



Avaya Call Management System

Terminals, Printers, and Modems

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

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Providing telecommunications security

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

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

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

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

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

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

Your responsibility for your company's telecommunications security

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

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

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

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

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Avaya support

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Preface

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

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

This section includes the following topics:

- [Purpose](#) on page 12
- [Intended users](#) on page 12
- [Overview](#) on page 13
- [Conventions and terminology](#) on page 14
- [Reasons for reissue](#) on page 14
- [Availability](#) on page 15
- [Related documentation](#) on page 16
- [Support](#) on page 21

Purpose

The purpose of this document is to describe how to install and maintain terminals, printers, NTSs, and modems used with the Avaya Call Management System (CMS).

Avaya Call Management System Terminals, Printers, and Modems was not written for a specific CMS release so some of the equipment described in this document might have been discontinued. Contact your Avaya support representative for information about currently supported hardware for your CMS system.

Intended users

This document is written for:

- Avaya support personnel
- Avaya factory personnel
- Contact center administrators

This document assumes a minimum level of technical knowledge on the part of its readers. It assumes, for example, that a reader knows how to connect peripheral equipment to their CMS computer.

Overview

This document includes the following topics:

- [Connecting terminals, printers, and modems](#) on page 23
Provides procedures for connecting terminals, printers, and modems to a CMS system.
- [Configuring terminals, printers, and modems](#) on page 51
Provides procedures for setting terminals, printers, and modems options.
- [Connecting a network hub unit](#) on page 101
Provides procedures for connecting a network hub to a CMS system.
- [Installing, connecting and configuring an NTS](#) on page 113
Provides procedures for connecting and configuring a NTS.
- [Administering ports with the Port Administration tool](#) on page 143
Provides procedures for using the port administration tool
- [Troubleshooting](#) on page 151
Provides troubleshooting procedures for terminal, printer, and modem problems.
- [Appendix A: Administering ports using the Solaris tools](#) on page 201
Provides procedures about manually configuring port parameters for printers using Solaris tools instead of the port administration tool.

Conventions and terminology

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

 **CAUTION:**

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

 **WARNING:**

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

 **DANGER:**

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

 **SECURITY ALERT:**

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

- Unless specified otherwise, all information and procedures in this document apply to the Sun SPARCserver computers, the Sun Fire V890 computer, the Sun Fire V880 computer, the Sun Enterprise 3000 computer, the Sun Enterprise 3500 computer, the Sun Blade 100 computer, the Sun Blade 150 computer, and the Sun Ultra 5 computer.
- Unless specified otherwise, the term CMS, always implies Avaya Call Management System.
- Unless specified otherwise, Sun Blade refers to either the Sun Blade 100 computer or the Sun Blade 150 computer.
- Unless specified otherwise, Sun Fire refers to either the Sun Fire V880 computer or the Sun Fire V890 computer.

Reasons for reissue

This document differs from the previous issue in the following ways:

- This document was updated and reorganized to support Release 13 CMS.
- A general update and correction of a variety of small problems, such as typographical errors, was done.

Availability

Copies of this document are available from one or both of the following sources:

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Although there is no charge to download documents through the Avaya Web site, documents ordered from the Avaya Publications Center must be purchased.

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totalware@gwsmail.com

Related documentation

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

- [Change description](#) on page 16
- [Software documents](#) on page 17
- [Administration documents](#) on page 17
- [Hardware documents](#) on page 18
- [Communication Manager documents](#) on page 18
- [Avaya CMS upgrade documents](#) on page 19
- [Documentation Web sites](#) on page 20

Change description

For information about the changes made in Avaya CMS R13, see:

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

Software documents

For more information about Avaya CMS software, see:

- *Avaya Call Management System Release 13 Software Installation, Maintenance, and Troubleshooting Guide*, 07-300340
- *Avaya CMS Open Database Connectivity Version 4.2*, 585-780-701
- *Avaya Call Management System Release 13 LAN Backup User Guide*, 07-300338
- *Avaya Call Management System Release 13 External Call History Interface*, 07-300332
- *Avaya CMS Custom Reports*, 585-215-822
- *Avaya CMS Forecast User Guide*, 585-215-825
- *Avaya Visual Vectors Release 13 Installation and Getting Started*, 07-300353
- *Avaya Visual Vectors Release 13 User Guide*, 07-300354
- *Avaya Business Advocate Release 13 User Guide*, 07-300336
- *Avaya Call Management System (CMS) Supervisor Release 13 Report Designer*, 07-300335

Administration documents

For more information about Avaya CMS administration, see:

- *Avaya Call Management System Release 13 Administration*, 07-300331
- *Avaya Call Management System (CMS) Release 13 Database Items and Calculations*, 07-300330
- *Avaya Call Management System Supervisor Release 13 Reports*, 07-300334
- *Avaya Call Management System (CMS) Supervisor Release 13 Installation and Getting Started*, 07-300333
- *Avaya Call Management System High Availability User Guide*, 07-300066
- *Avaya Call Management System High Availability Connectivity, Upgrade and Administration*, 07-300065

Hardware documents

For more information about Avaya CMS hardware, see:

- *Avaya Call Management System Sun Fire V880/V890 Computer Hardware Installation, Maintenance, and Troubleshooting*, 585-215-116
- *Avaya Call Management System Sun Blade 100/150 Workstation Hardware Installation, Maintenance, and Troubleshooting*, 585-310-783
- *Avaya Call Management System Terminals, Printers, and Modems*, 585-215-874

Communication Manager documents

For more information about Avaya CMS communication servers, see:

- *Avaya Communication Manager Call Center Software Basic Call Management System (BCMS) Operations*, 07-300061
- *Avaya Call Management System Switch Connections, Administration, and Troubleshooting*, 585-215-876
- *Avaya Communication Manager Call Center Software Call Vectoring and Expert Agent Selection (EAS) Guide*, 07-300303
- *Avaya Communication Manager Call Center Software Automatic Call Distribution (ACD) Guide*, 07-300301

Avaya CMS upgrade documents

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

This section includes the following topics:

- [Base load upgrades](#) on page 19
- [Platform upgrades and data migration](#) on page 19
- [Avaya Call Management System Upgrade Express \(CUE\)](#) on page 19

Base load upgrades

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

For more information about base load upgrades, see:

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

Platform upgrades and data migration

Use a platform upgrade when upgrading to a new hardware platform (for example, upgrading from a SPARCserver 5 to a Sun Blade 150). The new hardware platform is shipped from the Avaya factory with the latest CMS load. Therefore, as part of the upgrade you will have the latest CMS load (for example, R3V9 to R13).

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

- *Avaya Call Management System Release 13 Platform Upgrade and Data Migration, 07-300339*

Avaya Call Management System Upgrade Express (CUE)

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

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

For information about customer requirements for CUE upgrades, see:

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

Preface

For information about CUE upgrade procedures, see:

- *Avaya Call Management System Release 13 Sun Blade 100/150 Workstation Mirrored and Nonmirrored Systems CMS Upgrade Express (CUE)*, 07-300481
- *Avaya Call Management System Release 13 Sun Fire V880/V890 Computer CMS Upgrade Express (CUE)*, 07-300344

Documentation Web sites

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

Use the following Web sites to view related support documentation:

- Information about Avaya products and service
<http://www.avaya.com>
- Sun hardware documentation
<http://docs.sun.com>
- Informix documentation
<http://www.informix.com>
- Tivoli Storage Manager documentation
<http://www.tivoli.com>
- Okidata printer documentation
<http://www.okidata.com>

Support

Contacting Avaya technical support

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

For United States support:

1- 800- 242-2121

For international support:

See the [1-800 Support Directory](#) listings on the Avaya Web site.

Escalating a technical support issue

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



Connecting terminals, printers, and modems

This section describes how to connect terminals, printers, and modems to ports on an Avaya CMS computer.

This section includes the following topics:

- [Peripheral equipment availability](#) on page 24
- [Connecting terminals, printers, and modems to an NTS](#) on page 26
- [Connecting terminals, printers, and modems to an SAI/P port](#) on page 35
- [Connecting a parallel printer to a Sun Ultra 5 or Sun Blade system](#) on page 39
- [Connecting terminals, printers, and modems to an Aurora port](#) on page 41
- [Connecting a parallel printer to the SPARCserver](#) on page 45
- [Extending cabling distances for terminals and serial printers](#) on page 46

Peripheral equipment availability

This section describes supported peripheral hardware configurations and current hardware availability. Depending on your CMS load, certain peripheral hardware configurations and CMS platforms will not be supported. Contact your Avaya support representative for information about currently supported equipment and hardware configurations for your CMS system.

This section includes the following topics:

- [Currently supported peripheral hardware configurations](#) on page 24
- [Current equipment availability](#) on page 24

Currently supported peripheral hardware configurations

The following table lists the currently supported port devices and peripheral connections. Depending on your CMS load, additional peripheral hardware configurations might be supported. Contact your Avaya support representative for information about currently supported hardware configurations for your CMS system.

Peripheral connection	Port device			
	Network terminal server (NTS)	Serial asynchronous interface/PCI card	Aurora SBus card	Parallel port on CMS computer
Terminal	Yes	No	No	No
Serial printer	Yes	No	No	No
Parallel printer	No	No	No	Yes
Modem	Yes	No	No	No

Current equipment availability

The following table lists the peripheral equipment that is currently available from Avaya.

Equipment type	Available	Discontinued
Terminals	<ul style="list-style-type: none"> ● 2900/260f 	<ul style="list-style-type: none"> ● 715 BCT ● 705 MT ● 615 CMT ● 615 MT ● 605 BCT ● 620 MTG ● 2900/AWTC ● 4000/AWTC
Modems	<ul style="list-style-type: none"> ● U.S. Robotics Sportster 33.6 ● Paradyne Comsphere 3910 	<ul style="list-style-type: none"> ● U.S. Robotics Sportster 14.4 ● Paradyne DataPort Express Model 3710 ● Paradyne DataPort Express Model 3715 ● Paradyne Comsphere 3830
NTSs	<ul style="list-style-type: none"> ● 8-port 	<ul style="list-style-type: none"> ● 16-port ● 64-port
Printers	<ul style="list-style-type: none"> ● - 	<ul style="list-style-type: none"> ● Okidata OKIPAGE 24 ● Okidata ML321T ● Okidata OP16N
Hubs	<ul style="list-style-type: none"> ● Allied Telesis CentreCOM - MR820TR ● StarLAN fiber-optic 	-

Connecting terminals, printers, and modems to an NTS

There are three NTS configurations that support terminals, printers, and modems. The 8-port NTS is currently offered with CMS computers. The 16- and the 64-port NTSs were discontinued, but are shown here to support existing systems.

This section includes the following topics:

- [Distance limits](#) on page 26
- [Port limits](#) on page 26
- [Cabling options](#) on page 26
- [Connecting terminals and serial printers to an 8- or 16-port NTS](#) on page 27
- [Connecting modems to an 8- or 16-port NTS](#) on page 28
- [Connecting terminals and serial printers to 64-port NTS](#) on page 30
- [Connecting modems to a 64-port NTS](#) on page 31
- [Connecting discontinued parallel printers to an NTS](#) on page 32

Distance limits

The distance limit for serial devices connected to an NTS is dependent on the speed of the device:

- Up to 19200 bps - 500 feet (150 meters)
- 38400 bps - 400 feet (120 meters)

Port limits

There can be 256 NTS ports on a CMS system.

Cabling options

If you need to extend the distance between the NTS and a terminal, see [Extending cabling distances for terminals and serial printers](#) on page 46.

The Okidata OP16N printer has a parallel interface. To convert that interface for serial connectivity, you must use a parallel cable and a serial-to-parallel converter. Both of these parts are provided with the printer.

The Okidata OKIPAGE 24 printer has a serial port and a parallel port. The serial port uses a RS-232 printer cable. The parallel port uses a Centronics printer cable (PEC 12167). The OKIPAGE 24 will detect which port is in use and automatically configure itself.

Connecting terminals and serial printers to an 8- or 16-port NTS

This section includes the following topics:

- [Parts list](#) on page 27
- [Diagram of 8- or 16-port NTS cabling](#) on page 28

Parts list

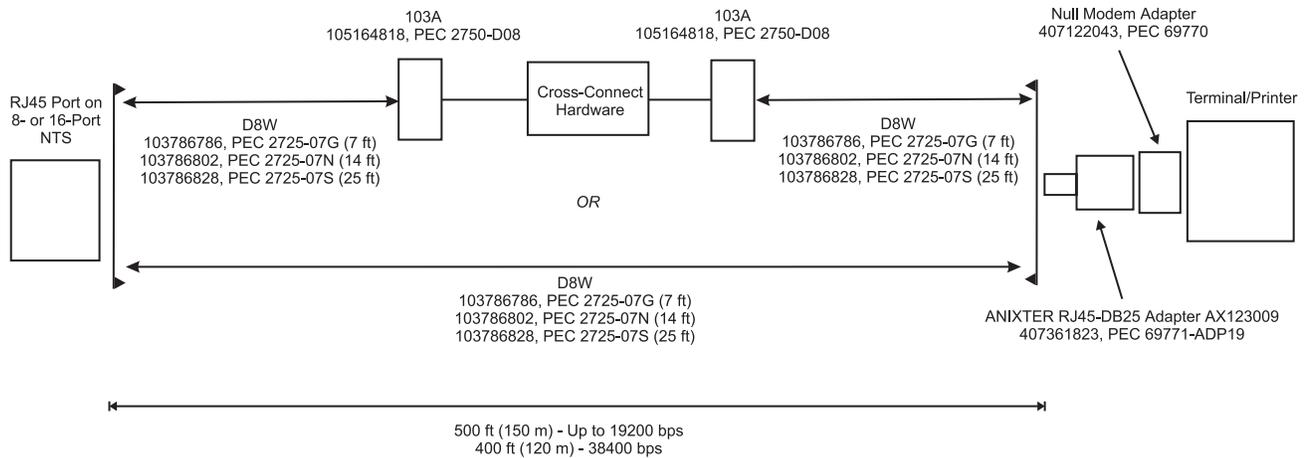
The following table contains a list of parts that you will need to connect a terminal or serial printer to an 8- or 16-port NTS.

Quantity	Description
1 or 2	D8W modular cord or equivalent (UTP Category 3) 103786786 (PEC 2725-07G) (7 feet, 2.1 meters) 103786802 (PEC 2725-07N) (14 feet, 4.2 meters) 103786828 (PEC 2725-07S) (25 feet, 7.6 meters)
2	103A connecting block (105164818, PEC 2750-D08)
1	Cross-connect hardware
1	Anixter RJ45-DB25 adapter AX123009 407361823 (PEC 69771-ADP19)
1	Null modem adapter 407122043 (PEC 69770)

Connecting terminals, printers, and modems

Diagram of 8- or 16-port NTS cabling

The following diagram provides an outline on how to connect a terminal or serial printer to an 8- or 16-port NTS.



The NTS needs a network connection to the CMS system. For information on how to connect a network hub to a CMS system, see [Connecting a network hub unit](#) on page 101. For information on how to connect a NTS to a network hub, see [Installing, connecting and configuring an NTS](#) on page 113.

Connecting modems to an 8- or 16-port NTS

This section includes the following topics:

- [Parts list](#) on page 29
- [Diagram of 8- or 16-port NTS cabling](#) on page 29

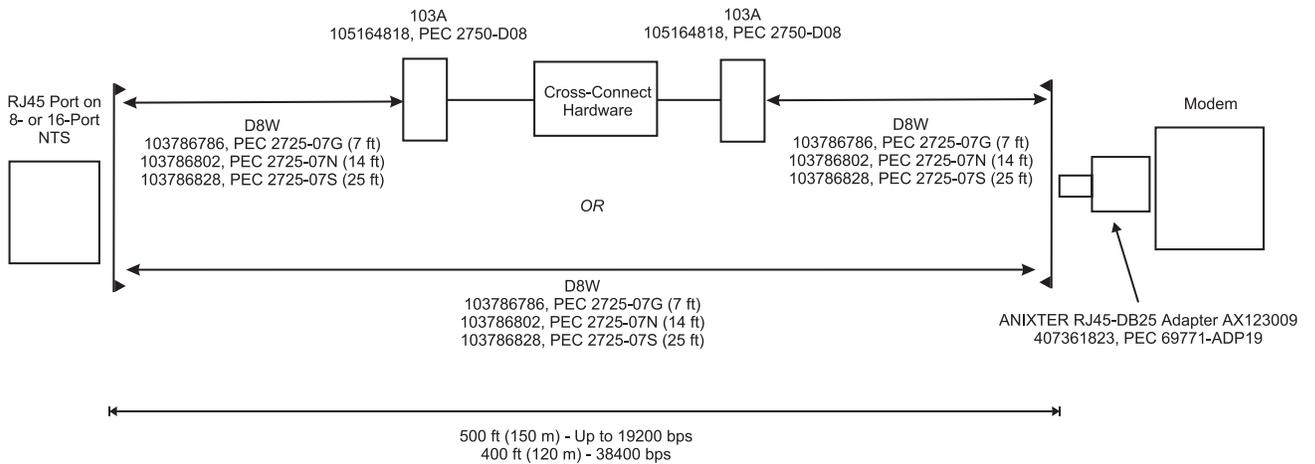
Parts list

The following table contains a list of parts that you will need to connect a modem to an 8- or 16-port NTS.

Quantity	Description
1 or 2	D8W modular cord or equivalent (UTP Category 3) 103786786 (PEC 2725-07G) (7 feet, 2.1 meters) 103786802 (PEC 2725-07N) (14 feet, 4.2 meters) 103786828 (PEC 2725-07S) (25 feet, 7.6 meters)
2	103A connecting block (105164818, PEC 2750-D08)
1	Cross-connect hardware
1	Anixter RJ45-DB25 adapter AX123009 407361823 (PEC 69771-ADP19)

Diagram of 8- or 16-port NTS cabling

The following diagram provides an outline on how to connect a modem to an 8- or 16-port NTS.



Connecting terminals and serial printers to 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. Four NTS patch panels provide sixteen 25-pin RS-232 connections each.

This section includes the following topics:

- [Parts list](#) on page 30
- [Diagram of 64-port NTS cabling](#) on page 31

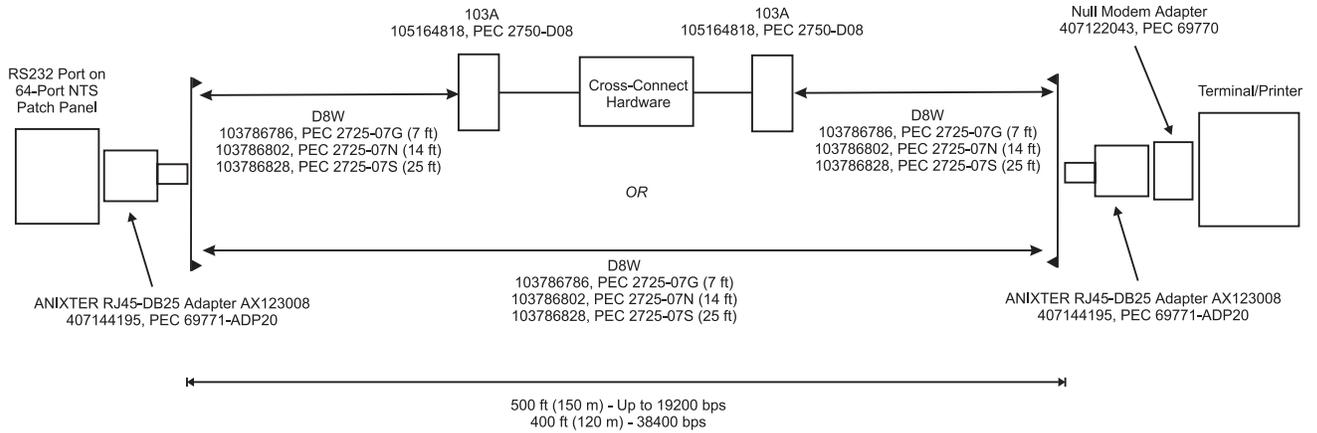
Parts list

The following table contains a list of parts that you will need to connect a terminal or serial printer to a 64-port NTS.

Quantity	Description
2	Anixter RJ45-DB25 adapter AX123008 407144195 (PEC 69771-ADP20)
1 or 2	D8W modular cord or equivalent (UTP Category 3) 103786786 (PEC 2725-07G) (7 feet, 2.1 meters) 103786802 (PEC 2725-07N) (14 feet, 4.2 meters) 103786828 (PEC 2725-07S) (25 feet, 7.6 meters)
2	103A connecting block (105164818, PEC 2750-D08)
1	Cross-connect hardware
1	Null modem adapter 407122043 (PEC 69770)

Diagram of 64-port NTS cabling

The following diagram provides an outline on how to connect a terminal or serial printer to a 64-port NTS.



The NTS needs a network connection to the CMS system. For information on how to connect a network hub to a CMS system, see [Connecting a network hub unit](#) on page 101. For information on how to connect a NTS to a network hub, see [Installing, connecting and configuring an NTS](#) on page 113.

Connecting modems 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. Four NTS patch panels provide sixteen 25-pin RS-232 connections each.

This section includes the following topics:

- [Parts list](#) on page 32
- [Diagram of 64-port NTS cabling](#) on page 32

Connecting terminals, printers, and modems

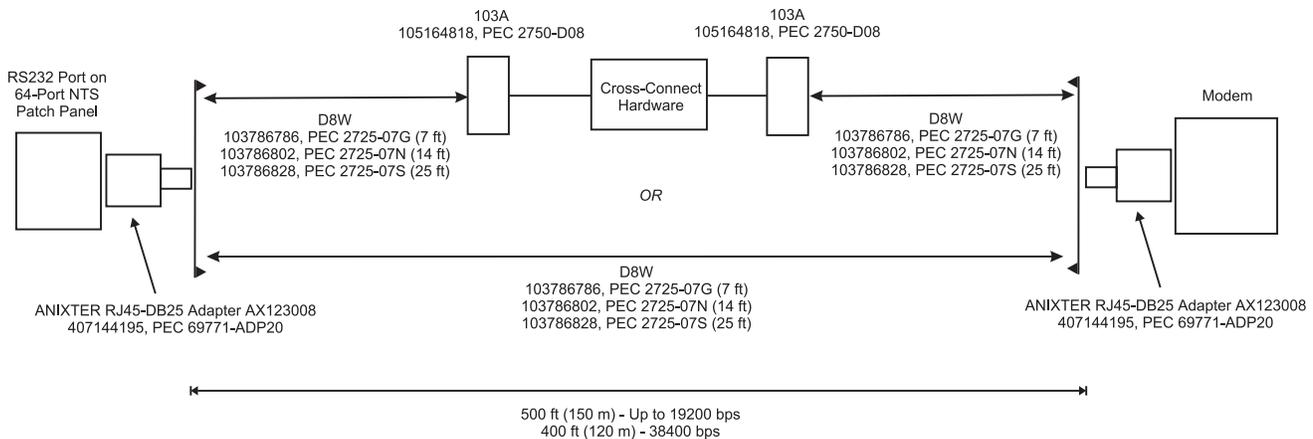
Parts list

The following table contains a list of parts that you will need to connect a modem to a 64-port NTS.

Quantity	Description
2	Anixter RJ45-DB25 adapter AX123008 407144195 (PEC 69771-ADP20)
1 or 2	D8W modular cord or equivalent (UTP Category 3) 103786786 (PEC 2725-07G) (7 feet, 2.1 meters) 103786802 (PEC 2725-07N) (14 feet, 4.2 meters) 103786828 (PEC 2725-07S) (25 feet, 7.6 meters)
2	103A connecting block (105164818, PEC 2750-D08)
1	Cross-connect hardware

Diagram of 64-port NTS cabling

The following diagram provides an outline on how to connect a modem to a 64-port NTS.



Connecting discontinued parallel printers to an NTS

This section contains reference information about how to set up equipment that is no longer sold with new Avaya CMS computers. The information is shown here to support existing systems.

Parallel printers may be connected to existing NTSs that have a parallel port and accompanying cable. Only one 8-port model NTS and the 64-port NTS have parallel ports (neither of these units are currently available from the manufacturer). The NTS parallel port supports either a Centronics- or Dataproducts-compatible printer.

This section includes the following topics:

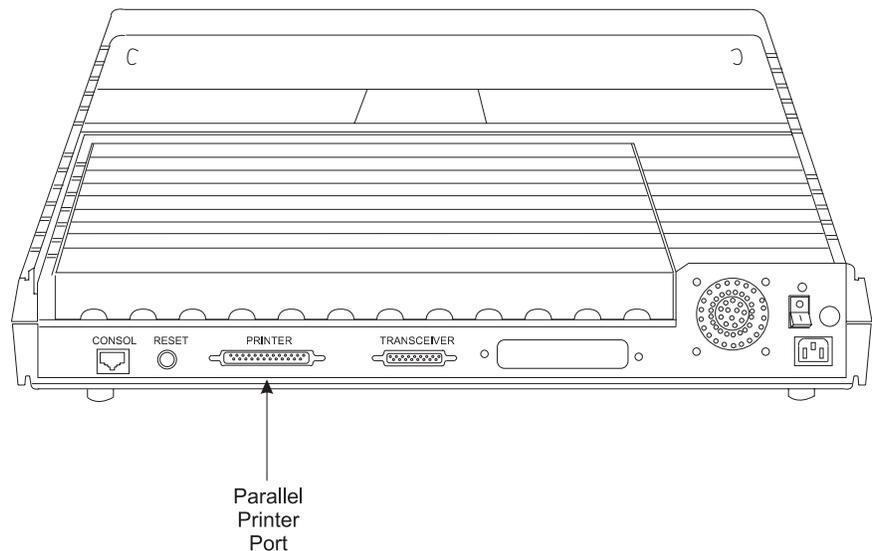
- [Cable types](#) on page 33
- [64-port NTS parallel printer port connections](#) on page 33
- [8-port parallel printer port connection](#) on page 34

Cable types

There are two types of cables that can be used to connect a parallel printer to the NTS. These cables are Centronics and IBM-type (also called Dataproducts). One or the other is needed depending on what type of printer is being used. All currently-offered printers use Centronics cables. These cables can no longer be ordered, but existing cables can be used for new parallel printer connections.

64-port NTS parallel printer port connections

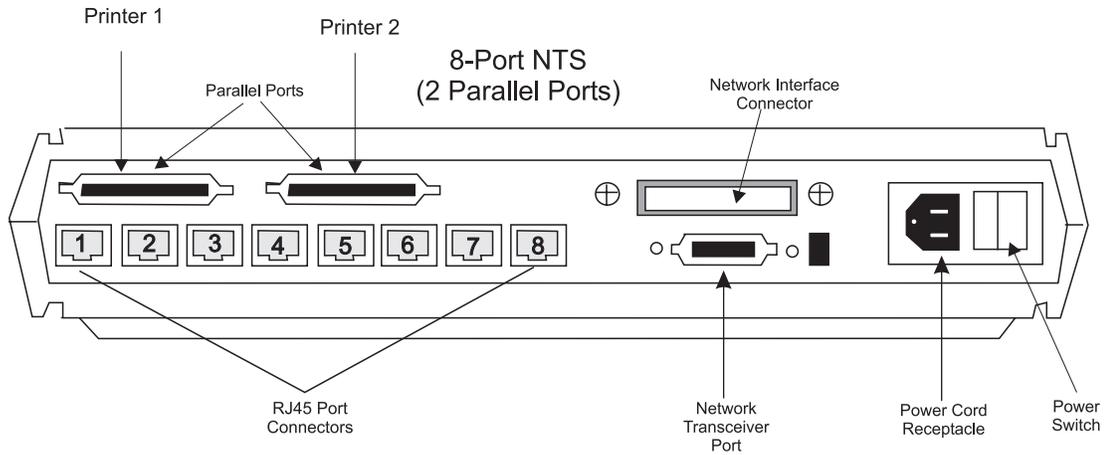
This figure shows where to connect a parallel printer to the 64-port NTS.



Connecting terminals, printers, and modems

8-port parallel printer port connection

This figure shows where to connect a parallel printer to an 8-port NTS.



Connecting terminals, printers, and modems to an SAI/P port

This section shows how to connect terminals, printers, and modems to an SAI/P port on an Ultra 5 or Sun Blade system. SAI/P ports are not supported with CMS R12 or later.

This section includes the following topics:

- [Distance limits](#) on page 35
- [Port limits](#) on page 35
- [Cabling options](#) on page 35
- [Connecting terminals and printers to an SAI/P port](#) on page 36
- [Connecting modems to an SAI/P port](#) on page 37

Distance limits

The distance limit for serial devices connected to an SAI/P port is 200 feet (61 meters).

Port limits

There can be 16 SAI/P ports on a CMS system.

Cabling options

Serial devices connect to an SAI/P port using modular cables or cross-connect wiring. If you need to extend the distance between the SAI/P port and a terminal or printer, see [Extending cabling distances for terminals and serial printers](#) on page 46.

The Okidata OP16N printer has a parallel interface. To convert that interface for serial connectivity, you must use a parallel cable and a serial-to-parallel converter. Both of these parts are provided with the printer.

The Okidata OKIPAGE 24 printer has a serial port and a parallel port. The serial port uses a RS-232 printer cable. The parallel port uses a Centronics printer cable (PEC 12167). The OKIPAGE 24 will detect which port is in use and automatically configure itself.

Connecting terminals and printers to an SAI/P port

This section includes the following topics:

- [Parts list](#) on page 36
- [SAI/P port cabling diagram](#) on page 37

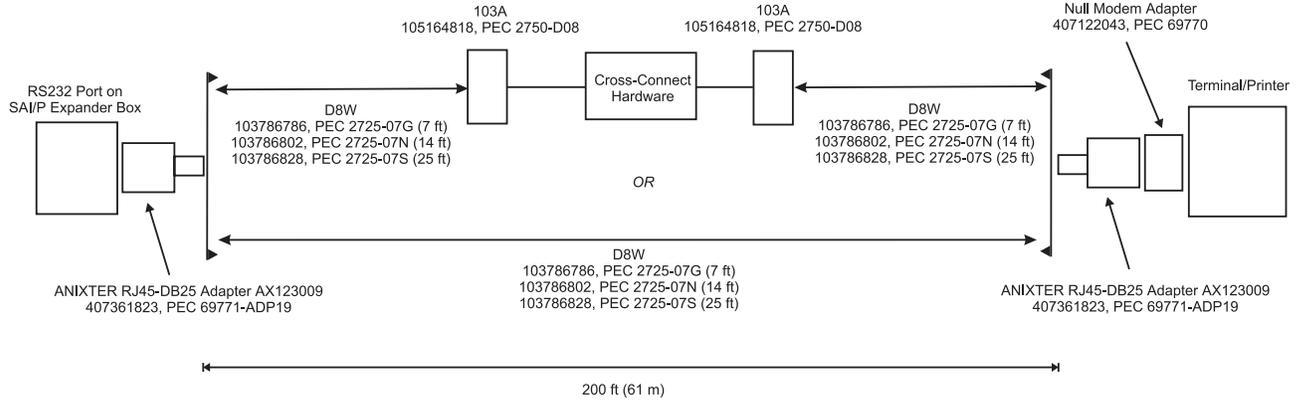
Parts list

The following table contains a list of parts that you will need to connect a terminal or printer to a SAI/P port.

Quantity	Description
2	Anixter RJ45-DB25 adapter AX123009 407361823 (PEC 69771-ADP19)
1 or 2	D8W modular cord or equivalent (UTP Category 3) 103786786 (PEC 2725-07G) (7 feet, 2.1 meters) 103786802 (PEC 2725-07N) (14 feet, 4.2 meters) 103786828 (PEC 2725-07S) (25 feet, 7.6 meters)
2	103A connecting block (105164818, PEC 2750-D08)
1	Cross-connect hardware
1	Null modem adapter 407122043 (PEC 69770)

SAI/P port cabling diagram

The following diagram provides an outline on how to connect a terminal or printer to a SAI/P port.



Connecting modems to an SAI/P port

This section includes the following topics:

- [Parts list](#) on page 37
- [SAI/P port cabling diagram](#) on page 38

Parts list

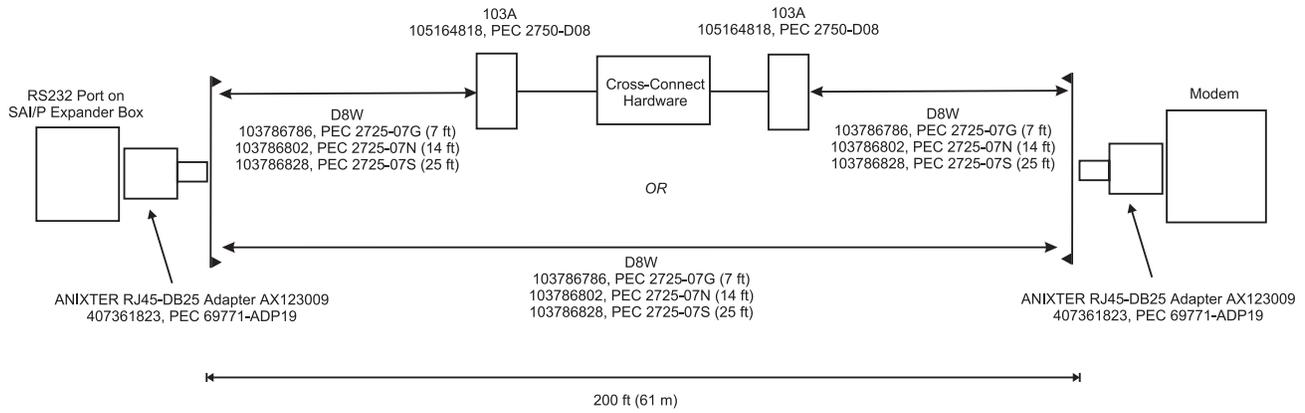
The following table contains a list of parts that you will need to connect a modem to a SAI/P port.

Quantity	Description
2	Anixter RJ45-DB25 adapter AX123009 407361823 (PEC 69771-ADP19)
1 or 2	D8W modular cord or equivalent (UTP Category 3) 103786786 (PEC 2725-07G) (7 feet, 2.1 meters) 103786802 (PEC 2725-07N) (14 feet, 4.2 meters) 103786828 (PEC 2725-07S) (25 feet, 7.6 meters)
2	103A connecting block (105164818, PEC 2750-D08)
1	Cross-connect hardware

Connecting terminals, printers, and modems

SAI/P port cabling diagram

The following diagram provides an outline on how to connect a modem to a SAI/P port.



Connecting a parallel printer to a Sun Ultra 5 or Sun Blade system

A parallel printer may be connected to the parallel port on a Sun Ultra 5 or Sun Blade system. The Okidata OP16N and OKIPAGE 24 printers have a parallel interface.

This section includes the following topics:

- [Distance limits](#) on page 39
- [Parts list](#) on page 39
- [Cabling diagram](#) on page 39

Distance limits

The distance limit for a parallel printer connected to a Sun Ultra 5 or Sun Blade system is 6 feet (1.8 meters).

Parts list

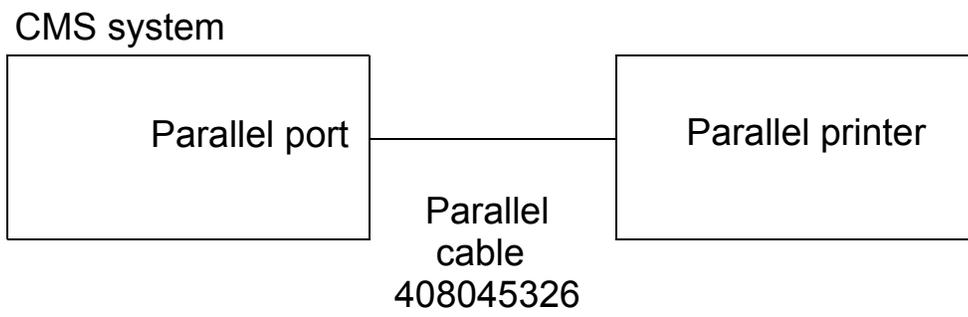
The following table contains a list of parts that you will need to connect a parallel printer to a Sun Ultra 5 or Sun Blade system.

Quantity	Description
1	Parallel printer
1	Parallel printer cable (408045326)

Cabling diagram

The following diagram provides an outline on how to connect a Sun Ultra 5 or Sun Blade system.

Connecting terminals, printers, and modems



Connecting terminals, printers, and modems to an Aurora port

This section describes how to connect a terminal, printer, or modem to an Aurora port on a Sun SPARCserver system. Aurora ports and Sun SPARCserver systems are not supported with CMS R3V9 or later.

This section includes the following topics:

- [Distance limits](#) on page 41
- [Port limits](#) on page 41
- [Cabling options](#) on page 41
- [Connecting terminals and printers to an Aurora port](#) on page 42
- [Connecting modems to an Aurora port](#) on page 43

Distance limits

The distance limit for serial devices connected to an Aurora port is 200 feet (61 meters).

Port limits

There can be 32 Aurora ports on a CMS system.

Cabling options

Serial devices connect to an Aurora port using modular cables or cross-connect wiring. If you need to extend the distance between the Aurora port and a terminal or printer, see [Extending cabling distances for terminals and serial printers](#) on page 46.

The Okidata OP16N printer has a parallel interface. To convert that interface for serial connectivity, you must use a parallel cable and a serial-to-parallel converter. Both of these parts are provided with the printer.

The Okidata OKIPAGE 24 printer has a serial port and a parallel port. The serial port uses a RS-232 printer cable. The parallel port uses a Centronics printer cable (PEC 12167). The OKIPAGE 24 will detect which port is in use and automatically configure itself.

Connecting terminals and printers to an Aurora port

This section includes the following topics:

- [Parts list](#) on page 42
- [Aurora port cabling diagram](#) on page 43

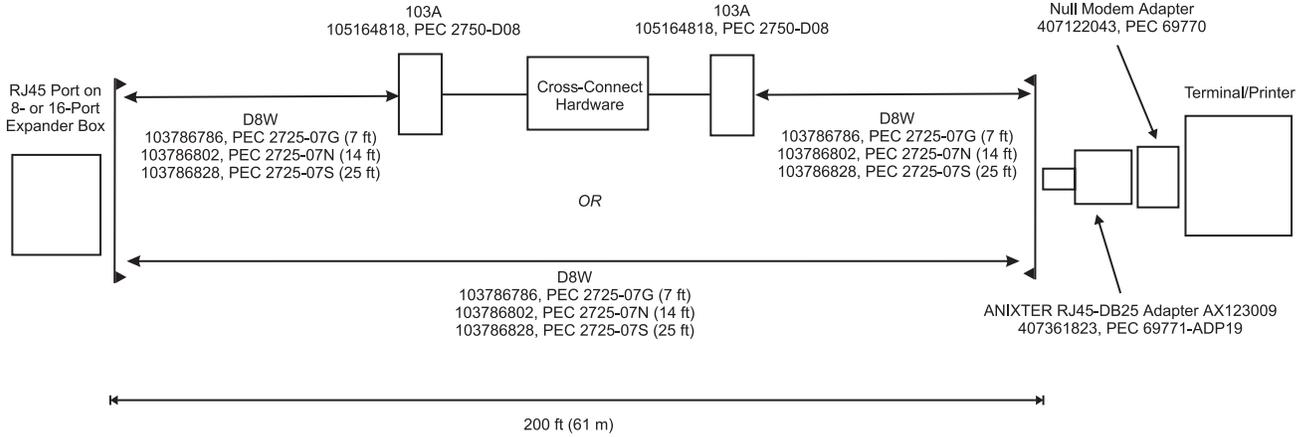
Parts list

The following table contains a list of parts that you will need to connect a terminal or printer to an Aurora port.

Quantity	Description
1 or 2	D8W modular cord or equivalent (UTP Category 3) 103786786 (PEC 2725-07G) (7 feet, 2.1 meters) 103786802 (PEC 2725-07N) (14 feet, 4.2 meters) 103786828 (PEC 2725-07S) (25 feet, 7.6 meters)
2	103A connecting block (105164818, PEC 2750-D08)
1	Cross-connect hardware
1	Anixter RJ45-DB25 adapter AX123009 407361823 (PEC 69771-ADP19)
1	Null modem adapter 407122043 (PEC 69770)

Aurora port cabling diagram

The following diagram provides an outline on how to connect a terminal or printer to an Aurora port.



Connecting modems to an Aurora port

This section includes the following topics:

- [Parts list](#) on page 43
- [Aurora port cabling diagram](#) on page 44

Parts list

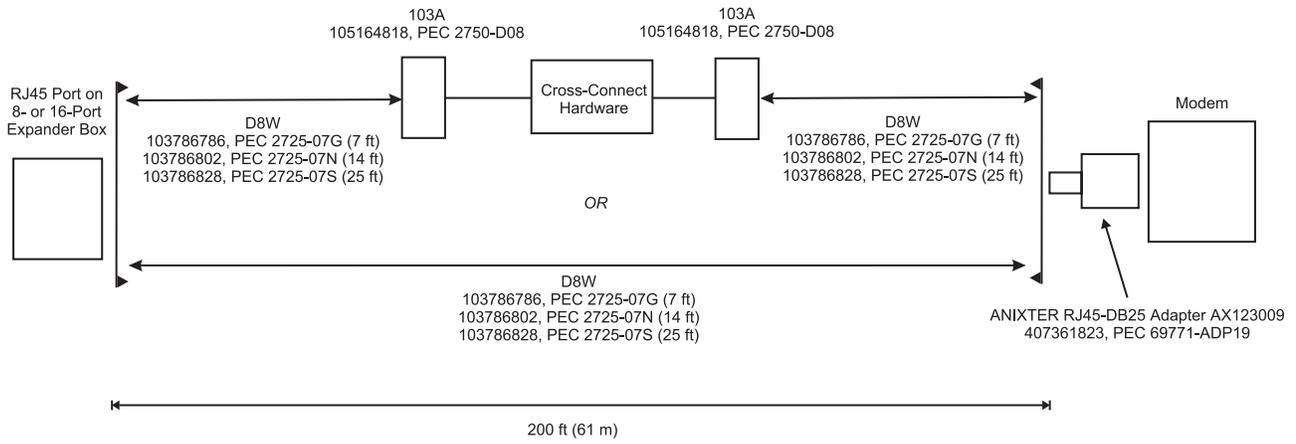
The following table contains a list of parts that you will need to connect a modem to an Aurora port.

Quantity	Description
1 or 2	D8W modular cord or equivalent (UTP Category 3) 103786786 (PEC 2725-07G) (7 feet, 2.1 meters) 103786802 (PEC 2725-07N) (14 feet, 4.2 meters) 103786828 (PEC 2725-07S) (25 feet, 7.6 meters)
2	103A connecting block (105164818, PEC 2750-D08)
1	Cross-connect hardware
1	Anixter RJ45-DB25 adapter AX123009 407361823 (PEC 69771-ADP19)

Connecting terminals, printers, and modems

Aurora port cabling diagram

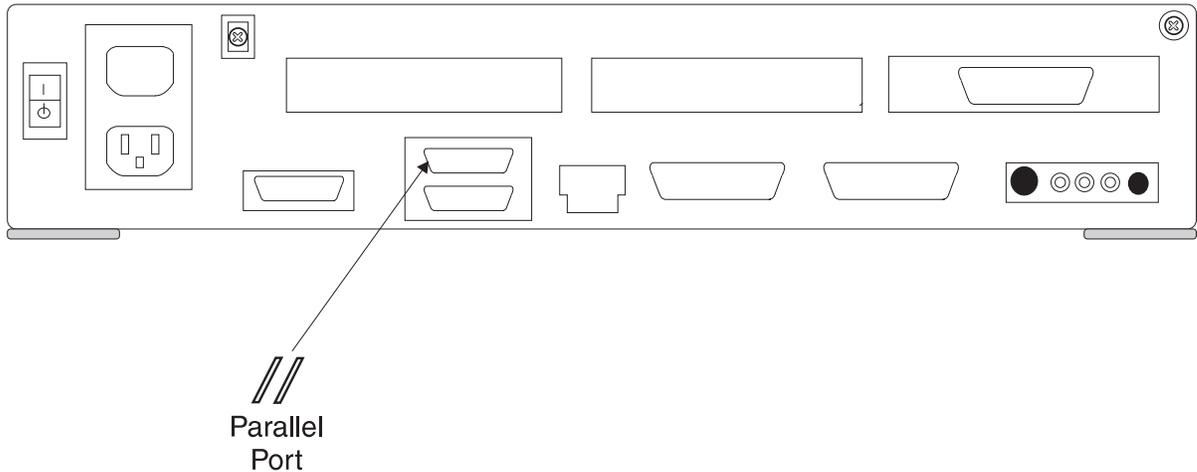
The following diagram provides an outline on how to connect a modem to an Aurora port.



Connecting a parallel printer to the SPARCserver

A parallel printer may be connected to a SPARCserver computer used for CMS. There are two types of cables that can be used to connect the parallel printer to the SPARCserver computer. These cables are Centronics and IBM-type (also called Dataproducts). One or the other is needed depending on what type of printer is being used. All the supported printers use Centronics. These cables can no longer be ordered, but existing cables can be used for new parallel printer connections.

Sun SPARCserver systems are not supported with CMS R3V9 or later.



Extending cabling distances for terminals and serial printers

This section describes how to extend the cabling distance for terminals and serial printers connected to CMS computer ports (NTS, SAI/P or Aurora ports). You can extend distances by either using a pair of Asynchronous Data Units (ADUs), or using a pair of modems.

This section contains the following procedures:

- [Extending distances with two ADUs](#) on page 46
- [Extending distances with two modems](#) on page 48

Note:

The connections shown in this section would be used instead of the connection diagrams in:

- [Connecting terminals and serial printers to an 8- or 16-port NTS](#) on page 27
- [Connecting terminals and serial printers to 64-port NTS](#) on page 30
- [Connecting terminals and printers to an SAI/P port](#) on page 36
- [Connecting terminals and printers to an Aurora port](#) on page 42

Extending distances with two ADUs

This section contains the following topics:

- [Distance limits](#) on page 46
- [Parts list](#) on page 47
- [ADU cabling diagram](#) on page 48

Distance limits

The distance limits between two ADUs are:

- 5000 ft 24 ga
- 4000 ft 26 ga

Parts list

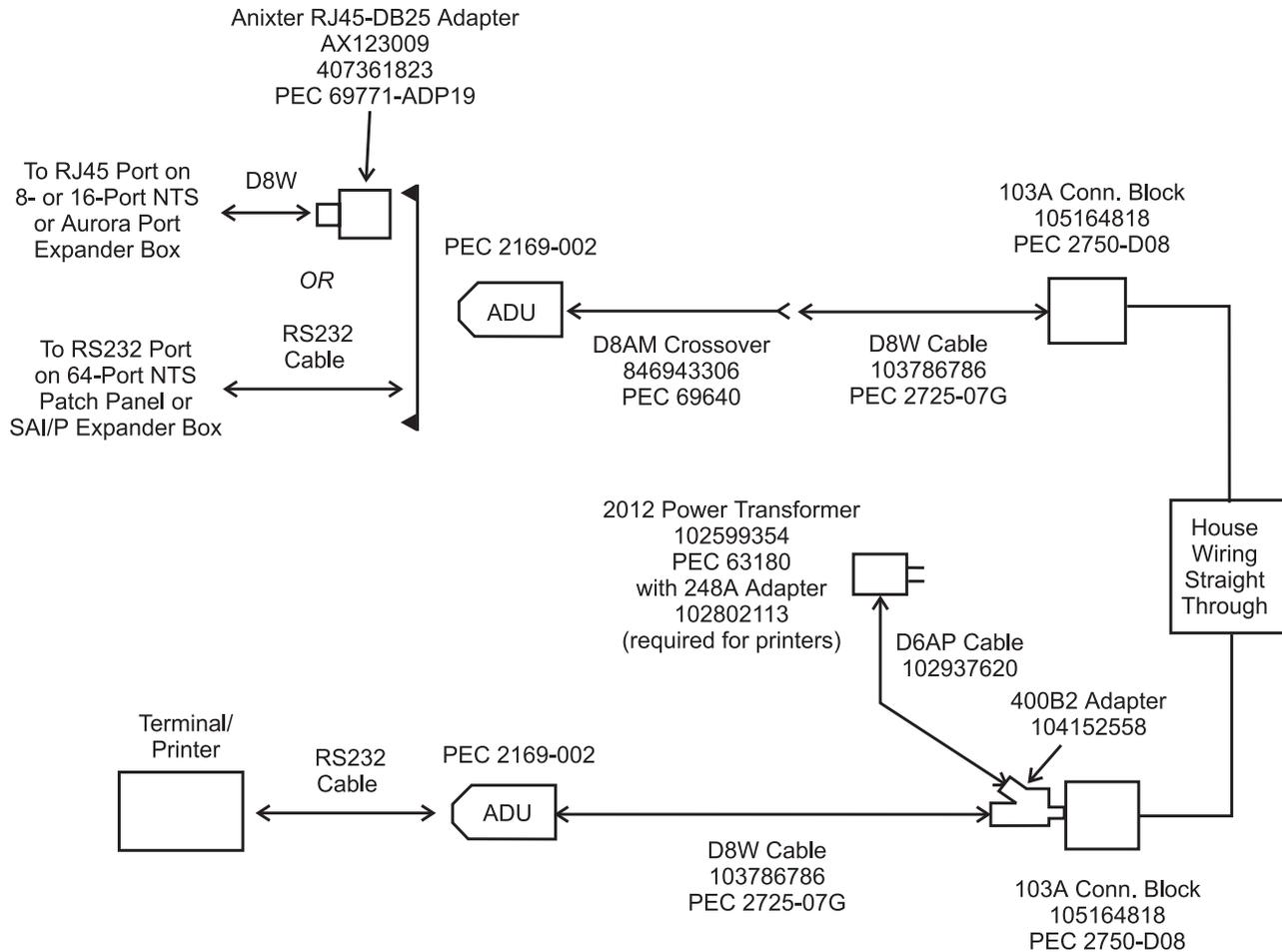
The following table contains a list of parts that you will need to extend the cabling distance for a terminal or serial printer with two ADUs.

Quantity	Description
2 or 3	D8W modular cord (103786786, PEC 2725-07G)
1	RS232 Cable or Anixter RJ45-DB25 adapter AX123009 407361823 (PEC 69771-ADP19)
2	Z3A2 ADU (103963971, PEC 2169-002)
1	D8AM crossover cable (846943306, PEC 69640)
2	103A connecting block (105164818, PEC 2750-D08)
1	Cross-connect hardware
1	RS232 Cable
Parts required for ADU power with printer connections:	
1	400B2 adapter (104152558)
1	D6AP modular cord (102937620)
1	2012 power transformer (102599354, PEC 63180)
1	248A adapter (102802113)

Connecting terminals, printers, and modems

ADU cabling diagram

The following diagram provides an outline on how to connect the cables for a terminal or serial printer and two ADUs.



Extending distances with two modems

This section includes the following topics:

- [Parts list](#) on page 49
- [Modem cabling diagram](#) on page 49

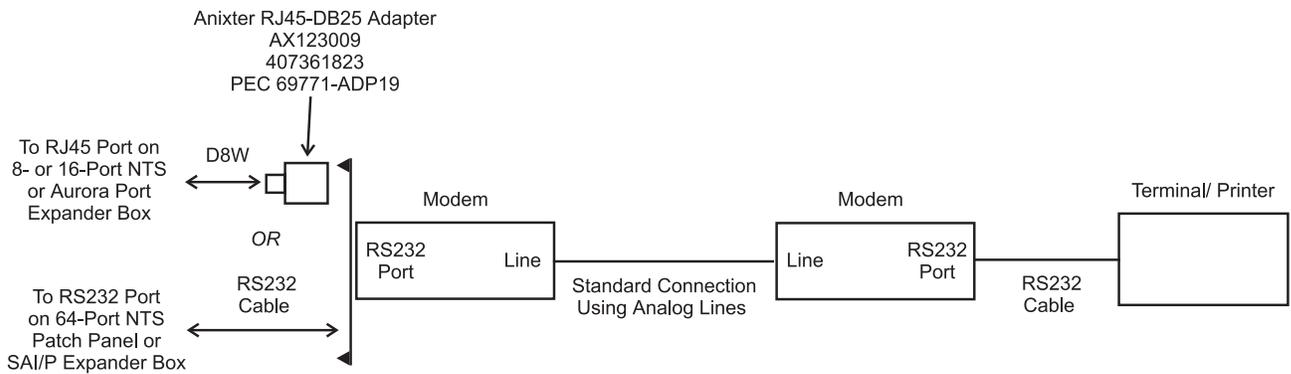
Parts list

The following table contains a list of parts that you will need to extend the cabling distance for a terminal or serial printer with two modems.

Quantity	Description
1	RS232 cable or D8W modular cord (103786786, PEC 2725-07G), and Anixter RJ45-DB25 adapter AX123009 407361823 (PEC 69771-ADP19)
2	Modem
1	Standard connection using analog lines
1	RS232 cable

Modem cabling diagram

The following diagram provides an outline on how to connect the cables for a terminal or serial printer and two modems.





Configuring terminals, printers, and modems

After connecting a terminal, printer or modem to the system, you need to configure the equipment options.

This section includes the following topics:

- [Configuring the 2900/260lf small footprint terminal](#) on page 52
- [Configuring discontinued terminals](#) on page 66
- [Configuring discontinued printers](#) on page 87
- [Setting the U.S. Robotics Sportster 33.6 faxmodem configuration options](#) on page 89
- [Setting the Paradyne Comsphere 3910 modem configuration options](#) on page 91
- [Configuration options for discontinued modems](#) on page 96

Configuring the 2900/260lf small footprint terminal

This section includes the following topics:

- [Configuring the terminal](#) on page 52
- [Recommended 2900/260lf terminal values](#) on page 52

Configuring the terminal

To configure the terminal options:

1. Access menus 1 through 12 by pressing the corresponding function key, **F1** through **F12**.
2. Access menu 13 by pressing the **Print Screen** key. Menu 13 provides terminal operations which may be executed.
3. Enter the terminal setup mode, press **Ctrl+Scroll Lock2**.
4. Make any necessary changes to the terminal options.
5. Exit setup, press **Pause**. Then press **y** or **n**.

The recommended 2900/260lf terminal values are shown in [Recommended 2900/260lf terminal values](#) on page 52.

Recommended 2900/260lf terminal values

This section includes the following topics:

- [F1 Quick window values](#) on page 53
- [F2 General window values](#) on page 54
- [F3 Display window values](#) on page 55
- [F4 Keyboard window values](#) on page 56
- [F5 Keys window values](#) on page 57
- [F6 Ports window values](#) on page 58
- [F7 Host window values](#) on page 59
- [F8 Print window values](#) on page 60
- [F9 Emulation window values](#) on page 61
- [F10 Tabs window values](#) on page 62

- [F11 Answer Back \(AnsBk\) window values](#) on page 63
- [F12 Program window values](#) on page 64
- [Print Screen Execute window values](#) on page 65

F1 Quick window values

The following figure shows the F1 Quick values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Emulation=VT-300-7 Comm Mode=Full Duplex Enhanced=On Host/Printer=EIA/None				Parameters EIA Baud Rate=9600 Aux Baud Rate=9600 Lanuguage=U.S.				EIA Data Format=8/1/N Aux Data Format=8/1/N Sessions=One				
Choices												
ADDS-VP VT-300-7 SCO Console			Wyse-60 VT-300-8 AT386		Wyse-325 Intecolor		Wyse-50+ VT-200-7		Wyse-350 VT-200-8		PC-Term TVI-925 VT-100	
↑ → ↓ ← : Parameter				Select				Enter/S-Enter: Next/Prev Choice Exit : PauseKey				

▲ Important:

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

F2 General window values

The following figure shows the F2 General (Genrl) window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Emulation=VT-300-7 Auto Font Load=On Monitor Mode=Off Warning Bell=On Sessions=One				Parameters 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 VT-300-7 SCO Console			Wyse-60 VT-300-8 AT386		Wyse-325 Intecolor		Wyse-50+ VT-200-7		Wyse-350 VT-200-8		PC-Term VT-100 TVI-925	
↑>↓< : Parameter				Select Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

F3 Display window values

The following figure shows the F3 Display (Displ) window values.

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

F4 Keyboard window values

The following figure shows the F4 Keyboard (Kybd) window values.

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

F5 Keys window values

The following figure shows the F5 Keys window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Enter Key=<CR> Alt Key=Compose Pound Key=U.S.				<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">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; width: fit-content; margin: 0 auto;">Choices</div>												
<CR> <CR><LF> <TAB>												
↑>↓<				<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">Select</div>				: Parameter Enter/S-Enter: Next/Prev Choice Exit : PauseKey				

F6 Ports window values

The following figure shows the F6 Ports window values.

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

! Important:

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

F7 Host window values

The following figure shows the F7 Host window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Comm Mode=Full Duplex Recv =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												
↑ → ↓ ← : Parameter				<div style="border: 1px solid black; padding: 2px; text-align: center;">Select</div> Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

F8 Print window values

The following figure shows the F8 Print window values.

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

F9 Emulation window values

The following figure shows the F9 Emulation (Emul) window values.

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

F10 Tabs window values

The following figure shows the F10 Tabs window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec
Parameters												
Auto Init Tabs=Off						Default Tabs						
<pre> T 10 T T 20 T T 30 T T 40 T 70 T : 80 90 100 1 </pre>												
Choices												
Off On												
↑ ⇒ ↓ ⇐				Select								
: Parameter				Enter/S-Enter: Next/Prev Choice				Exit : PauseKey				

F11 Answer Back (AnsBk) window values

The following figure shows the F11 Answer Back (AnsBk) window values.

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

F12 Program window values

The following figure shows the F12 Program (Prog) window values.

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

Print Screen Execute window values

The following figure shows the Print Screen Execute (PrtSc Exec) window values.

F1 Quick	F2 Genrl	F3 Displ	F4 Kybd	F5 Keys	F6 Ports	F7 Host	F8 Print	F9 Emul	F10 Tabs	F11 Ansbk	F12 Prog	PrtSc Exec			
Save Terminal				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			

Configuring discontinued terminals

This section contains reference information about how to set up terminals that have been discontinued by the manufacturer and are no longer sold with new Avaya CMS systems. The information is shown here to support existing systems.

This section provides the configuration options for the following terminals:

- [715 BCT](#) on page 66
- [705 MT](#) on page 69
- [615 CMT](#) on page 72
- [615 MT](#) on page 73
- [605 BCT](#) on page 74
- [620 MTG](#) on page 75
- [2900/AWTC](#) on page 76
- [4000/AWTC](#) on page 81

715 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 in to CMS, identify the terminal type as a 705.

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

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

User preferences

The figure below shows the recommended user preferences options.

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

Communications options

The figure below shows the recommended communications options.

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

Configuring terminals, printers, and modems

General options

The figure below 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)

Display options

The figure below 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

Keyboard options

The figure below 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

Printer options

The figure below 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

705 MT

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.

Configuring terminals, printers, and modems

User preferences

The figure below shows the recommended user preferences options.

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

Communications options

The figure below shows the recommended communications options.

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

General options

The figure below 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)

Display options

The figure below 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
multnat1	Character Mode	multnat1
ISO Latn	International Font	ISO Latn
on	Autowrap	on

Keyboard options

The figure below 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	

Printer options

The figure below 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	

615 CMT

The following table contains the recommended 615 CMT terminal options.

Communications		User Preferences	
Speed	9600	Columns	80
Send Parity	none	Reverse Video	no

Communications		User Preferences	
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	

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

Note:

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

615 MT

The following table contains the recommended 615 MT terminal options.

Communications		User Preferences	
I/O Card	idle	Cartridge	idle
Speed	9600	Columns	80
Send Parity	spac	Reverse Video	no
Check Parity	no	Volume	1

Communications		User Preferences	
Local Echo	off	Key Click	off
Encoding	off	Scrolling	jump
Generate Flow	off	Scroll Speed	med
Receive Flow	off		
Pass Flow	off		
Monitor Mode	off	Cursor Type	blck
Autowrap	on	Cursor Blink	no
Newline on LF	no	Labels	off
Return Key	CR		
Enter Key	<--		

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

605 BCT

The the following table contains the recommended 605 BCT terminal options.

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	blck
Return Key	CR	Cursor Blink	no

Communications		User preferences	
Enter Key	< - -	Labels	on
Terminal Mode	norm	Swap Delete/Del	no

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

620 MTG

The following table contains the recommended 620 MTG terminal options.

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		
		Printer Type	5320
		Printer Alarm	no
		Printer Speed	1200
		Printer Parity	none
Monitor Mode	no	Cursor Type	blck
Auto Wrap	on	Cursor Blink	no
Newline on LF	no	Labels	on
Return Key	CR		
Enter Key	< - -		

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

2900/AWTC

The AWTC terminals may be labeled either NCR 2900 or ADDS 4000. For both you need to enter 615c for the terminal type in the term info file.

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

User preferences

The following table contains the recommended user preferences 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

User preferences	
Control Graphics	ASCII
Background Pattern	default

Communications Options

There are two communications options submenus - one for each port. These are SES 1, shown in the following figure; and SES 2, shown in the figure following.

SES 1 communications options

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

The following table contains the recommended SES 1 communications options.

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

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).

The following table contains 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

General options

The following table contains the recommended general options.

General options	
Emulation	705
Terminal ID	track

General options	
Newline on LF	no
Newline on CR	no
Transmit Controls	8 bits
Backspace Mode	normal
User Features	unlocked
Conceal Answerback	no
Answerback

Display options

The following table contains the recommended display options.

Display options	
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

Keyboard options

The following table contains the recommended keyboard options.

Keyboard options	
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

Printer options

The following table contains the recommended printer options.

Printer options	
Select Print Region	page
Print mode	normal
Print Terminator	none
Printer Type/Driver	Propmtr

Printer options	
Select Print Region	page
Printer Alarm	no
Printer To host	no

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

To properly set up the terminal, you may need to change some of the options on the Setup menu. The recommended option values for the 4000/AWTC display terminal are shown in this section.

User preferences

The following table contains the recommended user preferences 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

User preferences	
Screen Lines	27
Mouse Hand	right
Parallel Port	printer
Enhanced Function Keys	off
Status Line Position	bottom
Control Graphics	ASCII
Background Pattern	default

Communications options

There are two communications options submenus, one for each port. These are the SES 1 and the SES 2, shown in the figures below.

SES 1 communications options

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

The following table contains the recommended SES 1 communications options.

SES 1 communications options (EIA port)	
Power-up Port	SES 1
Port Service	host
Speed	9600
Stop Bits	1 bit
Data Bits	8 bits
Send Parity	space
Check Parity	no
Local Echo	off
Generate Flow	XON/XOFF
Receive Flow	XON/XOFF
XOFF at	240

SES 1 communications options (EIA port)	
Transmit Limit	500 cps
Answerback on Connect	no
Line Break	280 ms
Clear Communications	SES 1

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).

The following table contains 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

General options

The following table contains the recommended general options.

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

Display options

The following table contains the recommended display options.

Display options	
Monitor Mode	off
Cursor Type	block
Cursor Blink	off
Display Cursor	yes
Status Line Type	host
Character Mode	multnati
International Font	ISO Latn

Display options	
Autowrap	on
Destructive Scroll	yes

Keyboard options

The following table contains the recommended keyboard options.

Keyboard options	
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

Printer options

The following table contains the recommended printer options.

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

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

Configuring discontinued printers

This section contains reference information about how to set up printers that are no longer sold with new Avaya CMS systems. The information is shown here to support existing systems.

This section includes the configuration options for the following printers:

- [Okidata OKIPAGE 24](#) on page 87
- [Okidata ML321T](#) on page 87
- [Okidata OP16N](#) on page 88

Okidata OKIPAGE 24

After you connect printers to the system, you need to set the printer options.

Use the OKIPAGE 24 printer default factory options.

Additional references

For more information about Okidata printers, go to <http://www.okidata.com>.

Okidata ML321T

The Okidata ML321T printer was discontinued, but is shown here to support existing systems.

Use the factory options except for the following:

- Print Mode - NLQ Courier (or customer preference)
- Page Width - 13.6" or 8"
- Graphics - Bi-directional
- Auto Select - Yes
- Protocol - X-ON/X-OFF

Other options may be changed per local requirements.

If this printer is used to print CMS reports (which require 66 lines per page), the Top of Form must be moved higher than the default setting of one inch. To reset the Top of Form, do the following using the red line on the paper shield as reference:

1. Make sure the printer is deselected (SEL light off).

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2. Press and hold **SHIFT**.
3. Press **LF** to move the Top of Form higher (paper moves down) or Press **FF/LOAD** to move Top of Form lower (paper move up) until the paper is set up to start printing at the top of the page.
4. Press **SEL** to reselect the printer.

Okidata OP16N

The Okidata OP16N printer was discontinued, but is shown here to support existing systems.

Use the factory options except for the following:

- Tray 1 - Light Medium
- Front/Manual - Light Medium
- Lines Per Page - 66 Lines
- Power Saving - 0 sec *or* 8 min

Other options may be changed per local requirements.

On the Serial/Parallel Converter, set the DTE/DCE slide switch to DTE. Set dip switches 2, 6, and 9 to on; all others to off. This enables the following:

- 9600 bps
- no parity
- xon/xoff flow control
- 8 data bits

For other settings, see the diagram on the Serial/Parallel Converter.

Setting the U.S. Robotics Sportster 33.6 faxmodem configuration options

The U.S. Robotics Sportster has eight DIP switches in the middle of the back panel. You need to reset these DIP switches from their factory defaults twice. Reset the DIP switches the first time so the modem can accept the soft options. Reset the DIP switches the second time so the modem will work with CMS.

This section includes the following topics:

- [Modem configuration options](#) on page 89
- [Diagram of the U.S. Robotics Sportster back panel](#) on page 90
- [U.S. Robotics Sportster switch settings table](#) on page 90

Additional references

For additional information, see the appropriate U.S. Robotics Sportster Modem user guide.

Modem configuration options

Complete these steps to option the U.S. Robotics Sportster modem for CMS:

1. Set the terminal speed to 9600 baud before connecting the modem to the terminal.
2. Connect a dumb terminal to the 25-pin connector at the back of the modem.
For more information on connecting the terminal to the modem, refer to the modem's user documentation.
3. Make the necessary power connections to the modem and to the terminal.
4. 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.
5. Turn on the modem and the terminal.
6. At the terminal, enter the following soft options (use numerical ones and zeros in the commands):

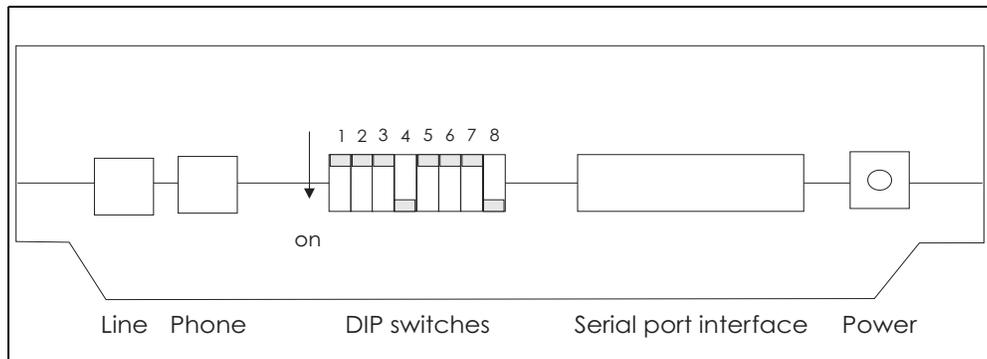
AT&F1	(loads factory default configuration options into active memory)
AT&W0	[writes the current configuration to NVRAM 0 template (Y0)]

Configuring terminals, printers, and modems

- Next, set all DIP switches to the up (OFF) position except switches 4 and 8, which are set to the down (ON) position. The following figure shows the final DIP switch settings for CMS.
- Finally, reset the modem using the power switch.

Diagram of the U.S. Robotics Sportster back panel

This figure shows the back panel of a U.S. Robotics modem.



U.S. Robotics Sportster switch settings table

The following table contains the U.S. Robotics Sportster switch settings for CMS.

Switch	CMS setting	CMS function
1	OFF (up)	OFF=normal DTR operation
2	OFF (up)	OFF=verbal (word) result codes
3	OFF (up)	OFF=disable result codes
4	ON (down)	ON=suppress echo of keyboard commands
5	OFF (up)	OFF=enable auto answer
6	OFF (up)	OFF=send CD signal on connect, drop on disconnect
7	OFF (up)	OFF=load stored software options on power up
8	ON (down)	ON=enable AT command set recognition

Setting the Paradyne Comsphere 3910 modem configuration options

The Paradyne Comsphere 3910 modem is used for many locations outside of the United States.

This section includes the following topics:

- [Recommended configuration options](#) on page 91
- [Option buttons](#) on page 91
- [Setting the Comsphere 3910 configuration options](#) on page 92

Recommended configuration options

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

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

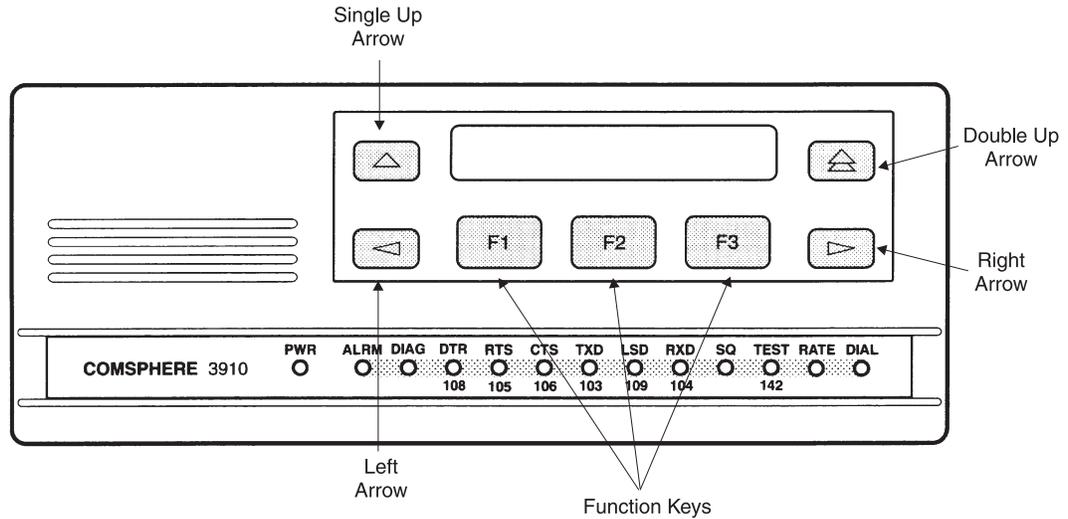
Option buttons

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

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

Configuring terminals, printers, and modems

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



Setting the Comsphere 3910 configuration options

This section contains the following topics:

- [Configuring Factory/Async_Dial](#) on page 92
- [Setting the data rate](#) on page 93
- [Setting the handshake options](#) on page 93
- [Setting the Dial_Line strap group](#) on page 94
- [Saving your settings](#) on page 95

Configuring Factory/Async_Dial

To configure the Factory/Async_Dial:

1. Press **F2** to select “Configure.”
“Ld EditArea frm” is displayed.
2. Press the **Right Arrow** four times.
“Factory” is displayed.
3. Press **F1** to select “Factory.”
“Ld Fact Preset:” is displayed.
4. Press **Right Arrow** four times.
5. Press **F1** to select “UNIX_Dial.”

6. Press **F3** to select "Save."

"Sav EditArea to" is displayed.

7. Press **F1** to save to "Active(Saved)."

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

Setting the data rate

To set the data rate:

1. Press **F2** to select "Configure."

"Ld EditArea frm" is displayed.

2. Press the **Right Arrow** once.

"Active(Saved)" is displayed.

3. Press **F1**.

"Choose Function" is displayed.

4. Press **F1** to select "Edit."

"Edit StrapGroup" is displayed.

5. Press **F1** to select "DTE_Interface."

"Async/Sync Mode" is displayed.

6. Press **F1** to select "Nxt."

"Async DTE Rate" is displayed.

7. Press the **Right Arrow** five times to display "9600."

8. Press **F2** to select "9600."

Setting the handshake options

To set the handshake options:

1. Press **F1** for "Nxt."

"Asyn #Data Bits (8)" is displayed.

2. Press **F1** for "Nxt."

"Asyn Parity Bit (None)" is displayed.

3. Press **F1** for "Nxt."

"Asyn #Stop Bits (1)" is displayed.

Configuring terminals, printers, and modems

4. Press **F1** for “Nxt.”
“DTR Action (Ignore)” is displayed.
5. Press **F1** for “Nxt.”
“DSR Control (Forced_On)” is displayed.
6. Press **F1** for “Nxt.”
“RTS Action (Ignore)” is displayed.
7. Press **F1** for “Nxt.”
“CTS Control (WinkWhenDisc)” is displayed.
8. Press **F1** for “Nxt.”
“RTS/CTS Delay (0 msec)” is displayed.
9. Press **F1** for “Nxt.”
“LSD Control (WinkWhenDisc)” is displayed.
10. Press **F1** for “Nxt.”
“CT111_Rate Cntl (Disable)” is displayed.
11. Press **F1** for “Nxt.”
“DTE_Rate=VF (Disable)” is displayed.
12. Press **F1** for “Nxt.”
“Extend Main Ch. (Disable)” is displayed.
13. Press **F1** for “End.”
“Edit StrapGroup” is displayed.

Setting the Dial_Line strap group

To set the Dial_Line strap group:

1. Press the **Right Arrow** three times to get to the “Dial_Line” strap group. Nothing needs to be changed for CMS in the “DTE_Dialer” or “Line_Dialer” strap groups, so you can skip them.
2. Press **F1** to edit the “Dial_Line” strap group.
“Dial Line Rate” is displayed.
3. Press the **Right Arrow** four times for “9600(V32b).”
4. Press **F2** to select “9600(V32b).”
5. Press **F1** for “Nxt.”
“V32bis Automode (Enable)” is displayed.

6. Press **F1** for “Nxt.”
“V32bis Autorate (Enable)” is displayed.
7. Press **F1** for “Nxt.”
“Dial Tx Level (Permissv (-9))” is displayed.
8. Press **F1** for “Nxt.”
“V22b Guard Tone (Disable)” is displayed.
9. Press **F1** for “Nxt.”
“V32bis Train (Long)” is displayed.
10. Press **F1** for “End.”
“Edit StrapGroup” is displayed. The other strap groups (“V42/MNP/Buffer,” “Test,” “Misc,” and “Security”) are not changed for CMS.

Saving your settings

To save your settings:

1. Press the **Single Up Arrow** to display “Choose Function” and “Edit Save.”
2. Press **F3** to select “Save.”
“Save EditArea to” is displayed.
3. Press **F1** to select “Active(Saved).”
“Command Complete” is displayed.
4. Press the **Single Up Arrow** again to display “Save EditArea to.”
5. Press the **Right Arrow** once to select “Customer 1.”
6. Press **F1** to save to “Customer 1.”
“Command Complete” is displayed.
7. Press the **Double Up Arrow**.
“Idle: 9600” and “Status Configure” are displayed. If the modem is powered off, it should return to this state when it is powered on.
8. To check the status of the Comsphere 3910 modem, use the “Status” choice in the top-level menu, or use the Right and Left Arrow buttons to view other top-level menu choices.

Configuration options for discontinued modems

This section contains reference information about how to set up modems that have been discontinued by the manufacturer and are no longer sold with new Avaya CMS systems. The information is shown here to support existing systems.

This section includes the following topics:

- [Setting the Paradyne Comsphere 3830 modem options](#) on page 96
- [U.S. Robotics Sportster 14.4 faxmodem](#) on page 97
- [Paradyne DataPort Express Model 3710](#) on page 98
- [Paradyne DataPort Express Model 3715](#) on page 99

Setting the Paradyne Comsphere 3830 modem options

The Paradyne Comsphere 3830 modem was discontinued, but is shown here to support existing systems.

To set the configuration options for the Paradyne Comsphere 3830 modem:

1. Connect a dumb terminal to the 25-pin connector located at the back of the modem. For more 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.

2. Make the necessary power connections to the modem and to the terminal.
3. Turn on the modem and the terminal.
4. At the terminal, enter the following soft options (use numerical ones and zeros and in the commands):

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

Note:

If needed, reset the modem using the power switch on the back.

Additional references

For additional information, see the appropriate U.S. Robotics Sportster Modem user guide.

U.S. Robotics Sportster 14.4 faxmodem

The U.S. Robotics Sportster 14.4 faxmodem was discontinued, but is shown here to support existing systems.

The U.S. Robotics Sportster 14.4 faxmodem has eight DIP switches in the middle of the back panel. You need to reset these DIP switches from their factory defaults; once so the modem can accept the soft options, and again so the modem will work with CMS.

To set the configuration options on the U.S. Robotics Sportster 14.4 modem:

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.

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:

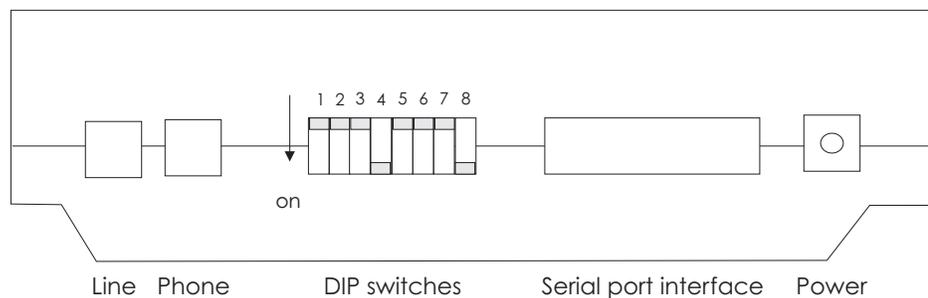
AT&F1	(loads factory default configuration options into active memory)
AT&W0	[writes the current configuration to NVRAM 0 template (Y0)]

6. Set all DIP switches to the up (OFF) position except switches 4 and 8, which are set to the down (ON) position. The figure below shows the final DIP switch settings for CMS, and the table below explains the settings.
7. Reset the modem using the power switch on the front.

Switch	Setting	Function
1	OFF (up)	OFF=normal DTR operation
2	OFF (up)	OFF=verbal (word) result codes

Switch	Setting	Function
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

This figure shows the back panel of a U.S. Robotics modem.



Paradyne DataPort Express Model 3710

The Paradyne DataPort Express Model 3710 modem was discontinued, but is shown here to support existing systems.

To set the configuration options for the Paradyne DataPort Express Model 3710 modem:

1. Connect a dumb terminal to the 25-pin connector located at the back of the modem. For information on connecting the terminal to the modem, refer to the modem's user documentation.

Note:

The terminal speed must be set to 9600 baud before connecting the modem to the terminal.

2. Make the necessary power connections to the modem and to the terminal.
3. Turn on the modem and the terminal.

4. At the terminal, enter the following soft options:

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

5. Reset the modem using the power switch on the back.

Paradyne DataPort Express Model 3715

The Paradyne DataPort Express Model 3715 modem was discontinued, but is shown here to support existing systems.

To set the configuration options for the Paradyne DataPort Express Model 3715 modem:

1. Connect a dumb terminal to the 25-pin connector located at the back of the modem. For information on connecting the terminal to the modem, refer to the modem's user documentation.

Note:

The terminal speed must be set to 9600 baud before connecting the modem to the terminal.

2. Make the necessary power connections to the modem and to the terminal.
3. Turn on the modem and the terminal.
4. At the terminal, enter the following soft options:

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

5. Reset the modem using the power switch on the back.



Connecting a network hub unit

This section describes how to connect the network hub units to the computer using UTP cables in a twisted-pair Ethernet (TPE) configuration.

 **CAUTION:**

Do not use telephone extension cables for network cables. The telephone extension cable wire pairs are not twisted and do not meet the requirements for use in a local area network (LAN).

Two different types of network hub units can be used:

- Allied Telesis CentreCOM - MR820TR network hub unit. This unit uses standard UTP network cables.
- StarLAN fiber-optic hub unit. This unit uses fiber-optic network cables.

The standard Avaya CMS configuration uses 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.

This section includes the following topics:

- [Distance limits](#) on page 102
- [Optional fiber-optic network configurations](#) on page 103
- [Installing a network hub unit](#) on page 106
- [Installing a fiber-optic hub unit](#) on page 111

Distance limits

This table shows the maximum distances that are associated with each type of network cable.

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-millimeter dual strand cable)	915 meters/3000 feet

If you need more distance between the network hub unit and the NTS, a fiber-optic configuration can be used. See [Optional fiber-optic network configurations](#) on page 103 for details.

Optional fiber-optic network configurations

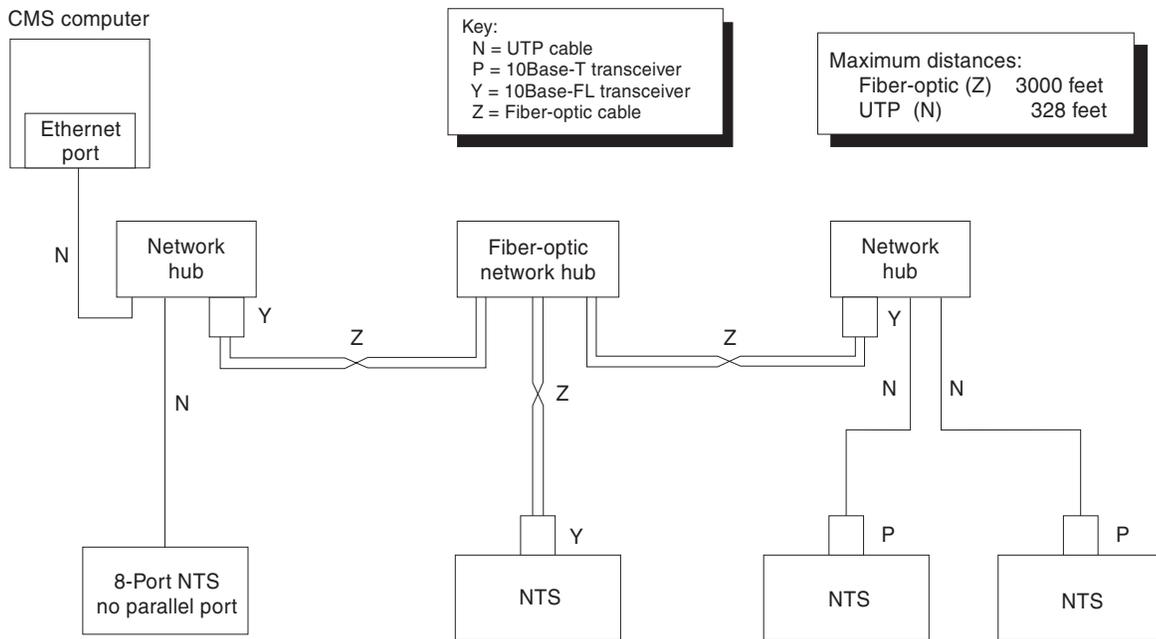
This section briefly describes some optional network configurations that can be used to increase the distance between the network hub unit and the NTS. These sample configurations use fiber-optic cables, fiber-optic hubs, or both.

This section includes the following topics:

- [Two network hubs and a fiber-optic network hub](#) on page 103
- [Two network hubs and a fiber-optic cable](#) on page 104
- [One network hub and four NTSs](#) on page 105

Two network hubs and a fiber-optic network hub

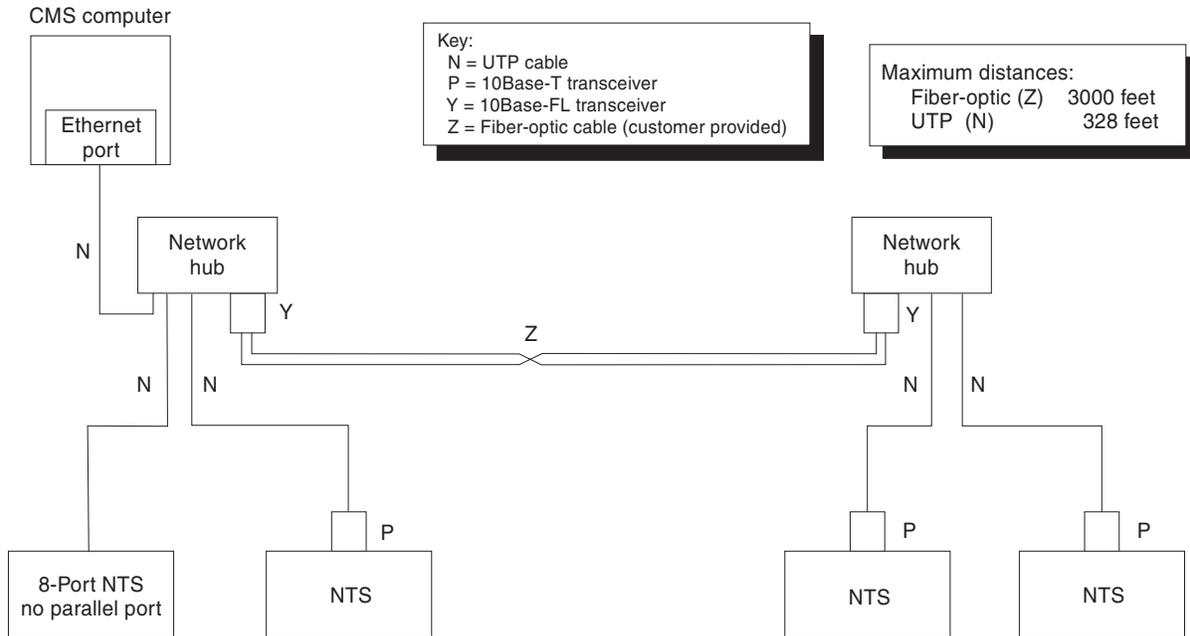
The following figure shows a configuration that uses two network hubs that are connected through a fiber-optic network hub. This configuration allows the network to extend across multiple buildings. For example, this can be used in a situation where the computer, network hub, and one NTS are located 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.



hwfhub1.cdr

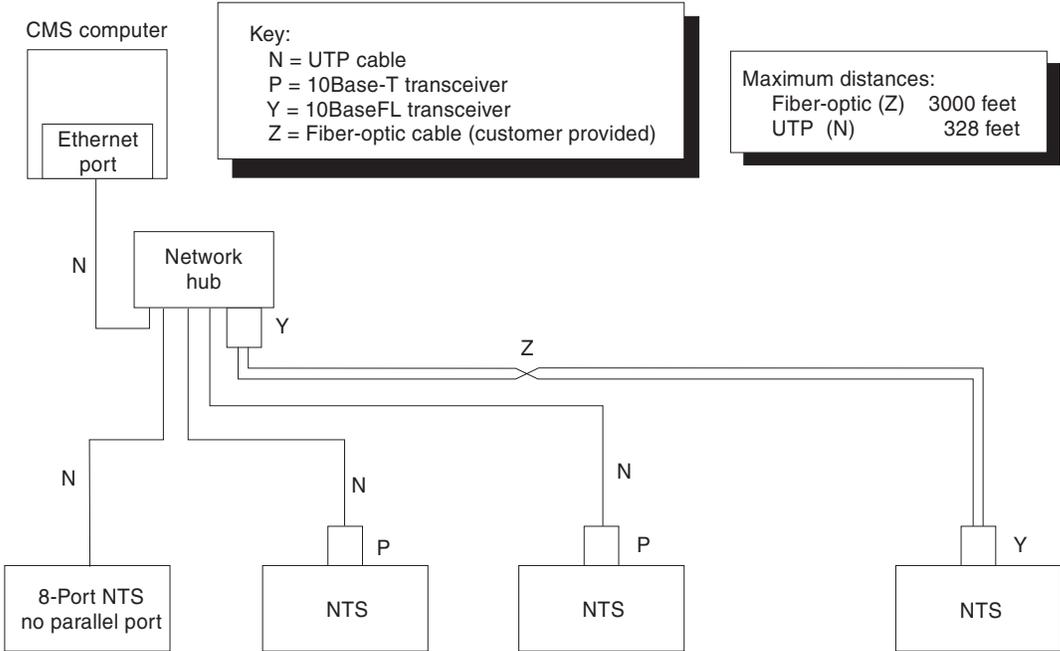
Two network hubs and a fiber-optic cable

The following figure shows two network hubs connected with a fiber-optic cable. This configuration allows the network to extend across two separate buildings. For example, this can be used in a situation where the computer, network hub, and two NTSs are located in one building, and the other network hub and remaining two NTSs are located in another building.



One network hub and four NTSs

The following figure shows a network hub that is connected to four NTSs. For example, this can be used in a situation where the computer, network hub, and three NTSs are located in one building, and another NTS is located in a separate building.



hwfhub3.cdr

Installing a network hub unit

This section describes how to connect the network hub unit to the computer. This network hub unit can be used in conjunction with other network hub units.

This section contains the following topics:

- [Installing a Allied Telesis CentreCOM network hub unit](#) on page 106
- [Network hub connection on a Sun Fire system](#) on page 107
- [Network hub connection on a Sun Blade system](#) on page 108
- [Network hub connection on an Enterprise 3500 or Enterprise 3000 system](#) on page 109
- [Network hub connection on an Ultra 5 system](#) on page 110

Additional references

For additional information, refer to the Allied Telesis CentreCOM AT-820TR Multiport 10BASE-T Micro Repeaters Installation Manual.

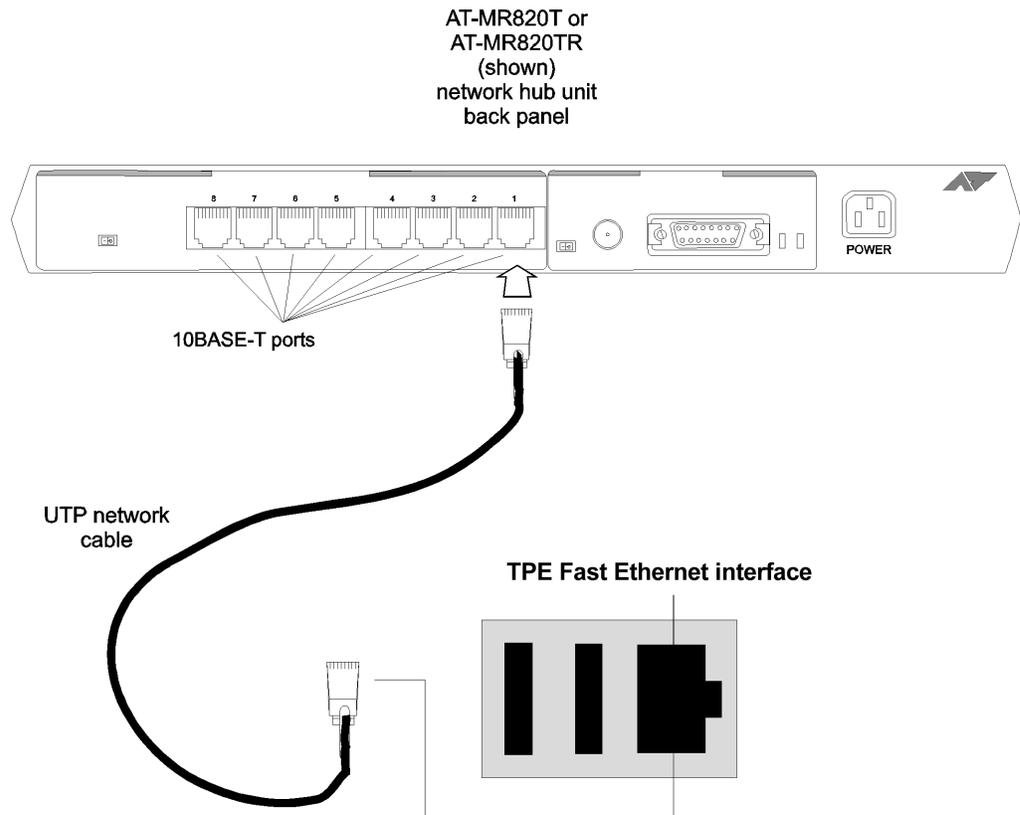
Installing a Allied Telesis CentreCOM network hub unit

To connect the network hub unit to the computer:

1. Position the network hub unit in the location selected by the customer. Make sure that 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 CMS computer. Use the UTP cable that came with your CMS computer.
4. Plug the other end of the UTP cable into Port 1 of the 10Base-T ports on the network hub unit as shown in the following figures.

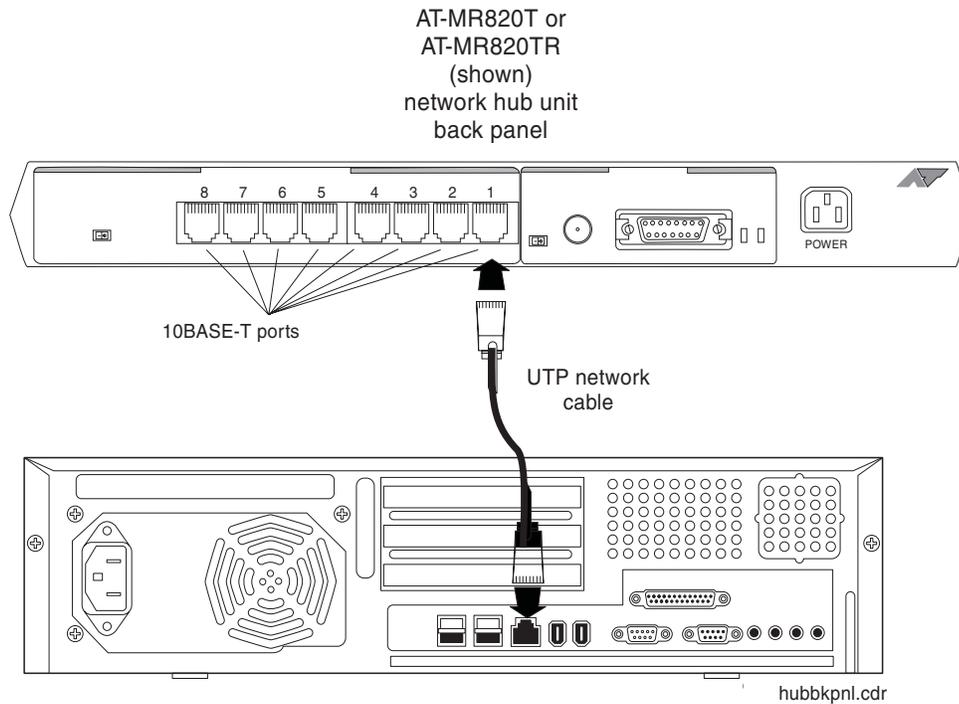
Network hub connection on a Sun Fire system

The following diagram shows how a network hub unit is connected to a Sun Fire V880 or Sun Fire V890 system.



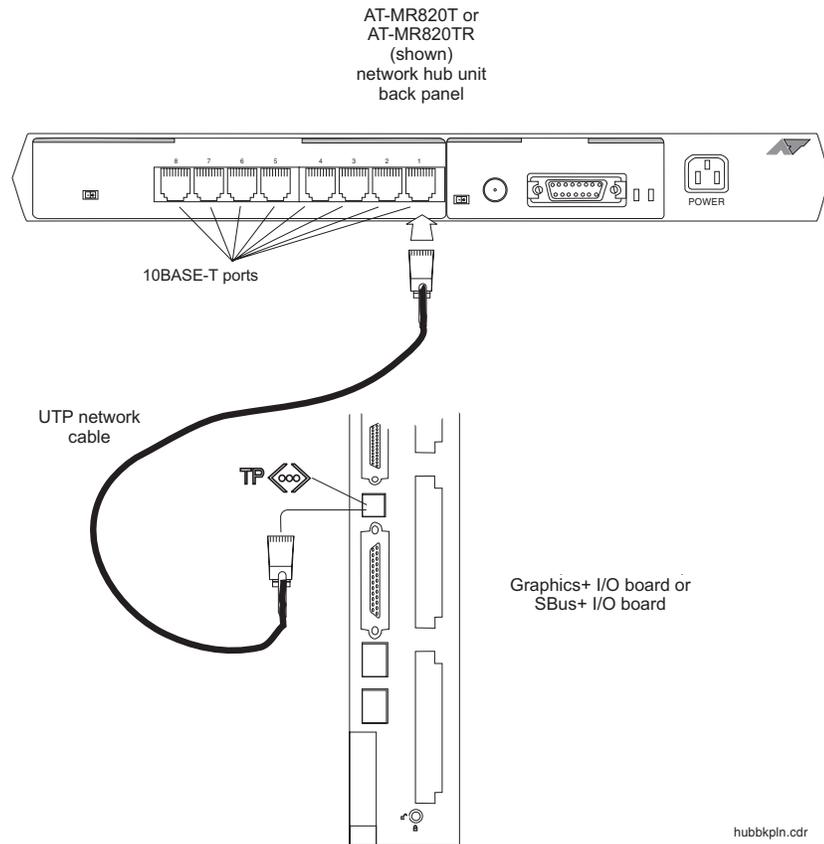
Network hub connection on a Sun Blade system

The following diagram shows how a network hub unit is connected to a Sun Blade system.



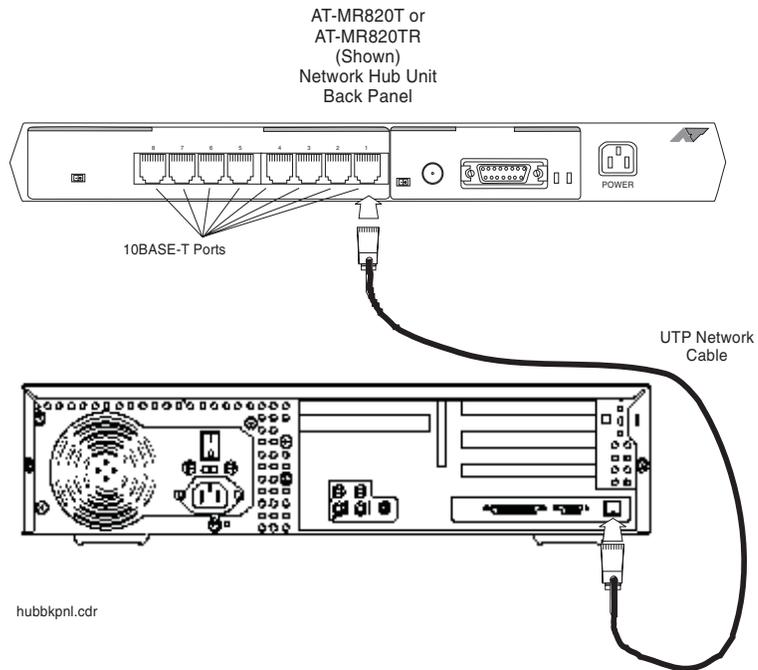
Network hub connection on an Enterprise 3500 or Enterprise 3000 system

The following diagram shows how a network hub unit is connected to an Enterprise 3500 or Enterprise 3000 system.



Network hub connection on an Ultra 5 system

The following diagram shows how a network hub unit is connected to an Ultra 5 system.

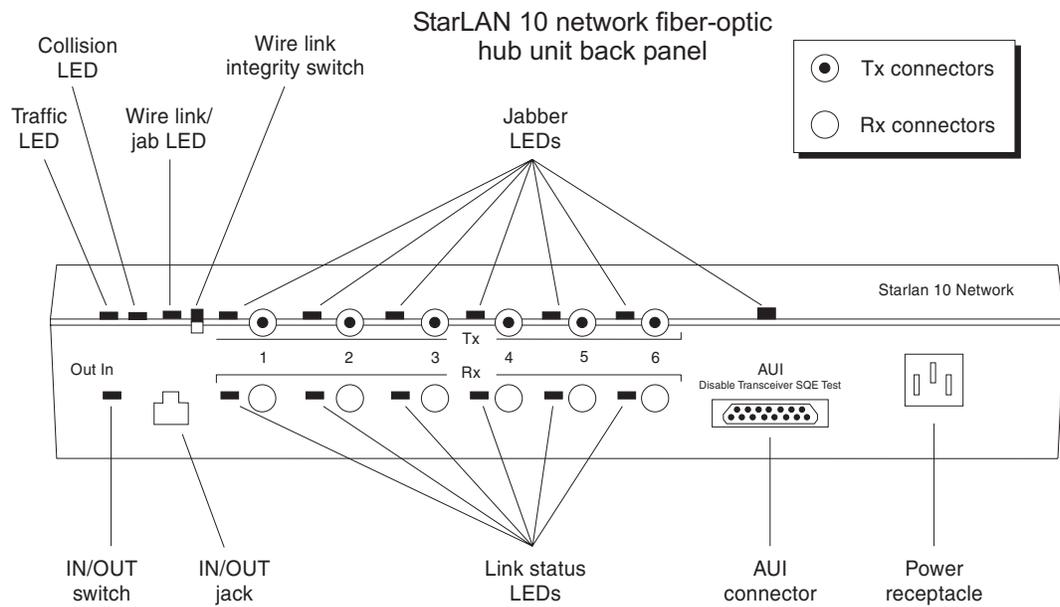


Installing a fiber-optic hub unit

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

To connect the StarLAN 10 network fiber-optic hub unit to the network:

1. Position the network fiber-optic hub unit in the location selected by the customer. Make sure that 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.



fiberhub.cdr

Note:

The fiber-optic cable has two plugs on each end. 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 that is connected to either the network hub unit or NTS.

Connect the plugs in the opposite manner at the other end. That is, attach the plug that was connected to the Tx port at the other end to the Rx port at this end, and attach the plug that was attached to the Rx port at the other end to the Tx port at this end.

Connecting a network hub unit

Additional references

For additional information, see the *StarLAN 10 Network Fiber-Optic Hub Installation Guide*.



Installing, connecting and configuring an NTS

This section includes procedures for the integration of a NTS onto a network hub and routine administration procedures.

Note:

Depending on your CMS load, certain peripheral hardware configurations and CMS platforms will not be supported. Contact your Avaya support representative for information about currently supported equipment and hardware configurations for your CMS system. This information is shown here to support existing systems.

This section includes the following procedures:

- [Installing the Bay Networks Annex NTS software](#) on page 114
- [Connecting the NTS to the network hub unit](#) on page 120
- [Provisioning an NTS](#) on page 127
- [Adding or removing NTS units](#) on page 140

Installing the Bay Networks Annex NTS software

This section describes how to install the NTS drivers and create symbolic links.

This section includes the following procedures:

- [Installing the NTS drivers](#) on page 114
- [Configuring the NTS start-up files](#) on page 118

Installing the NTS drivers

To install the NTS drivers:

Note:

If you are reinstalling the NTS drivers, the options presented will differ slightly.

1. Log into the system as **root**.
2. Load the CD-ROM, *Annex Communication Server R10.0(B) Annex Host Tools* into the CD-ROM drive.

3. Enter:

```
cd /
```

4. Enter:

```
/cdrom/cdrom0/install
```

The system displays the following message:

```
Do you want to continue (y/n/q=quit) [y]:
```

5. Press **Enter**.

The system displays the following message:

```
After installing one product you will be asked if you want to  
install the other product.
```

```
Indicate desired action:
```

- 1) Install Comm.Server Software
- 2) Install Annex Manager
- 3) Quit

```
Enter desired action [1]:
```

6. Press **Enter**.

The system displays the following message:

```
Enter the name of the Comm. Server Software installation directory.  
Directory name [/usr/annex/cs_R10.0B]:
```

7. Press **Enter**.

The system displays the following message:

```
Comm. Server Software Installation Script  
  
This installation shell script will examine your system and  
possibly ask you questions to generate the needed configuration to  
allow you to compile the Comm. Server host utilities.  
.  
Type carriage return to continue. Your cursor should be here-->
```

8. Press **Enter**.

The system displays the following message:

```
Where do you want the Annex utilities installed?  
Utility directory [/usr/annex]:
```

9. Press **Enter**.

The system displays the following message:

```
BFS directory [/usr/spool/erpcd/bfs]:
```

10. Press **Enter**.

The system displays the following message:

```
Do you wish to install manual pages at this time? [y]:
```

11. Press **Enter**.

The system displays the following message:

```
On-line manual pages will be installed in the appropriate  
subdirectory (i.e., ANNEX and index) of the manual base directory.  
What is the manual page base directory? (q=quit) [/usr/man]:
```

Installing, connecting and configuring an NTS

12. Press **Enter**.

The system displays the following message:

```
Available installation options are:
  1. Install binary images only (7MB)
  2. Install source code only, but do not compile (11MB)
  3. Get both binary images and source code, but do not compile (13MB)
  4. Quit

Enter installation choice [1]:
```

13. Press **Enter**.

The system displays the following message:

```
Are you ready to continue (y/q=quit) [y]:
```

14. Press **Enter**.

The system displays a message similar to the following:

```
1)      Com-Server Annex 3
2)      Com-Server MicroAnnex
3)      Install all images

Please select the annex model(s) you will be using.
You can specify a list separated by spaces or 'N' for none:
```

15. Enter the number associated with the **Install all images** option.

The system displays the following message:

```
To save room on your system, the above directories can be removed.
You may want to enter "?" at the prompt below to get more help.

Remove these directories (y/n) [n]:
```

16. Enter: **y**

The system displays a message similar to the following:

```
What is your default security regime:
  1) acp
  2) native UNIX
  3) SecureID
  4) safeword
  5) kerberos
  6) deny (access will be denied)
  7) none (access is unconditionally granted)
  8) radius

Enter security regime [1]:
```

17. Enter the number associated with the none option.

The system displays the following message:

```
Do you want the restrictions to apply to PPP and SLIP? [n] :
```

18. Press **Enter**.

The system displays the following message:

```
Do you want the erpcd daemon to provide access control (y/n) [y] :
```

19. Enter: **n**

The system displays the following message:

```
Copies of the following files have been updated:  
    service annex-initd  
Do you want to install any of these files (y/n) [y]
```

20. Press **Enter**.

The system displays the following message:

```
Copy file save/modified/service to /etc/services  
(y/n) [y] :
```

21. Press **Enter**.

The system displays the following message:

```
Copy file save/modified/annex-initd /etc/  
rc2.d/annex-initd  
  
(y/n) [y] :
```

22. Press **Enter**.

The system displays the following message:

```
No more system files to create or update  
  
Do you want to start-up the new version of the erpcd  
daemon? (y/n) [y] :
```

Installing, connecting and configuring an NTS

23. Press **Enter**.

The system displays the following message:

```
Starting-up the new version of the erpcd daemon.  
Comm.Server Software Installation Script  
  
Do you wish to install the Annex Manager (y/n/q=quit) [y]:
```

24. Enter: **n**

The system displays the command prompt.

Configuring the NTS start-up files

To configure the NTS start-up files:

1. Enter:

```
chmod 744 /etc/rc2.d/annex-initd
```

2. Enter:

```
ln -s /etc/rc2.d/annex-initd /etc/rc2.d/S99annex-initd
```

3. Enter:

```
ls -l /etc/rc2.d/annex-initd
```

4. Review the first column of the output to verify that file permissions are set correctly. The correct file permissions will exhibit the following format:

```
-rwxr--r--
```

5. Enter:

```
ls -l /etc/rc2.d/S99annex-initd
```

The system displays permissions for the linked file similar to the following example:

```
-rwxr--r-- 1 root other 2 current date S99annex-initd -> /etc/  
rc2.d/annex-initd
```

6. Enter the following commands:

```
ln -s /usr/annex/na /usr/bin/na
```

```
ln -s /usr/annex/rtnet /usr/bin/rtnet
```

```
ln -s /usr/annex/aprint /usr/bin/aprint
```

7. Enter the following commands, and review the output to verify that the symbolic links are set correctly.

```
ls -l /usr/bin/na
```

```
ls -l /usr/bin/rtnet
```

```
ls -l /usr/bin/aprint
```

If the symbolic links are set correctly, the `ls` command output will indicate the link at the end of each line.

Example:

The `ls -l /usr/bin/na` command generates the following output:

```
lrwxrwxrwx 1 root other 563072 current date usr/bin/na -> usr/annex/na
```

8. Enter:

```
eject cdrom
```

Connecting the NTS to the network hub unit

This section describes how to connect an 8-port, 16-port, and 64-port NTS to the network hub unit, and the four 16-port NTS patch panels to the 64-port NTS. The 64-port NTS provides twelve 50-pin PBX-champ connectors that are used to attach 64 serial devices using the patch panel cables and patch panels. These serial devices are accessed by means of the local Ethernet network.

If the NTS is not administered, or if you are adding an NTS to your system for the first time, see [Provisioning an NTS](#) on page 127.

 **CAUTION:**

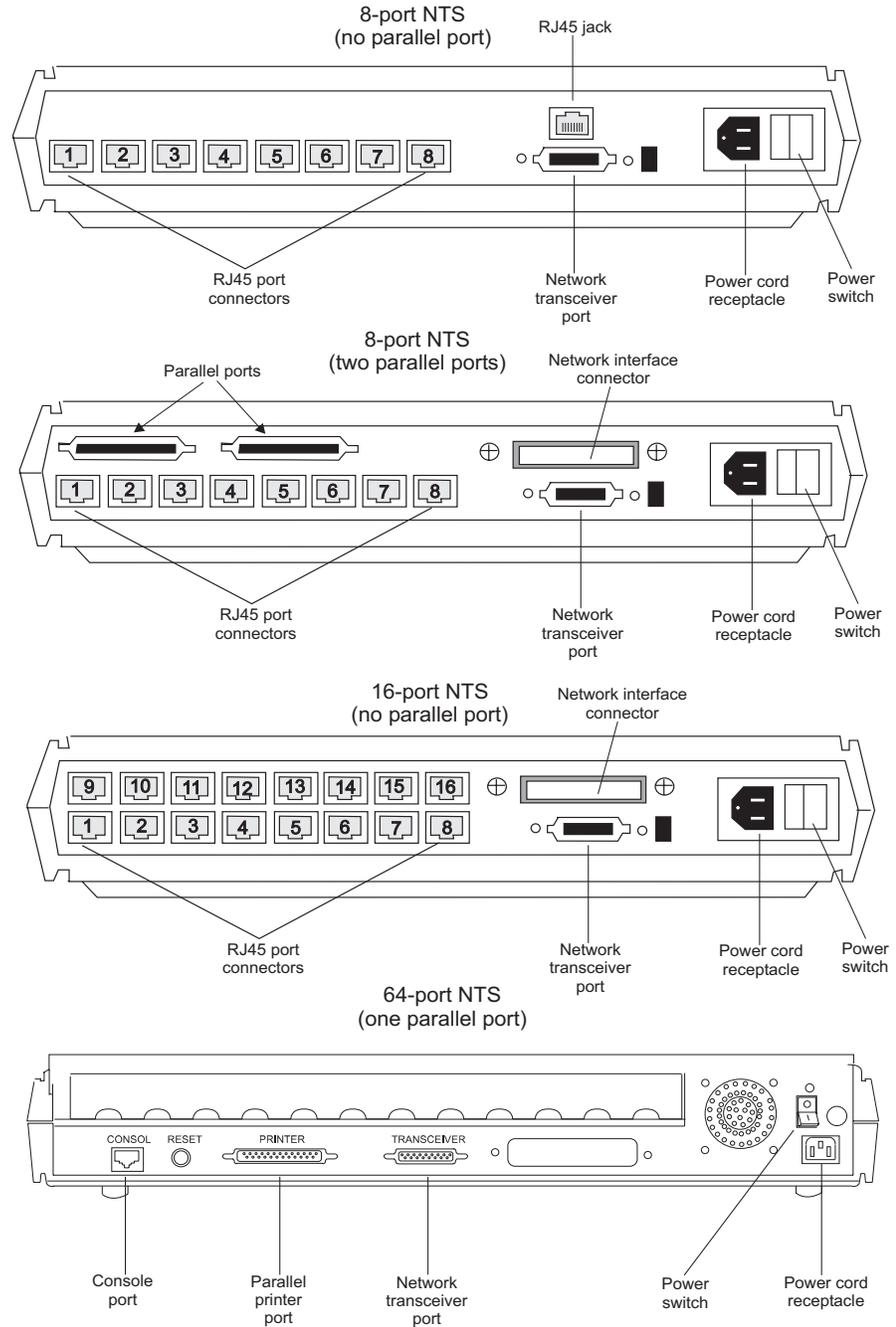
Do not use telephone extension cables for network cables. The telephone extension cable wire pairs are not twisted and do not meet the requirements for use in a local area network (LAN).

This section includes the following topics:

- [Back panels for NTS units](#) on page 121
- [Network hub port connectivity](#) on page 122
- [Connecting the NTS](#) on page 122
- [Connecting the NTS patch panels to a 64-port NTS](#) on page 125

Back panels for NTS units

The following figure shows the typical back panel layout of an 8-port, 16-port, or 64-port NTS.



ds-xnts.cdr

Network hub port connectivity

If you are connecting more than one NTS to the network hub unit, use the information in the following table as a guide for connecting the UTP cable between the network hub unit and the NTS.

NTS	NTS name	Network hub port
First	cmsterm1	2
Second	cmsterm2	3
Third	cmsterm3	4
Fourth	cmsterm4	5
Fifth	cmsterm5	6
Sixth	cmsterm6	7
Seventh	cmsterm7	8

Connecting the NTS

To connect an NTS to the network hub unit:

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

If you are connecting. . .	Then. . .
An 8-port NTS without a parallel port	Complete 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 complete Steps 6 and 7

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

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

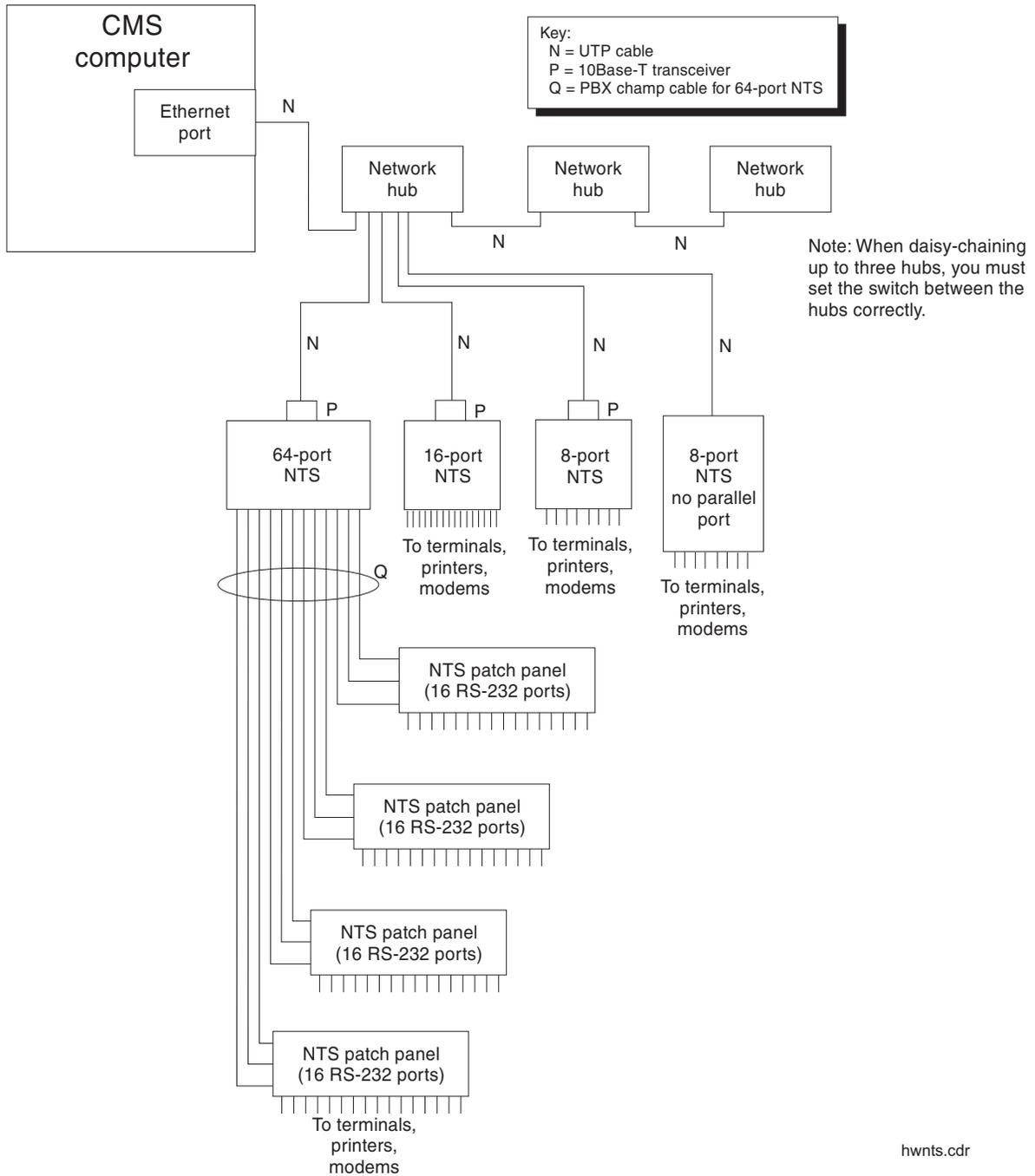
Note:

You may have an earlier version of a 10Base-T transceiver which allows you to change three switch settings: SQE, Link, and LRT. 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 that was previously connected to the back of the NTS.
 8. Repeat this procedure for each NTS that you are connecting.

Installing, connecting and configuring an NTS

The following figure shows how the NTSs are connected to the network hub unit.



Connecting the NTS patch panels to a 64-port NTS

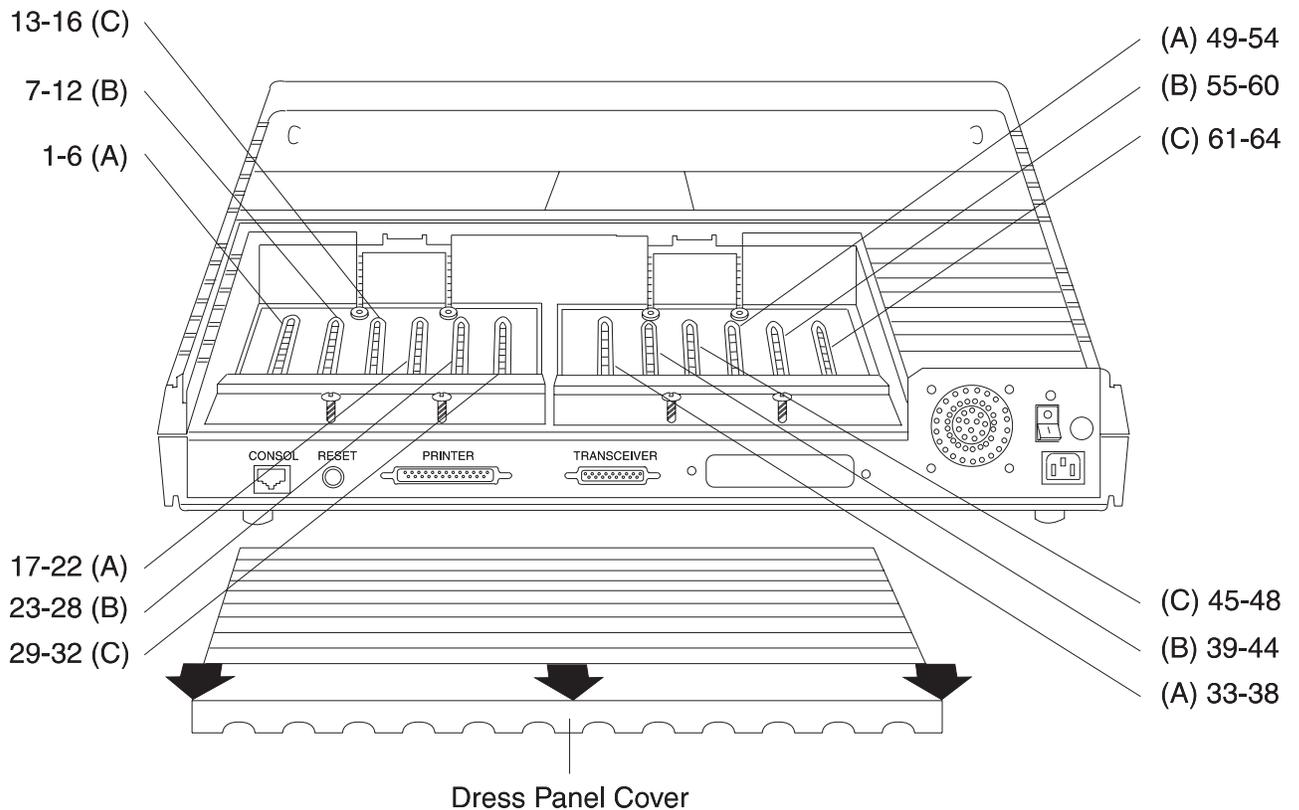
This section describes how to connect the 16-port patch panels to a 64-port NTS.

This section includes the following topics:

- [PBX-champ connectors and port designations](#) on page 125
- [Cabling procedure](#) on page 125

PBX-champ connectors and port designations

The following figure shows the 64-port NTS with PBX-champ connectors and port designations.



Cabling procedure

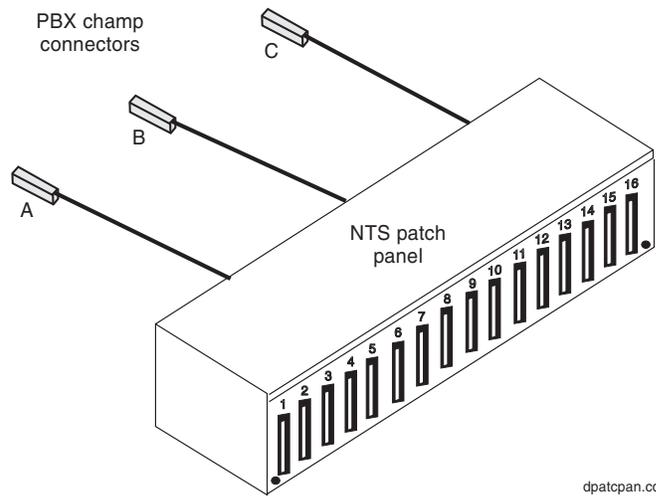
To connect a 16-port NTS patch panel to the 64-port NTS:

1. Remove the cover of the NTS by sliding it toward the back of the NTS.

Installing, connecting and configuring an NTS

2. Slide the cable retainer back to allow room for the cables.
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 which connect to the PBX-champ connectors located inside the 64-port NTS. The PBX-champ connectors are labeled A, B, and C, respectively.



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.
7. Repeat Steps 3 through 6 for each NTS patch panel that you are installing.
8. Replace the cover on the 64-port NTS by sliding it toward the front of the NTS.
9. Label each 16-port patch panel to identify which ports belong to each patch panel.

Additional references

For additional information, see the *Micro Annex Communications Server Hardware Installation Guide*.

Provisioning an NTS

The NTS units are set up at the factory to interface with the CMS computer based on IP addresses that are supplied at the factory. For more information on the factory default values, see the appropriate CMS software, installation, maintenance and troubleshooting book for your version of CMS.

 **Important:**

If the IP addresses for the CMS computer and NTS units do not require changes, skip this section. If, however, the IP addresses for the CMS computer and the NTS units require changes to integrate into a customer network, use these procedures to change the IP addresses.

There are two ways to change the IP addresses on the CMS computer and the NTS units:

- Remotely - Use this procedure in most cases. To change an IP address remotely, you must dial into the CMS computer. Then connect to the NTS units.
- Locally - Use this procedure only in the following cases:
 - If the NTS unit from the factory is defective.
 - If an NTS unit was added after the initial factory order.
 - If the remote provisioning personnel cannot get into the system to set up the NTS unit remotely.

This section includes the following procedures:

- [Changing IP addresses on an NTS remotely](#) on page 127
- [Changing IP addresses on an NTS locally](#) on page 133

Changing IP addresses on an NTS remotely

This section describes how to remotely change the IP addresses on the CMS computer and the NTS units that are used with CMS. This procedure should be performed only if you are connecting your system to a different network.

The administration process must be completed on each NTS that is being installed. If you administer more than one NTS for this system, the IP addresses must be unique.

Note:

If you are replacing an existing NTS, you must read in the **terminfo** file.

This section includes the following topics:

- [Prerequisites](#) on page 128

Installing, connecting and configuring an NTS

- [Changing an IP address remotely](#) on page 128

Prerequisites

Perform the following tasks before starting this procedure:

- Verify that the Bay Networks Annex software is installed. For more information, see [Installing the Bay Networks Annex NTS software](#) on page 114.
- The IP address that is assigned to the CMS. Record the address in the following table.
- The IP address assigned to each NTS. Record the address in the following table.

Device	Network name	IP address
CMS Computer		
First NTS		
Second NTS		
Third NTS		
Fourth NTS		
Fifth NTS		
Sixth NTS		
Seventh NTS		

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

Changing an IP address remotely

To change the IP address of the CMS computer or the NTS:

 **CAUTION:**

If you change the IP address, it can affect the X.25 or LAN switch link. Make sure that your changes do not affect the switch link.

1. Log in as **root**.
2. Determine which NTS may need to change by looking at the **/etc/hosts** file and pinging each NTS. Repeat Step 3 through Step 16 for each NTS that needs to be changed.

3. At the system prompt, enter:

```
na
```

The system accesses the NTS administration software. The system displays a message similar to the following:

```
Annex network administrator R release number and date
command:
```

Note:

This is an example. The response may differ depending on what type of NTS you have.

4. Enter:

```
annex cmstermX
```

Where *x* is the number of the NTS.

The system displays a message similar to the following:

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

5. Enter:

```
write cmstermX /etc/local.admin/cmstermX_info.old
```

where *x* is the number of the NTS.

The system displays the following message:

```
.
.
.
writing.....
command:
```

6. Enter:

```
set annex inet_addr NTS_IP_addr
```

where *NTS_IP_addr* is the NTS IP address.

The system displays the following message:

```
Change will take effect at next annex boot.
command:
```

Installing, connecting and configuring an NTS

7. Enter:

```
set annex subnet_mask 255.255.255.0
```

or other subnet mask as required.

The system displays the `command:` prompt.

8. Enter:

```
set annex pref_load_addr SUN_IP_addr
```

where *SUN_IP_addr* is the IP address of the CMS computer.

The system displays the `command:` prompt.

9. Enter:

```
set annex pref_dump_addr SUN_IP_addr
```

where *SUN_IP_addr* is the IP address of the CMS computer.

The system displays the `command:` prompt.

10. Enter:

```
set port=1-64 dedicated_address SUN_IP_addr
```

where *SUN_IP_addr* is the IP address of the CMS computer.

Note:

The `set port=1-64 dedicated_address SUN_IP_addr` line that you entered in this step 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 displays the following message:

```
Change will take effect at next annex boot or reset.  
command:
```

11. Enter:

```
write cmstermX /etc/local.admin/cmstermX _info
```

This saves the new options.

The system displays the following message:

```
.  
. .  
writing.....  
command:
```

12. Enter:

```
boot
```

The system displays the following message:

```
time (return for 'now'):
```

13. Press **Enter**.

The system displays the following message:

```
annex list (return for default):
```

14. Press **Enter**.

The system displays the following message:

```
filename (return for default):
```

15. Press **Enter**.

The system displays the following message:

```
warning (return for default):
```

16. Press **Enter**.

The system displays the following message:

```
booting annex cmsterm(x)
The annex is performing self diagnostics, and will not respond to
administration operations for a short period.

command:
```

17. Repeat Step 3 through Step 16 for each NTS that needs to be changed.

18. Enter: **q**

Note:

You cannot communicate with the NTS again until each IP address that was changed for an NTS is also changed on the CMS computer.

19. Enter:

```
vi /etc/hosts
```

The system opens the file in the VI editor.

 **CAUTION:**

If you change the IP address of the computer, you must restart the system within 12 hours. If you do not restart the system within 12 hours, X.25 will stop.

20. Add the new addresses for the NTSs and the CMS computer to the **/etc/hosts** file.

21. Add the router IP and name to the **/etc/hosts** file.

22. Remove or comment out old entries in the **/etc/hosts** file.

23. Press **Esc**. Then enter:

```
:wq!
```

The VI editor saves and closes the file.

24. Enter:

```
vi /etc/defaultrouter
```

The system opens the file in the VI editor.

25. Add the router node name that is given in the **/etc/hosts** file.

26. Press **Esc**. Then enter:

```
:wq!
```

The VI editor saves and closes the file.

27. Enter:

```
vi /etc/netmasks
```

The system opens the file in the VI editor.

28. Modify the subnet mask if it is different from the default for the IP address that you are using. Note that an example is provided in the file.

29. Press **Esc**. Then enter:

```
:wq!
```

The VI editor saves and closes the file.

30. Enter:

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

The CMS computer shuts down and reboots.

Changing IP addresses on an NTS locally

This section describes how to locally change the IP addresses on the CMS computer and the NTS units that are used with CMS. This should be performed only if you are connecting your system to a different network.

The administration process must be completed on each NTS that is being installed. If you administer more than one NTS for this system, the IP addresses must be unique.

If you are replacing an existing NTS, you must read in the **terminfo** file.

This section includes the following topics:

- [Prerequisites](#) on page 133
- [Changing an IP address locally](#) on page 134

Prerequisites

Perform the following tasks before starting this procedure:

- Verify that the Bay Networks Annex software is installed. See your CMS software installation document for those procedures.
- The IP address that is assigned to the CMS. Record the address in the following table.
- The IP address assigned to each NTS. Record the address in the following table.

Device	Network name	IP address
CMS Computer		
First NTS		
Second NTS		
Third NTS		
Fourth NTS		
Fifth NTS		
Sixth NTS		
Seventh NTS		

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

Changing an IP address locally

To change the IP address of the CMS computer or the NTS:

1. Enter:

```
vi /etc/hosts
```

The system opens the file in the VI editor.

2. Locate the lines in the **/etc/hosts** file that contain the IP addresses for the CMS computer and the NTS units.
3. Change the existing IP addresses in the file to the new addresses that you recorded in the preceding table.
4. Press **Esc**. Then enter:

```
:wq!
```

The VI editor saves and closes the file.

5. Check with the network administrator for additional routing functions in the **/etc/netmasks** and **/etc/networks** files.
6. Using the console cable that came with the NTS unit, connect a dumb terminal to the console port on the rear of the NTS.

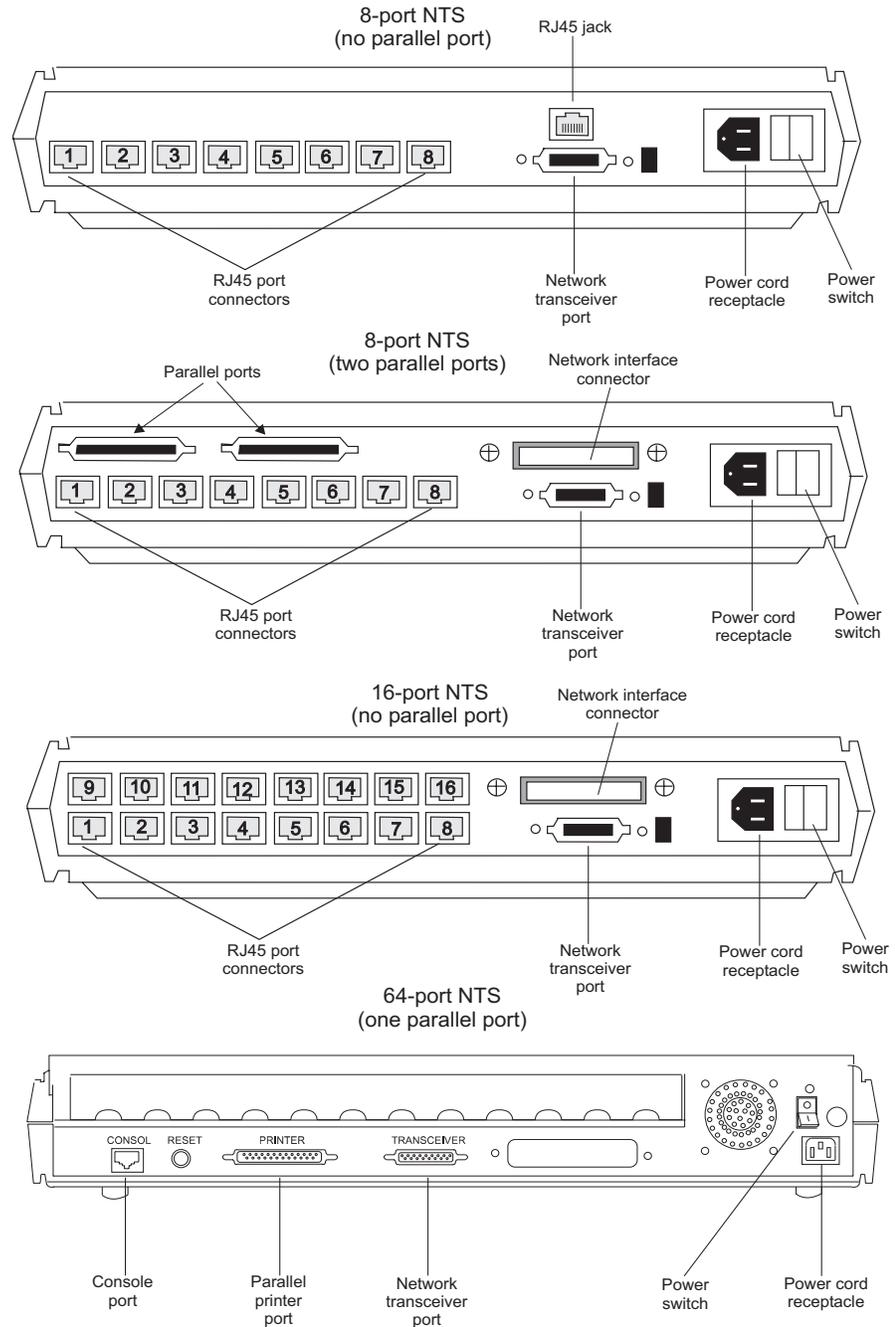
On the 8-port and 16-port NTS units, the console port is port **#1** of the RJ45 ports. To make this connection, you need the following:

- A console cable
- An adapter - comcode 407361823
- A null modem - comcode 407122043

On the 64-port NTS unit, the console port is labeled **CONSOL**. To make this connection, you need the following:

- A console cable

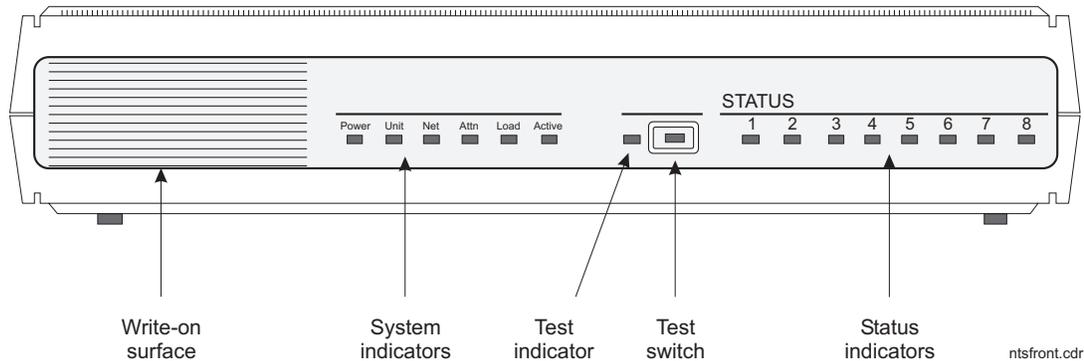
- An adapter - part number 06-988-260-20



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Installing, connecting and configuring an NTS

- Turn the NTS off and on again. Within 5 to 10 seconds, push the **Test Switch** button on the front of the NTS (see the following figure).



The NTS goes through its hardware diagnostics, and the system displays the following:

```
Monitor::
```

- Enter:

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. After the information is erased, continue with Step 15.

If both types of information are present, continue with Step 9.

- The program prompts you to select what you want to erase. Erase both the EEPROM and the FLASH information. The system displays the following message:

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

- Enter **1** to erase EEPROM.

The system displays the following message:

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

11. Enter: **y**

The system displays the following message:

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

The program returns to the `monitor::` prompt.

12. Enter:

erase

The system displays the following message:

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

13. Enter **2** to erase FLASH.

The system displays the following message:

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

14. Enter: **y**

The system displays the following message:

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

The program returns to the `monitor::` prompt.

15. Enter:

addr

The system displays the following message:

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

16. Enter the IP address for this NTS.

The system displays the following message:

```
Internet address : XXX.XXX.XXX.XXX
Enter Subnet mask [255.255.0.0]::
```

17. Perform one of the following tasks:

Installing, connecting and configuring an NTS

- Press **Enter** to accept the default subnet mask.
- Enter a subnet mask.

The system displays the following message:

```
Subnet mask: 255.255.255.0
Enter preferred load host Internet address [<any host>]::
```

18. Enter the IP address of the computer.

The system displays the following message:

```
Preferred load host address XXX.XXX.XXX.XXX
Enter Broadcast address [0.0.0.0]::
```

19. Press **Enter** to accept the default broadcast message address.

The system displays the following message:

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

20. Enter the IP address of the computer.

The system displays the following message:

```
Preferred dump address: xxx.xx.x.x
Select type of IP packet encapsulation (ieee802/ethernet)
[<ethernet>] ::
```

21. Press **Enter** to accept the default IP packet encapsulation.

The system displays one of the following messages:

- If you have a 64-port NTS the program returns to the `monitor::` prompt. Continue with Step 23.
- If you have an 8-port or 16-port NTS the system displays the following message:

```
Type of IP packet encapsulation: <ethernet>
Load Broadcast Y/N [Y]::
```

22. Enter:

N

The program returns to the `monitor::` prompt.

23. Enter:

```
boot
```

This re-initializes the NTS with the new parameters.

The system displays a message similar to the following:

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

Note:

The boot file name differs depending on the type of NTS. For the 8-port 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 **Enter** to accept the default boot file name.

The system displays the following message:

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

Booting file: oper.42.enet from 192.168.2.1

Loading image from 192.168.2.1
.....
```

The system continues to display periods as the NTS is initialized and set up.

Note:

If the system displays "SELF" instead of the IP address `192.168.2.1`, it means that you did not erase the EEPROM. Go back to Step 8 to erase the EEPROM information.

When the initialization is finished, the system displays the following message:

```
annex::
```

25. Disconnect the dumb terminal from the NTS.

26. Power cycle the NTS.

The NTS has been administered.

Additional references

For additional information, see the *Network Terminal Server Guide*.

Adding or removing NTS units

This section includes the following topics:

- [Adding an NTS](#) on page 140
- [Removing an NTS](#) on page 140

Adding an NTS

The procedures you must follow when adding an Network Terminal Server (NTS) differ depending upon whether it is the first NTS or an additional NTS.

- If you are adding an NTS for the first time, you must install the Bay Networks Annex software and then set up the NTS units. See your CMS software installation document for the software installation procedures and [Provisioning an NTS](#) on page 127.
- If you are adding an NTS to a system that already has an NTS, see [Changing IP addresses on an NTS locally](#) on page 133.

Removing an NTS

To remove an NTS from service:

 **CAUTION:**

Only qualified support personnel should perform the procedures in this section.

1. Log in to the system as root.

2. Enter:

```
/etc/rc2.d/annex-initd stop
```

This stops the erpcd daemon.

3. Enter:

```
rm /etc/rc2.d/*annex-initd
```

This removes the initialization files for the NTS software.

4. Enter:

```
rm -rf /usr/annex
```

This removes the program files.

5. If any of the following files still exist, remove them with the following commands:

```
rm /etc/rc2.d/S65ntserv
```

```
rm /etc/rc2.d/K41ntserv
```

```
rm /etc/rc3.d/S65ntserv
```

```
rm /etc/rc3.d/K41ntserv
```

```
rm /etc/init.d/ntsserv
```

6. Disconnect the NTS from the network hub or CMS computer. Disconnect all printers, terminals, and modems from the NTS.

Installing, connecting and configuring an NTS

■ ■ ■ ■ ■ ■

Administering ports with the Port Administration tool

The Avaya CMS Port Administration tool automatically configures external ports to receive specific types of peripheral equipment. Users of the tool do not need to have a deep technical knowledge of the equipment to be configured. The only requirement is knowing the kind of equipment available and its use.

It is highly recommended that you use the port administration tool instead of the Solaris tools to administer terminals, printers, and modems. The port administration tool keeps a record of all administrative activity in a format that is more structured than the Solaris tools. Once you start using the port administration tool, you should consistently use it for all port administration. The Port Administration Tool cannot be used to administer serial port A or B.

The Port Administration Tool can administer the following ports:

- The built-in parallel printer port on the CMS computer (Ultra 5, Sun Blade, and SPARCserver only)
- NTS ports
- Ports on an Aurora ports expander box
- Ports on an SAI/P expander box.

This section includes the following topics:

- [Determining the Port Administration tool availability](#) on page 144
- [Gathering information for the Port Administration tool](#) on page 145
- [Using the Port Administration tool](#) on page 147

Determining the Port Administration tool availability

The Port Administration tool is an option on the CMSADM menu, but is not available in all loads of CMS.

To determine if you have the Port Administration tool perform the following steps:

1. Log on to the system as **root**.

2. Enter:

```
cmsadm
```

The system displays the CMSADM menu.

One of the menu options should be `port_admin`. If you do not have the Port Administration Tool, use the Solaris tools to administer the I/O ports as described in [Appendix A: Administering ports using the Solaris tools](#) on page 201.

3. To return to the command prompt, enter: `q`

Gathering information for the Port Administration tool

The questions asked by the Port Administration tool will differ depending on the type of equipment you are configuring the ports for. Before you begin a port administration session, use the following table as a guide to ensure that you have all the information you will need.

Function	Required information
Add a modem	<ul style="list-style-type: none"> ● Port type (NTS, Aurora, or SAI/P) ● Usage (inbound or outbound¹) ● Port number to be configured ● Baud rate ● Manufacturer and model
Remove a modem	<ul style="list-style-type: none"> ● Port type (NTS, Aurora, or SAI/P) ● Port number to be reset
Add a terminal	<ul style="list-style-type: none"> ● Port type (NTS, Aurora, or SAI/P) ● Port number to be configured ● Baud rate
Remove a terminal	<ul style="list-style-type: none"> ● Port type (NTS, Aurora, or SAIP) ● Port number to be reset
Add a printer	<ul style="list-style-type: none"> ● Port type (NTS, Aurora, SAI/P, or standard parallel port) ● Port number to be configured ● Connection (serial or parallel) ● Baud rate ● Manufacturer and model (see, LPADMIN printer settings on page 225)
Remove a printer	<ul style="list-style-type: none"> ● Port type (NTS, Aurora, SAI/P, or standard parallel port) ● Connection (serial or parallel) ● Port number to be reset

Administering ports with the Port Administration tool

Function	Required information
Reset ports ²	<ul style="list-style-type: none">● Port type (NTS, or Aurora, or SAI/P)● Port numbers to be reset
Re-administer an NTS to last known configuration	<ul style="list-style-type: none">● No specific knowledge required. Simply select the NTS Re-administer option³

1. An “inbound” modem port is configured to answer incoming calls only. An “outbound” modem port is configured to handle calls originated from the CMS computer.
2. You may reset more than one port at a time using the reset ports option, but the port numbers must be consecutive. When you use reset ports you do not need to know anything specific about any port being reset, except to make sure you do not reset a port that is in use.
3. NTS configuration files are in `/etc/local.admin/ntsname_info`, where *ntsname* is the name of the NTS unit. Any NTS configuration changes are saved in this file after each port administration session.

Using the Port Administration tool

When the Port Administration tool is used, it will prompt for information, perform the requested function, and then return to the main menu. You may configure a range of ports all at the same time, but all must be configured for the same types and models of equipment.

Note:

If you are changing a port assignment from terminal to printer or printer to terminal, remove the current port assignment before adding a new port assignment.

The following, is an example of a typical CMSADM session to configure an NTS port for a modem.

1. Log on to the system as **root**.

2. Enter:

```
cmsadm
```

The system displays the CMSADM menu.

3. Enter the number for the `port_admin` option.

The system displays the following message:

```
*****
*** Please select a port adapter board to administer ***
*****
 1) NTS (Network Terminal Server)
 2) PCI SAIP Card
 3) The parallel port on back of CMS server
Enter a choice (1-3) or q to quit: (default 1)
```

Note:

The screen examples in this section may differ, according to the version of CMS installed on your system.

Administering ports with the Port Administration tool

4. Select the option for the port you wish to administer and enter responses when prompted for information.

The following is an example of a typical session for configuring a NTS port for a modem. Examples of user responses are in bold.

```
*****
*** Please select a port adapter board to administer ***
*****
1) NTS (Network Terminal Server)
2) PCI SAIP Card
3) The parallel port on back of CMS server
Enter a choice (1-3) or q to quit: (default 1) 1

*****
This server knows about the following Network Terminal Server(s)
*****

135.9.135.35      cmsterm1
135.9.135.50      cmsterm2
Enter the hostname or IP address of the NTS: (default cmsterm1)
cmsterm1
Detecting cmsterm1 ... found

NTS cmsterm1 - 64 serial, 1 parallel ports
*****
*** Network Terminal Server Administration Menu ***
*****
1) modem
2) terminal
3) printer
4) display administered ports on the NTS
5) reset ports
6) readminister NTS from saved configuration
Enter a choice (1-6) or q to quit: (default 4) 1

1) add a modem
2) remove a modem
3) list all modems
Enter a choice (1-3) or q to quit: (default 2) 1

*****
*** Modem Connection Type Menu ***
*****
1) inbound modem
2) outbound modem
Enter a choice (1-2) or q to quit: (default 1) 1

Enter a port number (1-64) or a range (e.g. 3 or 4-9):
(default 0) 4
```

```
*****
*** Available Baud Rates ***
*****
1) 1200
2) 2400
3) 9600
4) 38400
Enter a choice (1-4) or q to quit: (default 3) 4

Enter a comment for this device/port: <Enter the location of the
modem>
This will take a moment...
*****
This server support the following inbound modems
*****
1) DataPort Express Model 3710
2) DataPort Express Model 3715
3) U.S. Robotics Sportster 14.4 External Faxmodem
4) Paradyne Comsphere 3830
5) Paradyne Comsphere 3910
Enter a choice (1-5) or q to quit: 5
```

5. Printers require additional setup within CMS, perform the following steps:

- a. Log into CMS.
- b. Select **Maintenance > Printer Administration**.
- c. Administer the printer in CMS.

Note:

For more information, see the appropriate call management system administration book for your version of CMS.

Administering ports with the Port Administration tool

Basic troubleshooting

When trying to figure out why a terminal, printer, or modem is not working, there are some basic steps you should take:

1. Make sure the device has power, is turned on, and is on-line.
2. Check the cabling based on the diagrams in [Connecting terminals, printers, and modems](#) on page 23. Make sure all the cables and connectors are securely attached.
3. Using the Port Administration tool, check the administration of the port, including the following data options:
 - speed
 - parity
 - data bits
 - stop bits
 - flow control
4. Check the same data options on the device to verify that they match the port administration.
5. Continue with troubleshooting sections in this chapter.
6. If you experience a problem that is not documented in this section or is not documented in your hardware manual, escalate the problem through normal procedures.

Entering printer commands

Unless otherwise noted, all commands are entered from the UNIX prompt. To access the UNIX system from CMS, press **F3** (Commands) and select the `UNIX(r) system` option.

Commands that can be executed while logged in only as `lp` or `root` are as follows:

- `/usr/lib/accept`
- `/usr/lib/lpshut`
- `/usr/lib/lpsched`
- `/usr/lib/lpmove`
- `/usr/lib/lpadmin`
- `disable`
- `enable`

Commands that can be executed while logged in as `cms`, `lp`, or `root` are as follows:

- `lpstat`
- `cancel`

 **Important:**

When you enter the `disable`, `enable`, or `cancel` commands, the printer will continue to print until the buffer is empty.

Printer maintenance commands

This section includes the following topics:

- [Listing the current printers](#) on page 154
- [Determining printer status](#) on page 155
- [Assigning a default printer](#) on page 156
- [Sending a test job](#) on page 156
- [Enabling a printer](#) on page 156
- [Disabling a printer](#) on page 157
- [Administering a printer to accept jobs](#) on page 157
- [Administering a printer to not accept jobs](#) on page 157
- [Canceling a print job](#) on page 157
- [Administering a printer](#) on page 158

Listing the current printers

To list the printers administered on the system:

1. Enter:

```
lpstat -v
```

The system displays a message similar to the following:

```
device for prt1: /dev/s_pdev_cmstern1_12
device for prt2: /dev/s_pdev_cmstern1_7
system for prt1: cms3
system for prt2: cms3
```

This example shows the devices for the printers, and the name of the system to which they are connected.

Determining printer status

To determine printer status:

1. Enter:

```
lpstat -t
```

The system displays a message similar to the following:

```
scheduler is running
system default destination: prt1
device for prt1: /dev/s_pdev_cmsterm1_12
device for prt2: /dev/s_pdev_cmsterm1_7
prt1 accepting requests since Thu Apr 6 13:33:12 MDT 2000
prt2 not accepting requests since Thu Oct 28 15:29:45 MDT 1999 -
    unknown reason
printer prt2 is idle. enabled since Wed Nov 10 13:19:57 MST 1999.
available.
printer prt1 is idle. enabled since Thu Apr 6 13:33:12 MDT 2000.
available.
```

This example shows that:

- The scheduler is running.
If the scheduler is not running, see [Restarting the printer scheduler](#) on page 159 for more information.
 - The system default printer. In this example it is prt1.
If you need to change or add a default printer, see [Assigning a default printer](#) on page 156.
 - The UNIX device for each assigned printer. This information will help you in troubleshooting administration of the port.
 - The status of each printer:
 - accepting or not accepting print jobs
 - enabled or disabled
 - active print requests
- See [Enabling a printer](#) on page 156 and [Administering a printer to accept jobs](#) on page 157 for more information on changing printer status.

Assigning a default printer

Default printers are usually automatically assigned. If a system default printer is not assigned, choose one of the following commands:

- To assign a default printer, enter:

```
/usr/lib/lpadmin -d printer_name
```

- To *not* assign a default printer, enter:

```
/usr/lib/lpadmin -d
```

Sending a test job

There are several ways to send test print job:

- To send a test job to a specific printer, enter:

```
lp -d printer_name /etc/passwd
```

- To send a test job to the default printer, enter:

```
lp /etc/passwd
```

- To test the printer while you are logged in to CMS:

Press **F3** (Commands), and select the `Print Window` option.

The printer will start printing your test print job in a few seconds. It might take a few minutes to print if it is not the first print job in the queue.

Enabling a printer

If a printer is not supposed to be out of service and the printer status shows that a printer is disabled, perform the following procedure:

1. Enter:

```
enable printer_name
```

2. Check the printer status again.

The printer should now be enabled. Any print jobs currently in queue should begin printing.

Disabling a printer

If you need to disable a printer for servicing:

1. Enter:

```
disable printer_name
```

Note:

The printer will continue to print until the buffer is empty.

2. After you have serviced the printer, remember to enable the printer.

Administering a printer to accept jobs

If the printer status shows that a printer is not accepting print jobs, and it is not out of service for a legitimate reason:

1. Enter:

```
/usr/lib/accept printer_name
```

2. Check the printer status again. The printer should now be accepting print jobs. Any print jobs currently in queue should begin printing.

Administering a printer to not accept jobs

If you need to keep jobs from queuing at a printer:

1. Enter:

```
/usr/lib/reject printer_name
```

2. After you have serviced the printer, remember to enable the printer.

Canceling a print job

You can cancel one or more specific jobs, or cancel all jobs for a specific user. Avaya services personnel will only cancel print jobs after receiving permission from customer.

Note:

The lp or root logins can cancel any print job. Users can only cancel their own print jobs.

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Choose one of the following commands to cancel a print job:

- To cancel one or more print jobs, enter:

```
cancel job# job# job#
```

The printer will continue to print until the buffer is empty.

- To cancel all print jobs for a specific user, enter:

```
cancel -u userID
```

The printer will continue to print until the buffer is empty.

Administering a printer

If a printer is being replaced with a different model, you must re-administer the printer if the printer type has changed. For example, if you are replacing an Okidata ML321T (type `ibmproprinter`) with an Okidata OKIPAGE 24 (type `hplaserjet`), you must readminister the printer.

To change the printer type, choose one of the following procedures:

- Use the Port Administration Tool to remove the old printer and add the new printer.

The Port Administration Tool is the recommended method for adding new printers. See, [Administering ports with the Port Administration tool](#) on page 143 for more information.

- Enter the following command on a single line at the command prompt:

```
lpadmin -p printer_name -T printer_type -o stty=printer_speed
```

Troubleshooting a printer that will not print

This section includes the following topics:

- [Restarting the printer scheduler](#) on page 159
- [Re-enabling a printer](#) on page 159
- [Checking the printer paper](#) on page 160

Restarting the printer scheduler

If the printer is not running the printer will not print the jobs in the queue. Verify that the scheduler is running before performing this procedure, see [Determining printer status](#) on page 155.

1. If the scheduler is not running, enter one of the following commands to log in as lp or root:

- `su lp`
- `su root`

2. Enter the correct password when prompted.

3. Turn on the scheduler by entering:

```
/usr/lib/lpsched
```

4. Verify that the scheduler is running by entering:

```
lpstat -t
```

Re-enabling a printer

If the printer status indicates that a printer is enabled but not working, perform the following procedure:

1. Stop the print jobs currently printing by entering:

```
disable printer_name
```

2. Re-enable the printer by entering:

```
enable printer_name
```

3. Send a print job to the printer.

4. Perform the following steps if the printer still will not print:

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a. Enter:

```
disable printer_name
```

b. Turn the printer power off and on.

c. Re-enable the printer by entering:

```
enable printer_name
```

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 line printer administration using the `lpstat -p printer -l` command for the baud rate, parity, and so on. The defaults are 9600, no parity, and 1 stop bit. Any exceptions will be noted.

Checking the printer paper

The printer will stop printing the current job when it detects an out-of-paper situation.

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.

To reload the printer with paper:

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 (or equivalent) on your printer. See your printer manual if necessary.

The printer should continue with the print job at the point where it stopped printing.

Correcting unreadable printer output

This section contains the following topics:

- [Replacing the printer ribbon or cartridge](#) on page 161
- [Correcting unreadable text](#) on page 161

Replacing the printer ribbon or cartridge

If the output from the current print job is unreadable, the printer ribbon or cartridge may need replacing.

To replace the printer ribbon or cartridge:

1. Stop the print job currently printing by entering:

```
disable printer_name
```

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.

2. Fix the problem as necessary. Refer to your printer manual if necessary.
3. After the printer has been fixed, properly align the paper in the printer.
4. Enable the printer by entering:

```
enable printer_name
```

The printer will start printing the current job over again.

Correcting unreadable text

If the printer is printing unreadable text and the printer is connected to an SAI/P port:

1. Enter:

```
stty -a < /dev/term/portdesignator
```

2. Verify that the printer port settings are set to:
 - 9600 baud

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- no parity
 - 8 data bits
 - 1 stop bit
 - xon-xoff flow control
3. If the settings are not correct, readminister the printer.

Recovering a print job when a printer loses power

When a printer loses power, the current print job is lost.

To recover from this problem:

1. Disable the printer until it receives power by entering:
`disable printer_name`
2. When the printer has power, enable the printer by entering:
`enable printer_name`
3. Resubmit the lost print job.

Stopping and reprinting the current print job

When you want to stop and reprint the current job:

1. Stop the print job currently printing by entering:

```
disable printer_name
```

The printer will continue to print until the buffer is empty.

2. Reposition the paper in the printer if necessary.
3. Re-enable the printer by entering:

```
enable printer_name
```

The printer should start reprinting the print job from the beginning.

Maintaining report production when a printer is out-of-service

This section provides procedures you can use when a printer is not functioning and CMS reports are being printed. Defective printers should be replaced as soon as possible.

This section includes the following topics:

- [Single printer configuration](#) on page 165
- [Multiple printer configuration](#) on page 166

Single printer configuration

If a system has only one printer and it is not functioning, you can choose one of the following procedures to maintain report production:

- [Saving print jobs until the printer is fixed](#) on page 165
- [Rejecting print jobs](#) on page 165

Saving print jobs until the printer is fixed

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. Disable the printer by entering:
`disable printer_name`
2. Fix the problem as necessary. Refer to your printer manual if necessary.
3. After the printer has been fixed, reposition the paper in the printer.
4. Enable the printer by entering:

`enable printer_name`

The printer should start printing the first print job in the queue over again.

Rejecting print jobs

To reject print jobs until the printer has been fixed:

1. Disable the printer by entering:
`disable printer_name`
2. Enter one of the following commands to log in as lp or root:

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- `su lp`
 - `su root`
3. Enter the correct password when prompted to do so.
 4. Reject all future print jobs by entering the following command:

```
/usr/lib/reject printer_name
```
 5. Choose one of the following:
 - If you do not need to cancel any print jobs in queue, go to Step 6.
 - If you need to cancel the jobs already in the queue:
 - i. Enter the following command to display the print jobs in queue:

```
lpstat -t
```
-  **Important:**
When you cancel a print job, it is removed from the printer queue. If you want this job to print after the printer is repaired, do not cancel the job.
- ii. Enter the following command to cancel the print jobs:

```
cancel job# job# job#
```
6. Fix the printer as necessary. Refer to your printer manual if necessary.
 7. Reposition the paper in the printer when the printer is ready to be brought on line.
 8. Enable the printer by entering:

```
enable printer_name
```
 9. Administer the printer to accept all future print jobs by entering:

```
/usr/lib/accept printer_name
```

A few seconds after you enter this command, the printer should start printing the first print job in the queue.

Multiple 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:

- [Routing print jobs to a working printer](#) on page 167
- [Moving print jobs in queue to another printer](#) on page 167
- [Rejecting print jobs](#) on page 167

Routing print jobs to a working printer

To temporarily route future print jobs from a disabled printer to a working printer:

1. Log into CMS.
2. Select **Maintenance**. Then select **Printer Administration**.
3. Enter **Ctrl+Z** to clear all data fields.
4. Enter the name of the disabled printer in the **CMS printer name** field.
5. Move to the **LP printer name** field, and change the printer name to another printer that is currently working.
6. Do a **Modify** to change the destination printer.

The CMS printer name is now associated with a new LP printer. The print jobs sent to the CMS printer will be redirected to the new LP printer.

Note:

Remember to reassociate the LP printer back to the original CMS printer when the disabled printer is working again.

Moving print jobs in queue to another printer

To move current print jobs from the queue of a disabled printer to the queue of a working printer:

Choose one of the following actions:

- Enter the following command to move *all* print jobs currently queued at the disabled printer to an alternate printer:

```
/usr/lib/lpmove disabled_printer alternate_printer
```

- Enter the following command to move selected print jobs currently queued at the disabled printer to an alternate printer:

```
/usr/lib/lpmove job# alternate_printer
```

Rejecting print jobs

To reject print jobs until the printer has been fixed:

1. Disable the printer by entering:

```
disable printer_name
```
2. Enter one of the following commands to log in as lp or root:
 - `su lp`
 - `su root`
3. Enter the correct password when prompted.

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4. Reject all future print jobs by entering the following command:

```
/usr/lib/reject printer_name
```

5. Choose one of the following:

- If you do not need to cancel any print jobs in queue, go to Step 6.
- If you need to cancel the jobs already in the queue:
 - i. Enter the following command to display the print jobs in queue:

```
lpstat -t
```

 **Important:**

When you cancel a print job, it is removed from the printer queue. If you want this job to print after the printer is repaired, do not cancel the job.

- ii. Enter the following command to cancel the print jobs:

```
cancel job# job# job#
```

6. Fix the printer as necessary. Refer to your printer manual if necessary.
7. Reposition the paper in the printer when the printer is ready to be brought on line.
8. Enable the printer by entering:

```
enable printer_name
```

9. Administer the printer to accept all future print jobs by entering:

```
/usr/lib/accept printer_name
```

A few seconds after you enter this command, the printer should start printing the first print job in the queue.

Troubleshooting serial printers connected to an NTS port

If you are experiencing a problem with a serial printer connected to an NTS port, do the following:

1. Check the cables from the NTS (and patch panel on a 64-port NTS) to verify that they are connected to the correct port and that the cables are correctly seated. See the [Solving general NTS problems](#) on page 185 for procedures.
2. Check the parity, data bits, and speed settings of the printer. Verify that the settings agree with the `na` setup (Network Administration).
3. Check the `rtelnet` and `lpadmin` administration if the port administration and connectivity (using `cli` commands) is correct. To verify that the `rtelnet` process is running, enter:

```
ps -ef | grep rtelnet
```

The system responds with one or more lines that indicate whether an `rtelnet` process is running for the port in question. The following example shows `rtelnet` processes running for three printers on the NTS named `cmsterm1`.

```
root xyz 2238 8 14:46:18 ?    0:14 rtelnet -brao cmsterm1 63 /dev/s_pdev_cmsterm1_63
root xyz 3367 8 14:46:18 ?    0:14 rtelnet -brao cmsterm1 25 /dev/s_pdev_cmsterm1_25
root xyz 3897 8 14:46:18 ?    0:14 rtelnet -brao cmsterm1 7 /dev/s_pdev_cmsterm1_7
```

4. If the `rtelnet` process is not running for the desired printer port, you must manually restart the process. For example, if there is a printer administered for port 12 and there is no `rtelnet` process running for that port, enter:

```
rtelnet -brao cmsterm1 12 /dev/s_pdev_cmsterm1_12
```

You must also make sure the `rtelnet` process is restarted after the machine reboots by adding the same `rtelnet` command to the `/etc/rc2.d/Speripherals` file. For more information, see [RTELNET administration](#) on page 224.

5. You must also verify that two or more `rtelnet` processes are not active for the same NTS port. If two identical processes are running, you must “kill” one of the processes. View all active `rtelnet` processes by entering:

```
ps -ef | grep rtelnet
```

The following example shows two identical processes on the same NTS port:

```
root xyz 265 8 14:46:18 ?    0:14 rtelnet -brao cmsterm1 63 /dev/s_pdev_cmsterm1_63
root xyz 735 8 14:46:18 ?    0:14 rtelnet -brao cmsterm1 63 /dev/s_pdev_cmsterm1_63
```

Troubleshooting

6. Kill one of the extra `rtnet` processes by entering:

```
kill -9 process_ID
```

In the previous example, you would kill process ID 735.

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 CMS application. In each section you will find several documented symptoms and corresponding solution steps. In some of the solution steps, you may have to refer to the user manual that came with your terminal.

If after you have tried to solve your terminal problem by using this section and your terminal manual and the terminal is still not functioning properly, escalate the problem through normal procedures.

This section includes the following procedures:

- [Diagnosing problems on a new terminal](#) on page 171
- [Diagnosing problems on a existing terminal](#) on page 172
- [Diagnosing problems on SAI/P cards](#) on page 176
- [Diagnosing problems on Aurora SBus Multiport cards](#) on page 179

Diagnosing problems on a new terminal

This table presents, some common problems associated with installing and setting up a new terminal on a CMS system.

Problem	Solution
The new terminal is not operating.	<ul style="list-style-type: none"> ● If you are experiencing a problem with a terminal that has just been installed and has never been used, check your terminal cabling and administration as described in Connecting terminals, printers, and modems on page 23 and Configuring terminals, printers, and modems on page 51. ● 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.
Terminal does not display anything.	<ul style="list-style-type: none"> ● Make sure that the terminal has been turned on. Check the power switch at the rear of the terminal. ● 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. ● 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.)

Troubleshooting

Problem	Solution
The terminal prints “garbage” on the screen.	Mismatches to speed, parity, and data bits will cause gibberish on the terminal. Reset the terminal. The terminal baud rate and the system baud rate may not match. Refer to the hardware installation document for your platform, regarding installing printers, terminals and modems, specifically the section describing 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 <code>na</code> administration as needed. Look for the correct baud rate, <code>cs8</code> , and <code>parenb</code> options. Verify that the following are not present: <code>cs7</code> and <code>-parenb</code> options.
“Trying IP address” message displays but does not give you a login prompt afterwards (only applicable to terminals connected to an NTS).	<ul style="list-style-type: none">● You probably have an address mismatch for the CMS computer. Check the address in the <code>/etc/hosts</code> file on the CMS computer, and reset the <code>dedicated_address</code> parameter for ports using <code>na</code> administration.
The terminal screen displays <code>login:</code> but does not respond to keyboard input.	<ul style="list-style-type: none">● Check for a loose connection at the keyboard and at the terminal.● 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 problems on a existing terminal

This table presents, some common problems associated with an existing terminal on a CMS system.

Problem	Solution
Several unexpected or “garbage” characters are displayed on the window.	<ul style="list-style-type: none">● Mismatches to speed, parity, and data bits will cause gibberish on the terminal. Reset the terminal or use the <code>na</code> administration as needed.● Try pressing the Ctrl +L keys simultaneously. This should cause the screen to be repainted without the “garbage” characters.

Problem	Solution
The screen suddenly goes blank.	<ul style="list-style-type: none"> ● 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 non-use, the screen will automatically go blank to protect the screen.) ● 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. ● Locate the power switch at the rear of the terminal. Turn the terminal OFF. Wait a few seconds. Turn the terminal ON. ● If all the other terminals have gone blank, a major power supply loss has probably occurred. Check the power source for the terminals.
The terminal "bell" is too loud or cannot be heard.	Adjust the volume control. Refer to your terminal manual for details.
Characters are not being displayed on the screen when the keys are pressed.	On the back of the terminal, locate the power switch. Turn the terminal off. Wait a few seconds. Turn the terminal on.
You turn the terminal on, but nothing is being displayed on the screen.	<ul style="list-style-type: none"> ● 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.) ● Make sure that the terminal has been turned on. Check the power switch on the back of the terminal. ● 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.
You turn the terminal on, and it displays "garbage" characters.	<ul style="list-style-type: none"> ● Press the Enter key once. Pause for a few seconds. Press the Enter key about four times. ● Locate the power switch at the rear of the terminal. Turn the terminal off. Wait a few seconds. Turn the terminal on.
The terminal is "locked up." In other words, the terminal screen does not respond to keyboard input.	<ul style="list-style-type: none"> ● 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. ● If the terminal still does not respond, turn the terminal off. Wait a few seconds. Turn the terminal on and log in again.

Troubleshooting

Problem	Solution
You cannot find a problem that relates to your terminal, or the solution step(s) corresponding to your terminal did not work.	<p>If a particular step does not work or you have already tried it, go to the next step in the list.</p> <p>Perform the following procedure:</p> <p>Note:</p> <p>In some cases, you will be logged off. If this happens, log in again.</p> <ol style="list-style-type: none">1. Press the Control + 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:<ul style="list-style-type: none">- 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.- Check for a loose connection at the keyboard and the terminal.- At the rear of the terminal, locate the cable connected to the connector labeled "modem." Make sure that the cable is connected properly to the "modem" connector. If possible, follow this cable to the system end, and check the connection there.- If another terminal is available, try using it.- See the CMS administrator, or escalate the problem through normal procedures.
The message "login incorrect" is displayed when you try to log in.	Either the login or password you entered is not correct. Carefully, reenter your login and password. Make sure you are not trying to enter an old password. If you still cannot log in, see the CMS administrator, or escalate the problem through normal procedures.

Problem	Solution
<p>Terminal connected to an Aurora SBus Multiport card does not display anything.</p>	<p>Perform the following procedure:</p> <ol style="list-style-type: none"> 1. Verify that the port has been enabled by entering the following command: <pre>pmadm -l -p ttyaurboard_number -sport_number</pre> <p>Verify that under the <code>FLGS</code> field there is a <code>u</code> (not <code>ux</code>), and that a correct device is being used.</p> 2. Check the following two logs for hints about what the trouble might be: <ul style="list-style-type: none"> - <code>/var/saf/_log</code> - <code>/var/saf/ttyaurboard_number/log</code> 3. Set the terminal to 9600 baud. Test the connectivity by entering the following commands: <pre>pmadm -d -p ttyaurboard_number -sport_number</pre> <pre>cat /etc/group > /dev/term/port_number</pre> <p>The contents of the <code>/etc/group</code> file should now be displayed on the screen. If not, check the wiring.</p> 4. Re-enable the port by entering the following command: <pre>pmadm -e -p ttyaur board_number -s port_number</pre> 5. Set the terminal to the correct baud rate (if not 9600 baud). 6. For more information, see the section on Diagnosing problems on Aurora SBus Multiport cards on page 179.

Problem	Solution
<p>Terminal connected to an SAI/P card does not display anything.</p>	<p>Perform the following procedure:</p> <ol style="list-style-type: none"> 1. Verify that the port has been enabled by entering the following command: <pre>pmadm -l -p ttysaipslot -s portdesignator</pre> where <i>slot</i> is the slot (a or b) and <i>portdesignator</i> is the full SAI/P port designation (a000, a001, and so on). Verify that under the <code>FLGS</code> field there is a <code>u</code> (not <code>ux</code>), and that a correct device is being used. 2. Check the following two logs for hints about what the trouble might be: <ul style="list-style-type: none"> - <code>/var/saf/_log</code> - <code>/var/saf/ttysaipslot/log</code> where <i>slot</i> is the slot (a or b). 3. Set the terminal to 9600 baud. Test the connectivity by entering the following commands: <pre>pmadm -d -p ttysaipslot -s portdesignator cat /etc/group > /dev/term/portdesignator</pre> The contents of the <code>/etc/group</code> file should now be displayed on the screen. If not, check the wiring. 4. Reenable the port by entering the following command: <pre>pmadm -e -p ttysaipslot -s portdesignator</pre> 5. Set the terminal to the correct baud rate (if not 9600 baud). 6. For more information, see the section on Diagnosing problems on SAI/P cards on page 176.

Diagnosing problems on SAI/P cards

Determine the extent of the problem. If only terminals connected to the same SAI/P cards have problems, try disabling and then re-enabling the `ttymon` process.

Perform the following procedure:

1. Disable and enable an individual port by entering the following commands:

```
pmadm -d -p ttysaipslot -s portdesignator
```

```
pmadm -e -p ttysaipslot -s portdesignator
```

where *slot* is the slot (a or b) and *portdesignator* is the full SAI/P port designation (a000, a001, etc.).

- If this does not help, disable and then re-enable the entire ttymon by entering the following commands:

```
sacadm -d -p ttysaipslot
```

```
sacadm -e -p ttysaipslot
```

- Verify that the administration is correct:

```
sacadm -l
```

The output should show that there is one tty mon for each SAI/P card. For example:

PMTAG	PMTYPE	FLGS	RCNT	STATUS	COMMAND
ttysaipa	ttymon		0	ENABLED	/usr/lib/saf/ttymon#

In this example, only the ttymon monitor, which is identified by the default port monitor tag of ttysaipa (first SAI/P card), is started, and the status is ENABLED.

- Verify that the ports are correctly administered on the SAI/P card by entering:

```
pmadm -l
```

- Verify that each port is administered with the correct device name (/dev/term/N).

The following table describes the fields in the `sacadm -l` output.

Field	Description
PMTAG	A unique tag that identifies a particular port monitor. The <code>pmtag</code> is used by the <code>sac</code> to identify the port monitor for all administration. Use the default <code>ttymon pmtag</code> , <code>zsmon</code> , for <code>ttymon</code> ports A and B; use the listen <code>pmtag</code> , <code>tcp</code> for listen ports in the United States. PMTAG can contain up to 14 alphanumeric characters.
PMTYPE	The type of the port monitor: <code>ttymon</code> or <code>listen</code> .
FLGS	If no flag is specified, the port monitor is started and enabled. The <code>d</code> flag specifies that when the port monitor is started, it is not enabled. The <code>x</code> flag specifies that the port monitor is not to be started.
RCNT	Retry count specifies the number of times a port monitor can fail before its state is changed to FAILED. If no count is specified, the field is set to 0, and the port monitor is not restarted if it fails.
STATUS	The status of activity for the port monitor. Possible states are STARTING, ENABLED, DISABLED, STOPPING, NOTRUNNING, and FAILED. The FAILED message is displayed if the <code>sac</code> cannot start the port monitor after the number of tries specified by RCNT.

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Field	Description
COMMAND	The complete path name of the command that starts the port monitor followed by a # and any comment that was entered when the port monitor was configured.

The following table describes the fields in the `pmadm -l` output.

Field	Description
PMTAG	A unique tag that identifies a particular port monitor. The system administrator assigns the name of the port monitor. The pmtag is used by the sac to identify the port monitor for all administration. Use the default <code>pmtag zsmon</code> for <code>ttymon</code> ports; use the <code>pmtag tcp</code> for listen ports. The pmtag can contain up to 14 alphanumeric characters. For SAI/P cards, the pmtags are <code>ttysaipa</code> and <code>ttysaipb</code> .
PMTYPE	The type of the port monitor: <code>ttymon</code> or <code>listen</code> .
SVCTAG	A tag unique to the port monitor that identifies a service. The service tags for the serial ports are <code>ttya</code> and <code>ttyb</code> . A service requires both a service tag and a port monitor tag to identify it uniquely.
FLGS	If no flag is specified, the port is enabled and no <code>utmp</code> entry is created for the service. The <code>x</code> flag specifies that the port should not be enabled; the <code>u</code> flag specifies that a <code>utmp</code> entry should be created for this service. Some services, such as <code>login</code> , will not start unless a <code>utmp</code> entry has been created.
ID	The login name of the person who starts the service, typically <code>root</code> .
PMSPECIFIC	The address, name of a process, name of a STREAMS pipe, or baud rate and configuration for a login port.

6. You can also check the logs for any hints about the source of the problem. The `sac` process records port monitor behavior in the `/var/saf/_log` file. In addition, each `ttymon` port monitor has its own log file, `/var/saf/pmtag/log`, where it records information such as messages that it receives from `sac` and services that it starts.

An example of the end of the `/var/saf/_log` file follows. Use the command `tail /var/saf/_log` to display the file. This information shows that the system was

rebooted three times and that the ttymon port monitor ttysaipa was started and enabled successfully each time.

```

Mon Mar 15 14:23:12 1993; 199; port monitor <ttysaipa> changed state from STARTING to
ENABLED
Fri Mar 19 09:43:18 1993; *** SAC starting ***
Fri Mar 19 09:43:19 1993; 203; starting port monitor <ttysaipa>
Fri Mar 19 09:43:19 1993; 119; port monitor <ttysaipa> changed state from STARTING to
ENABLED
Wed Mar 24 15:24:24 1993; 437; *** SAC starting ***
Wed Mar 24 15:24:25 1993; 443; starting port monitor <ttysaipa>
Wed Mar 24 15:24:25 1993; 437; port monitor <ttysaipa> changed state from STARTING to
ENABLED
Thu Mar 25 20:36:11: 1993; 201; *** SAC starting ***
Thu Mar 25 20:36:12 1993; 208; starting port monitor <ttysaipa>
Thu Mar 25 20:36:13 1993; 201; port monitor <ttysaipa> changed state from STARTING to
ENABLED

```

An example of the end of the `/var/saf/ttysaipa/log` file is shown next. Use the command `tail /var/saf/ttysaipa/log` to display this file. This information gives more details about how the ttymon port monitor ttysaipa was initialized successfully.

```

Thu Mar 25 20:36:13 1993; 208; PMTAG: ttysaipa
Thu Mar 25 20:36:13 1993; 208; Starting state: enabled
Thu Mar 25 20:36:13 1993; 208; Got SC_ENABLE message
Thu Mar 25 20:36:13 1993; 208; max open files = 1024
Thu Mar 25 20:36:13 1993; 208; max ports ttymon can monitor = 1017
Thu Mar 25 20:36:13 1993; 208; *ptr == 0
Thu Mar 25 20:36:13 1993; 208; SUCCESS
Thu Mar 25 20:36:13 1993; 208; *ptr == 0
Thu Mar 25 20:36:13 1993; 208; SUCCESS

```

Diagnosing problems on Aurora SBus Multiport cards

Determine the extent of the problem. If only terminals connected to the same Aurora SBus Multiport cards have problems, try disabling and then enabling the ttymon process.

Perform the following procedure:

1. To disable and enable an individual port, enter the following commands:

```
pmadm -d -p ttyaurboard_number -s port_number
```

```
pmadm -e -p ttyaurboard_number -s port_number
```

2. If this does not help, then disable and enable the entire ttymon by entering the following commands:

```
sacadm -d -p ttyaurboard_number
```

```
sacadm -e -p ttyaurboard_number
```

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3. Verify that the administration is correct:

```
sacadm -l
```

The output should show that there is one tty mon for each Aurora SBus Multiport card. For example:

```
PMTAG  PMTYPE  FLGS RCNT  STATUS  COMMAND
ttyaur1 ttymon          0   ENABLED /usr/lib/saf/ttymon
```

In this example, only the ttymon monitor, which is identified by the default port monitor tag of ttyaur1 (first Aurora card), is started, and the status is ENABLED.

4. Verify that the ports are correctly administered on the Aurora SBus Multiport card by entering:

```
pmadm -l
```

5. Verify that each port is administered with the correct device name (`/dev/term/N`).

The following table describes the fields in the `sacadm -l` output.

Field	Description
PMTAG	A unique tag that identifies a particular port monitor. The <code>pmtag</code> is used by the <code>sac</code> to identify the port monitor for all administration. Use the default <code>ttymon</code> <code>pmtag</code> , <code>zsmom</code> , for <code>ttymon</code> ports A and B; use the <code>listen</code> <code>pmtag</code> , <code>tcp</code> for <code>listen</code> ports in the United States. PMTAG can contain up to 14 alphanumeric characters.
PMTYPE	The type of the port monitor: <code>ttymon</code> or <code>listen</code> .
FLGS	If no flag is specified, the port monitor is started and enabled. The <code>d</code> flag specifies that when the port monitor is started, it is not enabled. The <code>x</code> flag specifies that the port monitor is not to be started.
RCNT	Retry count specifies the number of times a port monitor can fail before its state is changed to FAILED. If no count is specified, the field is set to 0, and the port monitor is not restarted if it fails.
STATUS	The status of activity for the port monitor. Possible states are STARTING, ENABLED, DISABLED, STOPPING, NOTRUNNING, and FAILED. The FAILED message is displayed if the <code>sac</code> cannot start the port monitor after the number of tries specified by RCNT.
COMMAND	The complete path name of the command that starts the port monitor followed by a # and any comment that was entered when the port monitor was configured.

The following table describes the fields in the `pmadm -l` output.

Field	Description
PMTAG	A unique tag that identifies a particular port monitor. The system administrator assigns the name of the port monitor. The <code>pmtag</code> is used by the <code>sac</code> to identify the port monitor for all administration. Use the default <code>pmtag zsmon</code> for <code>ttymon</code> ports; use the <code>pmtag tcp</code> for listen ports. PMTAG can contain up to 14 alphanumeric characters.
PMTYPE	The type of the port monitor: <code>ttymon</code> or <code>listen</code> .
SVCTAG	A tag unique to the port monitor that identifies a service. The service tags for the serial ports are <code>ttya</code> and <code>ttyb</code> . A service requires both a service tag and a port monitor tag to identify it uniquely.
FLGS	If no flag is specified, the port is enabled and no <code>utmp</code> entry is created for the service. The <code>x</code> flag specifies that the port should not be enabled; the <code>u</code> flag specifies that a <code>utmp</code> entry should be created for this service. Some services, such as <code>login</code> , will not start unless a <code>utmp</code> entry has been created.
ID	The login name of the person who starts the service, typically <code>root</code> .
PMSPECIFIC	The address, name of a process, name of a STREAMS pipe, or baud rate and configuration for a login port.

6. You can also check the logs for any hints about the source of the problem. The `sac` process records port monitor behavior in the `/var/saf/_log` file. In addition, each `ttymon` port monitor has its own log file, `/var/saf/pmtag/log`, where it records information such as messages that it receives from `sac` and services that it starts.

An example of the end of the `/var/saf/_log` file follows. Use the command `tail /var/saf/_log` to display the file. This information shows that the system was

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rebooted three times and that the ttymon port monitor ttyaur1 was started and enabled successfully each time.

```
Mon Mar 15 14:23:12 1993; 199; port monitor <ttyaur1> changed state from
STARTING to ENABLED
Fri Mar 19 09:43:18 1993; *** SAC starting ***
Fri Mar 19 09:43:19 1993; 203; starting port monitor <ttyaur1>
Fri Mar 19 09:43:19 1993; 119; port monitor <ttyaur1> changed state from
STARTING to ENABLED
Wed Mar 24 15:24:24 1993; 437; *** SAC starting ***
Wed Mar 24 15:24:25 1993; 443; starting port monitor <ttyaur1>
Wed Mar 24 15:24:25 1993; 437; port monitor <ttyaur1> changed state from
STARTING to ENABLED
Thu Mar 25 20:36:11: 1993; 201; *** SAC starting ***
Thu Mar 25 20:36:12 1993; 208; starting port monitor <ttyaur1>
Thu Mar 25 20:36:13 1993; 201; port monitor <ttyaur1> changed state from
STARTING to ENABLED
```

7. An example of the end of the `/var/saf/ttyaur1/log` file is shown next. Use the command `tail /var/saf/ttyaur1/log` to display this file. This information gives more details about how the ttymon port monitor ttyaur1 was initialized successfully.

```
Thu Mar 25 20:36:13 1993; 208; PMTAG: ttyaur1
Thu Mar 25 20:36:13 1993; 208; Starting state: enabled
Thu Mar 25 20:36:13 1993; 208; Got SC_ENABLE message
Thu Mar 25 20:36:13 1993; 208; max open files = 1024
Thu Mar 25 20:36:13 1993; 208; max ports ttymon can monitor = 1017
Thu Mar 25 20:36:13 1993; 208; *ptr == 0
Thu Mar 25 20:36:13 1993; 208; SUCCESS
Thu Mar 25 20:36:13 1993; 208; *ptr == 0
Thu Mar 25 20:36:13 1993; 208; SUCCESS
Thu MAR 25 20:36:13 1993; 208; Initialization Completed
```

Solving modem-related problems

This section provides solutions to problems that may occur during the normal operation of the modems supporting the CMS application.

This section includes the following topics:

- [General modem problems](#) on page 183
- [Modems not disconnecting](#) on page 183
- [Modems connected to an Aurora port](#) on page 184

General modem problems

If your modem does not seem to be working upon installation, do the following:

- Check the physical connections. See [Solving general NTS problems](#) on page 185 in this chapter for more details.
- Check to see whether the modem is connected to port 12, 13, 14, or 15 of an Aurora Expander Box. If it is, see [Modems connected to an Aurora port](#) on page 184.
- Check the modem settings.

Note:

The default modem script assumes 8 data bits, 1 stop bit, no parity.

- Check the network administration (`na`) and reset it to match the modem settings. Outbound Modem `speed` must match the speed specified in the `na` administration (for example, 9600 baud). Inbound modem `speed` is unimportant if set to `autobaud`.

Modems not disconnecting

If you are using a U.S. Robotics® Sportster®, a Comsphere™ 3830 or a Comsphere 3910 modem, and you enter the `exit` command to end a dial-in session from a dumb terminal to a CMS system, a new `login` prompt may be returned. To actually disconnect these modems, you should enter `+++` at the dumb terminal to return to the on-line command mode from the data mode. Then, enter `ATH0` to disconnect the modem.

Modems connected to an Aurora port

A factory-configured Aurora Expander Box supports modems only on ports 0 through 11. Ports 12 through 15 do not transmit hardware flow control signals, and are used to support only terminals and printers. Consequently, a modem attached to ports 12, 13, 14, or 15 will not work. The usual corrective measure for such a problem is to disconnect the modem and reconnect it to any available port numbered 0 through 11. You must readminister that port for modem use.

Solving general NTS problems

This section provides several procedures to help solve general problems with ports on an NTS, regardless of the type of equipment connected to the port. If you are experiencing problems with NTS ports, the NTS can be remotely diagnosed by either connecting a modem directly to the NTS in question, or diagnosing the problem through the CMS computer.

This section includes the following topics:

- [Using NTS diagnostic tools](#) on page 185
- [Displaying port configuration](#) on page 190
- [Diagnosing NTS port problems](#) on page 190
- [Replacing the NTS](#) on page 192
- [Checking port connectivity](#) on page 193
- [Resetting NTS ports](#) on page 194

Using NTS diagnostic tools

To diagnose a problem with the terminal server, you can use the Network Administrator utility, the Call Level Interface tool, or panel indicators.

This section includes the following topics:

- [Using the Network Administrator utility](#) on page 185
- [Using the CLI tool](#) on page 186
- [CLI commands](#) on page 187
- [Examples of using CLI commands](#) on page 188
- [Using panel indicators](#) on page 189

Using the Network Administrator utility

The Solaris Network Administrator (`na`) utility on a CMS computer provides the commands for managing the NTS.

These commands allow the user (also remote users) to do the following:

- Set and display the operating characteristics of the NTS and its ports
- Reboot or reset the NTS and its ports
- Broadcast messages to the NTS ports.

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The following table provides the `na` commands that are available.

Command	Description
<code>annex</code>	Defines default <code>annex_list</code> .
<code>boot</code>	Boots the NTS.
<code>broadcast</code>	Sends a broadcast message to one or more ports.
<code>copy</code>	Copies NTS port configuration parameters to other ports.
<code>dumpboot</code>	Boots the NTS and produces a dump.
<code>echo</code>	Writes remainder of the line to the standard output.
<code>help</code>	Displays help for commands.
<code>password</code>	Defines the administrative password.
<code>port</code>	Defines a default port.
<code>printer</code>	Defines a default printer.
<code>quit</code>	Terminates <code>na</code> command.
<code>read</code>	Reads and executes a script file.
<code>reset</code>	Resets the NTS or a port.
<code>set</code>	Defines or modifies the value of a parameter.
<code>show</code>	Displays current value of a parameter.
<code>write</code>	Writes current configuration to a file.

Using the CLI tool

You can use the Call Level Interface tool (CLI) to do the following:

- Check port or NTS statistics
- Check port or NTS statistics and administration
- Tap into any port to check the data being transmitted and received

See [Examples of using CLI commands](#) on page 188.

To access CLI tool:

1. Log into the CMS computer.

- Enter the following command:

```
telnet ntsname
```

The system displays the following message:

```
Trying IP address ...
Connecting to IP address
Escape character is ...
```

Note:

If the connection does not work, you may have the wrong address for your NTS. Check the `/etc/hosts` file.

- Press **Enter**.

The system displays the following message:

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

- At the `annex:` prompt, enter a `cli` command. See [CLI commands](#) on page 187 for additional information.

CLI commands

The following table 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.

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 information for commands.
<code>hosts</code>	Displays current Sun system table.
<code>jobs</code>	Displays a list of current jobs.
<code>kill</code>	Terminates a job.
<code>lock</code>	Locks a port.

Command	Description
<code>netstat</code>	Displays network status.
<code>ppp</code>	Converts a CLI port to a PPP interface port.
<code>queue</code>	Displays or Removes queued requests.
<code>rlogin</code>	Connects to a Sun system.
<code>services</code>	Displays or Removes queued requests.
<code>slip</code>	Converts a CLI port to a SLIP port.
<code>stats</code>	Displays NTS statistics.
<code>stty</code>	Displays and modifies CLI port parameters.
<code>telnet</code>	Connects to a Sun system.
<code>who</code>	Displays NTS users.

Examples of using CLI commands

Example 1: Check NTS or port statistics

To display a list of all NTS users with port numbers, enter:

```
who
```

The system responds with a list of administered user names, locations per port, and the NTS status.

Example 2: Check NTS or port statistics and administration

- The `stats` command, without any arguments, gives overall statistics on the NTS. You can check the Internet address, the serial ports received, and the transmitted numbers.
- The `stats -s5-7` command gives statistics on ports 5-7. This can be helpful to check the receive and transmit on a per-port basis.
- Using the CLI (in superuser mode) allows more flexibility. Do the following steps to enter the CLI mode:

- a. Enter the `su` command at the `Annex:` prompt.

You will be asked for a password. The default password is the IP address of the NTS.

- b. Clear the statistics (in superuser mode) by entering:

```
stats -c
```

c. Use NTS administration with the `admin` command.

The `admin` interface is the same as the `na` administration.

Example 3: Tap a port to check the data

To monitor all communications to or from a port (in super-user mode), do the following steps:

1. Enter:

```
tap x
```

where `x` is the port number.

2. Stop monitoring the port by pressing **Ctrl + A**

3. Enter:

```
jobs
```

The system responds: `+1 tap 7`

4. Stop the job by entering:

```
kill 1
```

where `1` is the job number.

5. Exit the CLI mode by entering:

```
hangup
```

6. Check the connectivity of the CMS computer by entering:

```
ping IP_address
```

7. Stop the output by pressing **Ctrl + A**

For additional information, see the *Network Terminal Server Administrator User's Guide*.

Using panel indicators

The NTS front panel has six system indicators and eight status indicators.

The system indicators are labeled:

- Power
- Unit
- Net
- Attn
- Load
- Active

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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 CMS computer. However, the indicators provide both a progress report and an error display to assist you in troubleshooting.

Displaying port configuration

This section describes how to display the current configuration for a port or a range of ports.

To find which port corresponds to a user:

1. Use an editor, such as vi editor to search through the `/etc/local.admin/*info` files.
2. If the files are not current or do not exist, they can be written from within the `na` administration. Enter:

```
write ntsname /etc/local.admin/ntsname_info
```

where *ntsname* is the name of the NTS.

3. View the port, by choosing one of the following commands:

- For a serial printer, enter:

```
show port=port_number/range
```

You can specify one port or multiple ports. For example, `port 1` or `port 1-10`.

- For parallel printers, enter:

```
show printer=port_number/range
```

Diagnosing NTS port problems

This section includes the following topics:

- [Listing NTS logins and ports](#) on page 191

- [Troubleshooting NTS port problems](#) on page 191

Listing NTS logins and ports

To diagnose an NTS-related port problem, you can print out each NTS login along with the NTS port each login is using.

- Enter:

```
/cms/toolsbin/cmstermwho
```

The system displays a list of NTS logins and NTS ports.

Troubleshooting NTS port problems

If none of the NTS ports seem to be working upon installation, do the following:

1. Check the ethernet wiring. One cable should run from the CMS computer to the first port on the network hub unit, and a second should run from one of the other ports on the network hub unit to a transceiver. The transceiver should connect directly to the back of the NTS.

2. If the cabling is correct, enter:

```
/usr/sbin/ping nts_name
```

The system displays the following message:

```
nts_name is alive
```

3. If the command times out or gives some other error condition, cycle 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 lighted.
5. If the NTS still fails to respond, check and reset the NTS address by doing the following:
 - a. Reattach a console (set to 9600 baud, no parity, 1 stop bit) to the console port, and cycle the power on the NTS.
 - b. Press the **Test** button within 10 seconds, and wait for the `monitor:` prompt to appear.
 - c. To check that the unit has a current address and load, enter:

```
addr
```

Note:

If the values displayed are not correct, change them to match the addresses given on the CMS computer in the `/etc/hosts` file. If the addresses were not changed via user error, notify the Technical Service Center (TSC).

Troubleshooting

6. Try different ethernet cables and swap out the transceiver. If the failure persists, call the TSC for assistance.
7. 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 existing configuration 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 the following table to readminister the ports. This table shows the factory defaults; the actual IP addresses and NTS names may differ.

Device	IP address	NTS	File name
CMS Computer	192.168.2.1	host_computer	N/A
NTS (#1)	192.168.2.101	cmsterm1	cmsterm1_info
NTS (#2)	192.168.2.102	cmsterm2	cmsterm2_info
NTS (#3)	192.168.2.103	cmsterm3	cmsterm3_info
NTS (#X)	192.168.2.1XX	cmstermX	cmstermX_info

Use the `read` command to repopulate the nonvolatile memory on the NTS with your latest translation by doing the following:

1. Select an NTS by entering:

```
annex ntsname
```

2. Load the stored configuration information for the first NTS from a file by entering:

```
read /etc/local.admin/ntsname_info
```

Note:

The configuration information is also stored in nonvolatile memory on the NTS.

The system displays the following message:

```
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:

```
reset all@ntsname
```

The system displays the following message:

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

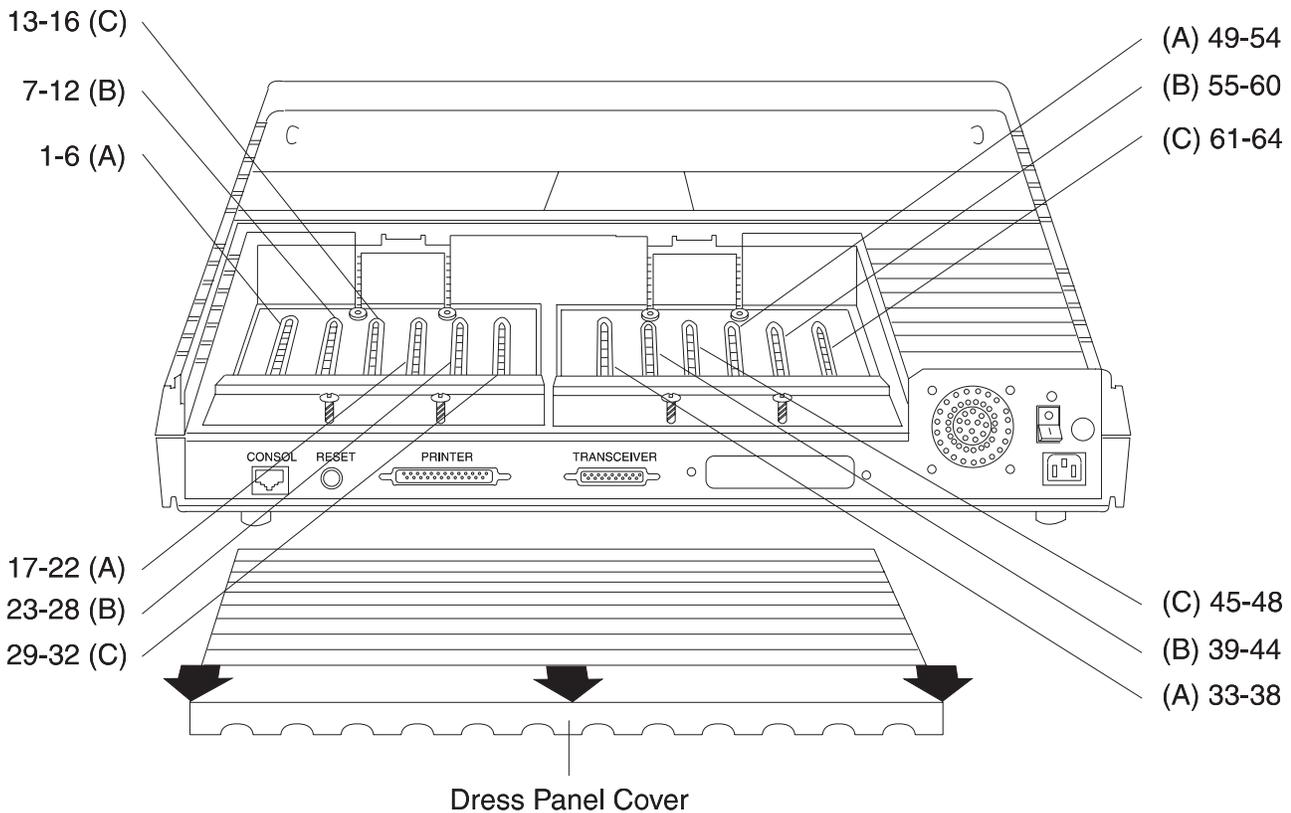
Checking port connectivity

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

- For 8- and 64-port NTSs, check the connection to each terminal, printer, or modem. See [Connecting terminals, printers, and modems](#) on page 23 for details.

Troubleshooting

- For a 64-port NTS, check the three cables (A, B, and C) that run from the NTS to each NTS octopus cable (see the following figure). Verify that the cables are correctly seated at each end.



Resetting NTS ports

If the `na` port administration is questionable, reset the port to its default configuration.

This section includes the following topics:

- [Checking port administration](#) on page 194
- [Resetting a port to the default configuration](#) on page 195
- [Storing port configurations](#) on page 195

Checking port administration

Do the following:

1. Check the port administration.

2. To reset the port to its default configuration, enter the `na` command at the system prompt.
3. To associate all subsequent administration with a specific NTS, enter the following command:

```
annex ntsname
```

Note:

The terminal address, *ntsname*, is the name defined in the `/etc/hosts` file.

Resetting a port to the default configuration

To reset a port or ports to the default configuration, do the following:

1. Enter the following command, where *port_number/range* can be a single port (x) or a range of ports (x-y):

```
reset port_number/range
```

Note:

The preceding command makes the specified ports the default set. All subsequent port commands will refer to these ports.

2. Enter the following command to reset the parameters associated with the default port set:

```
read /etc/local.admin/defport
```

Note:

This returns the parameters to their factory defaults except for *user_name*, *location*, and *dedicated_address*.

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

```
read /etc/local.admin/96term
```

4. To make any additional changes to the speed or parity, enter the following command (2400 is only an example one of the speeds that you can use):

```
set port speed 2400
```

Note:

If the ports are not specified, the default setting is used.

Storing port configurations

To store the port configurations to a file:

1. Enter:

```
write ntsname /etc/local.admin/ntsname_info
```

Troubleshooting

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 a text editor).

The system displays the following message:

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

2. Reset the port exit the administration session by entering the following commands:

```
reset port_number/range
```

```
quit
```

Solving problems with NTS administration

Examples of common problems with NTS administration are described along with their solution.

This section contains the following procedures:

- [Version numbers do not match](#) on page 197
- [NTSs are not recognized](#) on page 197
- [Serial port warnings](#) on page 198
- [Unknown pass phrase](#) on page 198
- [NTS does not load the boot file](#) on page 198

Version numbers do not match

Problem:

When you first start `na` it reports version R13.3 or later, but when you annex an NTS it reports version R7.0.

Solution:

This is normal behavior when you are using older info files with more recent administration software. Power cycle the NTS.

NTSs are not recognized

Problem:

When you try to annex an NTS you receive an error similar to `ntsname not responding` or some other similar message indicating that the NTS is not being recognized.

Solution:

You may have a problem with network connectivity or with routing. Quit the `na` command and try to ping the NTS. If that fails, the NTS may be hung and may require a reboot via the console terminal.

Serial port warnings

Problem:

You receive warnings for serial port parameters like `input_buffer_size` and `bidirectional_modem`, and so on.

Solution:

The new administration software retires a number of serial port parameters, and institutes a large number of new parameters. Consequently, messages concerning serial port parameters can be ignored.

Unknown pass phrase

Problem:

The NTS administration program has asked for a pass phrase, and you do not know it.

Solution:

If the system administrator has access-protected the NTSs, you will not be able to do anything without knowing the pass phrase.

NTS does not load the boot file

Problem:

After administering an NTS, it fails to load the boot file. You can ping the NTS but cannot telnet to, or use the Network Administrator (NA) utility on the NTS. If there are additional NTSs setup they will be operating normally.

Solution:

When a NTS boots for the first time it uploads its boot file from the CMS system and stores it in NVRAM for future use. Sometimes this file becomes corrupt. For more information, see [NTS fails to load the boot file](#) on page 199.

NTS fails to load the boot file

After administering an NTS, it fails to load the boot file. You can ping the NTS but cannot telnet to, or use the Network Administrator (NA) utility on the NTS. If there are additional NTSs set up, they will be operating normally.

When an NTS boots for the first time, it uploads its boot file from the CMS system and stores it in NVRAM for future use. Sometimes this file becomes corrupted.

To repair a corrupted file:

1. From a command prompt on the CMS system, enter:

```
mv /usr/annex /usr/annex.old
```

2. Enter:

```
mkdir /usr/annex
```

3. Enter:

```
chmod 755 /usr/annex
```

4. Reload the NTS drivers according to the instructions in the CMS software installation document.
5. Power-cycle the NTS. Within 15 seconds, push the **Test Switch** button on the front of the NTS.

The NTS goes through its hardware diagnostics, and the system displays the following message:

```
Monitor:
```

6. To verify the configuration of the NTS, enter the following command:

```
addr
```

The system displays a series of prompts for the NTS network configuration.

7. Make any changes to the network settings or press **Enter** to accept the default settings.
8. Enter:

```
boot
```

9. From the `command:` prompt on the CMS system, enter:

```
na
```

The system displays the following message:

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

Troubleshooting

10. Enter:

```
annex cmsterm $x$ 
```

where x equals the number of the NTS.

The system displays a message that is similar to the following example. The response may differ depending on what type of NTS you have.

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

11. Enter the following commands:

```
read
```

```
/etc/local.admin/ntsm $x$  info
```

where x equals the number of the NTS.

12. Enter:

```
boot
```

13. Enter:

```
quit
```

Note:

If the NTS still fails to boot, re-administer the NTS according to [Provisioning an NTS](#) on page 127. For additional troubleshooting information, see [Solving general NTS problems](#) on page 185 and [Solving problems with NTS administration](#) on page 197.

■ ■ ■ ■ ■ ■

Appendix A: Administering ports using the Solaris tools

This section describes how you administer terminals, printers, and modems using the Solaris tools instead of the Port Administration tool as described in [Administering ports with the Port Administration tool](#) on page 143.



Important:

The Port Administration tool is the recommended method for administering ports, but you can use the Solaris tools if your Avaya CMS software does not have the Port Administration tool.

This section contains the following topics:

- [Administering terminals with Solaris tools](#) on page 202
- [Administering printers with Solaris tools](#) on page 221
- [Administering modems with Solaris tools](#) on page 239

Administering terminals with Solaris tools

This section includes the following topics:

- [Administering terminals on an NTS](#) on page 202
- [Port administration used for SAI/P cards](#) on page 205
- [Port administration used for Aurora SBus Multiport cards](#) on page 211

Administering terminals on an NTS

This section describes how to set port parameters for terminals connected using an NTS. After the terminals are connected, you must complete the `na` administration for the CMS computer to recognize the new terminal(s).

Note:

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

Configuring the NTS

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

1. Log in at the CMS computer as **root**.
2. Access the NTS administration software by entering:

```
na
```

The system displays the following message:

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

3. To associate all subsequent administration with a specific network terminal server, enter:

```
annex ntsname
```

where `ntsname` is the administered name of the NTS.

For example, if the NTS is named `cmsterm1`, use the command **annex cmsterm1**

Note:

When you enter `annex ntsname`, that NTS 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 as administered in the `/etc/hosts` file.

The system displays the following message:

```
ntsname: Annex-3-UXR<current release number>, 64 ports
command:
```

4. For terminals, enter the set port command string on a single line at the command prompt:

```
set port=port number/range mode dedicated type hardwired
    dedicated_address IPaddress 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 *port number/range* 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.

Note:

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

The system displays the following message:

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

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

Port generic parameter	Default parameter	Recommended setting	Comments
port	NA	NA	Enter a single port number (such as <code>port=5</code>), or a range of port numbers (such as <code>port=3-9</code>).
mode	cli	dedicated	NA

Administering ports using the Solaris tools

Port generic parameter	Default parameter	Recommended setting	Comments
type	hard-wired	hard-wired	NA
dedicated_address	0.0.0.0	IP address of CMS computer	Set to the IP address of CMS computer.
control_lines	none	modem_control	NA
location	""	"a location"	It is important to set this parameter so port problems can be traced.
user_name	""	"a user"	It is important to set this parameter so port problems can be traced.
speed	9600	Match the baud rate of your terminal (for example, 9600).	Speed may be changed to your baud rate.
data_bits	8	8	Can be set to match the terminal settings.
parity	none	none	Can be set to match the terminal settings.
stop_bits	1	1	Can be set to match the terminal settings.

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

```
reset port_number/range
```

For example, to reset port 9, enter `reset 9`. To reset ports 12 through 15, enter `reset 12-15`.

The system displays the following message:

```
# resetting serial port <port number/range> of annex  
<ntsname>
```

⚠ CAUTION:

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

6. To store the new port configurations to a file, enter:

```
write ntsname /etc/local.admin/ntsname_info
```

where `ntsname` is the name of the NTS.

The system displays the following message:

```
<ntsname>: Annex-3-UX R(most current release number & date)
          writing...
command:
```

7. To check the new port configurations, enter the following command:

```
show port=port number/range
```

where `port number/range` is a single port or a range of ports.

8. To get out of NTS administration, enter:

```
quit
```

Port administration used for SAI/P cards

Each port on an SAI/P card used by terminals or incoming modems needs to have a port administered.

- To find out which port monitors are running, enter:

```
sacadm -l
```

There will be one entry for each SAI/P card installed and administered.

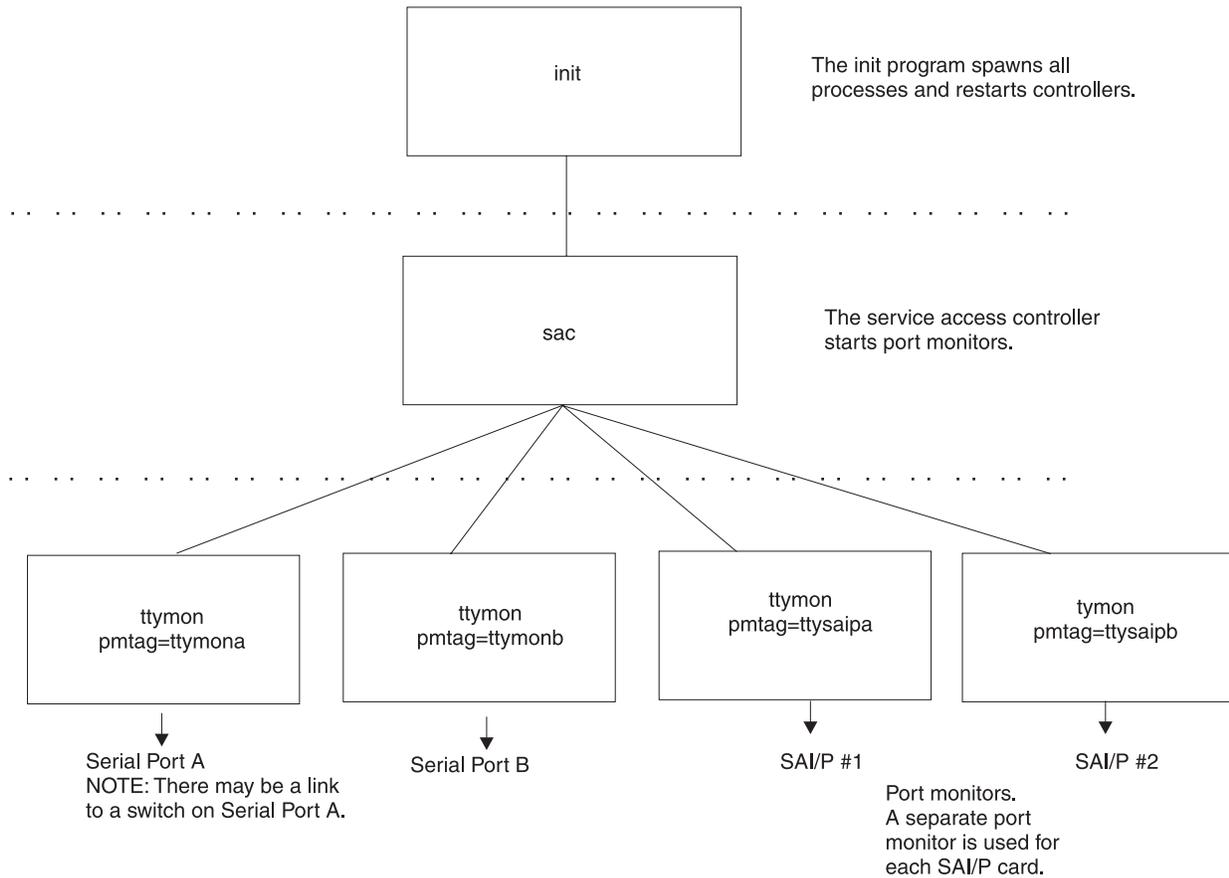
Administering ports using the Solaris tools

- To see the administration for each port monitor, enter:

```
pmadm -l
```

There will be one entry for each port on that SAI/P card that is used for logging in from a terminal or a modem. Ports used by printers or outgoing modems will not appear.

The figure below shows the process involved in port administration.



Setting up a terminal requires that you use either:

- **sacadm** and **pmadm** commands
- **admintool &** command

Administering terminals using sacadm and pmadm

Perform the following procedure:

1. To check to see if a port monitor `ttysaipsaip letter` already exists, enter:

```
sacadm -l | grep ttysaipsaip letter
```

2. If port monitor `ttysaipsaip letter` does not exist, enter the following command on a single line at the command prompt for each serial port card:

```
sacadm -a -p ttysaipsaip letter -t ttymon -c /usr/lib/saf/ttymon
-v 1 -y "serial ports"
```

3. If any errors are reported or if there is one administered incorrectly, it can be removed by entering:

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

4. Enter the following command for each terminal and incoming modem connected to the expander box (that is, connected to the serial ports card), on a single line at the command prompt:

```
pmadm -a -p ttysaipsaip letter -s saip lettersaip number -i
root -f u -v 1 -m ``ttyadm -d /dev/term/saip lettersaip
number -l n9600 -s /usr/bin/login -m ldterm,ttcompat -S
n``
```

Note:

The *saip letter* of the first SAI/P card in the above command is labeled 'a.' A second SAI/P card would be labeled 'b.' SAI/P numbers range from 000-007.

5. If a port is administered incorrectly, the administration can be removed by entering:

```
pmadm -r -p ttysaipsaip letter -s svctag
```

The value for *pmtag* and *svctag* can be obtained from the `pmadm -l` command.

The value of the *svctag* is the same as the *saip lettersaip number*, which is the same as the port number.

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

```
sacadm -r -p pmtag
```

Example:

To administer two terminals connected to port 2 of the first SAI/P card and port 7 of the second SAI/P card, you would enter the following commands.

```
pmadm -a -p ttysaipa -s a002 -i root -f u -v 1 -m ``ttyadm -d /
dev/term/a002 -l n9600 -s /usr/bin/login -m ldterm,ttcompat -
S n``
```

```
pmadm -a -p ttysaipb -s b007 -i root -f u -v 1 -m ``ttyadm -d /
dev/term/b007 -l n9600 -s /usr/bin/login -m ldterm,ttcompat
- S n`
```

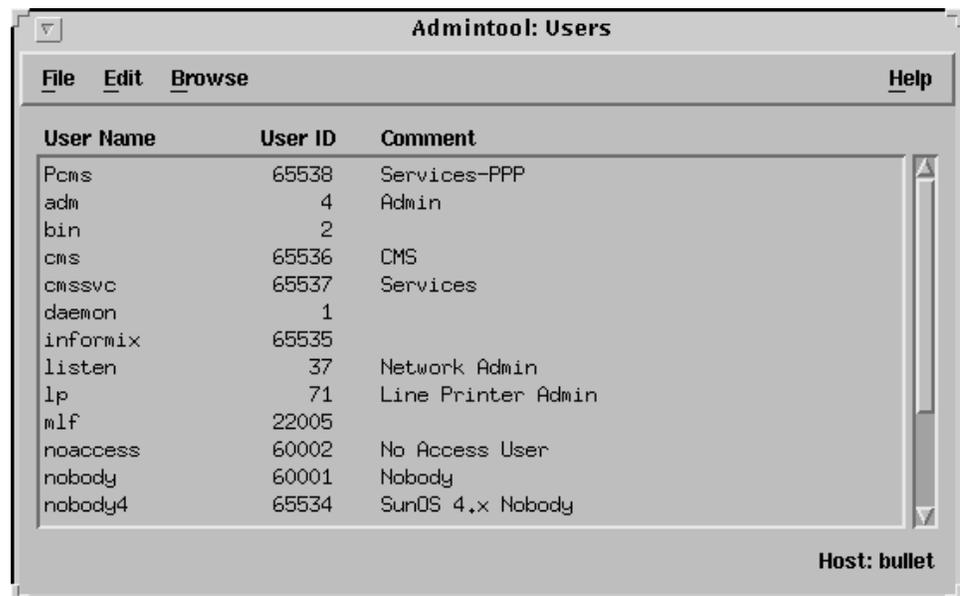
Administering terminals using admintool

To administer terminals on SAI/P cards (8-port) using the admintool command:

1. Enter:

```
admintool &
```

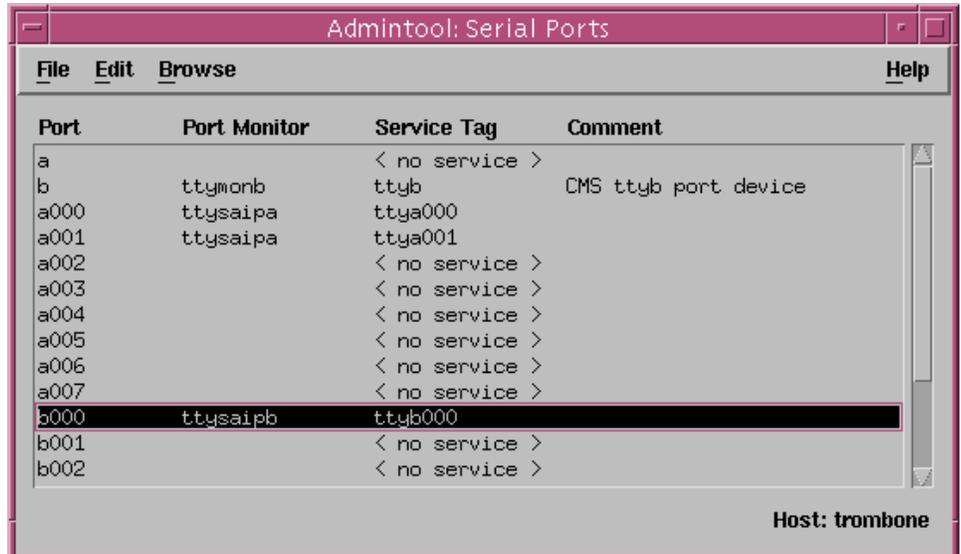
The system displays the **Administration Tool** window:



2. Select the **Browse** pull-down menu, then select **Serial Ports**.

The system displays the Admintool: Serial Ports window.

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



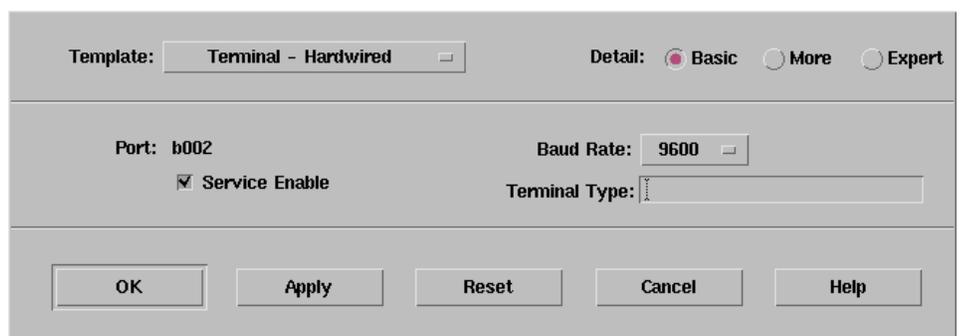
3. Select the port you want to administer.

Note:

The Admintool of Solaris 2.5.1 allows administration of only one port at a time.

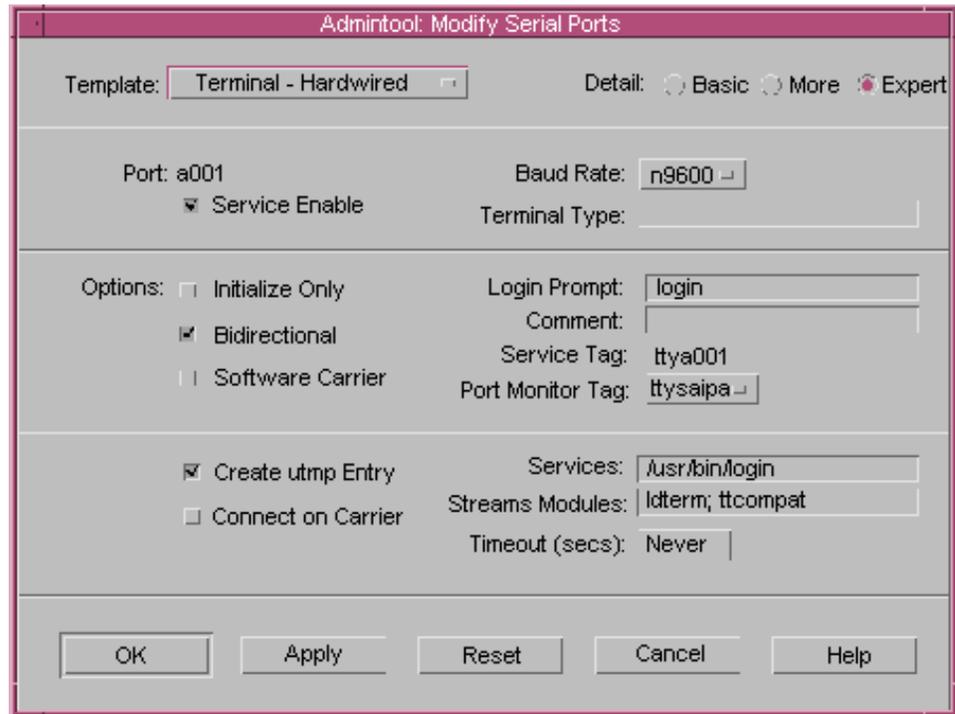
4. Select the **Edit** pull-down menu, then select **Modify**.

The system displays the Modify Serial Port window.



Administering ports using the Solaris tools

5. Click on the **Expert** button.



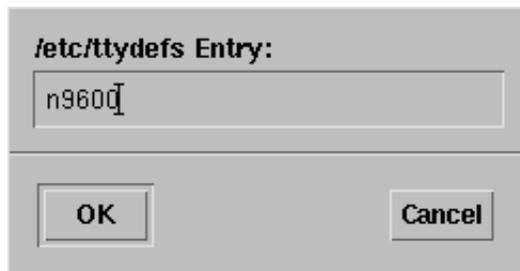
6. Click on the menu to the right of **Baud Rate** and select **other**.

The system displays the Baud Rate window.

7. In the **/etc/ttydefs Entry** text line, enter:

nbaud rate

Example:



8. Click on the **OK** button.

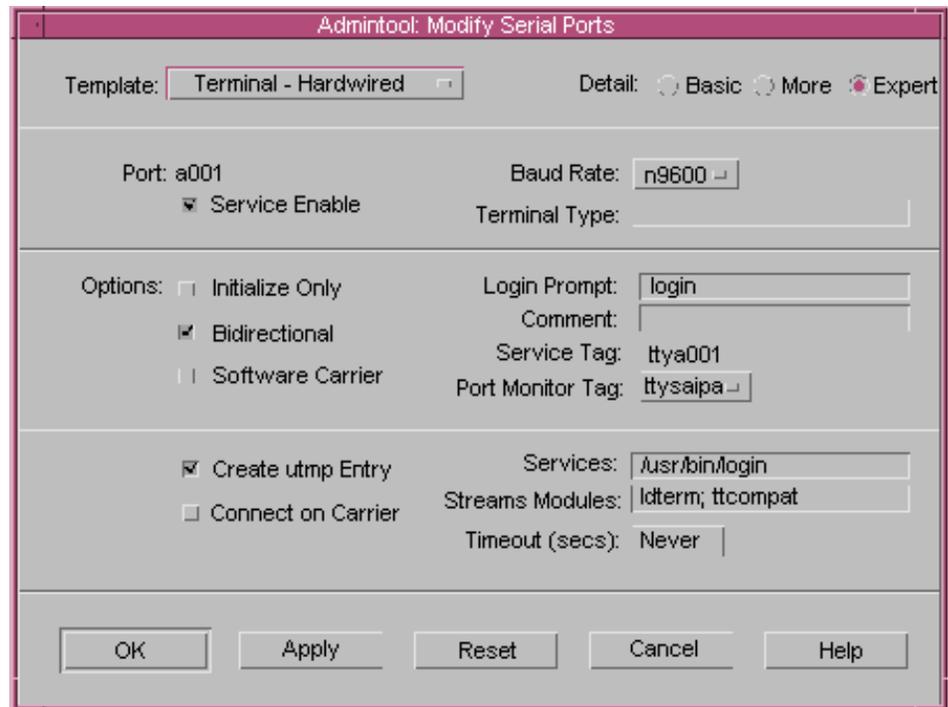
The Baud Rate window disappears and the Modify Serial Ports window becomes active.

9. Select the **Port Monitor Tag** dropbox. Then select **Other** from the list.

10. In the **Set Port Monitor Tag** field, enter:

```
ttysaipa
```

11. Select **OK**.



12. Click on the **Apply** button.

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

13. Click on **OK**.

The system displays the Serial Port Manager window, with the changes made to the system. The ports selected in the beginning of this procedure are now administered for terminals.

14. Repeat this procedure for each SAI/P card needing administration.

Port administration used for Aurora SBus Multiport cards

Each Aurora SBus Multiport card needs to have a port monitor administered.

- To find out which port monitors are running, enter:

```
sacadm -l
```

There will be one entry for each Aurora SBus Multiport card installed and administered.

Administering ports using the Solaris tools

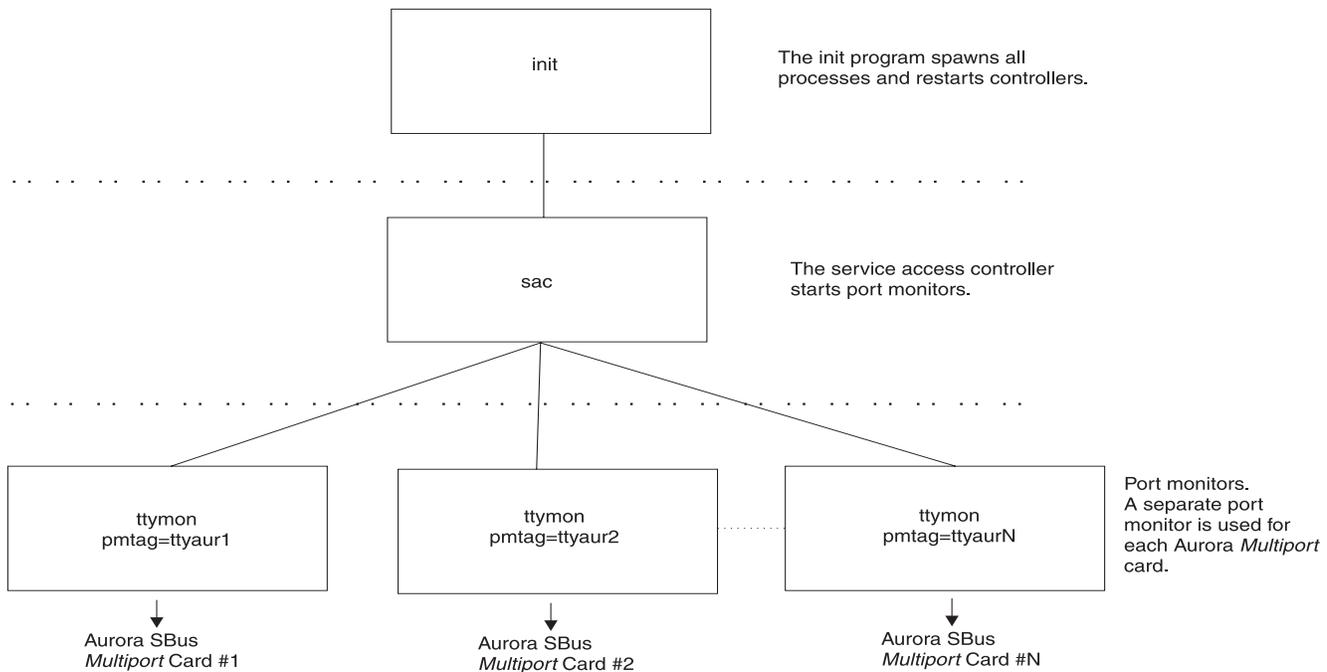
Each port on an Aurora SBus Multiport card used by terminals or incoming modems needs to have a port administered.

- To see the administration for each port monitor, enter:

```
pmadm -l
```

There will be one entry for each port on that Aurora SBus Multiport card that is used for logging in from a terminal or a modem. Ports used by printers or outgoing modems will not appear.

The figure below shows the process involved in port administration.



Administering terminals using sacadm and pmadm

Perform the following procedure:

1. For each serial ports card, enter the following command on a single line at the command prompt:

```
sacadm -a -p ttyaurcard number -t ttymon -c /usr/lib/saf/ttymon  
-v 1 -y "aurports"
```

The *card number* represents the serial ports card number. Start at one for the first card, two for the second, and so on.

2. Enter:

```
sacadm -l
```

3. Verify that there is one entry for each Aurora SBus Multiport card on the system.

4. If there are any entries that are not needed or if there is one administered incorrectly, it can be removed by entering:

```
sacadm -r -p pmtag
```

5. For each terminal and incoming modem connected to the expander box (that is, connected to the serial ports card), enter the following command on a single line at the command prompt:

```
pmadm -a -p ttyaurcard number -s port number -i root -f u -v 1
-m ``ttyadm -d /dev/term/port number -l n9600 -s /usr/bin/login
-m ldterm,ttcompat -S n``
```

6. If a port is administered incorrectly, the administration can be removed by entering:

```
pmadm -r -p pmtag -s svctag
```

The value for *pmtag* and *svctag* can be obtained from the `pmadm -l` command.

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

```
sacadm -r -p pmtag
```

Example:

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

```
sacadm -a -p ttyaurcard number -t ttymon -c /usr/lib/saf/ttymon
-v 1 -y "aurports"
```

```
pmadm -a -p ttyaur1 -s 2 -i root -f u -v 1 -m ``ttyadm -d /dev/
term/2 -l n9600 -s /usr/bin/login -m ldterm,ttcompat - S
n``
```

```
pmadm -a -p ttyaur1 -s 7 -i root -f u -v 1 -m ``ttyadm -d /dev/
term/7 -l n9600 -s /usr/bin/login -m ldterm,ttcompat-S n``
```

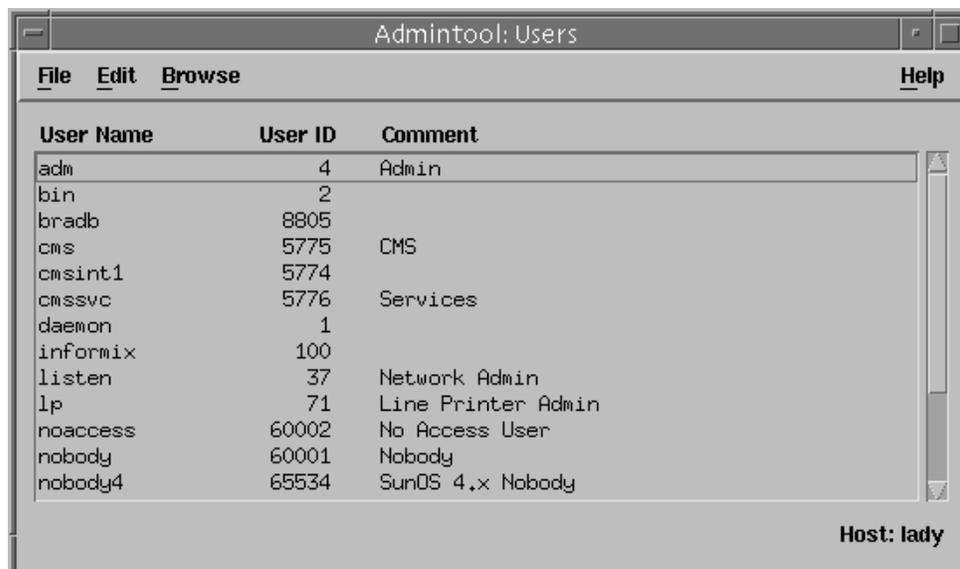
Administering terminals using admintool

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

1. Enter:

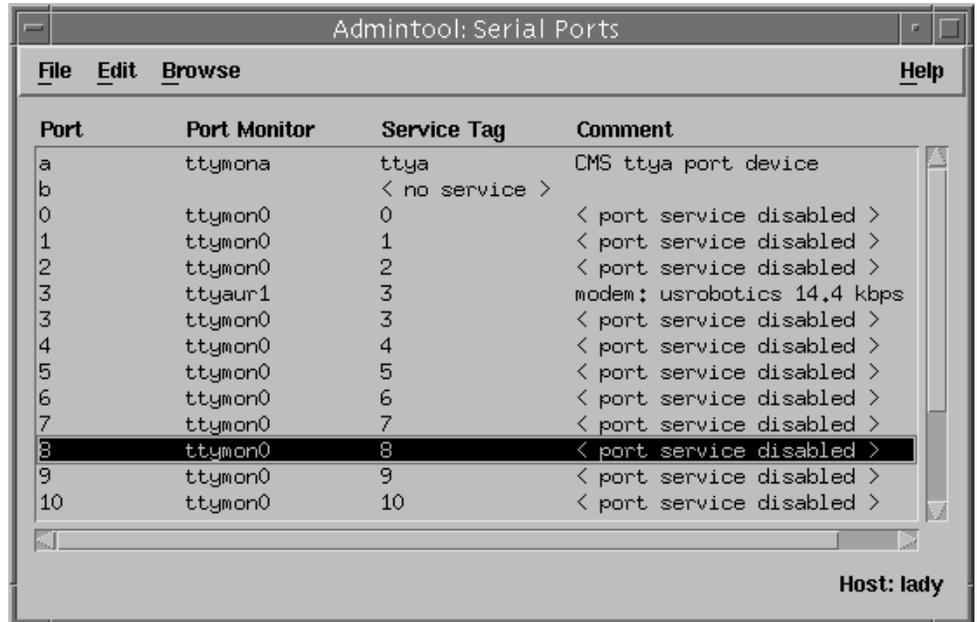
```
admintool &
```

The **Admintool: Users** window appears.



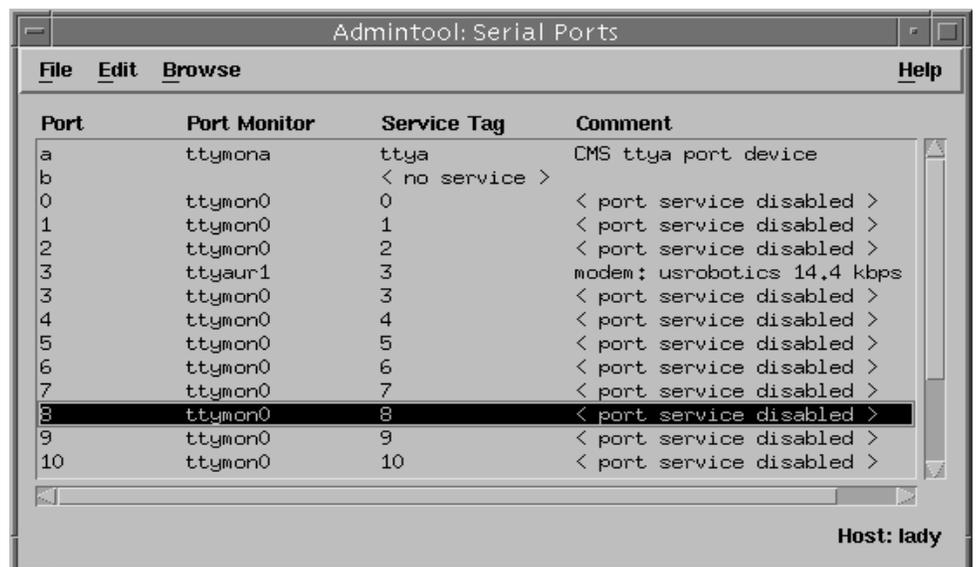
2. Select the **Browse** pull-down menu. Then select **Serial Ports**.

The system displays the **Admintool: Serial Ports** window. The information in the window will differ depending upon your configuration.



3. Highlight the port you want to administer.

The system displays the following window:.



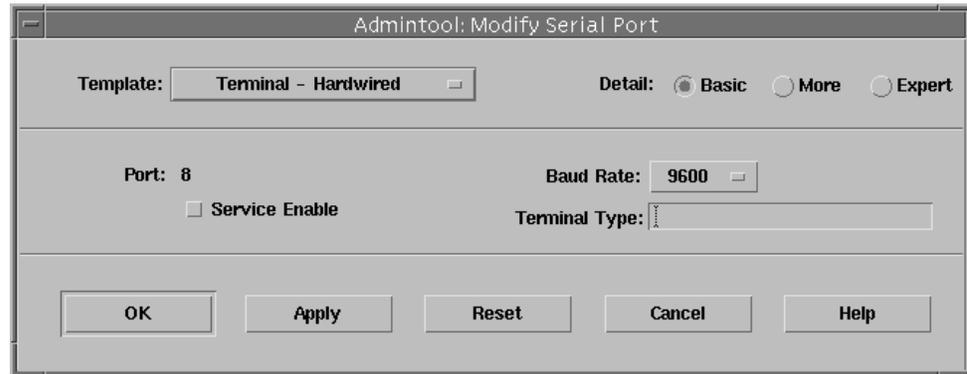
Administering ports using the Solaris tools

Note:

The Admintool of Solaris 2.5.1 allows administration of only one port at a time.

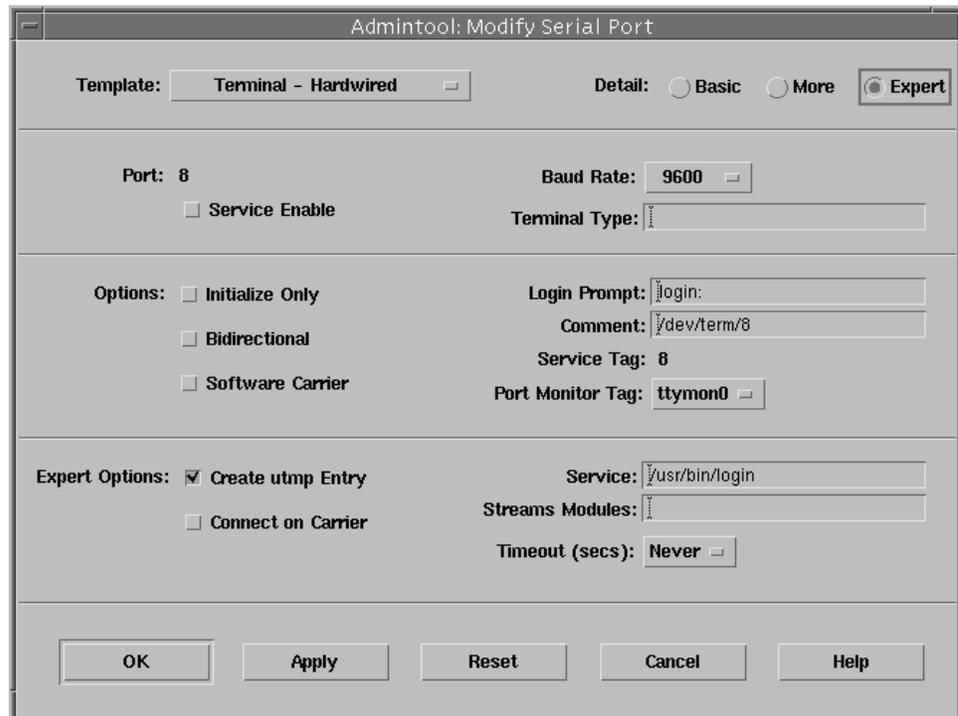
4. Select the **Edit** pull-down menu. Then select **Modify**.

The system displays the **Modify Serial Port** window.



5. Click on the **Expert** button.

The system expands the **Modify Serial Port** window.



- Click on the **Service Enable** button.

The system displays the **Admintool: Set Baud Rate** window.

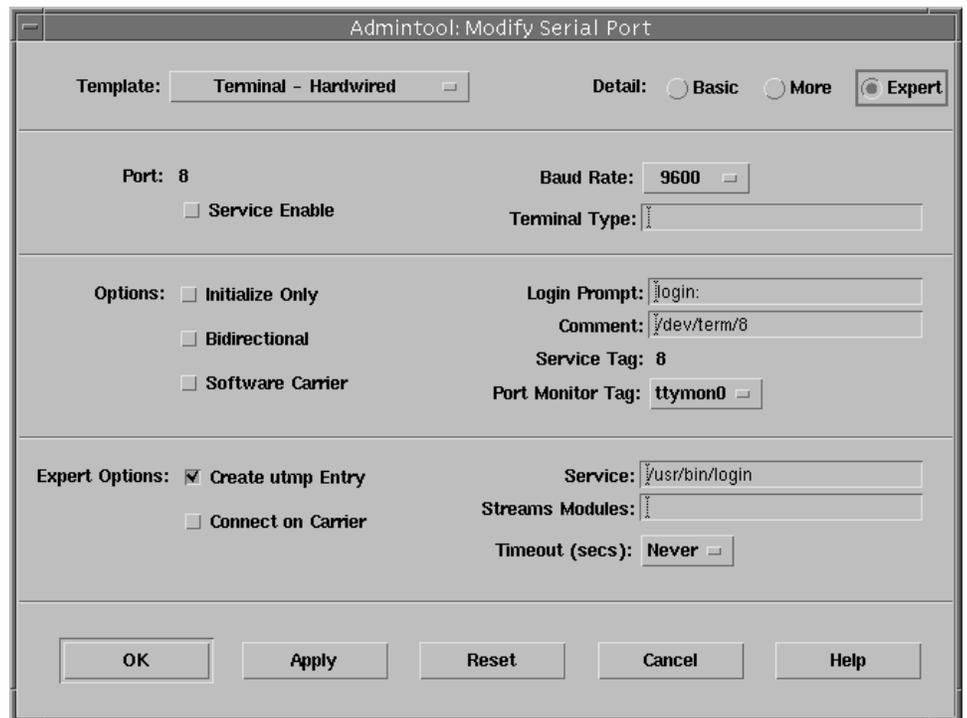
- In the **/etc/ttydefs Entry** text line, enter:

nbaud rate



- Click on the **OK** button.

The **Admintool: Set Baud Rate** window disappears and the system displays the **Admintool: Modify Serial Port** window.



- Click on the menu to the right of **Port Monitor Tag** and select **other**.

The system displays the **Admintool: Set Port Monitor Tag** window.

Administering ports using the Solaris tools

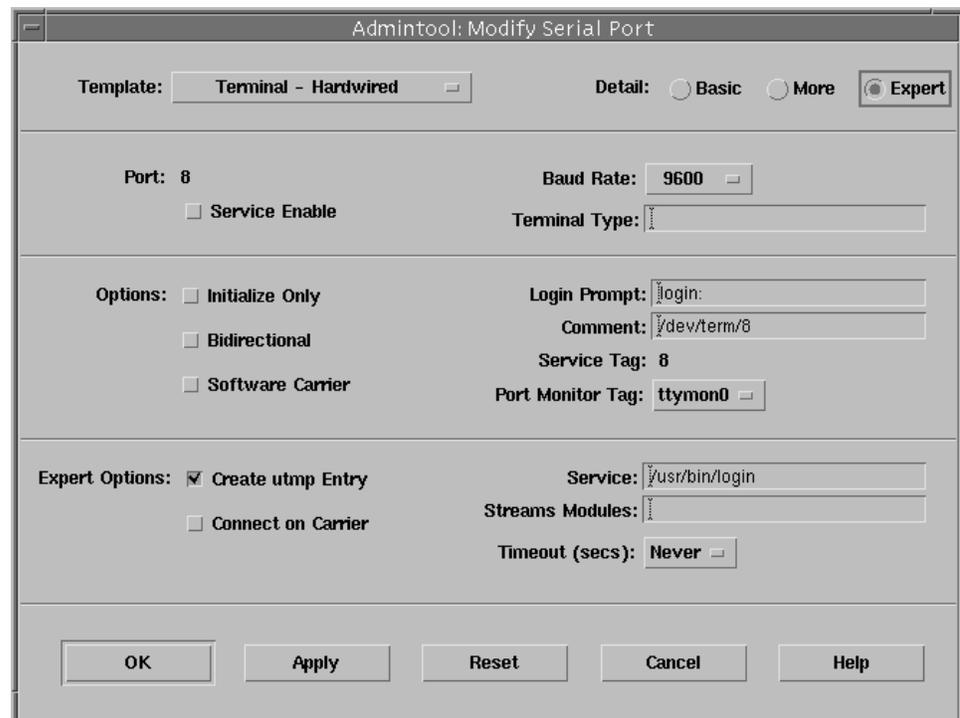
10. Enter:

```
ttyaur2
```



11. Click on the **OK** button.

The **Admintool: Set Port Monitor Tag** window disappears and the system displays the **Admintool: Modify Serial Ports** window.



12. In the **Streams Modules** text line, enter:

```
ldterm, ttcompat
```

13. In the **Expert Options** area, click **Create utmp Entry**.

The system displays the following window:

Admintool: Modify Serial Port

Template: Terminal - Hardwired Detail: Basic More Expert

Port: 8 Baud Rate: 9600

Service Enable Terminal Type: []

Options: Initialize Only Login Prompt: /login:

Bidirectional Comment: /dev/term/8

Software Carrier Service Tag: 8

Port Monitor Tag: ttyaur2

Expert Options: Create utmp Entry Service: /usr/bin/login

Connect on Carrier Streams Modules: ldterm,ttcompat

Timeout (secs): Never

OK Apply Reset Cancel Help

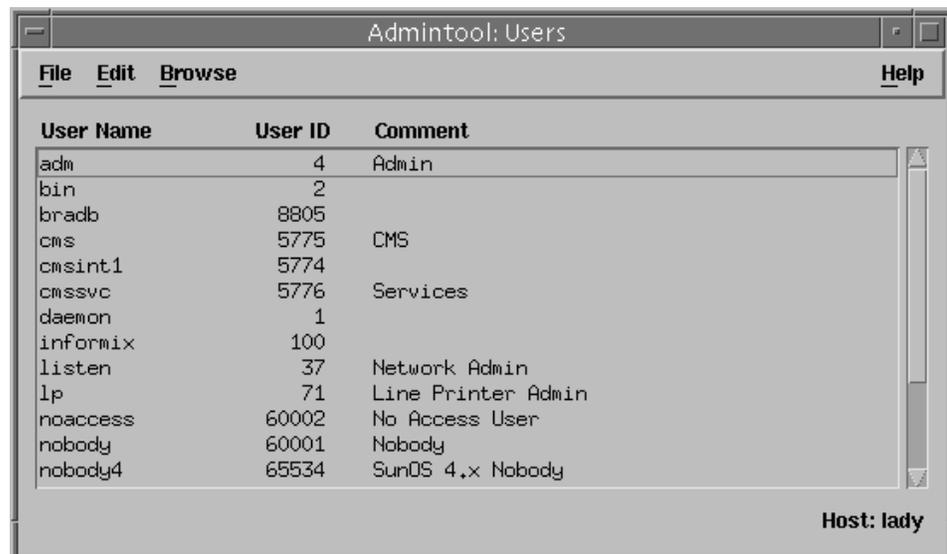
14. Click on the **Apply** button.

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

Administering ports using the Solaris tools

15. Click on **OK**.

The system displays the **Admintool: Users** window, displaying the changes made.



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

Administering printers with Solaris tools

If the `port_admin` tool is not available, printers can be administered using Solaris.

This section includes the following topics:

- [Serial printers connected to an NTS](#) on page 221
- [Serial printers connected to an SAI/P card](#) on page 227
- [Serial printers connected to an Aurora SBus Multiport card](#) on page 228
- [Parallel printers connected to an NTS](#) on page 229
- [Parallel printers connected to the built-in port on an Ultra 5 or Blade 100](#) on page 232
- [Parallel printers connected to the built-in port on a SPARCserver](#) on page 233
- [Removing a printer](#) on page 234

Serial printers connected to an 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 following procedures:

- [Configuring the NTS](#) on page 221
- [RTELNET administration](#) on page 224
- [LPADMIN administration](#) on page 225

Note:

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

Configuring the NTS

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

1. Log in at the CMS computer as **root**.
2. Access the NTS administration software by entering:

na

The system displays the following message:

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

Administering ports using the Solaris tools

3. Associate all subsequent administration with a specific network terminal server by entering:

```
annex ntsname
```

where *ntsname* is the administered name of the NTS. Use the NTS names and addresses as administered in the */etc/hosts* file.

Note:

When you enter *annex ntsname*, that NTS 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.

The system displays the following message:

```
ntsname : Annex-3-UXR current release number, 64 ports  
command:
```

4. To administer a serial printer, enter the following command on a single line at the command prompt:

```
set port=port number/range mode slave type hardwired  
control_lines both input_flow_control start/stop  
output_flow_control start/stop location "location"  
user_name "name" speed printer_speed
```

Note:

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

The system displays the following message:

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

See the following table for more details about using the set port command string. You do not have to set any parameters if the default parameters are correct.

Port generic parameter	Default parameter	Recommended setting	Comment
port	NA	NA	Enter a single port number (such as port=5), or a range of port numbers (such as port=3-9).
mode	cli	slave	NA

Port generic parameter	Default parameter	Recommended setting	Comment
type	hardwired	hardwired	NA
dedicated_address	0.0.0.0	IP address of CMS computer	Set to the IP address of CMS computer.
control_lines	none	Set to both.	NA
input_flow_control	bell	Set to start/stop.	NA
output_flow_control	none	Set to start/stop.	NA
location	""	"a location"	It is important to set this parameter so port problems can be traced.
user_name	""	"a user"	It is important to set this parameter so port problems can be traced.
speed	9600	Set to match the speed of the printer. Do not use autobaud.	Speed can be changed to match your printer's baud rate.
data_bits	8	Set to match the requirements of the printer.	Can be set to match the printer settings.
parity	none	Set to none.	Can be set to match the printer settings.
stop_bits	1	Set to match the requirements of the printer.	Can be set to match the printer settings.

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

```
reset port_number/range
```

For example, to reset port 9, enter `reset 9`. To reset ports 12 through 15, enter `reset 12-15`.

The system displays the following message:

```
# resetting serial port port number/range of annex
ntstname
```

⚠ CAUTION:

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

6. To store the new port configurations to a file, enter the following:

```
write ntsname /etc/local.admin/ntsname_info
```

where `ntsname` is the name of the NTS.

The system displays the following message:

```
ntsname : Annex-3-UX R current release number & date
        writing...
command:
```

7. To check the new port configurations, enter the following command:

```
show port=port_number/range
```

where `port_number/range` is a single port or a range of ports.

8. To get out of NTS administration, enter:

```
quit
```

9. Continue with `rtelnet` administration.

RTELNET administration

To place the command for serial printers in a file, continue with the following:

1. Edit the **Speripherals** file by using the following command:

```
vi /etc/rc2.d/Speripherals
```

2. Add a line for each printer port you just administered for the NTS. Enter on a single line:

```
rtelnet -brao ntsname port# /dev/s_pdev_ntsname_port#
```

where `ntsname` is the name of the NTS and `port#` is the port on the NTS.

Example:

To set up `cmsterm1`, port 9, enter:

```
rtelnet -brao cmsterm1 9 /dev/s_pdev_cmsterm1_9
```

3. When finished adding entries, enter:

```
:wq!
```

4. Enter:

```
cd /
```

- For each new printer just administered you must start a rtelnet process. Enter on a single line:

```
rtelnet -brao ntsname port# /dev/s_pdev_ntsname_port#
```

- Enter:

```
ps -ef | grep rtelnet
```

- Verify that there is one rtelnet process running for each administered printer.

Note:

If there is more than one rtelnet process running for a printer, use `kill -9 process_ID` to stop the process.

- Continue with `lpadmin` administration.

LPADMIN administration

To run the command to administer serial printers, continue with the following steps:

- For serial printers connected to the NTS, enter the following command on a single line at the command prompt:

```
lpadmin -p printername -D "printer location" -i /usr/spool/lp/  
model/standard -o nobanner -v /dev/s_pdev_ntsname_port# -A  
mail -T type -o "stty=baud rate"
```

where *printername* is the name of the printer, and

where *printer location* is the location of the printer, and

where *ntsname_port#* is the NTS and port number administered using rtelnet, and

where *type* is the lpadmin type in the [LPADMIN printer settings](#) on page 225, and

where *baud rate* is the speed of the printer.

LPADMIN printer settings

Printer	"lpadmin" type	Emulation mode
475 Dot Matrix	475	-
476 Dot Matrix	476	-
477 Dot Matrix	477	-
495 Laser	495hp	HP
570 Parallel Dot Matrix	570ibm	IBM

Administering ports using the Solaris tools

Printer	“lpadmin” type	Emulation mode
571 Parallel Dot Matrix	571libm	IBM
572 Serial Dot Matrix (Narrow Paten)	572	-
573 Serial Dot Matrix (Wide Platen)	573	-
580 Parallel Dot Matrix	580ibm	IBM
581	581ibm	IBM
583 Dot Matrix	583ibm	IBM
593 Laser	593hp	HP
595 Laser	hplaserjet	HP
5310 Dot Matrix	5310	-
5320 Dot Matrix	5320	-
6417 GIS Parallel Dot Matrix	ibmproprinter	IBM
Okidata 183	ibmproprinter	IBM
Okidata 320	ibmproprinter	IBM
Okidata 321	ibmproprinter	IBM
Okidata OL810e	hplaserjet	HP
Okidata OL830 Plus	hplaserjet	HP
Okidata ML321T	ibmproprinter	IBM
Okidata OP16N (120V)	hplaserjet	HP
Okidata OKIPAGE 24	hplaserjet	HP

2. To make a printer the default destination, enter the following command:

```
lpadmin -d printername
```

Note:

Only one printer can be designated as the system default printer.

3. Enter:

```
enable printername
```

The system enables the printer and displays the following message:

```
printername enabled
```

4. To complete the printer default destination and put the printer into service, enter:

```
accept printername
```

The system displays the following message:

```
printername accepted
```

5. Printers require additional setup within CMS, perform the following steps:
- Log into CMS and select **Maintenance > Printer Administration**.
 - Administer the printer in CMS.

Note:

For more information, see the appropriate Call Management System Administration book for your version of CMS.

Serial printers connected to an SAI/P card

Do the following to verify that a port monitor is not using the desired port

1. To see if there are any entries that use the same device, enter:

```
pmadm -l
```

2. If there is one, it needs to be removed. Enter:

```
pmadm -r -p pmtag -s svctag
```

where *pmtag* and *svctag* are obtained from the `pmadm -l` command done earlier.

To administer a serial printer, do the following:

1. Enter the following command on a single line at the command prompt:

```
lpadmin -p printername -D "comment" -v /dev/term/saip letterport  
number -A mail -T type -o nobanner -o "stty='9600 cs8 -parenb -  
cstopb -crtsets ixon
```

2. Enter the following commands:

```
chown lp /dev/term/saip letterport number  
chmod 600 /dev/term/saip letterport number  
enable printername
```

where *type* is the lpadmin type in the [LPADMIN printer settings](#) on page 225.

The system displays the following message:

```
printername enabled
```

Administering ports using the Solaris tools

3. Enter:

```
printername enabled
```

The system displays the following message:

```
printername accepted
```

4. If you wish to make the printer the default destination, enter the following command from the CMS computer console:

```
lpadmin -d printername
```

5. If your printer has options that can be set, then set your printer to the correct speed, 8 data bits, no parity, 1 stop bit and xon-xoff flow control.

6. Printers require additional setup within CMS, perform the following steps:

a. Log into CMS and select **Maintenance > Printer Administration**.

b. Administer the printer in CMS.

Note:

For more information, see the appropriate Call Management System administration book for your version of CMS.

Serial printers connected to an Aurora SBus Multiport card

Do the following to verify that a port monitor is not using the desired port:

1. to see if there are any entries that use the same device (*/dev/term/port number*), enter:

```
pmadm -l
```

2. If there is one, it needs to be removed. Enter:

```
pmadm -r -p pmtag -s svctag
```

where *pmtag* and *svctag* are obtained from the `pmadm -l` command done earlier.

To administer a serial printer, do the following:

1. Enter the following command on a single line at the command prompt:

```
lpadmin -p printername -D "comment" -v /dev/term/port_number -A  
mail -T type -o nobanner -o "stty='9600 cs8 -parenb -cstopb  
-crtcts ixon tabs'"
```

Where *type* is the lpadmin type in the [LPADMIN printer settings](#) on page 225.

2. Enter the following commands:

```
chown lp /dev/term/port_number
chmod 600 /dev/term/port_number
enable printername
```

The system displays the following message:

```
printername enabled
```

3. Enter:

```
printername enabled
```

The system displays the following message:

```
printername accepted
```

4. If you wish to make the printer the default destination, enter the following command from the CMS computer console:

```
lpadmin -d printername
```

5. If your printer has options that can be set, then set your printer to the correct speed, 8 data bits, no parity, 1 stop bit and xon-xoff flow control.
6. Printers require additional setup within CMS, perform the following steps:
- Log into CMS and select **Maintenance > Printer Administration**.
 - Administer the printer in CMS.

Note:

For more information, see the appropriate Call Management System administration book for your version of CMS.

Parallel printers connected to an NTS

Set up the printers by connecting the printer to the NTS parallel port. The port used to connect parallel printers is found on the back panel of the network terminal server. This NTS parallel port supports either a Centronics or Dataproducts compatible printer.

After the parallel printers are connected, you must complete the `na` and `lpadmin` administration for the CMS computer to recognize the new parallel printer(s).

Configuring the NTS

Complete the `na` administration to set the NTS parallel printer up as Dataproducts.

Administering ports using the Solaris tools

Do the following:

1. Log in at the CMS computer as **root**.
2. To access the NTS administration software, enter:

```
na
```

The system displays the following message:

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

3. To associate all subsequent administration with a specific network terminal server, enter:

```
annex ntsname
```

where *ntsname* is the administered name of the NTS. For example, if the NTS is named `cmsterm1`, use the command `annex cmsterm1`.

Note:

When you enter `annex ntsname`, that NTS 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.

Use the NTS names and addresses as administered in the `/etc/hosts` file.

The system displays the following message:

```
ntsname: Annex-3-UXR current release number, 64 ports
command:
```

4. Depending on your terminal type, you must do one of the following:
 - a. For a Centronics interface, use the default value.
 - b. For a Dataproducts interface, use the following 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`.

Note:

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

5. To reset the parallel printer when you are done, enter:

```
reset printer x
```

where *x* is the number of the printer, 1 or 2.

The system displays the following message:

```
resetting printer 1
```

6. To get out of NTS administration, enter:

```
quit
```

Continue with [LPADMIN administration](#) on page 231.

LPADMIN administration

Continue with the following for parallel printers:

1. For a parallel printer on the first NTS, enter the following command on a single line at the command prompt:

```
lpadmin -p printername -D "comment about printer location" -v /  
dev/lpnull -A mail -i /usr/spool/lp/cmsterm1pr -T type
```

where *type* is the lpadmin type in the [LPADMIN printer settings](#) on page 225.

Note:

The first parallel printer ports on the three other NTSs will use cmsterm2pr, cmsterm3pr, and cmsterm4pr instead of cmsterm1pr. If the speed is not 9600, add the `-o stty=baud` to the command string. The second parallel printer ports will use cmsterm1pr2 on the first NTS, cmsterm2pr2 on the second, cmsterm3pr2 on the third, and cmsterm4pr2 on the fourth.

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:

- i. Copy the `/usr/spool/lp/cmsterm1pr` file to the `/usr/spool/lp/newntspr` file.
- ii. Edit the `/usr/spool/lp/newntspr` file and replace the `ANNEX=cmsterm1` line with `ANNEX=newnts`.

2. To make a printer the default destination, enter:

```
lpadmin -d printername
```

Note:

Only one printer can be designated as the system default printer.

Administering ports using the Solaris tools

3. To enable the printer, enter:

```
enable printername
```

The system displays the following message:

```
printername enabled
```

4. To complete the printer default destination and put the printer into service, enter:

```
accept printername
```

The system displays the following message:

```
printername accepted
```

5. Printers require additional setup within CMS, perform the following steps:
 - a. Log into CMS and select **Maintenance > Printer Administration**.
 - b. Administer the printer in CMS.

Note:

For more information, see the appropriate Call Management System administration book for your version of CMS.

Parallel printers connected to the built-in port on an Ultra 5 or Blade 100

To administer a printer using the built-in port on the Ultra 5 or Blade 100 computer, use the following steps:

1. Enter the following command on the console at the system prompt, for the built-in parallel port:

```
lpadmin -p printername -D "comment" -v /dev/ecpp0 -A mail -i /  
usr/spool/lp/cmsppr -T type
```

where *type* is the lpadmin type in the [LPADMIN printer settings](#) on page 225.

2. To make a printer the default destination, enter:

```
lpadmin -d printername
```

Note:

Only one printer can be designated as the system default printer.

3. To enable the printer, enter:

```
enable printername
```

The system displays the following message:

```
printername enabled
```

4. To complete the printer default destination and put the printer into service, enter:

```
accept printername
```

The system displays the following message:

```
printername accepted
```

5. Printers require additional setup within CMS, perform the following steps:
- Log into CMS and select **Maintenance > Printer Administration**.
 - Administer the printer in CMS.

Note:

For more information, see the appropriate Call Management System administration book for your version of CMS.

Parallel printers connected to the built-in port on a SPARCserver

To administer a printer using the built-in port on the SPARCserver computer, use the following steps:

1. For the built-in SPARCserver parallel port, enter the following command on a single line at the command prompt:

```
lpadmin -p printername -D "comment" -v /dev/bpp0 -A mail -i /usr/spool/lp/cmsppr -T type
```

where *type* is the lpadmin type in the [LPADMIN printer settings](#) on page 225.

2. To make a printer the default destination, enter:

```
lpadmin -d printername
```

Note:

Only one printer can be designated as the system default printer.

Administering ports using the Solaris tools

3. To enable the printer, enter:

```
enable printername
```

The system displays the following message:

```
printername enabled
```

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

```
accept printername
```

The system displays the following message:

```
printername accepted
```

5. Printers require additional setup within CMS, perform the following steps:

- a. Log into CMS and select **Maintenance > Printer Administration**.
- b. Administer the printer in CMS.

Note:

For more information, see the appropriate Call Management System administration book for your version of CMS.

Removing a printer

The Port Admin tool should be used to remove printers, see [Administering ports with the Port Administration tool](#) on page 143 for more information. If the Port Admin tool is not available on your version of CMS the printer can be removed using Solaris.

This section contains the following procedures:

- [Removing a serial printer connected to a NTS](#) on page 234
- [Removing serial printers connected to a SAI/P card](#) on page 236
- [Removing serial printers connected to an Aurora SBus Multiport card](#) on page 237
- [Removing parallel printers connected to a NTS](#) on page 237

Removing a serial printer connected to a NTS

To remove a serial printer connected to a NTS:

1. Enter:

```
lpstat -t
```

2. Verify that there are no print jobs in queue.

3. To cancel one or more print jobs enter:

```
cancel job# job# job#
```

Note:

The printer will continue to print until the buffer is empty.

4. Enter:

```
lpadmin -x printer_name
```

5. Access the NTS administration software by entering:

```
na
```

The system displays the following message:

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

6. Associate all subsequent administration with a specific network terminal server by entering:

```
annex ntsname
```

where *ntsname* is the administered name of the NTS.

7. Enter:

```
port_number/range
```

8. Enter:

```
read /etc/localadmin/defport
```

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

```
reset port_number/range
```

For example, to reset port 9, enter `reset 9`. To reset ports 12 through 15, enter `reset 12-15`.

The system displays the following message:

```
# resetting serial port <port number/range> of annex
<ntsname>
```

10. To store the new port configurations to a file, enter:

```
write ntsname /etc/local.admin/ntsname_info
```

where *ntsname* is the name of the NTS.

The system displays the following message:

```
ntsname: Annex-3-UX R current release number & date
writing...
command:
```

Administering ports using the Solaris tools

11. Enter:

```
quit
```

12. Edit the **Speripherals** file by using the following command:

```
vi /etc/rc2.d/Speripherals
```

13. Delete the rtelnet line that references the removed port.

14. Press **Esc** and enter:

```
:wq!
```

15. Enter:

```
ps -ef | grep rtelnet
```

16. Verify that there are no rtelnet processes running for the removed printer.

Note:

If there is a rtelnet process running for the printer, use `kill -9 process_ID` to stop the process.

17. Perform the following steps within CMS:

- a. Log into CMS and select **Maintenance > Printer Administration**.
- b. Remove the printer from CMS.

Note:

For more information, see the appropriate Call Management System administration book for your version of CMS.

Removing serial printers connected to a SAI/P card

To remove a serial printer connected to a SAI/P card:

1. Enter:

```
lpstat -t
```

2. Verify that there are no print jobs in queue.

3. To cancel one or more print jobs enter:

```
cancel job# job# job#
```

Note:

The printer will continue to print until the buffer is empty.

4. Enter:

```
lpadmin -x printer_name
```

5. Perform the following steps within CMS:

- a. Log into CMS and select **Maintenance > Printer Administration**.

- b. Remove the printer from CMS.

Note:

For more information, see the appropriate Call Management System Administration book for your version of CMS.

Removing serial printers connected to an Aurora SBus Multiport card

To remove a serial printer connected to a Aurora SBus Multiport card:

1. Enter:

```
lpstat -t
```

2. Verify that there are no print jobs in queue.
3. To cancel one or more print jobs enter:

```
cancel job# job# job#
```

Note:

The printer will continue to print until the buffer is empty.

4. Enter:

```
lpadmin -x printer_name
```

5. Perform the following steps within CMS:

- a. Log into CMS and select **Maintenance > Printer Administration**.
- b. Remove the printer from CMS.

Note:

For more information, see the appropriate Call Management System Administration book for your version of CMS.

Removing parallel printers connected to a NTS

To remove a parallel printer connected to a NTS:

1. Enter:

```
lpstat -t
```

2. Verify that there are no print jobs in queue.
3. To cancel one or more print jobs enter:

```
cancel job# job# job#
```

Note:

The printer will continue to print until the buffer is empty.

Administering ports using the Solaris tools

4. Enter:

```
lpadmin -x printer_name
```

5. Perform the following steps within CMS:

- a. Log into CMS and select **Maintenance > Printer Administration**.
- b. Remove the printer from CMS.

Note:

For more information, see the appropriate Call Management System administration book for your version of CMS.

Stopping the print scheduler utility

To stop the print scheduler utility:

1. Enter:

```
/usr/lib/lpshut
```

Administering modems with Solaris tools

This section describes how to configure port parameters for modems and devices that behave like modems (for example, serial line switches).

Administering modems connected to an NTS

A modem connected to an NTS can be configured in one of two ways:

- Outbound - initiates only outgoing calls.

After the outbound modems are connected, you must complete the `na` and `rtelnet` administration for the CMS computer to recognize the new outbound modem(s).

- Inbound - accepts only incoming calls.

After the inbound modems are connected, you must complete the `na` administration for the CMS computer to recognize the new inbound modem(s).

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.

Configuring the NTS

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

1. Log in at the CMS computer as **root**.
2. To access the NTS administration software, enter:

na

The system displays the following message:

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

Administering ports using the Solaris tools

3. To associate all subsequent administration with a specific network terminal server, enter:

```
annex ntsname
```

where *ntsname* is the administered name of the NTS. For example, if the NTS is named *cmsterm1*, use the command **annex cmsterm1**.

Note:

When you enter **annex ntsname**, that NTS 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.

Use the NTS names and addresses as administered in the **/etc/hosts** file.

The system displays the following message:

```
ntsname : Annex-3-UXR current release number, 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, enter:

```
set port=port number/range mode slave type dial_in  
dedicated_address IPaddress control_lines flow_control  
input_flow_control eia output_flow_control eia location "a  
location" user_name "a user" speed 9600
```

Note:

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

The system displays the following message:

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

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

Port generic parameter	Default parameters	Recommended setting	Comments
<code>port</code>	NA	NA	Enter a single port number (such as <code>port=5</code>), or a range of port numbers (such as <code>port=3-9</code>).
<code>mode</code>	<code>cli</code>	<code>slave</code>	NA
<code>type</code>	<code>hardwired</code>	<code>dial_in</code>	NA
<code>dedicated_address</code>	<code>0.0.0.0</code>	IP address of CMS computer	Set to the IP address of CMS computer.
<code>control_lines</code>	<code>none</code>	<code>flow_control</code>	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
<code>input_flow_control</code>	<code>bell</code>	<code>eia</code>	
<code>output_flow_control</code>	<code>start/stop</code>	<code>eia</code>	
<code>location</code>	""	"a location"	It is important to set this parameter so port problems can be traced.
<code>user_name</code>	""	"a user"	It is important to set this parameter so port problems can be traced.
<code>speed</code>	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.
<code>data_bits</code>	8	8	Can be set to match the modem settings.

Administering ports using the Solaris tools

Port generic parameter	Default parameters	Recommended setting	Comments
parity	none	none	Can be set to match the modem settings.
stop_bit	1	1	Can be set to match the modem settings.

5. To reset the modem ports, enter:

```
reset port_number/range
```

For example, to reset port 9, enter: `reset 9`. To reset ports 12 through 15, enter `reset 12-15`.

The system displays the following message:

```
# resetting serial port <port number/range> of annex
<ntsname>
```

CAUTION:

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

6. To store the new port configurations to a file, enter:

```
write ntsname /etc/local.admin/ntsname_info
```

where `ntsname` is the name of the NTS.

The system displays the following message:

```
<ntsname>: Annex-3-UX R<current release number & date>
writing...
command:
```

7. To check the new port configurations, enter:

```
show port=port_number/range
```

where `port_number/range` is a single port or a range of ports.

8. To get out of NTS administration, enter:

```
quit
```

Continue with rtelnet administration.

RTELNET administration

To place the command for modems in a file, continue with the following:

1. Edit the **Speripherals** file by using the following command:

```
vi /etc/rc2.d/Speripherals
```

2. Add a line for each modem port you just administered for the NTS:

```
rtelnet -fmrt ntsname port# /dev/s_pdev_ntsname_port#
```

where *ntsname* is the name of the NTS and *port#* is the port on the NTS.

For example, to set up cmsterm1, port 9, enter:

```
rtelnet -fmrt cmsterm1 9 /dev/s_pdev_cmsterm1_9
```

3. When finished adding entries, enter:

```
:wq!
```

4. Enter:

```
cd /
```

5. For each new modem just administered you must start a rtelnet process. Enter:

```
rtelnet -brao ntsname port# /dev/s_pdev_ntsname_port#
```

6. Enter:

```
ps -ef | grep rtelnet
```

7. Verify that there is one rtelnet process running for each administered modem.

Note:

If there is more than one rtelnet process running for a modem, use `kill -9 process_ID` to stop the process.

8. Continue with lpadmin administration.

Inbound modems

This section provides examples for configuring and administering port parameters for inbound modems connected to the NTS.

Configuring the NTS

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 at the CMS computer as **root**.

Administering ports using the Solaris tools

2. To access the NTS administration software, enter:

```
na
```

The system displays the following message:

```
Annex network administrator R<current release number & date>  
command:
```

3. To associate all subsequent administration with a specific network terminal server, enter:

```
annex ntsname
```

where *ntsname* is the administered name of the NTS. For example, if the NTS is named *cmsterm1*, use the command `annex cmsterm1`.

Note:

When you enter `annex ntsname`, that NTS 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.

Use the NTS names and addresses as administered in the `/etc/hosts` file.

The system displays the following message:

```
<ntsname>: Annex-3-UXR<current release number>, 64 ports  
command:
```

4. You must include all the parameters you want to change. For inbound modems, use the following `set port` command string:

```
set port=port number/range mode dedicated type dial_in  
dedicated_address IPaddress control_lines modem_control  
location "a location" user_name "a user" speed autobaud
```

Note:

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

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

Port generic parameter	Default parameter	Recommended setting	Comments
<code>port</code>	NA	NA	Enter a single port number (such as <code>port=5</code>), or a range of port numbers (such as <code>port=3-9</code>).
<code>mode</code>	<code>cli</code>	<code>dedicated</code>	NA
<code>type</code>	<code>hardwired</code>	<code>dial_in</code>	NA
<code>dedicated_address</code>	<code>0.0.0.0</code>	IP address of CMS computer	Set to the IP address of CMS computer.
<code>control_lines</code>	<code>none</code>	<code>modem_control</code>	NA
<code>location</code>	<code>" "</code>	"a location"	It is important to set this parameter so port problems can be traced.
<code>user_name</code>	<code>" "</code>	"a user"	It is important to set this parameter so port problems can be traced.
<code>speed</code>	<code>9600</code>	<code>autobaud.</code>	Do not use a specific speed.
<code>data_bits</code>	<code>8</code>	<code>8</code>	Can be set to match the modem settings.
<code>parity</code>	<code>none</code>	<code>none</code>	Can be set to match the modem settings.
<code>stop_bits</code>	<code>1</code>	<code>1</code>	Can be set to match the modem settings.

The system displays the following message:

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

Administering ports using the Solaris tools

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

```
reset port_number/range
```

For example, to reset port 9, enter `reset 9`. To reset ports 12 through 15, enter `reset 12-15`.

The system displays the following message:

```
# resetting serial port <port number/range> of annex  
<ntsname>
```

CAUTION:

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

6. To store the new port configurations to a file, enter:

```
write ntsname /etc/local.admin/ntsname_info
```

where `ntsname` is the name of the NTS.

The system displays the following message:

```
<ntsname>: Annex-3-UX R<current release number & date>  
writing...  
command:
```

7. To check the new port configurations, enter:

```
show port=port_number/range
```

where `port_number/range` is a single port or a range of ports.

8. To get out of NTS administration, enter:

```
quit
```

Administering modems connected to the SAI/P cards

Inbound modem - For an inbound modem, administer the port the same way as for a terminal.

Outbound modem - For an outbound modem, no port-specific administration is required.

Make sure that existing administration is removed from that port by entering the following command:

```
pmadm -r -p ttysaipx -s sai/p letterport number
```

where *x* is card a or b.

For example, for port number six on SAI/P card A, you would enter the following:

```
pmadm -r-p ttysaipa -s a006
```

Administering modems connected to the Aurora SBus Multiport cards

Inbound Modem - For an inbound modem, administer the port the same way as for a terminal.

Outbound Modem - For an outbound modem, no port-specific administration is required.

Make sure that existing administration is removed from that port by entering the following command:

```
pmadm -r -p ttyaurcard number -s port_number
```

Note:

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

Administering ports using the Solaris tools

Glossary

ACD	See “Automatic Call Distribution (ACD)”
ADU	See “Asynchronous Data Unit (ADU)”
Agent	A person who answers calls to an extension in an ACD split. This person is known to CMS by a login identification keyed into a voice terminal.
Asynchronous Connector	A logical device used to control the computer timing protocol in which a specific operation is begun upon receipt of an indication (signal) that the preceding operation has been completed.
Asynchronous Data Transmission	A scheme for transmitting data where each character is preceded by a start bit and followed by a stop bit, thus permitting data elements to occur at irregular intervals. This type of transmission is advantageous when transmission is not regular (when characters are typed at a keyboard).
Asynchronous Data Unit (ADU)	A data communications equipment (DCE) type device that allows direct connection between RS-232 equipment and the digital switch.
Automatic Call Distribution (ACD)	<p>A switch feature. ACD is software that channels high-volume incoming call traffic to agent groups (splits or skills).</p> <p>Also an agent state where the extension is engaged in an ACD call (with the agent either talking to the caller or the call waiting on hold).</p>
Avaya CMS	Avaya Call Management System (CMS). A software product used by business customers that have a Avaya Inc. switch and receive a large volume of telephone calls that are processed through the Automatic Call Distribution (ACD) feature of the switch.
Boot	To load the system software into memory and start it running.

Bus	
Bus	<p>A signal route to which several items of a computer system may be connected in parallel so that signals can be passed between them.</p> <p>In general, a multiconductor electrical path used to transfer information over a common connection from any of several sources to any of several destinations.</p>
Cables	Wires or bundles of wires configured with adapters or connectors at each end and used to connect two or more hardware devices.
CMS	Call Management System. See "Avaya CMS."
CMSADM	Call Management System Administration. The part of the CMS software that allows a user to administer features of CMS. See also "CMSSVC."
Command	A command is an instruction used to tell the computer to perform a function or to carry out an activity.
Daemon	Pronounced "demon." A UNIX program that executes in the background ready to perform an operation when required. Usually unattended processes initiated at start-up, such as print spoolers, e-mail handlers or schedulers.
Data Communications Equipment (DCE)	Any equipment that connects to Data Terminal equipment (DTE) using an RS-232 standard interface. A modem is a DCE device.
Data Terminal Equipment (DTE)	Data Terminal Equipment (DTE) includes terminals, personal computers, and workstations. A Sun SPARCserver computer is a DTE device.
DCE	See "Data Communications Equipment."
DCIU	See "Data Communications Interface Unit."
Device	The term used to refer to the peripheral itself; for example, a hard disk or a tape drive. A peripheral is sometimes referred to as a subdevice or an Logical Unit (LU).
DTE	See "Data Terminal Equipment (DTE)."
EIA	Electronic Industries Association. An organization that sets standards for consumer products and electronic components.
Error Message	An error message is a response from a program indicating that a problem has arisen or something unexpected has happened, requiring your attention.
ESD	Electro Static Discharge

Host Adapter	An I/O card that plugs into the computer backplane and is used as an interface between the computer system and the Small Computer System Interface (SCSI) bus.
Host Computer	A computer that is attached to a network and provides services other than simply acting as a store-and-forward processor or communication switch.
Host Name	A name that you (or the system administrator) assign to your system unit to uniquely identify it to the Solaris operating system and to the network.
Interface	A common boundary between two systems or pieces of equipment.
Internet Protocol (IP)	An integral part of the internet communication protocol system (see Transmission Control Protocol/Internet Protocol [TCP/IP]). The IP provides the routing mechanism of the TCP/IP. See also Network Address.
Keyboard	An input device for entering information by typing.
Log In	The process of gaining access to a system by entering a user name and, optionally, a password.
Log Out	The process of exiting from a system.
Modem	A device that enables a computer or terminal to establish a connection with another computer or terminal and to communicate data through telephone lines.
Network Address	A unique number assigned to each system on a network, consisting of the network number and the system number. Also known as Internet Address or Internet Protocol (IP) address.
Network Hub	Hardware that connects a computer to a Network Terminal Server (NTS).
Network Terminal Server (NTS)	A hardware terminal that connects to the Network Hub via cabling. The NTS provides 50-pin switch champ connectors used to attach 64 serial devices using the patch panel cables and patch panels.
Network Terminal Server Patch Panel	Hardware that has ports for connecting serial peripheral devices (for example, printers, terminals and modems). The NTS patch panel connects to the NTS via PBX-Champ cabling.
NTS	See "Network Terminal Server (NTS)."

Password

Password	A character string that is associated with a user name. Provides security for a user account. CMS computers require you to type a password when you log into the system, so that no unauthorized person can use your system.
Port (I/O Port)	A designation of the location of a circuit that provides an interface between the system and lines and/or trunks.
Printer	A physical device that takes electronic signals, interprets them, and prints them on paper.
Recommended Standard (RS)	Any one of several Electronic Industries Association (EIA) standards commonly used in U.S. electronic applications.
Refresh Rate	The number of seconds CMS should wait for each update of the real-time report data. A user's fastest allowable refresh rate is defined in the User Permissions - User Data window as a minimum refresh rate. The default refresh rate when a user brings up the report input window is the administered minimum refresh rate plus 15 seconds.
RISC	Reduced Instruction Set Computer. A computer architecture that reduces chip complexity by using a simpler instruction set. RISC keeps instruction size constant, bans the indirect addressing mode, and retains only those instructions that can be overlapped and made to execute in one machine cycle or less.
RS	See "Recommended Standard (RS)."
RS-232	An electrical interface standard, normally using a 25-pin (DB-25) physical connector. The electrical portion of the interface is unbalanced (for example, RS-232 has a positive voltage and a ground). This standard was officially renamed TIA/EIA-232-E in 1984, but the RS-232 designation is still most commonly used.
SBus Expansion Subsystem	A peripheral device attached to a computer system. The SBus expansion subsystem provides three additional SBus slots and space for two optional SCSI hard disk drives. The SBus expansion subsystem consists of the following: the SBus expansion chassis, the expansion adapter card (in the computer system), and the SBus expansion subsystem cable.
Serial Interface Y-Cable	A cable that attaches to the A/B port on the back of the SPARCserver computer. The SPARCserver computer system has two serial ports located on the two terminations of its optional serial interface Y-cable.

Slot	An electronic connection designed to receive a module or a printed circuit board (such as a Single In-line Memory Module [SIMM] or a frame buffer board).
Small Computer System Interface (SCSI)	A hardware interface that allows the connection of peripheral devices (such as hard disks, tape drives and CD-ROM drives) to a computer system.
Solaris	The UNIX operating system package required by CMS.
Sun Enterprise System	A series of host computer systems manufactured by Sun Microsystems Inc. that are used to support CMS.
Sun SPARCserver Computer	A host computer that is attached to a network and provides services other than simply acting as a store-and-forward processor or communication switch.
Syntax	The format of a command line.
System	A general term for a computer and its software and data.
Terminal	A device that consists of a video display and keyboard that you use to type and display information. A terminal is connected to a serial port on the NTS. This is not the same thing as a monitor.
TIA	Telecommunication Industry Association. An organization that sets standards for physical level interfaces (RS-232, RS-422, etc.) and cellular radio.
TSC	Technical Service Center. The organization that provides technical support for Avaya Inc. products.
UNIX System	The operating system on the computer on which CMS runs. A user can access the UNIX system from the "Commands" SLK. SUN uses Solaris as its UNIX operating system.
User ID	The login ID for a CMS user.
User Name	A combination of letters, and possibly numbers, that identifies a user to the system.
Write Permission	A mode of CMS that allows the CMS user to add, modify, or delete data and execute processes. Write permission is granted from the User Permissions subsystem.

Write Permission

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