

# **Remote Annex 6300**

## **Hardware Installation Guide**

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June 1996



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## Notice

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Industry Canada does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repair to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

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

**Notice to Users of ISDN Service**

The following instructions are provided to ensure compliance with the Federal Communications Commission (FCC) Rules, Part 68.

- 1 All direct connections to ISDN lines must be made using standard plugs and jacks.
- 2 Before connecting your unit, you must inform the local telephone company of the following information:

Port ID	REN/SOC	FIC	USOC
PRI ISDN	6.0Y	04DU9-1SN	RJ48C

- 3 If the unit appears to be malfunctioning, it should be disconnected from the telephone lines until you learn if your equipment or the telephone line is the source of the trouble. If your equipment needs repair, it should not be reconnected until it is repaired.
- 4 This device has been designed to prevent harm to the ISDN network. If the telephone company finds that the equipment is exceeding tolerable parameters, the telephone company can temporarily disconnect service, although they will attempt to give you advance notice if possible.
- 5 Under the FCC Rules, no customer is authorized to repair this equipment. This restriction applies regardless of whether the equipment is in or out of warranty.
- 6 If the telephone company alters their equipment in a manner that will affect use of this device, they must give you advance warning so as to give you the opportunity for uninterrupted service. You will be advised of your right to file a complaint with the FCC.
- 7 In the event of equipment malfunction, all repairs should be performed by our Company or an authorized agent. It is the responsibility of users requiring service to report the need for service to our Company or one of our authorized agents. For more details, see *Technical Support and Online Services* on page xxi.

### Revision Level History

Revision	Description
A1	Initial release incorporating the 166-024-837 Addendum..





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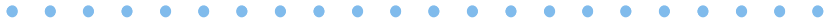
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This guide describes what a network administrator needs to know to install a Remote Annex 6300 on a local area network (LAN).

The *Remote Annex Software Installation Notes* describe how to install the software. The *Annex Administrator's Guide for UNIX* provides 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 6300; it describes the hardware features and firmware functions.

### Chapter 2 Installing the Remote Annex 6300

This chapter describes how to install the Remote Annex 6300 on a LAN, and how to confirm its operating status.

### Chapter 3 ROM Monitor Commands

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

### Chapter 4 Troubleshooting Procedures

This chapter provides troubleshooting and verification procedures.





- Appendix A Port Pins and Signals**  
This appendix details the connectors located on the rear panel of the Remote Annex 6300.
- Appendix B Connectors and Jumpers**  
This appendix describes the loopback connectors and jumper settings for the Remote Annex 6300.
- Appendix C Modem Carrier Card Upgrade Instructions**  
This appendix describes how to install the modem carrier card into the Remote Annex 6300.
- Appendix D Modem Upgrade Instructions**  
This appendix describes how to install additional modem cards into the Remote Annex 6300.

## 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.



Convention:	Represents:
<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.
[ ]	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 give you important information.
	Warnings inform you about conditions that can have adverse effects on processing.
	Cautions notify you about dangerous conditions.

## Related Documents

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

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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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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 6300 is a dial-in remote access server that supports mixed traffic, such as analog modems, V.120 ISDN Terminal Adapters, and devices supporting synchronous PPP.

## Remote Network Access

The Remote Annex 6300 provides remote network access to the following networks (see [Figure 1-1](#)):

- ❑ Novell Network
- ❑ TCP/IP
- ❑ AppleTalk

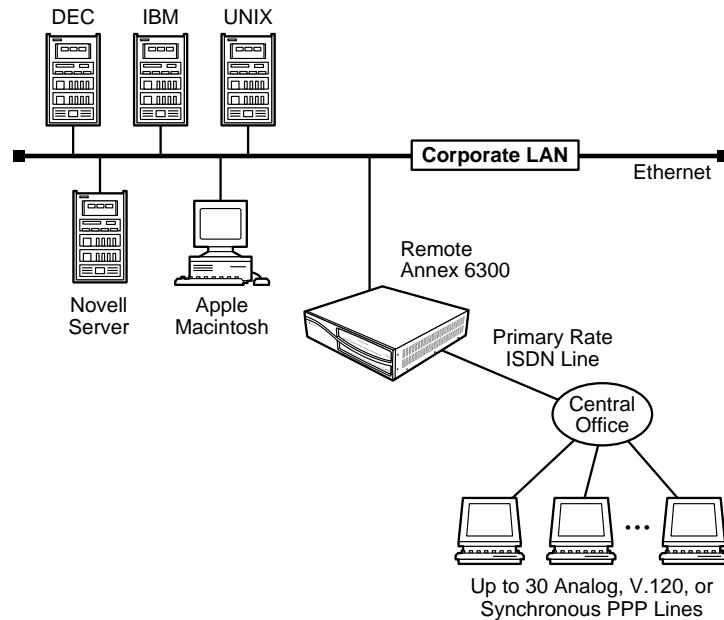


Figure 1-1. The Remote Annex 6300 as a Remote Access Server

## Remote Annex 6300 Description

The Remote Annex 6300 is a Primary Rate ISDN server that houses up to 32 modems to provide the flexibility of terminating calls originated by analog modems, terminal adapters, and routers. [Figure 1-2](#) illustrates a Remote Annex 6300.

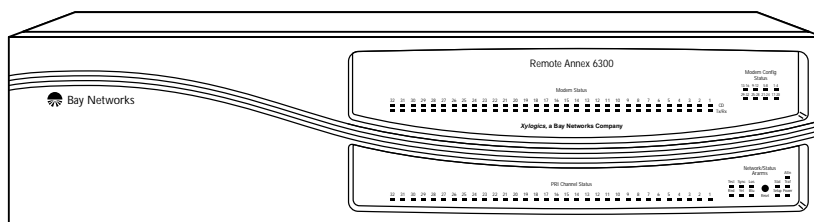


Figure 1-2. Remote Annex 6300

The Remote Annex 6300 contains two main boards:

- ❑ *Main Logic Board (MLB)*
- ❑ *Modem Carrier Card*

The Remote Annex 6300 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 6300 main logic board (MLB) utilizes two 80486 DX2, 64-Mhz, clock-doubled processors.

### Ethernet Interfaces

The MLB provides 10Base2, 10Base5, and 10BaseT autosensed Ethernet interfaces.

PRI Interface	This interface resides on the MLB in the form of a module whose RJ45 connector is accessible through the rear panel of the Remote Annex 6300. This interface is controlled by a second 486DX2 processor, which also controls the internal modems.
Memory	The MLB has 8 megabytes of main DRAM, and an additional 4 megabytes of DRAM is used by the PRI interface controller.
Flash Memory	The MLB supports 2 megabytes of Flash memory.

## Modem Carrier Card

Modems	The Remote Annex 6300 can be configured with 0, 4, 8, 12, 16, 24, or 32 internal V.34 modems. The modems, located on quad modem cards, are installed on the Modem Carrier Card. 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 6300 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 PRI interface along with data that is purely digital in nature, such as that used with V.120 and synchronous PPP protocols.

## Firmware and Software

Firmware	<p>The Remote Annex 6300's ROM contains firmware for performing power-up self-tests and loading operational code. A non-volatile EEPROM stores the configuration parameters.</p> <p>The Remote Annex 6300 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 6300.</p>
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## 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 6300 manually

Once the Remote Annex 6300 has obtained a boot image and is booted, the console leaves the ROM monitor and displays the console monitor. (for more details, see [Chapter 2](#)).

## Supported Configurations

You can self-boot the Remote Annex 6300 from its Flash ROM, and you can obtain full operational code over the network from one of the following devices:

- ❑ UNIX host
- ❑ Remote Annex 6300 configured as a load server

## Watchdog Timer

The Remote Annex 6300 has a watchdog timer that its software resets at regular intervals. The watchdog timer reboots the Remote Annex 6300 in the unlikely event of an internal software error. This feature enables the Remote Annex 6300 to run for long periods of time without intervention.

## Front Panel

The Remote Annex 6300 front panel consists of:

- ❑ Modem Port Status LEDs
- ❑ Modem Configuration Status LEDs
- ❑ PRI Channel Status LEDs
- ❑ Network /Status Alarms
- ❑ Reset Button
- ❑ Power LED

[Figure 1-3](#) illustrates the Remote Annex 6300 front panel. The front panel components are described in the following paragraphs.

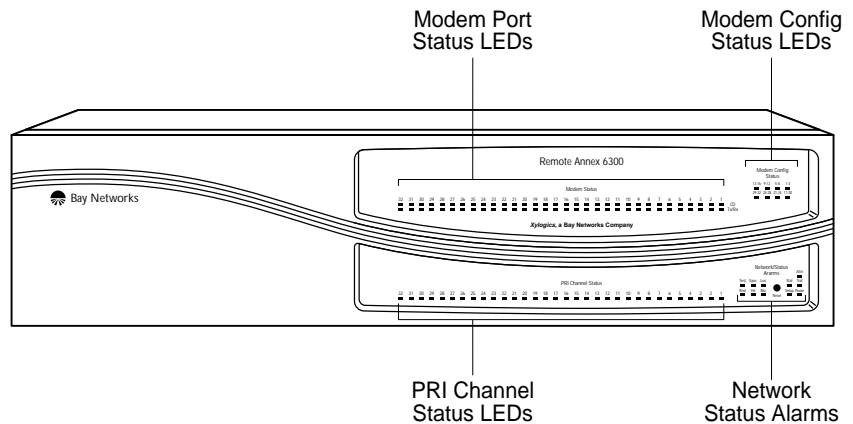


Figure 1-3. Remote Annex 6300 Front Panel

## Front Panel Components

## Modem Port Status LEDs

The Remote Annex 6300 has two status LEDs for each modem port (up to 32, if installed). The status LEDs display modem port status during system operation. [Table 1-1](#) describes the modem port status LEDs.

### Table 1-1. Modem Port Status LEDs

LED	Description
CD	CD (Data Carrier Detect) LED is green and ON when carrier has been detected by the corresponding modem. There are 32 CD LEDs, one LED per channel, on the front of the Remote Annex 6300.
TX/RX	TX/RX LED is green and flashes to indicate the corresponding modem is transmitting or receiving data. There are 32 TX/RX LEDs, one LED per channel, on the front of the Remote Annex 6300. For North American models, up to 32 modems can be installed (although only 23 are active at any given time). For European countries that use E1 lines for PRI access, a maximum of 32 modems can be installed (only 30 are active at any given time).

Modem Config  
Status LEDs

The Modem Config Status LEDs indicate the number of modems installed. An LED is green if all the modems in its group are good. An LED is amber if one or more modems in its group are bad.

### PRI Channel Status LEDs

The PRI Channel Status LEDs indicate B channel allocation. There are 32 PRI Channel Status LEDs on the front of the Remote Annex 6300. For T1, 23 are used to indicate B channel allocation. For E1, 30 are used for B channel allocation.

## Network/Status Alarms

The six Network/Status Alarms, labeled RED, YEL, BLU, TEST, SYNC, and LOS, display PRI network activity during system operation. The front panel also has four system status LEDs labeled ATTN, STAT, TRAF, and STATUS that display operational status conditions for the Remote Annex 6300. [Table 1-2](#) describes the alarms.

Technical Support personnel can use this information to diagnose problems.





If you are using an external CSU, some of the Network/Status alarm LEDs may not give true readings. In this case, defer to the status and alarm conditions indicated on the external CSU.

Table 1-2. Network/Status Alarms


Alarm	Description
RED	RED alarm LED 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 LED is ON when receiving a YELLOW alarm condition from the telephone network.
BLU	BLUE alarm LED 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 LED is ON when the ISDN Network Interface is looped back. Loopback tests are activated either locally by the user or by the telephone company.
SYNC	GREEN SYNC LED is ON when the PRI interface is properly synchronized with the received network signal and is receiving proper framing information.




*(continued on next page)*

Table 1-2. Network/Status Alarms (continued)

Alarm	Description
LOS	RED LOS LED is ON when the PRI interface is detecting no signal (pulses) on the network interface receiver. When a LOS condition exists, the PRI interface transmits unframed all ones (AIS) to the network.
ATTN	The ATTN (Attention) LED is amber and ON when the Remote Annex 6300 requires operator attention. The LED is flashing when there is a problem.
STAT	The STAT (Status) LED is green and ON after the Remote Annex 6300 passes the core power-up diagnostics. The LED flashes after resetting the Remote Annex 6300.
TRAF	The TRAF (Traffic) LED is green and flashing when the Remote Annex 6300 successfully transmits or receives data from the LAN.
SETUP	The SETUP LED is green when the  button is pressed ON (Setup mode) and flashing when the  button is pressed ON for 3 seconds (Reset Mode).

## Reset Button

The  button is used to:

- ❑ **Enter Setup Mode.**  
When the  button is pressed (ON), the SETUP LED is green and the Remote Annex 6300 enters Setup mode. In this mode, configuration data is entered via the Console Terminal prior to booting the operational software.
- ❑ **Reset the Remote Annex 6300.**  
When the  button is pressed and held for 3 seconds, the SETUP LED flashes and the Remote Annex 6300 begins to execute its power-up diagnostics. If the  button is depressed again within 5 to 10 seconds, the Remote Annex 6300 enters Setup mode and waits for configuration information to be entered.



Power LED

The Power LED is ON when the Remote Annex 6300 is connected to an AC power source and switched ON.

## Rear Panel

[Figure 1-4](#) shows the Remote Annex 6300 rear panel with the following connectors and switches:

- ❑ PRI ISDN Interface Port
- ❑ Ethernet Ports
- ❑ Console Port
- ❑ Power Switch
- ❑ Power Select Switch
- ❑ AC Line Socket

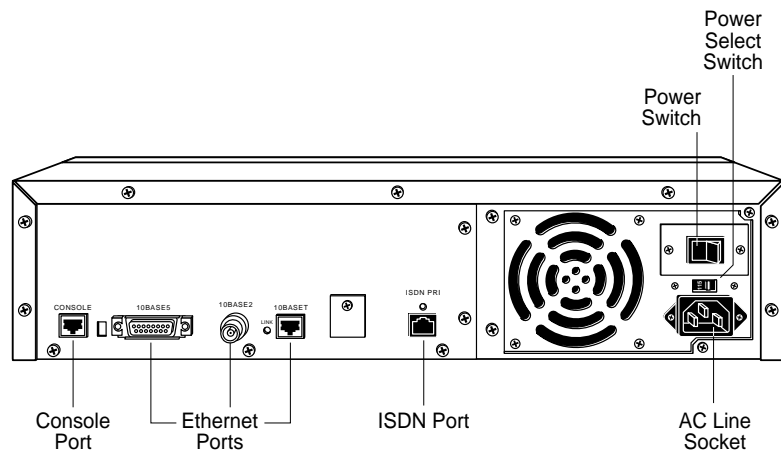


Figure 1-4. Remote Annex 6300 Rear Panel

## Rear Panel Components

### PRI ISDN Interface Port

The PRI ISDN Interface port comes with an 8-pin, RJ48C port for attaching the PRI ISDN Interface cable connector. The PRI ISDN Interface provides access to a digital PRI ISDN line.

### Ethernet Ports

The Remote Annex 6300 comes with auto-sensed 10Base2, 10Base5, and 10BaseT Ethernet connectors. 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 6300 must be reset (hard reset) when changing network interface connections.

### Console Port

The Remote Annex 6300 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 6300 is in test mode and provides access to the console commands when the unit is running.

### Power Switch

The Power switch disconnects AC power without disconnecting the Remote Annex 6300 from the power source.

#### Power Select Switch

The Power Select switch selects the operational voltage range. The Remote Annex 6300 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 unit through the AC power cord. The AC power cord plugs into this socket.

## Physical Characteristics

The Remote Annex 6300 enclosure has the following characteristics:

- ❑ **Dimensions:**

Height: 4.06 in.

Width: 17.25 in.

Depth: 16.75 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  $1.2 \cdot 10^{-3} \text{ G}^2/\text{Hz}$ , 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, conforms to ANSI/UL STD 1950, EN60950, and CSA C22.2 No. 950
  - ❑ Meets EMI requirements of FCC Class A and EN55022 Class A with shielded and unshielded cables
  - ❑ Meets Canadian Telcom requirements IC CS-03
- ❑ **MTBF:**  
50,000 hrs. (estimated), calculated @ 25°C (Mil Std 217)
- ❑ **Rear clearance requirement (for connectors and cables):**  
6 in. (15 cm)

This chapter describes how to install your Remote Annex 6300 hardware and connect it to your Ethernet network. Setting up the Remote Annex 6300 consists of:

- ❑ *Installing the Remote Annex 6300 in a Rack (Optional)*
- ❑ *Connecting a LAN*
- ❑ *Connecting a Console Terminal*
- ❑ *Connecting a PRI ISDN Interface*
- ❑ *Powering Up and Testing the Remote Annex 6300*
- ❑ *Installing the Software and Loading the Operational Image*
- ❑ *Auto-initializing the ROMs*
- ❑ *Self-booting the Remote Annex 6300*
- ❑ *Invoking a Console Monitor*

## Before you Begin

The Remote Annex 6300's software and operational image can be installed on two different devices. [Table 2-1](#) outlines the different configurations the Remote Annex 6300 supports.

Table 2-1. Remote Annex 6300 Configuration Options

Device on which the Operational Software and Image is installed	Remote Annex 6300 Must be Connected to the Network	Input Device used to Enter Installation Parameters
UNIX Load Host	Yes	Console
Remote Annex 6300 Flash ROM (Self-booting)	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 6300 in a Rack (Optional)

Installing the Remote Annex 6300 in a rack is optional and requires the following equipment:

- ❑ Mounting brackets, front and back
- ❑ Hardware kit
- ❑ Phillips screwdriver

The following paragraphs contain a description of how to mount the Remote Annex 6300 in a rack. The device can be mounted in two ways:

- ❑ *Front Mount*
- ❑ *Rear Mount*

### Front Mount

The Remote Annex 6300 is mounted to the front of the rack by attaching the front mounting bracket to the device and then attaching the device and mounting bracket to the rack.

## Attaching the Mounting Bracket to the Remote Annex 6300

Attach the front mounting bracket to the Remote Annex 6300 as follows:

- 1 Remove the mounting bracket from its package.
- 2 Remove three screws from the front of the cover on each side of the Remote Annex 6300, as shown in [Figure 2-1](#). Save these screws; you will need them later to install the front mounting bracket.
- 3 Install front mounting bracket to the device using the six screws previously removed.
- 4 Tighten the screws to secure the bracket to the device.

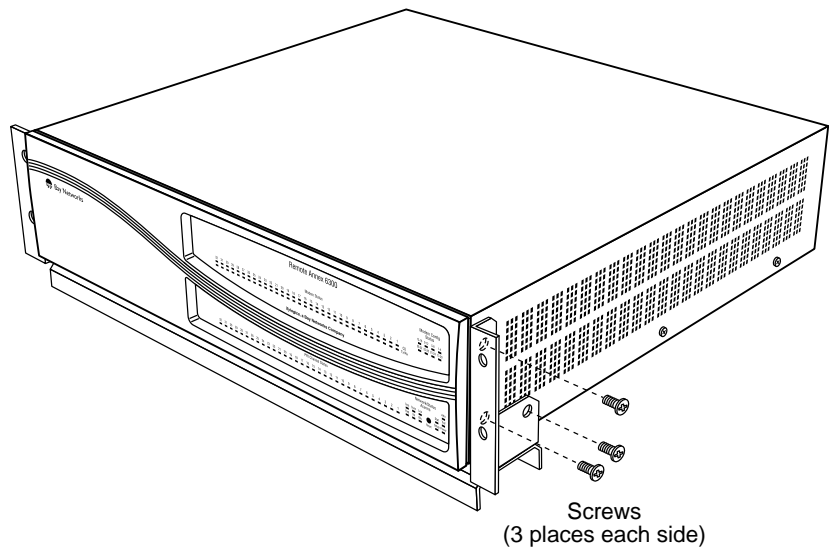


Figure 2-1. Attaching the Mounting Bracket to the Remote Annex 6300

## 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 6300 to the front rack (see [Figure 2-2](#)).

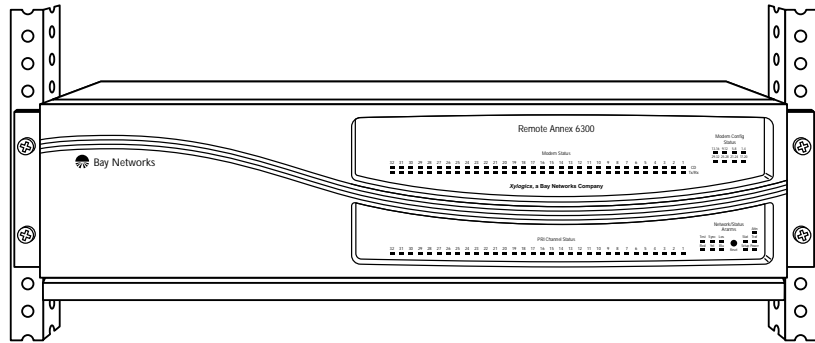


Figure 2-2. Attaching the Mounting Bracket and Device to the Rack

## Rear Mount

The Remote Annex 6300 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 6300

Attach the rear mounting bracket to the Remote Annex 6300 as follows:

- 1 Remove the mounting brackets and hardware kit from its package.
- 2 Remove two screws from the rear of the cover on each side of the Remote Annex 6300, as shown in [Figure 2-3](#). Save these screws; you will need them later to install the rear mounting bracket.
- 3 Install rear mounting brackets to the device using the four screws previously removed and the additional hardware supplied in the hardware kit.
- 4 Tighten the screws to secure the bracket to the device.

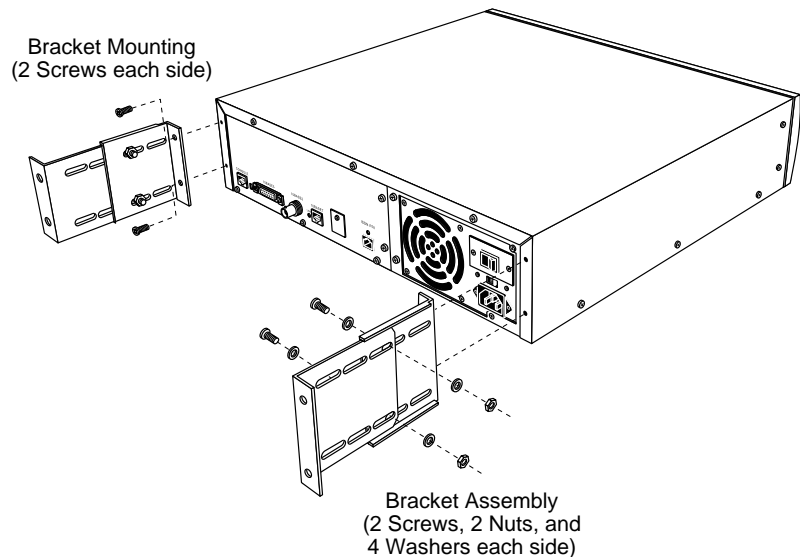


Figure 2-3. Attaching the Mounting Bracket to the Remote Annex 6300

## 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 6300 to the rack (see [Figure 2-4](#)).

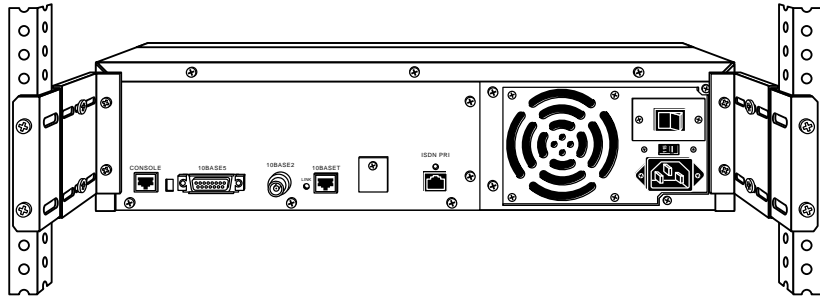


Figure 2-4. Attaching the Mounting Bracket and Device to the Rack

## Connecting a LAN Using Ethernet

The Remote Annex 6300 supports three types of Ethernet connections: Thin Ethernet, Thick Ethernet, or Twisted Pair (see [Figure 2-5](#)).

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 6300 is powered off before disconnecting or connecting the Ethernet cabling.

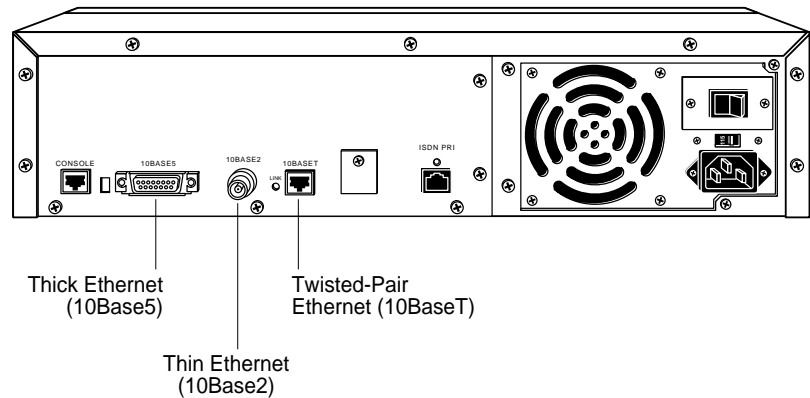


Figure 2-5. Remote Annex 6300 Ethernet Connections

The following subsections contain a description of how to connect your Remote Annex 6300 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 6300 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 6300 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 6300.
- 3 Twist the sleeve on the T-connector clockwise to lock the connection in place.

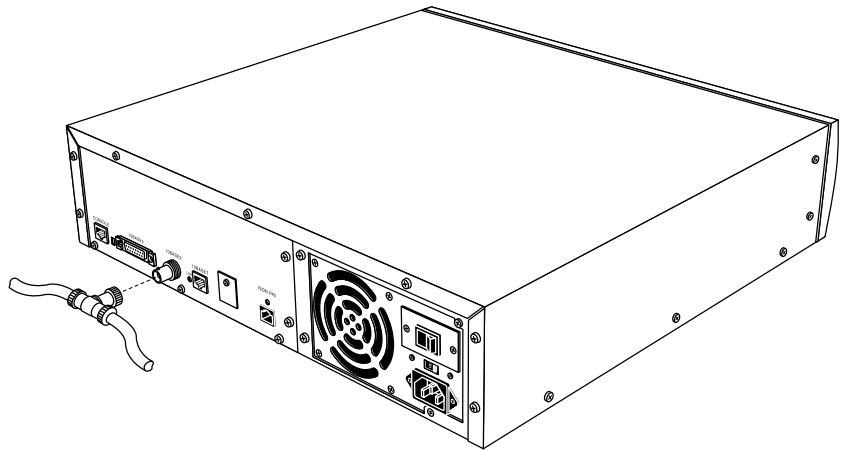


Figure 2-6. Connecting Thin Ethernet Cable

## 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 6300 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 6300'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.

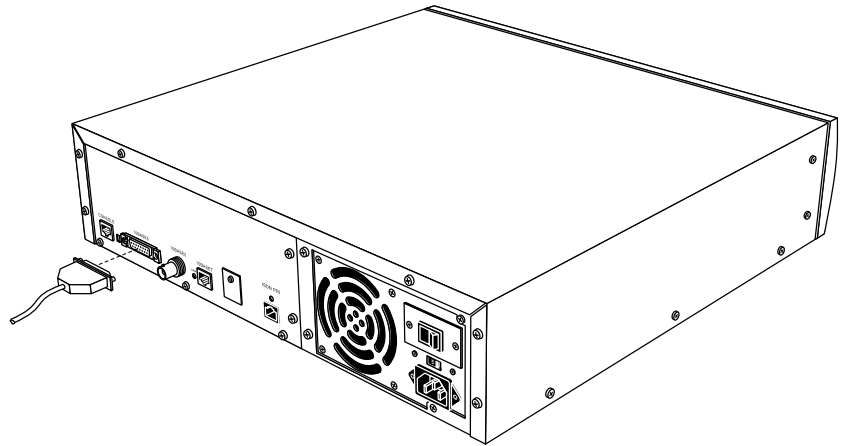


Figure 2-7. Connecting Thick Ethernet Cable

## Connecting Twisted Pair Ethernet (10BaseT) Cable

Follow the steps in this section to connect Twisted Pair (10BaseT) Ethernet cable to the Remote Annex 6300 (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 6300.
- 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.

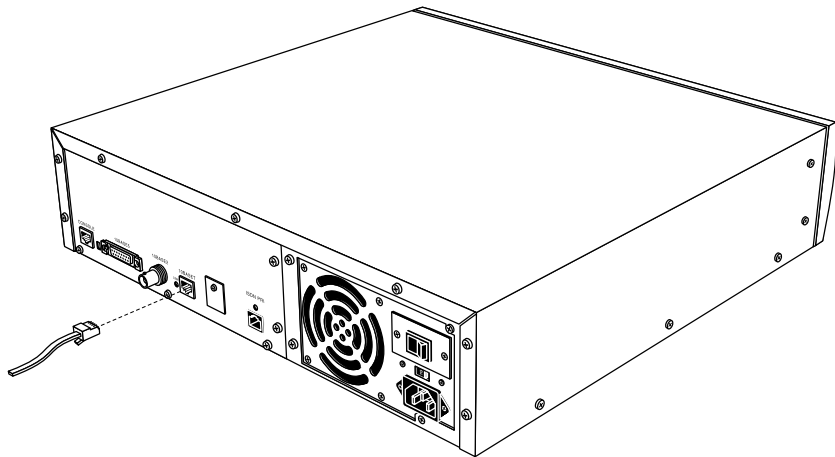


Figure 2-8. Connecting Twisted Pair Ethernet Cable

## Connecting a Console Terminal

A console terminal is used to access the ROM Monitor and boot the Remote Annex 6300 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 6300.

- 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](#)).

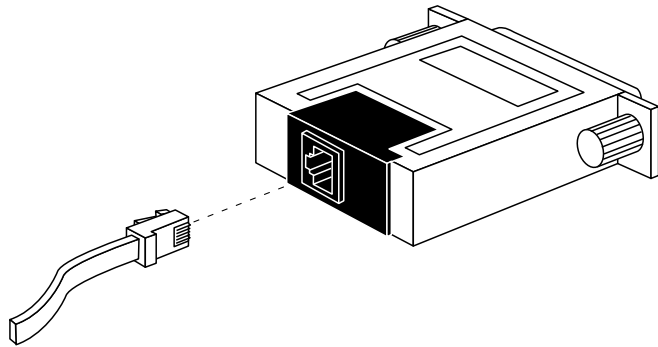


Figure 2-9. Connecting the Cable to the DB-25 DTE Drop Adapter

- 2 Plug the 8-pin connector into the console port located on the back panel of the Remote Annex 6300 ([Figure 2-10](#)).

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

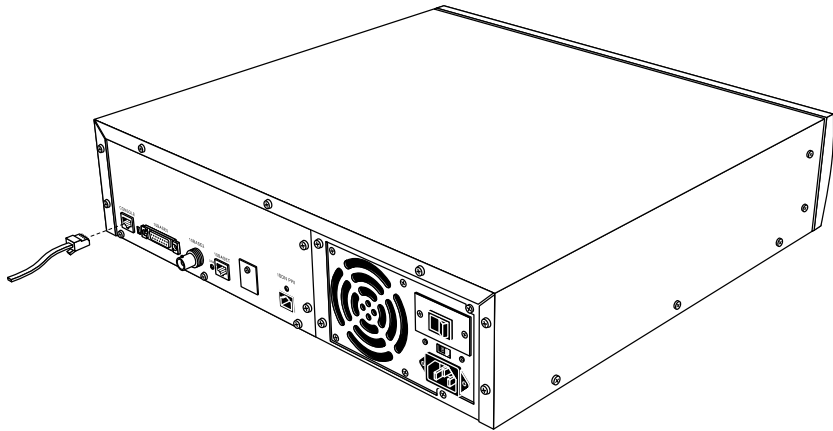


Figure 2-10. Connecting a Console Terminal

- 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. See [Chapter 3](#) for information on invoking the ROM monitor.



## Connecting the PRI ISDN Interface

A PRI ISDN Interface is used to connect the Remote Annex 6300 to an ISDN line. Follow the steps in this section to connect the ISDN line to the PRI ISDN Interface port located on the rear panel of the Remote Annex 6300.

- 1 Plug the RJ48C connector located on the PRI ISDN Interface Cable into the PRI ISDN Interface port located on the rear panel of the Remote Annex 6300 (see [Figure 2-11](#)).

When the connector clicks into place, the connection is secure. [Appendix A](#) describes the PRI ISDN Interface port's signal/pin allocation.

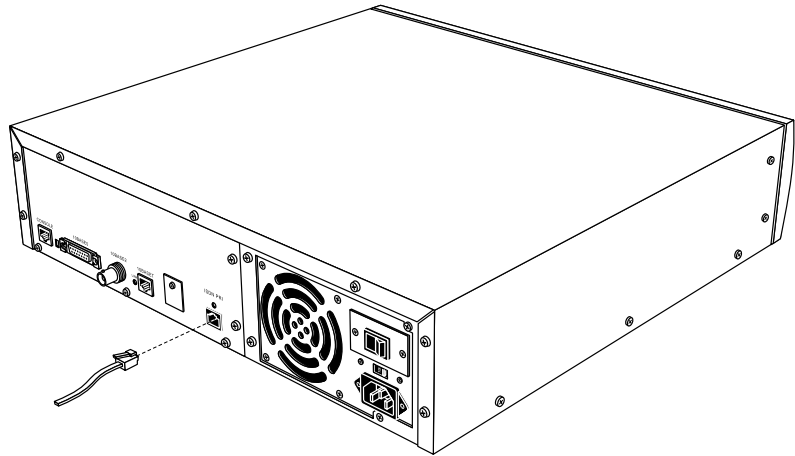


Figure 2-11. Connecting the PRI ISDN Interface

## Powering Up and Testing the Remote Annex 6300

Power-up and test your Remote Annex 6300 as follows:

- 1 **Verify the Remote Annex 6300'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 2-12](#)).

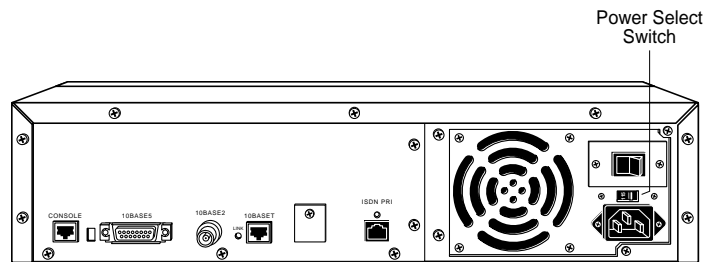


Figure 2-12. Verifying the Remote Annex 6300 Operational Power Range



Setting the power select switch incorrectly can damage the Remote Annex 6300.

- 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 2-13](#)). Turn the power switch on. The Power LED is now active.

The Remote Annex 6300 now runs its ROM-resident power-up diagnostics. The LEDs light and then turn off, except for some status LEDs.



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

If the diagnostics complete successfully, the Remote Annex 6300 either enters Setup Mode and waits for configuration data to be entered or boots its operational image from Flash.

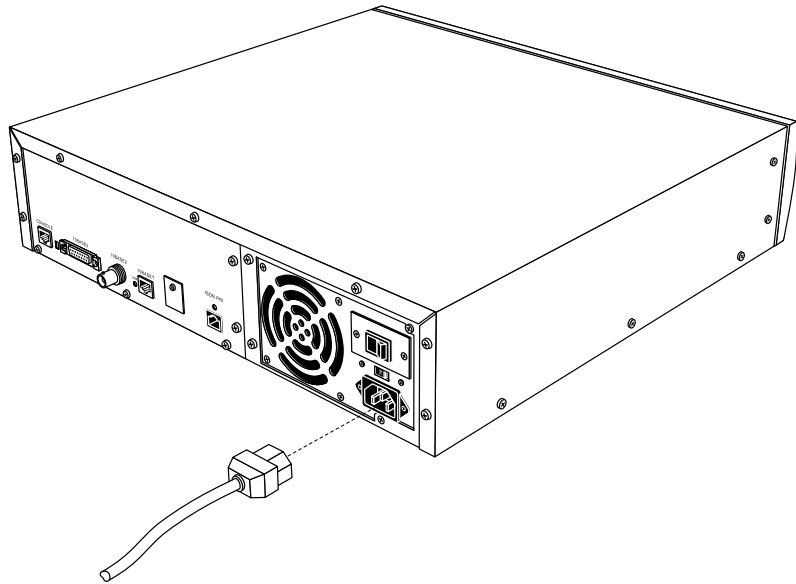


Figure 2-13. Connecting the Power Cord

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 [Chapter 4](#) 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 3-23.

### 3 Verify the Remote Annex 6300'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: 1002												
Board ID: 63				Board Type: RA6300								
CPU Type: 486DX2				Ethernet Address: 00-80-2D-02-CE-A9								
Memory size: 8 Meg				EEPROM size: 65504								
Flash size: 2 Meg				Flash ID: 8989								
Available Interfaces (* = selected) ThickNet ThinNet *Twisted Pair												
SLC Local DRAM Size: 4 Meg				SLC SRAM Size: 128K								
TDM Interface: PRI T1 USA				Revision: VERSION A MGR=1.117								
Modem Country Code: 63												
Port #	1	2	3	4	5	6	7	8	9	10	11	12
Modem ID	2883	2883	2883	2883	2883	2883	2883	2883	2883	2883	2883	2883
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
Mod ID	2883	2883	2883	2883	2883	2883	2883	2883	2883	2883	2883	2883
Mod Status	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK



This display is typical for T1 versions. For E1, information, 32 ports will be shown. For versions without modems, no port or modem information will be shown.

- 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 6300 to your LAN.

This section describes:

- ❑ How to install the Remote Annex 6300's operational software and image on a device that resides on a network accessible to the Remote Annex 6300.
- ❑ How to download the operational image from the device to the Remote Annex 6300.

## Installing to and Loading from a UNIX Host

This section describes how to install the Remote Annex 6300's operational software and image to a UNIX host (see the *Annex Administrator's Guide for UNIX* for more details).

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



If you have a BOOTP server (see [Chapter 3](#)), boot the Remote Annex 6300. Otherwise, continue to the next step.

- 2 Execute the ROM Monitor `addr` command:
  - ❑ Enter the Remote Annex 6300's Internet address.
  - ❑ Modify any other parameters that the Remote Annex 6300 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 6300 is up and running (see [boot](#) on page 3-8).

## Auto-initializing the Remote Annex 6300

The Remote Annex 6300 is distributed without an IP address or preferred load host (UNIX/IP) defined in ROM. When the device is booted, the Remote Annex 6300 attempts to auto-initialize itself using BOOTP (bootstrap protocol) and RARP (Reverse Address Resolution Protocol).

The Remote Annex 6300 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 6300.

- ❑ 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 6300 is not initialized. Under this condition, the Remote Annex 6300 first tries to get boot information via BOOTP or RARP.

If all requests fail, the Remote Annex 6300 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 6300 and must have the appropriate information in the **bootptab** file. The Remote Annex 6300's BOOTP implementation adheres to rfc951, rfc1048, and rfc1084. A sample **bootptab** file entry used to initialize the Remote Annex 6300 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 6300's hardware address (Ethernet Address).
- ❑ *ip* is the Remote Annex 6300's Internet Address.

When the Remote Annex 6300 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 6300 in this case) with whatever format the client requests; the Remote Annex 6300 (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 6300 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 6300, and the host's ARP table must be initialized with the Remote Annex 6300's Internet and Ethernet addresses (see the **arp** man page, **arp -s**).



The only boot information that RARP provides is the Remote Annex 6300'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 6300 its boot information must be running on the same network as the Remote Annex 6300 because the Remote Annex 6300 only broadcasts BOOTP and RARP queries.

If BOOTP and RARP fail, the Remote Annex 6300 transmits an IPX Advertisement Request for Service and a MOP Multicast boot request.

If all requests fail, the Remote Annex 6300 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 6300

The Remote Annex 6300 comes with Flash memory. Your device already contains an operational image. You can check your Remote Annex 6300'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:* appears under the *REVISION/CONFIGURATION INFORMATION* section.

To boot your Remote Annex 6300 from Flash ROM.

- 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 unit.

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

This chapter describes the ROM Monitor commands. Access these commands through a terminal connected to the console port located on the back of the Remote Annex 6300.

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 6300; 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 6300'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 6300 to load by requesting assistance from a specific host, rather than by broadcasting that request to all hosts on the subnet.

After booting the Remote Annex, you can define the same parameters you defined using the ROM monitor, using the **na** utility, the local **admin** command, or SNMP. See [Chapter 4](#) for information on Power-up and boot procedures; the *Remote Annex Administrator's Guide for UNIX* describes the **na** utility in detail.

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.

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

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
boot [-l] [<file>]	Erases the existing Flash memory and copies a new image to Flash.	Upgrading or replacing the Flash image.
config	Displays the current hardware configuration and revision levels.	Identifying your hardware, memory, and ROM versions.
console-baud	Changes the console port's baud rate.	Configuring the console port for remote maintenance.
erase	Erases non-volatile memory.	Loading a new image and need to erase the old image.
help	Displays the list of ROM Monitor commands.	Referencing the ROM monitor commands.
image [-d   <file>]	Displays and/or sets the load image and <b>tftp</b> load dump names.	Loading an image that differs from the default.
ipx [-d] (not supported in this release)	Displays and sets EEPROM values relevant to Novell/IPX network addressing, including the IPX load/dump file server.	Changing Novell/IPX configuration parameters. This command is not used for this configuration of the Remote Annex 6300.
lat_key [-d]	Sets the LAT key.	Connecting to a DEC VMS host.

*(continued on next page)*

Table 3-1. ROM Monitor Commands (continued)

Command	Description	Use
mop [-d] (not supported in this release)	Displays and sets EEPROM values relevant to VAX/VMS network addressing, including the MOP load/dump address.	Loading software from a DEC VMS host. This command is not used for this configuration of the Remote Annex 6300.
net	Executes an Ethernet transceiver loopback test.	Checking your Ethernet connection.
option_key [-d]	Sets or displays the option key.	Checking your option key setting.
ping	Sends ICMP ECHO_REQUEST datagram to a host or gateway.	Checking to see if a host or gateway can be reached.
ports [-d]	Shows the current status of all ports.	Checking a port.
sequence [-d   <list>]	Displays and edits the load/dump interface list.	Checking or changing the load/dump interface list.
stats	Displays current network statistics gathered by the ROM.	Checking the network resources.

## addr

The **addr** command displays and sets several Remote Annex 6300 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 *Remote Annex Administrator's Guide for UNIX*.) The command syntax is:

**addr [-d]**

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

The **addr -d** command displays the Remote Annex 6300'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 6300 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 6300 from a UNIX load host. If you do not define a subnet mask, the Remote Annex 6300 uses the generic mask for the specified IP address.

The Remote Annex 6300 tries to boot from a preferred UNIX load host. If you do not define a preferred load host, the Remote Annex 6300 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 6300 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 6300 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 6300 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 6300 operating software from a cooperating host. The command syntax is:

**boot** [-lv | *filename*]



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 6300'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 6300, **boot** requests the default **oper.63.enet** file. Optionally, you can enter a file name using the **image** command.

The Remote Annex 6300 boots from the defined preferred load host. If the preferred load host is not defined or does not respond, the Remote Annex 6300 broadcasts on the Ethernet and loads from the first host that responds.

To initiate loading, the Remote Annex 6300 sends a load request message to the selected host. After receiving a response, the Remote Annex 6300 loads its operational code to RAM. When loading is complete, it transfers control to the newly-loaded program. The Remote Annex 6300 displays a symbol on the console for each data block received during the boot.

When the Remote Annex 6300 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

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

```
monitor:: boot
Enter boot file name[(ip) "oper.63.enet", \
(mop) "OPER_63_ENET.SYS"]::
Requesting default boot file "OPER_63_ENET.SYS" for MOP/VMS\
loads and "oper.63.enet" for all other protocols.
Unanswered requests shown as '?', transmission errors as '*'.
Requesting boot from 192.9.200.88 via Ethernet...
Booting BFS file using open delay of 8
Booting BFS file from 192.9.200.88
Header received OK. Received data blocks shown as '.'.
. . . . .
. . . . .
. . . . . ? . . . . .
. . . . . *
. . . . . * . . . . .
. . . . . ? . . . . .
. . . . . EOF
```

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

```
monitor:: boot
Enter boot file name [(ip) "oper.63.enet", \
(mop) "OPER_63_ENET.SYS"]::
Requesting default boot file "OPER_63_ENET.SYS" for MOP/VMS\
loads and "oper.63.enet" for all other protocols.
Unanswered requests shown as '?', transmission errors as '*'.
Requesting boot from 192.9.200.88 via Ethernet...
Booting BFS file using open delay of 8
?
Booting TFTP file using open delay of 8
Booting TFTP file from 192.9.200.88
Header received OK. Received data blocks shown as '.'.
. . . . .
. . . . . ? . . . . .
. . . . .
. . . . . *
. * . . . . ? . . . . .
. . . . . EOF
```

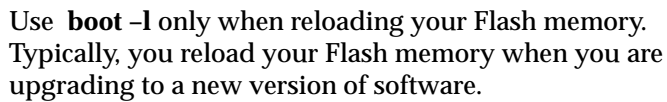
The **boot -l** command downloads and saves the operational image to non-volatile memory, erases the existing Flash memory, copies the new image from non-volatile memory to Flash memory, and then executes the image.



After executing a **boot -l**, the **ls** command may not show the newly-loaded image.

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

```
monitor:: boot -l
Enter boot file name [(ip) "oper.63.enet", \
(mop) "OPER_63_ENET.SYS"]::
Requesting default boot file "OPER_63_ENET.SYS" for \
MOP/VMS loads and "oper.63.enet" for all other protocols.
Unanswered requests shown as '?', transmission errors as '*'.
Requesting boot from 192.9.200.88 via Ethernet...
  Booting BFS file using open delay of 8
Booting from 192.9.200.88
Header received OK.  Received data blocks shown as '.'.
. . . . .
. . . . .
. . . . .
. . . . .EOF
      Saving image into storage device ...
Erasing device
|-----|
|-----|
.....
Erase completed
  Storing image .....
  Storage completed
Beginning execution of image...
Annex Command Line Interpreter * Copyright 1991, 1995\
Xylogics, Inc.
```



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

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

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

```
monitor:: boot -v
Enter boot file name [(ip) "oper.63.enet", \
(mop) "OPER_63_ENET.SYS"]:::

Requesting default boot file "OPER_63_ENET.SYS" for MOP/VMS\
loads and "oper.63.enet" for all other protocols.
Unanswered requests shown as '?', transmission errors as '*'.

    Requesting boot from 192.9.200.88 via Ethernet...
    Booting from 192.9.200.88 (42 msec)
    Header received OK. Received data blocks shown as msec
turnaround time.
```

4 4 6 4 6 4 4 4 4  
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 4 4 4 4 4 4 4 4 4 4 4 4 4 5 4  
4 4 4 4 4 4 6 4 6 4  
4 6 4 24 4 4 6 4 10 4  
73 4 4 5 4 4 4 4 4 4 9 4 4 11 4 4 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4  
4 4 6 4 11 6 4 4 4 4  
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 4 4 4 4 4 4 4 4 4 4 4 4 4 4  
4 4 4 4 4 4 6 4 6 4  
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 EOF

```
Ethernet Statistics

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

## config

The **config** command displays the current configuration information and revision levels for the Remote Annex 6300. The **config** command displays revision information, the amount of memory installed, T1 or E1 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 6300 with 24 modems (T1) looks similar to this:

REVISION/CONFIGURATION INFORMATION												
ROM Software Rev: 1002												
Board ID: 63				Board Type: RA6300								
CPU Type: 486DX2				Ethernet Address: 00-80-2D-02-CE-A9								
Memory size: 8 Meg				EEPROM size: 65504								
Flash size: 2 Meg				Flash ID: 8989								
Available Interfaces ( *= selected) ThickNet ThinNet *Twisted Pair												
SLC Local DRAM Size: 4 Meg				SLC SRAM Size: 128 K								
TDM Interface: PRI T1 USA				Revision: VERSION A MGR=1.117								
Modem Country Code : 63												
Port #	1	2	3	4	5	6	7	8	9	10	11	12
Modem ID	2883	2883	2883	2883	2883	2883	2883	2883	2883	2883	2883	2883
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
Modem ID	2883	2883	2883	2883	2883	2883	2883	2883	2883	2883	2883	2883
Mod Status	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK



This display is typical for T1 versions. For E1 versions, information on 32 ports will be shown. For modem-less versions, no port or modem information will be shown.

## 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 6300 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 6300 is booted.



To provide remote access to the Remote Annex 6300 ROMs:

- 1 From a site local to the Remote Annex 6300:
  - ☐ 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 6300 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 Return key until the monitor prompt appears.

## erase

The **erase** command erases the contents of non-volatile memory, including the Remote Annex 6300'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. Self boot image)
Enter 1 or 2:: 1
Erase all non-volatile EEPROM memory? (y/n) [n]:: y
Erasing 65504 bytes of non-volatile memory. Please
wait...
                                                    16K->|Data 0x0
.....
Initialized checksum record installed
.
:
```

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

```
monitor:: erase
Erase all non-volatile EEPROM memory? (y/n) [n]:: y
Erasing 65504 bytes of non-volatile memory. Please
wait...

                                           16K->|Data 0x0
.....
Initialized checksum record installed
Erasing 65504 bytes of non-volatile EEPROM memory
```

help

Entering **help**, or **?**, displays brief descriptions of the Remote Annex 6300 ROM Monitor commands.

## image

The **image** command sets and displays the name of the image file containing the Remote Annex 6300'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.63.enet**. The **image** command display looks like this:

```
monitor:: image
Enter Image name: [(ip)"oper.63.enet", \
(mop) "OPER_63_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.63.enet"
          Default (mop):"OPER_63_ENET.SYS"
TFTP Load Directory: ""
TFTP Dump path/filename: "dump.192.9.200.88"
SELF image name: "oper.63.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



This release does not support this command.

The **ipx** command sets several parameters associated with IPX booting and dumping. This is useful when loading the Remote Annex 6300'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



This release does not support this command.

The **mop** command sets the MOP load/dump address. This is useful when loading the Remote Annex 6300'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 6300 through the transceiver to test the integrity of the network. The test can be executed either by attaching the Remote Annex 6300 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 6300 fails, the **Net** LED remains off, and the console displays an error message.

Failing this test indicates that either the Remote Annex 6300, 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 6300 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 6300; call technical support.
- 2 The Remote Annex 6300 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 network 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 PRI interface port. The syntax is:

### **ports**

To test the PRI port, the interface must be connected to a loopback plug. No external clocking is required.

When invoked, the command displays a menu of options. The following is a sample screen display for a T1 or E1 version of the Remote Annex 6300.

```
monitor:: ports
Some Important Notes:
- These tests require the PRI port to have a loopback
  plug installed.
- An even number of ports must be selected for the Modem
  Ports test because pairs of modems are connected
  together and data is looped back between them.

  1) Digital Ports
  2) Modem Ports

Selection (Return to exit)::
```

The following is a sample screen display for a modem-less version of the Remote Annex 6300.

```
monitor:: ports
Some Important Notes:
- These tests require the PRI port to have a loopback
  plug installed.

Ports with faulty Data Lines:
Enter port number or range of ports to test
(Return to exit)::
```

## sequence

The **sequence** command edits the load/dump interface list. This list determines the order of the network interfaces the Remote Annex 6300 will use for loading and dumping. The default, **net**, uses the LAN interface. If the Remote Annex 6300 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 **sequence -d** command displays the current load/dump interface list. You cannot specify both the **-d** argument and the interface list with the same command. The command display looks like this:

```
monitor:: sequence -d
Interface sequence: 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 6300 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 6300 lost the Clear to Send signal – usually the result of excessive traffic.
Collisions Detected	The number of times the Remote Annex 6300 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 6300 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 “*.”



The Remote Annex 6300'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 6300's front panel LEDs.

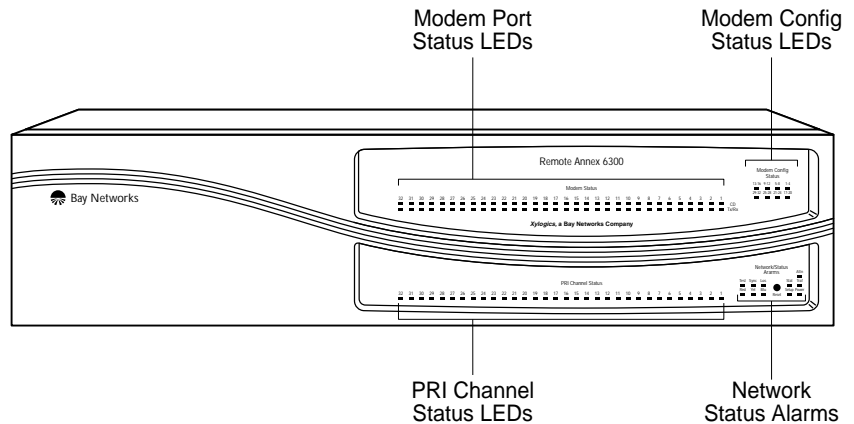


Figure 4-1. Remote Annex 6300 Front Panel Alarms and LEDs

Refer to [Table 4-1](#) for a description of the LEDs located on the front of the Remote Annex 6300.

Table 4-1. Remote Annex 6300 Front Panel LEDs

LED(s)	Description
<b>Modem Status</b>	<p>The Remote Annex 6300 has two status LEDs for each modem port (up to 32):</p> <p>CD - 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>TX/RX - TX/RX is a green LED that flashes to indicate that the corresponding modem is transmitting or receiving data.</p>
<b>Modem Config Status</b>	<p>These LEDs indicate the number of modems installed. An LED is green if all the modems in its group are good. An LED is amber if one modem in its group is bad.</p>
<b>PRI Channel Status</b>	<p>These green LEDs indicate B channel allocation. There are 32 PRI Channel Status LEDs on the front of the Remote Annex 6300. For T1, 23 are used to indicate B channel allocation. For E1, 30 are used for B channel allocation.</p>
<b>Network/Status Alarms</b>	<p>RED - RED alarm LED is ON during a locally detected carrier failure. During the RED alarm condition, a YELLOW alarm is transmitted across the telephone network.</p> <p>YEL - YELLOW alarm LED is ON when receiving a YELLOW alarm condition from the telephone network.</p> <p>BLU - BLUE alarm LED 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>

*(continued on next page)*

Table 4-1. Remote Annex 6300 Front Panel LEDs (continued)

LED(s)	Description
Network/ Status Alarms (continued)	<p>TEST - RED network TEST LED is ON when the ISDN Network Interface is looped back. Loopback tests are activated either locally by the user or by the telephone company.</p> <p>SYNC - GREEN SYNC LED is ON when the PRI interface is properly synchronized with the received network signal and is receiving proper framing information.</p> <p>LOS - RED LOS LED is ON when the PRI interface is detecting no signal (pulses) on the network interface receiver. When a LOS condition exists, the PRI interface transmits unframed all one (AIS) to the network.</p> <p>ATTN - The ATTN (Attention) LED is amber and ON when the Remote Annex requires operator attention. The LED flashes when there is a problem.</p> <p>STAT - The STAT (Status) LED is green and ON after the Remote Annex passes the core power-up diagnostics. The LED flashes after resetting the Remote Annex.</p> <p>TRAF - The TRAF (Traffic) LED is green and flashing when the Remote Annex 6300 successfully transmits or receives data from the LAN.</p> <p>SETUP - The SETUP LED is green when the <input type="button" value="Reset"/> button is pressed ON (Setup mode) and flashing when the <input type="button" value="Reset"/> button is pressed ON for 3 seconds (Reset mode).</p>
Power	<p>This LED is ON when the Remote Annex 6300 is connected to an AC power source.</p>



If you are using an external CSU, some of the Network/Status alarm LEDs may not give true readings. In this case, defer to the status and alarm conditions indicated on the external CSU.

In addition to the front panel LEDs, the Remote Annex 6300 contains a Link LED on the rear panel. The Link LED is green when an active 10BaseT segment is attached.


During power-up and booting, it is more difficult to diagnose problems because they can originate in the Remote Annex 6300, 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 6300 dump.

## Power-up and Boot Procedures

The Remote Annex 6300 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  button on the front panel puts the Remote Annex 6300 into Setup mode. When the Remote Annex 6300 is in Setup mode, the Setup LED lights.

During the Remote Annex 6300 power-up and boot sequence, the Remote Annex 6300 runs a set of diagnostics. The system LEDs display the diagnostics' status. The Remote Annex 6300 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 6300 Diagnostics

Following power-up or reset, the Remote Annex 6300 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 LED) turn off, confirming that all LEDs are operational.

During the power-up sequence, the Remote Annex 6300 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** LED) lights for a few seconds, then the **TRAF** LED flashes during the power-up self-tests. After the self-tests complete, only the **STAT** and Ethernet **Link** LED remain on.


**Table 4-3** shows the state of the LEDs when an error occurs at various stages of the start-up process. If the Remote Annex 6300 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.

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

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

The ROM diagnostics detected a Remote Annex 6300 hardware problem requiring service; call Technical Support.

### Activity NE5: Booted Wrong Image

The Remote Annex 6300 loaded the wrong image. Press the  button for 3 seconds to reset the device. Following is a list of ways to prevent this problem in the future:

- ❑ Make sure that you configure the Remote Annex 6300 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 6300 booted the wrong image, enter Setup mode and issue an **image -d** command. The command display will list the image file the Remote Annex 6300 is trying to load.

## Setup Mode

Enter Setup mode by pressing the  button located on the Remote Annex 6300 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 LEDs	●	●	●
T2: Testing Hardware	●	×	■
T3: At Monitor Prompt	●	●	■

Key:

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

## Activity T1: Testing LEDs

All front panel LEDs light for a few seconds, then all but the Ethernet Link LED turns off. This sequence confirms that all LEDs are operational. At this point, the Remote Annex 6300 is in Normal mode. Press the  button to put the Remote Annex 6300 into ROM monitor mode.

## Activity T2: Testing the Hardware

During power-up, the Remote Annex 6300 runs self-tests that execute diagnostics for the CPU, ROM, EEPROM, Flash, etc. The TRAF LED flashes during the tests and after completing the power-up self-tests, the STAT and Ethernet Link LED remain on.

### Activity T3: At the Monitor Prompt

When the STAT and ATTN LEDs 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 LEDs that are used to describe errors that occur at different stages of the system start-up process. If the Remote Annex 6300 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.
- × Off.
- Flashing irregularly.
- ◆ Flashing regularly (about 1Hz).

Activity TE2:  
Hardware Failure

The ROM diagnostics detected a Remote Annex 6300 hardware problem requiring service. Call Customer Support.

Activity TE7: Booted  
Wrong Image

The Remote Annex 6300 loaded an inappropriate image. Press the Reset 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 6300 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 6300 can communicate with the Ethernet.

If the Remote Annex 6300 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 6300 is not configured properly.
- ❑ The load server host is not responding.

The Remote Annex 6300 requests a boot image from a pre-defined load host or by broadcasting a boot request. When a host responds, the Remote Annex 6300 loads its operational image.

The Remote Annex 6300 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 6300 timed out while waiting for a response to its boot request; if this field is empty, check the Remote Annex 6300's configuration parameters.

## Boot Error Report

If an error occurs, a Remote Annex 6300 boot error report is generated *only* if the Remote Annex 6300 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 6300 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 6300 sensed a hardware error during message transmission or reception. This error indicates a fault with the Remote Annex 6300 LAN interface. Use the <b>net</b> command to isolate the problem (see page 3-23).
Msgs from wrong host	The Remote Annex 6300 received a message from an incorrect host. This indicates that the Remote Annex 6300 received, and ignored, an unsolicited packet.
Rsp T/O's	The Remote Annex 6300 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 6300, 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 6300'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 6300 is configured to boot from a specified host, but the host would not transmit its Ethernet address to the Remote Annex 6300. Possibly, the Remote Annex 6300 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 6300'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 6300 Parameters


The following parameters must accurately reflect both the Remote Annex 6300 and the network environment in which it operates.

Verify the Remote Annex 6300'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 6300's software and the address of the preferred load server host. If the value for the image name is incorrect, the Remote Annex 6300 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 6300 has to broadcast for a host. Correct the load host's address using the **addr** command.

Confirm that the Remote Annex 6300 boot parameters are correct by using the appropriate ROM Monitor commands. Modify any boot parameters that are incorrect or missing. Boot the Remote Annex 6300 either by entering the **boot** command at the console, or by holding down the  button until the Power LED blinks rapidly.

## Load Server Host Not Responding

The Remote Annex 6300 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 6300
- ❑ 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 6300 software is installed properly on the host (see the *Remote Annex Software Installation Notes*).
- ❑ The **erpcd** daemon or **tftp** server, which loads the operational image to the Remote Annex 6300, is running.

In Test mode, both the Remote Annex 6300 and **erpcd** on the load server host display boot progress reports. The Remote Annex 6300 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  button until the Power LED blinks rapidly, then release the  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 6300 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 6300-related files are missing or cannot be installed, contact technical support.

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 6300 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 6300, hold down the  button for 3 seconds. Then enter:  

```
# boot -v
```

### Another Remote Annex 6300

When troubleshooting a Remote Annex 6300 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 *Remote Annex Administrator's Guide for UNIX* provides more information on these commands.

A Remote Annex 6300 that has been reconfigured as a load server host, but not rebooted, cannot boot another Remote Annex 6300 on the network. Rebooting the Remote Annex 6300 load server host ensures that the parameters are set.



# Remote Annex 6300 Dumps

The Remote Annex 6300 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 6300 dumps are:

- ❑ Non-recoverable hardware or software errors.
- ❑ Software fails to reset the Remote Annex 6300's watchdog timer.
- ❑ Software fails one or more internal consistency checks.
- ❑ Hardware detects an internal fault.

Table 4-9. Remote Annex 6300 LED States During a Dump

Activity	STAT Green	ATTN Amber	TRAF Green
Dump	●	●	■

Key:

- On continuously.
- Flashing irregularly.

The Remote Annex 6300 sends a dump file to a preferred load dump host. If you do not define this host by specifying an address, the Remote Annex 6300 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'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 6300 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 6300.

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

Table 4-10. Remote Annex 6300 Dump File Naming Conventions

Remote Annex 6300 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 6300 ports:

- ❑ *Console Port.*
- ❑ *10Base2 Ethernet Port.*
- ❑ *10Base5 Ethernet Port.*
- ❑ *10BaseT Ethernet Port.*
- ❑ *PRI ISDN Interface.*

## Console Port

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

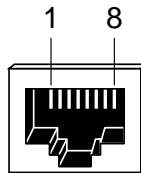


Figure A-1. Console Port

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.

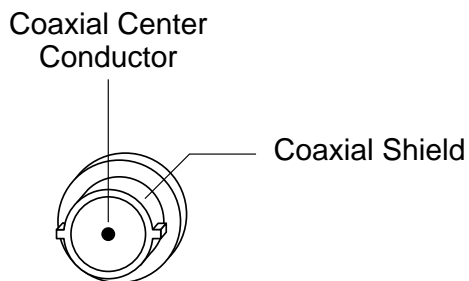


Figure A-2. 10Base2 BNC Ethernet Port

# 10Base5 Ethernet Port

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

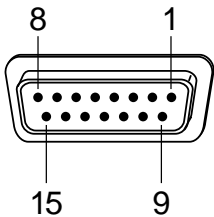


Figure A-3. 10Base5 Ethernet Port

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.

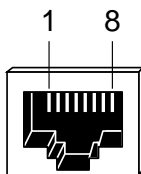


Figure A-4. 10BaseT Ethernet Port

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



## PRI ISDN Interface

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

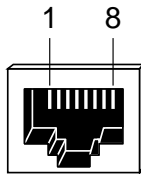


Figure A-5. PRI ISDN Interface Port Receptacle

Table A-4. PRI ISDN 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



This appendix describes the loopback connectors.

## Loopback Connectors

10Base2 Ethernet  
Loopback  
Connector

The 10Base2 loopback connector is a 22-Ohm BNC terminator plug. This plug places a 22-Ohm resistor 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 6300 Signal	Connects to Pin Number	Signal
3	Transmit +	5	Receive +
10	Transmit –	12	Receive –

10BaseT Ethernet  
Loopback  
Connector

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

Table B-2. 10BaseT Ethernet Loopback Connector Wiring

Pin Number	Remote Annex 6300 Signal	Connects to Pin Number	Signal
1	Transmit +	3	Receive +
2	Transmit –	6	Receive –



The Remote Annex 6300 supports 4, 8, 12, 16, 20, 24, 28, or 32 internal modems. The Remote Annex 6300 modem carrier upgrade kit enables you to add modems to the Remote Annex 6300 by adding a carrier card and modem card to your existing platform. 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 6300 modem carrier upgrade kit contains:

- ❑ One modem carrier card with quad modem card(s) pre-installed
- ❑ Two 34P ribbon cables
- ❑ One power extension cable
- ❑ One hardware kit containing nine screws and nine washers

## Required Tools

A Phillips screwdriver is needed to secure the modem carrier card.

## Disassembly Instructions

The following instructions describe how to disassemble the Remote Annex 6300. These instructions assume that you are facing the unit's rear panel. Figure C-1 illustrates the instructions.

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

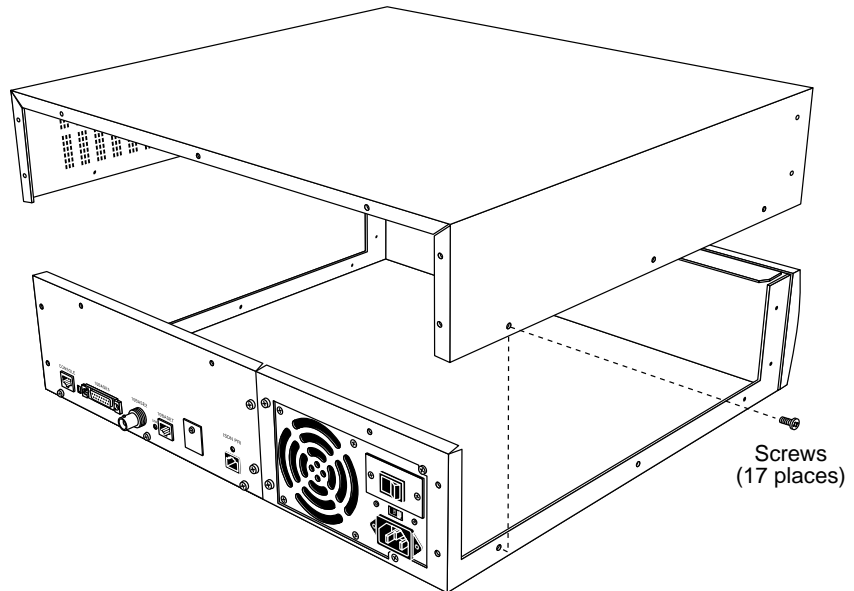


Figure C-1. Removing the Remote Annex 6300 Cover

## Installation Instructions

The following instructions describe how to install the modem carrier card into the Remote Annex 6300. The RA6300 modem carrier upgrade kit allows you to add modems to the Remote Annex 6300 by adding a modem carrier card, containing the modem card(s) to your existing platform. [Figure C-2](#) illustrates the instructions.

- 1 Plug each 34P ribbon cable into the main logic board (Connectors J12 and J14) with the red stripe (Pin 1 indicator) facing toward the rear of the unit. Make sure that the connector is fully seated and that the locking ears latch over the connector, securing it to the MLB.
- 2 Plug the power extension cable into the MLB (Connector J15), making sure that the cable is fully seated and secured by its locking detents.
- 3 Lower the modem carrier card into the chassis and secure it using the nine (9) 6-32 screws and flat washers provided in the hardware kit.
- 4 Plug each 34P ribbon cable from the MLB into its corresponding connector above on the modem carrier board (Connectors J17 and J18). Make sure that the connector is fully seated and that the locking ears latch over the connector, securing it to the modem carrier card.

- 5 Plug the power extension cable from the MLB into the modem carrier card (Connector J19), making sure that it is fully seated and secured by its locking detents.

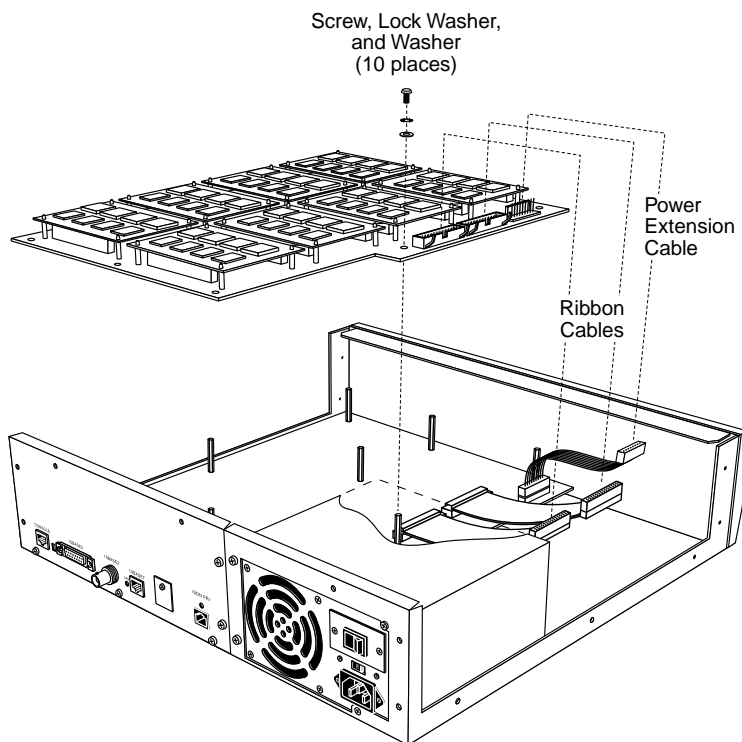


Figure C-2. Adding Modem Carrier Card to the Remote Annex 6300



## Assembly Instructions

To reassemble the Remote Annex 6300:

- 1 Lower the Remote Annex 6300's cover onto the unit and slide it forward (see [Figure C-3](#)).
- 2 Secure the cover by installing the 17 screws back into the cover, starting at the rear and working to the sides.



Do not over-tighten these screws.

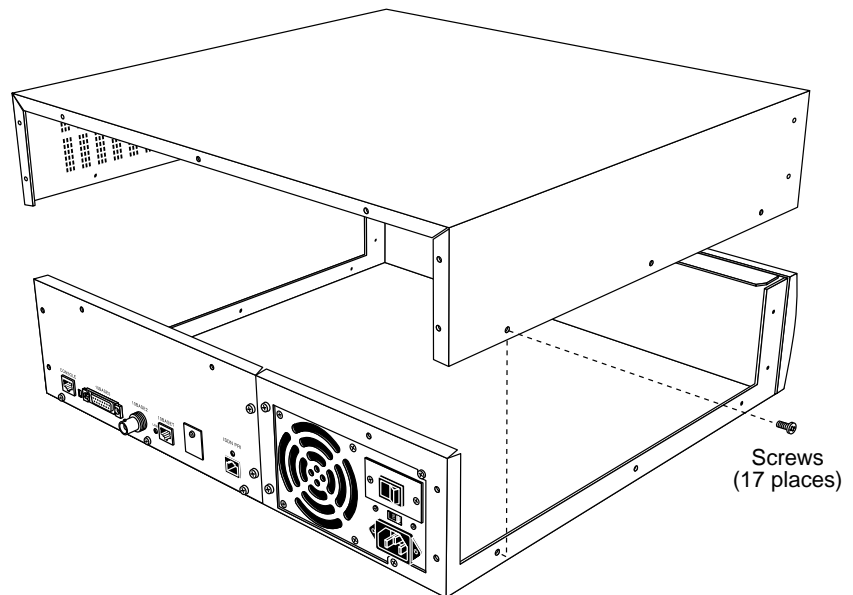


Figure C-3. Replacing the Remote Annex 6300 Cover

## Power-up and Test

To run the Remote Annex 6300 power-up and test sequence:

- 1 Reconnect all the cables, including:
  - ❑ The Ethernet cable
  - ❑ The PRI ISDN Interface cable
  - ❑ The console terminal cable
  - ❑ The power cord
- 2 Turn on the unit's power.
- 3 Set the Remote Annex 6300 to Test mode by pressing and holding the **Reset** button (located on the front panel) for three seconds (see [Figure C-4](#)).

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

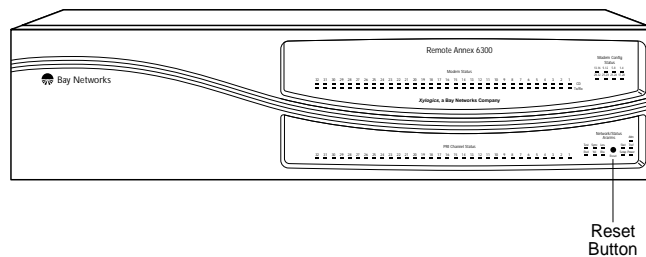
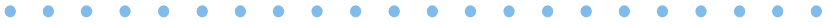


Figure C-4. Setting the Remote Annex 6300 to Test Mode

- 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 6300 sees the new modems, the installation is complete.



The Remote Annex 6300 supports 4, 8, 12, 16, 20, 24, 28, or 32 internal modems. The modems reside on quad modem cards. This chapter describes how to install additional quad modem cards into the Remote Annex 6300. The additional modem cards are installed onto the modem carrier card.



Installation of the modem carrier card is a prerequisite for installing additional modem cards. If the modem carrier card is not installed on your Remote Annex 6300, see [Appendix C](#) for instructions on installing it.

These installation instructions contain a description of the following:

- ☐ *Contents of the Kit*
- ☐ *Disassembly Instructions*
- ☐ *Installation Instructions*
- ☐ *Assembly Instructions*
- ☐ *Power-up and Test*
- ☐ *Removing Quad Modem Cards*

### Contents of the Kit

The Remote Annex 6300 modem upgrade kit contains:

- ☐ One or more quad modem cards
- ☐ One hardware kit containing four nylon standoffs

### Required Tools

A Phillips screwdriver is needed.

## Disassembly Instructions

These instructions assume that you are facing the unit's rear panel. To disassemble the Remote Annex 6300 (see [Figure D-1](#)):

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

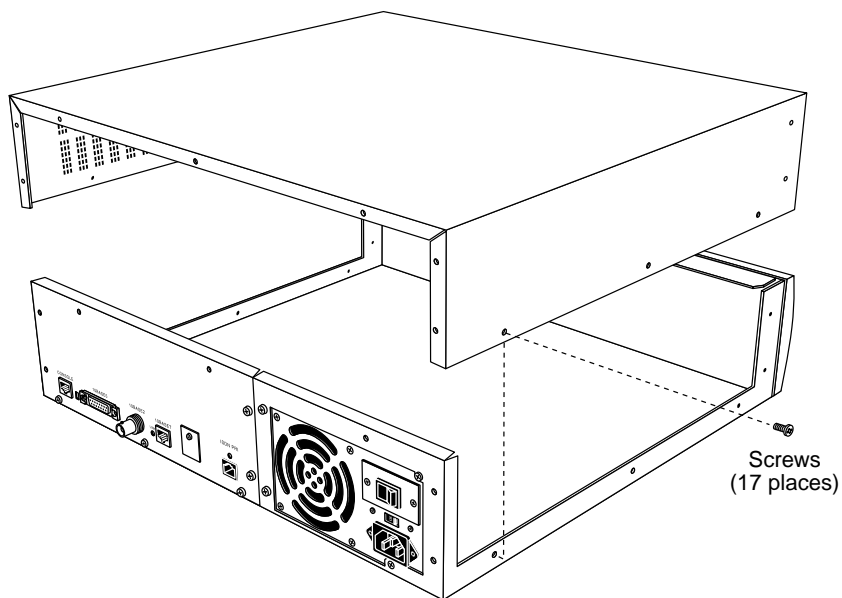


Figure D-1. Removing the Remote Annex 6300 Cover

## Installation Instructions



Observe handling precautions: electrostatic-sensitive devices.

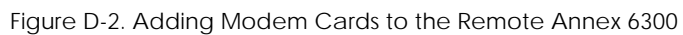
To install the additional quad modem card(s) onto the modem carrier card (see [Figure D-2](#)):

- 1 Find the next available location on the modem carrier card into which a modem card can be installed.



There are eight locations on the modem carrier card that can accommodate quad modem cards (up to 32 modems). These locations are numbered (1-4, 5-8, 9-12, and so on). If, for example, modem cards are already installed in locations 1-4 through 17-20, the next available location would be 21-24. It is important to use the next available location, and not leave any empty locations.

- 2 Lower the modem card onto the modem carrier card, keeping the modem card horizontal.
- 3 Carefully press the modem card into the card connector, making sure not to bend or damage any pins. Make sure that the connector is fully seated.
- 4 Push one corner of the modem card down onto the nylon standoff until the locking detent engages.
- 5 Repeat the previous procedure with the other three corners of the modem card.





## Assembly Instructions

To reassemble the Remote Annex 6300:

- 1 Lower the Remote Annex 6300's cover onto the unit and slide it forward (see [Figure D-3](#)).

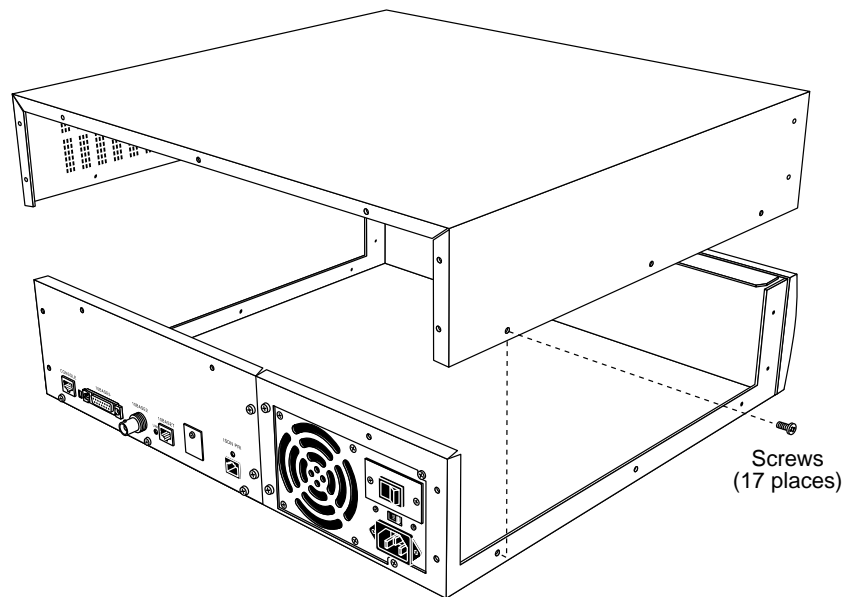


Figure D-3. Replacing the Remote Annex 6300 Cover

- 2 Secure the cover by installing the 17 screws back into the cover, starting at the rear and working to the sides.



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 PRI ISDN 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 **Reset** button (located on the front panel) for three seconds (see [Figure D-4](#)).

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

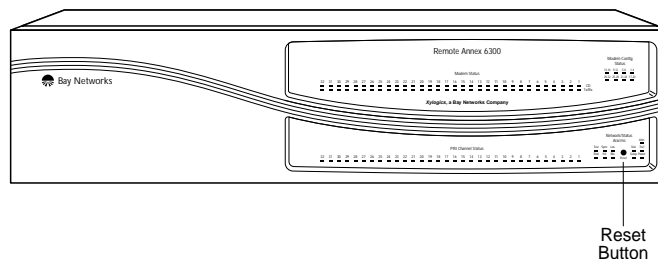


Figure D-4. Setting the Remote Annex 6300 to Test Mode

- 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 6300 sees the new modems, the installation is complete.

## Removing Quad Modem Cards

Occasionally it may be necessary to remove quad modem cards from the Remote Annex 6300 (for example, if a quad modem card fails and needs to be replaced). On the modem carrier card, there are eight locations that can accommodate quad modem cards (up to 32 modems). These locations are numbered (1-4, 5-8, 9-12, and so on). When the Remote Annex 6300 encounters an empty location, it assumes that the modem card before the empty location is the last modem card in the series. Therefore, any empty location resulting from the removal of a quad modem card will be interpreted as an indicator that the last modem card has been reached. Any quad modem cards installed after the empty location will not be recognized, unless the DIP switch section corresponding to the removed modem card is toggled ON. [Table D-1](#) provides a map of the quad modem card locations and their corresponding DIP Switch assignments.

Table D-1. Modem Card/S1 DIP Switch Section Assignments

Modem Card Location	DIP Switch Section (S1)
1-4	1
5-8	2
9-12	3
13-16	4
17-20	5
21-24	6
25-28	7
29-32	8

The following instructions detail how to remove a quad modem card and toggle its appropriate DIP switch section (on DIP switch S1) to assure that all remaining modem cards will be recognized by the Remote Annex 6300. [Figure D-5](#) and [Figure D-6](#) illustrate the instructions. These instructions assume that the cover of the unit has already been removed.

- 1    Locate the quad modem card that you want to remove.
- 2    Starting at one corner of the card, push in the locking detent on the nylon standoff, and gently work the corner of the card off the nylon standoff (see [Figure D-5](#)).
- 3    Repeat the procedure for the other three corners of the modem card.

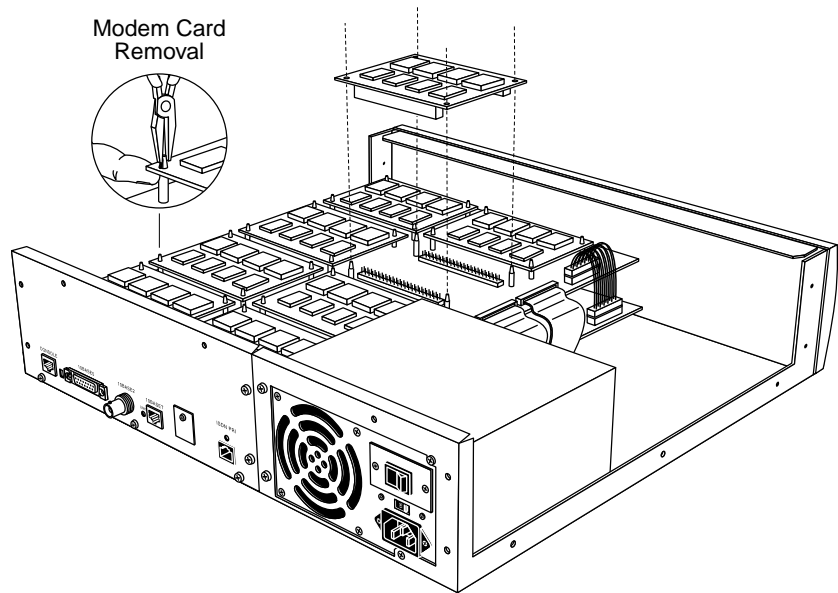


Figure D-5. Removing Modem Cards from the Remote Annex 6300

- 4 Lift the modem card straight out of its connector, making sure not to damage any pins.
- 5 Referring to [Table D-1](#), identify the S1 DIP switch section that corresponds to the location of the modem card you removed.

- 6 Locate the S1 DIP switch section and set it to the ON position (see [Figure D-6](#)).

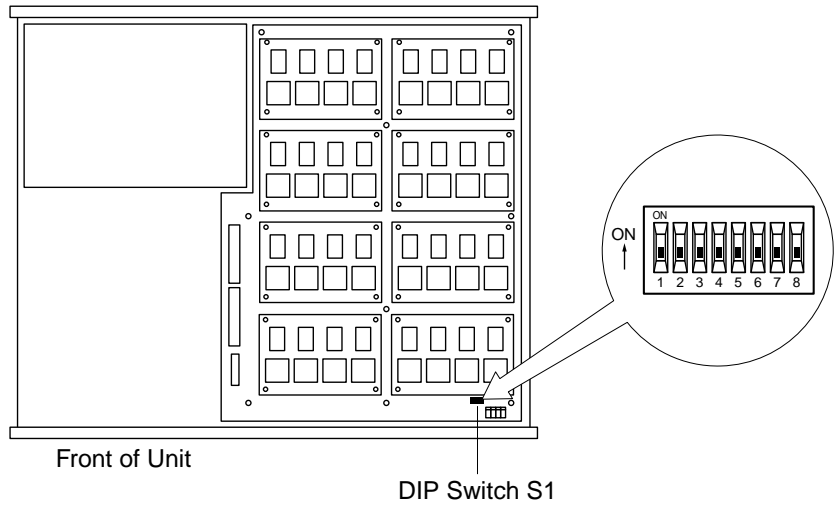


Figure D-6. Locating and Setting DIP Switch S1

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