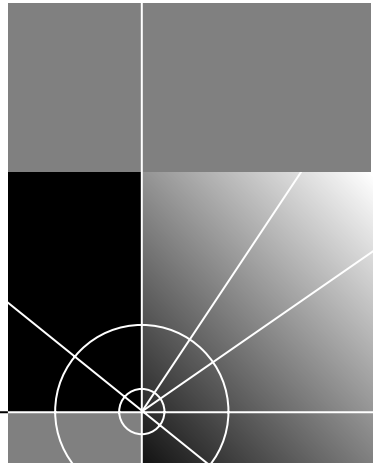
SuperStack® II Remote Access System 1500

Getting Started Guide 1.5



http://www.3com.com/

Part No. 1.024.1910 Rev 1.00
March, 1999

3Com Corporation
5400 Bayfront Plaza
Santa Clara, California
95052-8145

CONTENTS

ABOUT THIS GUIDE

This guide describes how to install and configure RAS 1500.

If the information in the release notes shipped with your product differs from the information in this guide, follow the instructions in the release notes.

Finding Specific Information

This table shows the location of specific RAS 1500 information.

If you are looking for this information	Turn to
Latest changes to documentation	Release Notes
Configuring LAN-to-LAN routing	TRAM online help; RAS 1500 System Management Guide
Configuring for dial-out	TRAM online help; RAS 1500 System Management Guide
Configuring to accept dial-in users	TRAM online help; RAS 1500 System Management Guide
Configuring for IP terminal service	TRAM online help; RAS 1500 System Management Guide
Configuring with TRAM	Chapter 3 of this guide
Configuring for frame relay	RAS 1500 System Management Guide
Configuring for security and accounting	TRAM online help; RAS 1500 System Management Guide

Conventions

This table lists conventions that are used throughout this guide.

Table 1 Notice Icons

Icon	Notice Type	Description
	Information note	Important features or instructions
	Caution	Information to alert you to potential damage to a program, system, or device
	Warning	Information to alert you to potential personal injury

Related Documentation

The RAS 1500 documentation set includes the following documents. All 3Com documentation is available on the 3Com web site:

http://www.3Com.com

- *RAS 1500 Release Notes*

  These notes provide information about the system software release, including new features and bug fixes. It also provides information about any changes to the RAS 1500's system documentation. Release notes are enclosed in the RAS 1500 package and are available at http://support.3com.com/software/smofficesw.htm.

- *RAS 1500 System Management Guide*

  This guide describes how to configure your RAS 1500 system. It is located on the RAS 1500 Resource CD-ROM.

- *Transcend Remote Access Manager (TRAM) Online Help*

  This online help file describes how to use TRAM to configure your RAS 1500. It is accessed from TRAM.

- RAS 1500 System Reference Guide

  Describes how to configure your RAS1500 system using the Command Line Interface (CLI).

- RAS 1500 Quick Reference Card

  Describes how to configure the more common tasks (e.g. protocols) on the RAS 1500.

- I/O Module Installation Guide

  Describes how to install an I/O module in a Router Module or Port Expansion Module.

Contacting 3Com

Use this chart as a reference when you need to contact 3Com.

Contacting 3Com	
3Com Corp. - 5400 Bayfront Plaza - P.O. Box 58145 - Santa Clara, CA - 95052-8145	
Internet	http://support.3Com.com

For a complete listing of support and contact numbers, refer to Appendix D, "Technical Support."

1 INTRODUCING THE SUPERSTACK II REMOTE ACCESS SYSTEM 1500

This chapter contains information about the SuperStack II® Remote Access System 1500 (RAS 1500) and how it can be used in your network.

This chapter contains the following information:

- About the RAS 1500
- Overview
  - Applications
  - Security options
  - Configuration options
- Front Panel View and Description

About the RAS 1500

The RAS 1500 is a stackable unit that provides terminal server and remote access services, via analog and ISDN BRI connections in a multi-protocol networking environment.

Consisting of a base router module (RM), port expansion module (PEM), and user-installable Input/Output (I/O) modules, RAS 1500 integrates multiprotocol remote access server and WAN router technology with high-performance 56 kbps (V.90) and/or ISDN modems.

Overview

The RAS 1500 is a powerful data communications platform that can support a broad variety of remote access applications.

The basic configuration of a RAS 1500 stack consists of one RM and two PEMs and supports up to 24 channels (up to a total of 12 BRI lines, 24 analog lines, or any combination up to 24 channels).

In a full RAS 1500 stack, each PEM is connected to the RM using 3Com's StackNet, a high speed (up to 200 Mbps), low cost technology.

Figure 1-1 One RM and two PEMs in a Stack without a StackNet Connection

Applications

The RAS 1500 is a multi-protocol, dial-up router and terminal server commonly described as a remote access server. The RAS 1500 performs five basic applications:

- IP Terminal Service
- Network Dial-in Access
- Dial-out Access (NCSI or telnet)
- LAN-to-LAN Routing
- Bridging

For more information about configuring these basic applications, see the SuperStack II Remote Access System 1500 Resource CD-ROM.

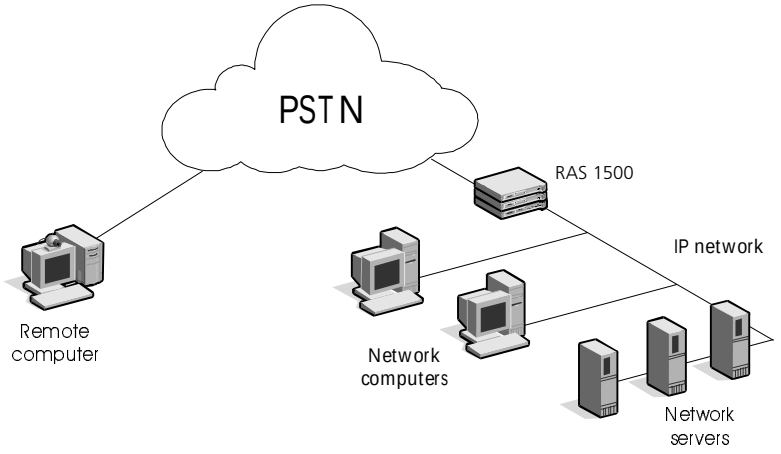


Figure 1-2 Application of the RAS 1500 within the IP Network

IP Terminal Service

RAS 1500 provides network access for dumb terminals or computers that emulate dumb terminals. The ASCII data stream to and from these remote terminals is converted into a networking protocol (telnet, Rlogin, or ClearTCP) and a session is established with a host to provide an IP terminal service connection on the RAS 1500's local network.

The RAS 1500 offers extensive access security, dialback, and easy configuration for terminal service connections.

Network Dial-in Access

RAS 1500 provides dial-in network access for remote users. Remote IP, IPX and Appletalk network users can dial in and connect to the local network as if they were local nodes.

Packets transmitted over the dial-in connection are encapsulated using the following protocols:

- PPP (Point-to-Point Protocol)
- SLIP (Serial Line IP Protocol)
- FCP (3Com's Fast Connect Protocol)

Dial-out Access

You can access RAS 1500 ports with network computers and workstations to provide users with NCSI and Telnet dial-out services. This allows network users to connect to Bulletin Board Systems (BBSs) or information services such as CompuServe, or access the Internet over a dial-up connection.

IP or IPX LAN users require a NCSI-compatible communications application to access RAS 1500 modems.

LAN-to-LAN Routing and Bridging

RAS 1500 performs dial-up routing over a PPP connection between facilities. Routing occurs when one device dials up another device and logs in as a user.

There are several types of LAN-to-LAN connections:

- Manual
- On demand
- Timed
- Continuous

RAS 1500 supports many routing and protocol configurations. It is capable of establishing additional connections to increase bandwidth automatically when network traffic increases.

Security Options

RAS 1500 supports the following security options:

- IP packet filtering in both the inbound and the outbound directions of ports, users, and dial-out locations.
- RADIUS
- NOS-based authentication (Windows NT 4.0, Novell NetWare)
- Dial-back, fixed and roaming
- PAP and CHAP
- Local password authentication

Configuration Options

The RAS 1500 supports the following configuration options:

- TRAM
- Command Line Interface (CLI)

TRAM

TRAM allows you to configure your RAS 1500 using a GUI interface, if you are using Windows 95 or Windows NT 4.0.

Command Line Interface

The RAS 1500's CLI includes an assortment of utilities for troubleshooting connections including:

- The ability to manually dial a location to test connectivity
- The ability to use telnet, Rlogin or ClearTCP to establish a session with another host.
- UNIX-like troubleshooting commands including ping to debug IP connections.

Universal Connect

Universal Connect allows ISDN I/O module users to access information at analog speeds up to 56 Kbps and at digital speeds up to 128 Kbps from the same equipment and port.

ISDN Configuration

The RAS 1500 supports Basic Rate Interface (BRI) ISDN with either the U-Interface (for North America) or the S/T-Interface (for other countries). Contact your ISDN provider for information about ISDN in your area or call 1-800-877-ISDN (USA only).

Front Panel Description

The following figure describes the RAS 1500 front panel.

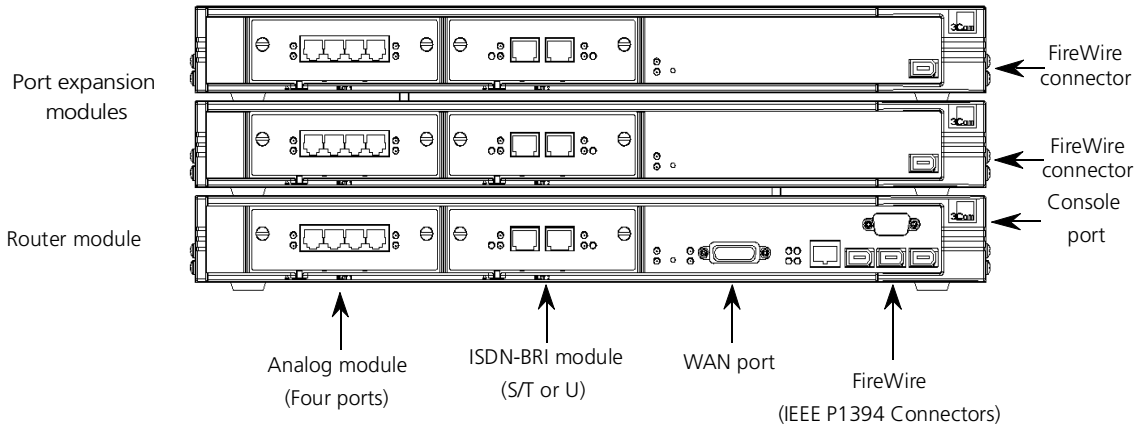


Figure 1-3 RAS 1500 Front Panel

Table 1-1 Front Panel Features

Description	Function
Analog module	Connect analog telephone lines.
ISDN -BRI module (S/T or U)	Connect ISDN-BRI telephone lines.
WAN port	Connect to the WAN through this port. Automatic cable detection defines interface type.
Console port	Connect a serial cable to a terminal from this port to access the unit's command line interface (CLI). The port defaults to 38.4 Kbps.
FireWire (IEEE P1394 connectors)	Connect supplied FireWire from these ports to RAS 1500 Expansion units.

RAS 1500 LEDs

The following tables describe Light Emitting Diodes (LEDs) on the RM, PEM, analog I/O modules, and ISDN I/O modules.

Power and Status LEDs

LED	Color	Status
Power	Green	Power is from the main power supply unit.
Power	Yellow	Power is from the backup power supply unit.
Power	Off	Power cable is not connected.
Status	Green	The RAS 1500 is running normally.
Status	Blinking green	The RAS 1500 software is running normally.
Status	Blinking yellow	Diagnostics are running.
Status	Red	Unit has just been powered on, or diagnostics have failed.

WAN Port LEDs

LED	Color	Status
Tx	Green	The RAS 1500 is sending data.
Tx	Off	The RAS 1500 is not sending data.
Rx	Green	The RAS 1500 is receiving data.
Rx	Off	The RAS 1500 is not receiving data.

LAN Port LEDs

LED	Color	Status
Tx	Green	The RAS 1500 is sending data.
Tx	Off	The RAS 1500 is not sending data.
Rx	Green	The RAS 1500 is receiving data.
Rx	Off	The RAS 1500 is not receiving data.
Lk	Green	The RAS 1500 has an active connection.
Lk	Off	The RAS 1500 does not have an active connection.
CO	Yellow	Data collisions have occurred.
CO	Off	Data collisions have not occurred.

ISDN I/O Module LEDs

LED	Color	Status
1,2,3, or 4	Green	A call is connected.
1,2,3, or 4	Yellow	A call is being negotiated.
1,2,3, or 4	Red	Module failed diagnostics. If all LEDs are red, the modem-manager software has failed.
1,2,3, or 4	Off	No call is connected.
D	Flashing green	Port is being initialized.
D	Flashing yellow	Port is being initialized.
D	Yellow	The physical ISDN link is active, but the D-Channel is not fully functional.
D	Green	The D-Channel is fully functional.
D	Red	The RAS 1500 failed diagnostics.
D	Off	ISDN U and ISDN S/T - The physical ISDN link is not active.

Analog I/O Module LEDs

LED	Color	Status
1,2,3, or 4	Green	A call is connected.
1,2,3, or 4	Yellow	A call is being negotiated.
1,2,3, or 4	Red	Module failed diagnostics. If all LEDs are red, the modem-manager software has failed.
1,2,3, or 4	Off	No call is connected.

2 INSTALLING THE RAS 1500 HARDWARE

This chapter contains the following information:

- Before you Begin
- Installing the RAS 1500 System
- Grounding the RM and the PEM
- Powering the RAS 1500 On or Off

Before you Begin

Before you begin installation:

- Confirm you have the required equipment
- Check that your RAS 1500 package is complete (see page 2-2).

The sections below detail each task. Contact your network administrator for further assistance.

Required Equipment

A Pentium PC running Windows 95 or Windows NT 4.0 (with the latest service pack from Microsoft) with the following minimum configuration:

- 32 MB RAM
- 40 MB free Hard Drive storage space
- Mouse
- TCP/IP configured

You Should Have Received

You should have received the following items with your RM or PEM:

- SuperStack® II RAS 1500 RM
- AC power cord
- Ethernet cable
- Cable-guide mounting brackets
- Flat-head mounting bracket screws
- Rubber feet
- User documentation:
  - TRAM and Resource CD-ROM
  - RAS 1500 Getting Started Guide
  - RAS 1500 Version 1.5 Release Notes
  - RAS 1500 Quick Reference Card
  - RAS 1500 Version Sheet
- Dual-end compact screwdriver

If your RAS 1500 packaging does not contain all the equipment listed above, contact 3Com Technical Support in your country. See Appendix C, *3Com Limited Warranty*, for more information.

Optional Components

You can purchase the following items separately:

- WAN cables: RS-232, RS-449, V.35, X.21, EIA 530
- I/O Modules:
  - 4-port V.34 modem module and cables
  - 2-port ISDN BRI module and cables
- Port Expansion Module (PEM) — each RM supports up to two PEMs

Installing the RAS 1500 System

The RAS 1500 system consists of a router module (RM) and up to two port expansion modules (PEMs). You can install RAS 1500 either as part of a stack of equipment or in a standard 19-inch rack.

WARNING: *To avoid personal injury or damage to the unit, make sure the stack or rack into which you install RAS 1500 is placed on a stable surface.*

Installing the RAS 1500 System in a Stack

Use the following steps to install both and RM and PEM in a stack:

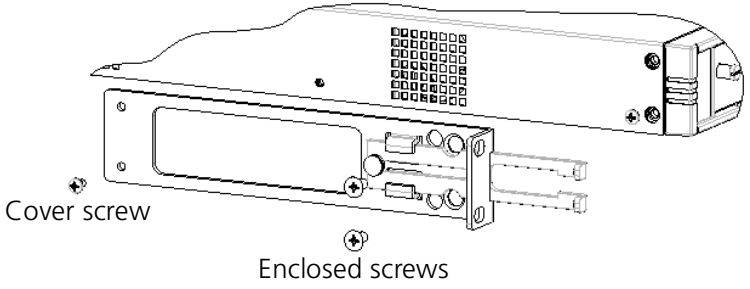
1. Peel each rubber foot from the adhesive sheet and attach it to the bottom of the unit. Use the circular marks on the bottom of the unit as guides.
2. Place the unit into an existing stack of equipment, or on a smooth, level surface.

Installing the RAS 1500 System in a Rack

Use the following steps to install both and RM and PEM into a standard 19-inch rack:

For rack installations, do not attach the rubber feet to the unit.

1. Fully extend the cable guides on the enclosed mounting brackets.
2. Fasten the mounting brackets to both sides of the RM or PEM using the enclosed screws and a Phillips-head screwdriver.



3. Mount the modules in the rack.

RAS 1500 modules can be mounted in any order, but for ease of management, we recommend you install RAS 1500 unit on the bottom of the stack or rack.

Rack Installation Guidelines

Follow these guidelines when you install RAS 1500 in a rack.

- Operating Ambient Temperature. If the RAS 1500 is installed in a closed or multi-module rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. We therefore recommend that you install the equipment in an environment compatible with the RAS 1500's maximum rated ambient temperature. Refer to Appendix A for detailed technical specifications.
- Air Flow. Install the RAS 1500 so that the rack has enough air flow for safe operation.

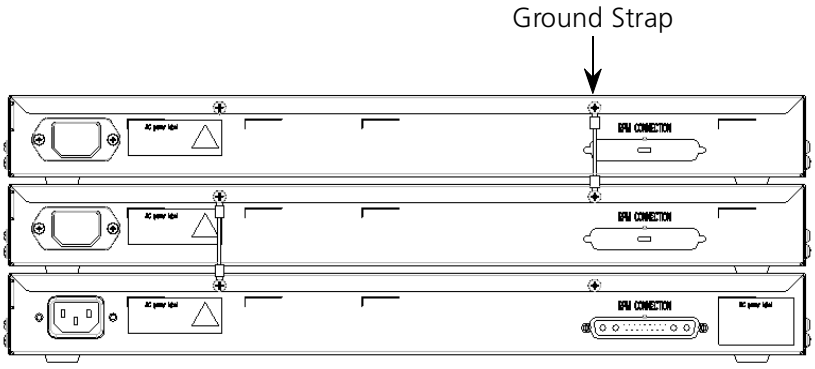
If the RAS 1500 fails while in a rack, you might have to allow more spacing between the other equipment in the rack to provide more air flow.

- Mechanical Loading. To avoid a hazardous condition, mount the equipment in the rack evenly and place the rack on a stable surface.
- Circuit Overloading. Make sure the RAS 1500 is properly connected to the power supply circuit. This circuit should include overcurrent protection and proper power supply wiring.
- Grounding. Maintain reliable grounding of the rack-mounted RAS 1500. Do not connect the RAS 1500 to a power supply connection other than the branch circuit.

Grounding the RM and the PEM

Stack installation of an RM and at least one PEM require proper grounding. Grounding straps are enclosed in the accessories kit. Install them as follows:

1. Remove one cover screw on RM and PEM.
2. Install a ground strap between the RM cover and the PEM cover and reinstall the screws as shown.



I/O Module

The RM and PEM must have at least one IO module installed in Slot 1. Refer to the I/O installation guide that is shipped with the I/O modules for installation instructions.

WARNING: The I/O modules are not hot-pluggable. You must have the power cord disconnected when installing I/O modules in the RM or PEM.

Powering the RAS 1500 On or Off

There is no power switch on the RAS 1500. Use the following steps to power on or power off the modules in a RAS 1500 stack.

Powering On the RAS 1500

To power on the RAS 1500, connect the power cord to the AC power port of the module and plug the power cord into the AC power supply source.

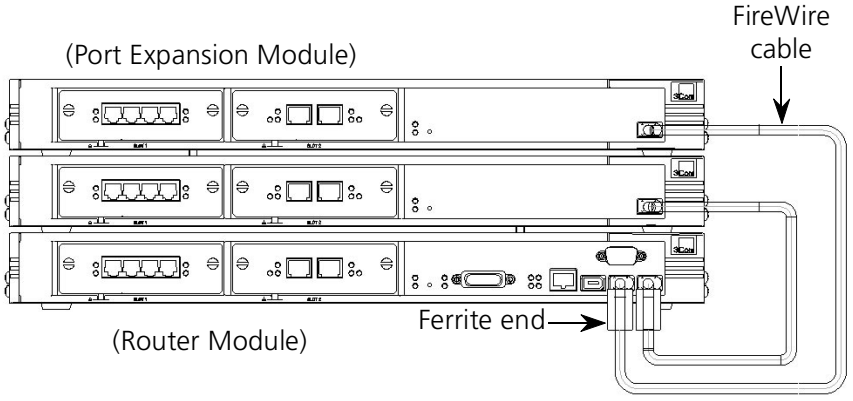
Powering Off the RAS 1500

To power off the RAS 1500, remove the AC power cord from the AC power port of the module.

WARNING: Remember to power off if you remove the cover of the router module before installation. Then unplug the power cord.

Connecting the FireWire

After the RM and PEM AC power cords are connected, connect the FireWire(s). Connect each PEM to the RM making sure the connection is securely connected. Note that the ferrite end must be connected to the RM as shown.



When adding a PEM to an existing RAS 1500 system, connect the PEM AC power cord before connecting the FireWire cable. Connecting the FireWire cable before the AC power cord may cause existing calls to shut down when AC power is applied.

3 USING TRAM TO CONFIGURE THE RAS 1500

This chapter contains the following information:

- Overview
- Before You Begin
- Installing TRAM
- Running TRAM
- Basic TRAM Configuration
- Using the Setup Wizard
- Managing the RAS 1500
- Viewing Online Help
- Additional Configuration

Overview

TRAM is a Windows-based application that provides a complete solution to managing the devices in the SuperStack® II RAS 1500 family of products.

TRAM uses a graphical user interface (GUI) to discover, configure, and manage SuperStack II RAS 1500 System modules.

Before You Begin

Before you begin, obtain the following information from your network administrator and record the information in the space provided below.

Ask your network administrator for	Your value
Network name	
IP address to assign to the RAS 1500	___.___.___.___
IP network mask	___.___.___.___
Community string (SNMP password)	
Default Gateway address	___.___.___.___
Default gateway metric	
DNS Server address	___.___.___.___
DNS server domain name	
IP addresses to assign incoming calls	___.___.___.___ ___.___.___.___
Range of IP addresses to assign incoming calls	___.___.___.___ ___.___.___.___
MAC address (from the sticker on the back of the RAS 1500)	
User names and passwords	

See Appendix A, *Configuration Assistance*, for a more detailed configuration worksheet.

Installing TRAM

To install TRAM:

1. Insert the Transcend® Remote Access Manager CD into the CD drive.

On most systems, TRAM 1500 launches itself and prompts you through the installation. If not, follow these steps:

2. At the Windows 95 or NT desktop, click *Start*, then click *Run*.
3. In the Run dialog box, type: **`<your CD drive letter>:\setup`**
4. Click *OK*.
5. Follow the instructions on the screen.

Running TRAM

From the Windows 95 or Windows NT 4.0 desktop, click *Start*, then *Programs*, then *Transcend Remote Access Manager*, then *Transcend Remote Access Manager*. TRAM starts.

Basic TRAM Configuration

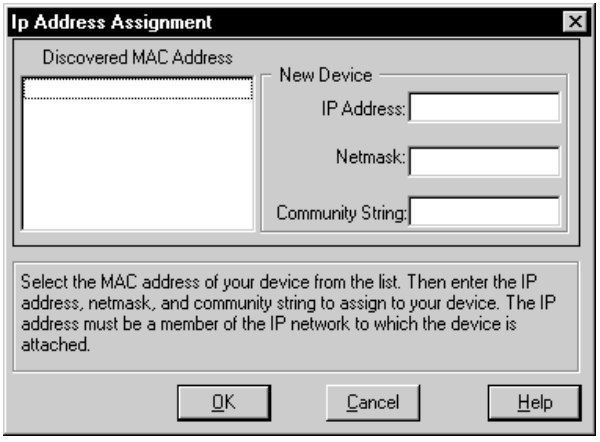
Use the following steps to initially configure TRAM:

Before you can manage a RAS 1500 in TRAM, it must have an IP address. Out of the box, a RAS 1500 does not have an IP address.

This procedure lets you assign an IP address, network mask, and community string to a RAS 1500 that does not have an IP address. The RAS 1500 must be connected to the same LAN segment as the TRAM workstation and cannot have an IP address.

To assign an IP address to a device:

1 On the Tools menu, click *IP Assignment*.



2 In the Discovered MAC Address list, select the RAS 1500 to which you want to assign an IP address. This list contains devices that are connected to the same LAN segment as the TRAM workstation but do not have an IP address.

The RAS 1500's MAC address is printed on a sticker on the rear of the unit.

3 In the IP Address text box, type the IP address (in dotted-decimal notation) you want to assign to the RAS 1500 (192.112.227.15, for example). The IP address you assign must be a part of the IP network to which the RAS 1500 is attached.

4 In the Netmask text box, type the network mask (in dotted-decimal notation) you want to assign to the RAS 1500. For example, a class C network with no subnetting is 255.255.255.0.

5 In the Community String text box, type the community string (public, for example) you want to assign to the RAS 1500.

This sets both the read and write community strings of the RAS 1500.

6 Click *OK*. TRAM assigns the settings to the RAS 1500, adds it to the Device Tree (the device's name in the Device Tree is its new IP address), and displays a dialog box asking if you want to configure it.

7 Click *Yes* or *No*. If you click *Yes*, TRAM opens the RAS 1500 and starts the Setup Wizard (see "Using the Setup Wizard," later in this chapter); if you click *No*, the procedure is complete.

Refer to TRAM's online help for a information on TRAM functions.

Using the Setup Wizard

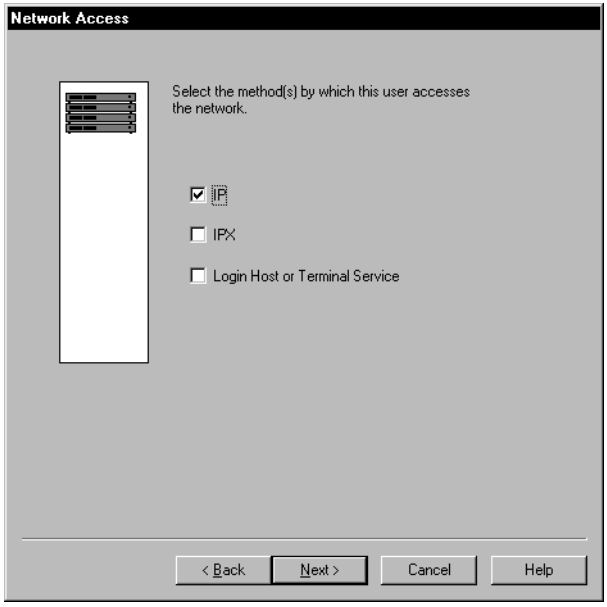
The Setup Wizard has been designed to help you configure your RAS 1500 (and RAS 1500 Port Expansion Module, if applicable) to accept users dialing into your network.

Getting Help in the Setup Wizard

If you encounter a term that is unclear to you, click *Help* at the bottom of the window. For example, if you are not sure of the type of user you are adding, click *Help*.

The user type can be described as follows:

- IP – IP dial in only
- IPX – IPX dial in
- Login Host or Terminal service – telnet or rlogin to a host



When you click Help, the online help system displays information about each screen.

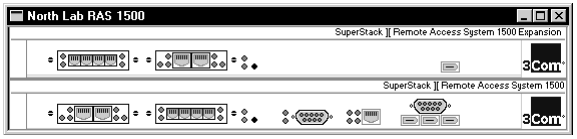
Starting the Setup Wizard

The Setup Wizard starts automatically for an unconfigured device and can be run at any time for a configured device.

To start a Setup Wizard for a device:

1. In the Device Tree, double-click the device you want to configure. A window containing a graphical representation of the device appears.
2. Select the module.
3. Right-click, then click *Configure*, then **<the object's name>**, then *Setup Wizard*. The Setup Wizard for the device starts. The Setup Wizard guides you through the configuration of the RAS 1500.

   Once you have completed the Setup Wizard, an image of the RAS 1500 appears in the right window. If any RAS 1500 Expansion units are attached to the RAS 1500, they are displayed in the same window as the RAS 1500 (as in the following illustration).



From this image, you can further configure your RAS 1500 and RAS 1500 Expansion units. Refer to the next section.

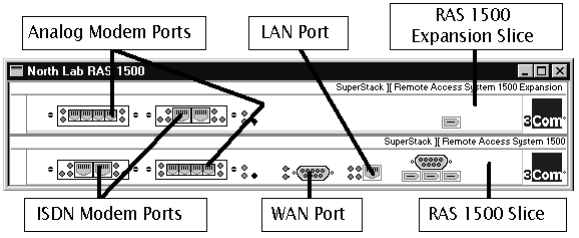
Managing the RAS 1500

Once you have done the initial configuration of the RAS 1500 through the Setup Wizard, you can manage it further in the Configuration window of TRAM.

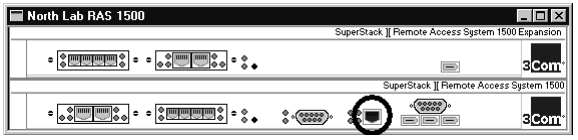
Managing a RAS 1500 and RAS 1500 Expansion unit:

The following procedure is an example.

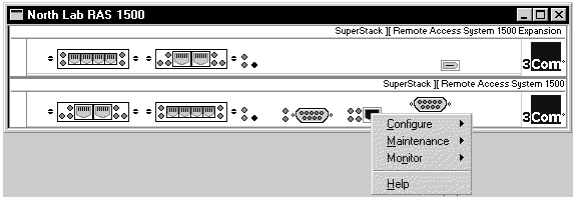
1 Move the cursor over the object on the RAS 1500 or RAS 1500 Expansion you want to configure, then left-click. The following illustration displays the objects you can configure on the RAS 1500 and RAS 1500 Expansion.



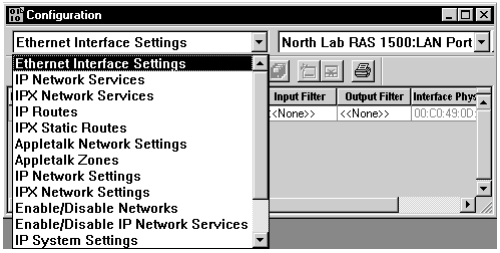
For example, left-click the LAN port on the RAS 1500 (circled in the illustration):



2 Right-click anywhere on the image to display the menu for the selected object.

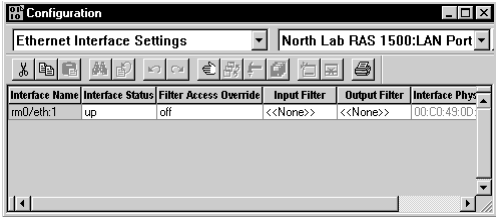


3 Select a menu item. For example, click *Configure*, then click *LAN Port*, then click *Properties*. The Configuration window appears.

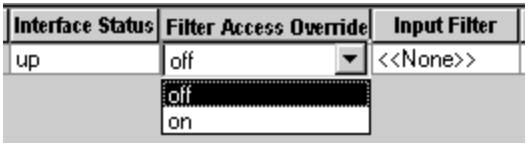


Only the management functions that are valid for the selected object are available; invalid items are greyed-out.

4 In the Parameter Group list (top-left corner of the window), click the parameter group you want to configure. For example, click *Network Interface*. The parameter values populate the fields.



5 Click the cell you want to change. For example, *Filter Access*.



6 Type or select the new setting.

7 Click the *set toolbar* button  .

8 Close the Configuration window.

Other toolbar actions used in the Configuration window include:

- Add a row to a table  .
- Retrieve settings from the RAS 1500 or RAS 1500 Expansion  .
- Undo an action  .
- Print a window  .

Viewing Online Help

TRAM provides two levels of help: "general" and "device-specific."

General help assists you with TRAM procedures, such as working with the Device Tree, toolbar, authorization, polling, and event logs. It also includes a dialog box and window reference.

Device-specific help assists you with RAS 1500 and RAS 1500 Expansion objects and parameters in the Configuration or Monitor window. It also guides you through setting up typical router applications: IP terminal service, network dial-out, network dial-in, and LAN-to-LAN routing.

To access "general" help:

- From the Help menu (at the top of the application window), select *Help*.

To access "device-specific" help:

1. Select a RAS 1500 or RAS 1500 Expansion object or parameter.
2. Right click to display the menu.
3. Select *Help*.

Viewing Specific Help Topics

View TRAM's on-line help for the following configuration options:

- Dial-in configuration
- Dial-out configuration
- IP Terminal Server configuration
- LAN-to-LAN routing configuration
- Security and accounting configuration

To access this on-line help about these topics:

1. In TRAM, left-click any object on the RAS 1500 or RAS 1500 Expansion.
2. Right-click to display the menu.
3. Click *Help*. The TRAM help window appears.
4. Click the *Help Topics* button. The Help Topics window appears.
5. Select the appropriate topic from the Contents tab.
6. Click *Display*. The help topic appears.

Additional Configuration

For additional configuration (for example, frame relay), 3Com recommends using the command line interface (CLI).

4 USING THE CLI TO CONFIGURE THE RAS 1500

This chapter contains the following information:

- Overview
- Before You Begin
- Basic CLI Configuration
- Configuring ISDN
- Configuring the PEM with the CLI
- Additional Information

For additional information on configuring the RAS 1500 with the CLI, consult the RAS 1500 System Management Guide on the RAS 1500 Resource CD-ROM.

Overview

Using Terminal Emulation

Windows HyperTerminal (included with Microsoft Windows) and Procomm Plus are popular communications packages which also support VT100 terminal emulation for IBM-PC compatible computers.

Getting CLI Help

To access help in the CLI, type **`help`** and press Enter.

Before You Begin

Before you can configure RAS 1500 with the CLI, you need to access the CLI. You can access the CLI in the following ways:

- Locally, through the Console Port
- Remotely, through your LAN connection

Accessing the CLI Locally

Use the following steps to access the CLI through the Console Port:

1. Connect the provided serial cable to the RAS 1500 console port and your PC's serial port.
2. At the Windows 95 or Windows NT desktop, click *Start*, then *Programs*, then *Accessories*, then *Hyperterminal*, then *HyperTerminal*. HyperTerminal starts and displays the Connection Description dialog box.
3. Type a name and select an icon for your connection.
4. Click *OK*. The Connect To dialog box appears.
5. From the Connect Using drop-down list, select the communications port from which you are connected to the RAS 1500.
6. Click *OK*. The Properties dialog box for the port you selected appears.
7. Make sure the Port Setting tab displays these options:
   - Bits per second: 38400
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: Hardware
8. Click *OK*.
9. Press Enter.

   If you are configuring RAS 1500 for the first time, the CLI Quick Setup appears. See "Using the CLI Quick Setup", later in this chapter.

Accessing the CLI Remotely

To access the CLI remotely, you need to do the following:

- Setting up a manage user
- Access the CLI with TELNET

Setting up a Manage User

Manage users are the only type of users who can configure the RAS 1500. The default login service is Telnet; the default dial-in service is PPP.

Use the following steps to set up a manage user:

1 Add a user. For example, user "michael" with password "benji".

At the CLI prompt, type:

```
add user michael password benji type manage
```

Press Enter.

The "manage" portion of the command gives the user configuration rights in the CLI.

Passwords are optional. You may add a null password with the keyword password and string: ""

2 Save the settings:

```
save all
```

Then press Enter.

Accessing the CLI with TELNET

This procedure accesses the RAS 1500 through a login session. For information about accessing the RAS 1500 through a dial-in session, refer to the RAS 1500 System Management Guide on the RAS 1500 Resource CD-ROM.

To start a login (Telnet) session:

1 At the Windows 95 or NT desktop, click *Start*, then *Run*. The Run dialog box appears.

2 In the Open text box, type: **`telnet <the IP address of the RAS 1500>`**.
For example, **`telnet 192.168.1.15`**

3 Click *OK*. The Telnet application window appears with a login prompt.

4 At the login prompt, type: **`<the name of the manage user>`**, for example, michael. Then press Enter.The password prompt appears.

5 At the password prompt, type: **<the user's password>**, for example benji. Then press Enter. The CLI prompt appears.

Basic CLI Configuration

You can configure the RAS 1500 CLI in two ways:

- Using the CLI Quick Setup (recommended)
- Using CLI commands only

Using CLI Quick Setup

RAS 1500's automated Quick Setup program provides initial configuration through the CLI. It starts automatically after the boot process of an unconfigured device (or when you type **delete config** at the CLI prompt).

3Com recommends using the CLI Quick Setup to configure the RAS 1500 and access the graphic user interface. The Quick Setup will let you set up simple configuration for your whole system or different portions of the system. Use the steps in the following section to perform basic CLI configuration.

Using CLI Commands

To configure enough to use the GUI based system, through the CLI Quick Setup, follow these steps:

1 Enter system identification information. The following prompts will appear on your screen.

```
>>> Enter the name of your system []:
>>> Who is the system contact person []:
>>> Where is this system located []?
```

2 Add Quick Setup management information. The GUI-based management system uses SNMP to communicate with the RAS 1500. The following CLI prompt will request an IP address for your management station.

```
>>> What is the address of the management station [0.0.0.0]?
```

Setting the management station address to 0.0.0.0 allows all stations to manage the RAS 1500. Setting a specific address limits management to a single computer and provides a level of security.

3 Add the following network administration information:

a Configure the IP address.

```
>>> Enter the network name of your IP network [ip]:
>>> Enter the IP address for the RAS 1500 []:
```

b Specify an IP mask. The default mask appears in brackets in the CLI prompt.

```
>>> What should the mask be set to [C]?
```

c Configure the default gateway. The default gateway gives the address of a router that the RAS 1500 will forward packets to when it has no other route to their destination.

The IP address for the default gateway cannot be the same address as the IP address for the RAS 1500 nor can it be a broadcast address for its IP address class.

```
>>> Enter the IP address of the default gateway []?
```

d Enter the metric or "hop count." The metric or hop count tells the RAS 1500 how far the default router is from the unit.

```
>>> What metric should be applied to the default gateway [1]?
```

4 Save your changes by typing **`save all`**.

At the end of the Quick Setup program you can review and change your settings, if necessary. You can continue advanced configuration with the CLI, or with TRAM.

Configuring ISDN

Once you have peformed the basic RAS 1500 configuration, configure RAS 1500 for ISDN. See "Using the I-Team" in *Appendix A, Configuration Assistance*, for more information about ordering ISDN service.

See "Accessing the CLI Locally", earlier in this chapter, to connect to the Console Port.

Use the following steps to configure RAS 1500 for ISDN:

If the switch type = NI - 1 (U.S. only), you need to specify Service Profile Identifiers (SPIDs). If a different switch type is being configured, proceed to Step 2.

1 Set up the Service Profile Identifiers (SPIDs):

```
set imod int rm0/slot:1/mod:1 at at*s1=[10 digit SPID]
set imod int rm0/slot:1/mod:1 at at*s2=[10 digit SPID]
```

You can set the SPIDs on modem channel one (rm0/slot:1/mod:1) or modem channel two (rm0/slot:1/mod:2); RAS 1500 applies the settings to both channels.

2 Set up the Directory Numbers (DNs) if applicable:

```
set imod int rm0/slot:1/mod:1 at at*p1=[7 digit DN]
set imod int rm0/slot:1/mod:1 at at*p2=[7 digit DN]
```

3 Set the ISDN switch type:

```
set imod int rm0/slot:1/mod:1 at at*w=[switch type]
```

Switch type	Command
AT&T 5ESS	**at*w=0**
Northern Telecom DMS-100	**at*w=1**
National ISDN-1	**at*w=2**
ETSI	**at*w=3**
Germany	**at*w=4**
Australia	**at*w=5**
Italy	**at*w=6**
Japan	**at*w=7**
New Zealand	**at*w=8**
Spain	**at*w=9**
Taiwan	**at*w=10**

4 Set the ISDN connection type:

```
set imod int rm0/slot:1/mod:1 at at*v2=5
set imod int rm0/slot:1/mod:2 at at*v2=5
```

You need to force a connection type for both channels (rm0/slot:1/mod:1 and rm0/slot:1/mod:2).

5 Save your changes:

```
set imod int rm0/slot:1/mod:1 at at&wz!
```

Configuring the PEM with the CLI

The RAS 1500 stack does not immediately recognize the removal or substitution of PEM units.

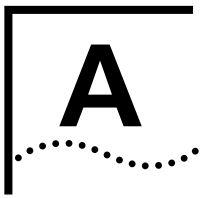
To remove and substitute another PEM module to an existing setup, issue the **reboot** command at the CLI prompt.

After the reboot process occurs, RM automatically recognizes each PEM attached to it.

See "Accessing the CLI Locally", earlier in this chapter, to connect to the Console Port.

Additional Information

For a more complete reference to configuring the RAS 1500 through the CLI, consult the RAS 1500 System Management Guide on the RAS 1500 Resource CD-ROM.



CONFIGURATION ASSISTANCE

This appendix contains the following configuration information:

- Configuration Worksheet

Configuration Worksheet

Obtain the following optional information and record the information in the space provided below:

ISDN Users

Obtain this from your ISDN provider	Your value
SPID numbers for NI–1 (1–25 digits)	
Switch type	
Directory numbers	

IPX users

Obtain this from your network administrator	Your value
IPX network name	
IPX network number	
IPX network framing (802.2 = DSAP)	
IPX user addressing	

NOS Users

Obtain this from your network administrator	Your value
NOS servers' IP address	__.__.__.__
NOS servers' Secret Password	

RADIUS Users

Obtain this from your network administrator	Your value
Radius servers' IP address	__.__.__.__
Radius secret	

UNIX SYSLOG users

Obtain this from your network administrator	Your value
Syslog servers' address	__.__.__.__
Syslog level value	

Users with an ISP

Obtain this information	Your value
ISP dial-in number (RAS 1500 to ISP)	
Alternate ISP dial-in number (RAS 1500 to ISP)	
RAS 1500's password (assigned by ISP)	
WAN IP address	__.__.__.__
WAN subnet address	__.__.__.__

Users connecting to a remote LAN

Obtain this information from the remote administrator	Your value
Network dial-in number	
Alternate network dial-in number	
RAS 1500's password (assigned by network administration)	
RAS 1500's Username	

Using the I-Team

Overview

The I-team/SuperNet Access has helped thousands of customers start with their ISDN service. Not only does the I-team/SuperNet Access eliminate the hassle of ordering the service, it also provides troubleshooting and technical support for any ISDN line it installs for 30-days and heads off potential trouble before it happens.

I-team provisioning services are available in the U.S. only.

I-Team Services

Every user that purchases a SuperStack II RAS 1500 is entitled to free I-Team service.

The 3Com I-Team offers the following services:

- Determining ISDN Service Availability

  The I-team performs a free "Loop Qualification" which determines whether ISDN service is available at your site.

- Determining Charges

  Deciphering ISDN providers' charges can be complex. The I-team/SuperNet Access determines installation and monthly charges for your service location.

- Determining Lead Times

  The I-team works with the ISDN service provider to determine when service can be installed at your location.

- Processing ISDN Service Orders

  I-team places the order for service with the ISDN service provider and provides you with a written confirmation of the date of installation, the installation price, and monthly charges.

  The I-team guarantees the ISDN line will work with your 3Com ISDN product and provides free troubleshooting and technical support for any ISDN line they provision for 30 days after installation.

- Contacting the I-Team

  For further information on I-Team services contact their toll-free hotline:

  1-800-877-ISDN 9am–9pm EST

B

TECHNICAL SPECIFICATIONS

This chapter contains information about technical specifications for the RAS 1500.

Certification

United States

FCC Part 15 Compliance Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

If these suggestions do not help, consult the following booklet:

Interference to Home Electronic Entertainment Equipment Handbook

You can order the booklet from the U.S. Government Printing Office, Washington, DC 20402. Ask for stock number 004-000-00498-1.

Analog V.34 Model: FCC Part 68 Compliance Statement

This equipment complies with Part 68 of the FCC rules concerning:

- FCC Registration Number: labeled on the board
- Facility Interface Code: 02LS2
- Service Order Code: 9.OF
- USOC Jack: RJ11C
- REN: 0.4B
- Equipment Jack: CA-A11

Canadian Installations

NOTICE: The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction. Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment. Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

BRI U Model

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

Le present appareil numerique níemet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par líIndustrie Canada (anterieurement le ministre des Communications).

Other Specifications

Physical Dimensions

The RAS 1500 has the following physical dimensions:

Length:	35.56 cm	(14.0 in.)
Width:	43.18 cm	(17.0 in.)
Height:	4.445 cm	(1.75 in.)

Interfaces

Console Interface

- Electrical specification: RS-232-C (EIA/TIA-232-E standard)
- Connector: DB-9 male
- Configuration: DTE
- Transmission method: Unbalanced RS-232
- Transmission rate: 38.4 Kbps

LAN Interface

- Data Transfer Rate: 10 Mbps
- Accessing Scheme: CSMA/CD (Carrier Sense Multiple Access with Collision Detection)
- Topology: Star Wired hub (using multiport repeater)
- Maximum Nodes: Limited only by repeater used
- Transmission Medium: Unshielded Twisted Pair (UTP)
- Network Lobe Distance: 100 m (328 ft) suggested maximum. Longer cabling may be used at the expense of reduced receiver squelch levels.
- Connector: RJ-45 8-position modular jack, Stewart 88-360808 or equivalent
- Wire Type: 10 Mbps: CAT 3 or CAT 5 twisted pairs 100 Mbps: CAT 5 twisted pairs

WAN Interface - Cabling Specifications

- Max. Cable Distance: 100 meters (328 ft.) suggested maximum. Longer cabling may be used at the expense of reduced receiver squelch levels.
- Cable Loss: Must be £ 11.5 dB/100 m for frequency range of 5–10 MHz
- Characteristic Impedance: 85–111 Ohms for frequency range of 5–10 MHz

- Propagation Delay: 5.7 nanseconds/meter
- Cabling: RJ-45 plug to RJ-45 plug straight-through for multiport repeater applications (transmit to receiver crossover cable for two-node network).

FireWire

- Electrical specification: N/A
- Connector: IEEE P1394
- Configuration: N/A
- Transmission method: HSSB (High Speed Serial Bus)
- Transmission rate: N/A

Environmental

- Shipping and Storage Temperature: 0° C to 40° C, 32° F to 104° F
- Shipping and Storage Relative Humidity: 0 – 95%, non-condensing
- Operating Temperature: 0° C to 40° C, 32° F to 104° F
- Maximum Rated Ambient Temperature: 40° C, 104° C
- Operating Relative Humidity: 0 – 95%, non-condensing

Power Requirements

Voltage (VDC)	Maximum Current (A)	Maximum Power Output (W)
12	1.5	30
5	12 *	35
3.3	10 *	33

The 5 and 3.3 VDC outputs "power-share." Since the maximum power output of the 12 VDC supply is 30 W, the remaining 40 W is shared between the 3.3 and 5 VDC supplies. If no load in 3.3 V and 12 V limited to 0.6 A, then 5 V can deliver 12 A.

Input Voltage: 100 - 240 VAC, 50/60 Hz

Maximum Input Current: 1.5 A

3COM LIMITED WARRANTY

SuperStack II Remote Access System 1500

HARDWARE

3Com warrants this hardware product to be free from defects in workmanship and materials, under normal use and service, for the following length of time from the date of purchase from 3Com or its authorized reseller:

One (1) year

3Com's sole obligation under this express warranty shall be, at 3Com's option and expense, to repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or if neither of the two foregoing options is reasonably available, 3Com may, in its sole discretion, refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3Com. Replacement products may be new or reconditioned. 3Com warrants any replaced or repaired product or part for ninety (90) days from shipment, or the remainder of the initial warranty period, whichever is longer.

SOFTWARE

3Com warrants that each software program licensed from it will perform in substantial conformance to its program specifications, for a period of ninety (90) days from the date of purchase from 3Com or its authorized reseller. 3Com warrants the media containing software against failure during the warranty period. Free software upgrades are provided for a period of ninety (90) days from the date of purchase from 3Com or its authorized reseller. 3Com's sole obligation under this express warranty shall be, at 3Com's option and expense, to refund the purchase price paid by Customer for any defective software product, or to replace any defective media with software which substantially conforms to applicable 3Com published specifications. Customer assumes responsibility for the selection of the appropriate applications program and associated reference materials. 3Com makes no warranty or representation that its software products will meet Customer's requirements or work in combination with any hardware or applications software products provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected. For any third party products listed in the 3Com software product documentation or specifications as being compatible, 3Com will make reasonable efforts to provide compatibility, except where the non-compatibility is caused by a "bug" or defect in the third party's product or from use of the software product not in accordance with 3Com's published specifications or user manual.

YEAR 2000 WARRANTY

In addition to the Hardware Warranty and Software Warranty stated above, 3Com warrants that each product sold or licensed to Customer on and after January 1, 1998 that is date sensitive will continue performing properly with regard to such date data on and after January 1, 2000, provided that all other products used by Customer in connection or combination with the 3Com product, including hardware, software, and firmware, accurately exchange date data with the 3Com product, with the exception of those products identified at 3Com's Web site, http://www.3com.com/products/yr2000.html, as not meeting this standard. If it appears that any product that is stated to meet this standard does not perform properly with regard to such date data on and after January 1, 2000, and Customer notifies 3Com before the later of April 1, 2000, or ninety (90) days after purchase of the product from 3Com or its authorized reseller, 3Com shall, at its option and expense, provide a software update which would effect the proper performance of such product, repair such product, deliver to Customer an equivalent product to replace such product, or if none of the foregoing is feasible, refund to Customer the purchase price paid for such product.

Any software update or replaced or repaired product will carry a Year 2000 Warranty for ninety (90) days after purchase or until April 1, 2000, whichever is later.

OBTAINING WARRANTY SERVICE

Customer must contact a 3Com Corporate Service Center or an Authorized 3Com Service Center within the applicable warranty period to obtain warranty service authorization. Dated proof of purchase from 3Com or its authorized reseller may be required. Products returned to 3Com's Corporate Service Center must be pre-authorized by 3Com with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepaid and packaged appropriately for safe shipment, and it is recommended that they be insured or sent by a method that provides for tracking of the package. The repaired or replaced item will be shipped to Customer, at 3Com's expense, not later than thirty (30) days after 3Com receives the defective product.

Dead- or Defective-on-Arrival. In the event a product completely fails to function or exhibits a defect in materials or workmanship within the first forty-eight (48) hours of installation but no later than thirty (30) days after the date of purchase, and this is verified by 3Com, it will be considered dead- or defective-on-arrival (DOA) and a replacement shall be provided by advance replacement. The replacement product will normally be shipped not later than three (3) business days after 3Com's verification of the DOA product, but may be delayed due to export or import procedures. When an advance replacement is provided and Customer fails to return the original product to 3Com within fifteen (15) days after shipment of the replacement, 3Com will charge Customer for the replacement product, at list price.

3Com shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3Com for repair, whether under warranty or not.

Telephone Support, with coverage for basic troubleshooting only, will be provided for ninety (90) days, on a commercially reasonable efforts basis. Telephone support from 3Com is available from 3Com only if Customer purchased this product directly from 3Com, or if Customer's reseller is unable to provide telephone support. Please refer to the Technical Support appendix in the user guide for telephone numbers.

WARRANTIES EXCLUSIVE

IF A 3COM PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, CUSTOMER'S SOLE REMEDY FOR BREACH OF THAT WARRANTY SHALL BE REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM'S OPTION. TO THE FULL EXTENT ALLOWED BY LAW, THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, TERMS, OR CONDITIONS, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES, TERMS, OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, SATISFACTORY QUALITY, CORRESPONDENCE WITH DESCRIPTION, AND NON-INFRINGEMENT, ALL OF WHICH ARE EXPRESSLY DISCLAIMED. 3COM NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE OR USE OF ITS PRODUCTS.

3COM SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT OR MALFUNCTION IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLECT, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO OPEN, REPAIR OR MODIFY THE PRODUCT, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, OTHER HAZARDS, OR ACTS OF GOD.

LIMITATION OF LIABILITY

TO THE FULL EXTENT ALLOWED BY LAW, 3COM ALSO EXCLUDES FOR ITSELF AND ITS SUPPLIERS ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATA, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF ITS PRODUCTS, EVEN IF 3COM OR ITS AUTHORIZED RESELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM'S OPTION. THIS DISCLAIMER OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

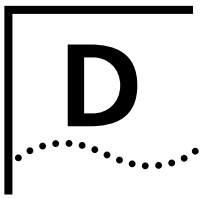
DISCLAIMER

Some countries, states, or provinces do not allow the exclusion or limitation of implied warranties or the limitation of incidental or consequential damages for certain products supplied to consumers, or the limitation of liability for personal injury, so the above limitations and exclusions may be limited in their application to you. When the implied warranties are not allowed to be excluded in their entirety, they will be limited to the duration of the applicable written warranty. This warranty gives you specific legal rights which may vary depending on local law.

GOVERNING LAW

This Limited Warranty shall be governed by the laws of the State of California, U.S.A. excluding its conflicts of laws principles and excluding the United Nations Convention on Contracts for the International Sale of Goods.

3Com Corporation
5400 Bayfront Plaza
Santa Clara, CA 95054 USA
(408) 326-5000



TECHNICAL SUPPORT

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the very latest, 3Com recommends that you access the 3Com Corporation World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com FTP site
- 3Com Bulletin Board Service (3Com BBS)
- 3ComFacts℠ automated fax service

World Wide Web Site

Access the latest networking information on the 3Com Corporation World Wide Web site by entering the URL into your Internet browser:

`http://support.3com.com/`

This service provides access to online support information such as technical documentation and software library, as well as support options ranging from technical education to maintenance and professional services.

3Com FTP Site

Download drivers, patches, software, and MIBs across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

- Hostname: **ftp.3com.com** (or **192.156.136.12**)
- Username: **anonymous**
- Password: **<your Internet e-mail address>**

A user name and password are not needed with Web browser software such as Netscape Navigator and Internet Explorer.

3Com Bulletin Board Service

The 3Com BBS contains patches, software, and drivers for 3Com products. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	Up to 14,400 bps	61 2 9955 2073
Brazil	Up to 14,400 bps	55 11 5181 9666
France	Up to 14,400 bps	33 1 6986 6954
Germany	Up to 28,800 bps	4989 62732 188
Hong Kong	Up to 14,400 bps	852 2537 5601
Italy	Up to 14,400 bps	39 2 27300680
Japan	Up to 14,400 bps	81 3 3345 7266
Mexico	Up to 28,800 bps	52 5 520 7835
P.R. of China	Up to 14,400 bps	86 10 684 92351
Taiwan, R.O.C.	Up to 14,400 bps	886 2 377 5840
U.K.	Up to 28,800 bps	44 1442 438278
U.S.A.	Up to 53,333 bps	1 847 262 6000

Access by Digital Modem

ISDN users can dial in to the 3Com BBS using a digital modem for fast access up to 64 Kbps. To access the 3Com BBS using ISDN, use the following number:

1 847 262 6000

3ComFacts Automated Fax Service

The 3ComFacts automated fax service provides technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone:

1 408 727 7021

Support from Your Network Supplier

If additional assistance is required, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to obtain assistance from the 3Com online technical resources or from your network supplier, 3Com offers technical telephone support services. To find out more about your support options, please call the 3Com technical telephone support phone number at the location nearest you.

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

Below is a list of worldwide technical telephone support numbers:

Country	Telephone Number	Country	Telephone Number
Asia Pacific Rim			
Australia	1 800 678 515	P.R. of China	10800 61 00137 or
Hong Kong	800 933 486		021 6350 1590
India	61 2 9937 5085	Singapore	800 6161 463
Indonesia	001 800 61 009	S. Korea	
Japan	0031 61 6439	From anywhere in S. Korea:	82 2 3455 6455
Malaysia	1800 801 777	From Seoul:	00798 611 2230
New Zealand	0800 446 398	Taiwan, R.O.C.	0080 611 261
Pakistan	61 2 9937 5085	Thailand	001 800 611 2000
Philippines	1235 61 266 2602		
Europe			
From anywhere in Europe, call:	+31 (0)30 6029900 phone +31 (0)30 6029999 fax		
From the following European countries, you may use the toll-free numbers:			
Austria	06 607468	Netherlands	0800 0227788
Belgium	0800 71429	Norway	800 11376
Denmark	800 17309	Poland	0800 3111206
Finland	0800 113153	Portugal	05 05313416
France	0800 917959	South Africa	0800 995014
Germany	0130 821502	Spain	900 983125
Hungary	00800 12813	Sweden	020 795482
Ireland	1 800 553117	Switzerland	0800 55 3072
Israel	177 3103794	U.K.	0800 966197
Italy	1678 79489		
Latin America			
Argentina	AT&T +800 666 5065	Mexico	01 800 CARE (01 800 2273)
Brazil	0800 13 3266	Peru	AT&T +800 666 5065
Chile	1230 020 0645	Puerto Rico	800 666 5065
Colombia	98012 2127	Venezuela	AT&T +800 666 5065
North America	1 800 NET 3Com (1 800 638 3266)		

Returning Products for Repair

Before you send a product directly to 3Com for repair, you must first obtain a Return Materials Authorization (RMA) number. Products sent to 3Com without RMA numbers will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

Country	Telephone Number	Fax Number
Asia, Pacific Rim	65 543 6500	65 543 6348
Europe, South Africa, and Middle East	+ 44 1442 435860	+ 44 1442 435718
From the following European countries, you may call the toll-free numbers; select option 2 and then option 2:		
Austria	06 607468	
Belgium	0800 71429	
Denmark	800 17309	
Finland	0800 113153	
France	0800 917959	
Germany	0130 821502	
Hungary	00800 12813	
Ireland	1800553117	
Israel	177 3103794	
Italy	1678 79489	
Netherlands	0800 0227788	
Norway	800 11376	
Poland	00800 3111206	
Portugal	05 05313416	
South Africa	0800 995014	
Spain	900 983125	
Sweden	020 795482	
Switzerland	0800 55 3072	
U.K.	0800 966197	
Latin America	1 408 326 2927	1 408 326 3355
U.S.A. and Canada	1 800 NET 3Com (1 800 638 3266)	1 408 326 7120

INDEX

S

T

U

W