6300+):
```

5. At the prompt, enter the type of terminal, and press **Return**.
6. Modify the `/etc/default/init` file with an appropriate value from the `/usr/share/lib/zoneinfo` directory.

Note

The entry in the `init` file is essentially a relative path name from the `/usr/share/lib/zoneinfo` directory.

7. Specify the relative path name.

For example, for Colorado, the contents of `/etc/default/init` could be `TZ=MST` or `TZ=US/Mountain`. In this example, `MST` (Mountain Standard Time) is a file in `/usr/share/lib/zoneinfo`, and `Mountain` is a file in `/usr/share/lib/zoneinfo/US`.

8. Reboot the machine using the following command:

```
init 6
```

Note

For additional information, enter the `man date` command at the system prompt, or see *AnswerBook* on-line software package.

Testing the Connection to the Technical Service Center

The information in this section is used to verify that the TSC is properly connected to the *Sun SPARCserver* computer. This connection allows the TSC to do remote maintenance.

Testing the Remote Access Port

Use the information in this section to verify that the TSC can dial in remotely and perform routine maintenance procedures on the *Sun SPARCserver* computer.

This section describes how to redirect port A (remote console port) on the *Sun SPARCserver* computer using the *Solaris* software package. Redirecting the console allows the TSC to dial in and do remote maintenance.

Test port A on the back of the *Sun SPARCserver* computer by redirecting the console to the remote terminal and then redirecting the console back to the *Sun* monitor.

How to Remote the Console

To test the connection between the TSC and the remote console, do the following:

1. Dial in (from the remote terminal) to the remote console modem (for example, access port A on the computer), and log in as *root*.
2. Remove the port monitor by entering the following command:

```
# /cms/install/bin/abcmadm -r ttya
```

The program responds:

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

3. Enter y. The program responds:

```
ttya administration removed
```

4. To check the speed of the modem, enter the following command:

```
# abcdm -k
```

Note

All remote access ports have a default baud rate of 9600.

5. Redirect the console to the A port (remote console) by entering the following commands:

```
# /cms/install/bin/abcdm -c -b <9600> ttya
```

The program responds:

```
This change requires a reboot to take affect
```

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

6. Enter y.

```
Starting port monitor.  
Setting console parameters.  
Proceeding to reboot.
```


The system automatically reboots.

As the system reboots, shutting down, reset, and rebooting messages will appear on the *Sun* monitor. When the system starts to come back up, the *Sun* monitor should go blank, and the system boot diagnostics should appear on the remote console terminal. After the system reboots, a console `login:` prompt should appear on the remote console terminal. The XDM login appears on the local monitor.

7. Log in to the remote console as *root*.

Note

At this time, an XDM login window for the *OpenWindows* interface appears on the *Sun SPARCserver* monitor.

How to Redirect Back to Local

1. Redirect the console back to the local console by entering the following command:

```
# /cms/install/bin/abcmadm -c local
```

The program responds:

```
Console set to local
```

```
This change requires a reboot to take affect
```

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

2. Enter y. The system will automatically reboot, and the A port will come up as the console.

As the system reboots, the shutting down messages will appear on the remote console monitor. When the system starts to come back up, the system boot diagnostics should appear on the *Sun* monitor. After the system reboots, a console `login:` prompt should appear on the *Sun* monitor. A `login:` prompt should appear on the dial-in terminal.

3. Log into the local console as *root*.
4. Log into the dial-in terminal as *root*.

The console has been redirected to the remote terminal and redirected back to the system console.

See Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures,” for more information about setting the remote console modem options, connecting the remote console to the *Sun SPARCserver* computer, and administering the remote console ports.

Assigning Passwords

This section describes how to assign passwords to each login on the *Sun SPARCserver* computer. Prior to testing the *CentreVu* CMS R3V5 software, you must assign passwords to each of the following logins:

- *root*
- *cms*
- *cmssvc*
- any other administration logins you add to the *Sun SPARCserver* computer.



Store the passwords for each login on the provided “Turning the System Over to the Customer” form at the end of this chapter.

To assign passwords, do the following procedures for each login:

1. Log in as *root*.
2. At the system prompt, enter the following command:

```
# passwd <login>
```

The system responds:

```
New password:
```

3. At the `new password:` prompt, enter the new password.
4. Enter the password again.

Testing the *CentreVu* CMS R3V5 Software

The following procedure should be completed by the on-site technician after the *CentreVu* CMS R3V5 software has been installed or upgraded to verify the sanity of *CentreVu* CMS R3V5 software:

1. Start the *OpenWindows* interface.

If the *OpenWindows* interface is not displayed, do the following:

- a. Log off the system console.
- b. Log back on the system console.
- c. Answer yes to the question: Open Windows? y/n:

Note

When in the *OpenWindows* interface, if you get a window that says “xterm” at the top of the screen, then the TERM should be set to xterm. If the window says “Sun command window,” then the TERM should be set to sun - cmd.

2. In one of the windows at a console terminal, log into the system by using a *CentreVu* CMS administrator's login ID (su cms). Supply the correct password when prompted.

For information about starting the *OpenWindows* interface, see Chapter 1, “Introduction.”

3. Access the *CentreVu* CMS R3V5 main menu by typing cms and entering the correct terminal type.
4. Test the Real-Time Reports subsystem by doing the following from the *CentreVu* CMS Main Menu:
 - a. Select the Reports option.
 - b. Select the Real-time option.
 - c. Select the Split/Skill option.
 - d. Select the Split Status or Skill Status option.
 - e. Verify that the Split/Skill Status Report Input window appears.
 - f. Enter a valid split number in the Split: or Skill field.
 - g. Select the Run action list item, and run the report.
 - h. Verify that the Split or Skill Status Report window appears.
 - i. Press the **Commands** Screen Label Key (SLK).
 - j. Select the Print window option to send the report to the printer.

- k. Look at the message line near the bottom of the window, and verify that there is a confirmation message about sending the report to the printer.
 - l. Verify that the report printed by checking the printer for the report.
 - m. Return to the *CentreVu* CMS Main Menu screen by pressing the **Exit** SLK twice.
5. Test the Historical Reports subsystem by doing the following from the *CentreVu* CMS Main Menu:
- a. Select the Reports option.
 - b. Select the Historical option.
 - c. Select the Split/Skill option.
 - d. Select the Status option.
 - e. Verify that the Split/Skill Status Report Input window appears.
 - f. Enter a valid split number in the Split/Skill: field.
 - g. Enter -1 in the Date: field.
 - h. Select the Run action list item, and run the report.
 - i. Verify that the report window appears and information is displayed in the appropriate fields.
- Note** If no historical data exists, the fields in the report window should be blank.
- j. Return to the *CentreVu* CMS Main Menu by pressing the **Exit** SLK twice.
6. Test the Dictionary subsystem by doing the following from the *CentreVu* CMS Main Menu:
- a. Select the Dictionary option.
 - b. Select the Login Identifications option.
 - c. Enter an * in the Login ID: field.
 - d. Select the List all action list item to list all the login IDs.
 - e. Verify that the logins are displayed.
 - f. Return to the *CentreVu* CMS Main Menu by pressing the **Exit** SLK twice.

7. Test the Exceptions subsystem by doing the following from the *CentreVu* CMS Main Menu:

- a. Select the Exceptions option.
- b. Select the Real-time Exception Log option.
- c. Verify that the window is accessible.

Note

For a new installation, this window may be blank.

- d. Return to the *CentreVu* CMS Main Menu by pressing the **Exit** SLK once.

8. Test the ACD Administration subsystem by doing the following from the *CentreVu* CMS Main Menu:

- a. Select the ACD Administration option.
- b. Select the Call Work Codes option.
- c. Press the **Return** key.
- d. Select the List all action list item, and list all the call work codes currently defined.
- e. Verify that the displayed information is correct.
- f. Return to the *CentreVu* CMS Main Menu by pressing the **Exit** SLK once.

9. Test the Custom Reports subsystem by doing the following from the *CentreVu* CMS Main Menu:

- a. Select the Custom Reports option.
- b. Select the Real-time option, and verify that the names of existing custom reports are listed. If there are no reports, you receive a message saying the submenu is empty.
- c. Return to the *CentreVu* CMS Main Menu by pressing the **Exit** SLK once.

10. Test the User Permissions subsystem by doing the following from the *CentreVu* CMS Main Menu:

- a. Select the User Permissions option.
- b. Select the User Data option.
- c. Verify that the User Data Input window appears.
- d. Return to the *CentreVu* CMS Main Menu by pressing the **Exit** SLK once.

11. Test the System Setup subsystem by doing the following from the *CentreVu* CMS Main Menu:
 - a. Select the System Setup option.
 - b. Select the CMS state option.
 - c. Verify that *CentreVu* CMS is operating in the Multi-user mode.
 - d. Return to the *CentreVu* CMS Main Menu by pressing the **Exit** SLK once.
12. Test the Maintenance subsystem by doing the following from the *CentreVu* CMS Main Menu:
 - a. Select the Maintenance option.
 - b. Select the Printer Administration option.
 - c. Enter a valid printer name in the CMS printer name: field.
 - d. Select the List all action list item, and list the printer parameters.
 - e. Verify that the printer has been administered correctly.
 - f. Return to the *CentreVu* CMS Main Menu by pressing the **Exit** SLK twice.
13. If the Graphics feature package has been enabled, test the Graphics subsystem by doing this from the *CentreVu* CMS Main Menu:
 - a. Select the Graphics option.
 - b. Verify that a Real-time Graphics screen can be accessed.
 - c. Return to the *CentreVu* CMS Main Menu by pressing the **Exit** SLK once.
14. At each *CentreVu* CMS terminal, log in as cms and choose the correct terminal type to verify that the terminals are working properly. To log off, select the Logout option from the *CentreVu* CMS Main Menu. Return to the system login prompt.
15. If you were able to complete each of the steps in the test successfully, do a CMSADM file system backup before you turn the R3V5 *CentreVu* CMS application over to the customer. See Chapter 9, "Maintenance," for details.

Note If any of the steps in the test failed, refer to Chapter 8, "Troubleshooting," and try to solve the problem associated with the step that failed. If you encounter a problem that you cannot solve, escalate the problem through normal procedures.

To complete the test, do the following before you turn the *CentreVu* CMS R3V5 application over to the customer:

1. If you have not already done so, back up the file systems by following the procedures outlined in the “Performing a CMSADM Backup” section in Chapter 9, “Maintenance.”
2. If you have not already done so, back up the customer's historical data by doing a full maintenance backup from the Maintenance subsystem in *CentreVu* CMS. See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document.
3. Log in at the console terminal and start *CentreVu* CMS. When the *CentreVu* CMS Main Menu appears, look at the banner line at the top of the window. You are looking for the time and the ACD link indicator.

The time is at the left side of the banner line, just after the date. Make sure the time displayed is current.

The link indicator consists of the “carets” (“^” and “v”) at the right side of the banner line. There should be one caret for each ACD, and all should be **UP**. (If you have four ACDs, for example, the link indicator should look like this: ^^^^v. That means that all four ACDs are up and running.)

To log off, select the Logout option on the *CentreVu* CMS Main Menu. This completes the test. You can now turn the *CentreVu* CMS R3V5 application over to the customer.

Turning the System Over to the Customer

When you finish the tests in this chapter, go to Chapter 9, “Maintenance,” and perform the backup procedures. Then, complete the worksheet below, attach the indicated printouts and screen dumps, and give the resulting package to the customer’s *CentreVu* CMS administrator.

Note

For system security, the *CentreVu* CMS administrator must store written passwords, *INFORMIX*^{*} serial number and key license information, and X.25 license information in a secure place.

* INFORMIX is a registered trademark of Informix Software, Inc.

☐	Passwords for system login IDs:	
	Login ID: <u> root </u>	Password: _____
	Login ID: _____	Password: _____
	Login ID: _____	Password: _____
☐	CentreVu CMS administrator login IDs and passwords:	
	Login ID: <u> cms </u>	Password: _____
	Login ID: _____	Password: _____
	Login ID: _____	Password: _____
☐	df -t results (attach screen dump showing df -t command results, or record results here):	

☐	Printer administration: Print out the CMS Maintenance - Printer Administration - List all window	
☐	Free Space Allocation: Print out the CMS System Setup - Free Space Allocation window	
☐	Data Storage Allocation parameters: Print out the CMS System Setup - Data Storage Allocation window for each ACD	

Chapter 8

Troubleshooting

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Overview

This chapter contains troubleshooting information about the *Sun*^{*} *SPARCserver*[†] computer and the *CentreVu*[™] Call Management System Release 3 Version 5 (CMS R3V5) application. You should use the information to clear problems that may arise during and after the *CentreVu* CMS software installation.

The following list outlines the troubleshooting sections in this chapter:

- Solving *CentreVu* CMS-Related Problems
- Solving Hardware-Related Problems
- Solving Terminal-Related Problems
- Solving Printer-Related Problems
- Solving Modem-Related Problems
- Solving Power-Related Problems
- Solving Installation-Related Problems
- Checking Error Logs.

^{*}Sun is a registered trademark of Sun Microsystems, Inc.

[†]SPARCserver is a trademark of SPARC International, Inc.

Solving *CentreVu* CMS-Related Problems

This section describes some of the problems that can arise when using the *CentreVu* CMS software.

See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document for information about restoring data, using backup strategies, accessing error logs, and using error messages.

Solving Hardware-Related Problems

This section describes how to solve the most common computer hardware problems that may arise before or after the installation of the *CentreVu* CMS software.

Hardware Diagnostic Tools and Resources

The remote maintenance person has four tools/resources that do hardware diagnostics:

- OpenBoot Diagnostics (requires console redirection)
- Power on self test (POST) messages during a reboot (requires console redirection)
- SunDiags on-line system tool/exerciser (does not require console redirection)
- Error logs (do not require console redirection).

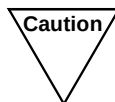
OpenBoot Diagnostics

The OpenBoot firmware serves two purposes:

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

To use OpenBoot Diagnostics, do the following steps:

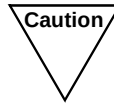
1. Do **one** of the following to enter the OpenBoot environment:
 - Stop the operating system with the *Solaris*^{*} `halt` or `shutdown -y -i0 -g0` command. This is the preferred method of stopping the operating system.
 - Press the **Stop** and **A** keys simultaneously on the keyboard while *Solaris* is running.



Using the **Stop** and **A** keys simultaneously while *Solaris* is running breaks the execution of the operating system and should be used with caution. Use this key combination as a last resort if the previous method fails.

^{*}Solaris is a registered trademark of Sun Microsystems, Inc.

- Power off and power on the *Sun SPARCserver* computer. Press the **Stop** and **A** keys simultaneously on the keyboard after the display console banner appears but before the system starts booting the operating system (referred to as power-cycling the system).



Use this method **only** if the previous methods fail to work.

After you are in the OpenBoot environment, the following prompt appears:

```
ok
```

2. At the ok prompt, enter `help` for a list of available commands, or see Table 8-1 for a summary of some of the OpenBoot diagnostic test commands.

Additional information about the OpenBoot firmware is available on-line through *AnswerBook*^{*} on-line software or by contacting the Technical Service Center (TSC).

^{*}AnswerBook is a trademark of Sun Microsystems, Inc.

Table 8-1: Summary of OpenBoot Diagnostic Test Commands

Test Command	Description	
probe-scsi	This command identifies the devices attached to the built-in SCSI bus.	
probe-scsi-all [device-path]	This command is the same as the probe-scsi command except that it includes all of the SCSI buses installed in the system below the specified device tree node. If the device path is absent, the root node is used.	
test device-specifier	This command executes the specified device's self-test method. Possible values for device-specifier are listed in the Alias column below:	
	Alias*	Description
	memory	memory
	cdrom	cdrom
	tape	QIC 2.5-GB
	tape1	QIC 2.5-GB
	tape2	14-GB
	disk	disk 1
	disk1	disk 1
	disk2	disk 2
	floppy	floppy
	*If you need to test additional devices that do not have an alias, use the test-all command.	
test-all [device-specifier]	This command tests all of the devices that have built-in self-test methods below the specified device tree node. If <device-specifier> is absent, the root node is used.	
watch-clock	This command tests the clock function.	
eject [device-specifier]	This command ejects either the floppy or cdrom devices.	

POST Messages Diagnostics

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

1. At the `ok>` prompt, enter the following command to boot your system:

```
ok> boot
```

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

SunDiag Diagnostics

SunDiag exerciser is an on-line system tool (an exerciser) that runs diagnostic hardware tests.



Running the *SunDiag* exerciser will cause system response delays in the default test configuration.

The *SunDiag* exerciser uses the following interfaces:

- *SunDiag OpenWindow* Interface — provides a graphical user interface that requires an *OpenWindows** environment with a local monitor.
- TTY Interface — provides a screen interface on a regular terminal. This is the default mode when trying to remote the system.
- Command Line Interface — provides a nonscreen interface.

Table 8-2 provides an overview of the available tests.

*OpenWindows is a trademark of Sun Microsystems, Inc.

Table 8-2: *SunDiag* Test Descriptions

Type of Device	Test Command	Description
Memory Devices	pmem	Read-only Physical Memory Test — checks the physical memory of the system. Locates parity errors, hard and soft Error Correction Code (ECC) errors, memory read errors, and address problems.
	vmem	Write/Read/Compare Virtual Memory Test — checks the virtual memory. Tests the combination of physical memory and the swap partitions of the disk(s).
CPU Devices	fptest	Floating Point Unit Test — uses various subtests to check the floating point unit on the <i>Sun SPARCserver</i> computer.
	nettest	Network Interface Test — checks all the networking hardware on the system CPU board and separate networking controllers.
	autest	Audio Hardware Test — checks the MAP registers in the audio chip.
	mpptest	Multiprocessing Test — verifies that the processors are functioning properly.
Disk Devices	rawtest	Disk Read/Write/Compare Test — performs read-only or read-write tests on “raw” disk partitions.
	fstest	Disk File System Test — uses the <i>Solaris</i> file system device driver to check the disk controller and drive. Reads and compares specified data patterns from two files.
	cdtest	Compact Disc Test — checks the CD table of contents and verifies that the table of contents matches <i>cdtest</i> ’s own Table of Contents table.
Tape Devices	tapetest	Tape Drive Test — waits 60 seconds to clear any bus traffic, rewinds the tape, erases it, writes a pattern to a specified number of blocks (or, for a SCSI tape, writes to the end of the tape). It rewinds the tape, reads, and compares the information just written.

Table 8-2: *SunDiag* Test Descriptions (Contd)

Type of Device	Test Command	Description
SBus Devices	fbtest	Frame Buffer Test — tests the frame buffer by sequentially writing, reading, and verifying small blocks of random patterns across the entire video RAM. Serves as a generic test for all dumb frame buffers used with <i>Solaris 2.4</i> .

For more information about the *SunDiag* exerciser, see any of the following resources:

- *SunDiag* on-line manual page (for example, the `man sundiag` command).
- *AnswerBook* on-line software (especially the content of the *SunDiag User's Guide* which is included in the *Solaris 2.4 System Administrator AnswerBook*).

OpenWindows or TTY Interface Procedures

To use the *SunDiag* on-line tool to diagnose hardware problems via the *OpenWindows* or TTY interface, do the following steps:

1. Log in as *root*.
2. If running the *SunDiag* exerciser in TTY mode, set the terminal type **before** attempting to start the *SunDiag* exerciser.
3. Start the *SunDiag* on-line tool with the command syntax:

```
/opt/SUNWdiag/bin/sundiag [-Cpqtw] [-i number]
[-o options-file] [-b batch-file] [-k kernel-name]
```

To start the *SunDiag* on-line system tool, enter the following command:

```
# /opt/SUNWdiag/bin/sundiag <options>
```

The system brings up the *SunDiag* on-line system tool.



The *SunDiag* exerciser in the *OpenWindows* environment or in the TTY mode on a terminal can grab control of the local monitor while running. To avoid this, make sure you disable the system with the Frame Buffer Test (see step 4).

4. To disable the system with the Frame Buffer Test, do the following:

From the *OpenWindows* interface:

- a. On the *SunDiag* Main Display menu (graphic window), select the following if they are listed under the CPU or SBUS category:
 - cgfourteen0 (a CPU device)
 - sx0 (a CPU device)
 - cgsix0 (an SBUS device).

From a TTY terminal interface:

- a. On the System Status Display Screen (text window), enter the following command:

```
.
.
Command: sx0
Command: cgfourteen0
Command: cgsix0
```

If your system does not contain all these frame buffers, you may see Message: Command error! displayed. Ignore this message.

See the *Solaris SunDiag 4.1 User's Guide* for more details.

5. To exit the *SunDiag* exerciser, do the following:

From the *OpenWindows* interface:

- a. Select **Stop** to stop any tests that are running. Some of the tests, such as the tape tests, may delay before actually stopping, because these tests require time to rewind the tapes.
- b. Move the cursor to the top bar on the *SunDiag* window, and select the QUIT option.

From a TTY terminal interface:

- a. Enter t to execute the STOP command. This command stops any test that is currently running. Some of the tests, such as the tape tests, may delay before actually stopping, because these tests require time to rewind the tapes.
- b. Enter q to execute the QUIT command.

Command Line Interface Procedures

To use the *SunDiag* on-line tool to diagnose hardware problems via the Command Line interface, do the following steps:

1. Log in as *root*.
2. Set the terminal type **before** attempting to start the *SunDiag* exerciser.
3. Change the directory to match the *SunDiag* exerciser location on your system:

```
# cd /opt/SUNWdiag/bin
```

The system prompt appears.

4. To start a specific test from the command line, enter the following command for an individual test:

```
# /opt/SUNWdiag/bin/<testname> test-specific-arguments  
[cprqvudt] [h hostname]
```

The system prompt appears.

For more information about values for <testname> and <test-specific-arguments>, see any of the following resources:

- *SunDiag* on-line manual page (for example, the `man sundiag` command).
- *AnswerBook* on-line software (especially the content of the *SunDiag User's Guide* which is included in the *Solaris 2.4 System Administrator AnswerBook*).

Checking Error Log Files

The `/var/adm/messages` files contain system messages that are often helpful in diagnosing problems. See the “Correcting Error Logs” section in this chapter for more details.

Diagnosing Remote Console Problems

This section addresses problem scenarios that develop when you dial-in to the remote console port. In general, you should have a person on site to look at remote console problems.

Problem Solving Scenarios

Scenario 1:

You do not get the RINGING and ANSWERED responses displayed on the screen.

Solutions:

- Check the port connectivity — see Figure 8-1. Refer to Chapter 3, “Installing the *Sun SPARCserver* Computer,” and Appendix D, “Sun *SPARCserver* Computer Factory Installation Procedures,” for details.
- Check modem setup — see Figure 8-1. Refer to Chapter 3, “Installing the *Sun SPARCserver* Computer,” and Appendix D, “Sun *SPARCserver* Computer Factory Installation Procedures,” for details.
- Check port A administration. Refer to Chapter 3, “Installing the *Sun SPARCserver* Computer” and Appendix D, “Sun *SPARCserver* Computer Factory Installation Procedures,” for details.

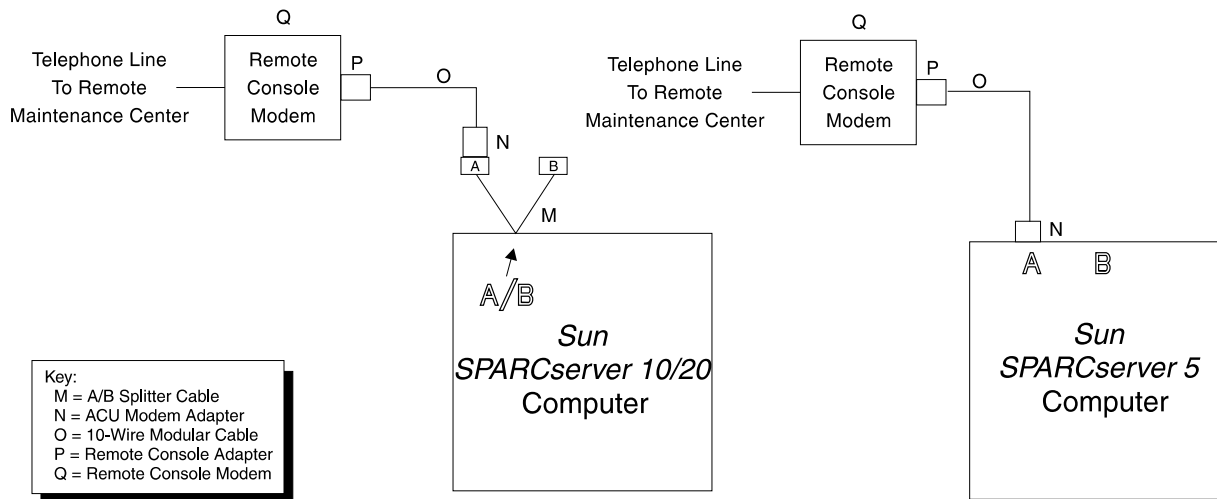


Figure 8-1: Remote Console Connectivity

Scenario 2:

You get the RINGING and ANSWERED responses displayed on the screen, but get no *login*.

Solutions:

- Check the dial-in parameters — see the following section “Diagnosing Dial-in Access Problems” for details.
- Check the state of the system — the console may not be remoted, and there may not be a port monitor on the port.

Note

The system could also be at the OpenBoot prompt (ok>), which would indicate that the console is local.

To have an on-site person check the state of the system, enter the following command, and press **Return** a few times:

```
# /cms/install/bin/abcmadm -k
```

If the console is not remoted, then remote the console.

Scenario 3:

The dial-in gives you garbage characters instead of a *login*.

Solution:

Try pressing a few keys to see if the problem corrects itself.

Scenario 4:

The dial-in continues to display garbage characters instead of a *login*.

Solution:

Check the baud rate of the remote console by doing the following:

- a. Have an on-site person run the following command:

```
# /cms/install/bin/abcmadm -k
```

- b. Make sure the baud rate is consistent with the modem connected on site and the modem and terminal at the remote site.
- c. If there is a baud rate inconsistency on site, reconfigure the machine with the appropriate baud rate for the modem with the following command:

```
# abcmadm -c -b<baud> <ttya>
```

The system responds by rebooting.

- d. If there is a baud rate inconsistency with the remote site, reconfigure the remote site and redial.

Scenario 5:

None of the above scenarios resolve the symptoms.

Solution:

Set the console back to local by switching to the local console via the OpenBoot method. See the “Diagnosing Problems Using the Remote Console” section in this chapter for details.

Scenario 6:

You experience problems when trying to:

- set the console to remote,
- create a command menu from XDM, or
- boot from XDM.

Solution:

Power on (turn on) your modem.

In addition, this section also describes what to do if you suspect a problem with the remote console.

Diagnosing Dial-In Access Problems

This section describes the scenarios where the console is local and you are attempting to dial-in via port A. It often takes a person on-site to look at the dial-in access problems.

Scenario 1:

The remote dial-in does not get the Answered and Connected responses displayed on the screen.

Solution:

At the on-site location, make sure the modem is on, and check the following cabling connections:

- Phone line to the modem
- Modem to port A
- Port A to the *Sun SPARCserver* computer.

Scenario 2:

The remote user gets Answered and Connected responses displayed on the screen, but no *login*.

Solution:

1. Enter **one** of the following commands to make sure that a monitor is running:

```
# pmadm -l; sacadm -l  
    <or>  
# /cms/install/bin/abcadm -k
```

2. If no port monitor is running, start a port monitor by entering the following command:

```
# /cms/install/bin/abcadm -i -b <baud> ttya
```

3. If a port monitor is running, make sure that the port monitor is set up at the correct baud rate relative to the local modem.
4. If the baud rate is not correct, remove the current port monitor, and start a new port monitor at the correct baud rate. Enter the following commands:

```
# /cms/install/bin/abcadm -r ttya  
    <and>  
# /cms/install/bin/abcadm -i -b <baud> ttya
```

5. If the port monitor is running and is at the correct baud rate, try to fix the problem by disabling and enabling the port monitor by entering the following commands:

```
# pmadm -d -p ttymona -s ttya  
    <and>  
# pmadm -e -p ttymona -s ttya
```

Scenario 3:

The remote user gets the Answered and Connected responses displayed on the screen, but the *login* is scrambled (for example, a short line of graphics characters).

Solution:

Have the remote user enter a few keys (any keys), and see if it clears up the problem. If this does not clear up the problem, then the port monitor is probably not the same baud rate as the modem.

Identifying Link Problems

This section describes how you can diagnose link problems on the *Sun SPARCserver* computer. To diagnose link problems, do the following:

- Check the status of Link Access Protocol B (LAPB) for the link in question.
- Stop and start the X.25.
- Check the switch administration.
- Check the cabling.
- Check the RS-232 to RS-422 Interface Converter. (Used only with a High Speed Serial Interface/SBus (HSI/S) card.)
- Check the HSI/S card.
- Monitor the LAPB and X.25 protocol.

Checking the Status of LAPB

The first item to check for troubleshooting link problems is the status of LAPB for the link in question.

To check if LAPB (layer 2 of the X.25 Protocol) is up, do the following:

1. Examine the */var/adm/messages* files or the system console for the last message about the link. One of the following messages appear:

Message 1: "LAPB Up on link x."

Diagnosis: LAPB is up for the link indicated.

Message 2: "LAPB Down on link x."

Diagnosis: LAPB is down for the link/port indicated.

Message 3: "hihx: xmit hung."

Diagnosis: LAPB is down for the link/port indicated.

2. If LAPB is not up, answer the following questions:

- Has X.25 been started without errors?
 - Is the switch administration correct?
 - Is the cabling correct?
 - Is the Interface Converter operating correctly?
 - Is the HSI/S card ok?
3. If LAPB is up, answer the following questions:
- Has data collection been turned on?
 - Is the switch administration correct?
 - Does the error log contain any link-related messages?
 - Does the `spi.err` file contain messages about mismatched administration?

Stopping and Starting Individual Links

The `linkstop` command is used to “stop” a link. The link will not respond to any LAPB messages until the link is restarted with the `linkreset` or the `linkstart` command. To stop a link enter the following command:

```
# /opt/SUNWconn/x25/bin/linkstop <linkid>
```

a <linkid> of 0 refers to HSI port 0

a <linkid> of 1 refers to HSI port 1

a <linkid> of 2 refers to HSI port 2

a <linkid> of 3 refers to HSI port 3

a <linkid> of 5 refers to Serial Port B

The `linkreset` command is used to “start” a link which has been stopped with the `linkstop` command. To start a link enter the following command:

```
# /opt/SUNWconn/x25/bin/linkstart <linkid>
```

The linkset command is used to “reset” a link. It may also be used to “start” a link which has been stopped with the linkstop command. To reset a link enter the following command:

```
# /opt/SUNWconn/x25/bin/linkreset <linkid>
```

Note All links are reset when X.25 is started.

The most common use of these commands would be to reset an X.25 link while troubleshooting a problem. For example, to reset link 1, enter the following command:

```
# /opt/SUNWconn/x25/bin/linkreset 1
```

Or enter the following commands:

```
# /opt/SUNWconn/x25/bin/linkstop 1  
/opt/SUNWconn/x25/bin/linkstart 1
```

Note X.25 must have been started prior to entering these commands.

Starting and Stopping X.25

When you start and stop X.25, you are starting and stopping it for all links on the machine.

To start and stop the X.25, do the following:

1. Check the status of the network daemons by entering the following command:

```
# /etc/init.d/x25.control status
```

The system responds:

```
The network is up
#
```

2. To stop the network daemons, enter the following command:

```
# /etc/init.d/x25.control stop
```

3. To start the network daemons, enter the following command:

```
# /etc/init.d/x25.control start
```

The system responds:

```
Starting the X.25 software - please wait
X.25 has found a valid license
The network has been brought up.
#
```

4. If other messages are displayed, the network did not start successfully. For example:


```
x25netd: failed to open driver "/dev/hih0" (Bad file
number[9])
#
```

Note

You will see the above message if you tried to restart the network too quickly after stopping it. When you see this message, wait a minute before starting X.25.

5. If X.25 cannot start due to license problems, check the license manager. The license manager (lmgrd) is started when the *Sun SPARCserver* computer is booted.
 - a. To check if the license manager is running, enter the following command:

```
# ps -ef | grep lmgrd
```

- b. If the license manager is not running, enter the following script command:

```
# /etc/rc2.d/S85lmgrd
```

- c. Examine the messages in the */tmp/license_log* file.

Refer to the *SunLink^{*} X.25 8.0.2 Installation Guide* for more information on licensing error messages.

The system responds:

```
The X.25 software is being stopped - please wait.
The network programs are being killed - please wait
The network has been stopped.
#
```

^{*}SunLink is a registered trademark of Sun Microsystems, Inc.

Checking Switch Administration

To verify that the switch link administration is correct, see Chapter 5, “Connecting the *Sun SPARCserver* Computer to the Switch,” and Appendix C, “Generic 3r Administration,” in this manual for details. In general, the switch administration is the same for connecting to the *INTEL*^{*} CMS platforms and the *Sun SPARCserver* platform. There is one exception in the G3r switch administration for the *Sun SPARCserver* computer.

Make the following required G3r switch administration changes:

1. Set the Number of Outstanding Frames(w) field on the data module for the *CentreVu* CMS link to 4.

Note

If the window size for the *Sun SPARCserver* computer is not 4, the link will reset under the heavy load. The Number of Outstanding Frames(w) field is commonly set to 2 for the *INTEL* platforms.

Checking B Port Administration

If you are using the B port on your *Sun SPARCserver* computer for the switch link, verify that there is no login administration on the B port. Enter the following command to list any login administration on the B port:

```
# pmadm -l | grep /dev/term/b
```

If the `pmadm -l` command shows the login administration on the B port use the `pmadm -r` command to remove the login administration. Remove **only** the login administration for the B port.

^{*}Intel is a registered trademark of Intel Corp.

Checking the Cabling

If the link is not operating reliably and does not operate for speeds above 9600 baud, do the following:

- Check that the “Link Adapter” is placed correctly between the Interface Converter and the IDI.
- If using the B port the link adapter must be between the B port and the IDI.

To verify the link cabling is correct, see Chapter 5, “Connecting the *Sun SPARCserver* Computer to the Switch,” Appendix A, “Generic 3i and Generic 1 Administration,” Appendix B, “Generic 2 and System 85 Administration,” and Appendix C, “Generic 3r Administration,” in this manual for details.

Checking the RS-232 to RS-422 Interface Converter

The purpose of the RS-232 to RS-422 converter is to convert the RS-422 electrical/RS-449 physical interface on the HSI/S card to the RS-232 interface supported in existing switch connections. Each switch link that is connected to the HSI/S card uses one converter.

Note

The Interface Converter is only used with the HSI/S card and not on the B port.

Checking Correct DTE/DCE Settings

The RS-232 to RS-422 converter described in the previous paragraph is shipped with the RS-422/RS-449 port configured as Data Terminal Equipment (DTE) and the RS-232 port configured as Data Communications Equipment (DCE). This is exactly the opposite of what is required for the *CentreVu* CMS X.25 switch link.

As part of the assembly process, each converter must be taken apart. The Dual In-line Package (DIP) shunts in jumpers XW1A, XW2A, and XW3A must be moved to jumpers XW1B, XW2B, and XW3B. This changes the RS-422/RS-449 port to DCE. The DIP shunts in jumpers XW4B and XW5B must be moved to jumpers XW4A and XW5A. This changes the RS-232 port to DTE. See Table 8-3 for an example.

Table 8-3: DTE/DCE DIP-Shunt Settings

Move DIP shunts	
From	To
XW1A	XW1B

Table 8-3: DTE/DCE DIP-Shunt Settings

Move DIP shunts	
From	To
XW2A	XW2B
XW3A	XW3B
XW4B	XW4A
XW5B	XW5A

Note

The DIP shunts are fragile. Be careful when you move them.

For more information, see Chapter 3, “Installing the *Sun SPARCserver* Computer,” Appendix D, “Sun *SPARCserver* Computer Factory Installation Procedures,” or the *Installation and Operation Manual* shipped with each converter.

Checking LEDs

The Interface Converter has six LEDs (light indicators) on the front panel of the black box which help troubleshoot link problems. Three LEDs (DSR, CTS, and DATA) are located on the left side of the monitor. These LEDs are the *Sun SPARCserver* computer's HSI/S portion of the connection. Three LEDs (DSR, CTS, and DATA) are located on the right side of the monitor. These LEDs are the switch portion of the connection. See Figure 8-2.

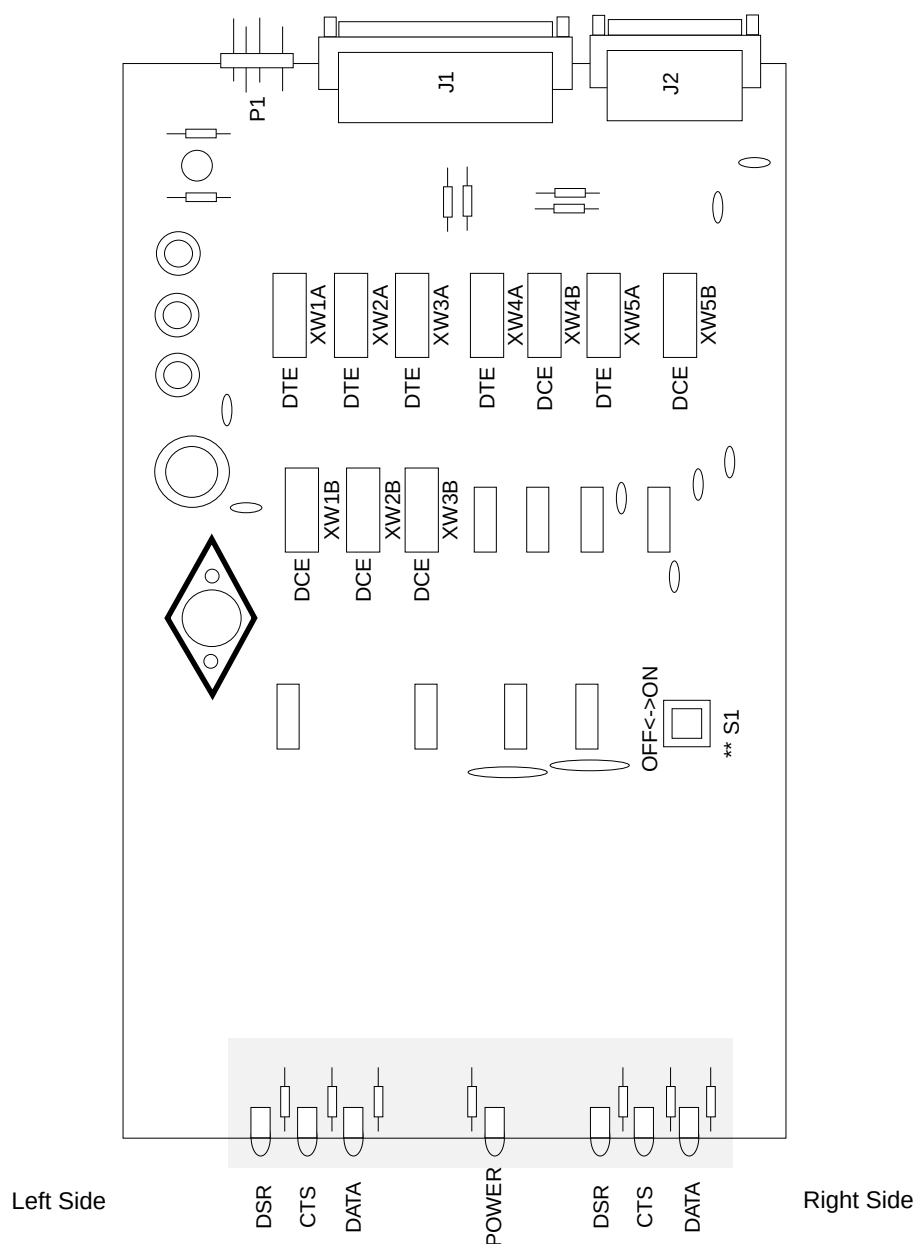


Figure 8-2: Black Box Component Layout — LEDs Location

When the X.25 daemons are started, the LEDs on the left side are lit.



It is normal for the DSR LED on the right (switch) side of the converter to be out or to be very dim when IDI-based connections are being used.

If the LEDs on the left side are not lit, check the following items:

- DCE/DTE DIP-shunt settings inside the converter

- Status of the *SunLink* X.25 daemons
- Cabling between the interface converter and the *Sun SPARCserver* computer.

When the X.25 daemons are started and the link is administered and enabled on the switch, the LEDs on the right side of the interface converter are lit. If the LEDs on the right side are not lit, check the following items:

- Switch administration for the link
- Cabling between the interface converter and the switch.

Testing the HSI/S Card for Problems

HSI/S card for the *Sun SPARCserver* computer provides a break-out for four separate female 37-pin RS-449 connections. *CentreVu* CMS on the *Sun SPARCserver* hardware platform supports four physical switches connected to a single HSI/S card (ports 0-3).

To test an individual port on the HSI/S card for problems, execute the loopback test by doing the following:

1. Log in as *root*.
2. Stop the X.25 daemons with the following command:

```
# /etc/init.d/x25.control stop
```

3. Remove the cable from the port to be tested, and attach the loopback plug (which was shipped with the HSI/S card).

4. Run the following two loopback tests:

- Internal loopback test
- Loopback test using the loopback plug.

Note

These tests send approximately 100 packets each. No transmission errors should be reported.

a. To run an internal loopback test, enter the following command:

```
# /opt/SUNWconn/bin/hsi_loop -t 1 hih0
```

The system responds:

```
hih0: [Using /dev/hih00]
hih0: speed=9600, loopback=yes, nrzi=no, txc=baud, rxc=rx
.
.
.
Port CRC errors Aborts Overruns Underruns   In <-Drops-> Out
hih0:    0    0    0    0    0    0
#
```

b. To run a loopback test using the loopback plug (which was shipped with the system), enter the following command:

```
# /opt/SUNWconn/bin/hsi_loop -t 2 hih0
```

The system responds:

```
hih0: [Using /dev/hih00]
hih0: speed=9600, loopback=yes, nrzi=no, txc=baud, rxc=rx
.
.
.
Port CRC errors Aborts Overruns Underruns   In <-Drops-> Out
hih0:    0    0    0    0    0    0
#
```

5. If the loopback test fails, you should suspect HSI/S hardware problems. Prior to replacing the HSI/S card, do the following:
 - a. Verify that the loopback plug is in the correct HSI/S port.
 - b. Check the cabling to the HSI/S break-out module.
6. Remove the loopback plug.
7. Recable the link.
8. Restart X.25 after completing this test.

Monitoring LAPB and X.25 Protocol

1. To monitor the LAPB (level 2) or the X.25 (level 3) protocol for any given link, enter the following command:

```
# /opt/SUNWconn/x25/bin/x25trace
```

In many situations this command can be used in place of a line monitor.

2. To monitor the LAPB protocol for link 0, enter the following command:

```
# /opt/SUNWconn/x25/bin/x25trace -i /dev/lapb -l 0 lapb
```

3. To monitor the X.25 protocol for link 0, enter the following command:

```
# /opt/SUNWconn/x25/bin/x25trace -i /dev/x25 -l 0 x25
```

Bringing Up the Link

If the link will not come up, you can also check the following:

- Examine `cms /usr/elog/elog` for messages.
- Verify that cms data collection is on, and examine the `spi.err` file for messages.
- Examine link and MIS status on the switch.

Identifying Port Problems

This section describes what to do if you suspect a problem with a specific port.

Note

To find which port corresponds to a user, use an editor (for example, vi editor) to search through the */etc/local.admin/nts*info* files. If the files are not current or do not exist, they can be written from within the na administration. The command is: write cmsterm1 /etc/local.admin/nts1info (if you are using cmsterm1). See Chapter 4, "Installing Printers, Terminals, and Modems," in this manual for specific details.

To view the port(s) in question, enter the `show port=<number(s)>` command. You can specify one port or multiple ports (for example, `port 1` or `port 1-10`). The port(s) you selected are displayed.

For parallel printers, use the `show printer=<number(s)>` instead of the `show port=<numbers(s)>` command.

Network Terminal Server (NTS) Port Problems

To diagnose an NTS-related port problem, you can print out each NTS login along with the NTS port each login is using. To do this, enter the following command:

```
# /cms/toolsbin/cmstermwho
```

A list of NTS logins and NTS ports are displayed.

If none of the NTS ports seem to be working upon installation, you can do the following:

1. Check the ethernet wiring. One cable should run from the *Sun SPARCserver* computer to the first port on the network hub unit, and a second should run from one of the other ports on the network hub unit to a transceiver. The transceiver should connect directly to the back of the NTS.

2. If the cabling is correct, enter the following command:

```
# /usr/sbin/ping cmsterm1
```

The system responds:

```
cmsterm1 is alive
```

3. If the command times out or gives some other error condition, cycle the power on the NTS, and retry the command.
4. If the NTS is functioning properly, the power lights should eventually stop flickering and display a green Unit and Net light. The TEST LED light may also be lit.
5. If the NTS still fails to respond, you can check and reset the NTS address by doing the following:
 - a. Reattach a terminal (set to 9600 baud, no parity, 1 stop bit) to the console port, and cycle the power on the NTS.
 - b. Press the **Test** key within 30 seconds, and wait for the `monitor:` prompt to appear.
 - c. To check that the unit has a current address and load, enter the following command at the `monitor:` prompt:

```
monitor: addr
```

Note

If the values displayed are not correct, change them to match the addresses given on the *Sun SPARCserver* computer in the */etc/hosts* file. If the addresses were not changed via user error, notify the Technical Service Center (TSC).

6. Try different ethernet cables and swap out the transceiver. If the failure persists, call the TSC for assistance.
7. As a last resort, if the NTS still fails to respond, replace the NTS.

Replacing the NTS

If the NTS fails and needs to be replaced, you can use files to readminister the NTS.

You can store configuration information on multiple files to use as a backup in the event your NTS loses translation. If the backup fails, you can use the files in Table 8-4 to readminister the ports.

Table 8-4: Configuration Information

Device	IP Address	NTS	File Name
<i>Sun SPARCserver computers</i>	129.200.9.1	host_computer	NA
NTS (#1)	129.200.9.11	cmsterm1	nts1info
NTS (#2)	129.200.9.12	cmsterm2	nts2info
NTS (#3)	129.200.9.13	cmsterm3	nts3info
NTS (#4)	129.200.9.14	cmsterm4	nts4info
NTS (#5)	129.200.9.15	cmsterm5	nts5info
NTS (#6)	129.200.9.16	cmsterm6	nts6info
NTS (#7)	129.200.9.17	cmsterm7	nts7info

Use the `read` command to repopulate the nonvolatile memory on the NTS with your latest translation (assuming you wrote them) by doing the following:

1. Default to an NTS using the annex `cmsterm<1>` command. For details, see the “Administering Terminals” section in Chapter 4, “Installing Terminals, Printers, and Modems.”
2. To read back the stored configuration information for the first NTS from a file, enter the following command:

```
# command: read /etc/local.admin/nts1info
```

Note

The configuration information is also stored in nonvolatile memory on the NTS.

The system responds:

```
Setting annex parameters
Setting serial port parameters for port 1
Setting serial port parameters for port 2
.
.
.
Setting serial port parameters for port 64
command:
```

3. When you are done, enter the following command to reset the terminal ports:

```
command: reset all@cmsterm1
```

The system responds:

```
# resetting all serial ports of annex cmsterm1
```

Checking Port Connectivity

To check the port connectivity for problems, do the following:

- For 8-, 16- and 64-port NTSSs, check the connection to each terminal, printer, or modem. See Chapter 4, “Installing Terminals, Printers, and Modems,” for details.
- For a 64-port NTS, check the three cables (A, B, and C) that run from the NTS to each NTS patch panel (see Figure 8-3). Check to see that the cables are correctly seated at each end.

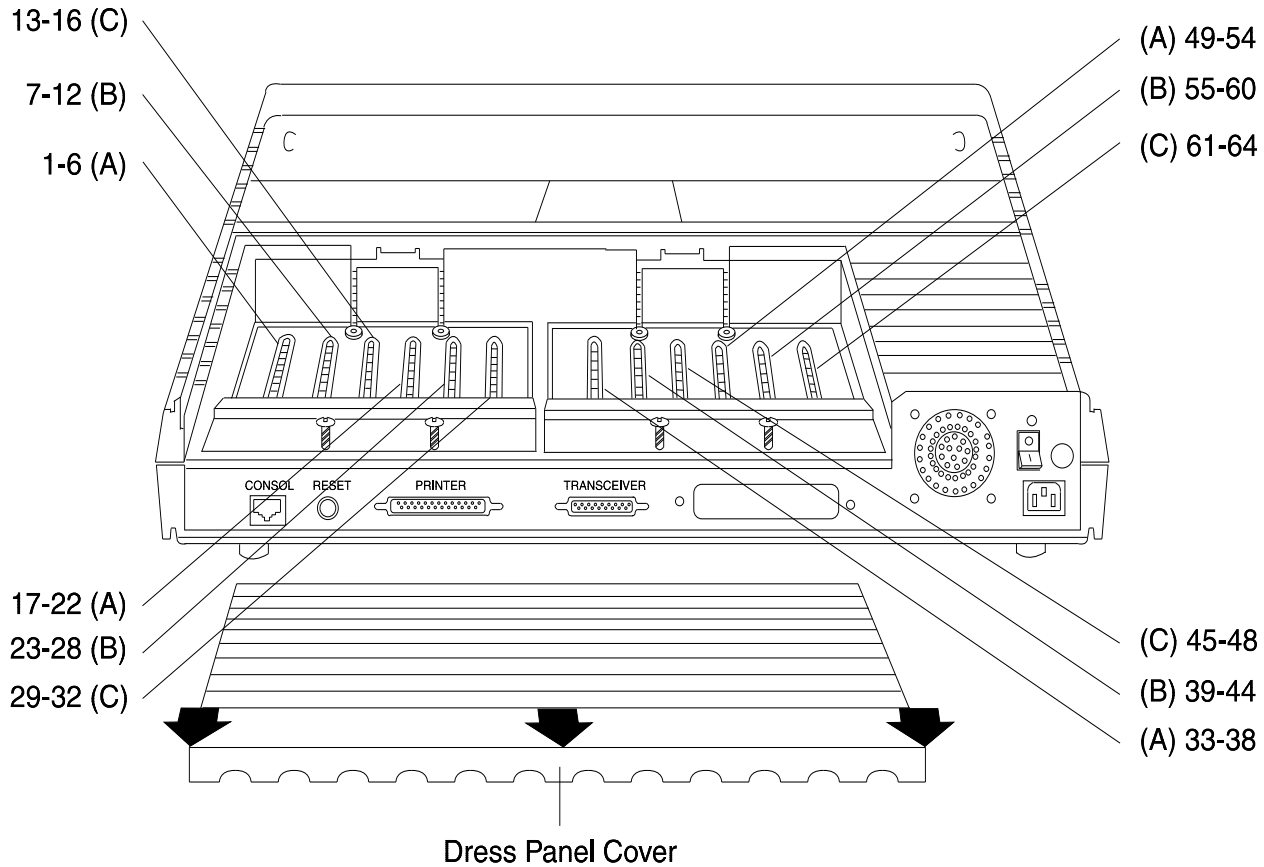


Figure 8-3: Network Terminal Server — PBX-Champ Connectors and Port Definitions

Resetting the Port

If the na port administration is questionable, reset the port to its default configuration. Do the following steps:

1. Check the port administration. See Chapter 4, “Installing Terminals, Printers, and Modems,” for details.
2. To reset the port to its default configuration, enter the na command at the system prompt.

```
# command: na
```

3. To associate all subsequent administration with a specific NTS, enter the following command at the prompt:

```
# annex cmsterm1
```

Note

The terminal address, cmsterm1, is the name defined in the */etc/hosts* file.

4. To reset the port(s), do the following:
 - a. To reset one port (x), enter the following command:

```
# port x
```

- b. To reset multiple ports (x - y), enter the following command:

```
# port x-y
```

- c. To reset additional ports (x-y, z), enter the following command:

```
# port x-y, z
```

Note

The preceding command makes the specified ports the default set. All subsequent port commands will refer to these ports.

5. Enter the following command to reset the parameters associated with the default port set:

Note

This returns the parameters to their factory defaults except for `user_name`, `location`, and `dedicated_address`.

```
# read/etc/local.admin/defport
```

6. To reset to a 9600 baud terminal, enter the following command:

```
# read/etc/local.admin/96term
```

7. To make any additional changes to the speed or parity, enter the following command (2400 is only one of the baud rates that you can use):

```
# set port speed 2400
```

Note

If the ports are not specified, the default setting is used.

8. To store the port configurations to a file (for example, `nts1info`), enter the following:

```
command: write cmsterm1/etc/local.admin/nts1.info
```

Note

At the end of provisioning, the `write` command downloads the port(s) and settings you selected to a flat file for use at a later date (for example, when you want to do a search or use the editor).

The system responds:

```
cmsterm1: Annex-3-UX R7.0, 64 ports
        writing...
command:
```

9. Reset the port by entering the following command:

```
# reset x
```

10. To send a message to a port using CLI commands while logged in to the *Sun SPARCserver* computer, enter the following command:

```
# telnet cmsterm1
```

The system responds:

```
Trying 129.200.9.11 ...
Connecting to 129.200.9.11
Escape character is ...
```


Note If the connection does not work, you may have the wrong address for your NTS. (See Table 8-4 for more information).

11. Press **Return**.

The system responds:

```
Rotaries defined:cli
Enter the Annex port name or number
```

12. Enter the `cli` command.

The system responds:

```
annex:
```

13. To get into the super-user mode on the NTS, enter the following command:

```
annex: su
```

The system responds:

```
annex:
```

14. At the `annex:` prompt, enter your password. The system prompts you for a password (one in the super-user mode). The default is the NTS internet address (if you have not changed addresses, this is 129.200.9.11 for `cmstern1`).

The system responds:

```
annex#:
```

15. At the annex# : prompt, enter tap x (where x is the port number in question).

The system now monitors all the communications to/from this port. For example, the system responds:

```
Trying 129.200.9.1 ...
Connected to 129.200.9.1
Escape character ...
Unix(r) System V Release
Login:
```

If you see the above messages on your CLI screen but not on the terminal, you have a connectivity problem from the NTS to the patch panel or the patch panel to the terminal.

16. To send data to a terminal (to determine, for example, what user corresponds to a specific port), enter the following commands:

```
Login: admin
admin: broadcast=x HELLO
```

Note

If either of the above commands cause garbage to appear on the screen, adjust the speed, parity, or data bits to match the settings on the terminal to 9600 baud, 8 data bits, and no parity.

17. To check for a bad port, connect the wiring to a different port. If you get results with a different port that is administered identically, you have a bad port on either the NTS or the NTS patch panel. Call the TSC for assistance.
18. To exit admin, type q at the admin : prompt.
19. To stop tapping the port, press the **Control** and **A** keys simultaneously.

20. Enter the `jobs` command:

```
annex: jobs
```

For example, the following may appear:

```
+1 tap x
```

21. To stop the job, enter the `kill 1` command (where the job number is 1).

The system responds:

```
+1 tap x  
annex#
```

22. To exit the super-user mode, enter the `su` command at the `annex#` prompt.

```
annex# su
```

The system responds:

```
annex:
```

23. To exit the CLI mode, enter the `hangup` command at the `annex:` prompt.

```
annex: hangup
```

The system responds:

```
#
```

24. After verifying the port and the connectivity, you can now readminister a terminal, modem, or printer with the `na` command.

```
# na
```

See Chapter 4, “Installing Terminals, Printers, and Modems,” for information about administering a terminal, printer, or modem.

System Fails to Boot Properly

This section discusses some common reasons why your system fails to boot properly and provides some corrective procedures.

Power-On Initialization Sequence

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.

Procedures

Table 8-5 describes the OpenBoot initialization command sequences provided by the *Sun SPARCserver* computer. These commands are useful in some boot-failure situations. To use the commands, hold down the keys after turning on the power to your system. Keep the keys pressed until the keyboard lights flash and the screen displays the firmware (ok>) prompt.

Table 8-5: Keyboard Commands

Command	Description
Stop	Bypass POST. This command does not depend on the security-mode. (Note: some systems bypass POST as a default; in such cases, use the Stop and A key combination to start POST.)
Stop-A	Abort.
Stop-D	Enter diagnostic mode (set diag-switch? to true).
Stop-F	Enter Forth on TTYA instead of probing. Use exit to continue with the initialization sequence. This is useful if hardware is broken.
Stop-N	Reset NVRAM contents to default values.

Preserving Data After a System Crash

Enter the Prom monitor (OpenBoot) 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 has crashed or has been interrupted before preserving all data.

The sync command returns control to the operating system and performs the data saving operations. After the disk data has been 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 using the **Stop** and **A** key sequence.

System Will Not Boot from Disk

Problem: You are booting from a disk, and the system fails with the following message:

The file just loaded does not appear to be executable.

Solution: The boot block is missing or corrupted. Reinstall the *Solaris* operating system, and restore all of the data.

Problem: You are booting from a disk, and the system fails with the following message:

The file just loaded does not appear to be executable.

Solution: The disk may be powered down (especially if it is an external disk). Turn on the power to the disk, and make sure the SCSI cable is connected to the disk and the system.

SCSI Problems

Problem: Your system has more than one disk installed, and you get SCSI-related errors.

Solution:

1. To quickly check the SCSI-related errors, enter the following command:

```
ok probe-scsi-all
```

The program responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991

. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

Note

The actual response (devices listed) depends on the devices installed on the SCSI bus.

2. Fix any obvious errors.

Your system might have duplicate SCSI target number settings. Try the following procedure:

1. Unplug all but one of the disks.
2. At the ok prompt, enter:

```
ok probe-scsi-all
```

Note

Use the target number and its corresponding unit number.

3. Plug in another disk, and perform Step 2 again.
4. If you get an error, change the target number of this disk to one of the unused target numbers.
5. Repeat Steps 2-4 until all the disks are plugged back in.

Blank Screen — No Output

Problem: The local monitor is blank.

Solutions:

1. Check to see if the machine is in the process of booting up; the screen goes blank during initialization and stays blank for a few minutes. This is especially true if the system is being booted to a remote console.
2. Find out if the console is remoted and the remote user is in the OpenBoot mode. Check the lights on the modem to indicate if someone might be dialed-in.
3. If all else fails, power-down and immediately hold down the **Stop** and **N** keys until something appears on the screen. Hold the keys down for at least a minute. If the machine is functioning properly, this forces the console to be local. Take a look at the keyboard — look for flashing green lights on the keys.

4. If nothing is seen after a minute or so, there is probably a hardware failure. Do the following:
 - a. Check to make sure the keyboard is attached. If the keyboard is unplugged, the output goes to TTYA instead. To fix this problem, power down the system and do the following in sequential order:
 1. Turn off the *Sun SPARCserver* computer.
 2. Turn off the system monitor.
 3. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
 - b. Plug in the keyboard, and power on again by using the following sequence:
 1. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
 2. Turn on the *Sun SPARCserver* computer.
 3. Turn on the system monitor.
 - c. Check to make sure the monitor is turned on and plugged in. Check the power cable on the monitor. Make sure the monitor cable is plugged into the system frame buffer; then, turn the monitor on.
 - d. Check to make sure the output-device is set to TTYA. This means that the NVRAM parameter output-device is set to ttya instead of being set to screen. You can do **one** of the following:
 - Power down the system (using the proceeding steps). Then, turn it on (using the proceeding steps), and immediately press the **Stop** and **N** keys. This sets all NVRAM parameters to their default values. As a result, the output-device parameter is set to screen.



In addition, all previous nondefault settings are reset to their default values. You must restore the settings as needed. See “Method 2 — From Local Site” in the following section of this chapter to restore the settings.

- Connect a terminal to TTYA, and reset the system. After getting to the ok prompt on the terminal, enter screen output to send the output to the frame buffer. Use the

setenv command to change the default display device, if needed.

- e. Check to see if the system has multiple frame buffers. If your system has several plugged-in frame buffers, then it is possible that the wrong frame buffer is being used as the console device.

Refer to your system documentation and call the TSC.

Diagnosing Problems Using the Remote Console

If your system will not boot, the TSC personnel could ask you to redirect the remote console to identify a problem. You can redirect the remote console using **either** of the following methods:

- Using *Solaris* software package
- Using OpenBoot diagnostics.

Redirecting the Remote Console Using *Solaris* Operating System

This section describes how to redirect the console to port A on the *Sun SPARCserver* computer using the *Solaris* operating system. Redirecting the console allows the TSC to dial in and do remote maintenance.

Set the Console to Remote:

To set the console to the remote, do the following:

1. Dial in (from the remote terminal) to the remote console modem (for example, access port A on the computer), and log in as *root*.
2. Remove the port monitor by entering the following command:

```
# /cms/install/bin/abcmadm -r ttya
```

The program responds:

```
ttya is currently set to incoming
Are you sure you want to remove it?
```

3. Enter y. The program responds:

```
ttya administration removed
```

4. Redirect the console to port A (remote console) by entering the following commands:

```
# /cms/install/bin/abcmadm -c -b 2400 ttya
```

The program responds:

```
This change requires a reboot to take affect
```

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

Note

The baud rate will vary depending on the modem (for example, 2400 or 9600).

5. Press **y**. The system will automatically reboot, and port A will come up as the console.

As the system reboots, the shutting down messages will appear on the *Sun SPARCserver* computer monitor. When the system starts to come back up, the *Sun SPARCserver* computer monitor should go blank, and the system boot diagnostics should appear on the remote console terminal. After the system reboots, a console login prompt should appear on the remote console terminal.

6. Log into the remote console as *root*.

Note

At this time, an *OpenWindows* login window will appear on the *Sun SPARCserver* computer monitor.

To set the console to local, do the following:

1. Redirect the console back to the local console by entering the following command:

```
# /cms/install/bin/abccadm -c local
```

The program responds:

```
Console set to local
```

```
This change requires a reboot to take affect
```

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

2. Press .

The program responds:

```
Starting port monitor.
```

```
Setting console parameters.
```

```
Proceeding to reboot.
```

3. The system will automatically reboot, and port A will come up as the dial in. A `login:` prompt appears.

As the system reboots, the shutting down reset and rebooting messages will appear on the remote console monitor. When the system starts to come back up, the system boot diagnostics should appear on the *Sun SPARCserver* computer monitor. After the system reboots, a login prompt should appear on the *Sun SPARCserver* computer monitor.

4. Log into the local console (*Sun SPARCserver* system) as *root*.

See Appendix D, "Sun *SPARCserver* Computer Factory Installation Procedures," for more information about setting the remote console modem options, connecting the remote console to the *Sun SPARCserver* computer, and administering the remote console ports.

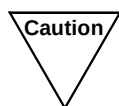
Redirecting the Remote Console Using OpenBoot Diagnostics

Use the OpenBoot mode to redirect port A (remote console port) on the *Sun SPARCserver* computer when the *Solaris* method does not work (typically because the system will not boot).

To redirect the local console to the remote console from the OpenBoot environment (prompt is `ok>`), do the following steps:

Enter the OpenBoot environment (prompt is `ok>`) in **one** of the following ways:

- If in the *Solaris* environment, halt the operating system with the *Solaris* `halt` command.
- If in the *Solaris* environment and the `halt` command does not work (for example, the system is hung up), press the **Stop** and **A** keys simultaneously.



The **Stop** and **A** key combination abruptly breaks the execution of the operating system and should be used with caution.

- If the above methods fail, press the **Stop** and **A** keys simultaneously after the display console banner appears but before the system starts booting the operating system.

To redirect the console to remote from the OpenBoot environment (prompt is `ok>`), perform the following steps:

1. To display a list of the current parameter settings on your system, enter the following command:

```
ok> printenv
```

The system responds:

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

2. At the `ok>` prompt, enter the `setenv` command to set the configuration parameters. Set the parameters to the values specified. (See Table 8-6.) For example:

```
ok>setenv output-device ttya
```

The system responds:

```
output device=ttya
```

Table 8-6: Parameter Commands

Parameter	Values
output-device	ttya
input-device	ttya
ttya-rts-dtr-off	true
ttya-ignore-cd	true
ttya-mode	9600,8,n,1,- In this example, the baud rate is 9600. The baud rate should correspond to the setting on the local modem. Typically, a 3830 would call for a setting of 9600, a 3715 would call for a setting of 9600, and an 2400 would call for a setting of 2400.

3. To verify the parameter changes, enter the following command:

```
ok> printenv
```

The system responds:

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

4. For the changes to take effect, boot the system by entering:

```
ok> boot
```

The system responds on the local console with the XDM login prompt (see the following example) or on the remote console with the console login:

Welcome to Open Windows

login:
password:

To redirect the remote console to the local console, enter the OpenBoot environment (prompt is ok>) in the following way:

- If in the *Solaris* environment, halt the operating system with the *Solaris* `halt` command.

To redirect the remote to the console from the OpenBoot environment (prompt is ok>), use one of the following methods:

Method 1 — From the Remote Site (Use this method from the remote site when the *Solaris* method does not work).

1. From the remote console, if not in OpenBoot, get into OpenBoot mode in **one** of the following ways:
 - If in the *Solaris* environment, halt the operating system with the *Solaris* halt command.
 - Power-cycle the machine, and press Break from the remote console (requires a local person).
2. To display a list of the current parameter settings on your system, enter the following command:

```
ok> printenv
```

The system responds:

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

3. To set the configuration parameters, enter the parameters (see Table 8-7) via the set env command at the ok> prompt. For example:

```
ok> setenv output-device ttya
```


Table 8-7: Specific Parameter Commands

Parameter	Values
output-device	screen
input-device	keyboard
ttya-rts-dtr-off	true
ttya-ignore-cd	false

4. To activate the changes, boot the system by entering:

```
ok> reset
```

5. Log into the system as *root* at the local monitor.
6. From the local monitor, enter the `cms/install/bin/abcaadm -k` command to see what is on the `ttya` port. Start a port monitor on the `ttya` port if there is not one already.

```
# /cms/install/bin/abcaadm -k
```

7. Reset the default console parameters by entering the following command:

```
# /cms/install/bin/abcaadm -c -b <baud>ttya
```

The system responds:

```
answer n to "Do you want to reboot?"
```

8. Press **N**.

Method 2 — From the Local Site (Use this method when the previous OpenBoot method does not work or if you want to switch the console from the local site).

At the local site (when the system is not running *Solaris*), do the following:

1. Power down the machine.
2. Press the **Stop** and **N** keys simultaneously. Continue to press the **Stop** and **N** keys simultaneously until something appears on the screen. The system reboots to the local console.
3. Log into the system as *root* at the standard interface.
4. From the local monitor, enter the following command to check what is on the `ttya` port:

```
# /cms/install/bin/abcmadm -k
```

5. Reset the default console parameters by entering the following command:

```
# /cms/install/bin/abcmadm-c-b <baud>ttya
```

The system responds:

```
#
```

6. Enter n in response to the following message:

```
# answer n to "Do you want to reboot?"
```

7. Start a port monitor on ttya.

```
# abcdm -i -b<baud>ttya
```

Single-User Mode and the Remote Console

Prerequisite: You must be logged into the customer's machine through the remote console interface.

To place the system in single-user mode, do the following:

1. At the remote console, enter the following command:

```
# shutdown -y -is -g0
```

Note

The system will **not** successfully enter single-user mode if you execute the shutdown command from the local console while the console is redirected. When this occurs, the local console will not respond if you try to enter data. The remote console will also be unresponsive.

To recover from the situation described in the previous note, put the system into single-user mode by doing the following:

1. Select a new window on the local console.
2. In the new window, enter the following command:

```
# shutdown -y -i0 -g0
```

3. On the remote console, enter the following command at the `ok>` prompt:

```
ok> boot -s
```

Machine Panics

If a machine panic is detected on your system, you must call the TSC (domestic) or remote (international) support personnel. The TSC may request that you deliver the following information on a tape:

- Crash dump from `/var/crash/<hostname>/vmcore.n`.
- Namelist from `/var/crash/<hostname>/unix.n`.
- Output of the `showrev -p` (put the information in a file). See Appendix D, “*SPARCserver* Computer Factory Installation Procedures,” for details.
- Output of the `prtconf -pv` (put the information in a file).
- Possibly output from the `/var/adm/messages` file.

Procedures

To put all the files on one tape, do the following procedures:

1. Log in as *root*.
2. Change to the dump directory by entering the following command:

```
# cd /var/crash/<hostname>
```

3. Verify that `unix.n` and `vmcore.n` are present, and match the date for the crash in question.
4. To retrieve the output from the `showrev -p` buffer, enter the following command:

```
# showrev -p>showrev.out
```

5. To retrieve the output from the prtconf -pv buffer, enter the following command:

```
# prtconf -pv>prtconf.out
```

6. To copy the output from the */var/adm/messages* file, enter the following command:

```
# cp /var/adm/messages messages
```

7. Insert a tape into the default backup tape drive.
8. Enter the following command:

```
# tar cvf <device-name> unix.n vmcore.n dmesg.out showrev.out  
prtconf.out messages
```

Note

The letter n represents the number of the crashdump.

The system responds with a list of all of the files.

9. To remove the temporary files, enter the following command:

```
# rm unix.n vmcore.n dmesg.out showrev.out prtconf.out messages
```

Note

The letter n represents the number of the crash dump.

10. Log out of the system.
11. Remove the tape from the disk drive.
12. Send the tape to the TSC.

Keyboard Gets Unplugged

If the console keyboard cable gets unplugged during system operation, the system will continue to run. If the console is reattached to the cable, the system freezes on its current display. Do the following to correct the problem:

1. Plug in the keyboard. The system responds:

```
ok>
```

2. Enter the following command at the ok> prompt:

```
ok> go
```

The system responds by continuing to run. It was not running during the time between getting the ok> prompt and entering go.

Note

If the system is rebooted, instead of entering go, you may be prompted to use the `fscck` command to repair the *Solaris* file systems.

Solving Terminal-Related Problems

This section describes some of the day-to-day problems that may occur during the normal operation of the terminals supporting the *CentreVu* CMS application.

In each section you will find several documented symptoms and corresponding solution steps. When you find a symptom that is similar to the problem you are experiencing with your terminal, follow the solution step(s) until the problem is resolved.

In some of the solution steps, you may have to refer to your terminal manual.

If you are experiencing a problem with a terminal that has just been installed and has never been used, go the “Supported Communications, Terminal, and Printer Equipment” section in Chapter 4, “Installing Printers, Terminals, and Modems.”

Note

If after you have tried to solve your terminal problem by using this section and your terminal manual and the terminal is still not functioning properly, escalate the problem through normal procedures.

When an Existing Terminal Fails to Operate

For problems with existing terminals, find the problem in this section and follow the corresponding solution step(s).

Problem: Several unexpected or “garbage” characters are displayed on the window.

Solution:

1. Mismatches to speed, parity, and data bits will cause gibberish on the terminal. Reset the terminal or use the na administration as needed.
 2. Try pressing the **Control** and **L** keys simultaneously. This should cause the screen to be repainted without the “garbage” characters.
-

Problem: The screen suddenly goes blank.

Solution:

1. If the terminal has not been used recently, press any key on the keyboard. The screen should be restored if the power is on. (After about 1 hour of nonuse, the screen will automatically go blank to protect the screen.)
 2. Check the power cord at the back of the terminal. Wiggle both ends of the cord. If the terminal screen flashes, the power cord is not connected properly, or the power cord is defective.
 3. Locate the power switch at the rear of the terminal. Turn the terminal OFF. Wait a few seconds. Turn the terminal ON.
 4. If all the other terminals have gone blank, a major power supply loss has probably occurred. Check the power source for the terminals.
-

Problem: The terminal “bell” is too loud or cannot be heard.

Solution: Adjust the volume control. (Refer to your terminal manual for details.)

Problem: Characters are not being displayed on the screen when the keys are pressed.

Solution: On the back of the terminal, locate the power switch. Turn the terminal off. Wait a few seconds. Turn the terminal on.

Problem: You turn the terminal on, but nothing is being displayed on the screen.

Solution:

1. The terminal intensity may need adjusting. The intensity control is located underneath the lower left side of the terminal screen. (Refer to your terminal manual for details.)
 2. Make sure that the terminal has been turned on. Check the power switch on the back of the terminal.
 3. Check the power cord on the back of the terminal. Wiggle both ends of the cord. If the terminal screen flashes, the power cord is not connected properly, or the power cord is defective.
-

Problem: You turn the terminal on, and it displays "garbage" characters.

Solution:

1. Press the **Return** key once. Pause for a few seconds. Press the **Return** key about four times.
 2. Locate the power switch at the rear of the terminal. Turn the terminal off. Wait a few seconds. Turn the terminal on.
-

Problem: The terminal is "locked up." In other words, the terminal screen does not respond to keyboard input.

Solution:

1. If your last request is taking an extremely long time to complete, press the **F8** key to bring up the main menu. Wait a few seconds. If the terminal does not respond, press the **F8** key again. Wait a few seconds.
 2. If the terminal still does not respond, turn the terminal off. Wait a few seconds. Turn the terminal on and log in again.
-

Problem: You cannot find a problem that relates to your terminal, or the solution step(s) corresponding to your terminal did not work.

Solution: The solution involves a list of things to try. If a particular step does not work or you have already tried it, go to the next step in the list.

Note

In some cases, you will be logged off. If this happens, log in again.

1. Press the **Control** and **L** keys simultaneously. In most cases, doing this will refresh the screen.
 2. Locate the power switch at the rear of the terminal. Turn the terminal OFF, wait a few seconds, and turn the terminal ON. (Refer to your terminal manual if necessary.)
 3. Check the terminal connections by doing the following:
 - a. Check the power cord at the back of the terminal. Wiggle both ends of the cord. If the terminal screen flashes, the power cord is not connected properly, or the power cord is defective.
 - b. Check for a loose connection at the keyboard and the terminal.
 - c. At the rear of the terminal, locate the cable connected to the connector labeled "modem." Make sure that the cable is connected properly to the "modem" connector. If possible, follow this cable to the computer, and check the connection at the computer end.
 - d. If another terminal is available, try using it.
 - e. See the *CentreVu* CMS administrator, or escalate the problem through normal procedures.
-

Problem: The message "login incorrect" is displayed when you try to log in.

Solution: Either the login or password you entered is not correct. Carefully, reenter your login and password. Make sure you are not trying to enter an old password. If you still cannot log in, see the *CentreVu* CMS administrator, or escalate the problem through normal procedures.

When a New Terminal Fails to Operate

If a new terminal fails to operate, do the following:

- Check the physical connectivity to the terminal. See Chapter 3, “Installing the *Sun SPARCserver* Computer,” for details.
- If the terminal is connected to an NTS, reset the port using the correct script file (96term, 48term, 24term, 12term). Make sure the data bits and parity settings are the same for the terminal and the na administration.

For problems with new terminals, find the problem in this section and follow the corresponding solution step(s) (log in on the system console or another working terminal to diagnose the problems).

Problem: Terminal does not display anything.

Solution:

1. Make sure that the terminal has been turned on. Check the power switch at the rear of the terminal.
 2. Check the power cord at the back of the terminal. Wiggle both ends of the cord. If the terminal screen flashes, the power cord is not connected properly, or the power cord is defective.
 3. The terminal intensity may need adjusting. The intensity control is located underneath the lower left side of the terminal screen. (Refer to your terminal manual for details.)
-

Problem: Terminal connected to an Aurora SBus *Multiport* card does not display anything.

Solution:

1. Check the steps above first.
2. Verify that the port has been enabled by entering the following command:

```
# pmadm -l -p ttyaur<board number> -s<port number>
```

 Verify that under the FLGS field there is a u (not ux), and that a correct device is being used.
3. Check the following two logs for hints about what the trouble might be: `/var/saf/_log` and `/var/saf/ttyaur<board number>/log`.
4. Set the terminal to 9600 baud. Test the connectivity by entering the following commands:

```
# pmadm -d -p ttyaur<board number> -s<port number>
# cat /etc/group > /dev/term/<port number>
```

The contents of the `/etc/group` file should now be displayed on the screen. If not, check the wiring (refer to Chapter 4).

Reenable the port by entering the following command:

```
# pmadm -e -p ttyaur<board number> -s<port number>
```

Set the terminal to the correct baud rate (if not 9600 baud).

Problem: The terminal prints “garbage” on the screen.

Solution: Mismatches to speed, parity, and data bits will cause gibberish on the terminal. Reset the terminal.

The terminal baud rate and the computer baud rate may not match. Refer to Chapter 4, “Terminal Options” and “Administering a Terminal,” to verify that the terminal options have been properly set and that the terminal baud rate has been properly administered on the computer.

If the terminal is connected to an NTS, use the `na` administration as needed.

If the terminal is connected to an Aurora SBus *Multiport* card, verify the port settings by entering the following command from another terminal or console while the port is active:

```
# stty -a < /dev/term/<port number>
```

Look for the correct baud rate, `cs8`, and `parenb` options. Verify that the following are not present: `cs7` and `-parenb` options.

Problem: “Trying 129.200.9.1” message displays but does not give you a login prompt afterwards (only applicable to terminals connected to an NTS).

Solution: You probably have an address mismatch for the *Sun SPARCserver* computer. Check the address in the `/etc/hosts` file on the *Sun SPARCserver* computer, and reset the `dedicated_address` parameter for ports using an `na` administration.

Problem: The terminal screen displays `login:` but does not respond to keyboard input.

Solution:

1. Check for a loose connection at the keyboard and at the terminal.
 2. Turn off the power to the terminal, wait for a few seconds, and turn the terminal back ON. (Refer to your terminal manual if necessary.)
-

Diagnosing Terminal-Related Problems on Aurora SBus *Multiport* Cards

First read the section “Administering Terminals on the Aurora SBus *Multiport Cards*” in Chapter 4 which provides an overview to the port administration. Then read the section “Identifying Device Entry Names for Ports on the Aurora Expander Box(es)” in Chapter 9 that describes the assignment of device names to the physical ports on each card.

Determine the extent of the problem. If only terminals connected to the same Aurora SBus *Multiport* cards have problems, try disabling and then enabling the ttymon process.

To disable and enable an individual port, enter (system response is in **bold**):

```
# pmadm -d -p ttyaur<board number> -s <port number>
# pmadm -e -p ttyaur<board number> -s <port number>
```

If this does not help, then disable and enable the entire ttymon by entering the following commands:

```
# sacadm -d -p ttyaur<board number>
# sacadm -e -p ttyaur<board number>
```

Verify that the administration is correct:

```
# sacadm -l
```

The output should show that there is one tty mon for each Aurora SBus *Multiport* card. For example:

```
# /usr/sbin/sacadm -l
PMTAG  PMTYPE  FLGS RCNT STATUS  COMMAND
ttyaur1 ttymon      0  ENABLED /usr/lib/saf/ttymon#
```

In this example, only the ttymon monitor, which is identified by the default port monitor tag of ttyaur1 (first Aurora card), is started, and the status is ENABLED.

Verify that the ports are correctly administered on the Aurora SBus *Multiport* card by entering `pmadm -l`. Verify that each port is administered with the correct device name (`/dev/term/N`).

Table 8-8 describes the fields in the `sacadm -l` output.

Table 8-8: Fields in the `sacadm -l` Output

Field	Description
PMTAG	A unique tag that identifies a particular port monitor. The <i>pmtag</i> is used by the sac to identify the port monitor for all administration. Use the default ttymon <i>pmtag</i> , <i>zsmon</i> , for ttymon ports A and B; use the listen <i>pmtag</i> , <i>tcp</i> for listen ports in the United States. PMTAG can contain up to 14 alphanumeric characters.
PMTYPE	The type of the port monitor: ttymon or listen.
FLGS	If no flag is specified, the port monitor is started and enabled. The <i>d</i> flag specifies that when the port monitor is started, it is not enabled. The <i>x</i> flag specifies that the port monitor is not to be started.
RCNT	Retry count specifies the number of times a port monitor can fail before its state is changed to FAILED. If no count is specified, the field is set to 0, and the port monitor is not restarted if it fails.
STATUS	The status of activity for the port monitor. Possible states are STARTING, ENABLED, DISABLED, STOPPING, NOTRUNNING, and FAILED. The FAILED message is displayed if the sac cannot start the port monitor after the number of tries specified by RCNT.
COMMAND	The complete path name of the command that starts the port monitor followed by a # and any comment that was entered when the port monitor was configured.

Table 8-9 describes the fields in the `pmadm -l` output.

Table 8-9: Fields in the `pmadm -l` Output

Field	Description
PMTAG	A unique tag that identifies a particular port monitor. The system administrator assigns the name of the port monitor. The <i>pmtag</i> is used by the <i>sac</i> to identify the port monitor for all administration. Use the default <i>pmtag</i> <i>zsmon</i> for <i>ttymon</i> ports; use the <i>pmtag</i> <i>tcp</i> for listen ports. PMTAG can contain up to 14 alphanumeric characters.
PMTYPE	The type of the port monitor: <i>ttymon</i> or <i>listen</i> .
SVCTAG	A tag unique to the port monitor that identifies a service. The service tags for the serial ports are <i>ttya</i> and <i>ttyb</i> . A service requires both a service tag and a port monitor tag to identify it uniquely.
FLGS	If no flag is specified, the port is enabled and no <i>utmp</i> entry is created for the service. The <i>x</i> flag specifies that the port should not be enabled; the <i>u</i> flag specifies that a <i>utmp</i> entry should be created for this service. Some services, such as <i>login</i> , will not start unless a <i>utmp</i> entry has been created.
ID	The login name of the person who starts the service, typically <i>root</i> .
PMSPECIFIC	The address, name of a process, name of a STREAMS pipe, or baud rate and configuration for a login port.

You can also check the logs for any hints about the source of the problem. The *sac* process records port monitor behavior in the `/var/saf/_log` file. In addition, each *ttymon* port monitor has its own log file, `/var/saf/pmtag/log`, where it records information such as messages that it receives from *sac* and services that it starts.

An example of the end of the `/var/saf/_log` file follows. This information shows that the system was rebooted three times and that the ttymon port monitor `ttysaur1` was started and enabled successfully each time.

```
# tail /var/saf/_log
Mon Mar 15 14:23:12 1993; 199; port monitor <ttysaur1> changed
state from STARTING to ENABLED
Fri Mar 19 09:43:18 1993; *** SAC starting ***
Fri Mar 19 09:43:19 1993; 203; starting port monitor <ttysaur1>
Fri Mar 19 09:43:19 1993; 119; port monitor <ttysaur1> changed
state from STARTING to ENABLED
Wed Mar 24 15:24:24 1993; 437; *** SAC starting ***
Wed Mar 24 15:24:25 1993; 443; starting port monitor <ttysaur1>
Wed Mar 24 15:24:25 1993; 437; port monitor <ttysaur1> changed
state from STARTING to ENABLED
Thu Mar 25 20:36:11: 1993; 201; *** SAC starting ***
Thu Mar 25 20:36:12 1993; 208; starting port monitor <ttysaur1>
Thu Mar 25 20:36:13 1993; 201; port monitor <ttysaur1> changed
state from STARTING to ENABLED
```

An example of the end of the `/var/saf/ttysaur1/log` file is shown next. This information gives more details about how the ttymon port monitor `ttysaur1` was initialized successfully.

```
#oak tail /var/saf/ttysaur1/log
Thu Mar 25 20:36:13 1993; 208; PMTAG: ttysaur1
Thu Mar 25 20:36:13 1993: 208; Starting state: enabled
Thu Mar 25 20:36:13 1993; 208; Got SC_ENABLE message
Thu Mar 25 20:36:13 1993: 208; max open files = 1024
Thu Mar 25 20:36:13 1993: 208; max ports ttymon can monitor = 1017
Thu Mar 25 20:36:13 1993; 208; *ptr == 0
Thu Mar 25 20:36:13 1993; 208; SUCCESS
Thu Mar 25 20:36:13 1993; 208; *ptr == 0
Thu Mar 25 20:36:13 1993; 208; SUCCESS
Thu Mar 25 20:36:13 1993; 208; Initialization Completed
```


Diagnosing Network Terminal Server Problems

If you are experiencing terminal problems, the NTS can be remotely diagnosed in one of two ways:

- Connect a modem directly to the NTS in question, or
- Diagnose the problem through the *Sun SPARCserver* computer.

See the “NTS Port Problems” section in this chapter and the *Network Terminal Server User’s Guide* for details.

To diagnose a problem with the terminal server, you can use the following:

- Network Administrator (na) Utility
- CLI Commands
- Panel Indicators.

Using Network Administrator Utility

The *Solaris 2.4* Network Administrator (na) utility on the *Sun SPARCserver* computer provides the commands for managing the NTS. These commands allow the user (also remote users) to do the following:

- Set and display the operating characteristics of the NTS and its ports.
- Reboot or reset the NTS and its ports.
- Broadcast messages to the NTS ports.

Table 8-10 provides the na commands that are available.

Table 8-10: Network Administrator Utility Commands

Command	Description
annex	Defines default annex_list.
boot	Boots the NTS.
broadcast	Sends a broadcast message to one or more ports.
copy	Copies NTS port configuration parms to other ports.
dumpboot	Boots the NTS and produces a dump.
echo	Writes remainder of the line to the standard output.
help	Displays help for commands.
password	Defines the administrative password.

Table 8-10: Network Administrator Utility Commands

Command	Description
port	Defines a default port_set.
printer	Defines a default printer_set.
quit	Terminates na command.
read	Reads and executes a script file.
reset	Resets the NTS or a port_set.
set	Defines or modifies the value of a parameter.
show	Displays current value of a parameter.
write	Writes current configuration to a file.

Using CLI Tool

You can use the CLI tool to do the following:

- Check port or NTS statistics (see Example 1 on page 9-71).
- Check port or NTS statistics and administration (see Example 2 on page 9-71).
- Tap into any port to see the data being transmitted and received (see Example 3 on page 9-72).

To access CLI tool, do the following steps:

1. Log into the *Sun SPARCserver* computer. Enter the following command from any active *Solaris* session on the *Sun SPARCserver* computer:

```
$ telnet cmsterm1
```

The system responds:

```
Trying 129.200.9.11 ...
Connecting to 129.200.9.11
Escape character is ...
```

2. Press **Return**. The system responds:

```
Rotaries defined: cli
Enter Annex port name or number:
```

3. Enter the `cli` command.

```
$ cli
```

The system responds:

```
annex:
```

4. At the `annex:` prompt, enter a `cli` command.

Table 8-11 includes a list of the available `cli` commands. Enter the `help` command to get a list of allowable `cli` commands at any point in a CLI session.

Table 8-11: CLI Commands

Command	Description
<code>bg</code>	Puts the job in the background.
<code>connect</code>	Uses LAT to connect to an advertised LAT service.
<code>fg</code>	Returns to an established job.
<code>hangup</code>	Disconnects all jobs and resets user CLI connections.
<code>help</code>	Displays help info for commands.
<code>hosts</code>	Displays current <i>Sun SPARCserver</i> computer table.
<code>jobs</code>	Displays a list of current jobs.
<code>kill</code>	Terminates a job.

Table 8-11: CLI Commands (Contd)

Command	Description
lock	Locks a port.
netstat	Displays network status.
ppp	Converts a CLI port to a PPP interface port.
queue	Displays/Removes queued requests.
rlogin	Connects to a <i>Sun SPARCserver</i> computer.
services	Displays/Removes queued requests.
slip	Converts a CLI port to a SLIP port.
stats	Displays NTS statistics.
stty	Displays and modifies CLI port parameters.
telnet	Connects to a <i>Sun SPARCserver</i> computer.
who	Displays NTS users.

Example 1: Check NTS or ports statistics

To display a list of all NTS users with port numbers, enter the `who` command at the prompt. The system responds with a list of administered user names, locations per port, and the NTS status.

Example 2: Check NTS or port statistics and administration

The `stats` command, without any arguments, gives overall statistics on the NTS. You can check the Internet address, the serial ports received, and the transmitted numbers.

The `stats -s5-7` command gives statistics on ports 5-7. This can be helpful to check the receive and transmit on a per-port basis.

Using the CLI (in super-user mode) allows more flexibility. Do the following steps to enter the CLI mode:

- At the `Annex:` prompt, enter the `su` command. You will be asked for a password. The default password is the Internet address to the NTS.
- To clear the statistics (in super-user mode), enter the `stats -c` command.
- Use NTS administration with the `admin` command (the `admin` interface is the same as the `na` administration). See the “Using Network Administrator (NA) Utility” section in this chapter for more details.

Example 3: Tap a port to check the data

To monitor all communications to or from a port (in super-user mode), do the following steps:

- At the prompt, enter the `tap x` command (x is the port number).
- To stop monitoring the port, press the **Control** and **A** keys simultaneously.
- At the prompt, enter the `jobs` command. The system responds: `+1 tap 7`.
- To stop the job, enter the `kill 1` (1 is the job number) command.
- To exit the CLI mode, enter the `hangup` command.
- To check the connectivity of the *Sun SPARCserver* computer, enter the `ping 129.200.9.1` (or whatever the address is) command.
- To stop the output, press the **Control** and **A** keys simultaneously.

See the *Network Terminal Server Administrator User's Guide* for more in-depth information.

Using Panel Indicators

The NTS's front panel has six system indicators and eight status indicators. The system indicators are labeled:

- Power
- Unit
- Net
- Attn
- Load
- Active.

The system indicators provide information about normal operations and problems that occur. Use the system indicators and the ROM Monitor commands to diagnose problems.

The status indicators are numbered one through eight.

The status indicators display port activity during normal operations; each indicator supports eight ports. When the NTS encounters a problem or an internal error condition, the indicators display error information.

Note

If an error occurs, save the status of the indicators. TSC personnel can use this information to diagnose the problem.

During power-up and booting, it is more complicated to diagnose problems because they can originate in the NTS, the transceiver, the ethernet, or the load server *Sun SPARCserver* computer. However, the indicators provide both a progress report and an error display to assist you in troubleshooting.

See the “Solving Power-Related Problems” section in this chapter and the *Network Terminal Server User’s Guide* for specific power-up and boot procedures.

Solving Printer-Related Problems

This section provides solutions to problems that may occur during the normal operation of the printers supporting the *CentreVu* CMS application.

If you are experiencing a printer problem, do the following:

- Check the cabling to the printer. See Chapter 4, “Installing Terminals, Printers, and Modems,” for details.
- Check that the printer is plugged in and that there is power to the printer.

Printers Connected to the NTS

If you are experiencing a problem with a printer connected to the NTS, do the following:

- Check the cables from the NTS to the NTS patch panel to make sure they are connected to the correct port and that the cables are correctly seated. See the “Identifying Port Problems” section in this chapter for procedures.
- Check the parity, data bits, and speed settings of the printer — make sure the settings agree with the `na` administration (Network Administration).
- If the port administration and connectivity (using `cli` commands) is correct, check the `rtelnet` and `lpadmin` administration. To check the `rtelnet` administration, enter the following command at the prompt:

```
# ps -ef | grep rtelnet
```

The system responds with a line that indicates `rtelnet` administration is running for the appropriate port with a corresponding device name. For example:

```
root xyz 1 8 14:46:18 ?    0:14 rtelnet -bra cmsterm1
63/dev/s_pdev163
```

Note

The above example assumes the printer is connected to port 63 on the NTS `cmsterm1`.

If the `rtnet` command did not appear, enter the `rtnet` command again. To make sure the command executes after the machine reboots, add the same `rtnet` command to the `/etc/rc2.d/Speripherals` file.

Note

Make sure that two `rtnets` are not active for the same NTS port. If this is the case, quit one of the two job numbers (identified in the `xyz` response portion of the `ps -ef | grep rtnet` command with the `kill -9 xyz` command). See the example below.

To quit one of the two job numbers, do the following:

1. Enter the `ps -ef | grep rtnet` command.

```
# ps -ef | grep rtnet
```

For example, the system responds:

```
# ps -ef | grep rtnet  root    238    1   3 15:18:41 ?
0:00 rtnet -bra cmsterm1 16 /dev/s_p

dev116  root    241    1  44 15:18:41 ?      0:00 rtnet -bra
cmsterm1 15 /dev/s_p

dev115 cmssvc   695    687   5 15:38:03 pts/0    0:00 grep
telnet
```

2. Enter the `kill -9 <number>` command.

```
# kill -9 <xxx>
```

Note

`<xxx>` is the process id of the `rtnet` which is being killed. For example, you could use the `kill -9 241` command to kill one of the processes shown in the `rtnet` example above.

Printers Connected to the Aurora Expander Box

If the printer is printing garbage, you can verify that the printer port settings are set to 9600 baud, no parity, 8 data bits, 1 stop bit, and xon-xoff flow control by entering the following command:

```
# stty -a < /dev/term/<port number>
```

Enter the above command while the printer port is active.

Additional Solutions

If problems persist, and if disabling and enabling the printer does not clear the problem, reenter the `lpadmin` command using the correct printer type. Check the `lpadm` using the `lpstat -p printer -l` command for the baud rate, parity, etc. The defaults are: 9600, no parity, and 1 stop bit. Any exceptions will be noted. See Chapter 4, “Installing Terminals, Printers, and Modems,” for more details.

Additional printer problems, along with the suggested actions for resolving the problems, are documented in the following sections:

- When the Printer Is Out of Paper
- When the Current Printer Output Is Bad
- How to Stop and Discard Current Print Job
- How to Stop and Reprint Current Print Job
- When Print Jobs Are Not Being Printed
- When Printer Is Out-of-Service — One Printer Configuration
- When Printer Is Out-of-Service — Two Printer Configuration.

Note

If you are experiencing a printer problem that is not documented in this section or is not documented in your printer manual, see the *UNIX*^{*} manual pages in *AnswerBook* on-line software. If you cannot solve the printer problem, escalate the problem through normal procedures.

^{*}UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Corporation.

Some of the commands used in the following sections can be executed while logged in *only* as *lp* or *root*; the commands are as follows:

- `/usr/lib/accept`
- `/usr/lib/lpshut`
- `/usr/lib/lpsched`
- `/usr/lib/lpmove`
- `/usr/lib/lpadmin.`

Other commands used in the following sections that can be executed while logged in *only* as *lp* or *root* are as follows:

- `disable`
- `enable`.

Commands used in the following sections that can be executed while logged in as *cms*, *lp*, or *root* are as follows:

- `lpstat`
- `cancel`.

Note

Only *lp* or *root* can cancel any print job, but any user can cancel their own job.

For more information on these commands and how to use them, see the *UNIX* manual pages in *AnswerBook* on-line software.

If you do not know the name(s) of the printer(s) connected to the computer, enter the following command:

```
$ lpstat -v
```

If you are currently in the *CentreVu* CMS environment and you want to test the printer, press the **Commands** Screen Labeled Key (SLK), and select the “Print Window” option. In a few seconds, the printer should start printing your test print job (if it is the first print job in the queue).

Whenever you enter the `disable`, `enable`, or `cancel` commands in the following sections, the printer will continue to print until the buffer is empty.

When the printer(s) do not function properly, additional information about the errors associated with the printer(s) can be seen in the *services error* log by entering the following command:

```
$ tail /usr/elog/elog
```

When the Enabled Printer Does Not Print

When the `lpstat` command shows that the printers are enabled but not working, do the following to correct the problem:

1. From the *CentreVu* CMS windows environment, move to the *Solaris* environment by pressing the **Commands** SLK and selecting the UNIX (r) system option.
2. Stop the print job currently printing by entering the following command:

```
$ disable <printer_name>
```

Replace the string `<printer_name>` with the real name of the printer.

3. Enable the printer by entering the following command:

```
$ enable <printer_name>
```

If the above method to get printers to print fails, do the following:

4. Enter the following command to disable the printer again:

```
$ disable <printer_name>
```

5. Turn the printer power off and on.
6. Enable the printer by entering the following command:

```
$ enable <printer_name>
```

When the Printer Is Out of Paper

The printer will stop printing the current job when it detects an out-of-paper situation. To reload the printer with paper, do the following:

Note

The following steps are an overview of what to do when the printer runs out of paper. The steps may vary depending on the printer model. For more information, refer to your printer manual.

1. Mark the position on the last sheet of paper where the printer stopped printing.
2. Remove the last sheet of paper from the printer.
3. Thread the first sheet on the new stack of paper into the printer (see your printer manual if necessary).
4. Position the first sheet of paper to the location where the printer stopped printing on the last sheet of paper.
5. Press the “ready printer” button (press the **correct** button on your printer; see your printer manual if necessary).

The printer should continue with the print job at the point where it stopped printing.

When the Current Printer Output Is Bad

If the output from the current print job is unreadable, the printer may be out of paper, the paper may be jammed, or the ribbon or cartridge may need replacing. Do the following to correct the printer problem:

1. From the *CentreVu* CMS windows environment, move to the *Solaris* environment by pressing the **Commands** SLK and selecting the UNIX (r) system option.
2. Disable the printer by entering the following command:

```
$ disable <printer_name>
```

Replace the string *<printer_name>* with the real name of the printer. The printer will continue to print until the buffer is empty.

Note

The print job currently printing will be reprinted when the printer has been enabled. While the printer is disabled, new print jobs routed to this printer will be queued (saved) and will be printed when the printer becomes available.

3. Fix the problem as necessary. (Refer to your printer manual if necessary.)
4. After the printer has been fixed, properly align the paper in the printer.
5. Enable the printer by entering the following command:

```
$ enable <printer_name>
```

Replace the string *<printer_name>* with the real name of the printer.

The printer should start printing the current job over again.

6. Exit the *Solaris* environment by entering the following command:

```
$ exit
```

How to Stop and Discard Current Print Job

1. From the *CentreVu* CMS windows environment, move to the *Solaris* environment by pressing the **Commands** SLK and selecting the UNIX (r) system option.
2. Cancel the print job currently printing by entering the following command:

```
$ cancel <printer_job>
```

Replace the string *<printer_job>* with the real name of the print job.

Note

The printer will continue to print until the buffer is empty.

3. Reposition the paper in the printer.

How to Stop and Reprint Current Print Job

1. From the *CentreVu* CMS windows environment, move to the *Solaris* environment by pressing the **Commands** SLK and selecting the UNIX (r) system option.
2. Stop the print job currently printing by entering the following command:

```
$ disable <printer_name>
```

Replace the string *<printer_name>* with the real name of the printer.

Note

The printer will continue to print until the buffer is empty.

3. Reposition the paper in the printer.
4. Enable the printer by entering the following command:

```
$ enable <printer_name>
```

The printer should start reprinting the print job from the beginning.

When Print Jobs Are Not Being Printed

If the printer is no longer printing the jobs in the queue, the *Solaris* system scheduler may not be running. To find out if the scheduler is running, do the following:

1. From the *CentreVu* CMS windows environment, move to the *Solaris* environment by pressing the **Commands** SLK and selecting the UNIX (r) system option.
2. When the \$ prompt appears, enter the following command:

```
$ lpstat -t
```

From the output, determine if the scheduler is running.

3. If the scheduler is not running, enter one of the following commands to log in as *lp* or *root*:

```
$ su lp
-- or --
$ su root
```

4. Enter the correct password when prompted to do so.
5. Next, enter the following command to turn the scheduler on:

```
# /usr/lib/lpsched
```

6. Enter the next command to verify that the scheduler is running:

```
# lpstat -t
```

7. To return to the *CentreVu* CMS environment, enter the following command:

```
# exit
```

When Printers Lose Power

When the printer is disconnected or loses power, the job currently printing is lost. To correct the problem, do the following:

- Disable the printer until it is operational.
- Enable the printer.
- Resubmit the print jobs.

If you want the system to recognize your administration for terminals, printers, and modems, you must reboot your system after performing the initial administration procedures.

Note

For more information about resubmitting print jobs because of a power failure or terminal, printer or modem administration, see Chapter 4, "Installing Terminals, Printers, and Modems."

When Printer Is Out-of-Service — One Printer Configuration

If the customer's system has only one printer and it breaks down, you can choose one of the following methods to maintain report production:

- Save all print jobs until the printer has been fixed.
- Reject all print jobs until the printer has been fixed.

However, you could replace the broken printer and immediately continue with report production.

How to Save Print Jobs

To save the print jobs currently in the queue and future print jobs submitted to the queue until the printer has been fixed, do the following:

1. From the *CentreVu* CMS windows environment, move to the *Solaris* environment by pressing the **Commands** SLK and selecting the UNIX (r) system option.
2. Disable the printer by entering the following command:

```
$ disable <printer_name>
```

3. Fix the problem as necessary. (Refer to your printer manual if necessary.)
4. After the printer has been fixed, reposition the paper in the printer.

5. Enable the printer by entering the following command:

```
$ enable <printer_name>
```

Replace the string *<printer_name>* with the real name of the printer.
The printer should start printing the first print job in the queue over again.

6. To return to the *CentreVu* CMS environment, enter the following command:

```
$ exit
```

How to Reject Print Jobs

To reject print jobs until the printer has been fixed, do the following:

1. From the *CentreVu* CMS windows environment, move to the *Solaris* environment by pressing the **Commands** SLK and selecting the UNIX (r) system option.
2. Disable the printer by entering the following command:

```
$ disable <printer_name>
```

3. Enter one of the following commands to log in as *lp* or *root*.

```
$ su lp  
-- or --  
$ su root
```

4. Enter the correct password when prompted to do so.
5. Reject all future print jobs by entering the following command:

```
# /usr/lib/reject <printer_name>
```

6. If you want to cancel the print jobs already in the queue, enter the following command to list the print jobs:

```
# lpstat -t
```

7. Next, use the *cancel* command as follows to cancel the print jobs in the queue:

```
# cancel <print_jobX> <print_jobY> <etc>
```

Note

When you cancel a print job it is removed from the print queue. If you want this job to print do not cancel it.

8. To return to the *CentreVu* CMS environment, enter the following command:

```
# exit
```

9. Fix the printer as necessary. (Refer to your printer manual if necessary.)
10. If you are in the *CentreVu* CMS environment, return to the *Solaris* system environment by pressing the **Commands** SLK and selecting the UNIX (r) system option.
11. After the printer has been fixed, reposition the paper in the printer.
12. Enable the printer by entering the following command:

```
$ enable <printer_name>
```

Replace the string *<printer_name>* with the real name of the printer.

13. Enter one of the following commands to log in as *lp* or *root*:

```
# su lp
-- or --
# su root
```

14. Enter the correct password when prompted to do so.
15. Accept all future print jobs by entering the following command:

```
# /usr/lib/accept <printer_name>
```

Note

A few seconds after you enter this command, the printer should start printing the first print job in the queue.

16. To return to the *CentreVu* CMS environment, enter the following command:

```
$ exit
```

When Printer Is Out-of-Service — Two Printer Configuration

If the customer's system has two or more printers and one of the printers breaks down, you can choose one of the following methods to maintain report production:

- Redirect all print jobs from the broken printer to a printer that works.
- Reject all print jobs until the broken printer has been fixed.

However, you could replace the broken printer and immediately continue with report production.

How to Route Print Jobs to Another Printer

To redirect future print jobs from a broken printer to one that works, do the following:

1. Access the Printer Administration window from the Maintenance subsystem. See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document for details.
2. Enter the name of the broken printer in the CMS `printer_name:` field.
3. Do a `Find` one to view the values (entries) associated with the printer.
4. When the values (entries) have been displayed, move to the LP `printer_name:` field, and change the printer name to the printer which is still operational.
5. Do a `Modify` to change the destination printer.

The *CentreVu* CMS printer name is now associated with a printer that is functional. The print jobs sent to the *CentreVu* CMS `printer_name` will be redirected to the functional LP printer.

Note

After the printer is operational, remember to reassign the *CentreVu* CMS `printer_name` to the LP `printer_name`.

How to Move Print Jobs in Queue to Another Printer

To move current print jobs from the queue of a broken printer to a working printer, do the following:

1. From the *CentreVu* CMS windows environment, move to the *Solaris* environment by pressing the **Commands** SLK and selecting the UNIX (r) system option.
2. Enter the following command to **move all the print jobs** currently queued to the broken printer (<printer1>) to a printer (<printer2>) that works:

```
# /usr/lib/lpmove <printer1> <printer2>
```

3. Enter the following command to **move selected print jobs** currently queued to the broken printer (<printer1>) to a printer (<printer2>) that works:

```
$ lpmove <print-jobX> <printer2>
```

4. To return to the *CentreVu* CMS environment, enter the following command:

```
$ exit
```

How to Reject Print Jobs

To reject print jobs until the printer has been fixed, do the following:

1. From the *CentreVu* CMS windows environment, move to the *Solaris* environment by pressing the **Commands** SLK and selecting the UNIX (r) system option.
2. Disable the printer by entering the following command:

```
$ disable <printer_name>
```

3. Enter one of the following commands to log in as *lp* or *root*:

```
$ su lp  
-- or --  
$ su root
```

4. Enter the correct password when prompted to do so.
5. Reject all future print jobs by entering the following command:

```
# /usr/lib/reject <printer_name>
```

6. If you want to cancel the print jobs already in the queue, enter the following command to list the print jobs:

```
# lpstat -t
```

7. Next, use the `cancel` command as follows to cancel the print jobs in the queue:

```
# cancel <print_jobX> <print_jobY> <etc>
```

Note

You can save any particular print job by not canceling it.

8. To return to the *CentreVu* CMS environment, enter the following command:

```
$ exit
```

9. Fix the printer as necessary. (Refer to your printer manual if necessary.)
10. If you are in the *CentreVu* CMS environment, return to the *Solaris* environment by pressing the **Commands** SLK and selecting the UNIX (r) system option.
11. After the printer has been fixed, reposition the paper in the printer.
12. Enable the printer by entering the following command:

```
$ enable <printer_name>
```

Replace the string *<printer_name>* with the real name of the printer.

13. Enter one of the following commands to log in as *lp* or *root*.

```
$ su lp
-- or --
$ su root
```

14. Enter the correct password when prompted to do so.
15. Accept all future print jobs by entering the following command:

```
# /usr/lib/accept <printer_name>
```

16. To return to the *CentreVu* CMS environment, enter the following command:

```
$ exit
```

Solving Modem-Related Problems

If your modem does not seem to be working upon installation, you can do the following:

- Check the physical connections. See “Identifying Port Problems” in this chapter for more details.
- Check to see whether the modem is connected to port 12, 13, 14, or 15 of an Aurora Expander Box. If it is, see “Connecting a Modem to an Aurora Expander Box,” below.
- Check the modem settings. See Chapter 3, “Installing the *Sun SPARCserver* Computer,” for more information.

Note

The default modem script assumes 8 data bits, 1 stop bit, no parity.

- Check the network administration (na) and reset it to match the modem settings. Outbound Modem speed must match the speed specified in the na administration (for example, 9600 baud). Inbound modem speed is unimportant if set to autobaud.

Disconnecting *U.S. Robotics* or *Comsphere* 3830 and 3910 Modems

If you are using a *U.S. Robotics** *Sportster*†, a *Comsphere* 3830 or a *Comsphere* 3910 modem, and you enter the exit command to end a dial-in session from a dumb terminal to a CMS system, a new login prompt may be returned. To actually disconnect these modems, you should enter +++ at the dumb terminal to return to the on-line command mode from the data mode. Then, enter ATH0 to disconnect the modem.

Connecting a Modem to an Aurora Expander Box

A factory-configured Aurora Expander Box supports modems only on ports 0-11; ports 12-15 do not transmit hardware flow control signals, and are used to support terminals and printers. Consequently, a modem attached to port 12, 13, 14, or 15 won't work. The usual corrective measure for such a problem is to simply disconnect the modem and reconnect it to any available port numbered 0 through 11.

If necessary, ports 12 through 15 can be made to support modems by opening the RJ45 connector box and rearranging the jumper settings. For instructions, see the *Communications Controllers/1600SE User's Manual*, which is shipped with the Aurora 16-port card and expander box.

*U.S. Robotics is a registered trademark of U.S. Robotics, Inc.

†Sportster is a registered trademark of U.S. Robotics, Inc.

Solving Power-Related Problems

This section provides some troubleshooting solutions to power-related problems (for example, when the *CentreVu CMS Sun SPARCserver* system loses power). If you cannot solve the power-related problems, escalate the problem through normal procedures. For printers with power-related problems, see the “Solving Printer-Related Problems” section in this manual.

When System Loses Power

If the *Sun SPARCserver* (system unit) loses power, it is recommended (but not required) to empty the CD-ROM and tape drive(s). The system boots from the disk by default.

To turn the power back *on*, use the following sequence:

1. Turn on devices attached to the *Sun SPARCserver computer* starting with the device at the end of the SCSI chain and working toward the computer.
2. Turn on the *Sun SPARCserver* computer.
3. Turn on the system monitor.

If the *Sun SPARCserver* computer is operating properly, the monitor displays a banner screen up to 30 seconds after it is powered on.

```
SPARCstation 10 MP (2x390Z55), Keyboard Present  
ROM Rev. 2.12, XX MB memory installed, Serial #XXX  
Ethernet address X:X:YY:Z:BB, Host ID: XXXXXXXX
```

\$

The following sequence is recommended to turn off the power:

1. Turn off the *Sun SPARCserver* computer.
2. Turn off the system monitor.
3. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.

When the Console `Login:` prompt appears on the console terminal, the computer will be up and running.

Note

For more information about restarting the *Sun SPARCserver* computer because of a power failure, refer to the user documentation that came with the computer.

Solving Installation-Related Problems

This section provides some suggestions for solving problems that could arise during an installation. The following installation-related problems are described:

- Troubleshooting a *Solstice DiskSuite*^{*} File System
- When a *Solaris* Patch Install Fails
- Checking for Error Messages
- Solving X.25 License Install Problems
- When X.25 Install Hangs Up
- Details for Installing *INFORMIX*[†]-SE
- Installing *CentreVu* CMS.

Troubleshooting a *Solstice DiskSuite* Software Installation

The *Solstice DiskSuite* software package allows multiple disk partitions to be logically combined to create a single large partition. Using the *Solstice DiskSuite* package allows CMS databases to span multiple disks, and so grow quite large.

In order to troubleshoot problems with the *Solstice DiskSuite* software or the */cms* file system, you must understand two basic concepts of *Solstice DiskSuite* operation: **state databases** and **metadevices**.

A state database contains the *Solstice DiskSuite* configuration information for the system, and is stored on a raw disk partition created for that purpose. At boot time, the operating system accesses the state database to configure the system. Typically, a system contains multiple copies of the state database.

A metadevice is a logical device that consists of a set of physical disk partitions. A system controlled by *Solstice DiskSuite* software can contain any number of metadevices; the state database contains a record of which disk partitions belong to which metadevices. Once a metadevice has been set up, the underlying disk partitions can be accessed only through the metadevice.

(For a complete description of *Solstice DiskSuite* software and its basic technical concepts, see *Solstice DiskSuite 4.0 Administration Guide*, published by Sun Microsystems, Inc.)

^{*}Solstice DiskSuite is a trademark of Sun Microsystems, Inc.

[†]INFORMIX is a registered trademark of Informix Software, Inc.

CMS uses the *Solstice DiskSuite* software to set up three state databases, and to create a single metadvice containing all the disk partitions used to store CMS data:

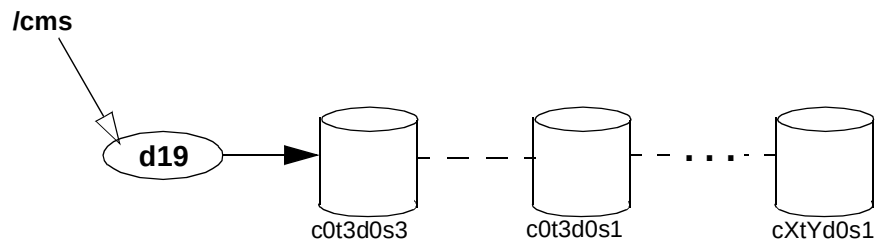


Figure 8-4: The Metadvice and the /cms File System

Identifying Problems

Use the procedures and hints in this section to help identify and resolve problems with the CMS scripts that administer *Solstice DiskSuite* software, with the physical disks, with the state databases, with the metadvice, or with the `/cms` file system.

Problems with CMS Administration Scripts

Use the `pkginfo` command to verify that the *Solstice DiskSuite* software is installed:

```
# pkginfo -l SUNWmd
```

If it has not been installed, you may have to reinstall the operating system and repartition your disks. Once the software has been installed, you must use `o lds` script to set up the environment so CMS can access the disks. See the section entitled “Setting up Your System for *Solstice DiskSuite* Software” in Chapter 3, *Upgrading a Sun SPARCserver Computer*, for step-by-step description of installing *Solstice DiskSuite* software and using the `o lds` script. If you receive an error message from the `o lds` script, see the “Common Error Messages” subsection, below.

Disk I/O Problems

Check the system console and the `/var/adm/messages` log for messages that indicate problems with a specific hard disk. If a disk is generating errors, it may need to be replaced. For procedures related to recovering from disk crashes and replacing hard disk drives, see Chapter 9, “Maintenance,” in Volume 2 of the *CentreVu™ CMS R3V5 Sun*

SPARCserver Computers Installation and Maintenance manual (585-215-827).

State Database Problems

Check the system console and the `/var/adm/messages` log for messages that indicate problems with a state database. Be aware that on a multiple-disk system, there should always be two copies of the state database on the first internal disk drive, and a third copy on the second internal disk drive. On a single-disk system, there should be three copies of the state database on the only disk.

Use the `metadb` command to check the status of the state database:

```
# /usr/opt/SUNWmd/sbin/metadb -i
.
.
.
#
```

If the response indicates a state database problem, you must remove and re-create the state database that is causing the problem. Follow these steps:

1. Check to see if the error is caused by an underlying disk problem. If it is, recover or replace the disk (see the *CentreVu™ CMS R3V5 Sun SPARCserver Computers Installation and Maintenance* manual) (585-215-827).
2. If you find no disk problem, or if the state database problem persists after the disk has been repaired, use the `metadb` command to remove and re-create the state database causing the problem. For example:

```
# /usr/opt/SUNWmd/sbin/metadb -d mddb01
# /usr/opt/SUNWmd/sbin/metadb -a mddb01
#
```

Metadevice Problems

Use the `metastat` command to verify that the metadevice is set up correctly. For example:

```
# /usr/opt/metastat
d19: Concat/Stripe
Size: 31315536 blocks
Stripe 0:
  Device      Start Block  Dbase
  c0t1d0s1      0         No
Stripe 1:
  Device      Start Block  Dbase
  c0t3d0s3      0         No
  .
  .
  .
Stripe 9:
  Device      Start Block  Dbase
  c2t1d0s1      0         No
#
```

To verify the metadevice setup, you must examine the response to the command. You are looking for two things:

- a. *All your disk drives must be accounted for.* You can verify that simply by checking the Size figure (it should roughly equal the total capacity of all your disks) and counting the number of devices listed (there should be a “Stripe” section for every drive). If some of your drives seem to be missing, check to make sure that all your drives are plugged in and turned on, and that each external drive has a unique target number.
- b. *The device names must reflect the appropriate slice numbers.* The slice numbers are represented by the final two characters of the device name. A properly set-up /cms file system begins with slice 3 of the first internal disk, and slice 1 of each of the remaining disk drives. Consequently, the device name of the first internal disk drive must be c0t3d0s3; all other device names must end in s1.

If there is any discrepancy between reality and the output of the metastat command, you will have to repartition your disk drives.

Problems with the /cms File System

Use the following steps to check the /cms file system for errors:

1. Log in as *root*.
2. Edit the /etc/vfstab file and comment out the /dev/md/rdisk/d19 and /cms/swap entries. Then save the file. For example:

```
# vi /etc/vfstab
```

```
<contents of the file is displayed>
```

#device	device	mount	FS	fsck	mount	mount
#to mount	to fsck	point	type	pass	at boot	options
#						
#/dev/dsk/c1d0s2	/dev/rdisk/c1d0s2	/usr	ufs	1	yes	-
/proc	-	/proc	proc	-	no	-
fd	-	/dev/fd	fd	-	no	-
#swap	-	/tmp	tmpfs	-	yes	-
/dev/dsk/c0t3d0s0	/dev/rdisk/c0t3d0s0	/	ufs	1	no	
-						
/dev/md/dsk/d19	/dev/md/rdisk/d19	/cms	ufs	2	yes	
-						
/swap1	-	swap	-	no	-	
/cms/swap	-	swap	-	no	-	

In this case, you would insert the pound sign (#) at the beginning of the `/dev/md/dsk/d19` and `/cms/swap` lines, and write and quit the file.

3. Reboot the system:

```
# init 6
```

4. When the system is back up, log in as `root`.
5. Check the `/cms` file system:

```
# fsck /dev/md/rdisk/d19
```

6. Mount `/cms`:

```
# mount /cms
```

7. Edit the `/etc/vfstab` file and uncomment the entries you commented out earlier. Then save the file. For example:

```
# vi /etc/vfstab

<contents of the file is displayed>

#device      device      mount      FS      fsck      mount      m
#to mount    to fsck      point      type     pass      at boot op
#
#/dev/dsk/c1d0s2 /dev/rdisk/c1d0s2 /usr      ufs      1          yes      -
/proc        -            /proc      proc     -          no       -
fd           -            /dev/fd     fd       -          no       -
#swap        -            /tmp        tmpfs    -          yes      -
/dev/dsk/c0t3d0s0 /dev/rdisk/c0t3d0s0 /          ufs      1          no
-
# /dev/md/dsk/d19      /dev/md/rdisk/d19      /cms      ufs      2
-
/swap1        -      -      swap      -      no      -
# /cms/swap    -      -      swap      -      no      -
```

Now, you delete the pound sign (#) at the beginning of the `/dev/md/dsk/d19` and `/cms/swap` lines, and write and quit the file.

If the check fails, examine the system for problems with the metadvice, state databases, or disks. If you find no other problems, you may need to recover `/cms`.

If you have trouble mounting `/cms`:

- Enter an `ls` command to verify that the `/cms` directory exists:

```
# ls -ld /cms
```

If `/cms` does not exist, use a `mkdir` command to create it.

- Use the `metastat` command to determine the metadvice being used. Then verify that the entry for `/cms` in the `/etc/vfstab` file is correct. If you find any errors, correct them.

Common Error Messages

The text below presents, in alphabetical order, the messages commonly associated with installing and setting up the *Solstice DiskSuite* software to work with a CMS system. Each message is accompanied by its probable cause and the likely corrective procedure.

/cms: Deadlock situation detected/avoided

Both CMS and the operating system are trying to access the swap file, leading to a deadlock. Turn off CMS, deactivate (swap -d /cms/swap) all the swap files residing on `/cms`, and re-enter

the command. Remember to reactivate (swap -a /cms/swap) the swap files back when the growfs command completes.

device: c0t6d0 will not be used

Warning that c0t6d0 will not be set up for *Solstice DiskSuite*. Since c0t6d0 is the CD-ROM drive, that is not a problem.

device: *devicename* cannot be setup, or does not exist...

The disk you are trying to attach is turned off, does not exist, or was removed from the system. Power-up the disk drive, or verify the correct name for the disk (stop-a, probe-scsi), or attach the disk to the system and reboot with a boot -r command from the open boot prompt.

Disk *devicename* already attached, exiting...

You are trying to attach a disk that is already attached. Verify the name of the disk by doing a *stop-a, probe-scsi-all*. Look at the target number on the back of the disk drive if possible, or consult the device documentation.

disk: *devicename* partition 1 is not partitioned correctly

You need to repartition disk *devicename*. Use the format command. See Chapter 9, "Maintenance," of *CentreVu™ CMS R3V5 Sun SPARCserver Computer Installation and Maintenance* (585-215-827) for details about adding disk drives to a CMS system.

DiskSuite must be installed

You must install the *Solstice DiskSuite* software package. See Appendix D, "*Sun SPARCserver Computer Factory Installation Procedures*," of this document.

In order to attach disk, /cms must already be mounted, exiting...

The /cms file system was not mounted. Execute a mount /cms command and rerun the command that failed.

metadb: *systemname: devicename*: has a metadatabase replica

There are already state database replicas existing on the indicated system and device. No further action is required.

metainit: *systemname: /etc/opt/SUNWmd/md.tab* line 12: d19: unit already set up

An initial setup of the file system has already been performed.

If you are trying to attach a new disk, execute an `olds -setup` command for that device. To attach device `c0t2d0`, for example, you would enter:

```
# /olds/olds -setup c0t2d0
#
```

If you need to do an initial setup, use these commands:

```
# /olds/olds -cleanup
.
.
.
<reboot when command completes>
# /olds/olds -check_disks
# /olds/olds -mk_files
# /olds/olds -metadbs
# /olds/olds -setup
```

When the setup completes, use the commands below to verify that all disks are controlled by the *Solstice DiskSuite* software:

```
# mount /cms
# df -k /cms
```

Then restore all your swap files and their `/etc/vfstab` entries.

metainit: syntax error

This is the `olds` general failure message. The most likely cause is that the `/etc/opt/SUNWmd.tab` file disagrees with your configuration. (The file, for example, says you have seven disks in a given metadvice, but your configuration only has six.) Verify that `/etc/opt/SUNWmd.tab` is accurate. As a last resort, use an old `md.tab` file or do an initial `olds` setup.

newfs of cms metadvice failed

There is an internal problem with one of your disks. Enter a `/usr/opt/SUNWmd/sbin/metaclear d19` command, and then rerun the `olds -setup` script. If the same error recurs after all that, repartition your disks or call Lucent Technologies National Customer Care Center at 1-800-242-2121.

prtvto: /dev/rdisk/c0t6d0: Device busy

This message usually implies that the device probed by the script is not to be used as a disk because it is a read-only disk (i.e., a CD-ROM drive). This is not a problem.

Warning: Current Disk has mounted partitions

Ignore this message. The format command is warning you that it is probing a mounted disk. A probe, however, is a nondestructive task that poses no danger to your data.

You must be root in order to run this command

Superuser privileges are necessary to run this script because most of the commands are related to system administration.

You need to have at least one disk set up, before attaching one, exiting...

You tried to use olds to attach a disk, but the metadvice has not yet been set up. To set it up, run the `olds -setup` command without arguments.

When a *Solaris* Patch Installation Fails

When a *Solaris* patch installation fails (for example, during `/tmp/patches /install-patches`), you can attempt to fix the source of the error and rerun `/tmp/patches/install-patches`. As a last resort, you can comment out the lines relating to the bad patch and rerun the script. You must resolve the problem and install the patch before returning the system to service.

Pkgchk Errors

The `pkgchk -n cms` command lists some common error messages that do not signal a problem. The following error messages in Table 8-12 can be ignored:

Table 8-12: Error Messages to Ignore

Location	Error Message	Occurs
<code>/cms/install/logdir/admin.log</code>	group name <root> expected <cms> actual.	After the installation and before setup.
<code>/usr/lib/cms/pbxtcrflags</code>	path name does not exist.	After the installation and before setup.
<code>/cms/env/cms_mon/State_tbl</code>	group name <bin> expected <other>actual.	After the setup and before running cms.

Table 8-12: Error Messages to Ignore

Location	Error Message	Occurs
/cms/install/logdir/admin.log	group name <root> expected <cms>actual.	After the setup and before running cms.
/usr/lib/cms/pbxtrcflags	path name does not exist.	After the setup and before running cms.
/cms/env/cms_mon/State_tbl	group name <bin> expected <cms> actual.	After running cms.
/cms/install/logdir/admin.log	group name <root> expected <cms> actual.	After running cms.
/usr/lib/cms/pbxtrcflags	group name <bin> expected <cms> actual.	After running cms.

Solving X.25 License Installation Problems

Error messages are generated by the license system if you have problems during the installation. The error messages are divided into three categories: informational, configuration, and daemon software errors. For example:

- Informational Error Message:

DEMO mode supports only one SERVER host!

Solution:

An attempt was made to configure a demonstration version of the software for more than one server *Sun SPARCserver* computer.

- Configuration Error Message:

hostname: Wrong hostid, exiting

Solution:

The hostid is wrong for the host name.

- Daemon Software Error Message:

hostname: Can't allocate server table space

Solution:

A malloc error. Check swap space.

See the “License Error Messages” section of the *SunLink X.25 8.02 Installation Guide* for a complete list of licensing error messages.

Details for Installing *INFORMIX-SE*

The serial numbers required to install *INFORMIX-SE* can be found on the back of the *INFORMIX-SE* CD-ROM, or see Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.”

CentreVu CMS Package Details

This section provides some *CentreVu* CMS package-related details to help you solve problems that could occur during installation. For example:

- The wrong cms package instance is used.
- The system fails to remove a cms package.
- The system fails to update a cms package.

Identifying *CentreVu* CMS Package Instances

You can have up to two *CentreVu* CMS package instances:

- *cms* — the base package instance used for regular installs
- *cms.2* — the package instance used for updates.

To identify the version of *CentreVu* CMS software you need, enter the `pkginfo -x cms.*` command at the system prompt.

Removing *CentreVu* CMS Package Fails

If you are exited from the system when removing a *CentreVu* CMS package (*cms* or */cms.2*), you may have done the following:

- Logged in as `cmssvc`
- Switched user — `su'd` to `root/root2`
- Ran `cmssvc`.

Solution:

- Log in directly as `root/root2`
- Remove package(s) as instructed by the system.

Checking Installed *Solaris* Patches

To verify that the correct *Solaris* patches are installed, do the following:

1. Enter the `showrev -p` command at the system prompt.

```
# showrev -p
```

The system responds:

```
# showrev -p
Patch: 100982-02 Obsoletes: Packages: SUNWcsr.2 11.5.0,
      REV=1.0.15.2, PATCH=15
Patch: 100992-03 Obsoletes: Packages: SUNWcsr.3 11.5.0,
      REV=1.0.15.2, PATCH=68
Patch: 100999-51 Obsoletes: 100985-06, 100998-02, 10108602,
      100998-02, 101086-02, 1011
Patch: 101014-05 Obsoletes: Packages: SUNWcsu.3 11.5.0,
      REV=      1.0.15.1, PATCH=85
.
.
.
```

2. Check the list to verify that all the *Solaris* Patches you need are installed.

See Chapter 9, "Maintenance," for more information about Installing *Solaris* Patches.

When an Update Fails

Do the following if the installation of an update fails:

1. At the system prompt, enter `pkgrm cms.2`.
2. From the information displayed, identify and correct the problem.
3. Reinstall the update. See the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-826) document for details.

When Installing an Update Fails

Table 8-13 provides a list of error messages that indicate when an update save (`upd_save`) fails during installation (`upd_inst`).

Table 8-13: Error Messages When a Save Update Fails During Installation

Error Message	Problem	Solution
"up_install: another update is already installed"	There is already an update installed.	Remove the Update (<code>upd_remove</code>), and then install an Update (<code>upd_install</code>).
"You must remove cms.2 before installing this update"	There is already an update installed.	Remove the Update (<code>upd_remove</code>), and then install an Update (<code>upd_install</code>).
"no update spooled run upd_save and then upd_install"	There is no update spooled.	Run the Save Update (<code>upd_save</code>), and then reinstall the Update (<code>upd_install</code>).
"<X> blocks and <Y> modes are required in the <Z> file system to install this package"	There is not enough space in <i>/cms</i> to install the update.	Remove the failed instance with an Update Remove (<code>upd_remove</code>) or a Package Remove (<code>pkgrm</code>). Reclaim the space in the file system, and attempt to install again.
"<M> free blocks and <N> free modes exist"	There is not enough space in <i>/cms</i> to install the update.	Remove the failed instance with an Update Remove (<code>upd_remove</code>) or a Package Remove (<code>pkgrm</code>). Reclaim the space in the file system, and attempt to install the update again.

See the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-826) document for more information about installing an update.

When an Update Save Fails

Table 8-14 provides a list of error messages that indicate when saving an update fails (upd_save).

Table 8-14: Error Messages When Update Save Fails

Error Message	Problem	Solution
"upd_save: pkgadd was unable to spool the package into the temporary directory."	The <i>/tmp</i> directory is out of space.	Clear out the <i>/tmp</i> directory, and attempt an upd_save again.
"upd_save: cannot determine if package is an update."	The update tape is not an update.	You might be using the wrong tape, or the tape is corrupted. You must get a new tape.
"upd_save: CMS version X is not an update."	The update tape is not an update.	You are using the wrong tape. Use the correct tape.
"upd_save: cannot determine version of update."	You cannot get the version number.	You are probably using the wrong tape, or the tape is corrupted. Use the correct tape.
"Failed to save installation files."	Not enough space in <i>/cms</i> to spool packages.	Check the amount of free space in <i>CentreVu CMS</i> . If the space is low, try to remove or clear out unnecessary files.

See the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-826) document for more information about installing an update.

When an Update Remove Fails

The following list provides some possible reasons why removing an update (upd_remove) fails:

- The original install failed (most common).
- No updates are installed.
- The *pkgmap* file is not present (unlikely situation).

An update remove could fail if the *pkgmap* file in */var/sadm/pkg/cms.2/save/pkgmap* was removed or was never present. You can remove the update instance, but there is no way to determine if the files are in an update; therefore, the files cannot be restored. The *checksums* will not be updated and *pkgchk* could show errors.

See the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-826) document for more information about installing an update.

AnswerBook Package Details

If you get the following error message when you start *AnswerBook* on-line software package, you probably did not insert *Solaris 2.4 System AnswerBook* CD-ROM into the disk drive:

AnswerBook "Solaris 2.4 System AnswerBook" is not accessible.

Verify that the card catalog entry for this *AnswerBook* is correct.

Do the following to correct the problem:

1. Click **Continue** with the left mouse button.
2. Insert the *AnswerBook* CD-ROM.
3. Wait until the light stops flashing on the disk drive.
4. Click **Modify Library** with the left mouse button.
5. Click **Solaris 2.4 System AnswerBook** with the left mouse button.
6. Click **Apply**.

See the “*AnswerBook* Software Package” section in Chapter 1, “Introduction,” for more information.

Checking Error Logs

This section describes some common log characteristics and covers information about each of the logs provided.

The following types of problems will generate an entry into the error log:

- Data conversion problems
- Start-up and shut-down problems
- Installation problems
- Set-up problems
- Critical or warning messages.

Wrapping Techniques

Many of the log files use a common, general purpose file wrapping technique to keep a controlled amount of historical log information. It keeps the current log in a file always named the name of the log. For example, the error log is named `eLog`, and there may be three older logs kept called `eLog.01`, `eLog.02`, and `eLog.03`.

When the current active log file becomes full, it rolls over and a new log file is started. At the time that the log rolls over, the oldest log is deleted, each of the other logs moves to its new name, and a new log file is started.

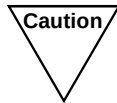
The size of the logs is controlled by the file size. If a specific number of hours of log information is needed, some monitoring will be needed to see how much time is covered by a log.

Each log file concludes with a message that the file size limit has been reached and that a new log will be started. This is particularly useful if using the *Solaris* 2.4 command `tail -f` to monitor ongoing activity in the log. When the message is displayed, a new `tail` command will need to be started. After you finish reviewing log activity, press **Del** to exit.

Administering Options

You can administer the following options:

- Location of the log files
- Number of historical log files
- Size of the Files.



Only qualified TSC personnel should administer these log files. Do not delete or change any information in these log files without first contacting the Technical Service Center.

Running Logs

The logs run under a variety of circumstances:

- Always running when *CentreVu* CMS and/or *Solaris* are running and cannot be stopped
- Must be manually started and stopped
- Are also automatically stopped after a reboot and/or restarting *CentreVu* CMS.

Contact the Technical Service Center for more information.

Contents of Error Logs

Each error log contains specific information about itself, including defaults, administration information, a description of the contents, and general information about how to interpret the contents of the logs:

- **Default Location** — the file name of the primary file where log information can be found if no administrative changes have been made.
- **Default Maximum File Size** — the approximate size of each of the log files (primary and historical) that will be saved if no administrative changes have been made.
- **Default Number of Older Files Retained** — the number of historical files that are kept, in addition to the primary file, if no administrative changes have been made.
- **Administration File** — if the log is controlled by the general purpose file wrapping technique, the location of the file where administrative changes can be made affecting the location of the log file, the size of the logs, and/or the number of historical log files.
- **Starting/Stopping** — describes the conditions for the log to be running, including any appropriate commands.
- **Writing Process** — indicates all processes that write into the log.
- **Intended Audience** — usually customer (for log information that is useful to the customer, easy to read, and documented) or services (for log information that is intended to aid troubleshooting).
- **First Implemented in Load** — indicates the first load when the log is available — an internal load numbering (such as 3.1z) is used.

Summary of Error Logs

Refer to Table 8-15 to identify which error log to use to resolve a problem.

Table 8-15: Types of Error Logs

Type of Log	Name of Error Log	Default Location
General Error Logs	elog	/usr/elog/elog
	elog_elog	/usr/elog/elog
	elog_if	/user/elog/elog_if
	customer elog	<i>INFORMIX</i> database table customer_log
	cow_paste.log	/usr/elog/cow_paste.log
Link-Related Logs	spi.err	/cms/pbx/acd1/spi.err
	spi.lnk	/cms/pbx/acd1/sim.lnk
	spi.log	/cms/pbx/acd1/spi.log
	ag.log	/cms/pbx/acd1/ag.log
	sim.err	/cms/pbx/acd1/sim.err
	sim.lnk	/cms/pbx/acd1/sim.lnk
	xln.log	/cms/pbx/acd1/xln.log
Process-Related Logs	proc_log	/cms/env/cms_mon/proc_log
	mq_clean	/cms/env/cms_mon/mq_clean
	gem_log	/cms/env/gem/gem_log
	rt_gem	/cms/env/gem/rt_gem
<i>Solaris</i> Logs	messages	/var/adm/messages*

Table 8-15: Types of Error Logs (Contd)

Type of Log	Name of Error Log	Default Location
Special Task Logs	harch.log	/cms/db/LogAdmin/hachiver
	arch.log	/cms/dc/archive/arch.log
	ttlog	/cms/db/journal/timetable/ttlog
	cow_paste.log	/usr/elog/cow_paste.log
	r3mig.log	/cms/migrate/r3mig.log
	back.log	/cms/maint/backup/back.log
	rest.log	/cms/maint/restore/rest.log
	migrate.log	/cms/migrate/migrate.log
	mig.log	/cms/maint/r3mig/mig.log
Installation/Upgrade/cmsadm Logs	install.log	/cms/install/logdir/install.log
	backup.log	/cms/install/logdir/backup.log (see also admin.log)
	admin.log	/cms/install/logdir/admin.log
<i>CentreVu</i> Supervisor Specific Logs	.win.log	\$HOME/.win.log
	cman.log	/cms/env/cman/cman.log
Miscellaneous Logs	log_msg	/lib/log_msg
	printer.errors	
	bp.uid	/cms/tmp/bp.uid

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Maintenance

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Overview

This chapter explains how to maintain the *CentreVu*™ Call Management System Release 3 Version 5 (CMS R3V5) hardware and software. Refer to the *Sun** *SPARCserver*† computer documentation for additional maintenance information.

This chapter discusses the following maintenance procedures:

- Performing Backups and Restores
- Recovering from Disk Corruption
- Recovering from a Disk Crash
- Adding SCSI Hard Disk Drives
- Recovering System Space
- Adding Memory
- Installing HSI/S Cards
- Changing the Date or Time
- Checking Installed Software Packages
- Auditing *CentreVu* CMS Package
- Moving Back to a Previous Load
- Backing Out of a *Solaris*‡ Patch
- Adding *INFORMIX*** -SQL
- Adding, Removing, or Replacing Tape Drives
- Identifying Device Entry Names for Ports on the Aurora Expander Box
- Removing Aurora SBus *Multiport*†† Software Drivers
- Adding, Removing, or Moving Aurora SBus *Multiport* Cards
- Adding Network Terminal Servers.

Personnel at the Technical Service Center (TSC) will need assistance from an on-site technician or the customer's *CentreVu* CMS administrator to do most of the procedures in this chapter.

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Performing Backups and Restores

A backup copies the data stored on the *CentreVu* CMS R3V5 hard disk to a removable tape. Regular backups provide a way to recover data that would otherwise be lost. *CentreVu* CMS provides two different types of backups:

- CMSADM File System Backup
- *CentreVu* CMS Maintenance Backup — Full and Incremental.

From backup tape(s) you can restore your system and data. For more information about backups and restores, see the *CentreVu™ CMS R3V5 Administration* (585-215-820) document.

Performing a CMSADM File System Backup

The CMSADM file system backup saves all the file systems on the machine onto a tape. This includes the following:

- *Solaris* 2.4 system files and programs
- *CentreVu* CMS programs and data
- Non-*CentreVu* CMS customer data placed on the computer (in addition to the *CentreVu* CMS data).

The CMSADM file system backup should be done as follows:

- At the factory

This backup is shipped with a new system and can be used during installation, if necessary.

- After the *CentreVu* CMS is provisioned

This backup contains the *Solaris* system files and programs and *CentreVu* CMS configuration data placed on the computer by TSC provisioning personnel.

Note

In addition, field technicians should perform a *CentreVu* CMS full maintenance backup before they turn a new system over to the customer. See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document.

- Before and after the *CentreVu* CMS software is upgraded or updated
- Monthly.

The number of cartridge tapes required to complete a CMSADM file system backup depends on the amount of data on the system and the capacity of the backup tape. The program estimates the number of tapes required and informs the user.

Before starting the backup procedures in this section, log in as *root*, and enter this command:

```
# lp /etc/vfstab
```

The output from the printer is necessary when doing a system restore.

Note

You should bundle the printout of the */etc/vfstab* file with the system backup tape(s) for future reference.

Do these steps to perform a CMSADM file system backup:

1. At the system console, log in as *root*, and verify that the computer is in a *Solaris* multi-user state (2 or 3).
2. To check if you are in the multi-user state, enter this command:

```
# who -r
```

Note

The `who -r` command gives you one line of output that describes the state of the terminal.

A sample response for the `who -r` command for a machine in run-level 3 follows:

```
who -r
```

```
. run-level 3 Feb 2 16:52 3 0 S
```

3. In the multi-user state, enter the following command to access the *CentreVu* CMS Administration menu:

```
# cmsadm
```


The *CentreVu* CMS Administration menu displays:

```
Lucent Technologies CentreVu(TM) Call Management System
Administration Menu
Select a command from the list below.
 1) acd_create  Define a new ACD
 2) acd_remove Remove all administration and data for an ACD
 3) backup      Filesystem backup
 4) diskmap     Estimate disk requirements
 5) memory      Estimate memory requirements
 6) realtime    Estimate real-time report refresh rate
 7) pkg_install Install a feature package
 8) pkg_remove  Remove a feature package
 9) run_cms     Turn CentreVu CMS on or off
Enter choice (1-9) or q to quit:
```

4. Enter 3 to select the backup option.

The system responds:

```
Select tape drive to use:
 1) 150MB cartridge tape
 2) 60MB cartridge tape
 3) 14.0 Gbyte 8mm tape
 4) 5.0 Gbyte 8mm tape
 5) 2.5 Gbyte cartridge tape

Enter choice (1-5):
```

Note

All systems are shipped with one or more tape drives (QIC-150, QIC 2.5-GB, 5-GB, and/or 14-GB). For systems with multiple tape drives, either the QIC-150 or the QIC 2.5-GB is the first drive in the SCSI chain.

Valid device names are as follows:

`/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187 for SCSI target numbers of external tape drives.

`/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

`/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

`/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

5. Enter the number that corresponds to the tape drive you want to use.

Note

If you have two tape drives and you enter 1, 2, or 4, the system responds:

Select the tape drive to use:

- 1) `/dev/rmt/0`
- 2) `/dev/rmt/1`

Enter choice (1-2):

If you have two tape drives and you enter 3 or 5 (14-GB or 2.5-GB), the system responds:

Select the tape drive to use:

- 1) `/dev/rmt/0c`
- 2) `/dev/rmt/1c`

Enter choice (1-2):

If you have only one tape drive, the system begins calculating the approximate number of tapes required. You are not prompted.

If the number of tapes required is one, the system responds:

The backup will need approximately 1 tape.

Please insert the first cartridge tape into `</dev/rmt/x>`.

Press ENTER when ready:

If the number of tapes required is more than one, the system responds:

The backup will need approximately `<X>` tapes.

You will be prompted for additional tapes.

Be sure to number the cartridge tapes consecutively in the order they will be inserted.

Please insert the first cartridge tape into `</dev/rmt/x>`.

Press ENTER when ready:

6. To begin the backup, insert the cartridge tape, wait for the tape to rewind and reposition, and press **Return**.

If *CentreVu* CMS is turned on, the system responds:

The backup is about to begin, CMS is currently on. CMS will be turned off automatically during that portion of the backup which needs CMS off. Press ENTER to proceed or BREAK to quit.

7. To continue the backup, press **Return**.

If you are using one tape, the system responds:

Backing up files...

.....

.....(*dots continue to display as the system is backed up*)

XXXXXX Blocks

If you are using more than one tape, a message prompts you to insert the next tape:

Backing up files ...

.....

.....

.....

Please remove the current tape, number it, insert tape number X, and press ENTER.

8. Insert the next tape and press **Return** to continue.

Note

When you insert another tape, allow it to rewind and reposition before you press **Return**.

After the system completes the back up, it verifies the back up.

Tape Verification

Insert the first tape

Press return to proceed: *(there is a delay as tape is verified)*

9. Insert the first tape and press **Return** to continue.

If you are using more than one tape, a message prompts you to insert the next tape.

Tape Verification

Insert the first tape

Press return to proceed: *(there is a delay as tape is verified)*

Please insert tape number X and press return: *(there is a delay as tape is verified)*

After the tape verification, the system prompts you to label the tapes and then returns you to the system prompt.

Please label the backup tape(s) with the date and the current CMS version (<version>).

10. Label the CMSADM backup tape(s) with the date and *CentreVu* CMS version.

Restoring from a CMSADM File System Backup

If backups are available, the file systems on the *Sun SPARCserver* computer can be restored when an accidental loss of data occurs.

To restore the file systems from a CMSADM backup, do the following:

1. Obtain the cartridge tape(s) that contain the system backups.
2. Obtain the printout of the */etc/vfstab* file that was stored with the backup tapes.

3. Reference the restore procedures in the “Recovering from Disk Corruption” section of this chapter.

Checking Contents of a CMSADM Backup Tape

To list the content of the CMSADM backup tapes, do the following:

1. Insert the first backup tape.
2. To list the files on the tape, enter the following commands:

```
# ulimit unlimited
# cpio -ict -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
```

Note

You must substitute one of these device names for *<device name>* in the `cpio` command:

`/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187 for SCSI target IDs of external tape devices.

`/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

`/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

`/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

The system displays a list of files.

Performing a CentreVu CMS Maintenance Backup

CentreVu CMS maintenance backups save only *CentreVu* CMS data (administration and historical).

The *CentreVu* CMS data for each ACD should be backed up as follows:

- After the *CentreVu* CMS is provisioned
- After the *CentreVu* CMS software is upgraded or updated
- Weekly.

You run these backups from the Maintenance: Back Up Data window. See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document.

Performing a *CentreVu* CMS Maintenance Restore

The *CentreVu* CMS R3V5 software application allows you to restore *CentreVu* CMS data lost due to system failure, disk crashes, etc. You can restore all *CentreVu* CMS data that you previously backed up via a *CentreVu* CMS maintenance backup.

Note

You can execute a *CentreVu* CMS maintenance restore from the console terminal; however, the console terminal must be powered on and *CentreVu* CMS must be in the single-user mode. You can verify that you are in the single-user mode from the System Setup: CMS State window.

After the CMSADM restore is completed or after you have the system in an operable state, restore the *CentreVu* CMS administration and historical data from available *CentreVu* CMS maintenance backups.

Run a restore from the Maintenance: Restore Data window. See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document.

CentreVu CMS Maintenance Backups Available

The *CentreVu* CMS maintenance restore loads the *CentreVu* CMS data up to the time of the last *CentreVu* CMS maintenance backup. See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document.

Only Full Maintenance Backups Available

If only full *CentreVu* CMS maintenance backups are available, the following steps are the fastest way to get the system running:

1. Load the *most recent* full backup tape.
2. Do an automatic restore of the system administration data, ACD-specific data, historical data, and non-CMS data by entering `y` in the Restore from last backup (y/n): field.

Note

When the *CentreVu* CMS restore is complete, turn the *CentreVu* CMS off and then back on so the *CentreVu* CMS runs with the newly restored administration data. To turn *CentreVu* CMS off and on, see the “run_cms” section in Chapter 2, “CMSADM and CMSSVC Menus,” for details.

Combination Full and Incremental Backups Available

If a combination of full and incremental *CentreVu* CMS maintenance backups are available, the following steps are the fastest way to get the system running:

1. Load the *most recent* full backup tape.
2. Do a manual restore of the system administration data, ACD-specific data, historical data, and non-CMS data by entering `n` in the `Restore from last backup (y/n):` field.
3. Load the *most recent* incremental backup tape.
4. Restore the system administration data, ACD-specific data, historical data, and non-CMS data.

Note

When the *CentreVu* CMS restore is complete, turn the *CentreVu* CMS off and then back on so the *CentreVu* CMS runs with the newly restored administration data. To turn *CentreVu* CMS off and on, see the “run_cms” section in Chapter 2, “CMSADM and CMSSVC menus” for details.

Disk Recovery Overview

A *CentreVu* CMS system can have one of three disk partitioning schemes. The schemes are:

- One-system disk scheme — *Solaris* operating system located on one disk.
- *Solstice DiskSuite*^{*} scheme — *Solaris* operating system, and everything else as well, is located on a single logical disk consisting of up to 12 physical disk drives.

Note With the one-system disk and *Solstice DiskSuite* partitioning schemes, the partitions on a 1.05-GB disk 1 differ from the partitions on a 2.1-GB disk 1.

- Two-system disks scheme — *Solaris* operating system located on two disks.

Figure 9-1 shows the differences between a one-system disk and a two-system-disk scheme. In this context, a *Solstice DiskSuite* scheme is identical to a one-system disk scheme.

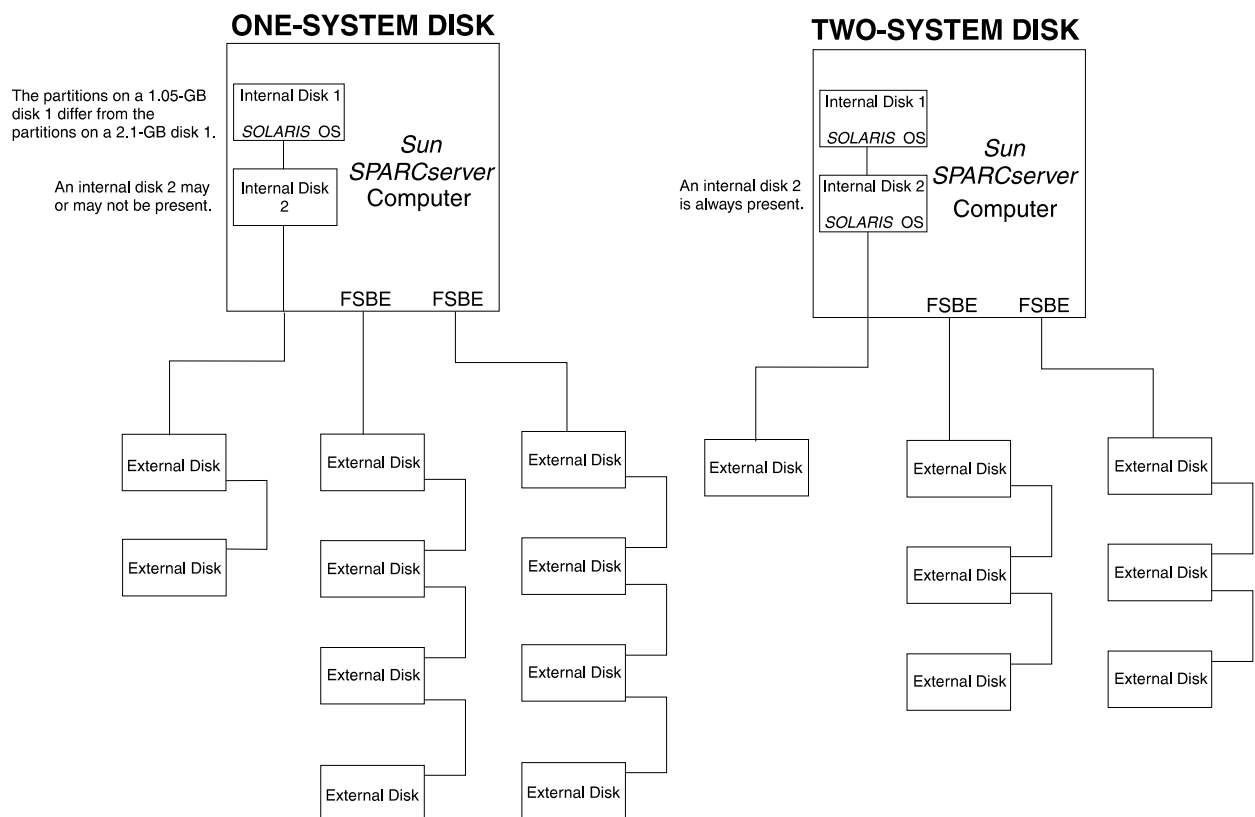


Figure 9-1: Disk Schemes

^{*}Solstice DiskSuite is a trademark of Sun Microsystems, Inc.

To determine the partitioning scheme on your system, do the following:

1. Log in as *root*.
2. Enter the following command to display the volume table of contents of disk 1:

```
# prtvtoc /dev/dsk/c0t3d0s0
```

A screen displays similar to the following example (this example is for a 1.05-GB disk):

```
* /dev/dsk/c0t3d0s0 partition map
*
* Dimensions:
*   512 bytes/sector
*   72 sectors/track
*   14 tracks/cylinder
*  1008 sectors/cylinder
*  2038 cylinders
*  2036 accessible cylinders
*
* Flags:
*   1: unmountable
*  10: read-only
*
*
* Partition  Tag  Flags      First      Sector      Last
*           Tag  Flags      Sector      Count      Sector  Mount Directory
*   0         2    00         0      41328      41327    /
*   1         3    01      41328     393120     434447
*   2         5    00         0     2052288     2052287
*   3         6    00     434448     300384     734831    /dump
*   4         6    00     734832     409248     1144079    /cms
*   5         6    00    1144080     205632     1349711    /opt
*   6         4    00    1349712     307440     1657151    /usr
*   7         7    00    1657152     395136     2052287    /var
#
```

3. Note the size of the disk by checking Dimensions: accessible cylinders. Accessible cylinders equal:

- 2733 for a 2.1-GB disk, or
- 2036 for a 1.05-GB disk.

4. Confirm / (root) is mounted on partition 0.
5. Look at which file systems are mounted on partitions 3 and 4 (refer to Table 9-1):

- If /opt and /usr are mounted on partitions 3 and 4, the system is a one-system disk scheme with a 2.1-GB disk 1.
- If /dump and /cms are mounted on partitions 3 and 4, the system is a one-system disk scheme with a 1.05-GB disk 1.
- If nothing is mounted on partitions 3 and 4, the system is a two-system disks scheme.
- If nothing is mounted on any of partitions 3 through 7, it is a *Solstice DiskSuite* partitioning scheme.

Table 9-1: Partitioning Scheme - Internal Disk 1

Partition	One-System Disk		System with <i>Solstice DiskSuite</i> Software		Two-System Disks
	File System (2.1-GB Disk)	File System (1.05-GB Disk)	File System (2.1-GB Disk)	File System (1.05-GB Disk)	File System (1.05-GB Disk)
0	/ (root)	/ (root)	/ (root)	/ (root)	/ (root)
1	/dump	swap*			swap*
2	backup*	backup*	overlap	overlap	backup*
3	/opt	/dump			(blank)
4	/usr	/cms			(blank)
5	/var	/opt			/opt
6	swap*	/usr			/usr
7	/cms	/var			/var

* The `prtvtoc` command does not display the word "swap," "backup," or "overlap" as indicated in the table. The Tag column, however, indicates swap or backup/overlap by displaying "03" or "05," respectively.

6. An internal disk 2 may be present and should be checked. Enter the following command to display the volume table of contents of disk 2:

```
# prtvtoc /dev/dsk/c0t1d0s0
```

Note

If disk 2 is not present, this message displays:
No such file or directory.

7. Note the size of disk 2 by checking Dimensions: accessible cylinders. Accessible cylinders equal:
- 2733 for a 2.1-GB disk, or
 - 2036 for a 1.05-GB disk.

8. Compare the results of the `prtvtoc` command for disk 2 with Table 9-2.

Table 9-2: Partitioning Scheme - Internal Disk 2

Partition	One-System Disk		System with <i>Solstice DiskSuite</i> Software		Two-System Disks
	File System (2-GB Disk)	File System (1-GB Disk)	File System (2-GB Disk)	File System (1-GB Disk)	File System (1-GB Disk)
0	/cms1	/cms1			/usr/dbtemp
1		swap*			/export/home
2	backup*	backup*	overlap*	overlap*	/dump†
3					/cms†

* The `prtvtoc` command does not display the word “swap,” “backup,” or “overlap” as indicated in the table. The Tag column, however, indicates swap and backup/overlap by displaying “03” or “05,” respectively.

† On some systems, /dump and /cms may be mounted on partitions 3 and 4, respectively.

If you have a one-system disk partitioning scheme, follow the procedures discussed on pages 9-16 through 9-67.

If you have a two-system disks partitioning scheme, follow the procedures discussed on pages 9-69 through 9-112.

If you have a *Solstice DiskSuite* partitioning scheme, follow the procedures discussed on pages 9-113 through 9-132.

Valid Internal Disk Configurations

CentreVu CMS systems have shipped from the Lucent Technologies factory with the following internal disk configurations:

- one 1.05-GB disk
- two 1.05-GB disks
- one 2.1-GB disk
- two 2.1-GB disks.

If a disk fails in the field due to a disk crash, it will be replaced with a disk of like capacity. However, if existing customers want to expand their disk capacity by adding a second internal disk, a 2.1-GB disk will be installed. Table 9-3 summarizes the valid internal disk configurations for *CentreVu* CMS systems:

Table 9-3: Valid Internal Disk Configurations

Configuration	Internal Disk 1 1.05-GB	Internal Disk 2 1.05-GB	Internal Disk 1 2.1-GB	Internal Disk 2 2.1-GB
A*	x			
B	x	x		
C			x	
D			x	x
E†	x			x

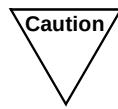
* This configuration not supported by systems using Solstice DiskSuite software

† This configuration is only for existing customers with a 1.05-GB internal disk 1 who expand their disk capacity.

Recovering from Disk Corruption (One-System Disk)

This section provides information about file system restore procedures and explains how to recover *CentreVu* CMS databases after disk corruption occurs.

The difference between disk corruption and a disk crash is the extent of the damage involved. On a corrupted disk, the disk and the file systems are still intact, and minor repair to the disk is needed. On a disk crash, the disk failed and needs to be replaced or reformatted. If a disk crashed and needs to be replaced, see “Recovering from a Disk Crash (One-System Disk)” section in this chapter for details.



Only **TSC PERSONNEL** should perform the procedures in this section.

The procedures for recovering the disk depend on if a backup is available and which disk is effected. This section is organized as follows:

- When the CMSADM backup is available
 - Recovering from corruption on the first disk
 - Recovering from corruption on the second through twelfth disks.
- When the CMSADM backup is **not** available
 - Recovering from corruption on the first disk
 - Recovering from corruption on the second through twelfth disks.

Restoring Disk(s) — CMSADM Backup Available

If a CMSADM backup is available, do the following tasks:

- Restore the file systems on the disk from the latest CMSADM backup.
- Restore the *CentreVu* CMS data from the latest *CentreVu* CMS maintenance backup.

The following sections provide the commands used to restore the file systems from the CMSADM backup.

First Disk

Use the procedures in this section to restore the first disk when a CMSADM backup is available.

To restore the first disk, do the following steps:

1. Log in as *root*.
2. Insert the first CMSADM backup tape.
3. At the system prompt, enter the following commands:

```
# ulimit unlimited
# cpio -icmudfv -C 10240 -I <device name> -M "Please remove
the current tape, insert tape number %d, and press ENTER"
<"/cms?/*"...>
```

Helpful Hints

- If any disks 2 through 12 are present, you must substitute the `<"/cms?/*"...>` portion of the `cpio` command with `"/cms1/*"` `"/cms2/*"` and so on for these disks. For example, if you have four disks, you would substitute `<"/cms?/*"...>` with `"/cms1/*"` `"/cms2/*"` `"/cms3/*"` for the second, third, and fourth disks. The `-f` option of the `cpio` command restores all files **except** those specified, so in this example, the files on disks 2, 3, and 4 are not restored. See Table 9-4 to determine on which disks the `/cms` file systems reside.

Table 9-4: /cms File Systems

Device	Disk	Slice	/cms File System
c0t1d0s0	2	0	/cms1
c0t2d0s0	3	0	/cms2
c0t0d0s0	4	0	/cms3
c1t1d0s0	5	0	/cms4
c1t2d0s0	6	0	/cms5
c1t3d0s0	7	0	/cms6
c1t4d0s0	8	0	/cms7
c2t1d0s0	9	0	/cms8
c2t2d0s0	10	0	/cms9
c2t3d0s0	11	0	/cms10
c2t4d0s0	12	0	/cms11

- You must substitute one of these device names for *<device name>* in the `cpio` command:

`/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

`/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

`/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

`/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

- You may get four error messages concerning the `/home` directory. These errors display when the directory is already present, so you can ignore them.
4. If the backup required more than one tape, follow the directions displayed on the screen:

```
Please remove the current tape, insert tape number <X>, and
press ENTER.
```

The system responds:

```
XXXXXX Blocks
#
```

5. After you restore the first disk, sync the file systems by entering the following commands:

```
# sync
```

6. Reboot the system by entering the command:

```
# init 6
```

7. Restore the *CentreVu* CMS from the latest *CentreVu* CMS maintenance backups. See the “Performing a *CentreVu* CMS Maintenance Restore” section in this chapter.

Second Through Twelfth Disks

Do these steps to restore data on the second through the twelfth disks when a CMSADM backup is available:

1. Log in as *root*.
2. Insert the first CMSADM backup tape.
3. To restore the data, enter the following commands at the system prompt:

```
# ulimit unlimited
# cpio -icmudv -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
"/cms?/*"
```

Helpful Hints

- You must substitute the "?" in the *cpio* command with the number that corresponds to the */cms* file system that resides on the disk you are restoring. For example, disk 2="/cms1/*", disk 3="/cms2/*" and so on for each disk. See Table 9-4 on page 9-17 to determine on which disks the */cms* file systems reside.
- You must substitute one of the following device names for *<device name>* in the *cpio* command:

/dev/rmt/0 Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

/dev/rmt/1 Indicates the tape drive with the second lowest target number in the SCSI chain.

/dev/rmt/0c Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

/dev/rmt/1c Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

4. Verify that the *CentreVu* CMS data is accessible (via *cmsql*), and resolve any problems before proceeding.
5. Restore the *CentreVu* CMS from the latest *CentreVu* CMS maintenance backups. See "Performing a *CentreVu* CMS Maintenance Restore" section in this chapter.

See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document for more information.

Restoring Disk(s) — No CMSADM Backup Available

If a CMSADM backup is not available, do the following:

- Restore all the information on the disk from the original installation sources (if other than *CentreVu* CMS data).
- Restore the *CentreVu* CMS data from CMS maintenance backups (if available).

First Disk

If the first disk is corrupted and a CMSADM backup is not available, do the following steps:

1. Reinstall *Solaris* software package, all add-on packages, spatches, and *CentreVu* CMS. See Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures,” for details.
2. Run setup. See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages,” for details.
3. Restore *CentreVu* CMS data from the *CentreVu* CMS maintenance backup. See the “Performing a *CentreVu* CMS Maintenance Restore” section in this chapter.
4. Administer Terminals, Printers, Users, etc. as needed. See Chapter 4, “Installing Terminals, Printers, and Modems” for details.

Second Through Twelfth Disks

If any of the second through twelfth disks is destroyed and a CMSADM backup is not available, do the following steps:

1. Run setup. See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages,” for details.
2. Restore the *CentreVu* CMS data from the *CentreVu* CMS maintenance backup. See the “Performing a *CentreVu* CMS Maintenance Restore” section in this chapter.

Restoring All Disks and File Systems

To do a complete file system restore, load the CMSADM backup tape into the tape drive and enter the following commands at the system prompt:

```
# ulimit unlimited
# cpio -icmudv -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
```

Note

You must substitute one of these device names for *<device name>* in the `cpio` command:

`/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

`/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

`/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

`/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

Restoring Specific Files

To restore specific files, enter the following commands at the system prompt:

```
# ulimit unlimited
# cpio -icmudv -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
<full_path_name>
```

Note

You must substitute one of these device names for *<device name>* in the `cpio` command:

`/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

`/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

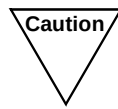
`/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

`/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

Recovering from a Disk Crash (One-System Disk)

This section provides information about file system restore procedures, and explains how to recover *CentreVu* CMS databases after a disk crash occurs.

The difference between disk corruption and a disk crash is the extent of the damage involved. On a corrupted disk, the disk and the file systems are still intact, and minor repair to the disk is needed. On a disk crash, the disk failed and needs to be replaced or reformatted. If a disk needs minor repair, see the “Recovering from Disk Corruption (One-System Disk)” section in this chapter for details.



Only **TSC PERSONNEL** should perform the procedures in this section.

The procedures for recovering the disk depend on whether a backup is available and which disk is effected. This section is organized as follows:

- When the CMSADM backup is available
 - Recovering from a crash on the first disk
 - Recovering from a crash on the second disk
 - Recovering from a crash on the third through twelfth disks
- When the CMSADM backup is **not** available
 - Recovering from a crash on the first disk
 - Recovering from a crash on the second disk
 - Recovering from a crash on the third through twelfth disks.

Recovering Disk(s) — CMSADM Backup Available

If a CMSADM backup is available, then the number of tasks required to recover a disk are reduced. The following sections provide the commands to restore the file systems.

First Disk

This section describes the procedures for replacing the first disk when a CMSADM backup is available and includes the following:

- Reinstall *Solaris* software package (see Appendix D).

- Restore the file systems on the first disk.
- Restore the *CentreVu* CMS data.

To restore the first disk, do the following steps:

1. Install a new disk.
2. Power on the system and stop the boot procedure.

To stop the boot procedure, press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system. The system responds with the ok prompt.

3. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

The system displays a list of all the SCSI devices.

4. Verify that the first disk is displayed as Target 3 Unit 0.

Note

If the disk is not displayed, then it was not installed correctly.

5. Reinstall the *Solaris* software package, but configure **only** the **first** disk:

- a. Boot from the CD-ROM (for example, use the `boot cdrom` command). See the “Bootting from the *Solaris* CD-ROM” section in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures,” for details.
- b. Follow the factory installation procedures for partitioning the first disk **only**. See the “Partitioning the Disks” section in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures,” for details. After configuring the first disk, you are at the Customized Disks screen. From the Customized Disks screen, click on ok.

Caution

Do **not** configure the second and additional disks.

- c. Continue with the *Solaris* 2.4 operating system installation procedures in the “Installing the *Solaris* 2.4 Operating System”

section in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.”

6. After *Solaris 2.4* operating system is booted, log in as *root*.
7. Eject the CD-ROM with the following command:

```
# eject cdrom
```

All the necessary factory installation procedures to recover the first disk are complete.

Note

Stop after completing the “Installing the *Solaris 2.4* Operating System” section — do **not** install the add-on packages, patches, or *CentreVu* CMS.

8. Log in as *root*.
9. Insert the first CMSADM backup tape.
10. To restore file systems on the first disk, enter the following commands:

```
# ulimit unlimited
# cpio -icmudfv -C 10240 -I <device name> -M "Please remove
the current tape, insert tape number %d, and press ENTER"
<"/cms?/*" ...>
```

Helpful Hints

- If any disks 2 through 12 are present, you must substitute the `<"/cms?/*" ...>` portion of the `cpio` command with `"/cms1/*"` `"/cms2/*"` and so on for these disks. For example, if you have a total of four disks, you would substitute `<"/cms?/*" ...>` with `"/cms1/*" "/cms2/*" "/cms3/*"` for the second, third, and fourth disks. See Table 9-4 on page 9-17 to determine on which disks the `/cms` file systems reside.
- You must substitute one of these device names for `<device name>` in the `cpio` command:
 - `/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.
 - `/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

/dev/rmt/0c Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

/dev/rmt/1c Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

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

The `cpio` command restores all of the entries on the first disk that are needed for all the file systems to be mounted.

11. Because the *Solaris* operating system was installed on the first disk, only the file systems on the first disk are mounted. To mount all file systems on the second through twelfth disks, enter the following command:

```
# mountall
```

The system displays all the mounted file systems.

12. To verify that all file systems mounted properly, check the displayed response and resolve any problems.
13. After you restore the first disk, synchronize the file systems by entering the following command:

```
# sync
```

14. To reboot the machine, enter the following command:

```
# init 6
```

15. Log in as *root*.
16. Restore *CentreVu* CMS data from the *CentreVu* CMS maintenance backup.

Second Disk

This section describes the procedures for replacing the second disk when a CMSADM backup is available and includes the following:

- Reformat the disk.
- Repartition the disk.

- Re-create the file systems.
- Restore the file systems.
- Restore the *CentreVu* CMS data.

To restore the second disk, do the following steps:

1. Install a new disk.
2. Power on the system, and stop the boot procedure.

To stop the boot procedure, press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system. The system responds with the ok prompt.

3. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

The system displays a list of all the SCSI devices.

4. Verify that the second disk is displayed as Target 1 Unit 0.

Note

If the disk is not displayed, then it was not installed correctly.

5. Boot the system:

```
ok boot
```

Note

During the reboot, the system displays one or two messages for each disk that was replaced. These messages inform you to run the `fsck` command and occur because the system cannot find the appropriate file systems on the replacement disks.

6. At each prompt that asks you to enter the `fsck` command for the missing file systems, press **Control** **D** simultaneously to continue booting.
7. After the machine is booted, log in as *root*.
8. Verify that no jobs are attempting to access file systems on the second disk (for example, check cron jobs, etc). If any jobs are running, stop them and record the information for your records.
9. To format the disk, see the “Adding SCSI Hard Disk Drives (One-System Disk) — Formatting Disks” section in this chapter for procedures. The device name should be `c0t1d0`.

Note

Formatting the disk takes approximately 1 hour.

10. To partition the disk, see the “Adding SCSI Hard Disk Drives (One-System Disk) — Partitioning Disks” section in this chapter as a guideline, and do the following:

- a. At the `partition>` prompt, enter the following command to check the default partition table:

```
partition> print
```

The system displays the default partition table.

- b. Change the partitions to match Tables 9-5 or 9-6 on pages 9-47 and 9-48.
- c. At the `partition>` prompt, enter the following command to verify that the partition table is accurate:

```
partition> print
```

The system displays the partition table.

- d. After the partitions are correct, label the disk. To label the disk, enter the following command at the `partition>` prompt:

```
partition> label
```

The system responds with a question.

- e. At the question, enter `y`.
- f. To quit the partition submenu, enter `q`.
- g. To quit the format program, enter `q`.

The system prompt is displayed.

11. Use the “Adding SCSI Hard Disk Drives (One-System Disk) — Constructing a New File System” section in this chapter as a guideline, and do the following:

- a. Make the file system for the partition by entering the following command:

```
# newfs -m 0 /dev/rdisk/c0t1d0s0
```


The system responds with the following question:

```
news: construct a new file system /dev/rdisk/<device>:(y/n)
```

b. Enter y.

Note

These file system(s) were not mounted because they did not exist on the new disk. However, since the operating system was initially installed with these file system(s), they exist in the */etc/vfstab* file.

12. To mount the file system(s) on the second disk, enter the following command:

```
# mountall
```

The system displays all the file systems mounted.

13. To verify that all file systems are mounted properly, check the displayed response and resolve any problems.
14. To ensure that the system initializes cleanly, reboot the system with the following command:

```
# init 6
```

15. Log in as *root*.
16. To restore the file systems on the second disk, enter the following commands:

```
# ulimit unlimited
# cpio -icmudv -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
"/cms1/"
```

Note

You must substitute one of these device names for *<device name>* in the `cpio` command:

`/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

`/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

`/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

`/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

17. Restore *CentreVu* CMS data from the *CentreVu* CMS maintenance backup.
18. Restart any stopped jobs. See Step 8.

Third Through Twelfth Disks

This section describes the procedures for replacing the third through twelfth disks when a CMSADM backup is available and includes the following:

- Reformat the disk.
- Repartition the disk.
- Re-create the file system.
- Restore the file system.
- Restore the *CentreVu* CMS data.

To restore the third through twelfth disk, do the following steps:

1. Install a new disk.
2. Power on the system, and stop the boot procedure.

To stop the boot procedure, press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system. The system responds with the ok prompt.

3. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

The system displays a list of all the SCSI devices.

4. Verify that the replaced disk is displayed. See Table 9-7 on page 9-56.

Note If the disk is not displayed, then it was not installed correctly.

5. Boot the system:

```
ok boot
```

Note During the reboot, the system displays one or two messages for each disk that was replaced. These messages inform you to run the `fscck` command and occur because the system cannot find the appropriate file systems on the replacement disks.

6. At each prompt that asks you to enter the `fscck` command for the missing file systems, press **Control** **D** simultaneously to continue booting.
7. Log in as *root*.
8. After the machine is booted, verify that no jobs are attempting to access file systems on the disk being replaced (for example, check cron jobs, etc.). If any jobs are running, stop them and record the information for your records.
9. To format the disk, see the “Adding SCSI Hard Disk Drives (One-System Disk) — Formatting Disks” section in this chapter for procedures. See Table 9-7 on page 9-56 for device names.

Note Formatting the disk takes approximately 1 hour.

10. To partition the disk, see the “Adding SCSI Hard Disk Drives (One-System Disk) — Partitioning Disks” section in this chapter as a guideline, and do the following:
 - a. At the `partition>` prompt, enter the following command to check the default partition table:

```
partition> print
```

The system displays the default partition table.

- b. Change the 0 partition. Enter un for the partition ID tag, wm for the partition permission flags, and 0 as the starting cylinder. For size, enter one of the following values: 2733c for a 2-GB disk or 2036c for a 1-GB disk.
- c. At the `partition>` prompt, enter the following command to verify that the partition table is accurate:

```
partition> print
```

The system displays the partition table.

- d. After the partitions are correct, label the disk. To label the disk, enter the following command at the `partition>` prompt:

```
partition> label
```

The system responds with a question.

- e. At the question, enter y.
 - f. To quit the partition submenu, enter q.
 - g. To quit the format program, enter q.
11. Use the “Adding SCSI Hard Disk Drives (One-System Disk) — Constructing a New File System” section in this chapter as a guideline, and do the following:
- a. To make a file system for the partition, enter the following command:

```
# newfs -m 0 /dev/rdisk/<device>
```

See Table 9-7 on page 9-56 for the `<device>`. For each command you enter, the system responds with the following question:

```
news: construct a new file system /dev/rdisk/<device>:(y/n)?
```

- b. Each time the message prompt appears, enter y.

Note

These file system(s) were not mounted because they did not exist on the new disk. However, since the operating system was initially installed with these file system(s), they exist in the */etc/vfstab* file.

12. To mount the file system on the new disk, enter the following command:

```
# mountall
```

The system displays all the file systems mounted.

13. To verify that all file systems mounted properly, check the displayed response and resolve any problems.
14. To ensure that the system initializes cleanly, reboot the system using the following command:

```
# init 6
```

15. Log in as *root*.
16. To restore the file systems on the new disk, enter the following commands:

```
# ulimit unlimited
# cpio -icmudv -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
"/cms?/*"
```

Helpful Hints

- You must substitute the "?" in the *cpio* command with the number that corresponds to the */cms* file system that resides on the disk you are restoring. For example, disk 3="/cms2/*", disk 4="/cms3/*" and so on for each disk. See Table 9-7 on page 9-56 to determine on which disks the */cms* file systems reside.

- You must substitute one of these device names for *<device name>* in the `cpio` command:

`/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

`/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

`/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

`/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

17. Restore *CentreVu* CMS data from the *CentreVu* CMS maintenance backup.
18. Restart any stopped jobs. See Step 8.

Recovering Disk(s) — No CMSADM Backup Available

If no CMSADM backup is available, do the following:

- Restore all the information on the disk from the source (if other than *CentreVu* CMS data).
- Restore the *CentreVu* CMS data.

First Disk

This section describes the procedures for replacing the first disk when a CMSADM backup is not available and includes the following:

- Reinstalling the *Solaris* software package.
- Reinstalling all add-on packages (for example, X.25).
- Reinstalling the *CentreVu* CMS software.
- Running setup.
- Restoring the *CentreVu* CMS data.

If the first disk is destroyed and a backup is not available, do the following steps:

1. Install a new disk.
2. Power on the system, and stop the boot procedure.

To stop the boot procedure, press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system. The system responds with the ok prompt.

3. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

The system displays a list of all SCSI devices.

4. Verify that the first disk is displayed as Target 3 Unit 0.

Note

If the disk is not displayed, then it was not installed correctly.

5. Reinstall the *Solaris* operating system, all add-on packages, spatches, and *CentreVu* CMS. See Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures,” for details.
6. Run setup. See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Package,” for details.
7. Restore *CentreVu* CMS data from the *CentreVu* CMS backup. See “Performing a *CentreVu* CMS Maintenance Restore” in this chapter for details.
8. Administer Terminals, Printers, Users, etc. as needed. See Chapter 4, “Installing Terminals, Printers, and Modems,” for details.

Second Disk

This section describes the procedures for replacing the second disk when a CMSADM backup is not available and includes the following:

- Reformat the disk.
- Repartition the disk.
- Re-create the file systems.
- Run setup.
- Restore the *CentreVu* CMS data.

If the second disk is destroyed and a backup is not available, do the following steps:

1. Install a new disk.
2. Power on the system, and stop the boot procedure.

To stop the boot procedure, press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system. The system responds with the ok prompt.

3. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

The system displays a list of all the SCSI devices.

4. Verify that the second disk is displayed as Target 1 Unit 0.

Note

If the disk is not displayed, then it was not installed correctly.

5. Boot the system.

```
ok boot
```

Note

During the reboot, the system displays one or two messages for each disk that was replaced. These messages inform you to run the `fsck` command and occur because the system cannot find the appropriate file systems on the replacement disks.

6. At each prompt that asks you to enter the `fsck` command for the missing file systems, press **Control** **D** simultaneously to continue booting.
7. After the machine is booted, verify that no jobs are attempting to access file systems on the second disk (for example, check cron jobs, etc.). If any jobs are running, stop them and record the information for your records.
8. To format the disk, see the “Adding SCSI Hard Disk Drives (One-System Disk) — Formatting Disks” section in this chapter for procedures. The device name should be `c0t1d0`.

Note

Formatting the disk takes approximately 1 hour to complete.

9. To partition the disk, see the “Adding SCSI Hard Disk Drives (One-System Disk) — Partitioning Disks” section in this chapter as a guideline, and do the following:

- a. At the `partition>` prompt, enter the following command to check the default partition table:

```
partition> print
```

The system displays the default partition table.

- b. Change the partitions to match Tables 9-5 or 9-6 on pages 9-47 and 9-48.
- c. At the `partition>` prompt, enter the following command to verify that the partition table is accurate:

```
partition> print
```

The system displays the partition table.

- d. After the partitions are correct, label the disk. To label the disk, enter the following command at the `partition>` prompt:

```
partition> label
```

The system responds with a question.

- e. At the question, enter `y`.
 - f. To quit the partition submenu, enter `q`.
 - g. To quit the format program, enter `q`.
10. Use the “Adding SCSI Hard Disk Drives (One-System Disk) — Constructing a New File System” section in this chapter as a guideline, and do the following:
 - a. Make file systems for all partitions by entering the following command:

```
# newfs -m 0 /dev/rdisk/<device>
```

The system responds with the following question:

```
news: construct a new file system /dev/rdisk/<device>:(y/n)?
```

- b. Enter `y`.

Note

These file system(s) were not mounted because they did not exist on the new disk. However, since the operating system was initially installed with these file system(s), they exist in the */etc/vfstab* file.

11. To mount the file system on the second disk, enter the following command:

```
# mountall
```

The system displays all the file systems mounted.

12. To verify that all file systems mounted properly, check the displayed response and resolve any problems.
13. To ensure that the system initializes cleanly, reboot the system using the following command:

```
# init 6
```

14. Log in as *root*.
15. Run setup.
16. Restore *CentreVu* CMS data from the *CentreVu* CMS maintenance backup. See “Performing a *CentreVu* CMS Maintenance Restore” in this chapter for details.

Third Through Twelfth Disks

This section describes the procedures for replacing the third through twelfth disks:

- Reformat the disk.
- Repartition the disk.
- Re-create the file system.
- Rerun setup.
- Restore the *CentreVu* CMS data.

If the third through twelfth disks are destroyed and a backup is not available to restore the third through twelfth disk, do the following steps:

1. Install a new disk.
2. Power on the system, and stop the boot procedure.

To stop the boot procedure, press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system. The system responds with the ok prompt.

3. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

The system displays a list of all the SCSI devices.

4. Verify that the replaced disk is displayed. See Table 9-7 on page 9-56.

Note

If the disk is not displayed, then it was not installed correctly.

5. Boot the system:

```
ok boot
```

Note

During the reboot, the system displays one or two messages for each disk that was replaced. These messages inform you to run the `fsck` command and occur because the system cannot find the appropriate file systems on the replacement disks.

6. At each prompt that asks you to enter the `fsck` command for the missing file systems, press **Control** **D** simultaneously to continue booting.
7. After the machine is booted, log in as *root*.
8. Verify that no jobs are attempting to access file systems on the disk being replaced (for example, check cron jobs, etc.). If any jobs are running, stop them, and record the information for your records.
9. To format the disk, see the “Adding SCSI Hard Disk Drives (One-System Disk) — Formatting Disks” section in this chapter for procedures. See Table 9-7 on page 9-56 for device names.

Note

Formatting the disk takes approximately 1 hour.

10. To partition the disk, see the “Adding SCSI Hard Disk Drives (One-System Disk) — Partitioning Disks” section in this chapter as a guideline, and do the following:
 - a. At the `partition>` prompt, enter the following command to check the default partition table:

```
partition> print
```

The system displays the default partition table.

- b. Change the 0 partition. Enter un for the partition ID tag, wm for the partition permission flags, and 0 as the starting cylinder. For size, enter one of the following values: 2733c for a 2-GB disk or 2036c for a 1-GB disk.
- c. At the partition> prompt, enter the following command to verify that the partition table is accurate:

```
partition> print
```

The system displays the partition table.

- d. After the partitions are correct, label the disk. To label the disk, enter the following command at the partition> prompt:

```
partition> label
```

The system responds with a question.

- e. At the question, enter y.
 - f. To quit the partition submenu, enter q.
 - g. To quit the format program, enter q.
11. Use the “Adding SCSI Hard Disk Drives (One-System Disk) — Constructing a New File System” section in this chapter as a guideline, and do the following:
 - a. To make a file system for the partition, enter the following command:

```
# newfs -m 0 /dev/rdisk/<device>
```

See Table 9-7 on page 9-56 for <device>.

For each command you enter, the system responds with the following question:

```
news: construct a new file system /dev/rdisk/<device>:(y/n)?
```

- b. Each time the message prompt appears, enter y.

Note

These file system(s) were not mounted because they did not exist on the new disk. However, since the operating system was initially installed with these file system(s), they exist in the */etc/vfstab* file.

12. To mount all file systems on the new disk, enter the following command:

```
# mountall
```

The system displays all the file systems mounted.

13. To verify that all file systems are mounted properly, check the displayed response, and resolve any problems.
14. To ensure that the system initializes cleanly, reboot the system using the following command:

```
# init 6
```

15. Log in as *root*.
16. Run setup.
17. Restore *CentreVu* CMS data from the *CentreVu* CMS backup. See “Performing a *CentreVu* CMS Maintenance Restore” in this chapter for details.

Recovering Specific Database Tables

When a CMSADM file system backup is *not* available to recover specific database tables, then you must do these steps to reinitialize the *CentreVu* CMS database:

1. Rerun the set up option on the CMSSVC menu. This reinitializes (removes and creates) all the *CentreVu* CMS *INFORMIX* database tables. See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages,” for information about setting up *CentreVu* CMS.
2. Restore the *CentreVu* CMS from the latest *CentreVu* CMS maintenance backups. This restore loads the *CentreVu* CMS data up to the time of the last *CentreVu* CMS backup.

Adding SCSI Hard Disk Drives - Disk 2 (One-System Disk)

This section describes how to install additional SCSI Hard Disk Drives to expand the capacity of the *Sun SPARCserver* computer. These procedures apply to systems without the *Solstice DiskSuite* software installed. For systems with the *Solstice DiskSuite* software installed, see “Adding SCSI Hard Disk Drives to a System Running *Solstice DiskSuite* Software.”

Adding Disk 2

To add disk 2 to the *Sun SPARCserver* computer that is already up and running, do the following steps:

1. Make sure the system is in the firmware mode (use the `init 0` command to get to the ok prompt).
2. Do the following in sequential order:
 - a. Turn off the *Sun SPARCserver* computer.
 - b. Turn off the system monitor.
 - c. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
3. Install disk 2 into the *Sun SPARCserver* computer.

See the “Installing the Internal Hard Disk Drives” section in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.”

4. Do the following in sequential order:
 - a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
 - b. Turn on the *Sun SPARCserver* computer.
 - c. Turn on the system monitor.
5. Press **Stop** **A**. The system responds:

> ok

6. To verify that the system sees all SCSI devices, enter the following command:

```
ok probe-scsi-all
```

The system responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991

. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

Note

The actual response (devices listed) depends on the devices installed on the SCSI bus.

7. Enter the following command:

```
> ok boot -r
```

The system responds:

```

Boot device ...
.
.
.
Configuring the /dev directory
Configuring the /dev directory (compatibility devices)
The system is coming up. Please wait.
checking filesystems
/dev/rdisk/c0t1d0s0: is clean
/dev/rdisk/c0t3d0s5: is clean
/dev/rdisk/c0t2d0s0: is clean      ***if c0t2d0 is already in system***
/dev/rdisk/c0t1d0s1: is clean
/dev/rdisk/c0t1d0s3: is clean
/dev/rdisk/c0t1d0s4: is clean
/dev/rdisk/c0t2d0s0 mounted      ***if c0t2d0 is already in system***
/dev/rdisk/c0t1d0s3 mounted
/dev/rdisk/c0t1d0s1 mounted
/dev/rdisk/c0t3d0s5 mounted
/dev/rdisk/c0t1d0s0 mounted
checking for crash dump ...
starting routing daemon.
starting rpc services: rpcbind deyserv kerbd done.
Setting default interface for multicast: add net 224.090.0 gateway
hostname.
syslog service starting.
Print services started.
volume management starting.

Starting terminal server network daemons.
Network Terminal Server daemon(s) startup complete.
The system is ready.

hostname console login:

```

8. Log in as *root*. The system displays the last login on the console (date and time).

Formatting Disk 2

To format the disks, do the following steps:

1. At the system prompt, enter the following command:

```
# format
```

The system responds:


```
Searching for disks ... done
```

```
AVAILABLE DISK SELECTIONS:
```

```
0.  c0t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/espdma@f,8000000/sd@1,0
1.  c0t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/espdma@f,8000000/sd@2,0
2.  c0t3d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/espdma@f,8000000/sd@3,0
3.  c1t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@1,0
4.  c1t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@2,0
Specify disk (enter its number):
```

2. Enter the disk number for disk c0t1d0 (for example, 0).

```
Specify disk (enter its number): 0
```

The system displays the disk you are adding (for example, c0t1d0 for disk 2) and the format menu:

```
selecting c0t1d0
```

```
FORMAT MENU:
```

```
disk
type
partition
current
format
repair
label
analyze
defect
backup
verify
save
inquiry
volname
quit
```

```
format>
```

3. At the `format>` prompt, enter `format`. The system responds:

```
Ready to format. Formatting cannot be interrupted
and takes 23 minutes (estimated). Continue?
```

4. To continue formatting, enter `y`. The system responds:

```
Beginning formatting. The current time is <date>.
Formatting...
```

5. Wait for the disk to format and verify the media.

When the disk is formatted, the system responds:

```
done.

Verifying media..
    pass 0 - pattern = 0xc6dec6de
    2035/12/18
    pass 1 - pattern = 0x6db6db6d
    2035/12/18

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

Now, you can partition the disk.

Partitioning Disk 2

To partition the disks, do the following steps:

1. At the `format>` prompt, enter the following command, and press **Return**:

```
format> partition
```

The program displays a confirmation message and the Partition menu:

****Do not format the drive, it is formatted already****

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
quit

```

partition>

2. At the partition> prompt, enter the print command to check the default partition table.

partition> print

The system displays the default partition table.

Most likely, you will need to change the partitions to correspond to your system's internal disk configuration.

3. Use the following decision table to determine which table to use to partition disk 2:

IF disk 1 is. . .	AND disk 2 is. . .	THEN use. . .
2.1-GB	2.1-GB	Table 9-5
1.05-GB	2.1-GB	Table 9-6
1.05-GB	1.05-GB	Table 9-6

Note

A 2.1-GB disk 1 and a 1.05-GB disk 2 is not a valid configuration. See the "Valid Internal Disk Configurations" section in this chapter.

Table 9-5: Partitioning Information for Disk 2 if Disk 1 = 2.1-GB

			2.1-GB Disk 2	
Partitions	Partition ID Tag	Partition Permission Flags	Start Cylinder	Size (Cylinders)
0	unassigned	wm	0	2733
1	unassigned	wm	0	0
2	backup	wm	0	2733
3-7	unassigned	wm	0	0

Table 9-6: Partitioning Information for Disk 2 if Disk 1 = 1.05-GB

If equipped RAM in (MB) is:		Partition	Partition ID Tag	Partition Permission Flags	2.1-GB Disk 2		1.05-GB Disk 2	
more than	but less than or equal to				Start Cylinder	Size (Cylinders)	Start Cylinder	Size (Cylinders)
0	96	0	unassigned	wm	0	2733	0	2036
		1	unassigned	wm	0	0	0	0
		2	backup	wm	0	2733	0	2036
		3-7	unassigned	wm	0	0	0	0
96	160	0	unassigned	wm	0	2473	0	1776
		1	swap	wu	2473	260	1776	260
		2	backup	wm	0	2733	0	2036
		3-7	unassigned	wm	0	0	0	0
160	224	0	unassigned	wm	0	2213	0	1516
		1	swap	wu	2213	520	1516	520
		2	backup	wm	0	2733	0	2036
		3-7	unassigned	wm	0	0	0	0
224	288	0	unassigned	wm	0	1953	0	1256
		1	swap	wu	1953	780	1256	780
		2	backup	wm	0	2733	0	2036
		3-7	unassigned	wm	0	0	0	0
288	352	0	unassigned	wm	0	1693	0	996
		1	swap	wu	1693	1040	996	1040
		2	backup	wm	0	2733	0	2036
		3-7	unassigned	wm	0	0	0	0
352	416	0	unassigned	wm	0	1433	0	736
		1	swap	wu	1433	1300	736	1300
		2	backup	wm	0	2733	0	2036
		3-7	unassigned	wm	0	0	0	0
416	512	0	unassigned	wm	0	1173	0	476
		1	swap	wu	1173	1560	476	1560
		2	backup	wm	0	2733	0	2036
		3-7	unassigned	wm	0	0	0	0

4. At the `partition>` prompt, enter `0`.

```
partition> 0
```

The system responds:

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

5. Enter `un` for unassigned.

The system responds:

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

6. Enter `wm` to indicate the partition is writable and mountable.

The system responds:

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

7. Enter `0` as the starting cylinder.

The system responds:

```
Enter partition size [205632b, 204c, 100.41mb]:
```

8. Enter the size for partition `0` (see Tables 9-5 or 9-6).

The system returns to the `partition>` prompt.

9. If you need to set up swap space on disk 2, continue with Step 10; otherwise, go to Step 15.

10. At the `partition>` prompt, enter `1`.

```
partition> 1
```

The system responds:

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

11. Enter swap.

The system responds:

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

12. Enter wu to indicate that the partition is writable and unmountable.

The system responds:

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

13. Enter the starting cylinder (see Table 9-6).

The system responds:

```
Enter partition size [205632b, 204c, 100.41mb]:
```

14. Enter the size of the swap partition (see Table 9-6).

The system returns to the `partition>` prompt.

15. At the `partition>` prompt, enter the `print` menu option to verify that the partition table is accurate.

```
partition> print
```

16. At the `partition>` prompt, enter the `name` menu option.

```
partition> name
```

17. Enter "cms1" as the table name.

```
partition> name
Enter table name (remember quotes): "cms1"
```

18. At the partition> prompt, enter the label menu option.

```
partition> label
```

19. To label the disk, enter y at the message prompt.

```
partition> label
Ready to label disk, continue: y
```

20. To exit the partition menu, enter q at the partition> prompt and q at the format> prompt.

The system responds:

```
partition> q
format > q
#
```

Constructing a New File System Disk 2

See the "Constructing a New File System" section on page 9-64 of this chapter.

Mounting the File System Disk 2

See the "Mounting the File System" section on page 9-64 of this chapter.

Setting Up the Swap Space Disk 2

If you have partitioned disk 2 to contain swap space, the `/etc/vfstab` file must be updated.

Note

If no swap space was partitioned on disk 2, then you do not need to change the `/etc/vfstab` file.

If the swap space was partitioned on disk 2, do the following:

1. Edit the `/etc/vfstab` file to add the following line:

```
/dev/dsk/c0t1d0s1 - - swap - no -
```

2. Verify that the `/etc/vfstab` file is correct by entering the `grep` command.

```
# grep swap /etc/vfstab
```

The following lines should be displayed (they represent the swap space on disk 1 and disk 2):

```
/dev/dsk/c0t3d0s1 -- swap - no -  
/dev/dsk/c0t1d0s1 -- swap - no -
```

Note

The following comment line may also be displayed:

```
# swap - /tmp tmpfs - yes -
```

Ignore this line.

3. Reboot the system using the `init` command.

```
# init 6
```

You should perform a CMSADM file system backup to save the updated system software and hardware configuration. See the “Performing a CMSADM File System Backup” section in this chapter.

Adding SCSI Hard Disk Drives - Disk 3 through 12 (One-System Disk)

This section describes how to install additional SCSI Hard Disk Drives to expand the capacity of the *Sun SPARCserver* computer. These procedures apply to systems without the *Solstice DiskSuite* software. For systems with the *Solstice DiskSuite* software, see “Adding SCSI Hard Disk Drives to a System Running *Solstice DiskSuite* Software.”

Adding SCSI Disks

To add more SCSI Disks to a *Sun SPARCserver* computer that is already up and running, do the following steps:

1. Make sure the system is in the firmware mode (use the `init 0` command to get to the ok prompt).
2. At the ok prompt, enter the following command:

`show-sbus`

This command provides a listing of the SBus cards and their locations in your system. Refer to “*Identifying Installed SBus Cards*” section in Chapter 3, “Installing the *Sun SPARCserver* Computer” for more information.

3. Do the following in sequential order:
 - a. Turn off the *Sun SPARCserver* computer.
 - b. Turn off the system monitor.
 - c. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
4. Install the first additional FSBE/S card in the next available SBus slot. See Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures” for information on filling SBus slots.

Note

You need to install additional FSBE/S cards only when you have reached the *CentreVu* CMS limit on the number of hard disks per SCSI controller. This limit is four for systems with one-system disk and three for systems with two-system disks. See the “Disk Recovery Overview” section of this chapter to determine which system disk scheme you have.

5. Install the second FSBE/S card in the next available SBus slot. See the *Sun FSBE/S SBus Card Manual* for more details.

6. Set the SCSI IDs on the external SCSI disks.
7. Connect the external SCSI disks to the desired FSBE/S cards.

See the *Sun FSBE/S SBus Card Manual* or the “Connecting the External Drives” section in Chapter 3, “Installing the *Sun SPARCserver* Computer,” for details.

See the “Connecting the External Drives” Chapter 3, “Installing the *Sun SPARCserver* Computer,” for details.

8. Do the following in sequential order:
 - a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
 - b. Turn on the *Sun SPARCserver* computer.
 - c. Turn on the system monitor.

9. Enter **Stop** **A**. The system responds:

```
ok
```

10. To verify that the system sees all SCSI devices, enter the following command:

```
ok probe-scsi-all
```

The system responds:

```

/iommu@f,e00000000/sbus@f.e00010000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991

. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok

```

Note

The actual response (devices listed) depends on the devices installed on the SCSI bus (see Table 9-7 below).

Table 9-7: SCSI Information for External Disks

Device	Disk	Target	Unit	File System
c0t2d0s0	3	2	0	/cms2
c0t0d0s0	4	0	0	/cms3
c1t1d0s0	5	1	1	/cms4
c1t2d0s0	6	2	1	/cms5
c1t3d0s0	7	3	1	/cms6
c1t4d0s0	8	4	1	/cms7
c2t1d0s0	9	1	2	/cms8
c2t2d0s0	10	2	2	/cms9
c2t3d0s0	11	3	2	/cms10
c2t4d0s0	12	4	2	/cms11

11. Enter the following command:

```
ok boot -r
```

The system responds:

```

Boot device ...
.
.
.
Configuring the /dev directory
Configuring the /dev directory (compatibility devices)
The system is coming up. Please wait.
checking filesystems
/dev/rdisk/c0t1d0s0:  is clean
/dev/rdisk/c0t3d0s5:  is clean
/dev/rdisk/c0t2d0s0:  is clean  ***if c0t2d0 is already in system***
/dev/rdisk/c0t1d0s1:  is clean
/dev/rdisk/c0t1d0s3:  is clean
/dev/rdisk/c0t1d0s4:  is clean
/dev/rdisk/c0t2d0s0 mounted      ***if c0t2d0 is already in system***
/dev/rdisk/c0t1d0s3 mounted
/dev/rdisk/c0t1d0s1 mounted
/dev/rdisk/c0t3d0s5 mounted
/dev/rdisk/c0t1d0s0 mounted
checking for crash dump ...
starting routing daemon.
starting rpc services: rpcbind deyserv kerbd done.
Setting default interface for multicast: add net 224.090.0 gateway
hostname.
syslog service starting.
Print services started.
volume management starting.

Starting terminal server network daemons.
Network Terminal Server daemon(s) startup complete.
The system is ready.

hostname console login:

```

12. Log in as *root*.

Formatting Disks

To format the disks, do the following steps:

1. At the system prompt, enter the following command:

```
# format
```

The following appears:

```
Searching for disks ... done
```

```
AVAILABLE DISK SELECTIONS:
```

- 0. c0t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/espdma@f,8000000/sd@1,0
- 1. c0t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/espdma@f,8000000/sd@2,0
- 2. c0t3d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/espdma@f,8000000/sd@3,0
- 3. c1t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@1,0
- 4. c1t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@2,0

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

Note

Be careful to specify the number that exactly matches the disk you are adding. See Table 9-7 on page 9-56 for more information.

2. Enter the number that corresponds to the disk you added.

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

The system displays the disk you are adding (for example, c1t1d0 for disk 5) and the format menu:

```
selecting c1t1d0
```

```
FORMAT MENU:
```

```
disk  
type  
partition  
current  
format  
repair  
label  
analyze  
defect  
backup  
verify  
save  
inquiry  
volname  
quit
```

```
format>
```

3. At the format> prompt, enter format.

The system responds:

```
Ready to format. Formattting cannot be interrupted  
and takes 23 minutes (estimated). Continue?
```

4. To continue formatting, enter y . The system responds:

```
Beginning formatting. The current time is <date>.  
Formatting...
```

5. Wait for the disk to format and verify the media. When the disk is formatted, the system responds:

done.

Verifying media..

pass 0 - pattern = 0xc6dec6de
2035/12/18

pass 1 - pattern = 0x6db6db6d
2035/12/18

Total of 0 defective blocks repaired.

format>

Now you can partition the disk.

Partitioning Disks

To partition the disks, do the following steps:

1. At the format> prompt, enter the following command:

```
format> partition
```

The program displays a confirmation message and the Partition menu.

****Do not format the drive, it is formatted already****

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
quit	

partition>

- At the `partition>` prompt, enter the `print` menu option to check the default partition table.

```
partition> print
```

The system displays the default partition table.

You may have to set up the partitions on the external disks you added. Table 9-8 lists the partitioning information for both 2.1- and 1.05-GB external disks.

Table 9-8: Partitioning Information for External Disks

Partitions	Partition ID Tag	Partition Permission Flags	2.1-GB Disk		1.05-GB Disk	
			Start Cylinder	Size (Cylinders)	Start Cylinder	Size (Cylinders)
0	unassigned	wm	0	2733	0	2036
1	unassigned	wm	0	0	0	0
2	backup	wm	0	2733	0	2036
3-7	unassigned	wm	0	0	0	0

- At the `partition>` prompt, enter `0`.

```
partition> 0
```

The system responds:

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

- Enter `un` for unassigned.

The system responds:

Enter partition permission flags [wm]:

5. Enter wm to indicate that the partition is writable and mountable.

The system responds:

Enter new starting cyl [0]:

6. Enter 0 as the starting cylinder.

For example, the system responds:

Enter partition size [205632b, 204c, 100.41mb]:

7. Enter the size of the partition (see Table 9-8).

The system responds with the partition> prompt.

8. At the partition> prompt, enter 1.

partition> 1

9. Enter un for the partition ID tag, wm for the partition permission flags, and 0 as the starting cylinder.

10. Enter 0c for the size of the partition.

Enter size of partition '1' [133056, 132c, 64.9mb]: 0c

11. At the partition> prompt, enter the print menu option to verify that the partition table is accurate (see Table 9-8).

partition> print

12. At the partition> prompt, enter the name menu option.

```
partition> name
```

13. Enter the *table name*.

```
partition> name
Enter table name (remember quotes): "cms?"
```

Note

The variable ? represents a number and varies depending on the disk you added (see Table 9-7 on page 9-56).

14. At the `partition>` prompt, enter the `label` menu option.

```
partition> label
```

15. To label the disk, enter `y` at the message prompt.

```
partition> label
Ready to label disk, continue: y
```

16. Repeat the above partitioning procedure for each disk that you are adding. The system responds:

```
partition>
```

17. To exit the partition menu, enter `q` at the `partition>` prompt and `q` at the `format>` prompt. The system responds:

```
partition> q
format > q
#
```

Constructing a New File System

To construct a new file system, do the following:

1. Enter the following command at the system prompt:

```
# newfs -m 0 /dev/rdisk/<device>
```

Note

The value you enter for <device> varies depending on the disk you added (see Table 9-7 on page 9-56).

The system responds:

```
# newfs -m 0 /dev/rdisk/<device>
newfs: construct a new file system /dev/rdisk/<device>: (y/n)?
```

2. At the message prompt, enter y. The system responds:

```
/dev/rdisk/<device>: ...
.
.
.
#
```

3. Repeat the above new file system procedure for each disk you added; then, mount the file system.

Mounting the File System

To mount the file system, do the following steps:

1. Edit the /etc/vfstab file by entering the following command:

```
# vi /etc/vfstab
```

The system responds:

<contents of the file is displayed>

.
. .
.

2. Add the following line to the */etc/vfstab* file:

```
/dev/dsk/<device> /dev/rdisk/<device> /cms? ufs  
<nn> yes
```

Note

The variables *<device>* and *?* in the above string vary depending on the disk you added (see Table 9-7). The variable *<nn>* represents the mount sequence number (see Table 9-9).

3. Write and quit the file.
4. Make a new directory for each new disk added to the *Sun SPARCserver* computer. At the system prompt, enter the following command:

```
# mkdir /cms?
```

Note

The variable *?* represents a number and varies depending on the disk you added (see Table 9-9).

Table 9-9: Make Directory for SCSI Disks

Directory	Description	Mount Sequence Number
/cms1	***for 2nd disk on (c0)***	10
/cms2	***for 3rd disk on (c0)***	11
/cms3	***for 4th disk on (c0)***	12
/cms4	***for 1st disk on (c1)***	13
/cms5	***for 2nd disk on (c1)***	14
/cms6	***for 3rd disk on (c1)***	15
/cms7	***for 4th disk on (c1)***	16
/cms8	***for 1st disk on (c2)***	17
/cms9	***for 2nd disk on (c2)***	18
/cms10	***for 3rd disk on (c2)***	19
/cms11	***for 4th disk on (c2)***	20

5. Enter the `mountall` command at the system prompt.

```
# mountall
```

Note

The `mountall` command will mount all of the file systems. You can verify that the file systems you added were mounted correctly by reviewing the displayed output. See Table 9-10 for other disk possibilities.

For example, messages containing the following file system information may be displayed:

Table 9-10: Mount File System for SCSI Disks

Disk with Mounted File System	Description
/dev/dsk/c0t1d0s0 /cms1	***for 2nd disk on (c0)***
/dev/dsk/c0t2d0s0 /cms2	***for 3rd disk on (c0)***
/dev/dsk/c0t0d0s0 /cms3	***for 4th disk on (c0)***
/dev/dsk/c1t1d0s0 /cms4	***for 1st disk on (c1)***
/dev/dsk/c1t2d0s0 /cms5	***for 2nd disk on (c1)***
/dev/dsk/c1t3d0s0 /cms6	***for 3rd disk on (c1)***
/dev/dsk/c1t4d0d0 /cms7	***for 4th disk on (c1)***
/dev/dsk/c2t1d0s0 /cms8	***for 1st disk on (c2)***
/dev/dsk/c2t2d0s0 /cms9	***for 2nd disk on (c2)***
/dev/dsk/c2t3d0s0 /cms10	***for 3rd disk on (c2)***
/dev/dsk/c2t4d0s0 /cms11	***for 4th disk on (c2)***

If error messages are displayed and the file system failed to mount, you must unmount the problem file system and edit the files again.

- To unmount the file system, enter one of the following commands:

```
# umount /dev/dsk/<device>
or
# umount /cms?
```

- Repeat the mount procedures described in steps 1-5.
6. To display how the disks are allocated (in kilobytes) for a successful mount, enter the following command:

```
# df -k
```

The system responds:

Filesystem	kbytes	used	avail	capacity	Mounted on
/dev/dsk/c0t3d0s0	17300	-	-	-	/
/dev/dsk/c0t3d0s4	129600	-	-	-	/usr
/proc	0	0	0	0%	/proc
fd	0	0	0	0%	/dev/fd
/dev/dsk/c0t3d0s5	248447				/var
/dev/dsk/c0t3d0s7		-	-	-	/cms
/dev/dsk/c0t1d0s0		-	-	-	/cms1
/dev/dsk/c0t2d0s0		-	-	-	/cms2
/dev/dsk/c0t0d0s0		-	-	-	/cms3
/dev/dsk/c1t1d0s0		-	-	-	/cms4
/dev/dsk/c1t2d0s0		-	-	-	/cms5
/dev/dsk/c1t3d0s0		-	-	-	/cms6
/dev/dsk/c1t4d0s0		-	-	-	/cms7
/dev/dsk/c2t1d0s0		-	-	-	/cms8
/dev/dsk/c2t2d0s0		-	-	-	/cms9
/dev/dsk/c2t3d0s0		-	-	-	/cms10
/dev/dsk/c2t4d0s0		-	-	-	/cms11

Note

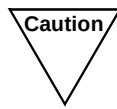
Disks for /cms2 through /cms11 are mounted only if they are installed.

You should perform a CMSADM file system backup to save the updated system software and hardware configuration. See the “Performing a CMSADM File System Backup” section in this chapter.

Recovering from Disk Corruption (Two-System Disks)

This section provides information about file system restore procedures and explains how to recover *CentreVu* CMS databases after disk corruption occurs.

The difference between disk corruption and a disk crash is the extent of the damage involved. On a corrupted disk, the disk and the file systems are still intact, and minor repair to the disk is needed. On a disk crash, the disk failed and needs to be replaced or reformatted. If a disk crashed and needs to be replaced, see the “Recovering from a Disk Crash (Two-System Disks)” section in this chapter for details.



Only **TSC PERSONNEL** should perform the procedures in this section.

The procedures for recovering the disk depends on if a backup is available and which disk was effected. This section is organized as follows:

- When the CMSADM backup is available
 - Recovering from corruption on the first disk
 - Recovering from corruption on the second disk
 - Recovering from corruption on the third through ninth disks
- When the CMSADM backup is **not** available
 - Recovering from corruption on the first disk
 - Recovering from corruption on the second disk
 - Recovering from corruption on the third through ninth disks.

Restoring Disk(s) — CMSADM Backup Available

If a CMSADM backup is available, do the following tasks:

- Restore the file systems on the disk from the latest CMSADM backup.
- Restore the latest *CentreVu* CMS data from the latest *CentreVu* CMS backup.

The following sections provide the commands used to restore the file system from the CMSADM backup.

First Disk

Use the procedures in this section to restore the first disk when a CMSADM backup is available. Refer to Tables 9-11 and 9-12 to determine how the data is stored on the first and second disks.

If a CMSADM backup is available, do the following:

- Restore the file systems
- Restore the *CentreVu* CMS data.

Table 9-11: First Internal Disk - Partitioning Information

Device	Disk	Partition	File System
c0t3d0s0	1	0	/
c0t3d0s1	1	1	swap
c0t3d0s5	1	5	/opt
c0t3d0s6	1	6	/usr
c0t3d0s7	1	7	/var

Table 9-12: Second Internal Disk - Partitioning Information

Device	Disk	Partition	File System
c0t1d0s0	2	0	/usr/dbtemp
c0t1d0s1	2	1	/export/home
c0t1d0s3	2	3	/dump
c0t1d0s4	2	4	/cms

To restore the first disk, do the following steps:

1. Log in as *root*.
2. Insert the first backup tape.
3. At the system prompt, enter the following command:

```
# cpio -icmudf -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
"/usr/dbtemp/" "/export/home/" "/dump/" "/cms/"
<"/cms?/"...>
```

Helpful Hints

- If any disks 3 through 9 are present, you must substitute the `<"/cms?/*" . . .>` portion of the `cpio` command with `"/cms1/*"` `"/cms2/*"` and so on for these disks. For example, if you have a total of five disks, you would substitute `<"/cms?/*" . . .>` with `"/cms1/*" "/cms2/*" "/cms3/*"` for the third, fourth, and fifth disks. See Table 9-13 on page 9-73 to determine on which disks the `/cms` file systems reside.
 - You must substitute one of these device names for `<device name>` in the `cpio` command:
 - `/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.
 - `/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.
 - `/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).
 - `/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).
 - You may get four error messages concerning the `/home` directory. These errors display when the directory is already present, so you can ignore them.
4. If the restore requires more than one tape, follow the directions displayed on the screen:

Please remove the current tape, insert tape number `<X>`, and press ENTER.

The system responds:

```
xxxxxx Blocks
#
```

5. After you restore the first disk, synchronize the file systems by entering the following commands:

```
# sync
```

6. After the first disk is restored, you should reboot the system via the following system command:

```
# init 6
```

7. Restore the *CentreVu* CMS from the latest *CentreVu* CMS maintenance backups. See the “Performing a *CentreVu* CMS Maintenance Restore” section in this chapter.

Second Disk

Use the procedures in this section to restore the second disk when a CMSADM backup is available. Refer to Table 9-12 to determine how the data is stored on the second disk.

If a CMSADM backup is available, do the following:

- Restore the file systems
- Restore the *CentreVu* CMS data.

Do these steps to restore the second disk:

1. Log in as *root*.
2. Insert the first backup tape.
3. To restore the data, enter the following commands at the system prompt:

```
# ulimit unlimited
# cpio -icmud -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
"/usr/dbtemp/" "/export/home/" "/dump/" "/cms/"
```

Helpful Hints

- Enter the above *cpio* command all on one line. The *cpio* command for restoring the second disk uses the *-icmud* options of the command, instead of *-icmudf*.
- You must substitute one of these device names for *<device name>* in the *cpio* command:

/dev/rmt/0 Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

`/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

`/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

`/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

4. Verify that the *CentreVu* CMS data is accessible (via `cmsql`), and resolve any problems before proceeding.
5. Restore the *CentreVu* CMS from the latest *CentreVu* CMS maintenance backups. See “Performing a *CentreVu* CMS Maintenance Restore” section in this chapter.

Third Through Ninth Disks

Use the procedures in this section to restore data on the third through ninth disk when a CMSADM backup is available. Refer to Table 9-13 to determine how the data is stored on the third through ninth disk.

If a CMSADM backup is available, do the following:

- Restore the file system
- Restore the *CentreVu* CMS data.

Table 9-13: Additional External Disks - Partitioning Information

Device	Disk	File System
c0t2d0s0	3	/cms1
c1t1d0s0	4	/cms2
c1t2d0s0	5	/cms3
c1t3d0s0	6	/cms4
c2t1d0s0	7	/cms5
c2t2d0s0	8	/cms6
c2t3d0s0	9	/cms7

Do these steps to restore the third through ninth disk:

1. Log in as *root*.
2. Insert the first backup tape.

3. To restore the data, enter the following commands at the system prompt:

```
# ulimit unlimited
# cpio -icmud -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
"/cms?/*"
```

Helpful Hints

- You must substitute the "?" in the cpio command with the number that corresponds to the /cms file system that resides on the disk you are restoring. For example, disk 3="/cms1/*", disk 4="/cms2/*", disk 5="/cms3/*" and so on for each disk. Refer to Table 9-13 to determine on which disks the /cms file systems reside.
- You must substitute one of these device names for <device name> in the cpio command:

/dev/rmt/0 Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

/dev/rmt/1 Indicates the tape drive with the second lowest target number in the SCSI chain.

/dev/rmt/0c Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

/dev/rmt/1c Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

4. Verify that the *CentreVu* CMS data are accessible (via cmsql), and resolve any problems before proceeding.
5. Restore the *CentreVu* CMS from the latest *CentreVu* CMS maintenance backups. See "Performing a *CentreVu* CMS Maintenance Restore" section in this chapter.

See the *CentreVu™ CMS R3V4 Administration* (585-215-820) document for more information.

Restoring Disk(s) — No CMSADM Backup Available

If no CMSADM backup is available, do the following:

- Restore all the information on the disk from the source (if other than just CMS data).
- Restore the *CentreVu* CMS data.

Note

The procedures for restoring the first or second disk tend to involve actions that affect the other disk. It is important to understand that the first and second disks are not independent of each other.

For example, the installation database resides on the first disk, but the CMS package (for example, */cms*) resides on the second disk. It is important for the cms package and installation database to be consistent. In addition, *CentreVu* CMS installs data files on both disks.

First Disk

If the first disk is corrupted and a backup is not available, do the following steps:

1. Reinstall *Solaris* software package, all add-on packages, spatches, and CMS. See Appendix D, “Sun *SPARCserver* Computer Factory Installation Procedures” for details.

Note

When *Solaris* is reinstalled, your system will be partitioned to use the one-system disk scheme.

2. Run setup. See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages,” for details.
3. Restore *CentreVu* CMS data from the *CentreVu* CMS Maintenance backup. See the “Performing a *CentreVu* CMS Maintenance Restore” section in this chapter for details.
4. Administer Terminals, Printers, Users, etc. as needed. See Chapter 4, “Installing Terminals, Printers, and Modems,” for details.

Second Disk

If the second disk is corrupted and a backup is not available, do the following steps:

1. Remove the CMS package using the `pkgrm cms` command. See the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-826) document.
2. Install the CMS package using the `pkgadd cms` command. See the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-826) document.
3. Run setup. See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages,” for details.
4. Restore *CentreVu* CMS data from the *CentreVu* CMS maintenance backup. See the “Performing a *CentreVu* CMS Maintenance Restore” section in this chapter.

Third Through Ninth Disks

If the third through ninth disks are destroyed and a backup is not available, do the following steps:

1. Run setup. See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages,” for details.
2. Restore the *CentreVu* CMS data from the *CentreVu* CMS maintenance backup. See the “Performing a *CentreVu* CMS Maintenance Restore” section in this chapter.

Restoring All Disks and File Systems

To do a complete file system restore, enter the following commands at the system prompt:

```
# ulimit unlimited
# cpio -icmud -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
```

Note

You must substitute one of these device names for *<device name>* in the `cpio` command:

`/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

`/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

`/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

`/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

Restoring Specific Files

To restore specific files, enter the following commands at the system prompt:

```
# ulimit unlimited
# cpio -icmud -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
<full_path_name>
```

Note

You must substitute one of these device names for *<device name>* in the `cpio` command:

`/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

`/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

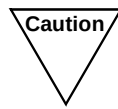
`/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

`/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

Recovering from a Disk Crash (Two-System Disks)

This section provides information about file system restore procedures, and explains how to recover *CentreVu* CMS databases after a disk crash occurs.

The difference between disk corruption and a disk crash is the extent of the damage involved. On a corrupted disk, the disk and the file systems are still intact, and minor repair to the disk is needed. On a disk crash, the disk failed and needs to be replaced or reformatted. If a disk needs minor repair, see the “Recovering from Disk Corruption (Two-System Disks)” section in this chapter for details.



Only **TSC PERSONNEL** should perform the procedures in this section.

The procedures for recovering the disk depends on whether a backup is available and which disk was effected. This section is organized as follows:

- When the CMSADM backup is available
 - Recovering from a crash on the first disk
 - Recovering from a crash on the second disk
 - Recovering from a crash on the third through ninth disks
- When the CMSADM backup is **not** available
 - Recovering from a crash on the first disk
 - Recovering from a crash on the second disk.
 - Recovering from a crash on the third through ninth disks.

Recovering Disk(s) — CMSADM Backup Available

If a CMSADM backup is available, then the number of tasks required to recover a disk is reduced. The following sections provide the commands to restore the file systems.

First Disk

This section describes the procedures for replacing the first disk when a CMSADM backup is available and includes the following:

- Reinstall the *Solaris* software package.
- Restore the file systems.
- Restore the *CentreVu* CMS data.

To restore the first disk, do the following steps:

1. Install a new disk.
2. Power on the system, and stop the boot procedure.

To stop the boot procedure, press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system. The system responds with the ok prompt.

3. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

The system displays a list of all the SCSI devices.

4. Verify that the first disk is displayed as Target 3 Unit 0.

Note

If the disk device number is not displayed, then it was not installed correctly.

5. Reinstall the *Solaris* software package. See “Bootting from the *Solaris* CD-ROM” section in Appendix D for details.

Note

When reinstalling *Solaris*, you must configure all disks. Your system will be partitioned to use the one system disk scheme.

6. After the *Solaris* 2.4 operating system is installed and the system has rebooted, log in as *root*.
7. Eject the CD-ROM with the following command:

```
# eject cdrom
```

All the necessary factory installation procedures to recover the first disk are complete.

Note

Stop after completing the “Installing the *Solaris* Operating System” section — do **not** install the add-on packages, patches, or CMS.

8. Log in as *root*.
9. Insert the first backup tape.
10. To restore file systems on all disks, enter the following commands:

```
# ulimit unlimited
# cpio -icmudf -C 10240 -I <device-name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
"/etc/vfstab" "/etc/mnttab" "/etc/device.tab" "/dev/dsk/*"
"/dev/rdisk/*"
"/dev/sd*" "/dev/rsd*" "/devices/*esp*" "/export/home"
"/usr/dbtemp"
```

Helpful Hints

- You must substitute one of these device names for *<device-name>* in the `cpio` command:
 - `/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.
 - `/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.
 - `/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).
 - `/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).
 - You may get four error messages concerning the `/home` directory. These errors display when the directory is already present, so you can ignore them.
11. After you restore the first disk, synchronize the file systems by entering the following command:

```
# sync
```

12. To shut down the machine, enter the following command:

```
# init 0
```

13. To reboot the machine, enter the following command at the ok prompt:

```
ok boot -r
```

14. Log in as *root*.
15. Restore *CentreVu* CMS data from the *CentreVu* CMS backup.

Second Disk

This section describes the procedures for replacing the second disk when a CMSADM backup is available and includes the following:

- Reformat the disk.
- Repartition the disk.
- Re-create the file systems.
- Restore the file systems.
- Restore the *CentreVu* CMS data.

To restore the second disk, do the following steps:

1. Install a new disk.
2. Power on the system, and stop the boot procedure.

To stop the boot procedure, press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system. The system responds with the ok prompt.

3. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

The system displays a list of all the SCSI devices.

4. Verify that the second disk is displayed as Target 1 Unit 0.

Note If the disk is not displayed, then it was not installed correctly.

5. Boot the system.

```
ok boot
```

Note During the reboot, the system displays one or two messages for each disk that was replaced. These messages inform you to run the `fsck` command and occur because the system cannot find the appropriate file systems on the replacement disks.

6. At each prompt that asks you to enter the `fsck` command for the missing file systems, press **Control** **D** simultaneously to continue booting.
7. After the machine is booted, log in as *root*.
8. Verify that no jobs are attempting to access file systems on the second disk (for example, check cron jobs, etc). If any jobs are running, stop them, and record the information for your records.
9. To format the disk, see the “Adding SCSI Hard Disk Drives (Two-System Disks) — Formatting Disks” section in this chapter for procedures. The device name should be `c0t1d0`.

Note Formatting the disk takes approximately 1 hour.

10. To partition the disk, do the following:
 - a. At the `partition>` prompt, enter the following command to check the default partition table:

```
partition> print
```

The system displays the default partition table.

- b. Change partitions 0, 1, 3, and 4 using the values in Table 9-14.

Table 9-14: Second Internal Disk - Partitioning Information

Partition	Partition ID Tag	Partition Permission Flags	Start Cylinder	Size (Cylinders)
0	unassigned	wm	0	204
1	unassigned	wm	204	204
2	backup	wm	0	2036
3	unassigned	wm	408	1049
4	unassigned	wm	1457	579
5-7	unassigned	wm	0	0

- c. At the `partition>` prompt, enter the following command to verify that the partition table is accurate:

```
partition> print
```

The system displays the partition table.

- d. After the partitions are correct, label the disk. To label the disk, enter the following command at the `partition>` prompt:

```
partition> label
```

The system responds with a question.

- e. At the question, enter `y`.
- f. To quit the partition submenu, enter `q`.
- g. To quit the format program, enter `q`.

The system prompt is displayed.

11. Use the “Adding SCSI Hard Disk Drives (Two-System Disks) — Constructing a New File System” section in this chapter as a guideline, and do the following:

- a. To make file systems for all partitions, enter the following commands:

```
# newfs /dev/rdisk/c0t1d0s0
# newfs /dev/rdisk/c0t1d0s1
# newfs /dev/rdisk/c0t1d0s3
# newfs -m 0 /dev/rdisk/c0t1d0s4
```

For each command you enter, the system responds with the following question:

```
news: construct a new file system /dev/rdisk/<device>:(y/n)?
```

- b. Each time the message prompt appears, enter y.

Note

These file system(s) were not mounted because they did not exist on the new disk. However, since the operating system was initially installed with these file system(s), they exist in the */etc/vfstab* file.

12. To mount all file systems on the second disk, enter the following command:

```
# mountall
```

The system displays all the file systems mounted.

13. To verify that all file systems are mounted properly, check the displayed response and resolve any problems.
14. To set the permissions on */usr/dbtemp* directory, enter the following command:

```
# chmod 777 /usr/dbtemp
```

The system prompt is displayed.

15. To ensure that the system initializes cleanly, reboot the system using the following command:

```
# init 6
```

16. Log in as *root*.
17. To restore the file systems on the second disk, enter the following commands:

```
# ulimit unlimited
# cpio -icmud -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
"/usr/dbtemp/*" "/export/home/*" "/dump/*" "/cms/*"
```

Note

You must substitute one of these device names for *<device name>* in the *cpio* command:

/dev/rmt/0 Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

/dev/rmt/1 Indicates the tape drive with the second lowest target number in the SCSI chain.

/dev/rmt/0c Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

/dev/rmt/1c Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

18. Restore *CentreVu* CMS data from the *CentreVu* CMS maintenance backup.
19. Restart any stopped jobs. See Step 8.

Third Through Ninth Disks

This section describes the procedures for replacing the third through ninth disks when a CMSADM backup is available and includes the following:

- Reformat the disk.

- Repartition the disk.
- Re-create the file system.
- Restore the file system.
- Restore the *CentreVu* CMS data.

To restore the third through ninth disk, do the following steps:

1. Install a new disk.
2. Power on the system, and stop the boot procedure.

To stop the boot procedure, press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system. The system responds with the ok prompt.

3. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

The system displays a list of all the SCSI devices.

4. Verify that the replaced disk is displayed. See Table 9-15 on page 9-101.
5. Boot the system:

```
ok boot
```

Note

During the reboot, the system displays one or two messages for each disk that was replaced. These messages inform you to run the `fsck` command and occur because the system cannot find the appropriate file systems on the replacement disks.

6. At each prompt that asks you to enter the `fsck` command for the missing file systems, press **Control** **D** simultaneously to continue booting.
7. Log in as *root*.
8. After the machine is booted, verify that no jobs are attempting to access file systems on the disk being replaced (for example, check

cron jobs, etc). If any jobs are running, stop them, and record the information for your records.

9. To format the disk, see the “Adding SCSI Hard Disk Drives (Two-System Disks) — Formatting Disks” section in this chapter for procedures. See Table 9-15 on page 9-101 for device names.

Note

Formatting the disk takes approximately 1 hour.

10. To partition the disk, see the “Adding SCSI Hard Disk Drives (Two-System Disks) — Partitioning Disks” section in this chapter as a guideline, and do the following:
 - a. At the `partition>` prompt, enter the following command to check the default partition table:

```
partition> print
```

The system displays the default partition table.

- b. Change the 0 partition. Enter `un` for the partition ID tag, `wm` for the partition permission flags, and `0` as the starting cylinder. For size, enter one of the following values: `2733c` for a 2.1-GB disk or `2036c` for a 1.05-GB disk.
 - c. At the `partition>` prompt, enter the following command to verify that the partition table is accurate:

```
partition> print
```

The system displays the partition table.

- d. After the partitions are correct, label the disk. To label the disk, enter the following command at the `partition>` prompt:

```
partition> label
```

The system responds with a question.

- e. At the question, enter y.
 - f. To quit the partition submenu, enter q.
 - g. To quit the format program, enter q.
11. To make a file system for the partition, enter the following command:

```
# newfs -m 0 /dev/rdisk/<device>
```

See Table 9-13 on page 9-73 for the *<device>*. For each command you enter, the system responds with the following question:

```
news: construct a new file system /dev/rdisk/<device>:(y/n)?
```

Each time the message prompt appears, enter y.

Note

These file system(s) were not mounted because they did not exist on the new disk. However, since the operating system was initially installed with these file system(s), they exist in the */etc/vfstab* file.

12. To mount the file system on the new disk, enter the following command:

```
# mountall
```

The system displays all the file systems mounted.

13. To verify that all file systems mounted properly, check the displayed response, and resolve any problems.
14. To ensure that the system initializes cleanly, reboot the system using the following command:

```
# init 6
```

15. Log in as *root*.
16. To restore the file systems on the new disk, enter the following commands:

```
# ulimit unlimited
# cpio -icmud -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
"/cms?/*"
```

Helpful Hints

- You must substitute the "?" in the cpio command with the number that corresponds to the /cms file system that resides on the disk you are restoring. For example, disk 3="/cms1/*", disk 4="/cms2/*", disk 5="/cms3/*" and so on for each disk. Refer to Table 9-13 on page 9-73 to determine on which disks the /cms file systems reside.
- You must substitute one of these device names for <device name> in the cpio command:

/dev/rmt/0 Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

/dev/rmt/1 Indicates the tape drive with the second lowest target number in the SCSI chain.

/dev/rmt/0c Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

/dev/rmt/1c Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

17. Restore *CentreVu* CMS data from the *CentreVu* CMS backup.
18. Restart any stopped jobs. See Step 8.

Recovering Disk(s) — No CMSADM Backup Available

If no CMSADM backup is available, do the following:

- Restore all the information on the disk from the source (if other than CMS data).
- Restore the *CentreVu* CMS data.

Note

The procedures for restoring the first or second disk tend to involve actions that affect the other disk. It is important to understand that the first and second disk are not independent of each other.

For example, the installation database resides on the first disk, but the CMS package (for example, /cms) resides on the second disk. It is important for the CMS package and installation database to be consistent. In addition, *CentreVu* CMS installs data files on both disks.

First Disk

This section describes the procedures for replacing the first disk when a CMSADM backup is not available and includes the following:

- Reinstall the *Solaris* software package.
- Reinstall all add-on packages (for example, X.25).
- Reinstall the *CentreVu* CMS software.
- Run setup.
- Restore the *CentreVu* CMS data.

If the first disk is destroyed and a backup is not available, do the following steps:

1. Install a new disk.
2. Power on the system, and stop the boot procedure.

To stop the boot procedure, press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system. The system responds with the ok prompt.

3. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

The system displays a list of all SCSI devices.

4. Verify that the first disk is displayed as Target 3 Unit 0.

Note

If the disk is not displayed, then it was not installed correctly.

5. Reinstall the *Solaris* operating system, all add-on packages, patches, and CMS. See Appendix D, “Sun *SPARCserver* Computer Factory Installation Procedures” for details.

Note

When you reinstall *Solaris*, your system will be partitioned to use the one system disk partitioning scheme.

6. Run setup. See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Package,” for details.
7. Restore *CentreVu* CMS data from the *CentreVu* CMS backup. See “Performing a *CentreVu* CMS Maintenance Restore — *CentreVu* CMS Maintenance Restore” in this chapter for details.
8. Administer Terminals, Printers, Users, etc. as needed. See Chapter 4, “Installing Terminals, Printers, and Modems,” for details.

Second Disk

This section describes the procedures for replacing the second disk when a CMSADM backup is not available and includes the following:

- Reformat the disk.
- Repartition the disk.
- Re-create the file systems.
- Remove the *CentreVu* CMS package.
- Install the *CentreVu* CMS software.
- Run setup.
- Restore the *CentreVu* CMS data.

If the second disk is destroyed and a backup is not available, do the following steps:

1. Install a new disk.
2. Power on the system, and stop the boot procedure.

To stop the boot procedure, press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system. The system responds with the ok prompt.
3. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

The system displays a list of all the SCSI devices.

4. Verify that the second disk is displayed as Target 1 Unit 0.

Note

If the disk is not displayed, then it was not installed correctly.

5. Boot the system.

```
ok boot
```

Note

During the reboot, the system displays one or two messages for each disk that was replaced. These messages inform you to run the `fsck` command and occur because the system cannot find the appropriate file systems on the replacement disks.

6. At each prompt that asks you to enter the `fsck` command for the missing file systems, press **Control** **D** simultaneously to continue booting.
7. After the machine is booted, verify that no jobs are attempting to access file systems on the second disk (for example, check cron jobs, etc.). If any jobs are running, stop them, and record the information for your records.
8. To format the disk, see the “Adding SCSI Hard Disk Drives (Two-System Disks) — Formatting Disks” section in this chapter for procedures. The device name should be `c0t1d0`.

Note

Formatting the disk takes approximately 1 hour.

9. To partition the disk, do the following:
 - a. At the `partition>` prompt, enter the following command to check the default partition table:

```
partition> print
```

The system displays the default partition table.

- b. Change partitions 0, 1, 3, and 4 using the values in Table 9-14 on page 9-83.
 - c. At the `partition>` prompt, enter the following command to verify that the partition table is accurate:

```
partition> print
```

The system displays the partition table.

- d. After the partitions are correct, label the disk by entering the following command at the `partition>` prompt:

```
partition> label
```

The system responds with a question.

- e. At the question, enter `y`.
 - f. To quit the partition submenu, enter `q`.
 - g. To quit the format program, enter `q`.
10. To make file systems for all partitions, enter the following commands:

```
# newfs /dev/rdisk/c0t1d0s0
# newfs /dev/rdisk/c0t1d0s1
# newfs /dev/rdisk/c0t1d0s3
# newfs -m 0 /dev/rdisk/c0t1d0s4
```

For each command you enter, the system responds with the following question:

```
news: construct a new file system /dev/rdisk/<device>:(y/n)?
```

Each time the message prompt appears, enter y.

Note

These file system(s) were not mounted because they did not exist on the new disk. However, since the operating system was initially installed with these file system(s), they exist in the */etc/vfstab* file.

11. To mount all file systems on the second disk, enter the following command:

```
# mountall
```

The system displays all the file systems mounted.

12. To verify all file systems mounted properly, check the displayed response, and resolve any problems.
13. Remove the CMS package using the `pkgrm cms` command. See the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-826) document.
14. Install *CentreVu* CMS using the `pkgadd cms` command. See the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-806) document.
15. Run setup. See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Package,” for details.
16. Restore *CentreVu* CMS data from the *CentreVu* CMS backup. See the “Performing *CentreVu* CMS Maintenance Restore” section in this chapter for details.

Third Through Ninth Disks

This section describes the procedures for replacing the third through ninth disks:

- Reformat the disk.
- Repartition the disk.
- Re-create the file system.
- Rerun setup.
- Restore the *CentreVu* CMS data.

If the third through ninth disks are destroyed and a backup is not available to restore third through ninth disk, do the following steps:

1. Install a new disk.
2. Power on the system, and stop the boot procedure.

To stop the boot procedure, press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system. The system responds with the ok prompt.

3. At the ok prompt, enter the following command:

```
ok probe-scsi-all
```

The system displays a list of all the SCSI devices.

4. Verify that the replaced disk is displayed. See Table 9-15 on page 9-101.

Note

If the disk is not displayed, then it was not installed correctly.

5. Boot the system.

```
ok boot
```

Note

During the reboot, the system displays one or two messages for each disk that was replaced. These messages inform you to run the `fsck` command and occur because the system cannot find the appropriate file systems on the replacement disks.

6. At each prompt that asks you to enter the `fsck` command for the missing file systems, press **Control** **D** simultaneously to continue booting.
7. After the machine is booted, log in as *root*.
8. Verify that no jobs are attempting to access file systems on the disk being replaced (for example, check cron jobs, etc.). If any jobs are running, stop them, and record the information for your records.
9. To format the disk, see the “Adding SCSI Hard Disk Drives (Two-System Disks) — Formatting Disks” section in this chapter for procedures. See Table 9-15 on page 9-101 for device names.

Note

Formatting the disk takes approximately 1 hour.

10. To partition the disk, see the “Adding SCSI Hard Disk Drives (Two-System Disks) — Partitioning Disks” section in this chapter as a guideline, and do the following:
 - a. At the `partition>` prompt, enter the following command to check the default partition table:

```
partition> print
```

The system displays the default partition table.

- b. Change the 0 partition. Enter `un` for the partition ID tag, `wm` for the partition permission flags, and 0 as the starting cylinder. For size, enter one of the following values: `2733c` for a 2-GB disk or `2036c` for a 1-GB disk.
- c. At the `partition>` prompt, enter the following command to verify that the partition table is accurate:

```
partition> print
```

The system displays the partition table.

- d. After the partitions are correct, label the disk. To label the disk, enter the following command at the `partition>` prompt:

```
partition> label
```

The system responds with a question.

- e. At the question, enter `y`.
 - f. To quit the partition submenu, enter `q`.
 - g. To quit the format program, enter `q`.
11. To make a file system for the partition, enter the following command:

```
# newfs -m 0 /dev/rdisk/<device>
```

See Table 9-15 on page 9-101 for `<device>`. For each command you enter, the system responds with the following question:

```
news: construct a new file system /dev/rdisk/<device>:(y/n)?
```

Each time the message prompt appears, enter `y`.

Note

These file system(s) were not mounted because they did not exist on the new disk. However, since the operating system was initially installed with these file system(s), they exist in the `/etc/vfstab` file.

12. To mount all file systems on the new disk, enter the following command:

```
# mountall
```

The system displays all the file systems mounted.

13. To verify that all file systems are mounted properly, check the displayed response and resolve any problems.
14. To ensure that the system initializes cleanly, reboot the system using the following command:

```
# init 6
```

15. Log in as *root*.
16. Run setup.
17. Restore *CentreVu* CMS data from the *CentreVu* CMS backup. See “Performing a *CentreVu* CMS Maintenance Restore” in this chapter for details.

Recovering Specific Database Tables

When a CMSADM file system backup is *not* available to recover specific database tables, then you must do these steps to reinitialize the *CentreVu* CMS database:

1. Rerun the set up option on the CMSSVC menu. This reinitializes (removes and creates) all the *CentreVu* CMS *INFORMIX* database tables. See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages,” for information about setting up *CentreVu* CMS.
2. Restore the *CentreVu* CMS from the latest *CentreVu* CMS maintenance backups. This restore loads the *CentreVu* CMS data up to the time of the last *CentreVu* CMS backup.

Adding SCSI Hard Disk Drives - Disks 3 through 9 (Two-System Disks)

This section describes how to install additional SCSI Hard Disk Drives to expand the capacity of the *Sun SPARCserver* computer.

Adding SCSI Disks

To add more SCSI Disks to a *Sun SPARCserver* computer that is already up and running, do the following steps:

1. Make sure the system is powered down and in the firmware mode (use the `init 0` command to get to the ok prompt).
2. At the ok prompt, enter the following command:

`show-bus`

This command provides a listing of the SBus cards and their locations in your system. Refer to “Identifying Installed SBus Cards” section in Chapter 3, “Installing the *Sun SPARCserver* Computer” for more information.

3. Do the following in sequential order:
 - a. Turn off the *Sun SPARCserver* computer.
 - b. Turn off the system monitor.
 - c. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
4. Install the first additional FSBE/S card in the next available SBus slot. See Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures” for information on filling SBus slots.

Note

You need to install additional FSBE/S cards only when you have reached the *CentreVu* CMS limit on the number of hard disks per SCSI controller. This limit is four for systems with one-system disk and three for systems with two-system disks. See the “Disk Recovery Overview” section of this chapter to determine which system disk scheme you have.

5. Install the second FSBE/S card in the next available SBus slot. See the *Sun FSBE/S SBus Card Manual* for more details.
6. Set the SCSI IDs on the external SCSI disks.
7. Connect the external SCSI disks to the desired FSBE/S cards.

See the *Sun FSBE/S SBus Card Manual* or the “Connecting the External Drives” section in Chapter 3, “Installing the *Sun SPARCserver* Computer,” for details.

See the “Connecting the External Drives” Chapter 3, “Installing the *Sun SPARCserver* Computer,” for details.

8. Do the following in sequential order:
 - a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
 - b. Turn on the *Sun SPARCserver* computer.
 - c. Turn on the system monitor.
9. Enter . The system responds:

ok

10. To verify that the system sees all SCSI devices, enter the following command:

ok probe-scsi-all

The system responds:

```

/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991

. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok

```

Note

The actual response (devices listed) depends on the devices installed on the SCSI bus. See Table 9-15 below.

Table 9-15: SCSI Information for External Disks

Device	Disk	Target	Unit	File System
c0t2d0s0	3	2	0	/cms1
c1t1d0s0	4	1	1	/cms2
c1t2d0s0	5	2	1	/cms3
c1t3d0s0	6	3	1	/cms4
c2t1d0s0	7	1	2	/cms5
c2t2d0s0	8	2	2	/cms6
c2t3d0s0	9	3	2	/cms7

Note

If the disk is not displayed, then it was not installed correctly.

11. Enter the following command:

```
ok boot -r
```

The system responds:

```
Boot device ...
.
.
.
Configuring the /dev directory
Configuring the /dev directory (compatibility devices)
The system is coming up. Please wait.
checking filesystems
/dev/rdisk/c0t1d0s0:  is clean
/dev/rdisk/c0t3d0s5:  is clean
/dev/rdisk/c0t2d0s0:  is clean   ***if c0t2d0 is already in system***
/dev/rdisk/c0t1d0s1:  is clean
/dev/rdisk/c0t1d0s3:  is clean
/dev/rdisk/c0t1d0s4:  is clean
/dev/rdisk/c0t2d0s0 mounted   ***if c0t2d0 is already in system***
/dev/rdisk/c0t1d0s3 mounted
/dev/rdisk/c0t1d0s1 mounted
/dev/rdisk/c0t3d0s5 mounted
/dev/rdisk/c0t1d0s0 mounted
checking for crash dump ...
starting routing daemon.
starting rpc services: rpcbind deyserv kerbd done.
Setting default interface for multicast: add net 224.090.0 gateway
hostname.
syslog service starting.
Print services started.
volume management starting.

Starting terminal server network daemons.
Network Terminal Server daemon(s) startup complete.
The system is ready.

hostname console login:
```

12. Log in as *root*. The system displays the last login on the console (same date and time) and returns you to the system prompt.

For example:

```
Sun Microsystems Inc. SunOS 5.2 Generic March 1993
#
```

Formatting Disks

To format the disks, do the following steps:

1. At the system prompt, enter the following command:

```
# format
```

The following appears:

```
Searching for disks ... done
```

AVAILABLE DISK SELECTIONS:

0. c0t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@1,0
1. c0t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@2,0
2. c0t3d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@3,0
3. c1t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@1,0
4. c1t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@2,0

Specify disk (enter its number):

Note

Be careful to specify the exact disk and associated number.

2. Enter the disk number you want to add.

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

See Table 9-15 on page 9-101 for more information.

The system displays the disk you are adding (for example, c1t1d0 for disk 4) and the format menu.

```
selecting c1t1d0
```

```
FORMAT MENU:
```

```
disk
```

```
type
```

```
partition
```

```
current
```

```
format
```

```
repair
```

```
label
```

```
analyze
```

```
defect
```

```
backup
```

```
verify
```

```
save
```

```
inquiry
```

```
volname
```

```
quit
```

```
format>
```

3. At the format> prompt, enter format.

The system responds:

```
Ready to format. Formattting cannot be interrupted  
and takes 23 minutes (estimated). Continue?
```

4. To continue formatting, enter y . The system responds:

```
Beginning formatting. The current time is <date>.  
Formatting...
```

5. Wait for the disk to format and verify the media.

When the disk is formatted, the system responds:

```
done.

Verifying media..
    pass 0 - pattern = 0xc6dec6de
2035/12/18
    pass 1 - pattern = 0x6db6db6d
2035/12/18

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

Now you can partition the disk.

Partitioning Disks

To partition the disks, do the following steps:

1. At the format> prompt, enter the following command:

```
format> partition
```

The program displays a confirmation message and the Partition menu.

```
***Do not format the drive, it is formatted already***
```

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
quit
```

2. At the partition> prompt, enter the print menu option to check the default partition table.

```
partition> print
```

The system displays the default partition table.

You may have to set up the partitions on the external disks you added. Table 9-16 lists the partitioning information for both 2.1- and 1.05-GB external disks.

Table 9-16: Partitioning Information for External Disks

Partitions	Partition ID Tag	Partition Permission Flags	2.1-GB Disk		1.05-GB Disk	
			Start Cylinder	Size (Cylinders)	Start Cylinder	Size (Cylinders)
0	unassigned	wm	0	2733	0	2036
1	unassigned	wm	0	0	0	0
2	backup	wm	0	2733	0	2036
3-7	unassigned	wm	0	0	0	0

- At the `partition>` prompt, enter 0.

```
partition> 0
```

The system responds:

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

- Enter un for unassigned.

The system responds:

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

- Enter wm to indicate that the partition is writable and mountable.

The system responds:

Enter new starting cyl [0]:

6. Enter 0 as the starting cylinder.

For example, the system responds:

Enter partition size [205632b, 204c, 100.41mb]:

7. Enter the size of the partition (see Table 9-16).
The system responds with the `partition>` prompt.
8. At the `partition>` prompt, enter 1.

`partition> 1`

9. Enter `un` for the partition ID tag, `wm` for the partition permission flags, and 0 as the starting cylinder.
10. Enter `0c` for the size of the partition.

Enter size of partition '1' [133056, 132c, 64.9mb]: `0c`

11. At the `partition>` prompt, enter the `print` menu option to verify that the partition table is accurate (see Table 9-16).

`partition> print`

12. At the `partition>` prompt, enter the `name` menu option.

`partition> name`

13. Enter the *table name*.


```
partition> name
Enter table name (remember quotes): "cms?"
```

Note

The variable ? represents a number and varies depending on the disk you added (see Table 9-15 on page 9-101).

14. At the `partition>` prompt, enter the `label` menu option.

```
partition> label
```

15. To label the disk, enter `y` at the message prompt.

```
partition> label
Ready to label disk, continue: y
```

16. Repeat the above partitioning procedure for each disk that you are adding. The system responds:

```
partition>
```

17. To exit the partition menu, enter `q` at the `partition>` prompt and `q` at the `format>` prompt. The system responds:

```
partition> q
format > q
#
```

Constructing a New File System

To construct a new file system, do the following:

1. Enter the following command at the system prompt.

```
# newfs -m 0 /dev/rdisk/<device>
```

Note

The value you enter for *<device>* varies depending on the disk you added (see Table 9-15).

The system responds:

```
# newfs -m 0 /dev/rdisk/<device>
newfs: construct a new file system /dev/rdisk/<device>: (y/n)?
```

2. At the message prompt, enter y. The system responds:

```
/dev/rdisk/<device>: ...
.
.
.
#
```

3. Repeat the above new file system procedure for each disk that you added; then, mount the file system.

Mounting the File System

To mount the file system, do the following steps:

1. Edit the `/etc/vfstab` file by entering the following command:

```
# vi /etc/vfstab
```

The system responds:

```
<contents of the file is displayed>
.
.
.
```

2. Add the following line to the `/etc/vfstab` file:

```
/dev/dsk/<device> /dev/rdisk/<device> /cms? ufs
<nn> yes
```

Note

The variables *<device>* and *?* in the above string vary depending on the disk you added (see Table 9-15). The variable *<nn>* represents the mount sequence number (see Table 9-17).

3. Write and quit the file.
4. Make a new directory for each new disk added to the *Sun SPARCserver* computer. At the system prompt, enter the following command:

```
# mkdir /cms?
```

Note

The variable *?* represents a number and varies depending on the disk you added (see Table 9-17).

Table 9-17: Make Directory for SCSI Disks

Directory	Description	Mount Sequence Number
/cms2	***for 1st disk on (c1)***	11
/cms3	***for 2nd disk on (c1)***	12
/cms4	***for 3rd disk on (c1)***	13
/cms5	***for 1st disk on (c2)***	14
/cms6	***for 2nd disk on (c2)***	15
/cms7	***for 3rd disk on (c2)***	16

5. Enter the `mountall` command.

```
# mountall
```

Note

The `mountall` command will mount all of the file systems. You can verify that the file systems you added were mounted correctly by reviewing the displayed output. See Table 9-18 for other disk possibilities.

For example, messages containing the following file system information may be displayed:

Table 9-18: Mount File System for SCSI Disks

Disk with Mounted File System	Description
<code>/dev/dsk/c1t1d0s0 /cms2</code>	***for 1st disk on (c1)***
<code>/dev/dsk/c1t2d0s0 /cms3</code>	***for 2nd disk on (c1)***
<code>/dev/dsk/c1t3d0s0 /cms4</code>	***for 3rd disk on (c1)***
<code>/dev/dsk/c2t1d0s0 /cms5</code>	***for 1st disk on (c2)***
<code>/dev/dsk/c2t2d0s0 /cms6</code>	***for 2nd disk on (c2)***
<code>/dev/dsk/c2t3d0s0 /cms7</code>	***for 3rd disk on (c2)***

If error messages are displayed and the system failed to mount, you must unmount the problem file system and edit the files again.

- To unmount the file system, enter one of the following commands:

```
# umount /dev/dsk/<device>
or
# umount /cms?
```

- Repeat the mount procedures described in steps 1-5.
6. To display how the disks are allocated (in kilobytes) for a successful mount, enter the following command:

```
# df -k
```

The system responds:

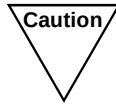
Filesystem	kbytes	used	avail	capacity	Mounted on
/dev/dsk/c0t3d0s0	19183	-	-	-	/
/dev/dsk/c0t3d0s6	143927	-	-	-	/usr
/proc	0	0	0	0%	/proc
fd	0	0	0	0%	/dev/fd
/dev/dsk/c0t3d0s7	248447	-	-	-	/var
/dev/dsk/c0t1d0s4		-	-	-	/cms
/dev/dsk/c0t2d0s0		-	-	-	/cms1
/dev/dsk/c1t1d0s0		-	-	-	/cms2
/dev/dsk/c1t2d0s0		-	-	-	/cms3
/dev/dsk/c1t3d0s0		-	-	-	/cms4
/dev/dsk/c2t1d0s0		-	-	-	/cms5
/dev/dsk/c2t2d0s0		-	-	-	/cms6
/dev/dsk/c2t3d0s0		-	-	-	/cms7

Note

Disks for /cms2 through /cms7 are mounted only if they are installed.

You should perform a CMSADM file system backup to save the updated system software and hardware configuration. See the “Performing a CMSADM File System Backup” section in this chapter.

Recovering from Disk Corruption (Systems running *Solstice DiskSuite* Software)



Only **TSC PERSONNEL** should perform the procedures in this section.

This section provides information about file system restore procedures and explains how to recover *CentreVu* CMS databases after disk corruption occurs in a system that has *Solstice DiskSuite* software installed on it.

The difference between disk corruption and a disk crash is the extent of the damage involved. On a corrupted disk, the disk and the file systems are still intact, and minor repair to the disk is needed. On a disk crash, the disk failed and needs to be replaced or reformatted.

The procedures for recovering a disk drive depend upon whether the disk is merely corrupted or has crashed, and whether the drive contained the operating system. If the disk is merely corrupted, you may be able to simply restore `/cms`. If the disk has crashed, or if the corrupted disk drive contained the operating system files, you may have to reinstall the entire system.

Restoring `/cms`

To restore the `/cms` file system only, follow the procedure in this section.

1. Remove stale information from system files, and clear and reinitiate the metadvice by entering an `olds -cleanup` command:

```
# /olds/olds -cleanup
.
.
.
Success, cleanup of DiskSuite, now reboot system.
#
```

2. Reboot the system with an `init 6` command.

```
# init 6
```

3. When the system prompt reappears, log on as *root*.

4. Check disk partitioning with an `olds -check_disks` command.

```
# /olds/olds -check_disks
.
.
.
disk:c0t0d0 is partitioned ok
disk:c0t1d0 is partitioned ok
disk:c0t2d0 is partitioned ok
Warning: Current Disk has mounted partitions
disk:c0t3d0 is partitioned ok
Success, checking disks
#
```

5. Re-create system files with an `olds -mk_files` command.

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

6. Set up metadvice replicas with an `olds -metadbs` command.

```
# nohup ./olds -metadbs | tee
.
.
.
Success, setting up metadb replicas
#
```

7. Set up the `/cms` metadvice with an `olds -setup` command. For example:

```
# nohup ./olds -setup | tee
. . .
prtvto: c0t6d0so: device busy
device: c0tod0 will not be used
valid disks are c0t0d0 c0t1d0 c0t2d0 c0t3d0
. . .
super-block backups (for fsck -F ufs -o b=#) at:
32, 16240, 32448, 48656, 64864, 81072, 97280, 113488,
. . .
10532656, 10548864, 10565072, 10580000, 10596208
ufs fsck: sanity check: /dev/md/rdisk/d19 okay
Success, activating or growing /cms metadvice
#
```

8. Mount the file system.

```
# mount /cms
```

9. Verify disk space by entering a `df -k` command. The system responds by displaying file system information for `/cms`. For example:

```
# df -k /cms
Filesystem      kbytes    used   avail capacity  Mounted on
/dev/md/dsk/d19 2047027 317080 1525247     17%    /cms
#
```

Use the information to verify that *DiskSuite* is administering all the available disks. You can use the following table to make the necessary calculations:

Calculation	Result
(1a) Enter the /cms line's 'used' figure:	
(1b) Enter the /cms line's 'avail' figure:	
(1c) Add (1a) and (1b):	
(1d) Divide (1c) by 1000:	
(2a) If Disk1=1.05G, enter 109 If Disk1=2.10G, enter 998	
(2b) Enter (# of other 1G disks) * 866	
(2c) Enter (# of other 2G disks) * 1755	
(2d) Add (2a) through (2c):	

Results (1d) and (2d) should be *approximately* equal (they need not be exact). If they are far off from one another, you may have a connectivity problem.

10. Find out how much RAM you have in your system by entering the following command. For example:

```
# prtconf | grep Mem
Memory size: 288 Megabytes
#
```


11. Create the swap file by entering:

```
# mkfile <x>m /cms/swap
```

where <x>—the swap file size—depends upon the amount of RAM displayed by the command in step 10. See Table 9-19, below.

Table 9-19: Swap File Size

If megabytes of RAM is at least...	... but not more than...	... your swap file must be this size:
0	32	61
33	64	122
65	96	183
97	128	244
129	160	305
161	192	366
193	224	427
225	256	488
257	320	610
321	384	732
385	448	931
449	512	977

For example, for a system with 288MB of RAM, the command would look like this: `mkfile 610m /cms/swap`

12. Reactivate the swap files by entering a `swap -a` command for each one. For example:

```
# swap -a /cms/swap
```

13. Edit the `/etc/vfstab` file and uncomment the `/cms/swap` entry. Then save the file. For example:

```
# vi /etc/vfstab

<contents of the file is displayed>

#Device    device    mount    FS    fsck    mount    mount
#to mount  to fsck   point    type   pass    at boot  option
. . .
#/cms/swap  -    -    swap    -    no      -
. . .
```

In this case, you would delete the pound sign (#) at the beginning of the `/cms/swap` line, and write and quit the file.

14. Reboot the system.

```
# init 6
```

15. **Perform this step only if you have a CMSADM backup available.** If you have no CMSADM backup, skip to step 16.

- a. Restore the latest available CMSADM backup data by loading the backup tape into the tape drive and entering the following command:

```
# nohup cpio -icmud -C 10240 -I <device-name> -M
"Please remove the current tape, insert tape number %d and
then press ENTER" "/cms" "/cms/*" | tee
```

where `<device-name>` is the device name of the drive. The device name depends upon the drive's SCSI ID (see Table 9-28 on page 9-187) and whether the drive supports data compression, and must be one of the following:

<code>/dev/rmt/0</code>	Indicates the noncompressing tape drive (QIC-150 or 5-GB, 8-mm drive) with the lowest target address in the SCSI chain.
<code>/dev/rmt/1</code>	Indicates the noncompressing tape drive (QIC-150 or 5-GB, 8-mm drive) with the second lowest target address in the SCSI chain.

`/dev/rmt/0c` Indicates the compressed-mode tape drive (either a QIC 2.5-GB or a 14-GB tape drive) with the lowest target address in the SCSI chain

`/dev/rmt/1c` Indicates the compressed-mode tape drive (either a QIC 2.5-GB or a 14-GB tape drive) with the second lowest target address in the SCSI chain.



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

- b. If you have *CentreVu* CMS maintenance backups dated after the latest CDMADM backup, also restore the latest maintenance backups. See “Performing a *CentreVu* CMS Maintenance Restore” section in this chapter.

See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document for more information.

16. Perform this step only if you have no CMSADM backup available. If you have a CMSADM backup, perform step 15 instead.

- a. Reinstall *CentreVu* CMS. See Appendix D, “Sun *SPARCserver* Computer Factory Installation Procedures” for details.
- b. Run CMS setup. See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages” for details.
- c. Restore *CentreVu* CMS data from the *CentreVu* CMS maintenance backup. See the “Performing a *CentreVu* CMS Maintenance Restore” section in this chapter.

Restoring an Entire System

If you have a disk crash that disables the operating system disk drive, you must perform the procedure outlined in this section. The procedure is essentially a new install: you will have to reinstall the operating system, all add-on packages, and all spatches, in addition to *CentreVu* CMS.

If your operating system disk is corrupted, or if you had to replace your system's disk 1, perform the following steps:

1. Reinstall the *Solaris* operating system software and repartition the disks. See Appendix D, “Sun *SPARCserver* Computer Factory Installation Procedures” for details.

2. If you have a CMSADM backup available, restore it. See “Performing a CMSADM File System Backup” on page 9-2 for details.

If you do not have a CMSADM backup, you must reinstall all add-on packages, all spatches, and *CentreVu* CMS. See Appendix D, “Sun *SPARCserver* Computer Factory Installation Procedures” for details.

3. Run CMS setup. See Chapter 6, “Setting Up *CentreVu* CMS and Installing Feature Packages” for details.
4. Restore *CentreVu* CMS data from the *CentreVu* CMS maintenance backup. See the “Performing a *CentreVu* CMS Maintenance Restore” section in this chapter.
5. Administer Terminals, Printers, Users, etc. as needed. See Chapter 4, “Installing Terminals, Printers, and Modems” for details.

Restoring Specific Files

To restore specific files, enter the following commands at the system prompt:

```
# ulimit unlimited
# cpio -icmudv -C 10240 -I <device name> -M "Please remove the
current tape, insert tape number %d, and press ENTER"
<full_path_name>
```

Note

You must substitute one of these device names for *<device name>* in the *cpio* command:

/dev/rmt/0 Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

/dev/rmt/1 Indicates the tape drive with the second lowest target number in the SCSI chain.

/dev/rmt/0c Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

/dev/rmt/1c Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

Adding SCSI Hard Disk Drives to a System Running *Solstice DiskSuite* Software

The *Solstice DiskSuite* software treats all the hard disks on your system as a single logical disk, allowing the call center data base to grow quite large. All factory-installed R3V5 systems have OLDS; systems upgraded in the field usually will have had OLDS installed only when needed to allow CMS to handle more than 5200 agents.

To add a hard disk drive to a system running *Solstice DiskSuite* software, follow the procedure in this section.

Adding the Disk Drive

To add more SCSI disks to a *Sun SPARCserver* computer that runs with *Solstice DiskSuite* software and that is already up and running, perform these steps:

1. Do a cmsadm backup.
See “Performing a CMSADM File System Backup” on page 9-2.
2. Make sure the system is in firmware mode (use the `init 0` command to get to the ok prompt).
3. Do the following in sequential order:
 - a. Turn off the system unit.
 - b. Turn off the system monitor.
 - c. Turn off all external devices starting with the device closest to the system unit and working toward the farthest device.
4. Install the FSBE/S card (if needed) in the next available Sbus slot.
See Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures” for information on filling Sbus slots.

Note

You need to install an additional FSBE/S card only when you have reached the limit on the number of disk drives per SCSI controller. That limit is four for systems running *Solstice DiskSuite* software.

5. Attach the new disk drives to the appropriate FSBE/S cards. See the *Sun FSBE/S SBus Card Manual*, or “Connecting the External Drives” in Chapter 3 of this manual for details.

6. Set the SCSI IDs on the new disk drives such that they do not conflict with devices already on the same SCSI chain. In the case of a normal external disk unit, a rotary switch on the rear of the unit sets the SCSI ID.
7. Turn on the power to the system units, in the opposite order in which you powered them off.

Note

Power on the SCSI devices first, starting with the device at the end of the chain and working toward the system unit. Then power on other devices, again working toward the system unit. Then power on the system unit itself and, finally, the system monitor.

When you power on the system unit, the system begins to boot. Interrupt the boot by entering **Stop** **A**. The system responds:

```
ok
```

8. To verify that the system sees all SCSI devices, including the new disk drive, enter the following command:

```
ok probe-scsi-all
```

The system responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012
ok
```

Note

The actual devices listed depends on the devices installed on the SCSI bus (see Table 9-20 below).

Table 9-20: SCSI Information for External Disks (Systems running *Solstice DiskSuite* Software)

Device	Disk	Target	Unit	File System
c0t2d0s0	3	2	0	overlap
c0t0d0s0	4	0	0	overlap
c1t1d0s0	5	1	1	overlap
c1t2d0s0	6	2	1	overlap
c1t3d0s0	7	3	1	overlap
c1t4d0s0	8	4	1	overlap
c2t1d0s0	9	1	2	overlap
c2t2d0s0	10	2	2	overlap
c2t3d0s0	11	3	2	overlap
c2t4d0s0	12	4	2	overlap

9. Enter the following command:

```
ok boot -r
```

The system responds:

```
Boot device ...
.
.
.
Configuring the /dev directory
Configuring the /dev directory (compatibility devices)
The system is coming up. Please wait.
checking filesystems
/dev/rdisk/c0t1d0s0:      is clean
/dev/rdisk/c0t3d0s5:      is clean
.
.
.
/dev/rdisk/c0t1d0s1 mounted
/dev/rdisk/c0t3d0s5 mounted
/dev/rdisk/c0t1d0s0 mounted
.
.
.
Starting terminal server network daemons.
Network Terminal Server daemon(s) startup complete.
The system is ready.

hostname console login:
```

10. Log in as *root*.

You may now format and partition the disks.

Formatting and Partitioning the Disks

To format and partition the disks, do the following steps:

1. At the system prompt, enter the format command:

```
# format
```

The following appears:

```
Searching for disks ... done
```

AVAILABLE DISK SELECTIONS:

- 0. c0t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@1,0
- 1. c0t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@2,0
- 2. c0t3d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@3,0
- 3. c1t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@1,0
- 4. c1t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
/iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@2,0

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

Note

Be careful to specify the number that exactly matches the disk you are adding. See Table 9-20 on page 9-122 for more information.

2. Enter the number that corresponds to the disk you added.

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

The system displays the disk you are adding (for example, c1t1d0 for disk 5) and the format menu:


```
selecting c1t1d0
```

```
FORMAT MENU:
```

```
disk  
type  
partition  
current  
format  
repair  
label  
analyze  
defect  
backup  
verify  
save  
inquiry  
volname  
quit
```

```
format>
```

3. At the format> prompt, enter format.

The system responds:

```
Ready to format. Formattting cannot be interrupted  
and takes 23 minutes (estimated). Continue?
```

4. Enter y. The system responds:

```
Beginning formatting. The current time is <date>.  
Formatting...
```

5. Wait for the disk to format and verify the media. When the disk is formatted, the system displays:

```
done.  
  
Verifying media..  
    pass 0 - pattern = 0xc6dec6de  
    2035/12/18  
    pass 1 - pattern = 0x6db6db6d  
    2035/12/18  
  
Total of 0 defective blocks repaired.  
format>
```

6. At the `format>` prompt, enter the `partition` command.

```
format> partition
```

The program displays a confirmation message and the Partition menu.

```
***Do not format the drive, it is formatted already***
```

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
quit
```

```
partition>
```

7. At the `partition>` prompt, enter the `print` menu option to check the default partition table.

```
partition> print
```

The system displays the default partition table, for example, the table for a 2.1-GB disk could look like this:

```
Current partition table (original):
```

```
Total disk cylinders available: 2733 + 2 (reserved cylinders)
```

Part	Tag	Flag	Cylinders	Size	Blocks
0	unassigned	wm	0 - 1	1.48MB	(2/0/0)
1	unassigned	wm	2 - 2732	1.98GB	(2731/0/0)
2	backup	wm	0 - 2732	1.98GB	(2733/0/0)
3	unassigned	wm	0	0	(0/0/0)
4	unassigned	wm	0	0	(0/0/0)
5	unassigned	wm	0	0	(0/0/0)
6	unassigned	wm	0	0	(0/0/0)
7	unassigned	wm	0	0	(0/0/0)

You may have to set up the partitions on the external disks you added. Table 9-21 lists the partitioning information for both 2.1- and 1.05-GB external disks.

Table 9-21: Partitioning Information for External Disks

Partitions	Partition ID Tag	Partition Permission Flags	2.1-GB Disk		1.05-GB Disk	
			Start Cylinder	Size (Cylinders)	Start Cylinder	Size (Cylinders)
0	unassigned	wm	0	2	0	2
1	unassigned	wm	2	2731	2	2034
2	backup	wm	0	2733	0	2036
3-7	unassigned	wm	0	0	0	0

8. At the `partition>` prompt, enter `0`.

```
partition> 0
```

The system responds:

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

9. Enter `un` for unassigned.

The system responds:

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

10. Enter `wm` to indicate that the partition is writable and mountable.

The system responds:

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

11. Enter `0` as the starting cylinder. The system responds:

```
Enter partition size [205632b, 204c, 100.41mb]:
```

12. Enter `2c` for the size of the partition (see Table 9-21).

The system responds with the `partition>` prompt.

13. At the `partition>` prompt, enter 1.

```
partition> 1
```

14. Enter `un` for the partition ID tag, `wm` for the partition permission flags, and 2 as the starting cylinder.

15. Enter the size of the partition (see Table 9-21).

```
Enter partition size [133056, 132c, 64.9mb]:
```

16. At the `partition>` prompt, enter the `print` menu option to verify that the partition table is accurate (see Table 9-21).

```
partition> print
```

Note

If partitions 3 through 7 have cylinders assigned, zero them out. **Do not** zero out partition 2, leave it as the whole disk.

17. At the `partition>` prompt, enter the `label` menu option.

```
partition> label
```

18. To label the disk, enter `y` at the message prompt.

```
partition> label
Ready to label disk, continue: y
```

The system responds:

```
partition>
```

Note

If you added more than one disk drive to your system, repeat steps 1 through 18 for each drive.

19. Exit the partition menu by entering `q` at the `partition>` prompt and `q` at the `format>` prompt. The system prompt returns.

```
partition> q
format > q
#
```

20. If cms is running, stop it by running cmsadm and executing the run_cms option.

```
# cmsadm
Lucent Technologies CentreVu(TM) Call Management System
Select a command from the list below.
  1) acd_create   Define a new ACD
  2) acd_remove  Remove all administration and data for an /
  3) backup       Filesystem backup
  4) diskmap     Estimate disk requirements
  5) memory      Estimate memory requirements
  6) realtime    Estimate real-time report refresh rate
  7) pkg_install Install a feature package
  8) pkg_remove  Remove a feature package
  9) run_cms     Turn CentreVu on or off
Enter choice (1-9) or q to quit: 9

Select one of the following
  1) Turn on CMS
  2) Turn off CMS
Enter choice (1-2): 2

*** Turning off CMS, Please wait ***
. . .
*** CMS is now off
#
```

Note

It is important that CMS be turned off for the remaining steps. If it is on, anyone trying to write to the filesystem will receive multiple error messages.

21. Determine the current size of the /cms file system. You can do that by entering a `df -k` command. The system responds by listing the current file systems. For example:

```
# df -k /cms

Filesystem      kbytes    used    avail  capacity Mounted on
/dev/dsk/c0t3d0s0  xxxxxx  310956  xxxxxx    45%    /
/proc           0         0         0         0%    /proc
fd              0         0         0         0%    /dev/fd
/dev/md/dsk/d19   xxxxxx     9    xxxxxx     0%    /cms

#
```

The operative figures are the “kbytes” and “available” figures for the / and /cms file systems, shown here as “xxxxxx.” Divide each of those numbers by 1000, and record the results. You will use them later to verify that the figures have increased as a result of adding a disk drive.

22. Check disk partitioning by running the `olds checkdisk` script:

```
# /olds/olds -checkdisk <device>
.
.
#
```

Note

The value you enter for *<device>* varies depending on the disk you added (see Table 9-20).

23. Create a new `md.tab` file by running the `olds mk_files` script:

```
# /olds/olds -mk_files <device>
.
.
.
#
```

When the system prompt reappears, check to make sure that all the disk drives on your system have been recognized. To do that, read the file `/olds/md.tab.new` into an editor. Find the `#/cms` section; it should reflect the precise number of disk drives on your system. The example below, for instance, shows three disk drives on the system:

```
# vi /olds/md.tab.new

<contents of the file is displayed>

.
.
.
#/cms
d19 3 1 /dev/dsk/c0t1d0s1 1 /dev/dsk/c0t3d0s3 1 /dev/dsk/c0t2d0s1
```

If there is a discrepancy, complete the following steps; otherwise, go to step 24.

- a. Reboot the system with an `init 0` command. The system reboots and displays the ok prompt:

```
# init 0
.
.
.
ok
```

- b. Do the following in sequential order:
1. Turn off the system unit.
 2. Turn off the system monitor.
 3. Turn off all external devices starting with the device closest to the system unit and working toward the farthest device.
- c. Check all disk drive connections to make certain they are secure. Also check the SCSI IDs on the disk drives to make sure no two drives on the same SCSI chain have the same IDs. (A normal external disk unit has a rotary switch on the rear of the unit that sets the SCSI ID.)
- d. Turn on the power to the system units in the opposite order in which you powered them off.

Power on the SCSI devices first, starting with the device at the end of the chain and working toward the system unit. Then power on other devices, again working toward the system unit. Then power on the system unit itself and, finally, the system monitor.

When you power on the system unit, the system begins to boot. Interrupt the boot by entering **Stop** **A**. The system responds:

```
ok
```

- e. To verify that the system sees all SCSI devices, including the new disk drive, enter the following command:

```
ok probe-scsi-all
```

The system responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
  .
  .
  .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012
ok
```

- f. When you have verified that the system is recognizing all its disk drives, enter the following command:

```
ok boot -r
```

The system responds:

```
Boot device ...
.
.
.
Configuring the /dev directory
.
.
.
/dev/rdisk/c0t1d0s1 mounted
.
.
hostname console login:
```

- g. Log in as *root*, and press **Return**. The system displays the last login on the console (same date and time) and returns you to the system prompt. For example:

```
Sun Microsystems Inc. SunOS 5.2 Generic November 1995
#
```

- h. Repeat steps 22 and 23.

24. Attach the new disk and grow the /cms file system by running the olds setup script:

```
# /olds/olds -setup <device>
```

Note

The value you enter for *<device>* varies depending on the disk you added (see Table 9-20).

The system responds with a series of system messages reflecting the disk drive setup process, eventually reporting success. For example:

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

re-adding swap files

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

25. Check to make sure that the new disk was indeed attached. You can do that by executing a `df -k` command on the `/cms` file system, and doing some quick math on the result. For example:

```
# df -k /cms

Filesystem            kbytes    used    avail  capacity  Mounted on
/dev/dsk/c0t3d0s0      xxxxxx   310956   xxxxxx     45%      /
/proc                  0         0         0         0%      /proc
fd                     0         0         0         0%      /dev/fd
/dev/md/dsk/d19        xxxxxx     9   xxxxxx     0%      /cms

#
```

The `/` and `/cms` “kbytes” and “avail” figures (shown here as “xxxxxx”) are the critical numbers. Divide each one by 1000 to determine the size, in megabytes, of your newly expanded disk drive system.

Compare these new numbers to the ones you recorded in step 21.

The numbers should have increased as the result of adding the disk drives. For each 2.1-GB disk that you add, you should gain about 998 MB of space; for each new 1.05-GB disk, about 109 MB.

26. Finish off the procedure by rebooting the system:

```
# init 6
```

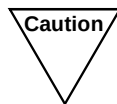
27. Start CMS (type a `cmssvc` or `cmsadm` command, and select the Run CMS option).

Recovering System Space

This section describes how to regain system space and *CentreVu* CMS file system space.

Regaining System Space

When the amount of *CentreVu* CMS data to save is reduced, data stored in *INFORMIX*-SQL tables will still use the original amount of space. The *INFORMIX*-SQL tables must be removed and re-created to regain the system space. There are two ways to remove the *INFORMIX*-SQL tables and regain the system space, as explained in the following two sections.



Only **TSC PERSONNEL** should perform the procedures in this section.

Reinitializing *CentreVu* CMS

One option is to reinitialize the *CentreVu* CMS database tables which you can do in the following manner:

1. Reduce the amount of historical data saved by making changes in the Data Storage Allocation window.
2. Run the daily, weekly and/or monthly archiver.

The tables now contain the correct amount of data. When the archiver runs, it cleans up the data that is older than the new values you entered in Step 1. You may let the archiver(s) run automatically for the day, week, or month, or you may manually run the archiver(s) as follows:

- If the amount of *intra-hour* data was reduced:

Manually run the daily archiver for the previous day.

OR

Let the daily archiver run automatically at the end of the current day.

- If the amount of *daily* data was reduced:

Manually run the daily archiver for the previous day.

OR

Let the daily archiver run automatically at the end of the current day.

- If the amount of weekly data was reduced:
Manually run the weekly archiver for the previous week.
OR
Let the weekly archiver run automatically at the end of the current week.
 - If the amount of monthly data was reduced:
Manually run the monthly archiver for the previous month.
OR
Let the monthly archiver run automatically at the end of the current month.
3. Perform a full *CentreVu* CMS Maintenance backup.
 4. Print the following CMS windows:
 - Data Storage Allocation
 - Free Space Allocation
 - Storage Intervals
 - Switch Setup.
 5. Run the CMSSVC set up option to reinitialize the *CentreVu* CMS database. Use the printouts obtained in step 4 and verify that the *CentreVu* CMS software has the same configuration as it did before setup was run.
 6. Restore the *CentreVu* CMS from the *latest CentreVu* CMS maintenance backups. This restore loads the *CentreVu* CMS data up to the time of the last *CentreVu* CMS backup. See the “Performing a *CentreVu* CMS Maintenance Restore” section in this chapter.
 7. Stop and start *CentreVu* CMS when the *CentreVu* CMS maintenance restore is finished. To start and stop the *CentreVu* CMS, see the “run_cms” section in Chapter 2, “CMSADM and CMSSVC Menus,” for details.

Re-creating Specific Tables

Another option is to manually remove and rebuild specific database tables, which you can do in this manner:

1. Perform Steps 1 and 2 of the previous section “Reinitializing *CentreVu* CMS” on page 9-133.
2. Perform a full *CentreVu* CMS maintenance backup.

3. Save the schemas of the historical database tables for which the amount of data to save was reduced. Do this in the following manner:

- a. Log in as *root*.

- b. Enter the following:

```
DBPATH=/cms/db/inf;export DBPATH
```

- c. Change to the directory where you want to place a file. For example, enter the following:

```
cd /export/home/cmssvc
```

- d. Use the following command to save the database table schema(s):

```
/usr/informix/bin/dbschema -t <tablename> -d  
cms -p all <table.sql>
```

This command produces an SQL command file (such as *table.sql*) that contains the necessary statements required to create the database table.

Note

You must supply the two arguments enclosed in brackets above. The two arguments are defined as follows:

- *-t <tablename>* is the *INFORMIX* database table name of the table that has had its size reduced.
- *<table.sql>* is the file name where the SQL commands are written. The suffix “.sql” should be used for the output file name to simplify creating the database tables. This file is placed in the directory where the *dbschema* command is executed.

Caution

If the *-t <tablename>* option is omitted, **all** the schemas for **all** the database tables in the database are saved.

4. Note the file system of *CentreVu* CMS data. Output from the *dbschema* command does not contain the file system/directory of the database table. The file produced by the *dbschema* command must be edited, and the correct path must be added to the create table statement(s). Even if the historical data is in the */cms* file system, the historical database tables are located in the */cms/cmstable*s directory. Historical data includes any of the following:

- Trunk group

- Agent trace
- Exceptions
- Call work codes
- Forecasting
- Trunks
- Agents
- Splits
- Vectors
- VDNs
- Call records
- Login/logout

If historical data is stored in the */cms1* file system, then the database tables are in the */cms1/cmstables* directory.

Following is an example of the dtrunk schema edited for the */cms1* file system:

```
{root is owner of table dtrunk}
create table dtrunk
(
  row_date date,
  acd smallint,
  eqloc char(9),
  incalls integer,
  intime integer,
  abncalls integer,
  o_abncalls integer,
  outcalls integer,
  outtime integer,
  failures integer,
  audio integer,
  mbusytime integer,
  acdcalls integer,
  othercalls integer,
  shortcalls integer,
```

```

o_acdcalls integer,
o_othercalls integer,
incomplete smallint
) in "/cms1/cmstables/dtrunk";
{root is owner of index dtk_ndx1}
create index dtk_ndx1 on dtrunk (row_date,eqloc,tkgrp);
revoke all on dtrunk from public;
grant dba to root;
grant resource to public;
grant insert on dtrunk to public;
grant delete on dtrunk to public;
grant index on dtrunk to public;
grant select on dtrunk to public;
grant update on dtrunk to public;

```

In this example, the statement in bold is what you add to the schema.

5. Turn off *CentreVu* CMS by using the `run_cms` option on either the CMSADM or CMSSVC menu. See Chapter 2, "CMSADM and CMSSVC Menus" for details.
6. Remove (drop) the database tables for which the administration changes were made by doing the following:
 - a. Enter the command:


```
/usr/informix/bin/dbaccess
```

 The dbaccess main menu appears.
 - b. Select `Table` from the main menu.
 - c. Select `Drop` from the `Table` menu.

You are prompted for a table name to drop.
 - d. Enter the table name you want dropped.
 - e. Select `Exit` to exit the `Table` menu.
7. Create the database tables in the correct directory as follows:
 - a. Select `Query-Language` from the dbaccess main menu.

You are prompted for the database name.
 - b. Enter `cms`.
 - c. Select `Choose` from the menu.

A list of the `.sql` files on the file system (such as your work directory) is displayed.

- d. Select a file.
 - e. Select `Run` to execute the commands in the file to create the database tables(s).
 - f. Select `Exit` to exit the `Query Language` menu.
 - g. Select `Exit` (to exit `dbaccess`) when all the database tables have been created.
8. Turn on *CentreVu* CMS by using the `run_cms` option on either the `CMSADM` or `CMSSVC` menu. See Chapter 2, “`CMSADM` and `CMSSVC` Menus” for details.
 9. Perform a *CentreVu* CMS restore for all ACDs to restore the historical data into the *CentreVu* CMS database tables. If the *CentreVu* CMS full maintenance backup uses more than one tape, an automatic *CentreVu* CMS restore is most efficient. The automatic restore prompts for the necessary tapes to restore the historical data. You have the following options:
 - Use the `specific tables` option to restore data for specific database tables. This will save time if only one type of data is being changed.
 - Restore historical data using the `Start date` and `Start time` input fields in the `Restore Data` window to restore data from a specific period of time.

Recovering *CentreVu* CMS File System Space

When you log into the system as a *CentreVu* CMS user, a program is executed that checks the free blocks available to `/`, `/usr`, and the various *CentreVu* CMS-related file systems located on the hard disks. If one of these file systems has less than 5000 but more than 1000 free blocks, a message similar to the following will be displayed on your terminal screen:

```
WARNING: File system, "<file system>", has only "<XXXX>"  
blocks free.
```

When this message occurs, file system maintenance must be done as soon as possible to keep the file system from running out of free blocks.

If one of these file systems has less than 1000 free blocks, a message similar to the following will be displayed:

```
*****
* CAUTION CAUTION CAUTION CAUTION CAUTION *
*                                           *
*                                           *
*                                           *
* File system, "<file system>", has only "<XXXX>" *
* blocks free.                             *
*****
```

When these messages occur, the file system is almost out of free blocks, and the *CentreVu* CMS software application can shut down at any time.

To reallocate space, use the Free Space Allocation window located in the System Setup subsystem. See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document for details. Read the “Things to Know Before You Start” and “Prerequisite System Administration” sections in this chapter before changing any fields in the window.

Adding Memory

To add more memory to a *Sun SPARCserver* computer that is already up and running, do the following:

1. Make sure the system is in the firmware mode by using the `init 0` command to get to the `ok` prompt.
2. Do the following in sequential order:
 - a. Turn off the *Sun SPARCserver* computer.
 - b. Turn off the system monitor.
 - c. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
3. Install the DSIMM into the *Sun SPARCserver* computer using the procedures described in the “Installing the DSIMMs” section of Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.”
4. Do the following in sequential order:
 - a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
 - b. Turn on the *Sun SPARCserver* computer.
 - c. Turn on the system monitor.
5. Boot the system.

```
ok boot -r
```

6. After the machine is booted, log in as *root*.
7. Enter the `prtconf` command, and verify that the displayed memory size is correct.

```
# prtconf | grep Memory  
  
Memory size: xx Megabytes
```

After you have added memory to your system, you may need to configure additional swap space. To find out whether you do, first

determine how your system is partitioned. (See the “Disk Recovery Overview” section in this chapter. In addition, note whether disk 1 is a 2.1-GB disk or a 1.05-GB disk.) Then use the following table to determine what to do next:

Table 9-22: Swap Space Decision Table

System Type	Condition	Action
Two-system disks	-	STOP. No changes to swap space are needed.
One-system disk	RAM = 96MB or less	STOP. No changes to swap space are needed.
	Disk 1 = 2.1 GB (swap space is on disk 1)	See the “Partitioning Swap Space on Disk 1” section on page 9-141.
	Disk 1 = 1.05 GB (swap space is on disk 2)	See the “Partitioning Swap Space on Disk 2” section on page 9-149.
System with <i>Solstice</i> <i>DiskSuite</i> Software	-	See “Adding Swap Space to a System with Solstice DiskSuite Software Installed” on page 9-154..

Partitioning Swap Space on Disk 1

This section describes how to change the swap space on disk 1. If you change the swap space, you will also have to change the space allocated to /cms. Swap and /cms are mounted on partitions 6 and 7 on a 2.1-GB disk 1.

1. Determine the amount of swap space configured on your machine by entering the following command:

```
# format
```

The system responds:

```
Searching for disks ... done
```

```
AVAILABLE DISK SELECTIONS:
```

```
0.  c0t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@1
,0
1.  c0t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@2
,0
2.  c0t3d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@3
,0
3.  c1t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@1,0
4.  c1t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@2,0
Specify disk (enter its number):
```

2. Enter the number for disk c0t3d0 (for example, 2).
3. At the format> prompt, enter the following:

```
format> partition
```

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

```
partition> print
```

5. Compare the displayed cylinder values for partitions 6 and 7 with the required values listed in Table 9-23.

Table 9-23: Partitioning Swap Space on Disk 1 - (Disk 1 = 2.1-GB)

If equipped RAM (in MB) is:		Partition	File System	Size (Cylinders)	Approximate Kilobytes
more than	but less than or equal to				
0	64	6	swap	181	
		7	/cms	1470	763700
64	192	6	swap	543	
		7	/cms	1108	575400
192	320	6	swap	906	
		7	/cms	745	386400
320	512	6	swap	1268	
		7	/cms	383	198800

6. Enter q at the partition> and format> prompts to return to the system prompt.

```
partition> q
format> q
#
```

If your current partitioning is correct (see Step 5), all the activities required to install the additional memory are complete. If your current partitioning on disk 1 is not correct, continue.

7. Reduce the amount of data stored in /cms so that disk 1 may be repartitioned. Use the df command to determine the kilobytes currently used in /cms.

```
# df -k /cms
```

```
Filesystem      Kbytes   Used Avail Capacity  Mounted On
/dev/dsk/c0t3d0s0  xxx     xxx   xxx    xxx      /cms
```

8. If the number of kilobytes used in /cms are larger than the "Approximate Kilobytes" column in Table 9-23, use the *CentreVu* CMS Free Space Allocation window to move data out of the /cms file system. The kilobytes used as reported by the df command

must be less than the “Approximate Kilobytes” for the repartitioned /cms before you proceed.

Note

If your system does not have available file system space, you may need to add an additional SCSI hard disk to store data moved from /cms.

9. Turn off *CentreVu* CMS using the cmsadm command.
10. Perform a cmsadm file system backup. See “Performing Backups and Restores” section in this chapter. This backup will be needed to restore the /cms file system after disk 1 has been repartitioned.
11. Unmount the /cms file system with the following command:

```
# umount /cms
```

Partitioning Disk 1

To partition disk 1, do the following steps:

1. At the system prompt, enter the following command:

```
# format
```

The system responds:

```
Searching for disks ... done
```

```
AVAILABLE DISK SELECTIONS:
```

```
  0.  c0t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
      /iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@1
,0
  1.  c0t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
      /iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@2
,0
  2.  c0t3d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
      /iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@3
,0
  3.  c1t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
      /iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@1,0
  4.  c1t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
      /iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@2,0
Specify disk (enter its number):
```

2. Enter the number for disk c0t3d0 (for example, 2).
3. At the `format>` prompt, enter the following:

```
format> partition
```

The program displays a confirmation message and the Partition menu.

```
***Do not format the drive, it is formatted already***
```

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
quit
```

```
partition>
```

4. At the `partition>` prompt, enter 6.
5. Enter `swap` for the partition ID tag, `wu` for the partition permission flags, the starting cylinder, and the size. See Table 9-24.
6. At the `partition>` prompt, enter 7.
7. Enter `un` for the partition ID tag, `wm` for the partition permission flags, the starting cylinder, and the size. See Table 9-24.



Do not change partitions 0 through 5. If you do, disk corruption may occur when you enter the `label` command in Step 11.

Table 9-24: Partitioning a 2.1-GB Disk 1 - Partitions 6 and 7

If equipped RAM in (MB) is:		Partition	Partition ID Tag	Partition Permission Flags	Start Cylinder	Size (Cylinders)
more than	but less than or equal to					
0	64	6	swap	wu	1082	181
		7	unassigned	wm	1263	1470
64	192	6	swap	wu	1082	543
		7	unassigned	wm	1625	1108
192	320	6	swap	wu	1082	906
		7	unassigned	wm	1988	745
320	512	6	swap	wu	1082	1268
		7	unassigned	wm	2350	383

8. At the `partition>` prompt, enter the print menu option to verify that the partition table is accurate.

```
partition> print
```

9. At the `partition>` prompt, enter the name menu option.

```
partition> name
```

10. Enter `"cms"` for the *table name*.

```
partition> name
Enter table name (remember quotes): "cms"
```

11. At the `partition>` prompt, enter the label menu option.

```
partition> label
```

12. To label the disk, enter y at the message prompt.

```
partition> label  
Ready to label disk, continue: y
```

The system responds:

```
partition>
```

13. To exit the partition menu, enter q at the `partition>` prompt and q at the `format>` prompt. The system responds:

```
partition> q  
format > q  
#
```

Creating and Mounting the /cms File System

To recreate and remount the /cms file system, do the following:

1. Enter the following command at the system prompt:

```
# newfs -m 0 /dev/rdisk/c0t3d0s7
```

The system responds:

```
# newfs -m 0 /dev/rdisk/c0t3d0s7  
newfs: construct a new file system /dev/rdisk/c0t3d0s7: (y/n)?
```

2. At the message prompt, enter y. The system responds:


```
/dev/rdisk/c0t3d0s7: ...  
.  
.  
.  
#
```

3. At the system prompt, enter the following command:

```
# mountall
```

The system displays all the file systems mounted.

4. To verify that all file systems are mounted properly, check the displayed response, and resolve any problems.
5. Restore the contents of the /cms file system using the cpio commands.

```
# ulimit unlimited  
# cpio -icumd -C 10240 -I <device name> -M  
"Please remove the current tape, insert tape number %d, and  
press Enter" "/cms"
```

Note

You must substitute one of these device names for *<device name>* in the cpio command:

/dev/rmt/0 Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

/dev/rmt/1 Indicates the tape drive with the second lowest target number in the SCSI chain.

/dev/rmt/0c Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

/dev/rmt/1c Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

6. Turn on *CentreVu* CMS using the `cmsadm` command.

You should perform a CMSADM file system backup to save the updated system software and hardware configuration. See the “Performing a CMSADM File System Backup” section in this chapter.

Partitioning Swap Space on Disk 2

This section describes how to change the swap space on disk 2. If you change the swap space, you will also have to change the space allocated to `/cms1`. Swap and `/cms1` are mounted on partitions 0 and 1 on disk 2.

Note

If additional swap space is required on disk 2, but disk 2 is not installed, then you need to install, format, and partition disk 2. In addition, you need to create and mount a `/cms1` file system on disk 2.

Use the procedures in the “Adding SCSI Hard Disk Drives - Disk 2 (One-System Disk)” section of this chapter (page 9-41 through page 9-52) instead of the procedures described here.

1. Determine the amount of swap space configured on your machine using the following command:

```
# format
```

The system responds:

```
Searching for disks ... done
```

```
AVAILABLE DISK SELECTIONS:
```

```
0.  c0t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@1
,0
1.  c0t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@2
,0
2.  c0t3d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/espdma@f,800000/sd@3
,0
3.  c1t1d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@1,0
4.  c1t2d0 <SUN1.05 cyl 2036 alt 2 hd 14 sec 727
    /iommu@f,e0000000/sbus@f,e0001000/dma@1,81000/sd@2,0
Specify disk (enter its number):
```

2. Select the disk 2 (c0t1d0).
3. At the format> prompt, enter the following:

```
format> partition
```

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

```
partition> print
```

5. Compare the displayed cylinder values for partitions 0 and 1 with the required values listed in Table 9-25.

Table 9-25: Internal Disk 2 (c0t1d0) - Partition Information

If equipped RAM (in MB) is:		Partition	File System	2.1-GB Disk 2		1.05-GB Disk 2	
more than	but less than or equal to			Size (Cylinders)	Approximate Kilobytes	Size (Cylinders)	Approximate Kilobytes
0	96	0	/cms1	2733	1419600	2036	701400
		2	backup	2733		2036	
96	160	0	/cms1	2473	1284500	1776	611800
		1	swap	260		260	
		2	backup	2733		2036	
160	224	0	/cms1	2213	1149400	1516	522200
		1	swap	520		520	
		2	backup	2733		2036	
224	288	0	/cms1	1953	1014300	1256	432600
		1	swap	780		780	
		2	backup	2733		2036	
288	352	0	/cms1	1693	879200	996	343000
		1	swap	1040		1040	
		2	backup	2733		2036	
352	416	0	/cms1	1433	744100	736	253400
		1	swap	1300		1300	
		2	backup	2733		2036	
416	512	0	/cms1	1173	609000	476	163800
		1	swap	1560		1560	
		2	backup	2733		2036	

6. Enter quit at the partition> and format> prompts to return to the system prompt.

```
partition> quit
format> quit
#
```

If your current partitioning is correct (see Step 5), all the activities required to install the additional memory are complete. If your current partitioning on disk 2 is not correct, continue.

7. Reduce the amount of data stored in /cms1 so that disk 2 may be repartitioned. Use the df command to determine the K-bytes currently used in /cms1.

```
# df -k /cms1
```

Filesystem	Kbytes	Used	Avail	Capacity	Mounted On
/dev/dsk/c0t3d0s0	xxx	xxx	xxx	xxx	/cms
or					
/dev/dsk/c0t1d0s0	xxx	xxx	xxx	xxx	/cms1

8. If the number of kilobytes used in /cms1 are larger than the “Approximate Kilobytes” column in Table 9-25, use the *CentreVu* CMS Free Space Allocation window to move data out of the /cms1 file system. The kilobytes used as reported by the df command must be less than the “Approximate Kilobytes” for the repartitioned /cms1 before you proceed.

Note

If your system does not have available file system space, you may need to add an additional external SCSI hard disk to store data moved from /cms1.

9. Turn off *CentreVu* CMS using the cmsadm command.
10. Perform a cmsadm file system backup. See “Performing Backups and Restores” section in this chapter. This backup will be needed to restore the /cms1 file system after disk 2 has been repartitioned.
11. Unmount the /cms1 file system with the following command:

```
# umount /cms1
```

12. Now, you need to repartition the disk and create the /cms1 file system. You also need to inform the *Solaris* operating system about the additional swap space.

See the “Partitioning Disk 2” section in this chapter for procedures on partitioning disk 2.

See the “Constructing a New File System Disk 2” and “Mounting the File System Disk 2” sections in this chapter for procedures on creating and mounting the /cms1 file system.

See the “Setting Up Swap Space Disk 2” section of this chapter for procedures on informing *Solaris* about the additional swap space.

13. Use the mount command to verify that the /cms1 file system is mounted.

```
# mount | grep /cms1
```

The system responds:

```
/cms1 on /dev/dsk/c0t1d0s0...
```

14. Restore the contents of the /cms1 file system using the cpio commands.

```
# ulimit unlimited
# cpio -icumd -C 10240 -I <device name> -M
"Please remove the current tape, insert tape number %d, and
press Enter" "/cms1"
```

Note

You must substitute one of these device names for *<device name>* in the `cpio` command:

`/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

`/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

`/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

`/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

15. Turn *CentreVu* CMS on using the `cmsadm` command.

You should perform a CMSADM file system backup to save the updated system software and hardware configuration. See the “Performing a CMSADM File System Backup” section in this chapter.

Adding Swap Space to a System with *Solstice DiskSuite* Software Installed

A system that uses *Solstice DiskSuite* software to manage disk space maintains its swap space in a file whose size depends entirely upon the amount of RAM installed on the system. If you add memory, you must also increase the size of the swap file. Follow the steps below.

1. Determine the amount of memory in your system with a `prtconf | grep Mem` command. The system responds by displaying the amount of RAM installed. For example:

```
# prtconf | grep Mem
Memory size: 224 Megabytes
#
```

2. Determine the required size of your swap file by looking in this table:

Table 9-26: Swap File Size

If megabytes of RAM is at least...	... but not more than...	... your swap file must be this size:
0	32	61
33	64	122
65	96	183
97	128	244
129	160	305
161	192	366
193	224	427
225	256	488
257	320	610
321	384	732
385	448	931
449	512	977

3. Determine whether your system already has swap space set up for it. To do that, enter the command:

```
# swap -l
```

The system responds by listing the currently active swap files, if any. If any swap file names are listed, you must delete them with the following procedure:

- a. Enter the following two commands for *each* swap file listed:

```
# swap -d <swap file name>
# rm <swap file name>
```

- b. Edit the file `/etc/vfstab` and comment out all entries pertaining to the listed swap files.
- c. Reboot the system with an `init 6` command.

4. Determine whether you have enough space to set up the new swap file. You can do that by entering the following command:

```
# df -k /cms
```

The system responds by displaying a file system table for /cms.

```
Filesystem      kbytes    used   avail  capacity  Mounted on
/dev/md/dsk/d19 10811937    9    xxxxx     0%      /cms
```

Divide the “avail” number by 1000. The result of the division must be greater than the swap file size from Table 9-26. If it is not, you will have to delete files from /cms until you have enough space to set up your swap file.

5. Create the swap file by entering:

```
# mkfile <x>m /cms/swap
```

where <x> is the swap file size from Table 9-26. So, for example, for a system with 224MB of RAM, the command would look like this:

```
mkfile 427m /cms/swap
```

(If the table does not list your RAM size, round up.)

6. Allocate space for the swap file by entering the command:

```
# swap -a /cms/swap
```

7. Edit the /etc/vfstab file.

```
# vi /etc/vfstab
```

Go to the end of the file and uncomment the following swap file entry you commented out earlier:

```
/cms/swap    -    -    swap    -    no    -
```

Save the file and exit vi.

8. Reboot the system by entering the command:

```
# init 6
```

9. When the reboot completes, verify that the space has been allocated by entering:

```
# swap -l
```

If the message “No swap devices configured” displays, repeat steps 6 through 9.

Installing an HSI/S Card

HSI/S cards allow the *CentreVu* CMS system to support up to four ACDs. To install an HSI/S card in the *Sun SPARCserver* computer, do the following:

1. Log into the system as root.
2. Turn off *CentreVu* CMS by using the *run_cms* option of the *cmssvc* command. See Chapter 2, “CMSADM and CMSSVC Menus” for details.
3. Remove the *CentreVu* CMS software using the *pkgrm* command. See the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-826) document.



Enter y when asked:

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

4. Shut the system down by using the *shutdown* command.

```
# shutdown -y -i0 -g0
```

5. Do the following in sequential order:
 - a. Turn off the *Sun SPARCserver* computer.
 - b. Turn off the system monitor.
 - c. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
6. Install the HSI/S card into the *Sun SPARCserver* computer by following the instructions described in the “Installing SBus Cards” section in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.”
7. Attach the HSI/S patch panel by following the instructions described in the “Connecting the *SunLink** HSI/S Patch Panel” section in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.”
8. Connect the switch links to the HSI/S patch panel by following the instructions described in Chapter 5, “Connecting the *Sun SPARCserver* Computer to the Switch.”

*SunLink is a registered trademark of Sun Microsystems, Inc.

Note

Do not use the “B” serial port to connect switch links when an HSI/S card is installed. All switch links must be connected to the HSI/S patch panel.

9. Do the following in sequential order:
 - a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
 - b. Turn on the *Sun SPARCserver* computer.
 - c. Turn on the system monitor.
10. Press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting.
11. Boot the system with the `-r` option so it will recognize the new HSI/S card:

```
ok boot -r
```

12. When the system comes back up, log in as root.
13. Enter the `pkginfo` command to see if there are any Aurora *Multiport* drivers installed on the system. For example:

```
# pkginfo
system      AURAcS      Aurora 400/800 S/SX/S+ device
              driver
system      AURAsio16   Aurora 1600 S/SM/SE device driver
application SUNWabe     Solaris 2.4 User AnswerBook
system      SUNWaccr    System Accounting, (Root)
.
.
.
```

Note

If the system has Aurora *Multiport* drivers installed, they will have to be removed before the HSI/S driver can be installed.

14. If Aurora *Multiport* drivers are installed, remove them using the `pkgrm` command:

```
# pkgrm AURAcS
and/or
# pkgrm AURAsio16
```

15. Remove all terminal and printer administration for the Aurora SBus *Multiport* cards by following the instructions in Chapter 4, “Installing Terminals, Printers, and Modems.”
16. Install the HSI/S software by following the instructions described in the “Installing the HSI/S (High-Speed Serial Interface/SBus) Software” section in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.”
17. Reinstall the Aurora *Multiport* drivers by following the instructions in the “Installing the Aurora SBus *Multiport* Software Driver” section in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.”
18. Readminister all terminals and printers on the Aurora SBus *Multiport* cards by following the instructions in Chapter 4, “Installing Terminals, Printers, and Modems.”
19. Install the *Solaris* patches package by following the instructions described in the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-826) document.
20. Install the *CentreVu* CMS software by following the instructions described in the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-826) document.
21. Change the switch link administration for ACD 1 by using the `cmssvc` command.

```
# cmssvc
```

22. The system responds:

CentreVu(TM) Call Management System Services Menu

Select a command from the list below.

- 1) auth_display Display feature authorizations
- 2) auth_set Authorize CMS capabilities/capacities
- 3) run_cms Turn CentreVu CMS on or off
- 4) setup Set up the initial configuration
- 5) swinfo Display switch information
- 6) swsetup Change switch information
- 7) upd_install Install update from disk files
- 8) upd_remove Back out the currently installed update
- 9) upd_save Save update on disk for later installation

Enter choice (1-9) or q to quit:

23. Select the swsetup option.
24. Select ACD 1.
25. Accept the existing defaults for the following:
 - Switch name
 - Switch model (release)
 - Vectoring
 - Expert agent
 - Central Office Disconnect Supervision
 - Local port
 - Remote port.
26. Select "HSI link 0" when prompted for the link information.
27. Perform a CMSADM file system backup to save the updated system software and hardware configuration. See the "Performing a CMSADM File System Backup."
28. Turn on *CentreVu* CMS using the run_cms option of the cmssvc command.

Changing the Date or Time

The switch time is displayed at the top of most *CentreVu* CMS screens.

Note

Changing the switch time may cause a small distortion in the *CentreVu* CMS data when the change is made. A small amount of data may also be lost when the change occurs. For example, if the *Solaris* system time is advanced, the switch connection is reestablished causing a small amount of data to be lost.

Changing the System Date and Time

Do these steps to change the *Solaris* system time:

1. Log in as *root*.
2. Change to an OpenBoot mode with the following command:

```
# init 0
.
.
.
```

3. At the ok prompt, enter the following command:

```
ok boot -s
.
.
.
Resetting...
Type Ctrl-d to proceed with normal startup
(or give root password for system maintenance):
```

4. Enter the *root* password.

The system responds:

```
Entering System Maintenance Mode
Enter Terminal Type: (default is 6300+):
```

5. At the prompt, enter the terminal type.

6. At *root*, enter the `date` command to set the time and date.

```
# date mmddHHMM[yy]
```

For example:

- **mm (month):** Enter the month (numeric). Range: 1-12 (1=January, 2=February, etc.).
 - **dd (day):** Enter the day of the month. Range: 1-31
 - **HH (hour):** Enter the hour of day, military time. Range: 00-23.
 - **MM (minute):** Enter the minute of the hour. Range: 00-59.
 - **[yy] (year):** Enter the last two digits of the year (96, for example, means 1996).
7. Set the time zone environment variable in the `/etc/default/init` file by doing the following:
- a. Examine the `/usr/share/lib/zoneinfo` directory for time zones. For more information about time zones, see the next section “Changing the System Country and Time Zones” in this chapter.
 - b. Edit the `/etc/default/init` file with a text editor (for example, `vi`).
 - c. Change the `/etc/default/init` file by using the `w!` command to overwrite the file.

Note

For more information, enter the `man date` command at the system prompt, or see *AnswerBook** on-line software.

* AnswerBook is a trademark of Sun Microsystems, Inc.

8. Return to a multi-user state with the following command:

```
# shutdown -i6 -g0 -y
```

Note

The `-i6` option of the `shutdown` command changes the system to a multi-user state.

Changing the System Country and Time Zones

To set the country and time zones, do the following:

1. At the console, exit the *OpenWindows*^{*} environment if it is currently running.
2. To initiate an OpenBoot mode, enter the following command:

```
# init 0
```

3. At the ok prompt, enter the following command:

```
ok boot -s
.
.
.
Resetting...
Type Ctrl-d to proceed with normal startup
(or give root password for system maintenance):
```

4. Enter the *root* password.

The system responds:

```
Entering System Maintenance Mode
Enter Terminal Type: (default is 6300+):
```

5. At the prompt, enter the terminal type.
6. Edit the */etc/default/init* file and set the TZ variable to equal the appropriate value in the */usr/share/lib/zoneinfo* directory. Then write and quit the file. For example:

^{*}OpenWindows is a trademark of Sun Microsystems, Inc.

```
# vi /etc/default/init
```

<contents of the file is displayed>

```
# @(#)init.dfl 1.2 92/11/26
#
# This file is /etc/default/init. /etc/TIMEZONE is a symlink to this file.
# This file looks like a shell script, but it is not. To maintain
# compatibility with old versions of /etc/TIMEZONE, some shell constructs
# (i.e., export commands) are allowed in this file, but are ignored.
#
# Lines of this file should be of the form VAR=value, where VAR is one of
# TZ, LANG, or any of the LC_* environment variables.
#
TZ=US/Mountain
```

← *This is the line you modify.*

As an example for Mountain Standard Time, the TZ variable can be set to MST or US/Mountain. The entry in the *init* file is essentially a relative path name from the */usr/share/lib/zoneinfo* directory. MST is a file in */usr/share/lib/zoneinfo*, and Mountain is a file in */usr/share/lib/zoneinfo/US*.

7. Reboot the machine using the following command:

```
# shutdown -i6 -g0 -y
```

Note

For more information, enter the `man date` command at the system prompt, or see *AnswerBook* on-line software.

Checking Installed Software Packages

To verify that the correct software packages have been installed, do the following steps:

1. Enter the following command at the system prompt:

```
# pkginfo | more
```

The system responds:

```
# pkginfo |more
application      SUNWabe      Solaris 2.4 User AnswerBook
system           SUNWaccr     System Accounting, (Root)
system           SUNWaccu     System Accounting, (Usr)
.
.
.
```

2. Check that all the software packages are installed by comparing the list generated by the pkginfo command to Table 9-27.

See Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures” for more information about installing *CentreVu* CMS software.

Table 9-27 lists all of the basic *Solaris* and *CentreVu* CMS software packages installed on a *Sun SPARCserver* computer.

Table 9-27: Installed *Solaris* and *CentreVu* CMS Software Packages

Type of Package	Package Name	Description
application	SUNWadm	<i>Solaris</i> 2.4 System Administrator <i>AnswerBook</i>
application	SUNWabe	<i>Solaris</i> 2.4 User <i>AnswerBook</i>
system	SUNWaccr	System Accounting, (Root)
system	SUNWaccu	System Accounting, (Usr)
system	SUNWaccu.2	System Accounting, (Usr)
system	SUNWaccu.3	System Accounting, (Usr)
system	SUNWadmap	System & Network Administration Applications

Table 9-27: Installed *Solaris* and *CentreVu* CMS Software Packages (Contd)

Type of Package	Package Name	Description
system	SUNWadmfw	System & Network Administration Framework
system	SUNWadmr	System & Network Administration Root
application	SUNWaman	<i>Solaris 2.4 Reference Manual AnswerBook</i>
system	SUNWaudio	Audio applications
application	SUNWax25x	<i>SunLink X.25 8.0.2 AnswerBook</i>
system	SUNWbcp	Binary Compatibility
system	SUNWbnur	Networking UUCP Utilities, (Root)
system	SUNWbnuu	Networking UUCP Utilities, (Usr)
system	SUNWbtool	CCS tools bundled with <i>SunOS</i>
system	SUNWcar	Core Architecture, (Root)
system	SUNWcar.2	Core Architecture, (Root)
system	SUNWcar.3	Core Architecture, (Root)
system	SUNWcar.4	Core Architecture, (Root)
system	SUNWcar.5	Core Architecture, (Root)
system	SUNWcar.6	Core Architecture, (Root)
system	SUNWcg6	GX (cg6) Device Driver
system	SUNWcg6.2	GX (cg6) Device Driver
system	SUNWcsd	Core <i>Solaris</i> Devices
system	SUNWcsr	Core <i>Solaris</i> , (Root)
system	SUNWcsr.10	Core <i>Solaris</i> , (Root)
system	SUNWcsr.11	Core <i>Solaris</i> , (Root)
system	SUNWcsr.12	Core <i>Solaris</i> , (Root)
system	SUNWcsr.13	Core <i>Solaris</i> , (Root)
system	SUNWcsr.2	Core <i>Solaris</i> , (Root)
system	SUNWcsr.3	Core <i>Solaris</i> , (Root)
system	SUNWcsr.4	Core <i>Solaris</i> , (Root)
system	SUNWcsr.5	Core <i>Solaris</i> , (Root)

Table 9-27: Installed *Solaris* and *CentreVu* CMS Software Packages (Contd)

Type of Package	Package Name	Description
system	SUNWcsr.6	Core <i>Solaris</i> , (Root)
system	SUNWcsr.7	Core <i>Solaris</i> , (Root)
system	SUNWcsr.8	Core <i>Solaris</i> , (Root)
system	SUNWcsr.9	Core <i>Solaris</i> , (Root)
system	SUNWcsu	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.10	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.11	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.12	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.13	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.14	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.15	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.16	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.2	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.3	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.4	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.5	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.6	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.7	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.8	Core <i>Solaris</i> , (Usr)
system	SUNWcsu.9	Core <i>Solaris</i> , (Usr)
system	SUNWdfb	Dumb Frame Buffer Device Drivers
system	SUNWdiag	Online Diagnostics Tool
system	SUNWdiag.2	Online Diagnostics Tool
system	SUNWdoc	Documentation Tools
system	SUNWesu	Extended System Utilities
system	SUNWfac	Framed Access Command Environment
system	SUNWhsis	HSI/S Driver/Utilities 2.0 v1.6

Table 9-27: Installed *Solaris* and *CentreVu* CMS Software Packages (Contd)

Type of Package	Package Name	Description
system	SUNWhsis.2	HSI/S Driver/Utilities 2.0 Patch 101130-04 v1.37
system	SUNWinst	Install Software
system	SUNWipc	Interprocess Communications
system	SUNWkvm	Core Architecture, (Kvm)
system	SUNWkvm.2	Core Architecture, (Kvm)
system	SUNWlibC	SPARCompilers Bundled libC
system	SUNWlibCf	SPARCompilers Bundled libC (cfront version)
system	SUNWlibms	SPARCompilers Bundled shared libm
application	SUNWlicsw	FlexLM License System
application	SUNWlit	STE License Installation Tool
application	SUNWllc2a	LLC2 kernel modules and include files for <i>Solaris/SPARC</i>
application	SUNWllc2b	LLC2 user programs and man pages for <i>Solaris/SPARC</i>
system	SUNWloc	System Localization
system	SUNWlpmsg	LP Alerts
system	SUNWlpr	LP Print Service, (Root)
system	SUNWlpr.2	LP Print Service, (Root)
system	SUNWlps	LP Print Service - Server, (Usr)
system	SUNWlps.2	LP Print Service - Server, (Usr)
system	SUNWlpu	LP Print Service - Client, (Usr)
system	SUNWlpu.2	LP Print Service - Client, (Usr)
system	SUNWman	On-Line Manual Pages
system	SUNWnistr	Network Information System, (Root)
system	SUNWnisu	Network Information System, (Usr)
system	SUNWolaud	<i>OpenLook</i> [*] Audio applications
system	SUNWolbk	<i>OpenWindows</i> online handbooks
system	SUNWoldcv	<i>OpenLook</i> document and help viewer applications
system	SUNWoldst	<i>OpenLook</i> deskset tools

Table 9-27: Installed *Solaris* and *CentreVu* CMS Software Packages (Contd)

Type of Package	Package Name	Description
system	SUNWoldte	<i>OpenLook</i> Desktop Environment
system	SUNWolimt	<i>OpenLook</i> imagetool
system	SUNWolman	<i>OpenLook</i> toolkit/desktop users man pages
system	SUNWolrte	<i>OpenLook</i> toolkits runtime environment
system	SUNWolrte.2	<i>OpenLook</i> toolkits runtime environment
system	SUNWowbcp	<i>OpenWindows</i> binary compatibility
system	SUNWowbcp.2	<i>OpenWindows</i> binary compatibility
system	SUNWowrqd	<i>OpenWindows</i> required core package
system	SUNWploc	European Partial Locales
system	SUNWscbcp	SPARCcompilers Binary Compatibility Libraries
system	SUNWscpr	Source Compatibility, (Root)
system	SUNWscpu	Source Compatibility, (Usr)
system	SUNWscpu.2	Source Compatibility, (Usr)
application	SUNWsx	<i>SPARCstation-10</i> ,SX Sharable Library
application	SUNWsx.2	<i>SPARCstation-10</i> ,SX Sharable Library
application	SUNWsxow	<i>SPARCstation-10</i> ,SX <i>OpenWindows</i> Support
application	SUNWsxow.2	<i>SPARCstation-10</i> ,SX <i>OpenWindows</i> Support
system	SUNWsxr	<i>SPARCstation-10</i> ,SX OS drivers
system	SUNWsxr.2	<i>SPARCstation-10</i> ,SX OS drivers
system	SUNWsxr.3	<i>SPARCstation-10</i> ,SX OS drivers
application	SUNWsxxgl	<i>SPARCstation-10</i> ,SX XGL Support
application	SUNWsxxgl.2	<i>SPARCstation-10</i> ,SX XGL Support
application	SUNWsxxil	<i>SPARCstation-10</i> ,SX XIL Support
application	SUNWsxxil.2	<i>SPARCstation-10</i> ,SX XIL Support
system	SUNWter	Terminal Information
system	SUNWtltk	ToolTalk runtime
system	SUNWtoo	Programming Tools

Table 9-27: Installed *Solaris* and *CentreVu* CMS Software Packages (Contd)

Type of Package	Package Name	Description
system	SUNWtoo.2	Programming Tools
system	SUNWuodte	American English <i>OpenLook</i> desktop environment
system	SUNWuorte	American English <i>OpenLook</i> toolkits runtime environment
system	SUNWuxplt	American English X <i>Windows</i> [†] platform software
system	SUNWvolg	Volume Management Graphical User Interface
system	SUNWvolr	Volume Management, (Root)
system	SUNWvolu	Volume Management, (Usr)
system	SUNWvolu.2	Volume Management, (Usr)
application	SUNWx25a	X.25 kernel modules and include files for <i>Solaris/SPARC</i>
application	SUNWx25b	X.25 user programs and libraries for <i>Solaris/SPARC</i>
application	SUNWxgldg	XGL Generic Loadable Libraries
application	SUNWxgler	XGL English Localization
application	SUNWxglft	XGL Stroke Fonts
application	SUNWxglrt	XGL Runtime Environment
application	SUNWxildg	XIL Loadable Pipeline Libraries
application	SUNWxiler	XIL English Localization
application	SUNWxilow	XIL Deskset Loadable Pipeline Libraries
application	SUNWxilrt	XIL Runtime Environment
system	SUNWxwcft	X <i>Windows</i> common (not required) fonts
system	SUNWxwdv	X <i>Windows</i> Window Drivers
system	SUNWxwdv.2	X <i>Windows</i> Window Drivers
system	SUNWxwman	X <i>Windows</i> online user man pages
system	SUNWxwmod	<i>OpenWindows</i> kernel modules
system	SUNWxwmod.2	<i>OpenWindows</i> kernel modules
system	SUNWxwoft	X <i>Windows</i> optional fonts
system	SUNWxwopt	nonessential MIT core clients and server extensions

Table 9-27: Installed *Solaris* and *CentreVu* CMS Software Packages (Contd)

Type of Package	Package Name	Description
system	SUNWxwplt	<i>X Windows</i> platform software
system	SUNWxwplt.2	<i>X Windows</i> platform software
system	SUNWxyl	1.0 <i>Sun</i> Network Terminal Server
application	cms	Call Management System
application	spatches	<i>CentreVu</i> CMS Supplied <i>Solaris</i> Patches

* OPEN LOOK is a registered trademark of Novell, Inc.

† X Window System is a trademark and product of the Massachusetts Institute of Technology.

Auditing *CentreVu* CMS Package

Do these steps to audit a *CentreVu* CMS Package:

1. To check the base package (cms), enter the following command:

```
# pkgchk -n cms
```

The system responds:

```
# pkgchk -n cms.*

ERROR: /cms/install/logdir/admin.log
        group name <root> expected <cms> actual
ERROR: /cms/install/logdir/install.log
        group name <root> expected <cms> actual
ERROR: /usr/lib/cms/Aname
        pathname does not exist
ERROR: /usr/lib/cms/Pname
        pathname does not exist
ERROR: /usr/lib/cms/Sname
        pathname does not exist
ERROR: /usr/lib/cms/pbxtrcflags
        group name <bin> expected <cms> actual
```

Note

The error messages listed above might print out after installing CMS. The messages do **not** signal a problem and can be disregarded.

2. To check an update (cms .2), enter the following command:

```
# pkgchk -n cms.2
```

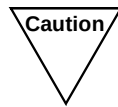
The system responds:

```
# pkgchk -n cms.2

WARNING: no pathname save associated with <cms.2>.
```

This warning message (listed above) indicates that there is no update present. If there is an update, this message will be different.

Moving Back to a Previous Load



Only **TSC PERSONNEL** should perform the procedures in this section.

If the installation of an upgrade fails, the upgrade has to be removed. If the upgrade fails, do the following:

1. Remove any currently installed updates. See the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-826) document.
2. Remove the *CentreVu* CMS base package, and answer no to the system prompt:

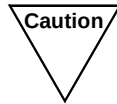
Do you want to preserve data?

See the *CentreVu™ CMS R3V5 Upgrades and Migration* (585-215-826) document.

3. Restore the *CentreVu* CMS from the CMSADM backup you performed just before upgrading to the current load. This restores the *CentreVu* CMS data as it existed just prior to the upgrade.

Backing Out of a *Solaris* Patch

If an update, upgrade, or new installation is administered, you may not need a specific patch.



You should perform the following procedures only when instructed by the TSC or upon receipt of a release letter.

To back out of a *Solaris* patch, do the following steps.

1. Enter the following command at the system prompt:

```
# cd /var/sadm/patch
```

The system responds:

```
#
```

2. Enter the following command:

```
# <patch-id>/backout <patch-id>
```

Note

The *<patch-id>* will be identified by the TSC or in the release letter.

The system responds:

```
# 101122-07/backoutpatch 101122-07
@(#) backoutpatch 3.5 93/08/11
Doing pkgrm of SUNWcsr.8 package:

Removal of <SUNWcsr.8> was successful.
Doing pkgrm of SUNWcsu.9 package:

Removal of <SUNWcsu.9> was successful.
Restoring previous version of files
/.
/etc
/etc/device.tab
/usr
/usr/bin
/usr/bin/pkginfo
/usr/bin/pkgmk
/usr/bin/pkgparam
/usr/bin/pkgproto
/usr/bin/pkgtrans
.
.
.
XXXX blocks
Making the package database consistent with restored files:
backoutpatch finished.
#
```

3. After you back out of a patch, reboot to make sure the patches are activated correctly. Enter the following command:

```
# shutdown -y -g0 -i6
```

Adding *INFORMIX-SQL*

This section describes how to install and set up *INFORMIX* on your system. *INFORMIX-SQL* (Structured Query Language) is optional.

Note

If you received *INFORMIX-SQL*, you do not need to install it on your system. **Only** *INFORMIX-SE* needs to be installed. *INFORMIX-SQL* is an optional package and must be purchased separately.

To add *INFORMIX-SQL* to your current system, you first remove the current version of *INFORMIX-SE*. You then install *INFORMIX-SQL* before you reinstall *INFORMIX-SE* or CMS errors may occur.

Installing the *INFORMIX* Software

Prerequisites: The *Solaris* operating system should be installed, you should be logged in as *root* at the console terminal, and you must have the *INFORMIX* Serial Number and Serial Number Key (located on the back of the *INFORMIX* CD-ROM).

This section describes how to install the *INFORMIX* software after the *Sun SPARCserver* computer has been installed at the customer's site. For this situation, installing the *INFORMIX* software consists of completing the following sequential tasks:

- Remove the current *INFORMIX-SE* software
- Set the environment
- Install the *INFORMIX-SQL* 4.13 package (optional)
- Install the *INFORMIX-SE* (Standard Engine) 5.04 package.

Note

Make sure you set the environment variables. If you log out prior to completing the above sequential tasks, you will lose the new environment variables that you set.

Additional References

For more information, refer to the following documentation:

INFORMIX UNIX^{*} Products Installation Guide Version 4.13

INFORMIX UNIX Products Installation Guide Version 5.04.

* UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Corporation.

Removing the *INFORMIX* Software

Do these steps to remove the current *INFORMIX* software:

1. Turn off the *CentreVu* CMS. Do the following steps:
 - a. At the system prompt, enter the following command:

```
# cmsadm
```

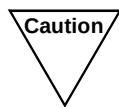
The system displays the CMSADM (Call Management System Administration Menu).

- b. From the *CentreVu* CMS Administration Menu, enter 9 to select the `run cms` option.
 - c. At the prompt, enter 2 to turn off the *CentreVu* CMS. You are returned to the system prompt.
2. Enter the following command to move to the existing *INFORMIX* directory:

```
# cd /opt/informix
```

-
3. Verify that you are in the */opt/informix* directory by entering the following command:

```
# pwd
```



The following command removes every file and subdirectory under the current directory.

-
4. Remove the existing *INFORMIX* software by entering the following command:

```
# rm -fr *
```

The *INFORMIX* software is now removed.

Setting Up the *INFORMIX* Environment

Do the following steps to set up the *INFORMIX* environment:

1. Complete the *INFORMIX* removal procedures. See the “Removing the *INFORMIX* Software” section in this chapter.
2. To set the environment variables, enter the following command:

```
# INFORMIXDIR=/opt/informix
# export INFORMIXDIR
# PATH=$PATH:$INFORMIXDIR/bin
# export PATH
```

3. Change to the */opt/informix* directory by entering:

```
# cd $INFORMIXDIR
```

4. Make sure you are in the */opt/informix* directory by entering:

```
# pwd
```

The *INFORMIX* installation environment is now set up.

Installing the *INFORMIX-SQL* Package

If you purchased the optional *INFORMIX-SQL* package, you should install it after you have set the environment. The *INFORMIX-SQL* software is on its own *INFORMIX* CD-ROM

Note

This software package is optional and is needed only if you are using *INFORMIX* reports. If you do not need this package, skip this section, and install the *INFORMIX-SE* software package.

To install the *INFORMIX-SQL* software, do the following:

1. Complete the *INFORMIX* removal and set up procedures. See “Removing the *INFORMIX* Software” and “Setting Up the *INFORMIX* Environment” sections in this chapter.
2. Remove the *INFORMIX-SQL* CD-ROM from its case, and write down the *INFORMIX -SQL* Serial Number and the Serial Number

Key exactly as they appear on the CD-ROM. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 3.

- a. Place the *INFORMIX-SQL* CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.
 - c. Go to Step 6.
3. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
 4. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.
 5. Push in the CD-ROM drive tray until it closes.
 6. Enter the following command to copy the *INFORMIX-SQL* files from the CD-ROM to the current directory:

```
# tar xvf /cdrom/unnamed_cdrom*/inf-sql.tar
```

The system responds:

```
x installsql, XXX bytes, XX tape blocks
x bin/isql, XXX bytes, XX tape blocks
. . . . .
. . . . .
. . . . .
x demo/sql2/stock.unl, XXX bytes, XX tape blocks
#
```

7. Enter the following command to start the installation of the *INFORMIX-SQL* software package:

```
# ./installsql
```

The system responds with the following screen:

```
INFORMIX-SQL Version 4.13.UD1
Copyright (C) 1984-1993 Informix Software, Inc.
```

Installation Script

```
This installation procedure must be run by root (super-user).
It will change the owner, group, and mode of all files of this
package in this directory. There must be a user "informix" and
a group "informix" known to this system.
```

```
Press RETURN to continue,
or the interrupt key (usually CTRL-C or DEL) to abort.
```

8. Press the **Return** key to continue with the installation procedure.

After a few minutes, your terminal displays the following message:

```
Enter your serial number (e.g., RDS#R999999) >
```

9. Enter the 11-character serial number that you wrote down in Step 2.
The system responds:

```
Enter your serial number KEY (uppercase letters only) >
```

10. Enter the 6-character serial number key that you wrote down in
Step 2. The system responds:

```
WARNING: This INFORMIX SOFTWARE, INC. SOFTWARE is licensed
for use by XX SIMULTANEOUS USER(S) on this computer system.
In the event you exceed XX simultaneous user(s), the End User
License Agreement, and the licenses granted to you thereunder
are subject to immediate termination by Informix.
```

```
Press RETURN to continue,
or the interrupt key (usually CTRL-C or DEL) to abort.
```

11. Press the **Return** key to continue with the installation procedure. The
system responds:

```
Installing directory ...
```

```
Installation complete.
```

```
#
```

12. Eject the *INFORMIX-SE 5.04.UC1* CD-ROM by entering the following command:

```
# eject cdrom
```

13. If you have an internal CD-ROM drive, remove the CD-ROM from the disk tray, place the CD-ROM back in its case, and push the CD-ROM tray in until it closes.

If you have an external CD-ROM drive, remove the CD-ROM caddy from the CD-ROM drive, remove the CD-ROM from the caddy, and place the CD-ROM back in its case.

The *INFORMIX-SQL* software is now installed.

Installing the *INFORMIX-SE* Package

After you have installed the *INFORMIX-SQL* package (optional), you install the *INFORMIX-SE* package. The *INFORMIX-SE* software is on its own *INFORMIX* CD-ROM.

To install the *INFORMIX-SE* software package, do the following:

1. Complete the *INFORMIX* removal and set up procedures. In addition, if you purchased the optional *INFORMIX-SQL* package, you should have installed it. See the “Removing the *INFORMIX* Software,” “Setting Up the *INFORMIX* Environment,” and “Installing the *INFORMIX-SQL* Package” sections in this chapter.
2. Remove the *INFORMIX-SE* CD-ROM from its case, and write down the *INFORMIX-SE* Serial Number and the Serial Number Key exactly as they appear on the CD-ROM. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 3.
 - a. Place the *INFORMIX-SE* CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.

- c. Go to Step 6.
3. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
4. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.
5. Push in the CD-ROM drive tray until it closes.
6. Enter the following command to copy the *INFORMIX-SE* files from the CD-ROM to the current directory:

```
# tar xvf /cdrom/unnamed_cdrom*/inf_se.tar
```

The system responds:

```
x installse, XXX bytes, XX tape blocks
x bin/bcheck, XXX bytes, XX tape blocks
. . . . .
. . . . .
. . . . .
x demo/dbaccess/upd_table.sql, XXX bytes, XX tape blocks
#
```

7. Enter the following command to start the installation of the *INFORMIX-SE* software package:

```
# ./installse
```

The system responds with the following screen:

```
INFORMIX-SE Version 5.04.UC1
Copyright (C) 1984-1993 Informix Software, Inc.
```

Installation Script

This installation procedure must be run by root (super-user). It will change the owner, group, and mode of all files of this package in this directory. There must be a user "informix" and a group "informix" known to this system.

Press RETURN to continue,
or the interrupt key (usually CTRL-C or DEL) to abort.

8. Press the **Return** key to continue with the installation procedure.

After a few minutes, your terminal displays the following message:

```
Enter your serial number (for example, RDS#R999999) >
```

9. Enter the 11-character serial number that you wrote down in Step 2. The system responds:

```
Enter your serial number KEY (uppercase letters only) >
```

10. Enter the 6-character serial number key that you wrote down in Step 2. The system responds:

```
WARNING: This INFORMIX SOFTWARE, INC. SOFTWARE is licensed
for use by XX SIMULTANEOUS USER(S) on this computer system.
In the event you exceed XX simultaneous user(s), the End User
License Agreement, and the licenses granted to you thereunder
are subject to immediate termination by Informix.
```

Press RETURN to continue,
or the interrupt key (usually CTRL-C or DEL) to abort.

11. Press the **Return** key to continue with the installation procedure. The system responds:

```
Installing directory ...
```

```
Installation of INFORMIX-SE complete.
```

```
#
```

12. Eject the *INFORMIX-SE 5.04.UC1* CD-ROM by entering the following command:

```
# eject cdrom
```

13. If you have an internal CD-ROM drive, remove the CD-ROM from the disk tray, place the CD-ROM back in its case, and push the CD-ROM tray in until it closes.

If you have an external CD-ROM drive, remove the CD-ROM caddy from the CD-ROM drive, remove the CD-ROM from the caddy, and place the CD-ROM back in its case.

The *INFORMIX-SE* software is now installed.

Adding, Removing, or Replacing Tape Drives

This section describes how to add, remove, or replace tape drives from an existing system.

Adding or Replacing a Tape Drive

When adding or replacing a tape drive to an existing system, you need to do the following:

- Remove existing SCSI device files (to prepare for new SCSI hardware configuration).
- Set the SCSI device ID(s).
- Connect the tape drive(s) to the SCSI chain.
- Reboot and reconfigure the system.

To remove SCSI device files, do the following:

1. Enter the following command:

```
# rm /dev/rmt/*
```

Note

If you do not remove the device files before rebooting the system, the SCSI device files may not match the hardware configuration. If this occurs, repeat Steps 1 through 10.

2. Shut the system down using the following command:

```
# init 0
```

3. Do the following in sequential order:
 - a. Turn off the *Sun SPARCserver* computer.
 - b. Turn off the system monitor.

- c. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
4. Set the SCSI ID(s) by doing the following:
 - a. Locate the target address switch on the rear panel of the SCSI device (see Figure 9-2).

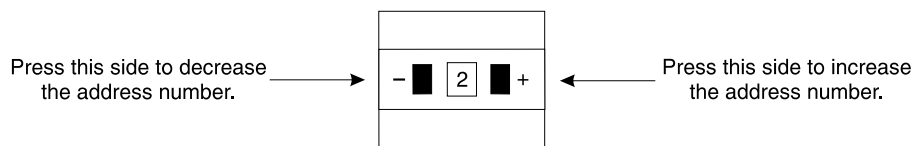


Figure 9-2: Setting the SCSI ID/Target Address

- b. Identify which SCSI ID will be associated with each of the devices on a specific SCSI bus (see Table 9-28).
- c. Press the left or right button on the switch until the appropriate SCSI ID number appears in the window.

Table 9-28: Internal SCSI Bus ID Map (c0)

Device	SCSI ID	Node	Location
Base Disk	3	c0t3	Internal
Disk #2	1	c0t1	Internal
QIC 2.5-GB UniPack Tape Drive	4	c0t4	External
5-GB or 14-GB 8mm	5	c0t5	External
CD-ROM	6	c0t6	Internal
Disk #3	2	c0t2	External
Disk #4	0	c0t0	External
SCSI Controller	7	N/A	Internal

Note

All systems are shipped with one or more tape drives (QIC-150, QIC 2.5-GB, 5-GB, and/or 14-GB). For systems with multiple tape drives, either the QIC-150 or the QIC 2.5-GB is the first drive in the SCSI chain.

Valid device names are as follows:

`/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain. See Table 9-28 on page 9-187.

`/dev/rmt/1` Indicates the tape drive with the second lowest target number in the SCSI chain.

`/dev/rmt/0c` Indicates the tape drive with the lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

`/dev/rmt/1c` Indicates the tape drive with the second lowest target number in the SCSI chain in compressed mode (the QIC 2.5-GB and the 14-GB tape drives support compressed mode).

5. Connect the tape drive to the other SCSI devices.

Figure 9-3 shows how to connect a SCSI cable from SCSI port c0 on the back of the *Sun SPARCserver* to the in-connector on the back of the UniPack device that is closest to the *SPARCserver* in the chain. Another SCSI cable is then connected from the out-connector of that device to the in-connector of the next device. You continue this process until all assigned devices are connected in the SCSI chain.

Since UniPack devices are auto-terminated, the last UniPack device in a SCSI chain does not require a terminator. To verify that the last UniPack device is terminated, check the LEDs on the back panel of the device labeled Auto Term High and Auto Term Low. In a CMS configuration, both LEDs are lit on the last device in the SCSI chain. If a UniPack device in the SCSI chain is not the last device, then neither termination LEDs are lit.

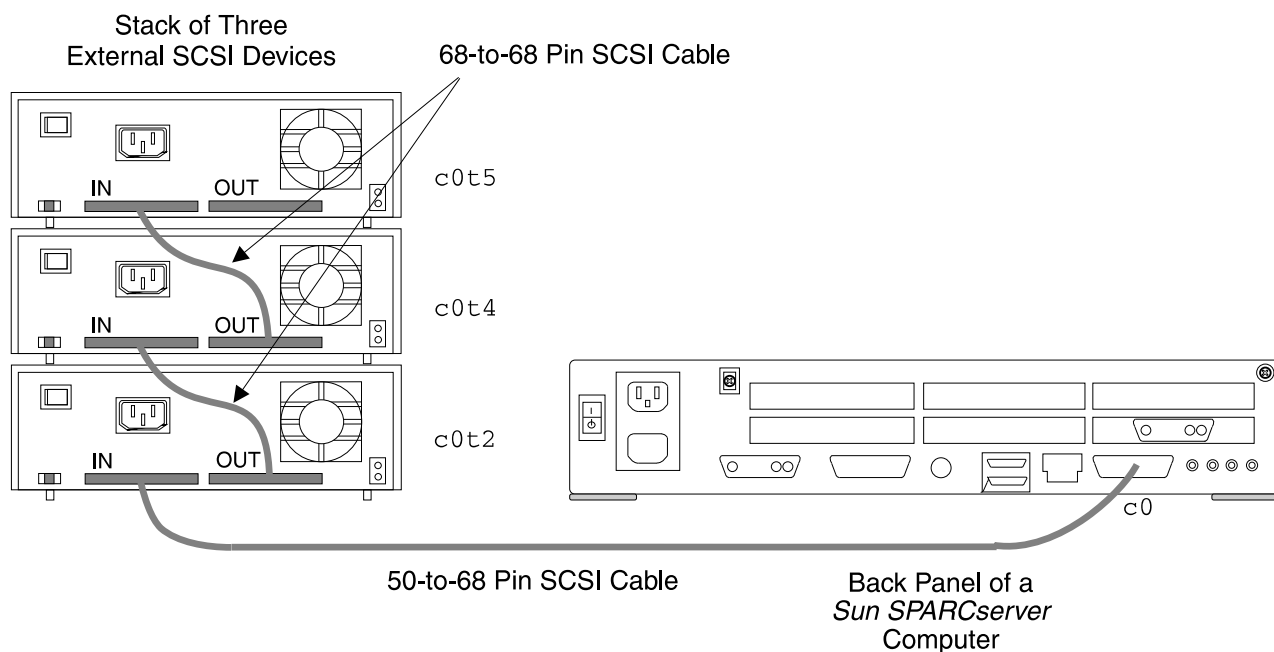


Figure 9-3: Sample Daisy Chaining of External SCSI Devices

Figure 9-4 shows the SCSI cabling scheme when one or more UniPack enclosures are present.

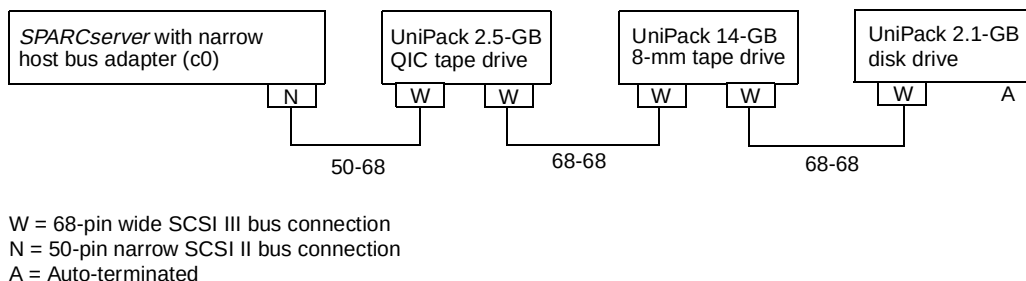


Figure 9-4: SCSI Cabling Schemes

6. Connect the power cord from the tape drive to a power source.
7. Do the following in sequential order:
 - a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
 - b. Turn on the *Sun SPARCserver* computer.
 - c. Turn on the system monitor.

The power-on diagnostics will occur when the computer is turned on.

While the system is booting up, enter the OpenBoot environment by doing the following:

8. Press the **Stop** and **A** keys simultaneously after the display console banner appears but before the system starts booting the operating system.

After you are in the OpenBoot environment, the following prompt appears:

```
ok
```

9. Enter the following command and verify that the system recognizes the SCSI devices:

```
ok probe-scsi-all
```

The system responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991

. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

Note

The actual response (devices listed) depends on the devices installed on the SCSI bus.

10. Enter the following command to reboot the system and reconfigure the devices.

```
ok boot -r
```

Fix for the UniPack QIC 2.5-GB Tape Drive

When adding a 2.5-GB QIC tape drive to a *CentreVu* CMS system running *Solaris* 2.4, it is necessary to edit the `/kernel/drv/st.conf` file so the new tape drive is recognized.

Do these steps to add the fix for the QIC 2.5-GB tape drive:

1. Log in as root.
1. Edit the `/kernel/drv/st.conf` file by entering the following command:

```
# vi /kernel/drv/st.conf
```

The system responds:

```
<contents of the file is displayed>
```

```
.  
.
.
```

2. Add the following four lines to the `/kernel/drv/st.conf` file:

```
tape-config-list=  
"TANDBERG TDC 4200", "Tandberg 2.5 Gig QIC", "TAND-25G-FIXED";  
TAND-25G-FIXED=1, 0x37, 512, 0x867a, 1, 0x00, 0;  
TAND-25G-VAR=1, 0x37, 0, 0x867b, 1, 0x00, 0;
```

3. Write and quit the file.

Removing a Tape Drive

When removing a tape drive from an existing system, you need to do the following:

- Remove SCSI device files (to prepare for new SCSI hardware configuration).

- Remove the SCSI tape drive. Reboot and reconfigure the system.

To remove SCSI device files, do the following:

1. Enter the following command:

```
# rm /dev/rmt/*
```

Note

If you do not remove the device files before rebooting the system, the SCSI device files may not match the hardware configuration. If this occurs, repeat Steps 1 through 10.

2. Shut the system down using the following command:

```
# shutdown -i0 -g0 -y
```

3. Do the following in sequential order:
 - a. Turn off the *Sun SPARCserver* computer.
 - b. Turn off the system monitor.
 - c. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
4. Remove the tape drive from the SCSI chain.
5. Disconnect the tape drive power cord from the power source.
6. Reconnect the remaining SCSI devices using the procedures starting on page 9-188.
7. Do the following in sequential order:
 - a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
 - b. Turn on the *Sun SPARCserver* computer.
 - c. Turn on the system monitor.

The power-on diagnostics will occur when the computer is turned on.

While the system is booting up, enter the OpenBoot environment by doing the following:

8. Press the **Stop** and **A** keys simultaneously after the display console banner appears but before the system starts booting the operating system.

After you are in the OpenBoot environment, the following prompt appears:

```
ok
```

9. Enter the following command, and verify that the system recognizes the SCSI devices:

```
ok probe-scsi-all
```

The system responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991

. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

Note

The actual response (devices listed) depends on the devices installed on the SCSI bus.

10. Enter the following command to reboot the system and reconfigure the devices:

```
ok boot -r
```

Identifying Device Entry Names for Ports on the Aurora Expander Box(es)

When the Aurora AURAcS and AURAsio drivers are installed, device entries are created to access the physical ports on the expander box(es).

The device name that is created is `/dev/term/N`, where N is a number. When only one Aurora SBus *Multiport* card is installed, the number matches the number that is printed next to the physical port on the expander box (see Figure 9-5). If there is more than one Aurora SBus *Multiport* card installed, the system will create device names for all 8-port cards first and then create device names for 16-port cards (see Figure 9-7). To display the `/dev/term` devices used by each card, you can use the `/cms/toolsbin/display_ports` command. An output example from the `display-ports` tool is shown below:

```
Aurora 8 port card in Sbus slot 1:
/dev/term devices: 0 1 2 3 4 5 6 7
```

```
Aurora 16 port card in Sbus slot 2:
/dev/term devices: 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
```

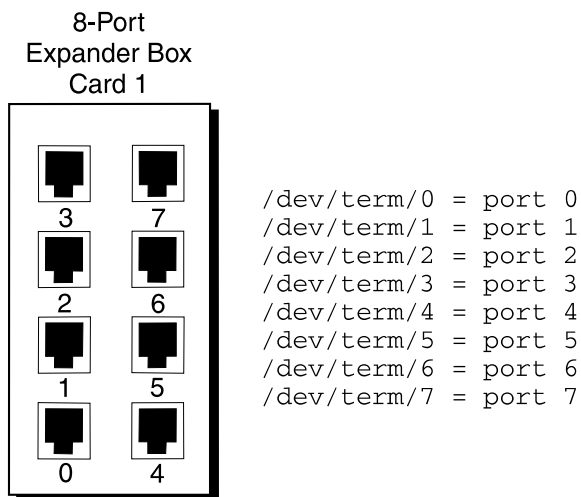


Figure 9-5: Device Names for a Single Aurora SBus Card — No HSI/S Card Installed

Note If an HSI/S card is installed in the system (prior to an Aurora SBus card), the HSI/S card is considered to be card 1 and uses device names `/dev/term/0` through `/dev/term/4`. An Aurora SBus *Multiport* card would be considered as card 2 and would begin at device name `/dev/term/5`.

When two Aurora SBus *Multiport* cards are installed, the system will create device names for all 8-port cards first and then create device names for 16-port cards. The device name for the second SBus card will start at the next available number. Thus, the device entry `/dev/term/0` corresponds to the physical port labeled “0” on the 8-port expander box connected to the first Aurora SBus *Multiport* card (see Figure 9-6). The device entry `/dev/term/8` corresponds to the physical port labeled “0” on the 16-port expander box connected to the second Aurora SBus *Multiport* card (see Figure 9-6).

The above scenario does not include an HSI/S card.

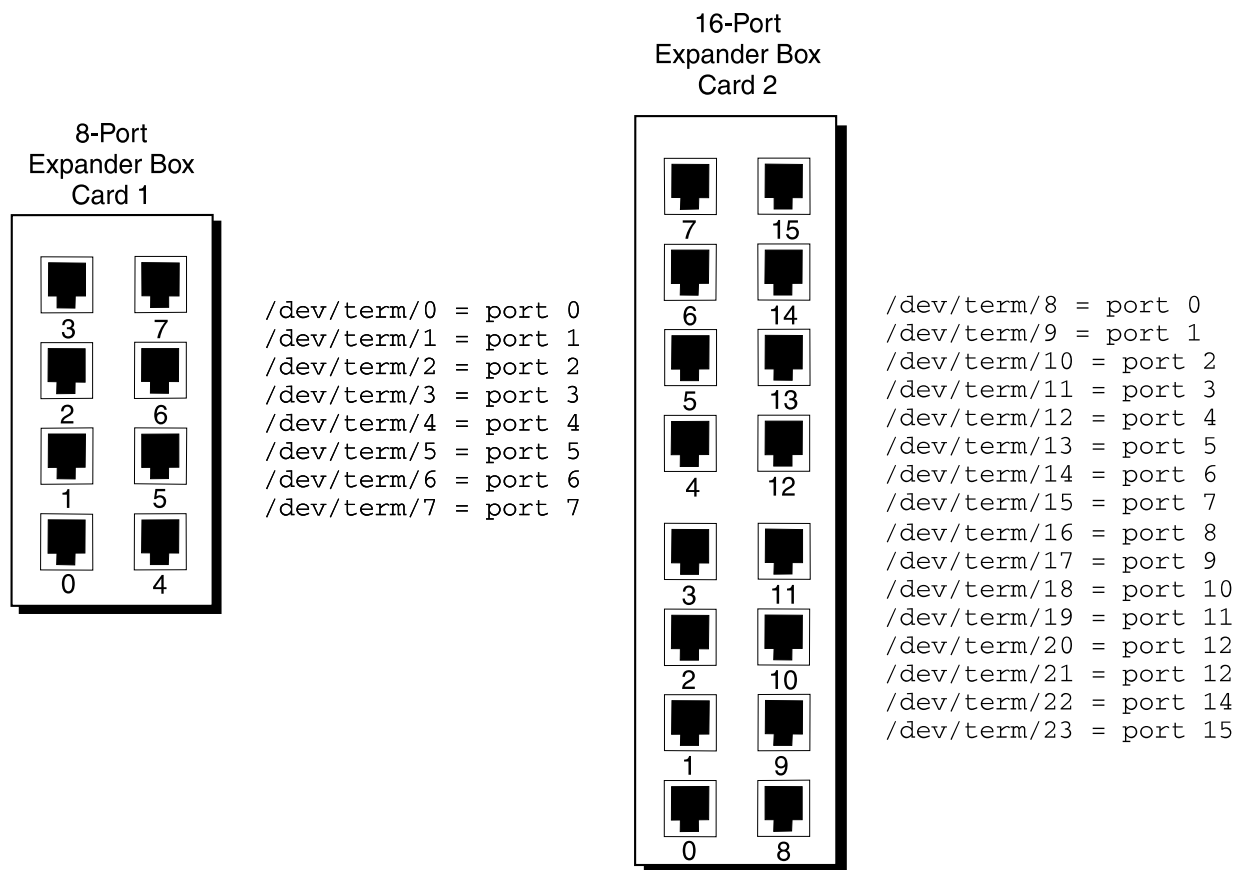


Figure 9-6: Device Names for Second Aurora SBus Card — No HSI/S Card Installed

If three or more Aurora ports cards are installed, the system creates device names for all 8-port cards first and then creates device names for 16-port cards regardless of the physical location of the cards (see Figure 9-7).

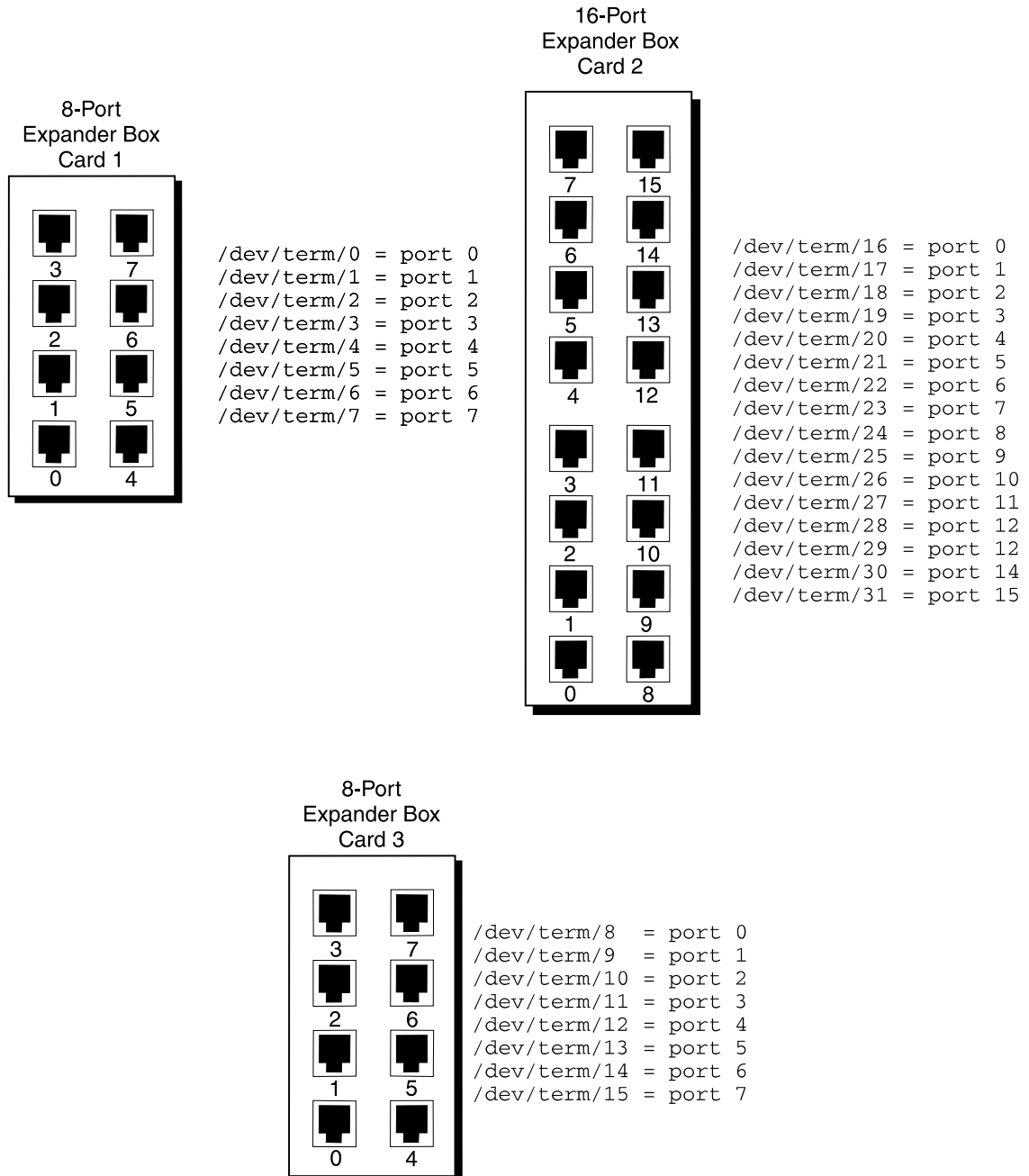


Figure 9-7: Device Names for Third Aurora SBus Card — No HSI/S Card Installed

The order sequence of the Aurora SBus *Multiport* card(s) is determined by the SBus slot it occupies in the *Sun SPARCserver* computer and the type of Aurora card (8-port or 16-port) it has. Each SBus slot in the *Sun SPARCserver* computer is numbered. See the section “Installing SBus Cards” in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures” for SBus locations and numbers. For procedures on how to identify pre-installed SBus cards, see the “Identifying Installed SBus Cards” section in Chapter 3, “Installing the *Sun SPARCserver* Computer.”

When device names are created, the 8-port SBus cards inserted into the lowest numbered SBus slots are considered first, then the 16-port SBus cards inserted into the lowest numbered SBus slots are considered second, and so on. (see Figure 9-8).

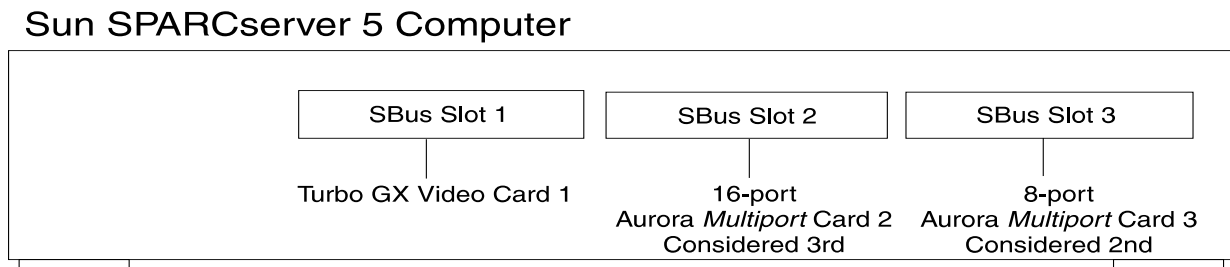


Figure 9-8: Determining the Order of Device Names for Aurora *Multiport* SBus Cards — No HSI/S Card Installed

In Figure 9-8, the Aurora SBus *Multiport* cards would be ordered as follows:

- 8-port Card 3- /dev/term/0-7
- 16-port Card 2- /dev/term/8-23

A system containing both an HSI/S card and Aurora SBus *Multiport* cards would be ordered differently than a system without an HSI/S card. Remember, HSI/S cards are always considered first (see Figure 9-9).

Sun SPARCserver 20 Computer

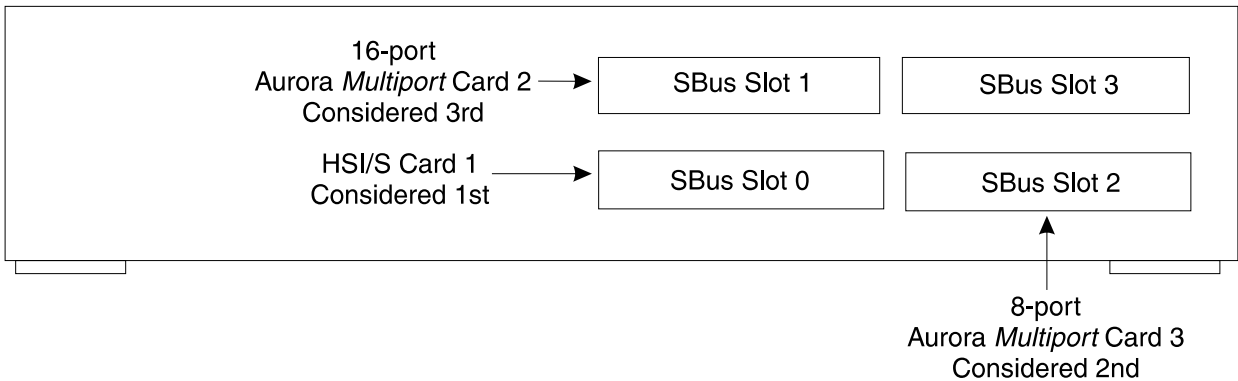


Figure 9-9: Determining the Order of Device Names for Aurora *Multiport* SBus Cards and HSI/S Card

In Figure 9-9, the HSI/S card and Aurora SBus *Multiport* cards would be ordered as follows:

- HSI/S Card 1- /dev/term/0-4
- 8-port Card 3- /dev/term/5-12
- 16-port Card 2- /dev/term/13-28.

Removing Aurora SBus *Multiport* Software Driver(s)

The following steps describe how to remove the Aurora SBus *Multiport* software driver(s):

1. Determine which Aurora software driver(s) is installed on the system by entering the following command:

```
# pkginfo | grep AURA
```

The system displays the installed Aurora software drivers. For example:

```
# pkginfo | grep AURA
system          AURAcS          Aurora 400/800 S/SX/S+ device driver
```

The Aurora software drivers that may be installed on your system are:

- AURAcS 8-port
- AURASio16 16-port.

2. Identify which Aurora software driver(s) you want to remove.

Note

Complete the following steps for each software driver you want to remove.

3. Start the software removal by entering the `pkgrm` command for each Aurora software driver you have. (The command for an 8-port driver is: `pkgrm AURAcS` and `pkgrm AURASio16` for a 16-port driver.) For example:

```
# pkgrm AURAcS
```

The system responds:

```
# The following package is currently installed:  
  AURAcS      Aurora 400/800 S/SX/S+ device driver  
                (sparc) 5.52
```

```
Do you want to remove this package?
```

4. Enter y to start the removal of the AURAcS software driver. The system responds:

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

```
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,?]
```

5. Answer y. The system responds:

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

If the removal is successful, the following message displays (this particular message is for the removal of an 8-port driver):

```
Removal of <AURAcS> was successful.
```

The system prompt returns to your screen.

Adding, Removing, or Moving an Aurora SBus *Multiport* Card

Adding an Aurora SBus *Multiport* Card

The following steps describe how to add another Aurora SBus *Multiport* card to a system that is already up and running:

1. Identify and remove Aurora software packages. See the “Removing Aurora SBus *Multiport* Software Drivers” section in this chapter for details.
2. Identify the existing Aurora SBus *Multiport* card(s) installed in the system. Refer to the “Identifying SBus Cards” section in Chapter 3, “Installing the *Sun SPARCserver Computer*” for details.
3. Decide where you will install the new Aurora SBus *Multiport* card. Insert the Aurora SBus *Multiport* card into the *Sun SPARCserver* computer by using the instructions described in the “Installing SBus Cards” section in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.
4. Connect the expander box to the new Aurora SBus *Multiport* card. See the “Connecting the 8- or 16-Port Expander Box” section in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.”
5. Do the following in sequential order:
 - a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
 - b. Turn on the *Sun SPARCserver* computer.
 - c. Turn on the system monitor.
6. Press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting.
7. Boot the system using the boot command.

```
ok boot -r
```

8. Do a “sacadm -l” and a “pmadm -l” command to get existing administration information. Record this information for later use.

9. Remove port administration for all Aurora SBus cards by using the following example:

```
# sacadm -r -p ttyaur2
# sacadm -r -p ttyaur3
# sacadm -r -p ttyaur4
```

10. Remove the Aurora SBus *Multiport* Software driver(s). Refer to the “Removing Aurora SBus *Multiport* Software Drivers” section in this chapter for instructions.
11. Install the Aurora SBus *Multiport* software driver (the 8-port driver must be installed before the 16-port driver). See the “Installing the Aurora SBus *Multiport* Software Driver” in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures” for instructions.
12. Administer all Aurora ports cards. Refer to Chapter 4, “Installing Terminals, Printers, and Modems” for instructions on administering ports using the `admintool` command.
13. Perform a CMSADM file system backup to backup the updated system software and hardware configuration. See the “Performing a CMSADM File System Backup” section in this chapter.
14. Refer to Chapter 4, “Installing Terminals, Printers, and Modems” for details on connecting peripherals to the 8- or 16-port expander box.

Removing an Aurora SBus Multiport Card

The following steps describe how to remove an Aurora SBus *Multiport* card from a system that is already up and running:

Note

You must remove the port administration for all Aurora SBus cards in an ordering sequence behind the Aurora SBus card you remove. To avoid readministering, always try to remove the **last** card in the ordering sequence as described in the “Identifying Device Entry Names for Ports on the Aurora Expander Box(es)” section of this chapter.

For example: there are four Aurora SBus cards installed and you want to remove the second Aurora SBus card in the ordering sequence.

With this scenario, you must remove the port administration for the second through fourth Aurora SBus cards and then readminister cards 2 and 3.

1. Do a “`sacadm -l`” and a “`pmadm -l`” command to get existing administration information. Record this information for later use.
2. Remove the port administration for the card you are moving as well as all Aurora SBus cards that follow the card you are removing by using the following example:

```
# sacadm -r -p ttyaur2
# sacadm -r -p ttyaur3
# sacadm -r -p ttyaur4
```

3. Remove the Aurora SBus *Multiport* Software driver(s). Refer to the “Removing Aurora SBus *Multiport* Software Drivers” section in this chapter for instructions.
4. Remove the Aurora SBus *Multiport* card from the system.
5. Do the following in sequential order:
 - a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
 - b. Turn on the *Sun SPARCserver* computer.
 - c. Turn on the system monitor.

6. Press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting.
7. Boot the system using the boot command.

```
ok boot -r
```

8. Readminister all terminals, modems, and printers that are connected to the Aurora Expander Box(es) that were ordered **after** the card that was removed. See Chapter 4, “Installing Terminals, Printers, and Modems” for instructions on administering terminals, printers, and modems.
9. Perform a CMSADM file system backup to backup the updated system software and hardware configuration. See the “Performing a CMSADM File System Backup” section in this chapter.

Moving an Aurora SBus *Multiport* Card

When moving Aurora SBus cards, make sure you preserve the original ordering sequence of the cards. To do this, you may need to move more than one card. See the “Identifying Device Entry Names for Ports on the Aurora Expander Box(es)” section in this chapter to determine the ordering sequence.

The following steps describe how to move an Aurora SBus *Multiport* card to a different SBus slot location in the *Sun SPARCserver* computer:

1. Remove the Aurora SBus *Multiport* software driver. See the “Removing Aurora SBus *Multiport* Software Drivers” section in this chapter for details.

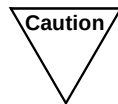
After the software is removed, the system prompt returns to your screen.

2. Enter this command:

```
# shutdown -g0 -y -i0
```

3. Do the following in sequential order:
 - a. Turn off the *Sun SPARCserver* computer.
 - b. Turn off the system monitor.

- c. Turn off all external devices starting with the device closest to the *Sun SPARCserver* computer and working toward the farthest device.
4. Remove the Aurora SBus *Multiport* card from the SBus slot.
5. Install the Aurora SBus *Multiport* card into a different SBus slot by using the instructions described in the “Installing SBus Cards” section in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.”



Make sure you preserve the original ordering sequence of the Aurora SBus cards.

6. Do the following in sequential order:
 - a. Turn on devices attached to the *Sun SPARCserver* computer starting with the device at the end of the SCSI chain and working toward the computer.
 - b. Turn on the *Sun SPARCserver* computer.
 - c. Turn on the system monitor.
7. Press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting.
8. Boot the system using the `boot` command.

```
ok boot -r
```

9. Reinstall the Aurora SBus *Multiport* software driver. See the “Installing the Aurora SBus *Multiport* Software Driver” in Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures” for instructions.
10. Perform a CMSADM file system backup to back up the updated system software and hardware configuration. See the “Performing a CMSADM File System Backup” section in this chapter.

Adding Network Terminal Servers

To connect additional Network Terminal Servers (NTSs) to your current configuration, use the procedures in sections “Connecting the Sun Network Terminal Server” and “Administering the Network Terminal Servers” of Appendix D, “*Sun SPARCserver* Computer Factory Installation Procedures.” You can connect a maximum of four NTSs per *Sun SPARCserver* computer.

Changing Network Addresses

If you want to change the network address of your *Sun SPARCserver* computer and each NTS, see Chapter 3, “Installing the *Sun SPARCserver* Computer” for additional procedures.

Appendix A

Generic 3i and Generic 1 Administration

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Overview

The *CentreVu*™ Call Management System Release 3 Version 5 (CMS R3V5) application can collect and process Automatic Call Distribution (ACD) data from the *DEFINITY*® Communications System Generic 3i and Generic 1 switches. However, before *CentreVu* CMS can collect and process the ACD data, a special hardware interface on the switch must be properly administered. For the Generic 3i and Generic 1, the hardware interface is a processor interface. This hardware interface is sometimes called the *CentreVu* CMS interface.

In addition to the *CentreVu* CMS interface, the following *CentreVu* CMS features on the switch must also be administered:

- Abandoned Call Search
- Agent Call Handling
- Hunt Groups
- Intraflow and Interflow
- Queue Status Indications
- Recorded Announcements
- Service Observing.

Note

For the screens to administer the EAS (Expert Agent Selection) feature, see the *CentreVu*™ R3V5 CMS Administration (585-215-820) document.

The following documents can be used by a qualified switch technician to implement the *CentreVu* CMS interface and features:

- *Lucent Technologies DEFINITY Communications System Generic 1 Implementation Manual* (555-204-654, Issue 1)
- *Lucent Technologies DEFINITY Communications System Generic 1 Installation and Test* (555-204-104)
- *Lucent Technologies DEFINITY Communications System Generic 1 Wiring* (555-204-111)
- *Lucent Technologies DEFINITY Communications System Generic 1 Maintenance* (555-204-105).

For your convenience, the next section contains step-by-step procedures that can be used to implement the *CentreVu* CMS interface. However, should you have any question about these procedures, refer to the appropriate switch documentation.



Only a qualified switch technician or switch administrator should administer the *CentreVu* CMS interface and features on the switch.

Administering *CentreVu* CMS Interface on Generic 3i

This section contains the procedures required to establish a communications link between the *Sun*^{*} *SPARCserver*[†] computer and the Generic 3i switch.

The processor interface on the Generic 3i has eight interface links (01 to 08) available on a multi-carrier cabinet system and four interface links (01 to 04) available on a single-carrier cabinet system. One of these interface links can be assigned to the *Sun SPARCserver* computer.

You assign the *CentreVu* CMS interface by logging in on the System Access Terminal (SAT) as *craft* and filling out the following forms:

- Processor Interface Data Module form
- Data Module (MPDM/MTDM) form
- Processor Channel Assignment form
- Interface Links form.

Note

If the EIA port on the processor interface is used to make the connection to the *Sun SPARCserver* computer, you do not have to fill out the data module form.

^{*}Sun is a registered trademark of Sun Microsystems, Inc.
[†]SPARCserver is a trademark of SPARC International, Inc.

Assigning the Processor Interface Data Module

The following procedures can be used to add the processor interface on the Generic 3i:

1. Verify that the System Access Terminal displays:

enter command:

2. Enter `add data-module 2005` where *2005* is the extension number assigned to the interface. The extension number you use will automatically appear in the Data Extension field of a data module form. Press the **Return** key.

The screen displays a data module form. (See Figure A-1 for reference.)

3. In the field labeled Type, enter `procr-infc` for Generic 3i. After entering the appropriate Type, press the **Return** key.

The cursor is positioned on the Physical Channel field.

4. Enter the physical channel number (for example, 01). The physical channel number becomes the interface link number that is used on the Interface Links and Processor Channel Assignment forms. For example, physical channel number 01 is interface link 1.

Note

If the EIA port on the processor interface is used to make the connection to the *Sun SPARCserver* computer, physical channel number 01 must be used.

5. Press the **Return** key.

The cursor is positioned on the Name field.

6. Enter `R3V5 CMS`, and press the **Return** key.

The cursor is positioned on the COS field.

Note

The COS and COR fields are defaulted to 1.

7. Do not make changes to the COS and COR fields; press the **Enter** key.

Screen displays:

command successfully completed

enter command:

DATA MODULE

Data Extension: 2005

Type: procr-infc

Physical Channel: 01

Name: R3 CMS

COS: 1

COR: 1

Maintenance Extension:

ABBREVIATED DIALING

List1:

HOT LINE DESTINATION

Abbreviated Dialing Dial Code (From above list):

ASSIGNED MEMBERS (Stations with a data extension button for this data module)

Ext	Name	Ext	Name
1:		3:	
2:		4:	

Figure A-1: Data Module Form for Generic 3i

Assigning a Data Module to the Sun SPARCserver Computer

After the processor interface has been assigned, the data module can be administered and connected to the *Sun SPARCserver* computer or to a modem for a *CentreVu* CMS located at a remote location.

Note

If the EIA port on the processor interface is used to make the connection to the *Sun SPARCserver* computer, you do not have to fill out the data module form.

If the *CentreVu* CMS is located at a remote location (with reference to the switch), a modem and MTDM will be used.

1. Verify that the System Access Terminal screen displays:

enter command:

2. Enter `add data-module 2009` where *2009* is the extension number assigned to the data module. The extension number will automatically appear in the Data Extension field on the screen form. The extension number entered here is also used as the destination number on the Interface Links form. Press the **Return** key.

The screen displays a data module form. (See Figure A-2 for reference.)

3. The cursor is positioned on the Type field. This field is defaulted to `pdm`. If the *CentreVu* CMS is remotely connected, this field needs to be changed to `tdm`.
4. Press the **Return** key.

The cursor is positioned on the Port field.

5. Enter the port location to which the data module is connected.

For a Generic 3i, the first character identifies the network (1-2, default is 1 if no entry), the second character identifies the carrier (A-E), the third and fourth characters identify the slot number in the carrier (01-20 for multi-carrier cabinets or 01-18 for single-carrier cabinets), and the last two characters identify the circuit number (01-24).

Press the **Return** key.

The cursor is positioned on the Name field.

6. Enter `cms link pdm`, or if *CentreVu* CMS is remotely connected, enter `cms link tdm`, and press the **Return** key.

The cursor is positioned on the COS field.

Note

The COS and COR fields are defaulted to 1, and the Connected To field is defaulted to dte.

7. Move the cursor to the Remote Loop-Around Test field.
8. Enter ☐ Y if the module supports a loopback at the EIA interface; otherwise, enter ☐ N. (The 7400D data module does not support a loopback.)

Note

If the *CentreVu* CMS is remotely connected (using a modem and MTDM), enter ☐ N.

9. Press the key.

Screen displays:

command successfully completed

enter command:

DATA MODULE

Data Extension: 2009 BCC: Type: pdm Port: 1A0101

Name: cms link pdm COS: 1 COR: 1

Connected to: dte Remote Loop-Around Test? y

ABBREVIATED DIALING

List1:

HOT LINE DESTINATION

Abbreviated Dialing Dial Code (From above list):

ASSIGNED MEMBERS (Stations with a data extension button for this data module)

Ext	Name	Ext	Name
1:		3:	
2:		4:	

Figure A-2: Data Module Form for Generic 3i

After the processor interface and the data module have been assigned, the processor channel and interface link can be established. The processor channel is assigned using the Processor Channel Assignment form, and the interface link is enabled using the Interface Links form.

Assigning the Processor Channel

The Processor Channel form is used to assign one of the 64 local processor channels from the processor link to one of the 64 interface channels assigned to one interface link (1 to 4). Only one interface link is assigned for the *Sun SPARCserver* computer.

The following procedure can be used to assign processor channels on the Generic 3i:

1. Verify that the System Access Terminal displays:

enter command:

2. Enter change communications-interfaces processor-channels command, and press the **Return** key.

The screen displays the Processor Channel Assignment form. (See Figure A-3 for reference.)

Note

The sample screen shown in Figure A-3 illustrates a configuration which assigns the processor channel 1 to the mis application with a remote processor channel of 1.

3. Select an available processor channel by using the up/down arrow keys to place the cursor in the Appl field of an available channel.

Note

The processor channel number should be the same number that was selected for the local port number when the *CentreVu* CMS software was installed. For more information on changing the port/link number, see the "swsetup" section in Chapter 2, "CMSADM and CMSSVC Menus."

4. Enter mis in the Appl field, and press the **Return** key.

The cursor is positioned on the Interface Link field.

5. Enter 1 in the Interface Link field. (This is the interface link number assigned on the processor interface data module form.)

6. Press the **Return** key.

The cursor is positioned on the Interface Chan field.

7. Enter 1 in the Interface Chan field, and press the **Return** key.

The cursor is positioned on the Priority field.

8. Enter h in the Priority field, and press the **Return** key.

The cursor is positioned on the Remote Proc Chan field.

9. Enter 1 in the Remote Proc Chan, and press the **Return** key.

The cursor is positioned on the MACHINE - ID field.

10. Make no entry; press the **Enter** key.

Screen displays:

command successfully completed,
enter command:

Proc Chan	Appl.	Interface Link	Interface Chan	Priority	Remote Proc Chan	Machine-ID
1:	mis	1	1	h	1	
2:						
3:						
4:						
5:						
6:						
7:						
8:						
9:						
10:						
11:						
12:						
13:						
14:						
15:						
16:						

Figure A-3: Processor Channel Assignment Form for Generic 3i

Note The *CentreVu* CMS R3V5 software requires that the Interface Chan assignment be administered as 1. Priority on this channel must be set to h (high).

Enabling the Interface Link

The following steps are used to enable the *CentreVu* CMS interface link on the Generic 3i:

1. Verify that the System Access Terminal displays:

enter command:

2. Enter change communications-interfaces links, and press the **Return** key.

The screen displays an Interface Links form. (See Figure A-4 for reference.)

3. The cursor is positioned on the Enabled field.
4. Enter **y** beside the interface link number assigned on the Processor Channel form to enable the interface link. Press the **Return** key.

The cursor is positioned on the Est Conn field.

5. Enter **y** to establish a connection to the MPDM that connects to the *Sun SPARCserver* computer, and press the **Return** key.

The cursor skips the PI Ext field. The extension number assigned on the processor interface data module form is automatically displayed in this field.

The cursor is positioned on the Prot field.

6. Enter BX.25 in the Prot field.

The cursor is positioned on the Destination Digits field.

7. Enter the extension number for the MPDM that connects to the *Sun SPARCserver* computer, and press the **Return** key.

The cursor is positioned on the DTE/DCE field.

8. Enter DTE for the *Sun SPARCserver* computer, and press the **Return** key.

The cursor is positioned on the Identification field.

9. Enter a 15-character name for the link. This field may be left blank.

10. Press the **Enter** key.

Screen displays:

command successfully completed,

enter command:

INTERFACE LINKS								
Link	Enable	Est Conn	PI Ext	Prot	Destination Digits	Brd	DTE/ DCE	Identification
1:	y	y	2005	BX.25	2009		DTE	
2:	y							
3:	y							
4:	y							

Figure A-4: Interface Links Form for Generic 3i

Enabling the EIA Port on the Processor Interface

If the EIA port on the processor interface of a Generic 3i is used to make the connection to the *Sun SPARCserver* computer, see Figure A-5.

INTERFACE LINKS						
Link	Enabled	Establish Connection	Interface Extension	Destination Number	DTE/DCE	Identification
1:	y	y	2005	eia	DTE	
2:	n	n	2006		DTE	
3:	n	n	2007		DTE	
4:	n	n	2008		DTE	

Link 1 [eia] - Connected to: DTE Clocking: internal

Figure A-5: Interface Links Form for EIA Port on Processor Interface for Generic 3i

Note

For *CentreVu* CMS R3V5, the DTE/DCE field must be set to DTE.

Administering *CentreVu* CMS Interface on the Generic 1 Switch

This section contains the procedures required to establish a communications link between the *Sun SPARCserver* computer and the Generic 1 switch.

The processor interface on the Generic 1 has eight interface links (01 to 08) available on a multi-carrier cabinet system and four interface links (01 to 04) available on a single-carrier cabinet system. One of these interface links can be assigned to the *Sun SPARCserver* computer.

You assign the *CentreVu* CMS interface by logging in on the SAT as *craft* and filling out the following forms:

- Processor Interface Data Module form
- Data Module (MPDM/MTDM) form
- Processor Channel Assignment form
- Interface Links form.



If the EIA port on the processor interface is used to make the connection to the *Sun SPARCserver* computer, you do not have to fill out the data module form.

Assigning the Processor Interface Data Module

The following procedures can be used to add the processor interface on the Generic 1:

1. Verify that the System Access Terminal displays:

enter command:

2. Enter `add data-module 2005` where *2005* is the extension number assigned to the interface. The extension number you use will automatically appear in the Data Extension field of a data module form. Press the **Return** key.

The screen displays a data module form. (See Figure A-6 for reference.)

3. In the field labeled Type, enter `procr-infc` for Generic 1. After entering the appropriate Type, press the **Return** key.

The cursor is positioned on the Physical Channel field.

4. Enter the physical channel number (for example 01). The physical channel number becomes the interface link number that is used on the Interface Links and Processor Channel Assignment forms. For example, physical channel number 01 is interface link 1.

Note

If the EIA port on the processor interface is used to make the connection to the *Sun SPARCserver* computer, physical channel number 01 must be used.

5. Press the **Return** key.

The cursor is positioned on the Name field.

6. Enter `R3 CMS`, and press the **Return** key.

The cursor is positioned on the COS field.

Note

The COS and COR fields are defaulted to 1.

7. Make no changes to the COS and COR fields, and press the **Enter** key.

Screen displays:
command successfully completed,
enter command:

DATA MODULE

Data Extension: 2005

Type: procr-infrc

Physical Channel: 01

Name: R3 CMS

COS: 1

COR: 1

Maintenance Extension:

ABBREVIATED DIALING

List1:

HOT LINE DESTINATION

Abbreviated Dialing Dial Code (From above list):

ASSIGNED MEMBERS (Stations with a data extension button for this data module)

Ext	Name	Ext	Name
1:		3:	
2:		4:	

Figure A-6: Data Module Form for Generic 1

Assigning a Data Module to the Sun SPARCserver Computer

After assigning the processor interface module, the data module can be administered and connected to the *Sun SPARCserver* computer or to a modem for a *CentreVu* CMS located at a remote location.

Note

If the EIA port on the processor interface is used to make the connection to the *Sun SPARCserver* computer, you do not have to fill out the data module form.

If the *CentreVu* CMS is located at a remote location (with reference to the switch), a modem and MTDM are used.

1. Verify that the System Access Terminal screen displays:

enter command:

2. Enter `add data-module 2009` where *2009* is the extension number assigned to the data module. Press the **Return** key.

The extension number will automatically appear in the Data Extension field on the screen form. The extension number entered here is also used as the destination number on the Interface Links form.

The screen displays a data module form. (See Figure A-7 for reference.)

3. The cursor is positioned on the Type field. This field is defaulted to `pdm`. If the *CentreVu* CMS is remotely connected, this field needs to be changed to `tdm`.
4. Press the **Return** key.

The cursor is positioned on the Port field.

5. Enter the port location to which the data module is connected. Press the **Return** key.

For a Generic 1, the first character identifies the network (1-2, default is 1 if no entry), the second character identifies the carrier (A-E), the third and fourth characters identify the slot number in the carrier (01-20 for multi-carrier cabinets or 01-18 for single-carrier cabinets), and the last two characters identify the circuit number (01-24).

The cursor is positioned on the Name field.

6. Enter `cms link pdm`, or if *CentreVu* CMS is remotely connected, enter `cms link tdm`, and press the **Return** key.

The cursor is positioned on the COS field.

Note The COS and COR fields are defaulted to 1, and the Connected To field is defaulted to dte.

7. Move the cursor to the Remote Loop-Around Test field.
8. Press **Y** if the module supports a loopback at the EIA interface; otherwise, enter **N**. (The 7400D data module does not support a loopback.)

Note If the *CentreVu* CMS is remotely connected (using a modem and MTDM), press **N**.

9. Press the **Enter** key.

Screen displays:

command successfully completed,

enter command:

DATA MODULE

Data Extension: 2009 BCC: Type: pdm Port: 1A0101

Name: cms link pdm COS: 1 COR: 1

Connected to: dte Remote Loop-Around Test? y

ABBREVIATED DIALING

List1:

HOT LINE DESTINATION

Abbreviated Dialing Dial Code (From above list):

ASSIGNED MEMBERS (Stations with a data extension button for this data module)

Ext	Name	Ext	Name
1:		3:	
2:		4:	

Figure A-7: Data Module Form for Generic 1

After assigning the processor interface and the data module, the processor channel and interface link can be established. The processor channel is assigned using the Processor Channel Assignment form, and the interface link is enabled using the Interface Links form.

Assigning the Processor Channel

The Processor Channel form is used to assign one of the 64 local processor channels from the processor link to one of the 64 interface channels assigned to one interface link (1 to 4). Only one interface link is assigned for the *Sun SPARCserver* computer.

The following procedure can be used to assign processor channels on the Generic 1:

1. Verify that the System Access Terminal displays:

enter command:

2. Enter `change communications-interfaces processor-channels` command, and press the **Return** key.

The screen displays the Processor Channel Assignment form. (See Figure A-8 for reference.)

Note The sample screen shown in Figure A-8 illustrates a configuration that assigns the processor channel 1 to the `mis` application with a remote processor channel of 1.

3. Select an available processor channel by using the up/down arrow keys to place the cursor in the `AppL` field of an available channel.

Note The processor channel number should be the same number that was selected for the port number when the *CentreVu* CMS software was installed. For more information on changing the port/link number, see the “swsetup” section in Chapter 2, “CMSADM and CMSSVC Menus.”

4. Enter `mis` in the `AppL` field, and press the **Return** key.

The cursor is positioned on the `Interface Link` field.

5. Enter 1 in the `Interface Link` field. (This is the interface link number assigned on the processor interface data module form.)

6. Press the **Return** key.

The cursor is positioned on the `Interface Chan` field.

7. Enter 1 in the `Interface Chan` field, and press the **Return** key.

The cursor is positioned on the `Priority` field.

8. Enter `h` in the `Priority` field, and press the **Return** key.

The cursor is positioned on the `Remote Proc Chan` field.

9. Enter 1 in the `Remote Proc Chan`, and press the **Return** key.

Cursor is positioned on the MACHINE - ID field.

10. Make no entry, and press the **Enter** key.

Screen displays:

command successfully completed,
enter command:

PROCESSOR CHANNEL ASSIGNMENT						
Proc Chan	Appl.	Interface Link Chan	Priority	Remote Proc Chan	Machine-ID	
1:	mis	1 1	h	1		
2:						
3:						
4:						
5:						
6:						
7:						
8:						
9:						
10:						
11:						
12:						
13:						
14:						
15:						
16:						

Figure A-8: Processor Channel Assignment Form for Generic 1

Note The *CentreVu* CMS R3V5 software requires that the Inter face Chan assignment be administered as 1. Priority on this channel must be set to h (high).

Enabling the Interface Link

The following steps are used to enable the *CentreVu* CMS interface link on the Generic 1:

1. Verify that the System Access Terminal displays:

enter command:

2. Enter change communications-interfaces links, and press the **Return** key.

The screen displays an Interface Links form. (See Figure A-9 for reference.)

The cursor is positioned on the Enabled field.

3. Enter **y** beside the interface link number assigned on the Processor Channel form to enable the interface link. Press the **Return** key.

The cursor is positioned on the Est Conn field.

4. Enter **y** to establish a connection to the MPDM that connects to the *Sun SPARCserver* computer, and press the **Return** key.

The cursor skips the PI Ext field. The extension number assigned on the processor interface data module form is automatically displayed in this field.

The cursor is positioned on the Prot field.

5. Enter BX.25 in the Prot field.

The cursor is positioned on the Destination Digits field.

6. Enter the extension number for the MPDM that connects to the *Sun SPARCserver* computer, and press the **Return** key.

The cursor is positioned on the DTE/DCE field.

7. Enter DTE for the *Sun SPARCserver* computer, and press the **Return** key.

The cursor is positioned on the Identification field.

8. Enter a 15-character name for the link. This field may be left blank.

9. Press the **Enter** key.

Screen displays:

command successfully completed,

enter command:

INTERFACE LINKS								Identification
Link	Enable	Est Conn	PI Ext	Prot	Destination Digits Brd		DTE/ DCE	
1:	y	y	2005	BX.25	2009		DTE	
2:	y							
3:	y							
4:	y							

Figure A-9: Interface Links Form for Generic 1

Enabling the EIA Port on the Processor Interface

If the EIA port on the processor interface on a Generic 1 is used to make the connection to the *Sun SPARCserver* computer, see Figure A-10.

Note

For R3V5 *CentreVu* CMS, the DTE/DCE field must be set to DTE.

INTERFACE LINKS

Link	Enabled	Establish Connection	Interface Extension	Destination Number	DTE/DCE Identification
1:	y	y	2005	eia	DTE
2:	n	n	2006		DTE
3:	n	n	2007		DTE
4:	n	n	2008		DTE

Link 1 [eia] - Connected to: DTE Clocking: internal

Figure A-10: Interface Links Form for EIA Port on Processor Interface for Generic 1

Appendix B

Generic 2 and System 85 Administration

Overview	B-1
Administering the <i>CentreVu</i> CMS Feature on the <i>DEFINITY</i> Generic 2.1 and System 85 R2V4.	B-2
Administering the <i>CentreVu</i> CMS Feature on the <i>DEFINITY</i> Generic 2.2	B-9
Administering a Dedicated Switch Connection on the System 85 R2V4	B-16
Administering a Dedicated Switch Connection on the <i>DEFINITY</i> Generic 2	B-18

Overview

The *CentreVu*™ Call Management System Release 3 Version 5 (CMS R3V5) application can collect and process Automatic Call Distribution (ACD) data from the *DEFINITY*® Communications System Generic 2 and System 85 R2V4 switches. See Chapter 1, “Introduction,” to verify that the switch software release supports the *CentreVu* CMS R3V5 application.

Before the *CentreVu* CMS R3V5 can collect and process the ACD data, the *CentreVu* CMS feature, the Data Communications Interface Unit (DCIU), and the ACD feature on the switch must be properly administered.

The following documents can be used by a qualified switch technician to administer the *CentreVu* CMS and ACD features:

- *Lucent Technologies DEFINITY Communications System Generic 2 Administration of Features and Hardware* (555-104-507, Issue 1)
- *Lucent Technologies System 85 Feature Translation Service Manual Release 2, Version 4, Issue 1* (555-103-107).

Use this appendix to do the following:

- Administer the *CentreVu* CMS Feature on the *DEFINITY* Generic 2.1 and System 85 R2V4.
- Administer the *CentreVu* CMS Feature on the *DEFINITY* Generic 2.2.
- Administer the Dedicated Switch Connection (DSC) Feature on the System 85 R2V4.
- Administer the DSC Feature on the *DEFINITY* Generic 2.

Note

Any changes to the switch translations should only be made by a skilled switch technician.

Note

For the procedures to administer the EAS (Expert Agent Selection) feature, see the *CentreVu*™ CMS R3V5 *Administration* (585-215-820) document.

Administering the *CentreVu* CMS Feature on the *DEFINITY* Generic 2.1 and System 85 R2V4

On a Generic 2.1, use the Manager II to administer the *CentreVu* CMS feature. On a System 85 R2V4, use the VMAAP or MAAP panel.

275 Word 1 Activates the DCIU.

Field 17 Enter the DCIU assignment:

1 Enable

275 Word 4 Enables or disables *CentreVu* CMS for the system.

Field 13 Enter the *CentreVu* CMS assignment:

1 Enable

258 Word 2 Copies the DCIU machine-read memory values to the scratch-pad table. Use this procedure *before* making any DCIU changes.

Field 1 Enter a 1 to make a copy of DCIU tables.



This procedure overwrites the contents of the scratch-pad table.

- 256 Word 1** Administers the major characteristics of the data link. Included are the link number, status, baud rate, DTE/DCE, type of link, protocol, destination machine type, and the destination machine number.
- | | |
|---------|--|
| Field 1 | Enter the DCIU physical link number (1-8). This is the link number of the physical port on the DCIU that is connected to the <i>Sun</i> [*] <i>SPARCserver</i> [†] computer. |
| Field 2 | Enter the assigned status:
1 Assigned |
| Field 3 | Enter the baud rate:
6 9600 Baud
7 19200 Baud |
| Field 4 | Enter the local DTE/DCE assignments:
0 Local end of DCIU link is functioning as a DTE |
| Field 5 | Enter the dial up capabilities:
0 Link is not a dial up link |
| Field 6 | Enter a 1 to specify the BX.25 protocol. |
| Field 7 | Enter the type of machine interface:
8 3B2 |
| Field 8 | Enter the destination machine number:
1-7 For APs, the AP number
If this is the first AP, enter 1. |
- 256 Word 2** Administers the BX.25 level-2 characteristics. Included are the link number, the retransmission timer, the idle timer, the maximum number of retransmissions, and the maximum number of unacknowledged frames allowed on the link.
- | | |
|---------|---|
| Field 1 | Enter the DCIU physical link number (1-8). |
| Field 2 | Enter the time in seconds before retransmitting unacknowledged frames (1-255). For <i>CentreVu</i> CMS, the value is 1. |
| Field 3 | Enter the time in seconds before frames are exchanged on a link (1-255). For <i>CentreVu</i> CMS, the value is 10. |
| Field 4 | Enter the maximum number of retransmissions of an acknowledged frame (1-15). For <i>CentreVu</i> CMS, the value is 2. |
| Field 5 | Enter the maximum number of frames transmitted on a link without acknowledgment (1-7). For <i>CentreVu</i> CMS, the value is 7. |

*Sun is a registered trademark of Sun Microsystems, Inc.

†SPARCserver is a trademark of SPARC International, Inc.

256 Word 3 Administers the BX.25 level-3 characteristics. Included are the link number, the activity timer, the acknowledgment timer, the interrupt timer, the restart timer, and the maximum number of unacknowledged packets.

Field 1	Enter the DCIU physical link number (1-8).
Field 2	Enter the time, in seconds, before sending a window advancement packet to indicate the present condition of a logical channel (1-255). For <i>CentreVu</i> CMS, the value is 180.
Field 3	Enter the time, in seconds, waited for acknowledgment of data packet before resetting a logical channel (1-255). For <i>CentreVu</i> CMS, the value is 20.
Field 4	Enter the time, in seconds, waited for confirmation of an interrupt packet before resetting a logical channel (1-255). For <i>CentreVu</i> CMS, the value is 180.
Field 5	Enter the time, in seconds, waited before retransmitting an unconfirmed reset request package (1-255). For <i>CentreVu</i> CMS, the value is 8.
Field 6	Enter the time, in seconds, waited before retransmitting an unconfirmed restart request package (1-255). For <i>CentreVu</i> CMS, the value is 8.
Field 10	Enter the maximum number of times an unacknowledged data packet can be transmitted (1-7). For <i>CentreVu</i> CMS, the value is 4.

Local/Remote Setup for *CentreVu* CMS:

257 Word 5 Reserves ports for *CentreVu* CMS usage including the port number, the application type, and the application instance number.

Field 1	Enter 64 for the number of the local port.
Field 2	Enter 11 to specify the application type as <i>CentreVu</i> CMS.
Field 3	Enter 1 for the application instance number.

257 Word 2 Administers the port characteristics including the local port, the remote port/destination, the alternate routing destination routing code, and the alternate routing postage.

Field 1	Enter 64 for the local port number.
Field 2	Enter 1 for the remote port/destination.

CentreVu CMS Channel:

257 Word 1 Administers the network channel for *CentreVu* CMS applications. Included are the switch link, the logical channel on the local port, the hardware link, the logical channel, the priority, and the alternate routing flag.

- Field 1 Enter 0 for the local link number (Component A).
- Field 2 Enter 64 for the logical channel number on the local link/switch.
- Field 3 Enter the link number (Component B):
 - 1-8 Hardware links (connected to the link specified in Field 1).
- Field 4 Enter 1 for the logical channel number on the link.
- Field 5 Enter 1 for the priority level (high).
- Field 6 Enter 0 for the alternate routing flag status.

Local/Remote Setup for Maintenance Channel:

257 Word 5 Reserves ports for *CentreVu* CMS usage including the port number, the application type, and the application instance number.

- Field 1 Enter 6 for the number of the local port.
- Field 2 Enter 10 to specify the DCIU test (TEST).
- Field 3 Enter 1 for the application instance number.

257 Word 5 Reserves ports for *CentreVu* CMS usage including the port number, the application type, and the application instance number.

- Field 1 Enter 20 for the number of the local port.
- Field 2 Enter 10 to specify the DCIU test (TEST).
- Field 3 Enter 2 for the application instance number.

257 Word 2 Administers the port characteristics including the local port, the remote port/destination, the alternate routing destination routing code, and the alternate routing postage.

- Field 1 Enter 6 for the local port number.
- Field 2 Enter 20 for the remote port/destination.

257 Word 2 Administers the port characteristics including the local port, the remote port/destination, the alternate routing destination routing code, and the alternate routing postage.

Field 1 Enter 20 for the local port number.

Field 2 Enter 6 for the remote port/destination.

Maintenance Channel:

257 Word 1 Administers the network channel for *CentreVu* CMS applications. Included are the switch link, the logical channel on the local port, the hardware link, the logical channel, the priority, and the alternate routing flag.

Field 1 Enter 0 for the local link number (Component A).

Field 2 Enter 6 for the logical channel number on the local link/switch.

Field 3 Enter 0 for the link number (Component B).

Field 4 Enter 20 for the logical channel number on the link.

Field 5 Enter 0 for the priority level (low).

Field 6 Enter 0 for the alternate routing flag status.

Initialize the Changes:

258 Word 1 Swaps the changes made to the DCIU scratch-pad table with the machine-read memory. Use this procedure *after* making any DCIU changes.

Field 1 Enter a 1 to swap the tables and reboot DCIU.

028 Word 2 This procedure is used to busy out *CentreVu* CMS while translation changes are made. After making the translation changes, the *CentreVu* CMS busy out must be released.

Field 1 Enter the *CentreVu* CMS busy out specifications:

1 Busied out

115 Word 1 Administers the termination point of *CentreVu* CMS trunk groups to ACD splits, ACD priority, and *CentreVu* CMS measurement types.

Field 1 Enter the trunk group number (18-999).

Field 2 Enter the termination point:

– Trunk group does not terminate at a CAS or SS attendant.

Field 3 Enter the split number (1-60) to which the trunk group terminates. Enter — (dash) if the trunk group terminates to a VDN.

Field 5 Enter *CentreVu* CMS measurement type (–, or 1 to 3). The applicable encodes are:

– Trunk group not measured by *CentreVu* CMS

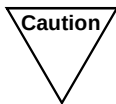
1 Trunk group measured for outgoing calls

2 Trunk group measured for incoming calls

3 Trunk group measured for outgoing and incoming calls.

Note

Only the trunk groups numbered from 18 to 255 can be measured.



Before using Procedure 028 Word 1, Procedure 350 Word 2 should be used to administer the login/logout codes. After the extension is assigned in Procedure 028 Word 1, the agent cannot use the “staffed” button.

028 Word 1 Administers the *CentreVu* CMS to an extension or group of extensions.

Field 2 Enter the *CentreVu* CMS extension low (000-99999).

Field 3 Enter the *CentreVu* CMS extension high (000-99999).

031 Word 1 Administers a vector directory number, a VDN (vector number), measuring the ICI message and the return call assignment. The machine number of the adjunct is displayed in Field 9.

Field 1 Enter the VDN (000-99999).

Field 2 Enter the vector number (–, 1-128).

Field 3 Enter the *CentreVu* CMS measurement capabilities:

0 VDN is not measured

1 VDN is measured.

Field 4 Enter the first console message character (–, 0-37).

0 = 0	A = 11	K = 21	U = 31
1 = 1	B = 12	L = 22	V = 32
2 = 2	C = 13	M = 23	W = 33
3 = 3	D = 14	N = 24	X = 34
4 = 4	E = 15	O = 25	Y = 35
5 = 5	F = 16	P = 26	Z = 36
6 = 6	G = 17	Q = 27	- = 37
7 = 7	H = 18	R = 28	blank = 10
8 = 8	I = 19	S = 29	
9 = 9	J = 20	T = 30	

Field 5 Enter the second console message character (–, 0-37).

Field 6 Enter the third console message character (–, 0-37).

Field 7 Enter the fourth console message character (–, 0-37).

Field 8 Enter the return call indicator:

–, 0 Not a return call VDN

1 MCS return call VDN

2 AUDIX return call VDN.

028 Word 2 This procedure is used to busy out *CentreVu* CMS while translation changes are made. After making the translation changes, the *CentreVu* CMS busy out must be released.

Field 1 Enter the *CentreVu* CMS busy out specifications:

0 Not busied out.

Administering the *CentreVu* CMS Feature on the *DEFINITY* Generic 2.2

On a Generic 2.2, use the Manager II to administer the *CentreVu* CMS feature.

275 Word 1 Activates the DCIU.

Field 17 Enter the DCIU assignment:
1 Enable.

275 Word 4 Enables or disables *CentreVu* CMS for the system.

Field 13 Enter the *CentreVu* CMS assignment:
1 Enable.

258 Word 2 Copies the DCIU machine-read memory values to the scratch-pad table. Use this procedure *before* making any DCIU changes.

Field 1 Enter a 1 to make a copy of DCIU tables.

Note

This procedure overwrites the contents of the scratch-pad table.

256 Word 1 Administers the major characteristics of the data link. Included are the link number, status, baud rate, DTE/DCE, type of link, protocol, destination machine type, and the destination machine number.

- Field 1 Enter the DCIU physical link number (1-8). This is the link number of the physical port on the DCIU that is connected to the *Sun SPARCserver* computer.
- Field 2 Enter the assigned status:
1 Assigned.
- Field 3 Enter the baud rate:
6 9600 Baud
7 19200 Baud.
- Field 4 Enter the local DTE/DCE assignments:
0 Local end of DCIU link is functioning as a DTE.
- Field 5 Enter the dial up capabilities:
0 Link is not a dial up link.
- Field 6 Enter a 1 to specify the BX.25 protocol.
- Field 7 Enter the type of machine interface:
8 3B2.
- Field 8 Enter the destination machine number:
1-7 For APs, the AP number
If this is the first AP, enter 1.

256 Word 2 Administers the BX.25 level-2 characteristics. Included are the link number, the retransmission timer, the idle timer, the maximum number of retransmissions, and the maximum number of unacknowledged frames allowed on the link.

- Field 1 Enter the DCIU physical link number (1-8).
- Field 2 Enter the time in seconds before retransmitting unacknowledged frames (1-255). For *CentreVu* CMS, the value is 1.
- Field 3 Enter the time in seconds before frames are exchanged on a link (1-255). For *CentreVu* CMS, the value is 10.
- Field 4 Enter the maximum number of retransmissions of an acknowledged frame (1-15). For *CentreVu* CMS, the value is 2.
- Field 5 Enter the maximum number of frames transmitted on a link without acknowledgment (1-7). For *CentreVu* CMS, the value is 7.

256 Word 3 Administers the BX.25 level-3 characteristics. Included are the link number, the activity timer, the acknowledgment timer, the interrupt timer, the restart timer, and the maximum number of unacknowledged packets.

Field 1	Enter the DCIU physical link number (1-8).
Field 2	Enter the time, in seconds, before sending a window advancement packet to indicate the present condition of a logical channel (1-255). For <i>CentreVu</i> CMS, the value is 180.
Field 3	Enter the time, in seconds, waited for acknowledgment of data packet before resetting a logical channel (1-255). For <i>CentreVu</i> CMS, the value is 20.
Field 4	Enter the time, in seconds, waited for confirmation of an interrupt packet before resetting a logical channel (1-255). For <i>CentreVu</i> CMS, the value is 180.
Field 5	Enter the time, in seconds, waited before retransmitting an unconfirmed reset request package (1-255). For <i>CentreVu</i> CMS, the value is 8.
Field 6	Enter the time, in seconds, waited before retransmitting an unconfirmed restart request package (1-255). For <i>CentreVu</i> CMS, the value is 8.
Field 10	Enter the maximum number of times an unacknowledged data packet can be transmitted (1-7). For <i>CentreVu</i> CMS, the value is 4.

Local/Remote Setup for *CentreVu* CMS:

257 Word 5 Reserves ports for *CentreVu* CMS usage including the port number, the application type, and the application instance number.

Field 1	Enter 64 for the number of the local port.
Field 2	Enter 11 to specify the application type as <i>CentreVu</i> CMS.
Field 3	Enter 1 for the application instance number.

257 Word 2 Administers the port characteristics including the local port, the remote port/destination, the alternate routing destination routing code, and the alternate routing postage.

Field 1	Enter 64 for the local port number.
Field 2	Enter 1 for the remote port/destination.

CentreVu CMS Channel:

257 Word 1 Administers the network channel for *CentreVu* CMS applications. Included are the switch link, the logical channel on the local port, the hardware link, the logical channel, the priority, and the alternate routing flag.

- Field 1 Enter 0 for the local link number (Component A).
- Field 2 Enter 64 for the logical channel number on the local link/switch.
- Field 3 Enter the link number (Component B):
 - 1-8 Hardware links (connected to the link specified in Field 1).
- Field 4 Enter 1 for the logical channel number on the link.
- Field 5 Enter 1 for the priority level (high).
- Field 6 Enter 0 for the alternate routing flag status.

Local/Remote Setup for Maintenance Channel:

257 Word 5 Reserves ports for *CentreVu* CMS usage including the port number, the application type, and the application instance number.

- Field 1 Enter 6 for the number of the local port.
- Field 2 Enter 10 to specify the DCIU test (TEST).
- Field 3 Enter 1 for the application instance number.

257 Word 5 Reserves ports for *CentreVu* CMS usage including the port number, the application type, and the application instance number.

- Field 1 Enter 20 for the number of the local port.
- Field 2 Enter 10 to specify the DCIU test (TEST).
- Field 3 Enter 2 for the application instance number.

257 Word 2 Administers the port characteristics including the local port, the remote port/destination, the alternate routing destination routing code, and the alternate routing postage.

- Field 1 Enter 6 for the local port number.
- Field 2 Enter 20 for the remote port/destination.

257 Word 2 Administers the port characteristics including the local port, the remote port/destination, the alternate routing destination routing code, and the alternate routing postage.

Field 1 Enter 20 for the local port number.

Field 2 Enter 6 for the remote port/destination.

Maintenance Channel:

257 Word 1 Administers the network channel for *CentreVu* CMS applications. Included are the switch link, the logical channel on the local port, the hardware link, the logical channel, the priority, and the alternate routing flag.

Field 1 Enter 0 for the local link number (Component A).

Field 2 Enter 6 for the logical channel number on the local link/switch.

Field 3 Enter 0 for the link number (Component B).

Field 4 Enter 20 for the logical channel number on the link.

Field 5 Enter 0 for the priority level (low).

Field 6 Enter 0 for the alternate routing flag status.

Initialize the Changes:

258 Word 1 Swaps the changes made to the DCIU scratch-pad table with the machine-read memory. Use this procedure *after* making any DCIU changes.

Field 1 Enter a 1 to swap the tables and reboot DCIU.

028 Word 1 This procedure is used to busy out *CentreVu* CMS while translation changes are made. After making the translation changes, the *CentreVu* CMS busy out must be released.

Field 1 Enter the *CentreVu* CMS busy-out specifications:

1 Busied out.

115 Word 1 Administers the termination point of *CentreVu* CMS trunk groups to ACD splits, ACD priority, and *CentreVu* CMS measurement types.

Field 1 Enter the trunk group number (18-999).

Field 2 Enter the termination point:

- Trunk group does not terminate at a CAS or SS attendant.

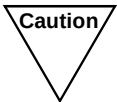
Field 3 Enter the split number (1-60) to which the trunk group terminates. Enter a - (dash) if the trunk group terminates to a VDN.

Field 5 Enter *CentreVu* CMS measurement type (–, or 1 to 3). The applicable encodes are:

- Trunk group not measured by *CentreVu* CMS
- 1 Trunk group measured for outgoing calls
- 2 Trunk group measured for incoming calls
- 3 Trunk group measured for outgoing and incoming calls.



Only the trunk groups numbered from 18 to 255 can be measured.



Before using Procedure 026 Word 2, Procedure 350 Word 2 should be used to administer the login/logout codes. After the extension is assigned in Procedure 028 Word 1, the agent cannot use the “staffed” button.

026 Word 2 Administers an ACD split and whether the split is measured.

Field 8 Enter the *CentreVu* CMS split measurement status. The applicable encodes are:

- 0 Split is not measured by *CentreVu* CMS
- 1 Split is measured by *CentreVu* CMS.

031 Word 1 Administers a vector directory number (VDN), a vector number, the ICI message, and the return call assignment. The machine number of the adjunct is displayed in Field 9.

- Field 1 Enter the VDN (000-99999).
- Field 2 Enter the vector number (–, 1-128).
- Field 3 Enter the *CentreVu* CMS measurement capabilities:
- 0 VDN is not measured
- 1 VDN is measured.
- Field 4 Enter the first console message character (–, 0-37).

0 = 0	A = 11	K = 21	U = 31
1 = 1	B = 12	L = 22	V = 32
2 = 2	C = 13	M = 23	W = 33
3 = 3	D = 14	N = 24	X = 34
4 = 4	E = 15	O = 25	Y = 35
5 = 5	F = 16	P = 26	Z = 36
6 = 6	G = 17	Q = 27	- = 37
7 = 7	H = 18	R = 28	blank = 10
8 = 8	I = 19	S = 29	
9 = 9	J = 20	T = 30	

- Field 5 Enter the second console message character (–, 0-37).
- Field 6 Enter the third console message character (–, 0-37).
- Field 7 Enter the fourth console message character (–, 0-37).
- Field 8 Enter the return call indicator:
- , 0 Not a return call VDN
- 1 MCS return call VDN
- 2 AUDIX return call VDN.

028 Word 2 This procedure is used to busy out *CentreVu* CMS while translation changes are made. After making the translation changes, the *CentreVu* CMS busy out must be released.

- Field 1 Enter the *CentreVu* CMS busy out specifications:
- 0 Not busied out.

Administering a Dedicated Switch Connection on the System 85 R2V4

On a System 85 R2V4, use the VMAAP or MAAP panel to administer the DSC (Dedicated Switch Connection) feature.

Note The System 85 R2V4 must have tape issue 1.1 (with patches 946, 947, and 954) to establish a connection between the switch and *CentreVu* CMS R3V5.

The translations should be done at both the local and distant end switches. If one of the switches is a *DEFINITY* Generic 2, follow the administration procedures in the “Administering a Dedicated Switch Connection on a *DEFINITY* Generic 2” section in this appendix.

000 Word 1 Administers the extension number and class of service.

Field 1 Enter the extension number of the distant end.

Field 7 Enter the class of service associated with the extension.

051 Word 1 Administers the characteristics of the data module.

Fields 1-5 Enter the terminal equipment location of the MPDM.

Field 6 Enter 4 to specify “PDM” as the type of data module.

Field 10 Enter 2 to set the extension origination preference as the “Prime Appearance.”

Field 11 Enter 0 to set the extension termination preference to “None.”

Field 13 Enter 0 to disable keyboard dialing feature.

052 Word 1 Administers the characteristics of the data module.

- Fields 1-5 Enter the terminal equipment location of the MPDM.
- Field 6 Enter 0 to specify the device type as a basic set.
- Field 7 Enter 0 to specify the button number.
- Field 8 Enter the extension number of the MPDM.
- Field 9 Enter 1 to specify the line appearance number.
- Field 10 Enter 1 to specify the line type.
- Field 11 Enter 1 to set ringing type.
- Field 12 Enter 1 to specify that it is the home terminal.
- Field 13 Enter 0 to specify that the terminal is not an originating only terminal.
- Field 14 Enter 0 to specify that this terminal is not in a SAC group.

Activate the Dedicated Switch Connection Feature:

360 Word 1 Administers the Dedicated Switch Connection (DSC) between the MPDM and the DS1 circuit.

- Field 1 Enter 1 to activate the DSC feature.
- Field 2 Enter an unused DSC number (0-1023).
- Fields 3-7 Enter the equipment location for the MPDM.
- Field 8 Enter 1 to set the "I" channel to voice.
- Fields 10-14 Enter the equipment location for the DS1 channel.
- Field 15 Enter – to specify the port is not a GPP.

Note

When using the DSC feature, Procedure 260, Word 1, Field 8 should be set to 0 to specify 24th Channel Signaling. Also, Procedure 116, Word 1, Field 8 should be set to 1 to disable signaling.

Administering a Dedicated Switch Connection on the *DEFINITY* Generic 2

On a *DEFINITY* Generic 2.1, administer the DSC (Dedicated Switch Connection) feature.

The translations should be done at both the local and distant end switches. If one of the switches is a System 85 R2V4, follow the administration procedures in the “Administering a Dedicated Switch Connection on the System 85 R2V4” section in this appendix.

000 Word 1 Administers the extension number and class of service.

Field 1 Enter the extension number of the distant end.

Field 7 Enter the class of service associated with the extension.

051 Word 1 Administers the characteristics of the data module.

Fields 1-5 Enter the terminal equipment location of the MPDM.

Field 6 Enter 1 to specify “PDM” as the type of data module.

Field 7 Enter 0 to specify terminal options as “Data Only.”

Field 8 Enter 1 to specify that it is a DTDM (data stand or ADM-T).

Field 9 Enter - to specify that the display is not assigned.

Field 10 Enter 2 to set the extension origination preference as the “Prime Appearance.”

Field 11 Enter 0 to set the extension termination preference to “None.”

Field 13 Enter 0 to disable keyboard dialing feature.

Field 15 Enter a - (dash) to specify that Terminal Alarming does not apply.

052 Word 1 Administers the characteristics of the data module.

- Fields 1-5 Enter the terminal equipment location of the MPDM.
- Field 6 Enter 0 to specify the device type as a basic set.
- Field 7 Enter 0 to specify the button number.
- Field 8 Enter the extension number of the MPDM.
- Field 9 Enter 1 to specify the line appearance number.
- Field 10 Enter 1 to specify the line type.
- Field 11 Enter 1 to set ringing type.
- Field 12 Enter 1 to specify that it is the home terminal.
- Field 13 Enter 0 to specify that the terminal is not an originating only terminal.
- Field 14 Enter 0 to specify that this terminal is not in an SAC group.

Activate the Dedicated Switch Connection Feature:

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- Field 1 Enter 1 to activate the DSC feature.
- Field 2 Enter an unused DSC number (0-1023).
- Fields 3-7 Enter the equipment location for the MPDM.
- Field 8 Enter 1 to set the "I" channel to voice.
- Fields 10-14 Enter the equipment location for the DS1 channel.
- Field 15 Enter - to specify the port is not a GPP.

Note

When using the DSC feature, Procedure 260, Word 1, Field 8 should be set to 0 to specify 24th Channel Signaling. Also, Procedure 116, Word 1, Field 8 should be set to 1 to disable signaling.

Appendix C

Generic 3r Administration

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Overview

The *CentreVu*™ Call Management System Release 3 Version 5 (CMS R3V5) application can collect and process Automatic Call Distribution (ACD) data from the *DEFINITY*® Communications System Generic 3r switch. However, before *CentreVu* CMS can collect and process the ACD data, a special hardware interface on the switch must be properly administered. For the Generic 3r switch, the hardware interface is a Packet Gateway (TN577) board. This hardware interface is sometimes called the *CentreVu* CMS interface.

In addition to the *CentreVu* CMS interface, the following *CentreVu* CMS features on the switch must also be administered:

- Abandoned Call Search
- Agent Call Handling
- Hunt Groups
- Intraflow and Interflow
- Queue Status Indications
- Recorded Announcements
- Service Observing.

Note

For the screens to administer the EAS (Expert Agent Selection) feature, see the *CentreVu*™ CMS R3V5 Administration (585-215-820) document.

The following documents can be used by a qualified switch technician to implement the *CentreVu* CMS interface and features:

- *Lucent Technologies DEFINITY Communications System Generic 3 Version 2 Implementation Manual* (555-230-653, Issue 1)
- *Lucent Technologies DEFINITY Communications System Generic 1 and Generic 3 Installation and Test* (555-230-104, Issue 4)
- *Lucent Technologies DEFINITY Communications System Generic 3r Maintenance* (555-230-105).

For your convenience, the next section contains step-by-step procedures that can be used to implement the *CentreVu* CMS interface. However, should you have any questions about these procedures, you should refer to the appropriate switch documentation.



Only a qualified switch technician or switch administrator should administer the *CentreVu* CMS interface and features on the switch.

Administering *CentreVu* CMS Interface on Generic 3r

This section contains the procedures required to establish a communications link between the *Sun*^{*} *SPARCserver*[†] computer and the Generic 3r switch.

The Packet Gateway (TN577) board on the Generic 3r has four interface links (01 to 04). One of these interface links can be assigned to the *Sun SPARCserver* computer.

You assign the *CentreVu* CMS interface by logging in on System Access Terminal (SAT) as *craft* and filling out the following forms:

- Feature-Related System Parameters form
- Pgate (Packet Gateway) Board form
- Data Module (MPDM/MTDM) form
- Processor Channel Assignment form
- Interface Links form
- Administered Connection form.

Note

If the Isolating Data Interface is used to make the connection to the *Sun SPARCserver* computer, you do not have to fill out the Data Module form and the Administered Connection form.

^{*}Sun is a registered trademark of Sun Microsystems, Inc.
[†]SPARCserver is a trademark of SPARC International, Inc.

Changing Feature-Related System Parameters

Use the following procedures to change the *CentreVu* CMS parameters on the Generic 3r:

1. Verify that the System Access Terminal displays:

```
enter command:
```
2. Enter `change system-parameters` features. Press the **Return** key.

The screen displays a Data Module form. (See Figure C-1 for reference.)
3. In the field labeled `Adjunct CMS Release`, enter `R3V5 CentreVu CMS for Generic 3r`. Press the **Return** key.
4. In the `Automatic Call Distribution (ACD) Log-in Identification Length` field, enter the length of the agent login IDs. The length of the agent login IDs for the Generic 3r is 0-9 characters. Press the **Enter** key.

Screen displays:

```
command successfully completed,  
enter command:
```

```
FEATURE-RELATED SYSTEM PARAMETERS  
  
SYSTEM PRINTER PARAMETERS  
  
    System Printer Type: _____  
  
    Printer Speed: _____  
  
SYSTEM-WIDE PARAMETERS  
    Switch Name: _____  
  
CALL MANAGEMENT SYSTEM PARAMETERS  
    BCMS Measurement Interval: _____  
    Adjunct CMS Release: R3V5  
    Automatic Call Distribution (ACD) Log-in Identification Length: X_  
  
MALICIOUS CALL TRACE PARAMETERS  
    Apply MCT Warning Tone? _  
    MCT Voice Recorder Trunk Group: _____
```

Figure C-1: Feature-Related System Parameters Form

Assigning the Packet Gateway Board

Use the following procedures to assign the Packet Gateway board on the Generic 3r:

1. Verify that the System Access Terminal displays:

enter command:

2. Enter add pgate 1c03 where 1c03 is the physical Packet Gateway (TN577) board location. Press the **Return** key.

The first character identifies the network (1-2, default is 1 if no entry), the second character identifies the carrier (A-E), the third and fourth characters identify the slot number in the carrier (01-20 for multi-carrier cabinets or 01-18 for single-carrier cabinets). The physical board location you use will automatically appear in the Board Location field of a Pgate Board form.

The screen displays a Pgate Board form. (See Figure C-2 for reference.)

3. In the External Cable Type field, enter rs232 for Generic 3r. Press the **Enter** key.

Screen displays:

command successfully completed,

enter command:

PGATE BOARD

Board Location: 01C03	Name: PGATE Board
Application: x.25	
External Cable Type: rs232	
Port Configuration: 1) RS232 2) RS232 3) RS232 4) RS232	

Figure C-2: Pgate Board Form

Assigning the Packet Gateway Port

Use the following procedures to assign the Packet Gateway port on the Generic 3r:

1. Verify that the System Access Terminal displays:

enter command:

2. Enter `add data-module 2005` where *2005* is the extension number assigned to the interface. The extension number you use will automatically appear in the Data Extension field of a Data Module form. Press the **Return** key.

The screen displays a Data Module form. (See Figure C-3 and Figure C-4 for reference.)

3. In the field labeled Type, enter `x.25`. Press the **Return** key.

The cursor is positioned on the Port field.

4. Enter the port number, for example `01C0302`. The port number identifies the physical equipment location of the circuit pack (packet gateway) being used. Press the **Return** key.

The cursor is positioned on the Name field.

5. Enter `Pgate 1C0302` where *1C0302* is the physical equipment location of the Pgate board. Press the **Return** key.

6. Enter `9600` or `19200` in the Baud Rate field.

Note The baud rate must be the same for all components used in the link.

The cursor is positioned on

7. Press **Y** in the Error Logging field.

Note To maximize call capacity, the Number of Outstanding Packets field on page 2 of the Data Module form should be increased from the default values of 2 to 7.

It is also recommended that the Baud Rate field be set to `19200` whenever the physical connection can support it. For example, if the switch is connected to the *Sun SPARCserver* computer via the Isolating Data Interface, the physical connection can support a baud rate of `19200`.

Screen displays:

command successfully completed,
enter command:

DATA MODULE

Data Extension: 2005	Type: x.25	Port: 01C0302
Name: pgate 1C0302	COR: 1	
Endpoint Type: adjunct	DTE/DCE: dte	Baud Rate: 19.2
Error Logging? n	Remote Loop-Around Test? n	

Permanent Virtual Circuit? y Highest PVC Logical Level: 64
Switched Virtual Circuit? n

Figure C-3: Data Module Form (Page 1)

DATA MODULE

LAYER 2 PARAMETERS

Number of Outstanding Frames (w) : 7
Retry Attempt Counter (N2) : 2
Frame Size (N1) : 135
Retransmission (T1) Timer (1/10 seconds) : 10
Idle (T4) Timer (1/10 seconds) : 30

LAYER 3 PARAMETERS

Number of Outstanding Packets : 7
Restart (T20) Timer (seconds) : 8
Reset (T22) Timer (seconds) : 10

Figure C-4: Data Module Form (Page 2)

Note

Both the Number of Outstanding Frames (w): and Number of outstanding packets: fields must be set to 7 for proper communication between the switch and the *Sun SPARCserver* computer.

Assigning a Data Module to the Switch

After assigning the interface on the Packet Gateway board, the data module can be administered and connected to the switch.

Note If the *CentreVu* CMS is located at a remote location (with reference to the switch), a modem and MTDM will be used.

1. Verify that the System Access Terminal screen displays:

enter command:

2. Enter `add data-module 2007` where *2007* is the extension number assigned to the data module. Press the **Return** key.

The extension number will automatically appear in the Data Extension field on the screen form. The extension number entered here is also used as the destination number on the Interface Links form.

The screen displays a Data Module form. (See Figure C-5 for reference.)

3. The cursor is positioned on the Type field. This field is defaulted to `pdm`. If the *CentreVu* CMS is remotely connected, this field needs to be changed to `tdm`.
4. Press the **Return** key.

The cursor is positioned on the Port field.

5. Enter the port location to which the data module is connected. Press the **Return** key.

For a Generic 3r, the first character identifies the network (1-2, default is 1 if no entry), the second character identifies the carrier (A-E), the third and fourth characters identify the slot number in the carrier (01-20 for multi-carrier cabinets or 01-18 for single-carrier cabinets), and the last two characters identify the circuit number (01-24).

The cursor is positioned on the Name field.

6. Enter `switch pdm`, or if *CentreVu* CMS is remotely connected, enter `switch tdm` and press the **Return** key.

The cursor is positioned on the COS field.

Note The COS and COR fields are defaulted to 1, and the Connected To field is defaulted to `dte`.

7. Press the key.

Screen displays:

command successfully completed,
enter command:

DATA MODULE

Data Extension: 2009 BCC: Type: Port:

 COS: COR:

 ITC: restricted

Remote Loop-Around Test? y

ABBREVIATED DIALING
List1:

SPECIAL DIALING OPTION: _____

ASSIGNED MEMBERS (Station with a data extension button for this data module)

Ext	Name
1:	

Figure C-5: Data Module Form

After the Pgate board and the data module have been assigned, the processor channel and interface link can be established. The processor channel is assigned using the Processor Channel Assignment form, and the interface link is enabled using the Interface Links form.

Assigning a Data Module to the Sun SPARCserver Computer

After assigning the interface on Packet Gateway board, the data module can be administered and connected to the *Sun SPARCserver* computer or to a modem for a *CentreVu* CMS located at a remote location.

Note If the *CentreVu* CMS is located at a remote location (with reference to the switch), a modem and MTDM will be used.

1. Verify that the System Access Terminal screen displays:

enter command:

2. Enter add data-module 2009 where 2009 is the extension number assigned to the data module. Press the **Return** key.

The extension number will automatically appear in the Data Extension field on the screen form. The extension number entered here is also used as the destination number on the Interface Links form.

The screen displays a Data Module form. (See Figure C-6 for reference.)

3. The cursor is positioned on the Type field. This field is defaulted to pdm. If the *CentreVu* CMS is remotely connected, this field needs to be changed to tdm.
4. Press the **Return** key.

The cursor is positioned on the Port field.

5. Enter the port location to which the data module is connected. Press the **Return** key.

6. For a Generic 3r, the first character identifies the network (1-2, default is 1 if no entry), the second character identifies the carrier (A-E), the third and fourth characters identify the slot number in the carrier (01-20 for multi-carrier cabinets or 01-18 for single-carrier cabinets), the last two characters identify the circuit number (01-24).

The cursor is positioned on the Name field.

7. Enter cms link pdm, or if *CentreVu* CMS is remotely connected, enter cms link tdm, and press the **Return** key.

The cursor is positioned on the COS field.

Note The COS and COR fields are defaulted to 1, and the Connected To field is defaulted to dte.

8. Move the cursor to the Remote Loop-Around Test field.

9. Press if the module supports a loopback at the EIA interface; otherwise, enter (The AT&T 7400D does not support loopback.)
10. Press the key.
11. Screen displays:

command successfully completed,
enter command:

DATA MODULE

Data Extension: 2009	BCC:	Type: pdm	Port: 1c0401
Name: cms link pdm	COS: 1	COR: 1	
Connected to: dte		ITC: restricted	
Remote Loop-Around Test? y			

ABBREVIATED DIALING
List1:

SPECIAL DIALING OPTION: _____

ASSIGNED MEMBERS (Station with a data extension button for this data module)

Ext	Name
1:	

Figure C-6: Data Module Form

After the Pgate board and the data module have been assigned, the processor channel and interface link can then be established. The processor channel is assigned using the Processor Channel Assignment form, and the interface link is enabled using the Interface Links form.

Enabling the Interface Link on the Generic 3r

Use the following steps to enable the *CentreVu* CMS interface link on the Generic 3r:

1. Verify that the System Access Terminal displays:

enter command:

2. Enter `change communications-interfaces links`, and press the **Return** key.

The screen displays an Interface Links form. (See Figure C-7 for reference.)

The cursor is positioned on the Enabled field.

3. Enter **Y** beside the interface link number assigned on the Processor Channel form to enable the interface link. Press the **Return** key.

The cursor is positioned on the X.25 Extension field.

4. Enter the extension number assigned to establish a connection to the MPDM that connects to the *Sun SPARCserver* computer, and press the **Return** key.

The cursor skips the Destination Number field. The extension number assigned on the Processor Interface Data Module form is automatically displayed in this field.

The cursor is positioned on the Identification field.

5. Enter a 15-character name for the link. This field may be left blank.

6. Press the key.

Screen displays:

command successfully completed,
enter command:

INTERFACE LINKS							
Link	Enabled	X.25 Extension	Destination Number	Establish Connection	Connected Data Module	Identification	
1:	y	2005	external			cms link	
2:	n	n	2006				
3:	n	n	2007				
4:	n	n	2008				

Figure C-7: Interface Links Form for EIA Port on Processor Interface

Assigning the Processor Channel

Use the Processor Channel form to assign one of the 64 local processor channels from the processor link to one of the 64 interface channels assigned to one interface link (1 to 4). Only one interface link is assigned for the *Sun SPARCserver* computer.

The interface link number used on this form is the same number assigned to the Physical Channel field on the Interface-3 Data Module form.

The following procedure can be used to assign processor channels on the Generic 3r:

1. Verify System Access Terminal displays:

enter command:

2. Enter change communication-interface processor-channels command, and press the **Return** key.

The screen displays the Processor Channel Assignment form.
(See Figure C-8 for reference.)

Note The sample screen shown in Figure C-8 illustrates a configuration which assigns the Processor Channel 1 to the *mis* Application with a Local and Remote Port of 1.

3. Select an available processor channel by using the up/down arrow keys to place the cursor in the Appl field of an available channel.

Note The Processor Channel number should be the same number that was selected for the *local port* number when the *CentreVu* CMS software was installed. For more information on changing the port/link number, refer to the "swsetup" section in Chapter 2, "CMSADM and CMSSVC Menus."

4. Enter *mis* in the Appl field, and press the **Return** key.

The cursor is positioned on the Interface Link field.

5. Enter 1 in the Interface Link field. (This is the interface link number assigned on the Processor Interface Data Module form.)

6. Press the **Return** key.

The cursor is positioned on the Interface Chan field.

7. Enter 1 in the Interface Chan field, and press the **Return** key.

Note

The *CentreVu* CMS R3V5 software requires that the Interface Chan assignment be administered as 1.

The cursor is positioned on the Local Port field.

8. Enter 1 in the Local Port field, and press the **Return** key.

The cursor is positioned on the Remote Port field.

9. Enter 1 in the Remote Port field, and press the **Return** key.

Cursor is positioned on the MACHINE-ID field.

10. Make no entry; press the **Enter** key.

Screen displays:

command successfully completed,
enter command:

PROCESSOR CHANNEL ASSIGNMENT							
Proc Chan	Appl.	Interface Link	Chan	Local Port	Remote Port	Adjunct Name	Machine-ID
1:	mis	1	1	1	1		
2:							
3:							
4:							
5:							
6:							
7:							
8:							
9:							
10:							
11:							
12:							
13:							
14:							
15:							
16:							

Figure C-8: Processor Channel Assignment Form

Setting Up an Administered Connection

The following procedures can be used to set up an administered connection on the Generic 3r:

1. Verify that the System Access Terminal displays:
enter command:
2. Enter add administered-connection 1. Press the **Return** key.
The screen displays an Administered Connection form.
(See Figure C-9 for reference.)
3. In the field labeled Originator, enter the extension number assigned to the modem being connected to the pgate connection.
Press the **Return** key.
4. In the field labeled Destination, enter the extension number assigned to the modem being connected to the Sun SPARCserver computer. Press the **Enter** key.

Screen displays:

command successfully completed,

enter command:

```

ADMINISTERED CONNECTION
Connection Number: 1 Enable? y
Originator: 2007
Destination: 2009
Name:
AUTHORIZED TIME OF DAY
Continuous? y
MISCELLANEOUS PARAMETERS
Alarm Type: warning Alarm Threshold: 5
Retry Interval: 2 Auto Restoration? y
Priority: 5
```

Figure C-9: Administered Connection Form

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Overview

This appendix outlines the hardware and software installation procedures performed by the factory for the *Sun*^{*} *SPARCserver*[†] computers. You can use these procedures to bring a *Sun SPARCserver* computer in the field up to factory standard. The factory performs the following installation procedures:

A. Hardware Procedures:

1. Unpack the system.
2. Install the Dynamic Single In-line Memory Modules (DSIMMs).
3. Install the Video Single In-line Memory Modules (VSIMMs).
4. Install the SBus cards.
5. Install the internal hard disk drives.
6. Install the internal floppy drive.
7. Install the internal CD-ROM drive.
8. Set the black box DTE/DCE DIP shunts.
9. Connect the system console peripherals.
10. Connect the external disks.
11. Connect the network hub unit and the network terminal servers (NTSs).
12. Connect the 8-and 16-port expander box.
13. Power up the computer and verify sanity.
14. Connect the remote console.

B. Software Procedures:

1. Install the *Sun Solaris*[‡] 2.4 operating system.
2. Install the *Solaris 2.4 AnswerBook*^{**} software.
3. Install the *SunLink*^{††} HSI/S Version 2.0 software.
4. Install the *Sun* 1.0 NTS package.
5. Install the *SunLink* X.25 Network Interface Version 8.0.2 software.

^{*}Sun is a registered trademark of Sun Microsystems, Inc.

[†]SPARCserver is a trademark of SPARC International, Inc.

[‡]Solaris is a registered trademark of Sun Microsystems, Inc.

^{**}AnswerBook is a trademark of Sun Microsystems, Inc.

^{††}SunLink is a registered trademark of Sun Microsystems, Inc.

6. Install the *INFORMIX*^{*} software.
7. Install the *Solstice DiskSuite*[†] Software.
8. Set up the swap file.
9. Install the *Sun Solaris* patches.
10. Install the *CentreVu*[™] Call Management System (CMS) application.
11. Install the Aurora SBus *Multiport*[‡] card software driver.
12. Set authorizations.
13. Set up the remote console.
14. Administer the NTS.

*INFORMIX is a registered trademark of Informix Software, Inc.

†Solstice DiskSuite is a trademark of Sun Microsystems, Inc.

‡Multiport is a trademark of Aurora Technologies, Inc.

Factory Hardware Installation Procedures



Before you begin the hardware installation, make sure that the computer is plugged in, the power is off, and you are wearing an Electro-Static Discharge (ESD) ground strap.

The following steps outline the factory hardware installation procedures and include the following:

- Installation procedures
- Documentation references
- SCSI ID and option settings, board locations, etc.

Opening the Machine

To open your *Sun SPARCserver* computer, do the following:

1. Shut down your system.
2. When the system has finished its shutdown, turn off the power to *all* the peripherals, the monitor, and the computer system.
3. Remove the cover screws located on the top right rear of the back panel (see Figure D-1).

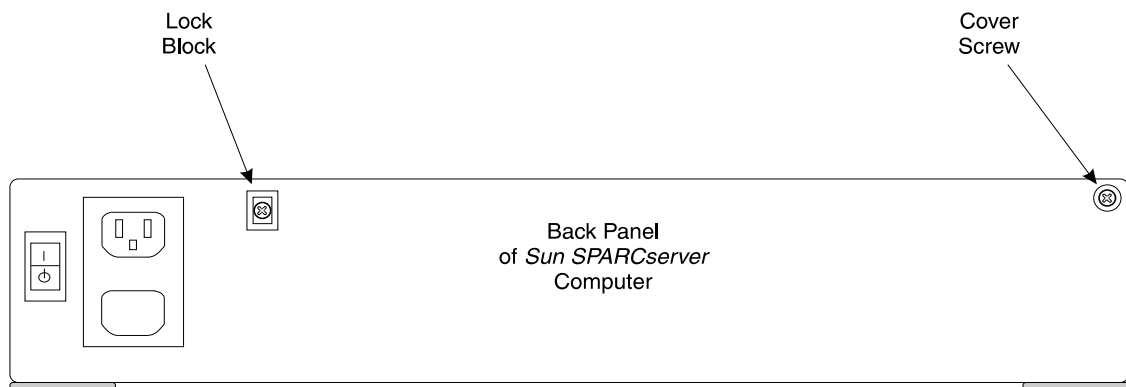


Figure D-1: Rear Panel of a *Sun SPARCserver* Computer

4. Find the lock block located towards the top left corner of the back panel (see Figure D-1).

5. Face the back panel, and grasp the sides of the cover. Carefully lift the back of the cover up and away from the back panel (see Figure D-2). The cover should start to swing up towards the front of the machine.

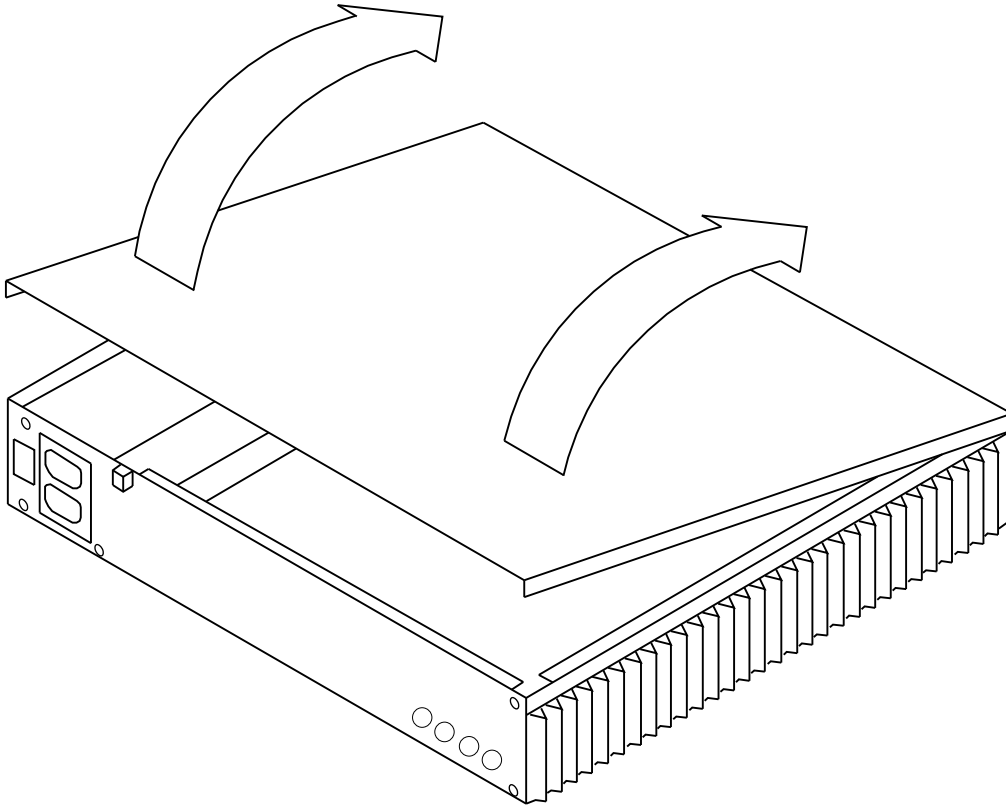


Figure D-2: Removing the Cover from a *Sun SPARCserver* Computer

6. When the cover is at approximately a 60-degree angle (relative to the system unit), push the cover forward until the cover's hinge tabs are free of the system unit.

Additional References For additional information, refer to the following documentation:

Sun SPARCstation Installation Guides (5, 10, and 20),
Chapter 4: "Opening the System Unit."

Installing SBus Cards in Desktop SPARCstations,
(Use "4SBus and 3SBus slot *SPARCstation*" references).

Identifying the Internal Hardware Components

Identify the following components in your *Sun SPARCserver* computer (see Figures D-3 through D-5):

- Internal CD-ROM Drive
- Internal Hard Disk Drives
- DSIMM Slots/Receptacles
- VSIMM Slots/Receptacles (*Sun SPARCserver 20* only)
- SBus Slots
- MBus Slots (*Sun SPARCserver 10 and 20* only)
- Power Supply.

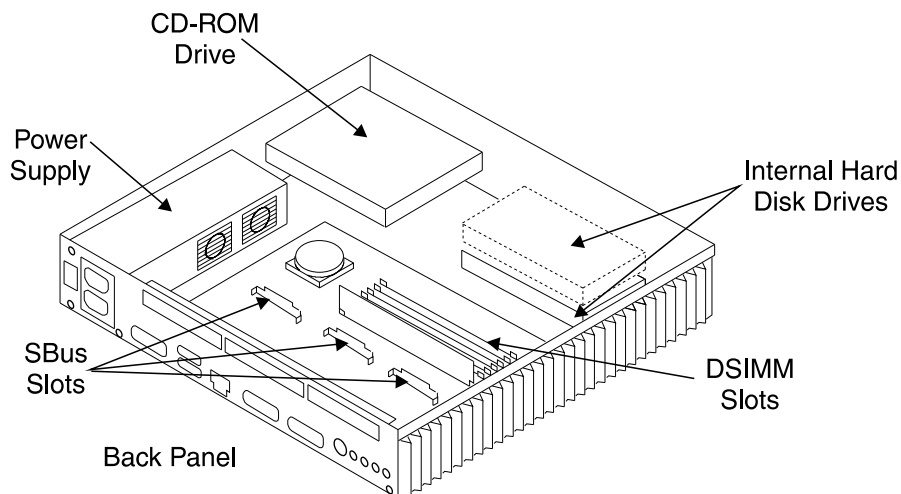


Figure D-3: *Sun SPARCserver 5* Computer Internal Hardware Components

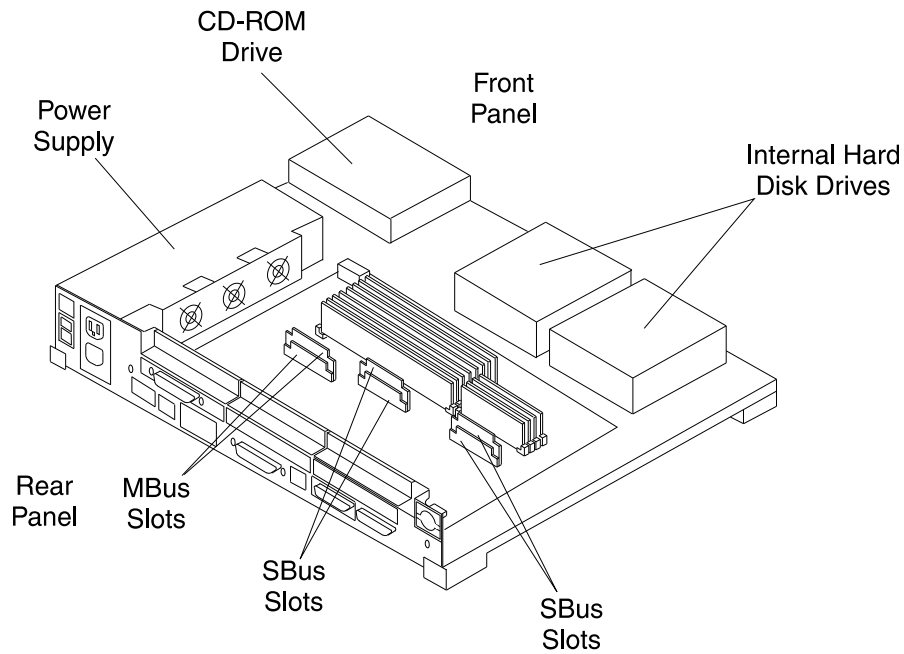


Figure D-4: *Sun SPARCserver 10* Computer Internal Hardware Components

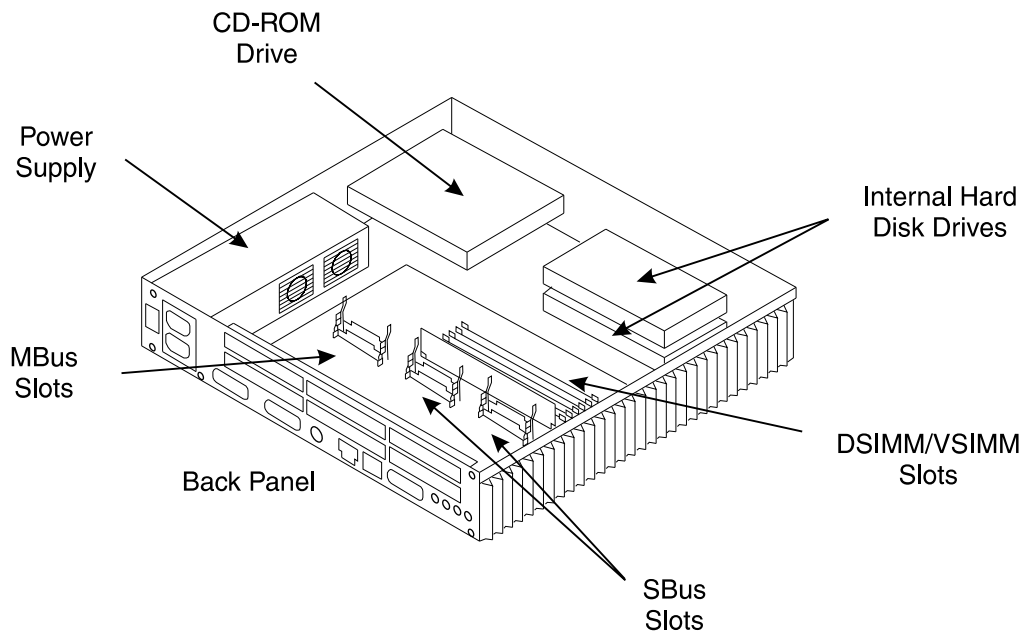


Figure D-5: *Sun SPARCserver 20* Computer Internal Hardware Components

Additional References For additional information, refer to the following documentation:

Installing SBus Cards in Desktop SPARCstations,
(Use “4 and 3 SBus slot *SPARCstation*” references).

Installing the DSIMMs — *Sun SPARCserver 5*

The *Sun SPARCserver 5* computer comes equipped with a 32-MB DSIMM installed.

Note

You may have to install additional DSIMMs to support the *CentreVu* CMS configurations.

To properly install the DSIMMs, you need to identify the front and back of the DSIMM and be able to align it properly with the DSIMM slots (located on the main logic board inside the computer). Figure D-6 and Figure D-7 show the back and front of a 32-MB DSIMM chip.

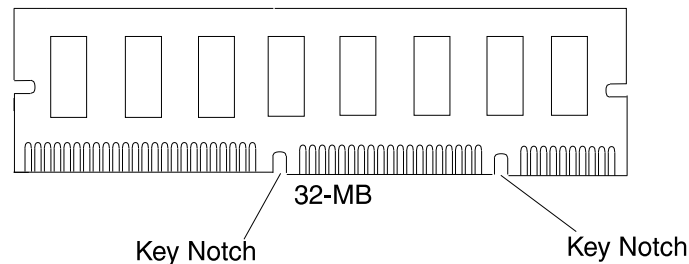


Figure D-6: 32-MB DSIMM Chip — Back Panel View

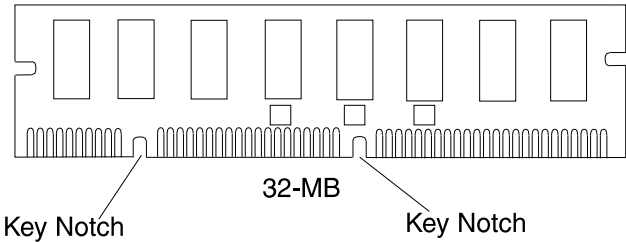


Figure D-7: 32-MB DSIMM Chip — Front Panel View

In addition to identifying the front and back of a DSIMM's chip, you must also locate the DSIMM slots on the main logic board of the computer (see Figure D-8).

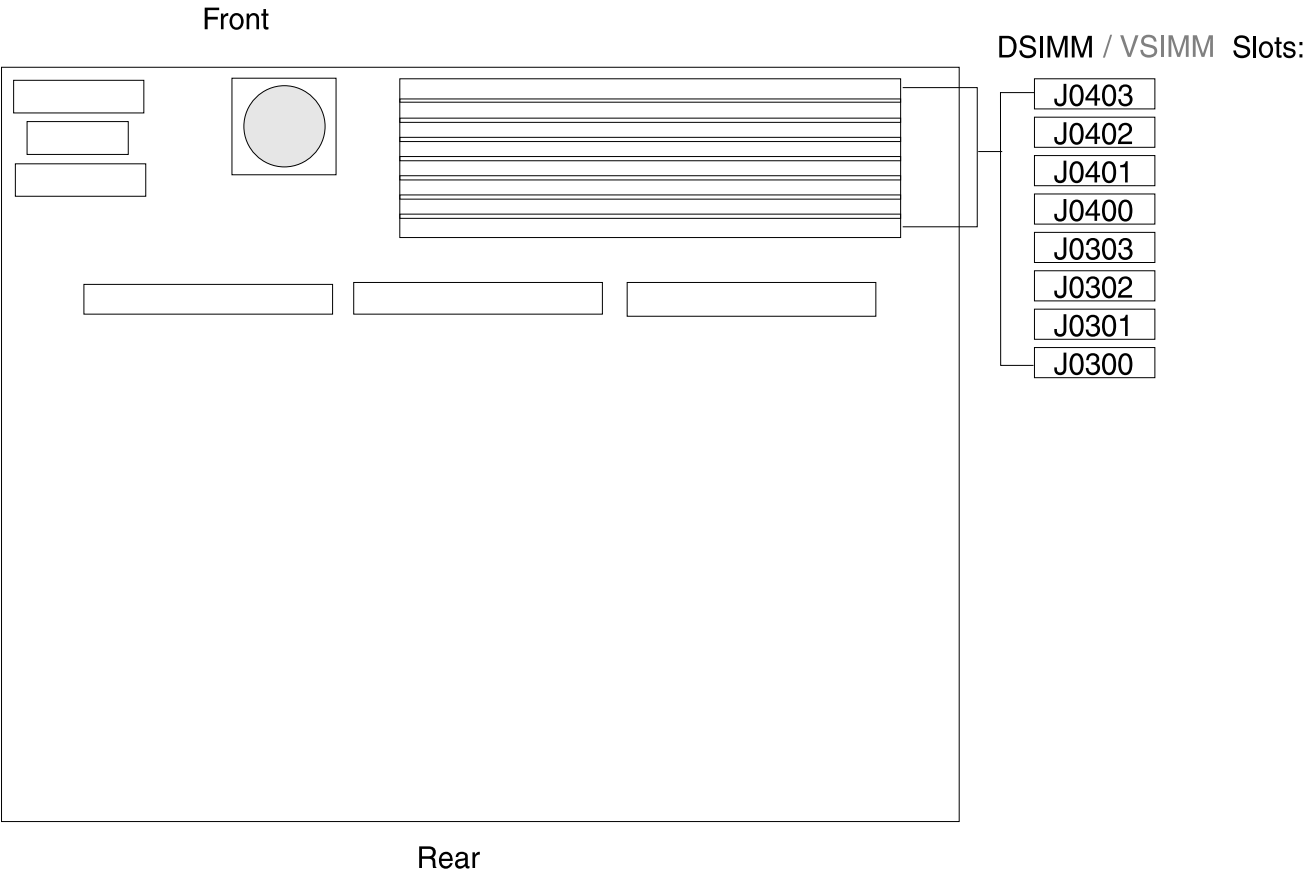


Figure D-8: *Sun SPARCserver 5* Computer DSIMM Slot Locations (Main Logic Board)

To install a DSIMM, do the following:

1. Carefully remove the new DSIMM from its protective packaging, and place it on an antistatic surface. The bag that the DSIMM came packed in is a good antistatic surface.
2. Choose the next available slot. Refer to Table D-1 for DSIMM installation order.

Table D-1: DSIMM Installation Sequence

Installation Sequence <i>Sun SPARCserver 5</i>	Slot Number
1 (DSIMM)	J0300
2 (DSIMM)	J0301
3 (DSIMM)	J0302
4 (DSIMM)	J0303
5 (DSIMM)	J0400
6(DSIMM)	J0401
7 (DSIMM)	J0402
8 (DSIMM)	J0403

Note

Slot J0300 (on the *Sun SPARCserver 5*'s main logic board) must have a DSIMM installed. Also, the largest (memory capacity) DSIMM must be installed in slot J0300.

3. Unlock (press down) the ejector levers at both ends of the connectors (see Figure D-9).

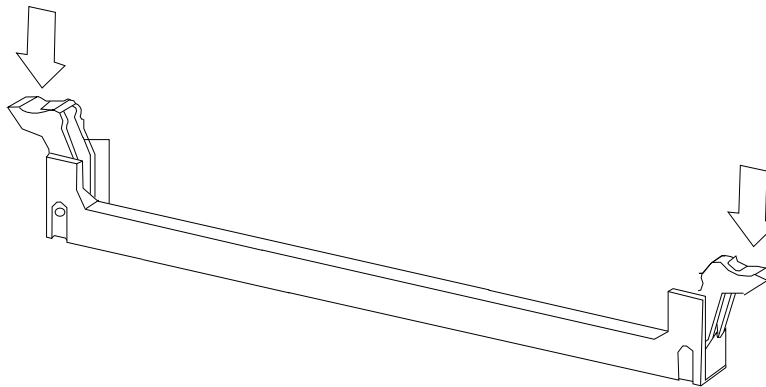


Figure D-9: Installing a 32-MB DSIMM Chip in the Sun SPARCserver 5

4. Align the DSIMM with the slot. Hold the DSIMM by its edges and orient it so that the two notches at the bottom of the DSIMM line up with the two tabs in the DSIMM connector (see Figure D-10).

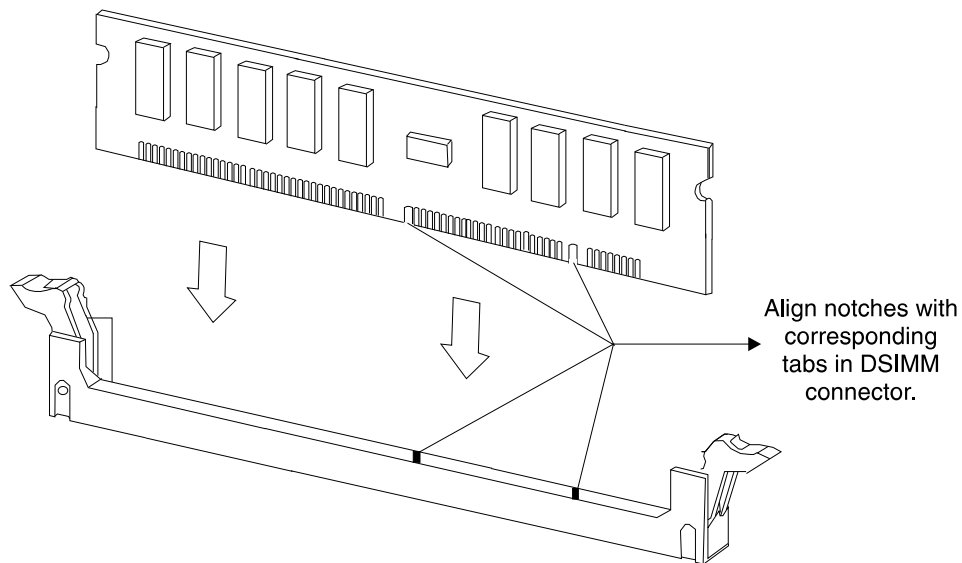


Figure D-10: Orienting a DSIMM

5. Place your thumbs on the top of the DSIMM, and push it firmly into its connectors.
6. To lock the DSIMM in place, push both ejector levers into the upright position (see Figure D-11).

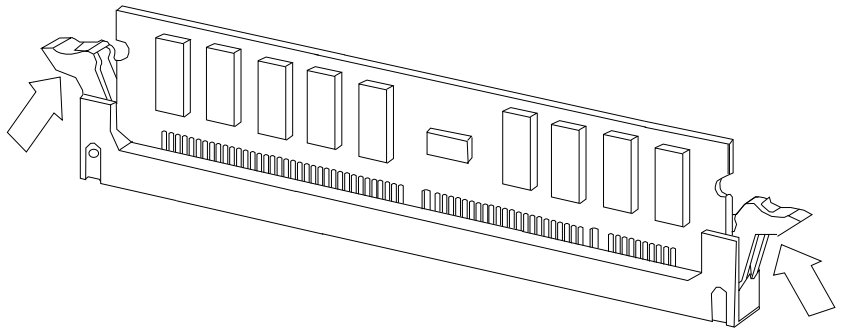


Figure D-11: Locking the DSIMMs in Place

Additional References For additional information, refer to the following documentation:

SPARCstation DSIMM/VSIMM Installation,
 Chapter 1, "General Installation Instructions"
 Chapter 2, "Installing DSIMMs"
 Chapter 4, "Removing DSIMMs/VSIMMs/AVB."

Installing the DSIMMs — *Sun SPARCserver 10 and 20*

The *Sun SPARCserver 10* and *20* computers come equipped with a 64-MB DSIMMs installed.

Note You may have to install additional memory to support the *CentreVu* CMS configurations.

To properly install the DSIMMs, you need to identify the front and back of the DSIMM and be able to align it properly with the DSIMM slots (located on the main logic board inside the computer). Figure D-12 shows the back panel of a 64-MB DSIMM chip for both the *Sun SPARCserver 10* and *20*. Figure D-13 shows the front panel of a 64-MB DSIMM chip for both the *Sun SPARCserver 10* and *20*.

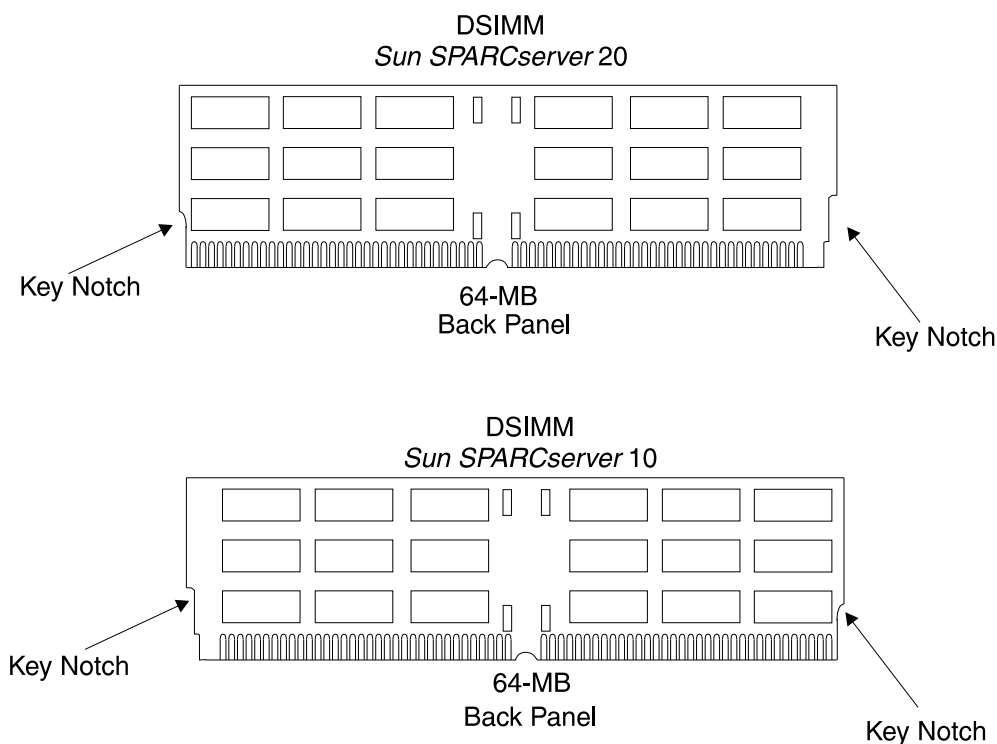


Figure D-12: 64-MB DSIMM Chip *Sun SPARCserver 20* — Back Panel View

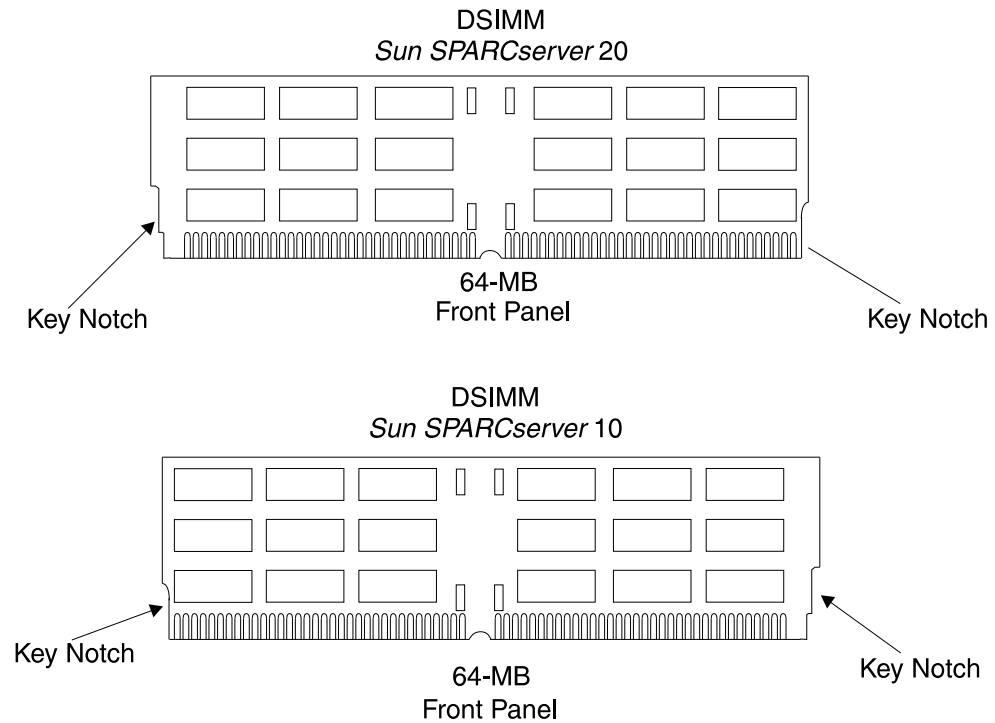


Figure D-13: 64-MB DSIMM Chip *Sun SPARCserver 10* — Front Panel View

In addition to identifying the front and back of a DSIMMs chip, you must also locate the DSIMM slots on the main logic board of the computer (see Figure D-14 and Figure D-15).

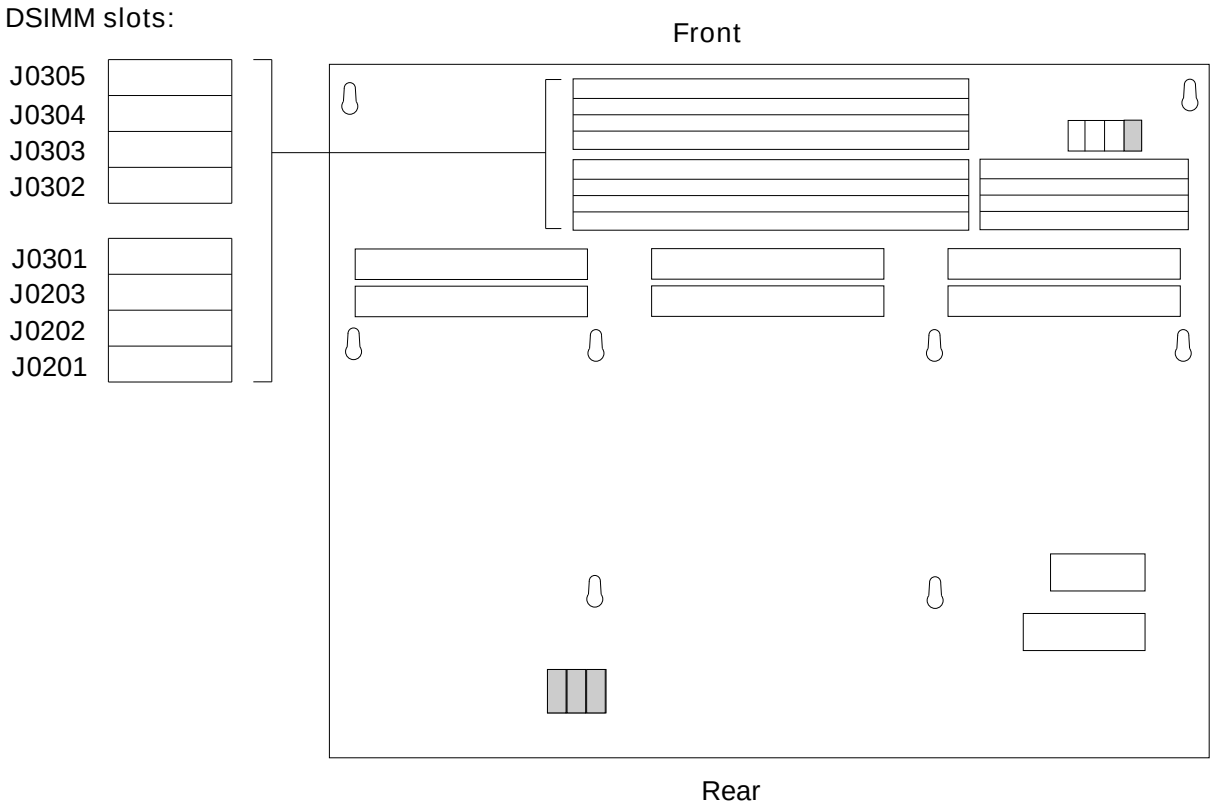


Figure D-14: Sun SPARCserver 10 Computer DSIMM Slot Location (Main Logic Board)

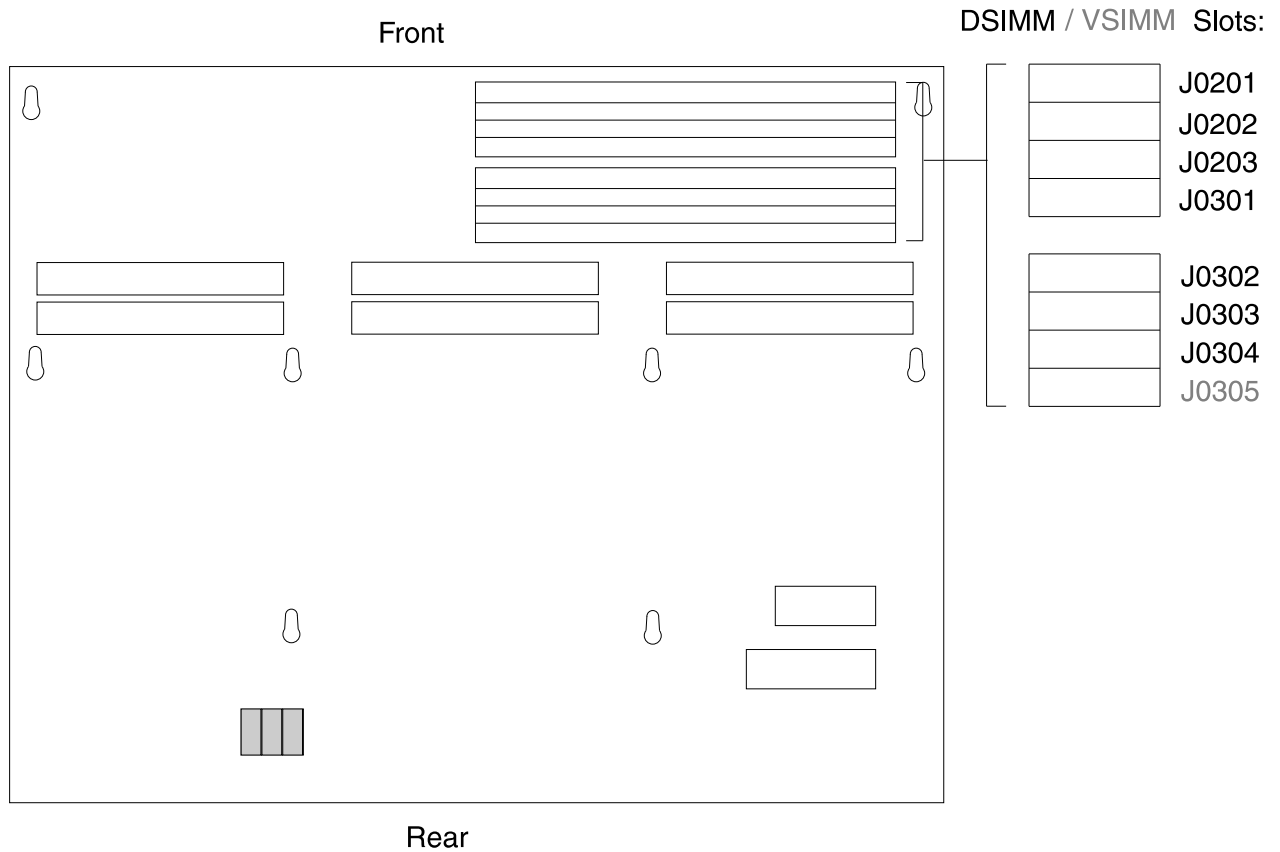


Figure D-15: Sun SPARCserver 20 Computer DSIMM Slot Locations (Main Logic Board)

To install a DSIMM, do the following:

1. Carefully remove the new DSIMM from its protective packaging and place it on an antistatic surface. The bag that the DSIMM came packed in is a good antistatic surface.
2. Choose the next available slot. Refer to Table D-2 for the DSIMM installation order.

Table D-2: DSIMM Installation Sequence

Installation Sequence <i>Sun SPARCserver 10</i>	Slot Number	Installation Sequence <i>Sun SPARCserver 20</i>	Slot Number
1 (DSIMM)	J0201	1 (DSIMM)	J0201
2 (DSIMM)	J0304	2 (DSIMM)	J0202
3 (DSIMM)	J0203	3 (DSIMM)	J0203
4 (DSIMM)	J0302	4 (DSIMM)	J0301
5 (DSIMM)	J0303	5 (DSIMM)	J0302
6 (DSIMM)	J0301	6 (DSIMM)	J0303
7 (DSIMM)	J0305	7 (VSIMM)	J0304
8 (DSIMM)	J0202	8 (DSIMM or VSIMM)	J0305

Note Slot J0201 (on the *Sun SPARCserver 10* and *20*'s main logic board) must have a DSIMM installed. Also, the largest (memory capacity) DSIMM must be installed in slot J0201.

3. Holding the DSIMM by the edges, carefully slide the DSIMM into the plastic guides and push straight down to seat it.

When you insert a DSIMM into a socket, make sure the chip's key notch and the socket orientation correspond.

Additional References For additional information, refer to the following documentation:

SPARCstation DSIMM/VSIMM Installation,
 Chapter 1, "General Installation Instructions"
 Chapter 2, "Installing DSIMMs"
 Chapter 4, "Removing DSIMMs/VSIMMs/AVB."

Installing the VSIMMs — Sun SPARCserver 20

The *Sun SPARCserver 20* computer is not shipped to the Lucent Technologies factory with VSIMMs installed.

To properly install the VSIMM chip, you need to identify the front and back, and align it properly with the VSIMM slots (located on the main logic board inside the computer). Figure D-16 and Figure D-17 show the back and front of a VSIMM chip.

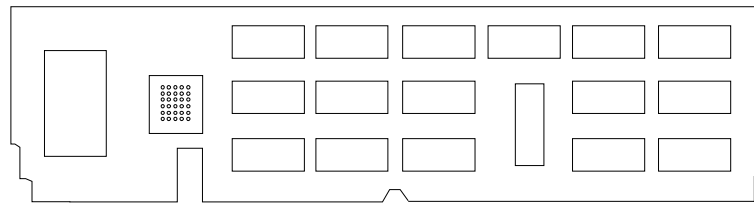


Figure D-16: VSIMM Chip — Back Panel View

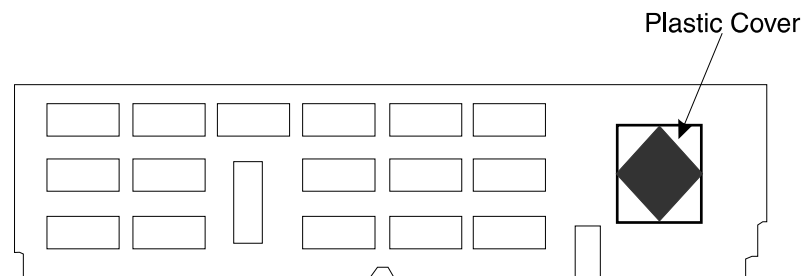


Figure D-17: VSIMM Chip — Front Panel View

Note

When you insert a VSIMM into a socket, make sure the chip's key notch and the socket orientation correspond.

The side with the plastic cover (on the VSIMM chip) must face the front panel of the computer (when the VSIMM is properly installed).

In addition to identifying the front and back of a VSIMM chip, you must also locate the VSIMM slots on the main logic board of the computer (see Figure D-18).

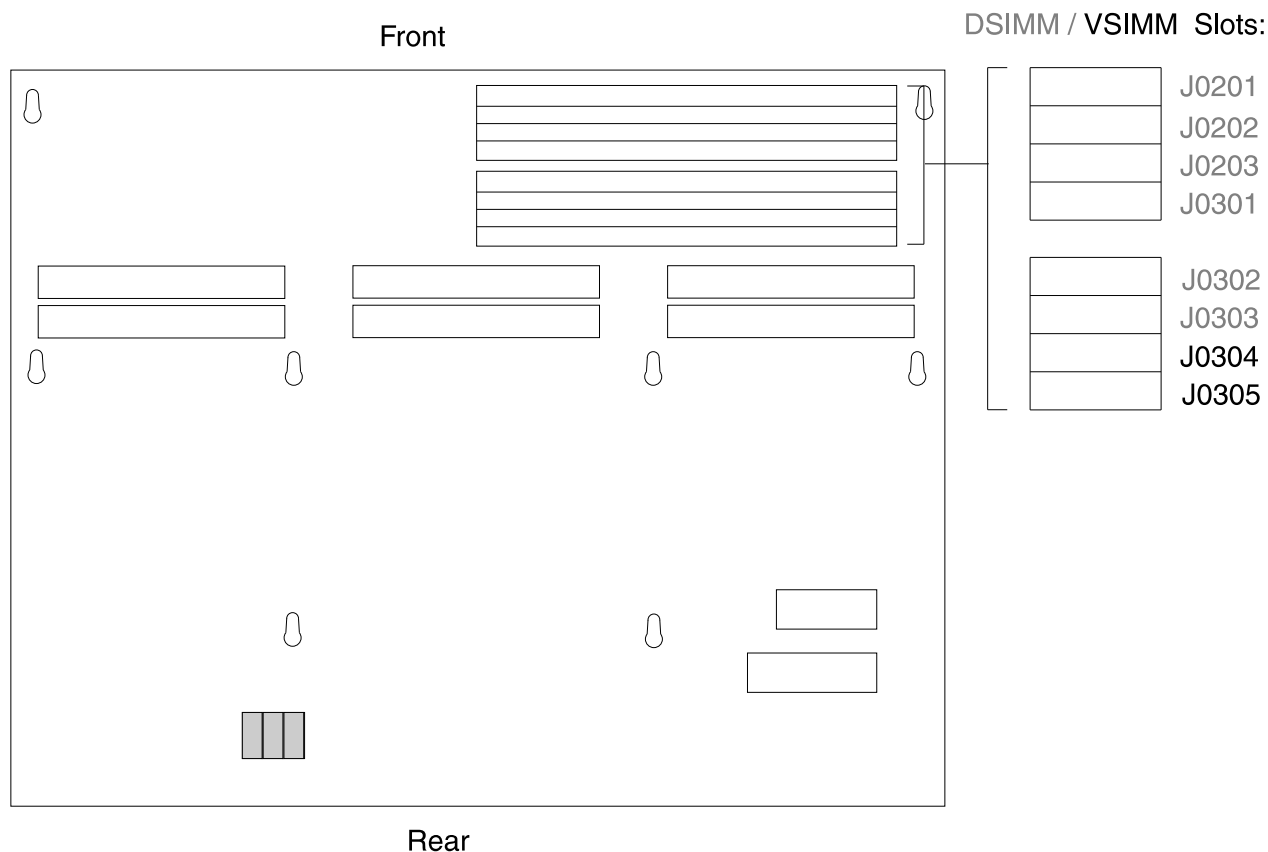


Figure D-18: Sun SPARCserver 20 Computer VSIMM Slot Locations (Main Logic Board)

To install the proper amount of memory in the system (using VSIMMs), do the following:

1. Carefully remove the new VSIMM from its protective packaging and place it on an antistatic surface. The bag that the VSIMM came packed in is a good antistatic surface.
2. Install the proper VSIMMs in the slots for the *CentreVu* CMS configuration you are currently building. Refer to Table D-3 for memory configurations and VSIMM installation order.

Table D-3: VSIMM Installation Sequence

Installation Sequence	Slot Number
1	J0304
2	J0305

3. Remove any additional VSIMMs from the protective packaging, and lay them on the static shielding bag.

4. Holding the VSIMM by the edges, carefully slide the VSIMM into the plastic guides and push straight down to seat it.

Note

When you insert a VSIMM into a socket, make sure the chip's key notch and the socket orientation correspond. The side with the plastic cover (on the VSIMM chip) must face the front panel of the computer (when the VSIMM is properly installed).

Additional References

For additional information, refer to the following documentation:

SPARCstation DSIMM/VSIMM Installation,
 Chapter 1, "General Installation Instructions"
 Chapter 3, "Installing VSIMMs"
 Chapter 4, "Removing DSIMMs/VSIMMs/AVB."

SBus Slots in the Sun Hardware Platforms

The number of available SBus slots on the *Sun SPARCserver* computer varies depending on your hardware configuration (see Table D-4).

Table D-4: SBus Slot Combinations for Sun SPARCserver Computers

<i>Sun SPARCserver 5</i> Computer	<i>Sun SPARCserver 10 and 20</i> Computer (one or two CPUs)
Three SBus slots available	Four SBus slots available
Slots 1, 2, and 3	Slots 0, 1, 2, and 3

Selecting the SBus Slots

The SBus slots should be filled as follows:

- The SBus slots in the *Sun SPARCserver* computer should be filled first in the following order:
 - Fill slot 1, 2, and then 3 (for *Sun SPARCserver* 5)
 - Fill slot 0, 1, 2, and then 3 (for *Sun SPARCserver* 10 and 20)

Table D-5 lists the different SBus cards. These cards should be assigned to SBus slots in the order listed below.

Table D-5: SBus Cards and Required SBus Slots

SBus Card	SBus Slot	Required/Optional
Turbo GX Video Card	SBus Slot 1 for the <i>SPARC</i> 5 SBus Slot 2 for the <i>SPARC</i> 10	Required for <i>Sun SPARCserver</i> 5 and 10 only
HSI/S Card	Next available SBus slot for the <i>SPARC</i> 5 SBus Slot 0 for the <i>SPARC</i> 10 and 20	Required for <i>Sun SPARCserver</i> 10 and 20
FSBE/S Card (Fast SCSI and Ethernet SBus card)	Next available SBus slot for the <i>SPARC</i> 5 Next available SBus slot of Slots 1, 3 for the <i>SPARC</i> 10 or Slots 1, 2, 3 for the <i>SPARC</i> 20	Optional
TRI Card (Token Ring Interface card)	Next available SBus slot for the <i>SPARC</i> 5 Next available SBus slot of Slots 1, 3 for the <i>SPARC</i> 10 or Slots 1, 2, 3 for the <i>SPARC</i> 20	Optional
<i>Aurora Multiport</i> Card	Next available SBus slot for the <i>SPARC</i> 5 Next available SBus slot of Slots 1, 3 for the <i>SPARC</i> 10 or Slots 1, 2, 3 for the <i>SPARC</i> 20	Optional

Use Table D-6 to record SBus cards and associated SBus slots that you will install in the system. The customer will use this information to reassemble their hardware.

Table D-6: SBus Card Installation Information

<i>Sun SPARCserver 5 Computer</i>	
Slot #	SBus Card
1	
2	
3	

<i>Sun SPARCserver 10 or 20 Computer</i>	
Slot #	SBus Card
0	
1	
2	
3	

Installing the SBus Cards

Figure D-19 shows the SBus slot locations on the Sun SPARCserver 5 and Sun SPARCserver 10/20.

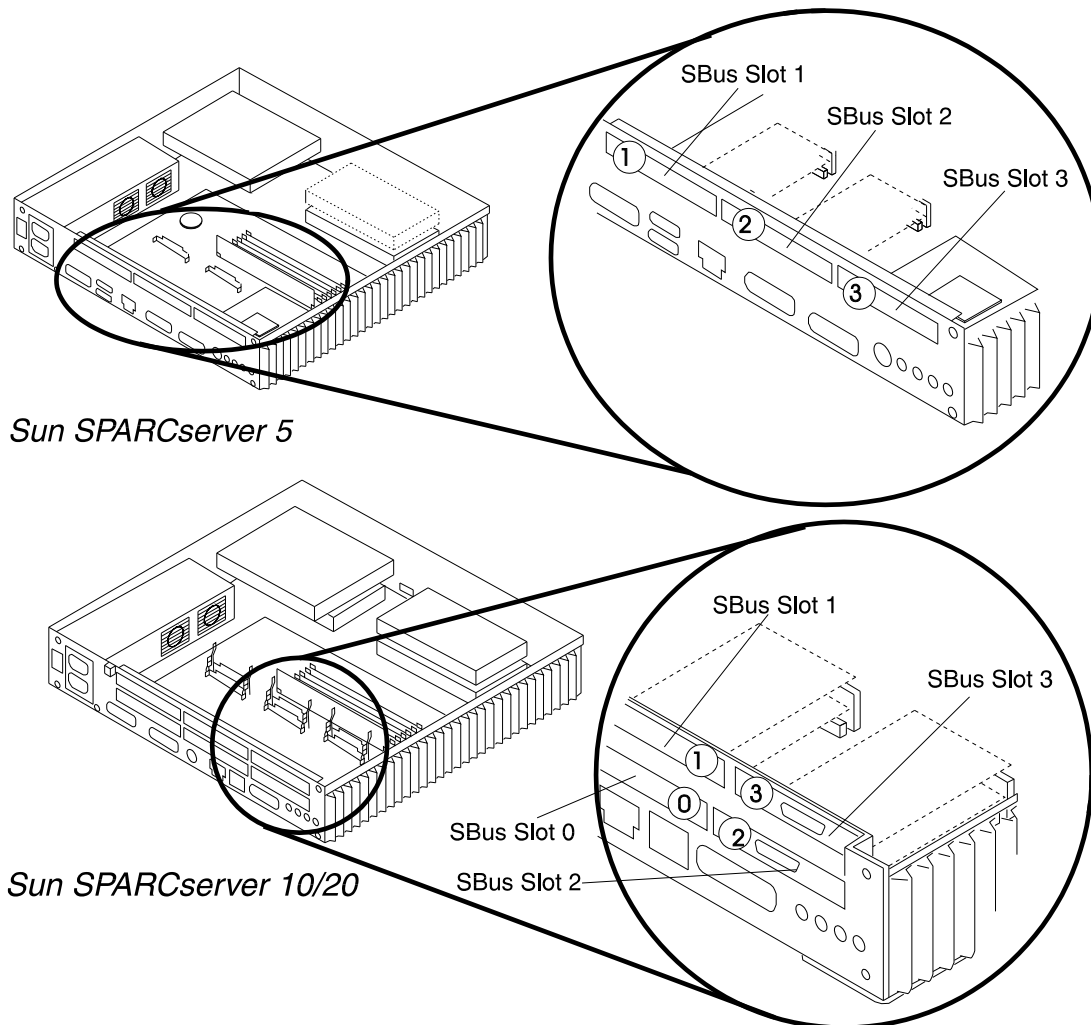


Figure D-19: SBus Slot Locations on the *Sun SPARCserver* Computers

Install each SBus card listed in Table D-6 by doing the following:

1. Make sure your ESD wrist strap is securely attached.
2. Look at the back of your system unit to identify how the filler panel is attached. The filler panel can be attached either by screws and washers (visible from the back of the unit) or by plastic tabs (visible from inside the system unit).
3. Remove the filler panel from the SBus slot where the card will be installed.
 - If the filler panel is held in place by screws and washers, do the following:
 - a. Remove the screws and washers from outside the filler panel. Save the screws and washers because you will need them later.
 - b. Press in on the outside of the filler panel to release it.
 - c. Carefully remove and save the filler panel. You will need the filler panel if you ever remove an SBus card from the computer.
 - If the filler panel is held in place by plastic tabs, then do the following:
 - a. From inside the machine, use both hands to grasp the tabs at the base of the filler panel.
 - b. Firmly squeeze both tabs until they are disengaged from the system chassis/unit, and swing the base of the filler panel towards you.
 - c. Carefully remove and save the filler panel. You will need the filler panel if you ever remove an SBus card from the computer.
4. Remove the adapter bracket (see Figure D-20) from the SBus card (if necessary) by doing the following:

Note

When installing SBus cards on either the *Sun SPARCserver 5*, do not remove the adapter brackets.

- a. Remove the screws that attach the adapter plate to the backplate of the SBus card.
- b. Save the adapter bracket and screws in case you need to install this card in a computer that requires the adapter bracket.

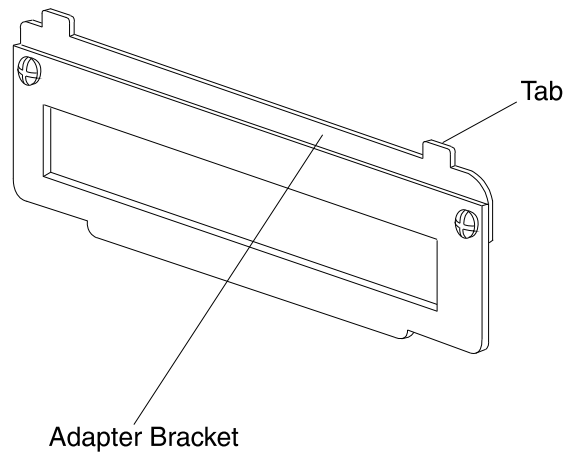


Figure D-20: SBus Card Adapter Bracket

5. Place the SBus card at an angle (see Figure D-21) in the opening of the back panel.

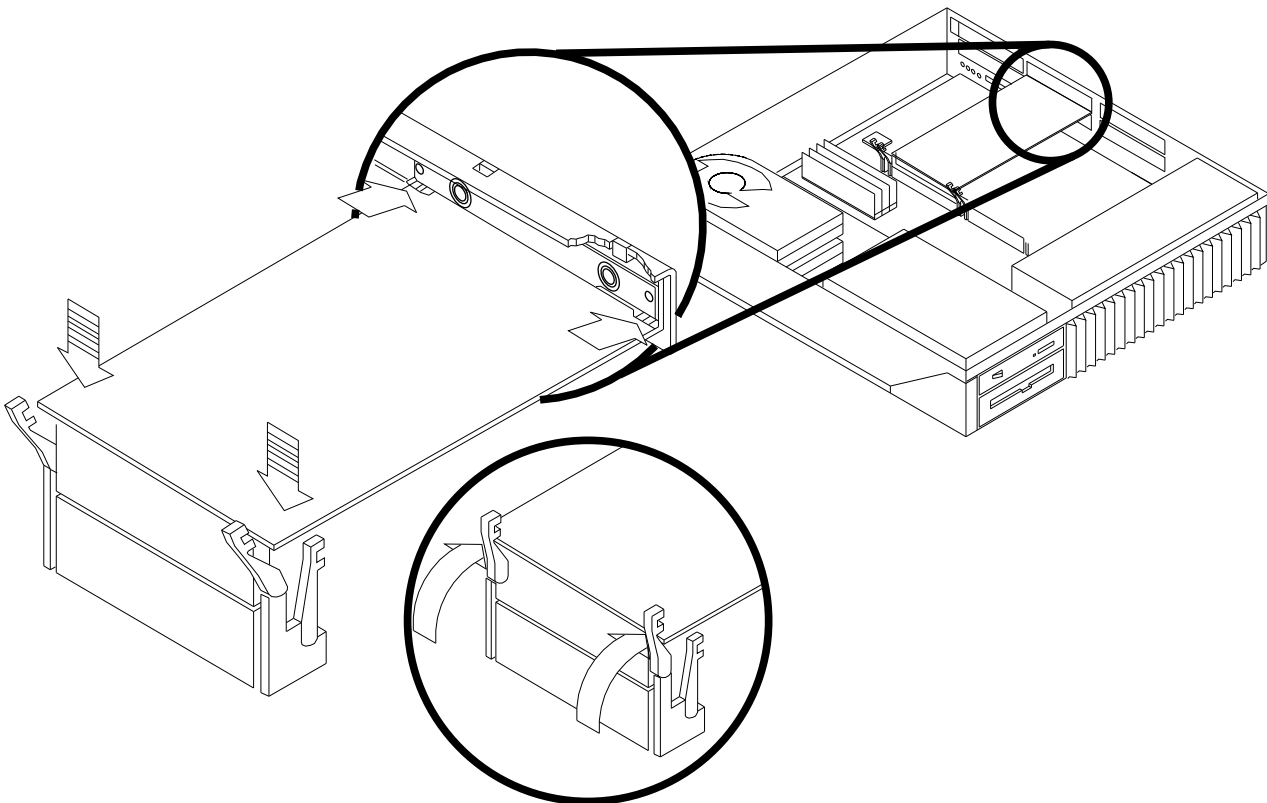


Figure D-21: Positioning the SBus Card

6. Hook the card in the mounting slot located above the rectangular openings in the back panel. Figure D-22 shows a side view of how

the card should hook into the mounting slot.

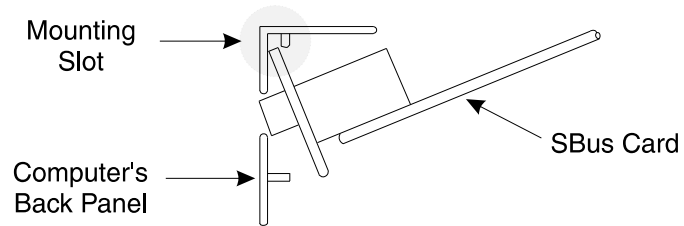


Figure D-22: SBus Card Mounting Slot — Side View

7. Align the card's connector to the socket on the main-logic board.
8. Gently press the card into the socket. Do not force the card or you may damage the pins on the card.
9. Push the rear card retainers forward over the rear edge of the SBus card (see Figure D-21).
10. Replace the washers and screws (removed earlier). Tighten the screws to secure the SBus board to the back panel of the computer.

Additional References

For additional information, refer to the following documentation:

Sun SPARCstation Installation Guides (5, 10, and 20),
Chapter 7: "Installing SBus Cards."

SunLink HSI/S 2.0 Installation and Administration Guide,
Chapter 2: "Installing the HSI/S Controller Card and Patch
Panel."

FSBE/S SBus Card Manual,
Chapter 1: "Introducing the FSBE/S SBus Card"

Installing SBus Cards in Desktop SPARCstations,
(Use "4SBus and 3SBus slot *SPARCstation*" references)

Installing the Internal Hard Disk Drives (*Sun SPARCserver 5 and 20 only*)

The internal hard disk drives (maximum of two) are installed in the left front corner of the system (see Figure D-23).

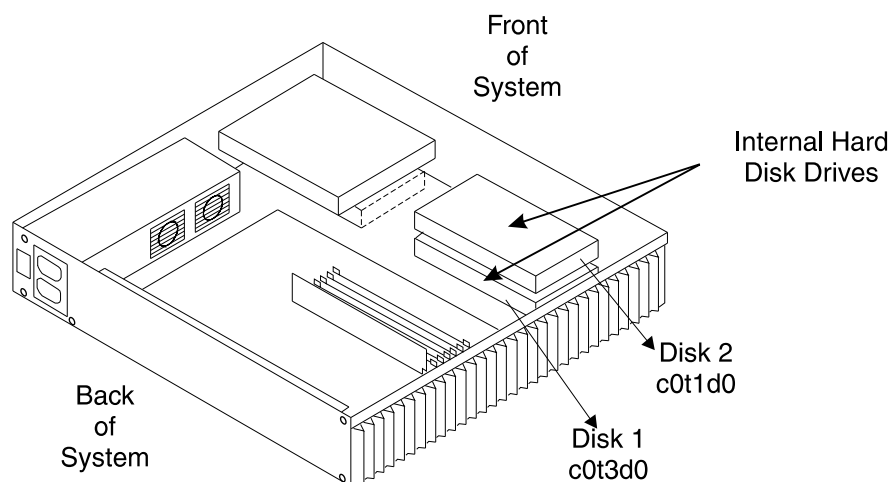


Figure D-23: *Sun SPARCserver 5 and 20* Computer Internal Hard Disk Drive Locations

To install the internal hard disk drives, do the following:

Note You do not need to set the SCSI IDs on the internal hard drives.

1. Make sure your ESD wrist strap is securely attached to the power supply.
2. Unpack the disk drive from the shipping box.

3. Remove the disk drive from the antistatic bag, lay the bag on a flat surface, and place the disk drive (PCB-side up) on top of the antistatic bag (see Figure D-24).

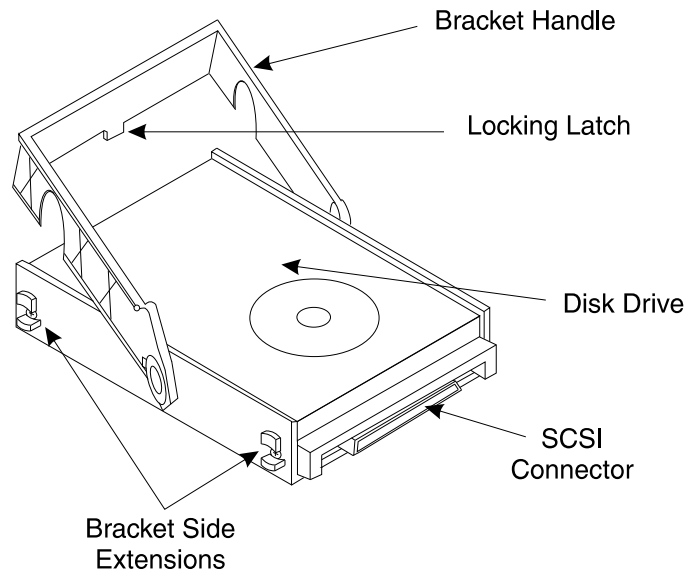


Figure D-24: Single Connector Drive — Handle, Latch, Bracket Side-Extensions, and SCSI Connector Components

4. Check the drive for any problems/damage that may have occurred during shipment.
5. Raise the plastic handle to a vertical position by pressing the handle-locking latch and pulling the handle up (see Figure D-24).
6. Pick the drive up with one hand and steady it with the other hand so that the drive is in a horizontal position.

7. Lower the drive into the chassis (connector end of the drive towards the side of the system case) and align the bracket side extensions of the drive casing with the holes in the rails of the chassis (see Figure D-25).

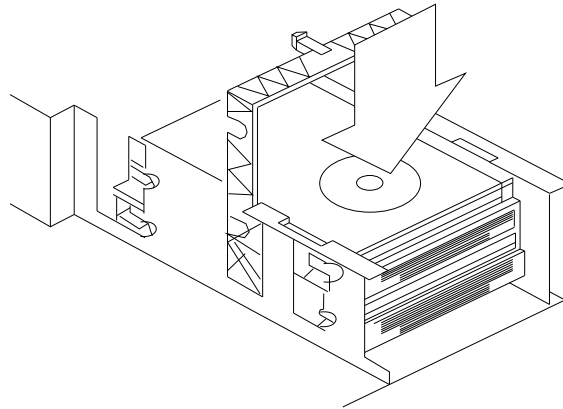
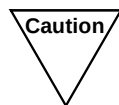


Figure D-25: Internal Hard Disk Drive — Alignment and Placement



You may have to “wiggle” the drive to make sure it is aligned properly.

8. Push the handle down towards the back of the drive (opposite of the SCSI connector). See Figure D-26. As you lower the handle, the drive will slide slowly towards the connector.



Do not use excessive force to push the handle down or seat the connector.

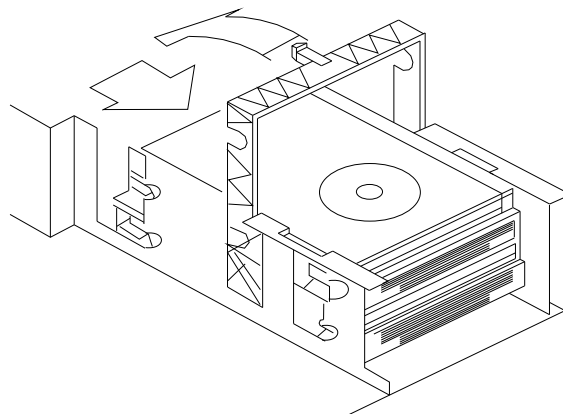


Figure D-26: Internal Hard Disk Drive — Bracket Handle Motion

Continue lowering the handle until the connector is properly seated and the drive handle locks into the locking latch on the back of the drive.

9. Make sure the handle is locked in position with the locking latch on the back of the drive (see Figure D-27).

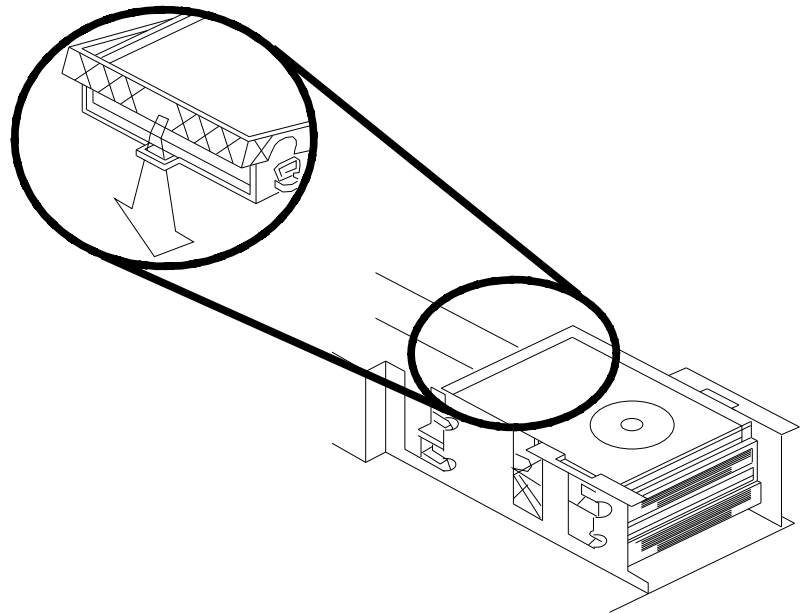


Figure D-27: Internal Hard Disk Drive — Locking Latch Position

10. Repeat the steps outlined in this section when installing any additional internal disk drives.

Additional References

For additional information, refer to the following documentation:

1.05 and 2.1 GByte Single Connector Disk Drive Installation Manual,

Chapter 1, "Before You Start"

Chapter 2, "Installing Disk Drives."

Installing the Internal Floppy Drive (Optional; *Sun SPARCserver 5 and 20 only*)

The internal floppy disk drive installs in the right-front corner of the system, directly beneath the CD-ROM drive (see Figure D-32).

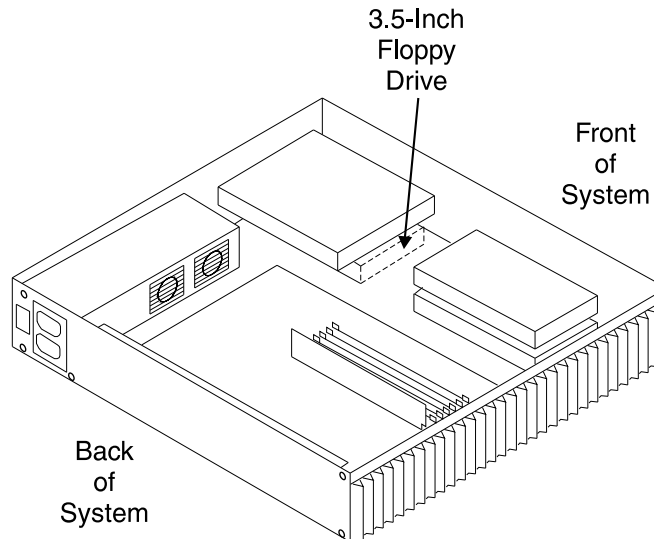


Figure D-28: *Sun SPARCserver* Internal Floppy Location

Note that the internal floppy drive is not a SCSI device. It connects to an 8-bit internal bus in the SPARCserver system.

Removing the CD-ROM Drive

If the internal CD-ROM drive has already been installed, you must remove it to gain access to the floppy drive slot. To remove the CD-ROM drive, do the following:

1. Make sure the CPU is powered down.
2. Disconnect the cables from the rear of the CD-ROM drive.
3. Disengage the drive by sliding it toward the side wall. Make sure that you push only on the rear of the drive; *do not push on any connectors or drive components.*
4. Lift out the drive and place it on an antistatic surface.

Installing the Floppy Drive

To install the internal floppy drive, do the following:

1. Make sure your ESD wrist strap is securely attached.
2. Remove the lower filler panel from the system chassis (see Figure D-33). Press the tabs toward the center of the filler panel, and push the panel toward the outside of the system chassis.

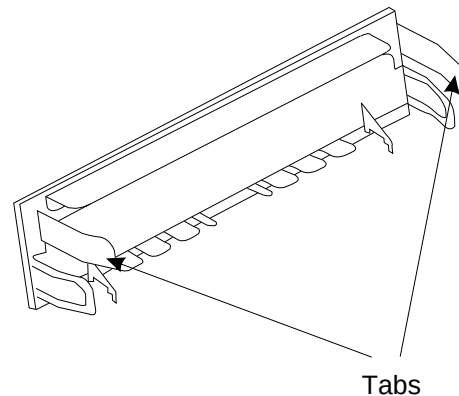


Figure D-29: Floppy Filler Panel

3. Disconnect the power supply cable and the SCSI disk cable from the system board (see Figure D-30). To disconnect the power cable, first press down on the connector latch.

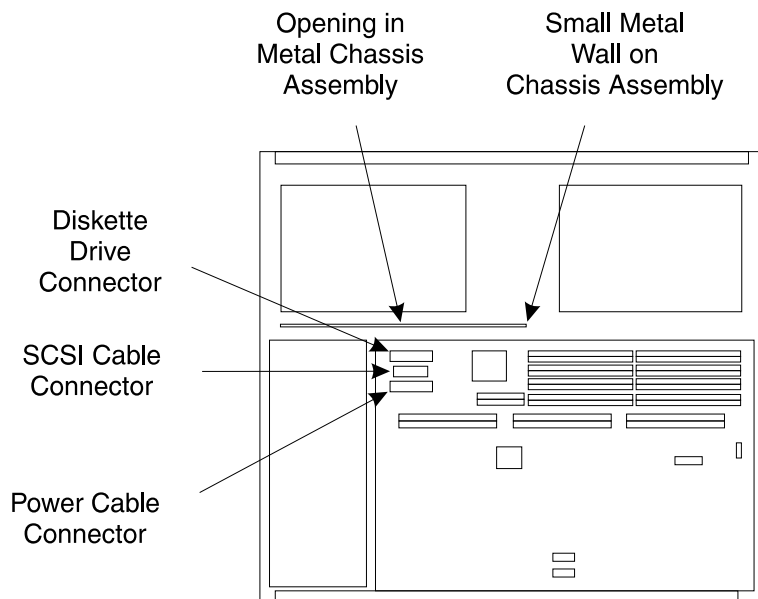


Figure D-30: System Board Power and Drive Connectors

4. Remove the floppy drive data cable from the shipping package. The cable has two connectors: one is straight, the other is bent at a 90° angle. The straight connector plugs into the system board; the bent connector plugs into the disk drive.
5. Feed the data cable's pull loop through the front of the opening in the metal chassis assembly, and tug the connector through the opening. Then attach the connector to the system board's diskette drive connector (Figure D-30).

6. Reconnect the power supply and SCSI data cables.
7. Remove the disk drive, the four mounting grommets, and the four mounting screws from the shipping package. Place the drive on an antistatic surface, and install the screws and grommets on the drive.
8. Verify that microswitch SW4, on the bottom (PCB side) of the drive, is set to 0. Set the switch by sliding it toward the rear of the drive (see Figure D-31).

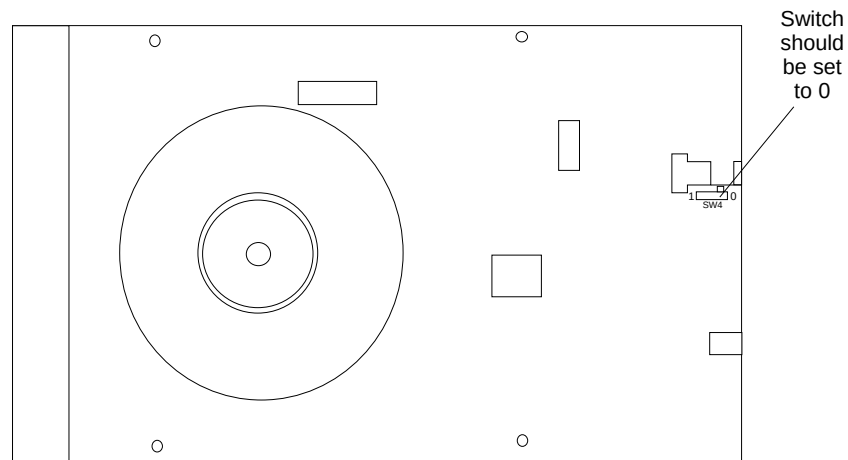


Figure D-31: Floppy Drive Microswitch Setting

9. Move the SCSI data and CD-ROM power cables away from the floppy disk drive opening, and locate the two-wire power cable labeled "P4."
10. Lift the P4 and floppy drive data cables out of the way, and lower the drive into place. Push the drive forward so it is fully seated in the drive mounts, being careful to push only on the rear edge of the drive. *Do not push on exposed motors or connectors.*
11. Connect the P4 and data cables to the drive. To connect the data cable, route it over the disk drive.
12. Install the slotted floppy disk drive filler panel. Place the three tabs on the bottom of the panel into the corresponding openings in the front of the chassis. Rotate the panel upward to latch it into place.
13. If necessary, remount and reconnect the CD-ROM drive.

Installing the Internal CD-ROM Drive (*Sun SPARCserver 5 and 20 only*)

The internal CD-ROM drive should be installed in the right-front corner of the system (see Figure D-32).

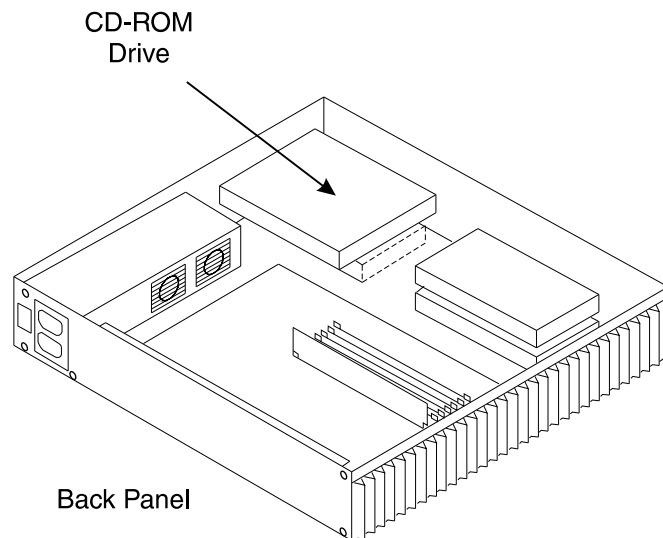


Figure D-32: Sun SPARCserver Computer Internal CD-ROM Location

To install the internal CD-ROM drive, do the following:

1. Make sure your ESD wrist strap is securely attached.
2. Remove the top filler panel from the system chassis (see Figure D-33). Press the tabs toward the center of the filler panel, and push the panel towards the outside of the system chassis.

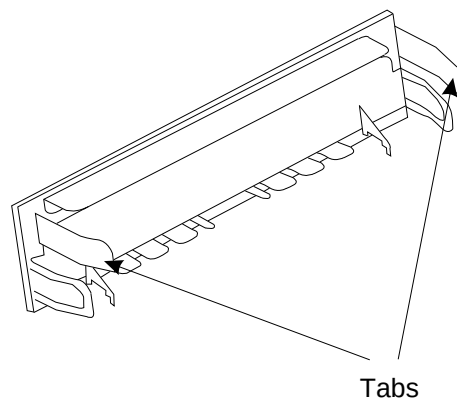


Figure D-33: CD-ROM Filler Panel

3. Remove the drive from the shipping package.
4. Verify that the jumpers (located on the rear of the drive) are set to the factory defaults.
5. **Sun SPARCserver 5 only.** Plug one end of the audio cable into the Audio Out Port on the rear of the drive. Plug the other end of the Audio cable into J0600 on the main logic board (see Figure D-34). Go to Step 6.

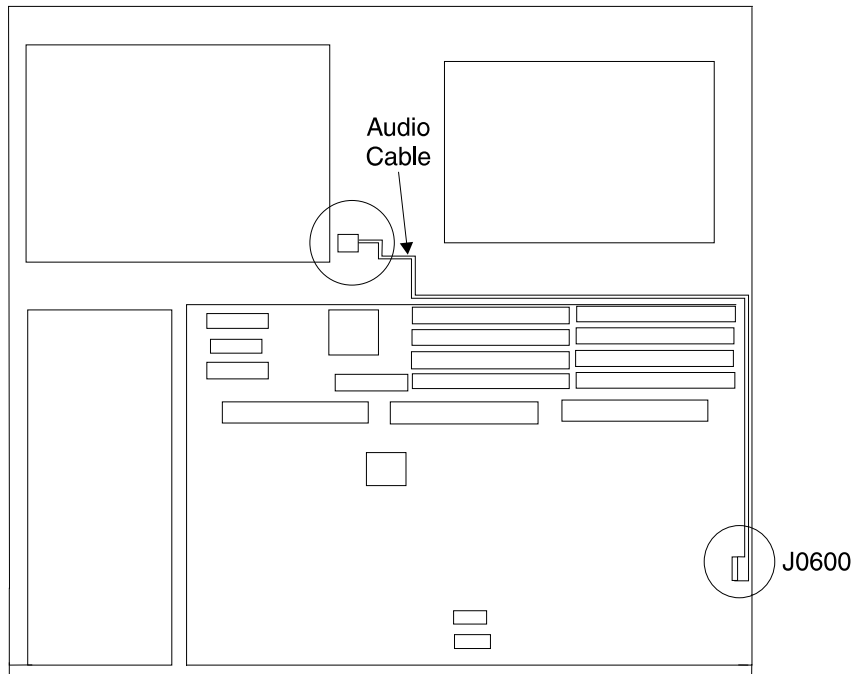


Figure D-34: Installing the *Sun SPARCserver 5* Audio Cable

6. Insert the drive in the system, and push the drive towards the center of the system (see Figure D-35).

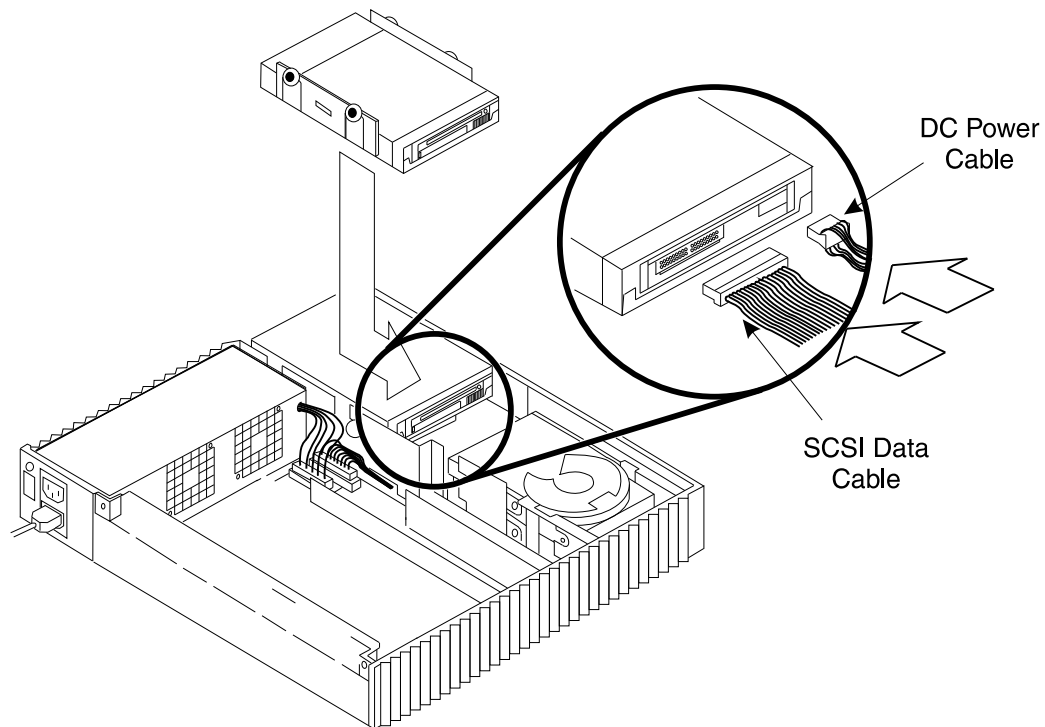


Figure D-35: Inserting the Internal CD-ROM Drive

7. Connect the power cable to the back of the CD-ROM drive (see Figure D-35).

8. Attach one end of the SCSI data cable to the connector on the back of the CD-ROM drive (see Figure D-35), and the other end of the SCSI data cable to the connector on the system board (see Figure D-36).

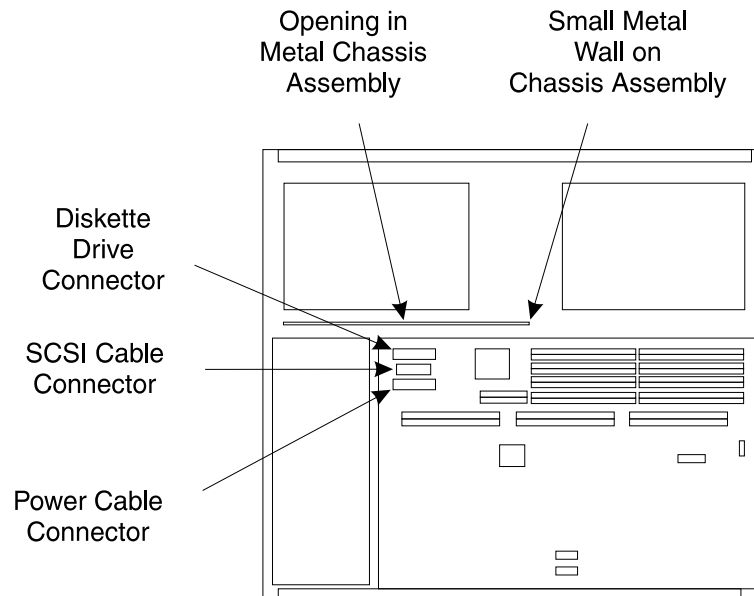


Figure D-36: Internal CD-ROM Drive — SCSI Cable Connector Location

Additional References For additional information, refer to the following documentation:

SPARCstation 5 Installation Guide

SPARCserver 20 Installation Guide

Closing the Machine

To close your *Sun SPARCserver* computer, do the following (see Figure D-37 and Figure D-38):

1. Hold the cover at a 60-degree angle to the system unit.
2. Gently guide the cover's hinge hooks into the tab slots located on the front of the system unit (see Figure D-37).

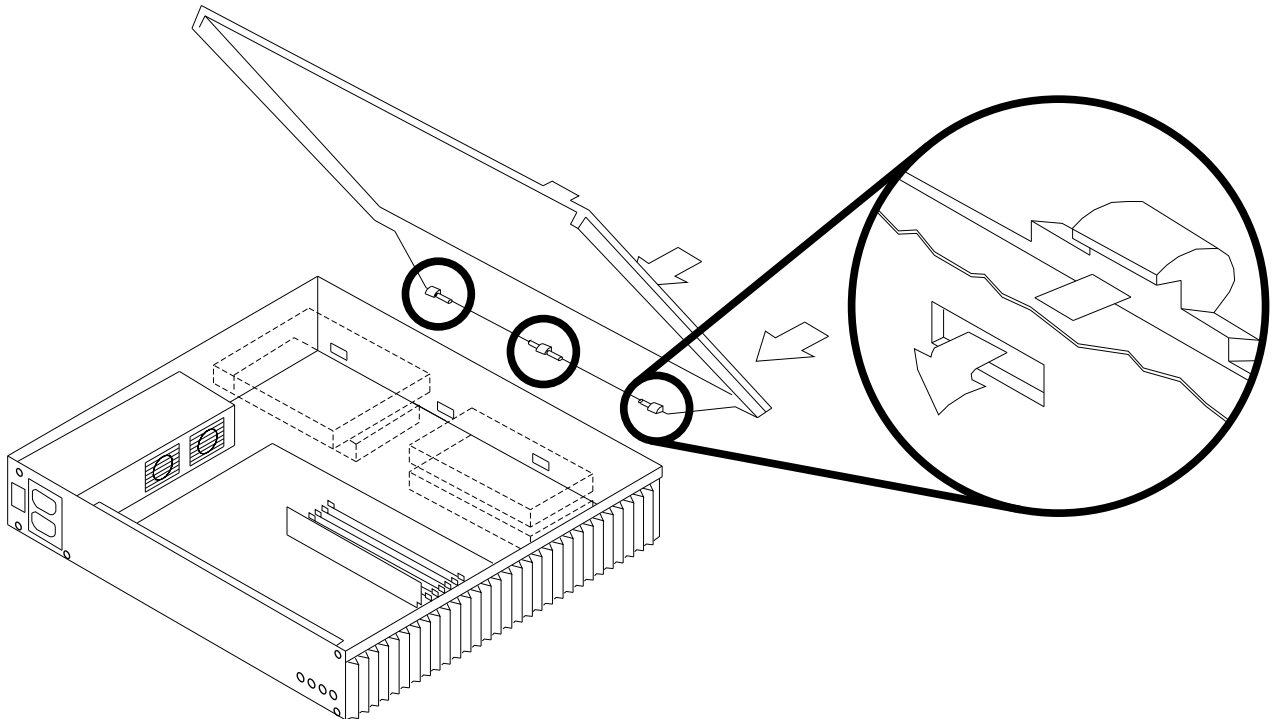


Figure D-37: Aligning System-Cover Tabs on the *Sun SPARCserver* Computer

3. Gently lower the cover onto the system unit.

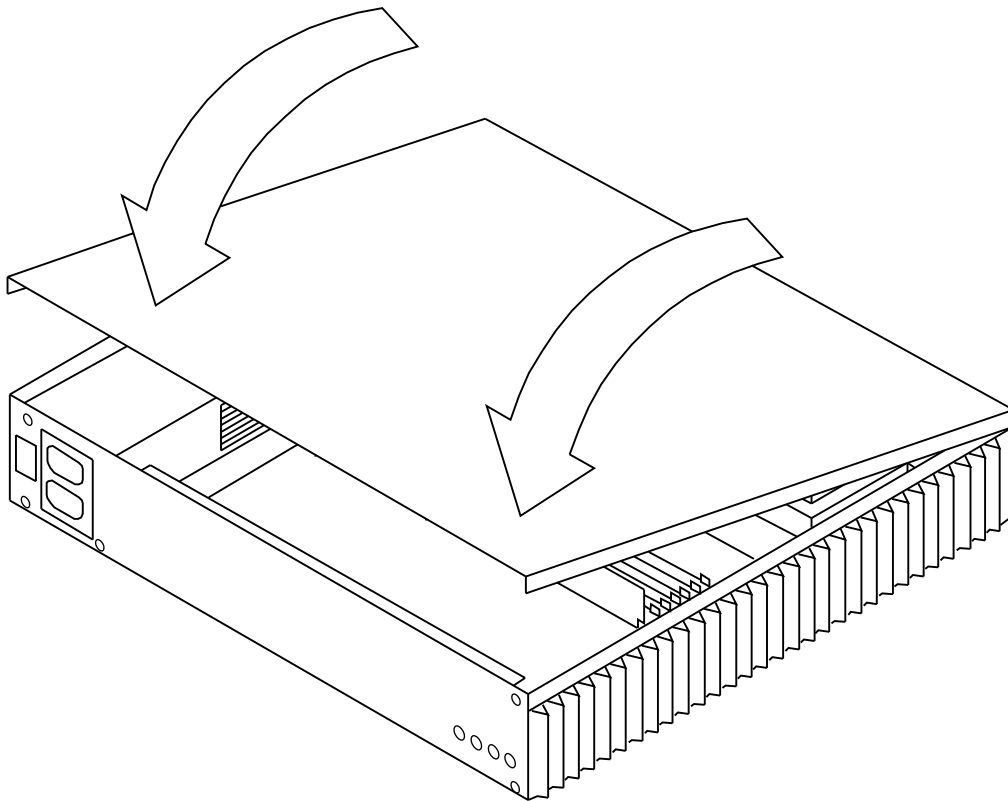


Figure D-38: Replacing the Cover on the *Sun SPARCserver* Computer

4. Insert and tighten the cover screw on the top right side of the rear panel using a Phillips screwdriver.
5. Insert and tighten the lock block towards the top left side of the rear panel using a Phillips screwdriver.
6. Reconnect all peripherals/cables to the computer.

Additional References For additional information, refer to the following documentation:

Sun SPARCstation Installation Guide (5 and 20),
Chapter 5: "Closing the System Unit"

Installing SBus Cards in Desktop SPARCstations,
(Use "4SBus and 3SBus slot *SPARCstation*" references).

Connecting the *SunLink* HSI/S Patch Panel

This section describes how to connect the HSI/S patch panel to the HSI/S controller card (previously installed in the *Sun SPARCserver* computer) using a 96-pin cable (see Figure D-39, shaded portion).

Note

The *Sun SPARCserver* 5 needs a *SunLink* HSI/S Patch Panel only if you have multiple ACDs.

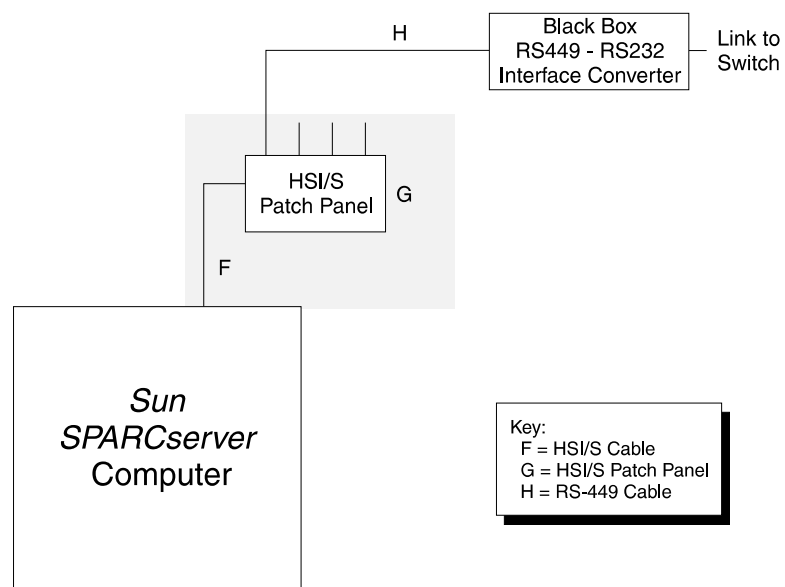


Figure D-39: *SunLink* HSI/S Patch Panel Connectivity

To connect the HSI/S patch panel to the HSI/S controller card, do the following:

1. Connect one end of the 96-pin cable to the 96-pin connector on the HSI/S patch panel.
2. Connect the other end of the 96-pin cable to the 96-pin connector on the HSI/S controller card.
3. Make sure the locking mechanisms on each end of the 96-pin cable click closed.

Additional References For additional information, refer to the following documentation:

SunLink HSI/S 2.0 Installation and Administration Guide,
Chapter 2: "Installing the HSI/S Controller Card and
Patch Panel" (Sections 2.11 and 2.12).

Setting the Black Box DTE/DCE DIP Shunts

This section describes how to set the Dual In-Line Package (DIP) shunts inside the interface converter to assign the RS-422/RS-449 input port for DCE operation and the RS-232 output port for DTE operation (see Table D-7 and Figure D-40).

Note

This section applies only to *Sun SPARCserver* computers that have an HSI/S card installed.

Table D-7: DTE/DCE DIP-Shunt Settings

Move DIP shunts	
From	To
XW1A	XW1B
XW2A	XW2B
XW3A	XW3B
XW4B	XW4A
XW5B	XW5A

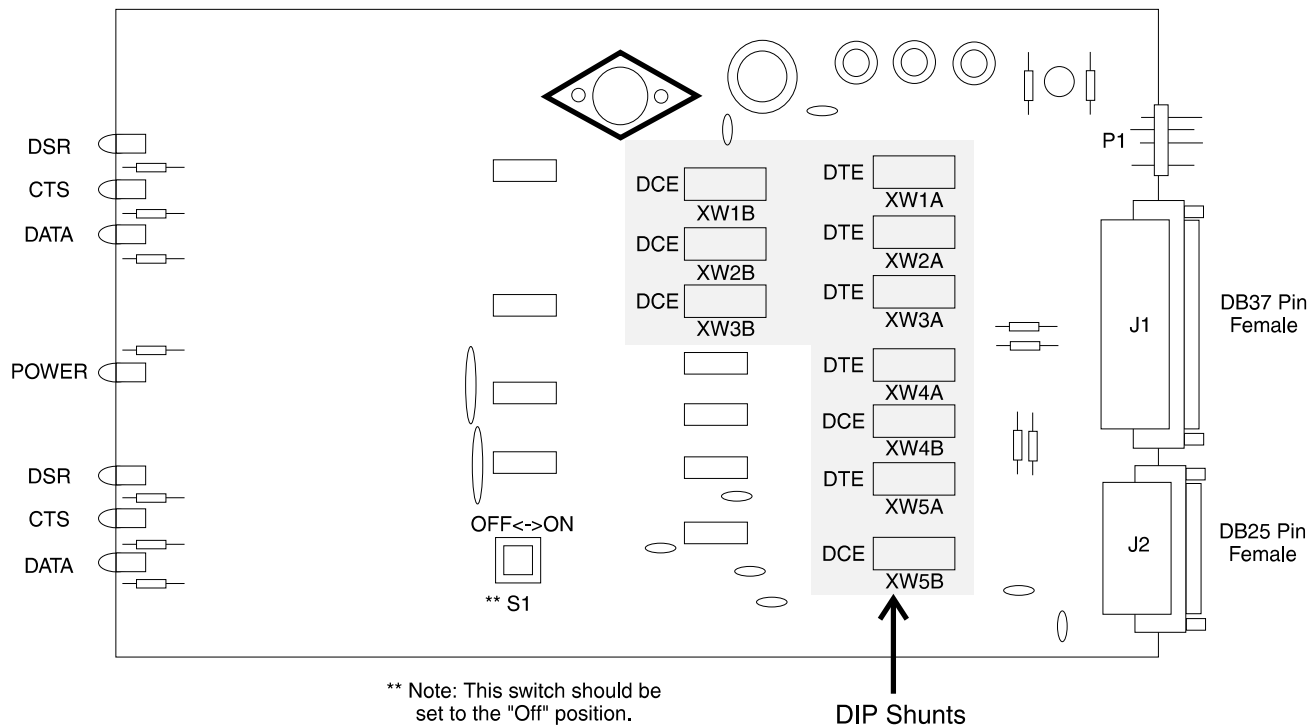
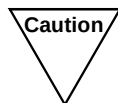


Figure D-40: Black Box Component Layout — DTE/DCE DIP-Shunt Locations

To reassign these ports, do the following:

1. Disconnect all power and cables from the Black Box converter.
2. Open the interface converter.
3. Move the DIP shunts to the appropriate DIP-shunt sockets by doing the following:
 - a. Use an IC-removal tool to grasp the DIP-shunt jumper, or carefully slide the tip of a common screwdriver between the DIP-shunt jumper and the DIP-shunt socket.



Be very careful when moving the DIP shunts. The DIP-shunt pins are very fragile and could easily be bent or broken.

- b. Gently “pry/wiggle” the DIP-shunt jumper free from the socket.
- c. Move the DIP-shunt jumper to the appropriate socket (see Table D-7).
- d. Carefully align the pins, and gently press the DIP-shunt jumper into place.

Additional References For additional information, refer to the following documentation:

*RS-232 ↔ RS-422 Interface Converter
Installation and Operation Manual,*
Section 2.0: “Introduction”
Section 3.0: “Installation”
Section 4.0: “Configuration.”

Connecting the System Console Peripherals

This section describes how to connect the system console peripherals to the *Sun SPARCserver* computer.

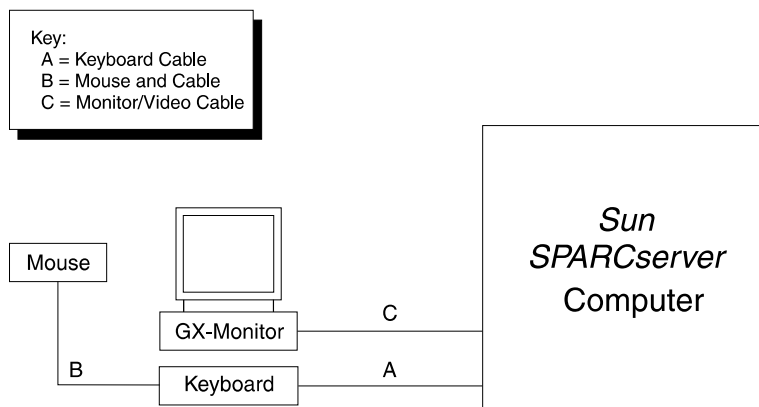


Figure D-41: System Console Connections

To assemble the *Sun SPARCserver* computer and system console, do the following (refer to Figure D-41):

- Position the computer in the location selected by the customer. Make sure the power switch is set to *Off*.
- Connect the following components (see Figure D-41):
 - Keyboard
 - Mouse
 - Monitor
 - Power cord (to a wall outlet or to an Uninterruptible Power Supply [UPS], if equipped).

This basic configuration represents the *CentreVu* CMS console terminal.

Additional References

For additional information, refer to the following documentation:

Sun Desktop SPARC Hardware Owner's Guide,
 Chapter 1: "Getting Started"
 Chapter 2: "Installing Your System."

Installing the External SCSI Devices

Each system can be configured to have various SCSI peripherals/devices.

This section describes how to connect the SCSI devices (tape drives, CD-ROM drives, and external hard disks) to the computer. The procedures outlined include the following:

- Setting the SCSI device IDs
- Connecting the SCSI devices to the computer.

Note

The SCSI hard disks will be configured/partitioned during the installation of the *Solaris 2.4* operating system.

Additional References

For additional information, refer to the following documentation:

Sun Solaris 2.x Handbook for SMCC Peripherals,
Chapter 2: "Setting Up Disk Drives"
Chapter 3: "Setting Up Tape Drives"
Chapter 4: "Setting Up CD-ROM Drives"

SPARCstorage UniPack User's Guide

SPARCstorage UniPack Installation.

Setting the SCSI IDs and Labeling the Devices

Each SCSI device on the SCSI bus must have a unique address or SCSI ID. Also, after you partition the disk drives and they are shipped to the customer site, the SCSI devices must be connected in the same way they were connected at the factory. To ensure that this occurs, you need to set the SCSI ID and label the drives appropriately.

To set the SCSI IDs, do the following:

1. Locate the target address switch on the rear panel of the SCSI device (see Figure D-42).

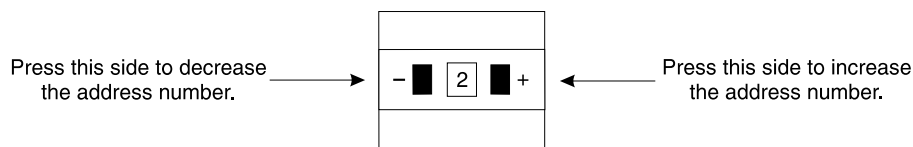


Figure D-42: Setting the SCSI ID/Target Address

2. Identify which SCSI IDs will be associated with each of the devices on a specific SCSI bus (see Table D-8, Table D-9, and Table D-10).
3. Press the left or right button of the switch until the appropriate SCSI ID number appears in the window.

Table D-8: Internal SCSI Bus ID Map (c0)

Device	SCSI ID	Node	Location
Base Disk	3	c0t3	Internal
Disk #2	1	c0t1	Internal
QIC 2.5-GB UniPack Tape Drive	4	c0t4	External
5-GB or 14-GB 8mm	5	c0t5	External
CD-ROM	6	c0t6	Internal
Disk #3	2	c0t2	External
Disk #4	0	c0t0	External
SCSI Controller	7	N/A	Internal

Table D-9: FSBE/E SCSI Interface Card Bus ID Map (c1)

Device	SCSI ID	Node	Location
Disk #5	1	c1t1	External
Disk #6	2	c1t2	External
Disk #7	3	c1t3	External
Disk #8	4	c1t4	External
SCSI Controller	7	N/A	Internal

Table D-10: Second FSBE/E SCSI Interface Card Bus ID Map (c2)

Device	SCSI ID	Node	Location
Disk #9	1	c2t1	External
Disk #10	2	c2t2	External
Disk #11	3	c2t3	External
Disk #12	4	c2t4	External
SCSI Controller	7	N/A	Internal

Additional References For additional information, refer to the following documentation:

Sun Solaris 2.x Handbook for SMCC Peripherals,
 Chapter 2: "Setting Up Disk Drives"
 Chapter 3: "Setting Up Tape Drives"
 Chapter 4: "Setting Up CD-ROM Drives"

SPARCstorage UniPack User's Guide

SPARCstorage UniPack Installation.

Connecting External SCSI Devices

This section describes how to connect the SCSI devices (tape drives, hard disks, etc.) to the *Sun SPARCserver* computer.

Figure D-43 shows how to connect UniPack SCSI devices. A SCSI cable is connected from the controller card port on the back of the *Sun SPARCserver* to the in-connector on the back of the UniPack device that is closest to the *SPARCserver* in the chain. Another SCSI cable is then connected from the out-connector of that device to the in-connector of the next device. You continue this process until all assigned devices are connected in the SCSI chain.

Since UniPack devices are auto-terminated, the last UniPack device in a SCSI chain does not require a terminator. To verify that the last UniPack device is terminated, check the LEDs on the back panel of the device labeled Auto Term High and Auto Term Low. In a CMS configuration, both LEDs are lit on the last device in the SCSI chain. If a UniPack device in the SCSI chain is not the last device, then neither termination LEDs are lit.

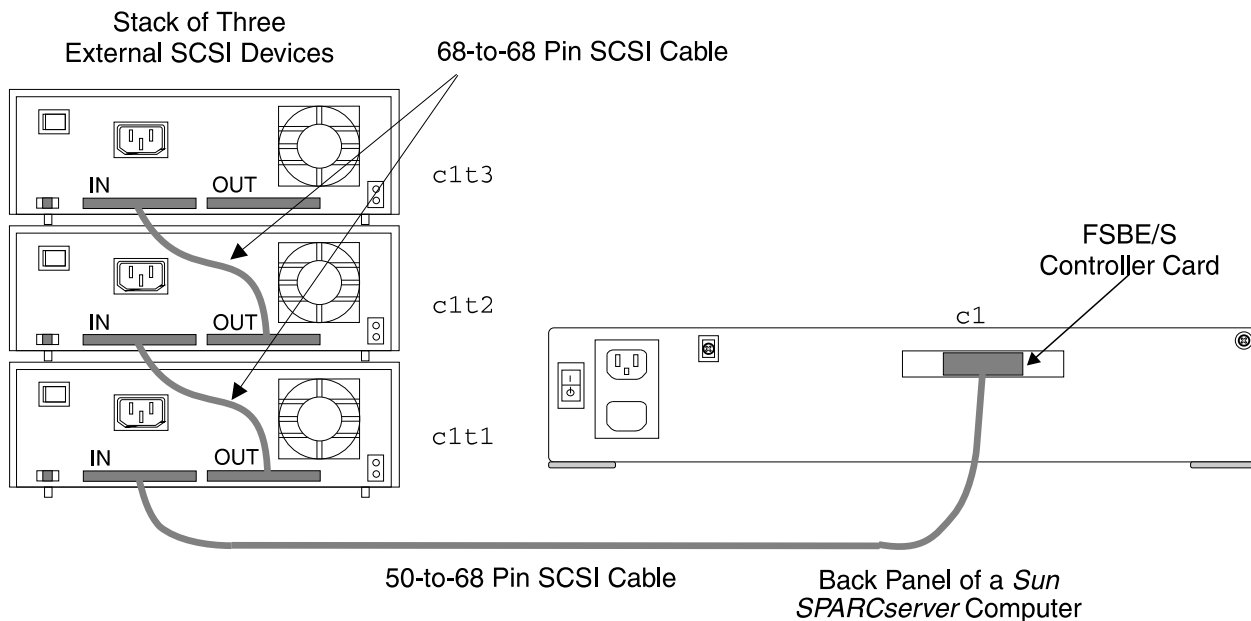


Figure D-43: Daisy-Chaining Example of UniPack Devices

Figure D-44 shows two SCSI cabling schemes that are possible with *Sun SPARCserver* computers.

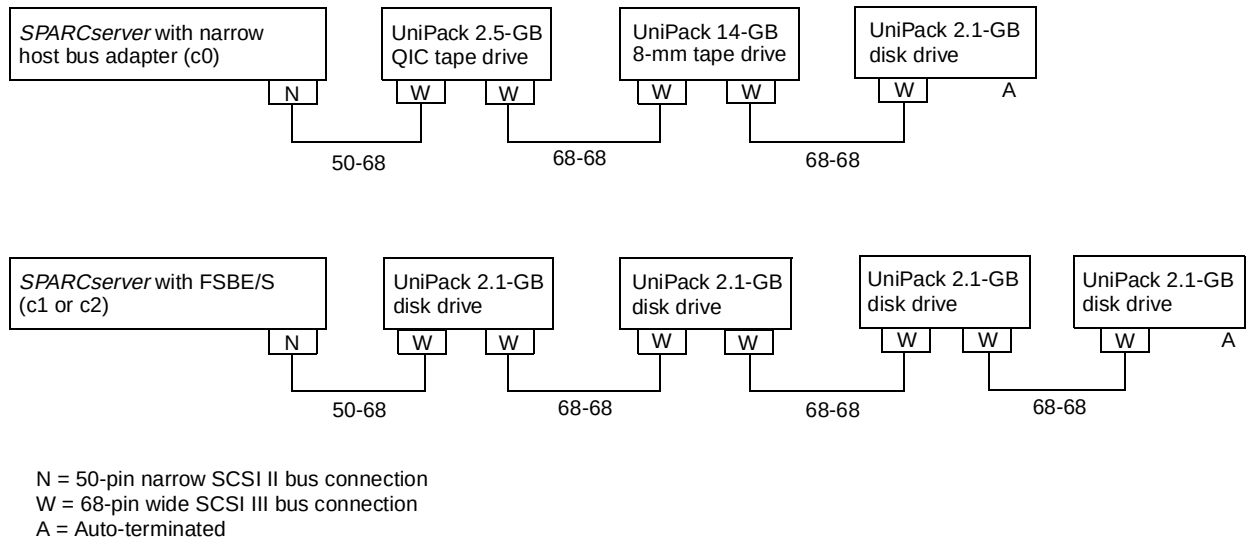


Figure D-44: SCSI Cabling Schemes

You can have up to three SCSI controllers on your system. One is built into the *Sun SPARCserver* computer and the other two are provided through FSBE/S controller cards (see Table D-11). Controller c1 is the first FSBE/S card and controller c2 is the second. The system determines which FSBE/S card is first (c1) by searching the SBus slots. See Table 3-4 on page 3-15 for an example.

Table D-11: SCSI Controllers

SCSI C0	SCSI C1	SCSI C2
Built into the <i>Sun SPARCserver</i> Computer	1st FSBE/S card	2nd FSBE/S card

Connect all external SCSI devices to the computer. Figure D-45 shows how to daisy-chain the SCSI bus through these devices. In addition, you need to make the power connections for the drives.

Figure D-45 shows the maximum number of external drives configured for the *Sun SPARCserver* computer. If the customer's external configuration is less than maximum, then the number of devices in each chain may vary.

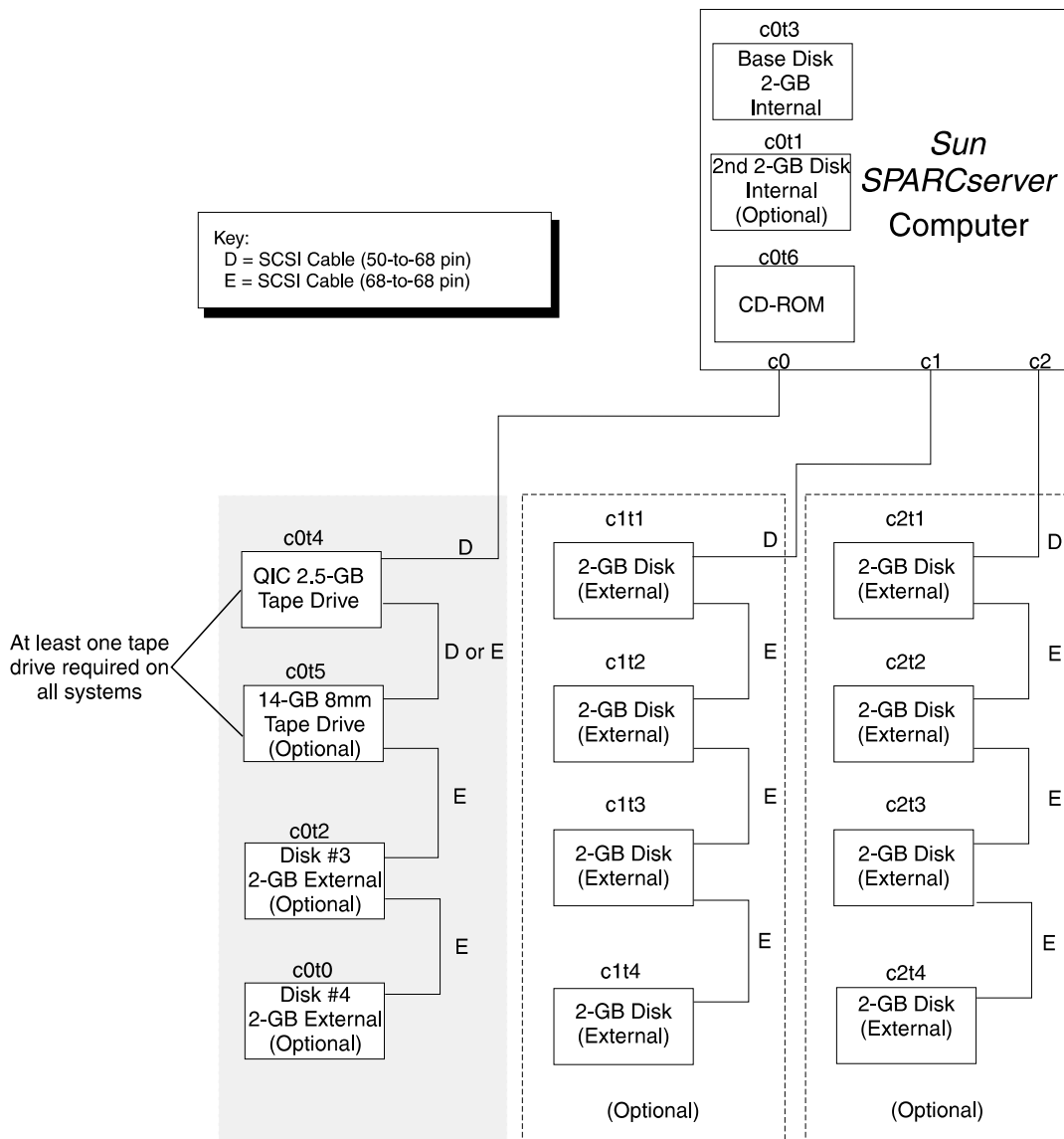


Figure D-45: External SCSI Device Connectivity

Additional References For additional information, refer to the following documentation:

Sun Solaris 2.x Handbook for SMCC Peripherals,
Chapter 2: "Setting Up Disk Drives"
Chapter 3: "Setting Up Tape Drives"
Chapter 4: "Setting Up CD-ROM Drives"

Desktop Storage Pack Installation and Operation Manual,
Appendix B: "Small Computer Serial Interface Information."

Connecting Network Hub Unit

This section describes how to connect the network hub unit(s) to the *Sun SPARCserver* computer using Unshielded Twisted-Pair (UTP) cables in a Twisted-Pair Ethernet (TPE) configuration.

Note

Do **not** use telephone extension cables in 10Base-T networks. The telephone extension cable wire pairs are not twisted and do not meet the requirements for use in a 10Base-T network.

Three different types of network hub units can be used:

- *IBM** 8222 network hub unit (uses standard UTP network cables)
- Allied Telesis MR820T network hub unit (uses standard UTP network cables)
- StarLAN fiber-optic hub unit (uses fiber-optic network cables).

The standard *CentreVu* CMS configuration uses the *IBM* 8222 network hub unit or the Allied Telesis - MR820T network hub unit. The StarLAN Fiber-Optic Hub can be used when you need more distance between the hub unit and the NTS(s). Table D-12 outlines the maximum distances associated with each type of network cable being used.

Table D-12: Network Cable Distances

Type of Cable	Maximum Cable Distance
UTP (Unshielded Twisted Pair) (Category 3 or 5)	100 meters / 328 feet
15-pin AUI	100 meters / 328 feet
Fiber-optic cable (62.5mm dual strand cable)	3000 feet

If you need more distance between the network hub unit and the NTS(s), refer to the "Optional Fiber-Optic Network Configurations" section that follows.

*IBM is a registered trademark of International Business Machines Corp.

Optional Fiber-Optic Network Configurations

This section briefly describes additional network configurations which can be used to increase the distance between the network hub unit and the NTS(s). These configurations use fiber-optic cables and/or fiber-optic hubs.

The configuration shown in Figure D-46 illustrates two network hubs connected through a fiber-optic network hub. This configuration allows the network to be spread across multiple buildings. For example, this would be useful in a situation where the *Sun SPARCserver* computer, network hub, and one NTS were located in one building, the fiber-optic hub and another NTS were located in an adjacent building, and another network hub with two additional NTSSs were located in another adjacent building.

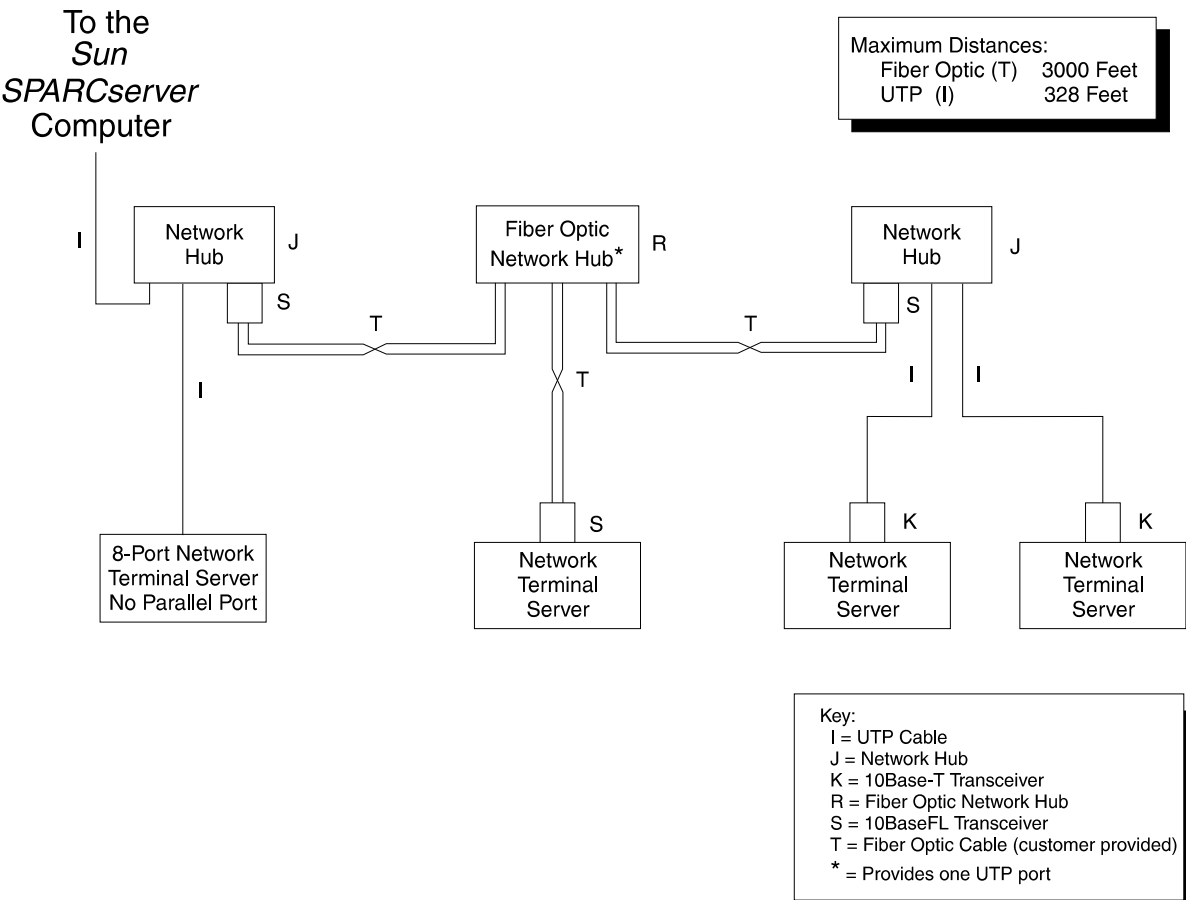


Figure D-46: Optional/Sample Fiber-Optic Configuration

The configuration shown in Figure D-47 illustrates two network hubs connected with a fiber-optic cable. This configuration allows the network to be spread across two adjacent buildings. For example, this would be useful in a situation where the *Sun SPARCserver* computer, network hub, and two NTSSs were located in one building, while the other network hub and remaining two NTSSs were located in an adjacent building.

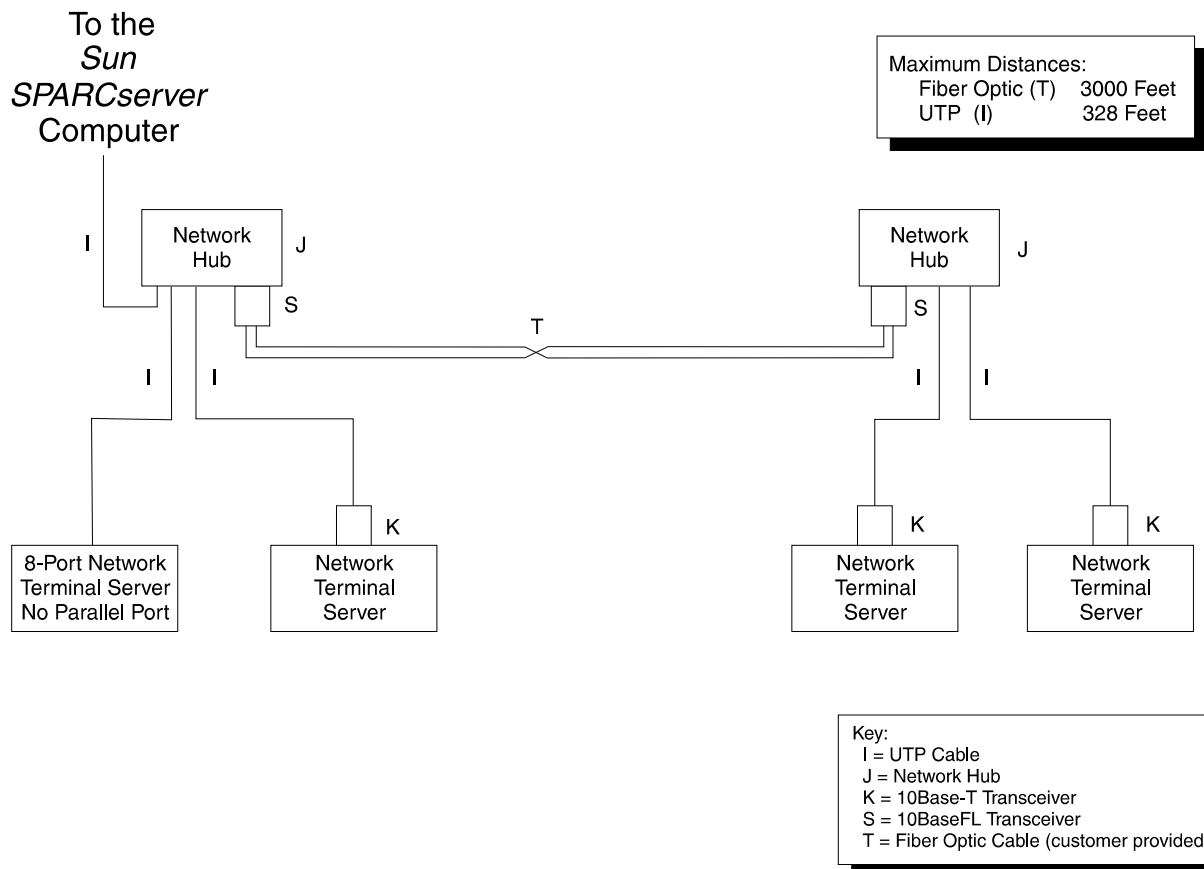


Figure D-47: Optional/Sample Fiber-Optic Configuration

The configuration shown in Figure D-48 illustrates a network hub connected to four NTSSs. This configuration allows the network to be spread across multiple buildings. For example, this would be useful in a situation where the *Sun SPARCserver* computer, network hub, and three NTSSs were located in one building, while an additional NTSS was located in an adjacent building.

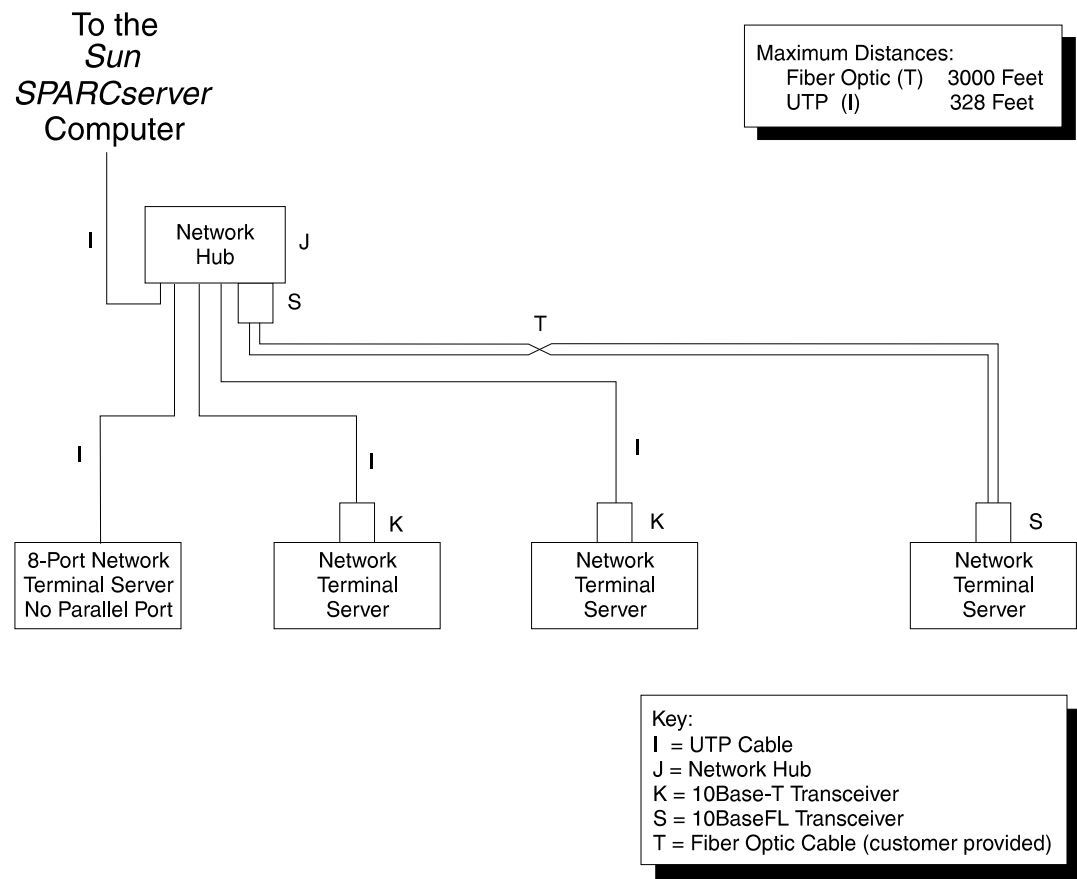


Figure D-48: Optional/Sample Fiber-Optic Configuration

Installing the *IBM* 8222 or the Allied Telesis Network Hub Unit

This section describes how to connect the *IBM* 8222 or the Allied Telesis network hub unit to the *Sun SPARCserver* computer. These hub units may be used in conjunction with other network hub units.

To connect a network hub unit to the *Sun SPARCserver* computer, do the following (see Figure D-49):

1. Position the network hub unit in the location selected by the customer. Make sure the power switch is set to off.
2. Plug the power cord into a wall outlet or to a UPS (if equipped).
3. Plug one end of the UTP cable into the twisted-pair connector on the back of the *Sun SPARCserver* computer.

Use the UTP cable that came with your *Sun SPARCserver* computer (Part number 180-1529-01).

4. Plug the other end of the UTP cable into Port 1 of the 10Base-T ports on the network hub unit (see Figure D-49).

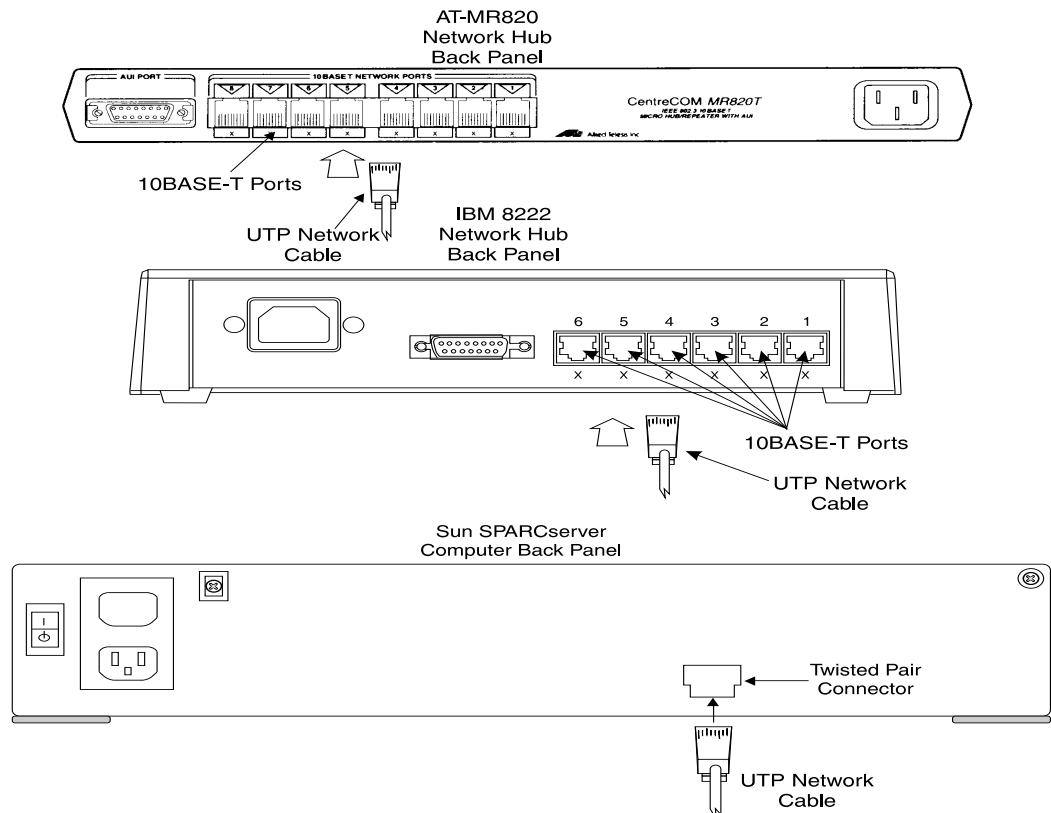


Figure D-49: Network Hub Units — Back Panel

Additional References For additional information, refer to the following documentation:

IBM 8222 6-Port 10Base-T Workgroup Hub Installation and Planning Guide,

Chapter 2: "Installing the IBM 8222."

Allied Telesis CentreCom AT-820T Multiport 10Base-T Micro Repeaters Users Manual,

Chapter 2: "Installation."

Installing the StarLAN 10 Network Fiber-Optic Hub Unit

This section describes how to connect the StarLAN 10 network fiber-optic hub unit to the *Sun SPARCserver* computer. This hub unit may be used in conjunction with other network hub units.

To connect the StarLAN 10 network fiber-optic hub unit to the network, do the following (see Figure D-50):

1. Position the network fiber-optic hub unit in the location selected by the customer. Make sure the power switch is set to off.
2. Plug the power cord into a wall outlet or to a UPS (if equipped).
3. Plug one end of the fiber-optic cable into the Tx (transmit) and Rx (receive) connectors on the front of the network fiber-optic hub unit (see Figure D-50).

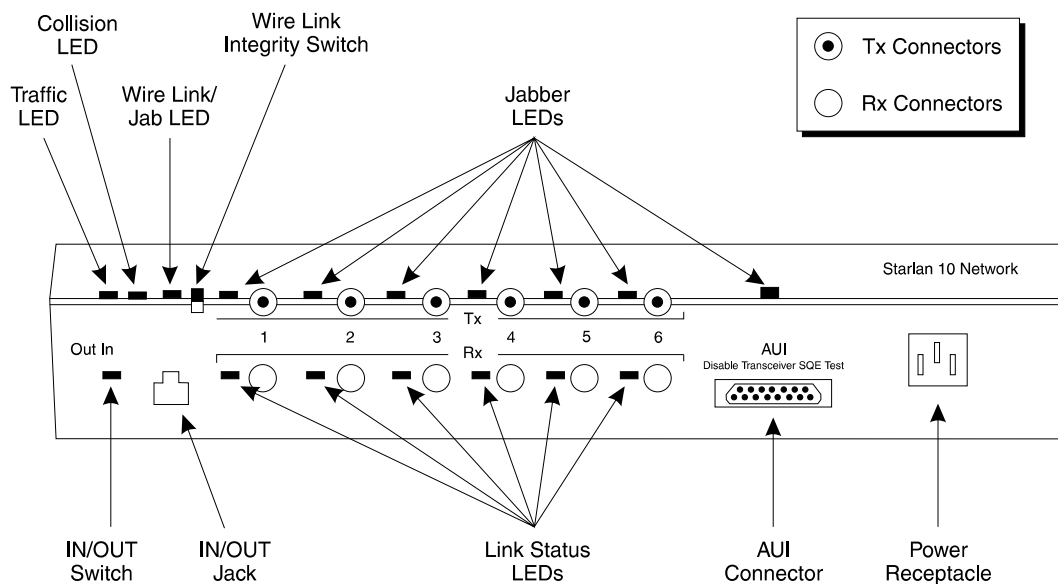


Figure D-50: StarLAN 10 Network Fiber-Optic Hub Unit

The fiber-optic cable has two plugs on each end. Generally, the two plugs are color-coded or identified in some other manner. Note which plug was attached to the Tx and Rx ports on the hub unit.

4. Plug the other end of the fiber-optic cable into the 10Base-FL transceiver connected to either the network hub or NTS.

Connect the plugs just opposite of how they were connected at the other end (that is, the plug that was attached to the Tx port at the other end should be connected to the Rx port at this end, and the plug that was attached to the Rx port at the other end should be connected to the Tx port at this end).

Additional References For additional information, refer to the following documentation:

StarLAN 10 Network Fiber-Optic Hub Installation Guide (999-100-458).

Connecting the NTS(s) to the Network Hub Unit

This section describes how to connect the 8-, 16-, or 64-port NTS(s) to the network hub unit (see Figure D-51 and Figure D-52). This section also describes how to connect the four 16-port NTS patch panel(s) to the 64-port NTS.

Note

Do **not** use telephone extension cables in 10Base-T networks. The telephone extension cable wire pairs are not twisted and do not meet the requirements for use in a 10Base-T network.

The 64-port NTS provides 12 50-pin PBX-champ connectors used to attach 64 serial devices using the patch panel cables and patch panels. These serial devices are accessed via the local ethernet network.

Note

If the NTS needs to be administered (for example the NTS has not been administered or if you are adding an NTS to your system), then follow the procedure outlined in the *Administering the Network Terminal Servers* section in this chapter.

Additional References

For additional information, refer to the following documentation:

Network Terminal Server: Hardware Installation Guide,
Chapter 2: "Installing the NTS."

*Xylogics** Micro Annex Communications Server Hardware
Installation Guide,

Chapter 2: "Installing the Micro Annex."

*Xylogics is a registered trademark of Xylogics, Inc.

Figure D-51 and Figure D-52 shows NTS(s) and network hub connectivity.

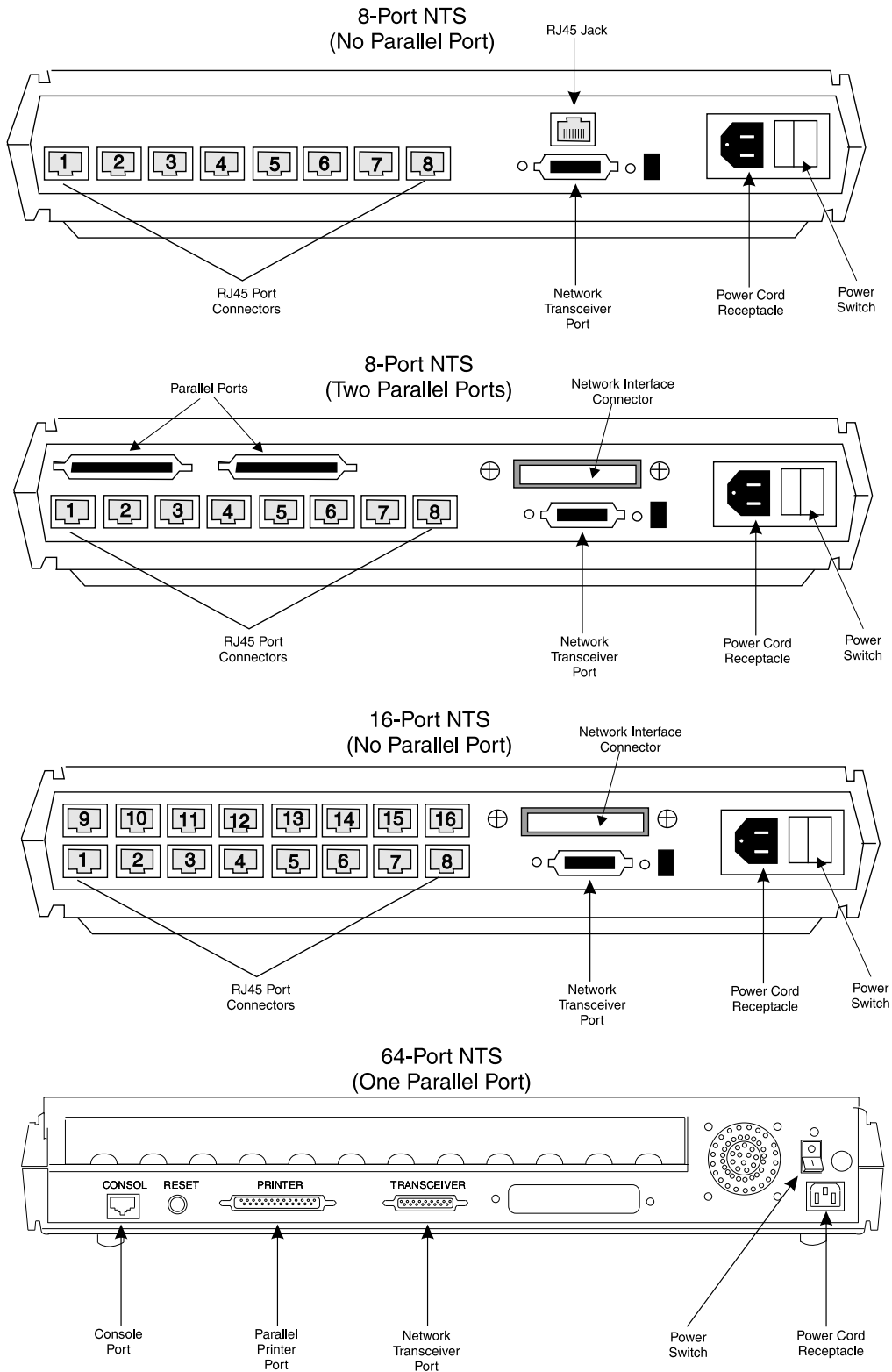


Figure D-51: 8-, 16-, and 64-Port NTS — Back Panels

To connect the NTS(s) to the network hub unit, do the following (see Figure D-52):

1. Position the NTS(s) in the location selected by the customer. Make sure each power switch is set to off.
2. Plug each power cord into a wall outlet or to an UPS (if equipped).
3. Plug one end of the UTP cable into a port on the 10Base-T ports on the network hub unit.
4. Use the following table to determine what to do next:

IF you are connecting. . .	THEN. . .
an 8-port NTS without a parallel port	do Step 5 and skip Steps 6 and 7
an 8-port NTS with two parallel ports, a 16-port NTS without a parallel port, or a 64-port NTS with one parallel port	skip Step 5 and do Steps 6 and 7

5. Plug the other end of the UTP cable into the RJ45 jack located on the back of the NTS.
6. Connect the 10Base-T transceiver to the transceiver port on the back of the NTS. Verify that the 10Base-T transceiver switch setting is set to SQE = Off.

Note

You may have an older version of a 10Base-T transceiver which allows you to physically change three switch settings: SQE, Link, and LRT. If you have this older version, verify that the switch settings are set to the following:

- SQE = Off
- Link = On
- LRT = Off.

7. Plug the other end of the UTP cable into the transceiver previously connected to the back of the NTS.

Figure D-52 shows the network hub and NTS connectivity.

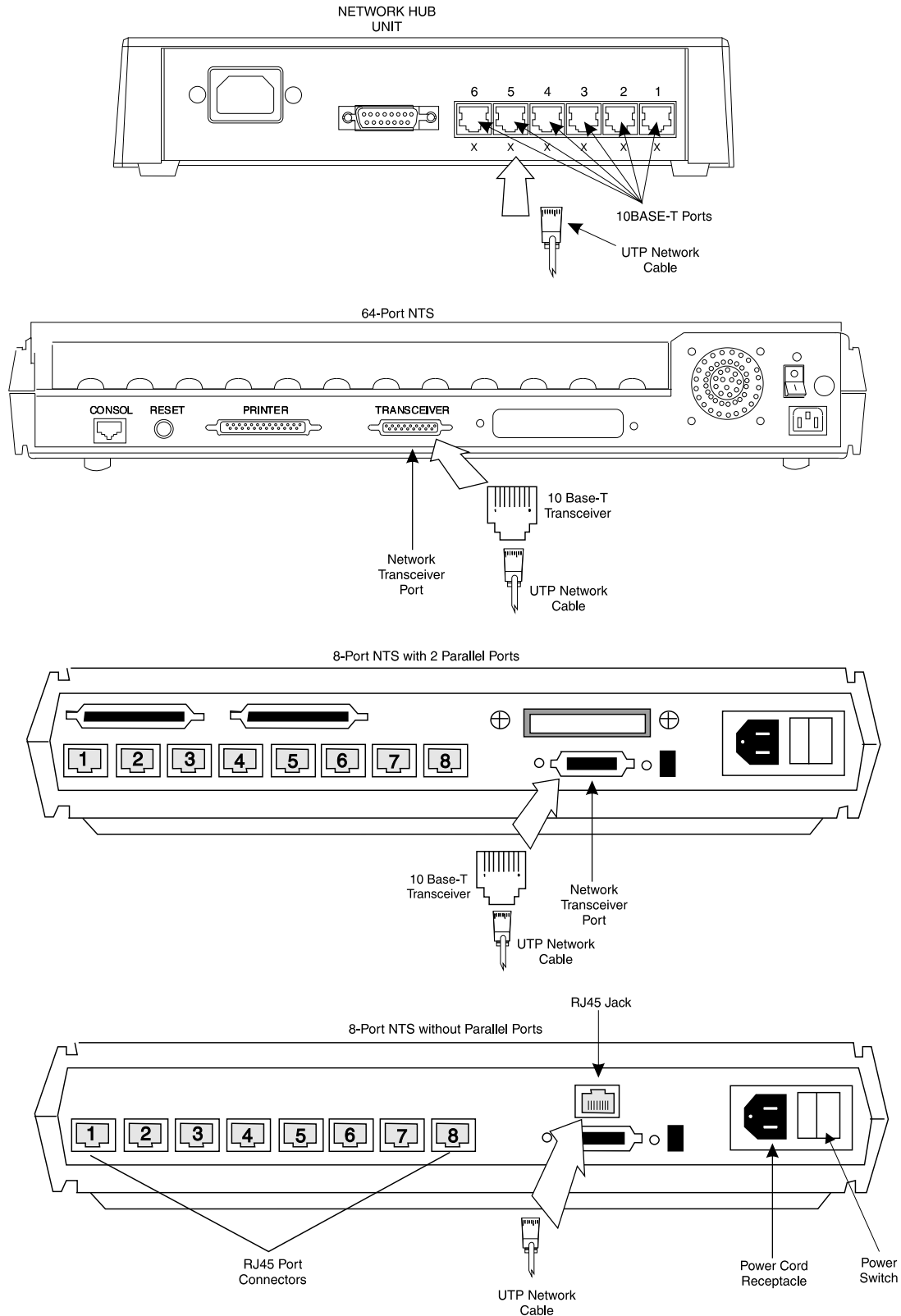


Figure D-52: NTS Connectivity to Network Hub Unit

Connecting the NTS Patch Panel(s) to the 64-Port NTS

This section describes how to connect the 16-port patch panel(s) to the 64-port NTS (see Figure D-53 and Figure D-54).

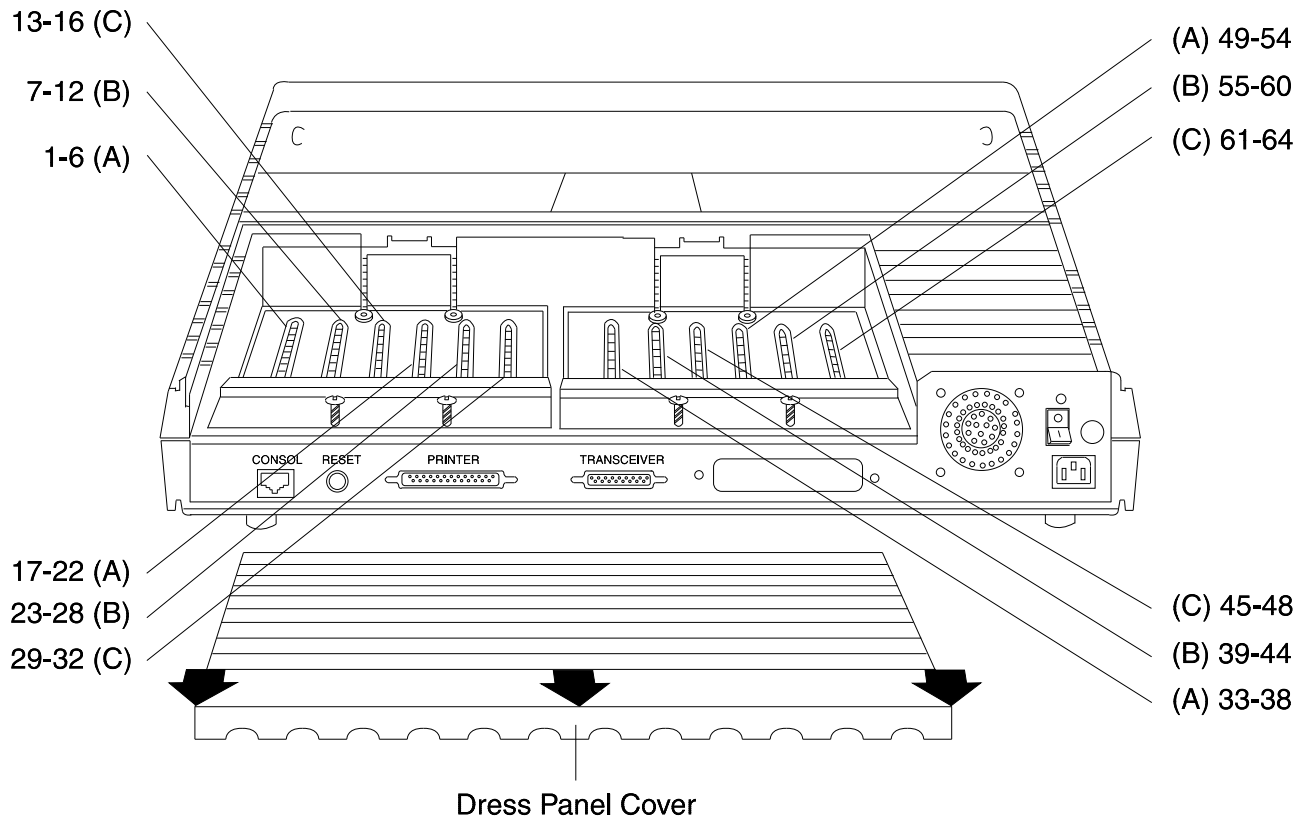


Figure D-53: 64-Port Network Terminal Server — PBX-Champ Connectors and Port Definitions

To connect a 16-port NTS patch panel (see Figure D-54) to the 64-port NTS (see Figure D-53), do the following:

1. Remove the back panel of the NTS by sliding it toward the back of the NTS. (This cover is located on the top back corner of the NTS.)
2. Slide the cable retainer back to allow room for the cable(s).
3. Position the 16-port patch panel in the location selected by the customer.
4. Connect the PBX ends of the patch panel cable to the PBX-champ connector.

Each 16-port patch panel has three connectors (see Figure D-54) which connect to the PBX-champ connectors located inside the NTS (see Figure D-53). The PBX-champ connectors are also labeled A, B, and C, respectively.

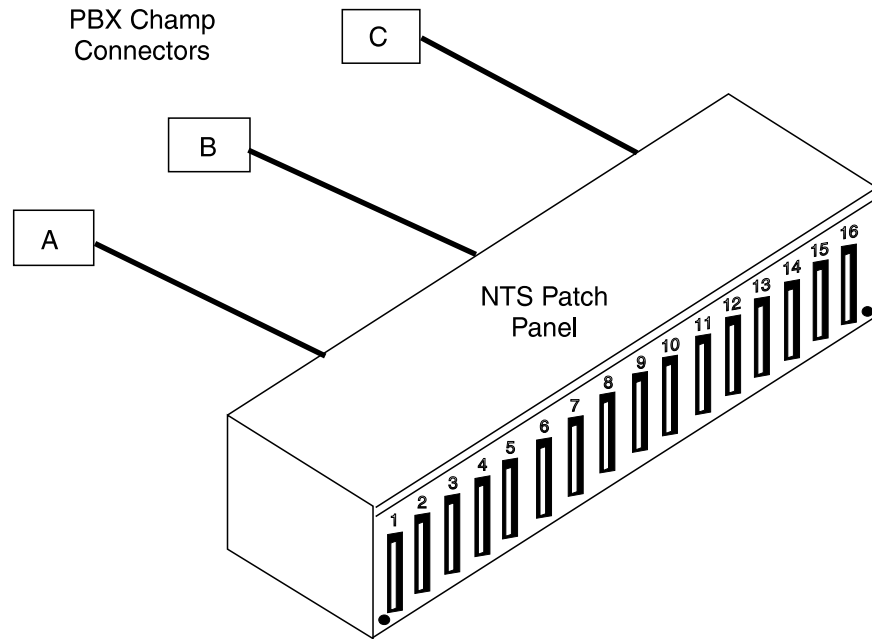


Figure D-54: NTS Patch Panel

5. Tighten the screw on the PBX end of the cable.
 6. Slide the cable retainer forward. Make sure that the lip of the retainer secures the connector.
- Repeat steps 3 through 6 for each NTS patch panel being installed.
7. Replace the back panel of the 64-port NTS (to its original position) by sliding it toward the front of the NTS. See Figure D-55 for a graphical view of the network terminal server connectivity.

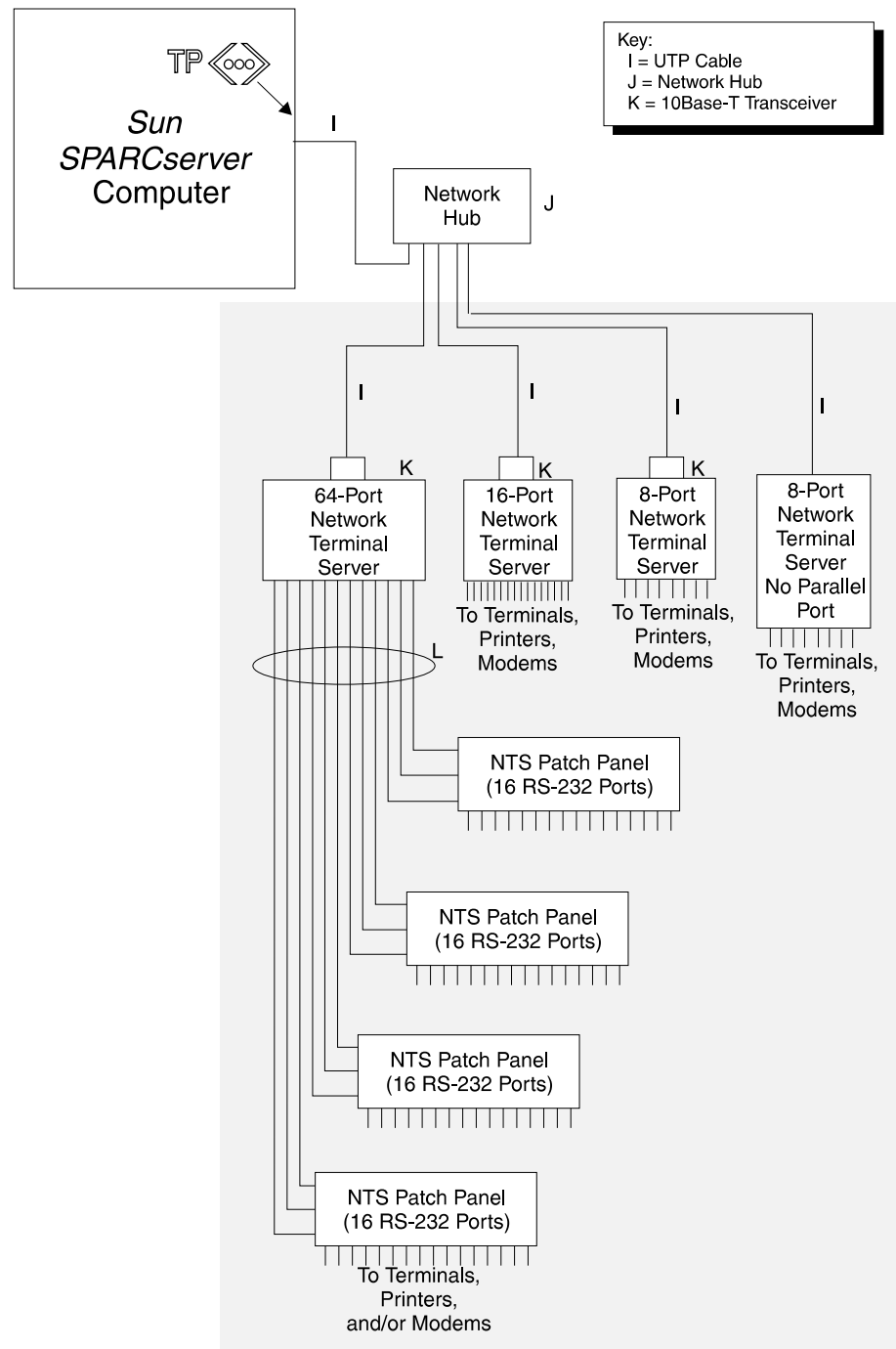


Figure D-55: Network Terminal Server Connectivity

Connecting the 8- or 16-Port Expander Box

The Aurora SBus *Multiport* card is used to connect terminals, printers, and modems to your *Sun SPARCserver* computer. Each SBus *Multiport* card is shipped with an expander box that attaches to the *Multiport* card and breaks out the new ports (see Figure D-56). In order to connect the 8- and 16-port expander box to the *Sun SPARCserver* computer, you must first install the SBus *Multiport* card. See the “Installing SBus Cards” section in this chapter to do so.

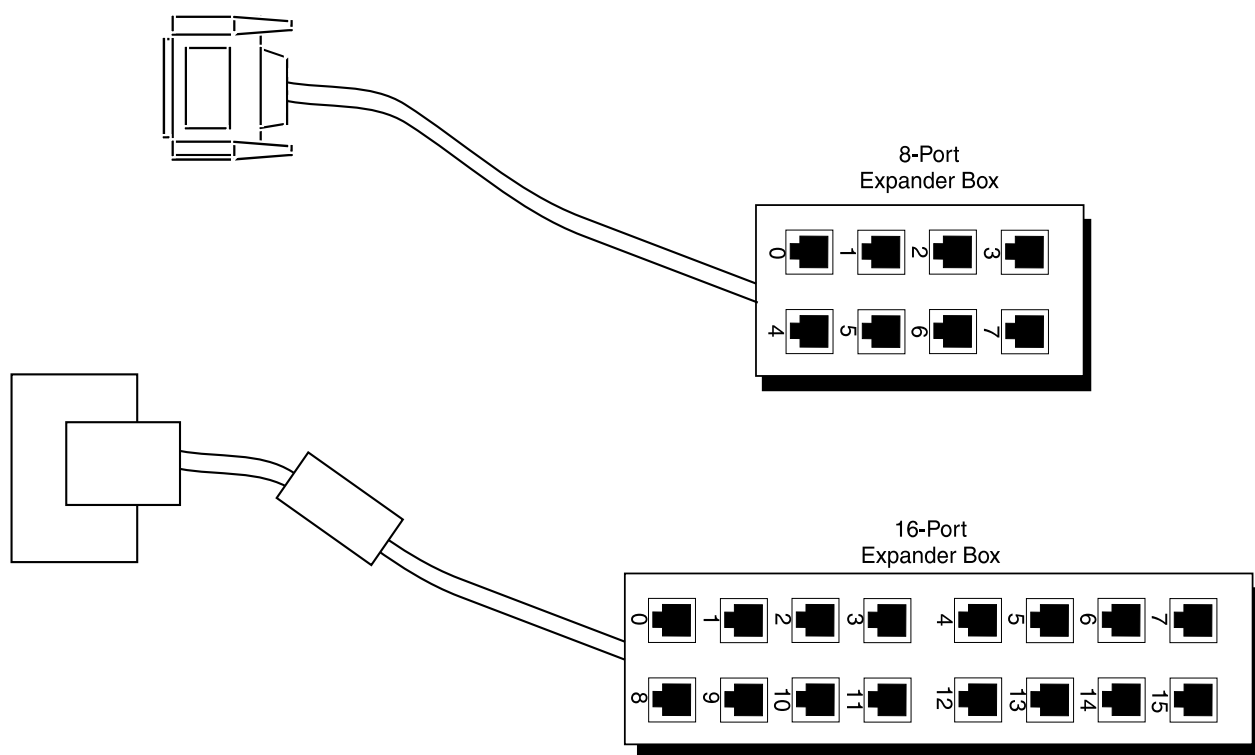


Figure D-56: 8- and 16-Port Expander Boxes for the Aurora SBus *Multiport* Cards

Note Ports 12-15 on the 16-port expander box cannot be used to connect modems.

To connect a peripheral device to the expander box, do the following:

1. Attach the expander box cable to the SBus *Multiport* card. Tighten the thumbscrews securely. See Figure D-57.

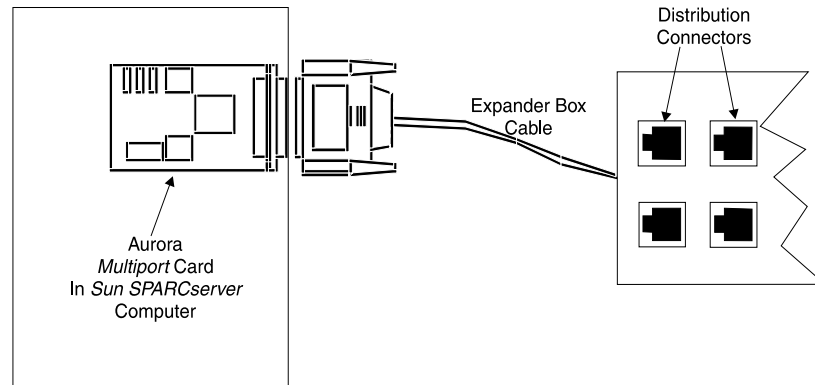


Figure D-57: Expander Box Connection to Aurora *Multiport* Card

2. Choose the correct peripheral cable.
3. Attach one end of the cable to the peripheral, and the other end to one of the expander box connectors (see Figure D-58).

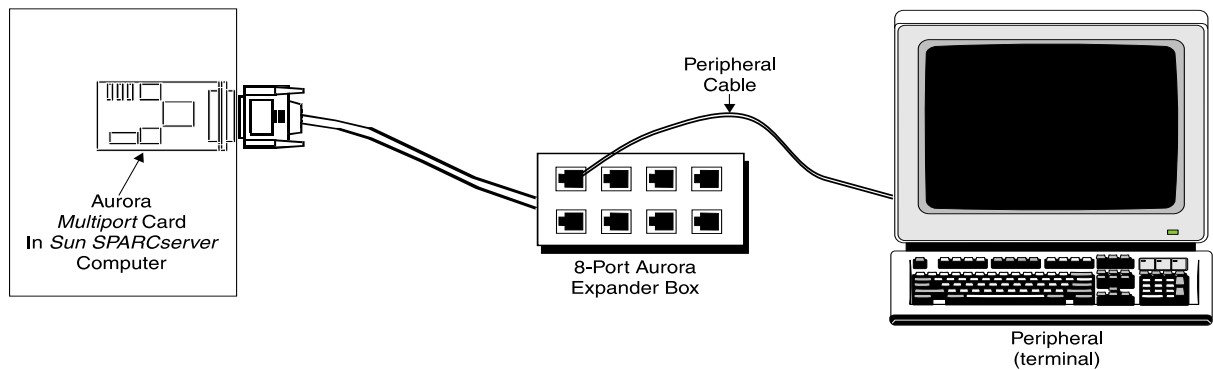


Figure D-58: Connecting an Aurora Expander Box to a Peripheral

4. Record the slot number of the SBus *Multiport* card and the port number the peripheral is connected to. The breakout connectors are numbered to match the device names that will be created when the driver software is installed. You will need to know which port the peripheral was connected to when you set up port services for it.

Note

If you have more than one expander box installed on your system, the port numbers connecting peripherals will follow a specific ordering sequence defined by the Aurora software. See the “Identifying Device Entry Names for Ports on the Aurora Expander Box(s)” section in Chapter 9, “*Maintenance*,” for details on ordering sequence.

Factory Software Installation Procedures

This section contains the factory software installation procedures.

The following list summarizes the software procedures in the order in which they should be performed:

1. Installing the *Solaris* 2.4 operating system
2. Installing the *Solaris* 2.4 *AnswerBook* software
3. Installing the High-Speed Serial Interface/SBus (HSI/S) software
4. Installing the Network Terminal Server (NTS) software
5. Installing the *SunLink* X.25 Network Interface software
6. Installing the *INFORMIX* software
7. Installing the *Sun Solaris* patches
8. Installing the *CentreVu* CMS application
9. Installing the Aurora SBus *Multiport* Software Driver
10. Setting authorizations
11. Setting up the remote console
12. Administering the NTS(s).

Installing the *Solaris 2.4* Operating System

Prerequisites: Make sure that your *Solaris* OS package is Release 2.4 and is dated 3/95.

The *Solaris* installation program is a menu-driven, interactive program that guides you step by step through installing the *Solaris* software. It also has on-line help to answer your questions.

You navigate through the *Solaris* installation program with the mouse. Your keyboard, however, provides similar functionality. For example, you can use the **Tab** or arrow keys to move through fields and the **Return** key to initiate actions.

Installing the *Solaris 2.4* operating system on the *Sun SPARCserver* computer consists of the following tasks:

- Booting from the *Solaris 2.4* CD-ROM
- Identifying the system
- Setting the system date and time
- Installing the *Solaris 2.4* system files
- Partitioning the hard disks.

Things to Know Before You Start

You need the following information to install the *Solaris 2.4* operating system:

- The system's name (as designated by Lucent Technologies' Technical Service Center [TSC])
- The system's IP address
- The number of disks equipped with the system
- The amount of Random Access Memory (RAM) equipped with the system.

Additional References

For additional information, refer to the following documentation:

Solaris 2.4 SPARC: "Installing Solaris Software."

Booting from the *Solaris 2.4* CD-ROM

To boot the *Sun SPARCserver* computer from the CD-ROM, do the following:

1. Turn on the system.
2. Remove the “*Solaris 2.4* Hardware: 3/95” CD-ROM from its case. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 3.
 - a. Place the “*Solaris 2.4* Hardware: 3/95” CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.
 - c. Go to Step 6.
3. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
4. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.
5. Push the CD-ROM drive tray in (towards the system unit) until it closes.
6. Press the **Stop** and **A** keys simultaneously. The following prompt displays:

```
ok
```

7. Boot the system from the CD-ROM by entering the following:

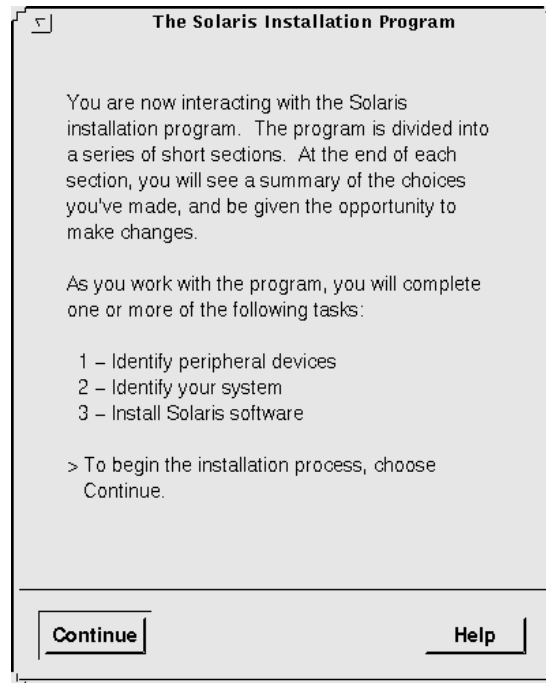
```
ok boot cdrom
```

The boot process takes approximately 5-10 minutes.

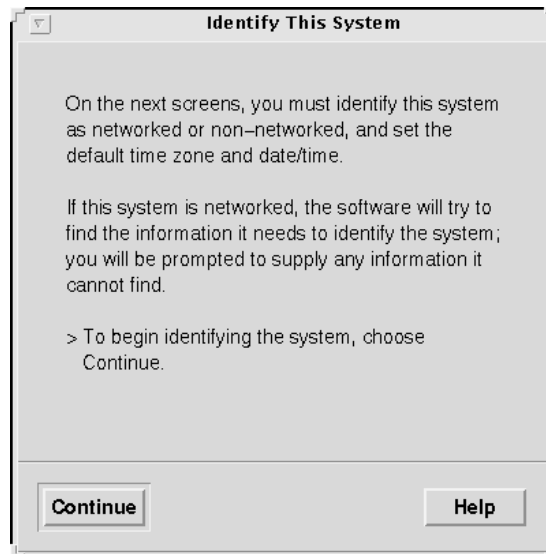
Note

At the start of the boot process, the system displays some parameters to the right of the *Sun* graphic. Note the amount the RAM equipped with the system (for example, 128-MB). You need this information later to partition the hard disks.

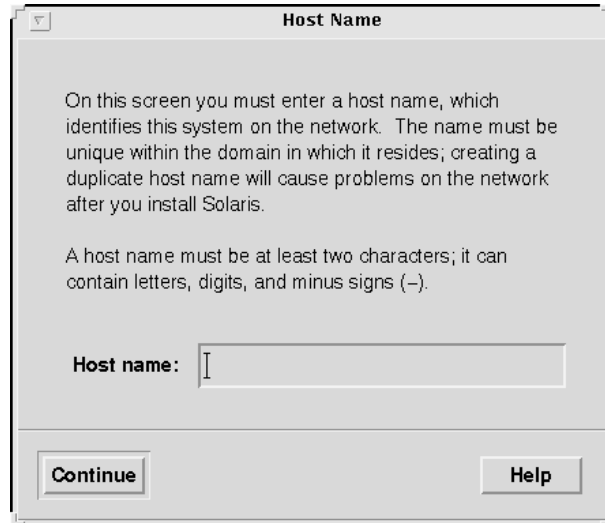
After the boot process, the system starts the *Solaris* Installation Program.



8. Click Continue. The Identify This System screen displays:

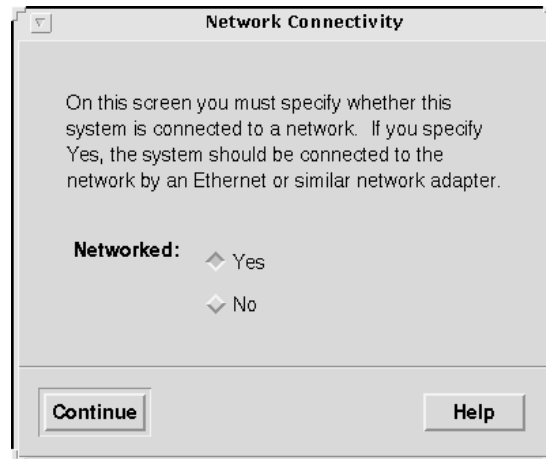


9. Click **Continue**. The **Host Name** screen displays:



10. Click the **Host name** box, type the host name for the workstation, and then click **Continue**. The host name for a specific system was designated by the TSC Provisioning personnel.

The **Network Connectivity** screen displays:



11. Click **Yes**, and then click **Continue**.

Note

If the system is equipped with more than one network board, the Primary Network Interface screen displays. You should click **1e0**, and then **Continue**.

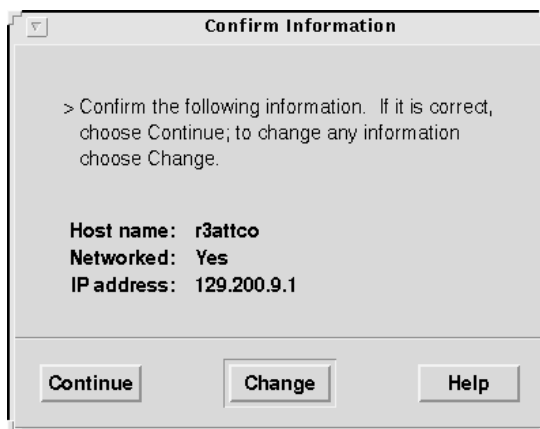
The IP Address screen displays:



The IP Address screen is a dialog box with a title bar that says "IP Address". Inside, it contains the following text: "On this screen you must enter the Internet Protocol (IP) address for this system. It must be unique and follow your site's address conventions, or a system/network failure could result." followed by "IP addresses contain four sets of numbers separated by periods (for example 129.200.9.1)." Below this text is a label "IP address:" followed by a text input field. At the bottom of the dialog are two buttons: "Continue" and "Help".

12. Click the IP address box, type the IP address (129.200.9.1 is recommended), and then click **Continue**.

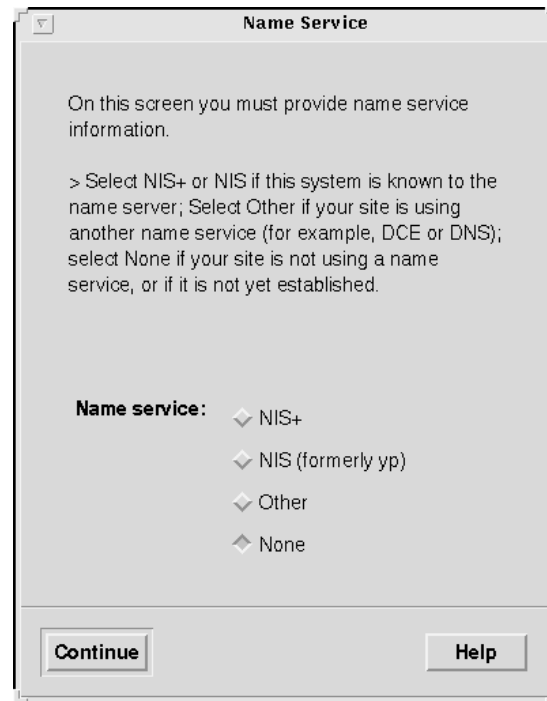
The Confirm Information screen displays:



The Confirm Information screen is a dialog box with a title bar that says "Confirm Information". Inside, it contains the following text: "> Confirm the following information. If it is correct, choose Continue; to change any information choose Change." Below this text, the following information is displayed: "Host name: r3attco", "Networked: Yes", and "IP address: 129.200.9.1". At the bottom of the dialog are three buttons: "Continue", "Change", and "Help".

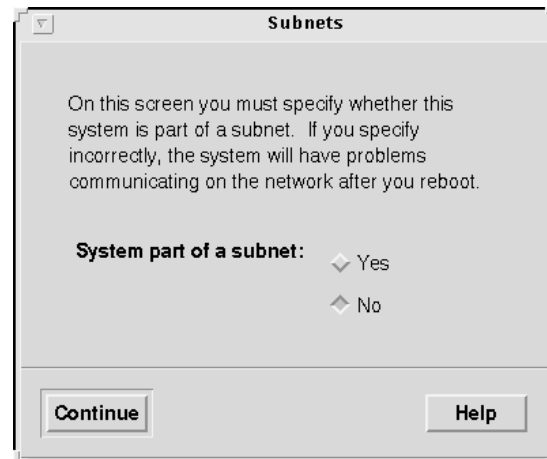
13. Click **Continue** if the displayed information is correct. If you click **Change**, the program returns to the Host Name screen.

The Name Service screen displays:

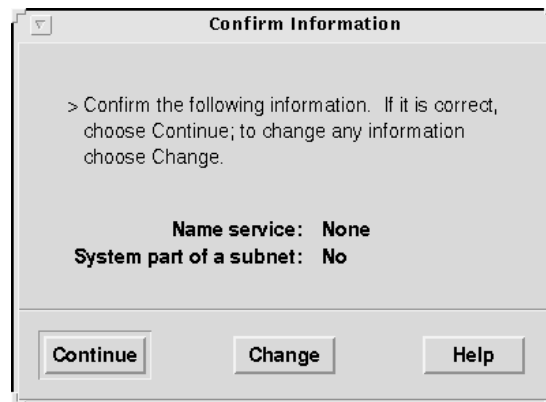


14. Click None, and then click Continue.

The Subnets screen displays:



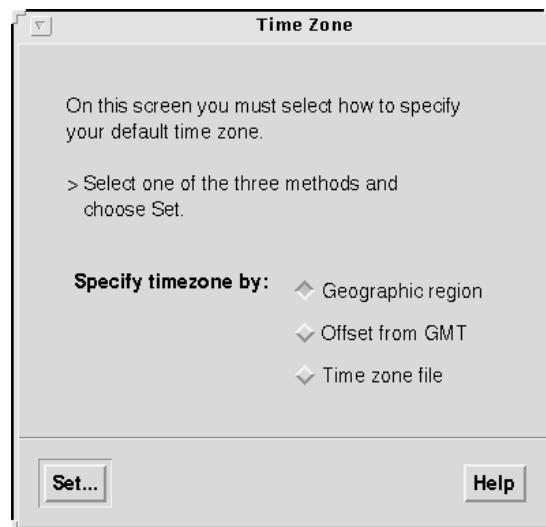
15. Click No, and then click **Continue**. The Confirm Information screen displays:



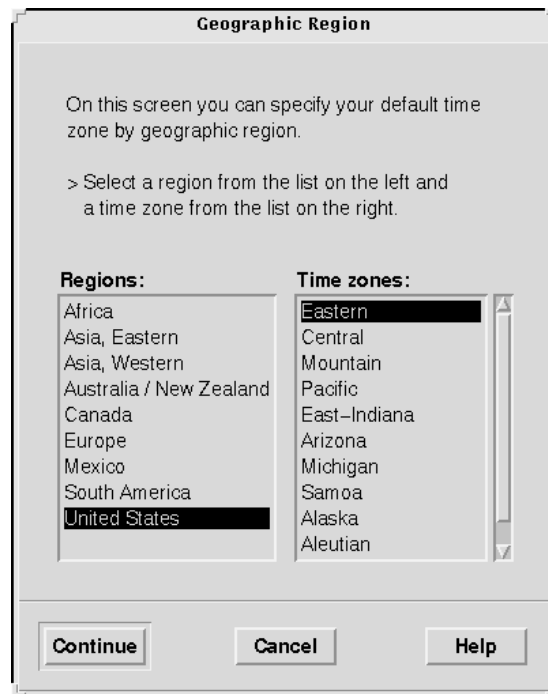
16. Click **Continue** if the displayed information is correct. If you click **Change**, the program returns to the Name Service screen.

Setting the Date and Time

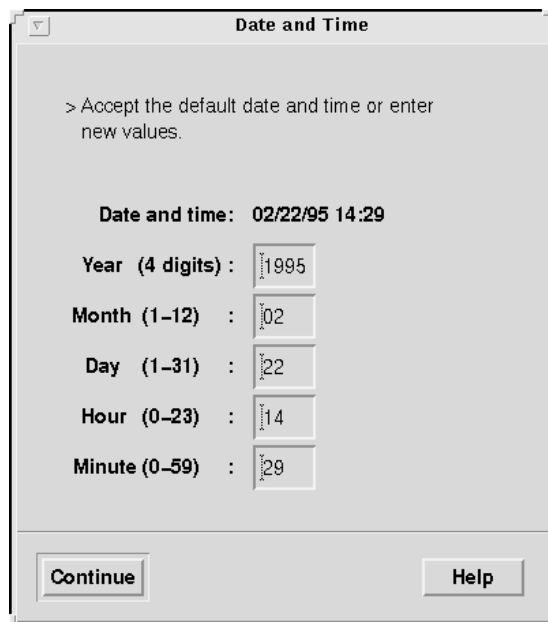
The Time Zone screen displays:



17. Click **Geographic region**, and then click **Set**. The **Geographic Region** screen displays:

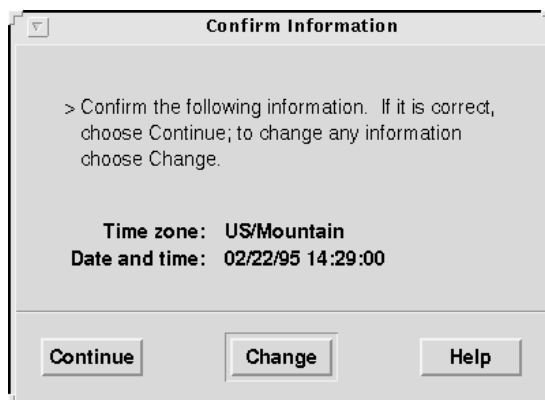


18. Click to highlight the region and time zone where this system is located, and then click **Continue**. The **Date and Time** screen displays:



19. Click **Continue** to accept the default date and time, or click and drag a value in a field you wish to change, and enter the appropriate information. Click **Continue** when all the information is correct.

The Confirm Information screen displays:



20. Click `Continue` if the displayed information is correct. If you click `Change`, the program returns to the Time Zone screen.

The system date and time are now set. The program continues with the installation of *Solaris* 2.4 system files.

Installing the *Solaris* 2.4 System Files

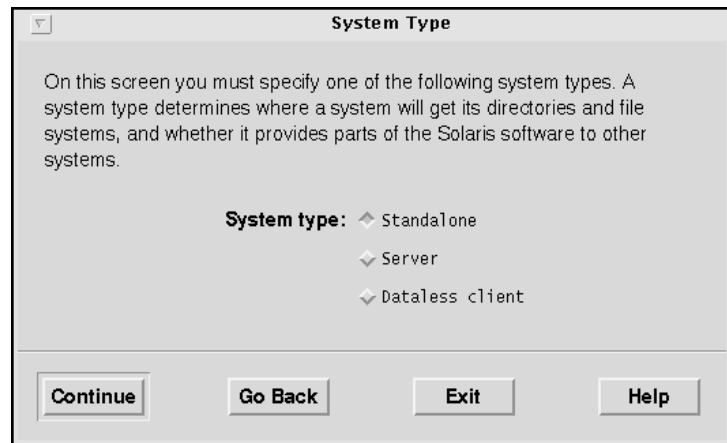
The Install *Solaris* Software screen displays:



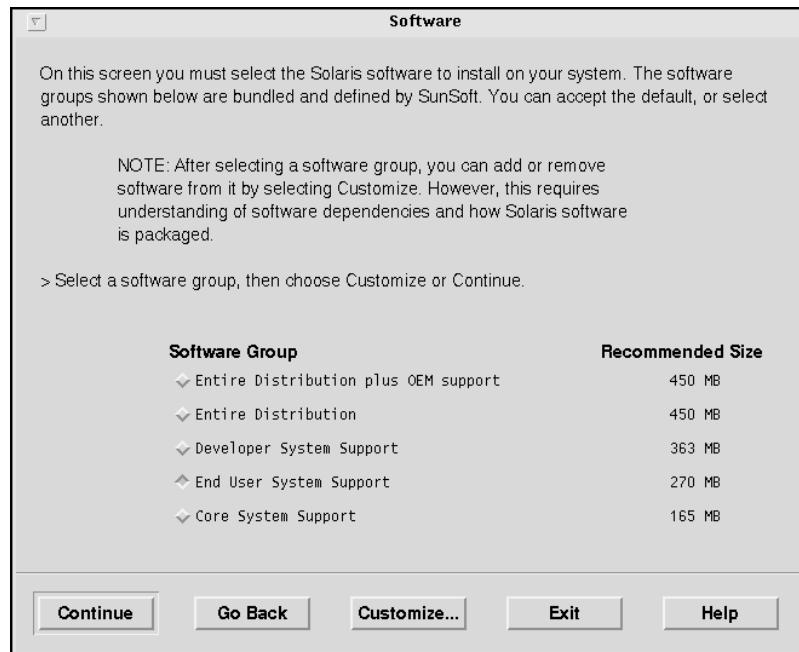
21. Click `Continue`.

Note If *Solaris* is already installed on the machine, which is the case for machines in the field, the Upgrade screen displays.

The System Type screen displays:



22. Click Standalone, and then click Continue. The Software screen displays:



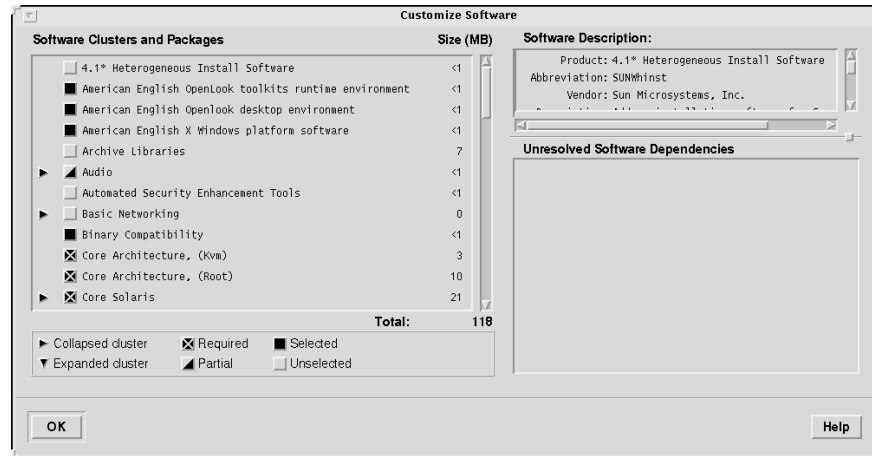
23. Click End User System Support, and then click Customize.

Note

If you click Continue instead of Customize, then the Disks screen on page D-83 displays, which is incorrect. If this happens, then click Go Back from the Disks screen.

In addition, the screen examples in this section show size values for a 2.01-GB disk. The actual size values may differ according to your system's disk configuration.

The Customize Software screen displays:



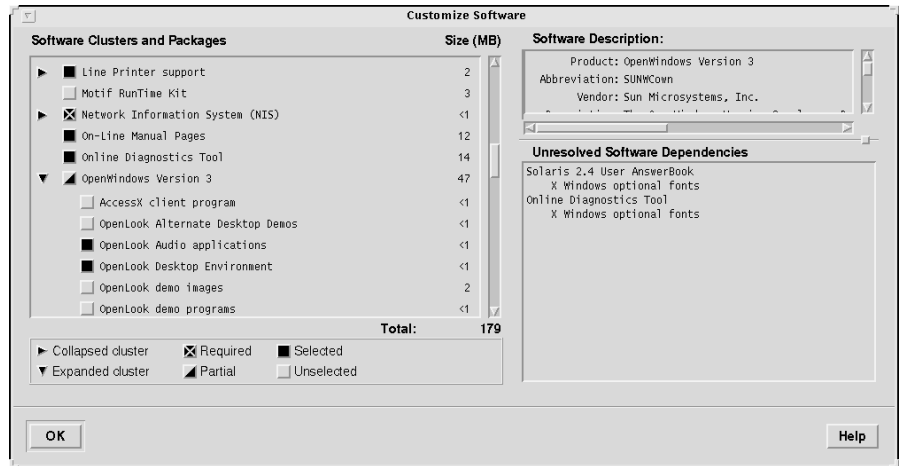
24. Click to select the following packages (using the scroll bar when necessary to bring the package names into view):

- Basic Networking
- On-Line Manual Pages
- On-Line Diagnostics Tool
- Point-to-Point Protocol
- SX API Support
- *Solaris 2.4 User AnswerBook*
- System Accounting.

25. Scroll up, and then click the triangular icon to expand the *OpenWindows** Version 3 cluster.

The program responds:

*OpenWindows is a trademark of Sun Microsystems, Inc.



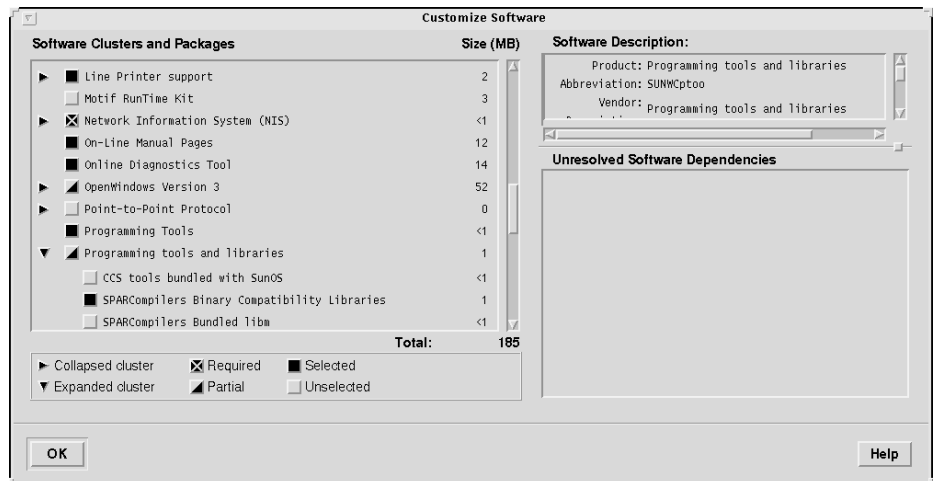
26. Scroll down, and then click to select the following packages:

- *X Windows** online user man pages
- *X Windows* optional fonts.

27. Scroll up, then click the triangular icon to collapse the *OpenWindows* Version 3 cluster.

28. Click the triangular icon to expand the Programming tools and libraries cluster.

The program responds:

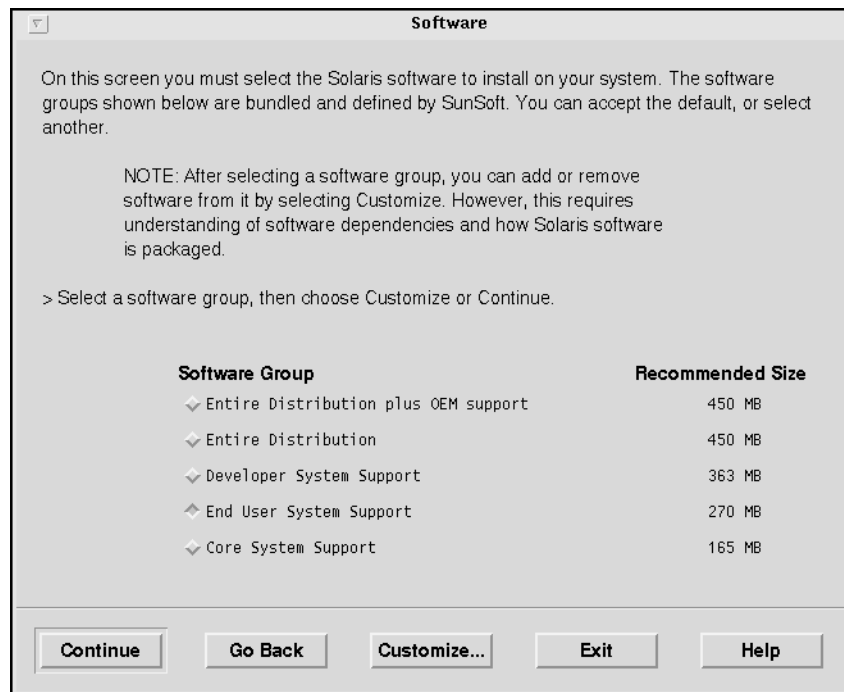


29. Click to select the CCS tools bundled with *SunOS* package.

30. Click the triangular icon to collapse the Programming tools and libraries cluster.

*X Windows is a trademark and product of the Massachusetts Institute of Technology.

31. Click OK. The program returns to the Software screen.



32. Click Continue.

The *Solaris 2.4* software packages are now selected and will be installed after the disks are partitioned.

Partitioning the Hard Disks

The Disks screen displays:



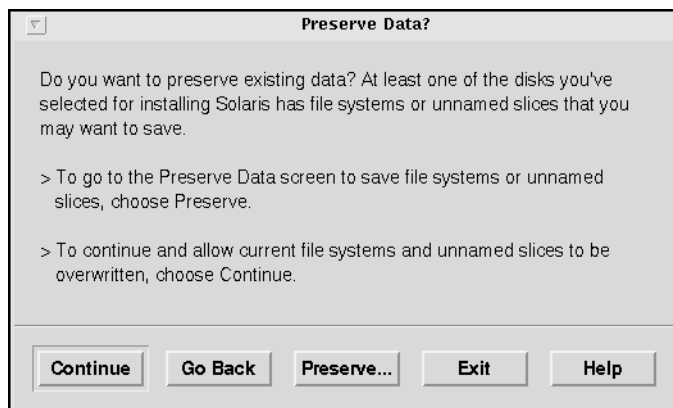
Note

In the above screen, all the disks equipped with the system should be listed as available. If not, you may have a connectivity problem.

In addition, the screen examples in this section show size values for 2.01-GB disks. The actual size values may differ according to your system's disk configuration.

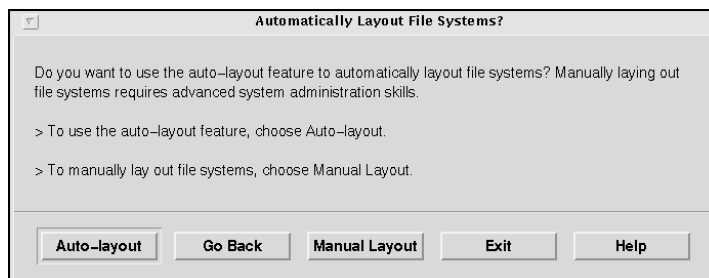
33. Click to highlight an available disk.
34. Click Add so the available disk becomes a selected disk.
35. Repeat Steps 33 and 34 until all available disks become selected disks.
36. Click Continue.

The Preserve Data screen displays:

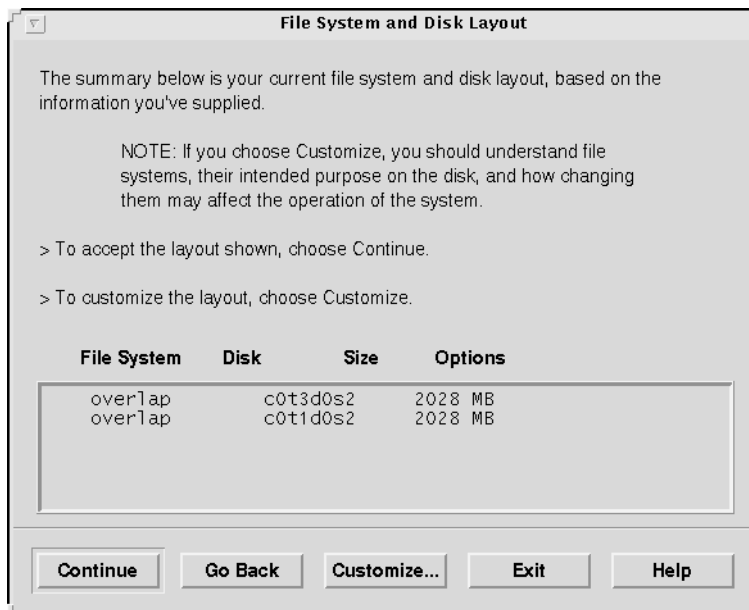


37. Click Continue.

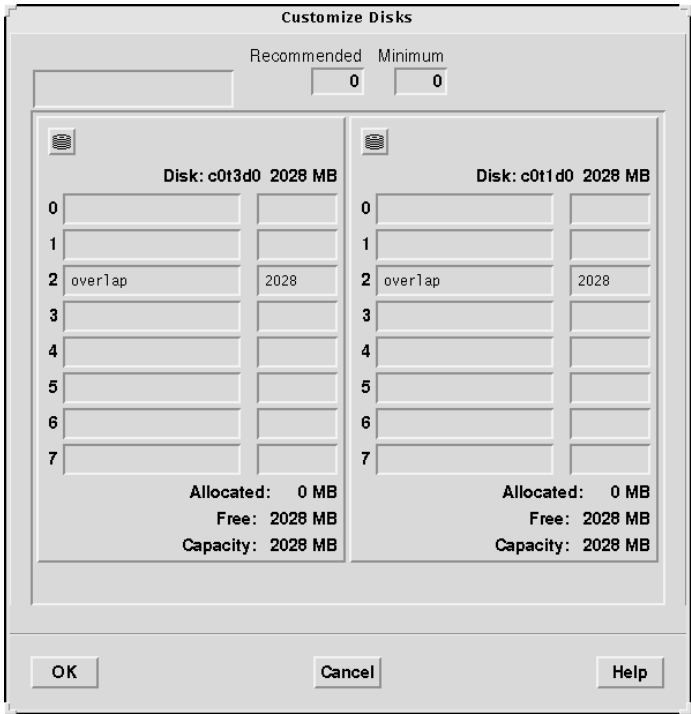
The Automatically Layout File Systems screen displays:



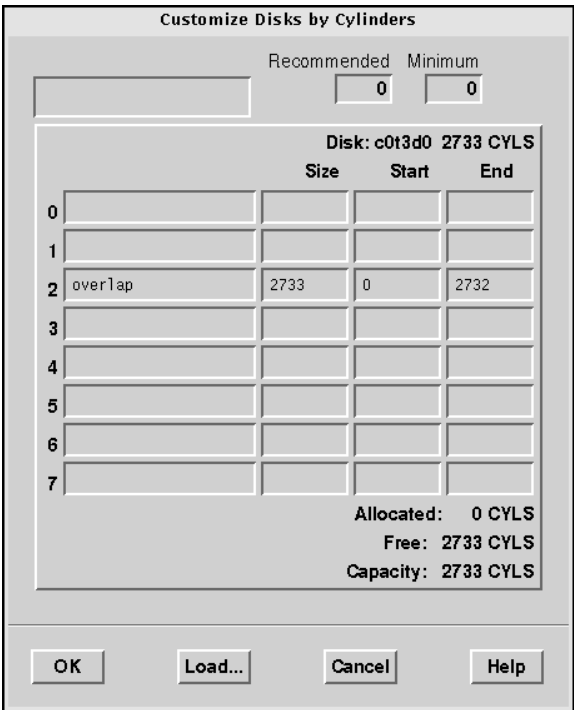
38. Click Manual Layout. The File System and Disk Layout screen displays:



39. Click Customize. The Customize Disks screen displays:



40. Click the cylinders icon in the upper left-hand corner of the disk 1 (c0t3d0) column. The Customize Disks by Cylinders screen displays:



41. Partition disk 1 (c0t3d0) by filling in the system name and size for each slice, using the names and numbers in Table 4-13.

Note

The size of the overlap file system always defaults to the size of the entire disk. Do not change this value.

Table 4-13: Internal Disk 1 (c0t3d0) Partitioning

Slice	File System Name	1.05G Disk Partition Size (cylinders)	2.1G Disk Partition Size (cylinders)
0	/	1630	1081
1	(unnamed)	150	100
2	overlap	2036	2733
3	(unnamed)	256	1552

The following example shows how the Customize Disks by Cylinders screen looks for a system with a 2.1-GB disk 1:

Customize Disks by Cylinders

Recommended: 0 Minimum: 0

Disk: c0t3d0 2733 CYLS

	Size	Start	End
0 /	1081		1080
1	100	1081	1180
2 overlap	2733	0	2732
3	1552	1181	2732
4			
5			
6			
7			

Allocated: 2733 CYLS
Free: 0 CYLS
Capacity: 2733 CYLS

OK Load... Cancel Help

42. Click OK after setting up the partitions for disk 1. The program returns to the Customize Disks screen.

Recommended		Minimum	
1151	0	0	0

Disk: c0t3d0 2028 MB

0	/	802
1		74
2	overlap	2028
3		1151
4		
5		
6		
7		

Allocated: 2028 MB
Free: 0 MB
Capacity: 2028 MB

Disk: c0t1d0 2028 MB

0		
1		
2	overlap	2028
3		
4		
5		
6		
7		

Allocated: 0 MB
Free: 2028 MB
Capacity: 2028 MB

OK

Cancel

Help

43. Click the cylinders icon for the next disk to be partitioned, if there is one. The Customize Disks by Cylinders screen displays.

Recommended		Minimum	
	0	0	0

Disk: c0t1d0 2733 CYLS

	Size	Start	End
0			
1			
2	2733	0	2732
3			
4			
5			
6			
7			

Allocated: 0 CYLS
Free: 2733 CYLS
Capacity: 2733 CYLS

OK

Load...

Cancel

Help

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Partition the disk by filling in the system name and size for each slice. Use Table 4-14 to determine the name and size of each slice.

Note

The size of the overlap file system always defaults to the size of the entire disk. Do not change this value.

Table 4-14: Partitioning for Disks 2-12

Slice #	File System	1.05GB DiskSize (cylinders)	2.10GB Disk Size (cylinders)
0	(unnamed)	2	2
1	(unnamed)	2034	2731
2	overlap	2036	2733

Properly set up, for example, the Customize Disks by Cylinders screen for a 2.1-GB disk would look like this:

Customize Disks by Cylinders

Recommended Minimum

2733 0 0

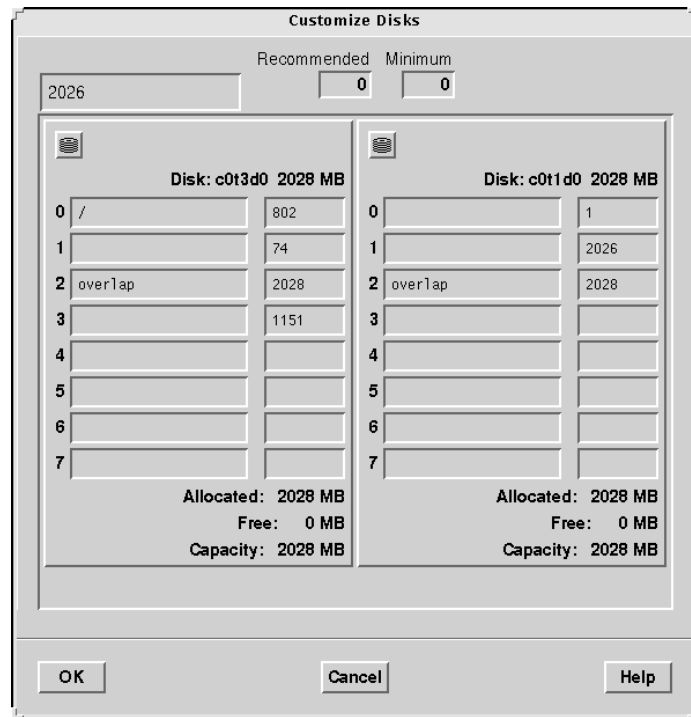
Disk: c0t1d0 2733 CYLS

	Size	Start	End
0	2		1
1	2731	2	2732
2	overlap	0	2732
3			
4			
5			
6			
7			

Allocated: 2733 CYLS
Free: 0 CYLS
Capacity: 2733 CYLS

OK Load... Cancel Help

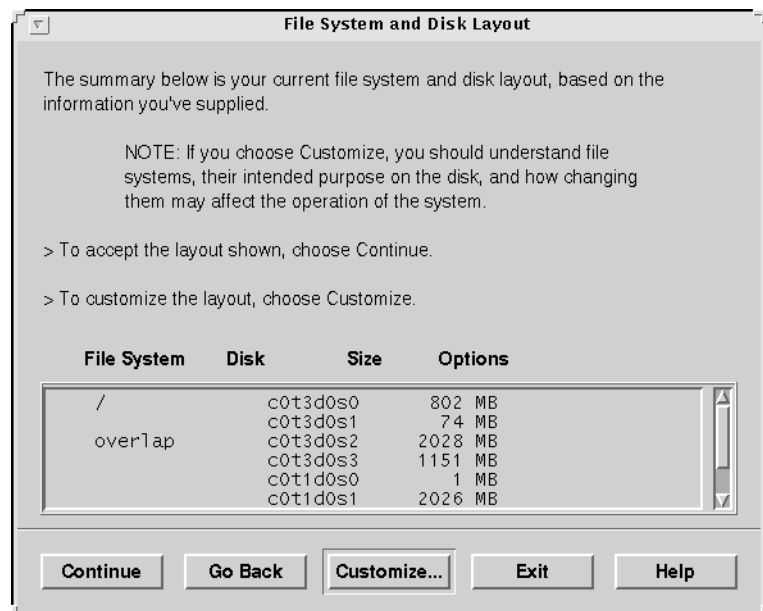
44. Click OK. The Customize Disks screen reappears:



If there is another disk attached to your system, repeat steps 43 and 44 for that disk. Continue on to step 45 only when you have partitioned every hard disk on your system.

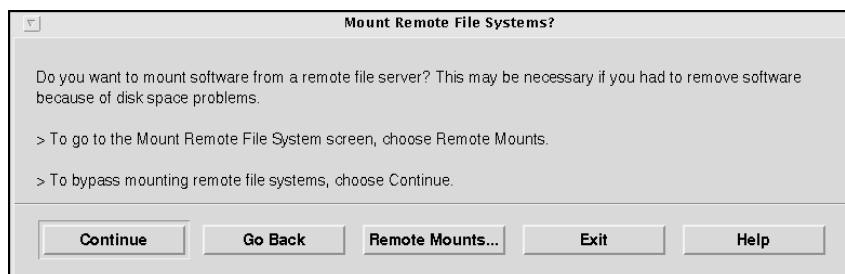
45. Click the OK button on the Customize Disks screen.

The File System and Disk Layout screen displays:



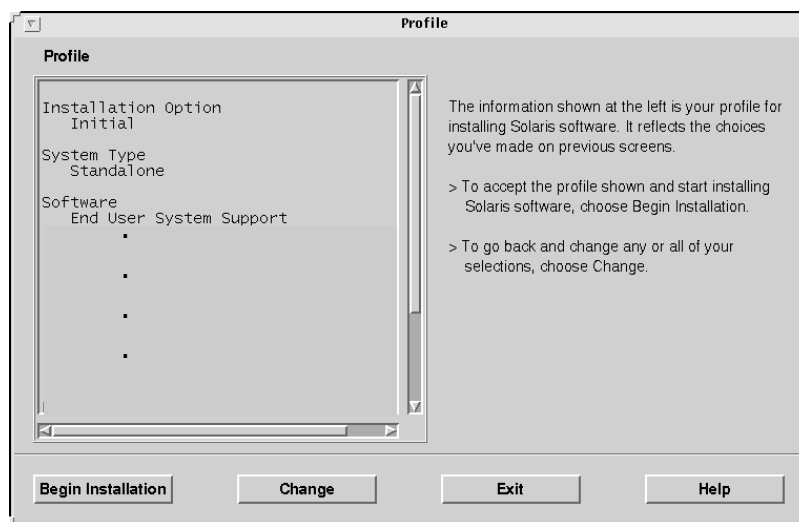
46. Click **Continue**.

The Mount Remote File Systems screen displays:



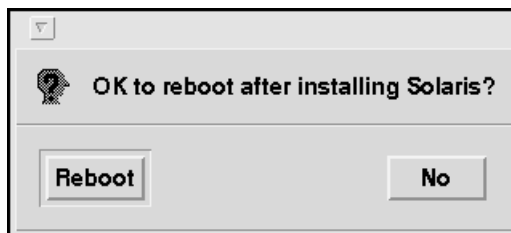
47. Click **Continue**.

The Profile screen displays:



48. Click **Begin Installation**.

The program responds:



49. Click **Reboot**.

The disk partitioning process begins with the display of the Installing *Solaris* - Progress screen:



The disk partitioning may take 40 minutes to 2 hours depending on the number of disks being partitioned. As the disks are partitioned and *Solaris* 2.4 system files are copied to the disk, the progress gauge is updated to indicate the progress of the installation.

When the installation completes, the machine reboots and displays:

On this screen you can create a root password.

A root password can contain any number of characters, but only the first eight characters in the password are significant. (For example, if you create 'a1b2c3d4e5f6' as your root password, you can use 'a1b2c3d4' to gain root access.)

You will be prompted to type the root password twice; for security, the password will not be displayed on the screen as you type it.

> If you do not want a root password, press RETURN twice.

Root password:

Press Return to continue.

50. Enter the *root* password. The program responds:

Please re-enter your root password?

Press Return to continue.

51. Reenter the *root* password. The program responds:

```
. . . . .
. . . . .
syslog services starting.
Print services started.
volume management starting.
The system is ready.

hostname console login:
```

52. Log in as *root*. The system prompt displays.

53. Edit the */etc/vfstab* file by entering:

```
# vi /etc/vfstab
```

You need to comment out the line in the file that sets up the swap space. Accordingly, you will insert a pound sign at the beginning of the line that begins with the word *swap*. In the following screen, for example, the line in boldface type has been commented out:

```
#device      device      mount   FS      fsck  mount  mount
#to mount    to fsck     point   type    pass  at boot options
#
#/dev/dsk/c1d0s2 /dev/dsk/c1d0s2 /usr     ufs      1      yes    -
/proc        -           /proc    proc     -      no     -
fd           -           /dev/fd  fd       -      no     -
#swap      -           /tmp     tmpfs    -      yes   -
.
.
.
```

Write and quit the file.

54. Remove the CD-ROM from the drive by entering:

```
# eject cdrom
#
```

55. Remove the CD-ROM from the disk tray, place the CD-ROM back in its case, and push the CD-ROM tray in until it closes.

The installation of *Solaris 2.4* and the disk partitioning is now complete.

Fix for the UniPack QIC 2.5-GB Tape Drive

When adding a 2.5-GB QIC tape drive to a *CentreVu* CMS system running *Solaris* 2.4, it is necessary to edit the `/kernel/drv/st.conf` file so the new tape drive is recognized.

Do these steps to add the fix for the QIC 2.5-GB tape drive:

1. Log in as root.
1. Edit the `/kernel/drv/st.conf` file by entering the following command:

```
# vi /kernel/drv/st.conf
```

The program responds:

```
<contents of the file is displayed>
.
.
.
```

2. Add the following four lines to the `/kernel/drv/st.conf` file:

```
tape-config-list=
"TANDBERG TDC 4200", "Tandberg 2.5 Gig QIC", "TAND-25G-FIXED";
TAND-25G-FIXED=1,0x37,512,0x867a,1,0x00,0;
TAND-25G-VAR=1,0x37,0,0x867b,1,0x00,0;
```

3. Write and quit the file.

Installing the *Solaris 2.4 AnswerBook* Software

Prerequisites: The *Solaris 2.4* operating system should be installed and you should be logged in as *root* at the console terminal.

Installing the *Solaris 2.4 AnswerBook* software on the *Sun SPARCserver* computer consists of installing only the drivers and programs necessary to start the *AnswerBook* programs. Therefore, when you use *AnswerBook*, you will need to have the appropriate CD-ROM ("*Solaris 2.4 System AnswerBook*") in the CD-ROM drive.

To install the *Solaris 2.4 AnswerBook* software, do the following steps:

1. Remove the *Solaris 2.4 AnswerBook* CD-ROM from its case. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 2.
 - a. Place the *Solaris 2.4 AnswerBook* CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.
 - c. Go to Step 5.
2. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
3. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.
4. Push the CD-ROM drive tray in (towards the system unit) until it closes.
5. Enter the following command to verify the name of the CD-ROM:

```
# mount
```

The program responds with a list of devices/filesystems currently mounted. The device that corresponds to the CD-ROM drive begins `"/cdrom...."` For example:

```
. . .  
. . .  
. . .  
/cdrom/solaris_2_4_ab on /vol/dev/dsk/c0t6/solaris_2_4_ab
```

6. Enter the following command to start the installation of *AnswerBook*:

```
# /usr/sbin/pkgadd -d /cdrom/solaris_2_4_ab
```

7. The program responds with a list of the packages available on the CD-ROM (similar to the one below).

```
The following packages are available:
1  SUNWadm      Solaris 2.4 System Administrator AnswerBook
                  (all) 47.2.19
2  SUNWaman     Solaris 2.4 Reference Manual AnswerBook
                  (all) 40.2.14

Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]:
```

8. Enter all. The program responds by displaying the *Sun* licensing information.

```
Processing package instance <SUNWadm> from
</cdrom/solaris_2_4_ab>

Solaris 2.4 System Administration AnswerBook

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. . .
. . .
. . .
```

When the licensing information finishes, the program displays the installation options:

```
. . .
. . .
. . .

Using </opt> as the package base installation directory.

The installation options are as follows:
Option:      Description:
1.nil:      less that 1 Megabyte disk space required (slowest
             performance)
2.heavy:     42.78 Megabytes disk space required (best
             performance)

Enter the number of an installation option from the list
above (1 or 2).

Select an installation option:
```

9. Enter 1 to select the nil option. The program responds:

Installation option: nil selected.

The next request for input asks you to specify the parent directory of AnswerBook.
Make sure to choose a parent directory on a file system big enough to accommodate all the files to be moved for the INSTALL OPTION you selected.

Specify the parent directory of the AnswerBook home directory:

10. Enter /opt.

The program responds:

```
## Processing package information.  
## Processing system information.  
## Verifying package dependencies.  
## Verifying disk space requirements.  
## Checking for conflicts with packages already installed.  
## Checking for setuid/setgid programs.
```

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

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

11. Enter y. The program responds by displaying the *Sun* licensing information.

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. . .
. . .
. . .

When the licensing information finishes, the program displays installation options:

```

. . .
. . .
. . .

```

The installation options are as follows:

Option:	Description:
1.nil:	less than 1 Megabyte disk space required (slowest performance)
2.heavy:	76.69 Megabytes disk space required (best performance)

Enter the number of an installation option from the list above (1 or 2).

12. Enter 1 to select the nil option. The program responds:

Installation option: nil selected.

The next request for input asks you to specify the parent directory of AnswerBook.
Make sure to choose a parent directory on a file system big enough to accommodate all the files to be moved for the INSTALL OPTION you selected.

Specify the parent directory of the AnswerBook home directory:

13. Enter /opt.

The program responds:

```

## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

```

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

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

14. Enter y. The program responds:

```
Installing Solaris 2.4 AnswerBook as <SUNWaman>

## Installation of part 1 of 1 is complete.
## Executing postinstall script

Installation of <SUNWaman> was successful.
```

The program continues:

```
The following packages are available:
1  SUNWadm      Solaris 2.4 System Administrator AnswerBook
                      (all) 47.2.19
2  SUNWaman     Solaris 2.4 Reference Manual AnswerBook
                      (all) 40.2.14

Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]:
```

15. Enter q. The program returns to the system prompt.
16. Enter the following command to remove the CD-ROM from the drive:

```
# eject cdrom
```

17. Remove the CD-ROM from the disk tray, place the CD-ROM back in its case, and push the CD-ROM tray in until it closes.

The installation of the *Solaris 2.4 System AnswerBook* software is now complete.

Additional References

For additional information, refer to the following documentation:

Solaris 2.4 System AnswerBook Installation Guide.

Installing the HSI/S (High-Speed Serial Interface/SBus) Software

Prerequisites: The *Solaris* 2.4 operating system should be installed, your system should have an HSI/S card installed, and you should be logged in as root at the console terminal.

Note

Install the HSI/S software only if an HSI/S card is installed. The HSI/S card must be installed before the HSI/S software is installed.

To install the HSI/S software, do the following steps:

1. Remove the “*SunLink* HSI/S 2.0” CD-ROM from its case. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 2.
 - a. Place the CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.
 - c. Go to Step 5.
2. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
3. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.
4. Push the CD-ROM drive tray in (towards the system unit) until it closes.
5. Enter the following command to verify the name of the CD-ROM:

```
# mount
```

6. The program responds with a list of devices/filesystems currently mounted. Locate the device that corresponds to the CD-ROM drive:

```
. . .  
. . .  
. . .  
/cdrom/unnamed_cdrom on /vol/dev/dsk
```

7. Enter the following command to start the installation of the HSI/S software:

```
# /usr/sbin/pkgadd -d /cdrom/unnamed_cdrom
```

8. The program responds with a list of the packages available on the CD-ROM (similar to the one below).

The following packages are available:

```
1  SUNWhsis      HSI/S Driver/Utilities 2.0 v1.6
                        (sparc) 2.0
```

Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]:

9. Enter all. The program responds by displaying the *Sun* licensing information.

```
Processing package instance <SUNWhsis> from
                                </cdrom/unnamed_cdrom>
```

```
HSI/S Driver/Utilities 2.0 v1.6
(sparc) 2.0
```

```
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```

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```

```
. . .
. . .
. . .
```

The licensing information finishes, and the program begins checking for software/machine dependencies.


```
. . .
. . .
. . .
```

The X Window System is a product of the Massachusetts Institute of Technology.

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Using </opt> as the package base directory.

```
## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
```

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

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

10. Enter y. The program continues:

```
Installing HSI/S Driver/Utilities 2.0 v1.6 as <SUNWhsis>
## Installing part 1 of 1.
/opt/SUNWconn/hsis/drv/HSI
/opt/SUNWconn/hsis/drv/HSI.SUN4d
/opt/SUNWconn/hsis/man/hsi.7
/opt/SUNWconn/hsis/man/hsi_init.1m
/opt/SUNWconn/hsis/man/hsi_loop.1m
/opt/SUNWconn/hsis/man/hsi_stat.1m
/opt/SUNWconn/hsis/SUNdiag/.usertest.hsis.diag
/opt/SUNWconn/hsis/SUNdiag/README.hsis.diag
/opt/SUNWconn/hsis/SUNdiag/SunLink.hsis.diag
/opt/SUNWconn/hsis/utilities/hsi_init
/opt/SUNWconn/hsis/utilities/hsi_loop
/opt/SUNWconn/hsis/utilities/hsi_stat
/opt/SUNWconn/hsis/utilities/hsi_trace
[ verifying class <none> ]
## Executing postinstall script.
```

```
Adding entries to /etc/devlink.tab
Checking if HSI hardware was installed
Installing driver into kernel; wait ... done
```

As the program continues, port initialization messages similar to the following appear on the screen:

```
hih0: reset
hih0: up and running baud ...
hih1: reset
hih1: up and running baud ...
hih2: reset
hih2: up and running baud ...
hih3: reset
hih3: up and running baud ...

NOTE: HSI driver will be loaded when it is referenced

Installation of <SUNWhsis> was successful.
```

The program continues:

```
The following packages are available:
  1 SUNWhsis      HSI/S Driver/Utilities 2.0 v1.6
                   (sparc) 2.0

Select package(s) you wish to process (or 'all' to
process all packages). (default: all) [?,??,q]:
```

11. Enter q. The program returns you to the system prompt.
12. Enter the following command to remove the CD-ROM from the drive:

```
# eject cdrom
```

13. If you have an internal CD-ROM drive, remove the CD-ROM from the disk tray, place the CD-ROM back in its case, and push the CD-ROM tray in until it closes.

If you have an external CD-ROM drive, remove the CD-ROM caddy from the CD-ROM drive, remove the CD-ROM from the caddy, and place the CD-ROM back in its case.

The installation of the HSI/S software is now complete.

Additional References For additional information, refer to the following documentation:

SunLink HSI/S 2.0 Installation and Administration Guide,
Chapter 3: "Installing the *SunLink* HSI/S 2.0 Software"
Chapter 4: "HSI/S Utilities and *SunDiag* Operation."

Installing the Network Terminal Server (NTS) Driver

Prerequisites: The *Solaris* 2.4 operating system should be installed, and you should be logged in as root at the console terminal. Install this software only if your system is using an NTS.

To install the NTS software, do the following steps:

1. Remove the "1.0 *Sun* Network Terminal Server" CD-ROM from its case. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 2.
 - a. Place the CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.
 - c. Go to Step 5.
2. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
3. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.
4. Push the CD-ROM drive tray in (towards the system unit) until it closes.
5. Enter the following command to verify the name of the CD-ROM:

```
# mount
```

6. The program responds with a list of devices and file systems currently mounted. Locate the device that corresponds to the CD-ROM drive:

```
. . .
. . .
. . .
/cdrom/unnamed_cdrom#1 on /vol/dev/dsk/.....
#
```

7. Enter the following command to start the installation of the software:

```
# /usr/sbin/pkgadd -d /cdrom/unnamed_cdrom#1/Solaris-2.x
```

8. The program responds with a list of the packages available on the CD-ROM (similar to the one below).

The following packages are available:

```
1  SUNWxyl      1.0 Sun Network Terminal Server
                        (sparc) 1.0
```

Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]:

9. Enter all. The program responds:

```
Processing package instance <SUNWxyl> from
                        </cdrom/unnamed_cdrom#1/Solaris-2.x>
```

```
1.0 Sun Network Terminal Server
(sparc) 1.0
```

```

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```

```

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```

```
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by Xylogics, Inc.
```

```
The selected base directory </opt/SUNWxyl> must exist
before installation is attempted.
```

```
Do you want this directory created now [y,n,?,q]
```

10. Enter y. The program continues:

```
Using </opt/SUNWxyl> as the package base directory.
```

```
-----
This package will install a minimum list of binarys for the
Solaris host.
```

```
-----
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
```

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

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

11. Enter y. The program responds:

```

Installing 1.0 SUN Network Terminal Server as <SUNWxyl>

## Executing preinstall script.
## Installing part 1 of 1.

i.comm: 1.0 Sun Network Terminal Server file install
started on [/opt/SUNWxyl]

infile
[/cdrom/unnamed_cdrom#1/Solaris-2.x/SUNWxyl/reloc/1.0/etc
/eservices] outfile [/opt/SUNWxyl/1.0/etc/eservices]
. . .
. . .
. . .
infile
[/cdrom/unnamed_cdrom#1/Solaris-2.x/SUNWxyl/reloc/1.0/etc
/init.d/ntserv] outfile [/opt/SUNWxyl/1.0/etc/init.d/ntserv]
1.0 Sun Network Terminal Software file install finished on
[/opt/SUNWxyl]

[ verifying class <comm> ]

i.comman: Manpages install started on [/opt/SUNWxyl]
. . .
. . .
. . .

```

The program continues:

```

. . .
infile [/cdrom/unnamed_cdrom#1/Solaris-2.x/SUNWxyl/reloc
/1.0/src/src/timserver/timserver.c] outfile
[/opt/SUNWxyl/1.0/src/src/timserver/timserver.c]
i.commsrc: Src kit install finished on [/opt/SUNWxyl]

[ verifying class <commsrc> ]
## Executing postinstall script.

Installation of <SUNWxyl> was successful.

```

Finally, the program redisplay the installation menu:

```

The following packages are available:
 1 SUNWxyl      1.0 Sun Network Terminal Server
                  (sparc) 1.0

Select package(s) you wish to process (or 'all' to
process all packages). (default: all) [?,??,q]:

```

12. Enter q. The program returns to the system prompt.

13. Enter the following command to remove the CD-ROM from the drive:

```
# eject cdrom
```

14. If you have an internal CD-ROM drive, remove the CD-ROM from the disk tray, place the CD-ROM back in its case, and push the CD-ROM tray in until it closes.

If you have an external CD-ROM drive, remove the CD-ROM caddy from the CD-ROM drive, remove the CD-ROM from the caddy, and place the CD-ROM back in its case.

The installation of the NTS software is now complete.

Additional References

For additional information, refer to the following documentation:

Network Terminal Server Guide, Quick Installation Guide for the Sun Network Terminal Server Leaflet (Software Installation Notes section).

Installing the SunLink X.25 Driver

Prerequisites: The *Solaris* 2.4 operating system should be installed, you should be logged in as root at the console terminal, and you need to know the hostname and hostid for the system.

Retrieve System Information

To properly install the X.25 license, you will need to know the *hostname* and *hostid* of the system. To determine that information, perform these steps:

1. Enter the following command:

```
# showrev
```

The program displays something similar to the following:

```
Hostname: XXXXXXXX
Hostid: XXXXXXXX
Release: 5.4
Kernel architecture: sun4m
Application architecture: sparc
Hardware provider: Sun_Microsystems
Domain:
Kernel version: SunOS 5.4 Generic <Date>
```

2. Identify the hostname and hostid (similar to that shown in bold on the previous screen). Use Table D-15 to record this information.

Table D-15: System Information for X.25 License

Description	Information
System hostname	
System hostid	

Install the *SunLink* X.25 Software

To install the *SunLink* X.25 software, do the following steps:

1. Remove the “*SunLink* X.25 8.02” CD-ROM from its case. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 2.
 - a. Place the CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.
 - c. Go to Step 5.
2. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
3. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.
4. Push the CD-ROM drive tray in (towards the system unit) until it closes.
5. Enter the following command to verify the name of the CD-ROM:

```
# mount
```

6. The program responds with a list of devices and filesystems currently mounted. Locate the device that corresponds to the CD-ROM drive:

```
. . .  
. . .  
. . .  
/cdrom/x25_8_0_2 on /vol/dev/dsk.....  
#
```

7. Enter the following command to start the installation of the X.25 software:

```
# /usr/sbin/pkgadd -d /cdrom/x25_8_0_2/sparc
```

8. The program responds with a list of the packages available on the CD-ROM (similar to the one below).

The following packages are available:

1	SUNWabx25	SunLink X.25 8.0.2 AnswerBook (all) 20.1.6
2	SUNWlicsw	FlexLM License System (sparc) 2.0
3	SUNWlit	STE License Installation Tool (sparc) 2.0
4	SUNWllc2a	LLC2 kernel modules and include files for Solaris/SPARC (sparc) 1.20
5	SUNW11c2b	LLC2 user programs and man pages for Solaris/SPARC (sparc) 1.20
6	SUNWx25a	X.25 kernel modules and include files for Solaris/SPARC (sparc) 1.20
7	SUNWx25b	X.25 user programs and libraries for Solaris/SPARC (sparc) 1.20

Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]:

9. Enter all. The program responds:

Processing package instance <SUNWabx25> from
</cdrom/x25_8_0_2/sparc>

SunLink X.25 8.0.2 AnswerBook
(all) 20.1.6

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any form by any means without prior written authorization
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. . .
. . .
. . .

The licensing information finishes, and the program continues by
displaying installation options:

```
. . .  
. . .  
. . .
```

Using </opt> as the package base installation directory.

The installation options are as follows:

Option:	Description:
1.nil:	less than 1 Megabyte disk space required (slowest performance)
2.heavy:	8.41 Megabytes disk space required (best performance)

Enter the number of an installation option from the list above (1 or 2).

Select an installation option:

10. Enter 2 to select the heavy option. The program responds:

Installation option: heavy selected.

The next request for input asks you to specify the parent directory of AnswerBook.

Make sure to choose a parent directory on a file system big enough to accommodate all the files to be moved for the INSTALL OPTION you selected.

Specify the parent directory of the AnswerBook home directory:

11. Enter /opt. The program responds:

For the heavy option all files will be placed under
/opt/SUNWax25x.

```
## Processing package information.  
## Processing system information.  
## Verifying package dependencies.  
## Verifying disk space requirements.  
## Checking for conflicts with packages already installed.  
## Checking for setuid/setgid programs.
```

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

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

12. Enter y. The program responds:

```
Installing SunLink X.25 AnswerBook as <SUNWax25x>

## Installing part 1 of 1.
/opt/SUNWabx25/index
/opt/SUNWabx25/index/Keys
. . .
. . .
. . .
```

13. The program lists the files being downloaded, prints an Installation of <SUNWxxxx> was successful message, and continues with the licensing agreement for the next package to be installed:

```
. . .
. . .
. . .
. . .

## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

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

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

14. Enter y. The program responds:

```
Installing FlexLM License System as <SUNWlicsw>

## Installing part 1 of 1.
/etc/opt/licenses/....
/etc/opt/licenses/....
. . .
. . .
. . .
```

15. The program lists the files being downloaded, prints an Installation of <SUNWxxxx> was successful message, and continues with the licensing agreement for the next package :

```
. . .
. . .
. . .
. . .

## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

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

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

16. Enter y. The program responds:

```
Installing STE License Installation Tool as <SUNWlit>

. . .
. . .
## Installing part 1 of 1.
/opt/SUNWste/....
/opt/SUNWste/....

. . .
. . .
. . .
```

17. The program lists the files being downloaded, prints an Installation of <SUNWxxxx> was successful message, and continues with the licensing agreement for the next package:

```
. . .
. . .
. . .

## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

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

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

18. Enter y. The program responds:

```
Installing LLC2 kernel modules and include files for
Solaris/SPARC as <SUNWllc2a>
```

```
## Installing part 1 of 1.
/usr/include/netdlc....
/usr/include/netdlc....
. . .
. . .
. . .
```

19. The program lists the files being downloaded, prints an Installation of <SUNWxxxx> was successful message, and continues with the licensing agreement for the next package:

```
. . .
. . .
. . .
```

```
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
```

```
The following files are already installed on the system and
are being used by another package:
```

```
    /opt/SUNWconn/man/man7 <attribute change only>
```

```
Do you want to install the conflicting files [y,n,?,q]
```

20. Enter y. The program responds:

```
## Checking for setuid/setgid programs.
```

```
Installing LLC2 user programs and man pages for
Solaris/SPARC as <SUNWllc2b>
```

```
## Installing part 1 of 1.
/opt/SUNWconn/llc2/....
/opt/SUNWconn/llc2/....
. . .
. . .
. . .
```

21. The program lists the files being downloaded, prints an Installation of <SUNWxxxx> was successful message, and continues with the licensing agreement for the next package:

```
. . .
. . .
. . .

## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

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

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

22. Enter y. The program responds:

```
Installing X.25 kernel modules and include files for
Solaris/SPARC as <SUNWx25a>

## Installing part 1 of 1.
/etc/SUNWconn/x25/....
/etc/SUNWconn/x25/....

. . .
. . .
. . .
```

23. The program lists the files being downloaded, prints an Installation of <SUNWxxxx> was successful message, and continues with the licensing agreement for the next package:

```
. . .
. . .
. . .

## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

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

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

24. Enter y. The program responds:

```
Installing X.25 user programs and libraries for
Solaris/SPARC as <SUNWx25b>
```

```
/opt/SUNWconn/bin/....
```

```
/opt/SUNWconn/bin/....
```

```
. . .
. . .
. . .
```

25. The program lists the files being downloaded and prints an Installation of <SUNWxxxx> was successful message similar to the following:

```
. . .
. . .
. . .
```

```
## Executing postinstall script.
```

```
Make sure to run the license insertion tool or the license
configuration script on this machine.
```

```
Installation of <SUNWx25b> was successful.
```

The program continues:

```
The following packages are available:
```

1	SUNWabx25	SunLink X.25 8.0.2 AnswerBook (all) 20.1.6
2	SUNWlicsw	FlexLM License System (sparc) 2.0
3	SUNWlit	STE License Installation Tool (sparc) 2.0
4	SUNWllc2a	LLC2 kernel modules and include files for Solaris/SPARC (sparc) 1.20
5	SUNW11c2b	LLC2 user programs and man pages for Solaris/SPARC (sparc) 1.20 for
6	SUNWx25a	X.25 kernel modules and include files for Solaris/SPARC (sparc) 1.20
7	SUNWx25b	X.25 user programs and libraries for Solaris/SPARC (sparc) 1.20

```
Select package(s) you wish to process (or 'all' to
process all packages). (default: all) [?,??,q]:
```

26. Enter q. The programs returns to the system prompt.
27. Enter the following command to remove the CD-ROM from the drive:

```
# eject cdrom
```

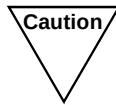
28. If you have an internal CD-ROM drive, remove the CD-ROM from the disk tray, place the CD-ROM back in its case, and push the CD-ROM tray in until it closes.

If you have an external CD-ROM drive, remove the CD-ROM caddy from the CD-ROM drive, remove the CD-ROM from the caddy, and place the CD-ROM back in its case.

The installation of the *SunLink* X.25 software is complete; you must now install the X.25 license.

Install the *SunLink* X.25 License

Prerequisites: The *Solaris* 2.4 operating system should be installed, you should be logged in as root at the console terminal, and you must have the `hostname` and `hostid` (recorded during the booting of the system).



Do **not** change the host name of your computer after installing the *SunLink* X.25 license. Changing the system's host name disables the X.25 software license.

To install the *SunLink* X.25 license, do the following steps:

1. Enter the following command to start the license package:

```
# /etc/opt/licenses/lit_tty
```

The program responds by displaying the following screen:


```
SunLink X.25 8.0.2 for Solaris 2 SPARC
8.0.2
```

```
Servers: [ ]1 [ ]3 [ ]5 **x=select. Tab=next count.
Return=server name**
```

```
SERVER NAME                                HOSTID
1:
```

```
Phone Number List [ ]   USA (+1) 800-USA-4786
Demo Exp Date:           Data Checksum: 65
Rights to Use:           Password Checksum: 77
Password:
```

```
Done Setting Up This License [ ]   Cancel This License[ ]
Exit - Save Licenses [ ]         Exit - Don't Save Licenses [ ]
```

```
** x=select/deselect item. Return=next field **
```

2. Type an x within the brackets for the Servers: [] 1 field. This represents the number of servers that this license supports. Press **Return**.
3. Enter the SERVER NAME (hostname) of the server (see Table D-15 on page D-107), and press **Return**.
4. Enter the HOSTID of the server (see Table D-15 on page D-107), and press **Return**.

Note

The hostname and hostid should have been recorded earlier when the showrev command was executed (see Table D-15 on page D-107).

5. Position the cursor (by using the **Enter** key) on the Rights to Use: field, and type a 1. Press **Return**.
6. Position the cursor on the Password: field, and enter the password from your license information. Press **Return**.
7. Type an x within the brackets for the [] Done Setting Up This License field. The program responds with a pop-up screen similar to the following:

```
License information successfully entered for
SunLink X.25 8.0.2 for Solaris 2 8.0.2
Type Any Key to Continue...
```

8. Press **Return**. The cursor should be on the [] Exit - Save Licenses field. Type an x in that field.

The program responds:

```
Licenses are being installed.  
Please wait...
```

When the license installation completes, the program displays:

```
License Successfully Installed for:  
SunLink X.25 8.0.2 for Solaris 2 8.0.2  
Now Execute the Script /etc/opt/licenses/lit_tty script  
on the product server.
```

Disregard the Now Execute the Script statement on the previous screen. This has already been done.

The licensing of the *SunLink* X.25 software is now complete.

Install the *SunLink* X.25 Software Patch

To complete the installation of the *SunLink* X.25 software, you need to install a software patch. The patch installation requires only that you enter the following two commands:

```
# installf SUNWx25a /etc/ttysrch  
# installf -f SUNWx25a
```

The X.25 installation is now complete; you may proceed with installing the *INFORMIX* software.

Installing the *INFORMIX* Software

Prerequisites: The *Solaris* 2.4 operating system should be installed, you should be logged in as *root* at the console terminal, and you must have the *INFORMIX* Serial Number and Serial Number Key (located on the back of the *INFORMIX* CD-ROM).

Installing the *INFORMIX* software consists of the following tasks:

- Set the environment.
- Install the *INFORMIX*-SQL 4.13 package (optional).
- Install the *INFORMIX* SE (Standard Engine) 5.04 package.

Note

You may have received an *INFORMIX*-ESQL software package. This package is not used and does not need to be installed.

Set Up the *INFORMIX* Environment

Do these steps to set up the environment:

1. Enter the following commands:

```
# TERM=sun-cmd
# export TERM
```

2. Add a new group (for example, *informix*) to the system by entering the following command:

```
# groupadd -g 100 informix
#
```

3. Add a new user (***informix***) to the system by entering the following command:

```
# useradd -g informix -m -d /opt/informix informix
```

4. Set the environment variables by entering:

```
# INFORMIXDIR=/opt/informix
# export INFORMIXDIR
# PATH=$PATH:$INFORMIXDIR/bin
# export PATH
```

5. Change to the *informix* directory by entering:

```
# cd $INFORMIXDIR
```

6. Make sure you are in the */opt/informix* directory by entering:

```
# pwd
# /opt/informix
```

The *INFORMIX* installation environment is now set.

Additional References

For additional information, refer to the following documentation:

INFORMIX UNIX^{*} Products Installation Guide Version 4.13

INFORMIX UNIX Products Installation Guide Version 5.04.

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Installing the *INFORMIX-SQL* Package (Optional)

If the *INFORMIX-SQL* package was purchased, you install it after you have set the environment. The *INFORMIX-SQL* software package is on its own CD-ROM.

Note

This software package is optional and is needed only if you are using custom reports. If you do not need this package, skip this section and install the *INFORMIX-SE* software package.

To install the *INFORMIX-SQL* software, do the following:

1. Remove the *INFORMIX-SQL* CD-ROM from its case, and write down the *INFORMIX -SQL* Serial Number and the Serial Number Key exactly as they appear on the CD-ROM. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 2.
 - a. Place the *INFORMIX-SQL* CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.
 - c. Go to Step 5.
2. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
3. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.

4. Push the CD-ROM drive tray in (towards the system unit) until it closes.
5. Enter the following command to copy the *INFORMIX-SQL* files from the CD-ROM to the current directory:

```
# tar xvf /cdrom/unnamed_cdrom*/inf-sql.tar
```

The program responds:

```
x installsql, XXX bytes, XX tape blocks
x bin/isql, XXX bytes, XX tape blocks
. . . . .
. . . . .
. . . . .
x demo/sql2/stock.unl, XXX bytes, XX tape blocks
#
```

6. Enter the following command to start the installation of the *INFORMIX-SQL* software package:

```
# ./installsql
```

The program responds with the following screen:

```
INFORMIX-SQL Version 4.13.UD1
Copyright (C) 1984-1994 Informix Software, Inc.

Installation Script

This installation procedure must be run by root (super-user).
It will change the owner, group, and mode of all files of
this package in this directory. There must be a user
"informix" and a group "informix" known to the system.

Press RETURN to continue,
or the interrupt key (usually CTRL-C or DEL) to abort.
```

7. Press **Return** to continue with the installation procedure.
After a few minutes, your terminal displays the following message:

```
Enter your serial number (e.g., INF#R999999) >
```

8. Enter the 11-character serial number that you wrote down in Step 1.
The program responds:

```
Enter your serial number KEY (uppercase letters only) >
```

9. Enter the 6-character serial number key that you wrote down in Step 1. The program responds:

```
WARNING: This INFORMIX SOFTWARE, INC. SOFTWARE is licensed
for use by XX SIMULTANEOUS USER(S) on this computer system.
In the event you exceed XX simultaneous user(s), the End
User License Agreement, and the licenses granted to you
thereunder are subject to immediate termination by Informix.
```

```
Press RETURN to continue,
or the interrupt key (usually CTRL-C or DEL) to abort.
```

10. Press **Return** to continue with the installation procedure. The program responds:

```
Installing directory ...
. . . . .
. . . . .
. . . . .
Installation complete.
```

11. Eject the CD-ROM by entering the following command:

```
# eject cdrom
```

12. If you have an internal CD-ROM drive, remove the CD-ROM from the disk tray, place the CD-ROM back in its case, and push the CD-ROM tray in until it closes.

If you have an external CD-ROM drive, remove the CD-ROM caddy from the CD-ROM drive, remove the CD-ROM from the caddy, and place the CD-ROM back in its case.

The *INFOMIX-SQL* software is now installed.

Additional References For additional information, refer to the following documentation:

INFORMIX UNIX Products Installation Guide Version 4.13.

Installing the *INFORMIX-SE* Package

After you have installed the *INFORMIX-SQL* package (optional), you install the *INFORMIX-SE* package. The *INFORMIX-SE* software is on its own *INFORMIX* CD-ROM.

To install the *INFORMIX-SE* software, do the following:

1. Remove the *INFORMIX-SE* CD-ROM from its case, and write down the *INFORMIX-SE* Serial Number and the Serial Number Key exactly as they appear on the CD-ROM. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 2.
 - a. Place the *INFORMIX-SE* CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.
 - c. Go to Step 5.
2. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
3. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.
4. Push the CD-ROM drive tray in (towards the system unit) until it closes.
5. Enter the following command to copy the *INFORMIX-SE* files from the CD-ROM to the current directory:

```
# tar xvf /cdrom/unnamed_cdrom*/inf-se.tar
```

The program responds:

```
x installse, XXX bytes, XX tape blocks
x bin/bcheck, XXX bytes, XX tape blocks
. . . . .
. . . . .
. . . . .
x demo/dbaccess/upd_table.sql, XXX bytes, XX tape blocks
#
```

6. Enter the following command to start the installation of the *INFORMIX-SE* software package:

```
# ./installse
```

The program responds with the following screen:

```
INFORMIX-SE Version 5.04.UD2
Copyright (C) 1984-1994 Informix Software, Inc.

Installation Script

This installation procedure must be run by root (super-user).
It will change the owner, group, and mode of all files of this
package in this directory. There must be a user "informix" and
a group "informix" known to the system.

Press RETURN to continue,
or the interrupt key (usually CTRL-C or DEL) to abort.
```

7. Press **Return** to continue with the installation procedure. After a few minutes, your terminal displays the following message:

```
Enter your serial number (for example, INF#R999999) >
```

8. Enter the 11-character serial number that you wrote down in Step 1. The program responds:

```
Enter your serial number KEY (uppercase letters only) >
```

9. Enter the 6-character serial number key that you wrote down in Step 1. The program responds:

```
WARNING: This Software, and its authorized use and number
of users, are subject to the applicable license agreement
with INFORMIX Software, Inc. If the number of users
exceeds the licensed number, the excess users may be
prevented from using the software. UNAUTHORIZED USE OR
COPYING MAY SUBJECT YOU AND YOUR COMPANY TO SEVERE CIVIL
AND CRIMINAL LIABILITIES.
```

10. Press **Return** to continue with the installation procedure.

The program responds:

```
Installing directory ...
. . . . .
. . . . .
. . . . .

Installation of INFORMIX-SE complete.
#
```

11. Eject the CD-ROM by entering the following command:

```
# eject cdrom
```

12. If you have an internal CD-ROM drive, remove the CD-ROM from the disk tray, place the CD-ROM back in its case, and push the CD-ROM tray in until it closes.

If you have an external CD-ROM drive, remove the CD-ROM caddy from the CD-ROM drive, remove the CD-ROM from the caddy, and place the CD-ROM back in its case.

The *INFORMIX-SE* software is now installed.

Additional References

For additional information, refer to the following documentation:

INFORMIX UNIX Products Installation Guide Version 5.04.

Installing the *Solstice* *DiskSuite* Software

The *Solstice DiskSuite* software package allows the disks of a *Sun SPARCserver* system to be managed as if they were a single file system. *Solstice DiskSuite* software is included in all new R3V5 installations.

Prerequisites: The *Solaris* 2.4 operating system should be installed, and you should be logged in as *root* at the console terminal. You will need both the *Solstice DiskSuite* CD and the CMS CD. In addition, you must have partitioned the internal and external hard disks for the *Solstice DiskSuite* system, as specified in the partitioning tables earlier in this appendix (see *Partitioning the Hard Disks* on page D-94).

Follow these steps to install the *Solstice DiskSuite* software:

1. Insert the "*Solstice DiskSuite* 4.0" CD into the CD-ROM drive.
2. Verify the CD-ROM name by entering the mount command. The system responds with a list of the currently mounted disk drives and file systems::

```
# mount
.
.
/cdrom/disksuite_4_0 on /vol/dsk/c0t6d0/disksuite_4_0 read
only on Mon Jul 8 12:36:55 1996
```

3. Begin the installation by entering:

```
# pkgadd -d /cdrom/disksuite_4_0
```

The system responds by displaying a list of the packages available on the CD-ROM:

```
The following packages are available:
 1 SUNWabmd DiskSuite 4.0 AnswerBook
   (all)68.1.5
 2 SUNWmd Solstice DiskSuite
   (all)4.0,REV=1.0
 3 SUNWmdg Solstice DiskSuite Tool
   (all)4.0,REV=1.0

Select package(s) you wish to process (or 'all' to process
all packages).(default:all)[?,??,q]:
```

4. Enter 1 to install SUNWabmd. The program responds by requesting an installation option:

```
Processing package instance SUNWabmd from </cdrom/disksuite_4_0>
.
.
.
The installation options are as follows:
Option:  Description:
-----
1.nil:   less than 1 Megabyte disk space required (slowest)
2.heavy: 14.21 Megabytes disk space required [best performance]
Note: If the install option which you choose below fails
due to lack of space, try another location, or
choose a lower install option number.

Enter the number of an installation option from the list above
(1 or 2).

Select an installation option:
```

5. Enter 1 to choose the nil option. The program responds:

```
Installation option: nil selected

The next request for input asks you to specify the parent
directory of AnswerBook. Make sure to choose a parent directory
on a file system big enough to accommodate all the files to be
moved for the INSTALL OPTION you selected.

Specify the parent directory of the AnswerBook home directory:
```

6. Enter /opt as the name of the directory. The program responds:

```
Processing package information.
Processing system information.
.
.
.
This package contains scripts which will be executed with
super-user permission during the process of installing
this package.

Do you want to continue with the installation of
<SUNWabmd> [y,n,?]
```

7. Enter y. The program installs the software and then again lists the software packages available on the CD-ROM:

```
The following packages are available:
 1 SUNWabmd DiskSuite 4.0 AnswerBook
   (all)68.1.5
 2 SUNWmd Solstice DiskSuite
   (all)4.0,REV=1.0
 3 SUNWmdg Solstice DiskSuite Tool
   (all)4.0,REV=1.0

Select package(s) you wish to process (or 'all' to
process all packages).(default:all)[?,??,q]:
```

8. Enter "2" to install SUNWmd. The program responds:

```
Processing package information.
Processing system information.
.
.
.
This package contains scripts which will be executed with
super-user permission during the process of installing
this package.

Do you want to continue with the installation of
<SUNWabmd> [y,n,?]
```

9. Answer y.

The program installs the *Solstice DiskSuite* software, displaying a series of messages as it does so. When the install menu reappears, the installation is complete:

```
The following packages are available:
 1 SUNWabmd DiskSuite 4.0 AnswerBook
   (all)68.1.5
 2 SUNWmd Solstice DiskSuite
   (all)4.0,REV=1.0
 3 SUNWmdg Solstice DiskSuite Tool
   (all)4.0,REV=1.0

Select package(s) you wish to process (or 'all' to
process all packages).(default:all)[?,??,q]:
```

10. Enter q.

The program replies with a reboot notification, and then the system prompt reappears:

```
*** IMPORTANT NOTICE ***
This machine must now be rebooted in order to ensure sane
operation. Execute
      shutdown -y -i6 -g0
and wait for the "Console Login:" prompt.
#
```

11. Unload the CD-ROM by entering the following command:

```
# eject cdrom
```

Remove the CD from the drive. Shut the drive and return the CD to its case.

12. Reboot the system by entering the shutdown command:

```
# shutdown -y -i6 -g0
```

The system begins to reboot.

Note: Ignore any warning messages during the boot about forceload of ... failed.

13. When the reboot completes, log in as *root*.

14. Set the environment to the Korn Shell by entering these commands:

```
# stty erase <Ctrl-H>
# ksh -o vi
#
```

(where *<ctrl-H>* indicates you should press and hold the Control key as you press the H key)

The stty command sets up your backspace key as an actual backspace. If you do not enter this command, you will have to use the Delete key as a backspace.

15. Insert the CMS CD into the CD-ROM drive.

16. Prepare to run the *Solstice DiskSuite* setup scripts by entering the following commands:

```
# mkdir /olds
# cp /cdrom/cdrom0/cms/reloc/ronly/olds_install/* /olds
# cd /olds
# chmod +x /olds/olds
```

17. Create system files for the *Solstice DiskSuite* software by entering these commands:

```
# export PATH=$PATH:/usr/opt/SUNWmd/sbin:/olds
# olds -check_disks
# olds -mk_files
.
.
.
#
```

18. When the system prompt reappears, you need to check to make sure that all the disk drives on your system have been recognized. To do that, read the file `/olds/md.tab.new` into an editor. Find the `#/cms` section; it should reflect the precise number of disk drives on your system. The example below, for instance, shows three disk drives on the system:

```
# vi /olds/md.tab.new

<contents of the file is displayed>

.
.
.
#/cms
d19 3 1 /dev/dsk/c0t1d0s1 1 /dev/dsk/c0t3d0s3 1 /dev/dsk/c0t2d0s1
```

If there is a discrepancy, complete the following steps; otherwise, go to step 19.

- a. Reboot the system with an `init 0` command. The system reboots and displays the ok prompt:

```
# init 0

.
.
.
ok
```

- b. Do the following in sequential order:
1. Turn off the system unit.
 2. Turn off the system monitor.
 3. Turn off all external devices starting with the device closest to the system unit and working toward the farthest device.
- c. Check all disk drive connections to make certain they are secure. Also check the SCSI IDs on the disk drives to make sure no two drives on the same SCSI chain have the same IDs. (A normal external disk unit has a rotary switch on the rear of the unit that sets the SCSI ID.)
- d. Turn on the power to the system units in the opposite order in which you powered them off.

Power on the SCSI devices first, beginning with the device at the end of the chain and working your way toward the system

unit. Then power on other devices, again working your way toward the system unit. Then power on the system unit itself and, finally, the system monitor.

When you power on the system unit, the system begins to boot. Interrupt the boot by entering **Stop** **A**. The system responds:

```
ok
```

- e. To verify that the system sees all SCSI devices, including the new disk drive, enter the following command:

```
ok probe-scsi-all
```

The program responds:

```
/iommu@f,e0000000/sbus@f.e0001000/esp@3,200000
Target 1
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
Target 3
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
. . . . .
. . . . .
. . . . .
Target 6
  Unit 0 Disk Removable Read Only Device SONY CD-ROM CDU-8012

ok
```

- f. When you have verified that the system is recognizing all its disk drives, enter the following command:

```
ok boot -r
```

The system responds:

```
Boot device ...
.
.
.
Configuring the /dev directory
.
.
.
/dev/rdisk/c0t1d0s1 mounted
.
.

hostname console login:
```

g. Log in as *root*. The system prompt displays:

```
Sun Microsystems Inc. SunOS 5.2 Generic November 1995
#
```

h. Repeat steps 17 and 18.

19. Run the *Solstice DiskSuite* setup scripts by entering the commands depicted below. **Enter the commands in the order shown, and be sure to enter every command.** Otherwise, your system will not be set up to run the *Solstice DiskSuite* software.

```
# nohup olds -metadbs | tee
# nohup olds -setup | tee
```

If any of those commands should fail, make a note of the error message you received and see “Troubleshooting a *Solstice DiskSuite* Software Installation” in Chapter 8 of this document.

If all the commands succeed, the system responds to the final command with a series of lines reflecting the structure of your disk system. Those lines will look something like this (though the specific disk names will vary from system to system):


```

..
..
prtvto: /dev/rdisk/c0t6d0s0: Device busy
device: c0t6d0 will not be used
..
..
valid disks are c0t0d0 c0t1d0 c0t2d0 c0t3d0....
disk: c0t0d0 is partitioned ok
disk: c0t1d0 is partitioned okay
..
..
d19: Concat/Stripe is setup
..
..

```

The program begins to construct the new file system. When the "Success . . ." message displays and the system prompt reappears, the file system is complete and you are ready to continue with the installation. For example:

```

/dev/md/rdisk/d19: 23017680 sectors in 22835 cylinders of 14 tracks
72 sectors

11239.1MB in 1428 cyl groups (16 c/g, 7.88MB/g, 3776 i/g)

32,16240,32448,48656,64864,81072,97280,113488,129696,145904,
162112,178320,194528,210736,226944,243152,258080,274288,290496,
..
..
..
1436144,1452352,1468560,1484768,1500976,1517184,1533392,1548320
1564528,1580736,1596944,1613152,1629360,1645568,1661776,1677984
..
..
..
Success, activating or growing /cms metadvice
#

```

20. Create and mount /cms and verify the disk space by entering the following commands:

```

# mkdir /cms
# mount /cms
# df -k

```

The system responds by displaying a file system table:

Filesystem	kbytes	used	avail	capacity	Mounted on
/dev/dsk/c0t3d0s0	10772308	310956	383882	45%	/
/proc	0	0	0	0%	/proc
fd	0	0	0	0%	/dev/fd
/dev/md/dsk/d19	10811937	9	xxxxxx	0%	/cms

The /cms 'avail' figure (shown here as "xxxxxx") is the critical number. You use it to verify that the *Solstice DiskSuite* software is administering all the available disks. Use this table to make the necessary calculations:

Calculation	Result
(1a) Enter the /cms line's 'used' figure:	
(1b) Enter the /cms line's 'avail' figure:	
(1c) Add (1a) and (1b):	
(1d) Divide (1c) by 1000:	
(2a) If Disk1=1.05G, enter 109 If Disk1=2.1G, enter 998	
(2b) Enter (# of other 1G disks) * 866	
(2c) Enter (# of other 2G disks) * 1755	
(2d) Add (2a) through (2c):	

If (1d) and (2d) are *approximately* equal (they need not be exact), then all is well, and the *Solstice DiskSuite* software is installed.

If there appears to be a problem, there are two files you can check to verify the installation. The file names are `/etc/vfstab` and `/etc/opt/SUNWmd/md.tab`, and you check them simply by viewing them with your editor.

`/etc/vfstab` file should look something like this (for example):

```
/dev/md/dsk/d19/dev/md/rdisk/d19 /cms ufs 2 yes -
```

Old /cms entries (in the form /cms[0-12]) should be commented out.

Similarly, `/etc/opt/SUNWmd/md.tab` should account for all your disk drives. Find the `#state` database replicas and `#/cms` sections. Each should reflect the precise number of disk drives on your system. The example below, for instance, shows three disk drives on the system:

```
# state database replicas
.
.
.
#/cms
d19 3 1 /dev/dsk/c0t1d0s1 1 /dev/dsk/c0t3d0s3 1 /dev/dsk/c0t2d0s1
```

Any discrepancy in or between the two files means you will have to rerun the `olds` setup script (step 17).

Setting up the Swap File

1. Determine the amount of memory in your system by entering:

```
# prtconf | grep Mem
```

The system responds by listing the amount of RAM installed :

```
System Configuration: Sun Microsystems sun4m
Memory size: 96 Megabytes
#
```

The amount of RAM in your system determines how big the swap file needs to be.

2. Determine the size of your swap file by looking in this table:

Table D-16: Swap File Size

If megabytes of RAM is at least ...	... but not more than...	... your swap file must be this size:
0	32	61
33	64	122
65	96	183
97	128	244
129	160	305
161	192	366
193	224	427
225	256	488
257	320	610
321	384	732
385	448	931
449	512	977

3. Determine whether you have enough space to set up the swap file by entering the command:

```
# df -k /cms
```

The system responds by displaying a file system table for /cms:

```
Filesystem      kbytes    used   avail  capacity  Mounted on
/dev/md/dsk/d19 10811937     9    xxxxx      0%      /cms
```

Divide the “avail” number by 1000. The result of the division must be more than the swap file size from Table D-16. If it is not, you will have to either delete files from /cms until you have enough space to set up your swap file, or install additional disk drives.

4. Create the swap file by entering the command:

```
# mkfile <x>m /cms/swap
```

Replace <x> with the appropriate value from Table D-16.

5. Allocate space for the swap file by entering the command:

```
# swap -a /cms/swap
```

6. Edit the /etc/vfstab file:

```
# vi /etc/vfstab
```

Go to the end of the file and add the following line (using tabs, not spaces, to separate fields):

```
/cms/swap    -    -    swap    -    no    -
```

Save the file and exit the editor.

7. Reboot the system by entering the command:

```
# init 6
```

8. When the reboot completes, verify that the space has been allocated by entering:

```
# swap -l
```

If the message “No swap devices configured” displays, repeat steps 5 through 8.

Installing the *Sun Solaris* Patches

Prerequisites: The *Solaris* 2.4 operating system should be installed, you should be logged in as *root* at the console terminal, and you should have the *CentreVu* CMS CD-ROM.

To install the *Sun Solaris* patches, do the following:

1. Remove the *CentreVu* CMS CD-ROM from its case. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 2.
 - a. Place the *CentreVu* CMS CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.
 - c. Go to Step 5.
2. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
3. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.
4. Push the CD-ROM drive tray in (towards the system unit) until it closes.
5. Enter the following command to verify the name of the CD-ROM:

```
# mount
```

The program responds with a list of the devices and file systems currently mounted.

6. In the device list, locate the device that corresponds to the CD-ROM drive, and use that path in a `pkgadd` command for the installation of the *Solaris* patches. For example:

```
...  
...  
/cdrom/cms on /vol/dev/dsk/...  
# pkgadd -d /cdrom/cms
```

The program responds by displaying the installation menu:

```
The following packages are available:
 1 cms          Lucent CentreVu(TM) Call Management System
                (sparc) r3v5xx.x
 2 spatches     CMS Supplied Solaris Patches
                (sparc) 1.0

Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]:
```

7. Enter 4 to start the installation of *Solaris* patches. The program responds:

```
Processing package instance <spatches> from </cdrom/cms>

CMS Supplied Solaris Patches
(sparc) 1.0
```

After a short period of time, the program continues:

```
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

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

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

8. Enter y to continue. The program responds:

Installing CMS Supplied Solaris Patches as <spatches>

```
## Installing part 1 of 1.
Spooling XXXXXX-XX
Spooling XXXXXX-XX
Spooling XXXXXX-XX
. . .
. . .
. . .
Solaris patches have been spooled into /tmp/patches.
To install the Solaris patches, run the following command:
    /tmp/patches/install_patches

Installation of <spatches> was successful.

The following packages are available:
  1 cms          Lucent CentreVu(TM) Call Management System
                  (sparc) r3v5xx.x
  2 spatches     CMS Supplied Solaris Patches
                  (sparc) 1.0

Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]:
```

9. Enter q. The program returns to the system prompt.
10. Enter the following command to continue installing the patches:

```
# /tmp/patches/install_patches
```

The program responds:

```
@(#) installpatch X.X XX/XX/XX

Generating list of files to be patched
/var/sadm/patch/xxxxxxx-xx/...
/var/sadm/patch/xxxxxxx-xx/...
/var/sadm/patch/xxxxxxx-xx/...
101 blocks
Installing patch packages
. . .
. . .
```

The program generates various lists of files to be patched, and takes about 30-45 minutes to process. When it finishes, it displays the system prompt.

11. Reboot the system by entering the following commands:

```
# cd
# shutdown -y -i6 -g0
```

The program begins the reboot process, eventually prompting you to log in:

```
Shutdown started. <date and time>
<Broadcast Message>
. . .
. . .
Login:
```

12. Log in as *root*. When the system prompt reappears, eject the CD by entering the command:

```
# eject cdrom
```

13. If you have an internal CD-ROM drive, remove the CD-ROM from the disk tray, place the CD-ROM back in its case, and push the CD-ROM tray in until it closes.

If you have an external CD-ROM drive, remove the CD-ROM caddy from the CD-ROM drive, remove the CD-ROM from the caddy, and place the CD-ROM back in its case.

The *Sun Solaris* patches have been successfully installed and the system kernel has been rebuilt. Now you can install the *CentreVu* CMS software.

Installing the *CentreVu* CMS Software

Prerequisites: The *Solaris* 2.4 operating system should be installed, you should be logged in as *root* at the console terminal, and you should have the *CentreVu* CMS CD-ROM.

This section describes how to download the *CentreVu* CMS R3V5 software. To install the *CentreVu* CMS R3V5 software, download the *CentreVu* CMS R3V5 software from the CD-ROM to the hard disk.

Note

All the preceding factory hardware and software installation requirements in this appendix must be completed before you begin the *CentreVu* CMS download.

Do the following steps to download the *CentreVu* CMS software:

1. Remove the *CentreVu* CMS CD-ROM from its case. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 2.
 - a. Place the *CentreVu* CMS CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.
 - c. Go to Step 5.
2. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
3. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.
4. Push the CD-ROM drive tray in (towards the system unit) until it closes.
5. Enter the following command to determine which state the computer is in:

```
# who -r
```

You should see a message similar to the following:

```
.          run-level 3 <date and time> 3    0 S
```

6. If the computer is **not** in run-level 3, enter this command:

```
# shutdown -g0 -y -i6
```

7. Enter the following command to verify the name of the CD-ROM:

```
# mount
```

The program responds with a list of devices and file systems currently mounted.

8. Locate the device that corresponds to the CD-ROM drive and use the path listed to install the *CentreVu* CMS package. For example:

```
. . .  
. . .  
. . .  
/cdrom/cms on /vol/dev/dsk/.....  
# pkgadd -d /cdrom/cms
```

The program responds:

The following packages are available:

1 cms	Lucent CentreVu(TM) Call Management System (sparc) r3v5xx.x
2 spatches	CMS Supplied Solaris Patches (sparc) 1.0

Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]:

9. Select the cms option to start the installation of the *CentreVu* CMS software. The program responds:

```
Processing package instance <cms> from </cdrom/cmsr>  
  
CentreVu(TM) Call Management System  
(sparc) r3v5XX.X
```

The system takes a few minutes to search the CD and verify the software packages being installed.

The program continues:

```
Using </cms> as the package base directory

This is a new install

## Processing package information.
## Processing system information.
    xx package pathnames are already properly installed.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.

The following files are already installed on the system and
are being used by another package:
    /etc/init.d/sysetup

Do you want to install these conflicting files [y,n,?,q]
```

10. Enter y.

The program responds:

```
## Checking for setuid/setgid programs.

The following files are being installed with setuid and/or
setgid permissions or are overwriting files which are
currently setuid/setgid:
/cms/bin/mqpeek <setuid root>
/cms/bin/spi <setuid root>
/cms/toolsbin/cmsu <setuid root>
/cms/toolsbin/initSimConf <setuid root>
/cms/toolsbin/initSimConf <setuid root>
/cms/toolsbin/psx <setuid root>
/cms/toolsbin/psx <setuid root>
/cms/toolsbin/setSimLink <setuid root>
/cms/toolsbin/setSimLink <setuid root>
/cms/toolsbin/shmdump <setuid root>

Do you want to install these setuid/setgid files [y,n,?,q]
```

11. Enter y.

The program continues:

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

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

12. Enter y. The program starts the preinstall script:

```
Installing CentreVu(TM) Call Management System as <cms>
```

```
## Executing preinstall script.
Creating cms group id
Creating cms user id
Assigning a new password for cms.
New password:
```

13. Enter the password for the *cms* login. The program continues:

```
Re-enter new password
```

14. Reenter the password for *cms*. The program continues:

```
Creating cmssvc user id
Assigning a new password for cmssvc.
New password:
```

15. Enter the password for the *cmssvc* login. The program continues:

```
Re-enter new password
```

16. Reenter the password for *cmssvc*. The program continues:

```
Creating Pcms user id
Assigning a new password for Pcms.
New password:
```

17. Enter the password for *Pcms*. The program continues:

```
Re-enter new password
```

18. Reenter the password for *Pcms*.

The program continues:

```
## Installing part 1 of 1.

/usr/elog <symbolic link>
[ verifying class <data> ]
[ verifying class <op_fix> ]
/cms/bin/Archiver
/cms/bin/Ed
. . . . .
. . . . .
. . . . .
```

The program takes approximately 5-10 minutes to download the *CentreVu* CMS R3V5 software from CD-ROM to hard disk. A list of files is displayed as the software is downloaded.

When the download finishes, this message appears:

```
## Initializing Customer CMS data . . .
. . . . .
. . . . .
Customer CMS data successfully initialized.

Setting UNIX system tunable parameters for CMS.

Installation of <cms> was successful.

The following packages are available:
  1 cms          Lucent CentreVu(TM) Call Management System
                  (sparc) r3v5xx.x
  2 spatches     CMS Supplied Solaris Patches
                  (sparc) 1.0

Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]:
```

19. Enter q.

The program returns to the prompt.

```
#
```

20. Remove the *CentreVu* CMS CD-ROM by entering the following command:

```
# eject cdrom
```

21. If you have an internal CD-ROM drive, remove the CD-ROM from the disk tray, place the CD-ROM back in its case, and push the CD-ROM tray in until it closes.

If you have an external CD-ROM drive, remove the CD-ROM caddy from the CD-ROM drive, remove the CD-ROM from the caddy, and place the CD-ROM back in its case.

22. Execute the following command to start the shutdown:

```
# shutdown -y -i6 -g0
```

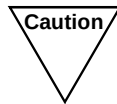
23. The program starts the shutdown process.

```
Shutdown started. <date and time>
<Broadcast Message>
. . . . .
. . . . .
. . . . .
```

Installing the Aurora SBus *Multiport* Software Driver

This section describes how to install the SBus *Multiport* software driver. This driver allows the *Sun SPARCserver* computer to communicate with the various peripherals you attach to the system. Install this software only if your system is using an SBus *Multiport* card.

Prerequisites: The *Solaris 2.4* operating system should be installed, you should be logged in as *root* at the console terminal, and you should have the Aurora Drivers CD-ROM.



If an HSI/S card is installed, the HSI/S software driver must be installed prior to installing the Aurora SBus *Multiport* software driver.

To install the SBus *Multiport* Software driver, download it from the CD-ROM to the hard disk.



All the preceding factory hardware and software installation requirements in this appendix must be completed before you begin the download.

Do the following steps to download the SBus *Multiport* Software driver:

1. Remove the Aurora Drivers CD-ROM from its case. If you have an external CD-ROM drive, follow the steps below. Otherwise, go to Step 2.
 - a. Place the *CentreVu* CMS CD-ROM in the CD-ROM caddy. When the CD-ROM is properly inserted in the caddy, the CD-ROM label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive slot.
 - c. Go to Step 5.
2. Open the CD-ROM drive tray by pressing the eject button on the CD-ROM drive unit.
3. Gently press the CD-ROM in place in the CD-ROM disk tray. When the CD-ROM is properly inserted in the disk tray, the CD-ROM label is visible.
4. Push the CD-ROM drive tray in (towards the system unit) until it closes.

5. Enter the following command to determine which state the computer is in:

```
# who -r
```

You should see a message similar to the following:

```
.      run-level 3 <date and time> 3    0 S
```

6. If the computer is **not** in run-level 3, enter this command:

```
# shutdown -g0 -y -i6
```

7. Start the installation of the SBus *Multiport* Software driver(s) by entering:

```
# pkgadd -d /cdrom/cdrom0
```

The program responds:

The following packages are available:

1 AURAcS	Aurora 400/800 S/SX/S+ device driver (sparc) 5.54
2 AURAsio16	Aurora 1600SE device driver (sparc) 5.11
3 AURASync	Aurora Sync driver (optional) (sparc) 2.04
4 AURAzsh	Aurora zsh driver (optional) (sparc) 1.04

Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]:

8. Enter 1 if you have an 8-port expander box or 2 if you have a 16-port expander box to start the installation of the SBus *Multiport* software driver. If you have both the 8- and 16-port cards, you must install both the AURAcS and AURAsio16 software drivers. The 8-port software driver must be installed before the 16-port software driver.

The system takes a few minutes to search the CD and verify the software packages being installed.

The program responds:

```
Processing package instance <AURAcS> from </cdrom/cmsxxxx>

Aurora 400/800 S/SX/S+ device driver
(sparc) 5.54
COPYRIGHT (c) 1992-94 AURORA TECHNOLOGIES, INC., WALTHAM, MA.
THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND
COPIED ONLY IN ACCORDANCE WITH THE TERMS OF SUCH LICENSE AND
WITH THE INCLUSION OF THE ABOVE COPYRIGHT NOTICE.....

Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
.....
.....
.....
```

The program continues:

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

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

9. Enter y.

The program responds:

```
Installing Aurora 400/800 S/SX/S+ device driver as <AURAcS>
```

```
## Installing part 1 of 1.
```

```
/etc/rc2.d/S68AURAcS
```

```
/kernel/drv/cseight
```

```
.....
```

```
.....
```

```
.....
```

```
## Executing postinstall script.
```

```
Installation of <AURAcS> was successful.
```

```
The following packages are available:
```

1 AURAcS	Aurora 400/800 S/SX/S+ device driver (sparc) 5.54
2 AURAsio16	Aurora 1600SE device driver (sparc) 5.11
3 AURASync	Aurora Sync driver (optional) (sparc) 2.04
4 AURAzsh	Aurora zsh driver (optional) (sparc) 1.04

```
Select package(s) you wish to process (or 'all' to process  
all packages). (default: all) [?,??,q]:
```

10. Enter q. The program returns to the system prompt:

```
#
```

11. Remove the Aurora Drivers CD-ROM by entering the following command.

```
# eject cdrom
```

12. If you have an internal CD-ROM drive, remove the CD-ROM from the disk tray, place the CD-ROM back in its case, and push the CD-ROM tray in until it closes.

If you have an external CD-ROM drive, remove the CD-ROM caddy from the CD-ROM drive, remove the CD-ROM from the caddy, and place the CD-ROM back in its case.

13. Execute the following command to start a shutdown:

```
# shutdown -y -i6 -g0
```

14. The program starts the shutdown process:

```
Shutdown started. <date and time>
<Broadcast Message>
. . . . .
. . . . .
. . . . .
```

Setting Up *CentreVu* CMS

Lucent Technologies Production Associates set authorizations for the *CentreVu* CMS features purchased by the customer, and then install those packages that require installation. See Chapter 6, “Setting Up and Installing Feature Packages.”

Setting Up the Remote Console

This section describes how to set up the remote console which will allow the TSC to dial in and do remote maintenance. To set up the remote console, do the following:

- Connect the remote console modem to the A-port on the *Sun SPARCserver* computer.
- Set the remote console modem options.
- Administer the serial A-port on the *Sun SPARCserver* computer.
- Test/redirect the serial A-port on the *Sun SPARCserver* computer.

Connecting the Remote Console to the Sun SPARCserver Computer

This section describes how to connect the remote console modem to the Sun SPARCserver computers (see Figure D-59).

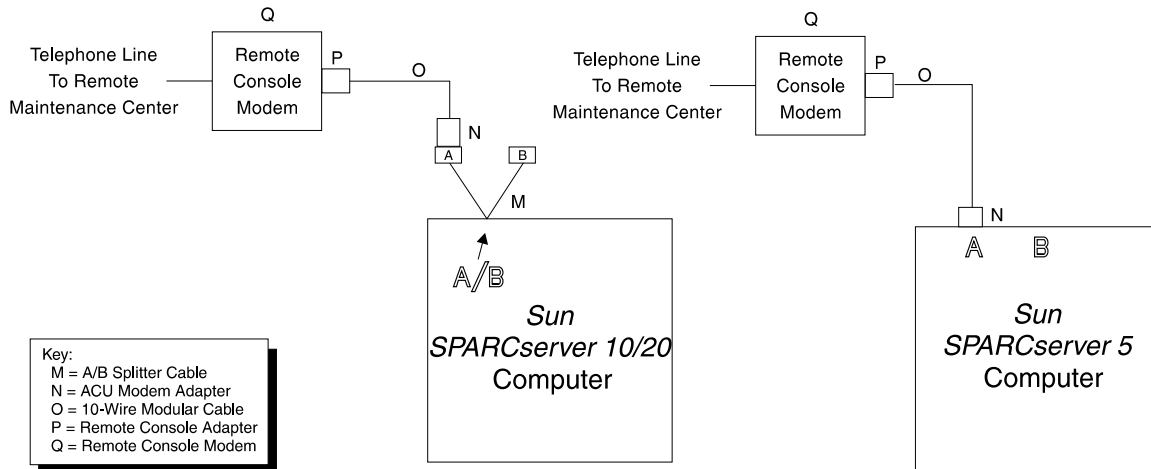


Figure D-59: Remote Console Connectivity to the Sun SPARCserver Computers

To connect to the remote console modem, do the following:

Note If you have a Sun SPARCserver 10 or 20, use Steps 1-7. For Sun SPARCserver 5, use Steps 2-7.

1. Connect the male end of the serial interface (A/B splitter) cable to the serial connector on the back panel of the Sun SPARCserver CPU.
2. Connect the ACU modem adapter to the A serial port interface.
3. Connect one end of a 10-conductor cable to the ACU/modem adapter installed in the previous step.
4. Connect the other end of the 10-conductor cable to the remote console adapter.
5. Connect the remote console adapter to the RS-232C port on the modem.
6. Connect the telephone line to the jack labeled "LINE" on the modem.
7. Make the necessary power connections to the modem.

Setting the Remote Console Modem Options

If the Remote Console modem is either a *U.S. Robotics*^{*} *Sportster*[†], a *DataPort*[®] Express Model 3710/3715 or a *Comsphere*[®] 3830, see the “Setting the Remote Console Modem Options” section in Chapter 3.

If the Remote Console modem is a *Comsphere* 3910, see the “*Paradyne Comsphere* 3910” section in Chapter 4.

Setting EEPROM Parameters — A&B Port

This section describes how to set the firmware eeprom values for the A and B ports on the *Sun SPARCserver* computer.

Enter the following commands to set the eeprom values for the A port:

```
# eeprom ttya-rts-dtr-off=true
# eeprom ttya-ignore-cd=false
# eeprom ttya-mode=9600,8,n,l,-
```

Note

This sets the A port to 9600 baud.

Enter the following commands to set the eeprom values for the B port:

```
# eeprom ttyb-rts-dtr-off=true
# eeprom ttyb-ignore-cd=false
# eeprom ttyb-mode=9600,8,n,l,-
```

Note

This sets the B port to 9600 baud.

You must reboot the system to activate these commands. Execute the following command to reboot:

```
# init 6
```

^{*}U.S. Robotics is a registered trademark of U.S. Robotics, Inc.

[†]Sportster is a registered trademark of U.S. Robotics, Inc.

Administering the Remote Console Port on the *Sun SPARCserver* Computer

This section describes how to administer the A port (remote console port) on the *Sun SPARCserver* computer.

To administer the A port on the back of the *Sun SPARCserver* computer, do the following:

1. Enter the following command to remove the current A port administration:

```
# /cms/install/bin/abcmadm -r ttya
```

The program responds:

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

2. Enter y.
3. Enter the following command to remove the current B port administration:

```
# /cms/install/bin/abcmadm -r ttyb
```

The program responds:

```
ttyb is currently set to incoming
Are you sure you want to remove it? [y,n,?]
```


4. Enter y.
5. Enter the following commands to administer the A port, and set the baud rate to 2400 or 9600 baud:

```
# /cms/install/bin/abcadm -i -b <baud_rate> ttya
```

The program responds:

```
ttya set to incoming/console port <baud_rate> baud
#
```

The remote console port has been administered.

Testing the Remote Console Port

This section describes how to test the A port (remote console port) on the *Sun SPARCserver* computer.

Test the A port on the back of the *Sun SPARCserver* computer by redirecting the console to the remote terminal and then redirecting the console back to the *Sun* monitor. To redirect the console, do the following:

1. Dial in (from the remote terminal) to the remote console modem (that is, access the A port on the computer), and log in as *root*.
2. Remove the port monitor by entering the following command:

```
# /cms/install/bin/abcmadm -r ttya
```

The program responds:

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

3. Enter y. The program responds:

```
ttya administration removed
```

4. Redirect the console to the A port (remote console) by entering the following commands:

```
# /cms/install/bin/abcmadm -c -b <baud_rate> ttya
```

The program responds:

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

5. Enter *y*.

The system will automatically reboot, and the A port will come up as the console.

As the system reboots, the shutting down messages will appear on the *Sun* monitor. When the system starts to come back up, the *Sun* monitor should go blank, and the system boot diagnostics should appear on the remote console terminal. After the system reboots, a login prompt should appear on the remote console terminal.

6. Log into the remote console as *root*.

Note

At this time, an *OpenWindows* login window will appear on the *Sun* monitor.

7. Redirect the console back to the local console by entering the following command:

```
# /cms/install/bin/abccadm -c local
```

The program responds:

```
Console set to local
```

```
This change requires a reboot to take affect
```

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

8. Enter *y*. The system will automatically reboot and the A port will come up as a regular dial-in port with the `login:` prompt displayed.

As the system reboots, the shutting-down messages will appear on the remote console monitor. When the system starts to come back up, the system boot diagnostics should appear on the *Sun* monitor. After the system reboots, a login prompt should appear on the *Sun* monitor.

9. Log into the local console (*Sun* system) as *root*.

The console has been redirected to the remote terminal and redirected back to the system console.

Administering the Network Terminal Servers

Each Network Terminal Server (NTS) needs to be administered so it will be recognized on the network. The following networking items need to be administered on the NTS:

- Internet address
- Subnet mask
- Preferred load host internet address
- Broadcast address
- Type of IP packet encapsulation.

Note

The administration process needs to be completed on each NTS being installed. If you administer more than one NTS for this system, the IP addresses must be unique (see Table D-17).

To administer the NTS network parameters, do the following:

1. Make sure you have the following information for each NTS you are administering:
 - *Sun SPARCserver* Computer IP address (see Table D-17)
 - NTS IP address for each NTS (see Table D-17).

Table D-17: CentreVu CMS Standard Network IP Addresses

Device	Network Name	IP Address
<i>SPARCserver</i> Computer	<i>hostname</i>	129.200.9.1
First NTS	cmsterm1	129.200.9.11
Second NTS	cmsterm2	129.200.9.12
Third NTS	cmsterm3	129.200.9.13
Fourth NTS	cmsterm4	129.200.9.14
Fifth NTS	cmsterm5	129.200.9.15
Sixth NTS	cmsterm6	129.200.9.16
Seventh NTS	cmsterm7	129.200.9.17

2. Edit the */etc/hosts* file by entering:

```
# vi /etc/hosts
```

3. Add the address for the NTS (in the */etc/hosts* file) that corresponds to the new addresses in Table D-17.
4. Write and quit the file.
5. Connect the power cord to the NTS (see Figure D-60).

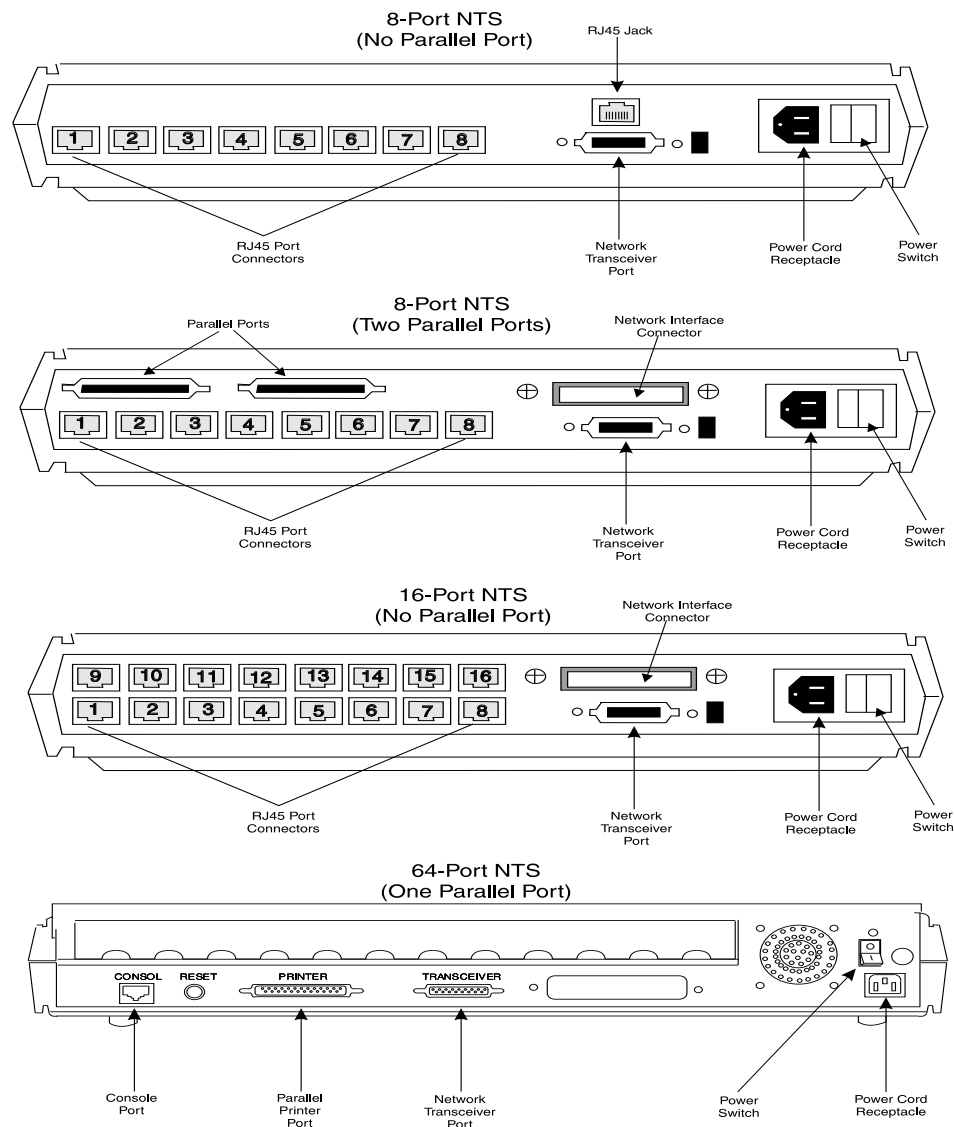


Figure D-60: Network Terminal Server — Back Panel

6. Connect the 10-T transceiver to the network transceiver port on the back panel of the NTS (see Figure D-60).
7. Connect the network hub unit to the NTS (10-T transceiver) using a UTP network cable.
8. Connect a dumb terminal to the **CONSOLE** port on the rear of the NTS using the console cable and adapter that came with the NTS. On the 8- and 16-port NTSSs, the **CONSOLE** port is port #1.

You will need the following for the 8- and 16-port NTSSs:

- Console Cable
- Adapter - comcode 407361823
- Null Modem - comcode 407122043.

You will need the following for the 64-port NTS(s):

- Console Cable
- Adapter - part number 06-988-260-20.

Note The terminal options should be set to 9600 bps, 8 bits, no parity, and a stop bit.

9. Turn on the NTS, and within 15 seconds push the **TEST** button on the front of the NTS (see Figure D-61).

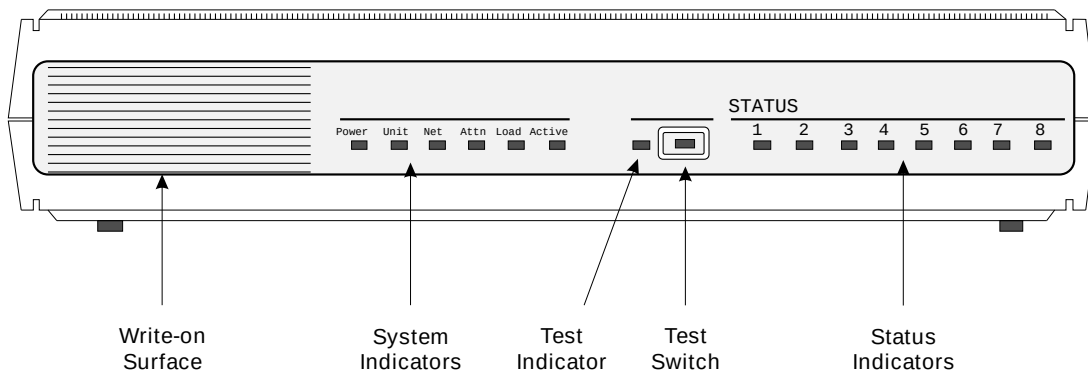


Figure D-61: Front Panel of the Network Terminal Server

10. The NTS goes through its hardware diagnostics, and the following prompt should appear:

```
Monitor::
```

11. Enter the following command at the `monitor::` prompt:

```
Monitor:: erase
```

Note

There are two types of information that can be erased:

- EEPROM (configuration information)
- FLASH (self-boot image).

If only one type of information is present, the program begins to erase it. If there are two types of information, the program prompts you to select the information you want to erase. Erase both the EEPROM and the FLASH information.

12. The program responds:

```
Erase
  1) EEPROM (i.e., Configuration Information)
  2) FLASH (i.e., Self Boot Image)
Enter 1 or 2::
```

13. Enter 1 to erase EEPROM. The program responds:

```
Erase all non-volatile EEPROM memory? (y/n) [n]::
```

14. Enter Y. The program responds:

```
Erasing xxxx bytes of non-volatile memory. Please wait....  
.....  
Erased xxxx bytes of non-volatile memory complete.
```

15. The program returns to the monitor:: prompt. Repeat steps 11-14 to erase the FLASH information.

16. After you have completed the erase command, enter the following command at the monitor prompt:

```
Monitor:: addr
```

17. The program responds:

```
Enter Internet address [<uninitialized>]::
```

18. Enter the IP address for this NTS. This should follow the IP address structure outlined in Table D-17 on page D-160.

The program responds:

```
Internet address : XXX.XXX.XXX.XXX  
  
Enter Subnet mask [255.255.0.0]::
```


19. Press **Return** to accept the default subnet mask. The program responds:

```
Subnet mask: 255.255.0.0
```

```
Enter preferred load host Internet address [<any host>]::
```

20. Enter the IP address of the *Sun SPARCserver* computer.
The program responds:

```
Preferred load host address XXX.XXX.XXX.XXX
```

```
Enter Broadcast address [0.0.0.0]::
```

21. Press **Return** to accept the default broadcast message address. The program responds:

```
Enter Preferred dump address [0.0.0.0]::)
```

22. Enter the IP address of the *Sun SPARCserver* computer.
The program responds:

```
Preferred dump address: xxx.xx.x.x
```

```
Select type of IP packet encapsulation (ieee802/ethernet)
[<ethernet>] ::
```

23. Press **Return** to accept the default IP packet encapsulation. The program responds with the following question if you have an 8- or 16-port NTS. The program returns to the monitor:: prompt if you have a 64-port NTS.

```
Type of IP packet encapsulation: <ethernet>
```

```
Load Broadcast Y/N [Y]::
```

24. Enter N. The program returns to the monitor:: prompt.
25. Enter the following command at the monitor prompt to reinitialize the NTS with the new parameters:

```
monitor:: boot
```

The program responds:

```
Enter boot file name [oper.42.enet]::
```

Note The boot file name differs depending on the type of NTS. For the 8- and 16-port NTS, the boot file name is [(ip) "oper.52.enet", (mop) "OPER_52_ENET.SYS"]:: . For the 64- port NTS, the boot file name is oper.42.enet.

26. Press **Return** to accept the default boot file name. The program continues:

```
Requesting boot file "oper.42.enet".
Unanswered requests shown as '?',
                               transmission errors as '*'.

Booting file: oper.42.enet from 129.200.9.1

Loading image from 129.200.9.1
.....
```

The periods (dots) continue to appear as the NTS is initialized and set up.

Note If the program displays "SELF" instead of the IP address (129.200.9.1), it means that you did not erase EEPROM. Go back to step 11 to erase EEPROM.

When the initialization finishes, the following appears:



```
annex::
```

27. Disconnect the dumb terminal from the NTS.

The NTS has been administered.

Additional References

For additional information, refer to the following documentation:

*Network Terminal Server Guide,
Quick Installation Guide for the Sun Network Terminal Server
Leaflet.*

Technical Glossary

This Technical Glossary defines terms and acronyms used in this document that may not be familiar to you. The Technical Glossary is divided into Terminology and Acronyms.

Terminology

Access Permissions	Permissions assigned to a CMS user so that the user can access different subsystems in CMS or administer specific elements (splits/skills, trunks, vectors, etc.) of the ACD. Access permissions are specified as read or write permission. Read permission allows the CMS user to access and view data (for example, run reports or view the Dictionary subsystem). Write permission allows the CMS user to add, modify, or delete data and execute processes.
ACD	Automatic Call Distribution — a switch feature. ACD is software that channels high-volume incoming call traffic to agent groups (splits or skills). Also an agent state where the extension is engaged in an ACD call (with the agent either talking to the caller or the call waiting on hold).
Acknowledgment	A window that requires the user to confirm an action or to acknowledge a system message (for example, system going down, warning, or fatal error for the user window). This window cannot be moved, sized, or scrolled and disappears only when the user confirms the message.
Action List	A menu in the upper right corner of most user windows. The menu lists the actions available for that particular user window (for example, add, modify, delete, etc.). The user selects an action after entering necessary data in the window.
Add Package	A <i>Solaris</i> operating system command (pkgadd) that allows you to add an additional software package.

ADU	Asynchronous Data Unit. A data communications equipment (DCE) type device that allows direct connection between RS-232 equipment and the digital switch.
Agent	A person who answers calls to an extension in an ACD split. Known to CMS by a login identification keyed into a voice terminal.
Agent Login ID	A 1- to 4-digit number (Generic 2/System 85) or a 1- to 9-digit number (Generic 1/Generic 3) entered by the agent at the ACD extension to activate the position. Agent logins are required for all CMS-measured ACD agents.
Agent Skill	The different types of calls a particular agent can handle. An agent can be assigned up to four skills. These skills are assigned as either primary or secondary skills. See "Primary Skill" or "Secondary Skill" definitions in this Glossary.
Agent State	A feature of agent call handling that allows agents to change their availability to the system (for example, ACW, AVAIL, ACD).
Announcement	A recorded message that tells the caller what destination the call has reached. The announcement also often tries to persuade the caller to stay on the line. With Call Vectoring, announcements can be part of a vector's call processing. An announcement is assigned to a vector by entering an announcement number.
Asynchronous Connector	A logical device used to control the computer timing protocol in which a specific operation is begun upon receipt of an indication (signal) that the preceding operation has been completed.
Asynchronous Data Transmission	A scheme for transmitting data where each character is preceded by a start bit and followed by a stop bit, thus permitting data elements to occur at irregular intervals. This type of transmission is advantageous when transmission is not regular (when characters are typed at a keyboard).

Backup	The process of protecting data by writing the contents of the disk to a tape that can be removed from the computer and stored safely. A spare copy of data or software that you keep in case the original is damaged or lost. CMS provides three different types of backups: CMSADM File System Backup, CMS Full Maintenance Backup, and CMS Incremental Maintenance Backup.
Boot	To load the system software into memory and start it running.
Bus	A signal route to which several items of a computer system may be connected in parallel so that signals can be passed between them. In general, a multiconductor electrical path used to transfer information over a common connection from any of several sources to any of several destinations.
Cables	Wires or bundles of wires configured with adapters/connectors at each end and used to connect two or more hardware devices.
Call Management System Query Language (CMS-QL)	A relational database management (operating) system used to organize most of CMS's data. Automatically comes with CMS and runs in the background.
Call Vectoring	A highly flexible method for processing ACD calls using VDNs and vectors as processing points between trunk groups and splits/skills. Call vectoring permits treatment of calls that is independent of splits/skills.
Cartridge Tape	A 0.25-inch (6.35-mm) magnetic tape used in the tape drive of the Desktop Backup Pack and External Storage Module to read and write data.
<i>CentreVu</i> CMS	<i>CentreVu</i> Call Management System. A software product used by business customers that have a Lucent Technologies telecommunications switch and receive a large volume of telephone calls that are processed through the ACD (Automatic Call Distribution) feature of the switch.

CMSADM Filesystem Backup	A backup that saves all the file systems on the machine which includes <i>Solaris</i> 2.4 system and programs, CMS programs and data, and non-CMS data you place on the computer in addition to the CMS data. See the “Backup” definition for more details.
Command	A command is an instruction used to tell the computer to perform a function or to carry out an activity.
Configuration	Configuration is the way that the computer is set up to allow for particular uses or situations.
Copy	Copy means to duplicate information.
Custom Reports	Real-time or historical reports that have been customized from standard reports or created from scratch. See the <i>CentreVu™ Call Management System Release 3 Version 5 Custom Reports</i> (585-215-822) document for more information.
Data Collection Off	CMS is not collecting ACD data. If you turn off data collection, CMS will not collect data on current call activity.
Database	A group of files that store ACD data according to a specific time frame: current and previous intrahour real-time data and intrahour, daily, weekly, and monthly historical data.
Database Item	A name for a specific type of data stored in one of the CMS databases. A database item may store ACD identifiers (split numbers or names, login IDs, VDNs, etc.) or statistical data on ACD performance (number of ACD calls, wait time for calls in queue, current states of individual agents, etc.).
Database Tables	Tables that CMS uses to collect, store, and retrieve ACD data. Standard CMS items (database items) are names of columns in the CMS database tables.

DCE	Data Communications Equipment. Modems are a good example of DCE. Any equipment that connects to DTE (Data Terminal equipment) using an RS-232 standard interface.
DCIU	Data Communications Interface Unit. A hardware device on the Generic 2 and System 85 switches that prepares and sends architecture messages to other switches or application adjuncts.
Device	The term used to refer to the peripheral itself; for example, a hard disk or a tape drive. A peripheral is sometimes referred to as a subdevice or an LU (Logical Unit).
Disk	A round platter, or set of platters, coated with magnetic medium and organized into concentric tracks for storing data.
DSIMM	A small printed circuit card that contains DRAM (dynamic random access memory) chips. The acronym "DSIMM" stands for <i>dynamic random access memory single in-line memory module</i> .
DTE	Data Terminal Equipment. Typically, DTE includes terminals, personal computers, and workstations. Your <i>Sun SPARCserver</i> system is a DTE device.
EAD	Expert Agent Distribution. A call queued for a skill will go to the most idle agent (primary skill agent). Agents who are idle and have secondary agent skills will receive the call queued for a skill if there are no primary agents available.
ECC	Error Correction Codes. Codes that protect the customer's system and data from single bit soft errors that can occur frequently depending on the environment.
Error Message	An error message is a response from a program indicating that a problem has arisen or something unexpected has happened, requiring your attention.

Ethernet	A type of network hardware that allows communication between systems connected directly together by transceiver taps, transceiver cables, and a coaxial cable. Also implemented using twisted-pair telecommunications wire and cable.
Ethernet Address	A unique number assigned to each system when it is manufactured. The Ethernet address of your system is displayed on the banner screen that appears when you power on your Desktop <i>Sun SPARCserver</i> system.
Exception	A type of activity on the ACD which falls outside of the limits the customer has defined. An exceptional condition is defined in the CMS Exceptions subsystem, and usually indicates abnormal or unacceptable performance on the ACD (by agents, splits/skills, VDNs, vectors, trunks, or trunk groups).
Expert Agent Selection	An optional feature that bases call distribution on agent skill. EAS matches the skills required to handle a call to an agent who has at least one of the skills required.
External Controller	A connector that is outside the cabinet and is accessible to the user without having to open any doors, remove any panels, or remove any cabinet covers. (Also known as a "External Connector.")
Forecast Reports	These reports display expected call traffic and agent/trunk group requirements for the customer's call center for a particular day or period in the future.
Gigabyte (GB)	One gigabyte equals 10^9 bytes (1,000,000,000).
Hand-Shaking Logic	A format used to initiate a data connection between two data module devices.
Hard Disk	A device that stores operating systems, programs, and data files.

Historical Database	Contains intrahour records for up to 62 days in the past, daily records for up to 5 years in the past, and weekly/monthly records for up to 10 years for each CMS-measured agent, split/skill, trunk, trunk group, vector, and VDN.
Historical Reports	Reports that display past ACD data for various agent, split/skill, trunk, trunk group, vector, or VDN activities.
Host Adapter	An I/O card that plugs into the computer backplane and is used as an interface between the <i>Sun SPARCserver</i> computer system and the SCSI bus.
Host Computer	A computer that is attached to a network and provides services other than simply acting as a store-and-forward processor or communication switch. The <i>Sun SPARCserver</i> is your host computer and hosts the CMS application software.
Host Name	A name that you (or your system administrator) assign to your system unit to uniquely identify it to the <i>Solaris 2.4</i> operating system (and also to the network).
HSI/S 2.0	The High-Speed Serial Interface/SBus controller card is a 4-port serial communications SBus card. Each of the four ports is used for a single physical X.25 link. An add-on software package needed by CMS (for multiple ACDs) on the <i>Sun SPARCserver</i> computer.
Hung System	A system that does not respond to input from the keyboard or mouse.
<i>INFORMIX</i>	A relational database management system used to organize CMS's data. An add-on software package needed by CMS on the <i>Sun SPARCserver</i> computer.

Install	The procedures used to set up the hardware and software of a computer, terminal, printer, and modem so that they can be used. Installing often includes customizing the system for a particular situation or user.
Interface	A common boundary between two systems or pieces of equipment.
Interval-Based Items	A category of database items. These items represent the amount of time during a collection interval spent doing a particular activity. Interval-based items are updated throughout the collection interval and timing is restarted at the end of the interval. Interval-based items should only be used to show the amount of time in an interval for an activity or to calculate percentages of time spent in an interval. Interval-based items should not be used to calculate averages (such as average hold time).
Intrahour Interval	A 15-, 30-, or 60-minute segment of time starting on the hour. An intrahour interval is the basic unit of CMS report time.
Keyboard	An input device for entering information by typing.
Keyboard Port	The port on your Desktop <i>Sun SPARCserver</i> system unit where the keyboard cable is connected.
Link	A transmitter-receiver channel or system that connects two locations.
Log In	The process of gaining access to a system by entering a user name and, optionally, a password.
Log Out	The process of exiting from a system.
Logical Unit	The term used to refer to a peripheral device such as a disk drive.
Measured	A term that means an ACD element (agent, split/skill, trunk, trunk group, vector, VDN) has been identified to CMS for collection of data.

Megabyte (MB)	One megabyte equals 10^6 bytes (1,000,000).
Menu	A list of items from which the user can select one. A menu cannot be moved or sized and does not count in the user window count.
Messages	Temporary windows used only for displaying information like “field help” and syntactical field errors. Message windows cannot be moved, sized, or scrolled and do not count in the user-window count. Messages windows are automatically removed when the user corrects the error or moves to the next field.
Mirrored Disks	The mirroring feature allows one driver to write to two separate disk partitions at once, provided they are available on the same processor. In mirroring, the data is written not to a single disk but automatically to disks on each of two independent buses, making all data saved to disk available at two physical locations. When a disk or a bus goes down, system operation continues uninterrupted, and the faulty component can be replaced or repaired.
Mirrored Partitions	A pair of disk partitions that contain identical data to provide increased data integrity. Whenever data are written, it is written to both partitions. Whenever data are read, it is read from one partition of the pair, alternating partitions with each read.
Modem	A device that enables a computer or terminal to establish a connection with another computer or terminal and to communicate data through telephone lines.
Multi-user Mode	A mode of CMS in which any administered CMS user can log into CMS. Data continues to be collected if data collection is “on.”
Network Address	A unique number assigned to each system on a network, consisting of the network number and the system number. Also known as Internet Address (IP).

Network Hub	Hardware that connects the <i>Sun SPARCserver</i> computer to the Network Terminal Server(s). See Chapter 3, "Installing the <i>Sun SPARCserver</i> Computer."
Network Terminal Server	A hardware terminal that connects to the Network Hub via cabling. The Network Terminal Server provides 50-pin switch champ connectors used to attach 64 serial devices using the patch panel cables and patch panels. See Chapter 3, "Installing the <i>Sun SPARCserver</i> Computer."
Network Terminal Server Patch Panel	Hardware that has ports for connecting serial peripheral devices (for example, printers, terminals and modems). The NTS patch panel connects to the Network Terminal Server via PBX-Champ cabling. See Chapter 3, "Installing the <i>Sun SPARCserver</i> Computer" and Chapter 4, "Installing Terminals, Printers, and Modems."
Open Window	A window that remains open because the user has not yet closed it with the "Exit" screen Label Key (SLK). An open window becomes the current window when it initially appears on the screen or when the user makes it the current window using the "Current" SLK.
Operating System	The software that controls and allocates the resources, such as memory, disk storage, and the screen display for the computer.
Partitions	Sections of the hard disk that are used to store an operating system and data files or programs. By dividing the disk into partitions, you can use the space allocated in a more efficient and organized manner.
Password	A character string that is associated with a user name. Provides security for a user account. Desktop <i>Sun SPARCserver</i> systems require you to type a password when you log into the system, so that no unauthorized person can use your system.
PBX	Private Branch Exchange. A private switch system providing voice-only or voice and data communications services (including access to public and private networks) for a group of terminals within a customer's premises. Also see Switch.

PI	Processor Interface. A hardware device on the Generic 1 and Generic 3i switches that prepares and sends architecture messages to other switches or application adjuncts.
Port (I/O Port)	A designation of the location of a circuit that provides an interface between the system and lines and/or trunks.
Primary Skill	An agent will handle calls to many skills before calls to secondary skills. See "Agent Skill" in this Glossary.
Primary Window	The first window opened in response to a menu selection. A primary window may also generate another user window (secondary window). A primary window can be moved, sized, or scrolled, and counts in the window count.
Printer	A physical device that takes electronic signals, interprets them, and prints them on paper. See Chapter 4, "Installing Printers and Terminals" for more information.
Queue	A holding area for calls waiting to be answered in the order in which they were received. Calls in a queue may have different priority levels, in which case, calls with a higher priority are answered first.
Read Permission	A mode that allows a CMS user to access and view data (for example, run reports or view the Dictionary subsystem). Read permission is granted from the User Permissions subsystem.
Real-Time Database	A database that consists of the current and previous intrahour data on each CMS-measured agent, split/skill, trunk, trunk group, vector, and Vector Directory Number (VDN).
Real-Time Reports	Reports that display current ACD call activity on agents, splits/skills, trunks, trunk groups, vectors, and VDNs for the current or previous intrahour interval. Current intrahour interval real-time reports are constantly updated as data changes during the interval. Previous

intrahour interval real-time reports show data totals for activity that occurred in the previous intra-hour interval.

Refresh Rate	The number of seconds CMS should wait for each update of the real-time report data. A user's fastest allowable refresh rate is defined in the User Permissions — User Data window as a minimum refresh rate. The default refresh rate when a user brings up the report input window is the administered minimum refresh rate plus 15 seconds.
RS-232	A 25-pin physical and electrical interface. The electrical portion of the interface is unbalanced (for example, RS-232 has a positive voltage and a ground).
RS-422	A balanced electrical interface (for example, RS-422 has a positive and a negative voltage). This interface is used by the HSI/S card.
RS-423	An unbalanced electrical interface (for example, RS-423 has a positive voltage and a ground).
RS-449	A 37-pin physical interface used by the HSI/S card.
SBus	The Input/Output bus for the <i>Sun SPARCserver</i> computer. Provides slots for additional cards (for example, HSI Controller Card).
SBus Expansion Subsystem	A peripheral device attached to a computer system. The SBus expansion subsystem provides three additional SBus slots and space for two optional SCSI hard disk drives. The SBus expansion subsystem consists of the following: the SBus expansion chassis, the expansion adapter card (in the computer system), and the SBus expansion subsystem cable.

Scroll Cursor	<i>INFORMIX</i> provides two kinds of cursor when traversing select results. A scroll cursor allows relative movement backward or forward within the query results while a non-scroll cursor allows only forward movement, one record at a time.
SCSI Bus	An industry standard peripheral bus that is used to connect intelligent peripherals to a <i>Sun SPARCserver</i> computer. It uses a daisy-chained cabling arrangement that originates at the Host Adapter to interconnect up to seven intelligent peripheral controllers on the bus. The <i>Sun SPARCserver</i> computer uses a fast SCSI-2 implementation (unlike the NCR3332 platform).
SCSI ID	Each tap on the SCSI bus is required to have a unique identification or address, which is the SCSI ID. The ID is set by a switch located on each controller. In a Lucent Technologies' implementation, the Host Adapter card (with a SCSI ID of 7) is preset. The rest can be set with external devices "push buttons." Users never have to open a chassis or touch a circuit-board switch.
SCSI Single-Ended Bus	A version of the SCSI bus designed to minimize cost and space. Cable lengths up to 6 meters are supported. It is not compatible with the differential version of the SCSI bus.
Secondary Skill	An agent will handle secondary skill calls after primary skill calls. See "Agent Skill" in this Glossary.
Secondary Window	A user window that is generated from a primary window. Secondary windows can be moved, sized, or scrolled and do not count in the user window count.
Serial Interface Y-Cable	A cable that attaches to the A/B port on the back of the <i>Sun SPARCserver</i> 10/20 computer. Your Desktop <i>Sun SPARCserver</i> 10/20 computer system has two serial ports located on the two terminations of its optional serial interface Y-cable.

Shortcut	A series of tasks which are run immediately on the screen. Shortcut is a fast, easy way to select windows that the customer might look at every day.
Single-User Mode	A CMS mode in which only one person can log into CMS. Data collection continues if data collection is "on." This mode is required to change some CMS administration.
Skill	In relationship to the call center, think of skill as a specific customer need/requirement or perhaps a business need of the call center.
SLK	Screen Labeled Key. The first eight function keys at the top of the keyboard that correspond to the screen labels at the bottom of the terminal screen. The screen labels indicate the function each key performs.
Slot	An electronic connection designed to receive a module or a printed circuit board (such as a SIMM or a frame buffer board).
<i>Solaris</i>	The operating system package on the <i>Sun SPARCserver</i> computer. The <i>Solaris</i> is a version of the <i>UNIX</i> System V Release 4. CMS requires the <i>Solaris</i> to run on the <i>Sun SPARCserver</i> computer.
Split	A group of extensions that receive special-purpose calls in an efficient, cost-effective manner. Normally, calls to a split arrive over one or a few trunk groups.
Storage Device	A hardware device that can receive data and retain it for subsequent retrieval. Such devices cover a wide range of capacities and speeds of access.
Submenu	A menu that appears as a result of a menu selection. All menu selections followed by a ">" have submenus.

Subsystem	Each CMS main menu selection (for example, Reports, Dictionary, System Setup, Exceptions, etc.), along with Timetable and Shortcut, is referred to as a subsystem of the Call Management System throughout this document.
<i>Sun SPARCserver</i> Computer	A host computer that is attached to a network and provides services other than simply acting as a store-and-forward processor or communication switch.
Super-user	A user with full access privileges on a system, unlike a regular user whose access to files and accounts is limited.
Switch	A private switch system providing voice-only or voice and data communications services (including access to public and private networks) for a group of terminals within a customer's premises. Also see PBX.
Syntax	The format of a command line.
System	A general term for a computer and its software and data.
Tap	A tap is any intelligent (microprocessor-based) controller connected to the SCSI bus.
Tape Cartridge	A magnetic piece of hardware that is used as a storage unit for data. Two types of tapes are used to back up and copy data for the High-Performance Platform — QIC-150, 5-GB, and 14-GB tape cartridges.
Task	Used with Timetables and Shortcuts. A task is a combination of inputs on a user window (like a report input window) and the completed action list selection (Add, Modify, etc.) which, when executed, performs an operation (for example, running a report).

Terminal	A device that consists of a video display and keyboard that you use to type and display information. A terminal is connected to a serial port on the NTS (Network Terminal Server). See Chapter 4, “Installing Printers and Terminals,” for information. Not the same thing as a monitor.
Timetable	An activity task or group of activities tasks (like reports) scheduled for completion at a time that is convenient and nondisruptive for the call center’s operation.
Trunk	A telephone line that carries calls between two switches, between a CO (Central Office) and a switch, or between a CO and a phone.
Trunk Group	A group of trunks that are assigned the same dialing digits — either a phone number or a DID (Direct Inward Dialed) prefix.
<i>UNIX</i> System	The operating system on the computer on which CMS runs. A user can access the <i>UNIX</i> system from the “Commands” SLK. <i>SUN</i> uses <i>Solaris</i> as its <i>UNIX</i> operating system.
User ID	The login ID for a CMS user.
User Name	A combination of letters, and possibly numbers, that identifies a user to the system.
User Window	A window the user can move, size, or scroll. It may contain input fields, reports, or help information.
VDN	Vector Directory Number. An extension number that is used in ACD software to permit calls to connect to a vector for processing. A VDN is not assigned an equipment location; it is assigned to a vector. A VDN can connect calls to a vector when the calls arrive over an assigned automatic-in trunk group or when calls arrive over a dial-repeating (DID) trunk group, and the final digits match the VDN. The VDN by itself may be dialed to access the vector from any extension connected to the switch.

Vector	A list of steps that process calls in a user-defined manner. The steps in a vector can send calls to splits, play announcements and/or music, disconnect calls, give calls a busy signal, or route calls to other destinations. Calls enter vector processing via VDNs, which may have received calls from assigned trunk groups, from other vectors, or from extensions connected to the switch.
Vector Command	The keyword in a vector step that describes the action to be executed on an incoming call (for example, "Queue to main," "check backup," "disconnect").
Vector Step	One processing step listed in a vector. A vector step consists of a command and one or more conditions or parameters.
Voice Terminal	A telephone set, usually with buttons, that gives an agent some control over the way calls are handled.
Weekly/Monthly Data	Daily data that has been converted to a weekly or monthly summary.
Window	Any rectangle on the CMS screen that encloses a menu, data entry fields, reports, or messages.
Window Count	The number of primary windows that can be open at any one time.
Write Permission	A mode of CMS that allows the CMS user to add, modify, or delete data and execute processes. Write permission is granted from the User Permissions subsystem.
X.25	An add-on software package that allows CMS to communicate with the switch using X.25 protocol.

Acronyms

ACD	— Automatic Call Distribution
ADU	— Asynchronous Data Unit
ANSI	— American National Standards Institute
CMS	— Call Management System
CMSADM	— Call Management System Administration
CMSSVC	— Call Management System Services
DCE	— Data Communications Equipment
DCIU	— Data Communications Interface Unit
DIP	— Dual In-Line Package
DSIMM	— Dynamic Random Access Memory Single In-line Memory Module
DTE	— Data Terminal Equipment
EAD	— Expert Agent Distribution
EAS	— Expert Agent Selection
ECC	— Error Correction Codes
ESQL/C	— Embedded SQL within 'C' language
IP	— Internet Protocol
IPC	— Intelligent Ports Card
NTS	— Network Terminal Server
PBX	— Public Broadcast Switch
PEC	— Price Element Code
RISC	— Reduced Instruction Set Computer
SCSI	— Small Computer System Interface
SLK	— Screen Labeled Key
SQL	— Structured Query Language
TSC	— Technical Service Center
UPS	— Uninterrupted Power Supply
VDN	— Vector Directory Number

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