

# Remote Annex 6100

## Hardware Installation Guide

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## *Revision Level History*

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Revision	Description
A	Initial release.
B	Chapters 1 and 4: Redefined the Network Status Alarm labeled LOS. Chapter 3: Added information regarding error codes that reflect an Ethernet problem during the boot sequence.

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This guide contains a description of what a network administrator needs to know to install a Remote Annex 6100 on a local area network (LAN).

Refer to the *Software Installation Notes* that come with your Remote Annex 6100 for a description of the software installation. Refer to the *Annex Network Administrator's Guide* 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 6100; it describes the hardware features and firmware functions.

### **Chapter 2 Installing the Remote Annex 6100**

This chapter contains a description of how to install the Remote Annex 6100 on a LAN, and how to confirm its operating status.

### **Chapter 3 ROM Monitor Commands**

This chapter contains a description of 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 Pins and Signals**  
This appendix details the connectors located on the rear panel of the Remote Annex 6100.
- Appendix B Connectors and Jumpers**  
This appendix contains a description of the loopback connectors and jumper settings for the Remote Annex 6100.
- Appendix C Warranty and Technical Support Information**  
This appendix contains warranty and technical support information.





## Printing Conventions

This manual uses the following printing conventions:

Convention:	Represents:
<code>special type</code>	In examples, special type indicates system output.
<b>special type</b>	Bold special type indicates user input.
<code>(Return)</code>	In command examples, this notation indicates that pressing <code>(Return)</code> enters the default value.
<b>bold</b>	Bold indicates commands, pathnames, or filenames that must be entered as displayed.
<i>italics</i>	In the context of commands and command syntax, lowercase italics indicate variables for which the user supplies a value.



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Convention:	Represents:
[ ]	In command dialogue, square brackets indicate default values. Pressing  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.
	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.

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## 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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The message section is monitored by Bay Networks engineers, who provide assistance wherever possible. Customers and resellers holding Bay Networks service contracts also have access to special libraries for advanced levels of support documentation and software. To take advantage of CompuServe's recently enhanced menu options, the Bay Networks Forum has been re-engineered to allow links to our Web sites and FTP sites.

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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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

The Remote Annex 6100 is a multi-purpose network server. The Remote Annex 6100 is used for:

- ❑ Remote Network Access.
- ❑ Dial-up Routing.

## Remote Network Access

The Remote Annex 6100 is a multi-protocol, remote access server that provides remote network access to the following networks:

- ❑ Novell Netware.
- ❑ TCP/IP.
- ❑ AppleTalk.

Figure 1-1 shows how the Remote Annex is used for remote access.

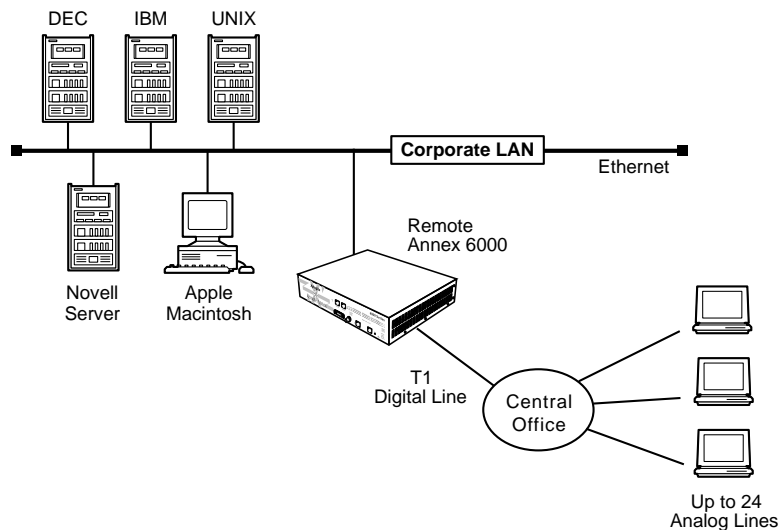


Figure 1-1. The Remote Annex 6100 as a Remote Access Server

# Dial-up Routing

The Remote Annex 6100 provides dial-up routing support for UNIX and Novell networks. Using a Remote Annex 6100, network administrators can connect two or more local area networks (LANs) over a wide area network (WAN) using one DS0 channel from each digital T1 line.

[Figure 1-2](#) shows how the Remote Annex is used for dial-up routing.

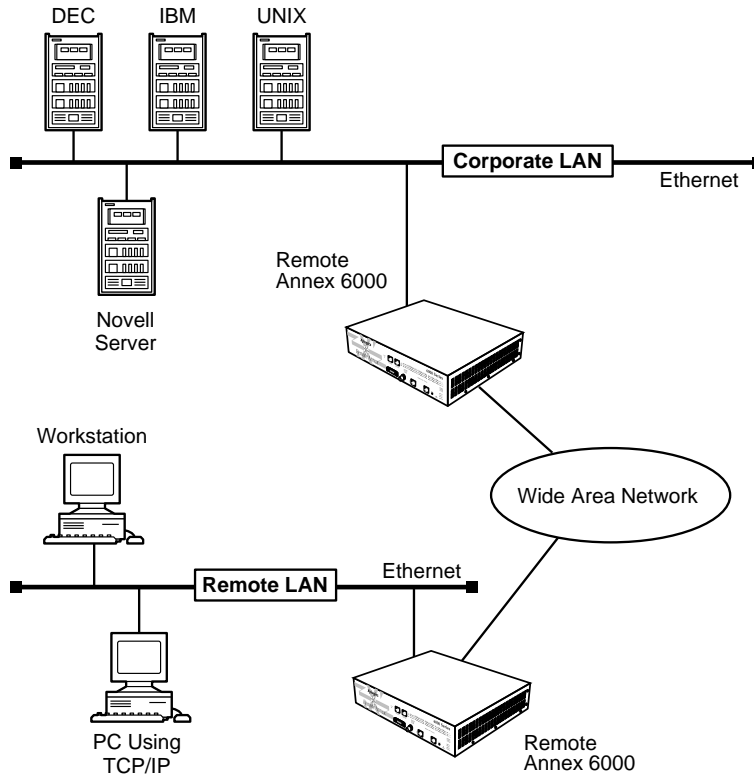


Figure 1-2. The Remote Annex 6100 as a Dial-up Router



## Remote Annex 6100 Description

The Remote Annex 6100 is a T1 remote access server that connects 24 internal modems to a digital T1 line. The Remote Annex 6100 also contains a Drop/Insert Interface to accommodate a Fractional T1 configuration. [Figure 1-3](#) illustrates a Remote Annex 6100.

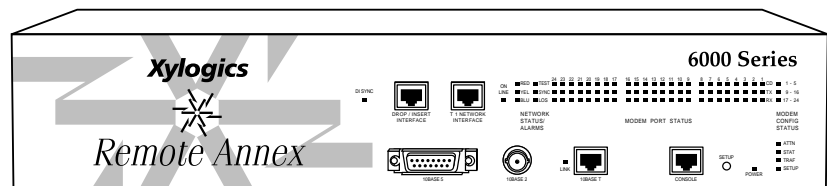


Figure 1-3. Remote Annex 6100

The Remote Annex 6100 contains two main boards:

- ❑ *Main Logic Board (MLB)*
- ❑ *Modem Interface Module*

The Remote Annex 6100 complies with the Ethernet Revision 2.0 or the IEEE 802.3 specifications using standard Ethernet 10Base2 (Thin), 10Base5 (Thick), and 10BaseT (twisted pair) as the physical medium.

## Main Logic Board

Processor

The Remote Annex 6100 main logic board (MLB) comes with the Intel 80486 SXLC2, 40-Mhz, clock-doubled processor.

Ethernet Connector

The MLB supports an integrated 10Base2, 10Base5, and 10BaseT autosense Ethernet connector.

Memory	The MLB comes with a minimum of 4 megabytes of memory, 2 Megabytes soldered on the MLB and two 1-Megabyte SIMM modules. The MLB can be upgraded to a total of 8 megabytes of memory using 4-Megabyte SIMM modules.
Flash Memory	The MLB supports 2 megabytes of flash memory.

## Modem Interface Module

Processor	The Remote Annex 6100 Modem Interface Module uses an Intel 80486 SXLC2,40-Mhz, clock-doubled processor located on the MLB.
Modems	The Remote Annex 6100 comes with 8, 16, or 24 internal V.34 modems. The modems receive data from a TTL serial channel and convert the data to a modulated analog waveform. The analog signal is then presented to a pulse-code-modulated coder/decoder (PCM codec).
PCM Codec	The Remote Annex 6100 uses PCM codecs to convert the analog signals coming from the modems into 8-bit serial data streams. The data streams are multiplexed and passed to the T1 engine.
T1 Engine	The T1 engine performs the framing, coding, and synchronization required by the T1 Network Interface or the Drop/Insert Interface.
Network Bypass Jumper	<p>The Remote Annex 6100 supports two power-down, bypass modes which are configured with this jumper. The modes are:</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Network Loopback Mode</li><li><input type="checkbox"/> Cross Connect Mode</li></ul> <p>Refer to Appendix B, <i>Connectors and Jumpers</i> for a description of the jumper settings.</p>

## Firmware and Software

### Firmware

The Remote Annex 6100's ROM contains firmware for performing power-up self-tests and loading operational code. A non-volatile EEPROM stores the configuration parameters.

The Remote Annex 6100 can have a boot image in Flash ROM or can receive its image from a device on the network. This image is used to boot the Remote Annex 6100.

### ROM Monitor

When the Remote Annex completes its self tests, 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 needs to 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's front panel. Using the ROM Monitor commands (see Chapter 3), you can:

- ❑ Modify and display a set of configuration parameters stored in EEPROM.
- ❑ Execute interactive diagnostic tests.
- ❑ Receive information and statistics for the hardware configuration and the network.
- ❑ Boot the Remote Annex 6100 manually.

Once the Remote Annex 6100 has obtained a boot image and is booted, the console leaves the ROM monitor and displays the console monitor. Refer to Chapter 2 for information on the console monitor.

Supported Configurations

The Remote Annex 6100 can obtain full operational code over the network from one of the following devices:

- ❑ UNIX host.
- ❑ VAX VMS host.
- ❑ Remote Annex 6100 configured as a load server.

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

Watchdog Timer

The Remote Annex 6100 has a watchdog timer that its software resets at regular intervals. The watchdog timer reboots the Remote Annex 6100 in the unlikely event of an internal software error. This feature enables the Remote Annex 6100 to run for long periods of time without intervention.

## Front Panel

The Remote Annex 6100's front panel consists of:

- ❑ *DI Sync LED.*
- ❑ *Drop/Insert Interface Port.*
- ❑ *T1 Network Interface Port.*
- ❑ *On-line LED.*
- ❑ *Network Status Alarms.*
- ❑ *Modem Port Status LEDs.*
- ❑ *Modem Configuration Status LEDs.*
- ❑ *Ethernet Ports.*
- ❑ *Console Port.*
- ❑ *Setup Button.*
- ❑ *Power LED.*
- ❑ *Remote Annex 6100 Status LEDs.*

[Figure 1-4](#) illustrates the Remote Annex 6100's front panel. The front panel components are described in the following paragraphs.

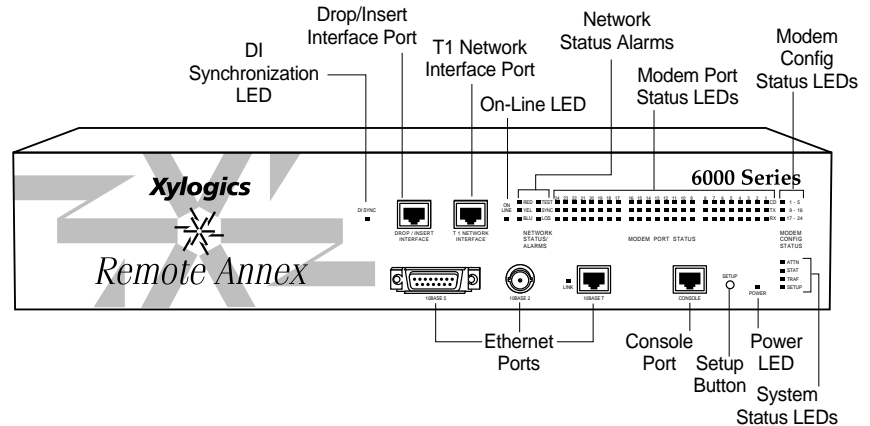


Figure 1-4. Remote Annex 6100 Front Panel

## Front Panel Components

### DI SYNC LED

The **DI SYNC LED** is green and ON when the T1 engine is detecting frame synchronization on the drop and insert interface receiver. The green LED is OFF when there is a loss of frame (LOF) synchronization.

A LOF condition causes the T1 engine to transmit unframed all ones (keep-alive) to the device attached to the Drop and Insert Interface.

### DROP/INSERT INTERFACE Port

The **DROP/INSERT INTERFACE** port comes with an 8-pin, modular jack for attaching the Drop and Insert Interface cable connector. The Drop and Insert Interface provides access to a local Private Branch Exchange (PBX) or other equipment.

T1 NETWORK  
INTERFACE Port

The **T1 NETWORK INTERFACE** port comes with an 8-pin, RJ48C port for attaching the T1 Network Interface cable connector. The T1 Network Interface provides access to a digital T1 line.

ON LINE LED

The **ON LINE LED** is green and ON when the T1 engine is connected to the network interface.

NETWORK STATUS  
ALARMS

The six **NETWORK STATUS ALARMS** labeled RED, YEL, BLU, TEST, SYNC, and LOS display network activity during system operation. Refer to [Table 1-1](#) for a description of the alarms.

Technical Support personnel can use this information to diagnose problems.

Table 1-1. Network Status Alarms

Alarm	Description
RED	RED alarm indicator is ON during a locally detected carrier failure. During the RED alarm condition, a YELLOW alarm is transmitted across the telephone network.
YEL	YELLOW alarm indicator is ON when receiving a YELLOW alarm condition from the telephone network.
BLU	BLUE alarm indicator is ON when receiving an unframed, all-ones Alarm Indication Signal (AIS) from the network. This condition exists upon a loss of originating signal, or when any action is taken that would cause a signal disruption.
TEST	RED network TEST indicator is ON when the T1 Network Interface is looped back. Loopback tests are activated either locally by the user or by the telephone company.
SYNC	GREEN SYNC indicator is ON when the T1 engine is properly synchronized with the received network signal and is receiving proper framing information.
LOS	RED LOS indicator is ON when the T1 engine is detecting no signal (pulses) on the network interface receiver. When a LOS condition exists, the T1 engine transmits a YELLOW alarm.

## MODEM PORT STATUS LEDs

The Remote Annex 6100 has three status indicators for each modem port (1 through 24). The status indicators display modem port status during system operation. Refer to [Table 1-2](#) for a description of the modem port status LEDs.

Table 1-2. Modem Port Status LEDs

LED	Description
CD	CD (Data Carrier Detect) indicator is green and ON when the carrier has been detected on the telephone line on the corresponding modem. There are 24 CD indicators, one LED per channel on the front of the Remote Annex 6100.
TX	TX (Transmit Data) indicator is green and flashes to indicate the corresponding modem is transmitting data. There are 24 TX indicators, one LED per channel on the front of the Remote Annex 6100.
RX	RX (Receive Data) indicator is green and flashes to indicate the corresponding modem is receiving data. There are 24 RX indicators, one LED per channel on the front of the Remote Annex 6100.

## MODEM CONFIG STATUS LEDs

The **MODEM CONFIG STATUS** LEDs indicate the number of modems installed (8, 16, or 24). An indicator is green if all the modems in its group are good. An indicator is amber if one or more modems in its group are bad.

## Ethernet Ports

The Remote Annex 6100 comes with an integrated 10Base2, 10Base5, and 10BaseT auto sense Ethernet connector. Connect to your LAN using one of the following:

- ❑ **10BASE2** (Thin Ethernet) Ethernet port with a BNC connector.
- ❑ **10BASE5** (Thick Ethernet) Ethernet transceiver port with a DB15 connector.

- ❑ **10BASET** (Twisted Pair Ethernet) Ethernet port with an RJ-45 connector.

A Link Indicator LED is provided. This LED is green when an active 10BaseT segment is attached.



Connect only one interface at a time.

The Remote Annex 6100 must be reset (hard reset) when changing network interface connections.

CONSOLE Port

The Remote Annex 6100 has a 9600-baud **CONSOLE** port with an 8-pin, modular jack for attaching the console. The console port provides access to the ROM Monitor commands when the Remote Annex 6100 is in test mode and provides access to the console commands when the unit is running.

SETUP Button

The **SETUP** button is used to:

- ❑ **Enter Setup Mode.**  
When the SETUP button is pressed (ON), the SETUP indicator is green and the Remote Annex 6100 enters Setup Mode. In this mode, configuration data is entered via the Console Terminal prior to booting the operational software.
- ❑ **Reset the Remote Annex 6100.**  
When the SETUP button is pressed and held for 3 seconds, the SETUP indicator flashes and the Remote Annex 6100 begins to execute its power-up diagnostics. If the Setup button is depressed again within 5 seconds, the Remote Annex 6100 either enters Setup Mode and waits for configuration information to be entered or boots its operational software.

POWER LED

The Power LED is ON when the Remote Annex 6100 is connected to an AC power source and switched ON.



## Remote Annex 6100 System LEDs

The Remote Annex 6100 has four status LEDs located on its front panel:

- ❑ **ATTN**  
The ATTN (Attention) indicator is amber and ON when the Remote Annex 6100 requires operator attention. The indicator is flashing when there is a problem.
- ❑ **STAT**  
The STAT (Status) indicator is green and ON after the Remote Annex 6100 passes the core power-up diagnostics. The indicator flashes after resetting the Remote Annex 6100.
- ❑ **TRAF**  
The TRAF (Traffic) indicator is green and flashing when the Remote Annex 6100 successfully transmits or receives data from the LAN.
- ❑ **SETUP**  
The SETUP indicator is green when the SETUP button is pressed ON (SETUP Mode) and flashing when the SETUP button is pressed ON for 3 seconds (RESET Mode).

## Rear Panel

[Figure 1-5](#) shows the Remote Annex 6100's rear panel with the following connectors and switches:

- ❑ *Power Switch.*
- ❑ *Power Select Switch.*
- ❑ *AC Line Socket.*

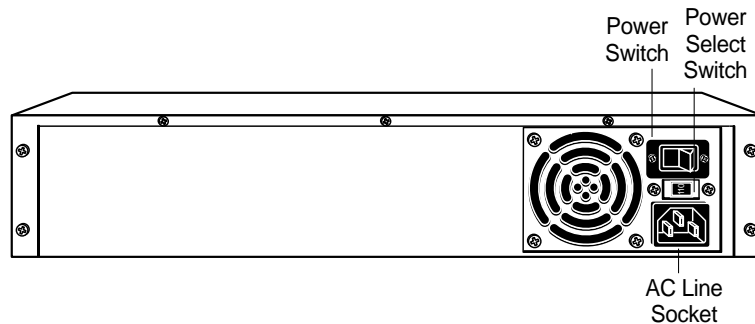


Figure 1-5. Remote Annex 6100 Rear Panel

## Rear Panel Components

Power Switch

The **Power Switch** disconnects AC power without disconnecting the Remote Annex 6100 from the power source.

Power Select Switch

The **Power Select Switch** selects the operational voltage range. The Remote Annex 6100 automatically compensates for variation within the 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 through the AC power cord. The AC power cord plugs into this socket.

## Physical Characteristics

The Remote Annex 6100 enclosure has the following characteristics:

❑ **Dimensions:**

Height: 4 in.  
Width: 17 in.  
Depth: 14.75 in.

❑ **Weight:**

20 lbs.

❑ **Power:**

Internal supply.  
100-120/220-240 VAC.  
4.0/2.0 A  
60/50 Hz, 200W, 682 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.

- ❑ Operating altitude: 0 to 4,000 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 and UL 1950. CSA C22.2 No. 950.
  - ❑ Meets EMI requirements of FCC Class A and EN55022 Class A with shielded and unshielded cables.
  - ❑ Meets US and Canadian Telecom requirements per FCC Part 68 and IC CS-03.
- ❑ **MTBF:**  
50,000 hrs. (estimated), calculated @ 25°C (Mil Std 217).
- ❑ **Front clearance requirement (for connectors and cables):**  
6 in. (15 cm).
- ❑ **Rear clearance requirement (for connectors and cables):**  
6 in. (15 cm).

This chapter contains a description of how to install your Remote Annex 6100 hardware and connect it to your Ethernet network. Setting up the Remote Annex 6100 consists of:

- ❑ *Installing the Remote Annex 6100 in a Rack (Optional).*
- ❑ *Connecting a LAN.*
- ❑ *Connecting a Console Terminal.*
- ❑ *Connecting Serial Devices.*
- ❑ *Connecting a T1 Network Interface.*
- ❑ *Connecting a Drop/Insert Interface.*
- ❑ *Powering Up and Testing the Remote Annex 6100.*
- ❑ *Installing the Software and Loading the Operational Image.*
- ❑ *Auto-initializing the ROMs.*
- ❑ *Self-booting the Remote Annex 6100.*
- ❑ *Invoking a Console Monitor.*

## Before you Begin

The Remote Annex 6100's software and operational image can be installed on three different devices. [Table 2-1](#) outlines the different configurations the Remote Annex 6100 supports.

Table 2-1. Remote Annex 6100 Configuration Options

Device on which the Operational Software and Image is installed	Remote Annex 6100 Must be Connected to the Network	Input Device used to Enter Installation Parameters
UNIX Load Host	Yes	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.

## Installing the Remote Annex 6100 in a Rack (Optional)

Installing the Remote Annex 6100 in a rack is optional and requires the following equipment:

- ❑ Mounting brackets, front or back
- ❑ Screws
- ❑ Phillips screwdriver

The following paragraphs contain a description of how to mount the Remote Annex 6100 in a rack. The device can be mounted in two ways:

- ❑ *Front Mount*
- ❑ *Rear Mount*

## Front Mount

The Remote Annex 6100 is mounted to the front of the rack by attaching the front mounting brackets to the device and then attaching the device and mounting brackets to the rack.

### Attaching the Mounting Bracket to the Remote Annex 6100

Attach the front mounting bracket to the Remote Annex 6100 as follows:

- 1 Remove the mounting brackets and screws from their package.
- 2 Attach one bracket to each side of the Remote Annex 6100 as shown in [Figure 2-1](#) using the screws provided.
- 3 Tighten the screws to secure the brackets to the device.

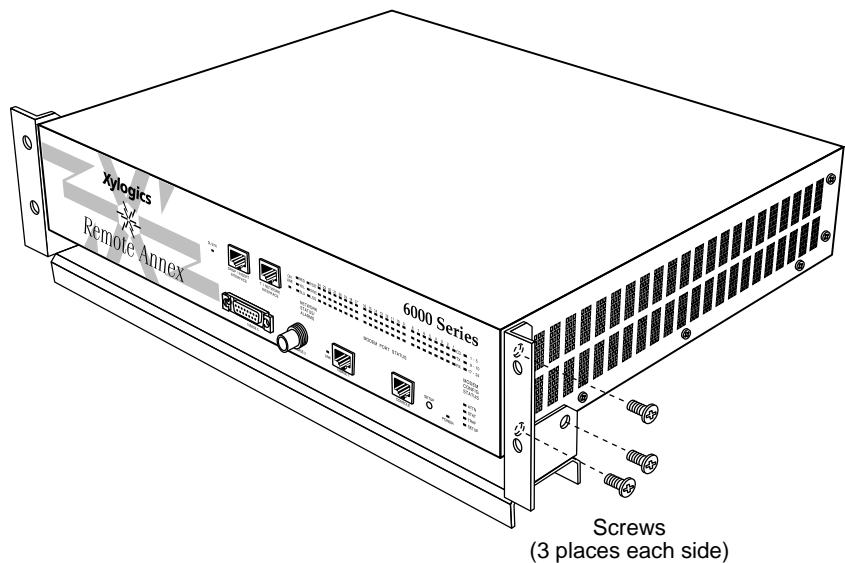


Figure 2-1. Attaching the Mounting Bracket to the Remote Annex 6100

## Attaching the Mounting Bracket and Device to the Rack

Attach the mounting bracket to the rack as follows:

- 1 Position the Remote Annex horizontally, facing forward in the rack.
- 2 Align the holes in the mounting bracket with the holes in the rack.
- 3 Insert the mounting screws and tighten the screws to attach the front of the Remote Annex 6100 to the front rack (see [Figure 2-2](#)).

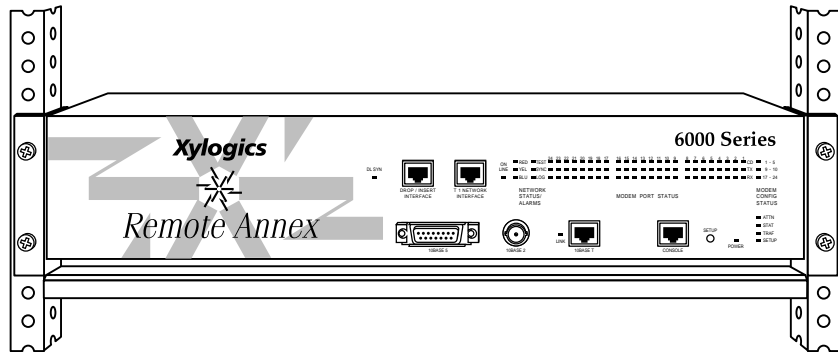


Figure 2-2. Attaching the Mounting Bracket and Device to the Rack

## Rear Mount

The Remote Annex 6100 is mounted to the rear of the rack by attaching the rear mounting brackets to the device and then attaching the device and mounting brackets to the rack.



## Attaching the Mounting Bracket to the Remote Annex 6100

Attach the rear mounting bracket to the Remote Annex 6100 as follows:

- 1 Remove the mounting brackets and screws from their package.
- 2 Attach one bracket to each side of the Remote Annex 6100 as shown in [Figure 2-3](#) using the screws provided.
- 3 Tighten the screws to secure the brackets to the device.

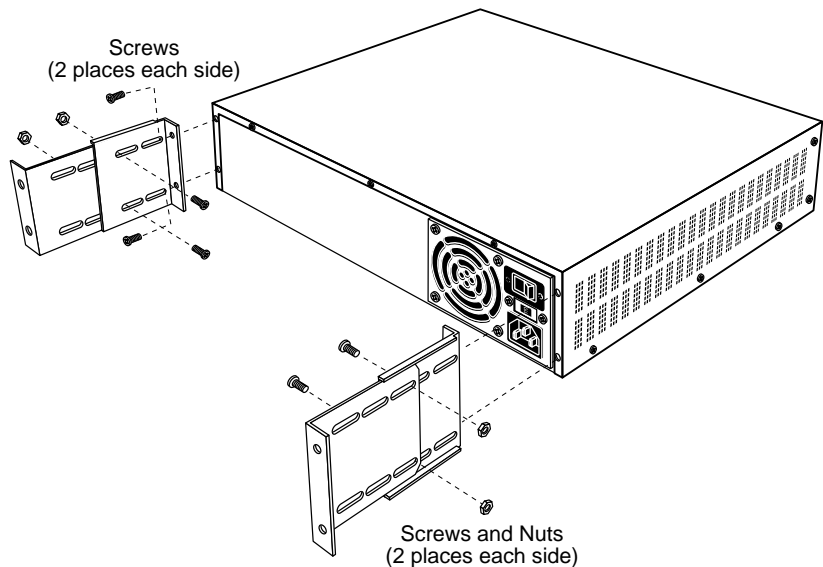


Figure 2-3. Attaching the Mounting Bracket to the Remote Annex 6100

## Attaching the Mounting Bracket and Device to the Rack

Attach the mounting bracket to the rack as follows:

- 1 Position the Remote Annex horizontally, facing forward in the rack.
- 2 Align the holes in the mounting bracket with the holes in the rack.
- 3 Insert the mounting screws and tighten the screws to attach the Remote Annex 6100 to the rack ([Figure 2-4](#)).

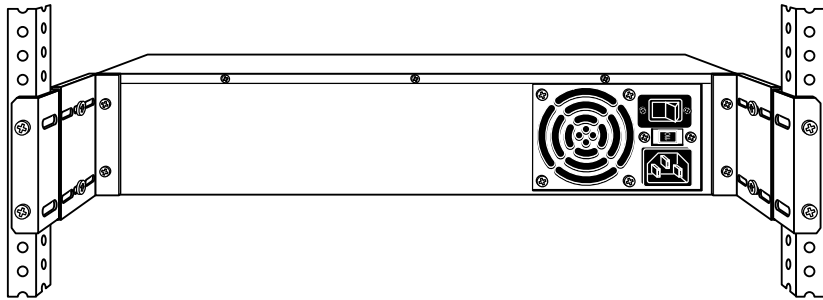


Figure 2-4. Attaching the Mounting Bracket and Device to the Rack

## Connecting a LAN Using Ethernet

The Remote Annex 6100 supports three types of Ethernet connections: Thin Ethernet, Thick Ethernet, or Twisted Pair (see [Figure 2-5](#)).

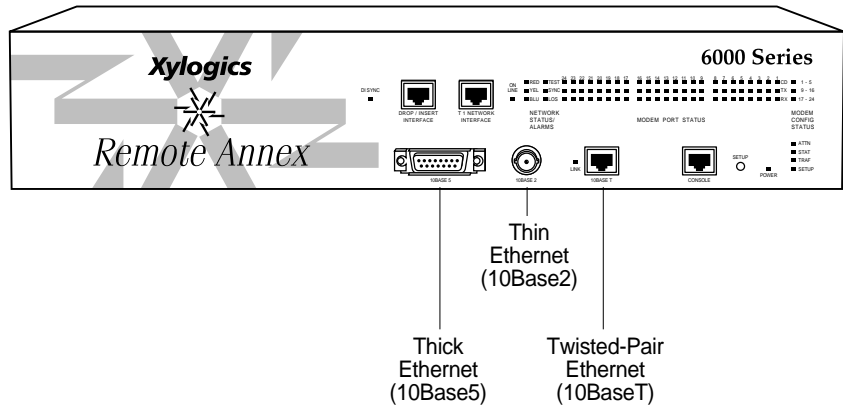


Figure 2-5. Remote Annex 6100 Ethernet Connections

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 6100 is powered off before disconnecting or connecting the Ethernet cabling.

The following subsections contain a description of how to connect your Remote Annex 6100 to:

- ❑ *Thin Ethernet (10Base2).*
- ❑ *Thick Ethernet (10Base5).*
- ❑ *Twisted Pair (10BaseT).*

## Connecting Thin Ethernet (10Base2) Cable

To connect 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 6100 to a Thin Ethernet cable (see [Figure 2-6](#)):

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

If the Remote Annex 6100 is the last device on the Thin Ethernet segment, 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 located on the rear panel of the Remote Annex 6100.
- 3 Twist the sleeve on the T-connector clockwise to lock the connection in place.

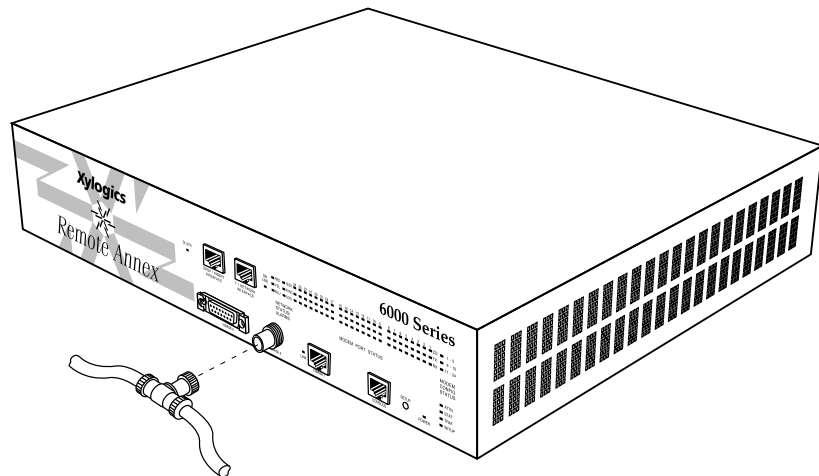


Figure 2-6. Connecting Thin Ethernet Cable

## Connecting Thick Ethernet (10Base5) Cable

To connect 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 6100 to a Thick Ethernet cable (see [Figure 2-7](#)):

- 1 Make sure the transceiver cable is plugged into the Ethernet network.
- 2 Push the slide mechanism on the Remote Annex 6100'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.

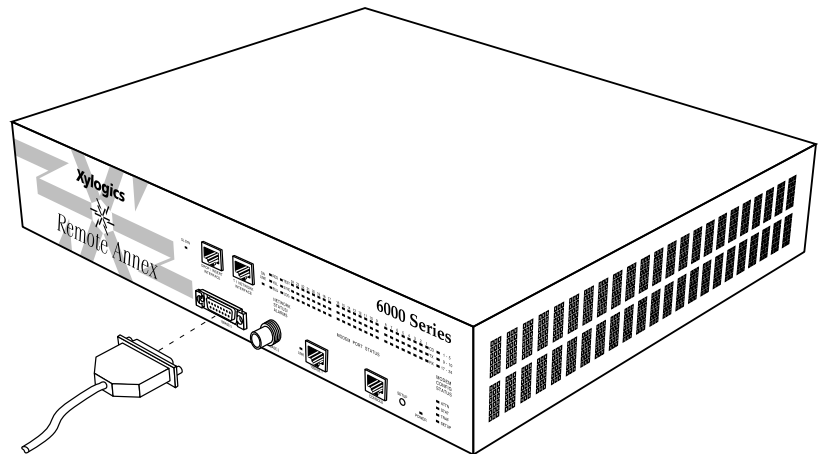


Figure 2-7. Connecting Thick Ethernet Cable

## Connecting Twisted-Pair Ethernet (10BaseT) Cable

Follow the steps in this section to connect Twisted-Pair (10BaseT) Ethernet cable to the Remote Annex 6100 (see [Figure 2-8](#)):

- 1 Insert the connector located on the Twisted-Pair Ethernet cable into the 10BaseT connector on the rear panel of the Remote Annex 6100.
- 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.

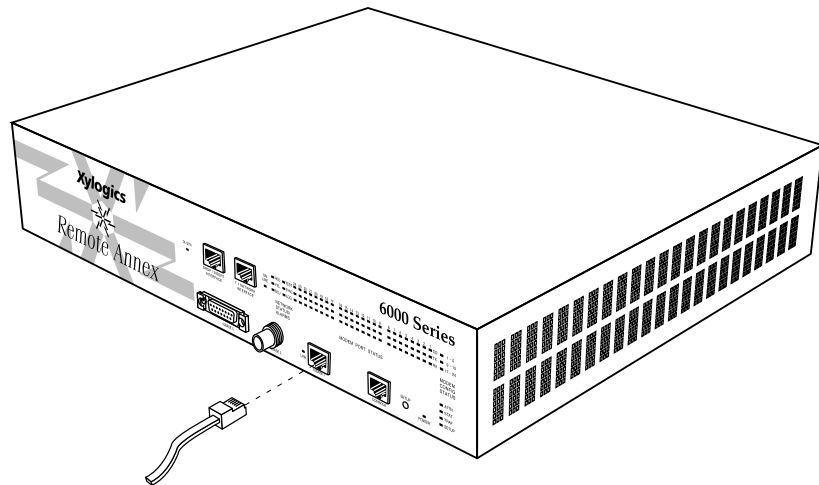


Figure 2-8. Connecting Twisted-Pair Ethernet Cable

## Connecting a Console Terminal

A console terminal is used to access the ROM Monitor and boot the Remote Annex 6100 for the first time. Follow the steps in this section to connect a console terminal to the console port located on the rear panel of the Remote Annex 6100.

- 1 Connect the Console Terminal's I/O connector to the cable (the accessory kit includes a cable) using a DB-25 DTE drop adapter (see [Figure 2-9](#)).

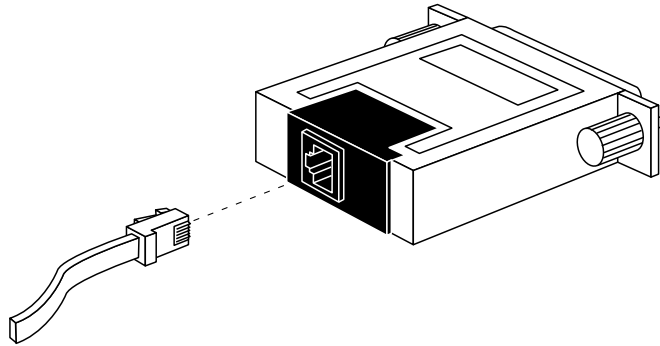


Figure 2-9. Connecting the Cable to the DB-25 DTE Drop Adapter

- 2 Plug the 8-pin connector into the console port located on the back panel of the Remote Annex 6100 (Figure 2-10).

When the connector clicks into place, the connection is secure. Appendix A describes the console port's signal/pin allocation.

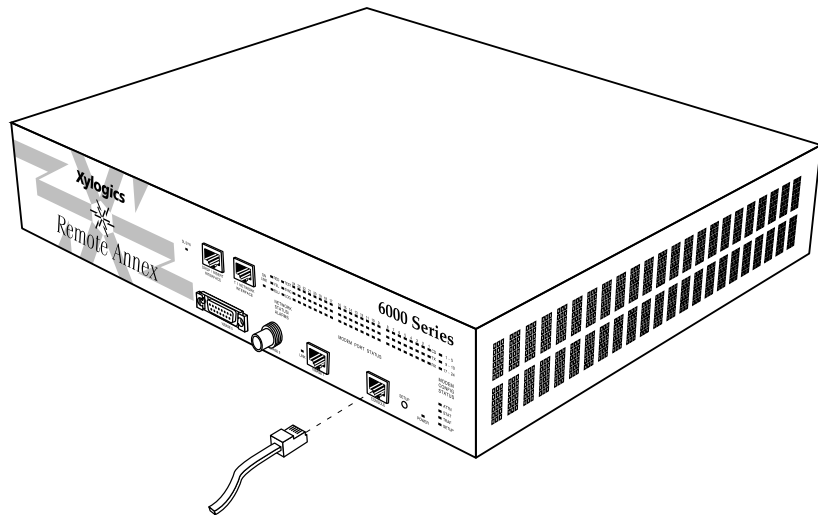


Figure 2-10. Connecting a Console Terminal

- 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. Refer to Chapter 3 for information on invoking the ROM monitor.



## Connecting a T1 Network Interface

A T1 Network Interface is used to connect the Remote Annex 6100 to the T1 line. Follow the steps in this section to connect the T1 line to the T1 Network Interface port located on the front panel of the Remote Annex 6100.

- 1 Plug the RJ48C connector located on the T1 Network Interface Cable into the T1 Network Interface port located on the front panel of the Remote Annex 6100 (Figure 2-11).

When the connector clicks into place, the connection is secure. Appendix A describes the T1 Network Interface port's signal/pin allocation.

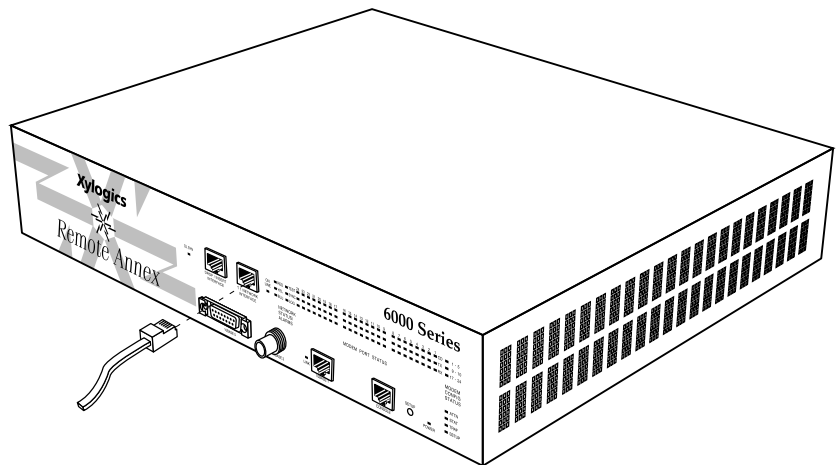


Figure 2-11. Connecting a T1 Network Interface

## Connecting a Drop/Insert Interface

A Drop/Insert Interface is used to connect various Remote Annex 6100 channels to a local PBX or other equipment. Follow the steps in this section to connect the cable to the Drop/Insert Interface port located on the front panel of the Remote Annex 6100.

- 1 Plug the Drop/Insert Interface Cable into the Drop/Insert Interface port located on the front panel of the Remote Annex (Figure 2-12). When the connector clicks into place, the connection is secure. Appendix A describes the T1 Network Interface port's signal/pin allocation.

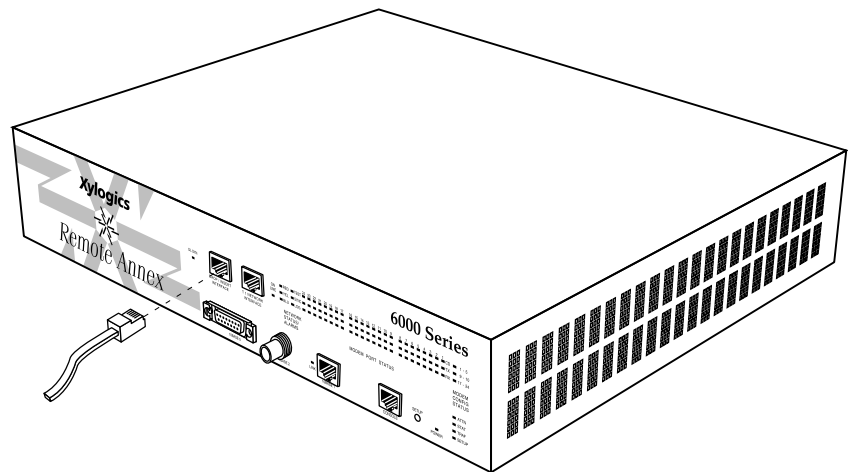


Figure 2-12. Connecting a Drop/Insert Interface

## Powering Up and Testing the Remote Annex 6100

Power-up and test your Remote Annex 6100 as follows:

- 1 **Verify the Remote Annex 6100's operational power range.**  
Check that the power select switch is set to the 110V position for operation in the 90 to 130 VAC range, or to the 220V position for operation in the 180 to 260 VAC range (see [Figure 2-13](#)).

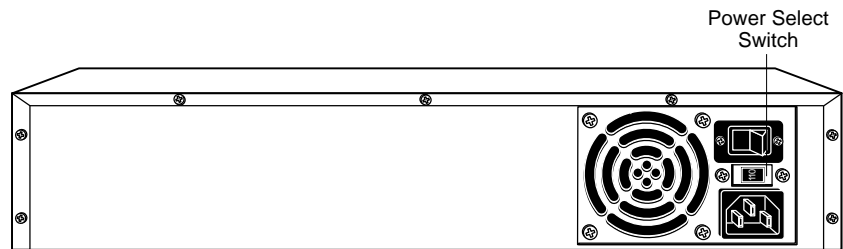


Figure 2-13. Verifying the Remote Annex 6100 Operational Power Range



Setting the power select switch incorrectly can damage the Remote Annex 6100.

- 2 **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 2-14](#)). Turn the power switch on. The POWER LED is now active.

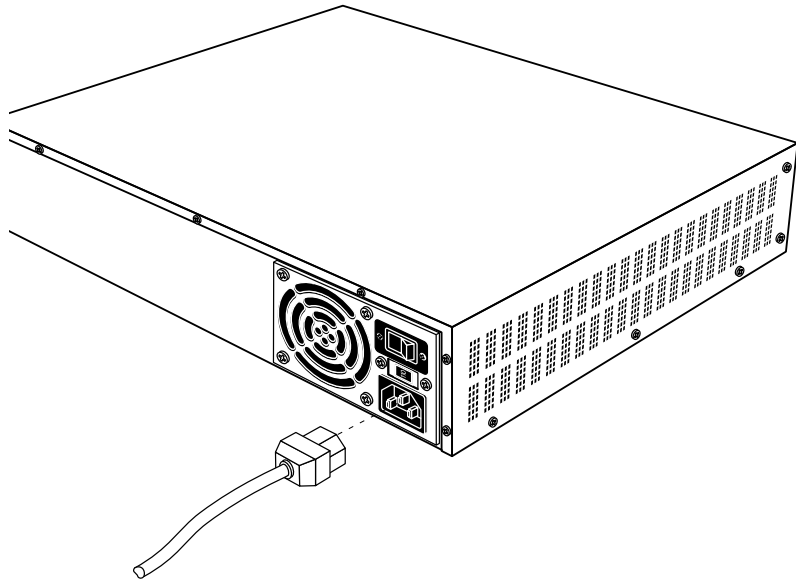


Figure 2-14. Connecting the Power Cord

The Remote Annex 6100 now runs its ROM-resident power-up diagnostics. The LEDs light and then turn off, except for the T1 ON LINE LED and some status LEDs.



The ROM-resident, power-up diagnostics take 2 to 3 minutes to complete.

If the diagnostics complete successfully, the Remote Annex 6100 either enters Setup Mode and waits for configuration data to be entered or boots its operational image from FLASH.

You can enter configuration information through a terminal connected to the console port. The ROM Monitor prompt (`monitor:::`) appears on the terminal.

If the ATTN LED is ON or flashing, one of the following failures has occurred (see See Chapter 4, *Troubleshooting*, for more details):

- ❑ Remote Annex hardware failure. Contact technical support.
- ❑ Network or network interface failure. 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 and then see [net](#) on page 3-22.

- 3 Verify the Remote Annex 6100's hardware configuration.

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

```

                                REVISION/CONFIGURATION INFORMATION

ROM Software Rev:           090X
Board ID: 46                 Board Type: RA6100
CPU Type: 486SXLC2          Ethernet Address: 00-80-2D-XX-XX-XX
Memory size: 4 Meg          EEPROM size: 65504
Flash size: N/A             Flash ID: N/A
Available Interfaces (*=selected) ThickNet ThinNet *Twisted Pair
T1 Unit Identification: XYLOGICS T1-ENGINE 085234 Rev. A 07/19/95 6343
T1 Network Jumper: Net Loopback Mode
DS0: B8ZS Coding    ESF Framing AT&T FDL Format
DSX: B8ZS Coding    ESF Framing Line Distance=535 to 635 Feet

Port #      1      2      3      4      5      6      7      8      9      10     11     12
T1 Slot Map N      N      N      N      N      N      N      N      N      N      N      N
Mod ID      288X  288X  288X  288X  288X  288X  288X  288X  288X  288X  288X  288X
Mod Status  OK      OK      OK      OK      OK      OK      OK      OK      OK      OK      OK      OK

Port #      13     14     15     16     17     18     19     20     21     22     23     24
T1 Slot Map N      N      N      N      N      N      N      N      N      N      N      N
Mod ID      288X  288X  288X  288X  288X  288X  288X  288X  288X  288X  288X  288X
Mod Status  OK      OK      OK      OK      OK      OK      OK      OK      OK      OK      OK      OK

```

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

At the monitor prompt, type **addr -d** and press **Return**. The screen display looks similar to this:

```
monitor:: addr -d
Ethernet address (hex): 00-80-2D-XX-XX-XX
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: 0.0.0.0
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 6100 to your LAN.

This section describes:

- ❑ How to install the Remote Annex 6100's operational software and image on a device that resides on a network accessible to the Remote Annex 6100.
- ❑ How to download the operational image from the device to the Remote Annex 6100.

## Installing to and Loading from a UNIX Host

This section contains a description of what you need to do to install the Remote Annex 6100's operational software and image to a UNIX host. Refer to the *Annex Network Administrator's Guide* for additional information. Proceed as follows:

- 1 Install the image on a UNIX host. The software installation notes describe how to do this.



If you have a BOOTP server (refer to Chapter 3), boot the Remote Annex 6100. Otherwise, continue to the next step.

- 2 Execute the ROM Monitor `addr` command:
  - Enter the Remote Annex 6100's Internet address.
  - Modify any other parameters that the Remote Annex 6100 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 Execute the `boot` command.

After successful execution of the **boot** command, the Remote Annex 6100 is up and running (see [boot](#) on page 3-8).

## Installing to and Loading from a VAX VMS Host

This section contains a description of what you need to do to install the Remote Annex 6100'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 installing 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 Remote 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 6100 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. Pressing **Control-Y** (^Y) stops the installation.

- 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've 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 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 *Annex Network Administrator's Guide*, Book C, Chapter 2).

If **disabled\_modules** 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
          State   Name       Routing Node
SVA-0     on
```

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

```
$MCR NCP SET CIRCUIT SVA-0 STATE OFF
$MCR NCP SET CIRCUIT SVA-0 SERVICE ENABLED
$MCR NCP DEF CIRCUIT SVA-0 SERVICE ENABLED
$MCR NCP SET CIRCUIT SVA-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. 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 BINGO DUMP FILE\  
DKA200:[ZETKIN.ANNEX_CRASH]BINGO.DMP
```

- 3 Assign the Remote Annex'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\_46\_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\_46\_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 Remote Annex 6100

The Remote Annex 6100 is distributed without an IP address or preferred load host (UNIX/IP or MOP) defined in ROM. When the device is booted, the Remote Annex 6100 attempts to auto-initialize itself using BOOTP (bootstrap protocol) and RARP (Reverse Address Resolution Protocol).

The Remote Annex 6100 supports the BOOTP and RARP protocols. Use these protocols to obtain boot information from a UNIX host without requiring any manual set-up on the Remote Annex 6100.

- ❑ BOOTP allows a diskless client to determine its IP address, the IP address of the server, and the name of the file to be loaded into memory.
- ❑ RARP maps a hardware address into an IP address.

The ROMs invoke this system of acquiring boot information when a boot is initiated and the Remote Annex 6100 is not initialized. Under this condition, the Remote Annex 6100 first tries to get boot information via BOOTP or RARP.

If BOOTP and RARP fail, the Remote Annex 6100 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 6100 will return to the ROM monitor (if in Test mode) or continue the auto-initializing procedure indefinitely (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 6100 and must have the appropriate information in the **bootptab** file. The Remote Annex 6100's BOOTP implementation adheres to rfc951, rfc1048, and rfc1084. A sample **bootptab** file entry used to initialize the Remote Annex 6100 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 6100's hardware address (Ethernet Address).
- ❑ *ip* is the Remote Annex 6100's Internet Address.

When the Remote Annex 6100 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 6100 in this case) with whatever format the client requests; the Remote Annex 6100 (client) always makes requests in 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's preferred load host.

## RARP

If the Remote Annex 6100 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 6100, and the host's ARP table must be initialized with the Remote Annex 6100's Internet and Ethernet addresses (see the **arp** man page, **arp -s**).

The only boot information that RARP provides is the Remote Annex 6100'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 6100 its boot information must be running on the same network as the Remote Annex 6100 because the Remote Annex 6100 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 6100 returns to the ROM monitor (if in Test mode) or continues the auto-initializing procedure indefinitely (if in normal mode).

## Self-Booting the Remote Annex 6100

The Remote Annex 6100 comes with Flash memory. Your device already contains an operational image. You can check your Remote Annex 6100's configuration by entering the **config** command at the `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:" will appear under the REVISION/CONFIGURATION INFORMATION section.

This section contains a description of what you need to do to boot your Remote Annex 6100 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 Annex.

## Invoking the Console Monitor

After the image boots, you can invoke a Console Monitor by pressing `Return` on the console. At the Console Monitor prompt, entering **help** or **?** displays the available options:

- ❑ **dump** (from the Annex to the host and reboots).
- ❑ **help** or **?** (displays the available options).
- ❑ **info** (displays configuration information for the Annex).
- ❑ **leds** (displays the current front panel LED status).
- ❑ **quit** (exit the Console Monitor, e.g., *quiet* the console).
- ❑ **reboot filename** (reboots the Annex).
- ❑ **rom** (returns the Annex to the ROM Monitor).
- ❑ **syslog** (displays syslog messages).



## Chapter 3 ROM Monitor Commands

This chapter describes the ROM Monitor commands. Access these commands through a terminal connected to the console port located on the front of the Remote Annex 6100.

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 required for booting the Remote Annex 6100; 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 6100'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 6100 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, by using the **na** utility, the **admin** utility on the Remote Annex, or SNMP. The *Annex Network Administrator's Guide* describes the **na** utility in detail. Refer to Chapter 4, *Troubleshooting*, for information on Power-up and Boot procedures.

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

(continued on next page)

Table 3-1. ROM Monitor Commands (continued)

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

## addr

The **addr** command displays and sets several Remote Annex 6100 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 displays the unit's ROM-resident Ethernet address in hexadecimal notation. (For a description of Internet addresses, see the *Annex Network Administrator's Guide*.) 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 6100'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 6100 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 6100 from a UNIX load host. If you do not define a subnet mask, the Remote Annex 6100 uses the generic mask for the specified IP address.

The Remote Annex 6100 tries to boot from a preferred UNIX load host. If you do not define a preferred load host, the Remote Annex 6100 broadcasts its load request and loads software from the first host that responds.

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

The Remote Annex 6100 uses the broadcast address parameter when loading a file. If this parameter contains a specific address (for example, 132.245.6.255), the Remote Annex 6100 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 6100 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 6100 operating software from a cooperating 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 ROM Monitor.

The **boot** command accepts a file name for the Remote Annex 6100'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 6100, **boot** requests the default **oper.46.enet** file. Optionally, you can enter a file name using the **image** command.

The Remote Annex 6100 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 6100 broadcasts on the Ethernet and loads from the first host that responds.

To initiate loading, the Remote Annex 6100 sends a load request message to the selected host. After receiving a response, the Remote Annex 6100 loads its operational code to RAM. When loading is complete, it transfers control to the newly-loaded program. The Remote Annex 6100 displays a symbol on the console for each data block received during the boot.



When the Remote Annex 6100 begins to boot, it displays the load server host's Internet 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 4-11).

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 issuance of 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







## config

The **config** command displays the current configuration information and revision levels for the Remote Annex 6100. The **config** command displays revision information, the amount of memory installed, T1 configuration information, and a description of the number and type of modems installed. The command syntax is:

### config

The **config** command display for a Remote Annex 6100 with 24 modems looks similar to this:

```

                                REVISION/CONFIGURATION INFORMATION

ROM Software Rev:          090X
Board ID: 46                Board Type: RA6100
CPU Type: 486SXLC2         Ethernet Address: 00-80-2D-XX-XX-XX
Memory size: 4 Meg         EEPROM size: 65504
Flash size: N/A            Flash ID: N/A
Available Interfaces (*=selected) ThickNet ThinNet *Twisted Pair

T1 Unit Identification: XYLOGICS T1-ENGINE 085234 Rev. A 07/19/95 6343
T1 Network Jumper: Net Loopback Mode
DS0: B8ZS Coding           ESF Framing AT&T FDL Format
DSX: B8ZS Coding           ESF Framing Line Distance=535 to 635 Feet

Port #      1      2      3      4      5      6      7      8      9      10     11     12
T1 Slot Map N      N      N      N      N      N      N      N      N      N      N      N
Mod ID      288X  288X  288X  288X  288X  288X  288X  288X  288X  288X  288X  288X
Mod Status  OK      OK      OK      OK      OK      OK      OK      OK      OK      OK      OK      OK

Port #      13     14     15     16     17     18     19     20     21     22     23     24
T1 Slot Map N      N      N      N      N      N      N      N      N      N      N      N
Mod ID      288X  288X  288X  288X  288X  288X  288X  288X  288X  288X  288X  288X
Mod Status  OK      OK      OK      OK      OK      OK      OK      OK      OK      OK      OK      OK

```

## 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 6100 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 6100 is booted.

### To provide remote access to the Remote Annex 6100 ROMs:

- 1 From a site local to the Remote Annex 6100:
  - Put the Remote Annex in test mode so the monitor prompt appears on the console.
  - Set the modem to auto-answer mode.
- 2 From the Remote Annex 6100 console port:
  - At the monitor prompt, enter **console-baud**.
  - At the Select Baud Rate prompt, enter the appropriate baud rate or auto.
  - Connect the modem to the Remote Annex's console port.
- 3 From the remote site:
  - Dial into the modem connected to the Remote Annex.
  - Press the  key until the monitor prompt appears.

## erase

The **erase** command erases the contents of non-volatile memory, including the Remote Annex 6100's Internet 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 the non-volatile memory to erase: EEPROM or FLASH. Entering 1 at the prompt causes the Remote Annex to erase the EEPROM memory (configuration information); entering 2 at the prompt causes the Remote Annex 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'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. S
Enter 1 or 2:: 1
Erase all non-volatile EEPROM memory? (y/n) [n]:: y
Erasing <65504 or 8160 bytes> of non-volatile memory. Please
wait...
                                                    16K->|Data 0xff
.....
                                                    16K->|Data 0x0
.....
Initialized checksum record installed
.
.
.
```



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]:: y
Erasing <65504 or 8160 bytes> of non-volatile memory. Please
wait...
................................................................................ 16K->|Data 0xff
................................................................................ 16K->|Data 0x0
................................................................................
Initialized checksum record installed
Erasing <65504 or 8160 bytes> of non-volatile EEPROM memory
```

### help

Entering **help**, or **?**, displays brief descriptions of the Remote Annex 6100 ROM Monitor commands.

## image

The **image** command sets and displays the name of the image file containing the Remote Annex 6100'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.46.enet**. The **image** command display looks like this:

```
monitor:: image
Enter Image name: [(ip)"oper.46.enet", \
(mop) "OPER_46_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.46.enet"
          Default (mop):"OPER_46_ENET.SYS"
TFTP Load Directory: ""
TFTP Dump path/filename: "dump.192.9.200.88"
SELF image name: "oper.46.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 6100'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>]: mars
Enter Frame type, 0=802.3 1=Ethernet II 2=802.2 3=SNAP\
[802.3]:
Enter IPX dump user name [<uninitialized>]: susans
Enter IPX dump password [<uninitialized>]: *****
Verify IPX dump password []: *****
Enter IPX dump path [<uninitialized>]: SYS:\user\susans\
```

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: "MARS"
IPX frame type: "802.3"
IPX dump user name: "SUSANS"
IPX dump password: <SET>
IPX dump path name: "SYS:\user\susans\"
```

## 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 loading the Remote Annex 6100'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
```

This transceiver loopback test sends out a short test packet from the Remote Annex 6100 through the transceiver to test the integrity of the network. The test can be executed either by attaching the Remote Annex 6100 to the Ethernet or by attaching an Ethernet loopback connector to the network port.

For the 10Base2 and 10Base5 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 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 6100 fails, the **Net** LED remains off, and the console displays an error message.

Failing this test indicates that either the Remote Annex 6100, 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 6100 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 6100. Call technical support.

- 2 The Remote Annex 6100 transceiver cable is defective or disconnected (this problem occurs only with the 10Base5 interface).

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. If errors did not occur during the first test run, 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 not experiencing difficulties, the problem is in the transceiver. If you have already 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 the internal T1 ports and the external Drop/Insert and T1 Network interface ports. The syntax is:

### ports

To test the external ports, the DSX or DS1 network interface must be connected to a loopback plug or a device that is capable of looping data back DS0 channel(s) to the Remote Annex 6100. No external clocking is required.

When invoked, the command displays a menu of options. The following sample screen display is for a Remote Annex 6100 with 24 asynchronous serial ports and a printer port.

```
onitor:: ports

ome Important Notes:
  For External Port Testing the DSX or DS1 network\
  interface must be connected to a loopback plug or\
  a device that is capable of looping data back DS0\
  channel(s) to the Remote Annex 6100. No external\
  clocking is required.

  1) DS1 External Loopback
  2) DSX External Loopback

election (Return to exit)::

f the T1 External Loopback test (1 or 2) is selected,\
he following will be displayed:

ou may enter a list of channels within the T1 frame to\
est, separated by spaces or commas.

ou may also enter ranges of channels such as 1-24.
aulty Channels:
nter port number or range of ports to test\
Return to exit):: 3
nter the number of times to loop this test [1]::
```

## sequence

The **sequence** command edits the load/dump interface list. This list determines the order of the network interfaces the Remote Annex 6100 will use for loading and dumping. The default, **net**, uses the LAN interface. If the Remote Annex 6100 fails to boot using the first interface, it will try the next interface. The command syntax is:

```
sequence [-d] | [interface[,interface]. . .]
```

Specify the LAN interface by selecting **net**. 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.

```
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
    SELF:    self
Enter interface sequence [net]:: self, net
interface sequence: self,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:

```
romitor:: sequence -d  
      Interface sequence: self,net
```

## stats

The **stats** command displays current network statistics gathered by the ROM. Use **stats** along with the **boot** command to help isolate problems. [Table 3-2](#) describes the network statistics displayed by the **stats** command. The syntax is:

### stats

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 3-2. 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 accepts the first response it receives and drops all others. Dropped packets are normal.

*(continued on next page)*

Table 3-2. 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 6100 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 6100 lost the Clear to Send signal – usually the result of excessive traffic.
Collisions Detected	The number of times the Remote Annex 6100 had to retry transmissions automatically – usually the result of normal Ethernet traffic. These retries do not cause the <b>boot</b> command to display “*.”
Excessive Collision Losses	The number of times the Remote Annex 6100 could not transmit packets because there were too many collisions – usually the result of excessive traffic on the Ethernet. The <b>boot</b> command displays these retries as “*.”

## Chapter 4 Troubleshooting Procedures

The Remote Annex 6100's front panel contains a number of LEDs that provide information about normal operations and about problems that occur. Use these LEDs and the ROM Monitor commands to diagnose problems. [Figure 4-1](#) illustrates the Remote Annex 6100's front panel LEDs.

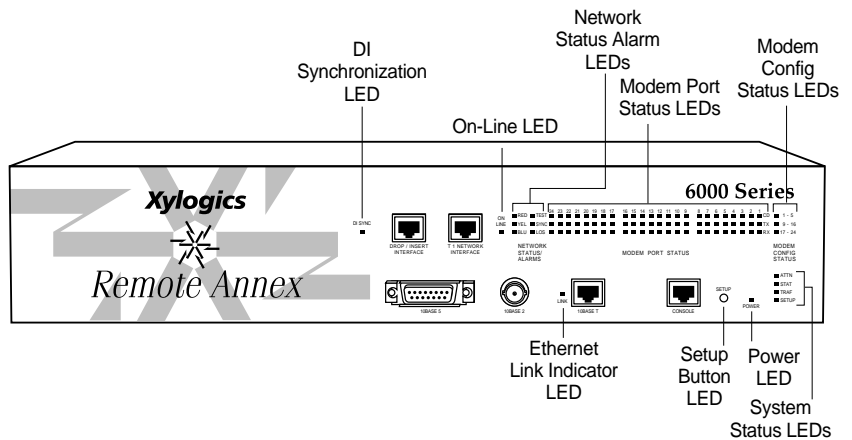


Figure 4-1. Remote Annex 6100 Front Panel Alarms and LEDs

Refer to [Table 4-1](#) for a description of the LEDs located on the front of the Remote Annex 6100.

Table 4-1. Remote Annex 6100 Front Panel LEDs

LED(s)	Description
D/I SYNC	<p>This LED is green and ON when the T1 engine is detecting frame synchronization on the drop and insert interface receiver. The green LED is OFF when there is a loss of frame (LOF) synchronization.</p> <p>A LOF condition causes the T1 engine to transmit unframed all ones (keep-alive) to the device attached to the Drop and Insert Interface.</p>
ON LINE	<p>This LED is green and ON when the T1 engine is connected to a T1 line.</p>
NETWORK STATUS/ ALARMS	<p><b>RED</b> - RED alarm indicator is ON during a locally detected carrier failure. During the RED alarm condition, a YELLOW alarm is transmitted across the telephone network.</p> <p><b>YEL</b> - YELLOW alarm indicator is ON when receiving a YELLOW alarm condition from the telephone network.</p> <p><b>BLU</b> - BLUE alarm indicator is ON when receiving an unframed, all-ones Alarm Indication Signal (AIS) from the network. This condition exists upon a loss of originating signal, or when any action is taken that would cause a signal disruption.</p> <p><b>TEST</b> - RED network TEST indicator is ON when the T1 Network Interface is looped back. Loopback tests are activated either locally by the user or by the telephone company.</p> <p><b>SYNC</b> - GREEN SYNC indicator is ON when the T1 engine is properly synchronized with the received network signal and is receiving proper framing information.</p> <p><b>LOS</b> - RED LOS indicator is ON when the T1 engine is detecting no signal (pulses) on the network interface receiver. When a LOS condition exists, the T1 engine transmits a YELLOW alarm.</p>

*(continued on next page)*



Table 4-1. Remote Annex 6100 Front Panel LEDs (continued)

LED(s)	Description
MODEM PORT STATUS	<p>The Remote Annex 6100 has three status indicators for each modem port (1 through 24):</p> <p><b>CD</b> - Data Carrier Detect is a green LED and is on when the carrier has been detected on the telephone line on the corresponding modem.</p> <p><b>TX</b> - Transmit Data is a green LED that flashes to indicate the corresponding modem is transmitting data.</p> <p><b>RX</b> - Receive Data is a green LED that flashes to indicate the corresponding modem is receiving data.</p>
MODEM CONFIG STATUS	<p>These LEDs indicate the number of modems installed (8, 16, or 24). An indicator is green if all the modems in its group are good. An indicator is amber if one modem in its group is bad.</p>
LINK	<p>This LED is green when an active 10BaseT segment is attached.</p>
POWER	<p>This LED is ON when the Remote Annex 6100 is connected to an AC power source.</p>
SYSTEM	<p><b>ATTN</b> - The ATTN (Attention) indicator is amber and ON when the Remote Annex requires operator attention. The indicator flashes when there is a problem.</p> <p><b>STAT</b> - The STAT (Status) indicator is green and ON after the Remote Annex passes the core power-up diagnostics. The indicator flashes after resetting the Remote Annex.</p> <p><b>TRAF</b> - The TRAF (Traffic) indicator is green and flashing when the Remote Annex 6100 successfully transmits or receives data from the LAN.</p> <p><b>SETUP</b> - The SETUP indicator is green when the SETUP button is pressed ON (SETUP Mode) and flashing when the SETUP button is pressed ON for 3 seconds (RESET Mode).</p>

During power-up and booting, it is more difficult to diagnose problems because they can originate in the Remote Annex 6100, 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.



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

This chapter describes power-up and booting, troubleshooting during booting, and the file created from a Remote Annex 6100 dump.

## Power-up and Boot Procedures

The Remote Annex 6100 has two modes of operation: normal and setup. Normal mode is the standard operational mode. Setup mode provides access to the ROM Monitor commands. Pressing the **SETUP** button on the front panel puts the Remote Annex 6100 into SETUP mode. When the Remote Annex 6100 is in Setup mode, the SETUP LED lights.

During the Remote Annex 6100 power-up and boot sequence, the Remote Annex 6100 runs a set of diagnostics. The system LEDs display the diagnostics' status. The Remote Annex 6100 stops when it detects one of two error conditions (see Table 4-2). The pattern of the system LEDs identifies the error condition.

## Normal Mode Remote Annex 6100 Diagnostics

Following power-up or reset, the Remote Annex 6100 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 Sequence

[Table 4-2](#) summarizes the LED display states during error-free power-up in normal mode. The following subsections describe these states.

Table 4-2. Normal Mode Error-free LED States

Activity	STAT Green	ATTN Amber	TRAF Green
N1: LEDs OK	●	●	●
N2: Hardware OK	●	×	●

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 **Ethernet** LED (segment indicator) turn off, confirming that all LEDs are operational.

Activity N2: Testing the Hardware

During the power-up sequence, the Remote Annex 6100 runs a series of self-test diagnostics. These diagnostics test internal hardware functions. If a test fails, the **ATTN** and **STAT** LEDs flash and an error message is displayed on the console port. The Ethernet LED (**LINK** Indicator) lights for a few seconds, then the **TRAF** indicator flashes during the power-up self-tests. After the self-tests complete, only the **STAT** and Ethernet **LINK** indicator remain on.

Normal Mode Error Sequence

[Table 4-2](#) shows the state of the indicators when an error occurs at various stages of the start-up process. If the Remote Annex 6100 fails during the hardware-test state (N2), the error condition is hardware failure NE2. A description of possible causes and solutions for each error condition is in the following paragraphs.

Table 4-3. Normal Mode Error LED States

Activity	STAT Green	ATTN Amber	TRAF Green
NE2: Hardware Failure	◆	◆	×
NE5: Booted wrong image	●	◆	●

Key:

- On continuously.
- × Off.
- Flashing irregularly.
- ◆ Flashing regularly (about 1Hz).

Activity NE2: Hardware Failure

The ROM diagnostics detected a Remote Annex 6100 hardware problem requiring service. Call Technical Support.

## Activity NE5: Booted Wrong Image

The Remote Annex 6100 loaded the wrong image. Press the **SETUP** button for 3 seconds to reset the device. Following is a list of ways to prevent this problem in the future:

- ❑ Be sure that you configure the Remote Annex 6100 with the appropriate image.
- ❑ Be sure that the image you are booting has the right name. Don't rename the image file unless you are making a copy for safe keeping.
- ❑ If you used an **na**, **admin**, or **cli** boot command, specify the correct image and a valid filename.

If you do not know why the Remote Annex 6100 booted the wrong image, enter **SETUP** mode and issue an **image -d** command. The command display will list the image file the Remote Annex 6100 is trying to load.

## SETUP Mode

Enter SETUP Mode by pressing the **SETUP** button located on the Remote Annex 6100 front panel. Press this button within 30 seconds of resetting or powering up the device.

## SETUP Mode Error-free Sequence

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

Table 4-4. Normal Mode Error LED States

Activity	STAT Green	ATTN Amber	TRAF Green
T1: Testing Indicators	●	●	●
T2: Testing Hardware	●	×	■
T3: At Monitor Prompt	●	●	■

Key:

- On continuously.
- × Off.
- Flashing irregularly.
- ◆ Flashing regularly (about 1Hz).

Activity T1: Testing Indicators

All front panel indicators light for a few seconds, then all but the Ethernet **LINK** indicator turns off. This sequence confirms that all indicators are operational. At this point, the Remote Annex 6100 is in normal mode. Press the **SETUP** button to put the Remote Annex 6100 into ROM monitor mode.

Activity T2: Testing the Hardware

During power-up, the Remote Annex 6100 runs self-tests that execute diagnostics for the CPU, ROM, EEPROM, FLASH, etc. The **TRAF** indicator flashes during the tests and after completing the power-up self-tests, the **STAT** and Ethernet **LINK** indicator remain on.

Activity T3: At the Monitor Prompt

When the **STAT** and **ATTN** indicators are on, the ROM monitor prompt displays on the console terminal. Enter the boot command at the prompt. If you do not enter a filename with the command, you are prompted to do so.

## SETUP Mode Error States

[Table 4-5](#) contains a description of the indicators that are used to describe errors that occur at different stages of the system start-up process. If the Remote Annex 6100 fails while testing the hardware, (state T2), the error condition is hardware failure TE2. A description of each error condition follows [Table 4-5](#).

Table 4-5. Normal Mode Error LED States

Activity	STAT Green	ATTN Amber	TRAF Green
TE2: Hardware Failure	◆	◆	×
TE7: Booted Wrong Image	●	◆	×

Key:

- On continuously.
- ×
- Flashing irregularly.
- ◆ Flashing regularly (about 1Hz).

Activity TE2: Hardware Failure

The ROM diagnostics detected a Remote Annex 6100 hardware problem requiring service. Call Customer Support.

Activity TE7: Booted Wrong Image

The Remote Annex 6100 loaded an inappropriate image. Press the SETUP button for 3 seconds to reset the device. Following is a list of ways to prevent this problem in the future:

- ❑ Be sure that you configure the Remote Annex 6100 with the appropriate image.
- ❑ Be sure that the image you are booting has the right name. Don't rename the image file unless you are making a copy for safe keeping.
- ❑ If you used an **na**, **admin**, or **cli** boot command, specify the correct image and a valid filename.

## BOOT Failures

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

- ❑ The hardware is functional.
- ❑ The Ethernet interface is functional.
- ❑ The Remote Annex 6100 can communicate with the Ethernet.

If the Remote Annex 6100 still is not booted, you must pinpoint the problem. The boot error report can help in this process.



The Remote Annex generates a boot error report only if it opens the boot file and an error occurs during the boot process.

Generally, two problems cause boot failures:

- ❑ The Remote Annex 6100 is not configured properly.
- ❑ The load server host is not responding.

The Remote Annex 6100 requests a boot image from a pre-defined load host or by broadcasting a boot request. When a host responds, the Remote Annex 6100 loads its operational image.

The Remote Annex 6100 requires setting certain configuration parameters. Enter these parameters using the ROM Monitor commands for the initial boot sequence. See Chapter 3 for more information on these commands.

If the problem is a non-responsive host, the boot error report displays that information under the *Rsp T/O's* field. This field indicates that the Remote Annex 6100 timed out while waiting for a response to its boot request; if this field is empty, check the Remote Annex 6100's configuration parameters.



## Boot Error Report

If an error occurs, a Remote Annex 6100 *boot error report* is generated *only* if the Remote Annex 6100 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 6100 generates a boot error report for the Internet address from which it tried, and failed, to boot. [Table 4-7](#) contains a description of the Errors from the Last Read Request; and [Table 4-6](#) contains a description of the Errors from Last ERPC Layer Invocation.

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 4-6](#)). The report does not list errors that occurred during any other Read Request (see [Table 4-7](#)) or during the Open Request (see [Table 4-8](#)).

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 4-6. Errors from Last ERPC Layer Invocation

Error	Description
H/W errors	The Remote Annex 6100 sensed a hardware error during message transmission or reception. This error indicates a fault with the Remote Annex 6100 LAN interface. Use the <b>net</b> command to isolate the problem (see page 3-22).
Msgs from wrong host	The Remote Annex 6100 received a message from an incorrect host. This indicates that the Remote Annex 6100 received, and ignored, an unsolicited packet.
Rsp T/O's	The Remote Annex 6100 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 6100, but the message was not a correctly formatted response to the transmitted request.

Table 4-7. Errors from Last Read Request

Error	Description
Msgs with wrong size	The correct host responded to the Read Request, but the data size is incorrect.
ERPC layer errors	See <a href="#">Table 4-6</a> .
Aborts rx'd	The host's BFS transmitted an abort in response to the Remote Annex 6100's Read Request. Run <b>erpcd -D</b> on the host to obtain more information.

Table 4-8. Errors from Last Open Request

Error	Description
ARP errors	Address Resolution Protocol (ARP) errors indicate that the Remote Annex 6100 is configured to boot from a specified host, but the host would not transmit its Ethernet address to the Remote Annex 6100. Possibly, the Remote Annex 6100 configuration includes the wrong IP encapsulation.
ERPC layer errors	See <a href="#">Table 4-6</a> .
Aborts rx'd	The host's BFS transmitted an abort in response to the Remote Annex 6100's Open Request. This often means that the requested file does not exist on that server. Run <b>erpcd -D</b> on the host to obtain more information.

## Correcting Remote Annex 6100 Parameters

The following parameters must accurately reflect both the Remote Annex 6100 and the network environment in which it operates.

Verify the Remote Annex 6100'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.

You can use the defaults for the name of the image file containing the Remote Annex 6100's software and the address of the preferred load server host. If the value for the image name is incorrect, the Remote Annex 6100 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 6100 has to broadcast for a host. Correct the load host's address using the **addr** command.

Confirm that the Remote Annex 6100 boot parameters are correct by using the appropriate ROM Monitor commands. Modify any boot parameters that are incorrect or missing. Boot the Remote Annex 6100 either by entering the **boot** command at the console, or by holding down the SETUP button until the Power LED blinks rapidly.

## Load Server Host Not Responding

The Remote Annex 6100 can boot from one of the following hosts acting as a load server host:

- ❑ A UNIX host on the local area network.
- ❑ Another Remote Annex 6100.
- ❑ 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 6100 software is installed properly on the host. See the *Software Installation Notes* that come with the Remote Annex 6100 software release.
- ❑ The **erpcd** daemon or **tftp** server, which loads the operational image to the Remote Annex 6100, is running.

In test mode, both the Remote Annex 6100 and **erpcd** on the load server host display boot progress reports. The Remote Annex 6100 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:

```
# /etc/erpcd -D5
```

- 2 To place the Remote Annex 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 Remote Annex, so warn users before you do it.) Then enter:

```
# boot -v
```

When the Remote Annex 6100 boots in test mode, the console displays the load server host's Internet 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 6100-related files are missing or cannot be installed, contact technical support (see Appendix C).

A PC host running the UNIX operating system has the **erpcd** daemon (provided with the distribution and installed in `/etc`) running in the background on the PC. Set the Remote Annex 6100 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 6100, hold down the SETUP button for 3 seconds. Then enter:  

```
# boot -v
```

### Another Remote Annex 6100

When troubleshooting a Remote Annex 6100 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 on the Ethernet using the Superuser CLI `ping` command.
- 3 Verify the unit's configuration using `na`.

The *Annex Network Administrator's Guide* provides more information on these commands.

A Remote Annex 6100 that has been reconfigured as a load server host, but not rebooted, cannot boot another Remote Annex 6100 on the network. Rebooting the Remote Annex 6100 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 6100 still fails to boot, performing the following steps may locate your problem:

- 1 Make sure that the file Remote Annex 6100 OPER\_46\_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_46_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_46_ENET.SYS, Operating
System
Ethernet address = 00-80-2D-00-1A-DE
```

## Remote Annex 6100 Dumps

The Remote Annex 6100 dumps its memory image to a host running load server software when certain software or hardware events occur. [Table 4-9](#) shows the LED states during a dump.



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

Events that trigger Remote Annex 6100 dumps are:

- Non-recoverable hardware or software errors.
- Software fails to reset the Remote Annex 6100's watchdog timer.
- Software fails one or more internal consistency checks.
- Hardware detects an internal fault.

Table 4-9. Remote Annex 6100 LED States During a Dump

Activity	STAT Green	ATTN Amber	TRAF Green
Dump	●	●	■

Key:

- On continuously.
- Flashing irregularly.



The Remote Annex 6100 sends a dump file to a preferred load dump host. If you do not define this host by specifying an address, the Remote Annex 6100 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 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'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 6100's IP network address as its name. The dump file uses the Remote Annex'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 6100 RAM memory and hardware state. The amount of space required for a dump file varies according to the port configuration. The ROM Monitor **config** command displays the amount of memory for the Remote Annex 6100.

[Table 4-10](#) shows sample dump file names. All pathnames are relative to the file **/usr/spool/erpcd/bfs**.

Table 4-10. Remote Annex 6100 Dump File Naming Conventions

Remote Annex 6100 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

This appendix identifies the signals and the associated pins used by the following Remote Annex 6100 ports:

- ❑ *Console Port.*
- ❑ *10Base2 Ethernet Port.*
- ❑ *10Base5 Ethernet Port.*
- ❑ *10BaseT Ethernet Port.*
- ❑ *T1 Network Interface.*
- ❑ *Drop/Insert Interface.*

## Console Port

[Figure A-1](#) illustrates the console port. [Table A-1](#) lists the console port pin/signal allocations.

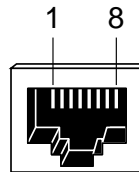


Figure A-1. Console Port

Table A-1. Console Port Pin/Signal Allocations

Pin Number	Signal
1	RTS -
2	DTR -
3	TXD -
4	DCD +
5	RXD +
6	GND
7	Unused
8	Unused

## 10Base2 Ethernet Port

Figure A-2 illustrates a 10Base2 BNC Ethernet port.

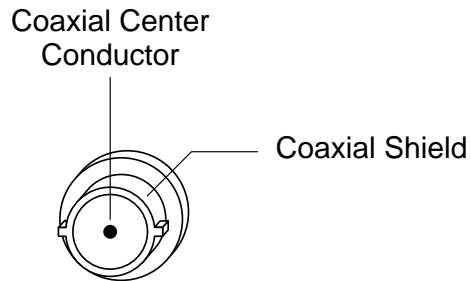


Figure A-2. 10Base2 BNC Ethernet Port

## 10Base5 Ethernet Port

[Figure A-3](#) illustrates a 10Base5 Ethernet transceiver port. [Table A-2](#) lists the connector's pin/signal allocations.

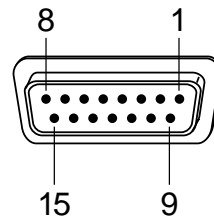


Figure A-3. 10Base5 Ethernet Port

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

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

## 10BaseT Ethernet Port

[Figure A-4](#) illustrates a 10BaseT Ethernet port receptacle. [Table A-3](#) lists the receptacle's pin/signal allocations.

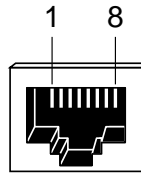


Figure A-4. 10BaseT Ethernet Port

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

## T1 Network Interface

[Figure A-5](#) illustrates a T1 Network Interface port connector. [Table A-4](#) lists the port's pin/signal allocations.

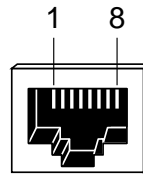


Figure A-5. T1 Network Interface Port Receptacle

Table A-4. T1 Network Interface Port/Pin Signal Allocations

Pin Number	Signal
1	Receive data from Network (RING)
2	Receive data from Network (TIP)
3	Unused
4	Transmit data to Network (RING)
5	Transmit data to Network (TIP)
6	Unused
7	Unused
8	Unused

## Drop/Insert Interface Port

[Figure A-6](#) illustrates a Drop/Insert Interface port. [Table A-5](#) lists the port's pin/signal allocations.

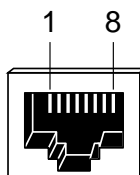


Figure A-6. Drop/Insert Interface Port

Table A-5. Drop/Insert Interface Port Pin/Signal Allocations

Pin Number	Signal
1	Transmit data to DTE receiver (RING)
2	Transmit data to DTE receiver (TIP)
3	Unused
4	Receive data from DTE transmitter (RING)
5	Receive data from DTE transmitter (TIP)
6	Unused
7	Unused
8	Unused



This appendix contains a description of the following:

- ❑ *Loopback Connectors*
- ❑ *Network Bypass Jumper*

### 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 a LED that confirms the presence of the +12-volt transceiver drive voltage. [Table B-1](#) shows this connector's pin/signal allocations.

Table B-1. 10Base5 Ethernet Loopback Connector

Pin Number	Remote Annex 6100 Signal	Connects to Pin Number	Signal
<b>3</b>	<b>Transmit +</b>	<b>5</b>	<b>Receive +</b>
<b>10</b>	<b>Transmit –</b>	<b>12</b>	<b>Receive –</b>

10BaseT Ethernet  
Loopback Connector

[Table B-2](#) lists the 10BaseT Ethernet connector's pin/signal allocations.

Table B-2. 10BaseT Ethernet Loopback Connector Wiring

Pin Number	Remote Annex 6100 Signal	Connects to Pin Number	Signal
<b>1</b>	<b>Transmit +</b>	<b>3</b>	<b>Receive +</b>
<b>2</b>	<b>Transmit –</b>	<b>6</b>	<b>Receive –</b>

## Network Bypass Jumper

The Remote Annex 6100 has an internal jumper that is used to select a bypass mode for the T1 Engine. The T1 engine goes into bypass mode when it is powered down or reset. [Figure B-1](#) shows the network bypass jumper's location.

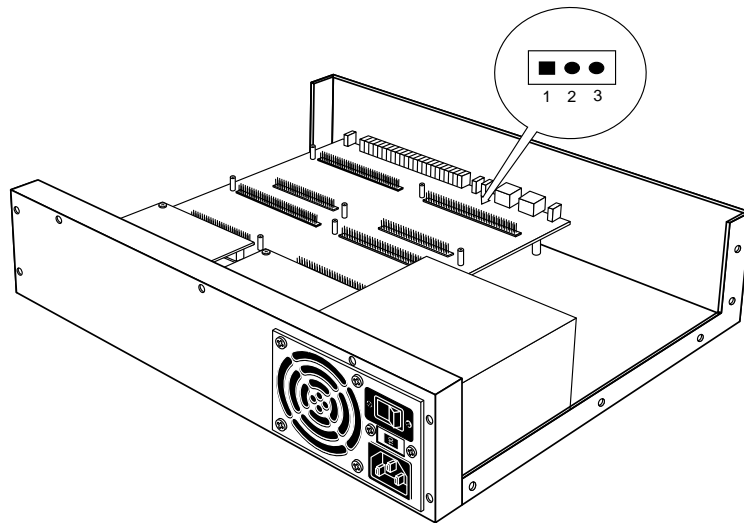


Figure B-1. Network Bypass Jumper Location

There are two bypass modes:

- Network Loopback Mode*
- Cross Connect Mode*

## Network Loopback Mode

Network loopback mode loops back all the signals. [Figure B-2](#) shows an example of this mode.

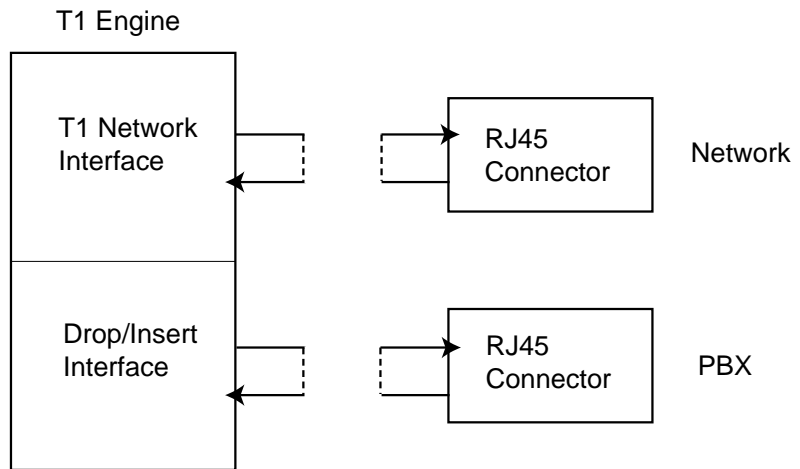


Figure B-2. Network Loopback Mode

### Network Loopback Mode Jumper Setting

The internal jumper block must be on pins 2 and 3 to obtain Network Loopback mode. [Figure B-3](#) shows an example of this setting. This is the default setting.



Figure B-3. Network Loopback Mode Jumper Setting

## Cross-Connect Mode

Cross-Connect mode connects the network to the PBX. This mode forces signals coming from the network to the PBX to be looped back to the network and signals coming from the PBX to the network to be looped back to the PBX. [Figure B-4](#) shows an example of this mode.

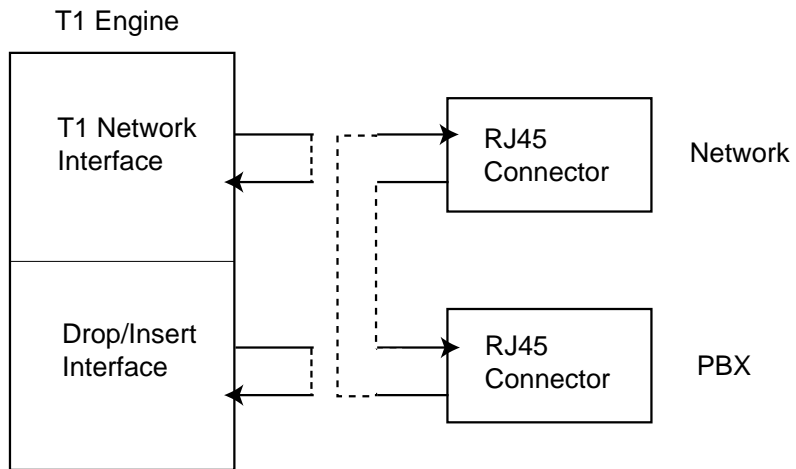


Figure B-4. Cross-Connect Mode

### Cross Connect Mode Jumper Setting

The internal jumper block must be on pins 1 and 2 to obtain Cross Connect mode. [Figure B-5](#) shows an example of this setting.



Figure B-5. Cross-Connect Mode Jumper Setting

## Appendix C Modem Upgrade Instructions

The Remote Annex 6100 supports 8, 16, or 24 internal modems. The modem upgrade kit enables you to increase the Remote Annex 6100's internal modems by adding modem cards. These installation instructions contain a description of the following:

- ❑ *Contents of the Kit.*
- ❑ *Disassembly Instructions.*
- ❑ *Installation Instructions.*
- ❑ *Assembly Instructions.*
- ❑ *Power-up and Test.*

### Contents of the Kit

The Remote Annex 6100 port upgrade kit contains:

- ❑ Two or four modem cards.
- ❑ Two screws and two washers for each card.

### Required Tools

A Phillips screwdriver is needed to secure the modem cards.

## Disassembly Instructions

The following instructions describe disassembling the Remote Annex 6100; these instructions assume that you are facing the unit's rear panel. [Figure C-1](#) illustrates the instructions. Proceed as follows:

- 1 Unplug the unit.
- 2 Disconnect all the cables.
- 3 Remove the screws from the side and back of the unit.
- 4 Lift the cover vertically ([Figure C-1](#)).

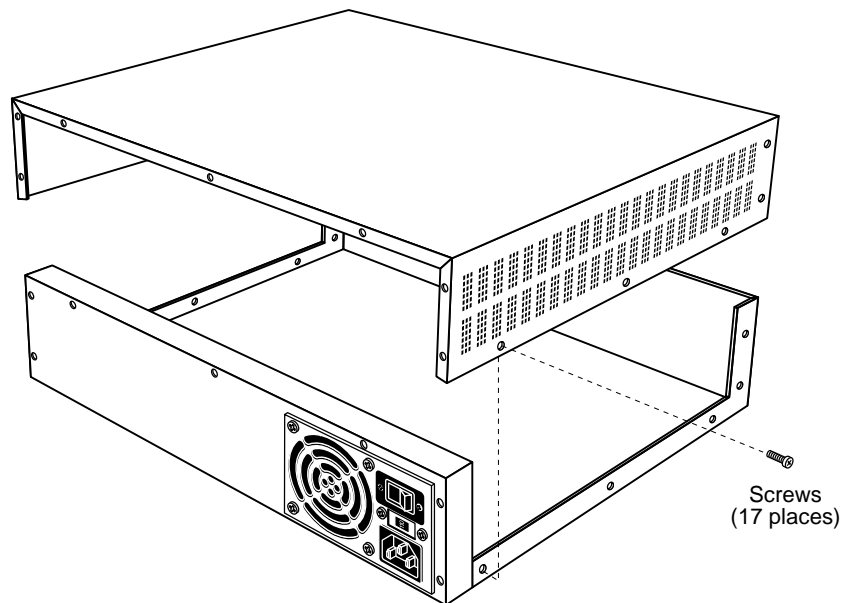


Figure C-1. Removing the Remote Annex 6100's Cover

## Installation Instructions

The following instructions describe how to install additional modem cards. You can install two or four additional modem cards. Figure C-5 illustrates the modem cards that can be added to the Remote Annex 6100.

- 1 Lower the modem card(s) onto the Modem Board; keep the modem card(s) horizontal (Figure C-2).

Align the modem card(s) with the Modem Board to avoid bending the pins during installation.

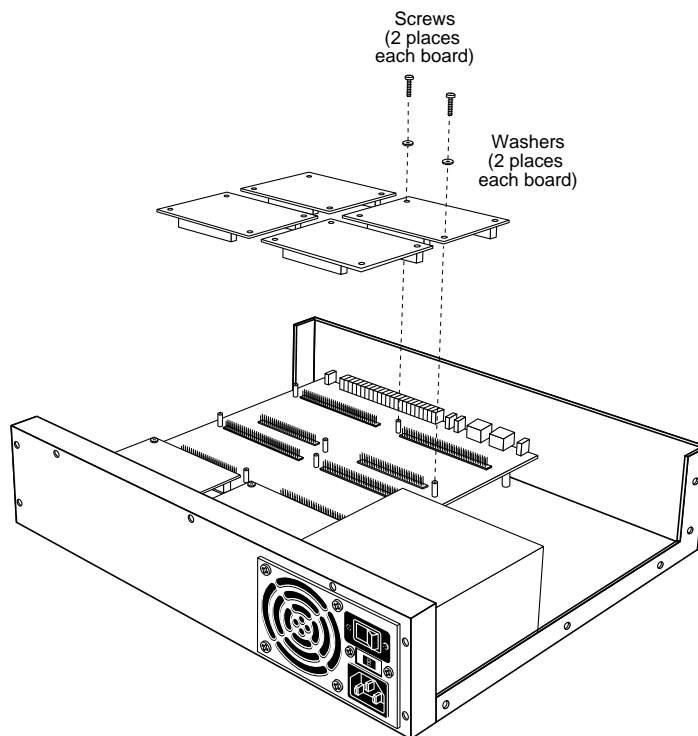


Figure C-2. Adding Modem Cards to the Remote Annex 6100



Observe handling precautions: electrostatic-sensitive devices.

- 2 Carefully press the modem card connectors into place. Make sure the connectors are seated properly.

## Assembly Instructions

The following instructions describe reassembling the Remote Annex 6100.

- 1 Lower the Remote Annex 6100's cover onto the unit (see [Figure C-3](#)).

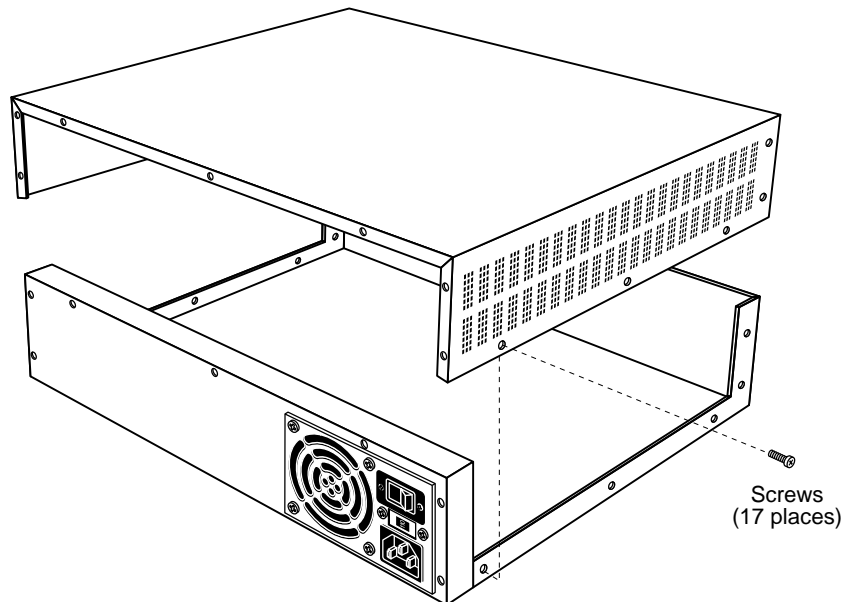


Figure C-3. Replacing the Remote Annex 6100's Cover



- 2 Secure the cover by replacing all the screws.



Do not over-tighten these screws (beyond 10 in-lbs. of torque).

## Power-up and Test

The following instructions describe the power-up and test sequence.

- 1 Reconnect all the cables, including:
  - The Ethernet cable.
  - The T1 Network Interface cable.
  - The Drop/Insert Interface cable.
  - The console terminal cable.
  - The power cord.
- 2 Turn on the unit's power.
- 3 Set the Remote Annex to test mode by pressing and holding the Setup button (located on the front panel) for three seconds (see [Figure C-4](#)).

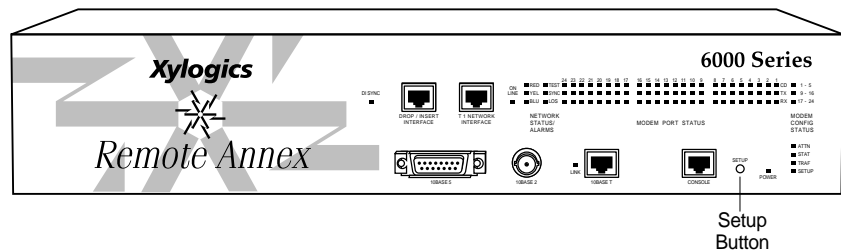


Figure C-4. Setting the Remote Annex 6100 to Test Mode

The Remote Annex runs its ROM-resident power-up diagnostics.

- 4 Issue the `config` command to verify the new hardware and modem configuration.
- 5 Issue the `ports` command and enter the number of ports to be tested as a range at the prompt requesting the port list.

If the ports tests complete successfully, and the **config** command indicates that the Remote Annex 6100 sees the new modems, the installation is complete.

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