

Lucent Technologies
Bell Labs Innovations



***CentreVu*TM Call Management System**

Release 3 Version 5

Sun[®] *Enterprise*TM 3000 System

Hardware Installation and Maintenance

585-215-837
Comcode 108048414
Issue 1
July 1997

Copyright © 1997, Lucent Technologies
All Rights Reserved
Printed in U.S.A.

Notice

Every effort was made to ensure that the information in this book was complete and accurate at the time of printing. However, information is subject to change.

Your Responsibility for Your System's Security

Toll fraud is the unauthorized use of your telecommunications system by an unauthorized party, for example, persons other than your company's employees, agents, subcontractors, or persons working on your company's behalf. Note that there may be a risk of toll fraud associated with your telecommunications system and, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

You and your system manager are responsible for the security of your system, such as programming and configuring your equipment to prevent unauthorized use. The system manager is also responsible for reading all installation, instruction, and system administration documents provided with this product in order to fully understand the features that can introduce risk of toll fraud and the steps that can be taken to reduce that risk. Lucent Technologies does not warrant that this product is immune from or will prevent unauthorized use of common-carrier telecommunication services or facilities accessed through or connected to it. Lucent Technologies will not be responsible for any charges that result from such unauthorized use.

Lucent Technologies Fraud Intervention

If you *suspect that you are being victimized* by toll fraud and you need technical support or assistance, call Technical Service Center Toll Fraud Intervention Hotline at 1-800-643-2353.

Federal Communications Commission Statement

Part 15: Class A Statement. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Canadian Department of Communications (DOC) Interference Information

This digital apparatus does not exceed the Class A limits for radio noise emissions set out in the radio interference regulations of the Canadian Department of Communications.

Le Présent Appareil Numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A prescrites dans le règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Trademarks

ANIXTER is a registered trademark of ANIXTER BROS., Inc.
Dataphone is a registered trademark of Paradine Corp.
CentreCOM is a registered trademark of Allied Telesis.
CentreVu is a trademark of Lucent Technologies.
DEFINITY is a registered trademark of Lucent Technologies.
Dataproductions is a registered trademark of Dataproducts Corp.
HP is a registered trademark of Hewlett-Packard Co.
IBM is a registered trademark of International Business Machines Corp.
EQUINOX is a registered trademark of Equinox Systems, Inc.
U.S. Robotics and *Sportster* are registered trademarks of U.S. Robotics, Inc.

Micro Annex is a registered trademark of Xylogics, Inc.
Okidata is a registered trademark of Oki Electronic Industry Co., Ltd.
Phillips is a registered trademark of the Phillips Screw Company.
INFORMIX is a registered trademark of Informix Software, Inc.
UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited.
Sun, *Sun Microsystems*, and the *Sun Logo* the *SMCC* logo, *SunLink*, *Solaris*, *OpenWindows*, *Solstice DiskSuite AnswerBook* and *Enterprise* are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States and other countries
All *SPARC* trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the United States and other countries. Products bearing *SPARC* trademarks are based upon an architecture developed by Sun Microsystems, Inc.
All other product names mentioned herein are the trademarks of their respective owners.

Ordering Information

Call: Lucent Technologies Publications Center
Voice: 1-800-457-1235
International Voice: 317-361-5353
Fax: 1-800-457-1764
International Fax: 317-361-5355
Write: Lucent Technologies Publications Center
P.O. Box 4100
Crawfordsville, IN 47933
Order: Document No. 585-215-837
Comcode 108048414
Issue 1, July 1997

For additional documents, refer to the sections entitled "*CentreVu* CMS Documents" and "Other *CentreVu* Documents" in "Preface."

You can be placed on a Standing Order list for this and other documents you may need. Standing Order will enable you to automatically receive updated versions of individual documents or document sets, billed to account information that you provide. For more information on Standing Orders, or to be put on a list to receive future issues of this document, please contact the Lucent Technologies Publications Center.

European Union Declaration of Conformity

Lucent Technologies Business Communications Systems declares that the equipment specified in this document conforms to the referenced European Union (EU) Directives and Harmonized Standards listed below:

EMC Directive 89/336/EEC
Low Voltage Directive 73/23/EEC



The "CE" mark affixed to the equipment means that it conforms to the above Directives.

Heritage Statement

Lucent Technologies—formed as a result of AT&T's planned restructuring—designs, builds, and delivers a wide range of public and private networks, communication systems and software, consumer and business telephone systems, and microelectronics components. The world-renowned Bell Laboratories is the research and development arm for the company.

Comments

To comment on this document, return the "How Are We Doing?" form to:
Lucent Technologies
Department JCOE11400
1200 West 120th Avenue
Westminster, CO 80234-2795.

Acknowledgment

This document was developed by Lucent Technologies Network Systems Customer Training and Information Products Organization.

CentreVu Call Management System

Release 3 Version 5

Sun Enterprise 3000 System

Hardware Installation and Maintenance

Table of Contents

		Page
Preface		P-1
	Overview	P-1
	Organization	P-1
	CentreVu CMS Documents	P-3
	Other CentreVu Documents	P-4
Chapter 1	Introduction	1-1
	Overview	1-1
	Supported Features	1-1
	Supported Hardware Platforms	1-1
	Required Software	1-2
	Supported Switch Releases	1-2
	Purpose of the Sun Enterprise 3000 System	1-3
	AnswerBook Software	1-3
	Starting AnswerBook Software	1-4
	Navigating Through AnswerBook Software	1-5
	Exiting AnswerBook Software	1-5
	Roles and Responsibilities	1-6
	CentreVu CMS Helplines	1-8
	Customer Number	1-8
	Technician Number	1-8
	International Support	1-8
Chapter 2	Installing the Sun Enterprise 3000 System	2-1
	Overview	2-1
	Installing the Sun Enterprise 3000 System	2-5
	Unpacking and Inventorying the Equipment	2-5
	Assembling the Sun Enterprise 3000 System and System Console	2-6
	SBus I/O Board and Components	2-7
	Identifying Installed SBus Cards	2-7
	Installing or Changing SBus Cards	2-10
	Other SBus Cards	2-11
	External I/O Components and Interfaces	2-12
	Overview	2-12
	Connecting the SunLink HSI/S Patch Panel	2-13
	Setting the Black Box DTE/DCE DIP Shunts	2-14
	Connecting the HSI/S Patch Panel to the Interface Converter	2-16
	Connecting the Network Hub Unit	2-17
	Optional Fiber-Optic Network Configurations	2-18
	Installing the Allied Telesis CentreCOM Network Hub Unit	2-21
	Installing the StarLAN 10 Network Fiber-Optic Hub Unit	2-23
	Connecting the NTS(s) to the Network Hub Unit	2-24
	Connecting the NTS Patch Panel(s) to the 64-Port NTS	2-29

Other Devices and Connections	2-31
Overview	2-31
Connecting the UPS	2-32
Required Parts	2-32
Procedure	2-32
Connecting the Remote Console Modem	2-33
Powering Up the System and Verifying POST	2-34
Setting the Remote Console Modem Options	2-36
Connecting to Another Network	2-37
Connecting to Another Network (Via Dumb Terminal)	2-42

Chapter 3 Installing Terminals, Printers, and Modems	3-1
Overview	3-1
Supported Terminal and Printer Equipment	3-2
Connection Options	3-2
Supported Terminals	3-4
Supported Printers	3-5
Supported Modem	3-6
Connecting Terminals, Printers, and Modems	3-7
New Installation Procedures	3-7
Connecting Communications Equipment, Terminals, and Printers to a 64-Port NTS	3-8
Connecting Terminals, and Printers to an 8- and 16-port NTS	3-10
Upgrade Installation Procedures	3-12
Using Existing Cabling	3-13
Administering Terminals	3-17
Administering Terminals on NTS	3-17
Procedure	3-18
Terminal Options	3-23
715 Business Communications Terminal (BCT)	3-23
User Preferences Window	3-24
Communications Options Window	3-25
General Options Window	3-26
Display Options Window	3-27
Keyboard Options Window	3-28
Printer Options Window	3-29
705 Multi-Tasking (MT) Terminal	3-29
User Preferences Window	3-30
Communications Options Window	3-31
General Options Window	3-32
Display Options Window	3-33
Keyboard Options Window	3-34
Printer Options Window	3-35
615 Color Multi-Tasking (CMT) Terminal	3-36
615 Multi-Tasking (MT) Terminal	3-37
605 Business Communications Terminal (BCT)	3-38
620 Multi-Tasking Graphics (MTG) Terminal	3-39
2900/AWTC Display Terminal	3-40
User Preferences Window	3-41
Communications Options Windows	3-42
General Options Window	3-44
Display Options Window	3-45
Keyboard Options Window	3-46
Printer Options Window	3-47

4000/AWTC Display Terminal	3-48
User Preferences Window	3-49
Communications Options Windows	3-50
General Options Window	3-52
Display Options Window	3-53
Keyboard Options Window	3-54
Printer Options Window	3-55
2900/260lf Small Footprint Terminal.	3-56
F1 Quick Window	3-57
F2 Genrl (General) Window	3-58
F3 Displ (Display) Window.	3-59
F4 Kybd (Keyboard) Window.	3-60
F5 Keys Window	3-61
F6 Ports Window.	3-62
F7 Host Window	3-63
F8 Print Window	3-64
F9 Emul (Emulation) Window	3-65
F10 Tabs Window	3-66
F11 AnsBk (Answer Back) Window	3-67
F12 Prog (Program) Window.	3-68
PrtSc Exec (Print Screen Execute) Window	3-69
Administering Printers.	3-70
Serial Printers on the NTS.	3-70
Parallel Printers Connected to the NTS	3-79
Cable Connections	3-79
Procedure	3-81
Administering Modems	3-86
Modems Connected to the NTS	3-86
Outbound Modems	3-87
Inbound Modems	3-92
Modem Options	3-96
U.S. Robotics <i>Sportster</i> 33.6 Faxmodem	3-96
Chapter 4 Connecting the <i>Sun Enterprise 3000</i> System to the Switch	4-1
Overview	4-1
<i>Sun Enterprise 3000</i> HSI/S Patch Panel.	4-3
Serial Port B.	4-4
Connecting the <i>CentreVu</i> CMS to the Generic 3r Switch	4-5
Isolating Data Interface (IDI)	4-6
Required Parts	4-6
Procedure	4-7
7400D Data Module	4-9
Required Parts	4-9
Procedure	4-11
Private Line	4-13
Required Parts	4-13
Procedure for Connecting the <i>Sun Enterprise 3000</i> System to a Private Line	4-15
Procedure for Connecting a Generic 3r Switch to a Private Line	4-17
Connecting the <i>CentreVu</i> CMS to the Generic 2 Switch	4-18
Isolating Data Interface (IDI)	4-19
Required Parts	4-19
Procedure	4-21
Local Data Service Units (LDSUs)	4-22
Required Parts	4-22

Procedure	4-24
Remote Data Service Units (RDSUs)	4-25
Required Parts	4-25
Procedure	4-28
Analog Private Line	4-30
Required Parts	4-30
Procedure	4-32
Connecting the <i>CentreVu</i> CMS to the Generic 3i Switch	4-33
EIA Connector on the Processor Interface	4-33
Required Parts	4-34
Procedure	4-36
7400D Data Module	4-37
Required Parts	4-37
Procedure	4-39
Analog Private Line	4-40
Required Parts	4-40
Connecting the <i>Sun Enterprise</i> 3000 System to an Analog Private Line	4-42
Connecting the Generic 3i Switch to an Analog Private Line	4-43
Multiple Automatic Call Distribution (ACD) Connectivity	4-45
Adding an ACD	4-45
Prepare for Adding the ACD	4-46
Turn Off <i>CentreVu</i> CMS	4-49
Execute the “acd_create” Option	4-49
Connect the Link	4-49
Turn On <i>CentreVu</i> CMS	4-50

Chapter 5 Troubleshooting	5-1
Overview	5-1
Solving Hardware-Related Problems	5-2
Hardware Diagnostic Tools and Resources	5-2
OpenBoot Diagnostics	5-2
POST Messages Diagnostics	5-5
<i>SunDiag</i> Diagnostics	5-5
Checking Error Log Files	5-9
Checking Tape Related Problems	5-10
Diagnosing Remote Console Problems	5-11
Problem Solving Scenarios	5-11
Diagnosing Dial-In Access Problems	5-14
Identifying Link Problems	5-16
Checking the Status of LAPB	5-16
Stopping and Starting Individual Links	5-17
Starting and Stopping X.25	5-18
Checking Switch Administration	5-20
Checking the Cabling	5-21
Checking the RS-232 to RS-422 Interface Converter	5-22
Testing the HSI/S Card for Problems	5-24
System Fails to Recognize a New or Relocated HSI Card	5-26
Monitoring LAPB and X.25 Protocol	5-32
Bringing Up the Link	5-32
Identifying Port Problems	5-33
Network Terminal Server (NTS) Port Problems	5-33
Checking Port Connectivity	5-37
Resetting the Port	5-38
System Fails to Boot Properly	5-45

Power-On Initialization Sequence	5-45
Procedures	5-45
Preserving Data After a System Crash	5-46
System Will Not Boot from Disk	5-46
Probe-SCSI Command Problem	5-47
SCSI Problems	5-47
Blank Screen — No Output	5-49
Diagnosing Problems Using the Remote Console	5-51
Redirecting the Remote Console Using Solaris Operating System	5-51
Redirecting the Remote Console Using OpenBoot Diagnostics	5-54
Machine Panics	5-61
Procedures	5-61
Keyboard Gets Unplugged.	5-63
Solving Terminal-Related Problems	5-64
When an Existing Terminal Fails to Operate	5-65
When a New Terminal Fails to Operate	5-68
Diagnosing Network Terminal Server Problems.	5-70
Solving Printer-Related Problems.	5-76
Printers Connected to the NTS.	5-76
Additional Solutions	5-78
When the Enabled Printer Does Not Print	5-80
When the Printer Is Out of Paper	5-81
When the Current Printer Output Is Bad	5-81
How to Stop and Discard Current Print Job	5-82
How to Stop and Reprint Current Print Job.	5-83
When Print Jobs Are Not Being Printed	5-83
When Printers Lose Power	5-85
When Printer Is Out-of-Service —One Printer Configuration	5-85
How to Save Print Jobs	5-85
How to Reject Print Jobs	5-86
When Printer Is Out-of-Service — Two Printer Configuration	5-89
How to Route Print Jobs to Another Printer	5-89
How to Move Print Jobs in Queue to Another Printer	5-90
How to Reject Print Jobs	5-91
Solving Modem-Related Problems	5-93
Disconnecting U.S. Robotics Modems.	5-93
Solving Power-Related Problems	5-94
When System Loses Power	5-94
System Fails to Auto-Boot After Power Failure or When Given Reboot Command.	5-95
Solving Clock Synchronization Problems.	5-96

Chapter 6 Maintenance and Upgrade	6-1
Overview	6-1
Recovering from Disk Corruption	6-2
Restoring /cms	6-2
Restoring an Entire System	6-7
Restoring Specific Files	6-8
Recovering System Space.	6-9
Regaining System Space	6-9
Reinitializing the CentreVu CMS	6-9
Re-creating Specific Tables	6-11
Recovering CentreVu CMS File System Space	6-15
Adding Memory	6-16

Adding/Installing Swap Space	6-18
Installing an HSI/S Card	6-19
Changing the Date or Time	6-22
Changing the System Date and Time	6-22
Changing the System Country and Time Zones	6-24
Synchronizing Clocks	6-25
Adding, Removing or Replacing Tape Drives.	6-27
Overview	6-27
Replacing the Internal Tape Drive	6-27
Procedure	6-28
Adding an External Tape Drive.	6-28
Procedure	6-29
Removing the External Tape Drive	6-31
Procedure	6-31
Adding Network Terminal Servers	6-34
Changing Network Addresses	6-34
Appendix A Generic 3i Switch Administration.	A-1
Overview	A-1
Administering <i>CentreVu</i> CMS Interface on Generic 3i Switch.	A-2
Assigning the Processor Interface Data Module (PIDM)	A-3
Assigning a Data Module to the <i>Sun Enterprise 3000</i> System	A-4
Assigning the Processor Channel	A-6
Enabling the Interface Link	A-8
Enabling the EIA Port on the Processor Interface.	A-10
Appendix B Generic 2 Switch Administration	B-1
Overview	B-1
Administering <i>CentreVu</i> CMS on the DEFINITY Generic 2.1 Switch	B-2
Administering <i>CentreVu</i> CMS on the DEFINITY Generic 2.2 Switch	B-9
Appendix C Generic 3r Switch Administration	C-1
Overview	C-1
Administering the <i>CentreVu</i> CMS Interface on Generic 3r Switch	C-2
Changing Feature-Related System Parameters	C-3
Assigning the Packet Gateway Board	C-4
Assigning the Packet Gateway Port.	C-5
Assigning a Data Module to the Switch	C-7
Assigning a Data Module to the <i>Sun Enterprise 3000</i> System	C-9
Assigning the Processor Channel	C-11
Enabling the Interface Link on the Generic 3r Switch	C-13
Setting Up an Administered Connection.	C-14
Appendix D <i>Sun Enterprise 3000</i> System Factory Hardware Installation Procedures	D-1
Overview	D-1
General Procedures	D-2
Identifying Hardware Components	D-2
Identifying Free Board Slots	D-3
Installing and Removing Boards	D-4
Installing a Board	D-4
Removing a Board.	D-5
Installing Specific Components	D-6
Installing Single In Line Memory Modules (SIMMs)	D-6

Installing SBus Cards	D-9
Installing Additional CPU/Memory Boards	D-11
Power/Cooling Module	D-12
Redundancy.	D-12
Installing or Replacing a PCM	D-12
Installing an Internal Tape Drive	D-13
Installing an Internal Hard Disk Drive	D-15

Index	IN-1
------------------------	-------------

Preface

Overview	P-1
Organization	P-1
<i>CentreVu</i> CMS Documents	P-3
Other <i>CentreVu</i> Documents	P-4

Overview

The *CentreVu™ Call Management System Release 3 Version 5 Sun® Enterprise™ 3000 System Hardware Installation and Maintenance*, Issue 1 (585-215-837) 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* Enterprise†* systems using the *Solaris‡* 2.5.1 operating system.

Organization

This document is organized as follows:

- **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 Enterprise* system, roles and responsibilities, and helpline information.
- **Chapter 2 — Installing the *Sun Enterprise 3000* System**

Describes how to set up the *Sun Enterprise 3000* system at the customer's location.
- **Chapter 3 — Installing Terminals, Printers, and Modems**

Describes how to install terminals, printers, and modems for the *CentreVu* CMS application.
- **Chapter 4 — Connecting the *Sun Enterprise 3000* System to the Switch**

Describes how to connect the *Sun Enterprise 3000* system to Lucent Technologies switches. In addition, it discusses multi-ACD connectivity.
- **Chapter 5 — Troubleshooting**

Discusses how to fix various software, hardware (including terminals, printers, and modems), power, and installation problems.
- **Chapter 6— Maintenance and Upgrade**

Discusses recovering from a disk corruption or crash, recovering system space, and other maintenance and upgrade procedures.

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

†Enterprise is a trademark of Sun Microsystems, Inc.

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

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

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

- **Appendix B — Generic 2 Administration**

Describes how to administer the *CentreVu* CMS application for Generic 2 switches.

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

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

- **Appendix D — *Sun Enterprise 3000 System* Factory Hardware Installation Procedures**

Outlines the factory hardware installation procedures for the *Sun Enterprise 3000* system. 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 2 (585-215-826)*
- *CentreVu™ Call Management System Release 3 Version 5 Sun® SPARCserver™ Computers Installation and Maintenance (Volumes 1 and 2), Issue 2 (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 Sun® Enterprise™ 3000 Software Installation, Issue 1 (585-215-836)*
- *CentreVu™ Call Management System Release 3 Version 5 Sun® Enterprise™ 3000 System Hardware Installation and Maintenance, Issue 1 (585-215-837)*
- *CentreVu™ Call Management System Release 3 Version 5 Sun® Enterprise™ 3000 System Connectivity Diagram, Issue 1 (585-215-838)*
- *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:

- *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)
- *CentreVu™ Supervisor Version 5 Change Description, Issue 1* (585-215-832).

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

Chapter 1

Introduction

Overview	1-1
Supported Features	1-1
Supported Hardware Platforms	1-1
Required Software	1-2
Supported Switch Releases	1-2
Purpose of the <i>Sun Enterprise 3000</i> System	1-3
<i>AnswerBook</i> Software	1-3
Starting <i>AnswerBook</i> Software	1-4
Navigating Through <i>AnswerBook</i> Software	1-5
Exiting <i>AnswerBook</i> Software	1-5
Roles and Responsibilities	1-6
<i>CentreVu</i> CMS Helplines	1-8
Customer Number	1-8
Technician Number	1-8
International Support	1-8

List of Tables

Table 1-1: Task Responsibility	1-7
---	------------

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.

Supported Features

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** *Enterprise*† 3000 system
- *Sun SPARCserver*‡ 20
- *Sun SPARCserver* 10**
- *Sun SPARCserver* 5
- NCR System 3000 Model 3332
- *StarServer*†† S
- 6386 WGS 33/S
- 6386 WGS 25/S.

This manual addresses only the *Sun Enterprise* 3000 System.

**Sun* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

†*Enterprise* is a trademark of Sun Microsystems, Inc. in the United States and other countries

‡All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the United States and other countries.

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

††*StarServer* is a registered trademark of AT&T.

Required Software

To operate properly, *CentreVu* CMS R3V5 requires the following software packages on the *Sun Enterprise 3000* system:

- *Solaris*^{*} 2.5.1
- Common Desktop Environment (CDE) 1.0.2
- HSI/S 2.0v1.37 (for systems having multiple ACDs)
- *INFORMIX*[†] 7.13
- R10.0-R4.2 Network Terminal Server
- *SunLink*[‡] X.25 Network Interface Software, Version 9.0 or later.
- *Solstice DiskSuite*^{**} 4.0

Supported Switch Releases

The *CentreVu* CMS R3V5 is certified to run with the following *DEFINITY*^{††} switches:

- *DEFINITY*[®] Communications System Generic 2.1 Release 3.3 (QPPCN 629DR) and later.
- *DEFINITY* Communications System Generic 2.2 Release 3.0 (QPPCN 696DR) and later
- *DEFINITY* Communications System Generic 3i Release 13.3 (QPPCN 576) and later
- *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.

**Solaris* is a registered trademark of Sun Microsystems, Inc. in the United States and other countries.

†*INFORMIX* is a registered trademark of Informix Software, Inc.

‡*SunLink* is a registered trademark of Sun Microsystems, Inc. in the United States and other countries.

***Solstice DiskSuite* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

††*DEFINITY* is a registered trademark of Lucent Technologies.

Purpose of the Sun Enterprise 3000 System

The *Sun Enterprise* 3000 system 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
- Provide multiprocessor capabilities for performance (up to six CPUs, 250-MHz clock)
- Improve reliability (redundant power supplies, redundant cooling fans, disk mirroring, enhanced Automatic Recovery System [ARS])
- Improve storage capacity (up to 42 GB of internal disk storage)
- Allow for cost-effective future upgrades (Ultra *SPARC* processors, disks, tape drives, SBus cards, and network interface cards)
- Provide on-line help via *AnswerBook*^{*} software package.

AnswerBook Software

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 Common Desktop Environment (CDE) interface running. The *AnswerBook* software package uses the following pair of windows for browsing, searching, bookmarking, and printing on-line document collections:

- *AnswerBook* Navigator v3.5.1
- *AnswerBook* Viewer v3.5.1.

The *AnswerBook* software installed on your system should include the following:

- *Solaris* 2.5 System Administrator Handbook
- *Solaris* 2.5.1 Supplemental System Administration *AnswerBook*
- *Solaris* 2.5 Reference Manual *AnswerBook*
- *Enterprise* 3000 Hardware *AnswerBook*

If these packages are not installed on your system, see the *CentreVu* Call Management System Release 3, Version 5, *Sun Enterprise* 3000 System, Software Installation document (585-215-837), Appendix B, "Installing the Solaris *AnswerBook* Software" for details.

^{*}*AnswerBook* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

To save hard disk space, the data for the *AnswerBook* software package are not stored on the hard disk. To access the data, you must insert the Server Supplement 1.1 CD into the CD-ROM drive.

See the *AnswerBook Administration Guide*, provided with your *AnswerBook* CD for more details.

Starting *AnswerBook* Software

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

1. Start the CDE interface.
If the interface is not displayed, reboot the machine.
2. Remove the “Server Supplement 1.1” CD from its case.
If you have an external CD-ROM drive, do the following steps 2a through 2c. Otherwise, go to step 3.
 - a. Place the CD in the CD-ROM caddy. When the CD is properly inserted in the caddy, the label is visible.
 - b. Insert the CD-ROM caddy into the CD-ROM drive.
 - c. Go to step 6.
3. Open the CD-ROM drive by pressing the unit’s eject button.
4. Gently press the CD into place in the drive tray. When the CD is properly inserted in the tray, the label is visible.
5. Push in the tray until it closes.
6. Enter the following command:

```
# answerbook
```

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

The *AnswerBook* Viewer 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 window and the *AnswerBook* Viewer window, you quit both the Navigator and the Viewer; quitting the *AnswerBook* Viewer 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 Enterprise 3000* system.

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 Enterprise 3000 System Factory Hardware Installation Procedures” .

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

Table 1-1: Task Responsibility

Chapter	Task	Tech	TSC	Customer
2	Installing the <i>Sun Enterprise 3000</i> System	X		
3	Installing terminals, printers, and modems	X		
4	Connecting <i>Sun Enterprise 3000</i> System to the switch	X		
4	Multiple ACD connectivity (adding an ACD)	X	X	X
5	Solving <i>CentreVu</i> CMS-related problems	X	X	X
5	Solving hardware-related problems	X	X	
5	Solving terminal-related problems	X	X	X
5	Solving printer-related problems	X	X	X
5	Solving modem-related problems	X	X	X
5	Solving power-related problems	X	X	X
5	Solving clock synchronization problems	X	X	
6	Recovering from a disk crash	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 *CentreVu* CMS R3V5) 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 Enterprise* 3000 system, 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

Installing the Sun Enterprise 3000 System

Overview	2-1
Installing the <i>Sun Enterprise 3000</i> System	2-5
Unpacking and Inventorying the Equipment	2-5
Assembling the <i>Sun Enterprise 3000</i> System and System Console	2-6
SBus I/O Board and Components	2-7
Identifying Installed SBus Cards	2-7
Installing or Changing SBus Cards	2-10
Other SBus Cards	2-11
External I/O Components and Interfaces	2-12
Overview	2-12
Connecting the <i>SunLink</i> HSI/S Patch Panel	2-13
Setting the Black Box DTE/DCE DIP Shunts	2-14
Connecting the HSI/S Patch Panel to the Interface Converter	2-16
Connecting the Network Hub Unit	2-17
Optional Fiber-Optic Network Configurations	2-18
Installing the Allied Telesis <i>CentreCOM</i> Network Hub Unit	2-21
Installing the StarLAN 10 Network Fiber-Optic Hub Unit	2-23
Connecting the NTS(s) to the Network Hub Unit	2-24
Connecting the NTS Patch Panel(s) to the 64-Port NTS	2-29
Other Devices and Connections	2-31
Overview	2-31
Connecting the UPS	2-32
Required Parts	2-32
Procedure	2-32
Connecting the Remote Console Modem	2-33
Powering Up the System and Verifying POST	2-34
Setting the Remote Console Modem Options	2-36
Connecting to Another Network	2-37
Connecting to Another Network (Via Dumb Terminal)	2-42

List of Figures

Figure 2-1:	Front and Rear Views of the <i>Sun Enterprise 3000</i> System	2-1
Figure 2-2:	<i>Sun Enterprise 3000</i> System — Peripheral Connectivity	2-2
Figure 2-3:	<i>Sun Enterprise 3000</i> System and System Console Connectivity	2-6
Figure 2-4:	SBus I/O Board SBus Card Locations	2-7
Figure 2-5:	Plastic Standoffs for SBus Cards	2-10
Figure 2-6:	<i>SunLink</i> HSI/S Patch Panel Connectivity	2-13
Figure 2-7:	Black Box Component Layout — DTE/DCE DIP-Shunt Locations	2-14
Figure 2-8:	Black Box Interface Converter Connectivity	2-16
Figure 2-9:	Optional/Sample Fiber-Optic Configuration — Version 1	2-18
Figure 2-10:	Optional/Sample Fiber-Optic Configuration — Version 2	2-19
Figure 2-11:	Optional/Sample Fiber-Optic Configuration — Version 3	2-20
Figure 2-12:	Network Hub Units — Back Panel	2-22
Figure 2-13:	StarLAN 10 Network Fiber-Optic Hub Unit	2-23
Figure 2-14:	8-, 16-, and 64-Port NTSs — Back Panels	2-25
Figure 2-15:	<i>Sun Enterprise 3000</i> System NTS Connectivity	2-28
Figure 2-16:	64-Port Network Terminal Server — PBX-Champ Connectors and Port Definitions	2-29
Figure 2-17:	NTS Patch Panel	2-30
Figure 2-18:	Remote Console Connectivity	2-33
Figure 2-19:	Options for the U.S. Robotics <i>Sportster</i>	2-36
Figure 2-20:	Network Terminal Servers — Back Panel	2-44
Figure 2-21:	Network Terminal Server — Front Panel	2-45

List of Tables

Table 2-1:	<i>Sun Enterprise 3000 System Connectivity References</i>	2-3
Table 2-2:	DTE/DCE DIP - Shunt Settings	2-14
Table 2-3:	Maximum Network Cable Distances	2-17
Table 2-4:	Network Hub Port Connectivity	2-26
Table 2-5:	UPS(s) and Part Numbers	2-32
Table 2-6:	<i>CentreVu CMS Standard Network IP Addresses</i>	2-42

Overview

This chapter describes how to install the Sun^{*} Enterprise[†] 3000 System and related peripheral equipment, including the following:

- Sun Enterprise 3000 System and system console
- 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)
- Uninterruptible Power Supply (UPS) (optional)
- Remote Console modem
- Connecting to Another Network.

Figure 2-1 shows the front and rear panels of the Sun Enterprise 3000 System and the locations of peripheral connections.

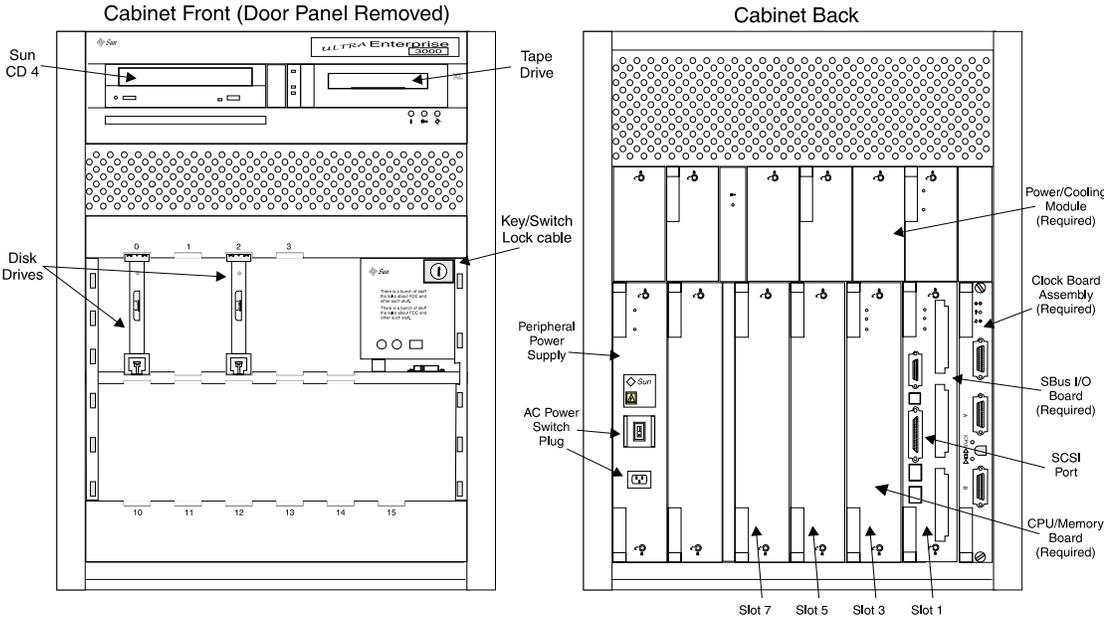


Figure 2-1: Front and Rear Views of the Sun Enterprise 3000 System

*Sun is a registered trademark of Sun Microsystems, Inc. in the United States and other countries.
† Enterprise is a trademark of Sun Microsystems, Inc. in the United States and other countries.
‡SunLink is a registered trademark of Sun Microsystems, Inc. in the United States and other countries.

Figure 2-2 shows how the peripheral equipment is connected to the *Sun Enterprise 3000 System*. Note the example of terminal, printer, and modem connectivity. This example shows the hardware that you can use to connect peripherals.

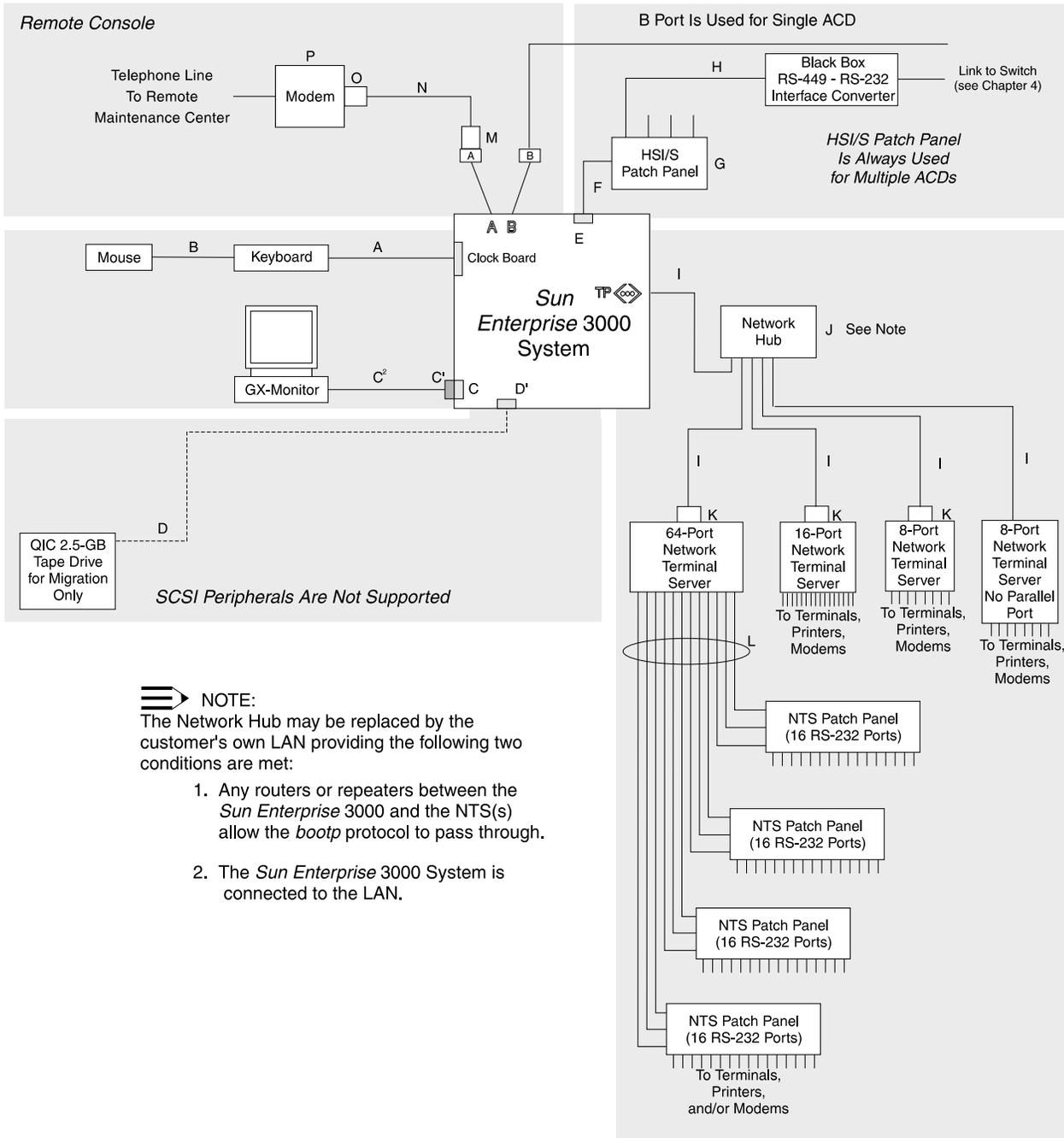


Figure 2-2: *Sun Enterprise 3000 System* — Peripheral Connectivity

Table 2-1 lists the parts required to connect peripherals to the *Sun Enterprise 3000* System.

Table 2-1: *Sun Enterprise 3000* System Connectivity References

Figure 2-2 Call Out	Part of Comcode	Vendor Part Number	Description
A	407361815	F530-2154-01	Keyboard Cable - 15' keyboard cable
B		370-1398-02	Mouse with Cable
C	407761063	595-3865-01	Turbo GX Card (must be installed in SBus slot 0)
C'	407780442	F130-3034-01	13W3-pin connector adapter (required for entry level high resolution color monitor)
C ²	407361807	F530-2020-01	Monitor Cable - 4-meter monitor cable
D		F530-2115-02	SCSI Cable, 50-to-68 pin (for migration only)
D'	407068337	X1053A?	FSBE/S Card (installed in SBus slot 2)
E			HSI/S Card
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	Allied Part # - AT-MR820T-15	Allied Telesis <i>CentreCOM</i> [*] Network Hub Unit
K	407086859	<i>CentreCOM</i> 210TS	10Base-T Transceiver
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

Table 2-1: *Sun Enterprise 3000 System Connectivity References (Contd)*

Figure 2-2 Call Out	Part of Comcode	Vendor Part Number	Description
P	407633999	<i>Sportster</i> [†] 33.6 Faxmodem	Remote Console Modem
Q	407122068		DB-25 M/M Direct-Connect Link Adapter
	406783613		DB-25 M/M Gender Converter
R			Standard RS-232 Cable
See Note	407144229	4261-1002-0600	StarLAN 10 Network Fiber Hub
	407144203	LDI-10FL	10Base-FL Transceiver

* *CentreCOM* is a registered trademark of Allied Telesis.

† *Sportster* is a registered trademark of U.S. Robotics Access Corp.

 NOTE:

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

Installing the *Sun Enterprise 3000 System*

Unpacking and Inventorying the Equipment

Unpack the *Sun Enterprise 3000 System* and associated peripheral equipment. Verify the equipment delivered using the shipping papers.

 **NOTE:**

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

 **NOTE:**

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

Contact the Technical Service Center (TSC) for any *Sun Enterprise 3000 System* 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 (for multiple ACDs only). 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 Chapter 5, "Troubleshooting, Testing the HSI/S Card for Problems," for details.

 **WARNING:**

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

Assembling the Sun Enterprise 3000 System and System Console

This section describes how to connect the system console peripherals to the *Sun Enterprise 3000 System* (see Figure 2-3).

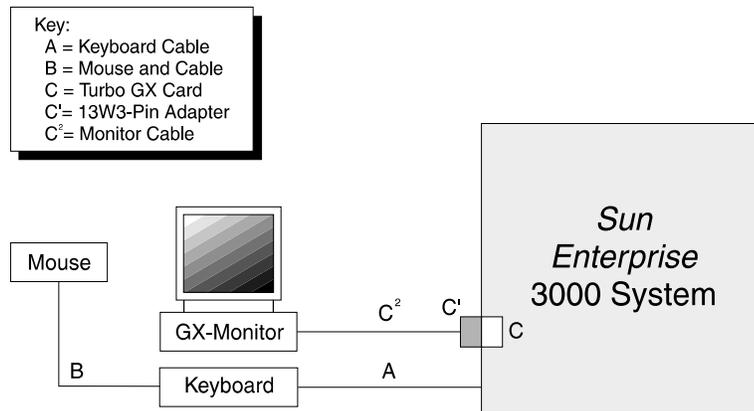


Figure 2-3: Sun Enterprise 3000 System and System Console Connectivity

To assemble the *Sun Enterprise 3000 System* and system console, do the following:

1. Place the system in the location selected by the customer. Make sure the power switch is set to *Off*.
2. Connect the following components (see Figure 2-3):
 - Keyboard
 - Mouse
 - Monitor
 - Power cord (to a wall outlet or to a UPS, 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 Enterprise 3000 System, Installation Guide

Sun Enterprise 3000 System, System Manual

*On-line AnswerBook**

for the Sun Enterprise 3000 System and for the documentation supporting the Solaris[†] 2.5.1 software environment.

*AnswerBook is a trademark of Sun Microsystems Inc. in the United States and other countries.

†Solaris is a trademark of Sun Microsystems Inc. in the United States and other countries.

SBus I/O Board and Components

There must be at least one SBus I/O board installed in the system and an SBus I/O board must be installed in Slot 3 (see Figure 2-1).

Identifying Installed SBus Cards

This section describes how to identify SBus cards and their locations within the *Sun Enterprise 3000 System*.

SBus card locations are provided on the SBus I/O board. There are three SBus card locations on the SBus I/O board. The locations are shown in Figure 2-4.

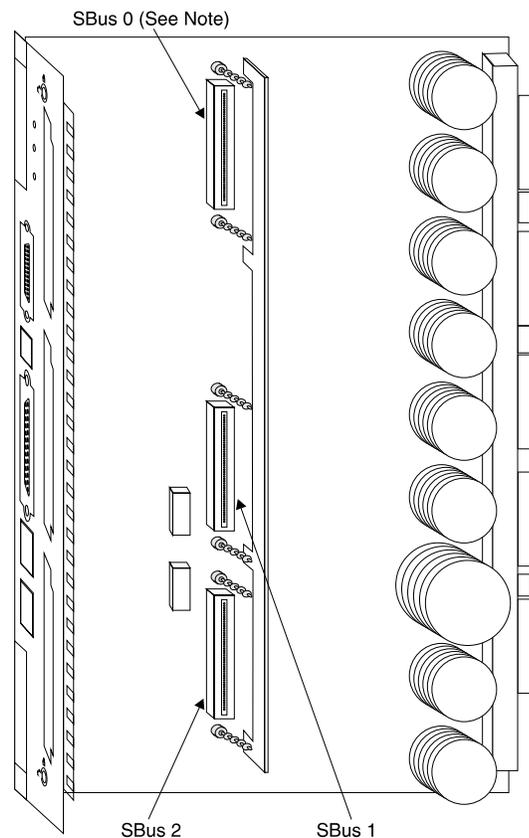


Figure 2-4: SBus I/O Board SBus Card Locations

➤ NOTE:

The SBus 0 card slot for the SBus I/O board in slot 1 must contain a Turbo GX video card. You need to install this card (see “Installing or Changing SBus Cards” in this chapter).

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 the *Sun Enterprise 3000* System. These names are as follows:

- cgsix (Turbo GX video card)
- HSI (HSI/S card)
- lebuffer le dma esp (FSBE/S card in *Sun Enterprise 3000* System)
- tr (Token Ring Interface card)

To identify SBus cards in the *Sun Enterprise 3000* System, do the following:

1. Assemble your system (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 Enterprise 3000 System...</i>	<i>If You Have Not Yet Powered Up the Sun Enterprise 3000 System...</i>
<p><i>then</i> stop the operating system by executing the shutdown command:</p> <pre>/usr/sbin/shutdown -y -i0 -g0.</pre>	<p>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.</p>

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



3. Enter the `show-devs` command at the `ok` prompt:

The following is an example of what you would see after entering the `show-devs` command.

```
{e} ok show-devs
/counter-timer@7,3000
•
/sbus@3,0/cgsix@0,0
•
•
/sbus@2,0/HSI@1,20000
•
/sbus@2,0/lebuffer@2,40000/lw@2,60000
•
•
```

In the above example:

- `/sbus@3,0/cgsix@0,0` shows the Turbo GX video card
- `/sbus@2,0/HSI@1,20000` shows an HSI card
- `/sbus@2,0/lebuffer@2,40000/lw@2,60000` shows a FSBE/S card.

The display you will see depends on the equipment and configuration of your system.

Installing or Changing SBus Cards

Initially, the SBus I/O board must have a Turbo GX video card installed in SBus card slot 0 and an FSBE/S card installed in card slot 2 (see Figure 2-4). Other cards may need to be installed or changed depending on the configuration required by the customer.

Follow the steps below to install an SBus card:

1. Remove the SBus I/O Board from slot 1 (see Figure 2-1, and Appendix D, “Sun Enterprise 3000 System Factory Hardware Installation Procedures, General Procedures”).

⚠ CAUTION:

Always wear an ESD wrist strap and use an anti-static pad whenever working with electronic components.

2. If there is an SBus card that is being replaced, remove it from the SBus I/O board (see the *Sun Enterprise 3000 System, System Manual, Chapter 4, section 4.5.4.2, “Removing an SBus Card”*).
3. Unpack the new SBus card and prepare it for installation.

⇒ NOTE:

Depending on the card and packaging, some card preparation other than care in unpacking may be required. See the *Sun Enterprise 3000 System, System Manual, Chapter 4* for further information.

4. If the plastic standoffs for the desired SBus card slot are locked (in the down position), gently lift up on the tip inserts until they move to the unlocked position (see Figure 2-5).

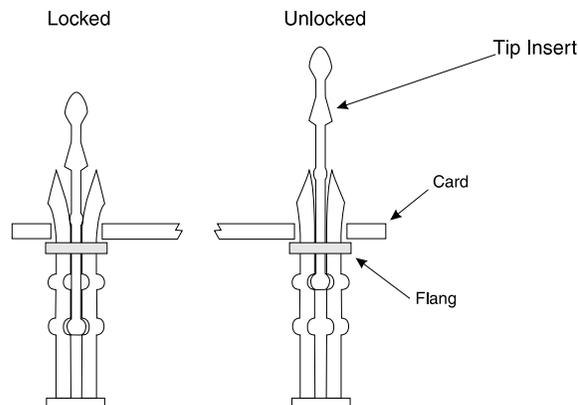


Figure 2-5: Plastic Standoffs for SBus Cards

5. Holding the SBus card by the edges, place the SBus card face plate under the springfinger and against the rear face of the SBus I/O board front panel.

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

6. Align the mounting holes in the rear of the SBus card with the unlocked plastic standoffs.
7. Press down on the rear corners of the SBus card until it seats onto the flange of the plastic standoffs.
8. Press down on the tip insert of each plastic standoff until it locks into position (see Figure 2-5).
9. Replace the face plate screws through the front of the SBus I/O board to secure the SBus card to the SBus I/O board front panel.
10. Replace the SBus I/O board in the slot from which you removed it in step 1 (see the *Sun Enterprise 3000 System, System Manual*, Chapter 4, section 4.5.3, "Installing a Board").

⇒ NOTE:

After an I/O board has been removed and replaced, the system may experience a clock synchronization problem. The clock on the I/O board will become unsynchronized with the clock on the Clock Board. For the procedures to re-synchronize these clocks, see Chapter 6, "Maintenance and Upgrade, Synchronizing Clocks."

Other SBus Cards

Other SBus cards that may need to be installed include the HSI card, and the Token Ring card.

Some SBus cards require additional steps or preparation. For information on specific card requirements see the *Sun Enterprise 3000 System, System Manual*, section 4.5.4 *SBus Cards*.

⇒ NOTE:

Sometimes when installing or moving an HSI card the system will fail to recognize the new or moved card. In this case, show-devs does not show the HSI card and /var/adm/messages fails to recognize the card upon bootup. In this case, see Chapter 5, "Troubleshooting, System Fails to Recognize a New or Relocated HSI Card."

Additional References

For additional information on installing SBus cards see the *Sun Enterprise 3000 System, System Manual*, Chapter 4, I/O Boards and Components, section 4.5.4, "SBus Cards."

External I/O Components and Interfaces

Overview

A variety of external I/O components and interfaces may be required depending on the configuration chosen by the customer. This section describes some of the most likely configurations.

Refer to the following subsections as appropriate for your installation:

- Connecting the SunLink HSI/S Patch Panel (for Multiple ACDs only)
- Setting the Black Box DTE/DCE DIP Shunts
- Connecting the Network Hub Unit
- Other Devices and Connections.

Connecting the SunLink HSI/S Patch Panel

This section describes how to connect the HSI/S patch panel to the HSI/S controller card (installed in the *Sun Enterprise 3000 System*) using a 96-pin cable (see Figure 2-6, shaded portion).

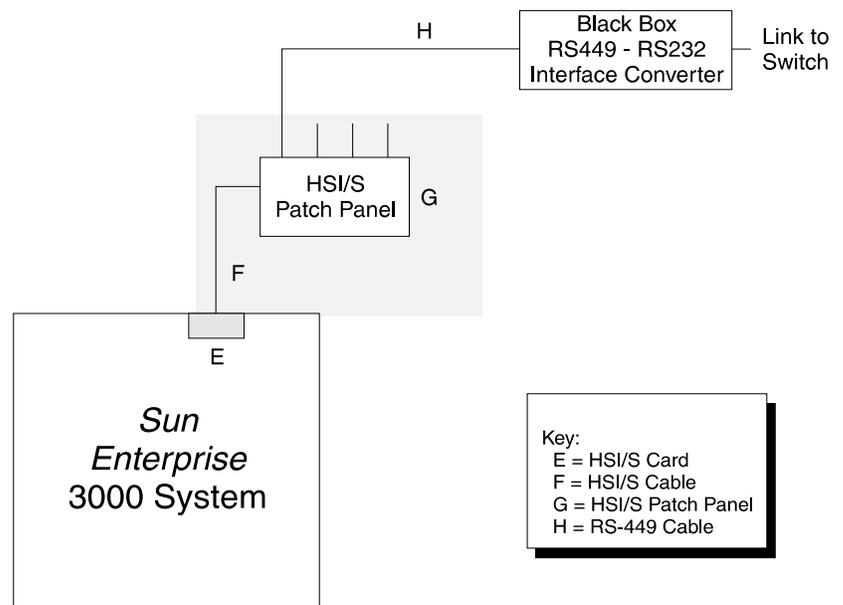


Figure 2-6: SunLink HSI/S Patch Panel Connectivity

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

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 2-2 and Figure 2-7).

Table 2-2: DTE/DCE DIP - Shunt Settings

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

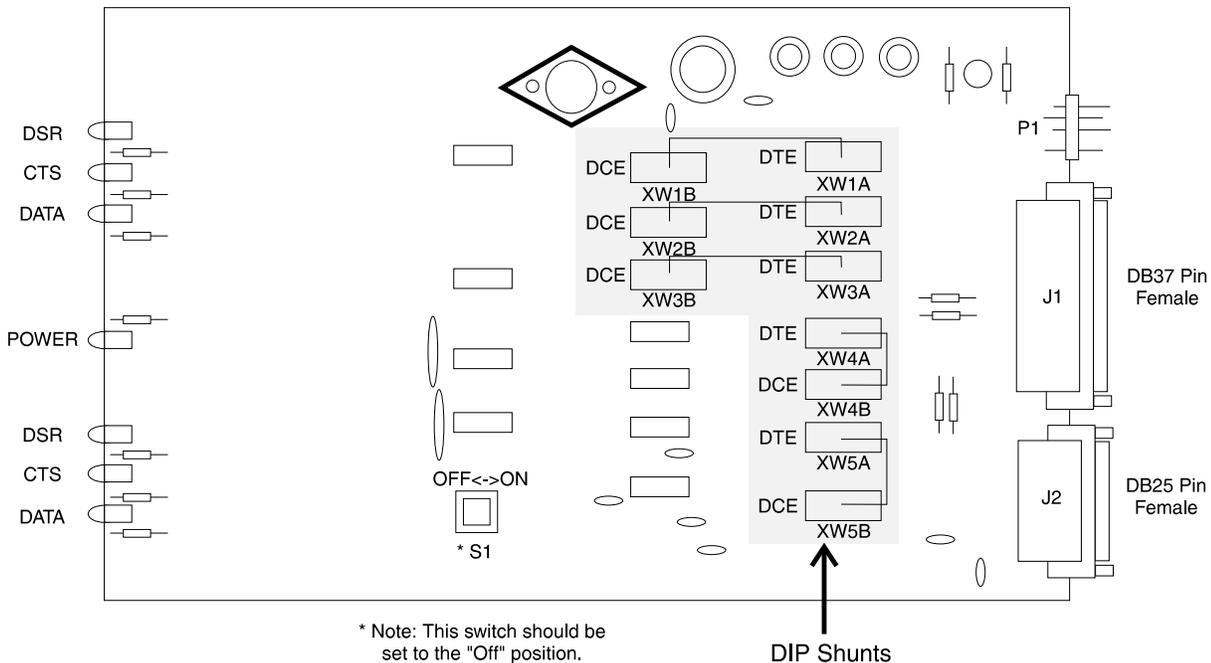


Figure 2-7: Black Box Component Layout — DTE/DCE DIP-Shunt Locations

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:

 **CAUTION:**

Always use an ESD strap when handling internal components. Be careful when moving the DIP shunts. The DIP-shunt pins are fragile and can easily be bent or broken.

- a. Carefully slide the tip of a common screwdriver between the DIP-shunt jumper and the DIP-shunt socket.
- b. Gently pry/wiggle the DIP-shunt jumper free from the socket.
- c. Move the DIP-shunt jumper to the appropriate socket (see Table 2-2).
- d. Carefully align the pins, and gently press the DIP-shunt jumper into place.

Additional References

For additional information, refer to the RS-232 ↔ RS-422 Interface Converter Installation and Operation Manual, Section 2.0, “Introduction,” Section 3.0, “Installation,” and Section 4.0, “Configuration.”

Connecting the HSI/S Patch Panel to the Interface Converter

This section describes how to connect multiple ACDs using RS-449 ports on the HSI/S patch panel to the RS-422/RS-449 DCE port on the black box interface converter (see Figure 2-8, shaded portion).

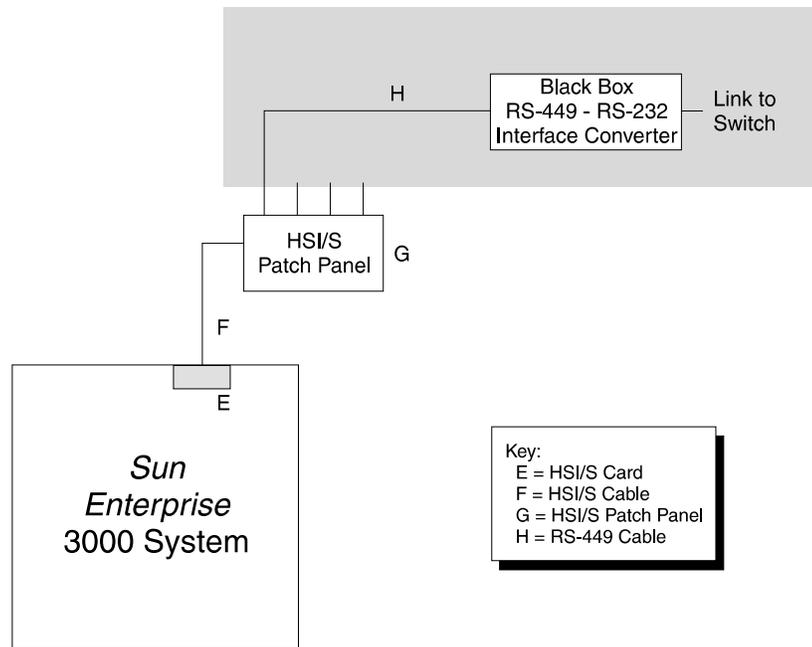


Figure 2-8: Black Box Interface Converter Connectivity

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:

When connecting 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 Enterprise 3000 Installation Guide

Sun Enterprise 3000 System Description.

Connecting the Network Hub Unit

This section describes how to connect the network hub unit(s) to the *Sun Enterprise 3000* System using 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 (see Figure 2-12). This unit uses standard UTP network cables.
- Allied Telesis *CentreCOM*†- MR820TR network hub unit (see Figure 2-12). This unit uses standard UTP network cables.
- StarLAN fiber-optic hub unit (see Figure 2-13). This unit uses fiber-optic network cables.

The standard *CentreVu* CMS configuration uses the *IBM* 8222 network hub unit or the Allied Telesis *CentreCOM* - MR820TR network hub unit. The StarLAN fiber-optic hub can be used when you need more distance between the network hub and the NTS(s). Table 2-3 shows the maximum distances associated with each type of network cable.

Table 2-3: Maximum Network Cable Distances

Type of Cable	Maximum Cable Distance
UTP (Category 3 or 5)	100 meters / 328 feet
15-pin AUI (Asynchronous Unit Interface)	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), a fiber-optic configuration can be used. See *Optional Fiber-Optic Network Configurations* for details.

**IBM* is a registered trademark of International Business Machines Corp.

†*CentreCOM* is a registered trademark of Allied Telesis.

Optional Fiber-Optic Network Configurations

This section briefly describes optional 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.

Figure 2-9 shows a configuration that uses 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 Enterprise 3000* System, network hub, and one NTS are located in one building, the fiber-optic hub and another NTS are located in a separate building, and another network hub with two additional NTSs are located in yet another separate building.

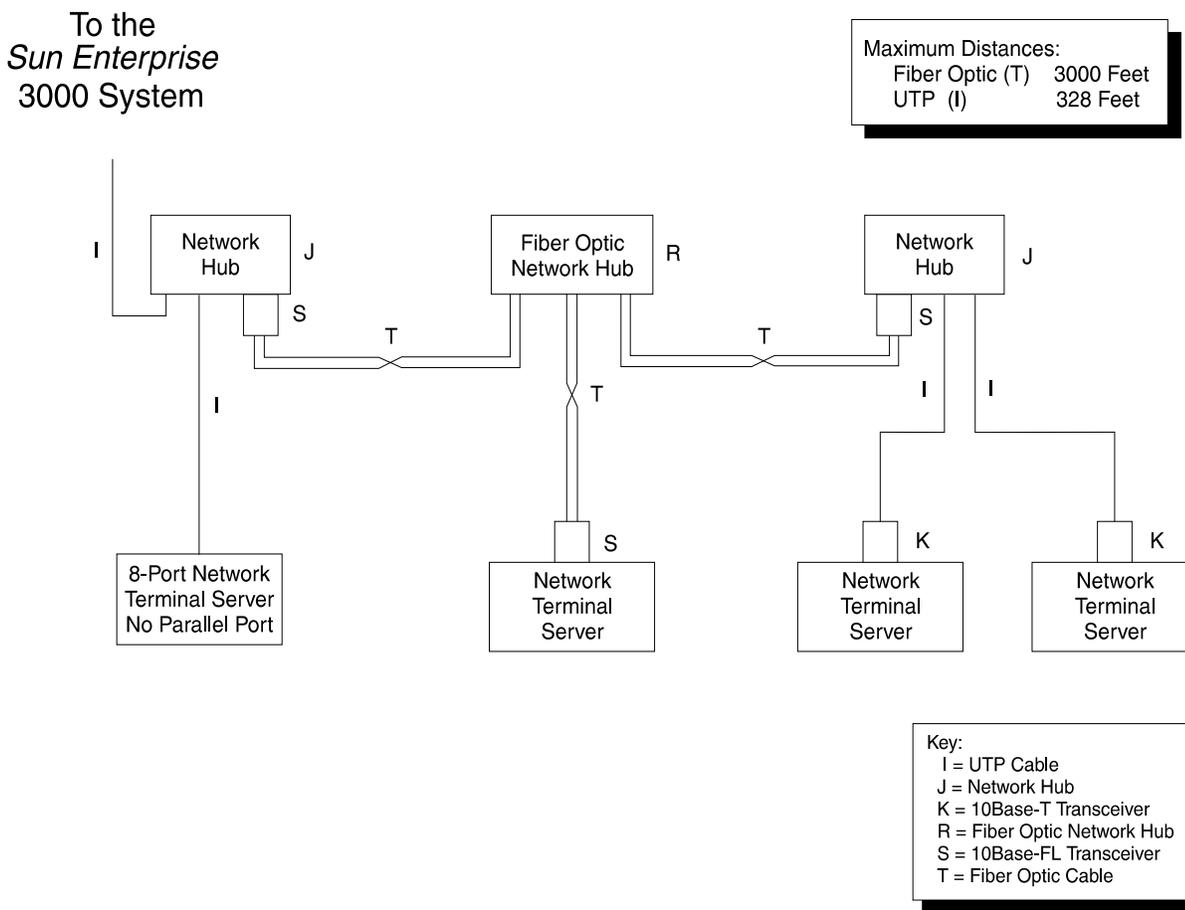


Figure 2-9: Optional/Sample Fiber-Optic Configuration — Version 1

Figure 2-10 shows two network hubs connected with a fiber-optic cable. This configuration allows the network to be spread across two separate buildings. This would be useful in a situation where the *Sun Enterprise 3000* System, network hub, and two NTSs are located in one building, while the other network hub and remaining two NTSs are located in another building.

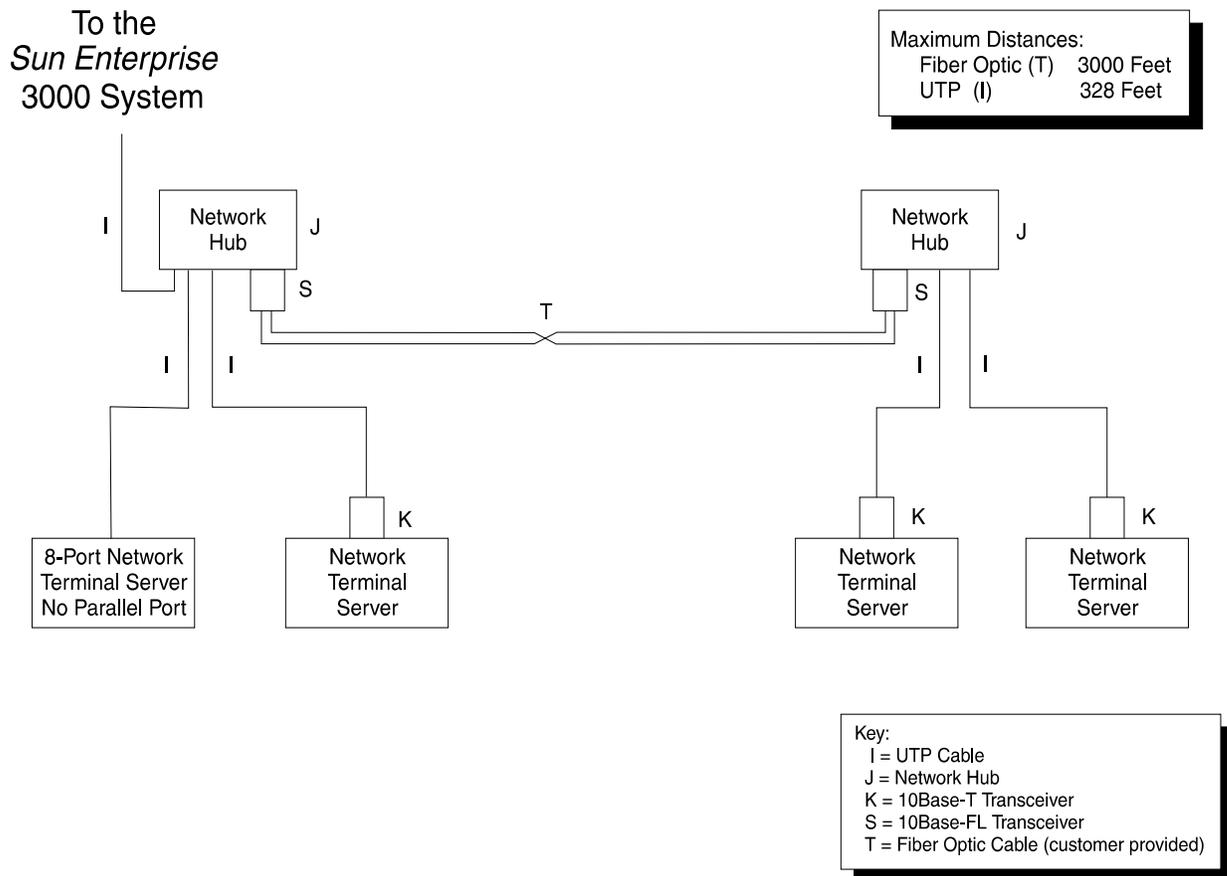


Figure 2-10: Optional/Sample Fiber-Optic Configuration — Version 2

Figure 2-11 shows a network hub connected to four NTSs. This would be useful in a situation where the *Sun Enterprise 3000 System*, network hub, and three NTSs are located in one building, while another NTS is located in a separate building.

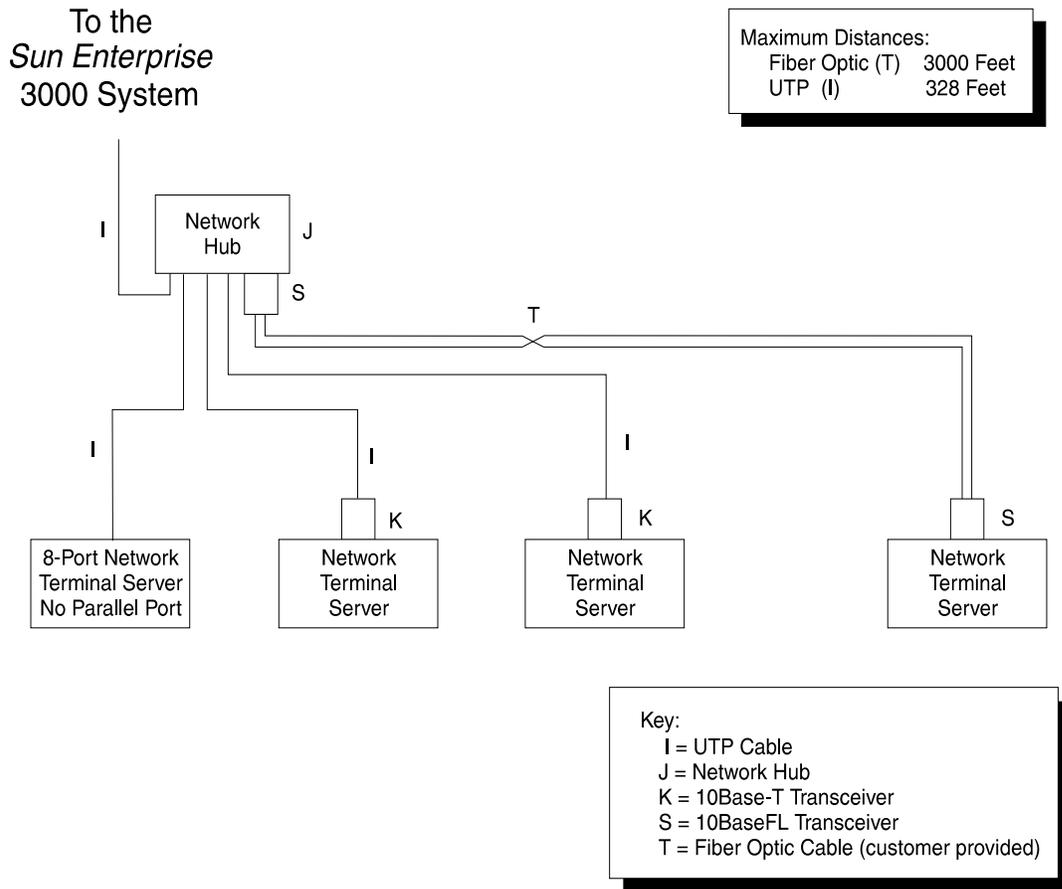


Figure 2-11: Optional/Sample Fiber-Optic Configuration — Version 3

Installing the Allied Telesis *CentreCOM* Network Hub Unit

This section describes how to connect the Allied Telesis *CentreCOM* network hub unit to the *Sun Enterprise* 3000 System. This network hub unit may be used in conjunction with other network hub units.

To connect the network hub unit to the *Sun Enterprise* 3000 System, do the following (see Figure 2-12):

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 Enterprise* 3000 System.

Use the UTP cable that came with your *Sun Enterprise* 3000 System (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 2-12).

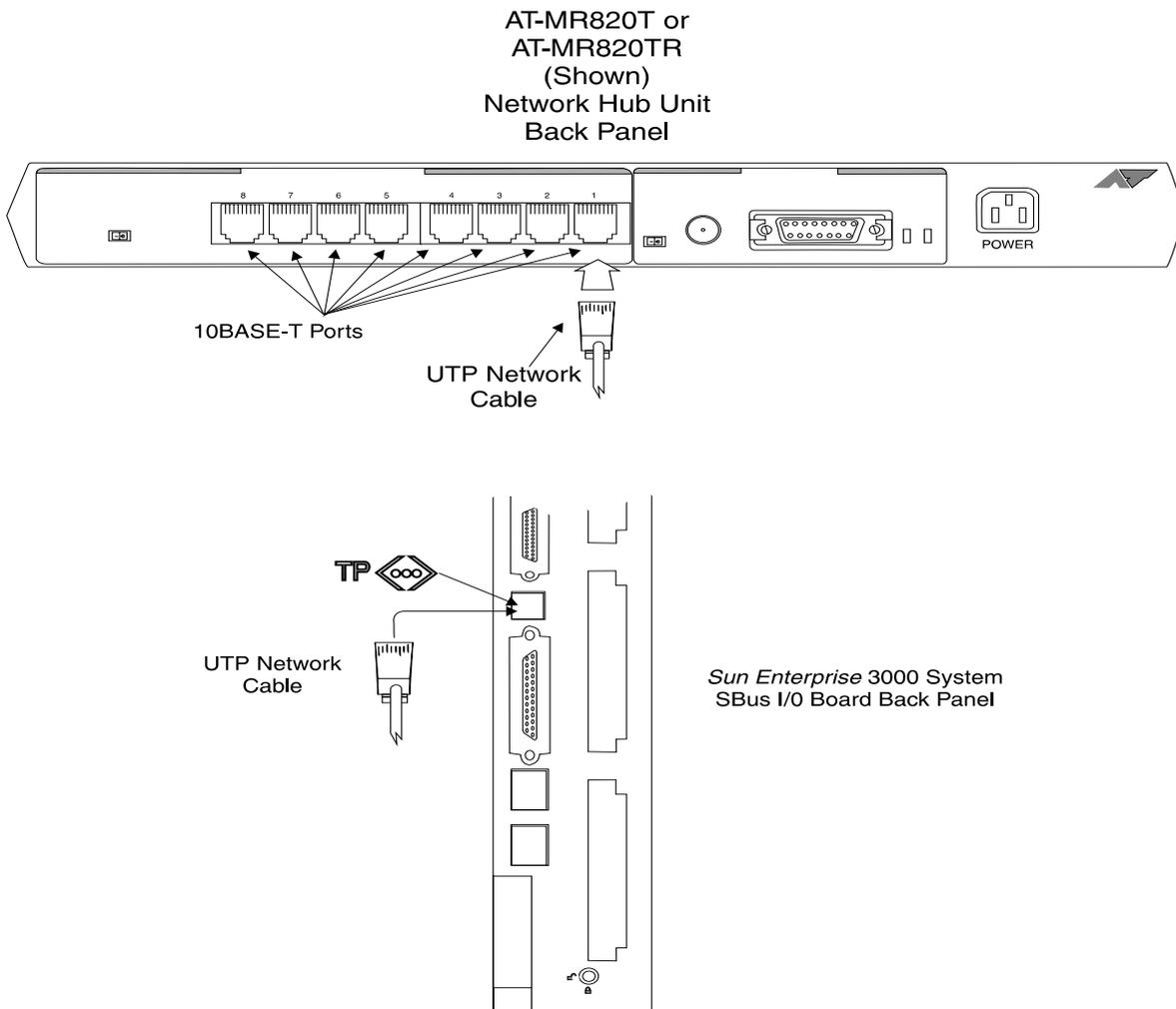


Figure 2-12: Network Hub Units — Back Panel

Additional References For additional information, refer to the Allied Telesis *CentreCOM AT-820TR Multiport 10BASE-T Micro Repeaters Installation 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 Enterprise 3000* System. 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 2-13):

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 (see Note) into a set of transmit (Tx) and receive (Rx) connectors on the front of the network fiber-optic hub unit (see Figure 2-13).

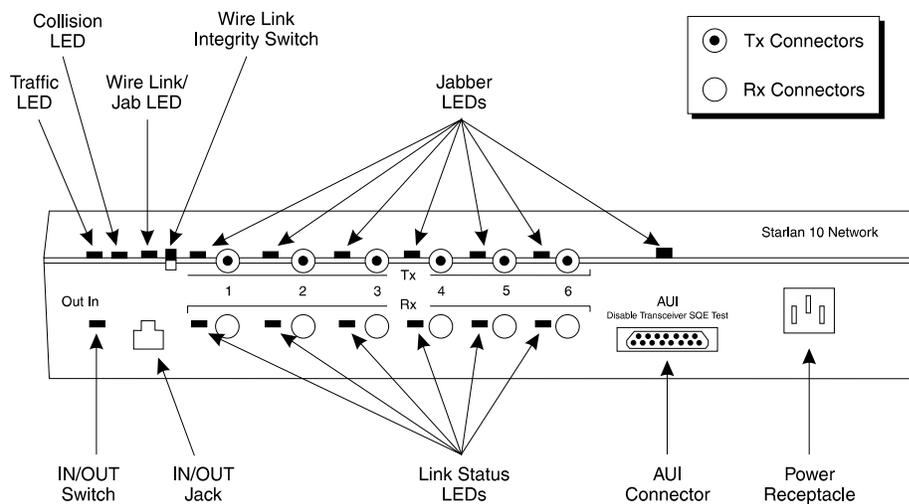


Figure 2-13: StarLAN 10 Network Fiber-Optic Hub Unit

⇒ NOTE:

The fiber-optic cable has two plugs on each end. Generally, the two plugs are color-coded or identified in some other way. Make a note of which plug is attached to the Tx and Rx ports on the network 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 in the opposite manner at the other end (that is, the plug that was connected to the Tx port at the other end should be attached to the Rx port at this end, and the plug that was attached to the Rx port at the other end should be attached 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 *CenterVu Call Management System, Release 3, Version 5, Sun Enterprise 3000 System, Software Installation document (585-215-836)*.

Figure 2-14 shows the back panels of the 8-, 16-, and 64-ports NTSs.

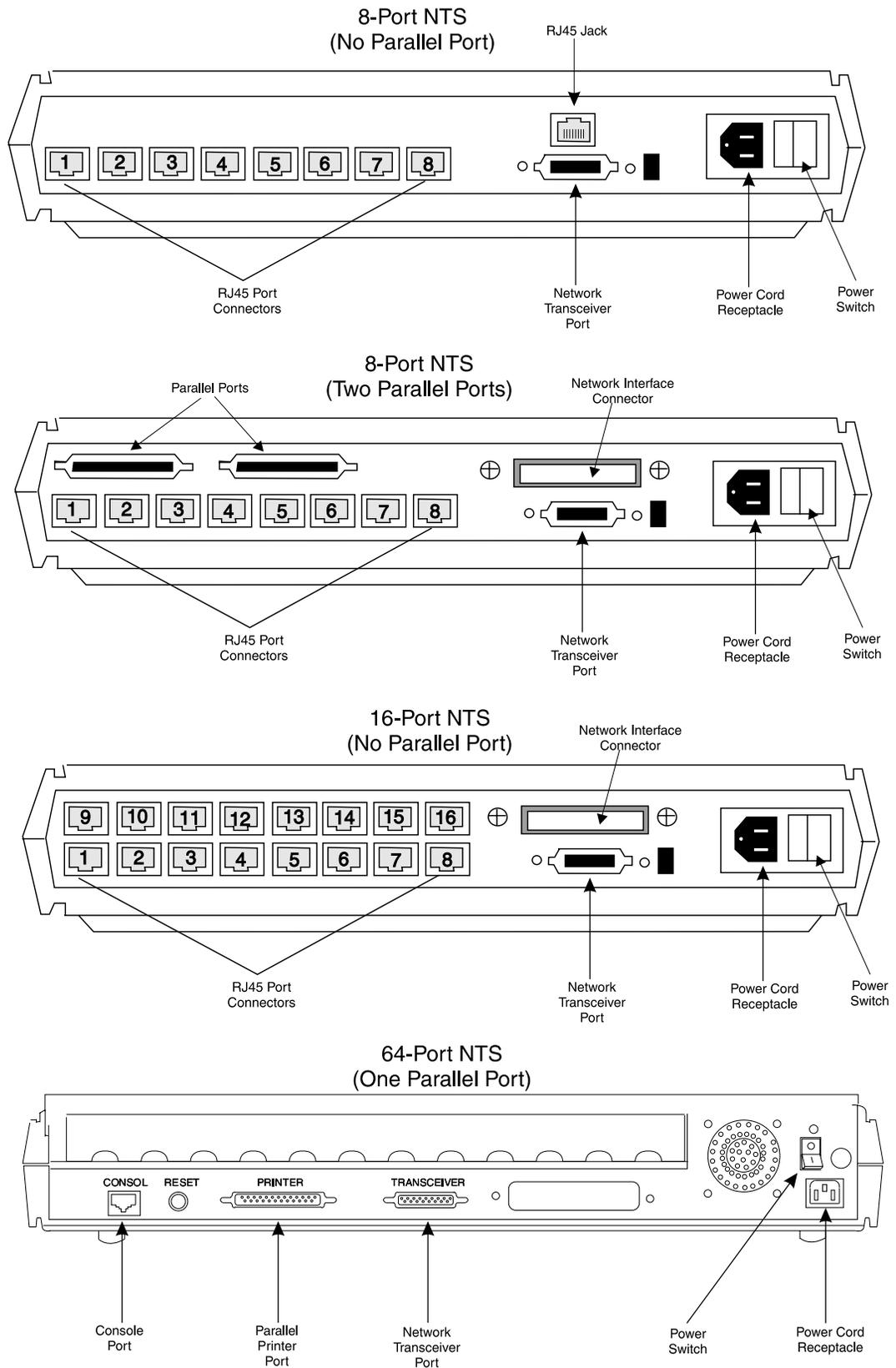


Figure 2-14: 8-, 16-, and 64-Port NTSs — Back Panels

If you are connecting more than one NTS to the network hub unit, use Table 2-4 to determine how to connect the UTP cable between the network hub unit and the NTS.

Table 2-4: 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

* The 8-port NTS with two parallel ports cannot be ordered; however, if the customer has one it can be used.

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 change three switch settings: SQE, Link, and LRT. If you do, make sure that the switch settings are as follows:

- 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 2-15 to see how the NTSs are connected to the network hub unit. Figure 2-15 shows how to connect the 8-, 16-, or 64-port NTS to the network hub unit.

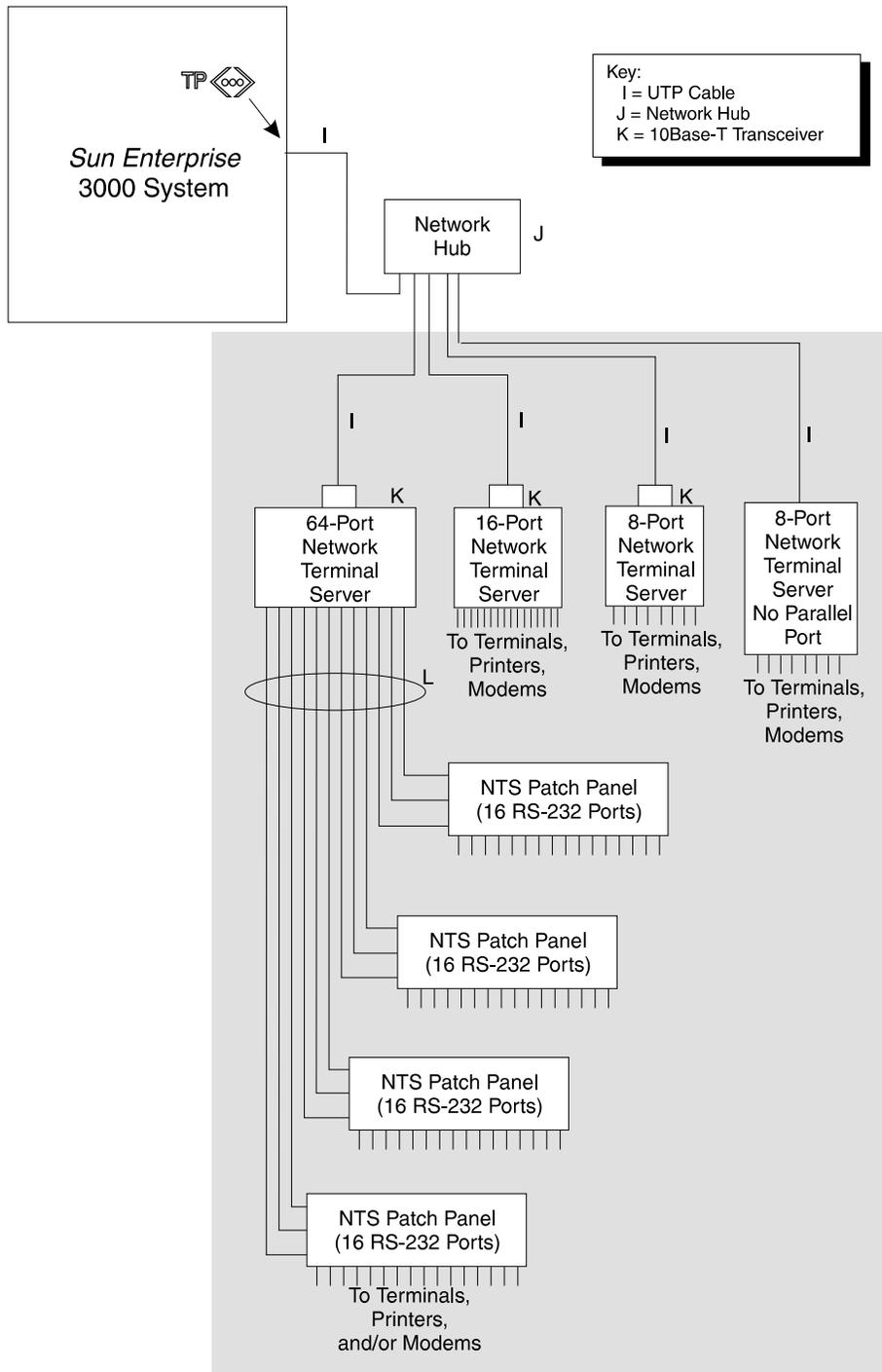


Figure 2-15: Sun Enterprise 3000 System NTS Connectivity

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 2-16 and Figure 2-17).

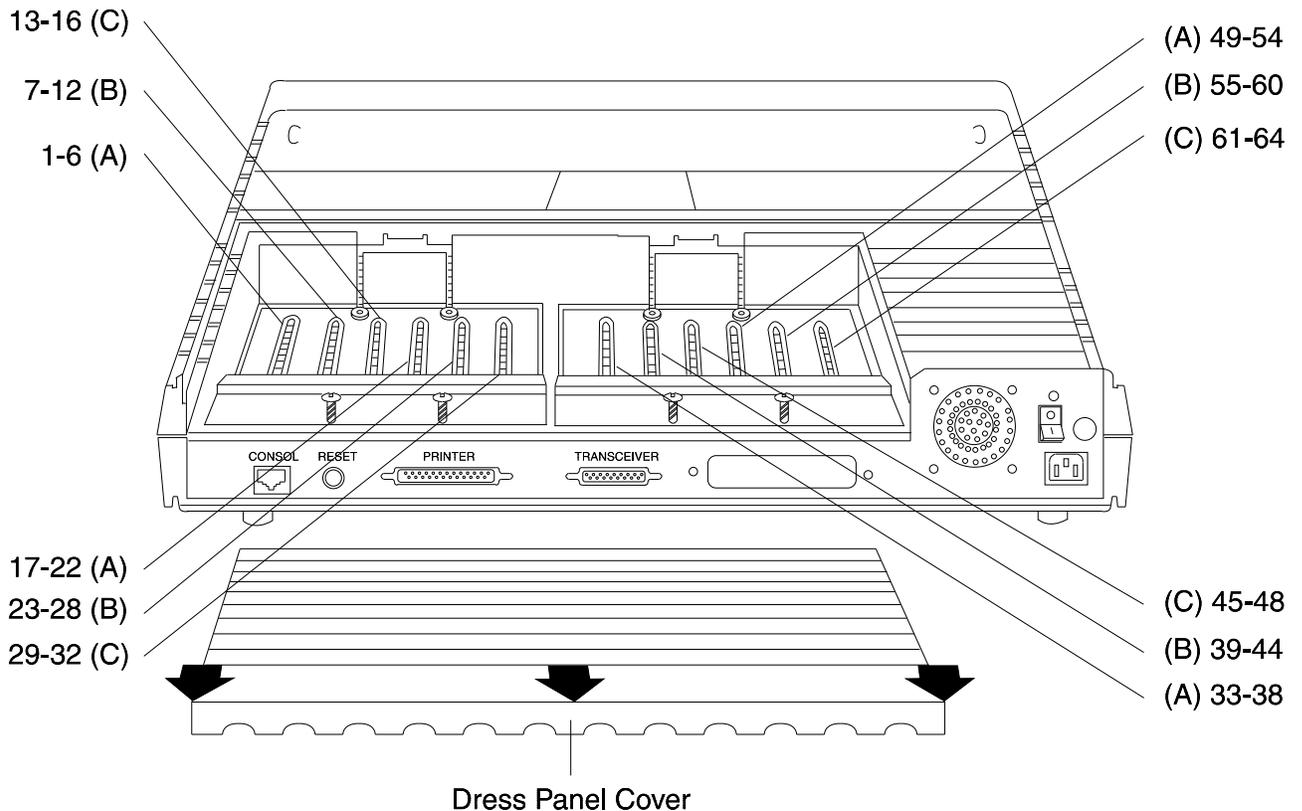


Figure 2-16: 64-Port Network Terminal Server — PBX-Champ Connectors and Port Definitions

To connect a 16-port NTS patch panel (see Figure 2-17) to the 64-Port NTS (Figure 2-16) 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 2-17) which connect to the PBX-champ connectors located inside the NTS (see Figure 2-16). The PBX-champ connectors are also labeled A, B, and C, respectively.

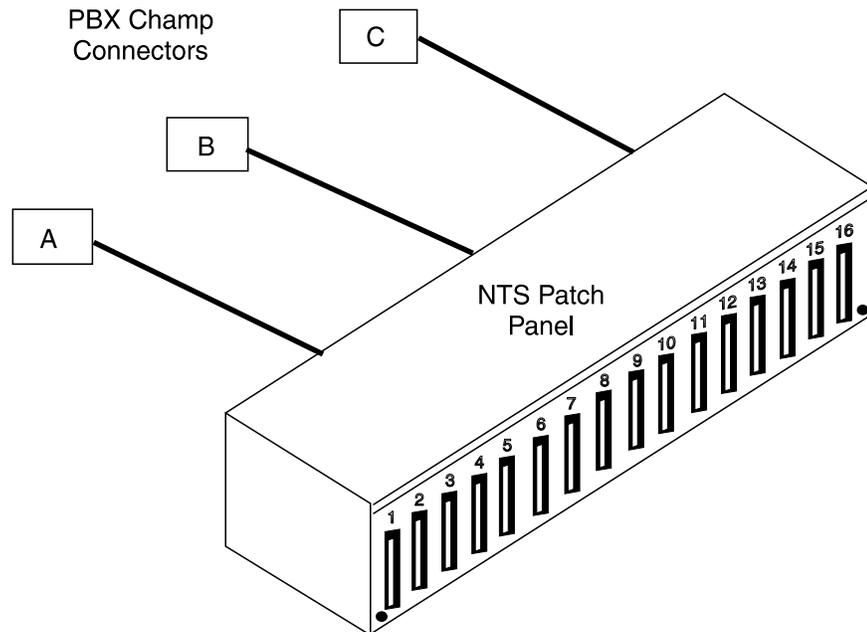


Figure 2-17: NTS Patch Panel

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.

Other Devices and Connections

Overview

A variety of other connections may be required depending on what the customer desires. The following are some of the more likely connections that will be encountered:

- Connecting the UPS
- Connecting the Remote Console Modem
- Powering Up the System and Verifying POST
- Setting the Remote Console Modem Options
- Connecting to Another Network
- Connecting to Another Network (Via Dumb Terminal).

Connecting the UPS

The UPS provides a temporary electrical supply to the *Sun Enterprise 3000 System* for about 7 minutes. If the system 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 Enterprise 3000 System*.

 **NOTE:**

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

Required Parts

Obtain the following parts:

- UPS (see Table 2-5)
- Appropriate power supply and outlet strip(s).

Table 2-5: 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 Enterprise 3000* System which allows the TSC to dial in and do remote maintenance.

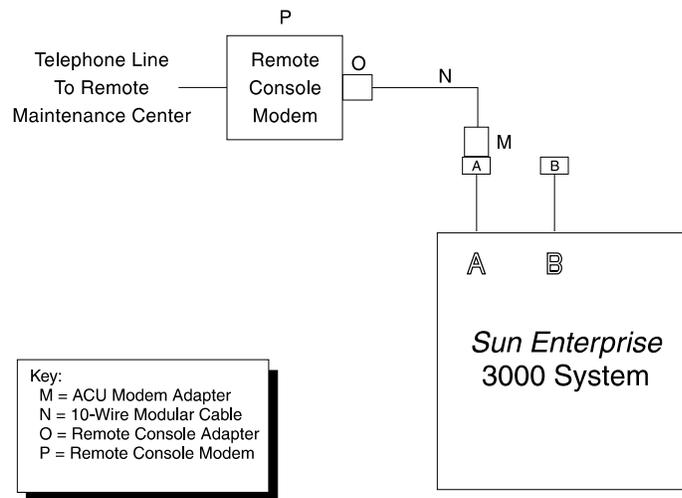


Figure 2-18: Remote Console Connectivity

To connect the Remote Console modem to the *Sun Enterprise 3000*, do the following (see Figure 2-18):

1. Connect the male end of the serial interface (A) cable to the serial connector on the back panel of the *Sun Enterprise 3000* 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 System and Verifying POST

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

1. Do the following in sequential order:
 - a. Turn on the devices attached to the *Sun Enterprise 3000*.
 - b. Turn on the *Sun Enterprise 3000 System* (see the *Sun Enterprise 3000 System Installation Guide*, section 3.2, "Powering on the System," for step-by-step instructions).
 - c. Turn on the system monitor.

 **NOTE:**

The power-on diagnostics will occur each time you turn on the system. 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
```

 **CAUTION:**

See Chapter 5, "Troubleshooting, Probe-SCSI Command Problem" before executing this command.

The program responds as follows:

```

/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. Reboot the system by entering the following command:

```
ok boot
```

The system reboots.

⇒ NOTE:

If the system stops at the `ok` prompt, see Chapter 5, “Troubleshooting, System Fails to Auto-Boot After Power Failure or When Given Reboot Command.”

Additional References

For additional information, refer to the following documentation:

Sun Enterprise 3000 System Installation Guide,
Chapter 3, “Turning the System Power On and Off.”

Sun Enterprise 3000 System Manual,
Chapter 11, “Powering Off and On.”

Setting the Remote Console Modem Options

The *Sun Enterprise 3000* System supports the *U.S. Robotics* Sportster†* 33.6 Faxmodem.

Complete the following steps:

1. 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 Chapter 3, "Installing Terminals, Printers, and Modems, U.S. Robotics Sportster 33.6 Faxmodem" 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 appear.

5. At the system console, enter the options.

⇒ NOTE:

Use numerical ones and zeros when entering the options.

```
AT&F1      (loads factory default configuration options
           into active memory)
AT&W0      [writes the current configuration to NVRAM 0
           template (Y0)]
```

Figure 2-19: 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. Set all the DIP switches on the back panel of the *Sportster* except switches 4 and 8, to the up (OFF) position. Switches 4 and 8, are set to the down (ON) position.
8. If needed, reset the modem using the power switch.

Additional References

For additional information, see the *U.S. Robotics Sportster Modems User's Guide*

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

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

Connecting to Another Network

This section describes how to change the Internet Protocol (IP) addresses on the *Sun Enterprise 3000 System* 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 Enterprise 3000 System* 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:

- What is the internet address assigned to the CMS?
- 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.

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

To change the TCP/IP address of the *Sun Enterprise 3000 System* 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 R(current release number and date)
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 as follows:

```
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 255.255.255.0 (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 Enterprise 3000* (steps 14-25).

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

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

 **WARNING:**

If you change the IP address of the *Sun Enterprise 3000* System 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 Enterprise 3000* System 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 the following:

```
# 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 the following:

```
# 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 the following:

```
# /usr/sbin/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 reads “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 Enterprise 3000 System* 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 Enterprise 3000 System* 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 Enterprise 3000 System* IP address (use Table 2-6 to record this information)
 - NTS IP address for each NTS (use Table 2-6 to record this information).

Table 2-6: CentreVu CMS Standard Network IP Addresses

Device	Network Name	IP Address
<i>Enterprise 3000 System</i>		
First NTS		
Second NTS		
Third NTS		
Fourth NTS		
Fifth NTS		

Table 2-6: CentreVu CMS Standard Network IP Addresses (Contd)

Device	Network Name	IP Address
Sixth NTS		
Seventh NTS		

2. Edit the `/etc/hosts` file by entering the following:

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

3. Locate the lines (in the `/etc/hosts` file) that contain the IP addresses for the *Sun Enterprise 3000* System and the NTS(s).
4. Change the existing IP addresses (in the file) to the new addresses recorded in Table 2-6.
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 2-20).

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.

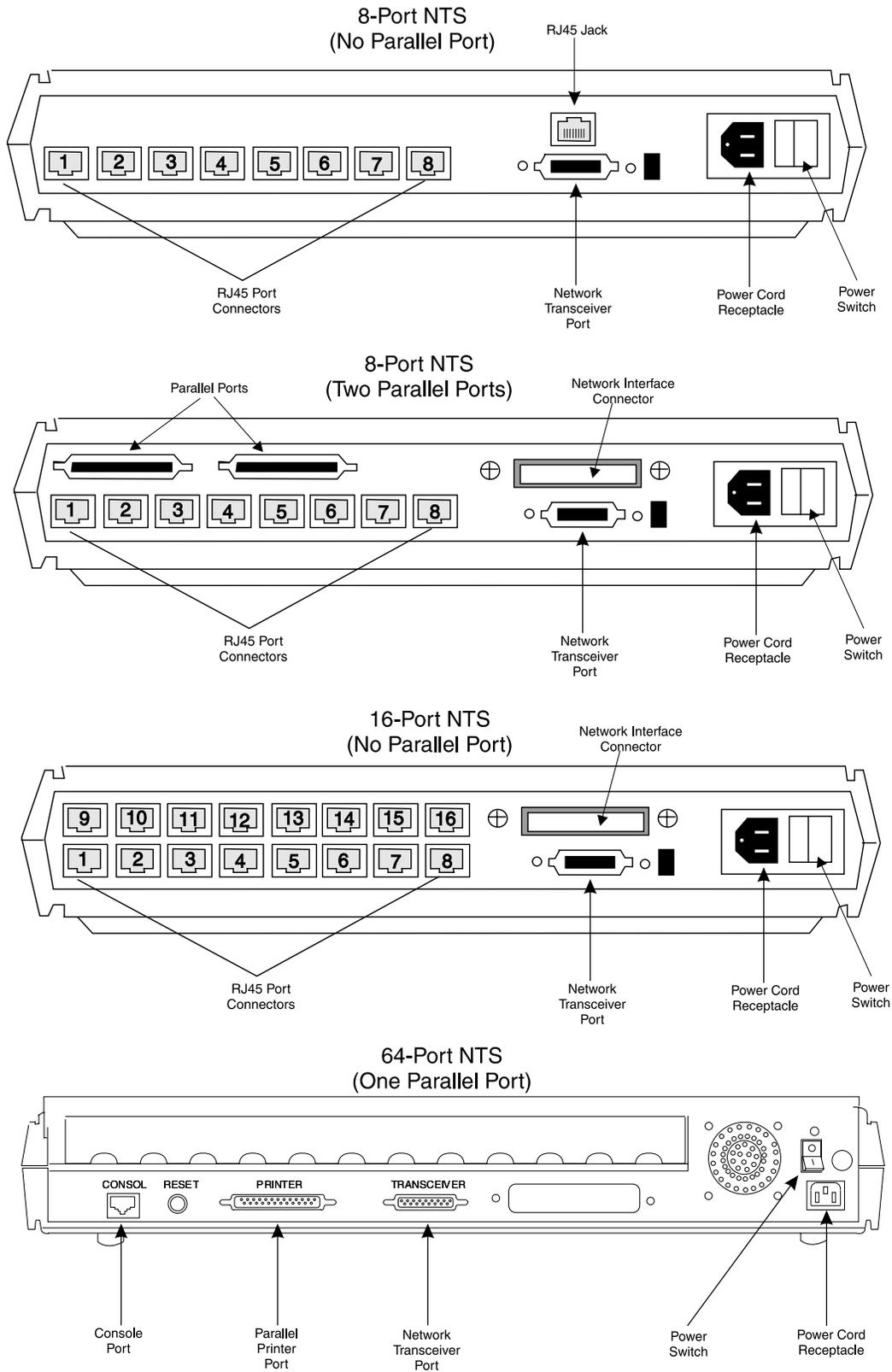


Figure 2-20: Network Terminal Servers — Back Panel

8. Turn the NTS off and on again. Within 15 seconds, push the **TEST** button on the front of the NTS (see Figure 2-21).

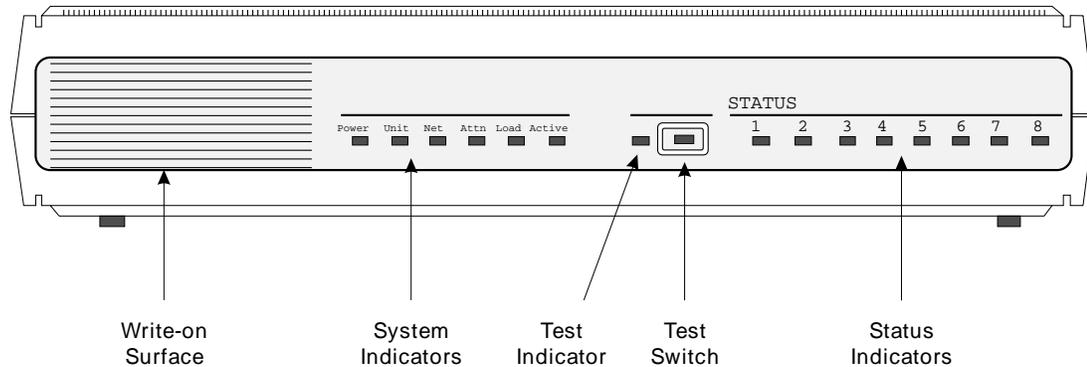


Figure 2-21: Network Terminal Server — Front Panel

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 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 what you want to erase. Erase both the EEPROM and the FLASH information.

The program responds as follows:

```
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 as follows:

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

12. Enter Y. The program responds as follows:

```
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 as follows:

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

16. Enter the IP address for this NTS. This should follow the IP address structure outlined in Table 2-6 on page 2-42.

The program responds as follows:

```
Internet address : XXX.XXX.XXX.XXX  
Enter Subnet mask [255.255.255.0]::
```

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

```
Subnet mask: 255.255.0.0  
Enter preferred load host Internet address [<any host>]::
```

18. Enter the IP address of the *Sun Enterprise 3000 System*.
The program responds as follows:

```
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 as follows:

```
Enter Preferred dump address [0.0.0.0]::)
```

20. Enter the IP address of the *Sun Enterprise 3000 System*. The program responds as follows:

```
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 as follows:

```
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 responds as follows:

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

Chapter 3

Installing Terminals, Printers, and Modems

Overview	3-1
Supported Terminal and Printer Equipment	3-2
Connection Options	3-2
Supported Terminals.	3-4
Supported Printers.	3-5
Supported Modem	3-6
Connecting Terminals, Printers, and Modems	3-7
New Installation Procedures	3-7
Connecting Communications Equipment, Terminals, and Printers to a 64-Port NTS	3-8
Connecting Terminals, and Printers to an 8- and 16-port NTS	3-10
Upgrade Installation Procedures.	3-12
Using Existing Cabling	3-13
Administering Terminals	3-17
Administering Terminals on NTS.	3-17
Procedure	3-18
Terminal Options	3-23
715 Business Communications Terminal (BCT)	3-23
User Preferences Window.	3-24
Communications Options Window	3-25
General Options Window	3-26
Display Options Window	3-27
Keyboard Options Window	3-28
Printer Options Window	3-29
705 Multi-Tasking (MT) Terminal.	3-29
User Preferences Window.	3-30
Communications Options Window	3-31
General Options Window	3-32
Display Options Window	3-33
Keyboard Options Window	3-34
Printer Options Window	3-35
615 Color Multi-Tasking (CMT) Terminal.	3-36
615 Multi-Tasking (MT) Terminal.	3-37
605 Business Communications Terminal (BCT)	3-38
620 Multi-Tasking Graphics (MTG) Terminal.	3-39
2900/AWTC Display Terminal	3-40
User Preferences Window.	3-41
Communications Options Windows	3-42
General Options Window	3-44
Display Options Window	3-45

Keyboard Options Window	3-46
Printer Options Window	3-47
4000/AWTC Display Terminal	3-48
User Preferences Window	3-49
Communications Options Windows	3-50
General Options Window	3-52
Display Options Window	3-53
Keyboard Options Window	3-54
Printer Options Window	3-55
2900/260lf Small Footprint Terminal	3-56
F1 Quick Window	3-57
F2 Genrl (General) Window	3-58
F3 Displ (Display) Window	3-59
F4 Kybd (Keyboard) Window	3-60
F5 Keys Window	3-61
F6 Ports Window	3-62
F7 Host Window	3-63
F8 Print Window	3-64
F9 Emul (Emulation) Window	3-65
F10 Tabs Window	3-66
F11 AnsBk (Answer Back) Window	3-67
F12 Prog (Program) Window	3-68
PrtSc Exec (Print Screen Execute) Window	3-69
Administering Printers	3-70
Serial Printers on the NTS	3-70
Parallel Printers Connected to the NTS	3-79
Cable Connections	3-79
Procedure	3-81
Administering Modems	3-86
Modems Connected to the NTS	3-86
Outbound Modems	3-87
Inbound Modems	3-92
Modem Options	3-96
<i>U.S. Robotics Sportster 33.6 Faxmodem</i>	<i>3-96</i>

List of Figures

Figure 3-1:	Sample Connection Using a Null Modem	3-2
Figure 3-2:	Null Modem	3-2
Figure 3-3:	Sample Connection Using Modems	3-3
Figure 3-4:	Sample Connection Between the ADU and the Terminal or Printer	3-3
Figure 3-5:	New Installation Cabling Scenarios — Terminals and Printers	3-8
Figure 3-6:	NTS Serial Port Adapter (64-Port NTS)	3-9
Figure 3-7:	New Installation and Cabling Scenarios — Terminals and Printers	3-10
Figure 3-8:	ANIXTER RJ45-DB25 Adapter (8- and 16-Port NTS)	3-11
Figure 3-9:	Upgrade Existing 3B2 Cabling to a 64-Port NTS	3-14
Figure 3-10:	Upgrade Existing INTEL Cabling to a 64-Port NTS	3-14
Figure 3-11:	Upgrade Existing 3332 Cabling to a 64-Port NTS	3-15
Figure 3-12:	Upgrade Existing 3B2 Cabling to 8- and 16-Port NTSs	3-15
Figure 3-13:	Upgrade Existing INTEL Cabling to 8- and 16-Port NTSs	3-16
Figure 3-14:	Upgrade Existing 3332 Cabling to 8- and 16-Port NTSs	3-16
Figure 3-15:	User Preferences Options for a 715 BCT	3-24
Figure 3-16:	Communications Options for a 715 BCT	3-25
Figure 3-17:	General Options for a 715 BCT	3-26
Figure 3-18:	Display Options for a 715 BCT	3-27
Figure 3-19:	Keyboard Options for a 715 BCT	3-28
Figure 3-20:	Printer Options for a 715 BCT	3-29
Figure 3-21:	User Preferences Options for a 705 MT Terminal	3-30
Figure 3-22:	Communications Options for a 705 MT Terminal	3-31
Figure 3-23:	General Options for a 705 MT Terminal	3-32
Figure 3-24:	Display Options for a 705 MT Terminal	3-33
Figure 3-25:	Keyboard Options for a 705 MT Terminal	3-34
Figure 3-26:	Printer Options for a 705 MT Terminal	3-35

Figure 3-27: Terminal Options for a 615 CMT Terminal	3-36
Figure 3-28: Terminal Options for a 615 MT Terminal	3-37
Figure 3-29: Terminal Options for a 605 BCT	3-38
Figure 3-30: Terminal Options for a 620 MTG Terminal	3-39
Figure 3-31: User Preference Options for a 2900/AWTC Terminal	3-41
Figure 3-32: SES 1 Communications Options for a 2900/AWTC Terminal	3-42
Figure 3-33: SES 2 Communications Options for a 2900/AWTC Terminal	3-43
Figure 3-34: General Options for a 2900/AWTC Terminal	3-44
Figure 3-35: Display Options for a 2900/AWTC Terminal	3-45
Figure 3-36: Keyboard Options for a 2900/AWTC Terminal	3-46
Figure 3-37: Printer Options for a 2900/AWTC Terminal	3-47
Figure 3-38: User Preference Options for a 4000/AWTC Terminal	3-49
Figure 3-39: SES 1 Communications Options for a 4000/AWTC Terminal	3-50
Figure 3-40: SES 2 Communications Options for a 4000/AWTC Terminal	3-51
Figure 3-41: General Options for a 4000/AWTC Terminal	3-52
Figure 3-42: Display Options for a 4000/AWTC Terminal	3-53
Figure 3-43: Keyboard Options for a 4000/AWTC Terminal	3-54
Figure 3-44: Printer Options for a 4000/AWTC Terminal	3-55
Figure 3-45: F1 Quick Values for a 2900/260If Terminal	3-57
Figure 3-46: F2 General Values for a 2900/260If Terminal	3-58
Figure 3-47: F3 Display Values for a 2900/260If Terminal	3-59
Figure 3-48: F4 Keyboard Values for a 2900/260If Terminal	3-60
Figure 3-49: F5 Keys Values for a 2900/260If Terminal	3-61
Figure 3-50: F6 Ports Values for a 2900/260If Terminal	3-62
Figure 3-51: F7 Host Values for a 2900/260If Terminal	3-63
Figure 3-52: F8 Print Values for a 2900/260If Terminal	3-64
Figure 3-53: F9 Emulation Values for a 2900/260If Terminal	3-65

Figure 3-54: F10 Tabs Values for a 2900/260lf Terminal	3-66
Figure 3-55: F11 Answer Back Values for a 2900/260lf Terminal	3-67
Figure 3-56: F12 Program Values for a 2900/260lf Terminal	3-68
Figure 3-57: Print Screen Execute Values for a 2900/260lf Terminal	3-69
Figure 3-58: 64-Port NTS Parallel Printer Port Connection	3-80
Figure 3-59: 8-Port Parallel Printer Port Connection	3-80
Figure 3-60: <i>U.S. Robotics Sportster</i> Backpanel	3-97

List of Tables

Table 3-1:	Approved Terminals	3-4
Table 3-2:	Approved and Supported Printers	3-5
Table 3-3:	Approved Modem	3-6
Table 3-4:	Cabling Upgrade Scenarios	3-13
Table 3-5:	Configuration Information	3-19
Table 3-6:	Terminal Configuration Guidelines	3-20
Table 3-7:	Serial Printer Configuration Guidelines	3-72
Table 3-8:	Printer Device Types	3-77
Table 3-9:	Parallel Printer Connections	3-79
Table 3-10:	Outbound Modem Configuration Guidelines for a <i>U.S. Robotics Sportster</i> Faxmodem	3-89
Table 3-11:	Inbound Modem Configuration Guidelines	3-94
Table 3-12:	<i>U.S. Robotics Sportster</i> Switch Settings for the CMS	3-97

Overview

This chapter describes how to connect terminals, printers, and modems to a *Sun* Enterprise* 3000 System*.

Refer to Chapter 2, "Installing the Sun Enterprise 3000 System," before connecting to terminals, printers, and modems.

You can use a Network Terminal Server (NTS) to connect to the terminals, printers, and modems.

You can use the parallel ports on the back of the NTS to connect parallel printers. See *Parallel Printers Connected to the NTS* in this chapter for details on how to use cables and adapters for these connections.

The following sections in this chapter provide general information on connecting terminals, printers, and modems:

- Supported Terminal and Printer Equipment
- Connecting Terminals, Printers, and Modems.

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

- Administering Terminals
- Administering Printers
- Administering Modems.

**Sun* and *Enterprise* are registered trademarks of Sun Microsystems, Inc. in the United States and other countries.

Supported Terminal and Printer Equipment

Connection Options

Three options are available for connecting supported trammels and printers. They are as follows:

Option 1 — Null Modem connection (see Figure 3-1).

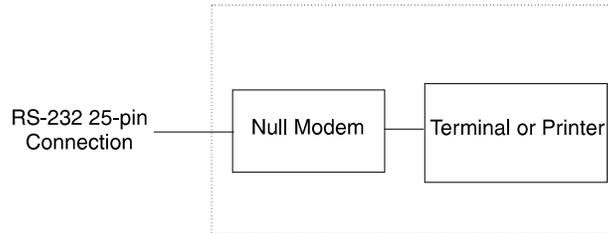


Figure 3-1: Sample Connection Using a Null Modem

A null modem is a connector device that presents a DTE interface on one side and a DCE interface on the other side, with no signal processing in between. An example of a null modem is shown in Figure 3-2.

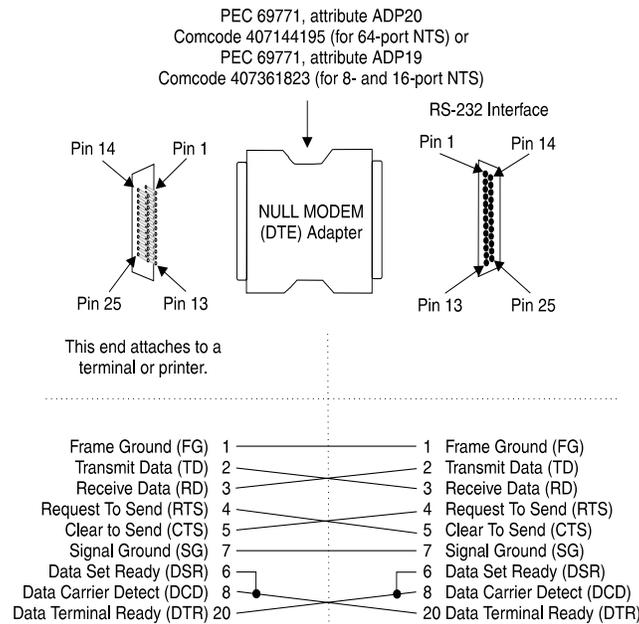


Figure 3-2: Null Modem

Option 2 — Two-Modem connection (see Figure 3-3).

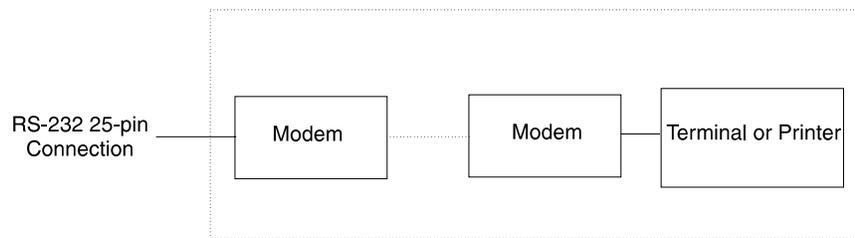


Figure 3-3: Sample Connection Using Modems

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

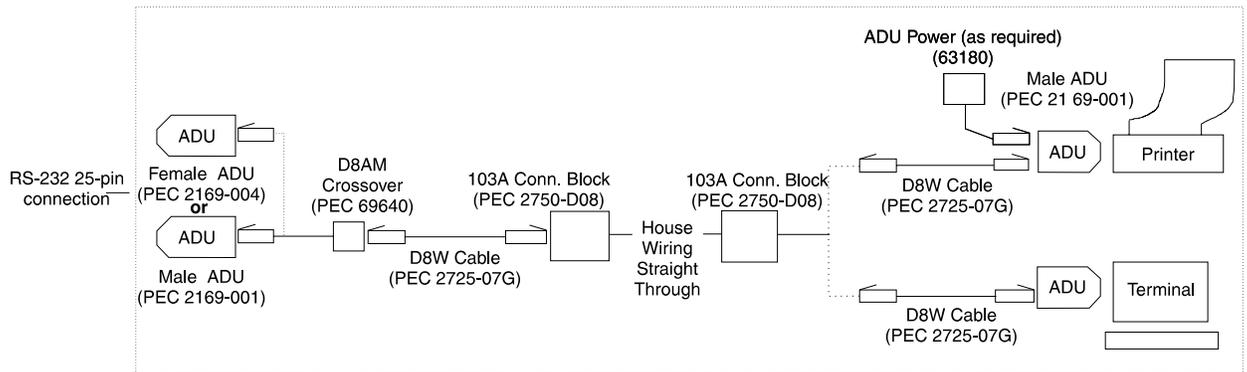


Figure 3-4: Sample Connection Between the ADU and the Terminal or Printer

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 adapters if it is convenient.

Supported Terminals

This section describes terminals that can be connected to the *Sun Enterprise 3000 System* for use with the *CentreVu™* Call Management System (CMS) R3V5 software application. Table 3-1 lists the approved and supported terminals.

⇒ NOTE:

The *Sun Enterprise 3000 System* currently supports up to peripherals (terminals, printers, and modems).

Table 3-1: 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 Enterprise 3000* System for use with the *CentreVu CMS R3V5* software application. See Table 3-2 for a list of the approved and supported printers.

Table 3-2: Approved and Supported Printers

Type of Printer	Offered	Discontinued	PEC
321 <i>Okidata</i> * 120-Column Dot Matrix Printer		X	NA
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	NA
573 Serial Dot Matrix (Wide Platen) Printer		X	NA
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	NA
OL810e <i>Okidata</i> LED Page Printer	X		12129
OL830 Plus <i>Okidata</i> LED Page Printer		X	NA
<i>Okidata</i> ML321T Serial/Parallel Dot Matrix Printer	X		69646

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

NOTE:

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

Supported Modem

This section describes the modem that can be connected to the *Sun Enterprise 3000* System for use with the *CentreVu CMS R3V5* software application.

Table 3-3 shows the approved and supported modem for use with the *Sun Enterprise 3000* System and the *CentreVu CMS R3V5* software application.

Table 3-3: Approved Modem

Type of Modem	Offered	Discontinued	PECs
<i>U.S. Robotics</i> [*] <i>Sportster</i> [†] 33.6 Faxmodem, External Version, (Model 000268-0?)	X		2569-839

* U.S. Robotics is a registered trademark of U.S. Robotics Access Corp.

† Sportster is a registered trademark of U.S. Robotics Access Corp.

 **NOTE:**

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

Connecting Terminals, Printers, and Modems

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

You can connect terminals and printers directly to the serial ports (up to a recommended distance of 300 feet using NTS). 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 “Upgrade Installation Procedures” 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), or an 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.

 **NOTE:**

To extend cabling beyond the 25 or 50 feet described in Figure 3-5 or Figure 3-7, you can use house wiring that will extend up to 300 feet. See Figure 3-4 in this chapter for an additional option. You must use either ADUs, modems, or a null modem (see Figure 3-3 or Figure 3-4).

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

- A Lucent Technologies provided or approved null-modem adapter
- A pair of modems
- A 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 Parallel Printers Connected to the NTS for more information.

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

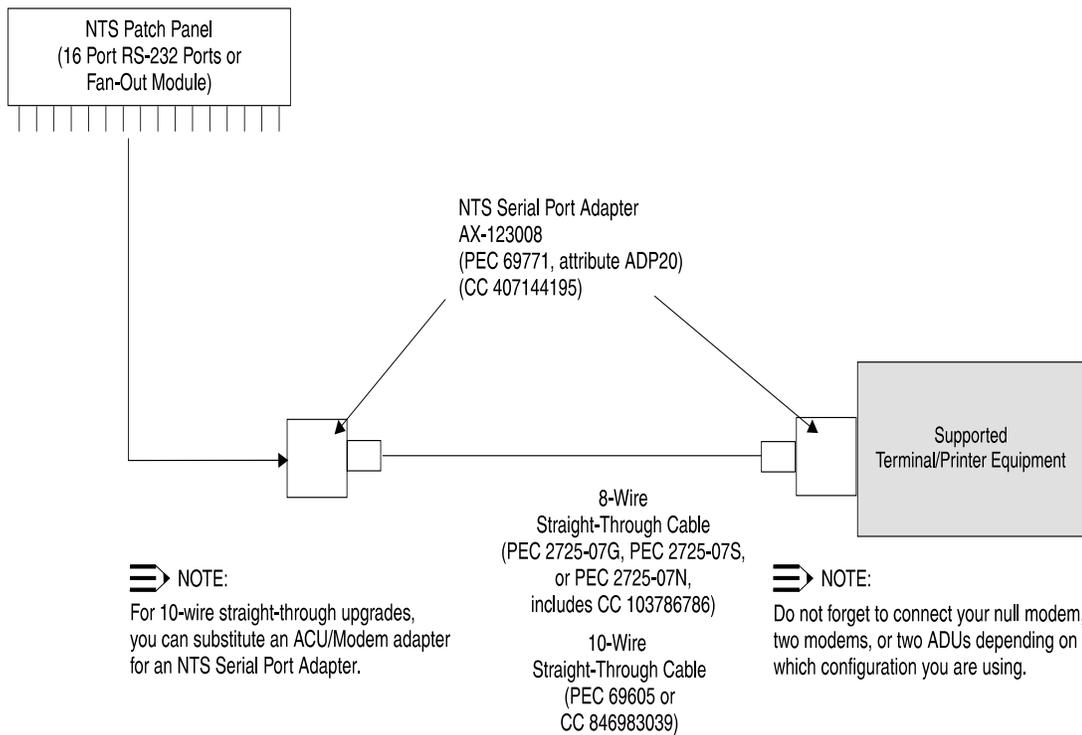


Figure 3-5: New Installation Cabling Scenarios — Terminals and Printers

⇒ 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, terminal, and printer equipment to a *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 3-5, "New Installation Cabling Scenarios — Terminals and Printers", 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 an 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 3-6 shows the adapters used to connect 8- and 10-wire straight-through cabling to the NTS patch panel.

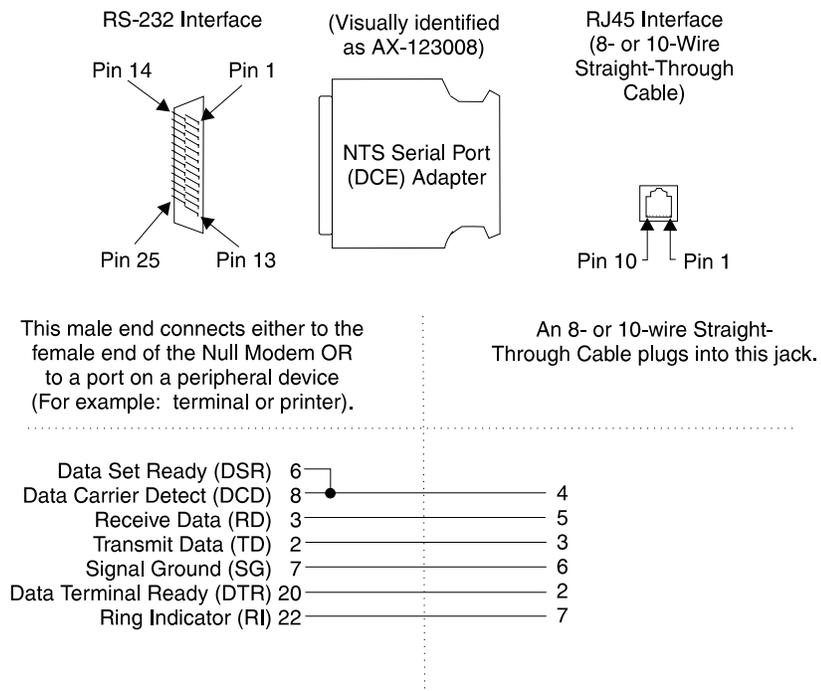


Figure 3-6: NTS Serial Port Adapter (64-Port NTS)

Connecting 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 with two parallel ports can no longer be ordered; however, if the customer has one it can be used. These ports can be used to connect parallel printers. See Parallel Printers Connected to the NTS 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 3-8).

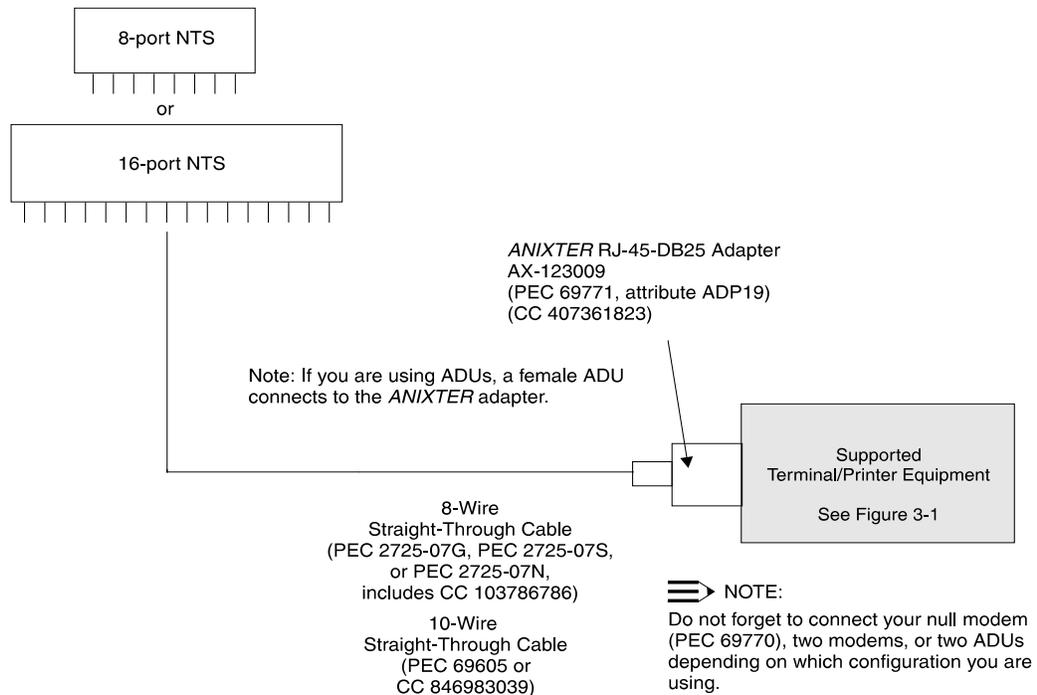


Figure 3-7: New Installation and Cabling Scenarios — Terminals and Printers

⇒ NOTE:

If you are using ADUs, a female ADU will connect to the *ANIXTER* adapter.

Do not forget to connect your Lucent Technologies provided or approved null modem, two modems, or two ADUs depending on which option 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 a *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 3-8)
- One 8- or 10-wire cable.

Refer to Figure 3-7 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.

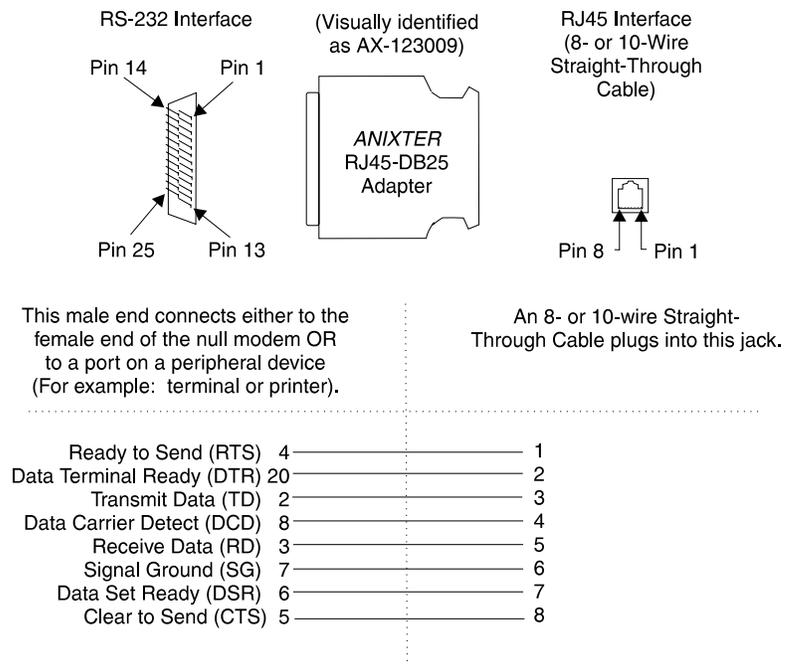


Figure 3-8: *ANIXTER* RJ45-DB25 Adapter (8- and 16-Port NTS)

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 Enterprise 3000* System, you may have one of the cable schemes listed in Table 3-4:

Table 3-4: 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). 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 3-9 through 3-11 for upgrade examples with a 64-port NTS and Figures 3-12 through 3-14 for upgrade scenarios with an 8- or 16-port NTS.

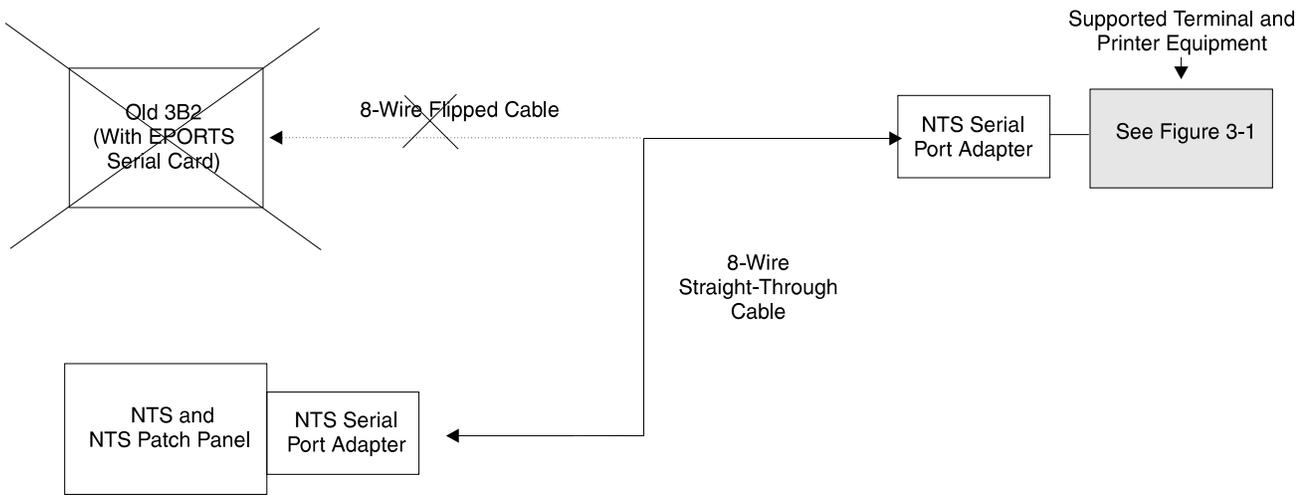


Figure 3-9: Upgrade Existing 3B2 Cabling to a 64-Port NTS

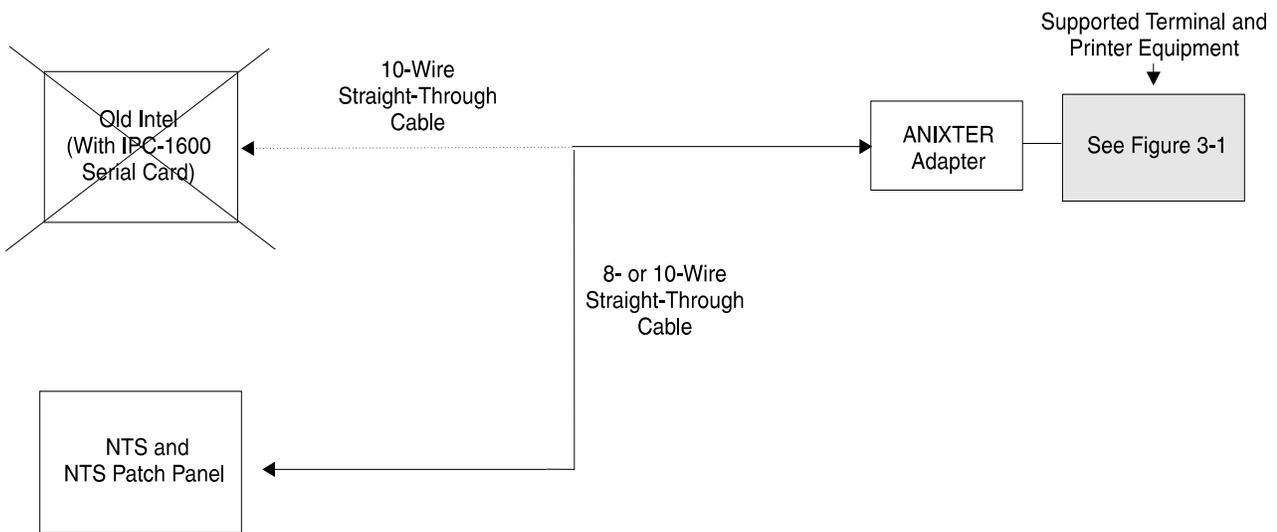


Figure 3-10: Upgrade Existing INTEL Cabling to a 64-Port NTS

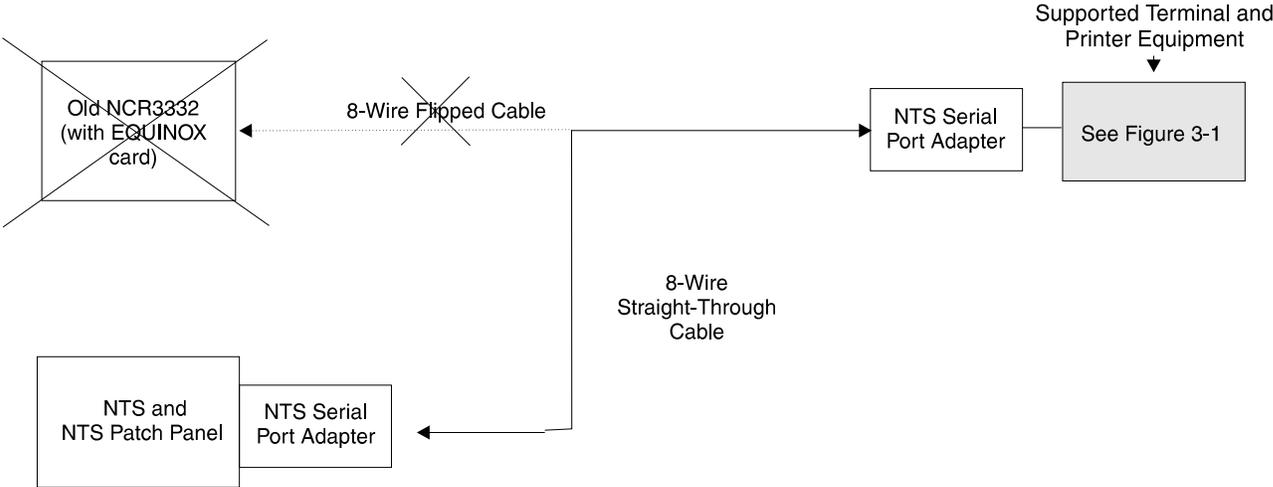


Figure 3-11: Upgrade Existing 3332 Cabling to a 64-Port NTS

See Using 8- or 10-Wire Straight-Through Cabling for 64-Port NTS in this chapter for more details.

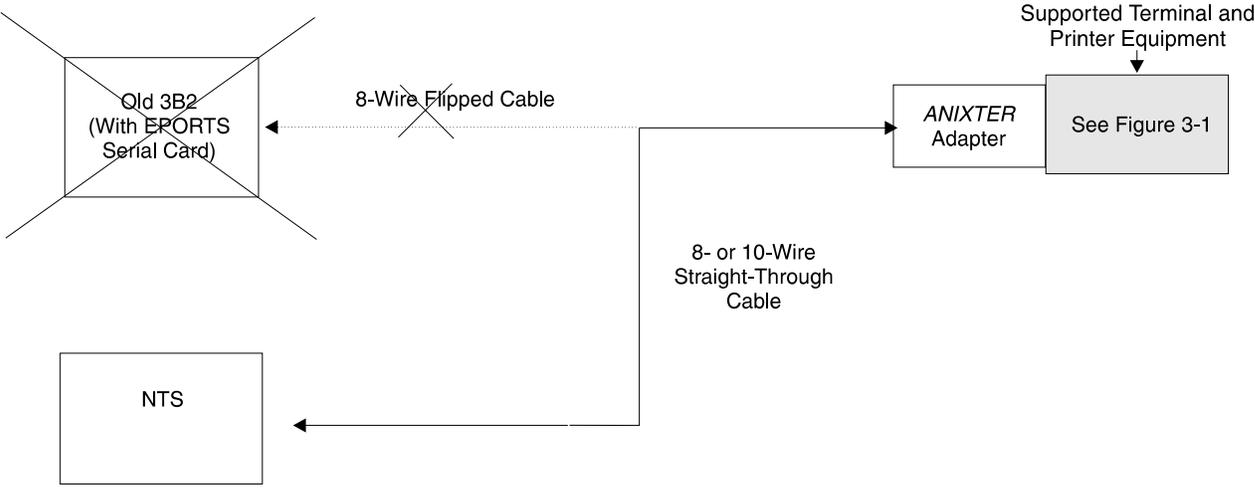


Figure 3-12: Upgrade Existing 3B2 Cabling to 8- and 16-Port NTSs

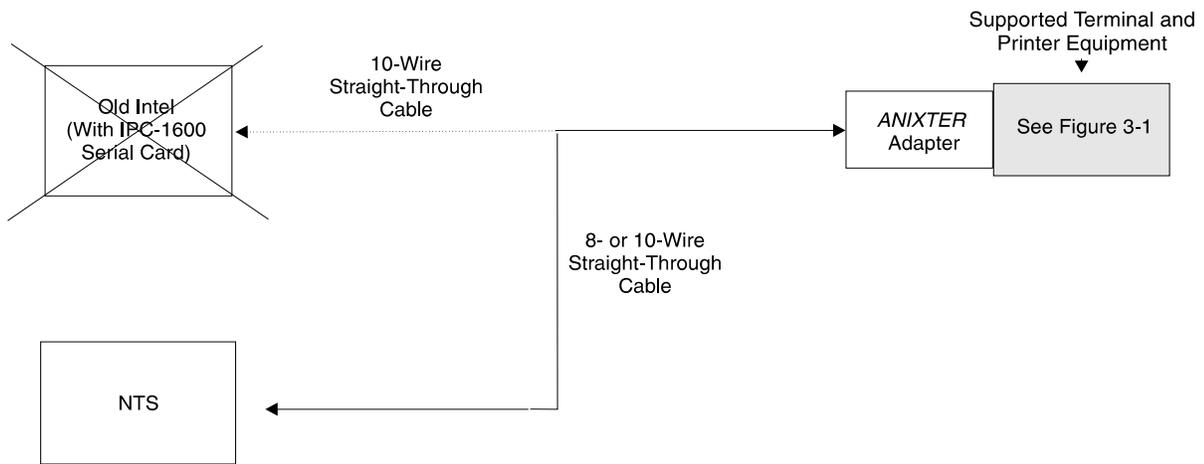


Figure 3-13: Upgrade Existing *INTEL* Cabling to 8- and 16-Port NTSs

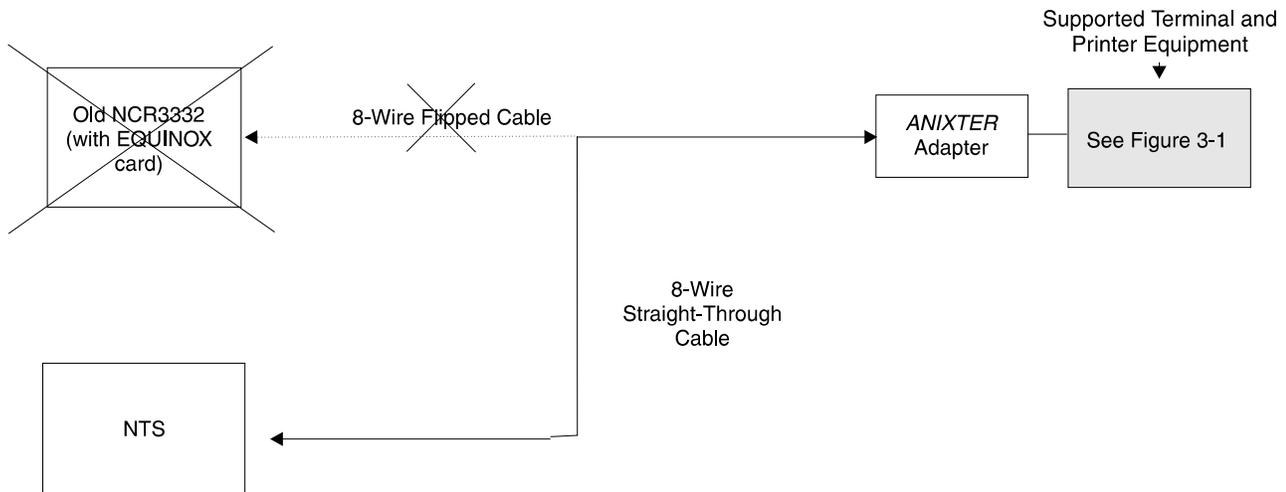


Figure 3-14: Upgrade Existing 3332 Cabling to 8- and 16-Port NTSs

Administering Terminals

This section describes how to set port parameters for terminals connected using an NTS.

Administering Terminals on NTS

After the terminals are connected, you must complete the `na` administration for the *Sun Enterprise 3000 System* 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 as follows:

```
Annex network administrator R(most current release number &  
date)  
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 3-5 for the recommended NTS names and addresses found in the `/etc/hosts` file.

Table 3-5: Configuration Information

Device	IP Address	Terminal	File Name
<i>Sun Enterprise 3000 System</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

The system responds as follows:

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

```
command:
```

4. 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.

Set `location` and `user-name`, and keep them populated to facilitate troubleshooting.

For more details about using the `set port` command string, use Table 3-6. You do not have to set any parameters if the default parameters are correct.

Table 3-6: 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 Enterprise 3000 System address</i>)	Set to your <i>Sun Enterprise 3000 System</i> 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.

⇒ NOTE:

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>
```

⇒ NOTE:

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

The system responds as follows:

```
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 is logged in.

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

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

The system responds as follows:

```
cmsterm1: Annex-3-UX R10.0, 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 3-5 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 Chapter 5, “Troubleshooting, Network Terminal Server (NTS) Port Problems,” for details.

7. To quit, enter the following command.

```
command: quit
```

The system responds as follows:

```
#
```

8. If this is the initial installation, reboot the *Sun Enterprise 3000* System.

⇒ NOTE:

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

Terminal Options

After you connect the terminal to the system, 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 Business Communications Terminal (BCT)
- 705 Multi-Tasking (MT) Terminal
- 615 Color Multi-Tasking (CMT) Terminal
- 605 Business Communications Terminal (BCT)
- 620 Multi-Tasking Graphics (MTG) Terminal
- 2900/AWTC Display Terminal
- 4000/AWTC Display 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 Business Communications Terminal (BCT)

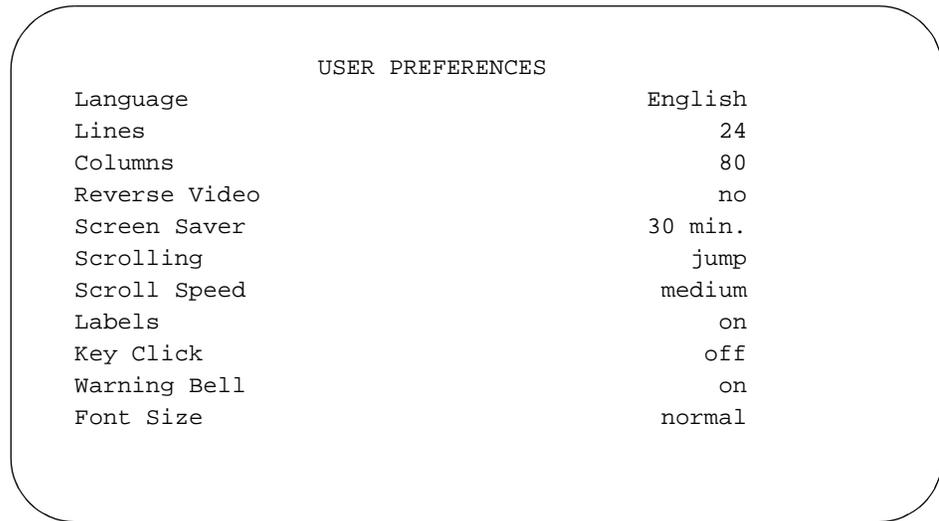
The 715 BCT replaces or emulates the 705 MT terminal. To properly set up the terminal, you may need to change some of the options on the Terminal Setup screen. Also, Port 2 is used as the main port. Therefore, connect the communications cable to Port 2 and when logging into *CentreVu* CMS, identify the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

User Preferences Window

Figure 3-15 shows the recommended user preference option.



The screenshot shows a window titled "USER PREFERENCES" with a list of settings and their values. The settings are: 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), and Font Size (normal).

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 3-15: User Preferences Options for a 715 BCT

Communications Options Window

Figure 3-16 shows the recommended communications options.

MAIN	COMMUNICATIONS OPTIONS	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 3-16: Communications Options for a 715 BCT

General Options Window

Figure 3-17 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 3-17: General Options for a 715 BCT

Display Options Window

Figure 3-18 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 3-18: Display Options for a 715 BCT

Keyboard Options Window

Figure 3-19 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 3-19: Keyboard Options for a 715 BCT

Printer Options Window

Figure 3-20 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 3-20: Printer Options for a 715 BCT

705 Multi-Tasking (MT) Terminal

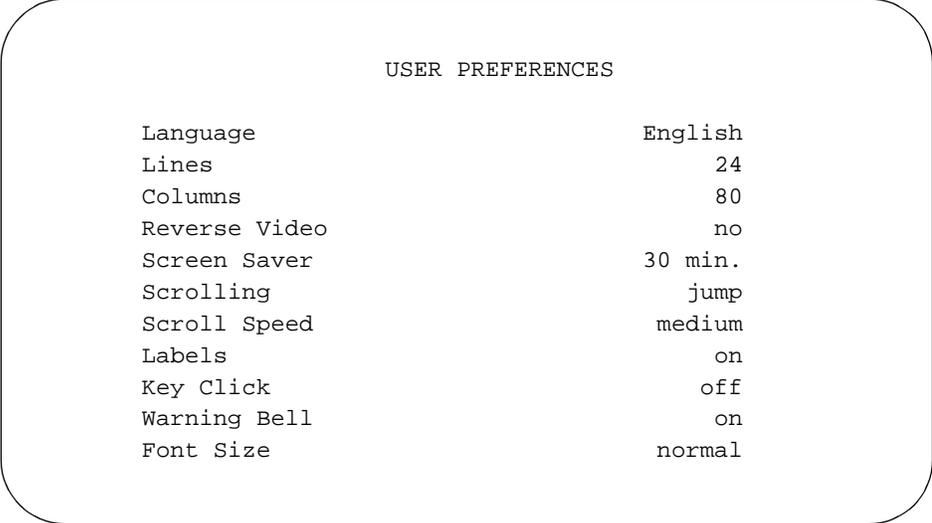
The 705 MT Terminal replaces or emulates the 605 BCT Terminal. To properly set up the terminal, you may need to change some of the options on the Terminal Setup screen.

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 3-21 shows the recommended user preference options.



The screenshot shows a window titled "USER PREFERENCES" with a list of settings and their values. The settings are: 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), and Font Size (normal).

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 3-21: User Preferences Options for a 705 MT Terminal

Communications Options Window

Figure 3-22 shows the recommended communications options.

MAIN	COMMUNICATIONS OPTIONS	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 3-22: Communications Options for a 705 MT Terminal

General Options Window

Figure 3-23 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 3-23: General Options for a 705 MT Terminal

Display Options Window

Figure 3-24 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 3-24: Display Options for a 705 MT Terminal

Keyboard Options Window

Figure 3-25 shows the recommended keyboard options.

KEYBOARD OPTIONS		
PRIMARY/WINDOW 1		WINDOW 2
Caps Lck	Caps/Shft 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 3-25: Keyboard Options for a 705 MT Terminal

Printer Options Window

Figure 3-26 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 3-26: Printer Options for a 705 MT Terminal

615 Color Multi-Tasking (CMT) Terminal

Figure 3-27 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	

DONE 615MT 1.1

<input type="checkbox"/>	<input type="checkbox"/>	CHANGE OPTION	DEFAULT VALUES	SAVED VALUES	SAVE	NEXT SETUP	CLEAR TO END
--------------------------	--------------------------	------------------	-------------------	-----------------	------	---------------	-----------------

Figure 3-27: Terminal Options for a 615 CMT Terminal

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 Multi-Tasking (MT) Terminal

Figure 3-28 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__	Cursor Type	_blk_
Monitor Mode	__off__	Cursor Blink	_no_
Autowrap	_on_	Labels	__off__
Newline on LF	_no_		
Return Key	_CR_		
Enter Key	<--		

DONE 615MT 1.1

		CHANGE OPTION	DEFAULT VALUES	SAVED VALUES	SAVE	NEXT SETUP	CLEAR TO END
--	--	------------------	-------------------	-----------------	------	---------------	-----------------

Figure 3-28: Terminal Options for a 615 MT Terminal

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 Business Communications Terminal (BCT)

Figure 3-29 shows the recommended 605 BCT 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__

DONE 605 BMT - 1.0

CHANGE
OPTION

DEFAULT
VALUES

SAVED
VALUES

SAVE

NEXT
SETUP

CLEAR
TO END

Figure 3-29: 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 Multi-Tasking Graphics (MTG) Terminal

Figure 3-30, "Terminal Options for a 620 MTG Terminal", shows the recommended 620 MTG terminal options.

```

                                OPTIONS SETUP

    Communications                                User Preferences

Speed          9600                                Reverse Video  _no_
Send Parity    spac                                Volume         _jump_
Check Parity   _no_                                Key Click      _no_
Local Echo     _off_
Generate Flow  _off_                                Mouse Movement _1:1
Receive Flow   _on_                                Mouse Button 3 right
Pass Flow      _off_

Monitor Mode   _no_                                Printer Type    5320
Auto Wrap      _on_                                Printer Alarm   _no_
Newline on LF  _no_                                Printer Speed   1200
Return Key     _CR_                                Printer Parity  none
Enter Key      <--

DONE                                                    620/Basic - 1.1

  CHANGE OPTION  DEFAULT VALUES  SAVED VALUES  SAVE  NEXT SETUP  CLEAR TO END

```

Figure 3-30: Terminal Options for a 620 MTG Terminal

If any of the 620 MTG terminal 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 labels, 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 3-31 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	<input type="checkbox"/>
Control Graphics	ASCII	
Background Pattern	default	<input type="checkbox"/>

SETUP MENU PREVIOUS SCREEN NEXT SCREEN CHANGE OPTION

Figure 3-31: User Preference Options for a 2900/AWTC Terminal

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, which should be set to read 8 bits.

Figure 3-32 shows the recommended SES 1 communications options.

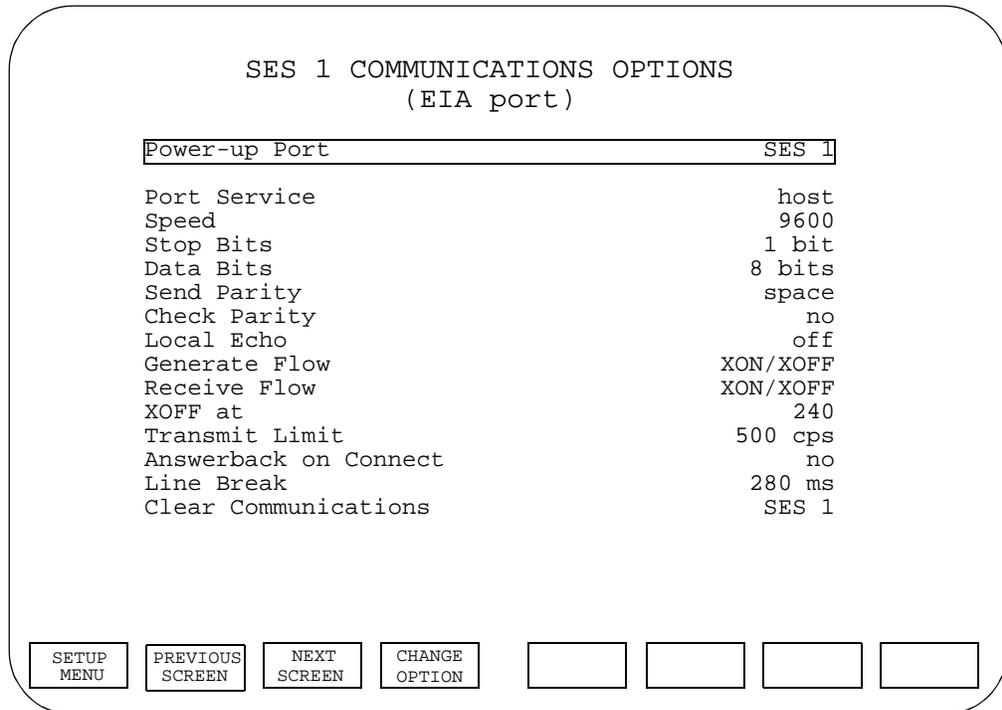


Figure 3-32: SES 1 Communications Options for a 2900/AWTC Terminal

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 3-33 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 3-33: SES 2 Communications Options for a 2900/AWTC Terminal

General Options Window

Figure 3-34 shows the recommended general options for a 2900/AWTC terminal.

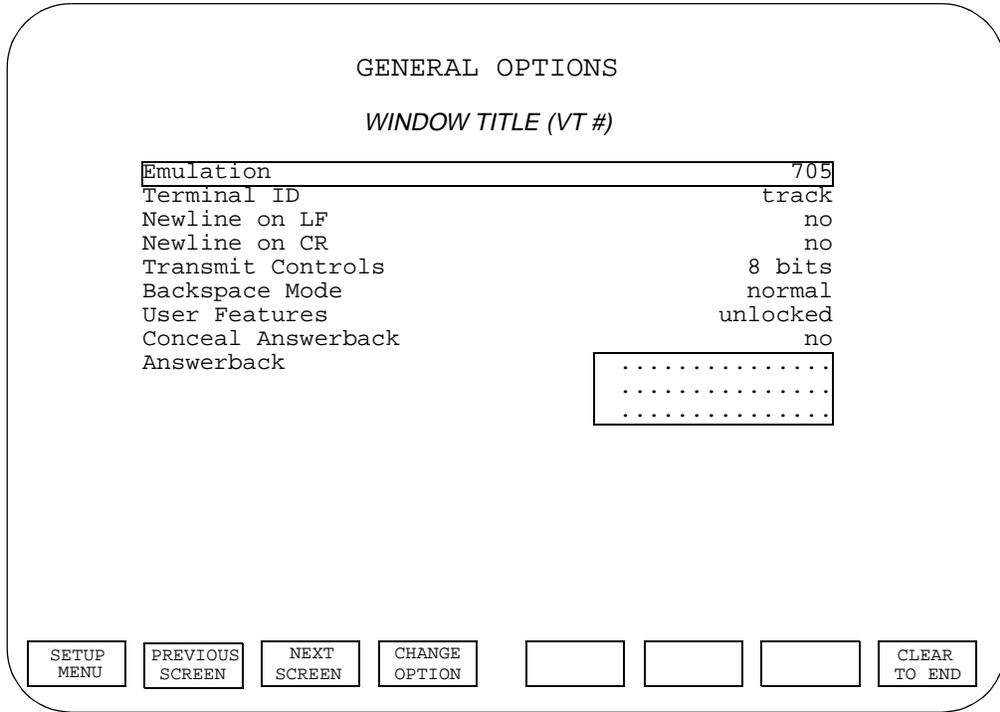


Figure 3-34: General Options for a 2900/AWTC Terminal

Display Options Window

Figure 3-35 shows the recommended display options for a 2900/AWTC terminal.

```
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 3-35: Display Options for a 2900/AWTC Terminal

Keyboard Options Window

Figure 3-36 shows the recommended keyboard options for a 2900/AWTC terminal.

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 3-36: Keyboard Options for a 2900/AWTC Terminal

Printer Options Window

Figure 3-37 shows the recommended printer options for a 2900/AWTC terminal.

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 3-37: Printer Options for a 2900/AWTC Terminal

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 3-38 shows the recommended user preference options for a 4000/AWTC terminal.

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 3-38: User Preference Options for a 4000/AWTC Terminal

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, which should be set to 8 bits.

Figure 3-39 shows the recommended SES 1 communications options for a 4000/AWTC terminal.

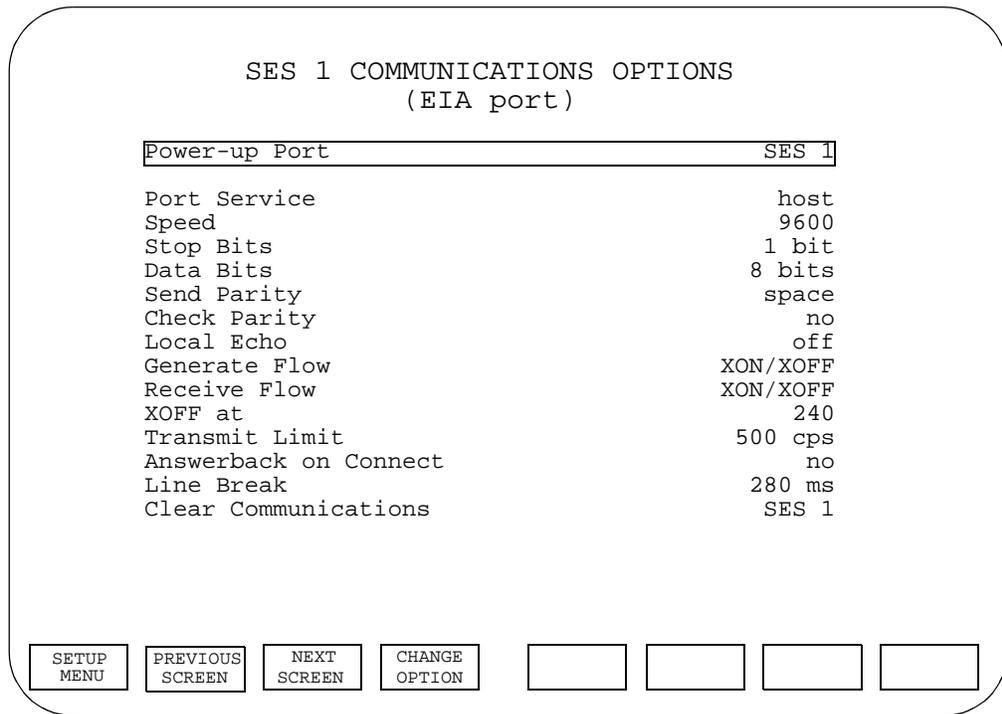


Figure 3-39: SES 1 Communications Options for a 4000/AWTC Terminal

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 3-40 shows the recommended SES 2 communications options for a 4000/AWTC terminal.

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 3-40: SES 2 Communications Options for a 4000/AWTC Terminal

General Options Window

Figure 3-41 shows the recommended general options for a 4000/AWTC terminal.

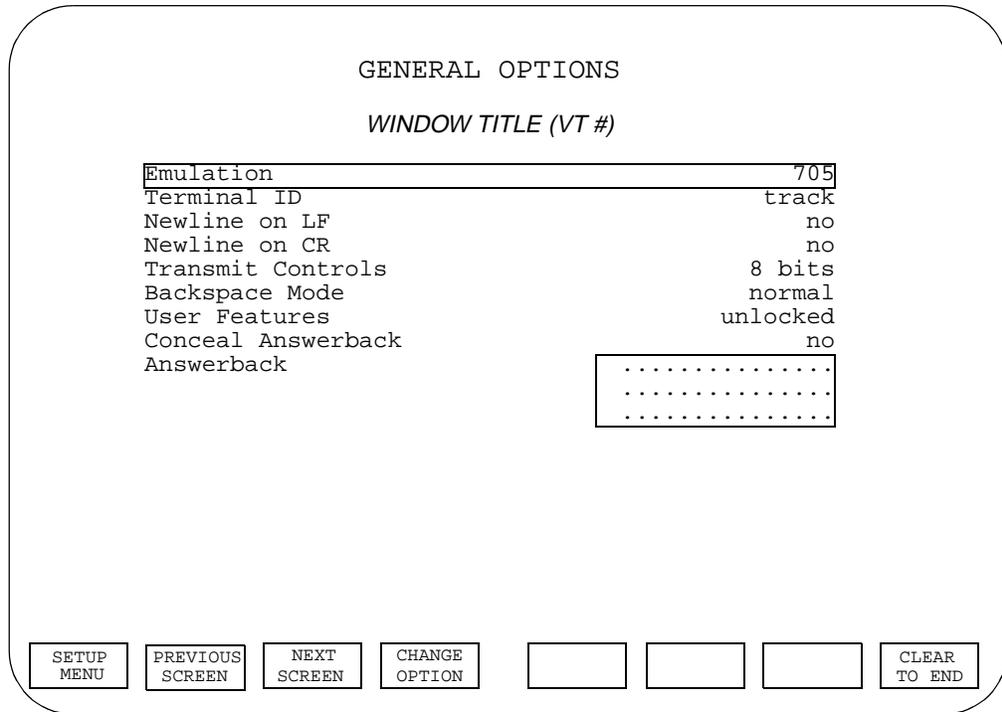


Figure 3-41: General Options for a 4000/AWTC Terminal

Display Options Window

Figure 3-42 shows the recommended display options for a 4000/AWTC terminal.

```
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 3-42: Display Options for a 4000/AWTC Terminal

Keyboard Options Window

Figure 3-43 shows the recommended keyboard options for a 4000/AWTC terminal.

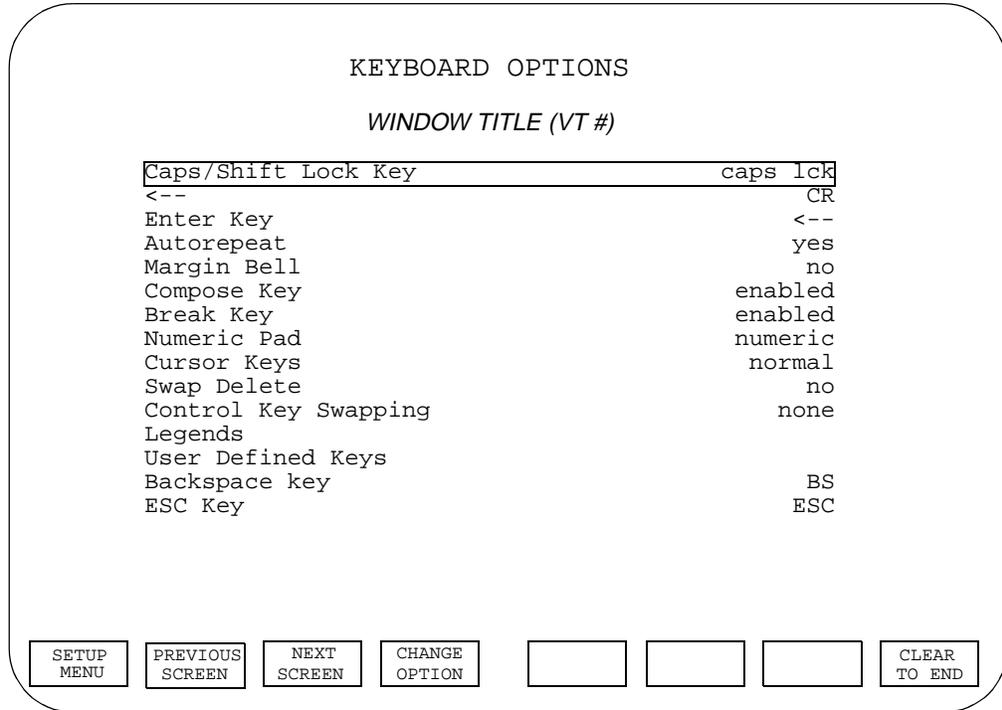


Figure 3-43: Keyboard Options for a 4000/AWTC Terminal

2900/260lf Small Footprint Terminal

The recommended 2900/260lf terminal values are shown in Figures 3-45 through 3-57. Twelve of the menus are accessed by the function keys F1 through F12. Menu 13 is accessed by the Print Screen key and provides terminal operations which may be executed.

To enter the terminal setup mode, simultaneously press **Ctrl** **Scroll Lock**. To exit Setup, press **Pause** and then press **y** or **n**.

F1 Quick Window

Figure 3-45 shows the F1 Quick Values for the 2900/260lf Small Footprint terminal.

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=On Host/Printer=EIA/Para				<input type="button" value="Parameters"/> EIA Baud Rate=9600 Aux Baud Rate=9600 Language=U.S.				EIA Data Format=8/1/N Aux Data Format=8/1/N Sessions=One				
<input type="button" value="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				<input type="button" value="Select"/>				Enter/S-Enter: Next/Prev Choice				
								Exit : PauseKey				

Figure 3-45: F1 Quick Values for a 2900/260lf Terminal

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

F2 Genrl (General) Window

Figure 3-46 shows the F2 General Window values for the 2900/260If Small Footprint terminal.

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								
Emulation=VT-300-7 Auto Font Load=On Monitor Mode=Off Warning Bell=On Sessions=One				Enhanced=On Auto Page=Off Screen Saver=5-min Bell Length=350 ms Color Mode=Direct				Auto Wrap=Off Auto Scroll=On Bell Volume=06 Host Printer=EIA/Para				
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										
↑ → ↓ ←				Select								
: Parameter				Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 3-46: F2 General Values for a 2900/260If Terminal

F3 Displ (Display) Window

Figure 3-47 shows the F3 Display Window values for the 2900/260lf Small Footprint terminal.

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=On Columns=80 Scroll=Jump				<div style="border: 1px solid black; padding: 2px; text-align: center;">Parameters</div> Screen Length=26 Lines Cursor=Blink Block Erase Color=Black				Screen Video=Normal Auto Adjust Cursor=On Speed=Fast				
<div style="border: 1px solid black; padding: 2px; text-align: center;">Choices</div> 24 25 42 43 48 50 84 86 96 100 168 172 192 200 *24 *25 *42 *43												
↑ → ↓ ← : Parameter				<div style="border: 1px solid black; padding: 2px; text-align: center;">Select</div> Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 3-47: F3 Display Values for a 2900/260lf Terminal

F4 Kybd (Keyboard) Window

Figure 3-48 shows the F4 Keyboard Window values for the 2900/260lf Small Footprint terminal.

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 3-48: F4 Keyboard Values for a 2900/260lf Terminal

F5 Keys Window

Figure 3-49 shows the F5 Keys Window values for the 2900/260lf Small Footprint terminal.

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.				<div style="border: 1px solid black; padding: 2px; display: inline-block;">Parameters</div> Return Key=<CR> Disconnect=Pause Return Key Repeat=Off				Backspace=<BS>/ Desk Acc=Ctrl+ UDKs=Emul Dependent				
<div style="border: 1px solid black; padding: 2px; display: inline-block;">Choices</div> <CR> <CR><LF> <TAB>												
↑→↓← : Parameter				<div style="border: 1px solid black; padding: 2px; display: inline-block;">Select</div>				Enter/S-Enter: Next/Prev Choice Exit : PauseKey				

Figure 3-49: F5 Keys Values for a 2900/260lf Terminal

F6 Ports Window

Figure 3-50 shows the F6 Ports Window values for the 2900/260lf Small Footprint terminal

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				EIA Data Format=8/1/N				EIA Parity Check=Off				
AUX Baud Rate=9600				AUX Data Format=8/1/N				AUX Parity Check=Off				
EIA Xmt=No Protocol				EIA Recv=Xany-Xoff(XPC)				EIA Xmt Pace=Baud				
AUX Xmt=No Protocol				AUX Recv=Xany-Xoff(XPC)				AUX Xmt Pace=Baud				
EIA Break=250 ms				EIA Modem Control=Off				EIA Disconnect=2 sec				
AUX Break=250 ms				AUX Modem Control=Off				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 3-50: F6 Ports Values for a 2900/260lf Terminal

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

F7 Host Window

Figure 3-51 shows the F7 Host Window values for the 2900/260lf Small Footprint terminal.

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 =Ignore Send Region=Screen Alt Input Data=On				<div style="border: 1px solid black; padding: 2px; text-align: center;">Parameters</div> Local=Off Send ACK=On Send End=Region				Recv <CR>=<CR> Send Block Term=None Null Supress=Off				
<div style="border: 1px solid black; padding: 2px; text-align: center;">Choices</div> Full Duplex Half Duplex Full Block Half Block												
↑ ⇒ ↓ <				<div style="border: 1px solid black; padding: 2px; text-align: center;">Select</div> Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 3-51: F7 Host Values for a 2900/260lf Terminal

F8 Print Window

Figure 3-52 shows the F8 Print Window values for the 2900/260lf Small Footprint terminal.

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				
<div style="text-align: center;">Choices</div> Normal Auto Controller												
↑ > ↓ < : Parameter				Select Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 3-52: F8 Print Values for a 2900/260lf Terminal

F9 Emul (Emulation) Window

Figure 3-53 shows the F9 Emulation Window values for the 2900/260lf Small Footprint terminal.

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				<div style="border: 1px solid black; padding: 2px; text-align: center;">Parameters</div> Cursor Kpd=Cursor ANSI-ID=VT320 Feature Lock=Off				Send Data=All Function Key Lock=Off Status Line=Off				
<div style="border: 1px solid black; padding: 2px; display: inline-block;">Choices</div>												
Numeric Application												
↑⇒↓<				<div style="border: 1px solid black; padding: 2px; text-align: center;">Select</div>				: Parameter Enter/S-Enter: Next/Prev Choice Exit : PauseKey				

Figure 3-53: F9 Emulation Values for a 2900/260lf Terminal

F10 Tabs Window

Figure 3-54 shows the F10 Tabs Window values for the 2900/260lf Small Footprint terminal.

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						
..... 10 20 30 40 50 60 70 80 90 100 110 120 130												
Choices												
Off On												
↑ ⇒ ↓ ⇐ : Parameter				Select Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

Figure 3-54: F10 Tabs Values for a 2900/260lf Terminal

F11 AnsBk (Answer Back) Window

Figure 3-55 shows the F11 Answer Back Window values for the 2900/260lf Small Footprint terminal.

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: <input type="text"/>												
Bytes Remaining:												
Choices												
Off On												
Select												
↑ → ↓ ←				: Parameter				Enter/S-Enter: Next/Prev Choice			Exit : PauseKey	

Figure 3-55: F11 Answer Back Values for a 2900/260lf Terminal

F12 Prog (Program) Window

Figure 3-56 shows the F12 Program Window values for the 2900/260lf Small Footprint terminal.

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: <input style="width: 90%; height: 20px;" type="text"/>												
Label: <input style="width: 10%; height: 15px;" type="text"/> 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 3-56: F12 Program Values for a 2900/260lf Terminal

PrtSc Exec (Print Screen Execute) Window

Figure 3-57 shows the Print Screen Execute Window values for the 2900/260lf Small Footprint terminal.

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				Parameters				Default Terminal							
Save Session				Recall Terminal				Default Session							
Reset Terminal				Recall Session				Reset Ports							
Clear Screen				Reset Session				Default Session UDKs							
Use Enter Key to Execute Action															
Choices															
Select															
↑ > ↓ <				: Parameter				Enter/S-Enter: Next/Prev Choice				Exit : PauseKey			

Figure 3-57: Print Screen Execute Values for a 2900/260lf Terminal

Administering Printers

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

- Serial Printers on the NTS
- Parallel Printers Connected to the NTS

 **NOTE:**

The *Sun Enterprise 3000* System does not have a parallel printer port. Therefore, it is not possible to connect a parallel printer directly to the system.

- Administering Modems.

 **CAUTION:**

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`, `rtelnet`, and `lpadmin` administration for the *Sun Enterprise 3000* System to recognize the new serial printer(s).

 **NOTE:**

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 R(most current release number &  
date)  
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 3-5 for specific devices, IP addresses, terminals, and file names. The system responds as follows:

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

```
command:
```

- 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 both 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 3-7 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 3-7: 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 Enterprise 3000 System</i>).	Set to your <i>Sun Enterprise 3000 System</i> 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.

Table 3-7: Serial Printer Configuration Guidelines (Contd)

Port Generic Parameter	Default Parameter	Recommended Setting	Comment
<code>data_bits</code>	8	Set to match the requirements of the printer.	Can be set to match the printer settings.
<code>parity</code>	none	Set to none.	Can be set to match the printer settings.
<code>stop_bits</code>	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 as follows:

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 as follows:

```
# 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, `ntslinfo`), enter the following:

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

⇒ 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 as follows:

```
cmsterm1: Annex-3-UX R(most current release number & date)
        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 as follows:

```
#
```

RTELNET Administration

Serial printers require some additional administration:

- You must place the command in a file (as specified below).
- You must run the command by either entering the command as described below or by rebooting the *Sun Enterprise 3000* System.

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. To access the `Speripherals` file using an editor (for example, `vi`), enter the following:

```
# 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, hold down the **Shift** key and press the **Z** key twice.

- e. To return to the root directory, enter the following command:

```
# cd /
```

10. At the *Sun Enterprise 3000* System 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/cmstermintf -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 Enterprise 3000* System is replacing an existing *INTEL* based product, check the *CentreVu CMS: Maintenance: Printer Administration* window to match settings. Use the device name from the `rtelnet` command (see Step 10). If the speed is **not** 9600, use `-o "stty=<baud rate>"`.

See Table 3-8 to identify the correct `lpadmin` type.

Table 3-8: 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
572 Serial Dot Matrix (Narrow Platen)	572	—	Discontinued
573 Serial Dot Matrix (Wide Platen)	573	—	Discontinued
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
<i>Okidata</i> ML321T	ibmproprinter	<i>IBM</i>	—

* 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 as follows:

```
<printername> enabled
```

15. To complete the printer default destination and put the printer into service, enter the following command:

```
# accept <printername>
```

The system responds as follows:

```
<printername> accepted
```

16. If this is the initial installation, reboot the *Sun Enterprise 3000* System.

⇒ 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 them 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 3-58 and Figure 3-59). This NTS parallel port supports either a Centronics or *Dataproducts** compatible printer.

⇒ NOTE:

The *Sun Ultra Enterprise* 3000 System does not have a parallel printer port. Therefore, a parallel printer can be connected to a *CentreVu* CMS system on the *Sun Enterprise* 3000 System, only through an NTS parallel port.

After the parallel printers are connected, you must complete the `na` and `lpadmin` administration for the *Sun Enterprise* 3000 System to recognize the new parallel printer(s).

Cable Connections

There are two types of cables that can be used to connect the parallel printer to the NTS. These cables are Centronics or *IBM* type (also called *Dataproducts*). One or the other is needed depending on what type of printer is being used. All supported printers use Centronics. For the correct cable to use in connecting the printer to the NTS, see Table 3-9.

Table 3-9: Parallel Printer Connections

Connector type	PEC	Comcode
Centronics	12105	407361856
<i>IBM</i> type (<i>Dataproducts</i>)	12106	407361831

To connect your printer to the 64-port NTS, see Figure 3-58.

**Dataproducts* is a registered trademark of Dataproducts Corp.

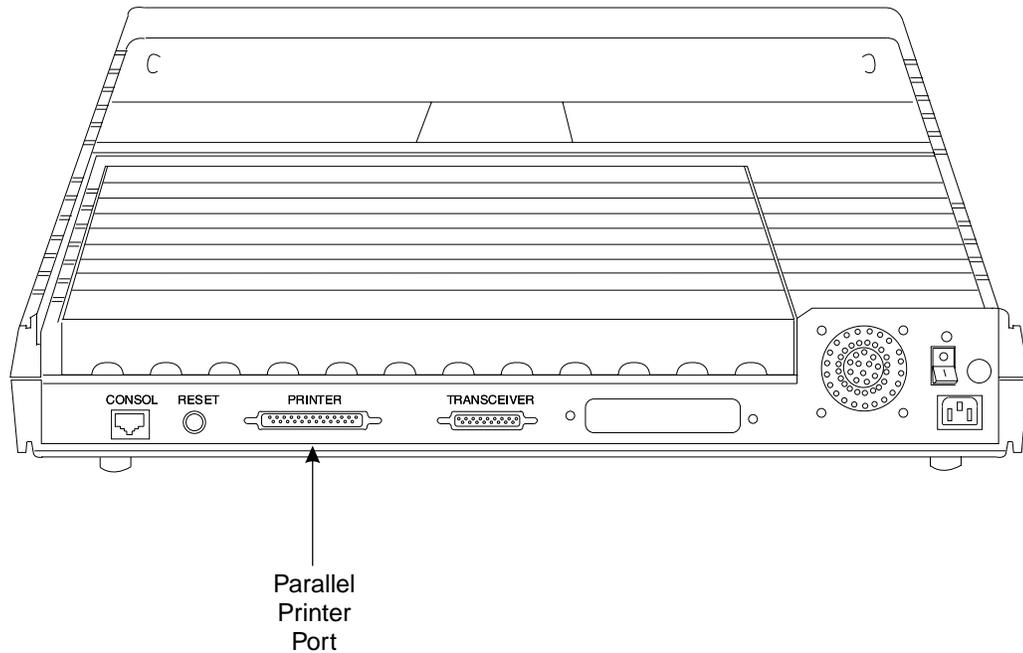


Figure 3-58: 64-Port NTS Parallel Printer Port Connection

⇒ 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.

Figure 3-59 shows the connections for the 8-Port NTS. This NTS cannot be ordered; however, if the customer has one it can be used.

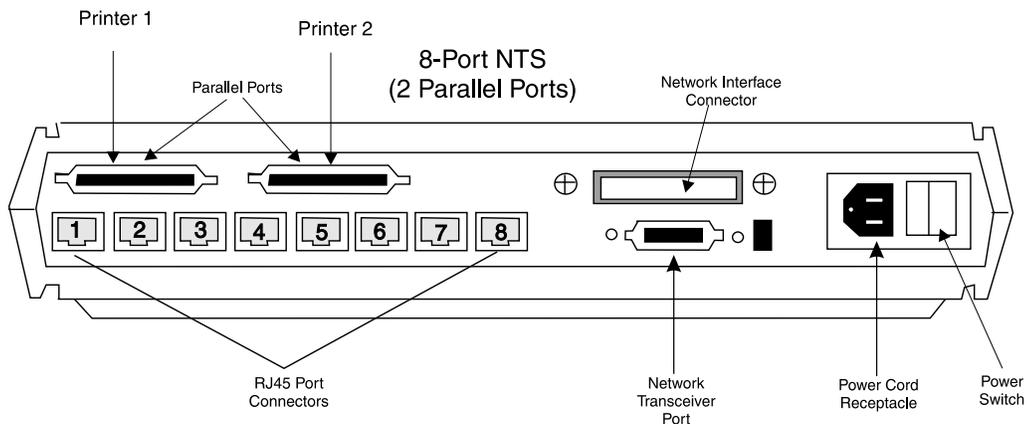


Figure 3-59: 8-Port Parallel Printer Port Connection

Procedure

To 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 following command to access the NTS administration software:

```
# na
```

The system responds as follows:

```
Annex network administrator R(most current release number &
date)
command:
```

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

```
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 3-5 for specific devices, IP addresses, terminals, and file names.

The system responds as follows:

```
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 finished, 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 as follows:

```
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 as follows:

```
#
```

LPADMIN Administration

Continue with the following steps for parallel printers:

7. For a parallel printer on the first NTS, issue the following command on the *Sun Enterprise 3000* System 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 NTS, cmsterm3pr2 on the third NTS, and cmsterm4pr2 on the fourth NTS.

⇒ **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 3-8 to identify the correct lpadmin type.

8. To make a printer the default destination, enter the following command from the *Sun Enterprise 3000* System console:

```
# lpadmin -d <printername>
```

9. To enable the printer, enter the following command:

```
# enable <printername>
```

The system responds as follows:

```
<printername> enabled
```

10. To complete the printer default destination, enter the following command:

```
# accept <printername>
```

The system responds as follows:

```
<printername> accepted
```

11. If this is the initial installation, reboot the *Sun Enterprise 3000* System.

⇒ NOTE:

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

See Table 3-8 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).

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 `rtelnet` administration for the *Sun Enterprise 3000* System 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 Enterprise 3000* System to recognize the new inbound modem(s).

You can complete `na` administration for modems using the following method:

- Complete Network Administration (`na`) — 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 following command to access the NTS administration software:

```
# na
```

The system responds as follows as follows:

```
Annex network administrator R(most current release number &
date)
command:
```

3. To associate all subsequent administration with a specific network terminal server, enter the following 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 NTSSs. Use the recommended NTS names and addresses in the `/etc/hosts` file.

See Table 3-5, for specific devices, IP addresses, terminals, and file names.

The system responds as follows:

```
cmstern1: 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 *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>
```

⇒ 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` parameters 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 3-10 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 3-10: Outbound Modem Configuration Guidelines for a *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 Enterprise 3000</i> System).	Set to your <i>Sun Enterprise 3000</i> System 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.

5. When you are finished, use the following command to reset the modem ports:

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

The system responds as follows:

```
resetting serial port <number>
```

 **CAUTION:**

You can also use the `reset all@cmstern1` command to terminate all active sessions on the NTS. Use the `reset all@cmstern1` 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. To run the command, enter the command as described below, or reboot the *Sun Enterprise 3000* System.

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. To access the `Speripherals` file using an editor (for example, `vi`) enter the following:

```
# vi Speripherals
```

- c. Enter the name(s) of the character special device(s) into the file as follows:

```
rtelnet -fmrt cmsterm2 20 /dev/s_pdev220
```

- d. To exit the file and return to the system prompt, hold down the **Shift** key and press the **Z** key twice.

- e. To return to the root directory, enter the following command:

```
# cd /
```

8. At the *Sun Enterprise 3000* System 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 do the parameters 2 and 20 in the command string `cmsterm2 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 *Sun Enterprise 3000* System.

⇒ NOTE:

You can wait to reboot your system until 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 as follows:

```
# na
```

The system responds as follows:

```
Annex network administrator R(most current release number &
date)
command:
```

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

```
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 3-5 for specific devices, IP addresses, terminals, and file names.

The system responds as follows:

```
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` parameters 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 3-11 for more details about entering the `set port` command string.

Table 3-11: 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 Enterprise 3000 System</i>)	Set to your <i>Sun Enterprise 3000 System's</i> 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 finished, use the following command to reset the modem ports:

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

The system responds as follows:

```
resetting serial port <number>
```

 **CAUTION:**

You can also use the `reset all@cmstern1` command to terminate all active sessions on the NTS.

Use the `reset all@cmstern1` command **only** if no one is logged in.

6. To quit, enter the following command:

```
command: quit
```

The system responds as follows:

```
#
```

7. If this is the initial installation, reboot the *Sun Enterprise 3000* System.

 **NOTE:**

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

Modem Options

After you connect the modem to the system, 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 system can recognize the new modem.

The sections that follow describe how to set options for the modem.

U.S. Robotics Sportster 33.6 Faxmodem

The *U.S. Robotics Sportster* has eight Dual Inline Package (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 the CMS (see Figure 3-60).

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 Enterprise 3000 System* as described in Chapter 2, "Installing the Sun Enterprise 3000 System, Setting the Remote Console Modem Options."

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&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 3-60 shows the final DIP switch settings for CMS, and Table 3-12 explains the settings.
7. Finally, reset the modem using the power switch on the front (see Figure 3-60).

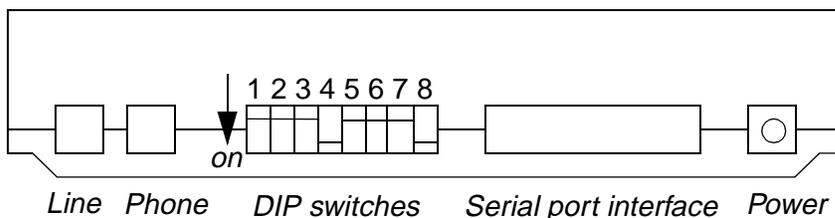


Figure 3-60: U.S. Robotics Sportster Backpanel

Table 3-12: U.S. Robotics Sportster Switch Settings for the 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

Additional References For additional information, refer to the *U.S. Robotics* Sportster* Modems User's Guide*

Chapter 4

Connecting the *Sun Enterprise 3000* System to the Switch

Overview	4-1
<i>Sun Enterprise 3000</i> HSI/S Patch Panel	4-3
Serial Port B	4-4
Connecting the <i>CentreVu CMS</i> to the Generic 3r Switch	4-5
Isolating Data Interface (IDI)	4-6
Required Parts	4-6
Procedure	4-7
7400D Data Module	4-9
Required Parts	4-9
Procedure	4-11
Private Line	4-13
Required Parts	4-13
Procedure for Connecting the <i>Sun Enterprise 3000</i> System to a Private Line	4-15
Procedure for Connecting a Generic 3r Switch to a Private Line	4-17
Connecting the <i>CentreVu CMS</i> to the Generic 2 Switch	4-18
Isolating Data Interface (IDI)	4-19
Required Parts	4-19
Procedure	4-21
Local Data Service Units (LDSUs)	4-22
Required Parts	4-22
Procedure	4-24
Remote Data Service Units (RDSUs)	4-25
Required Parts	4-25
Procedure	4-28
Analog Private Line	4-30
Required Parts	4-30
Procedure	4-32
Connecting the <i>CentreVu CMS</i> to the Generic 3i Switch	4-33
EIA Connector on the Processor Interface	4-33
Required Parts	4-34
Procedure	4-35
7400D Data Module	4-37
Required Parts	4-37
Procedure	4-38
Analog Private Line	4-40
Required Parts	4-40
Connecting the <i>Sun Enterprise 3000</i> System to an Analog Private Line	4-42
Connecting the Generic 3i Switch to an Analog Private Line	4-43

Multiple Automatic Call Distribution (ACD) Connectivity	4-45
Adding an ACD	4-45
Prepare for Adding the ACD	4-46
Turn Off <i>CentreVu</i> CMS	4-49
Execute the “acd_create” Option	4-49
Connect the Link	4-49
Turn On <i>CentreVu</i> CMS	4-50

List of Figures

Figure 4-1:	SunLink HSI/S Patch Panel for Multiple ACD Systems	4-3
Figure 4-2:	Serial Port B for Single ACD System	4-4
Figure 4-3:	Sun Enterprise 3000 System to Generic 3r Switch Via the IDI	4-7
Figure 4-4:	Sun Enterprise 3000 System to Generic 3r Cabling with a 7400D	4-10
Figure 4-5:	Connecting a Sun Enterprise 3000 System to a Private Line	4-14
Figure 4-6:	Connecting a Generic 3r Switch to a Private Line.	4-16
Figure 4-7:	Sun Enterprise 3000 System to Generic 2 Cabling Via the IDI	4-20
Figure 4-8:	Sun Enterprise 3000 System to Generic 2 Cabling with Local DSUs	4-23
Figure 4-9:	Sun Enterprise 3000 System to Generic 2 Cabling with Remote DSUs	4-27
Figure 4-10:	Generic 2 Cabling to an Analog Private Line.	4-31
Figure 4-11:	Sun Enterprise 3000 System to Generic 3i Cabling Via the IDI	4-35
Figure 4-12:	Sun Enterprise 3000 System to Generic 3i Cabling with a 7400D	4-38
Figure 4-13:	Sun Enterprise 3000 System Cabling to an Analog Private Line	4-41
Figure 4-14:	Connecting a Generic 3i Switch to an Analog Private Line	4-43

List of Tables

Table 4-1:	LADC Ranges	4-26
Table 4-2:	Form for Adding a New ACD	4-46

Overview

Lucent Technologies technicians connect the *Sun*^{*} *Enterprise*[†] 3000 System to a *DEFINITY*[‡] switch. This connection allows the *CentreVu*[™] Call Management System (CMS) software on the *Sun Enterprise* 3000 System 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 Lucent Technologies switches. The following sections give detailed information on how to connect the *CentreVu* CMS to the listed switches:

- Connecting the CentreVu CMS to the Generic 3r Switch
- Connecting the CentreVu CMS to the Generic 2 Switch
- Connecting the CentreVu CMS to the Generic 3i Switch.

⇒ NOTE:

The configurations described in this chapter are for maintenance purposes only. Much of the equipment described for the Generic 3i and the Generic 2 switch configurations 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 feature and the *CentreVu* CMS.

The *CenterVu* CMS software will not communicate with the switch if the ACD feature, *CentreVu* CMS, or the PGATE/DCIU/PI hardware on the switch are not properly administered.

An experienced switch technician can refer to the following appendixes to administer the switch:

- **Appendix A** — contains reference material about the link administration for the Generic 3i switches
- **Appendix B** — contains reference material about the Data Communications Interface Unit (DCIU) link administration for the Generic 2 switch
- **Appendix C** — contains reference material about the link administration for the Generic 3r switch.

^{*}*Sun* is a registered trademark of Sun Microsystems, Inc. in the United States and other countries.

[†]*Enterprise* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

[‡]*DEFINITY* is a registered trademark of Lucent Technologies.

 **NOTE:**

When using a Generic 3r, set the `Number of Outstanding Frames (w):` field to 7. See Appendix C, “Generic 3r Switch Administration” Figure C-5

There are two different methods for connecting a switch to the *Sun Enterprise 3000* System. These methods are as follows:

- Sun Enterprise 3000 HSI/S Patch Panel, used for multiple ACD connections
- Serial Port B, used for connection to a single ACD.

**Sun
Enterprise
3000 HSI/S
Patch Panel**

On the *Sun Enterprise 3000 System*, the *SunLink High Speed Interface/Serial (HSI/S) Patch Panel* is used for multiplied systems (see Figure 4-1).

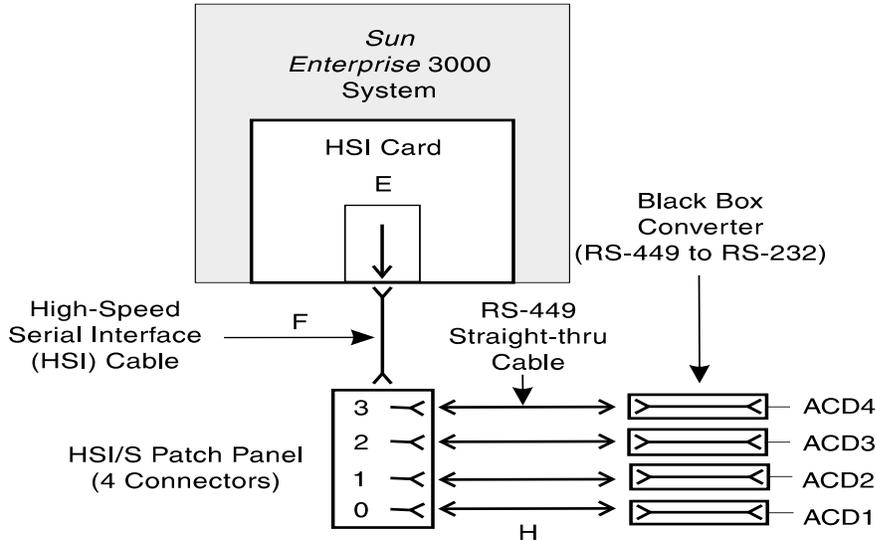


Figure 4-1: SunLink HSI/S Patch Panel for Multiple ACD Systems

⚠ WARNING:

For multiple ACDs, the Black Box Converter must be used when connecting the system 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 Enterprise 3000 System* or switch components.

Verify that the *Sun Enterprise 3000 System*, HSI/S Patch Panel, and Black Box Converter are connected properly (see Figure 4-1).

The Black Box Converter is connected to the *Sun Enterprise 3000 System* via the HSI/S controller card and patch panel.

These connections should be made when the HSI/S controller card is installed in the *Sun Enterprise 3000 System*. If the connections have not been made, see Chapter 2, *Installing the Sun Enterprise 3000 System, Connecting the SunLink HSI/S Patch Panel*.

Serial Port B

Serial port B on the *Sun Enterprise 3000 System* is used for single ACD systems (see Figure 4-2). A standard RS-232 cable is used for this connection. At the *Sun Enterprise 3000 System* end, an adapter, either a DB-25 M/M Gender Changer or a DB-25 Direct-Connect link adapter, is required depending upon the switch interface device to be used.

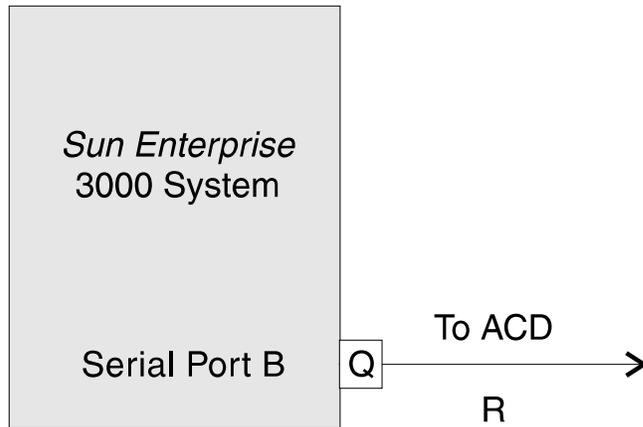


Figure 4-2: Serial Port B for Single ACD System

Connecting the *CentreVu* CMS to the Generic 3r Switch

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 Enterprise* 3000 System 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 Enterprise* 3000 System and the Generic 3r is 200 feet.

- 7400D Data Module

With this method, the maximum distance between the DTE (RS-232) output port of the *Sun Enterprise* 3000 System 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.

^{*}*Dataphone* is a registered trademark of Parading Corp.

Isolating Data Interface (IDI)

This section describes how to connect the DTE (RS-232) port on the *Sun Enterprise 3000* System to the Packet Gateway board on the Generic 3r via an IDI (see Figure 4-3). This interface can be used with either a single ACD configuration or a multiple ACD configuration. With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun Enterprise 3000* System and the Generic 3r switch is 200 feet.

Required Parts

Obtain the following parts:

- DB25 M/M Direct Connect Link Adapter
- IDI unit
- H600-347, Group 1 (RS-232C) cable
- H600-210, Group 1 (RS-232C to RS-449) cable
- 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.

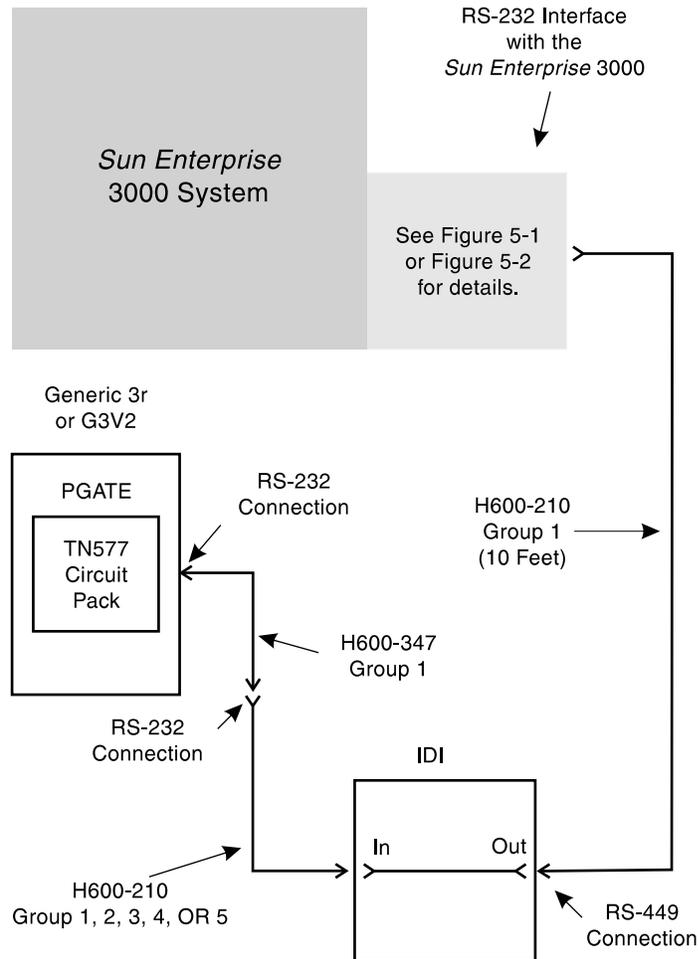


Figure 4-3: Sun Enterprise 3000 System to Generic 3r Switch Via the IDI

Procedure

To connect the *Sun Enterprise* 3000 System to the Packet Gateway of a Generic 3r switch via an IDI unit do the following:

1. If an HSI/S card is installed (multiple ACD configuration), connect the direct-connect Link Adapter to the DTE (RS-232) output port on the Black Box Converter (switch side of the converter).

For a single ACD configuration (no HSI/S card), connect the Direct-connect Link Adapter to the serial port B of the *Sun Enterprise* 3000 system.

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.
6. The switch technician should connect the male end of the H600-347, Group 1 cable to the Packet Gateway board on the switch.
7. Verify with the switch technician that the ACD feature and *CentreVu* CMS are administered on the switch.

7400D Data Module

This section describes how to connect the *Sun Enterprise* 3000 System to the Generic 3r using 7400D Data Modules (see Figure 4-4). This interface can be used for either a single ACD configuration or a multiple ACD configuration.

With this method, the maximum allowable distance between the output port of the *Sun Enterprise* 3000 System 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
- Two 7400Ds with a stand-alone housing
- Two 7-foot D8W-87 modular plug telephone cords (included with the stand-alone housing)
- One H600-347, Group 1 (RS-232C) cable
- Two M25A (RS-232C) cables

 **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 B25A (RS-232C) cables
- Two locally engineered cables with modular plugs at both ends (see “Procedure,” steps 7 and 8).

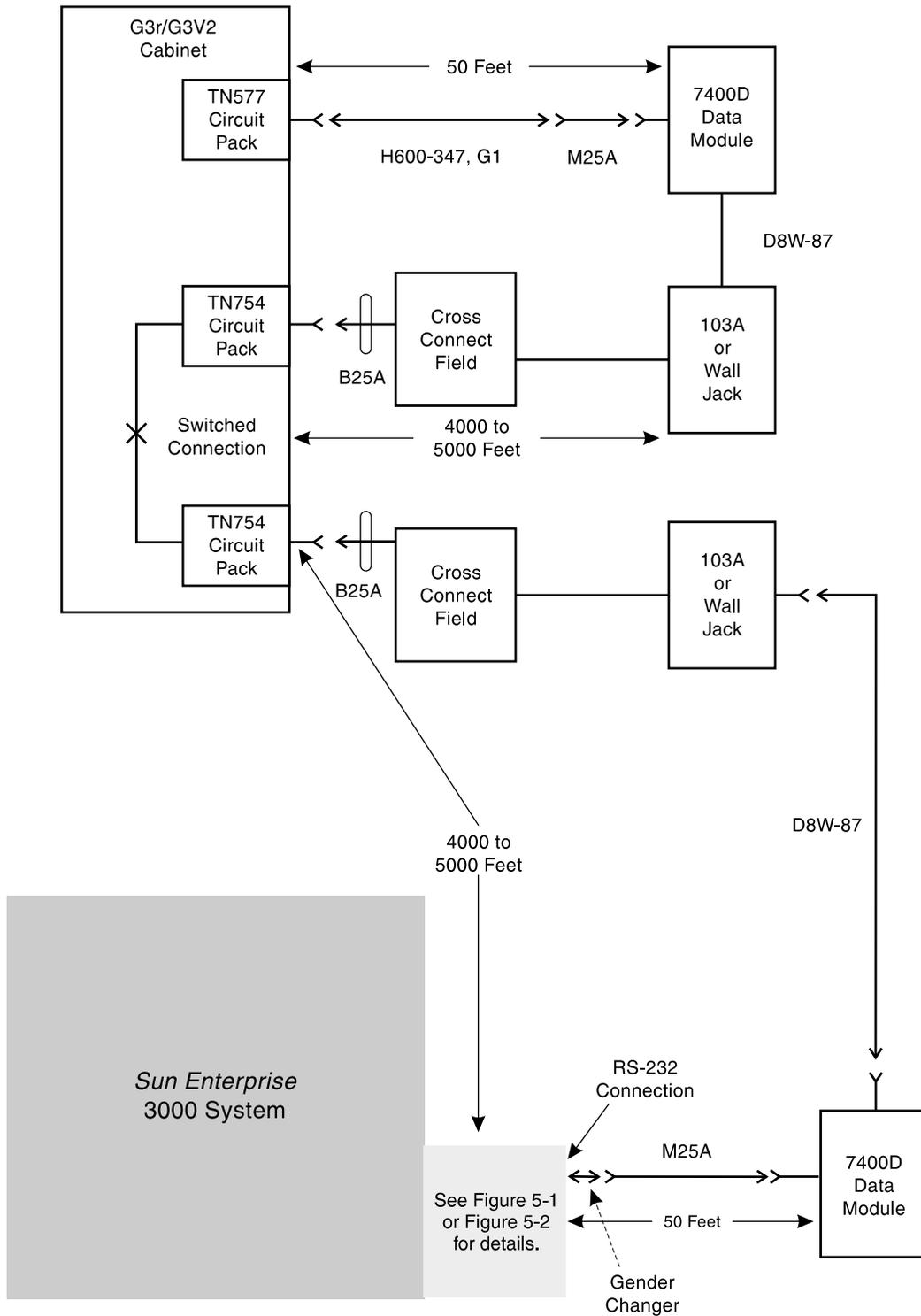


Figure 4-4: Sun Enterprise 3000 System to Generic 3r Cabling with a 7400D

Procedure

Do the following to connect the *Sun Enterprise 3000* System to a Packet Gateway board on the Generic 3r (see Figure 4-4):

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, set the speed of the 7400Ds to 19200. The remaining default options are acceptable for *CentreVu* CMS. See the *7400D Data Module User's Guide* (555-020-712) for information on options and how to set 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 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.

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 cross-connect.

10. Connect the other end of a D8W-87 modular plug telephone cord into the LINE jack on the 7400D.
11. Connect the AC Power Converter to the 7400D and to an AC power outlet, as follows:
 - 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.
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 (multiple ACD configuration). For a single ACD configuration, connect the gender changer to the serial port B.
15. Verify with the switch technician that the ACD feature and *CentreVu* CMS are administered on the switch.

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 Enterprise 3000 System* (see Figure 4-5). This interface can be used with either a single ACD configuration or a multiple ACD configuration.

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 Enterprise 3000 System* to a private line:

- 110-type cross-connect hardware
- 829 Channel Interface Unit (CIU) (no longer available)

 **NOTE:**

The Channel Interface Unit can no longer be ordered. If it is not available on the customer's premises, use PEC 9200-030 to order a stand-alone replacement unit. You can order this unit through the Custom Systems organization via the Custom Systems Automation Program (CSAP).

- DB25 M/M Gender Changer
- M25A cable
- One 2096C *Dataphone II* modem (no longer available).

Also, obtain these parts to connect the Generic 3r to a private line:

- 110-type cross-connect hardware
- 829 Channel Interface Unit (no longer available)

 **NOTE:**

The Channel Interface Unit can no longer be ordered. If it is not available on the customer's premises, use PEC 9200-030 to order a stand-alone replacement unit. You can order this unit through the Custom Systems organization via the CSAP.

- M25A cable
- One 2096C *Dataphone II* modem (no longer available).

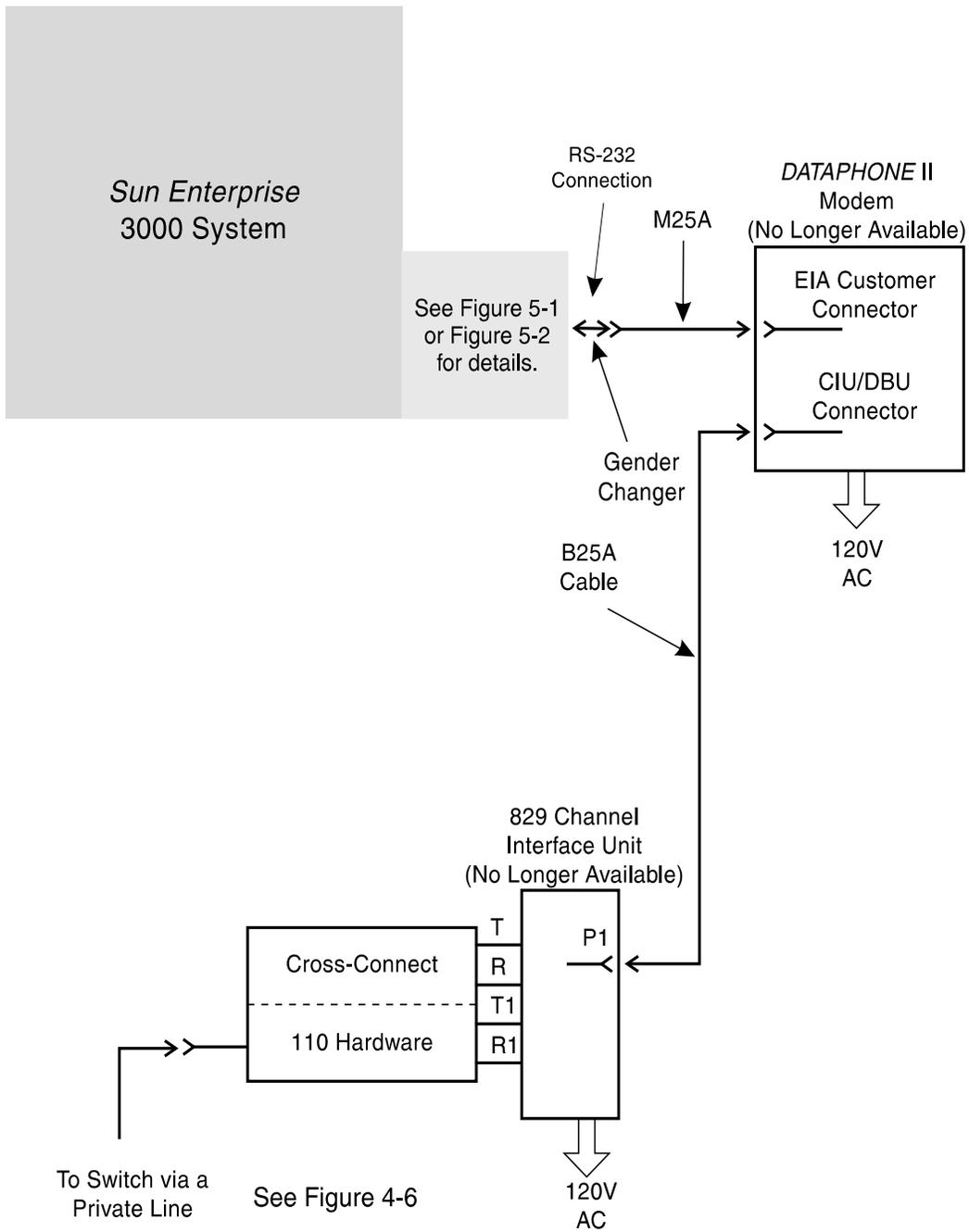


Figure 4-5: Connecting a Sun Enterprise 3000 System to a Private Line

Procedure for Connecting the *Sun Enterprise* 3000 System to a Private Line

Do the following to connect the *Sun Enterprise* 3000 System to a private line (see Figure 4-5):

1. If an HSI/S card is installed (multiple ACD configuration), connect the gender changer to the DTE (RS-232) output port on the Black Box Converter.

For a single ACD configuration (no HSI/S card), connect the gender changer to serial port B of the *Sun Enterprise* 3000 System.

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.
4. Connect the 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.

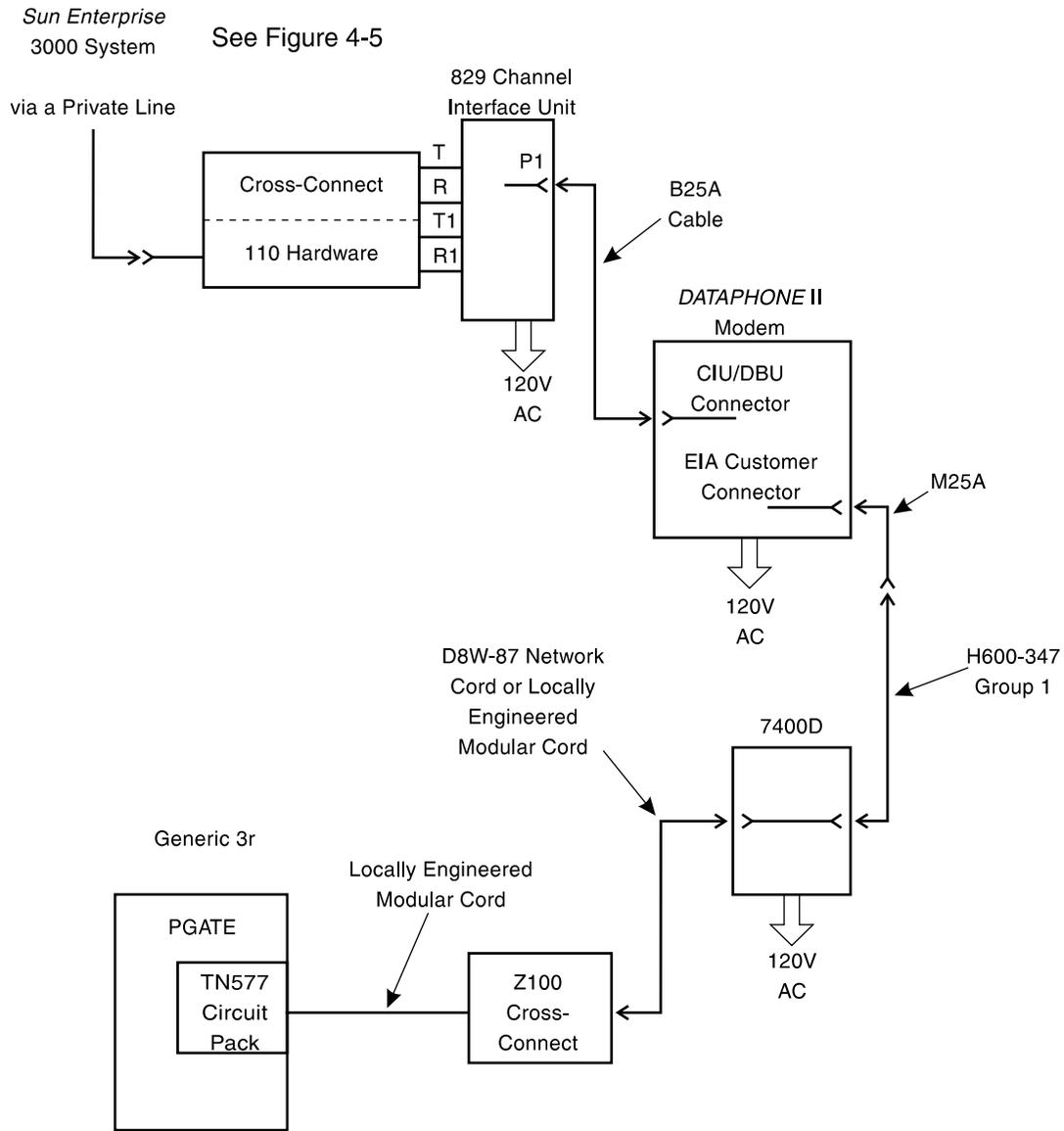


Figure 4-6: Connecting a Generic 3r Switch to a Private Line

Procedure for Connecting a Generic 3r Switch to a Private Line

To connect the Generic 3r to a private line (see Figure 4-6) do the following:

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 one end of the B25A cable to the P1 receptacle on the 829 Channel Interface Unit.
4. Connect the other end of the B25A 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 feature and *CentreVu* CMS are administered on the switch.

Connecting the *CentreVu* CMS to the Generic 2 Switch

To connect the *Sun Enterprise* 3000 System to a *DEFINITY* Communications System Generic 2, you will need to connect a DTE (RS-232C) port on the *Sun Enterprise* 3000 System to the Data Communications Interface Unit (DCIU) on the Generic 2. This connection uses the RS-232C protocol.

You can connect the *Sun Enterprise* 3000 System to the Generic 2 switch by using one of the following interfaces:

- Isolating Data Interface (IDI).

With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun Enterprise* 3000 System and the Generic 2 is 400 feet.

- Local Data Service Units (LDSUs).

With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun Enterprise* 3000 System and the Generic 2 is 100 feet.

- Remote Data Service Units (RDSUs).

With this method, the distance between the DTE (RS-232C) output port of the *Sun Enterprise* 3000 System and the Generic 2 is over 100 feet.

NOTE:

For this method, 4-wire nonloaded metallic lines are required to connect the Data Service Units (DSUs). When provided by the telephone company, these 4-wire nonloaded metallic lines are called Local Area Data Channels (LADCs).

- Analog Private Line.

With this method, the distance limits of the DSUs can be exceeded.

Check the equipment and parts delivered to the customer's site to determine which method to use.

Additional References

For additional information on connecting the CenterVu CMS to a Generic 2 switch see the following:

Appendix B, "Generic 2 Switch Administration"

AT&T DEFINITY Communications System Generic 2

Administration of Features and Hardware, (issue and version appropriate to the specific switch being administered).

Isolating Data Interface (IDI)

With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun Enterprise 3000* System and Generic 2 switch is 400 feet (see Figure 4-7). This interface can be used for either a single ACD configuration or a multiple ACD configuration.

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.

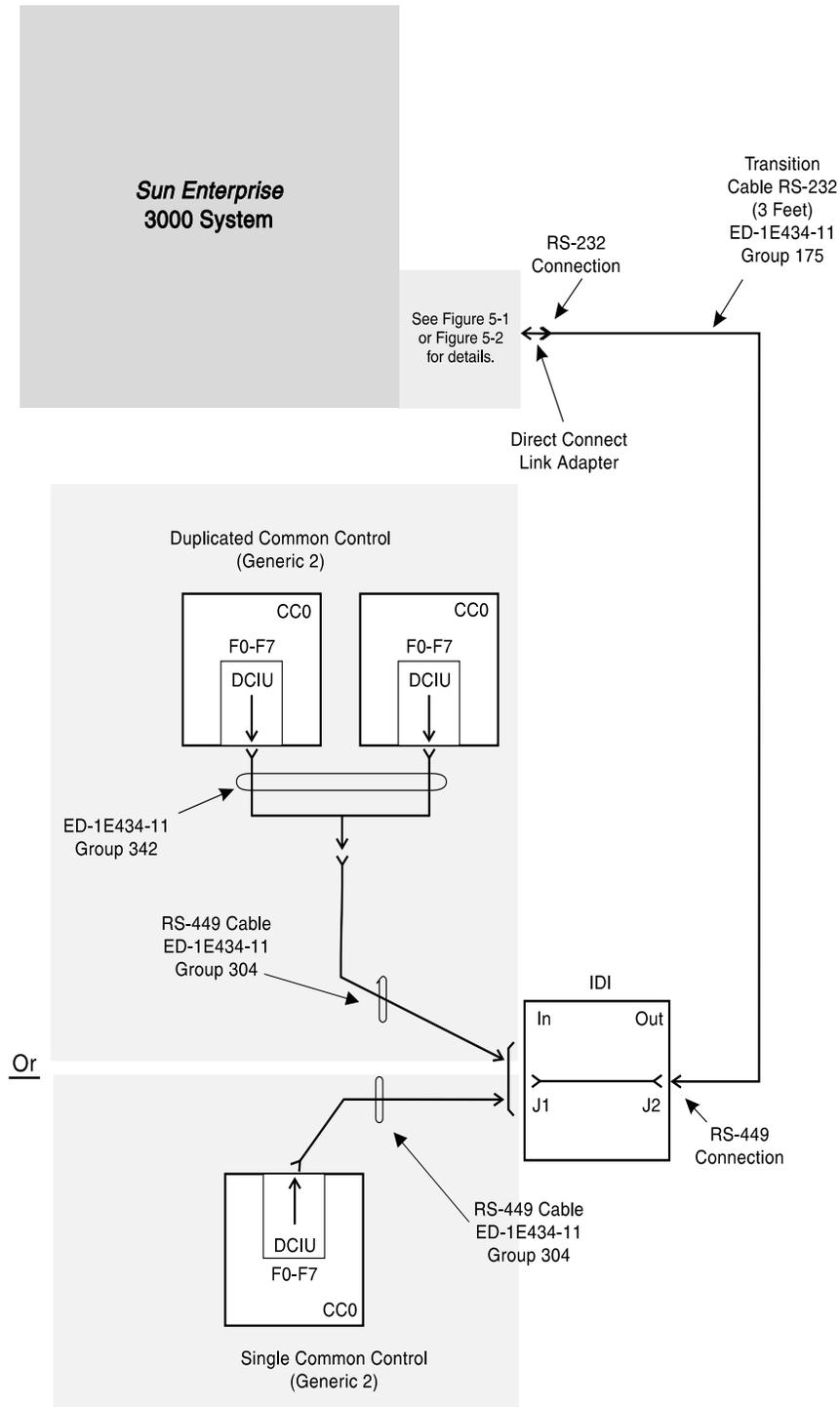


Figure 4-7: Sun Enterprise 3000 System to Generic 2 Cabling Via the IDI

Procedure

Do the following to connect the *Sun Enterprise* 3000 System to the DCIU on the Generic 2 via an IDI (see Figure 4-7):

1. If an HSI/S card is installed (multiple ACD configuration), connect the Direct Connect Link Adapter to the DTE (RS-232) output port on the Black Box Converter.

For a single ACD configuration (no HSI/S card) connect the Direct Connect Link Adapter to serial port B on the *Sun Enterprise* 3000 system.

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 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 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 feature and *CentreVu* CMS are administered on the switch.

Local Data Service Units (LDSUs)

This section describes how to connect the DTE (RS-232) port on the *Sun Enterprise 3000* System to the DCIU on the Generic 2 using LDSUs. This interface can be used for either a multiple ACD configuration or a single ACD configuration. See Figure 4-8 for details.

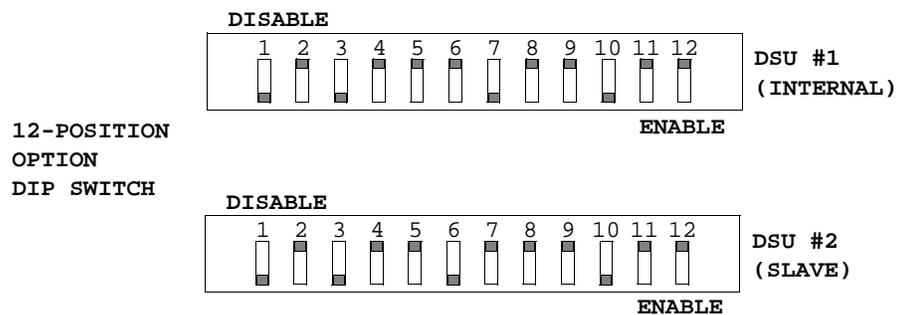
With this method, the maximum allowable distance between the DTE (RS-232C) output port of the *Sun Enterprise 3000* System and the Generic 2 switch is 100 feet.

Required Parts

Obtain the following parts:

- DB25 M/M Gender Changer
- One ED-1E434-11, Group 309 (RS-232) cable
- Two Data Service Units (DSUs)
- 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.



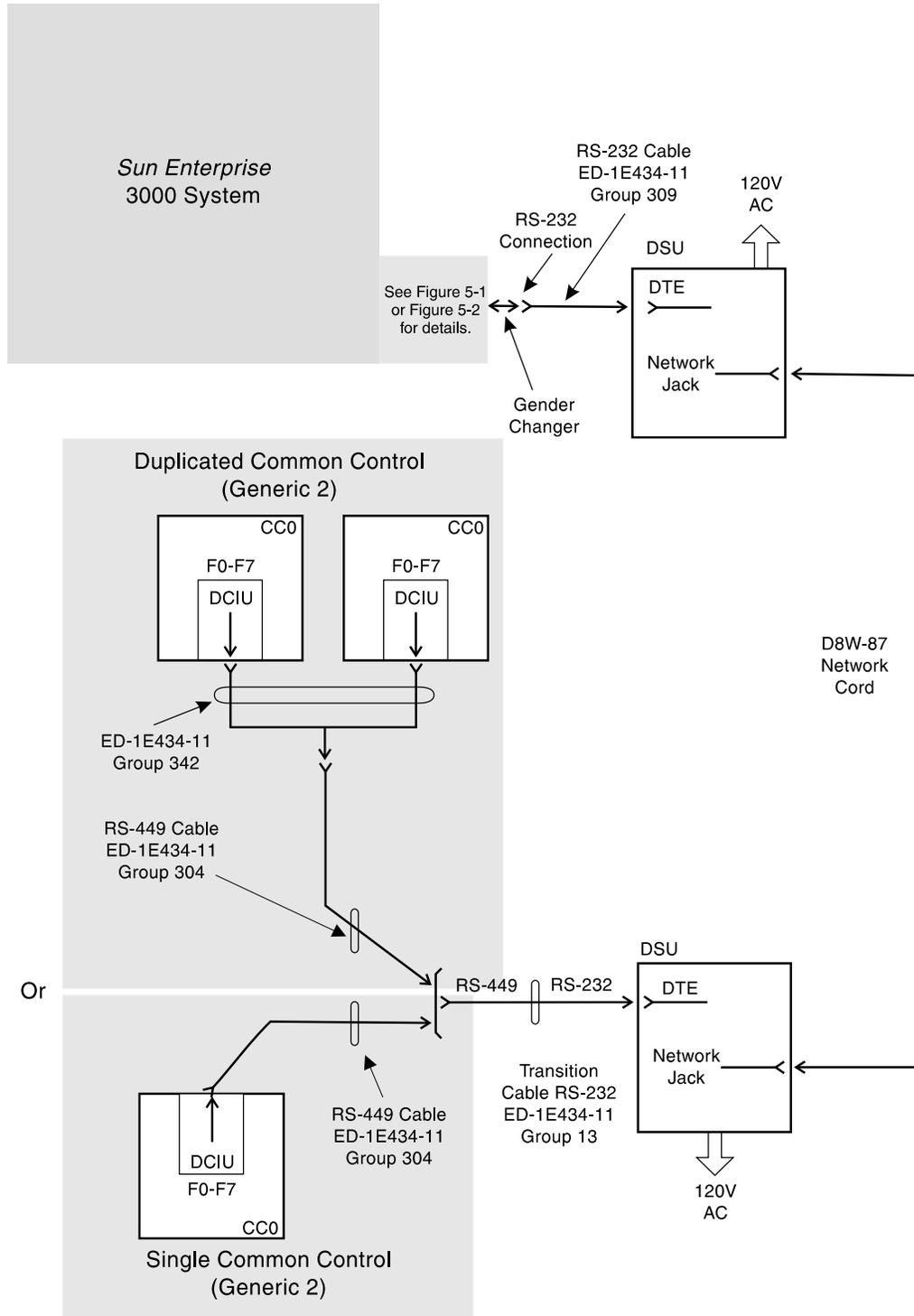


Figure 4-8: Sun Enterprise 3000 System to Generic 2 Cabling with Local DSUs

Procedure

Do the following to connect the *Sun Enterprise* 3000 System to the DCIU on the Generic 2 using LDSUs (see Figure 4-8):

1. If an HSI/S card is installed (multiple ACD configuration), connect the gender changer to the DTE (RS-232) output port on the Black Box Converter.

For a single ACD configuration (no HSI/S card), connect the gender changer to serial port B.

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.

NOTE:

In the next step, the switch technician should make the final connection to the DCIU port.

8. If the Generic 2 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 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 feature and *CentreVu* CMS are administered on the switch.

Remote Data Service Units (RDSUs)

This section describes how to connect the DTE (RS-232) port on the *Sun Enterprise 3000 System* to the DCIU on the Generic 2 using RDSUs (see Figure 4-9). This interface can be used with either a multiple ACD configuration or a single ACD configuration.

Use this method when the distance between the DTE (RS-232) output port of the *Sun Enterprise 3000 System* and the Generic 2 switch is over 100 feet.

Required Parts

Obtain the following parts:

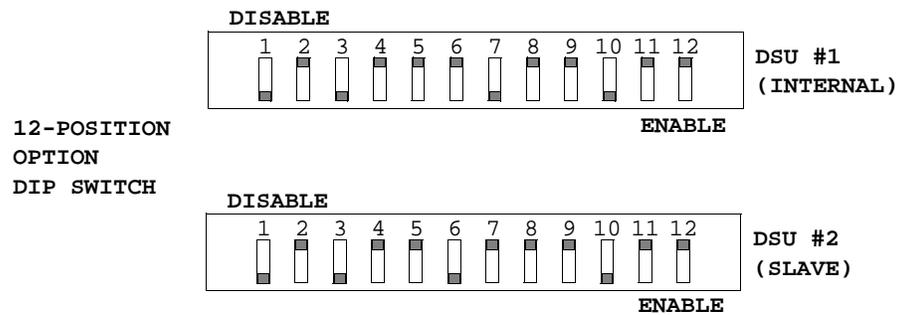
- DB25 M/M Gender Changer
- One ED-1E434-11, Group 309 (RS-232) cable
- Two DSUs
- Two D8W-87 network cords (25 feet) — one cord is provided with each DSU
- Two Network Interface adapters — one adapter is provided with each DSU
- ED-1E434-11, Group 13 transition (RS-449 to RS-232C) cable (3 inches)
- 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 4-1 shows the maximum allowable distances between the DSUs based on various wire sizes and a speed of 9.6 Kbps.

Table 4-1: 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.



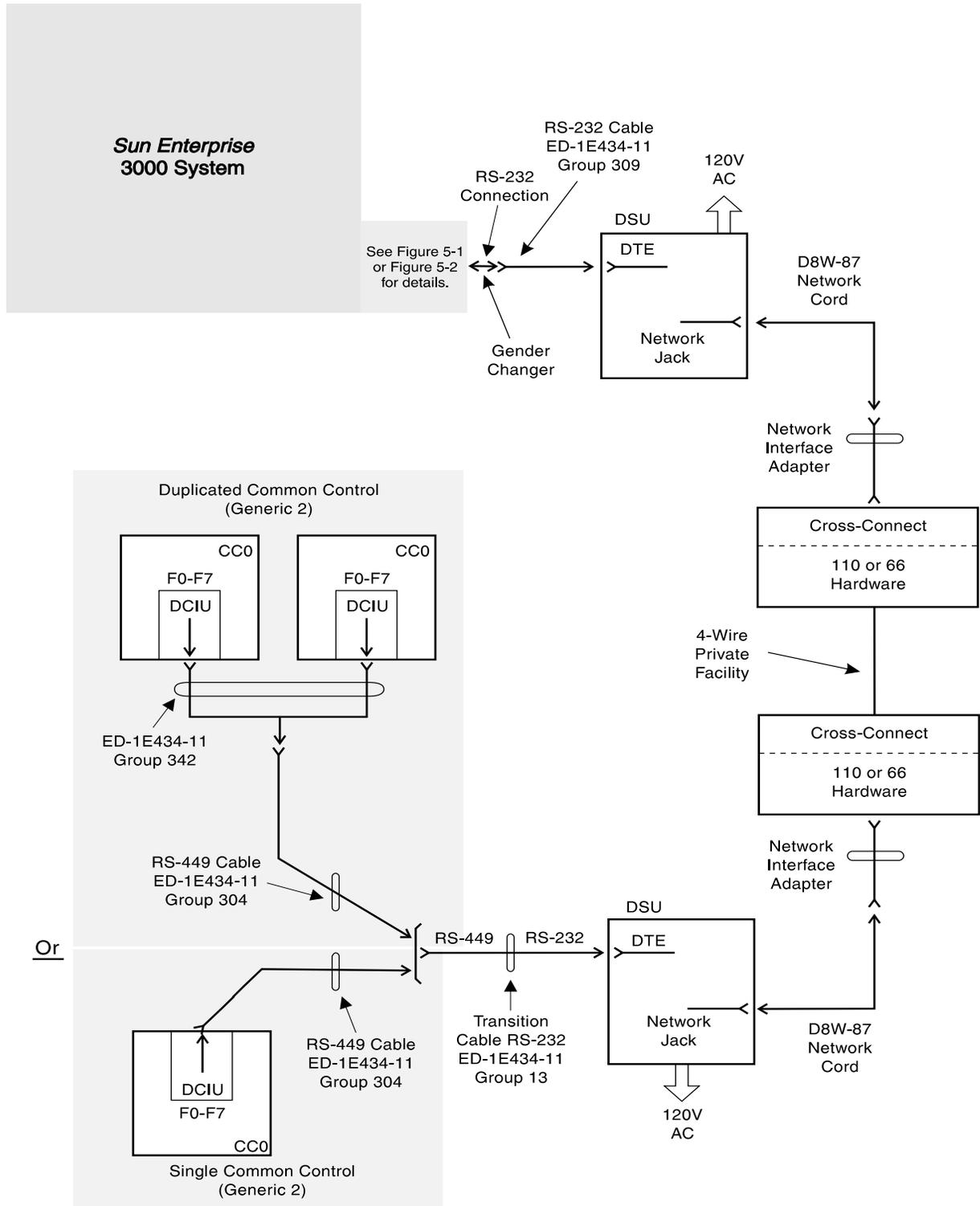


Figure 4-9: Sun Enterprise 3000 System to Generic 2 Cabling with Remote DSUs

Procedure

Do the following to connect the *Sun Enterprise* 3000 System to the DCIU on the Generic 2 using RSDUs (see Figure 4-9):

1. If an HSI/S card is installed (multiple ACD configuration), connect the gender changer to the DTE (RS-232) output port on the Black Box Converter.

For a single ACD configuration (no HSI/S card), connect the gender changer to the serial port B.
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 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.

 **NOTE:**

In the next step, the switch technician should make the final connection to the DCIU port.

15. If the Generic 2 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 you use because it will be needed during switch administration.

If the Generic 2 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 feature and *CentreVu* CMS are administered.

Analog Private Line

This section describes how to connect the Generic 2 to the DTE (RS-232) port on the *Sun Enterprise 3000 System* using an analog private line. This method is used when the distance of the DSUs has been exceeded.

 **NOTE:**

To connect the *Sun Enterprise 3000 System* to an analog private line, see Procedure for Connecting the Sun Enterprise 3000 System to a Private Line.

Required Parts

Obtain the following parts to connect 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 (no longer available)
- B25A cable
- 829 Channel Interface Unit (no longer available)

 **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.

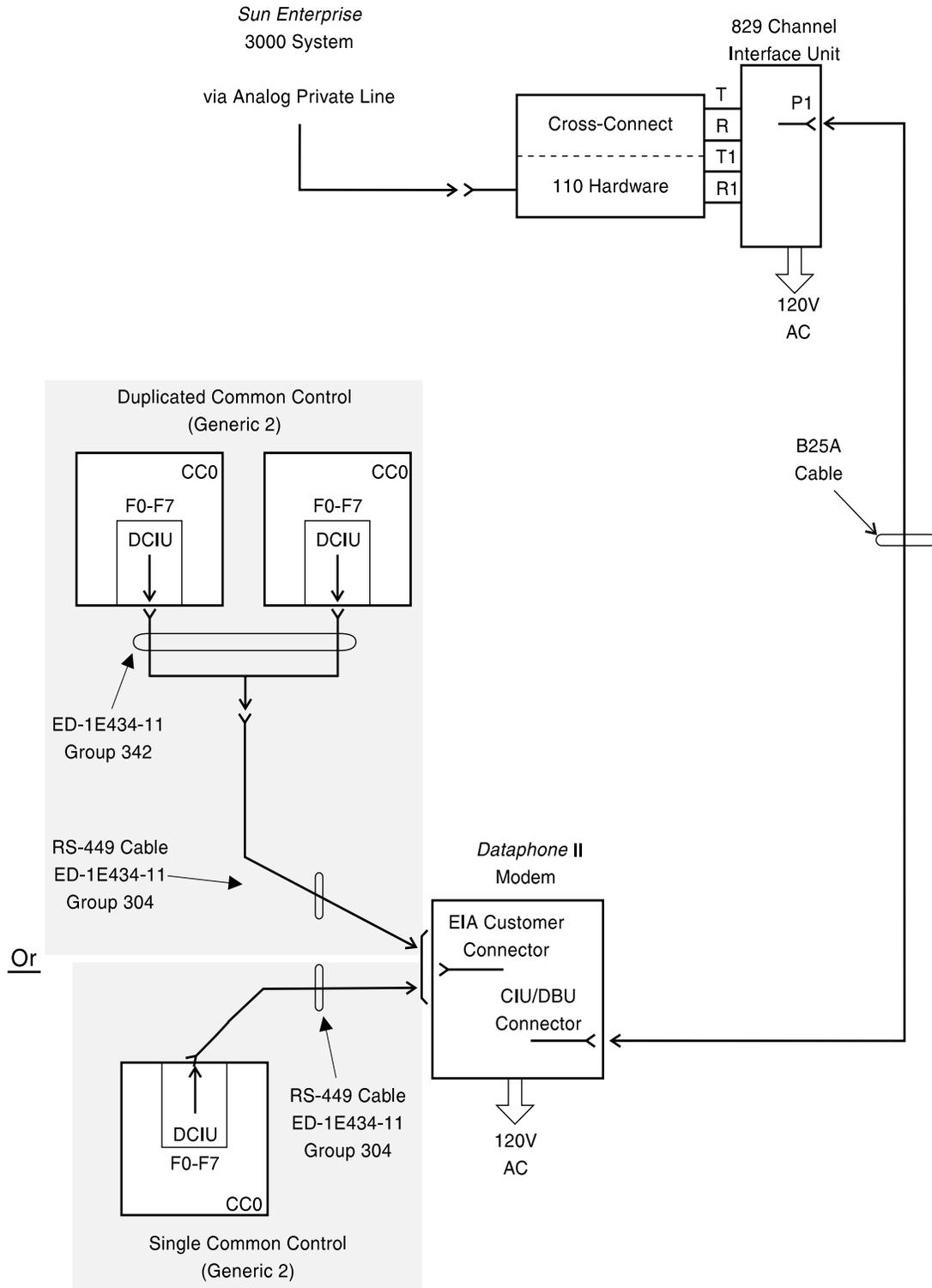


Figure 4-10: Generic 2 Cabling to an Analog Private Line

Procedure

Do the following to connect the Generic 2 to an analog private line (see Figure 4-10):

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.

 **NOTE:**

In the next step, the switch technician should make the final connection to the DCIU port.

6. If the Generic 2 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 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 feature and *CentreVu* CMS are administered.

Connecting the *CentreVu* CMS to the Generic 3i Switch

To connect the *Sun Enterprise* 3000 System to the Generic 3i, you will need to connect the DTE (RS-232) port on the *Sun Enterprise* 3000 System to a digital port on the Generic 3i switch. This connection uses the RS-232C protocol.

You can connect the *Sun Enterprise* 3000 System to the Generic 3i 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 Enterprise* 3000 System and the Generic 3i is 50 feet.

- 7400D Data Module

With this method, the maximum allowable distance between the DTE (RS-232) output port of the *Sun Enterprise* 3000 System and the 7400D is 50 feet. The maximum allowable distance between the 7400D and the Generic 3i 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 Enterprise* 3000 System to the EIA connector of a Processor Interface on the Generic 3i.

CAUTION:

If the Generic 3i 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 Enterprise* 3000 System and the Generic 3i switch is 50 feet.

⇒ NOTE:

If the Generic 3i switch and the DTE (RS-232) output port of the *Sun Enterprise* 3000 System are over 50 feet apart, refer to “*Connecting the CentreVu CMS to the Generic 3i*” 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 follows:

- Group 1 - 10 feet
- Group 2 - 25 feet
- Group 3 - 50 feet
- Group 4 - 100 feet
- Group 5 - 200 feet.

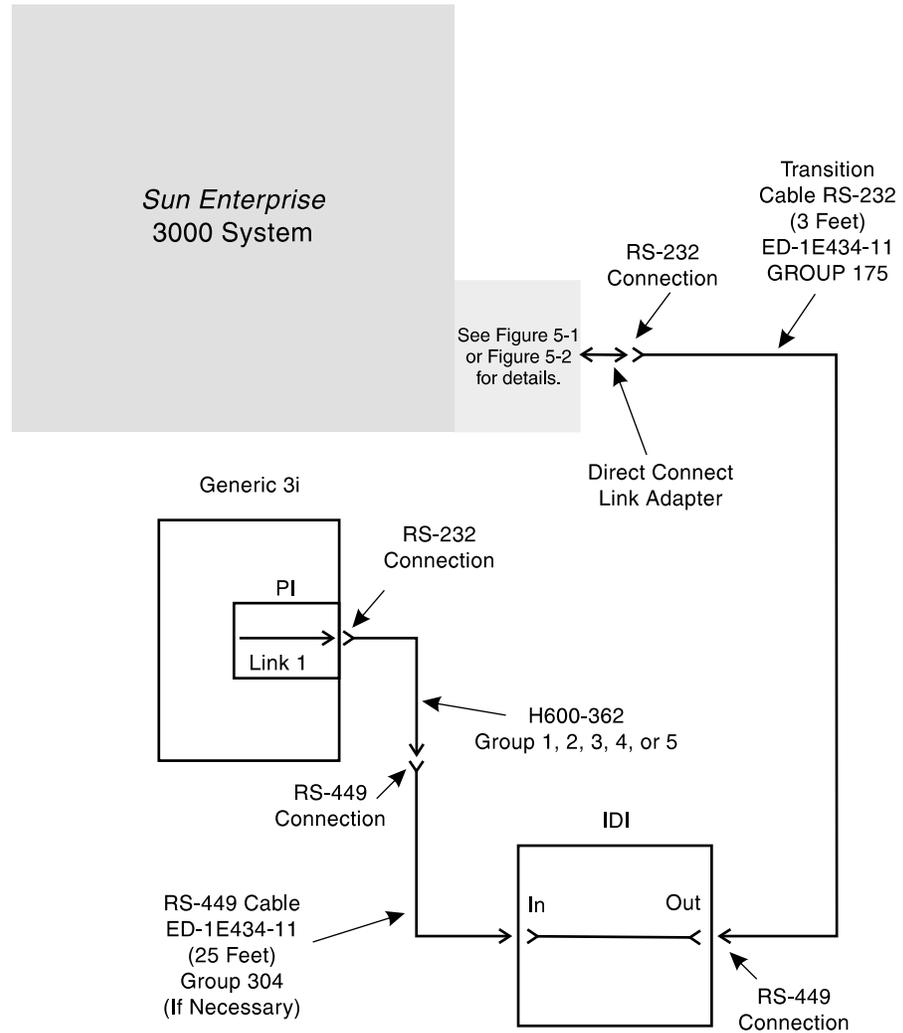


Figure 4-11: Sun Enterprise 3000 System to Generic 3i Cabling Via the IDI

Procedure

Do the following to connect the *Sun Enterprise* 3000 System to the Processor Interface of a Generic 3i switch (see Figure 4-11):

1. If an HSI/S card is installed (multiple ACD configuration), connect the Direct Connect Link Adapter to the DTE (RS-232) output port on the Black Box Converter.

For a single ACD configuration (no HSI/S card), connect the Direct Connect Link Adapter to serial port B.

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 IDI unit.
4. Connect the male end of the ED-1E434-11, Group 304 cable to the In connector on the IDI unit.
5. Connect the female end of the ED-1E434-11, Group 304 cable to the male end of the ED-H600-362 cable.

NOTE:

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. Verify with the switch technician that the ACD feature and *CentreVu* CMS are administered.

7400D Data Module

This section describes how to connect the DTE (RS-232) port on the *Sun Enterprise 3000* System to the Packet Gateway board on the Generic 3i switch using 7400D data modules.

With this method, the maximum allowable distance between the *Sun Enterprise 3000* System and the 7400D data module is 50 feet. The maximum allowable distance between the 7400D and the Generic 3i switch 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).

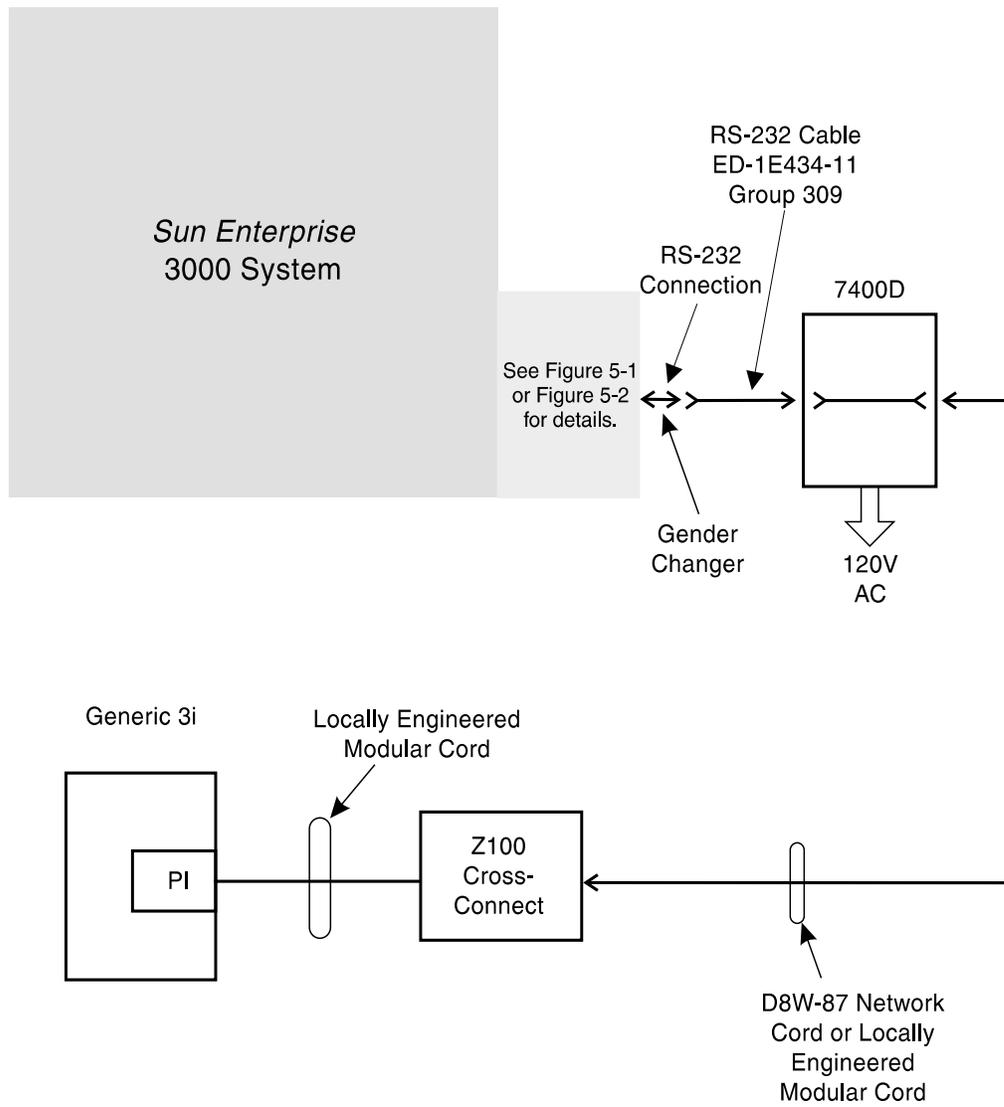


Figure 4-12: Sun Enterprise 3000 System to Generic 3i Cabling with a 7400D

Procedure

Do the following to connect the *Sun Enterprise 3000* System to a digital port on the Generic 3i switch (see Figure 4-12):

1. If an HSI/S card is installed (multiple ACD configuration), connect the gender changer to the DTE (RS-232) output port on the Black Box Converter.

For a single ACD configuration (no HSI/S card), connect the gender changer to serial port B.

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 the *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 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 Z100 cross-connect. This cable must have a modular plug on each end.

5. Make the necessary power connections to the 7400D.

⇒ NOTE:

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. This cable also requires a modular plug on each end.
7. Verify with the switch technician that the ACD feature and *CentreVu* CMS are administered.

Analog Private Line

This section describes how to connect the Generic 3i to an analog private line that connects to a *Sun Enterprise* 3000 System. 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 Enterprise* 3000 System to an analog private line:

- DB25 M/M Gender Changer

⇒ NOTE:

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 (no longer available)
- B25A cable
- 829 Channel Interface Unit (no longer available).

⇒ NOTE:

The Channel Interface Unit can no longer be ordered. If it is not available on the customer's premises, use PEC 9200-030, to order a stand-alone replacement unit. You order this unit through the Custom Systems organization via the CSAP.

Also, obtain the following parts to connect the Generic 3i to an analog private line:

- 110-type cross-connect hardware
- 829 Channel Interface Unit (no longer available)

⇒ NOTE:

The Channel Interface Unit can no longer be ordered. If it 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 (no longer available)
- RS-232C cable

- One 7400D Data Module
- D8W-87 cord.

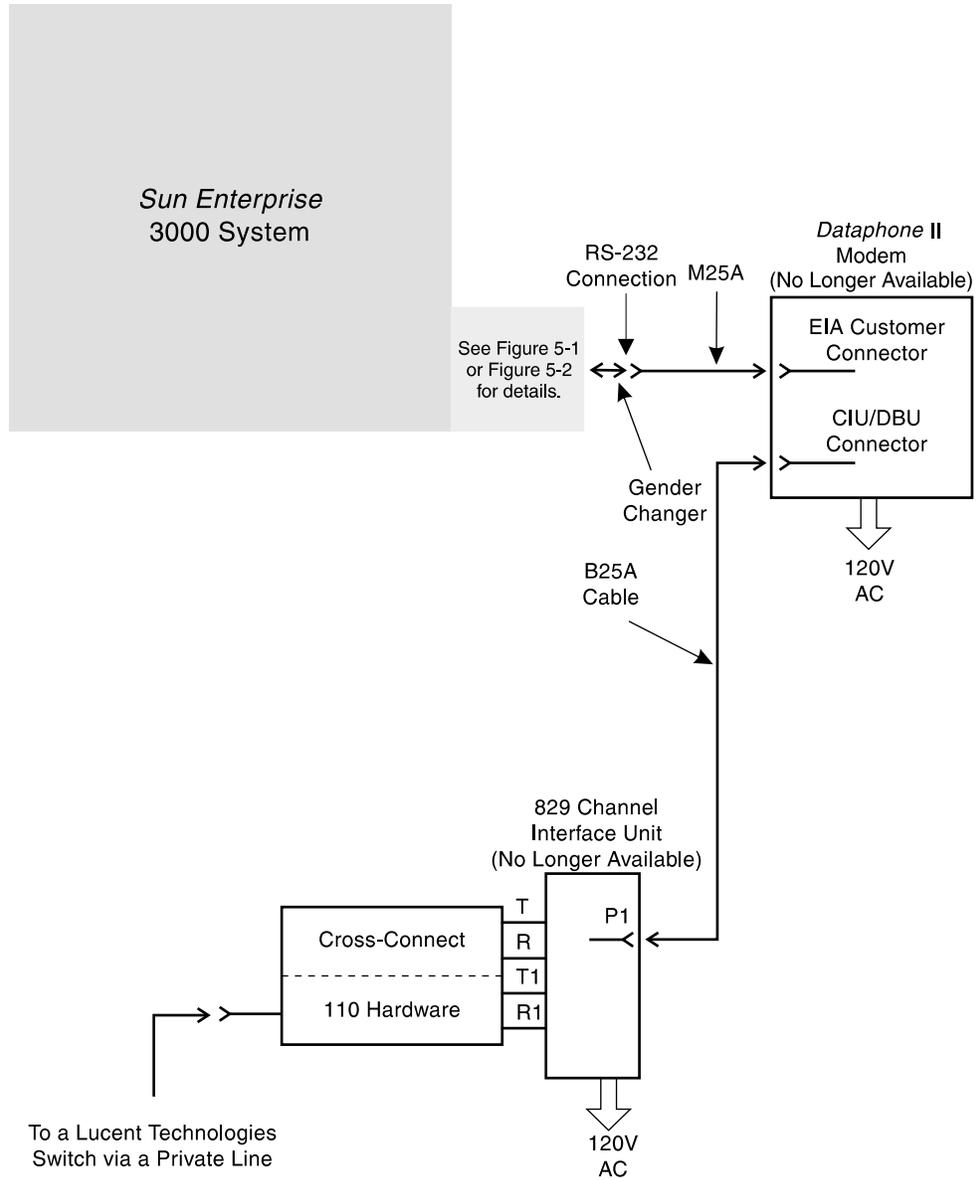


Figure 4-13: Sun Enterprise 3000 System Cabling to an Analog Private Line

Connecting the Sun Enterprise 3000 System to an Analog Private Line

Do the following to connect the *Sun Enterprise* 3000 System to an analog private line (see Figure 4-13):

1. If an HSI/S card is installed (multiple ACD configuration), connect the gender changer to the DTE (RS-232) output port on the Black Box Converter.

For a single ACD configuration (no HSI/S card), connect the gender changer to serial port B.

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.

NOTE:

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.

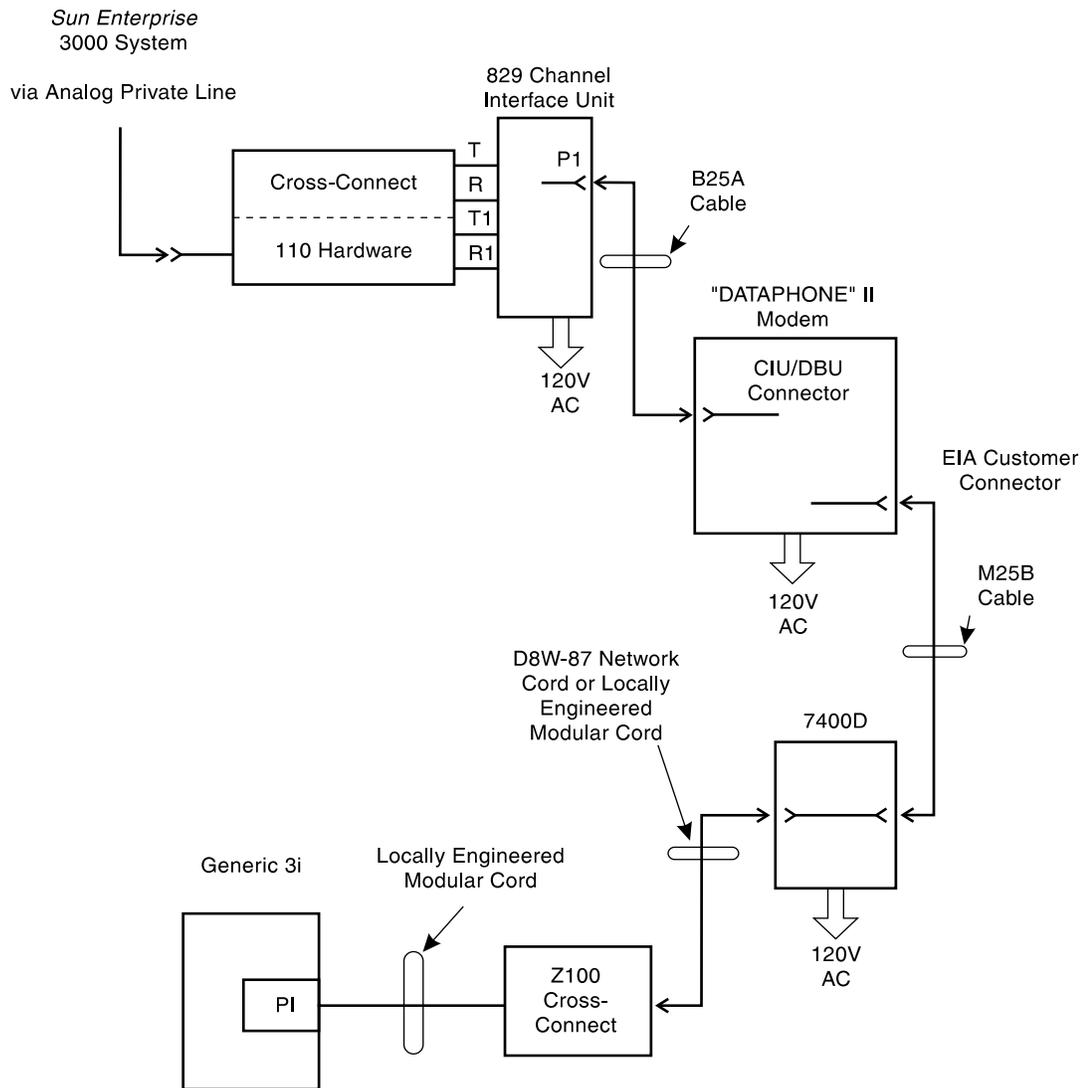


Figure 4-14: Connecting a Generic 3i Switch to an Analog Private Line

Connecting the Generic 3i Switch to an Analog Private Line

Do the following to connect the Generic 3i to an analog private line (see Figure 4-14):

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 (CIU).

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 the *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 Z100 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 Z100 cross-connect. 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. This cable also requires a modular plug on each end.
12. Verify with the switch technician that the ACD feature and *CentreVu CMS* are administered.

Multiple Automatic Call Distribution (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.

⇒ NOTE:

Before you begin the procedures in this section, do a CMSADM file system backup. See the *CentreVu* Call Management System Release 3, Version 5, *Sun Enterprise* Software Installation document (585-215-836), “Performing a CMSADM File System Backup.”

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 the following tasks:

- Prepare for Adding the ACD.
- Turn Off CentreVu CMS.
- Execute the “acd_create” Option.
- Connect the Link.
- Turn On CentreVu CMS.

Prepare for Adding the ACD

You need to furnish the software certain information about the switch and the *CentreVu* CMS. To accomplish this, do the following:

1. Make a copy of Table 4-2.

Table 4-2: 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

* *Solstice DiskSuite* is a registered trademark of Sun Microsystems Inc. in the United States and other countries.

⇒ NOTE:

For Table 4-2, the sum of the ACD1, ACD2, ACD3, and ACD4 entities (splits, agents, trunk groups, trunks, vectors, and Vector Directory Numbers [VDNs]) cannot exceed the *CentreVu* CMS Supported Maximum Values shown in Table 4-2.

A maximum of 100 unmeasured trunks is available to each ACD. If more than 100 unmeasured trunks is required, and the ACD is currently using the maximum number of trunks, then the measured trunks must be reduced accordingly.

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 as follows:

```
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 this information into Table 4-2.
 6. Log into *CentreVu* CMS and access the Data Storage Allocation window. See the *CentreVu™ Call Management System, Release 3, Version 5, Administration* document (585-215-820).
 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 ACD Entities into Table 4-2:
 - Number of splits/skills
 - Total split/skill members summed over all splits/skills
 - Number of shifts
 - Shift start and stop times as applicable
 - 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 ACD Entities associated with the new ACD into Table 4-2.
 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 4-2.
 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 *CentreVu* Call Management System Release 3, Version 5, *Sun Enterprise* Software Installation document (585-215-836), “run_cms” section.

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 the *CentreVu* Call Management System Release 3, Version 5, *Sun Enterprise* Software Installation document (585-215-836), “Setting Authorizations.”

1. Log in as *root*.
2. Access the *CentreVu* CMS Administration menu by entering `cmsadm` at the # prompt. The CMSADM menu appears as follows:

```
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 4-2.

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

Connect the Link

Lucent Technologies field technicians will connect the link from the switch where the new ACD resides to the *Sun Enterprise* 3000 System.

Each HSI/S supports four RS-232C ports.

**Turn On
CentreVu CMS**

Access the CMSADM menu and turn on the *CentreVu* CMS application. See the *CentreVu* Call Management System Release 3, Version 5, *Sun Enterprise* Software Installation document (585-215-836), “CMSADM and CMSSVC Menus,” “run_cms”.

Chapter 5

Troubleshooting

Overview	5-1
Solving Hardware-Related Problems	5-2
Hardware Diagnostic Tools and Resources	5-2
OpenBoot Diagnostics	5-2
POST Messages Diagnostics	5-5
<i>SunDiag</i> Diagnostics	5-5
Checking Error Log Files	5-9
Checking Tape Related Problems	5-10
Diagnosing Remote Console Problems	5-11
Problem Solving Scenarios	5-11
Diagnosing Dial-In Access Problems	5-14
Identifying Link Problems	5-16
Checking the Status of LAPB	5-16
Stopping and Starting Individual Links	5-17
Starting and Stopping X.25	5-18
Checking Switch Administration	5-20
Checking the Cabling	5-21
Checking the RS-232 to RS-422 Interface Converter	5-22
Testing the HSI/S Card for Problems	5-24
System Fails to Recognize a New or Relocated HSI Card	5-26
Monitoring LAPB and X.25 Protocol	5-32
Bringing Up the Link	5-32
Identifying Port Problems	5-33
Network Terminal Server (NTS) Port Problems	5-33
Checking Port Connectivity	5-37
Resetting the Port	5-38
System Fails to Boot Properly	5-45
Power-On Initialization Sequence	5-45
Procedures	5-45
Preserving Data After a System Crash	5-46
System Will Not Boot from Disk	5-46
Probe-SCSI Command Problem	5-47
SCSI Problems	5-47
Blank Screen — No Output	5-49
Diagnosing Problems Using the Remote Console	5-51
Redirecting the Remote Console Using <i>Solaris</i> Operating System	5-51
Redirecting the Remote Console Using OpenBoot Diagnostics	5-54
Machine Panics	5-61
Procedures	5-61
Keyboard Gets Unplugged	5-63

Solving Terminal-Related Problems	5-64
When an Existing Terminal Fails to Operate	5-65
When a New Terminal Fails to Operate	5-68
Diagnosing Network Terminal Server Problems	5-70
Solving Printer-Related Problems	5-76
Printers Connected to the NTS	5-76
Additional Solutions	5-78
When the Enabled Printer Does Not Print	5-80
When the Printer Is Out of Paper	5-81
When the Current Printer Output Is Bad	5-81
How to Stop and Discard Current Print Job	5-82
How to Stop and Reprint Current Print Job	5-83
When Print Jobs Are Not Being Printed	5-83
When Printers Lose Power	5-85
When Printer Is Out-of-Service —One Printer Configuration	5-85
How to Save Print Jobs	5-85
How to Reject Print Jobs	5-86
When Printer Is Out-of-Service — Two Printer Configuration	5-89
How to Route Print Jobs to Another Printer	5-89
How to Move Print Jobs in Queue to Another Printer	5-90
How to Reject Print Jobs	5-91
Solving Modem-Related Problems	5-93
Disconnecting <i>U.S. Robotics</i> Modems	5-93
Solving Power-Related Problems	5-94
When System Loses Power	5-94
System Fails to Auto-Boot After Power Failure or When Given Reboot Command	5-95
Solving Clock Synchronization Problems	5-96

List of Figures

Figure 5-1:	Remote Console Connectivity	5-11
Figure 5-2:	Black Box Component Layout — LEDs Location	5-23
Figure 5-3:	Network Terminal Server — PBX-Champ Connectors and Port Definitions . .	5-37

List of Tables

Table 5-1:	Summary of OpenBoot Diagnostic Test Commands	5-4
Table 5-2:	SunDiag Test Descriptions	5-6
Table 5-3:	DTE/DCE DIP-Shunt Settings	5-22
Table 5-4:	Configuration Information	5-35
Table 5-5:	Keyboard Commands	5-45
Table 5-6:	Parameter Commands	5-55
Table 5-7:	Specific Parameter Commands	5-58
Table 5-8:	Network Administrator Utility Commands	5-70
Table 5-9:	CLI Commands	5-72

Overview

This chapter contains troubleshooting information about the *Sun*^{*} *Enterprise*[†] 3000 System 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 sections in this chapter:

- Solving Hardware-Related Problems
- Solving Terminal-Related Problems
- Solving Printer-Related Problems
- Solving Modem-Related Problems
- Solving Power-Related Problems
- Solving Clock Synchronization Problems.

^{*}*Sun* is a registered trademark of Sun Microsystems, Inc. in the United States and other countries.

[†]*Enterprise* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

Solving Hardware-Related Problems

This section describes how to solve the most common system 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:

1. Do **one** of the following to enter the OpenBoot environment:
 - Stop the operating system with either the *Solaris*^{*} `/usr/sbin/shutdown -y -i0 -g0` command (preferred method) or the command sequence `sync` **Return** then `halt` **Return**.
 - Press the **Stop** and **A** keys simultaneously on the keyboard while *Solaris* is running.

CAUTION:

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. in the United States and other countries.

- Power off and power on the *Sun Enterprise 3000* system. 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).

 **CAUTION:**

Use this method **only** if the previous methods fail to work.

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

```
ok
```

2. At the `ok` prompt, enter `help` for a list of available commands, or see Table 5-1 for a summary of some of the OpenBoot diagnostic test commands.

Additional References

Additional information about the OpenBoot firmware is available through *AnswerBook** on-line software or by contacting the Technical Service Center (TSC).

**AnswerBook* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

Table 5-1: Summary of OpenBoot Diagnostic Test Commands

Test Command	Description	
probe-scsi	This command identifies the devices attached to the built-in SCSI bus. Note: See Probe-SCSI Command Problem for procedures used with the <code>probe-scsi</code> and <code>probe-scsi-all</code> commands.	
probe-scsi-all [device-path]	This command is the same as the <code>probe-scsi</code> 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 CD-ROM devices.	

POST Messages Diagnostics

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

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.

WARNING:

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 a Common Desktop Environment (CDE) 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 5-2 provides an overview of the available tests.

Table 5-2: SunDiag Test Descriptions

Type of Device	Test Command	Description
Memory Devices	<code>pmem</code>	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.
	<code>vmem</code>	Write/Read/Compare Virtual Memory Test — checks the virtual memory and tests the combination of physical memory and the swap partitions of the disk(s).
CPU Devices	<code>fptest</code>	Floating Point Unit Test — uses various subtests to check the floating point unit on the <i>Sun Enterprise 3000</i> system.
	<code>nettest</code>	Network Interface Test — checks all the networking hardware on the system CPU board and separate networking controllers.
	<code>autest</code>	Audio Hardware Test — checks the MAP registers in the audio chip.
	<code>mptest</code>	Multiprocessing Test — verifies that the processors are functioning properly.
Disk Devices	<code>rawtest</code>	Disk Read/Write/Compare Test — performs read-only or read-write tests on “raw” disk partitions.
	<code>fstest</code>	Disk File System Test — uses the <i>Solaris</i> file system device driver to check the disk controller and drive, and reads and compares specified data patterns from two files.
	<code>cdtest</code>	Compact Disc Test — checks the CD table of contents and verifies that the table of contents matches <code>cdtest</code> 's own Table of Contents table.
Tape Devices	<code>tapetest</code>	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 then rewinds the tape, reads, and compares the information just written.

Table 5-2: SunDiag Test Descriptions (Contd)

Type of Device	Test Command	Description
SBus Devices	<code>fbtest</code>	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*).

CDE or TTY Interface Procedures

To use the SunDiag on-line tool to diagnose hardware problems via the *CDE* or TTY interface, do the following steps:

1. Log in as root.
2. If running the SunDiag exerciser in the 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.

WARNING:

The SunDiag exerciser in the CDE environment or in the TTY mode on a terminal can grab control of the local monitor while

running. To avoid this, disable the system with the Frame Buffer Test, step 4.

4. To disable the system with the Frame Buffer Test, do the following:

From the *CDE* 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 *CDE* 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 (CLI) Procedures

To use the SunDiag on-line tool to diagnose hardware problems via the CLI, do the following:

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 as follows:

```
# 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.

Checking Tape Related Problems

The `mt` command can be useful if you are having tape problems. Run this command with a tape inserted into the applicable drive.

⇒ NOTE:

If you run the `mt` command with no tape in the drive you get the following message:

```
# mt -f /dev/rmt/0 status
/dev/rmt/0: no tape loaded or drive offline
```

To run the `mt` command, enter one of the following, as appropriate for the tape drive with which you are having the problem:

```
# mt -f /dev/rmt/0 status
Exabyte EXB-8500 8mm tape drive:
  sense key (0x6)= Unit Attentionresidual= 0retries= 0
  file no= 0block no= 0
```

and/or

```
# mt -f /dev/rmt/1 status
Tandberg 2.5 Gig QIC tape drive:
  sense key (0x0)= No Additional Senseresidual= 0retries= 0
  file no= 0block no= 0
```

Diagnosing Remote Console Problems

This section addresses problem scenarios that develop when you dial-in to the remote console port. In general, have a person on site 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 5-1. Refer to Chapter 2, “Installing the Sun Enterprise 3000 System,” and Appendix D, “Sun Enterprise 3000 System Factory Hardware Installation Procedures” for details.
- Check modem setup — see Figure 5-1. Refer to Chapter 2, “Installing the Sun Enterprise 3000 System,” and Appendix D, “Sun Enterprise 3000 System Factory Hardware Installation Procedures” for details.
- Check port A administration. Refer to Chapter 2, “Installing the Sun Enterprise 3000 System,” and Appendix D, “Sun Enterprise 3000 System Factory Hardware Installation Procedures” for details.

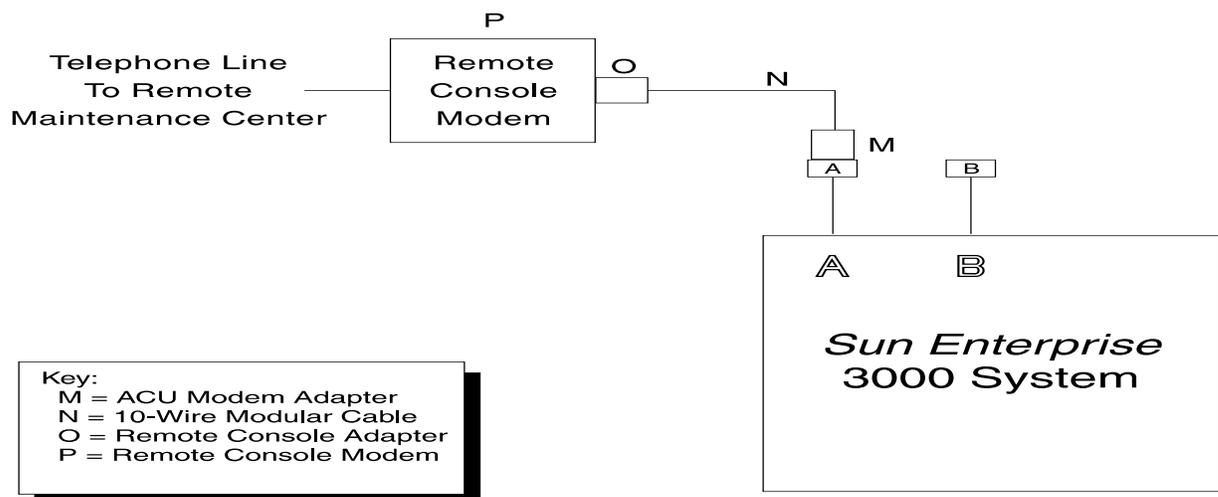


Figure 5-1: Remote Console Connectivity

Scenario 2:

You get the RINGING and ANSWERED responses displayed on the screen, but get no login.

Solutions:

- Check the dial-in parameters — see “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** several times:

```
# /cms/install/bin/abccadm -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/abccadm -k
```

- b. Check the baud rate for consistency with the modem connected on site, and the modem and terminal connected 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:

```
# abcdm -c -b<baud> <tty>
```

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 Diagnosing Problems Using the Remote Console 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, verify that the modem is on, and check the following cabling connections:

- Phone line to the modem
- Modem to port A
- Port A to the *Sun Enterprise 3000* system.

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, verify 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/abcmadm -r ttya  
    <and>  
# /cms/install/bin/abcmadm -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 probably is not using the same baud rate as the modem.

Identifying Link Problems

This section describes how you can diagnose link problems on the *Sun Enterprise 3000* system. 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 `linkreset` 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 as follows:

```
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 as follows:

```
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. The following message will appear:

```
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 Enterprise 3000* system 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 as follows:

```
The X.25 software is being stopped - please wait.  
The network programs are being killed - please wait  
The network has been stopped.  
#
```

Checking Switch Administration

To verify that the switch link administration is correct, see Chapter 4, “Connecting the Sun Enterprise 3000 System to the Switch” and Appendix C, “Generic 3r Switch Administration” in this document for details. In general, the switch administration is the same for connecting to the *INTEL*[†] CMS platforms and the *Sun Enterprise 3000* platform. There is one exception in the G3r switch administration for the *Sun Enterprise 3000* system.

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 7.

NOTE:

If the window size for the *Sun Enterprise 3000* system is not 7, the link will reset under the heavy load.

**SunLink* is a registered trademark of Sun Microsystems, Inc. in the United States and other countries.

†*Intel* is a registered trademark of Intel Corp.

2. Check port B administration. If you are using Port B on your *Sun Enterprise 3000* system for the switch link, verify that there is no login administration on the Port B. Enter the following command to list any login administration on the Port B:

```
# pmadm -l | grep /dev/term/b
```

3. If the `pmadm -l` command shows the login administration on Port B use the `pmadm -r` command to remove the login administration. Remove only the login administration for Port B.

Checking the Cabling

If the link is not operating reliably and does not operate for speeds above 9600 baud, do the following:

1. Make sure that the “Link Adapter” is placed correctly between the Interface Converter and the IDI.
2. If using Port B the link adapter must be between Port B and the IDI.

To verify that the link cabling is correct, see Chapter 5, “Connecting the Sun Enterprise 3000 System to the Switch,” and either Appendix A, “Generic 3i Switch Administration,” Appendix B, “Generic 2 Switch Administration,” or Appendix C, “Generic 3r Switch Administration” as appropriate 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 used only with the HSI/S card and not on Port B.

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 5-3 below for an example.

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

Move DIP shunts	
From	To
XW1A	XW1B
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 2, "Installing the Sun Enterprise 3000 System," and Appendix D, "Sun Enterprise 3000 System Factory Hardware Installation Procedures," or the *Installation and Operation Manual* shipped with each converter.

Checking Light Emitting Diodes (LEDs)

The Interface Converter has six LEDs (light indicators) on the front panel of the black box which help troubleshoot link problems. Three LEDs, labeled DSR, CTS, and DATA, are located on the left side of the monitor. These LEDs are the *Sun Enterprise 3000* system'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 5-2 below for details.

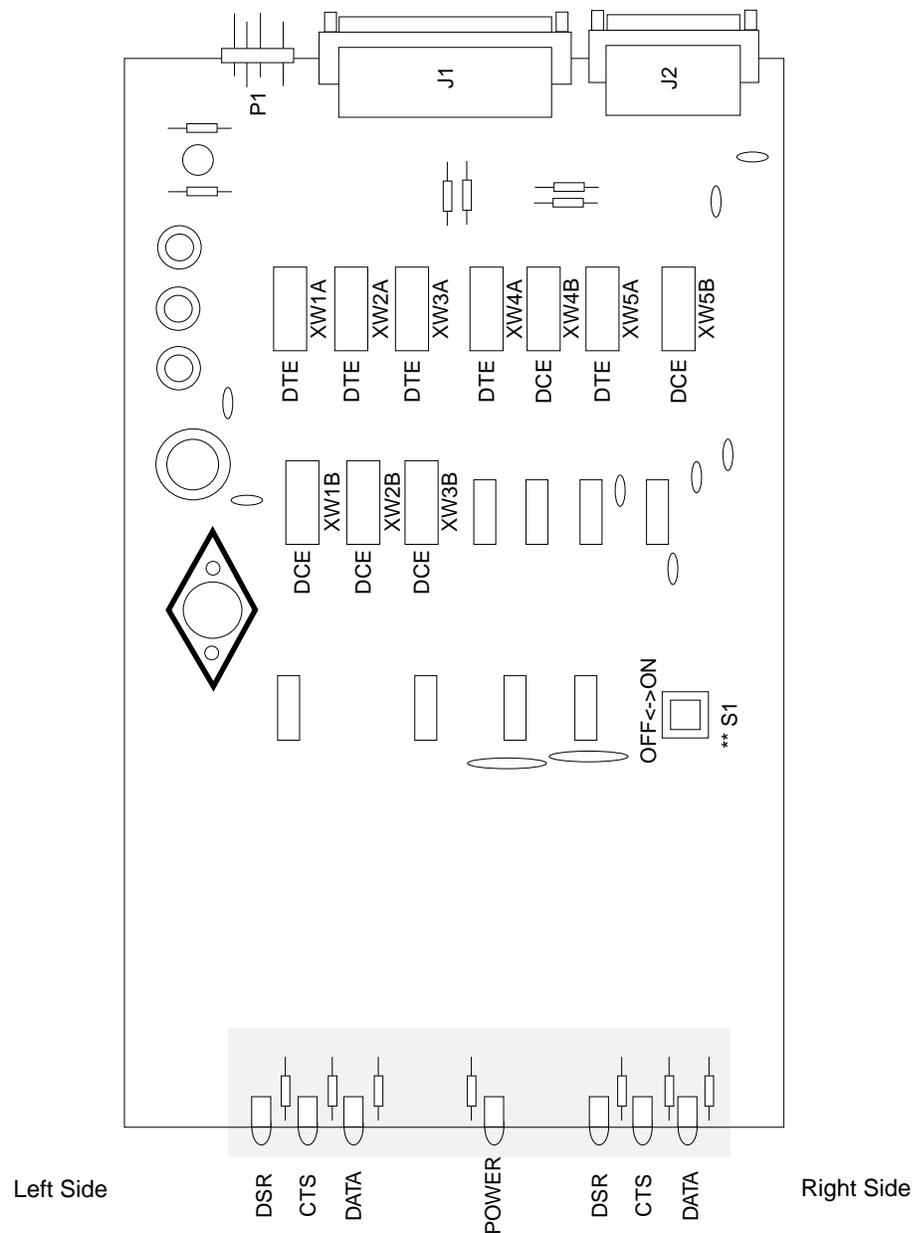


Figure 5-2: Black Box Component Layout — LEDs Location

When the X.25 daemons are started, the LEDs on the left side are lit.

⇒ NOTE:

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 Enterprise 3000* system.

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 Enterprise 3000* system provides a break-out for four separate female 37-pin RS-449 connections. *CentreVu* CMS on the *Sun Enterprise 3000* System 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 as follows:

```
hih0: [Using /dev/hiho0]
hih0: speed=9600, loopback=yes, nrzi=no, txc=baud, rxc=rxrc
.
.
.
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 as follows:

```
hih0: [Using /dev/hiho0]
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 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.

System Fails to Recognize a New or Relocated HSI Card

Sometimes when a new HSI card is installed or an existing HSI card is moved to a new location, the system will fail to recognize the new or moved card. This is shown when the `show-devs` command (run from the open boot prompt) does not show the HSI card and when `/var/adm/messages` fails to recognize the card upon bootup even after booting with `boot -r`. If this happens, perform the following procedures in the order given.

Backout (Remove) the HSI/S Patch

Use the following procedure to backout or remove the current HSI/S patch (should be 101130-9, 101130-10 or 101130-12).

1. Go to the patch directory at `/var/sadm/patch/101130.09` and read the `README.101130-09` file.
2. Become super-user
3. Change directories

```
# cd /var/sadm/patch
```

4. Backout the current patch by entering the following:

```
# <patch number>/backoutpatch <patch number>
```

Where <patch number> is the number of the current patch. This should be 101130-9, 101130-10 or 101130-12.

Remove HSI/S Software /Driver

Use the following procedure to remove the HSI software/driver.

1. Enter the following:

```
# pkginfo | grep HSI
```

The system responds with an information screen similar to the following:

```
# pkginfo | grep HSI
system SUNWhsis HSI/S Driver/Utilities 2.0 v1.6
system SUNWhsis.2 HSI/S Driver/Utilities 2.0 Patch 101130-09 v1.=37
```

In the above example, v1.6 and 101130-09 v1.=37 are examples. Your system numbers may be different.

2. Remove the software by entering the following commands:

```
# pkgrm SUNWhsi.2
# pkgrm SUNWhsi
```

Move or Install HSI/S Card

Move or install the HSI/S card(s) using the procedures given in Chapter 2, "Installing the Sun Enterprise 3000 System, Installing or Changing SBus Cards."

Administer the HSI/S Software/Driver

Readminister the HSI software/driver with the following procedure:

1. Remove the “SunLink HSI/S 2.0” CD-ROM from its case.
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/file systems 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
```

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]:
```

8. 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
    Copyright 1993 Sun Microsystems, Inc. All Rights
    Reserved.
        Printed in the United States of America.
2550 Garcia Avenue, Mountain View, California, 94043-1100 U.S.A.

This product and related documentation is protected by
copyright and distributed under licenses restricting its
use, copying, distribution and decompilation. No part of this
product or related documentation may be reproduced in any form by
any means without prior written authorization of Sun and its
licensors, if any.

    . . .
    . . .
    . . .
```

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.

This product incorporates technology used under license
from Fulcrum Technology.

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,?]
```

9. 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.lm
/opt/SUNWconn/hsis/man/hsi_loop.lm
/opt/SUNWconn/hsis/man/hsi_stat.lm
/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 ...
.
.
.
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]:
```

c. Enter *q*. The program returns you to the system prompt.

- d. Enter the following command to remove the CD-ROM from the drive:

```
# eject cdrom
```

- e. 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 HSI/S software is now complete.

Install HSI/S Patch 101130-12

To install HSI/S patch 101130-12 use the `installpatch` command as follows:

1. Become super-user.
2. Apply the patch by entering the following:

```
# <dir>/101130-12/installpatch /<dir>/101130-12
```

Where `<dir>` is the directory containing the patch. In the above example, 101130-12 is the patch number for the HSI/S patch. This procedure can be used to install other patches by substituting the appropriate patch number.

The entry for `<dir>` must be a full path name entry.

If any errors are reported, see "Patch Installation Errors" in the README file.

3. Reboot the system after the patch has been successfully installed.

Additional Reference

See the *CentreVu Call Management System Release 3 Version 5 Sun Enterprise Software Installation* document (585-215-836) for additional information on software procedures.

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 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 the 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 3, “Installing Terminals, Printers, and Modems” 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 Enterprise 3000* system 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 as follows:

```
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 Enterprise 3000* system 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 5-4 to readminister the ports.

Table 5-4: Configuration Information

Device	IP Address	NTS	File Name
<i>Sun Enterprise 3000 systems</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 Chapter 3, "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 as follows:

```
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 finished, enter the following command to reset the terminal ports:

```
command: reset all@cmsterm1
```

The system responds as follows:

```
# resetting all serial ports of annex cmsterm1
```

Checking Port Connectivity

To check the port connectivity for problems, do the following:

- For an 8-, 16- or 64-port NTS, check the connection to each terminal, printer, or modem. See Chapter 3, “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 5-3). Check to see that the cables are correctly seated at each end.

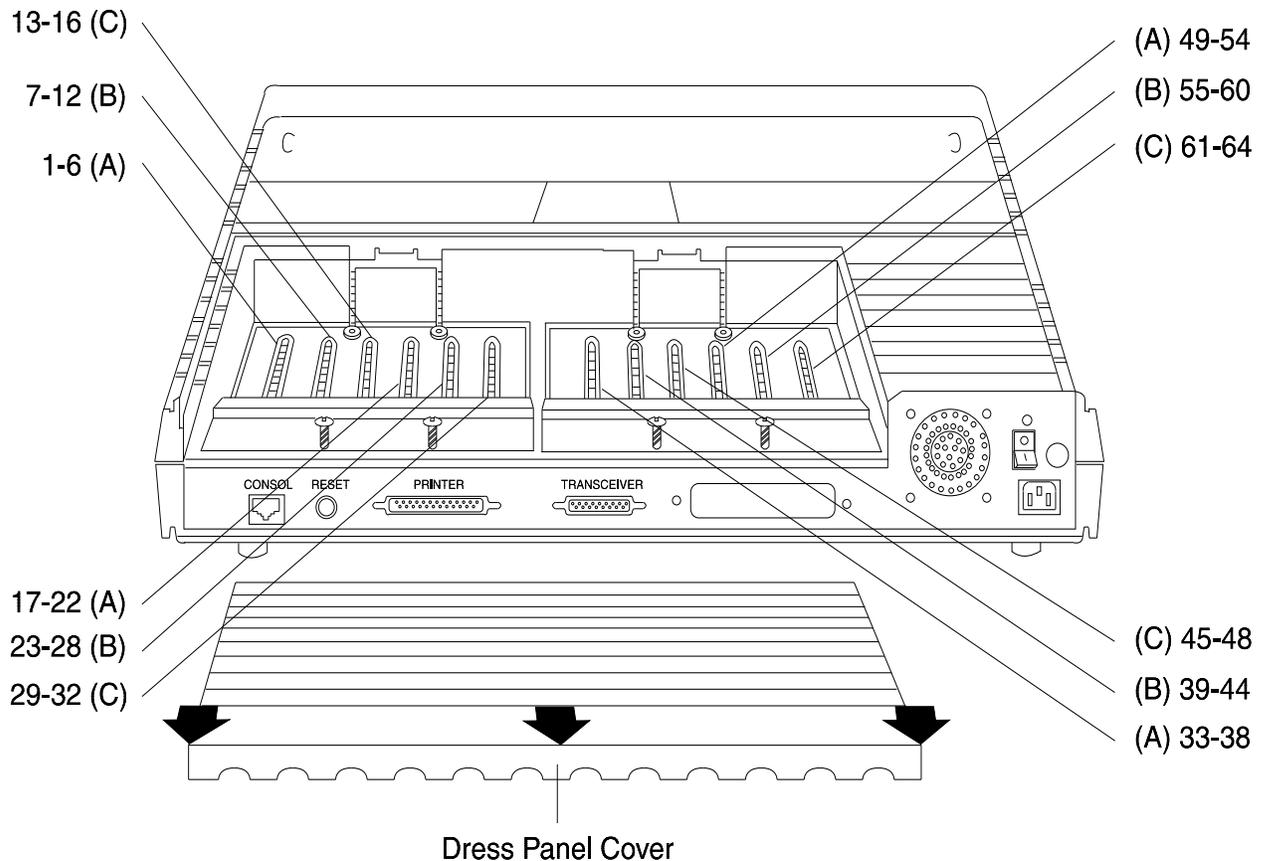


Figure 5-3: Network Terminal Server — PBX-Champ Connectors and Port Definitions

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 3, “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:

```
# command: port x
```

- b. To reset multiple ports (`x-y`), enter the following command:

```
# command: port x-y
```

- c. To reset additional ports ($x-y, z$), enter the following command:

```
# 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`.

```
# command: read /etc/local.admin/defport
```

6. To reset to a 9600 baud terminal, enter the following command:

```
# 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):

```
# command: 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, `ntslinfo`), enter the following:

```
# command: write cmsterm1/etc/local.admin/ntsl.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 as follows:

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

9. Reset the port by entering the following command:

```
# command: reset x
# command: quit
```

10. To send a message to a port using CLI commands while logged in to the *Sun Enterprise 3000* system enter the following command:

```
# telnet cmsterm1
```

The system responds as follows:

```
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 5-4 for more information).

11. Press **Return**.

The system responds as follows:

```
Rotaries defined:cli
Enter the Annex port name or number
```

12. Enter the `cli` command.

The system responds as follows:

```
annex:
```

13. To get into the super-user mode on the NTS, enter the following command:

```
annex: su
```

The system responds as follows:

```
password:
```

14. The default password is the NTS internet address (if you have not changed addresses, this is 129.200.9.11 for `cmsterm1`).

The system responds as follows:

```
annex#:
```

15. At the `annex# :` prompt, enter `tap x` (where `x` is the port number in question). The system responds as follows:

```
*** Warning. This port is being tapped. ***
```

This warning message appears on both the origination and tapped monitors. The system now monitors all the communications to/from this port.

16. To send data to a terminal (to determine, for example, what user corresponds to a specific port), simultaneously press the **Control** and **A** keys. Then enter the following command:

```
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. Enter the `jobs` command:

```
annex: jobs
```

For example, the following may appear:

```
+1 tap x
```

20. To stop the job, enter the `kill 1` command (where the job number is 1).

The system responds as follows:

```
+1 tap x  
annex#
```

21. To exit the super-user mode, enter the `su` command at the `annex#` prompt.

```
annex# su
```

The system responds as follows:

```
annex:
```

22. To exit the CLI mode, enter the `hangup` command at the `annex:` prompt.

```
annex: hangup
```

The system responds as follows:

```
#
```

23. After verifying the port and the connectivity, you can now readminister a terminal, modem, or printer with the `na` command.

```
# na
```

See Chapter 3, “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 5-5 describes the OpenBoot initialization command sequences provided by the *Sun Enterprise 3000* system. 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 5-5: 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, press the Stop and A key simultaneously to start POST.)
Stop-A	Abort.
Stop-D	Enter diagnostic mode (set <code>diag-switch?</code> to <code>true</code>).
Stop-F	Enter Forth on TTYA instead of probing. Use <code>exit</code> 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 by pressing the **Stop** and **A** keys simultaneously.

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.

Probe-SCSI Command Problem

Problem: When using the “probe-scsi” or “probe-scsi-all” command, users may get the following message:

```
"This command may hang the system if a Stop-A
or halt command has been executed. Please type
reset-all to reset the system before executing
this command. Do you wish to continue [Y/N]."
```

The appropriate user response is not intuitively obvious.

Solution: Do Not continue. Instead, do the following:

1. Type “n” so that the `probe-scsi` does not continue.
2. Type “`setenv auto-boot? false`”

Otherwise, when you do run the `reset-all` command the machine automatically reboots instead of leaving you at the OK prompt.

3. Type “`reset-all`”

This may take a minute or so to complete.

4. Now you can execute “probe-scsi” or “probe-scsi-all” and perform any other boot prompt level diagnostics.
5. Before booting up the machine, reset the system to “`setenv auto-boot? true`”

Failure to do this will cause the reboot commands to stop at the boot prompt instead of proceeding through the normal boot-up.

SCSI Problems

Problem: Your system has more than one disk installed, and you get SCSI-related errors.

Solution: Do the following:

1. To quickly check the SCSI-related errors, enter the following command:

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

CAUTION:

See Probe-SCSI Command Problem before executing this command.

The program responds as follows:

```
/sbus@3,0/sunw,fas@3,8800000
Target 0
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
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

/sbus@2,0/sunw,fas@3,8800000
ok
```

⇒ NOTE:

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

2. Fix any obvious errors.

To determine if your system has duplicate SCSI target number settings on one bus, do the following:

⇒ NOTE:

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

1. Unplug all but one of the disks.
2. At the `ok` prompt, enter:

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

⚠ CAUTION:

See Probe-SCSI Command Problem before executing this command.

⇒ 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. If so 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 simultaneously 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 and look for flashing green lights on the keys.
4. If nothing is seen after a minute or so, there is probably a hardware failure. Then 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 Enterprise 3000* system.
 2. Turn off the system monitor.
 3. Turn off all external devices starting with the device closest to the *Sun Enterprise 3000* system and working toward the farthest device.
 - b. Plug in the keyboard, and power on again by using the following sequence:

1. Turn on the devices attached to the *Sun Enterprise 3000* system starting with the device at the end of the SCSI chain and working toward the system.
 2. Turn on the *Sun Enterprise 3000* system.
 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 preceding steps). Then, turn it on and immediately press the **Stop** and **N** keys simultaneously. This sets all NVRAM parameters to their default values. As a result, the `output-device` parameter is set to `screen`.
-  **WARNING:**
- 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 the `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 Enterprise 3000* system 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 system), and log in as *root*.
2. Remove the port monitor by entering the following command:

```
# /cms/install/bin/abccadm -r ttya
```

The program responds as follows:

```
ttya is currently set to incoming
Are you sure you want to remove it?
```

3. Enter *y*. The program responds as follows:

```
ttya administration removed
```

4. Redirect the console to port A (remote console) by entering the following commands:

```
# /cms/install/bin/abccadm -c -b 9600 ttya
```

The program responds as follows:

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

5. Enter `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 Enterprise 3000* system monitor. When the system starts to come back up, the *Sun Enterprise 3000* system 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 Enterprise 3000* system monitor.

Set the Console to Local

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 as follows:

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

2. Enter *y*.

The program responds as follows:

```
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 Enterprise 3000* system monitor. After the system reboots, a login prompt should appear on the *Sun Enterprise 3000* system monitor.

4. Log into the local console as root.

See Appendix D, “Sun Enterprise 3000 System Factory Hardware Installation Procedures” for more information about setting the remote console modem options, connecting the remote console to the *Sun Enterprise 3000* system, 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 Enterprise 3000* system 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:

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.

CAUTION:

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 as follows as follows:

Variable 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 5-6.) For example:

```
ok>setenv output-device ttya
```

The system responds as follows:

```
output device=ttya
```

Table 5-6: 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 as follows:

Variable Name	Value	Default Value
.		
.		
.		
output-device	screen	screen
input-device	keyboard	keyboard
.		

4. For the changes to take effect, boot the system by entering the following:

```
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, get into the OpenBoot mode (if not in OpenBoot) 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 as follows:

Variable Name	Value	Default Value
.		
.		
.		
output-device	screen	screen
input-device	keyboard	keyboard
.		

3. To set the configuration parameters, enter the parameters (see Table 5-7) via the `setenv` command at the `ok>` prompt. For example:

```
ok> setenv output-device ttya
```

Table 5-7: 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 the following command:

```
ok> reset
```

5. Log into the system as root at the local monitor.
6. From the local monitor, enter the `cms/install/bin/abcadm -k` command to see what is on the `ttya` port. Start a port monitor on the `ttya` port if one does not already exist.

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

7. Reset the default console parameters by entering the following command:

```
# /cms/install/bin/abcadm -c -b <baud>ttya
```

The system responds as follows:

```
answer n to "Do you want to reboot?"
```

8. Enter `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/abccadm -k
```

5. Reset the default console parameters by entering the following command:

```
# /cms/install/bin/abccadm -c -b <baud>ttya
```

The system responds as follows:

```
#
```

6. Enter `n` in response to the following message:

```
# answer n to "Do you want to reboot?"
```

7. Start a port monitor on `ttya` enter the following command

```
# 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:

```
# /usr/sbin/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:

```
# /usr/sbin/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, “Sun Enterprise 3000 System Factory Hardware 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:

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 as follows:

```
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 `fsck` 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 to Chapter 3, “Installing Terminals, Printers, and Modems, Supported Terminal and Printer Equipment” for more information.

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 escalation 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 garbage 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 displays 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, 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.” Verify that the cable is connected properly to the “modem” connector. If possible, follow this cable to the system end, and check the connection there.
- d. Try using another terminal if one is available.
- e. See the *CentreVu* CMS administrator, or escalate the problem through normal escalation channels.

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. Verify that 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 escalation channels.

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 2, “Installing the Sun Enterprise 3000 System” 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. Verify 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. (See your terminal manual for details.)

Problem: The terminal prints garbage on the screen.

Solution: Mismatches to speed, parity, and data bits will cause garbage on the terminal. Reset the terminal.

The terminal baud rate and the system baud rate may not match. Refer to Chapter 3, “Installing Terminals, Printers, and Modems, Terminal Options” to verify that the terminal options have been properly set and that the terminal baud rate has been properly administered on the system.

If the terminal is connected to an NTS, use the `na` administration as needed.

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 Enterprise 3000* system. Check the address in the `/etc/hosts` file

on the *Sun Enterprise 3000* system, 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 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 Enterprise 3000 system*.

See Network Terminal Server (NTS) Port Problems 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 Enterprise 3000* system 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 5-8 provides the `na` commands that are available.

Table 5-8: 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 5-8: Network Administrator Utility Commands (Contd)

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).
- Check port or NTS statistics and administration (see Example 2).
- Tap into any port to see the data being transmitted and received (see Example 3).

To access the CLI tool, do the following steps:

1. Log into the *Sun Enterprise 3000* system. Enter the following command from any active *Solaris* session on the *Sun Enterprise 3000* system:

```
$ telnet cmsterml
```

The system responds as follows:

```
Trying 129.200.9.11 ...
Connecting to 129.200.9.11
Escape character is ...
```

2. Press **Return**. The system responds as follows:

```
Rotaries defined: cli
Enter Annex port name or number:
```

3. Enter `cli`:

```
$ cli
```

The system responds as follows:

```
annex:
```

4. At the `annex:` prompt, enter `cli`.

Table 5-9 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 5-9: 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 Enterprise 3000</i> system table.
<code>jobs</code>	Displays a list of current jobs.
<code>kill</code>	Terminates a job.

Table 5-9: 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 Enterprise 3000</i> system.
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 Enterprise 3000</i> system.
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. These are helpful in checking 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 Using Network Administrator Utility 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:

- 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 Enterprise 3000* system, 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. However, the indicators provide both a progress report and an error display to assist you in troubleshooting.

See Solving Power-Related Problems 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 3, “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 Identifying Port Problems for procedures.
- Check the parity, data bits, and speed settings of the printer — make sure the settings agree with the Network Administration (`na`).
- 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. The following is an example of what you might see:

```
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 `rtelnet` command did not appear, enter the `rtelnet` command again. To make sure the command executes after the machine reboots, add the same `rtelnet` command to the `/etc/rc2.d/Speripherals` file.

⇒ NOTE:

Verify that two `rtelnets` 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 rtelnet` 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 following command.

```
# ps -ef | grep rtelnet
```

The system responds as follows:

```
# ps -ef | grep rtelnet  root    238    1   3 15:18:41 ?
0:00 rtelnet -bra cmsterm1 16 /dev/s_p

devl16  root    241    1  44 15:18:41 ?      0:00 rtelnet -bra
cmsterm1 15 /dev/s_p

devl15  cmssvc  695    687  5 15:38:03 pts/0    0:00 grep
telnet
```

2. Enter the following command.

```
# kill -9 <xxx>
```

⇒ NOTE:

`<xxx>` is the process id of the `rtelnet` which is being killed. For example, you could use the `kill -9 241` command to kill one of the processes shown in the `rtelnet` example above.

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 3, “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 escalation channels.

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.`

^{*}UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited.

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 system, 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 then on again.
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. (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 when it becomes operational again.
- 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 see Chapter 3, “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. (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. (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* document (585-215-820) 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.

- To return to the *CentreVu* CMS environment, enter the following command:

```
$ exit
```

- Fix the printer. (Refer to your printer manual, if necessary.)
- 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.
- After the printer has been fixed, reposition the paper in the printer.
- Enable the printer by entering the following command:

```
$ enable <printer_name>
```

Replace the string `<printer_name>` with the real name of the printer.

- Enter one of the following commands to log in as lp or root:

```
$ su lp
-- or --
$ su root
```

- Enter the correct password when prompted to do so.
- Accept all future print jobs by entering the following command:

```
# /usr/lib/accept <printer_name>
```

- 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 for more details.
- Check the modem settings. See Chapter 2, “Installing the Sun Enterprise 3000 System” for more information.

NOTE:

The default modem script assumes eight data bits, one stop bit, and 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* Modems

If you are using a *U.S. Robotics** *Sportster*† 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.

*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 Enterprise 3000* system loses power). If you cannot solve the power-related problems, escalate the problem through normal escalation channels. For printers with power-related problems, see *Solving Printer-Related Problems*.

When System Loses Power

If the *Sun Enterprise 3000* system 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 Enterprise 3000* system.
2. Turn on the *Sun Enterprise 3000* system.
3. Turn on the system monitor.

If the *Sun Enterprise 3000* system is operating properly, the monitor displays a banner screen up to 3 minutes after it is powered on as shown in the following example.

```
UE3000 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 Enterprise 3000* system.
2. Turn off the system monitor.
3. Turn off all external devices starting with the device closest to the *Sun Enterprise 3000* system and working toward the farthest device.

When the `Console Login:` prompt appears on the console terminal, the system will be up and running.

NOTE:

For more information about restarting the *Sun Enterprise 3000* system because of a power failure, refer to the user documentation that came with the system.

System Fails to Auto-Boot After Power Failure or When Given Reboot Command

If the system fails to automatically pass the boot prompt (stops at the `ok` prompt) when the reboot command is given or on a restart from a power failure, a boot environment variable may be set incorrectly.

To correct this problem do the following:

1. At the `ok` prompt enter `printenv`
2. Scroll until you come to the variable `auto-boot?`

The `auto-boot` variable should be set to `true`. If not, do the following:

1. Enter the command `setenv auto-boot? true`
2. Enter `boot`

The system should now reboot after a power failure without stopping at the boot prompt.

Solving Clock Synchronization Problems

Each I/O board has its own clock. These clocks must be synchronized for proper system operation. After removing and replacing an I/O board, the system may experience a clock synchronization problem. That is, the clock on the I/O board will become un-synchronized with the clock on the Clock Board.

To re-synchronize the clocks, do the following:

1. If CMS is running, turn it off.
2. Go to the `boot` prompt. You can do that in one of three ways:
 - a. You can type `init 0`, or
 - b. You can type `/usr/sbin/shutdown -y -g0 -i0`, or
 - c. You can press Stop-A while the *Enterprise* is booting, after the *Sun* logo displays.
3. Type the following command:

```
copy-clock-tod-to-io-boards
```
4. Boot the machine by typing one of the following commands:

```
boot  
boot -r (to reconfigure for new devices)
```

Chapter 6

Maintenance and Upgrade

Overview	6-1
Recovering from Disk Corruption	6-2
Restoring /cms	6-2
Restoring an Entire System	6-7
Restoring Specific Files	6-8
Recovering System Space	6-9
Regaining System Space	6-9
Reinitializing the <i>CentreVu</i> CMS	6-9
Re-creating Specific Tables	6-11
Recovering <i>CentreVu</i> CMS File System Space	6-15
Adding Memory	6-16
Adding/Installing Swap Space	6-18
Installing an HSI/S Card	6-19
Changing the Date or Time	6-22
Changing the System Date and Time	6-22
Changing the System Country and Time Zones	6-24
Synchronizing Clocks	6-25
Adding, Removing or Replacing Tape Drives	6-27
Overview	6-27
Replacing the Internal Tape Drive	6-27
Procedure	6-28
Adding an External Tape Drive.	6-28
Procedure	6-29
Removing the External Tape Drive.	6-31
Procedure	6-31
Adding Network Terminal Servers	6-34
Changing Network Addresses	6-34

List of Figures

Figure 6-1: Front View of the <i>Sun Enterprise 3000</i> System	6-27
Figure 6-2: SCSI Cabling Schemes.	6-29

List of Tables

Table 6-1: Disk Space Verification (4-GB Disks)	6-4
--	------------

Overview

This chapter explains some of the most frequently encountered maintenance and upgrade issues for the *CentreVu™* Call Management System Release 3 Version 5 (CMS R3V5) hardware and software. See the *CentreVu* Call Management System, Release 3, Version 5, *Sun Enterprise* System, Software Installation document (585-215-836) document, 585-215-836, Issue 1 and the *Sun Enterprise* 3000 System documentation for additional information.

This chapter discusses the following maintenance procedures:

- Recovering from Disk Corruption
- Recovering System Space
- Adding Memory
- Installing an HSI/S Card
- Changing the Date or Time
- Adding, Removing or Replacing Tape Drives
- 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.

NOTE:

If you should need to remove a side panel from the *Sun Enterprise* 3000 System for any reason, it is necessary to pull out on the bottom center of the panel before sliding the panel upwards to remove it. See the *Sun Enterprise* 3000 System, System Manual, Appendix E for additional information.

Recovering from Disk Corruption

CAUTION:

Only TSC personnel should perform the procedures in this section.

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 procedures in this section.

1. Remove stale information from system files, and clear and reinitiate the metadvice by entering the `olds -cleanup` command as follows:

NOTE:

This will remove everything from the CMS file system.

```
# /olds/olds -cleanup
.
.
.
Success, cleanup of DiskSuite, now reboot system.
#
```

2. Reboot the system with the `init 6` command as follows.

```
# init 6
```

3. When the system prompt reappears, log on as root.

4. Check disk partitioning with the `olds -check_disks` command as follows.

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

5. Make sure all drives are accounted for with the `olds -mk_files` command as follows.

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

6. Set up the `/cms` metadvice with the `olds -setup` command as follows:

```
# nohup ./olds/olds -setup | tee
. . .
prvtoc: 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
#
```

7. Mount the file system as follows.

```
# mount /cms
```

8. Verify disk space by entering the `df -k /cms` command as follows.

```
# df -k /cms
```

The system responds by displaying file system information for `/cms` as follows:

```
Filesystem      kbytes    used    avail    capacity  Mounted or
/dev/dsk/c0t3d0s0 10772308 310956 383882    45%      /
/proc           0         0         0         0%      /proc
fd              0         0         0         0%      /dev/fd
/dev/md/dsk/d19  xxxxxxxx  9         yyyyyy    0%      /cms
```

The `/cms kbytes` figure (shown here as “xxxxxxx”) is the critical number. You use it to verify that the *Solstice DiskSuite* software is administering all the available disks. Use Table 6-1 to make the necessary calculations:

Table 6-1: Disk Space Verification (4-GB Disks)

Calculation	Result
(1a) Divide the <code>/cms</code> line’s ‘kbytes’ figure by 1000 (move the decimal point three places to the left) and record the result:	(1a)
(1b) Enter the figure from the “ <code>/cms Size (MB)</code> ” column below corresponding to the number of hard disks in your system	(1b)
(1a) and (1b) should be approximately equal (the correspondence will not be exact, but must be within 4000MB)	

No. of 4-GB Disks	/cms Size (MB)
1	3104
2	7137
3	11170
4	15203
5	19236
6	23269
7	27302

**Solstice* and *DiskSuite* are registered trademarks of Sun Micro Systems Inc.

Table 6-1: Disk Space Verification (4-GB Disks) (Contd)

8	31335
9	35368
10	39401

If there seems to be a problem, check to see that the file `/etc/opt/SUNWmd/md.tab` accounts for all your disk drives. The `d19` line of the `#/cms` section should reflect the precise number of disk drives on your system.

9. Install the swap file on the CMS file system as follows:

```
# /olds/olds -oldswapfile /cms
```

10. Reboot the system as follows:

```
# init 6
```

⚠ CAUTION:

Perform Step 11 only if you have a CMSADM backup available.

11. If you have no CMSADM backup, skip to Step 12.
- 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 /dev/rmt/0c -M "Please
remove the current tape, insert tape number %d and then
press ENTER" "/cms" "/cms/*" | tee
```

The device name in this example is `/dev/rmt/0c`. This will be the usual case. However, the device name used depends upon the drive's SCSI ID and whether the drive supports data compression (indicated by the `c` suffix). The device name must be one of the following:

`/dev/rmt/0` Indicates the internal noncompressing tape drive (14-GB, 8-mm drive) with the lowest target address.

- `/dev/rmt/1` Indicates the external noncompressing tape drive (QIC-150 or 5-GB, 8-mm drive) with the second lowest target address.
- `/dev/rmt/0c` Indicates the internal compressed-mode tape drive (usually a 14-GB tape drive) with the lowest target address (the most common usage with the *Sun Enterprise 3000* system).
- `/dev/rmt/1c` Indicates the external compressed-mode tape drive (either a QIC 2.5-GB or a 14-GB tape drive) with the second lowest target address.

⇒ NOTE:

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 the *CenterVu Call Management System, Release 3, Version 5, Sun Enterprise System, Software Installation* document (585-215-836), “Performing a *CentreVu* CMS Maintenance Restore.”

See the *CentreVu™ CMS R3V5 Administration* (585-215-820) document for more information.

12. **Perform this step only if you have no CMSADM backup available.** If you have a CMSADM backup, perform Step 11 instead.
- a. Reinstall the *CentreVu* CMS. See the *CenterVu Call Management System, Release 3, Version 5, Sun Enterprise System, Software Installation* document (585-215-836) for details.
 - b. Run CMS setup. See the *CenterVu Call Management System, Release 3, Version 5, Sun Enterprise System, Software Installation* document (585-215-836) document, “Setting Up *CentreVu* CMS and Installing Feature Packages” for details.
 - c. Restore the *CentreVu* CMS data from the *CentreVu* CMS maintenance backup. See the *CenterVu Call Management System, Release 3, Version 5, Sun Enterprise System, Software Installation* document (585-215-836), “Performing a *CentreVu* CMS Maintenance Restore.”

Restoring an Entire System

If you have a disk crash that disables the operating system disk drive, you must perform the procedures outlined in this section. The procedures are the same as a new install. You will need to install/replace the crashed disk drive (see Appendix D “Sun Enterprise 3000 System Factory Hardware Installation Procedures”, “Installing an Internal Hard Disk Drive”) and then 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 the *CentreVu* Call Management System, Release 3, Version 5, *Sun Enterprise* System, Software Installation document (585-215-836) for details.
2. If you have a CMSADM backup available, restore it. See the *CentreVu* Call Management System, Release 3, Version 5, *Sun Enterprise* System, Software Installation document (585-215-836) for details.

If you do not have a CMSADM backup, you must reinstall all add-on packages, all patches, and *CentreVu* CMS. See the *CentreVu* Call Management System, Release 3, Version 5, *Sun Enterprise* System, Software Installation document (585-215-836) for details.

3. Run CMS setup. See the *CentreVu* Call Management System, Release 3, Version 5, *Sun Enterprise* System, Software Installation document (585-215-836) for details.
4. Restore *CentreVu* CMS data from the *CentreVu* CMS maintenance backup. See *CentreVu* Call Management System, Release 3, Version 5, *Sun Enterprise* System, Software Installation document (585-215-836), “Performing a *CentreVu* CMS Maintenance Restore.”
5. Administer Terminals, Printers, Modems, and other peripherals as needed. See Chapter 3, “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 /dev/rmt/0c -M "Please remove the
current tape, insert tape number %d, and press ENTER"
<full_path_name>
```

⇒ NOTE:

The device name in this example is `/dev/rmt/0c`. This will be the usual case. However, the device name used depends upon the drive's SCSI ID. You must use one of the following device names in the `cpio` command:

- `/dev/rmt/0` Indicates the tape drive with the lowest target number in the SCSI chain.
- `/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 14 GB internal tape drive is the most common usage with the *Sun Enterprise 3000* system).
- `/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 tape drives support compressed mode).

Recovering System Space

This section describes how to regain system space and the *CentreVu* CMS file system space.

Regaining System Space

When the amount of the *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.

 **CAUTION:**

Only TSC personnel should perform the procedures in this section.

Reinitializing the *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

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

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 setup` 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 the 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 *CentreVu* Call Management System, Release 3, Version 5, *Sun Enterprise System, Software Installation* document (585-215-836), "Performing a *CentreVu* CMS Maintenance Restore."
7. Stop and start *CentreVu* CMS when the *CentreVu* CMS maintenance restore is finished. To start and stop the *CentreVu* CMS, see the *CentreVu* Call Management System, Release 3, Version 5, *Sun Enterprise System, Software Installation* document (585-215-836), "run_cms" for details.

Re-creating Specific Tables

Another option is to manually remove and rebuild specific database tables, which you can do in the following manner:

1. Perform Steps 1 and 2 of the previous section Reinitializing the CentreVu CMS.
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.

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 the *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/cmstables` 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.

An example of the `dtrunk` schema edited for the `/cms1` file system is as follows:

```
{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,
mbusytme 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;

```

5. Turn off the *CentreVu* CMS by using the `run_cms` option on either the CMSADM or CMSSVC menu. See the *CenterVu Call Management System, Release 3, Version 5, Sun Enterprise System, Software Installation document (585-215-836), "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 the *CentreVu* CMS by using the `run_cms` option on either the `CMSADM` or `CMSSVC` menu. See the *CentreVu* Call Management System, Release 3, Version 5, *Sun Enterprise System, Software Installation* document (585-215-836), “`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.

Adding Memory

To add more memory to a *Sun Enterprise 3000* system that is already up and running, do the following:

1. Enter the `prtconf` command, and record the displayed memory size as follows.

```
# prtconf | grep Memory  
  
Memory size: xx Megabytes
```

2. Make sure the system is in the firmware mode by using the `init 0` command to get to the `ok` prompt.
3. Do the following in sequential order:
 - a. Turn off the *Sun Enterprise 3000* system.
 - b. Turn off the system monitor.
 - c. Turn off all external devices starting with the device closest to the *Sun Enterprise 3000* system and working toward the farthest device.
4. Install the Single In Line Memory Module (SIMM) into the *Sun Enterprise 3000* system using the procedures described in Appendix D “Sun Enterprise 3000 System Factory Hardware Installation Procedures”, “Installing Single In Line Memory Modules (SIMMs)”.
5. Do the following in sequential order:
 - a. Turn on devices attached to the *Sun Enterprise 3000* system starting with the most distant device and working toward the computer.
 - b. Turn on the *Sun Enterprise 3000* system.
 - c. Turn on the system monitor.
6. Boot the system as follows.

```
ok boot -r
```

7. After the machine is booted, log in as root.

8. Enter the `prtconf` command as follows.

```
# prtconf | grep Memory  
  
Memory size: xx Megabytes
```

9. Verify that the displayed memory size is correct (compare with value recorded in Step 1). If not correct, recheck Step 4 to insure that all SIMMs are fully seated and properly installed.

Adding/Installing Swap Space

Your system requires two swap files: one in the root and one in the /cms file system. You create the files with the olds script. The script determines how big the files need to be.

Create the files with the following steps:

1. Create the files by running the olds script with the swap file options, as follows:

```
# olds -addswapfile  
# olds -addswapfile /cms
```

2. Reboot the system by entering the following command:

```
# init 6
```

3. When the reboot completes, verify that the space has been allocated by entering the following command:

```
# swap -l
```

If you receive the message “No swap devices configured,” load the /etc/vfstab file into an editor. Check to see that the /swap and /cms/swap entries are not commented out. If they are, uncomment them and execute the following commands:

```
# swap -a /swap  
# swap -a /cms/swap
```

Finally, reenter the `swap -l` command to verify that the swap devices have been configured as they should have been.

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 Enterprise* 3000 system, do the following:

1. Log into the system as root.
2. Turn off the *CentreVu* CMS by using the `run_cms` option of the `cmssvc` command. See the *CenterVu Call Management System, Release 3, Version 5, Sun Enterprise System, Software Installation* document (585-215-836), “CMSADM and CMSSVC Menus” for details.
3. Remove the *CentreVu* CMS software using the `pkgrm` command. See the *CentreVu™ CMS R3V5 Upgrades and Migration* document (585-215-826).

Enter `y` when asked:

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

4. Shut the system down by using the `shutdown` command as follows.

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

5. Do the following in sequential order:
 - a. Turn off the *Sun Enterprise* 3000 system.
 - b. Turn off the system monitor.
 - c. Turn off all external devices starting with the device closest to the *Sun Enterprise* 3000 system and working toward the farthest device.
6. Install the HSI/S card into the *Sun Enterprise* 3000 system by following the instructions described in Chapter 2, “Installing the Sun Enterprise 3000 System, Installing or Changing SBus Cards.”
7. Attach the HSI/S patch panel by following the instructions described in Chapter 2, “Installing the Sun Enterprise 3000 System, Connecting the SunLink HSI/S Patch Panel.”
8. Connect the switch links to the HSI/S patch panel by following the instructions described in Chapter 4, “Connecting the Sun Enterprise 3000 System to the Switch.”

 **NOTE:**

Do not use the “B” serial port to connect switch links when an HSI/S card is installed. The “B” serial port is used only for single ACD installations. 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 Enterprise 3000* system starting with the device at the end of the SCSI chain and working toward the computer.
 - b. Turn on the *Sun Enterprise 3000* system.
 - 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.

 **CAUTION:**

See Troubleshooting, Probe-SCSI Command Problem before executing this command.

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. Install the HSI/S software by following the instructions described in the *CentreVu Call Management System, Release 3, Version 5, Sun Enterprise System, Software Installation* document (585-215-836), “Installing the HSI/S (High-Speed Serial Interface/SBus) Software”.
14. Install the *Solaris* patches package by following the instructions described in the *CentreVu™ CMS R3V5 Upgrades and Migration* document (585-215-826).
15. Install the *CentreVu CMS* software by following the instructions described in the *CentreVu™ CMS R3V5 Upgrades and Migration* document (585-215-826).

16. Change the switch link administration for ACD 1 by using the `cmssvc` command as follows.

```
# cmssvc
```

17. The system responds as follows:

```
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:
```

18. Select the `swsetup` option.
19. Select ACD 1.
20. Accept the existing defaults for the following:
 - Switch name
 - Switch model (release)
 - Vectoring
 - Expert agent
 - Central Office Disconnect Supervision
 - Local port
 - Remote port.
21. Select the `HSI link 0` option when prompted for the link information.
22. Perform a CMSADM file system backup to save the updated system software and hardware configuration. See the *CenterVu Call Management System, Release 3, Version 5, Sun Enterprise System, Software Installation* document (585-215-836), "Performing a CMSADM File System Backup."
23. Turn on the *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 as follows:

```
Entering System Maintenance Mode
Enter Terminal Type: (default is 615):
```

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.
 - 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.

For more information, enter the `man date` command at the system prompt, or see *AnswerBook*^{*} on-line software.

8. Return to a multi-user state with the following command:

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

The `-i6` option of the `shutdown` command changes the system to a multi-user state.

^{*}*AnswerBook* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

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 as follows:

```
Entering System Maintenance Mode
Enter Terminal Type: (default is 615):
```

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. See the following example.

**OpenWindows* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

```
# 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:

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

For more information, enter the `man date` command at the system prompt, or see *AnswerBook* on-line software.

Synchronizing Clocks

Each I/O board has its own clock. These clocks must be synchronized for proper system operation. After removing and replacing an I/O board, the system may experience a clock synchronization problem. That is, the clock on the I/O board will become un-synchronized with the clock on the Clock Board.

To resynchronize the clocks, do the following:

1. If CMS is running, turn it off.
2. Go to the boot prompt. You can do that in one of three ways:
 - a. You can type `init 0`, or
 - b. You can type `/usr/sbin/shutdown -y -g0 -i0`, or

- c. You can press the **Stop** and **A** keys simultaneously while the *Enterprise* is booting, after the *Sun* logo displays.
3. Type the following command:
`copy-clock-tod-to-io-boards`
4. Boot the machine by typing one of the following commands:
`boot`
`boot -r` (*to reconfigure for new devices*)

Adding, Removing or Replacing Tape Drives

Overview

This section describes how to replace the internal tape drive and how to add and remove an external tape drive from an existing system. External SCSI devices are not generally supported on the *Sun Enterprise 3000* system except for migration purposes.

Replacing the Internal Tape Drive

The basic configuration for the *Sun Enterprise 3000* system equipped for the CMS application includes a 14-GB internal tape drive. This tape drive is installed in the right hand side of the SCSI tray, which mounts from the front of the system (see Figure 6-1).

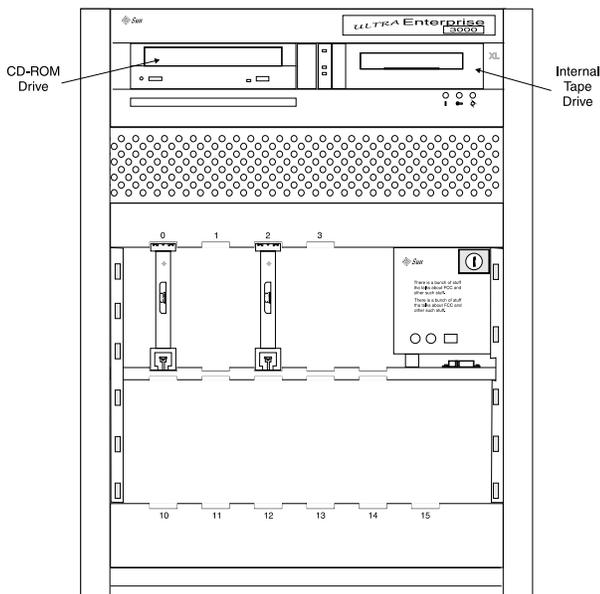


Figure 6-1: Front View of the Sun Enterprise 3000 System

Procedure

To replace a tape drive in the SCSI tray:

1. Remove the front bezel.

 **NOTE:**

It may be necessary to apply pressure to release the front bezel anchor pins. To do this, place your thumbs against the face of the SCSI tray installed units and press in with your thumbs while pulling out with your fingers.

2. Loosen the two captive screws.

 **CAUTION:**

When loosening or tightening the captive screws, use your thumb and fingers only. The shafts of these screws are thin and are easily broken if too much pressure is applied.

3. Remove the SCSI tray with any installed devices.
4. Remove seven screws on top of the tray and remove the top panel
5. Remove the old tape drive as follows:
 - a. Loosen the three captive screws securing the tape drive to the tray.
 - b. Remove the mounting plate from the old tape drive and attach it to the new tape drive using the same screws.
 - c. Set the SCSI address to 5.
 - d. Secure the tape drive with the mounting bracket to the SCSI tray using the three captive screws.
6. Reverse Steps 1 through 4.

Adding an External Tape Drive

This procedure is used only as a temporary measure during the migration process.

When adding an external tape drive to an existing system, do the following:

- Remove the existing SCSI device files (to prepare for new SCSI hardware configuration).
- Set the SCSI device IDs.
- Connect the tape drive to the FSBE/S card.
- Reboot and reconfigure the system.

Procedure

To remove the SCSI device files for all but the 14GB internal tape drive, do the following:

1. Enter the following command:

```
# rm -f /dev/rmt/[1-9]*
```

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 Enterprise 3000* system.
 - b. Turn off the system monitor.
 - c. Turn off all external devices starting with the device closest to the *Sun Enterprise 3000* system and working toward the farthest device.
4. Set the tape drive's SCSI ID to 4.
5. Connect the tape drive to the FSBE/S card.

Connect the SCSI cable from the FSBE/S card to the in-connector on the back of the device. Figure 6-2 shows the SCSI cabling scheme.

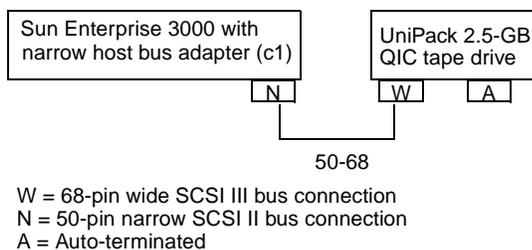


Figure 6-2: SCSI Cabling Schemes

6. Connect the power cord from the tape drive to a power source.

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:

7. Press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system.

 **CAUTION:**

See Troubleshooting, “Probe-SCSI Command Problem” before executing this command.

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

```
ok
```

8. Enter the following command and verify that the system recognizes the SCSI devices:

 **CAUTION:**

See Troubleshooting, “Probe-SCSI Command Problem” before executing this command.

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

The system responds as follows:

```
/sbus@3,0/sunw,fas@3,8800000
Target 0
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
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 /sbus@2,0/sunw,fas@3,8800000
```

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

9. Enter the following command to reboot the system and reconfigure the devices.

```
ok boot -r
```

Removing the External Tape Drive

When removing the external tape drive from an existing system, you need to do the following:

- Remove the SCSI device files (to prepare for the new SCSI hardware configuration).
- Remove the SCSI tape drive.
- Reboot and reconfigure the system.

Procedure

To remove the SCSI device files for all but the 14GB internal tape drive, do the following:

1. Enter the following command:

```
# rm -f /dev/rmt/[1-9]*
```

 **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:

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

3. Do the following in sequential order:
 - a. Turn off the *Sun Enterprise 3000* system.
 - b. Turn off the system monitor.
 - c. Turn off all external devices starting with the device closest to the *Sun Enterprise 3000* system and working toward the farthest device.
4. Remove the tape drive from the FSBE/S card.
5. Disconnect the tape drive power cord from the power source.
6. Do the following in sequential order:
 - a. Turn on the *Sun Enterprise 3000* system.
 - b. Turn on the system monitor.

Power-on diagnostics will be run when the computer is turned on.

While the system is booting up, enter the OpenBoot environment by doing the following:

7. Press the **Stop** and **A** keys simultaneously after the display console banner appears, but before the system starts booting the operating system.

 **CAUTION:**

See Chapter 5, “Troubleshooting, Probe-SCSI Command Problem” before executing this command.

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

```
ok
```

8. Enter the following command, and verify that the system recognizes the SCSI devices:

 **CAUTION:**

See Chapter 5, “Troubleshooting, Probe-SCSI Command Problem” before executing this command.

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

The system responds as follows:

```
/sbus@3,0/sunw,fas@3,8800000
Target 0
  Unit 0 Disk SEAGATE ST14801 SUN04246266 Copyright (C) 1991
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 /sbus@2,0/sunw,fas@3,8800000
```

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

9. Enter the following command to reboot the system and reconfigure the devices:

```
ok boot -r
```

Additional References

For additional information on this process, see the *Sun Enterprise 3000 System Manual*, Section 7.1.2, Removing/Replacing a Tape or CD-ROM Drive

Adding Network Terminal Servers

To connect additional Network Terminal Servers (NTSs) to your current configuration, use the procedures in Chapter 2, “Installing the Sun Enterprise 3000 System, Connecting the NTS(s) to the Network Hub Unit.” Also see the *CenterVu* Call Management System, Release 3, Version 5, *Sun Enterprise* System, Software Installation document (585-215-836), “Administering the Network Terminal Servers.” You can connect a maximum of four NTSs per *Sun Enterprise* 3000 system.

Changing Network Addresses

If you want to change the network address of your *Sun Enterprise* 3000 system and each NTS. See Chapter 2, “Installing the Sun Enterprise 3000 System, Connecting to Another Network or Connecting to Another Network (Via Dumb Terminal)” for additional procedures.

Appendix A

Generic 3i Switch Administration

Overview	A-1
Administering <i>CentreVu</i> CMS Interface on Generic 3i Switch	A-2
Assigning the Processor Interface Data Module (PIDM)	A-3
Assigning a Data Module to the <i>Sun Enterprise 3000</i> System	A-4
Assigning the Processor Channel	A-6
Enabling the Interface Link	A-8
Enabling the EIA Port on the Processor Interface	A-10

List of Figures

Figure A-1:	Data Module Form for the Generic 3i Switch.	A-4
Figure A-2:	Data Module Form for the Generic 3i Switch.	A-6
Figure A-3:	Processor Channel Assignment Form for the Generic 3i Switch.	A-8
Figure A-4:	Interface Links Form for the Generic 3i Switch	A-9
Figure A-5:	Interface Links Form for EIA Port on Processor Interface for the Generic 3i Switch	A-10

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 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 3i switch, the hardware interface is a processor interface. This hardware interface is sometimes called the *CentreVu* CMS interface.

⇒ NOTE:

For the screens to administer the Expert Agent Selection (EAS) feature, see the *CentreVu*[™] R3V5 CMS Administration (585-215-820) document.

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.

⇒ NOTE:

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 Switch

This section contains the procedures required to establish a communications link between the *Sun*^{*} *Enterprise*[†] 3000 system and the Generic 3i switch.

The processor interface on the Generic 3i switch 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 Enterprise* 3000 system.

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 Enterprise* 3000 system, you do not have to fill out the data module form.

^{*}*Sun* is a registered trademark of Sun Microsystems, Inc. in the United States and other countries.

[†]*Enterprise* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

Assigning the Processor Interface Data Module (PIDM)

The following procedures can be used to add the processor interface on the Generic 3i switch:

1. Verify that the SAT 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.)

3. In the `Name` field, Enter `R3V5 CMS`, and press the **Return** key.

The cursor is positioned on the `Type` field.

4. In the field labeled `Type`, enter `procr-infc` for the Generic 3i switch. After entering the appropriate `Type`, press the **Return** key. The cursor is positioned on the `COS` field.

⇒ NOTE:

The `COS` and `COR` fields are defaulted to 1.

5. Do not make changes to the `COS` and `COR` fields; press the **Return** key.

The cursor is positioned on the `Physical Channel` field.

6. 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 Enterprise 3000* system, physical channel number `01` must be used.

7. Press the **Enter** key.

The screen displays the following:

```
command successfully completed
enter command:
```

```

                                DATA MODULE

Data Extension: 2005           Name: R3 CMS
                                Type: procr-infc       COS: 1       Maintenance Extension: _____
Physical Channel: 01           COR: 1
                                ITC: restricted         TN: ____

ABBREVIATED DIALING
List1:

SPECIAL DIALING OPTION:

ASSIGNED MEMBERS (Station with a data extension button for this data module)
    Ext      Name
    1:

```

Figure A-1: Data Module Form for the Generic 3i Switch

Assigning a Data Module to the Sun Enterprise 3000 System

After the processor interface has been assigned, the data module can be administered and connected to the *Sun Enterprise 3000* system 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 Enterprise 3000* system, 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 Modular Trunk Data Module (MTDM) will be used.

1. Verify that the SAT screen displays the following:

```
enter command:
```

2. Enter `add data-module 2009` where *2009* 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-2.)

3. In the `Port` field, enter `1A0101`, and press the `Return` key.

The cursor is positioned on the `Type` field.

4. In the field labeled `Type`, enter `procr-infc` for the Generic 3i switch. After entering the appropriate `Type`, press the `Return` key.

⇒ NOTE:

The cursor is positioned on the `COS` field. The `COS` and `COR` fields are defaulted to 1.

5. Do not make changes to the `COS` and `COR` fields; press the `Return` key.

The cursor is positioned on the `Physical Channel` field.

6. 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 Enterprise 3000* system, physical channel number `01` must be used.

7. Press the `Enter` key.

The screen displays the following:

```
command successfully completed
enter command:
```

```

                                DATA MODULE

Data Extension: 2009          Port: 1A0101
      Type: pdm              COS: 1      Maintenance Extension: _____
Physical Channel: _____ COR: 1_
                                ITC: restricted          TN: _____

ABBREVIATED DIALING
List1:

SPECIAL DIALING OPTION:

ASSIGNED MEMBERS (Station with a data extension button for this data module)
      Ext      Name
1:

```

Figure A-2: Data Module Form for the Generic 3i Switch

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 Enterprise 3000* system.

The following procedure can be used to assign processor channels on the Generic 3i switch:

1. Verify that the SAT displays the following:

```
enter command:
```

2. Enter the change communications-interfaces processor-channels command, and press the **Return** key.

The screen displays the Processor Channel Assignment form. (See Figure A-3.)

⇒ 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 `App1` 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 *CenterVu Call Management System Release 3 Version 5 Sun Enterprise Software Installation* document (585-215-836), "swsetup".

4. Enter `mis` in the `App1` 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` field, and press the **Return** key.
The cursor is positioned on the `MACHINE-ID` field.
10. Make no entry; press the **Enter** key.

The screen displays the following:

```
command successfully completed,  
enter command:
```

```

PROCESSOR CHANNEL ASSIGNMENT

Proc
Chan  Appl.  Interface  Remote
      Link  Chan  Priority  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 the Generic 3i Switch

⇒ 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 switch:

1. Verify that the SAT displays the following:

```
enter command:
```

2. Enter the `change communications-interfaces links` command, and press the **Return** key.

The screen displays an Interface Links form. (See Figure A-4.)

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 and press the **Return** key.

The cursor is positioned on the `Est Conn` field.

- Enter `y` to establish a connection to the MPDM that connects to the *Sun Enterprise 3000* system, 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.

- Enter `BX.25` in the `Prot` field.

The cursor is positioned on the `Destination Digits` field.

- Enter the extension number for the MPDM that connects to the *Sun Enterprise 3000* system, and press the `Return` key.

The cursor is positioned on the `DTE/DCE` field.

- Enter `DTE` for the *Sun Enterprise 3000* system, and press the `Return` key.

The cursor is positioned on the `Identification` field.

- Enter a 15-character name for the link. This field may be left blank.
- Press the `Enter` key.

The screen displays the following:

```
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 the Generic 3i Switch

Enabling the EIA Port on the Processor Interface

If the EIA port on the processor interface of a Generic 3i switch is used to make the connection to the *Sun Enterprise 3000* system, see Figure A-5.

```

                                INTERFACE LINKS

Link  Enabled      Establish  Interface  Destination
      Enabled      Connection Extension  Number     DTE/DCE  Identification
-----
1:    y            y          2005      eia         DTE
2:    n            n          2006
3:    n            n          2007
4:    n            n          2008

Link 1 [eia] - Connected to: DTE      Clocking: internal
    
```

Figure A-5: Interface Links Form for EIA Port on Processor Interface for the Generic 3i Switch

⇒ NOTE:

For *CentreVu CMS R3V5*, the DTE/DCE field must be set to DTE.

Appendix B

Generic 2 Switch Administration

Overview	B-1
Administering <i>CentreVu</i> CMS on the <i>DEFINITY</i> Generic 2.1 Switch	B-2
Administering <i>CentreVu</i> CMS on the <i>DEFINITY</i> Generic 2.2 Switch	B-9

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 switches. See Chapter 1, “Introduction,” of this document, 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.

Use this appendix to do the following:

- Administer the *CentreVu* CMS Feature on the *DEFINITY* Generic 2.1.
- Administer the *CentreVu* CMS Feature on the *DEFINITY* Generic 2.2.
- Administer the Dedicated Switch Connections (DSC) Feature on the *DEFINITY* Generic 2.

 **NOTE:**

Any changes to the switch translations should be made only by a skilled switch technician.

 **NOTE:**

For the procedures to administer the Expert Agent Selection (EAS) feature, see the *CentreVu*™ CMS R3V5 Administration (585-215-820) document.

Administering *CentreVu* CMS on the *DEFINITY* Generic 2.1 Switch

On a Generic 2.1, 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 in these characteristics 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^{*} Enterprise[†]* 3000 system.
- 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 in these characteristics 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.

^{*}*Sun* is a registered trademark of Sun Microsystems, Inc. in the United States and other countries.

[†]*Enterprise* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

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 in these characteristics 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 *CentreVu* CMS, the value is 180.

Field 3 Enter the time, in seconds, wait for acknowledgment of data packet before resetting a logical channel (1-255). For *CentreVu* CMS, the value is 20.

Field 4 Enter the time, in seconds, wait for confirmation of an interrupt packet before resetting a logical channel (1-255). For *CentreVu* CMS, the value is 180.

Field 5 Enter the time, in seconds, wait before retransmitting an unconfirmed reset request package (1-255). For *CentreVu* CMS, the value is 8.

Field 6 Enter the time, in seconds, wait before retransmitting an unconfirmed restart request package (1-255). For *CentreVu* CMS, the value is 8.

Field 10 Enter the maximum number of times an unacknowledged data packet can be transmitted (1-7). For *CentreVu* 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 *CentreVu* 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 characteristics 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 in these characteristics 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 Centralized Attendant Service (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.

 **NOTE:**

Only the trunk groups numbered from 18 to 255 can be measured.

 **CAUTION:**

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 an ACD split and whether the split is measured.

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 (VDN), a vector number, the Incoming Call Identification (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 *CentreVu* CMS on the *DEFINITY* Generic 2.2 Switch

On a Generic 2.2 switch, use the Manager II to administer *CentreVu* CMS.

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 in these characteristics 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* Enterprise†* 3000 system.
- 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 in these characteristics 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.

**Sun* is a registered trademark of Sun Microsystems, Inc. in the United States and other countries.

†*Enterprise* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

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 in these characteristics 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 *CentreVu* 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 *CentreVu* 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 *CentreVu* CMS, the value is 180.

Field 5 Enter the time, in seconds, waited before retransmitting an unconfirmed reset request package (1-255). For *CentreVu* CMS, the value is 8.

Field 6 Enter the time, in seconds, waited before retransmitting an unconfirmed restart request package (1-255). For *CentreVu* CMS, the value is 8.

Field 10 Enter the maximum number of times an unacknowledged data packet can be transmitted (1-7). For *CentreVu* 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 *CentreVu* 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 characteristics 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 characteristics 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.

 **NOTE:**

Only the trunk groups numbered from 18 to 255 can be measured.

 **CAUTION:**

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 Incoming Call Identification (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.

Appendix C

Generic 3r Switch Administration

Overview	C-1
Administering the <i>CentreVu</i> CMS Interface on a Generic 3r Switch	C-2
Changing Feature-Related System Parameters	C-3
Assigning the Packet Gateway Board	C-4
Assigning the Packet Gateway Port	C-5
Assigning a Data Module to the Switch	C-7
Assigning a Data Module to the <i>Sun Enterprise 3000</i> System	C-9
Assigning the Processor Channel	C-11
Enabling the Interface Link on the Generic 3r Switch	C-13
Setting Up an Administered Connection	C-14

List of Figures

Figure C-1: Feature-Related System Parameters Form (Page 1)	C-3
Figure C-2: Feature-Related System Parameters Form (Page 2)	C-4
Figure C-3: Pgate Board Form	C-5
Figure C-4: Data Module Form (Page 1)	C-6
Figure C-5: Data Module Form (Page 2)	C-7
Figure C-6: Data Module Form	C-9
Figure C-7: Data Module Form	C-11
Figure C-8: Processor Channel Assignment Form	C-13
Figure C-9: Interface Links Form for EIA Port on Processor Interface	C-14
Figure C-10: Administered Connection Form	C-15

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.

 **NOTE:**

For the screens to administer the Expert Agent Selection (EAS) feature, see the *CentreVu*[™] *CMS R3V5 Administration* (585-215-820) document.

For more information, see the following documentation:

- *Lucent Technologies DEFINITY Communications System Generic 3 Version 2 Implementation* document (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.

 **NOTE:**

Only a qualified switch technician or switch administrator should administer the *CentreVu* CMS interface and features on the switch.

Administering the *CentreVu* CMS Interface on Generic 3r Switch

This section contains the procedures required to establish a communications link between the *Sun*^{*} *Enterprise*[†] 3000 system 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 Enterprise* 3000 system.

You assign the *CentreVu* CMS interface by logging in on the 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 (IDC) is used to make the connection to the *Sun Enterprise* 3000 system, 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. in the United States and other countries.

[†]*Enterprise* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

Changing Feature-Related System Parameters

Use the following procedures to change the *CentreVu* CMS parameters on the Generic 3r switch:

1. Verify that the SAT displays the following:

```
enter command:
```

2. Enter the `change system-parameters features` command.

The screen displays a Data Module form. (See Figure C-1 and Figure C-2.)

3. In the field labeled `Expert Agent Selection (EAS) Enabled?`, the default is `yes`. Press `Enter`.

4. In the `Message Waiting Lamp Indicates Status For` field, enter your login ID. The length of the agent login ID for the Generic 3r switch is 0-9 characters.

5. Press your terminal's "page forward" key to go to Page 2.

6. In the field labeled `Adjunct CMS Release`, enter `R3V5`.

The screen displays the following:

```
command successfully completed,
```

```
enter command:
```

```

CALL CENTER SYSTEM PARAMETERS

EAS
  Expert Agent Selection (EAS)Enabled? y
  Minimum Agent-LoginID Password Length: _
  Direct Agent Announcement Extension: ___ Delay ___
  Message Waiting Lamp Indicates Status For: loginID
VECTORING
  Converse First Data Delay:___ Second Data Delay: ___
  Converse Signaling Tone (msec): _____ Pause (msec): ___
  Prompting Timeout (secs): ___
SERVICE OBSERVING
  Service Observing Warning Tone?___
ASAI
  Call Classification After Answer Supervision? _

```

Figure C-1: Feature-Related System Parameters Form (Page 1)

```
CALL CENTER SYSTEM PARAMETERS

MOST IDLE AGENT
    MIA Across Splits or Skills? __
    ACW Agents on MIA List? __

REASON CODES
    Aux Work Reason Code Type: _____
    Logout Reason Code Type: _____

CALL MANAGEMENT SYSTEM
    Adjunct CMS Release: _R3V5_
    BCMS/VuStats Measurement Interval: _____
    BCMS/VuStats Abandon Call Timer (seconds): _____
    Validate BC|M|S/VuStats Login IDs? __
    Clear VuStats Shift Data: _____
```

Figure C-2: Feature-Related System Parameters Form (Page 2)

Assigning the Packet Gateway Board

Use the following procedures to assign the Packet Gateway board on the Generic 3r switch:

1. Verify that the SAT displays the following:

```
enter command:
```

2. Enter `add pgate 1c03` where `1c03` is the physical Packet Gateway (TN577) board location.

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-3.)

3. In the `External Cable Type` field, enter `rs232` for Generic 3r switch.

The screen displays the following:

```
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-3: Pgate Board Form

Assigning the Packet Gateway Port

Use the following procedures to assign the Packet Gateway port on the Generic 3r switch:

1. Verify that the SAT displays:

```
enter command:
```

2. Enter `add data-module 2005` where *2005* is the extension number assigned to the interface. The extension number you use automatically appears in the `Data Extension` field of a Data Module form.

The screen displays a Data Module form. (See Figure C-4 and Figure C-5.)

3. In the field labeled `Name`, enter `Pgate 1C0302` where *1C0302* is the physical equipment location of the Pgate board.

The cursor is positioned on the `Type` field.

4. Enter `x.25`.

The cursor is positioned on the `Port` field.

5. Enter the port number, for example `01C0302`. The port number identifies the physical equipment location of the circuit pack (packet gateway) being used.

The cursor is positioned on the `Baud Rate` field.

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.

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 a value of 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 Enterprise 3000* system via the Isolating Data Interface (IDI), the physical connection can support a baud rate of 19200.

The screen displays the following:

```
command successfully completed,  
enter command:
```

```
DATA MODULE  
  
Data Extension:2005  
Type: x.25  
Port: 01C090  
Baud Rate: 19.2  
Endpoint Type: adjunct  
  
Name: pgate 1C0302  
Remote Loop-Around Test? n  
COR: 1  
TN: 1  
DTE/DCE: dte Error Logging? n  
  
Permanent Virtual Circuit? y  
Switched Virtual Circuit? n  
Highest PVC Logical Level: 64
```

Figure C-4: Data Module Form (Page 1)

```

                                DATA MODULE

LAYER 2 PARAMETERS

    Number of Outstanding Frames (w) : 
      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 : 
  Restart (T20) Timer (seconds) : 8
    Reset (T22) Timer (seconds) : 10

```

Figure C-5: 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 Enterprise 3000* system.

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 SAT displays the following:

```
enter command:
```

2. Enter `add data-module 2007` where *2007* is the extension number assigned to the data module.

The extension number automatically appears 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.)

3. In the `Name` field, enter `cms link pdm`.

The cursor is positioned on the `Type` field.

4. In the field labeled `Type`, enter `pdm` for Generic 3r switch.

⇒ NOTE:

The cursor is positioned on the `COS` field. The `COS` and `COR` fields are defaulted to 1.

5. Do not make changes to the `COS` and `COR` fields; and press the `Return` key.

The cursor is positioned on the `Physical Channel` field.

6. 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 Enterprise 3000* system, physical channel number 01 must be used.

7. Press the `Enter` key.

The screen displays the following:

```
command successfully completed
enter command:
```

```

DATA MODULE

Data Extension: 2009   Name: cms link pdm
Type: pdm             COS: 1   Maintenance Extension: _____
Physical Channel:1_   COR: 1_
                    ITC: restricted   TN: __

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 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 Enterprise 3000 System

After assigning the interface on Packet Gateway board, the data module can be administered and connected to the *Sun Enterprise 3000* system 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 SAT displays the following:

```
enter command:
```

2. Enter `add data-module 2009` where *2009* is the extension number assigned to the data module.

The extension number automatically appears 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-7.)

3. In the `Name` field, enter `cms link pdm`.

The cursor is positioned on the `Type` field.

4. In the field labeled `Type`, enter `pdm` for Generic 3r switch.

⇒ NOTE:

The cursor is positioned on the `COS` field. The `COS` and `COR` fields are defaulted to 1.

5. Do not make changes to the `COS` and `COR` fields; press `Enter` instead.

The cursor is positioned on the `Physical Channel` field.

6. 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 Enterprise 3000* system, physical channel number `01` must be used.

7. Press `Enter`.

The screen displays the following:

```
command successfully completed
enter command
```

```

                                DATA MODULE

Data Extension: 2009      Name: cms link pdm
      Type: pdm          COS: 1      Maintenance Extension: _____
Physical Channel: 1      COR: 1_
                        ITC: restricted      TN: __

ABBREVIATED DIALING
List1:
SPECIAL DIALING OPTION:

ASSIGNED MEMBERS (Station with a data extension button for this data module)
      Ext      Name
1:

```

Figure C-7: 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.

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 Enterprise 3000* system.

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 switch:

1. Verify that the SAT displays the following:

```
enter command:
```

2. Enter the `change communication-interface processor-channels` command.

The screen displays the Processor Channel Assignment form.
(See Figure C-8.)

⇒ 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 `App1` 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 *CenterVu Call Management System Release 3 Version 5 Sun Enterprise Software Installation* document (585-215-836), "swsetup".

4. Enter `mis` in the `App1` field.

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.)

The cursor is positioned on the `Interface Chan` field.

6. Enter `1` in the `Interface Chan` field.

⇒ NOTE:

The *CentreVu* CMS R3V5 software requires that the `Interface Chan` field assignment be administered as `1`.

The cursor is positioned on the `Local Port` field.

7. Enter `1` in the `Local Port` field.

The cursor is positioned on the `Remote Port` field.

8. Enter `1` in the `Remote Port` field.

Cursor is positioned on the `MACHINE-ID` field.

9. Press Enter.

The screen displays the following:

```
command successfully completed,
enter command:
```

```

PROCESSOR CHANNEL ASSIGNMENT

Proc
Chan  Appl.  Interface  Local  Remote  Adjunct
      Link  Chan    Port   Port   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

Enabling the Interface Link on the Generic 3r Switch

Use the following steps to enable the *CentreVu* CMS interface link on the Generic 3r switch:

1. Verify that the SAT displays the following:

```
enter command:
```

2. Enter the change communications-interfaces links command.

The screen displays an Interface Links form. (See Figure C-9.)

The cursor is positioned on the Enabled field.

3. Enter beside the interface link number assigned on the Processor Channel form to enable the interface link and press the 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 Enterprise 3000* system.

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. (You may leave the field blank and just press Enter.)

The screen displays the following:

```
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-9: Interface Links Form for EIA Port on Processor Interface

Setting Up an Administered Connection

The following procedures can be used to set up an administered connection on the Generic 3r switch:

1. Verify that the SAT displays the following:

```
enter command:
```

2. Enter `add administered-connection 1`.

The screen displays an Administered Connection form. (See Figure C-10.)

3. In the field labeled `Originator`, enter the extension number assigned to the modem being connected to the pgate connection.

- In the field labeled *Destination*, enter the extension number assigned to the modem being connected to the *Sun Enterprise 3000* system.

The screen displays the following:

```
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-10: Administered Connection Form

Appendix D

Sun Enterprise 3000 System Factory Hardware Installation Procedures

Overview	D-1
General Procedures	D-2
Identifying Hardware Components	D-2
Identifying Free Board Slots	D-3
Installing and Removing Boards	D-4
Installing a Board	D-4
Removing a Board	D-5
Installing Specific Components.	D-6
Installing Single In Line Memory Modules (SIMMs)	D-6
Installing SBus Cards.	D-9
Installing Additional CPU/Memory Boards	D-11
Power/Cooling Module	D-12
Redundancy	D-12
Installing or Replacing a PCM	D-12
Installing an Internal Tape Drive	D-13
Installing an Internal Hard Disk Drive	D-15

List of Figures

Figure D-1:	<i>Sun Enterprise 3000</i> Components	D-2
Figure D-2:	Filler Panel	D-3
Figure D-3:	Board Locking Mechanisms	D-4
Figure D-4:	SIMM Chip	D-6
Figure D-5:	CPU/Memory Board and Layout	D-7
Figure D-6:	Installing a SIMM in the <i>Sun Enterprise 3000</i>	D-8
Figure D-7:	Plastic Standoffs for SBus Cards	D-9
Figure D-8:	Power/Cooling Module (PCM)	D-12
Figure D-9:	Front View of the <i>Sun Enterprise 3000</i> System	D-13
Figure D-10:	Internal Hard Disk Drive Locations	D-15

List of Tables

Table D-1:	SIMM Installation Sequence	D-6
Table D-2:	Minimum and Redundant Power Supply Requirements	D-12

Overview

This appendix outlines the hardware installation procedures performed by the factory for the *Sun*^{*} *Enterprise*[†] 3000 Systems. You can use these procedures to bring a *Sun Enterprise* 3000 System in the field up to factory standard.

The factory hardware installation procedures include the following:

- General Procedures
- Installing and Removing Boards
- Installing Single In Line Memory Modules (SIMMs)
- Installing SBus Cards
- Installing Additional CPU/Memory Boards
- Power/Cooling Module
- Installing an Internal Tape Drive
- Installing an Internal Hard Disk Drive.

 **WARNING:**

Before you begin the hardware installation, make sure the computer is plugged in, the power is off, and you are wearing an Electro-Static Discharge (ESD) ground strap.

^{*}*Sun* is a registered trademark of Sun Microsystems, Inc. in the United States and other countries.
[†]*Enterprise* is a trademark of Sun Microsystems, Inc. in the United States and other countries.

General Procedures

⚠ CAUTION:

You must wear an ESD wrist strap when installing or removing electronic components to prevent electrical discharge that may harm the system.

Identifying Hardware Components

Identify the following components in your *Sun Enterprise 3000* System (see Figure D-1):

- Internal CD-ROM and tape drives
- Internal Hard Disk Drives
- Free Board Slots
- Power Supply
- Memory boards/SIMM Receptacles

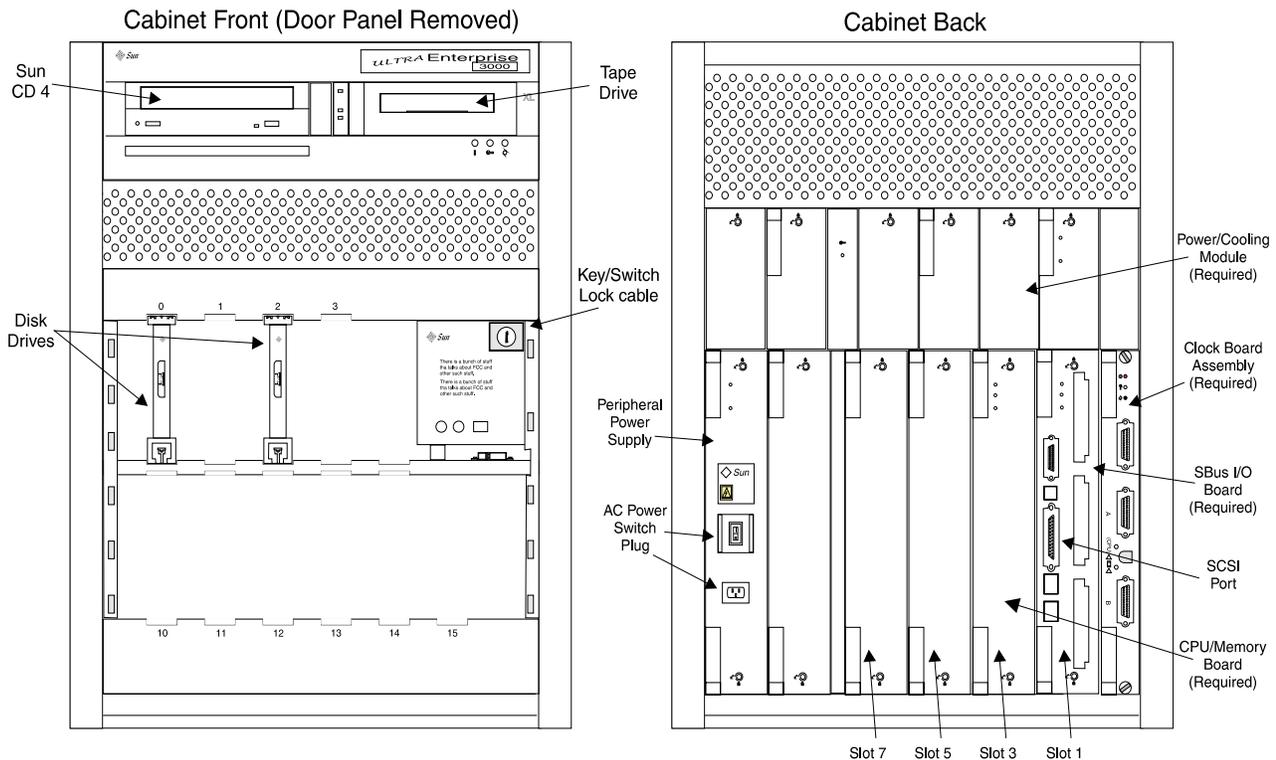


Figure D-1: Sun Enterprise 3000 Components

Identifying Free Board Slots

Free board slots are easily recognized because they are covered by filler panels, which have rectangular plastic knobs instead of extraction levers (Figure D-2).

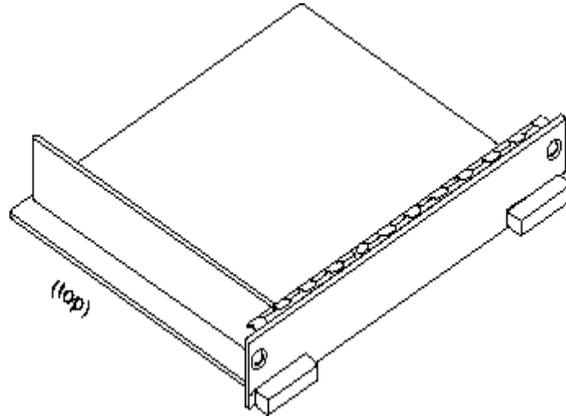


Figure D-2: Filler Panel

Installing and Removing Boards

Boards are accessed from the rear of the system. Each board is locked into place by a combination of “extraction levers,” which help seat the board in the centerplane receptacles, “access slots.” These centerplane receptacles and access slots align and attach the board to the system’s card cage.

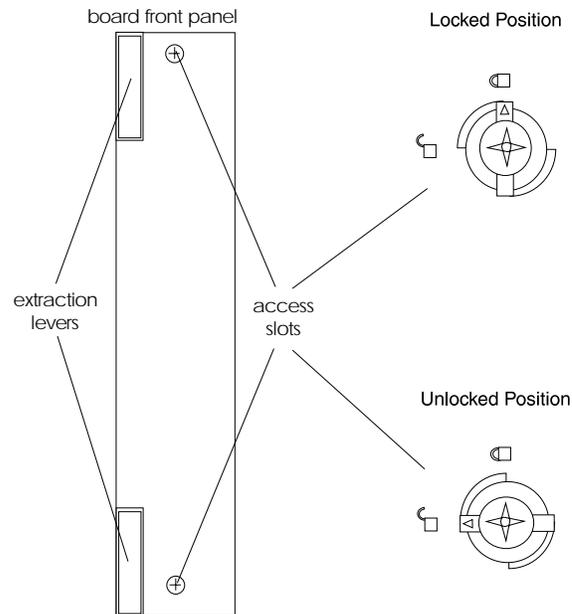


Figure D-3: Board Locking Mechanisms

Installing a Board

To install a board, grasp the extraction levers in the open position. Align the board with the centerplane receptacles and slide the board to the rear until it seats into the backplane receptacle. Then rotate the extraction levers into the locked position and, using a *Phillips*^{*} head screwdriver, rotate the board locks into the locked position (see Figure D-3).

⇒ NOTE:

Adding a board may require adding a Power/Cooling Module (PCM). There must be one PCM for every two boards installed in the system. The PCMs must be installed adjacent to populated board slots to ensure the fan in the PCM can cool the associated boards.

^{*}*Phillips* is a registered trademark of the Phillips Screw Company.

Removing a Board

CAUTION:

A board should be removed from a powered-on system only after the ARS software has disabled that board. Otherwise, the operating system must be halted and the system powered off prior to board removal.

To remove a board, you must unlock the access slots with a *Phillips* head screwdriver and then unseat the board by pulling the ends of both extraction levers simultaneously.

Additional References

For additional information and step-by-step instructions for installing or removing boards, see the *Sun Enterprise 3000 System Manual* distributed with your unit.

Installing Specific Components

Installing Single In Line Memory Modules (SIMMs)

⇒ NOTE:

The *Sun Enterprise 3000* System comes equipped with one bank of SIMMs (256 MB) installed. If you need to install additional SIMMs, they must be installed in full banks (see Figure D-5).

To install a SIMM, you need to identify the front and back of the SIMM and align it in the connector on the CPU/Memory board. Figure D-4 shows back and front views of a 32-MB SIMM chip.

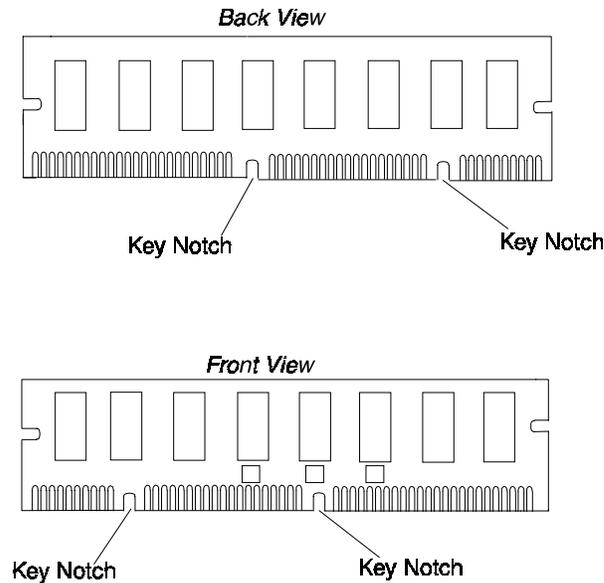


Figure D-4: SIMM Chip

Locate the SIMM slots on the CPU/Memory board and install the appropriate chips. (All slots must contain the same speed and capacity chips.) See Figure D-5 for the board layout.

Fill one entire bank at a time. You will add memory in blocks of 256 MB. Fill slots in the order shown in Table D-1.

Table D-1: SIMM Installation Sequence

Installation Sequence	Slot Number	Installation Sequence	Slot Number
1	B0J3100	9	B1J3101
2	B0J3200	10	B1J3201
3	B0J3300	11	B1J3301

Table D-1: SIMM Installation Sequence (Contd)

Installation Sequence	Slot Number	Installation Sequence	Slot Number
4	B0J3400	12	B1J3401
5	B0J3500	13	B1J3501
6	B0J3600	14	B1J3601
7	B0J3700	15	B1J3701
8	B0J3800	16	B1J3801

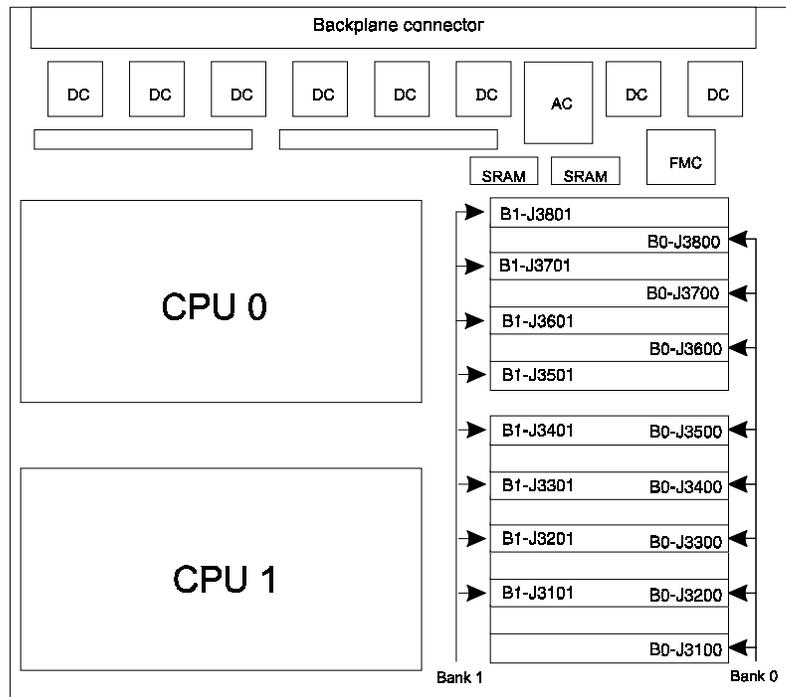
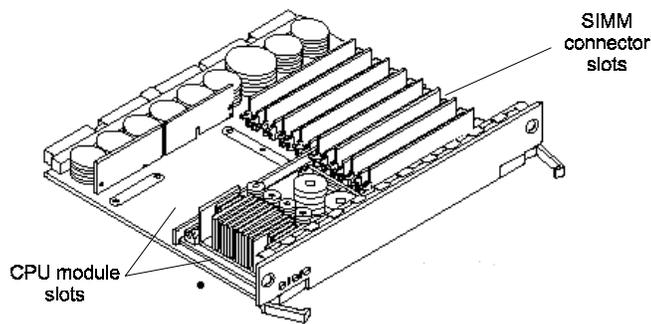


Figure D-5: CPU/Memory Board and Layout

To install a SIMM, unlock (press down) the ejector levers at both ends of the connectors, insert the SIMM into the slot, and relock the ejector levers (see Figure D-6).

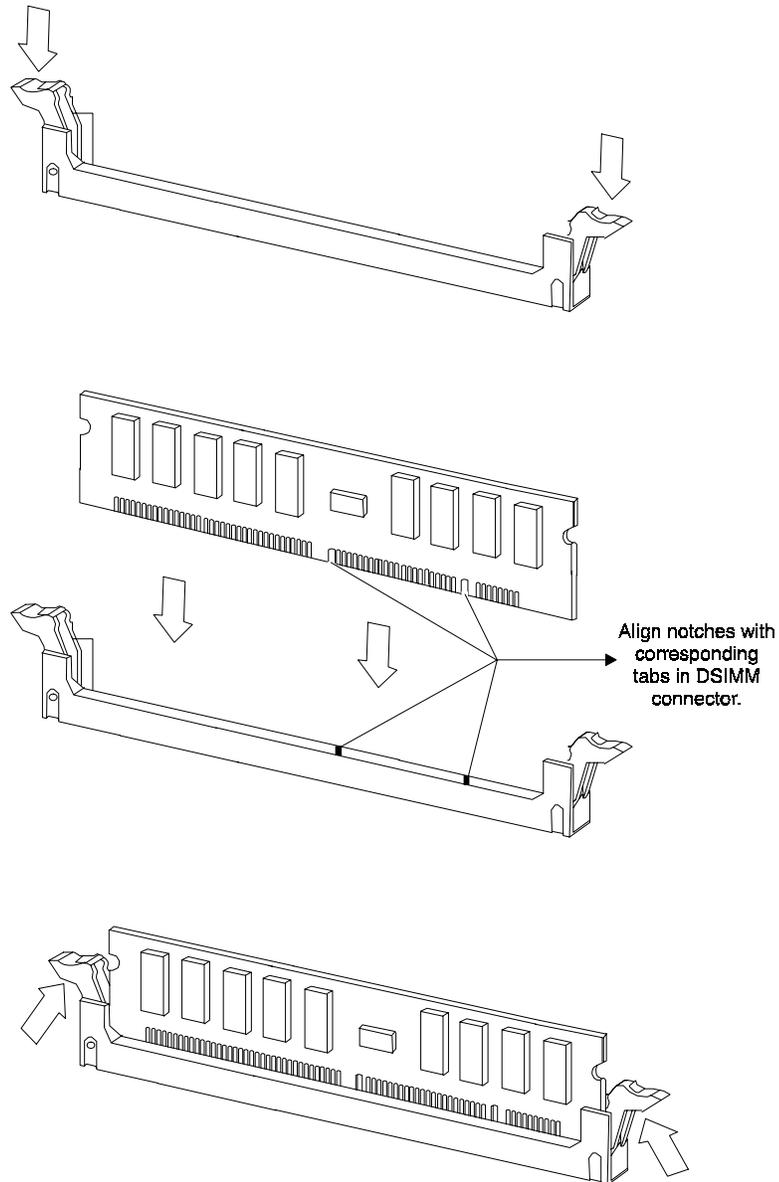


Figure D-6: Installing a SIMM in the *Sun Enterprise 3000*

Additional References

For additional information, see the *Sun Enterprise 3000 System Manual* distributed with your unit.