Remote Annex 2000

Hardware Installation Guide

Bay Networks

Revision	Description
A	Initial release.
B	Added 4-port and ISDN support. Added new illustrations.
C	Removed ISDN information; the Remote Annex 2000 does not support ISDN.
	Chapter 3: Added notes to **boot** command; also added information regarding status codes during a boot sequence.
C1	Format change.

Revision Level History

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This guide describes how to install a Remote Annex 2000 on a local area network (LAN).

See the *Annex Quick Start* or the *Remote Annex Software Installation Notes* that come with your Remote Annex 2000 for a description of the software installation. See the *Remote Annex Administrator's Guide for UNIX* for configuration information.

About this Guide

This guide includes the following chapters and appendices:

Chapter 1   **Introduction**
This chapter contains an overview of the Remote Annex 2000; it describes the hardware features and firmware functions.

Chapter 2   **Installing the Remote Annex 2000**
This chapter describes how to install the Remote Annex 2000 on a LAN, and how to confirm its operating status.

Chapter 3   **ROM Monitor Commands**
This chapter describes the ROM Monitor commands that modify specific configuration parameters, perform diagnostic tests, and load the operational code.

Chapter 4   **Troubleshooting Procedures**
This chapter provides troubleshooting and verification procedures.

Appendix A   **Port Pin/Signal Allocations**
This appendix details the connectors located on the rear panel of the Remote Annex 2000.

Appendix B   Cables and Connectors
This appendix describes the wiring for Remote Annex 2000 cables.

Appendix C   Warranty and Technical Support Information
This appendix provides warranty and technical support information.

Printing Conventions

This manual uses the following printing conventions:

Convention:	Represents:
special type	In examples, special type indicates system output.
special type	Bold special type indicates user input.
Return	In command examples, this notation indicates that pressing Return enters the default value.
bold	Bold indicates commands, path names, or file names that must be entered as displayed.
italics	In the context of commands and command syntax, lowercase italics indicate variables for which the user supplies a value.
[ ]	In command dialogue, square brackets indicate default values. Pressing Return selects this value. Square brackets appearing in command syntax indicate optional arguments.
{ }	In command syntax, braces indicate that one, and only one, of the enclosed value must be entered.

Convention:	Represents:
		In command syntax, this character separates the different options available for a parameter.
	Notes provide important information.
	Warnings inform you about conditions that can have adverse effects on processing.
	Cautions notify you about dangerous conditions.

Related Documents

Each Remote Annex hardware platform ships with the appropriate hardware guide. The remaining documentation is included with the software.

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Bay Networks Information Services complement the Bay Networks Service program portfolio by giving customers and partners access to the most current technical and support information through a choice of access/retrieval means. These include the World Wide Web, CompuServe, Support Source CD, Customer Support FTP, and InfoFACTS document fax service.

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	(508) 436-8880 (direct)	
Europe	(33) 92-968-300	(33) 92-968-301
Asia/Pacific Region	(612) 9927-8800	(612) 9927-8811
Latin America	(407) 997-1713	(407) 997-1714

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❑ Customize the listing of cases according to a variety of criteria, including date, severity, status, and case ID.

❑ Log notes to existing open cases.

❑ Create new cases for rapid, efficient handling of noncritical network situations.

❑ Communicate directly via e-mail with the specific technical resources assigned to your case.

The Bay Networks URL is *http://www.baynetworks.com.* Customer Service is a menu item on that home page.

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The Support Source CD contains extracts from our problem-tracking database; information from the Bay Networks Forum on CompuServe; comprehensive technical documentation, such as Customer Support Bulletins, Release Notes, software patches and fixes; and complete information on all Bay Networks Service programs.

You can run a single version on Macintosh, Windows 3.1, Windows 95, Windows NT, DOS, or UNIX computing platforms. A Web links feature enables you to go directly from the CD to various Bay Networks Web pages.

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We recommend the use of CompuServe Information Manager software to access these Bay Networks Information Services resources. To open an account and receive a local dial-up number in the United States, call CompuServe at 1-800-524-3388. Outside the United States, call 1-614-529-1349, or your nearest CompuServe office. Ask for Representative No. 591. When you are on line with your CompuServe account, you can reach us with the command **GO BAYNET**.

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Technical Response Center	Telephone Number	Fax Number
Billerica, MA	1-800-2LANWAN	(508) 670-8765
Santa Clara, CA	1-800-2LANWAN	(408) 764-1188
Valbonne, France	(33) 92-968-968	(33) 92-966-998
Sydney, Australia	(612) 9927-8800	(612) 9927-8811
Tokyo, Japan	(81) 3-5402-0180	(81) 3-5402-0173

T he Remote Annex 2000 is a multi-purpose network server. The Remote Annex is used for:

❑ *Remote Network Access.*

❑ *Dial-up Routing.*

❑ *Terminal, Printing, and Communications Access.*

Remote Network Access

The Remote Annex 2000 is a multi-protocol, remote access server that provides remote network access to the following networks:

❑ Novell Netware.

❑ TCP/IP.

❑ AppleTalk.

illustrates the Remote Annex 2000 as a remote access server.
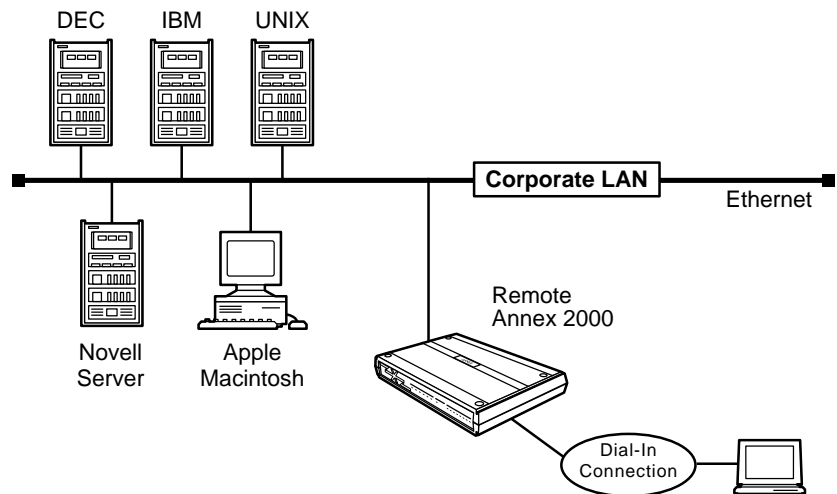
Figure 1-1. The Remote Annex 2000 as a Remote Access Server

Dial-up Routing

The Remote Annex 2000 provides dial-up routing support for UNIX and Novell networks. Using a Remote Annex 2000, network administrators can connect two or more local area networks (LANs) over a wide area network (WAN) using a standard telephone line.

Figure 1-2 illustrates the Remote Annex 2000 as a dial-up router.
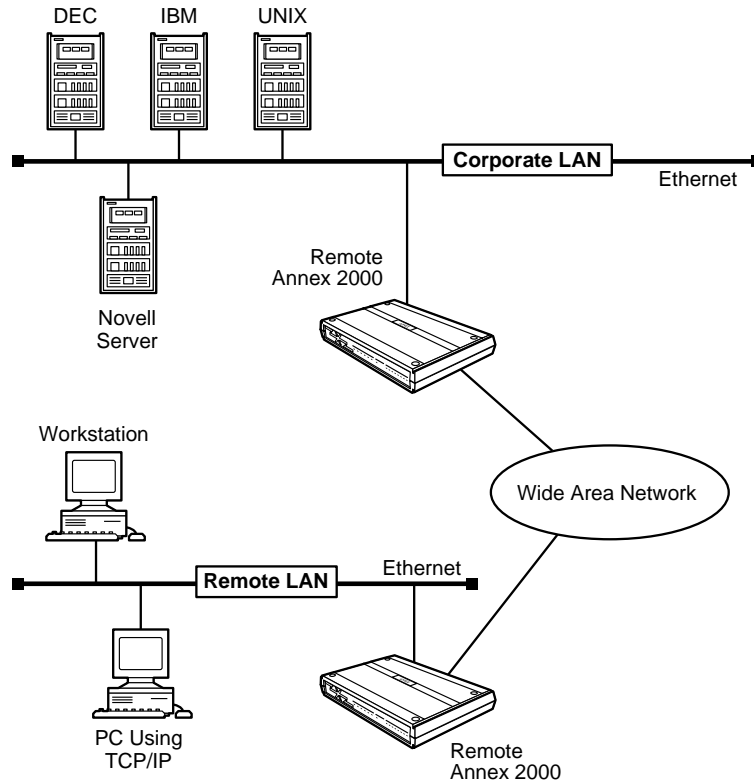
Figure 1-2. RA 2000 as a Dial-up Router

Terminal, Printer, and Communications Access

The Remote Annex 2000 provides terminal, printer, and communications access to users on a local area network.

Figure 1-3 illustrates the Remote Annex 2000 as a terminal, printer, and communications server.
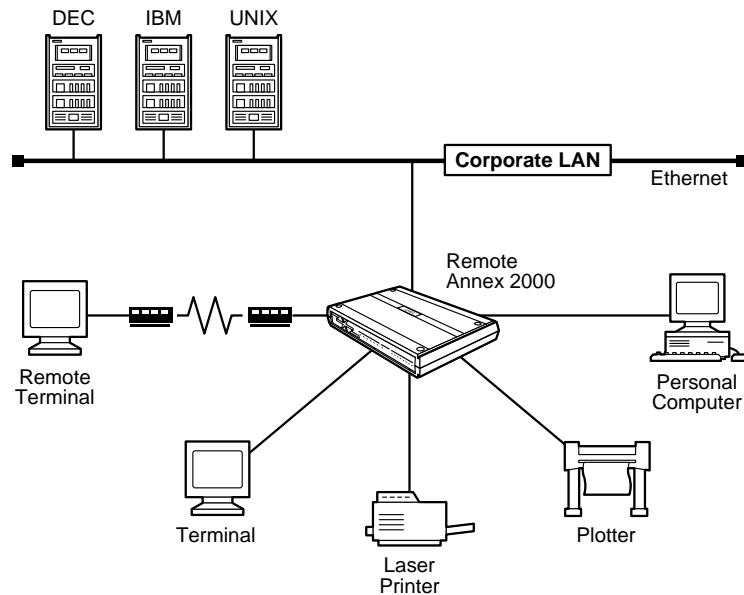
Figure 1-3. RA 2000 as a Terminal, Printer, and Communications Server

Remote Annex 2000 Description

The Remote Annex 2000 connects from 1 to 16 asynchronous serial devices to host computers on a local area network (LAN). Figure 1-4 illustrates a Remote Annex 2000.
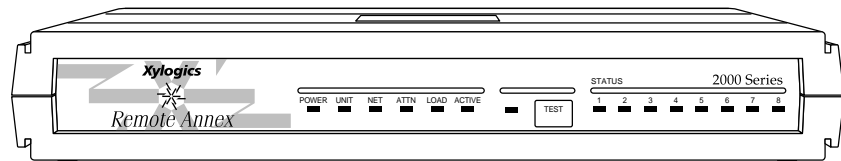
Figure 1-4. The Remote Annex 2000

The Remote Annex 2000 complies with the Ethernet Revision 2.0 or the IEEE 802.3 specifications using standard Ethernet 10Base2 (Thin), 10Base5 (Thick), or 10BaseT (twisted pair) as the physical medium.

Memory

The Remote Annex 2000 is a powerful 32-bit device that comes with an Intel 80486 SXLC2 clock-doubled processor. The Remote Annex 2000 read-only memory (ROM) contains firmware for performing power-up self-tests and loading operational code. A non-volatile EEPROM stores the configuration parameters.

ROM Monitor

When the Remote Annex 2000 is first booted, the console displays the ROM monitor prompt. The ROM monitor is an interactive command interpreter that is used to define configuration parameters. All of the information that the Remote Annex 2000 needs to find and boot an operational image is defined using the ROM monitor and its command set.

ROM Monitor commands are issued from a console terminal connected to the console port on the Remote Annex 2000's rear panel. Using the ROM Monitor commands (see Chapter 3), you can:

❑ Modify and display a set of configuration parameters stored in EEPROM memory.

❑ Execute interactive diagnostic tests.

❑ Receive statistics on both the hardware configuration and the network.

❑ Boot the Remote Annex 2000 manually.

Once the Remote Annex 2000 has obtained a boot image and is booted, the console leaves the ROM monitor and displays the console monitor. Refer to the *Remote Annex Administrator's Guide for UNIX* for information on the console monitor.

Supported
Configurations

The Remote Annex 2000 can obtain full operational code over the network from one of the following devices:

❑ Novell server.

❑ UNIX host.

❑ VMS host.

❑ Remote Annex 2000 Series configured as a load server.

You can also boot a Remote Annex 2000 from the optional Flash ROM (self-booting).

Communications
Support

The Remote Annex 2000 is available with 4, 8, or 16 RJ45 asynchronous serial ports.

Watchdog Timer

The Remote Annex 2000 has a watchdog timer that its software resets at regular intervals. The watchdog timer reboots the Remote Annex 2000 in the unlikely event of an internal software error.

All Remote Annex 2000 support full modem control (five control lines) on all ports.

Front Panel

The Remote Annex 2000 front panel consists of:

❑   *Six system LEDs.*

❑   *A test LED.*

❑   *A test button.*

❑   *Eight status LEDs.*

Figure 1-5 illustrates the Remote Annex 2000 front panel. Table 1-1 describes the LEDs on the front panel.
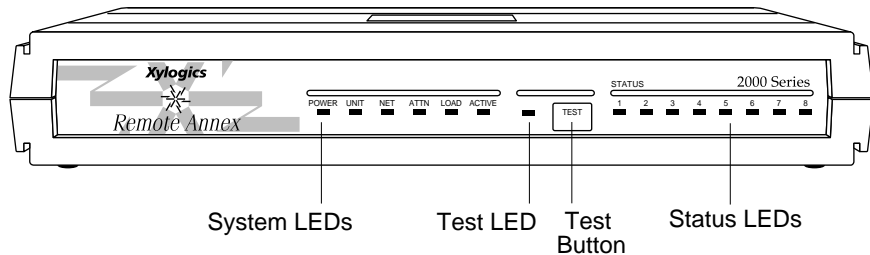
Figure 1-5. Remote Annex 2000 Front Panel

Front Panel Components

System LEDs

There are six system LEDs located on the front panel of the Remote Annex 2000. The LEDs turn on or off to reflect the Remote Annex 2000's status. Table 1-1 describes the LEDs.

Table 1-1. Front Panel System LEDs

LED	Definition
Power	*On* when the unit is receiving AC power and the internal DC power supply is working properly.
Unit	*On* after the unit successfully passes its self-test.
Net	*On* when the unit successfully transmits test data to, and receives test data from, the network.
Attn	*On* when the unit requires operator attention; *flashing* when the unit encounters a problem.
Load	*On* when the unit is loading or dumping; *flashing* when the unit is trying to initiate a load.
Active	*Flashing* when the unit is transmitting data to, and receiving data from, the network; *flashing* during diagnostics.

Test LED

The **Test** LED lights when the Remote Annex 2000 is in test mode.

Test Button

The ⃞ Test button allows you to change the operational mode of the Remote Annex 2000 from Normal to Test. It also functions as a ⃞ Reset button (see Note below). The Remote Annex 2000 automatically powers up in normal mode. To enter test mode, press the ⃞ Test button within three seconds of powering-up.

Holding the ⃞ Test button for longer than 3 seconds resets the unit.

Status LEDs   The eight status LEDs, numbered one through eight, display serial port activity during normal operations. When the Remote Annex 2000 encounters a problem or an internal error condition, these LEDs display error information. Technical support personnel can use this information to diagnose problems.

Rear Panels

The Remote Annex 2000 is available in the following configurations:

❑   4-port

❑   8-port

❑   16-port

4-Port Remote Annex 2000

The Remote Annex 2000 is available with 4 asynchronous ports. Figure 1-6 illustrates the rear panel of a 4-port unit.
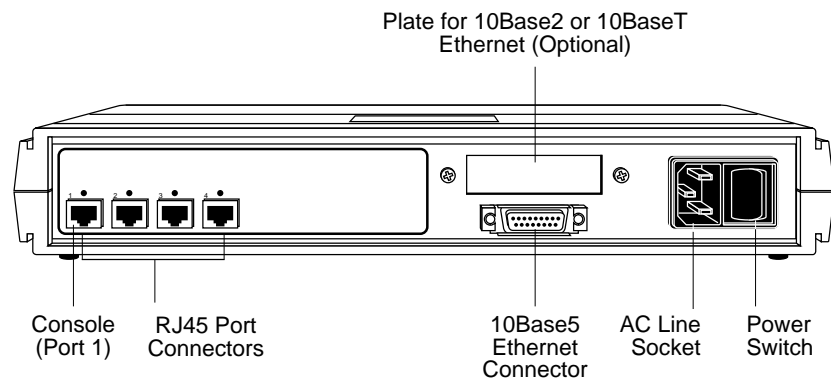
Figure 1-6. Rear Panel of a 4-Port Remote Annex 2000

8-Port Remote Annex 2000

The Remote Annex 2000 is available with **8** asynchronous ports.
Figure 1-7 illustrates the rear panel of an 8-port unit.

Plate for 10Base2 or 10BaseT
Ethernet (Optional)

Console   RJ45 Port   10Base5   AC Line   Power
(Port 1)   Connectors   Ethernet   Socket   Switch
                                        Connector
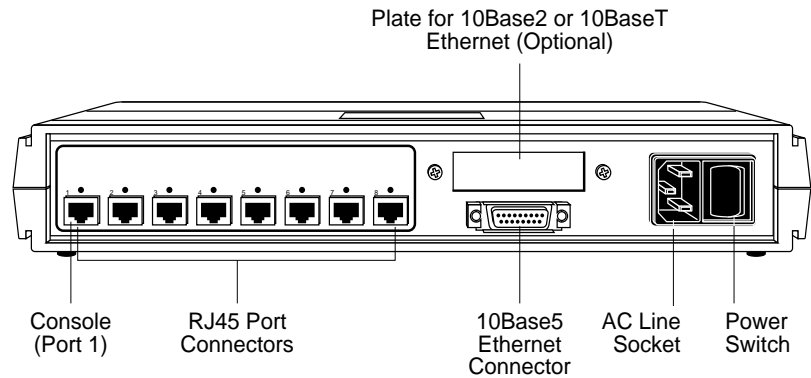
Figure 1-7. Rear Panel of an 8-Port Remote Annex 2000

16-Port Remote Annex 2000

The Remote Annex 2000 is available with 16 asynchronous ports. Figure 1-8 illustrates the rear panel of a 16-port unit.
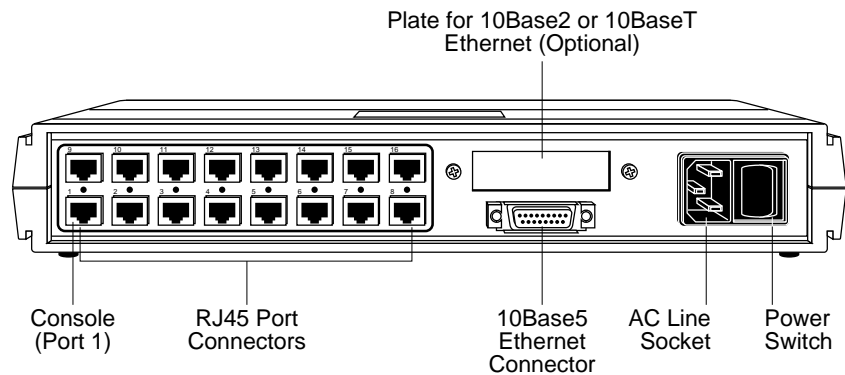
Figure 1-8. Rear Panel of a 16-Port Remote Annex 2000

Rear Panel Components

The Remote Annex 2000 can have the following connectors and switches (Appendix A lists the connectors' signal/pin allocations).

- ❑ *Console Port (port 1).*
- ❑ *RJ45 Port Connectors.*
- ❑ Network Interface Connectors.
- ❑ *AC Line Socket.*
- ❑ *Power Switch.*

| Console Port (Port 1) | The console port (Port 1) provides access to the ROM Monitor commands when the Remote Annex 2000 is in test mode. |

RJ45 Port Connectors

The RJ45 Port Connectors connect from 1 to 16 asynchronous serial devices to the Remote Annex 2000.

Network Interface Connectors

The Remote Annex 2000 has the following network interface ports for connecting to a LAN:

❑ 10Base2 Ethernet port with a BNC connector (optional).

❑ 10Base5 Ethernet transceiver port with a DB15 connector.

❑ 10BaseT Ethernet port with an RJ45 connector (optional).

The DB15 Ethernet 10Base5 transceiver port is present on the rear panel even when another network interface port is present. The BNC 10Base2 and RJ45 10BaseT connectors are present only if ordered with the unit. The Remote Annex 2000 automatically determines which interface to use.

Connect only one interface at a time.

The Remote Annex 2000 must be reset when changing network interface connections.

Power Switch

The Power Switch disconnects AC power without disconnecting the Remote Annex 2000 from the power source.

Power Select
Switch

The Power Select Switch selects the operational voltage range. The Remote Annex 2000 automatically selects the operational voltage range. The 110V position allows operation in the 90 to 130 VAC range; the 220V position allows operation in the 180 to 260 VAC range.

AC Line Socket

The AC Line Socket supplies power to the Remote Annex 2000 through the AC power cord. The AC power cord is plugged into the AC Line Socket.

Physical Characteristics

The Remote Annex 2000 enclosure has the following characteristics:

❑ **Dimensions:**

Height: 2.5 in. (63.5 mm).
Width: 13 in. (330 mm).
Depth: 9.5 in. (241 mm).

❑ **Weight:**

5 lbs (2.3 kg).

❑ **Power:**

Internal supply.
90–130 VAC, 1.0A.
180–260 VAC, 0.5A.
47–63 Hz, 110W, 376 BTU/hr.

❑ Environment:

  ❑ Operating temperature: 0° to 50°C.

  ❑ Non-operating temperature: -25° to 65°C.

  ❑ Operating humidity: 5% to 95% relative humidity, non-condensing.

  ❑ Non-operating humidity: 5% to 95% relative humidity, non-condensing.

  ❑ Operating shock: 10G peak 1/2 sine wave, 11 ms duration.

  ❑ Operating vibration: random vibration $1.2 * 10^{-3}\ G^2/Hz$, 12 to 198 Hz.

  ❑ Audible noise: A-Weighted Sound Pressure level less than 36 dB @ 1 meter from all 6 surfaces.

  ❑ Operating altitude: 0 to 4000 meters.

  ❑ Storage altitude: 0 to 15,000 meters.

  ❑ Transportation vibration and shock: NSTA project 1A standard in shipping container.

❑ **Approvals:**

  ❑ Meets safety requirements of ETL (US and Canada), UL1950, CSA C22.2 No. 950, and EN60950.

  ❑ Meets EMI requirements of FCC Class A and EN55022 Class A with shielded and unshielded cables. Meets EMI requirements of EN55022 Class B with shielded cables.

  ❑ Meets EMC requirements of EN50082-1.

❑ **MTBF:**

114,000 hrs. calculated @ 25°C (Mil Std 217).

❑ **Rear clearance requirement (for connectors and cables):**

6 in. (15 cm).

T his chapter contains a description of how to install your Remote Annex 2000 on your Ethernet network. Installing the Remote Annex 2000 consists of:

❑   *Connecting a LAN Using Ethernet.*

❑   *Connecting a Console Terminal.*

❑   *Connecting Serial Devices.*

❑   *Powering Up and Testing the Remote Annex 2000.*

❑   *Installing the Software and Loading the Operational Image.*

❑   *Auto-initializing the ROMs.*

❑   *Self-booting the Remote Annex 2000.*

Before you Begin

The Remote Annex 2000's software and operational image can be installed on four different devices. Table 2-1 outlines the different configurations the Remote Annex 2000 supports.

Table 2-1. Remote Annex 2000 Configuration Options

Device where the Operational Software and Image is installed	Remote Annex 2000 Must be Connected to the Network	Input Device used to Enter Installation Parameters
Novell Server	Yes	PC on the network or Console
UNIX Load Host	No	Console
VAX VMS Load Host	Yes	Console
Self-boot Unit (contains Flash)	No	Console

Connecting the Remote Annex to a LAN requires the following equipment:

❑ The appropriate network cable (e.g., Ethernet transceiver cable) for connecting to a LAN or an Ethernet loopback connector.

❑ The console port cable (supplied with software) and a console terminal.

❑ An RJ45 cable (for a SLIP connection).

❑ A PC on the network (Novell boot).

Connecting devices to the Remote Annex 2000 requires:

❑ One RJ45 cable for each serial connection.

Connecting a LAN Using Ethernet

The Remote Annex 2000 supports three types of Ethernet connections: Thin Ethernet, Thick Ethernet, or Twisted Pair (see Figure 2-1).
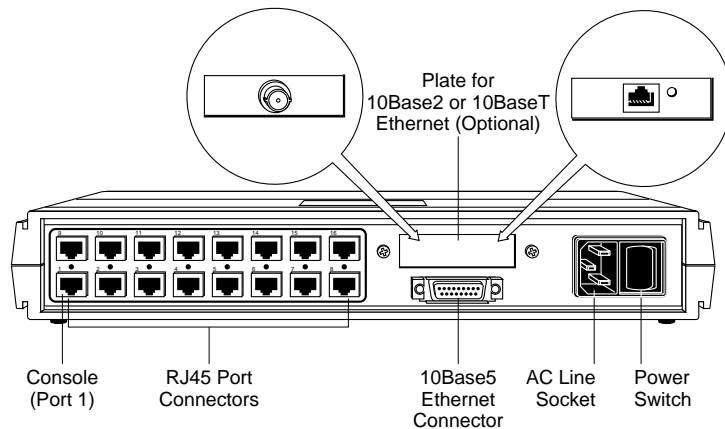
Figure 2-1. Remote Annex 2000 Ethernet Connections

Each connection type requires a different connection procedure described in the following sections. Connect only one type of Ethernet cabling at one time.

> Make sure the Remote Annex 2000 is powered off before disconnecting or connecting the Ethernet cabling.

The following subsections contain a description of how to connect your Remote Annex 2000 to:

❑ *Thin Ethernet (10Base2).*

❑ *Thick Ethernet (10Base5).*

❑ *Twisted Pair (10BaseT).*

Connecting Thin Ethernet (10Base2) Cable

To connect to Thin Ethernet (10Base2) or equivalent cable, you must use a T-connector. The T-connector is installed in your Ethernet network cable. Follow these steps to connect the Remote Annex 2000 to a Thin Ethernet cable (see Figure 2-2):

1   Verify that both sides of the T-connector are connected to the Thin Ethernet cable.

   If the Remote Annex 2000 is the last device on the Thin Ethernet cable, make sure that one side of the T-connector is connected to the cable and the other side is connected to a network terminator.

2   Plug the T-connector on the Thin Ethernet cable (RG-58 coaxial cable) into the 10Base2 Ethernet connector (optional) located on the rear panel of the Remote Annex 2000.

3   **Twist the sleeve on the T-connector clockwise to lock the connection in place.**
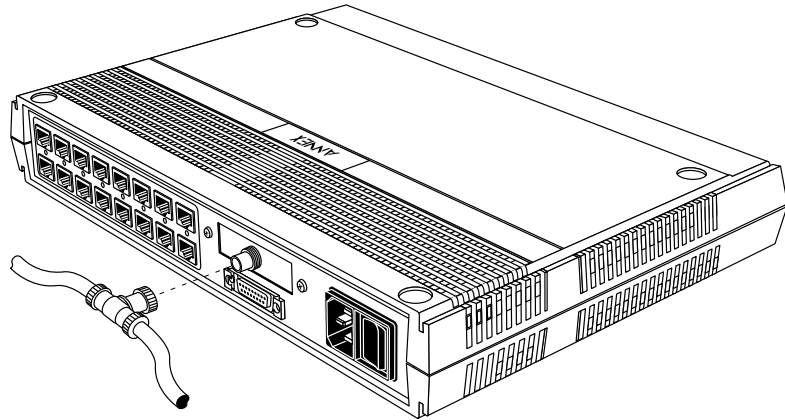
Figure 2-2. Connecting Thin Ethernet Cable

Connecting Thick Ethernet (10Base5) Cable

To connect to Thick Ethernet (10Base5) or equivalent transceiver cable, you must have already installed a 10Base5 Ethernet network cable. Follow these steps to connect the Remote Annex 2000 to a Thick Ethernet cable (see Figure 2-3):

1   **Make sure the Thick Ethernet cable is plugged into the Ethernet network.**

2   **Push the slide mechanism on the Remote Annex 2000's Thick Ethernet connector to the right and plug in the transceiver cable.**

3   **Push the slide mechanism to the left to secure the connection.**
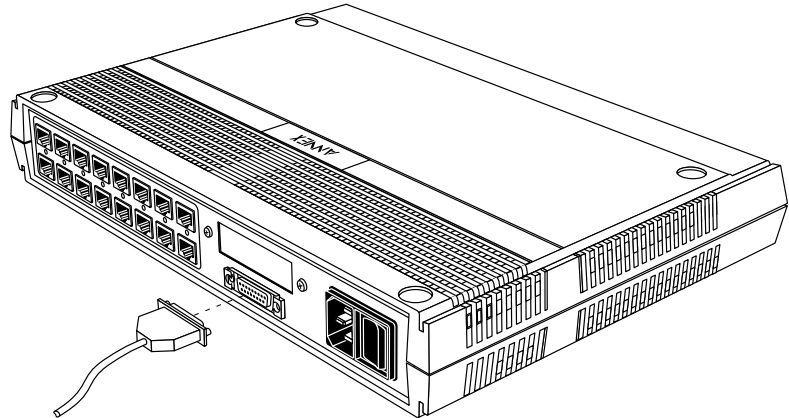
Figure 2-3. Connecting Thick Ethernet Cable

Connecting Twisted Pair Ethernet (10BaseT) Cable

Follow the steps in this section to connect a Twisted Pair (10BaseT)
Ethernet cable to the Remote Annex 2000 (see Figure 2-4):

1   **Insert the RJ-45 connector located on the Twisted Pair Ethernet cable
     into the 10BaseT connector on the rear panel of the Remote
     Annex 2000.**

2   **When the connector clicks into place, the connection is secure.**

3   **Verify that the Link Indicator is green.**

The green link indicator LED next to the 10BaseT connector goes on when power is applied and an active 10BaseT network segment is plugged in.
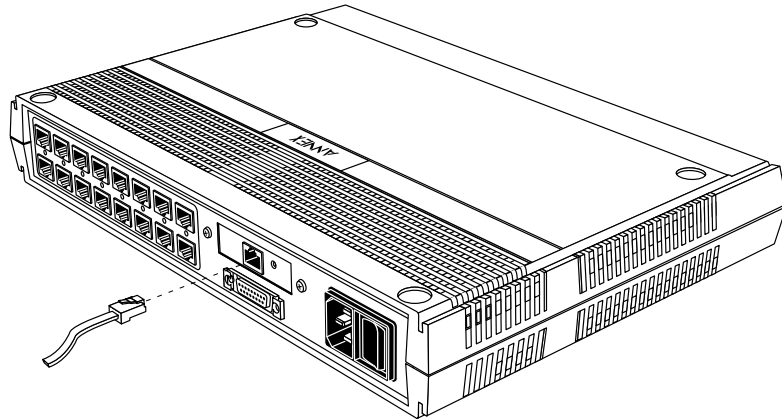
Figure 2-4. Connecting Twisted Pair Ethernet Cable

Do not confuse this connector with the console port RJ-45 connector (Port 1).

Connecting a Console Terminal

A console terminal is used to access the ROM Monitor and boot the Remote Annex 2000 for the first time. Follow the steps in this section to connect a console terminal to the console port (Port 1) located on the rear panel of the Remote Annex 2000.

1   **Connect the Console Terminal's I/O connector to the RJ-45 cable (the accessory kit includes a cable) using a Telco RJ wire to a DB-25 DTE drop adapter (see Figure 2-5).**
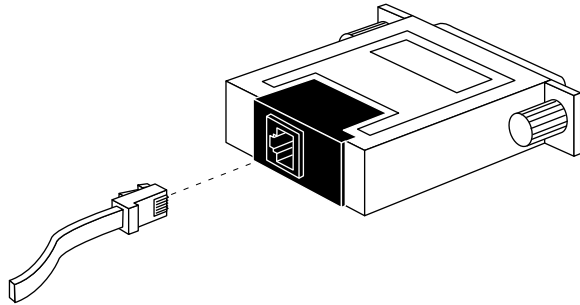
Figure 2-5. Connecting the RJ-45 Cable to the DB-25 Drop Adapter

2   **Plug the RJ-45 connector into the console port (Port 1), located on the back panel of the Remote Annex 2000 (Figure 2-6).**

When the connector clicks into place, the connection is secure. Appendix A describes the console port's signal/pin allocation.
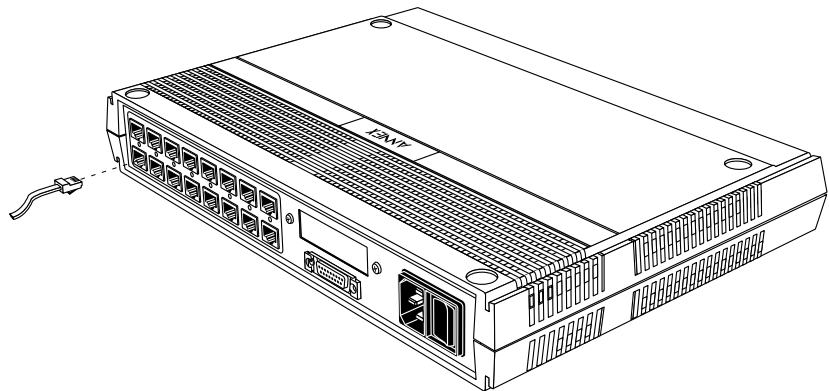
Figure 2-6. Connecting a Console Terminal

3   **Turn on the Console Terminal and set the terminal to 9600 baud, eight data bits, no parity, one stop bit, and XON/XOFF flow control.**

The ROM Monitor assumes that this terminal is CRT-based and displays the backspace (BS) character accordingly. See Chapter 3 for information on invoking the ROM monitor.

Connecting Serial Devices

The Remote Annex 2000 provides 4, 8, or 16 asynchronous RJ45 serial ports, depending on the device configuration. To attach the serial port cables:

1   **Insert the RJ45 end of the cable into one of the serial ports located on the Remote Annex 2000's rear panel (see Figure 2-7).**

2   **Connect the opposite end of the serial port cable to your serial device.**
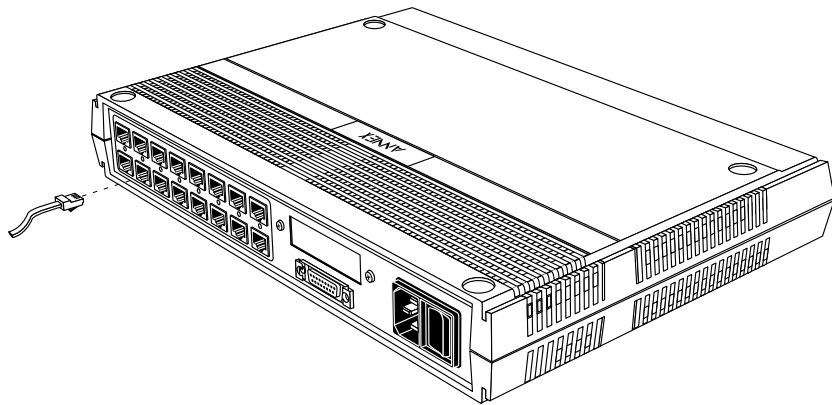
Figure 2-7. Connecting the Serial Port Cable to the Remote Annex 2000

Serial port line speed determines the maximum cable length between a device and the Remote Annex 2000: the slower the speed, the greater the distance. Table 2-1 lists recommended cable lengths according to line speed

The Remote Annex 2000 can incur damage if the cables are hit by lightning.

Table 2-1. Recommended Cable Lengths

Line Speed: bps	Cable Length: Feet	Cable Length: Meters
50–19,200	250	75
38,400	200	60
57,600	100	30
115,200	50	15

If you exceed these recommended cable lengths, you must compensate for any resulting electrical problems. Exceed these distances at your own risk.

Powering-up and Testing the Remote Annex 2000

Power-up and test your Remote Annex 2000 as follows:

1   **Apply power.**

Connect the female end of the power cord to the AC line socket. Connect the male end to an active AC line outlet (see Figure 2-8). Turn the Power switch on.
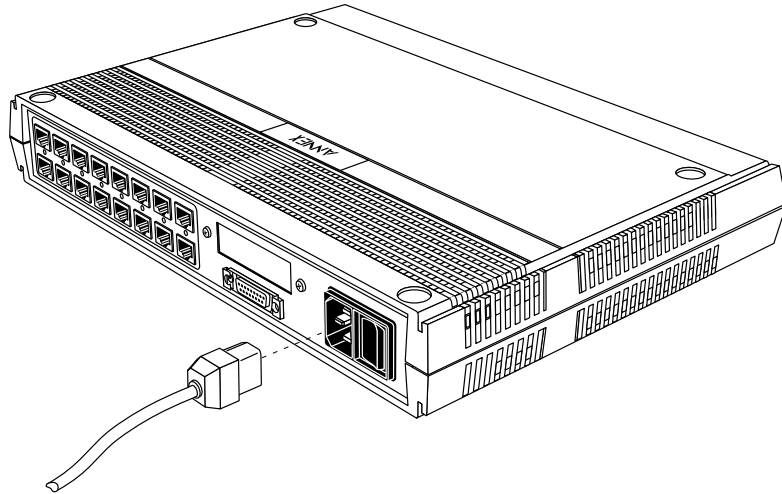
Figure 2-8. Connecting the Power Cord

The Remote Annex 2000 now runs its ROM-resident power-up diagnostics. The LEDs light and then turn off, except for the **Power** and some status LEDs.

2   **Set the Remote Annex 2000 to Test Mode.**

> Pressing the ⎡ Test ⎤ button within 3 seconds of powering up puts the Remote Annex 2000 into test mode. To enter test mode when the Annex is already running, hold down the ⎡ Test ⎤ button until the Power LED blinks rapidly, then release the ⎡ Test ⎤ button and press it again within 3 seconds. This second method resets the Annex, so warn users before you do it.

Press the ⌐ Test ⌐ button located on the Remote Annex 2000 front panel. The **Test** LED lights when the unit enters Test Mode (see Figure 2-9).
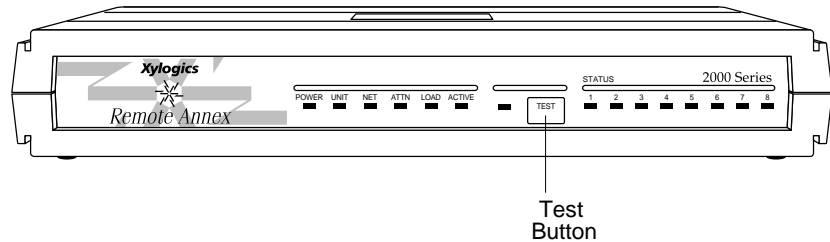
Figure 2-9. Setting the Remote Annex 2000 to Test Mode

Next, the Remote Annex 2000 runs diagnostic tests, causing the **Active** LED to flash; the status LEDs display the test number progression. If the diagnostics complete successfully, the **Unit**, **Net**, and **Attn** LEDs light, and the ROM Monitor prompt appears on the console terminal (attached to Port 1).

If the **Unit**, **Net**, and **Attn** LEDs do not light within one minute, one of the following failures has occurred:

❑ Remote Annex 2000 hardware failure: **Unit** and **Attn** LEDs flash. Contact technical support.

❑ Network or network interface failure: the **Net** and **Active** LEDs flash; the error message displays on the console.

If a network or network interface failure occurs, typing **q** accesses the ROM Monitor prompt. Check the network connection (also, see *net* on page 3-22). Chapter 4 provides troubleshooting information.

3   **Verify the Remote Annex 2000's hardware configuration.**

At the monitor prompt on the console, type **config** and press
Return . The screen display looks like this:

```
monitor:: config

                REVISION/CONFIGURATION INFORMATION


ROM Software Rev: 0901
Board ID: 56         Board Type: Remote Annex 2000
CPU Type: 486SXLC2   Ethernet Address: 00-80-2D-00-C6-1E
Memory Size: 4 Meg
Flash Size: 2 Meg    Flash ID: 8989
EEPROM Size: 32736

Installed Alternate Interface: ThinNet

ASYNC Config
  Number of Ports: 16
  Max Port Speed: 115.2 Kbps
```

4   **Record the Remote Annex 2000's Ethernet address for future
reference.**

At the monitor prompt type **addr –d** and press Return . The screen
display should look like this:

```
monitor:: addr -d
Ethernet address (hex): 00-80-2D-00-18-B6
Internet address: <uninitialized>
Subnet mask: 255.255.0.0
Broadcast address: 0.0.0.0
Preferred Load Host address: <any host>
Preferred Dump Host address: 0.0.0.0
Load/Dump Gateway address: <uninitialized>
Type of IP packet encapsulation: <ethernet>
Load Broadcast: Y
```

Installing the Operational Software and Loading the Image

Use this section if you have successfully connected the Remote Annex 2000 to your LAN.

This section describes:

❑   How to install the Remote Annex 2000's operational software and image on a device that resides on a network accessible to the Remote Annex 2000.

❑   How to download the operational image from the network device to the Remote Annex 2000.

This section contains the following subsections:

❑   Installing to and Loading from a Novell Server.

❑   Installing to and Loading from a UNIX Host.

❑   Installing to and Loading from a VAX VMS Host.

Installing to and Loading from a Novell Server

This section contains a description of what you need to do to install the Remote Annex 2000's operational software and image on a Novell Server. Proceed as follows:

1   **Log into your Novell server as SUPERVISOR or equivalent.**

2   **Insert the Network Administrator Program Install Disk into your PC's floppy drive.**

3   **Change to your PC's floppy drive (usually drive A or B).**

4   **Display or print the README.TXT file for updated information about the current version of Annex Manager for DOS software.**

5   **Type INSTALL and press** ⎡ Enter ⎤ **.**

A list of your PC's available drives appears.

6   **Select a network drive that is accessible to all users on the network and press** ⎡ Enter ⎤ **.**

7   **Enter the name of the directory where you want to copy the files or select the default \PUBLIC directory and press** ⎡ Enter ⎤ **.**

The installation program copies each file from the Administrator's Install Disks to the network drive and directory you specified in Steps 5 and 6. The installation program then decompresses and verifies each file being copied. See the *Annex Manager for DOS Administrator's Guide for the PC* for a list and description of the Administrator's files.

8   **Power up or reset the Remote Annex 2000. Do not enter test mode.**

9   **Run the Annex Installation Utility. At the prompt, start the Annex Installation Utility by typing:**

AMINSTAL ⎡ Enter ⎤

A window appears with selections for installing or upgrading the software.

10   **Select** Install **and press** ⎡ Enter ⎤ **.**

The Annex Installation utility automatically lists any uninstalled Annexes in the *Uninstalled Annexes* window.

11   **Use the arrow keys or the mouse to highlight the Annex(es) to be installed and select** OK.

A list of available servers appears.

To install several Remote Annexes, select each Remote Annex and press ⎡ Enter ⎤ **.**

12 **Choose the server that contains the operational code that will be downloaded to the Annex(es) and select** OK.

A message appears when the installation is complete. If any errors occur during the process, an error message window appears.

13 **Now you can run the Annex Manager, which configures the Annex(es) and security. Refer to the** *Annex Manager for DOS Administrator's Guide for the PC* **for information about Annex Manager.**

If a Remote Annex 2000 boots from a Novell server, the Remote Annex is available for IPX dial-in and dial-out only. Other Remote Annex 2000 features such as PPP, SLIP, ARAP, and CLI are not supported.

Installing to and Loading from a UNIX Host

This section contains a description of what you need to do to install the Remote Annex 2000's operational software and image to a UNIX host. See the *Remote Annex Administrator's Guide for UNIX* for additional information. Proceed as follows:

1 **Install the image on a UNIX host. The software Installation Notes that come with your software release describe how to do that**.

If you have a BOOTP server, boot the Remote Annex 2000. Otherwise, continue to the next step.

2 **Execute the ROM Monitor** addr **command:**

❑ Enter the Remote Annex 2000's Internet address.

❑ Modify any other parameters that the Remote Annex 2000 may require for the initial boot, i.e., the preferred load host's Internet address and the subnet mask (see *addr* on page 3-5).

3   **If you are booting the Remote Annex 2000 using a Serial Line Internet Protocol (SLIP) network interface, you must:**

❏   Use the **slip** command to modify the port parameters for the SLIP network interface (see *slip* on page 3-30).

❏   Use the **sequence** command to list the SLIP network interface in the load/dump interface list (see *sequence* on page 3-28).

4   **Execute the** boot **command (see *boot* on page 3-8).**

After successful execution of the **boot** command, the Remote Annex 2000 is up and running.

Installing to and Loading from a VAX VMS Load Host

This section contains a description of what you need to do to install the Remote Annex 2000's operational software and image on a VAX VMS Load Host. Refer to the *Annex Interface for VMS Environments Administrator's Guide* and the *Annex Interface for VMS Environments User's Guide* for additional information.

This product cannot be installed on an AXP system. This section contains the following subsections:

❏   Installing the Operational Software and Image on a VAX VMS Load Host.

❏   Configuring NCP for Downloading.

❏   Configuring for Crash Dump Support.

❏   Customizing for Multiple Remote Annex Images.

Installing the Operational Software and Image on a VAX VMS Load Host

Prerequisites

The following should be in place before you install the software and image on your load host.

❑ Your load host must be running VMS 5.5 (or higher).

❑ Your load host must be running DECnet VAX™.

❑ The Ethernet controller must be on the same Ethernet as the Annex.

❑ The CMKRNL and SYSPRIV privileges must be enabled.

❑ The load host has at least 4000 blocks of available disk space (on any disk), and up to an additional 17,000 blocks available (depending on the amount of memory installed in the Annex) if dumps are to be supported.

> In a VMS environment, dumps do not overwrite each other, as VMS allows multiple versions of the same file. Therefore, up to 17,000 blocks of memory must be available for each Remote Annex dump.

❑ The system is backed up before installing the software.

❑ The software medium is mounted on an appropriate device drive, unless you are installing from save sets copied from another load host.

Installation

Perform the following steps to install the software and image on your system load host. To stop the installation at any time, press ⌐CTRL⌐-Y (^Y).

1   **Log into the system manager account**.

2   **Enter @SYS$UPDATE:VMSINSTAL to start VMINSTAL**.

VMINSTAL lists any active processes and asks if you want to continue.

3   Enter yes **and continue the installation.**

4   Enter yes **if you have backed up your system disk.**

5   **Enter the device on which your distribution medium is loaded.**

6   Enter * **for the products to be processed.**

7   Press Return **to indicate** none **for installation options.**

8   Enter yes **if you have mounted the software medium on the appropriate device.**

The Remote Annex parameter **disabled_modules** *disables* specified software modules and frees memory space for use by the system.

The default Remote Annex setting for **disabled_modules** includes **vci** which disables the Remote Annex interface for VMS environments along with the following commands: **backwards**, **change**, **clear**, **crash**, **define**, **disconnect**, **forward**, **list**, **logout**, **resume**, **set**, and **show**.

Booting the Remote Annex 2000 from a VAX VMS load host automatically enables **vci**. The following message appears in the syslog file: *MOP Booting, vci enabled.* On subsequent boots (regardless of the type of load host; e.g., VMS or UNIX), **vci** remains enabled. To disable **vci**, you must re-enter it in the **disabled_modules** parameter (for more details, see the *Remote Annex Administrator's Guide for UNIX*).

If the **disabled_modules** parameter is set to **vci**, even if the **cli_interface** parameter is set to **vci**, none of the VMS-specific commands will be available, the *Local >* prompt will not be displayed, and the *Username>* prompt will not appear upon port reset.

Configuring NCP for Downloading

The operational image now resides in the directory to which the logical MOM$LOAD points. You must now enable downline loading of the image on the appropriate circuit using NCP.

1   **To find the appropriate circuit, type the following command:**

    ```
    $MCR NCP SHOW KNOWN CIRCUITS
    ```

    The system responds:

    ```
    Known Circuit Volatile Summary as of 25-May-1993
    Circuit State Loopback Adjacent
                  Name     Routing Node
    SVA-0   on
    ```

2   **Go back into NCP and enable that circuit to honor service requests by issuing the following NCP commands:**

    ```
    $MCR NCP SET CIRCUIT SVA-0 STATE OFF
    $MCR NCP SET CIRCUIT SVA-0 SERVICE ENABLED
    $MCR NCP SET CIRCUIT SVA-0 SERVICE ENABLED
    $MCR NCPSET CIRCUITSVA-0 STATE ON
    ```

Configuring for Crash Dump Support

The VAX VMS load host can be set up to accept crash dumps from the Remote Annex at any time. To enable this feature, you must assign a DECnet node name and address to your Remote Annex and set up NCP to point to a directory that will receive the crash dumps. You will need the Remote Annex's Ethernet address before you can execute these commands. The **show server** command displays the Remote Annex's Ethernet address. See the *Annex Interface for VMS Environments Administrator's Guide* for more information about this command.

To enable your VAX VMS load host to accept crash dumps:

1 **Assign a DECnet node number to your Remote Annex 2000. You can pick any node number or name as long as it does not conflict with any node or address already defined within NCP. For example:**

   $MCR NCP SET NODE 2.69 NAME BINGO

2 **Assign a directory and file to receive the crash dump. For example:**

   **$MCR NCP SET NODE 2.69 NAME BINGO DUMP FILE\
   DKA200: [ZETKIN.REMOTEANNEX_CRASH]BINGO.DMP**

3 **Assign the Remote Annex 2000's hardware address to the node name. For example:**

   **$MCR NCP SET NODE BINGO\
   HARDWARE ADDRESS 00-80-2D-00-1A-DE**

4 **Issue the equivalent** define **commands so this crash dump support continues when your VMS load host is restored.**

   The VMS load host now supports crash dumps.

Customizing for Multiple Remote Annex Images

The Remote Annex operational code is installed in MOM$LOAD as OPER_56_ENET.SYS. The Remote Annex does not require that this be the exact file name and you may want to keep multiple versions of the Remote Annex software. You can rename Remote Annex operational images, but they must remain in MOM$LOAD. If you do change the operational image name from OPER_56_ENET.SYS to some other name, the new file name plus the extension can be no longer than 16 characters total. This is due to a MOP restriction of 16 characters in passing the load file name field.

Auto-initializing the ROMs

The Remote Annex 2000 is distributed without an IP address or preferred load host (UNIX/IP, IPX, or MOP) defined in ROM. When the device is booted, the Remote Annex 2000 attempts to auto-initialize its ROMs using BOOTP (bootstrap protocol) and RARP (Reverse Address Resolution Protocol).

The Remote Annex 2000 supports the BOOTP and RARP protocols. Use these protocols to automatically obtain boot information from a UNIX host without requiring any manual set-up on the Remote Annex 2000.

❑   BOOTP allows a diskless client to determine its Internet address, the Internet address of the server, and the name of the file to be loaded into memory.

❑   RARP maps a hardware address into an Internet address.

The ROMs invoke this system of acquiring boot information when a boot is initiated and the Remote Annex 2000's Internet address is not initialized. Under this condition, the Remote Annex 2000 first tries to get boot information via BOOTP or RARP.

If BOOTP and RARP fail, the Remote Annex 2000 attempts to load an image by transmitting an IPX advertisement request for service and a MOP multicast boot request.

If all requests fail, the Remote Annex 2000 will return to the ROM monitor (if in Test mode) or continue the auto-initializing procedure indefinately (if in normal mode).

BOOTP

For a successful BOOTP retrieval, a **bootpd** must be running on a host on the same network as the Remote Annex 2000 and must have the appropriate information in the **bootptab** file. The Remote Annex 2000*'s* BOOTP implementation adheres to rfc951, rfc1048, and rfc1084.

A sample **bootptab** file entry used to initialize the Remote Annex 2000 named *terminator* looks like this:

```
remoteannexdefault:\
        :sm=255.255.255.0:gw=132.245.22.66:\
        :hn:vm=auto:to=-18000:
terminator:\
        :ht=1:ha=00802d004879:ip=132.245.22.226:\
        :tc=remoteannexdefault:
```

In the previous example:

- ❑ *sm* is the subnet mask.
- ❑ *gw* is the load/dump gateway address.
- ❑ *vm* is the Vendor Magic Cookie.
- ❑ *ht* is host type (1=Ethernet).
- ❑ *ha* is the Remote Annex 2000*'s* hardware address (Ethernet Address).
- ❑ *ip* is the Remote Annex 2000's Internet Address.

When the Remote Annex 2000 receives a BOOTP response with the *sm*, *gw*, and *ip* set, it sets the respective parameters: **subnet_mask**, **load_dump_gateway**, and **inet_addr**. The Vendor Magic Cookie must be set to **auto**. This indicates that **bootpd** should respond to the client (Remote Annex 2000 in this case) in whatever format the client requests; the Remote Annex 2000 (client) always requests the decimal dot notation format (e.g., 99.130.83.99).

The **bootpd** adds the address of the host on which it is running as the *Server Address* in the **bootp** response message. The ROMs use the *Server Address* as the preferred load host and store it in the **pref_load_addr** parameter.

The **bootpd** must be running on the Remote Annex 2000's preferred load host.

RARP

If the Remote Annex 2000 does not receive a successful BOOTP response, it uses RARP to get the boot information. For a successful RARP retrieval, TCP/IP must be running on a host that is on the same network as the Remote Annex 2000, and the host's ARP table must be initialized with the Remote Annex 2000's Internet and Ethernet addresses (see the **arp** man page, **arp −s**).

The only boot information that RARP provides is the Remote Annex 2000's Internet address. The ROMs save this information in the **inet_addr** parameter. The ROMs use default information for the subnet mask and preferred load host. This means the ROMs will broadcast their requests.

The host serving the Remote Annex 2000 its boot information must be running on the same network as the Remote Annex 2000 because the Remote Annex 2000 only broadcasts BOOTP and RARP queries.

If BOOTP and RARP fail, the Remote Annex 2000 transmits an IPX Advertisement Request for Service and a MOP Multicast boot request.

If all requests fail, the Remote Annex 2000 returns to the ROM monitor (if in Test mode) or continues the auto-initializing procedure indefinately (if in normal mode).

Self-booting the Remote Annex 2000

If you purchased a Remote Annex 2000 with Flash ROM, your device already contains an operational image. You can check your Remote Annex 2000's configuration by entering the **config** command at the ROM Monitor prompt. The **config** command displays the current configuration information and revision levels. If your device has Flash ROM installed, the line *FLASH PROM size:* appears under the *REVISION/CONFIGURATION INFORMATION* section.

This section contains a description of what you need to do to boot your Remote Annex 2000 from Flash ROM. Proceed as follows:

1   Enter the ROM Monitor prompt from the Console.
2   Set the Internet address to a valid IP address and the subnet mask to a valid mask using the addr command.
3   Set the interface sequence to *self* using the sequence command.
4   Boot the Remote Annex.

This chapter describes the ROM Monitor commands. Access these commands through a terminal connected to the console port (Port 1) when the Remote Annex 2000 is in test mode.

> Pressing the ⬚ Test ⬚ button within 3 seconds of powering up puts the Remote Annex 2000 into test mode. To enter test mode when the unit is already running, hold down the ⬚ Test ⬚ button until the **Power** LED blinks rapidly, then release the ⬚ Test ⬚ button and press it again within 3 seconds. This second method resets the unit, so warn users before you do it.
>
> If you try to access the ROM monitor and receive a password prompt, contact your system administrator. The ROM monitor is password protected.

The ROM Monitor commands allow you to set a subset of the configuration (EEPROM) parameters. Some of these parameters, like the unit's IP address, are sometimes required for booting the Remote Annex 2000; some parameters, like the broadcast address, are required if the network configuration differs from the supplied defaults. Table 3-1 lists the ROM Monitor commands.

Other parameters, although not required, are recommended for the Remote Annex 2000's initial boot. Setting these parameters, rather than using the assigned defaults, minimizes errors during the initial boot. For example, setting the parameter that defines the preferred load host enables the Remote Annex 2000 to load by requesting assistance from a specific host, rather than by broadcasting that request to all hosts on the subnet.

After the Remote Annex has booted, you can define the same parameters you defined using the ROM monitor using the **na** utility, the local CLI **admin** command, or SNMP (for more details, see the *Remote Annex Administrator's Guide for UNIX).*

ROM Monitor commands generally provide data about a subset of current configuration(EEPROM) parameters. When appropriate, they also display a prompt that allows the operator to change those parameters.

Default or current values for parameters are displayed in brackets. For example:

```
Enter broadcast address [132.245.6.255]:
```

At the prompt, enter a different value, or press ⬚Return⬚ to leave the displayed value unchanged.

You can use unique abbreviations for all ROM Monitor commands except **erase**. For example, enter **boot** as **bo**, and enter **net** as **n**. If you enter an abbreviation that is not unique, an error message describing the command as ambiguous displays on the console terminal.

Command Descriptions

Table 3-1 lists the ROM Monitor commands; the following subsections describe them.

Table 3-1. ROM Monitor Commands

Command	Description	Use
addr [-d]	Displays and sets EEPROM values relevant to IP network addressing, including the unit's IP address.	Changing IP configuration parameters.
boot [-v] [<file>]	Manually boots and loads the unit's operating code.	Changing the address of the boot image.

(continued on next page)

Table 3-1. ROM Monitor Commands (continued)

Command/ Abbreviation	Description	Use
boot [-l] [<file>]	Erases the existing Flash memory and copies a new image to Flash.	Upgrading or replacing the Flash image.
config	Displays the current hardware configuration and revision levels.	Identifying your hardware, memory, and ROM version.
console-baud	Changes the console port's baud rate.	Configuring the console port for remote maintenance.
erase	Erases non-volatile memory.	Loading a new image and need to erase the old image.
help	Displays the list of ROM Monitor commands.	Referencing the ROM monitor commands.
image [-d │ <file>]	Displays and/or sets the load image and **tftp** load dump names.	Loading an image that differs from the default.
ipx [-d]	Displays and sets EEPROM values relevant to Novell/IPX network addressing, including the IPX load/dump file server.	Changing Novell/IPX configuration parameters.
lat_key [-d]	Sets the LAT key.	Connecting to a DEC VMS host.

(continued on next page)

Table 3-1. ROM Monitor Commands (continued)

Command	Description	Use
mop [-d]	Displays and sets EEPROM values relevant to VAX/VMS network addressing, including the MOP load/dump address.	Loading software from a DEC VMS host.
net	Executes an Ethernet transceiver loopback test.	Checking your Ethernet connection.
option_key [-d]	Sets or displays the option key.	Checking your option key setting.
ping	Sends ICMP ECHO_REQUEST datagram to a host or gateway.	Checking to see if a host or gateway can be reached.
ports [-d]	Shows the current status of all ports.	Checking a port.
sequence [-d	<list>]	Displays and edits the load/dump interface list.	Checking or changing the load/dump interface list.
slip [-d] [<port>]	Defines a serial port as a Serial Line Internet Protocol (SLIP) network interface.	Checking or changing a serial port's settings.
stats [-slip]	Displays current network statistics gathered by the ROM.	Checking the network resources.

addr

The **addr** command displays and sets several Remote Annex 2000 operating parameters (EEPROM values) relevant to IP network addressing:

❑   Internet address.

❑   Subnet mask.

❑   Broadcast address.

❑   Preferred Load Host address.

❑   Preferred Dump Host address.

❑   Load/Dump Gateway address.

❑   Type of IP Packet encapsulation.

❑   Load Broadcast

The **addr** -**d** command also displays the unit's ROM-resident Ethernet address in hexadecimal notation (see the *Remote Annex Administrator's Guide for UNIX*). The command syntax is:

addr [–**d**]

If you enter the **addr** command without the –**d** argument, the console prompts you for each Internet address. Enter Internet addresses using the standard decimal dot notation.

The **addr** –**d** command displays the Remote Annex 2000's Ethernet address, IP address, subnet mask, broadcast address, preferred load host address, preferred dump host address, load/dump gateway address, IP encapsulation type, and Load Broadcast. The **addr** -**d** command cannot be used to make changes to any of the displayed parameters.

The **addr** command display looks like this:

```
monitor:: addr
Enter Internet address [<uninitialized>]:: 192.9.200.214
     Internet address: 192.9.200.214
Enter Subnet mask [255.255.0.0]::
Enter Broadcast address [0.0.0.0]:: 192.9.200.0
     Broadcast address: 192.9.200.0
Enter Preferred Load Host address [<any host>]::
192.9.200.88
     Preferred Load Host address: 192.9.200.88
Enter Preferred Dump Host address [0.0.0.0]:: 192.9.200.88
     Preferred Dump Host address: 192.9.200.88
Enter Load/Dump Gateway address [<uninitialized>]::
192.9.200.10
Load/Dump Gateway address: 192.9.200.88
Select type of IP packet encapsulation (ieee802/ethernet)
[<ethernet>]::
Load Broadcast Y/N [Y]::
```

The **addr** -**d** command display looks like this:

```
monitor:: addr -d
Ethernet address (hex): 00-80-2D-00-18-B6
Internet address: 192.9.200.214
Subnet mask: 255.255.0.0
Broadcast address: 192.9.200.0
Preferred Load Host address: 192.9.200.88
Preferred Dump Host address: 192.9.200.88
Load/Dump Gateway address: 192.9.200.10
Type of IP packet encapsulation: <ethernet>
Load Broadcast: Y
```

The Remote Annex 2000 must have an Internet (IP) address in its memory before it can load its operational image across the Ethernet via the IP protocol. Therefore, you *must* enter the IP address before booting the Remote Annex 2000 from a UNIX load host. If you do not define an IP address for the Remote Annex, it will attempt to learn the address using BOOTP or RARP. If you do not define a subnet mask, the Remote Annex 2000 uses the generic mask for the specified IP address.

The Remote Annex 2000 tries to boot from a preferred UNIX load host. If you do not define a preferred load host, the Remote Annex 2000 broadcasts its load request on the subnet and loads software from the first host that responds.

If the part of the IP address containing the network address differs from the preferred load or dump host, that host must be reached through a gateway. The **addr** command prompts you for this gateway's IP address.

The Remote Annex 2000 uses the broadcast address parameter when loading a file. If this parameter contains a specific address (e.g.,, 132.245.6.255), the Remote Annex 2000 uses only that address for broadcast. If the value is all zeroes (0.0.0.0), the ROM Monitor tries various combinations of broadcast addresses and subnet or network broadcasts. The Remote Annex 2000 broadcasts its request three times for each possible combination of broadcast addresses.

You can specify the IP encapsulation type as either **ethernet** for Ethernet, or **ieee802** for IEEE 802.2/802.3. The default IP encapsulation is **ethernet**. Many systems have hardware Ethernet interfaces that are IEEE 802.3 compliant, but very few actually do 802.3 IP packet encapsulation.

Do not change this parameter unless you know absolutely that your Ethernet does 802.2/802.3 IP packet encapsulation. An incorrect IP encapsulation type prevents your Remote Annex from booting.

boot

The **boot** command requests the loading of appropriate Remote
Annex 2000 operating software from the preferred load host. The
command syntax is:

boot [**–lv** | *filename*]

The **boot –l** command is supported only if the self-boot option
(Flash) is installed.

Typing the letter **q** or ⌷Control⌷-C interrupts the boot.

If you try to boot with a non-existent **image** file name, the
Annex will hang as it searches for the image. You must press
the ⌷Reset⌷ button to recover.

A successful boot disables the Console and the ROM monitor.

The **boot** command accepts a file name for the Remote Annex 2000's
image. If the file name is not specified, **boot** displays the default file
name and prompts for one. If you do not provide a file name, or have
not defined one for the Remote Annex 2000, **boot** requests the default
file **oper.56.enet**. You can also enter a file name using the **image**
command.

The Remote Annex boots from the defined preferred load host
(UNIX/IP, Novell/IPX, or VAX VMS/MOP). If the preferred load
host is not defined or does not respond, the Remote Annex 2000
broadcasts on the Ethernet and loads from the first host
that responds.

To initiate loading, the Remote Annex 2000 sends a load request
message to the selected host. After receiving a response, the Remote
Annex 2000 loads its operational code to RAM memory. When
loading is complete, it transfers control to the newly-loaded program.
The Remote Annex 2000 displays a symbol on the console for each
data block received during the boot.

When the Remote Annex 2000 begins to boot, it displays the load server host's IP address. If the unit does not boot successfully after several attempts, it displays a *boot attempt failed* message; if the unit has opened the boot file and an error occurs during the boot process, it displays a boot error report on the console and returns to the ROM Monitor. The boot error report can help determine the cause of the boot failure (see *Boot Error Report* on page 4-12).

During a boot, the console may display four possible status symbols: "." indicates received data blocks, "?" indicates unanswered requests, "*" indicates transmission errors, and "! ~XXXX~" is a status word from the Ethernet chip on the Annex indicating a gross problem with the Ethernet connection (if this symbol appears in your **boot** command display, contact technical support).

The status word "! ~XXXX~", where XXXX are four hexadecimal digits, decodes as follows:

8000 = Command complete
4000 = Chip is busy
2000 = Command completed without error
1000 = Command aborted by an abort command
800 = Late collision detected
400 = Carrier lost
200 = CTS lost
100 = DMA underrun
80 = Transmission deferred because link was busy
40 = Collision detected during interframe spacing (SQE/Heartbeat detected)
20 = Excessive collisions
10 = Reserved

The lowest nibble (bits 3 to 0) are a count of collisions during this transmission. For example:

~**8802**~ = Complete, Late collision, 2 collisions
~**8841**~ = Complete, Late Collision, SQE detected, 1 collision

The **boot** command display (using **bfs**) looks like this:

```
monitor:: boot
Enter boot file name[(ip) "oper.56.enet",\
    (mop) "OPER_56_ENET.SYS"]::
Requesting default boot file "OPER_56_ENET.SYS" for MOP/VMS\
    loads and "oper.56.enet" for all other protocols.
Unanswered requests shown as '?',transmission errors as '*'.
Requesting boot from 192.9.200.88 via Ethernet...
Booting BFS file using open delay of 8
Booting BFS file from 192.9.200.88
Header received OK. Received data blocks shown as '.'.
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . ..
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . .. . . . . . . . . . . . ? . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . * . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . * . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . . . . . . . ? . . . . . . . . . .
. . . . . . . . . . . . . . . . . EOF
```

The next example shows a boot using **tftp**. The Remote Annex 2000 always tries to open a file using **bfs** first. If unsuccessful, the Remote Annex uses **tftp** to open the file.

```
monitor:: boot
Enter boot file name [(ip) "oper.56.enet", \
  (mop) "OPER_56_ENET.SYS"]::
Requesting default boot file "OPER_56_ENET.SYS" for MOP/VMS\
  loads and "oper.56.enet" for all other protocols.
Unanswered requests shown as '?',transmission errors as '*'.
Requesting boot from 192.9.200.88 via Ethernet...
Booting BFS file using open delay of 8
?
Booting TFTP file using open delay of 8
Booting TFTP file from 192.9.200.88
Header received OK. Received data blocks shown as '.'.
. .. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . ? . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . . . * . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . * . . . . . . . . . . . . . . . . . . . ? . . . . . .
. . . . . . . . . . . . . . . . . . . . . EOF
```

The **boot –l** command downloads and saves the operational image to non-volatile memory, erases the existing Flash memory, copies the new image from non-volatile memory to Flash memory, and then executes the image.

> The **boot –l** command is supported only if the self-boot option is installed.
>
> After executing a **boot –l**, the **ls** command may not show the newly-loaded image.

The **boot –l** command display looks like this:

```
monitor:: boot –l
Enter boot file name [(ip) "oper.56.enet", \
  (mop) "OPER_56_ENET.SYS"]::

Requesting default boot file "OPER_56_ENET.SYS" for \
MOP/VMS loads and "oper.56.enet" for all other protocols.\
Unanswered requests shown as '?', transmission errors as\
'*'.

Requesting boot from 192.9.200.88 via Ethernet...
 Booting BFS file using open delay of 8

Booting from 192.9.200.88
Header received OK. Received data blocks shown as '.'.
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . . . . .EOF
       Saving image into storage device ...
Erasing device
|---------------------------|
............................
Erase completed
  Storing image ............
  Storage completed

Beginning execution of image...
Annex Command Line Interpreter * Copyright 1993, 1995\
Xylogics, Inc.
```

Only use the **boot -l** command when reloading your Flash
memory (e.g., when upgrading to a new version of software).

Make sure that you have a properly configured load host
available or you will erase your image from Flash and will not
be able to load a new one.

The **boot –v** command displays the boot in verbose mode. This output
includes the turnaround time in milliseconds for each request. This
value equals the time lapse between sending the request and receiving
the proper reply from the host.

When the boot is complete, verbose output includes a display of
network statistics:

```
monitor:: boot –v
Enter boot file name [(ip) "oper.56.enet", \
  (mop) "OPER_56_ENET.SYS"]::

Requesting default boot file "OPER_56_ENET.SYS" for MOP/VMS\
  loads and "oper.56.enet" for all other protocols.
Unanswered requests shown as '?', transmission errors as '*'.
 Requesting boot from 192.9.200.88 via Ethernet...
 Booting from 192.9.200.88 (42 msec)
 Header received OK. Received data blocks shown as msec
 turnaround time.
4 4 6 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 4 4 4 4 4 4 4 4 4 4
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 5 4 4 4 4 4 4
4 4 4 4 4 6 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 4 4 4 4 4 4
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 4 24 4 4 6 4 10 4 6 4 4 4 4
73 4 4 5 4 4 4 4 9 4 4 11 4 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 4 4 4 5 4 4
4 4 6 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 11 6 4 4 4 4 4 4 5 4
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 5 4 4 5
4 4 4 4 4 6 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 4 4 4 4 4 4
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 EOF

   Ethernet Statistics

   Frames Received:    1031        Frames Sent:                 1031
   CRC Errors:         0           Carrier Sense Losses:        0
   Alignment Errors:   0           Clear to Send Losses:        0
   Resource Drops:     9           Collisions Detected:         9
   Bus Wait Drops:     0           Excessive Collision Losses:  0
   Bad Types/Lengths:  0
```

config

The **config** command displays the Remote Annex 2000's total number of ports, total amount of memory, the ID number, the serial number, the major and minor hardware revision numbers, and the ROM software revision number. The **config** command display contains information describing whether or not Flash ROM is installed. The command syntax is:

config

The **config** command display looks like this:

```
monitor:: config

        REVISION/CONFIGURATION INFORMATION


ROM Software Rev: 0901
Board ID: 56      Board Type: Remote Annex 2000
CPU Type: 486SXLC2   Ethernet Address: 00-80-2D-00-C6-1E
Memory Size: 4 Meg
Flash Size: 2 Meg    Flash ID: 8989
EEPROM Size: 32736

Installed Alternate Interface: ThinNet

ASYNC Config
 Number of Ports: 16
 Max Port Speed: 115.2 Kbps
```

console-baud

The **console**-**baud** command changes the console port's baud rate. Thus, the console port can interface with any modem to which it is connected. When the baud rate is entered as *auto*, the Remote Annex 2000 detects the baud rate of the incoming line and adjusts its baud rate accordingly. This command provides support for remote troubleshooting. The command syntax is:

console-**baud**

The command display looks like this:

```
monitor:: console-baud
Remote Diagnostic Test Mode
In order to use the remote diagnostic functionality, you
must first connect a modem to the console port of the
Annex. The modem should be configured such that DTR is
forced on, carrier detect and DSR are set normal, and
auto-answer is enabled. Once this is done, contact your
service representative for remote diagnostic maintenance.
To enter "Autobaud Mode", please type "Auto". To
"manually" configure the Annex console port, please
type in the desired baud rate. To return to the
"monitor::" prompt strike the "carriage return <CR>" key.

[Baudrate Range: 50-9600 BAUD]
Select Baudrate []:
```

This command has no effect on the port's baud rate after the Remote Annex 2000 is booted.

To provide remote access to the Remote Annex 2000 ROMs:

1   **From a site local to the Remote Annex 2000***:*

❑   Set the Remote Annex 2000 into test mode so the monitor prompt appears on the console.

❑   Set the modem into auto-answer mode.

2   **From the Remote Annex 2000 console port:**

❑   At the monitor prompt, enter **console**-**baud**.

❑   At the *Select baud rate* prompt, enter the appropriate baud rate or enter *auto*.

❑   Connect the modem to the Remote Annex 2000 's console port.

3   **From the remote site:**

❑   Dial into the modem connected to the Remote Annex 2000.

❑   Press ⌐Return⌐ until the monitor prompt appears.

erase

The **erase** command erases the contents of non-volatile memory, including the Remote Annex 2000's IP address. This command also restores the parameters to their factory defaults. The syntax is:

erase

If the self-boot option is installed, the **erase** command prompts for which non-volatile memory to erase: EEPROM or FLASH. Entering **1** at the prompt causes the Remote Annex 2000 to erase the EEPROM memory (configuration information); entering **2** at the prompt causes the Remote Annex 2000 to erase the Flash memory (self-boot image).

> The **erase** command does not erase the Ethernet address.
>
> Since the **erase** command erases the IP address, you *must* use the **addr** command to re-enter the Remote Annex 2000's IP address before reloading any software.

The **erase** command display looks like this:

```
monitor:: erase
    1) EEPROM (i.e. Configuration information)
    2) FLASH (i.e. Self boot image)
Enter 1 or 2:: 1
Erase all non-volatile EEPROM memory? (y/n) [n]:: n
```

If the self-boot option is not installed, the command display looks like this:

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

help

Entering **help**, or **?**, displays brief descriptions of the Remote Annex 2000 ROM Monitor commands.

image

The **image** command sets and displays the name of the image file containing the Remote Annex 2000's software. The syntax is:

image [**–d** | *filename*]

The *filename* argument permits up to 100 characters. To return the image name to its default, enter a pair of double-quote characters (""). The default image name is **oper.56.enet**. The **image** command display looks like this:

```
monitor:: image
Enter Image name: [(ip)"oper.56.enet", \
 (mop) "OPER_56_ENET.SYS"]::
Enter TFTP Load Directory [""]::
Enter TFTP Dump path/filename ["dump.192.9.200.88"]::
```

The **image –d** command display looks like this:

```
monitor:: image -d

Image name:Default (ip): "oper.56.enet"
           Default (mop):"OPER_56_ENET.SYS"
TFTP Load Directory: ""
TFTP Dump path/filename: "dump.192.9.200.88"
SELF image name: "oper.56.enet"
```

The *SELF image name* appears only if the self-boot image is loaded.

If the **image** file name contains more than 16 characters, it is truncated when MOP is attempted.

ipx

The **ipx** command sets several parameters associated with IPX booting and dumping. This is useful when loading the Remote Annex 2000's operational image from a Novell file server. The syntax is:

ipx [**–d**]

The **ipx** command display looks like this:

```
monitor:: ipx
Enter IPX file server name [<uninitialized>]:: saturn
Enter Frame type, 0=802.3 1=Ethernet II 2=802.2 3=SNAP\
    [802.3]::
Enter IPX dump user name [<uninitialized>]:: hobbes
Enter IPX dump password [<uninitialized>]:: ******
Verify IPX dump password []:: ******
Enter IPX dump path [<uninitialized>]:: SYS:\user\hobbes\
```

The **ipx –d** command displays the current settings for all of the entries. The command display looks like this:

```
monitor:: ipx –d
IPX preferred load file server: "saturn"
IPX frame type: "802.3"
IPX dump user name: "HOBBES"
IPX dump password: <SET>
IPX dump path name: "SYS:\user\hobbes\"
```

lat_key

The **lat_key** command allows you to set the LAT key from the ROM monitor.

The **lat_key** is optional and may be purchased separately.

The command syntax is:

lat_key [**–d**]

The **lat_key** command display looks like this:

```
monitor:: lat_key
Enter LAT KEY [<uninitialized>]::
```

The **lat_key –d** command displays the current LAT key setting:

```
monitor:: lat_key –d
Enter LAT KEY [<uninitialized>]::
```

mop

The **mop** command sets the MOP load/dump address. This is useful when the loading the Remote Annex 2000's operational image from a VAX VMS load host. The command syntax is:

mop [**–d**]

The **mop** command display looks like this:

```
monitor:: mop
Enter preferred MOP load/dump address [<uninitialized>]::
Load Broadcast Y/N [Y]::
```

The **mop –d** command displays the current MOP settings:

```
monitor:: mop –d
MOP preferred load/dump address: <uninitialized>
Load Broadcast: Y
```

net

The **net** command executes an Ethernet transceiver loopback test on the local area network. The command syntax is:

net

The **net** command display looks like this:

```
monitor:: net
  Network test – PASSED
```

The Ethernet transceiver loopback test sends a short packet from the Remote Annex 2000 through the transceiver to test the network's integrity. The test can be executed either by attaching the Remote Annex 2000 to the Ethernet, or by attaching an Ethernet loopback connector to the network port.

For the 10Base5 and 10Base2 network interfaces, the preferred method for running an Ethernet transceiver loopback test is to attach the loopback connector to the network port, because short test packets can interfere with normal network traffic. The accessory kit supplies Ethernet loopback connectors for these interfaces.

The 10BaseT network interface does not require a loopback connector, because it provides a Link Integrity LED next to the RJ45 connector. This LED verifies that the receive circuit to the wiring concentrator is operating correctly. If this LED is not lit, link LED impulses are not present on the receive line due to a disconnected cable or some other link failure.

The Ethernet transceiver loopback test causes the **Net** LED to turn off. If the unit passes this test, the **Net** LED turns on and the console displays *Passed*. If the Remote Annex 2000 fails, the **Net** LED remains off, and the console displays an error message.

Failing this test indicates that either the Remote Annex 2000, its transceiver cable, its transceiver, or the Ethernet, is bad. Isolate the failure by using this test and the Ethernet loopback connector. Any of the following conditions can cause these test failures:

1   The Remote Annex 2000 has faulty Ethernet port electronics.

To test for this condition, connect the Ethernet loopback connector directly into the network connector. Run the **net** test again. If errors still occur or the +12-volt LED on the 10Base5's loopback connector fails to light, the problem is with the Remote Annex 2000. Call technical support.

2   The Remote Annex 2000 transceiver cable is defective or disconnected. (This problem occurs only with 10Base5 Ethernet.)

To test for this condition, connect the 10Base5's loopback connector to the transceiver end of the transceiver cable (while the cable is connected to the Ethernet port) and run the **net** test again. If errors did not occur during the previous test, but do occur during this test, the cable is faulty and should be replaced.

3   The transceiver at the end of the transceiver cable is defective or improperly connected to the Ethernet.

If the cable is free of faults (tested as described above) and other devices on the Ethernet are experiencing no difficulties, the problem is probably in the transceiver. However, if you have ruled out the transceiver, contact technical support.

4   The Ethernet cable is shorted or improperly terminated.

Other devices on the net should show evidence of problems.

option_key

The **option_key** command loads an option key from the ROM monitor. The command syntax is:

option_key [**–d**]

The **option_key** command display looks like this:

```
monitor:: option_key
Enter option_key [<uninitialized>]::
```

The **option_key –d** command displays the current settings:

```
monitor:: option_key –d
option_key: <uninitialized>
```

ping

The **ping** command sends an Internet Control Message Protocol (ICMP) mandatory ECHO_REQUEST datagram to elicit an ICMP ECHO_RESPONSE from a host or gateway. ECHO_REQUEST datagrams (*pings*) have an IP and ICMP header, followed by a structured time value and an arbitrary number of pad bytes that fill out the packet. The syntax for this command is:

ping *host_ip_address* [*data_size*] [*npackets*]

❑ The *host_ip_address* entry is the Internet address of the host or gateway from which you wish to elicit a response.

❑ The optional *data_size* entry is the number of bytes sent in a datagram packet. The default value is 64 and the maximum value is 1024.

❑ The optional *npackets* entry is the number of packets to transmit. If you specify *npackets*, then you must also specify a *data_size*.

The **ping** command display looks something like this:

```
monitor:: ping 132.245.33.69
    PING 132.245.33.69: 64 data bytes
```

If you enter the **ping** command without specifying an IP address, the display looks like this:

```
monitor:: ping
    IP address required, ie: ping 132.245.33.69\
    [data bytes] [npackets]
```

To exit out of **ping** either wait for *npackets* to be transmitted or, at any point, type **q**. The **ping** statistics display upon exit.

ports

The **ports** command tests serial line ports, exercising both the data lines and the control lines for each serial port specified. The syntax for this command is:

ports [**–d**]

Each serial port to be tested must be looped-back with a loopback plug to test both the data lines and the control lines (the accessory kit provides a loopback plug). Connect this plug to the connector on the back of the Remote Annex 2000 that corresponds to the port to be tested.

> Do not run the **ports** command for a port to which a device is connected. The test will transmit data to the device and toggle its control lines.

When invoked, the **ports** command displays a menu of options. A display for asynchronous serial ports looks like this:

```
monitor:: ports
Individual Port Tests (Data And Control Lines)
Some important notes:
- All Serial Ports (1-64) which are to be tested require
a loopback plug in order to pass the Data Line and Control
Line loopback tests.
WARNING. If there is a device instead of a loopback plug
connected to the port being tested, the device will have
data transmitted to it and its Control Line toggled.
- The Printer Port does not require a loopback plug.
1) Async Serial Ports
2) Printer Port
Selection (Return to exit):: 1
```

(continued on next page)

```
You may enter a list of ports to test, separated by spaces
or commas. You may also enter ranges of ports, such as 1-64.
Ports with faulty Control Lines:
Ports with faulty Data Lines:
Enter port number or range of ports to test (Return to
exit)::3
Enter the number of times to loop on this test [1]::
Testing data lines on channel 3
ERROR -- Data line loopback failure on port 3
Testing modem signals on channel 3
ERROR -- No RTS/CTS turning (ON) loopback interrupt sensed
on chan 3!
1 pass(es) with 2 failure(s)
```

Pressing the ⌐Return⌐ key after the prompt *Selection (Return to exit)*
returns you to the monitor prompt.

If you enter the **ports –d** command, only the data lines are tested. The
outgoing control lines are asserted during this test.

```
monitor:: ports –d
Individual Port Tests (Data Lines)
Some important notes:
- All Serial Ports (1-64) which are to be tested require
a loopback plug in order to pass the Data Line loopback
tests. WARNING. If there is a device instead of a loopback
plug connected to the port being tested, the device will
have data transmitted to it.
- The Printer Port does not require a loopback plug.
1) Async Serial Ports
2) Printer Port
Selection (Return to exit)::
```

sequence

The **sequence** command edits the load/dump interface list. This list determines the order of the network interfaces, and either the local area network (LAN) or the SLIP interface the Remote Annex 2000 will use for loading and dumping. The default, **net**, uses the LAN interface. The list can contain up to four interfaces. If the Remote Annex 2000 fails to boot using the first interface, it will try the next, and then the next interface, and then repeat the sequence. The command syntax is:

sequence [−**d**] | [*interface*[,*interface*]. . .]

Specify the LAN interface by selecting **net**; specify each SLIP interface as **sl***nn*, where *nn* is a port number; and specify self-boot by selecting **self**. Separate each interface with a comma or a space. Enter the interface list as an argument to the command; otherwise, the console displays a list of available interfaces and prompts for a new list.

In the following example, interfaces are assigned to the load/dump sequence list. Ports 12, 14, and 15 can be added to the list because they were configured earlier as SLIP interfaces:

```
monitor:: sequence
Enter a list of 1 to 4 interfaces to attempt to use for
downloading code or upline dumping. Enter them in the order
they should be tried, separated by commas or spaces.
Possible interfaces are:
    Ethernet: net
    SL/IP:sl12,sl14,sl15
    SELF: self
Enter interface sequence [net]:: sl12, net
Interface sequence: sl12,net
```

The *SELF* option appears only if the self-boot image is loaded.

The **sequence –d** command displays the current load/dump interface list. You cannot specify both the **–d** argument and the interface list with the same command. The command display looks like this:

```
monitor:: sequence –d
    Interface sequence: sl12,net
```

> The Remote Annex 2000 can **slip boot** over any port except Port 1.

slip

The **slip** command defines a serial port as a Serial Line Internet Protocol (SLIP) interface. This command defines a number of port parameters. The command syntax is:

slip [**–d**] [*port*]

The **slip** command automatically sets the number of data bits to 8 for all SLIP interfaces. The number of data bits does not include the start, stop, or parity bits.

After entering the command, you are prompted for each parameter. The *port* is the number of the serial port to be configured with this command. If you do not enter a port number, you are prompted for one. Table 3-2 lists the information for which the **slip** command prompts. The **slip** display looks like this:

```
monitor:: slip
Line number (1–16)::6
Allow SL/IP on this port? (y/n) [n]::y
Enter local endpoint address [0.0.0.0]::192.9.200.214
Local endpoint address: 192.9.200.214
Enter subnet mask [255.0.0.0]::
Constructed new subnet mask.
Enter remote endpoint address [0.0.0.0]::192.9.200.0
Remote endpoint address: 192.9.200.0
Enter remote load/dump host address [default
192.9.200.88]::
Remote load/dump host address: 192.9.200.88
Should this interface be used for memory dumps? (y/n) [y]::
Enter the baud rate [9600]::38400
Enter the number of stop bits (1,1.5,2) [1]::
Enter the parity (none,even,odd) [none]::
```

The **slip –d** command displays all the current settings. The **slip –d** command display looks like this:

```
monitor:: slip –d
    Local endpoint address: 192.9.200.214
    Subnet mask: default 255.0.0.0
    Remote endpoint address: 192.9.200.0
    Remote load/dump host address: 192.9.200.88
    This interface may be used for memory dumps
    Baud rate: 38400
    Stop bits: 1
    Parity: none
```

Pressing Control-C interrupts the **slip** command; the parameters remain unchanged until the command completes normally.

Table 3-2. The slip Command Prompts

Prompt	Description
Allow SLIP on this port	Modifies the port's mode. A **y** response changes the port to a SLIP interface. An **n** response changes the port's mode to CLI. The port is not available as a SLIP interface and the SLIP parameters are ignored. The default is **n**.
Enter local endpoint address	Specifies the Remote Annex 2000 IP address for this SLIP interface. The Remote Annex 2000 boots over the SLIP interface only if this address is set. The Remote Annex 2000 can slip boot over any port except port 1.

(continued on next page)

Table 3-2. The slip Command Prompts (continued)

Prompt	Description
Enter remote endpoint address	Specifies the IP address of the remote end of the SLIP interface.
Enter remote load/ dump host address	Specifies the IP address of the remote host to which load and dump requests are sent. This address is required only if the remote host is a gateway and not the load host. By default, this is the same as the remote end-point address.
Should this interface be used for memory dumps	Enables the Remote Annex 2000 to use a SLIP interface for memory dumps. The default is **y**.
Enter the baud rate	Specifies the baud rate of the serial interface. The default is 9600.
Enter the number of stop bits	Pressing the ⌷Return⌷ key accepts the default (one). Generally, SLIP implementations require the default.
Enter the parity	Pressing the ⌷Return⌷ key accepts the default (none). Generally, SLIP implementations require the default.

stats

The **stats** command displays current network statistics gathered by
the ROM. Use **stats** along with the **boot** command to help isolate
problems. Table 3-3 describes the network statistics displayed by the
stats command. The syntax is:

stats [-slip]

The **stats** command display looks like this:

```
monitor:: stats
Ethernet Statistics
Frames Received:    398    Frames Sent:                 3
CRC Errors:           0    Carrier Sense Losses:        0
Alignment Errors      0    Clear to Send Losses:        0
Resource Drops:       0    Collisions Detected:         0
Bus Wait Drops:       0    Excessive Collision Losses:  0
Bad Types/Lengths:    0
```

Table 3-3. Network Statistics

Statistic	Description
Frames Received	The number of frames received.
CRC Errors	The number of CRC checksum errors detected.
Alignment Errors	The number of frames received misaligned with a CRC error.
Resource Drops	The number of packets dropped because the ROM code could not buffer them quickly enough. The ROM code cannot always handle back-to-back incoming packets. The Remote Annex 2000 accepts the first response it receives and drops all others. Dropped packets are normal.

(continued on next page)

Table 3-3. Network Statistics (continued)

Statistic	Description
Bus Wait Drops	The number of packets dropped due to waiting too long for a bus to become available.
Bad Types/ Lengths	The number of unknown packet types if Ethernet IP encapsulation is being used. The number of packets with illegal lengths if IEEE 802.2/802.3 IP encapsulation is being used.
Frames Sent	The number of frames sent.
Carrier Sense Losses	The number of times packets could not be transmitted because the Remote Annex 2000 lost the Carrier Sense signal – usually the result of excessive traffic on the Ethernet.
Clear to Send Losses	The number of times packets could not be transmitted because the Remote Annex 2000 lost the Clear to Send signal – usually the result of excessive traffic.
Collisions Detected	The number of times the Remote Annex 2000 had to retry transmissions automatically – usually the result of normal Ethernet traffic. These retries do not cause the **boot** command to display '"*."
Excessive Collision Losses	The number of times the Remote Annex 2000 could not transmit packets because there were too many collisions – usually the result of excessive traffic on the Ethernet. The **boot** command displays these retries as "*."
Alignment Errors	The number of frames received misaligned with a CRC error.

T his chapter describes power-up and booting, troubleshooting during booting, and the file created from a Remote Annex 2000 dump.

System LEDs

The Remote Annex 2000's front panel has six system LEDs, a **Test** LED, and eight status LEDs. The system LEDs are labeled **Power**, **Unit**, **Net**, **Attn**, **Load**, and **Active**. The status LEDs are numbered one through eight.

The system LEDs provide information about normal operations and problems that occur. Use these LEDs and the ROM Monitor commands to diagnose problems.

The status LEDs display port activity during normal operations; each LED supports one or two ports. When the Remote Annex 2000 encounters a problem or an internal error condition, these LEDs flash error information.

If an error occurs, save the status of these LEDs. Technical support personnel can use this information to diagnose problems.

During power-up and booting, it is more complicated to diagnose problems because they can originate in the Remote Annex 2000, the transceiver, the Ethernet, or the load server host. However, the LEDs provide both a progress report and an error display to assist you in troubleshooting.

Power-up and Boot Procedures

The Remote Annex 2000 has two modes of operation: normal and test. Normal mode is the standard operational mode. Test mode provides access to the ROM Monitor commands. Pressing the ⬚ Test button on the front panel within 3 seconds of powering-up or a system reset puts the Remote Annex 2000 into test mode. When the Remote Annex 2000 is in test mode, the ⬚ Test button's LED lights. Figure 1-5 on page 1-6 illustrates the Remote Annex 2000's front panel.

During the power-up and boot sequence, the Remote Annex 2000 runs a set of diagnostics. The system LEDs display the diagnostics' status; the status LEDs light in sequence. The Remote Annex 2000 stops when it detects one of four error conditions (see Table 4-2 or Table 4-4). The flashing pattern of the system LEDs identifies the error condition.

Normal Mode Diagnostics

Following power-up or reset, the Remote Annex 2000 enters normal mode. The following subsections describe both the possible error and error-free conditions that can occur during power-up and booting in normal mode.

Normal Mode Error-free Sequences

Table 4-1 summarizes the LED display sequences during error-free power-up in normal mode. The following subsections describe these states.

Table 4-1. Normal Mode Error-free LED States

Activity	Power green	Unit green	Net green	Attn amber	Load green	Active green
N1: LEDs OK	●	✗	✗	✗	✗	✗
N2: Hardware OK	●	●	✗	✗	✗	■
N3: Network OK	●	●	●	✗	✗	■
N4: Looking for boot file	●	●	●	✗	◆	■
N5: Loading code	●	●	●	✗	●	■
N6: Running operational code	●	●	●	✗	✗	■

Key:

●   On continuously.

✗   Off.

■   Flashing irregularly.

◆   Flashing regularly (about 1Hz).

Activity N1: Testing LEDs

All front panel LEDs light for a few seconds, then all but the **Power** LED turn off, confirming that all LEDs are operational.

Activity N2: Testing the Hardware

During the power-up sequence, the Remote Annex 2000 runs a series of self-test diagnostics. These tests verify internal hardware functions. The **Power** LED lights for a few seconds, then **Unit** and **Active** LEDs flash during the power-up self-tests. After the self-tests complete, only the **Unit** and **Power** LEDs remain on.

Activity N3: Testing the Network

The Remote Annex 2000 sends a short packet addressed to itself through the transceiver to test the transceiver and its cable. After passing this test, the **Net** LED flashes and remains on.

Activity N4: Looking for the Boot File

The **Load** LED flashes while the Remote Annex 2000 waits for a load server host to respond to its load request.

Activity N5: Loading the Code

The **Load** LED lights while the Remote Annex 2000 loads its operational code from a load server host.

> If a port is set up for *syslogging*, the associated LED will flash when data is output on the port, thus interfering with the normal LED sequence.

Activity N6: Running the Operational Code

The **Load** LED turns off when the proper image is loaded. The operational code has control, and the Remote Annex 2000 is ready.

Normal Mode Error Sequences

Table 4-2 shows the state of the LEDs when an error occurs at given stages of the start-up process. For example, if the Remote Annex 2000 fails during the testing hardware state (N2), the error condition is hardware failure NE2. A description of possible causes and solutions for each error condition follows Table 4-2.

Table 4-2. Normal Mode Error LED States

Activity	Power green	Unit green	Net green	Attn amber	Load green	Active green
NE2: Hardware failure	●	◆	✕	◆	✕	✕
NE3:Network test failure	●	●	◆	◆	✕	■
NE4:No IP address or gateway	●	●	●	◆	◆	✕
NE5:Booted wrong image	●	●	●	◆	✕	✕

Key:

●   On continuously.

✕   Off.

■   Flashing irregularly.

◆   Flashing regularly (about 1Hz).

Activity NE2:
Hardware Failure

The ROM diagnostics detected an Remote Annex 2000 hardware problem requiring service. Call technical support.

Activity NE3: Network Test Failure	The Ethernet interface did not pass a simple transceiver loopback test. First, verify that the Ethernet port either is connected to an Ethernet transceiver or has a loopback plug installed. If the test still fails, enter test mode (see *net* on page 3-22 for more details).
Activity NE4: No IP Address or Gateway	Some of the boot information required in EEPROM is missing; either the information was never entered or it was erased accidentally. Two EEPROM parameters are required:

❑ The Remote Annex 2000's IP address.

❑ The load/dump gateway required to reach the preferred load server host when the preferred host is on a different network or subnet from the Remote Annex 2000.

The Remote Annex 2000 runs the ROM Monitor **addr** command automatically, allowing you to enter the missing parameter(s). When you are finished, the unit continues with the load or dump and returns to normal mode at the end of the boot.

If the IP address or load/dump gateway address is lost during normal operation, i.e., not through operator error, the Remote Annex 2000 may require service.

Activity NE5: Booted Wrong Image	The Remote Annex 2000 has just loaded an inappropriate image. A system reset clears this error. The Remote Annex 2000 loads inappropriate images if one of the following operator errors occurs:

❑ Configuring the Remote Annex 2000 with an incorrect file name, or renaming or copying the **image** file to the wrong name.

❑ Supplying the wrong name to any of the boot commands (**na boot**, **dumpboot**, or the superuser CLI **boot**).

If you are uncertain as to why the Remote Annex 2000 booted the wrong image, enter test mode and issue an **image –d** command. This command shows which host file the Remote Annex is trying to load.

Test Mode Diagnostics

Test Mode

Pressing the ⌷ Test ⌷ button within 3 seconds of either cycling on power or resetting the unit via the ⌷ Test ⌷ button puts the Remote Annex 2000 into test mode.

Test Mode Error-free Sequences

Table 4-3 summarizes the LED sequences that display in test mode during an error-free start-up. A description of each sequence follows Table 4-3.

Table 4-3. Test Mode Error-free LED States

Activity	Power green	Unit green	Net green	Attn amber	Load green	Active green
T1: Testing LEDs	●	●	●	●	●	●
T2: Testing hardware	●	■	✕	✕	✕	■
T3: Testing network	●	●	■	✕	✕	■
T4: At monitor prompt	●	●	●	●	✕	■
T5: Looking for boot file	●	●	●	●	◆	■
T6: Loading code using the **boot** command	●	●	●	✕	●	■
T7: Running operational code	●	●	●	✕	✕	■

Key:

●	On continuously.	✕	Off.
■	Flashing irregularly.	◆	Flashing regularly (about 1Hz).

Activity T1: Testing LEDs	All front panel LEDs light for a few seconds, then all but the **Power** LED turn off. This sequence confirms that all LEDs are operational. At this point, the Remote Annex 2000 is in normal mode; pressing the ⬛ Test ⬛ button readies it for the next activity.
Activity T2: Testing the Hardware	During power-up, the Remote Annex 2000 runs self-tests that execute CPU diagnostics, ROM and E2 ROM checksums, internal serial port and LAN loopbacks, and RAM tests. The **Unit** and **Active** LEDs flash during the power-up tests. After completing the power-up self-tests, only the **Unit** and **Power** LEDs remain on.
Activity T3: Testing the Network	The Remote Annex 2000 sends a short packet addressed to itself through the transceiver to test the transceiver and its cable. The **Net** LED flashes during the test. After completing the test, the **Net** LED remains on.
Activity T4: At the Monitor Prompt	When the **Power**, **Unit**, and **Net** LEDs are on, the console terminal displays the ROM Monitor prompt. Enter the **boot** command at the prompt. If you did not enter a file name with the command, a prompt asks you for one.
Activity T5: Looking for the Boot File	The **Load** LED flashes while the Remote Annex 2000 waits for a response to its load request from a load server host.
Activity T6: Loading Code with the boot Command	The **Load** LED lights when the Remote Annex 2000 tries to load from a load server host. The Remote Annex 2000 loads its operational code when a host responds. The console terminal displays messages describing the boot request and the boot process.
Activity T7: Running Operational Code	After the Remote Annex 2000 loads the proper image, the **Load** LED turns off. The Remote Annex 2000 is ready.

Test Mode Error Sequences

Table 4-4 describes the state of the LEDs if errors occur at different stages of the start-up process. For example, if the Remote Annex 2000 fails while testing the hardware (state T2), the error condition is hardware failure TE2. A description of each error condition follows Table 4-4.

Table 4-4. Test Mode Error LED States

Activity	Power green	Unit green	Net green	Attn amber	Load green	Active green
TE2: Hardware failure	●	◆	✕	◆	✕	✕
TE3: Network test failure	●	●	◆	✕	✕	■
TE4: Network test aborted or **net** command failed	●	●	✕	◆	✕	■
TE7: Booted wrong image	●	●	●	◆	✕	✕

Key:

●   On continuously.

✕   Off.

■   Flashing irregularly.

◆   Flashing regularly (about 1Hz).

Activity TE2: Hardware Failure	The ROM diagnostics detected an Remote Annex 2000 hardware problem requiring service. The status LEDs flash the specific error number. Call technical support.
Activity TE3: Network Test Failure	The Ethernet interface did not pass a simple transceiver loopback test. First, verify that the Ethernet port is either connected to an Ethernet transceiver or has a loopback plug installed. If the test still fails, typing **q** on the console accesses the ROM Monitor prompt. See *net* on page 3-22 for more information.
Activity TE4: Network Test was Aborted or the net Command Failed	The Ethernet loopback test failed and the operator has typed **q** to access the ROM Monitor prompt.
Activity TE7: Booted Wrong Image	The Remote Annex 2000 has just loaded an inappropriate image. Clear this error by pressing the ⬚ Reset button. The Remote Annex 2000 loads inappropriate images if one of the following operator errors occurs:

❑ Configuring the Remote Annex 2000 with an incorrect file name, or renaming or copying the image file to the wrong name.

❑ Supplying the wrong name to the **boot** command.

Boot Failures

The procedures for troubleshooting a power-up failure established that:

❑ The hardware is functional.

❑ The Ethernet interface is functional.

❑ The Remote Annex 2000 can communicate with the Ethernet.

If the Remote Annex 2000 still is not booted, you must pinpoint the problem. The *boot error report* can help in this process.

> The Remote Annex 2000 generates and displays a *boot error report* only if it has opened the boot file and an error occurs during the boot process.

Generally, two problems cause boot failures: the Remote Annex 2000 is not configured properly, or the load server host is not responding. The Remote Annex 2000 requests a boot either from a pre-defined load host, or by broadcasting its boot request. When a host responds, the Remote Annex 2000 loads its operational code.

The Remote Annex 2000 requires setting certain configuration parameters. Enter these parameters with ROM Monitor commands for the initial boot sequence. Chapter 3 describes these commands in detail.

If the problem is a non-responsive host, the *boot error report* displays that information under the *Rsp T/Os* field. This field indicates that the Remote Annex 2000 timed out while waiting for a response to its boot request; if this field is empty, check the Remote Annex 2000's configuration parameters.

Boot Error Report

If an error occurs, a *boot error report* is generated *only* if the Remote Annex 2000 has opened the boot file. The report is displayed using the following format:

```
BOOT ERROR REPORT (for BFS files only)
Boot attempt from host nn.nn.nn.nn:
Errors from Last Open Request:
0 ARP errors 0 ERPC layer errors 0 Aborts rx'd
Errors from Last Read Request:
0 Msgs w/ wrong size 0 ERPC layer errors 0 Aborts rxd
Errors from Last ERPC Layer Invocation:
0 H/W errors 1 Msgs from wrong host 0 Rsp T/O's 0 Msgs of wrong type
```

> TFTP error reporting complies with the standard, predefined TFTP error codes.

The Remote Annex 2000 generates a *boot error report* for the IP address from which it tried, and failed, to boot.

The error count pinpoints the error that caused the boot failure. For example, if the boot failed during a Read Request due to excessive Expedited Remote Procedure Call (ERPC) layer errors, the *Errors from Last ERPC Layer Invocation* lists only errors that occurred during the failed Read Request (see Table 4-5). The report does not list errors that occurred during any other Read Request (see Table 4-6) or during the Open Request (see Table 4-7).

The Open Request and the Read Request layers communicate with the block file server (BFS) on the host. The ERPC layer resides below the Open Request and the Read Request layers. It is responsible for sending a given message to a specific host UDP port, and for receiving the correct response to that message from the port.

Table 4-5. Errors from Last ERPC Layer Invocation

Error	Description
H/W errors	The Remote Annex 2000 sensed a hardware error during message transmission or reception. This error indicates a fault with the Remote Annex 2000, the transceiver cable, or the transceiver. Use the **net** command to isolate the problem (see *net* on page 3-22).
Msgs from wrong host	The Remote Annex 2000 received a message from an incorrect host. This indicates that the Remote Annex 2000 received, and ignored, an unsolicited packet.
Rsp T/O's	The Remote Annex 2000 never received a correctly formatted response from the correct host, or any response from any load server hosts.
Msgs of wrong type	The correct host sent a message to the Remote Annex 2000, but the message was not a correctly formatted response to the transmitted request.

Table 4-6. Errors from Last Read

Error	Description
Msgs with wrong size	The correct host responded to the Read Request, but the data size is incorrect.
ERPC layer errors	See Table 4-5.
Aborts rx'd	The host's BFS transmitted an abort in response to the Remote Annex 2000's Read Request. Run **erpcd –D** on the host to obtain more information.

Table 4-7. Errors from Last Open Request

Error	Description
ARP errors	Address Resolution Protocol (ARP) errors indicate that the Remote Annex 2000 is configured to boot from a specified host, but the host would not transmit its Ethernet address to the Remote Annex 2000. Possibly, the Remote Annex 2000 configuration includes the wrong IP encapsulation.
ERPC layer errors	See Table 4-5.
Aborts rx'd	The host's BFS transmitted an abort in response to the Remote Annex 2000's Open Request. This often means that the requested file does not exist on that server. Run **erpcd –D** on the host to obtain more information.

Correcting Remote Annex 2000 Parameters

The following parameters must accurately reflect both the Remote Annex 2000 and the network environment in which it operates. Verify the Remote Annex 2000's IP address using the **addr** command. If your network configuration does not support the factory defaults, verify the following parameters using the **addr** command:

❑ The broadcast address.

❑ The subnet mask.

❑ The load/dump gateway address (which must be specified if the preferred load server host is located on another network or subnet).

❑ The IP encapsulation type. Many systems have hardware Ethernet interfaces that are IEEE 802.3 compliant, but very few actually do 802.3 IP packet encapsulation. Use the default, Ethernet, unless you know absolutely that your LAN does 802.2/802.3 IP packet encapsulation.

Unless otherwise stated, if you are using a SLIP interface to boot the Remote Annex 2000, obtain the following information using the **slip** command:

❑ Whether the port is configured as a SLIP interface.

❑ The default IP address for the SLIP network interface.

❑ The default IP address for the remote end of the SLIP connection.

❑ The default IP address for the load/dump host (this must be specified if the remote end is a gateway and not a load host).

❑ Whether the SLIP network interface is included in the load/ dump interface list (use the **sequence** command).

❑ The baud rate.

❑ The number of stop bits.

❑ The parity.

You can use the defaults for both the name of the image file containing the Remote Annex 2000's software and the address of the preferred load server host. If the value for the image name is incorrect, the Remote Annex 2000 cannot boot. Correct the name using the **image** command. If the address for the preferred load server host is incorrect, the boot takes longer, since the Remote Annex 2000 has to broadcast for a host. Correct the load host's address using the **addr** command.

Confirm that the Remote Annex 2000 boot parameters are correct by using the appropriate ROM Monitor commands. Modify any boot parameters that are incorrect or missing. Boot the Remote Annex 2000 either by entering the **boot** command at the console, or by holding down the ⬚ Test ⬚ button until the **Power** LED blinks rapidly and then releasing the ⬚ Test ⬚ button.

Load Server Host Not Responding

The Remote Annex 2000 can boot from one of six types of hosts acting as a load server host:

❑   Novell Server.

❑   A UNIX host on the local area network.

❑   A UNIX host at the end of a SLIP interface.

❑   Another Remote Annex 2000.

❑   A VAX VMS load server host.

❑   Any host (UNIX or non-UNIX) using **tftp**.

The following subsections discuss troubleshooting for some of these load server hosts.

UNIX Host on the LAN

When troubleshooting a UNIX host on the LAN, make sure that:

❑   The host is booted and functioning properly.

❑   The host can communicate with other network nodes using standard UNIX networking features and utilities.

❑   All Remote Annex 2000 software is installed properly on the host (see the software installation notes that come with the Remote Annex 2000 software release).

❑   The **erpcd** daemon or **tftp** server, which loads the operational image to the Remote Annex 2000, is running.

In test mode, both the Remote Annex 2000 and **erpcd** on the load server host display boot progress reports. The Remote Annex 2000 displays its reports on the console; **erpcd** displays its reports on the UNIX terminal that invokes test mode.

1   To place erpcd **on the load server host into test mode, kill the** erpcd **program (requires superuser privileges) and restart it using the** −D **option:**

```
# /usr/annex/erpcd −D5
```

2   **To place the Remote Annex 2000 into test mode, hold down the** Test **button until the** Power **LED blinks rapidly, then release the** Test **button and press it again within 3 seconds. (This resets the unit, so warn users before you do it.) Then enter:**

```
# boot -v
```

When the Remote Annex 2000 boots in test mode, the console displays the load server host's IP address, and indicates whether it receives a response to its Open File Request and to any of its Read File Requests. The host's progress report indicates receipt of any File Server Requests and its responses to such requests. The host displays *erpc_return 0* if it successfully receives a request and is sending out an affirmative response. If any Remote Annex 2000-related files are missing or cannot be installed, contact technical support (see <u>Appendix C</u>).

UNIX Host on a SLIP Interface

When troubleshooting a UNIX host at the end of a SLIP network interface, make sure:

❑   The host is booted and functioning properly.

❑   The SLIP link is connected correctly.

❑   The IP addresses are correct for both sides of the SLIP link.

❑   All Remote Annex 2000 software is installed properly on the host (see the software installation notes that accompany your software release).

❑   The **erpcd** daemon or **tftp** server, which loads the Remote Annex 2000's operational code, is running.

A PC host running the UNIX operating system has both the **erpcd** and **slipd** daemons (provided with the distribution and installed in **/etc**) running in the background on the PC. Set the Remote Annex 2000 and the **erpcd** on the load host into test mode:

1   **For** erpcd **on the load server host, as superuser, kill the** erpcd **program and restart it using the** –D **option:**

   # /usr/annex/erpcd -D5

2   **For the Remote Annex 2000, hold down the** ⎡ Test ⎤ **button until the Power LED blinks rapidly, then release the** ⎡ Test ⎤ **button and press it again within 3 seconds. Then enter:**

   # boot -v

Another Remote Annex 2000

When troubleshooting a Remote Annex 2000 configured as a load server host:

1   **Use the CLI** telnet **command to access the unit and verify that it is up and running.**

2   **Communicate with the unit using the CLI** ping **command.**

3   **Verify the unit's configuration using the** na **utility or the local CLI** admin **command.**

The *Remote Annex Administrator's Guide for UNIX* provides more information on these commands.

A Remote Annex 2000 that has been reconfigured as a load server host, but not rebooted, cannot boot another Remote Annex 2000 on the network. Rebooting the Remote Annex 2000 load server host ensures that the parameters are set.

VAX VMS Load Host on the LAN

If the installation was successful and the NCP CIRCUIT SERVICE is enabled, but the Remote Annex still fails to boot, performing the following steps may locate your problem:

1   Make sure that the file OPER_56_ENET.SYS is in the directory MOM$LOAD and the file protection allows reading.

2   Enter the system manager account and enable console logging to see the MOP boot requests, as in the following example:

```
$reply/enable
$
%%%%%%% OPCOM 23-DEC-1994 08:3.37 %%%%%%%
Operator_NTA2: has been enabled, username TOPAZ
$
$
%%%%%%% OPCOM 23-DEC-1994 08:0.49 %%%%%%%
Operator status for operator _NTA2:
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK,
CLUSTER, SSECURITY, LICENSE, OPER1, OPER2, OPER3, OPER4,
OPER5, OPER6, OPER7, OPER8, OPER9, OPER10, OPER11, OPER12
$
$
%%%%%%% opcom 23-DEC-1994 08:03:43.55 %%%%%%%%
Message from user DECNET
DECnet event 0.3, automatic line service
From node 1.69 (BINGO), 23-DEC-1994 08.03.43.52
Circuit SVA-0, Load, requested, Node =2.69 (BART)
File = MOM$SYSTEM_SOFTID:OPER_56_ENET.SYS, Operating
System
Ethernet address = 00-80-2D-00-1A-DE
$
%%%%%%% opcom 23-DEC-1994 08:03:50.55 %%%%%%%
Message from user DECNET
DECnet event 0.3, automatic line service
From node 1.69 (BINGO), 23-DEC-1994 08.03.50.52
Circuit SVA-0, Load, Successful, Node =2.69 (BART)
File = MOM$SYSTEM_SOFTID:OPER_56_ENET.SYS, Operating
System
Ethernet address = 00-80-2D-00-1A-DE
```

Remote Annex 2000 Dumps

The Remote Annex 2000 dumps its memory image to a host running load server software when certain software or hardware events occur. Table 4-8 illustrates the state of the front-panel LEDs during a dump.

> Dump files are generated for use by technical support personnel only.

Events that trigger Remote Annex 2000 dumps are:

❑ Non-recoverable hardware or software errors occur.

❑ Software fails to reset the Remote Annex 2000's watchdog timer.

❑ Software fails one or more internal consistency checks.

❑ Hardware detects an internal fault.

Table 4-8. LED States During a Dump

Activity	Power green	Unit green	Net green	Attn amber	Load green	Active green
Dump	●	●	●	●	●	■

Key:

●   On continuously.
■   Flashing irregularly.

The Remote Annex 2000 sends a dump file to a preferred load dump host. If you do not define this host by specifying an address, the Remote Annex 2000 broadcasts a request and dumps to the first host that responds.

The Remote Annex sends a dump to the **/usr/spool/erpcd/bfs** directory on the dump host. The **/usr/spool/erpcd/bfs** directory is a default pathname and can be changed. The receiving Remote Annex assigns a unique file name for each device that it receives a dump from but not for each crash dump.

> Rename any crash dumps that you want to save. The Remote Annex 2000 overwrites crash dumps.

The assigned name depends on the number of characters per file name that the dump host supports. For hosts supporting file names longer than 14 characters (e.g., BSD hosts), dump files are named **dump.addr**. The file extension **addr** is the Remote Annex 2000's IP address.

For hosts that limit file names to 14 characters (e.g., System V hosts), a dump creates two additional directories under **/usr/spool/erpcd/bfs**. The name of the first directory is **dump**; the second directory uses the Remote Annex 2000's IP network address as its name. The dump file uses the Remote Annex 2000's IP host address as its name.

> The **tftp** dump names are user-defined. If a name is not specified, the Remote Annex uses the **bfs** convention.

Each dump file contains a complete image of the Remote Annex 2000 RAM memory and hardware state. The amount of space required for the dump file varies according to the port configuration. The ROM Monitor **config** command displays the amount of memory for the Remote Annex 2000.

Table 4-9 shows sample dump file names. All pathnames are relative to the file **/usr/spool/erpcd/bfs**.

Table 4-9. Dump File Naming Conventions

Remote Annex 2000 Address	Network Address	BSD Filename	System V Pathname
63.0.0.75	63	dump.63.0.0.75	dump/63/0.0.75
131.140.23.1	131.140	dump.131.140.23.1	dump/131.140/23.1
195.46.2.15	195.46.2	dump.195.46.2.15	dump/195.46.2/15

T his appendix identifies the signals and the associated pins used by the following Remote Annex 2000 ports:

❑ Serial Port (Port 1 is Console Port).

❑ 10Base2 Ethernet Port.

❑ 10Base5 Ethernet Port.

❑ 10BaseT Ethernet Port.

Serial Port

Figure A-1 illustrates a serial port receptacle. Table A-1 lists the receptacle's pin/signal allocations.
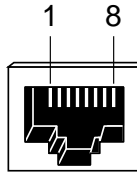
Figure A-1. Serial Port Receptacle

Table A-1. Serial Port Pin/Signal Allocations

Pin Number	Signal
1	RTS
2	DTR
3	TXD
4	DCD
5	RXD
6	GND
7	DSR
8	CTS

10Base2 Ethernet Port

Figure A-2 illustrates a 10Base2 BNC Ethernet connector.
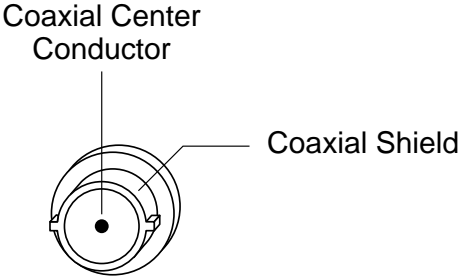
Figure A-2. 10Base2 BNC Ethernet Connector

10Base5 Ethernet Port

Figure A-3 illustrates a 10Base5 Ethernet transceiver port connector. Table A-2 lists the connector's pin/signal allocations.
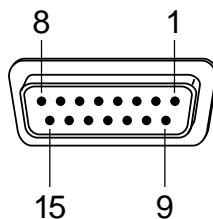
Figure A-3. 10Base5 Ethernet Port Connector

Table A-2. 10Base5 Ethernet Port Pin/Signal Allocations

Pin Number	Signal
1	Chassis ground
2	Collision +
3	Transmit +
4	NC
5	Receive +
6	Ground (for transceiver power)
7–8	NC
9	Collision –
10	Transmit –
11	NC
12	Receive –
13	+ 12 volts (for transceiver power)
14–15	NC

10BaseT Ethernet Port

Figure A-4 illustrates a 10BaseT RJ45 Ethernet port receptacle. Table A-3 lists the connector's pin/signal allocations.
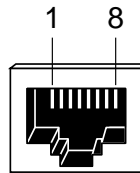
Figure A-4. 10BaseT RJ45 Ethernet Port Receptacle

Table A-3. 10BaseT Ethernet Port Pin/Signal Allocations

RJ45 Pin	Signal
1	TXD +
2	TXD –
3	RXD +
4	NC
5	NC
6	RXD –
7	NC
8	NC

This appendix describes the wiring for the following cables and connectors:

❑   *Serial Port Cables.*

❑   *Loopback Connectors.*

The Remote Annex 2000 accessory kit includes the loopback connectors; it does not supply the serial port cables.

Serial Port Cables

The Remote Annex 2000 is a DTE system that conforms to an 8-wire USOC wiring standard.

Serial Cable Wiring Diagrams

Figure B-1 and Figure B-2 illustrate the pin numbers and signal directions for cabling from the RA 2000 to respective devices.

Remote Annex 2000		25-way Female DB25
5 RXD	←	2 TXD
3 TXD	→	3 RXD
8 CTS	←	4 RTS
1 RTS	→	5 CTS
2 DTR	→	6 DSR
	→	8 DCD
7 DSR	←	20 DTR
4 DCD	←	
6 GND	——	7 GND
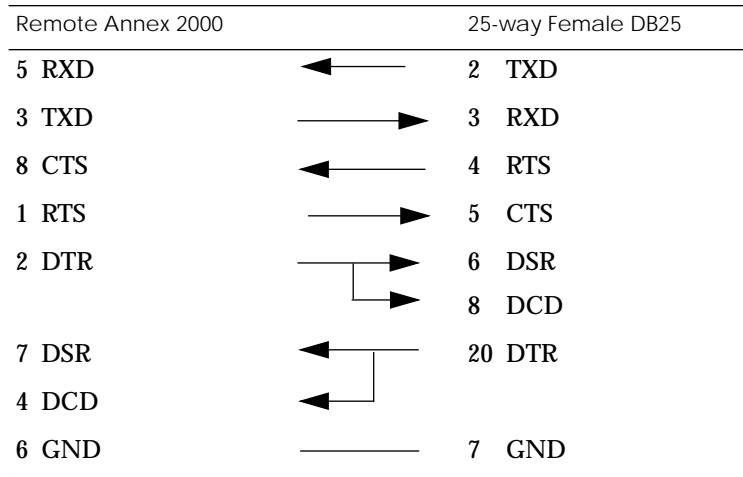
Figure B-1. DTE Crossover Terminal Cable

Remote Annex 2000		25-way Male DB25
3 TXD		2 TXD
5 RXD	→	3 RXD
1 RTS	←	4 RTS
8 CTS	→	5 CTS
7 DSR	←	6 DSR
4 DCD	←	8 DCD
2 DTR	←	20 DTR
6 GND	→	7 GND
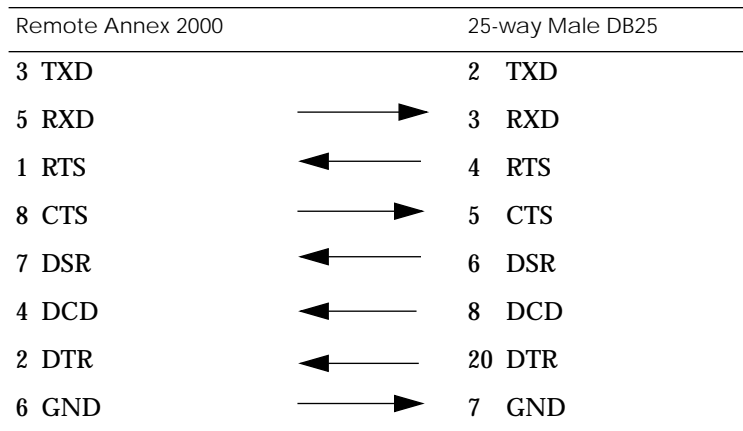
Figure B-2. DCE Straight-Through Modem Cable

Loopback Connectors

10Base2 Ethernet
Loopback
Connector

The 10Base2 loopback connector is a 22-Ohm BNC terminator plug. The connector comprises a 22-Ohm resistor connected between the BNC plug's center coaxial line and shield.

10Base5 Ethernet
Loopback
Connector

The 15-pin male Ethernet 10Base5 loopback connector is equipped with an LED that confirms the presence of the +12-volt transceiver drive voltage. Table B-1 shows this connector's pins/signal allocations.

Table B-1. 10Base5 Ethernet Loopback Connector Wiring

Pin Number	Signal	Connects to Pin Number	Signal
3	Transmit +	5	Receive +
10	Transmit −	12	Receive −

10BaseT Ethernet
Loopback
Connector

The 10BaseT loopback connector is an RJ45 plug with two pairs of signals looped back. Table B-2 shows this connector's pins and signals.

Table B-2. 10BaseT Ethernet Loopback Connector Wiring

Pin Number	Signal	Connects to Pin Number	Signal
1	Transmit +	3	Receive +
2	Transmit −	6	Receive −

Serial Port
Loopback
Connector

The 8-pin RJ45 loopback plug loops the following signals: Transmit and Receive; DTR and CTS; and RTS, DCD, and DSR. Table B-3 shows this connector's pins and signals.

Table B-3. Serial Port Loopback Connector Wiring

Pin Number	Signal	Connects to Pin Number	Signal
5	RXD	3	TXD
1	RTS	4, 7	DCD, DSR
2	DTR	8	CTS

This appendix describes:

❑   Contacting Technical Support.

❑   Customer Assistance Programs.

❑   What to Do if the Remote Annex 2000 Fails.

❑   Remote Annex 2000 Dumps.

❑   Repair Information Request Form.

Contacting Technical Support

If your Remote Annex 2000 fails, or develops problems, contact your reseller to determine if the problem is hardware- or software-related. If you recently purchased your Remote Annex 2000 you may be eligible for our 30 Day Free Support Program. Please call Xylogics Technical Support for more information. If you have purchased one of the Customer Assistance Programs available from Xylogics, see the program information for instructions (see *Customer Assistance Programs* on page C-6). If you have not purchased an Assistance Program, you can contact Xylogics Technical Support at one of the following phone numbers (depending on your location):

❑   United States and Canada

1-800-2LANWAN (800-252-6926)

Enter the Express Routing Code (ERC) of 170, or listen for the Xylogics Menu Options.

❑   International

Monday through Friday from 9 a.m. to 5 p.m. GMT:
+44 1908 222112 (Milton Keynes, UK).

You can also contact us via the Internet's electronic services:

❑   Electronic Mail

In Burlington, MA: **support@xylogics.com**

In the UK: **int-support@xylint.co.uk**

❑   World Wide Web

http://www.xylogics.com

❑   Bulletin Board Service (BBS)

The BBS telephone number is (617) 273-1499. Use the modem
settings: 14400, 8, 1, N. Or, you can **ftp** files from the BBS at
bbs.xylogics.com.

Customer Assistance Programs

There are eight Xylogics' Customer Assistance Programs available,
designed to provide high-level support packages that address a
variety of needs:

❑   Premium Customer Assistance.

❑   Prioritized Support Response.

❑   Express Hardware Replacement.

❑   Automatic Software Updates.

❑   Multiple-site Software Redistribution License.

❑   On-site Support and Consulting.

❑   University Support Program.

Contact your reseller for information on selecting and purchasing a
support plan.

What to Do if the Remote Annex 2000 Fails

❑ If the problem is hardware-related, arrange for repair or replacement.

❑ If the Remote Annex 2000 is covered under the original warranty, contact the place of purchase to arrange for repair or replacement.

❑ If the Remote Annex 2000 is covered under a Xylogics Hardware Maintenance Agreement, contact Xylogics Customer Returns at (617) 272-8140, x 307, for a Return Authorization (RA) number. Please have your contract number available when you call.

❑ When returning the Remote Annex 2000, please include the Repair Information Request Form (see page C-11). If you prefer, you can copy the form rather than remove it.

> For information on purchasing a Hardware Maintenance Agreement or Software Update Agreement from Xylogics, see the insert in the shipping container, or contact Xylogics' Sales Support at (617) 272-8140.

If for some reason the Remote Annex 2000 is not covered under any warranty or agreement, contact Xylogics Customer Returns at (617) 272-8140, extension 307, for a Return Authorization (RA) number. Please have the following information available when you call:

❑ Product type.

❑ Serial number.

❑ Billable Purchase Order (PO) number.

❑ Description of the problem.

Terms and Conditions of the Warranty

WARRANTY: The Seller warrants products of its manufacture to be free from defects in workmanship and material (except in those cases where the materials are supplied by the Buyer) under normal and proper use and service for as long as you own your Remote Annex (not transferable).

The Seller agrees to repair or replace at the place of manufacture, without charge, all parts of said products which are returned at the Buyer's expense for inspection, to the Seller's factory within the applicable warranty period provided such inspection discloses to the satisfaction of the Seller that the defects found are as above specified and provided also that the product has not been altered or repaired, other than with the Seller's authorization and by the Seller's approved procedures, subjected to misuse, improper maintenance, negligence, or accident, damaged by excessive current or otherwise, had its serial number or seal or any part of thereof altered, defaced, or removed. Products of non-Seller manufacture not incorporated into the Seller's equipment at the Seller's factory shall be and is hereby excluded from the provisions of this warranty. If, after inspection by Seller, product is not found to be defective, Buyer will be invoiced for said inspection and test at the then current repair charge, whether product is or is not in warranty. In addition, it is expressly agreed by the Buyer, in purchasing the products, that the liability of the Seller, if any, shall be limited solely to the replacement and repair of the products in accordance with the warranties specifically and expressly set forth herein. The remedies of the Buyer are the exclusive and sole remedies available, and, in the event of a breach of repudiation of any provision of this agreement by the Seller, the Buyer shall not be entitled to receive any incidental damages as that term is defined in Section 2-715 of the Uniform Commercial Code. The Buyer waives the Benefit of any rule that disclaimer of warranty shall be construed against the Seller, and agrees that such disclaimers herein shall be construed liberally in favor of the Seller.

> Warranty does not cover the parts or labor associated with repairs made in the field.

THE FOREGOING CONSTITUTES THE SELLER'S SOLE LIABILITY AND THE BUYER'S SOLE REMEDY WITH RESPECT TO PRODUCTS SOLD BY THE SELLER, EXCEPT AS THUS PROVIDED. THE SELLER DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: No action, regardless of form, arising from the transaction(s) of this Agreement may be brought by either party more than two (2) years after the cause of action has occurred. The Buyer agrees that the Seller will not be liable for any lost profits, or for any claim or demand against the Buyer by any other party, or by the Buyer. In no event shall the Seller be liable for any incidental or consequential damages, even if advised of the possibility of such damages. The Seller's liability, if any, with respect to any claim arising from the Agreement, shall be limited to repair or replacement as provided in the Warranty.

Remote Annex 2000 Dumps

In the unlikely event that the Remote Annex 2000 generates a dump, you can send the file to Xylogics for evaluation, either by Internet/ **ftp** or by sending it on tape.

To **ftp** a dump via Internet, use anonymous **ftp** to **xylogics.com** and perform the following steps:

❑ Use **cd** to change to the **/annex/incoming** directory.

❑ Use **mkdir** to create a directory, using your site as the directory name.

❑ Use **cd** to change to the new directory.

❑ Transfer the dump file in compressed and binary form.

❑ Send electronic mail to **annex-ftp@xylogics.com** to notify Technical Support that you are transferring a dump file. Include details about the crash, e.g., error messages, network configuration, user activity, commands issued, etc.

To send a tape, **tar** the dump onto either a 9-track (1600 bpi) or a 1/4-inch cartridge (QIC 11) tape, and send it to:

Technical Support
Xylogics, Inc.
53 Third Ave.
Burlington, MA 01803

Repair Information Request Form

Annex model:

_____

Unit's serial number (located on the bottom of the box):

_____

Using either the CLI **stats** command or the ROM Monitor **config** command, obtain:

Number of ports:

_____

Memory size:

_____

Software revision:

_____

ROM Monitor Revision:

_____

Hardware revision:

_____

MLB Serial number:

_____

Using the ROM Monitor **addr** command, obtain the following Annex addresses:

IP address:

_____

Preferred load host:

_____

Subnet mask:

_____

Broadcast address:

_____

Image name:

_____

LAN interface: Ethernet   ThinNet   Twisted Pair

Type of IP encapsulation: Ethernet   IEEE802

Problem description (indicate commands issued, error messages received, source of errors, etc.):_____

_____

_____

Network environment (e.g., Ethernet backbone, multiport, other hosts):_____

_____

Can the unit currently boot?   Y   N

Load host hardware platform:

_____

Load host operating system:

_____

Has the unit booted successfully from this load host and
operating system?   Y   N

If booting the unit for the first time, did you first run the ROM Monitor
erase command?   Y   N

Which front panel system indicators were *on* at the time of failure?

_____

Which front panel status indicators were *on* or *flashing* at the time
of failure?

_____

_____

Did the unit pass the Ethernet loopback test?   Y   N

If problems are port-related, what were the results of the
ports command?

_____

_____

_____

_____

Additional information:

Additional information (continued):

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