ADTRAN

Express XR/XRT
128 kbps ISDN Modem

Quick Start Guide

1200153L1	Express XR, Data Only
1200153L2	Express XRT, Two Phone Ports
3360.9VU01	Express XR Power Supply, 9.0 V DC Output
336048VUR-2	Express XRT Power Supply, 48 V DC Output

Trademarks

Express XR, Express XRT, and Express Configuration Wizard are trademarks of ADTRAN, Inc.

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The Express XR and Express XRT incorporate Synchronous Data Compression based on either IBM or Stac Electronics proprietary intellectual property depending on the time of manufacture. The following trademarks and copyrights are applicable:

FCC regulations require that the following information be provided to the customer in this manual.

1. If your telephone equipment (Express XR/XRT) causes harm to the telephone network, the Telephone Company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

2. Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

3. If you experience trouble with this equipment (Express XR/XRT), please contact ADTRAN (see inside back cover) for repair/warranty information. The telephone company may ask you to disconnect this equipment from the network until the problem has been corrected, or until you are sure the equipment is not malfunctioning.

4. This unit contains no user-serviceable parts.

FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or TV reception, which can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

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

WARNING *Changes or modifications not expressly approved by ADTRAN will void the user's authority to operate this equipment.*

CANADIAN EMISSIONS REQUIREMENTS

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Department of Communications.

Cet appareil nuerique respecte les limites de bruits radioelectriques applicables aux appareils numeriques de Class B prescrites dans la norme sur le materiel brouilleur: "Appareils Numeriques," NMB-003 edictee par le ministre des Communications.

CANADIAN EQUIPMENT LIMITATIONS

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

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. 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.

Repairs 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 an electrician, as appropriate.

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all devices does not exceed 100.

WARRANTY: ADTRAN warrants that items manufactured by ADTRAN and supplied under Buyer's order shall be free from defects in materials and workmanship and will conform to applicable specifications and drawings. ADTRAN's liability herein, whether based upon breach of warranty or contract or negligence in manufacture, shall be limited to replacement or repair at ADTRAN's election of all such defective or nonconforming items, provided that this warranty shall apply only where Buyer has given ADTRAN written notice of such defects or nonconformity within five (5) years* after delivery by ADTRAN of such items to Buyer. ADTRAN shall have the right prior to return to inspect at Buyer's plant any items claimed to be defective or nonconforming.

   *Note: The following items carry warranty period as shown.

   1.   Items not of ADTRAN manufacture will carry the remaining warranty and related terms and conditions of the original manufacturer.

   2.   **Encapsulated U-Repeater and Encapsulated DDS Repeater - 2 years.**

The foregoing constitutes the sole and exclusive remedy of the Buyer and exclusive liability of ADTRAN AND IS IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESSED OR IMPLIED OR STATUTORY AS TO MER-CHANTABILITY, FITNESS FOR PURPOSE SOLD, DESCRIPTION, QUAL-ITY, PRODUCTIVENESS OR ANY OTHER MATTER. Without limiting the foregoing, in no event shall ADTRAN be liable for the loss of use or profit or other collateral, special or consequential damages.

RETURNS: Return authorization must be obtained from ADTRAN prior to return of any items, including those for repair. Buyer's right to repair or replacement are governed by this Warranty. Issuance of credit for returned items shall be made at ADTRAN's discretion upon Buyer's request. All returns for credit accepted by ADTRAN are subject to a restocking fee.

SHIPPING: The cost of shipping the equipment from Buyer's facility back to ADTRAN shall be paid by the Buyer. The cost for return shipping of the equipment by surface carrier shall be paid by ADTRAN. ADTRAN will utilize other means of express shipment at the request of the Buyer. The cost of shipping shall be paid by the Buyer if express shipment is requested. In-warranty equipment returned for repair that is found not defective will carry a nominal charge to cover handling cost.

OUT OF WARRANTY: The cost of out-of-warranty repairs including return shipment are subject to a charge as quoted by ADTRAN. The cost of the

repair will be invoiced and the return of the item will be made using the most economical shipment means available. ADTRAN will use other means of express shipment at the request of the Buyer. In this case, the cost of shipping shall be paid by the Buyer.

ALTERATION TO EQUIPMENT PURCHASED: Modification or alteration to purchased equipment by Buyer, other than that specifically authorized by this Agreement or by ADTRAN, shall VOID AND NULLIFY, in its entirety, all warranty conditions as set forth in Warranty paragraph.

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PATENT AND COPYRIGHT INDEMNITY: ADTRAN warrants that the equipment and documentation furnished under this Agreement shall be free and clear of infringement of any patent or copyright covering the structure or composition of such articles or documentation. In the event of a claim, suit or action against Buyer alleging such infringement, ADTRAN shall save Buyer and its affiliates, agents or customers harmless from liability as finally determined by a court of competent jurisdiction, for such infringement, provided that Buyer gives ADTRAN notice promptly of such claim, suit or action, and shall have given ADTRAN full and exclusive control of the defense thereof, and that ADTRAN shall have sole right to settle or compromise such claim, suit or action.

In the event of a claim, suit or action against ADTRAN alleging infringement by the use of any such equipment or documentation, furnished under this Agreement, in combination with other articles or in carrying out any process covered by a patent owned or controlled by any other person, in which independent use of the equipment under this Agreement would not be an infringement. Buyer shall save ADTRAN harmless from liability, as finally determined by a court of competent jurisdiction, for such infringement, provided that ADTRAN shall have given Buyer full and exclusive control of the defense thereof, and that Buyer shall have the sole right to settle claim, suit or action.

Except as here in provided in this indemnity paragraph, neither Buyer nor ADTRAN makes any warranty to the other with respect to any claim, suit or action of any third party by way of infringement and neither party shall be responsible to the other for any loss, cost or damages consequential or otherwise, that may be suffered by the other as a result of any such claim, suit or action.

Telephone Company Contacts for ISDN Service

Ameritech ISDN Repair	1-800-TEAMDATA
Bell Atlantic	1-800-204-7332
Bell South	1-800-247-2020
Cincinnati Bell	1-513-566-1611
NYNEX	1-800-NYT-FAST (New York Area)
	1-800-650-ISDN (New England Area)
Pac Bell	811-8081*
Rochester Tel	1-716-777-1811
Southwestern Bell	1-214-841-7799 (Dallas area)
	1-800-286-8313 (Houston area)
	1-800-344-6357 (Austin area)
	1-314-571-2200 (St. Louis area)
US West	1-800-223-7508

*all Pac Bell customers may call this number with no need for area code

Table of Contents

Chapter 1
Introduction

EXPRESS XR/XRT OVERVIEW

The Express XR/XRT provides high speed network access for Internet and remote office connectivity using ISDN. The unit includes ISDN terminal adapter and network termination (NT1) functionality, eliminating the need for an external NT1 device.

The Express XR™ and the Express XRT™ provide the following features:

- Data rates up to 230.4 kbps - over eight times faster than analog modems
- Simple setup with the Express Configuration Wizard™
- Automatic SPID and Switch Detection (patent pending)
- Stac® LZS™ compression up to 230.4 kbps
- Remote configuration
- HyperACCESS® data communications software
- Windows® Plug and Play compatibility

The Express XRT provides the following additional features:

- Connections for two analog devices
- External analog modem support - no additional COM port required (patent pending)
- Custom calling features and Caller ID support

GETTING STARTED

This Quick Start guide describes how to install, operate, and troubleshoot the Express XR and Express XRT ISDN modems, referred to throughout this guide as Express XR/XRT.

Before getting started, review the section *Minimum Requirements* in this chapter to ensure your computer is compatible. In addition, examine the contents of the box to ensure everything has been received undamaged and gather the required setup information provided by your telephone company.

MINIMUM REQUIREMENTS

What You Provide

In order to operate the Express XR/XRT the following is required:

- A computer (386 or higher PC, or Macintosh)
- Windows 3.1 or higher for PC
- 16550 UART high speed serial port (16650 UART required for data speed of 230.4 kbps)
- RS-232 serial cable with a DB-25 connector for the Express XR/XRT and the other end matching the COM port on the computer (Do not use a null modem cable)
- One Basic Rate ISDN line (Two ISDN phone numbers, sometimes referred to as local directory numbers)

NOTE *Single ISDN phone number and point-to-point lines are not recommended for use with the XRT.*

Basic Rate ISDN Line

When ordering your ISDN line from the telephone company, request **EZ-ISDN 1** (Capability Package U) to ensure it is set up properly. EZ-ISDN 1 is recommended by the industry for most home office/small business applications. If EZ-ISDN is not available from your service provider order **Generic Data M**. For more information regarding ordering ISDN, see the ADTRAN document *Ordering ISDN Service User Guide* part number 60000.015-8, or contact the telephone company for alternative line configurations. The *Ordering ISDN Service User Guide* is available on the ADTRAN home page at **http://www.adtran.com** (under the Information Desk) or by calling ADTRAN.

What ADTRAN Provides

The ADTRAN Express XR/XRT is packaged with the following contents (see Figure 1-1):

- Express XR or Express XRT
- ADTRAN Express XR/XRT Quick Start Guide
- ADTRAN Express Configuration Wizard software (2 disks)
- HyperACCESS® communications software (1 disk)
- AC power supply
- RJ-45 to RJ-11 telephone cable
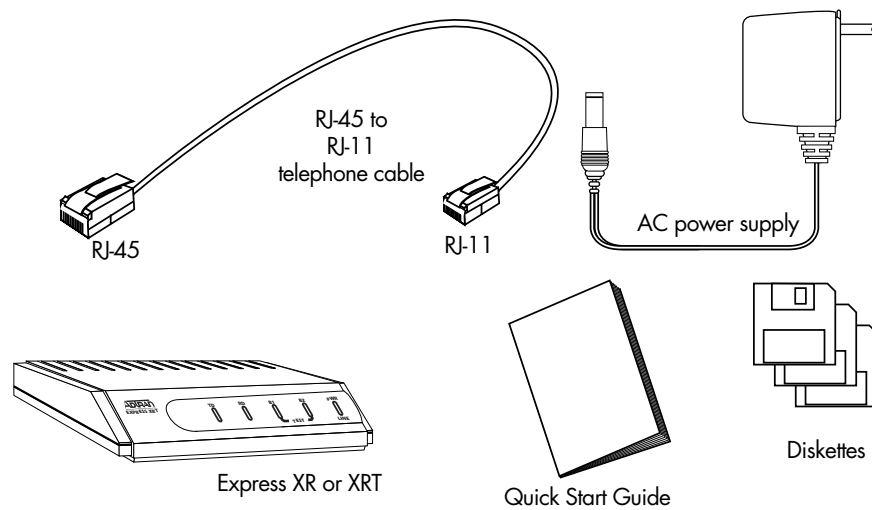
Figure 1-1
Express XR/XRT Contents

Chapter 2
Installation

INSTALLING THE ADTRAN EXPRESS XR/XRT

This section describes how to connect the Express XR/XRT to a PC and how to install the Express Configuration Wizard software.

Verify Switch Settings

Dip switches 1 and 2 located on the rear panel of the Express XR/XRT allow certain settings to be physically configured. Figure 2-1 shows the location of the dip switches on the rear panel of the unit.

NOTE *The factory default position for all switches is down (On) during initial installation.*

SW 1: Off (Up)   =   230.4 kbps
        On (Down) =   Autobaud (speeds up to 115.2 kbps)

If switch 1 is set to the Off position, the unit is set to operate at a DTE speed of 230.4 kbps. A special serial COM port using a 16650 UART is required while in this mode. If switch 1 is set to the On position, the unit will automatically adapt to the DTE rate (up to 115.2 kbps).

NOTE *In order to configure the Express XR/XRT to operate at 230.4 kbps with Windows 95 or Windows NT 4.0 Dial-Up Networking, a new modem must be added from the **Modems** icon in the Control Panel. Enter the name for this new connection and select **ADTRAN Express XR** or **XRT 230.4 Kbps & 16650 UART**. See the section Installing Windows 95 Dial-Up Networking.*

SW 2: Off (Up)   =   Factory Default
       On (Down) =   Normal (previous settings saved)

If Switch 2 is set to the Off position, the unit continues to use the factory default settings until Switch 2 is set to the On position. Also, area code, phone numbers, SPIDS, and stored numbers are cleared.

Express XRT Only:

SW 3: Off (Up)   =   Phone Volume Loud
       On (Down) =   Phone Volume Normal

SW 4:   Reserved for future use.
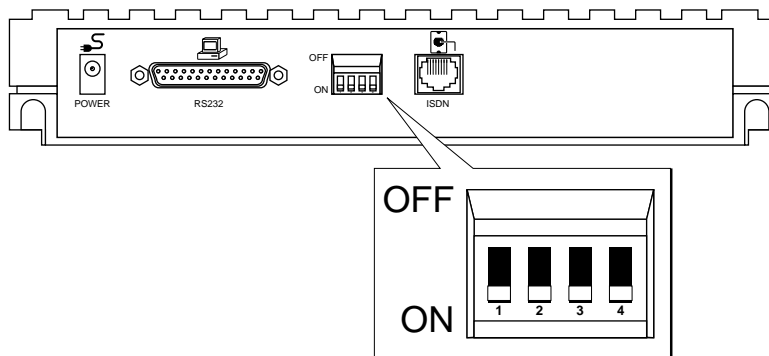
Figure 2-1
Dip Switches on Rear Panel

Connecting the Express XR/XRT

1. Turn the computer off.
2. Using an RS-232 cable, (see the section *Minimum Requirements*) connect the end with the DB-25 connector to the port labeled **RS232** on the Express XR/XRT rear panel.
3. Connect the other end of the RS-232 cable to an available serial COM port on the PC.
4. Plug the small round end of the AC power cord into the jack labeled **POWER** on the Express XR/XRT rear panel.
5. Place the AC power cord plug into a 120 VAC electrical outlet. The Express XR/XRT is now powered on.
6. Plug the RJ-45 connector (large end) of the RJ-45 to RJ-11 telephone cable into the jack labeled **ISDN** on the rear of the Express XR/XRT.

7. Plug the RJ-11 connector (small end) of the RJ-45 to RJ-11 telephone cable into the ISDN telephone wall jack. At this time the Express XR/XRT is powered on and the **PWR** LED should either be flashing or on solid. See the section *LEDs* for more information.
8. Power on the computer.
9. Go to the *Express XR/XRT Software Installation* procedure.
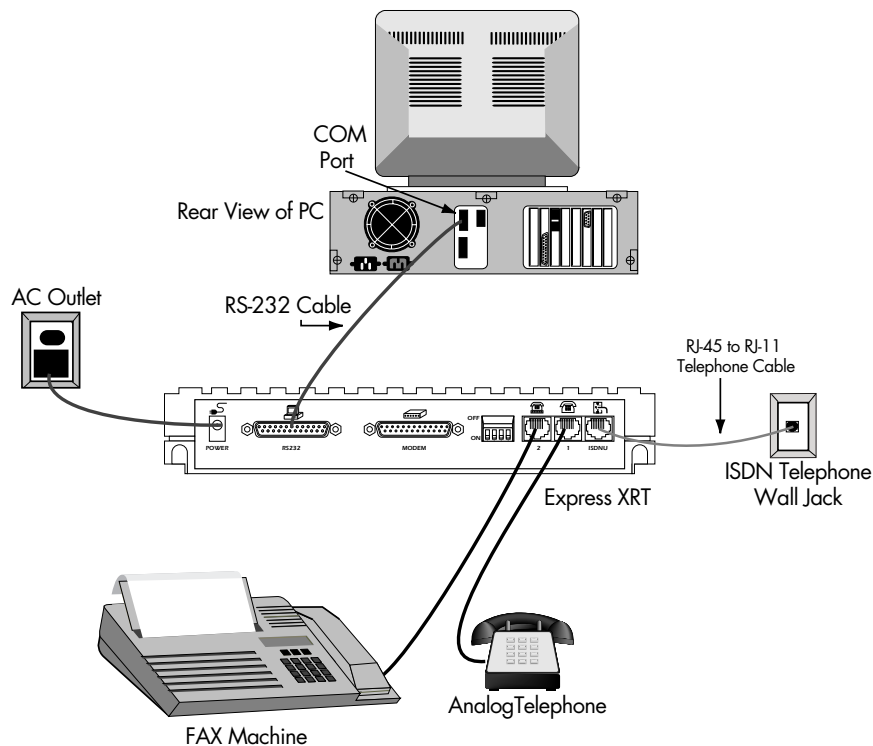
Figure 2-2
Standard ISDN Internet/Remote Access Application

Express XR/XRT Software Installation

The installation procedure varies according to the PC operating system. If the PC is not already on, power on the PC, start Microsoft Windows and use the following installation procedure that applies to your operating system.

Microsoft Windows 95 and Windows NT 4.0

Windows 95 Plug and Play

1. During the Windows 95 boot process, if the **New Hardware Found** screen appears indicating **Unknown Device**, select **Driver from disk provided by hardware manufacturer**. If the Windows 95 **New Hardware Found** screen does not appear, skip the rest of this section and go to the *Win 95/NT 4.0 Control Panel Modem Installation* section.
2. Insert the disk labeled **Windows 95 and Windows NT** into the 3.5" floppy disk drive.
3. Click **OK**. The **Install From Disk** screen should appear.
4. Click **OK** or use **Browse** to locate the correct disk drive.
5. Select **ADTRAN Express XR** or **XRT** from the Drivers list.
6. Click **OK**. Windows installs the INF file and a modem labeled **ADTRAN XR** or **XRT** on the COM port to which the unit is connected.
7. Check for the device. From **Start**, choose **Settings**, then **Control Panel**, then double click **Modems**.
8. The ADTRAN Express XR or XRT should be listed under the General tab in the **Modems Properties** dialog box.

NOTE *If the computer does not have a 16650 UART (or you are not sure it has a 16650 UART), select the **ADTRAN Express XR** or **XRT,** click on **Properties** ,and change the Maximum speed from 230400 to 115200.*

9. Click **OK**.
10. Click **Close**.
11. Go to the *Express Configuration Wizard Installation* section.

Win 95/NT 4.0 Control Panel Modem Installation

NOTE *For Windows NT 4.0, you must be a member of the **administrator group** to install a new modem.*

1. From the **Start** button, choose **Settings**, then choose **Control Panel**, then double click **Modems**.
2. If a modem has not been installed on the computer previously, the modem installation process begins immediately. From this menu, choose **Add** to begin installation of the Express XR/XRT.
3. In the **Install New Modem** dialog box, check **Don't detect my modem; I will select it from a list**.

4.   Click **NEXT**.
5.   Click the **Have Disk** button.
6.   Insert the disk labeled **Windows 95 and Windows NT** into the 3.5" floppy disk drive.
7.   Click **OK**.
8.   Select **ADTRAN Express XR or XRT** from the **Drivers** list.
9.   Click **NEXT**.
10. Choose the COM port to which the Express XR/XRT is attached from the list of available COM ports.
11. Click **NEXT**. The modem.INF file is now installed.
12. Continue the installation by providing country, area code, and outside line access information as prompted.
13. Click **NEXT**.
14. Click **Finish** to complete the modem installation process.
15. Select **Close**.
16. Go to the *Express Configuration Wizard Installation* section.

Express Configuration Wizard Installation

The Express Configuration Wizard is a graphical user interface which allows you to configure and test the Express XR/XRT with ease. Follow the installation procedure that applies to the operating system.

Microsoft Windows 95 and Windows NT 4.0

1.   From the **Start** button, choose **Settings**, then **Control Panel**, then double click **Add/Remove Programs**.
2.   From the **Install/Uninstall** tab select the **Install** button.
3.   Insert the disk labeled **Windows 95 and Windows NT**.
4.   Click **NEXT**.
5.   If the disk is found click **Finish**, otherwise use **Browse** to first locate the disk. The Express Configuration Wizard begins installation.
6.   Follow the step-by-step screen instructions throughout the installation process. Three options are available for installation during the Express Configuration Wizard installation: Express Configuration Program, INF Files, and HyperACCESS Communications Software. Figure 2-3 illustrates the three options.

Figure 2-3
Installation Options

By default, the Express Configuration Wizard and INF files are installed. Click on the box labeled **HyperAccess Communications Software** if you wish to use HyperACCESS as your communications software. Otherwise, leave the box unchecked.

Once installation is complete, an **ADTRAN** group is created and placed in the **Programs** menu on the **Start** button. The software can be started by choosing the **Express Configuration Wizard** icon or it can also be started by double clicking on the **ADTRAN Express Configuration** icon located on the control panel.

Get On With It!
Go to the section *Using the Express Configuration Wizard.*

Microsoft Windows 3.1 and Windows NT 3.51

If running Windows 3.1, or version 1.2 or later of the Express Configuration Wizard, skip the *Windows NT 3.51 INF File Installation* section and go to *Express Configuration Wizard Installation* section.

NOTE *If running Windows NT 3.51, install remote access service before following the INF file installation procedure.*

Windows NT 3.51 INF File Installation

To install an ADTRAN Express XR/XRT use the following procedure:

1. Locate the **modem.inf** file. This file is normally located in the **c:\winnt35\system32\ras** directory. See the Windows NT documentation for instructions on installing the Remote Access Service.
2. In order to recover in case of a user mistake, create a backup of the modem.inf file.
3. Using Notepad or another text editor, open the adtran.inf file on the Express Configuration Wizard disk labeled **Windows 95 and Windows NT**.
4. Copy the contents of the adtran.inf file to the Windows clipboard.
5. Open the modem.inf file.
6. Paste the contents of the clipboard (adtran.inf) to the end of the modem.inf file.
7. Save the altered modem.inf file.
8. Close the modem.inf file.
9. Restart the system.
10. Go to the section *Express Configuration Wizard Installation*.

The Express XR/XRT can now be configured for use with the Remote Access Service.

Express Configuration Wizard Installation

Microsoft Windows 3.1 and Windows NT 3.51

The Express Configuration Wizard is a graphical user interface which allows you to configure and test the Express XR/XRT with ease. Follow the installation procedure that applies to the operating system.
1. For Windows 3.1 operating systems, insert the ADTRAN Express Configuration Wizard disk labeled **Windows 3.1** into your 3.5" disk drive. For Windows NT 3.51, insert the disk labeled **Windows 95, Windows NT** into your 3.5" disk drive.
2. In Windows Program Manager, select the **Run...** option under the **File** menu.

3. In the command line, type **a:\setup** (where *a* is the disk drive where the ADTRAN Express Configuration Wizard disk was inserted).
4. Follow the screen prompts and insert disk(s) as requested.

Once installation is complete, an **ADTRAN** program group is created and placed in the Program Manager. The Express Configuration Wizard software can be started by double clicking on the **Express Configuration** icon in the ADTRAN program group. The ADTRAN Express Configuration Wizard software can also be started by double clicking on the **Express Configuration** icon on the Control Panel.

Get On With It!
Go to the section *Using the Express Configuration Wizard.*

Basic Telephone Service

In addition to the computer connection, two analog devices such as a telephone, FAX, modem, answering machine, or caller ID box can be connected using the two POTS interfaces on the rear panel (RJ-11 jacks labeled **1** and **2** with a diagram of a telephone above the jack).

Supplementary Voice Services

Supplementary services such as call forwarding, caller ID, call return, call holding, three- or six-way conference, call transfer, and call waiting are fully supported by the Express XR/XRT on a touch-tone telephone. These services are available only if included in the ISDN line configuration and are implemented using the standard commands provided by the telephone company.

Call Waiting

Call Waiting permits one voice call to be placed on hold while answering another voice call. Use the flash-hook to place the active call on hold and answer an incoming call. Hanging up terminates both calls. The call waiting tone can be disabled and enabled using a touch-tone phone as follows:

Disable call waiting: Press ** **0**
Enable call waiting: Press ** **1**

Conference Calling

Conference Calling (also known as three-way calling) permits a conversation between three parties, each at different locations.

During a voice call, the call waiting tone signals a second incoming call. Flash-hook to place the first call on hold and answer the incoming call. Flash-hook again to retrieve the first caller. A third flash-hook conferences all three parties.

Automatic Redial

Automatic redial dials the last number dialed. This can be accomplished using a touch-tone phone as follows:

Redial last number: Press ** **5**

> **NOTE** *When connecting to a National ISDN 1 switch, call conferencing and call transferring are assigned a unique feature identifier number. This number may not be the same in all areas. S-registers 90 and 91 contain the feature identifier numbers for conference and transfer. If these features do not work, contact your ISDN provider.*

Phone Number Allocation

The Express XRT allocates ISDN phone number 1 to POTS port 1. Connect the primary telephone to POTS port 1 as shown in Figure 2-2.

ISDN phone number 2 is shared by the RS-232 port and POTS port 2, therefore only one can be used at a time.

> **NOTE** *ISDN data calls and external modem applications must be placed to ISDN phone number 2.*

Single Phone Number Operation

For AT&T 5ESS point-to-point lines and other lines with a single phone number, incoming voice calls are routed to POTS port 2 to allow for use of either a modem or a telephone. Service on POTS port 1 is not available.

Using the Express Configuration Wizard

1. From the **Start** button, choose **Programs,** then **ADTRAN**, then double click **Express Configuration**. After auto-detection, the screen shown in Figure 2-4 is displayed; skip to Step 5. If the Express XR/XRT cannot be auto-detected the error message shown in Figure 2-5 is displayed.
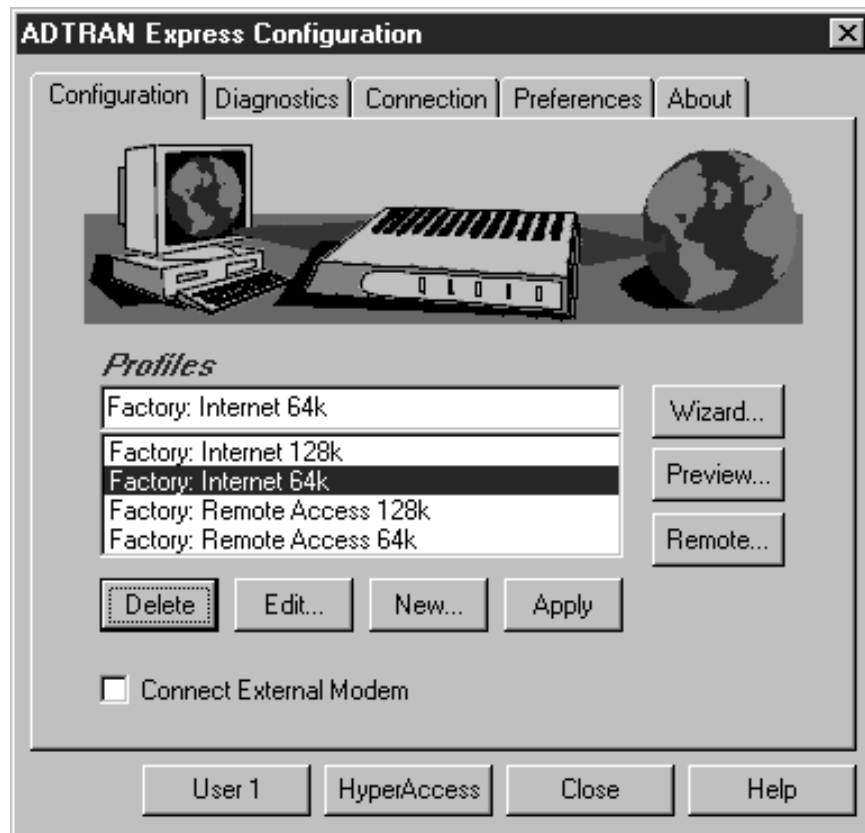
Figure 2-4
ADTRAN Express Configuration Screen
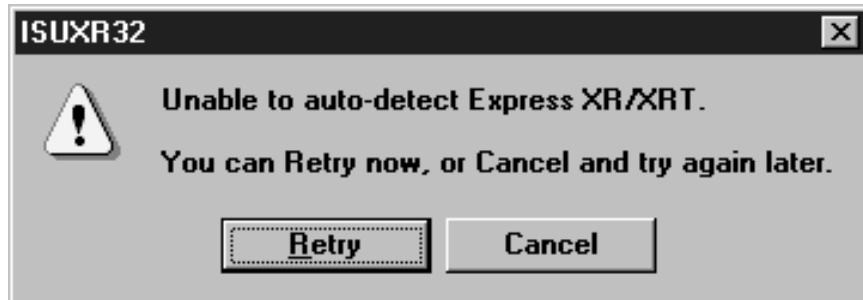
Figure 2-5
Unable to Auto-Detect

2.   If the error message shown in Figure 2-5 is displayed, click
     Cancel. The screen shown in Figure 2-4 is displayed.
3.   Select the **Connection** tab. The screen shown in Figure 2-6
     is displayed.
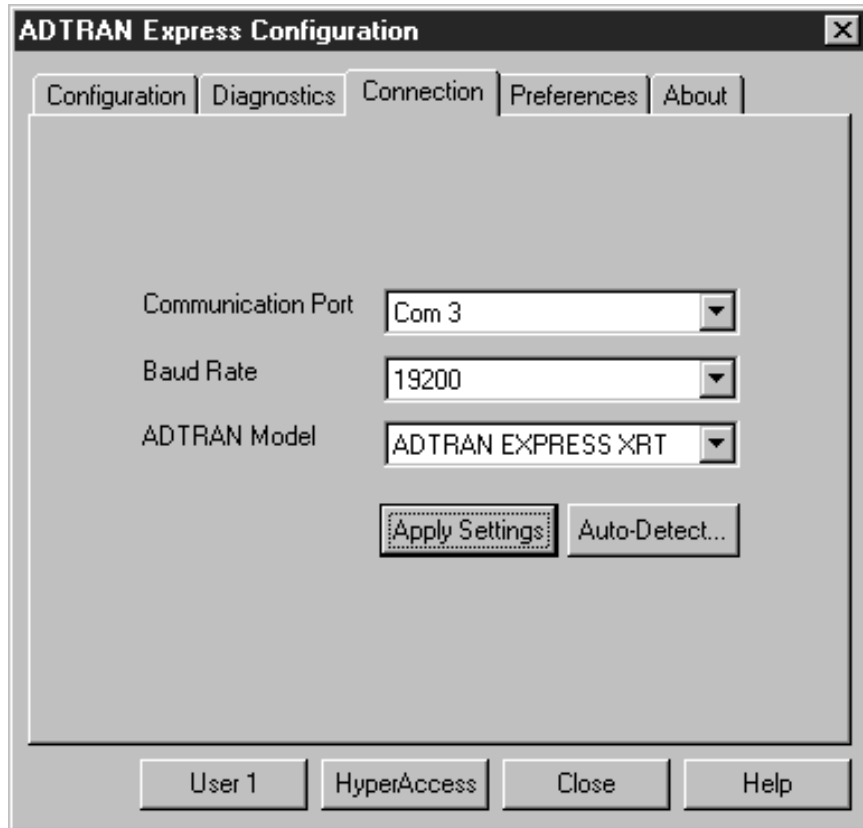
Figure 2-6
Express Configuration Wizard Connection Tab

4. Check the power and the cable connections then select the
    Auto-Detect button.   If the error message shown in
    Figure 2-5 is displayed again, see the chapter *Troubleshooting*.
5. Choose **Wizard** under the **Configuration** tab.
6. Read the screen instructions and click **NEXT**.
7. Verify the unit information and the COM port to which it is
    connected are shown correctly; choose **NEXT**.
8. Enter the area code and ISDN phone numbers provided by
    the ISDN service provider. Since the ADTRAN Express XR/
    XRT supports an **Automatic SPID and Switch Detection**
    algorithm, this is all the information required.
9. Click **NEXT**.

10. Click **NEXT** to use **Automatic SPID and Switch Detection** or enter the Switch Type and service profile IDs (SPIDs) provided by the telephone company.
11. Check the **Auto-detect SPIDs/Switch Types** option.
12. Click **NEXT.**
13. Choose the factory profile closest to your particular application. The **Preview** button can be used to view these settings.
14. Click **NEXT.**
15. To change the profile name for future reference select the **Change Profile name** option and enter a new name. Otherwise, the default name shown on the screen is used. Ensure the telephone cable between the Express XR/XRT ISDN connector and the walljack is connected before proceeding.
16. Click **Finish**. The **Auto-Detecting Service Profile IDs** screen is displayed while the **Automatic SPID and Switch** algorithm executes.

After installation is complete the Express XR/XRT is ready for use. If any error screens are encountered or the unit remains at **Link Down** for longer than 15 minutes, see the chapter *Troubleshooting*.

Auto-Detect SPIDs/Switch Type

Auto-detection of SPIDs and Switch Type greatly reduces the likelihood of time-consuming problems occurring during installation of the Express XR/XRT. It evaluates common SPID formats based on the area code and phone numbers and reports success after placing a test call.

NOTE *After installation is complete, the Express XR/XRT resets the ISDN line for a clean start. Therefore, the PWR/LINE LED may not be on solid (indicating link up) for a few more seconds.*

In the few cases where the procedure does not succeed, the nonstandard SPIDs may be entered at Step 10 of the preceding procedure (*Using the Express Configuration Wizard*).

Using the Express Configuration Wizard Help

On-line help is available by clicking the **Help** button displayed in the Configuration screen. On-line help provides detailed information regarding such features as creating a custom profile, defining a user button, remote configuration, and testing.

Express Configuration Wizard Tray Tool

The Tray Tool is used for quick access to the Express Configuration Wizard and to enable or disable the external analog modem when used with an Express XRT.

NOTE *The Express Configuration Wizard Tray Tool is provided only with the Windows 95 and Windows NT 4.0 versions of the Express Configuration Wizard.*

To enable the Express Configuration Wizard Tray Tool, use the following procedure:

1. Run the Express Configuration Wizard. See the section *Using the Express Configuration Wizard.*
2. Close the Express Configuration Wizard.
3. Once the Express Configuration Wizard is closed, the Windows 95 or Windows NT 4.0 taskbar will have a new icon in the Tray Tool. Figure 2-7 illustrates the new taskbar with the new icon in the Tray Tool.

Figure 2-7
Express Configuration Wizard Tray Tool

To prevent the Express Configuration Wizard Tray Tool from launching once the Express Configuration Wizard software is closed, uncheck the box labeled **Add tray icon** under the Preferences tab in the Express Configuration Wizard software (shown in Figure 2-8).
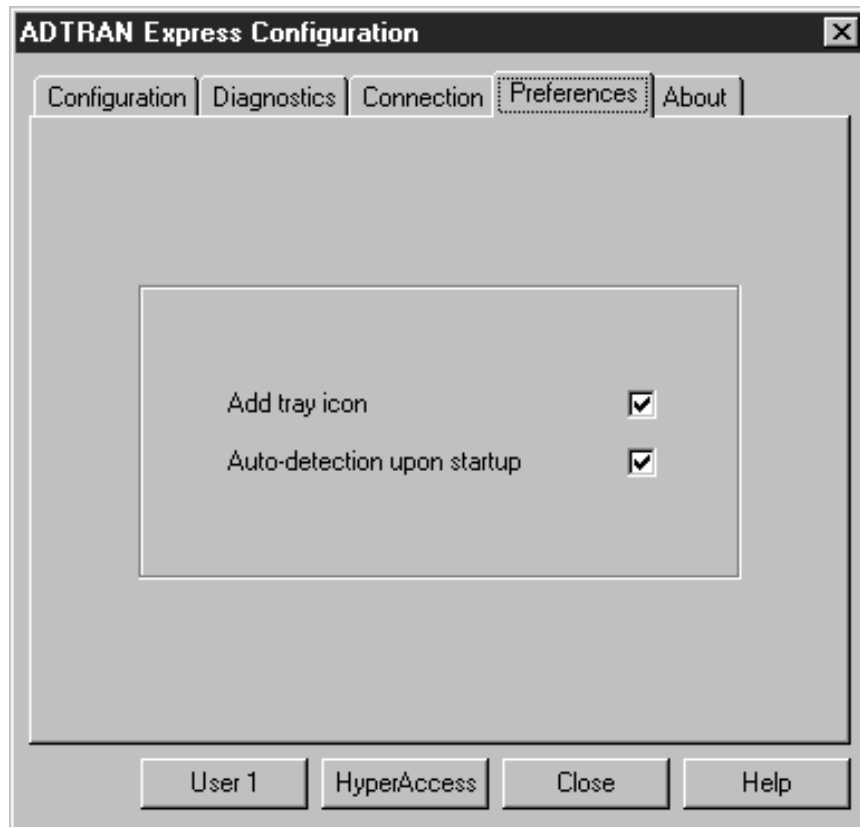
Figure 2-8
Preferences Tab

Three icons appear in the Tool Tray at different times representing three different states of the Express Configuration Wizard Tray Tool.

The icon illustrated in Figure 2-9 indicates the external analog modem is connected to the Express XRT and is enabled. Double clicking on this icon causes the Express Configuration Wizard Tray Tool to disable the external analog modem.

Figure 2-9

Express XRT Disabled, External Analog Modem Enabled

This icon is not available when using an Express XR. Double clicking on this icon, when using an Express XRT, enables the external analog modem.

The icon illustrated in Figure 2-10 indicates the external analog modem is not connected and/or not enabled.

Double clicking on this icon enables the external modem when connected to an Express XRT. This is the default icon when in use with the Express XR.

Figure 2-10

Express XR/XRT Enabled, External Analog Modem Disabled

The icon illustrated in Figure 2-11 indicates the Express Configuration Wizard Tray Tool is in an unknown state. This icon may appear if the Express XRT is not connected to a COM port on the PC. Double clicking on this icon instructs the Express Configuration Tray Tool to refresh the connection status.

Figure 2-11

Unknown State

Express Configuration Tray Tool Menu

When using the Express Configuration Wizard Tray Tool with the Express XRT, use the **right** mouse button and click on the icon. The menu in Figure 2-12 appears.

Figure 2-12
Express Configuration Wizard Tray Tool Menu

If the Express Configuration Wizard Tray Tool is used with an Express XR, a slightly different menu appears.

Enable/Disable Modem
Enable or Disable the external analog modem. This option is only available when connected to an Express XRT. See the chapter *Installing an Analog Modem* for more information.

Properties
Launches the Express Configuration Wizard software.

Refresh
Instructs the Express Configuration Wizard Tray Tool to refresh the icon status.

About
Displays version information.

Exit
Exits the Tray Tool.

Installing Windows 95 Dial-Up Networking

Dial-Up Networking for Windows 95 is most commonly used for connections to Internet Service Providers or other networks.

Use the following procedure to install Windows 95 Dial-Up Networking:

1. From **Star**t, choose **Settings**, then **Control Panel**, then double click **Add/Remove Programs**.
2. Double click on the **Communications** option under the **Windows Setup** tab.
3. If not already selected, check **Dial-Up Networking.**
4. Click **OK** to select these changes.
5. Click **OK** to begin installation of **Dial-Up Networking**.
6. Restart the computer.
7. Once Windows boots, from **Star**t, choose **Settings**, then **Control Panel**, then double click **Network**.
8. From the Network list, verify the following components are installed: Dial-Up Adapter and TCP/IP for Dial-Up Adapter. If you intend to use your Express XR/XRT for Internet access, these should be the only components needed. Verify the software setup from your Internet Service Provider or network administrator to ensure the networking components are set up properly.
9. Click **OK** once you have verified these components are installed.
10. To create a Dial-Up Networking connection select **My Computer**, then choose **Dial-Up Networking**. The first time Dial-Up Networking has been used, the **Welcome to Dial-Up Networking** menu appears.
11. Click **NEXT**.
12. Enter the name for this connection and select the **ADTRAN Express XR or XRT** from the modem list. You may configure DTE speed and server information by choosing the **Configure** button next to the selected modem.
13. Click **NEXT**.

14. In the **Make a New Connection** menu, enter the number to dial.
15. Click **NEXT**.
16. Click **Finish** to complete the new connection setup.
17. To use this connection, select it from **My Computer**, **Dial-Up Networking**. Windows dials the number using the modem and properties as configured. When using the connection the first time, network log in information such as the user name and password must be entered. This information should be provided from the Internet Service Provider.

MACINTOSH CONFIGURATION

A Macintosh can be used to configure the Express XR/XRT by using a terminal emulation package such as MicroPhone Pro™ and following the VT 100 configuration directions.

VT 100 TERMINAL EMULATION

The Express XR/XRT can be configured using any communications package supporting VT 100 terminal emulation. To enter into the menus, type **AT!V Enter**. To go to a particular menu, press the hot key sequence for that menu. The main branches of the menu tree and their hot keys are as follows:

STATUS (Ctrl + V)
TEST (Ctrl + T)
CONFIG (Ctrl + C)
DIAL (Ctrl + D)

> **NOTE** *Ensure that the communications package is configured to pass these Control Sequences through to the Express XR/XRT.*

To exit the menus, press **Ctrl** + **X**. The **Ctrl** + **X** command also places the unit back on-line if a call is connected.

Some features in the Express XR/XRT do not immediately take effect upon selection. This prevents unintentional reconfiguration of the Express XR/XRT during an active call. Items such as **Protocol** and **Call Type** take effect *only* at the beginning of a new call.

VT 100 Configuration

1. After connecting a VT 100 terminal enter the command **AT!V** followed by **Enter.** The Configuration screen is the first screen displayed. An illustration of this screen is shown in Figure 2-13.
2. Enter the area code.
3. Enter ISDN phone number 1.
4. Enter ISDN phone number 2.
5. Enable Auto-Detect SPIDs/Switch.
6. View the status by using the key sequence Ctrl+V. An illustration of the status screen is shown in Figure 2-14.

```
                    Express XRT Configuration Menu
  1) Area Code = 205                      17) Configure Remote Unit
  2) ISDN Phone Number 1 =                18) Remote Num. Password =
  3) ISDN Phone Number 2 =
  4) Auto-Detect SPIDs/Switch = Disabled
  5) Switch Type = National ISDN1
  6) Call Type = Data 64K
  7) SPID 1 =
  8) SPID 2 =
  9) Auto Answer = Disabled
 10) Call Screening = Answer Any
 11) Call Routing = All Types->DTE
 12) DTR Options = Ignore DTR
 13) Flow Control = Hardware Flow
 14) Protocol = PPP Asyn-Sync
 15) PPP Mode = PPP
 16) Profiles
_____
 Select =                          Enter SELECT    Esc NO CHANGE



_____
  Ctl-V STATUS   Ctl-T TEST   Ctl-C CONFIG   Ctl-D DIAL   Ctl-X EXIT
```

Figure 2-13
VT 100 Terminal Configuration Menu

VT 100 Terminal Status Buffer

The status buffer can be displayed at any time after entering the menu structure. Pressing **Ctrl** + **V** displays the Express XR/XRT Status menu. The last 20 status messages generated during the operation of the unit are displayed with relevant status items. See Figure 2-14. Status messages provide information about call progress, ISDN link status and error conditions. The most recent status message appears as Status 1 with the remaining status messages appearing in descending order. The status buffer messages and their descriptions are listed in the appendix *Status Buffer Messages.*

Press **Ctrl** + **C** to return to the Configuration menu.

```
                        Express XRT Status Menu
UNIT/LOOP STATUS                          STATUS BUFFER
Call Type        = Data 64K          1 = Factory Reset 0
DTE Rate         = 9600              2 = EMPTY
Self Test        = Passed            3 = EMPTY
Software Rev     = X.27              4 = EMPTY
Checksum         = c23c              5 = EMPTY
Serial Number    =                   6 = EMPTY
Loop Status      = Link Down         7 = EMPTY
Num Dialed       = No Call           8 = EMPTY
RTS              = On                9 = EMPTY
CTS              = On               10 = EMPTY
DCD              = Off              11 = EMPTY
DTR              = On               12 = EMPTY
                                    13 = EMPTY
                                    14 = EMPTY
                                    15 = EMPTY
                                    16 = EMPTY
                                    17 = EMPTY
                                    18 = EMPTY
                                    19 = EMPTY
                                    20 = EMPTY_

 Ctl-V STATUS   Ctl-T TEST   Ctl-C CONFIG   Ctl-D DIAL   Ctl-X EXIT
```

Figure 2-14
VT 100 Terminal Status Buffer Menu

Chapter 3
Installing an Analog Modem

An external or internal analog modem can be connected to the Express XRT to access an Internet provider, BBS, or host server that does not support ISDN.

EXTERNAL ANALOG MODEM APPLICATION

In order to connect an external analog modem to the Express XRT, the following items are necessary:

- External analog modem
- RS-232 serial cable
- RJ-11 to RJ-11 telephone cable

NOTE *Incoming calls must use ISDN phone number 2 for external analog applications.*

In addition to the RS-232 cable connecting the Express XRT to the PC, a separate RS-232 cable is required to connect an external analog modem to the Express XRT. This RS-232 cable is not supplied.

Figure 3-1 illustrates an external analog modem connected to the Express XRT. This setup requires only one PC COM port, and supports DTE rates of up to 115.2 kbps.
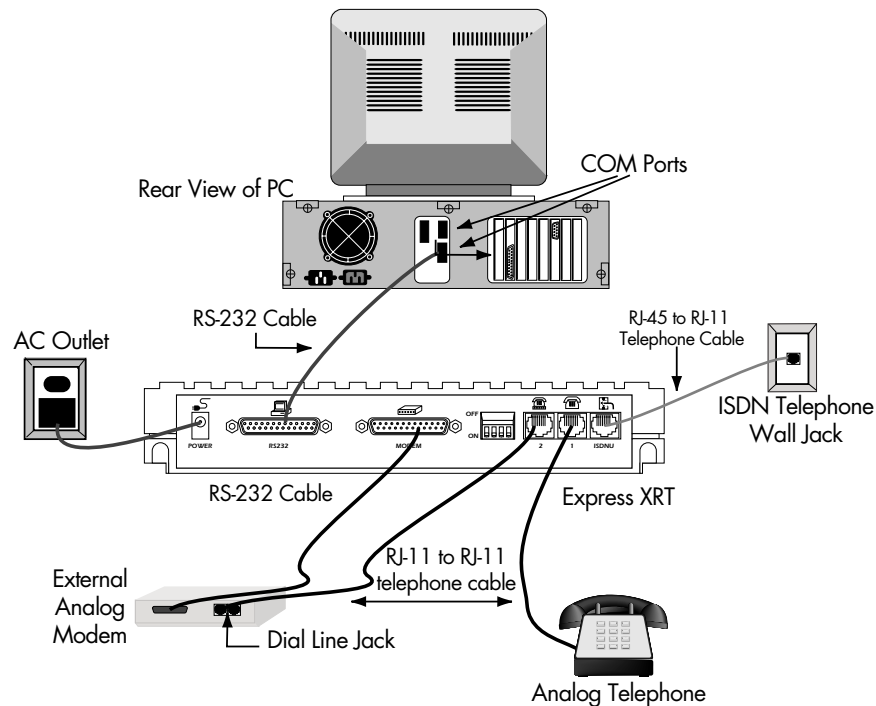
Figure 3-1
External Analog Modem Application

Connecting an External Analog Modem

To connect an external analog modem to the Express XRT use the following procedure:

1. Ensure the Express XRT is connected to the PC. See the section *Connecting the Express XR/XRT* for detailed instructions.
2. Ensure the modem power is OFF before connecting it to the Express XRT.
3. Connect one end of the RS-232 serial cable to the external analog modem.
4. Connect the other end of the same RS-232 serial cable to the Express XRT port labeled **MODEM**. An illustration of a modem is positioned above the modem port.
5. Connect one end of the RJ-11 to RJ-11 telephone cable to the telephone jack labeled **2** on the Express XRT. Positioned

above the jack is an illustration of a telephone above a
modem.

6. Connect the other end of the RJ-11 to RJ-11 telephone cable
    to the **Dial Line** or **Line** jack on the external analog modem.
    See the documentation with the external analog modem to
    determine which jack on the external analog modem is the
    Dial Line or **Line** jack.

7. Power ON the external analog modem.

The external analog modem is now connected to the Express
XRT. In order to configure the external analog modem for use,
set up the communications software to use the same COM port
to which the Express XRT is connected.

If you are connecting a modem to the Express XRT that has
already been in use by Windows 95, you are ready to use the
external analog modem. The external analog modem can be
enabled either through the Express Configuration Wizard or by
using a VT 100 terminal emulation package. See the section
Express Configuration Tray Tool Menu for more information on
enabling and disabling an analog modem.

If you are connecting an external analog modem that has not
been previously in use by Windows 95 see the section *Installing a
New External Analog Modem.*

Installing a New External Analog Modem

1. Start the Express Configuration Wizard.
2. Click **Connect External Modem**.
3. Click **Close**.
4. From **Start**, select **Setting**, then **Control Panel,** and double
    click **Modems**.
5. Click **Add**.
6. Select **Don't detect my modem; I will select it from a list**.
7. Click **NEXT**.
8. Select the manufacturer and model of your modem. If your
    modem is not listed, or if you have an installation disk, click
    Have Disk.
9. Click **NEXT**.
10. Select the COM port to use with this modem. This will be
    the same COM port that is used by the Express XRT.
11. Click **NEXT**.
12. Click FINISH.

13. Click **Close**.
14. The external analog modem may now be used, or you may restart the Express Configuration Wizard and deselect the **Connect External Modem** option to enable the Express XRT.

Configuring an External Analog Modem

If the modem does not support 230.4 kbps, Switch 1 on the back panel of the Express XRT must be On (down) to install and use an external modem with the Express XRT. This limits the DTE speed to 115.2 kbps when using the Express XRT with an external modem. To re-enable the 230.4 kbps operation for ISDN connections, set Switch 1 to the On position.

When using applications supporting Express XRT operation at 230.4 kbps with an external analog modem that does not support 230.4 kbps, attach the Express XRT to the high speed 16650 UART COM port and connect the external modem to a separate COM port. This allows the Express XRT to operate at 230.4kbps and the external modem to operate at the reduced speed.

Required External Analog Modem Settings

There is one setting in the external modem that is required before trying to enable the modem with the Express Configuration Wizard. The Carrier Detect signal from the modem should be set to **Normal** (track the CD signal). This can be accomplished by using the AT command **AT&C1**. AT commands can be entered into the modem using the following procedure:

<cr> indicates to press the **Enter** key on the keyboard.
1. Open a terminal emulation session using HyperACCESS or HyperTerminal.
2. Type **AT_L1 <cr>**
3. Type **AT <cr>**
4. Type **ATI <cr>**
5. Type **AT &C1 <cr>**
6. Type **AT&W <cr>**
7. Type **AT_L0 <cr>**

Controlling an External Analog Modem

There are three options for enabling and disabling an external modem: the Express Configuration Wizard, the WIN 95/NT 4.0 Tool Tray Icon, or a terminal emulation package. See the section *Express Configuration Wizard Tray Tool* for more information on enabling and disabling a modem.

Once the external analog modem is enabled, all further COM activity is transmitted to the external analog modem connected to the Express XRT modem port. The external analog modem RTS and CTS lines are switched over to the PC COM port directly when the Express XRT is commanded to enable the external modem port. This allows the external analog modem to provide flow control as normal.

When the external analog modem is disabled, all further COM port activity is processed by the ISDN terminal adapter within the Express XRT.

Express Configuration Wizard Modem Enable

Run the Express Configuration Wizard and select the **Connect External Modem** option under the Configuration tab. Figure 3-2 illustrates the Express Configuration Wizard **Connect External Modem** option.

See the section *Express Configuration Wizard Tray Tool* for more information on enabling a modem.
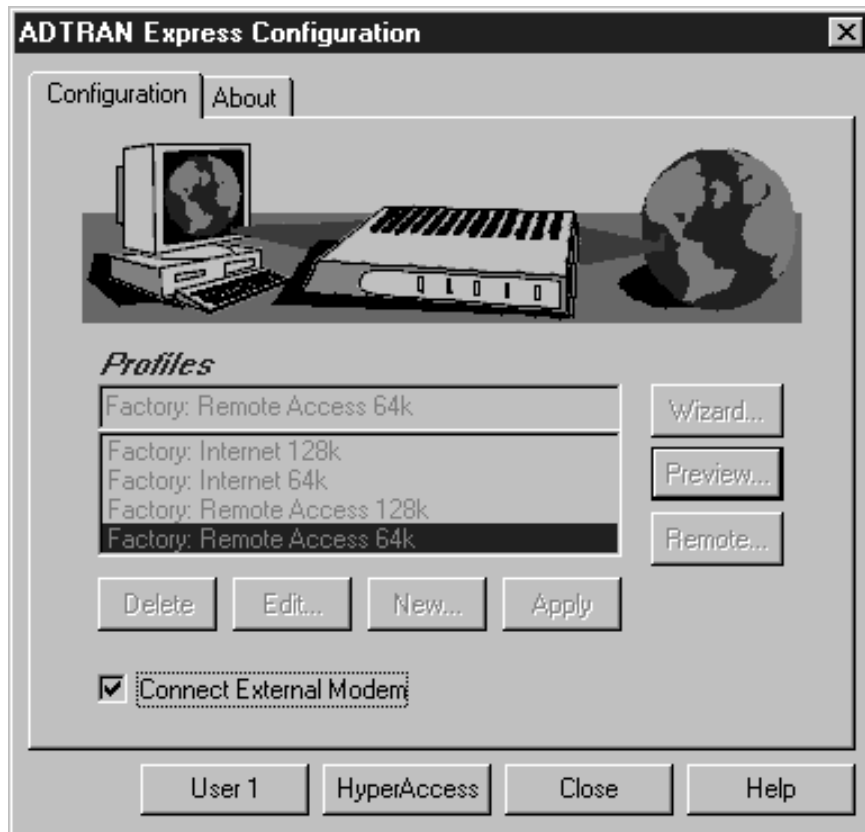
Figure 3-2
Express Configuration Wizard: Connecting an External Modem

If the Express Configuration Wizard software cannot detect the external analog modem, the error message shown in Figure 3-3 is displayed. Ensure the external analog modem and the Express XRT are powered On and the external analog modem is properly connected to the Express XRT.

ISUXR32   ☒

⚠   There is no modem attached to the Express XRT.
     Please attach a modem before checking the "Connect
     External Modem" box.

                              [OK   ]
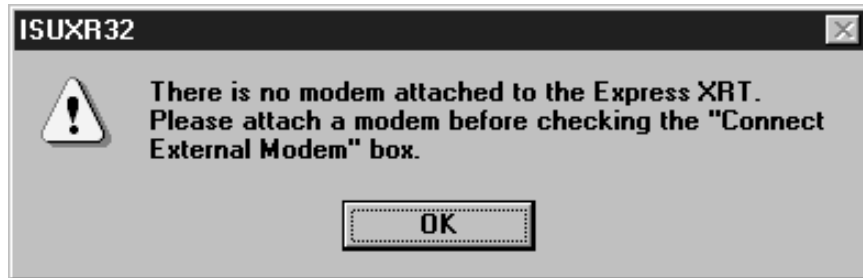
Figure 3-3
No Modem Attached Error Message

Express Configuration Wizard Modem Disable

The external analog modem is disabled using the Express
Configuration Wizard by deselecting the **Connect External
Modem** option. Figure 3-2 illustrates the **Connect External
Modem** option.

See the section *Express Configuration Wizard Tray Tool* for more
information on disabling a modem.

Terminal Emulation Modem Enable

An alternative method is to use a terminal emulation package such as HyperACCESS. In order to determine if an external analog modem is properly connected to the Express XRT, issue the AT command **AT!Z** (followed by **Enter**). If an external analog modem is properly connected to the Express XRT, the Express XRT responds with the message **MODEM FOUND** (shown in Figure 3-4).

The AT!Z command is directed to the Express XRT not the analog modem itself. An ERROR occurs if the command is sent while the external analog modem is enabled.

If the external analog modem is not properly connected to the Express XRT, the Express XRT responds with the message **NO MODEM FOUND**.
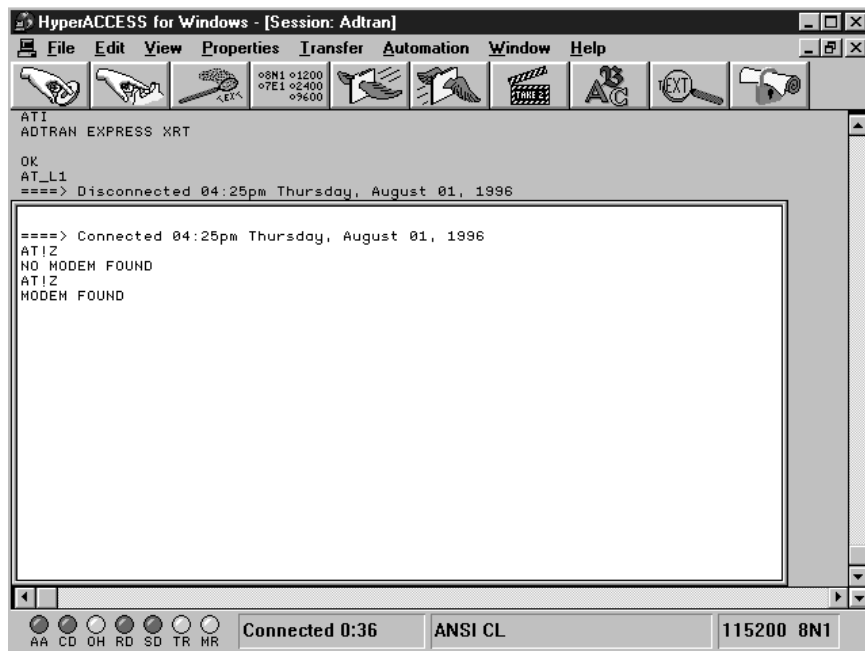
Figure 3-4
HyperACCESS: Verifying External Modem Connection

To enable an external analog modem, issue the AT command **AT_L1** (followed by **Enter**). Figure 3-5 illustrates a HyperACCESS session enabling an external analog modem.
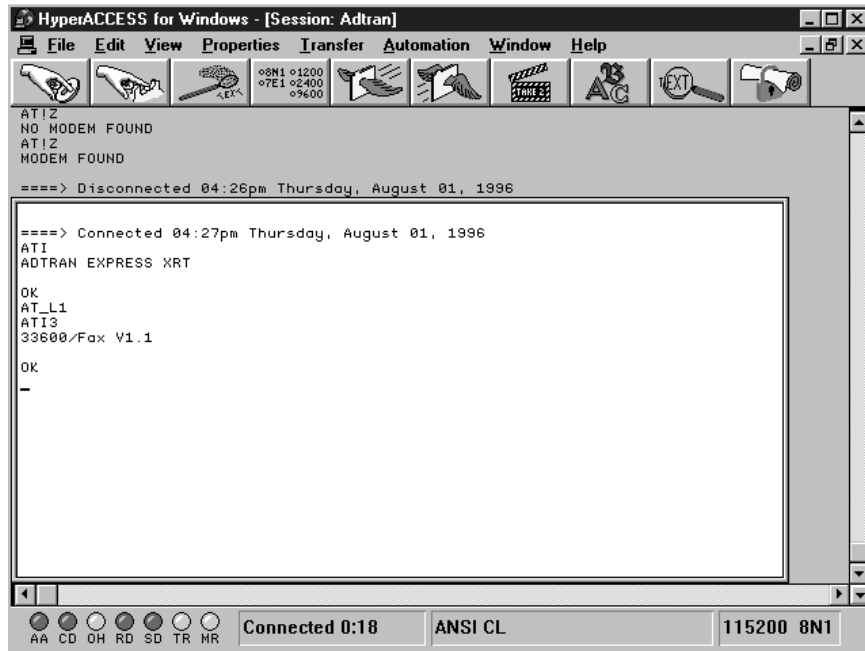
Figure 3-5
HyperACCESS: Enabling an External Analog Modem

Terminal Emulation Modem Disable

When using HyperACCESS or other terminal emulation package issue the AT command **AT_L0** (followed by **Enter**). Figure 3-6 illustrates a HyperACCESS session disabling an external analog modem.
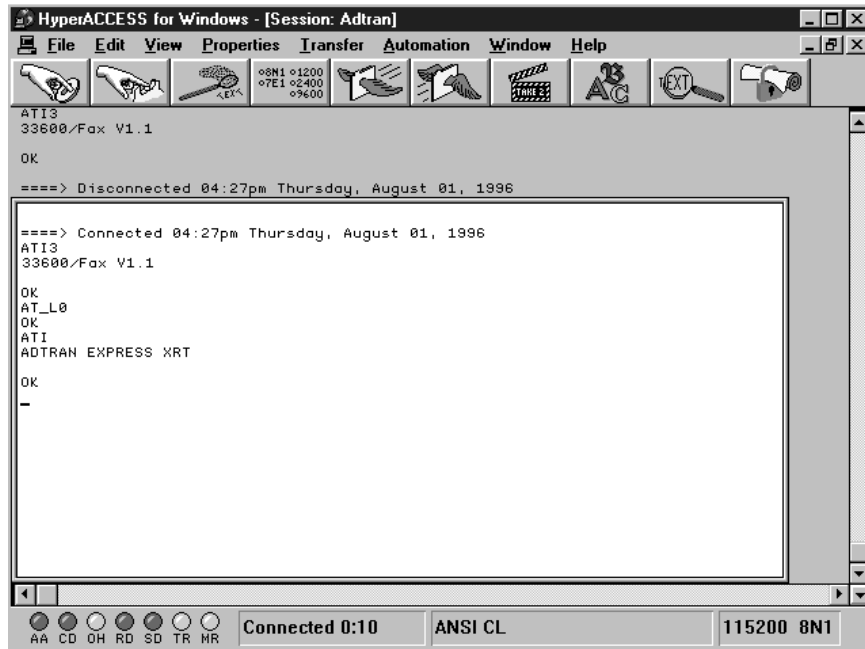
Figure 3-6

HyperACCESS: Disabling an External Analog Modem

NOTE *If carrier detect (CD) is active (a call is connected) on the external analog modem when attempting to disable it, the Express XRT will not switch control from the modem port. The call must be hung-up (disconnected) to deactivate CD.*

INTERNAL ANALOG MODEM APPLICATION

In order to connect an internal analog modem to the Express XRT the following items are necessary:

- Internal analog modem
- RJ-11 to RJ-11 telephone cable

Figure 3-7 shows how to connect an internal modem to the Express XRT.
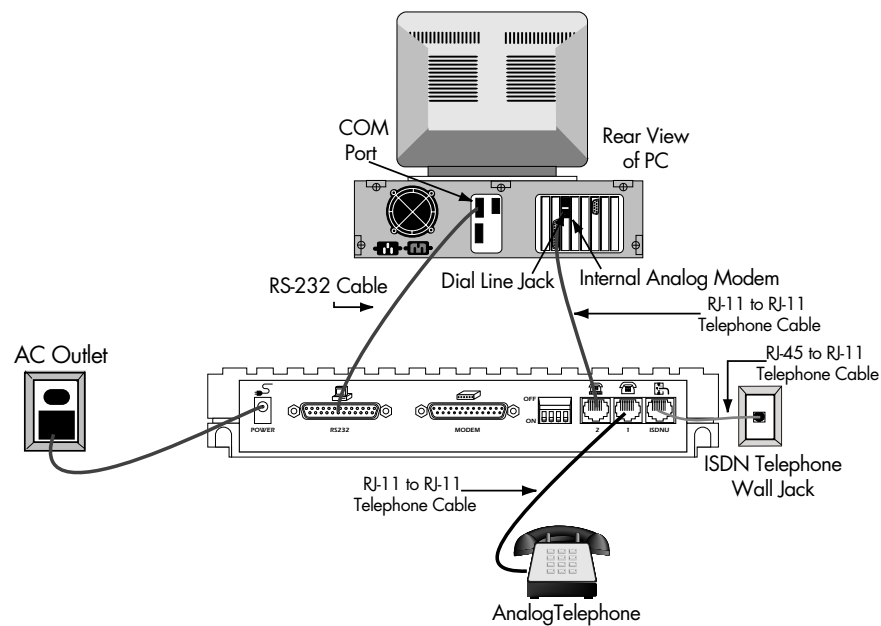
Figure 3-7
Internal Analog Modem Application

When using an internal analog modem and the Express XRT, two COM ports are assigned on the PC. Both COM ports are configured independently. See the manufacturer's documentation for internal analog modem configuration.

Connecting an Internal Analog Modem

To connect an internal analog modem to the Express XRT use the following procedure:

1. Ensure the Express XRT is connected to the PC. See the section *Connecting the Express XR/XRT* for detailed instructions.

2. Connect one end of the RJ-11 to RJ-11 telephone cable to the telephone jack labeled **2** on the Express XRT. Positioned above the jack is an illustration of a telephone above a modem.

3. Connect the other end of the RJ-11 to RJ-11 telephone cable to the **Dial Line** or **Line jack** on the internal analog modem. See the documentation for the internal analog modem to determine which jack on the internal analog modem is the **Dial Line** or **Line** jack.

Chapter 4
Application Configuration

There are three methods available for configuring the Express XR/XRT: Express Configuration Wizard, VT 100 terminal, or AT Commands.

Before configuring the Express XR/XRT for any application, the Express XR/XRT should be connected correctly for the application as described in the chapter *Installation*.

Some features in the Express XR/XRT do not take effect upon selection. This prevents unintentional reconfiguration of the Express XR/XRT during an active call. Items such as Bit Rate, Protocol, and Call Type take effect only at the beginning of a new call.

Technical notes, documents and scripts can be found on the ADTRAN web home page at **http://www.adtran.com** under the **Information Desk**. These provide information on how to use ADTRAN products in specific applications on PC and Macintosh platforms.

FACTORY DEFAULT CONFIGURATION

The Express XR/XRT is shipped configured as follows:

Auto-Detect SPIDs/Switch .... Disabled
Switch Type .... National ISDN 1
Call Type .... Data 64K
Auto Answer .... Enabled
Call Screening .... Answer Any
Call Routing .... Speech/Audio calls to POTS (XRT Only)
DTR Options .... Ignore DTR
Flow Control .... Hardware Flow
Protocol .... Fallback

The Express XR/XRT can be reset to the factory default settings by setting switch 2 to the Off (Up) position. See the section *Switch Settings* in the chapter *Installation* for more information.

PROFILE CONFIGURATIONS

Some common configurations are preset in the Express XR/XRT software as profiles. Most Internet service providers supporting ISDN also support PPP protocol. If connecting to an Internet service provider using one B-channel, select **Factory: Internet 64k** which sets the protocol to PPP. If arrangements have been made with the Internet service provider to use two B-channels, select **Factory: Internet 128k**, which uses multilink PPP protocol.

Loading a factory profile has no effect on any SPID(s), ISDN Phone Number(s), or Switch Type settings already configured. The settings that are altered when applying a profile are shown as follows:

Factory: Internet 64k
Call Type .... Data 64kbps
Auto Answer .... Enabled
DTR Options .... Ignore DTR
Flow Control .... Hardware
Protocol Type .... PPP
PPP Mode .... Single-link PPP

Factory: Internet 128k
Call Type .... Data 64kbps
Auto Answer .... Enabled
DTR Options .... Ignore DTR
Flow Control .... Hardware
Protocol Type .... PPP
PPP Mode .... Multilink PPP

Factory: Remote Access 64k
Call Type .... Data 64kbps
Auto Answer .... Enabled
DTR Option .... Ignore DTR
Flow Control .... Hardware
Protocol Type .... CCITT V.120

Factory: Remote Access 128k

Call Type .... Data 64kbps
Auto Answer .... Enabled
DTR Options .... Ignore DTR
Flow Control .... Hardware
Protocol Type .... Async BONDING

EXPRESS CONFIGURATION WIZARD

This section describes how to use the Express Configuration Wizard software to configure the Express XR/XRT for three common applications: Internet access, remote access, and bulletin board service (BBS) access.

The Express Configuration Wizard software and the application software such as Chameleon™ for Internet™ access or ShivaRemote for remote access should be installed on the computer.

NOTE *The following procedures have been written for Windows 3.1 operating systems. Other operating systems may vary.*

Starting the Express Configuration Wizard Software

After installing the Express Configuration Wizard Software, use the following procedure to launch the software:

1.   In the Windows Program Manager, open ADTRAN program group.

2.   Double click on the icon labeled **Express Configuration**. The ADTRAN Express Configuration Wizard window is displayed.

Internet and Remote Access

Chameleon by NetManage is a Microsoft Windows software package commonly used for Internet access.

ShivaRemote is a software package developed by Shiva Corporation for remote access.

Use the following procedure to configure the Express XR/XRT for Internet access using Chameleon or remote access using ShivaRemote.

Creating a Custom Profile

1. In the ADTRAN Express Configuration window, create a **New** profile by choosing the **New** button and continuing through the steps in this procedure or choose the **Wizard** button and let the Express Configuration Wizard guide you through the setup (skip the rest of this procedure).

2. Select an existing profile on which to base a new profile. To view the settings for a profile, click on the name of the profile and choose the **Preview** button.

3. Once the setup parameters are displayed under the **ISDN Line Setup** tab, select the text in the **Name of Profile** box and enter a new name for the profile. For example: **Joe's Internet Connection.**

4. Enter the following information (under the **ISDN Line Setup** tab) as provided by your telephone company:

   Switch Type
   Area Code
   ISDN Phone Number(s)
   Service Profile Identification Number(s)

   ✎ NOTE
   *If the service profile identifiers (SPIDs) and switch type are unknown, check the box labeled **Auto-detect SPIDs/Switch** and they are determined automatically once the **OK** button is selected.*

5. After completing the parameters in the **ISDN Line Setup** window, click on the **Protocol** tab.

6. The Call Type should only be changed to **Data 56 kbps** if **Data 64 kbps** is not available in your area.

7. Select **PPP** protocol if configuring for Internet access using Chameleon (or other Internet access package), or select **Async BONDING** protocol if configuring for remote access using ShivaRemote.

8. Choose the **OK** button. The new profile, now appears alphabetically in the profiles list of the ADTRAN Express Configuration Wizard window.

Defining a User Program Button

A button can be added to the ADTRAN Express Configuration Wizard window to automatically launch an application like Chameleon, ShivaRemote, or other data communications packages.

ADTRAN has developed a variety of technical support notes and modem scripts for popular data communication packages such as Procomm Plus®, pcANYWHERE™, ReachOut® and more. These can be found on the ADTRAN home page (http://www.adtran.com) under the ISDN Information Desk.

The following procedure explains how to create a button for the profile created in the previous procedure:

1. Select the profile from the profile list in the ADTRAN Express Configuration Wizard window.

2. Choose the **Edit** button.

3. Choose the **Advanced** tab.

4. Choose either the **User Program 1...** or **User Program 2...** button.

5. Choose the **Change Program...** button.

6. Use the Drives and Directories fields to navigate to the executable file. The executable file for Chameleon is **custom.exe** and the default location is **c:\netmanag\custom**. The executable file for ShivaRemote is **connectw.exe** and the default location is **c:\shiva\connectw.exe**.

7. Once the executable file has been selected, choose the **OK** button in the **Open** window.

8. The User Program window is displayed again and the name field can be changed to give the button being created a different name. If no name is entered, a button is created with a default name of the executable file.

9. Choose the **OK** button to update the profile settings.

The **User Program** button previously selected is updated in the ADTRAN Express Configuration Wizard window to reflect the new profile name. To launch the application, choose this button

and follow the application documentation for complete setup information.

BBS Applications

To access a bulletin board service a new profile will need to be created and the protocol of the bulletin board service must be known. HyperACCESS is a Microsoft windows communications package, included with the ADTRAN Express Configuration Wizard software, for use in accessing bulletin board services. To define a custom HyperACCESS session use the following procedure:

Defining a Custom HyperACCESS Session

The following procedure explains how to create a custom HyperACCESS session that can be launched using an icon in the HyperACCESS Phonebook menu.

1. Choose the **HyperAccess** button in the ADTRAN Express Configuration Wizard window. The Phonebook window is displayed.

2. Press the **New** button in the Phonebook window. The Description window is displayed.

3. Type in a name for the session in the **System Name** box.

4. Choose an icon for the session in the Icon box.

5. Choose the **OK** button.

6. Verify and enter the following settings:

   Phone Number to Dial
   Baud Rate
   COM Port
   Modem

7. Choose the **OK** button.

8. Choose the **Establish a Connection** button on the tool bar (the first button on the left). Once connection is established, **Connected** is displayed at the bottom of the Session window.

9. When the session is complete, disconnect the call by choosing the **Break a Connection** button on the tool bar (second

button from the left). **Disconnected** is displayed at the bottom of the Session window.

10. Save the file by selecting **Save** in the File menu.

11. Select **Close** in the File menu.

This custom session can now be used by double-clicking on the new icon just created.

Chapter 5
Troubleshooting

TROUBLESHOOTING GUIDELINES

This section provides troubleshooting techniques to possible problems that may be encountered while operating the Express XR/XRT. If problems persist contact ADTRAN technical support for assistance (see the back cover of this manual).

Power/Line LED is Off

Indicates a problem with the power to the unit. Verify the power cord is connected to the Express XR/XRT and is plugged into a known working 120 volt AC electrical outlet.

Power/Line LED Flashes and B1 and B2 LEDs are Off

This indicates a problem with the physical connection of the ISDN line from the local telephone company to the Express XR/XRT.

1. Verify the large end of the RJ-45 to RJ-11 telephone cable (included with the Express XR/XRT) is connected to the ISDN connector on the rear panel of the Express XR/XRT.

2. Verify the small end of the RJ-45 to RJ-11 telephone cable is connected to the ISDN telephone wall jack installed with Basic Rate ISDN.

3. Contact the local telephone service provider.

Power/Line LED, B1, and B2 LEDs Flash Green

This indicates a configuration problem. Verify the following information is correct:
• Switch Type
• Service Profile Identifiers (SPIDs)
• ISDN Phone Numbers

This information can be viewed by choosing the **Status Register** button under the **Diagnostics** tab of the ADTRAN Express Configuration Wizard window or the Configuration Screen in the VT 100 menu system. The Link Status should indicate **Link Up** if all configuration information is correct and the unit is properly connected. If the link status is good and calls still can not be placed, review the section for *Dial-Up Connection Problems.*

Auto-Detect can be used under the **Wizard** button in the AD-TRAN Express Configuration software (or by using the **Auto-Detect SPIDs/Switch** option in the Configuration screen of the VT 100 menus) to automatically detect the SPIDs and the Switch Type.

Look for the following with the COM port setup:

• IRQ conflicts.
• Wrong DTE speed.
• Use Microsoft diagnostics (msd.exe) to verify the COM port has 16550 UART (for speeds of 115.2 kbps and below) or a 16650 UART (for speeds up to 230.4 kbps).
• Proper COM driver is installed (not provided) to support DTE speeds above 19.2 kbps.

Verify the correct protocol is selected:

• PPP or V.120 generally for Internet applications
• V.120 or Async BONDING for work-at-home

Dial-Up Connection Problems

Many connection problems can be diagnosed by viewing the status buffer message returned from the ISDN network and the Express XR/XRT. These messages are accessed by choosing the **Status Buffer** button in the **Diagnostics** tab of the ADTRAN Express Configuration window.

The Status buffer can also be accessed using the key sequence **Ctrl+V** in the VT 100 menu system. Issue the AT command **AT!V** from a terminal emulation package such as HyperACCESS to invoke the VT100 menu system.

Auto-detect Switch/SPIDs Remains at Link Down

The Link Down condition persisting for longer than 15 minutes indicates a problem with the ISDN line provided from the telephone company. The ISDN physical layer device has not been able to synchronize to the network. Ensure the RJ-45 to RJ-11 telephone cable is correctly installed between the Express XRT and the ISDN wall jack and that the Express XR/XRT is powered on. If the wall jack does not have ISDN installed on the two middle pins (tip, ring), the Express XR/XRT will never synchronize to the telephone switching equipment. Call the local telephone company and have them check the ISDN line for correct operation.

Express XR/XRT Not Detected

If the Express Configuration Wizard cannot detect the Express XR/XRT verify the following:

1. The Express XR/XRT is powered on.

2. No other Windows applications are running that could be using the COM port to which the Express XR/XRT is attached. A Windows application does not have to be active to tie up a COM port, be sure to check the Windows 95 Taskbar for any suspended applications (such as HyperTerminal and HyperACCESS) that may be using the COM port. If any are minimized, these must be closed before starting the Express Configuration Wizard.

3. If you are operating the Express XR/XRT at 230.4 kbps, ensure that switch 1 on the rear panel is off. This is required for operation at 230.4 kbps. Also, confirm that the computer has a 16650 UART.

External Analog Modem Not Detected

If the Express Configuration Wizard cannot detect the external analog mode verify the following:

1. The external analog modem is powered on.

2. The external analog modem is properly installed and configured for use with the Express Configuration Wizard. See *Configuring an External Modem* for more details on the required settings.

Difficulty with 230.4 kbps Operation

If the Express XR/XRT does not work when the DTE rate is set to 230.4 kbps inside Windows, verify the following:

1. Verify that switch 1 on the back of the Express XR/XRT is set to off (up).

2. Verify that a high speed serial card with a 16650 UART is being used and the software drivers to support the extended baud rate tables are installed.

Dial-Up Networking Difficulty

If Windows 95 Dial-Up Networking cannot talk to the Express XR/XRT, check the modem configuration for the Express XR/XRT. Ensure the bit rate for the DTE is set correctly. If the PC is not equipped with a 16650 UART then the fastest DTE operation speed is 115.2 kbps. Ensure the speed is not higher than the PC and modem can support.

Appendix A
AT Commands and S-Registers

AT Commands

While a call is not established, the DTE port accepts AT commands. During this time, the CD signal is inactive. When a call is established, the port is used for data. This data mode is indicated by the CD signal active. The Express XR/XRT can be configured and controlled with AT commands from a serial port similarly to analog modems.

To exit data mode and enter command mode, the serial port must transmit a proper escape sequence to the Express XR/XRT. A specified time delay must occur between the last data character and the first escape sequence character. This is the guard time delay, and it can be changed by writing a value to the S12 register. The default value for the guard time is one second. For a valid escape sequence to occur, the DTE must transmit the escape code character three times in succession with delay between each character being less than the guard time. The default escape sequence is +++.

Once command mode is entered, AT commands can be transmitted to the Express XR/XRT to configure most of the options, dial remote Express XR/XRTs, or initiate tests to check both the Express XR/XRT and the network connections. All command lines must begin with the AT character set in either capital or lower case letters. To return an active call to the on-line state type **ATO**.

The command line may contain a single command or a series of commands after the AT attention code. AT commands **_L1** and **_L0** are exceptions and must be on a separate line followed by **Enter**. When a series of commands are used, the individual

commands may be separated with spaces for readability. The maximum length for a command line is 40 characters. Each command line is executed by the Express XR/XRT upon receipt of a terminating character. The default terminating character is a carriage return (ASCII 013), but it can be changed by writing a different value to register S3. Before the terminating character is transmitted, the command line can be edited by using the backspace character (ASCII 008) to erase errors so the proper commands can be entered.

Using an AT Command

Type **AT** followed by the letter of the command and numeric value of the setting desired and then press **Enter**. The following command returns the software version of the unit:

```
ATI1
```

Using S-Registers

The configuration of the Express XR/XRT can be changed or reviewed with S-registers. See the section *S-Register List* in this chapter for a description of each S-register and its corresponding range of values.

Reading an S-Register

Type **ATS** followed by the number of the S-register to be read followed by a question mark and press **Enter**.

```
ATS0?
```

Reading an S-Register String

The Express XR/XRT uses S-register strings to store strings of digits for stored phone numbers, SPIDs, etc. Type **ATSS** followed by the number of the string S-register to be read followed by a question mark and press **Enter.**

```
ATSS80?
```

Changing an S-Register

Type **ATS** followed by the number of the S-register to be changed, an equal sign, the numeric value to be assigned to the register, then press **Enter**.

```
ATS0=2
```

Changing a String S-Register

Type **ATSS** followed by the number of the string S-register to be changed, an equal sign, the numeric string to be assigned to the register, then press **Enter**.

```
ATSS80=5551212
```

Dialing a Call using the AT Command Processor

To dial a call using the DTE terminal and AT commands type **ATD, ATDT,** or **ATDP** and the telephone number on one line and press **Enter**.

ATD5551212

To end an active call with the AT command processor press the break in key sequence +++ or the redefined key then type **ATH** and press **Enter** to hang up the line.

Command	Function
A	Answer. Places the Express XR/XRT in answer mode.
AT!S	Displays Status Buffer.
AT!S1	Displays Link Status
AT!V	Configuration Menu.
AT!Z	Detect a modem connected to the Express XRT.
D	Dial. Precedes the telephone access number [ATD5551212].
H	Hang up. Disconnects the current call.
I0	Identify unit. Commands the unit to display model number.
I1	Identify software. Commands the unit to display software version.
O	On-line. Commands the unit to go back on line.
S	S Register.
SS	S String register.
Z	Reset. Resets the AT command processor.
&W	Save. Save current configuration to EEPROM.
+++	Break in. Break in AT command processor during an active call. The break in key is defined in S2.

Carrier Detect (CD) Control Line Options

&C0	CD forced on.
&C1	CD normal.
&C2	CD off with local disconnect (LOCD).
&C3	CD off with link down.

Data Terminal Ready (DTR Control Line Options)

&D0	Ignore DTR.
&D1	DTR off forces command.
&D2	Idle when off. DTR off forces idle (On allows auto answer).

Command   Function

Generic Unit Configurations

&F0   Factory Default (fallback auto-protocol detect)
&F1   Internet 64K
&F2   Internet 128K
&F3   Remote access 64K
&F4   Remote access 128K
&F7   Configures unit for Dial 57.6k async
&F8   Configures unit for Dial 115.2k async
&F11   Configures unit for FALLBACK

Calling Number Identifiers

&N0   Number 1. Read far-end phone number 1 if service
                subscribed from telephone company.
&N1   Number 2. Read far-end phone number 2 if service
                subscribed from telephone company.

Clear-To-Send (CTS) Control Line Options

&R0   Follows RTS
&R1   Forced CTS

Data Set Ready (DSR) Control Line Options

&S0   DSR forced on
&S1   DSR if call up
&S2   DSR off if link down

Accessing Stored numbers for Dialing Options*

&Z0   Stored number 0
&Z1   Stored number 1
&Z2   Stored number 2
&Z3   Stored number 3
&Z4   Stored number 4
&Z5   Stored number 5
&Z6   Stored number 6
&Z7   Stored number 7
&Z8   Stored number 8
&Z9   Stored number 9

*These presets are invoked by &Z0 through &Z9 AT commands.
They access the stored numbers used for dialing.*

Command **Function**

Local Echo Options

E0	Echo off. Does not allow command characters typed to be displayed on the screen.
E1	Echo on. Allows the command characters typed to be displayed on the screen.

AT Command Response Message Options

Q0	Response messages on
Q1	Response messages off

AT Command Response Message Types

V0	Numeric response messages
V1	Verbal response messages

AT Command Connect Message Options

X0	Simple connect message
X1-7	Connect messages with bit rate

Ready-To-Send (RTS) Control Line Options

_D0	1 mS delay
_D1	18 mS delay

ISDN Switch Type Options

_S0	5ESS
_S1	DMS-100
_S2	National ISDN-1

Data Flow Control Options

\Q0	No flow control
\Q1	Software flow control (XON/XOFF)
\Q2	CTS only
\Q3	Hardware flow control (RTS/CTS) factory default
\Q4	Software from DCE only

DTE and Modem Interface Selection

_L0	Disable external analog modem connected to the Express XR/XRT modem port.
_L1	Enable external analog modem connected to the Express XR/XRT modem port.

S-REGISTER LIST

S0 ..... AUTO ANSWER Determines how the Express XR/XRT answers
an incoming call.
0 = Disable (Express XR/XRT does not
answer call).
1 = Enable (Express XR/XRT answers all
calls).
2 = Dump all calls.

S2 ..... ESCAPE............... Determines which key or character (in
CHARACTER ASCII code) defines the escape command. The
standard escape character is a plus **(+)** sign
(ASCII value of 43 decimal). To change the
character set, set S2 to the desired ASCII value.
Range = 0 to 127

S3 ..... END OF LINE .... Determines which key or character (in
CHARACTER ASCII code) ends a command line. The stan-
dard end-of-line character is the carriage return
(ASCII value of 13 decimal).
Range = 0 to 127

S4 ..... LINE FEED .... Determines which key or character (in
CHARACTER ASCII code) advances the cursor to the next line
after ending a command line or after an Express
XR/XRT message. The standard character is the
line feed (ASCII value of 10 decimal).
Range = 0 to 127

S5 ..... BACK SPACE .... Determines which key moves the cursor back
CHARACTER one space to erase a character. The standard
character is the backspace (ASCII value of 8
decimal).
Range = 0 to 127

S7 ..... CONNECT .... Determines how long the Express XR/XRT waits
TIME for an outgoing call to be answered.
15 = 15 seconds
30 = 30 seconds
60 = 1 minute
120 = 2 minutes
240 = 4 minutes

S12 ... ESCAPE TIME ... Determines the delay required immediately
before and after entering the escape command
for the Express XR/XRT to recognize and

execute the command.
Range = 0 to 127

S14 ... MISC BITS .... Miscellaneous bits (bit 8 is most significant bit).

Bit 2 = 1: Enables on screen echo of AT commands.
Bit 2 = 0: Disables on screen echo of AT commands.
Bit 3 = 0: Enables AT responses from the Express XR/XRT.
Bit 3 = 1: Disables AT responses from the Express XR/XRT.
Bit 4 = 1: Enables AT responses to be displayed in text form.
Bit 4 = 0: Enables AT responses to be displayed in numeric form.
Bit 7 = 1: Disable PPP ACCM spoofing.
Bit 7 = 0: Enable PPP ACCM spoofing.
Bit 8 = 1: Ring indicator uses cadence.
Bit 8 = 0: Ring indicator remains on.

S15 ... ASYNC ....   Asynchronous BONDING method.
     BONDING   0 = ADTRAN revision 0 (default)
                      1 = Multi-vender option

S22 ... MSG BITS .... Miscellaneous message bits (bit 8 is most significant bit).

Bit 5 = Bit 6 = Bit 7 = 1   Allows connect message with baud rate.
Bit 5 = Bit 6 = Bit 7 = 0   Connect message without baud rate.

S25 ... DTR DETECT .... Determines time, in hundredths of a second, that
     TIME   must elapse before the Express XR/XRT recognizes a change in DTR.
                          Range = 0 to 255

S27 ... PPP MODE .... Value determines whether or not PPP will be a single-link or multilink connection.
                           0 = Single-link operation (default)
                           1 = Multilink operation
                           2 = Use compression

S30 ... DTE CTS .... Controls the operation of the DTE connector CTS line.
                           0 = Follows RTS
                           1 = Force CTS

S31 ... DTE RTS .... Controls operation of the RTS line.

<div style="text-align:center">0 = 1 ms delay
17 = 18 ms delay</div>

S32 ... DTE DSR .... Controls the operation of the Data Set Ready signal on the DTE connectors.
  0 = Force DSR on always
  1 = DSR off OOS + Test
  2 = DSR off Link Down

S33 ... DTE CD .... Controls the operation of the Carrier Detect line on the DTE connectors.
  0 = Force CD on always
  1 = CD is active during a call (Normal Operation)
  2 = Off with LOCD
  3 = Off link down

S34 ... DTE DTR .... Determines how the Express XR/XRT responds to changes in DTR. This is a bit-mapped register.
  0 = Ignore DTR
  1 = Force AT command mode when DTR is off
  2 = Dump incoming call when DTR is off
  4 = Hang up incoming call when DTR is off
  8 = Hang up outgoing call when DTR is off
  16 = Answer incoming call when DTR is on
  28 = Idle when off
  32 = Dial SN0 when DTR is on
  64 = Dial SN0 when DTR transitions from off to on

S40 ... BOND TXINIT .. Specifies the number of seconds the originating endpoint attempts to detect the Async BONDING negotiation pattern from the answering endpoint before deciding the Async BONDING call has failed.
0 to 255, 10 sec is default.

S41 ... BOND TXFA ...... Specifies the number of seconds both endpoints attempt to detect the async BONDING frame pattern when a call is connected before deciding the async BONDING call has failed. When operating with other manufacturer's async BONDING equipment it may be necessary to lengthen this timer so that it matches TXADD01.
0 to 255, 10 sec is default.

S42 ... BOND .... TXADD01 The number of seconds both endpoints wait for the additional call to be connected at the end of negotiation before deciding the async BOND-ING call has failed. When dialing overseas it may be necessary to lengthen this timer to allow for slower call routing.
0 to 255, 50 sec is default

S43 ... BOND TXDEQ .. The number of seconds both endpoints attempt to equalize the network delay between the bearer channels before deciding the Async BONDING call has failed.
0 to 255, 50 sec is default

S44 ... BOND TANULL The number of seconds the answering endpoint attempts to detect the Async BONDING negotia-tion pattern from the originating endpoint before aborting to clear channel mode. It may be necessary to shorten this timer if the DTE equipment connected to the Express XR/XRT also has timer constraints for completing non-BONDING parameter negotiation.
0 to 255, 10 sec is default

S45 ... BOND TCID ...... The number of seconds both endpoints attempt to negotiate agreeable values for bearer channels and channel capacities before deciding the async BONDING call has failed.
0 to 255, 5 sec is default

S52 ... SWITCH TYPE .. Selects the network switch type for dial service.
    0 = AT&T 5ESS
    1 = Northern Telecom DMS-100
    2 = National ISDN-1

S53 ... CALL TYPE .... Call type (Dial service only).
    0 = Speech
    1 = Audio
    2 = 56 Kbps data
    3 = 64 Kbps data

S54 ... PROTOCOL .... TYPE Rate adaption protocol type.
    2 = Async BONDING
    6 = V.120
   11 = FALLBACK
   12 = PPP async-to sync conversion

**S58 ... CALL .... Allows the Express XR/XRT to screen incoming
     SCREENING** calls.
        0 = Answer any call
        1 = Answer only calls from numbers matching
           those stored in SN0 through SN9.

**SS60 SPID1 LOC .... SPID string location.

**SS61 SPID2 LOC .... SPID string location.

**SS62 LDN1 LOC .... ISDN phone number string location.

**SS63 LDN2 LOC .... ISDN phone number string location.

**S65 ... AUTOSPID .... Sets the AutoSpid determination feature.
        0 = Disable (default)
        1 = Enable

**SS67 AREA CODE ...... Area code location.

**S71 ... DTE RATE .... Selects the DTE connector bit rate.
        3 = 1200
        6 = 2400
        8 = 4800
      11 = 9600
      15 = 19200
      17 = 38400
      20 = 57600
      23 = 115200
      25 = 230400

**S72 ... DATA BITS .... Selects the number of asynchronous data bits.
        0 = 8 bits
        1 = 7 bits

**S73 ... DTE PARITY ...... Selects the number of asynchronous parity bits.
        0 = None
        1 = Odd
        2 = Even

**S74 ... DTE STOP .... Selects the number of asynchronous stop bits.
        0 = 1 stop bit
        1 = 1.5 stop bits
        2 = 2 stops bits

**S75 ... DTE FLOW .... Selects asynchronous flow control.
        0 = None
        1 = XON/OFF from DTE controls DCE
        2 = XON/OFF from DCE controls DTE

> 3 = Hardware
> 12 = Software

SS77 REMOTE............. Numeric password string for remote
NUMERIC configuration.
PASSWORD

The following are the string locations for stored numbers 0 - 9:

SS80 SN0 LOC .... Stored number 0 string
SS81 SN1 LOC .... Stored number 1 string. Used for second
number dialed in a multilink connection.
SS82 SN2 LOC .... Stored number 2 string
SS83 SN3 LOC .... Stored number 3 string
SS84 SN4 LOC .... Stored number 4 string
SS85 SN5 LOC .... Stored number 5 string
SS86 SN6 LOC .... Stored number 6 string
SS87 SN7 LOC .... Stored number 7 string
SS88 SN8 LOC .... Stored number 8 string
SS89 SN9 LOC .... Stored number 9 string

S90... CONFERENCE .. NI-1 feature identification number for
ID conferencing. See the ISDN service provider for
this ID.

S91... TRANSFER ID .. NI-1 feature identification number for transfer-
ring. See the ISDN service provider for this ID.

S93... CALL TYPE .... Determines how incoming call is routed when
ROUTING connected to a point-to-point ISDN line.
> 0 = Route all call types to DTE
(XRT ONLY) > 1 = Route Speech call types to POTS
> 2 = Route Speech and Audio call types to
> POTS

S94... LOCAL TONES . Forces the POTS interface to generate all tones.
> Bit 0 = 0: In-band tones from ISDN switch
> (when available)
> Bit 0 = 1: All tones generated locally
> Bit 1 = 0: Warnings to POTS when unavailable
> Bit 1 = 1: Disable all warnings to POTS

S118. CHAP Enable ..... 32 = CHAP enabled
> 0 = CHAP disabled (Windows 95 setting)

Appendix B
LEDs

LEDs

The Express XR/XRT front panel contains five LEDs associated with the DTE port and the ISDN interface as shown in Figure B-1 and described in Table B-A.
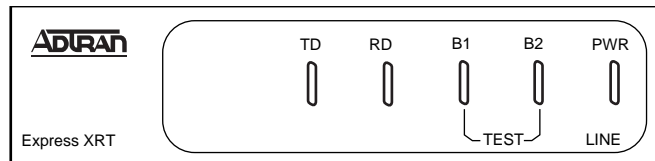
Figure B-1
Front Panel LEDs

Table B-A
Express XR/XRT LEDs

LED	Color	Description
B1 or B2	Slow Green Flash	Attempting SPID registration.
	Fast Green Flash	Attempting TEI registration.
	Off	Ready. No data traffic.
	Solid Green	B channel passing data (in-use).
	Solid Amber	Loopback protocol test (one or both channels).
	Amber Flash	Remote test originate.
PWR/Line	Green (On Solid)	Link established. Calls can be placed.
	Off	No Power.
	Flashing	Link is not established. Calls cannot be placed.
TD	Green	Transmit Data (TxD).
RD	Green	Received Data (RxD).

Appendix C
Status Buffer Messages

2047 BERT orig
Test remote originated 2047 BERT (bit error rate test) pattern.

2047 loopbk ansr
Test remote answered 2047 BERT pattern.

Answer
The EXPRESS XR answered a call on either the first or second channel. The calling phone number is displayed if available.

ACCESS_INFO_DISCARDED
The network was unable to deliver access information to the far end.

Area Code Req'd
Area code required for Auto Spid determination.

AutoSpid Active
Unit is attempting automatic detection of switch type and SPID numbers.

AutoSpid Disable
The user has stopped the automatic SPID detection process.

AutoSpid Failed
Automatic determination of switch type and SPID numbers failed.

AutoSpid Passed
Automatic determination of switch type and SPID numbers succeeded.

AutoSwitch YYY
Switch type YYY detected during AutoSpid determination.
(YYY can be DMS, NI-1, or AT&T)

Back to online
Express XR went back on line.

Bad async BPS
The Bonding protocol determined that the selected asynchro-
nous bit rate is not supported.

Bad AT numeric
User issued an AT command with an argument that was out of
range.

Bad call type
Express XR placed a call with an improper call type.

Bad DTE Baud
The DTE bit rate does not match a valid bit rate for the protocol
selected.

BAD_INFO_ELEM
Call control error.

Bad phone number
Express XR/XRT attempted to call an invalid phone number.

BEAR_CAP_NOT_AVAIL
The bearer channel requested is not available.

BEARER_CAP_NOT_AUTH
Bearer capability requested is not authorized.

Bearer Mode?
Incoming call is not of a type the Express XR/XRT can accept.

Bearer Info Cap?
Incoming call information transfer capability is not known.

BONDING (+/-XXX)
The amount of bytes or corrected delay between the B2 and B1
Bearer channels (XXX can range from -8000 to +8128).

BPS mismatch
Bonding negotiation found a bit rate mismatch.

Break to AT cmd
User issued a break-in request.

Break ignored
User issued an extra break-in request.

BUSY
The called number is busy.

B-X disconnected
B-channel disconnected. X can be 1 or 2 representing the appropriate B-channel.

CallID 1 in use
The Express XR/XRT tried to place a call using SPID 1 when SPID 1 was already in use.

CallID 2 in use
The Express XR tried to place a call using SPID 2 when SPID 2 was already in use.

Call lost
Held call could not be retrieved.

Call not ringing
User executed an answer command (ATA) but there was not a call present.

CALL_REJECTED
The call has been rejected by the ISDN network.

Can't go online
Express XR/XRT cannot go back on line. Unknown AT command user issued an unknown AT command.

CHAN_DOES_NOT_EXIST
The user asked for a bearer channel that is not present.

CHAN_NOT_IMPLEMENTED
The network or far end does not support the bearer capability requested.

CHANNEL_UNACCEPTABLE
The channel requested has not been subscribed.

CID>0 rcvd
Received an incoming call from a third party during negotiations with a far-end BONDING unit on the use of the second Bearer channel.

Connect Timeout
Call attempt does not connect in x amount of time.

DEST NOT ISDN
The number called is not ISDN (warning only).

DEST_OUT_OF_ORDER
The called number is out of order.

Dial
The Express XR/XRT placed a call on either the first or second channel. The number called is displayed following the message.

Disconnect
The call on either the first or second channel was disconnected from the network. The far-end phone number is displayed if available. Ensure flow control setting match on both terminal adapters.

Disconnect Req
Far-end unit disconnected during BONDING negotiation.

DTR not up
Express XR/XRT tried to place a call in a dialing mode that requires DTR to be in an active state, but it is not.

Dump call
The Express XR/XRT could not accept an incoming call because it was already involved in a call.

Dump
An incoming call on either the first or second channel was discarded by the Express XR/XRT. The calling number is displayed if available.

FACILITY_NOT_IMPLEMENT
The network does not support the requested supplementary service.

FACILITY_NOT_SUBSCRIBED
The channel type requested has not been subscribed.

FACILITY_REJECTED
A facility requested by the user cannot be provided by the network.

Factory Reset 0
Unit defaulted to factory configuration.

FlowCtl mismatch
Bonding negotiation determined a flow control mismatch.

FlowCtl required
Bonding negotiation determined that flow control needs to be optioned on.

Hangup
The call on either the first or second channel was disconnected by the Express XR/XRT. The far-end phone number is also displayed.

Hold
Voice call is on hold.

ID = XXXX
Calling party number.

INCOMING_CALL_BARRED
The network will not allow an incoming call.

INCOMPATIBLE_DEST
The called number cannot accept the type of call that has been placed.

INTERWORKING_UNSPEC
A non-ISDN network sent an unspecified message.

Inv Password
Remote configuration failed due to incorrect password.

INVALID_CALL_REF
Call control error.

INVALID_ELEM_CONTENTS
Call control error.

INVALID_MSG_UNSPEC
Invalid message: protocol error.

INVALID_NUMBER_FORMAT
The dialed number has an invalid format.

L1 not up
The network interface is not active.

L2 not up
The data link layer interface is not active.

L3 not up
The call control interface is not active.

L2 #2 not up
The data link layer interface for a second call (BONDING) is not active.

L3 #2 not up
The call control layer interface for a second call (BONDING) is not active.

LDN TOO LONG
The local directory number entered has too many digits.

Login failed
Unable to connect to remote unit on remote configuration attempt.

MANDATORY_IE_LEN_ERR
Mandatory information element length error.

MANDATORY_IE_MISSING
Mandatory information element missing.

MULTILINK PPP UP
Unit connected with Multilink PPP.

Need 64K call
The BONDING protocol requires the Express XR/XRT to be configured for 64K data call types.

NETWORK BUSY
The ISDN switch is busy and unable to process a call.

NETWORK_CONGESTION
The phone network is currently congested.

NETWORK_OUT_OF_ORDER
The phone network is out of order.

No calling ID
Calling party number not provided.

NO_CIRCUIT_AVAILABLE
The requested bearer channel is not available.

NONEXISTENT_MSG
Nonexistent/undefined message received from network.

NO_ROUTE
NO_ROUTE_DEST
The phone network was unable to find a route to the destination number.

No Sreg number
Attempted to change an S-register but did not specify a specific S-register (example: ATS=1).

No Sreg value
Attempted to change an S-register but did not specify a value (example: ATS=).

No String Space
Stored number string space is full.

NO_USER_RESPONDING
The dialed number is not responding.

NORMAL_CLEARING
The network is disconnecting the current call.

NOT end2end ISDN
The path that the call was routed over is not ISDN from end-to-end (warning only).

NUMBER_CHANGED
The number dialed has been changed.

OUTGOING_CALL_BARRED
The network will not allow the outgoing call to be placed.

Phone # Req'd
Phone number required for AutoSpid determination.

PPP COMPRESSION UP
Unit connected with compression.

PPP LINK LOOPBACK
Network link is looped backed.

PPP Timeout
PPP negotiation failed.

PROTOCOL_ERROR
Call control error.

PUMPIO: dpump-quit
Rate adaption stopped due to DTE error.

Rcv Cause XXX
Undefined cause message received.

REQ_CHANNEL_NOT_AVAIL
The channel type requested is currently not available.

Remote not ISU
Bonding negotiation determined the far-end unit is not another ISU product.

RESOURCE_UNAVAIL
The requested resource is unavailable.

RESP_TO_STAT_ENQ
Response to status enquiry.

Restarting Rate
Unit restarts DTE rate.

Retrieve
Voice call is retrieved from a holding state.

Ring
An incoming call on either the first or second channel (third channel if call waiting) entered the Ring state.   The calling phone number is displayed if available.

S cmd not = or ?
Proper syntax not used.

SERVICE_NOT_AVAIL
The requested service is not available.

SOURCE NOT ISDN
The incoming calling party is not ISDN (warning only).

TANULL expired
Bonding timer TANULL expired. Received call from non-BONDING equipment.

TEMPORARY_FAILURE
The network has temporarily failed, try the call again.

TIMER_EXPIRY
Call control error.

TXADD01 expired
Bonding timer TXADD01 expired.

TXDEQ expired
B-channel delay equalization during bonding failed.

TXFA1 expired
Bonding timer TXFA1 expired.

TXFA2 expired
Bonding timer TXFA2 expired.

TXINIT expired
Bonding timer TXINIT expired; called non-BONDING equipment.

UNASSIGNED_NUMBER
The phone number dialed does not exist.

Unknown AT cmd
User issued an unknown AT command.

USER_ALERT_NO_ANS
Ringing call is not answered.

USER_BUSY
The dialed number is busy.

V120 connected
The V.120 rate adaption successfully connected to the far-end unit.

V120 Timeout
V.120 negotiation failed.

WRONG_MESSAGE
Call control error.

WRONG_MSG_FOR_STATE
Call control error.

Appendix D
Loop Status Messages

This appendix lists the status line messages and their definitions. Messages shown entirely in capital letters are generated by the ISDN network. Messages with lower case letters are generated by the Express XR/XRT.

AutoSpid X
The SPID is being attempted by the AutoSpid determination. X starts at 0 and counts up for each SPID tried.

Call Connect B1
Bearer channel 1 is connected and is active.

Call Connect B2
Bearer channel 2 is connected and is active.

Call Connect B1/B2
Bearer channels 1 and 2 are active.

Disconnecting
The current phone call is being disconnected (hung up).

Getting TEI #1
The Express XR/XRT is receiving its first TEI from the network.

Getting TEI #2
The Express XR/XRT is receiving its second TEI from the network.

Link Down
The network interface is not in sync.

Network Loopback
The Express XR/XRT has been commanded to perform an ISDN loopback toward the network.

Ready
The unit is ready to make or accept a call.

Register SPID #1
The Express XR/XRT is registering its first SPID with the network.

Register SPID #2
The Express XR/XRT is registering its second SPID with the network.

Ringing
The phone number just dialed is ringing.

xxxxx nnnn
A rate adaption is running at the bit rate specified by nnnn.

xxxxx Quitting
A rate adaption protocol is turning off.

xxxxx Ready
A rate adaption protocol is ready.

xxxxx Setup
A rate adaption protocol is setting up.

YYYY
ISDN switch-type selected.

xxxxx can be any of the following:

Bonding
Bandwidth on demand industry users group protocol.

PPP
Point-to-point rate adaption protocol.

V120
V.120 rate adaption protocol.

Appendix E
Connector Pinouts
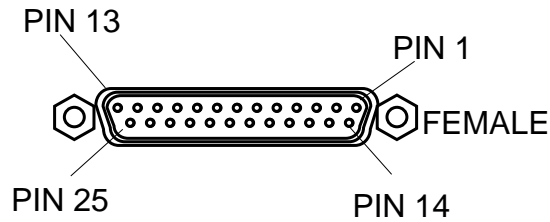
Figure E-1
RS-232 Interface

Table E-A
RS-232 Interface

Pin	Name	I/O	Description
1	Shield	I/O	Shield for cable
2	TD	I	Transmitted Data
3	RD	O	Received Data
4	RTS	I	Request to Send
5	CTS	O	Clear To Send
6	DSR	O	Data Set Ready
7	SG	I/O	Signal Ground
8	CD	O	Carrier Detect
20	DTR	I	Data Terminal Ready
22	RI	O	Ring Indicator

I = Input   O = Output

PIN 1

PIN 13

MALE

PIN 14

PIN 25
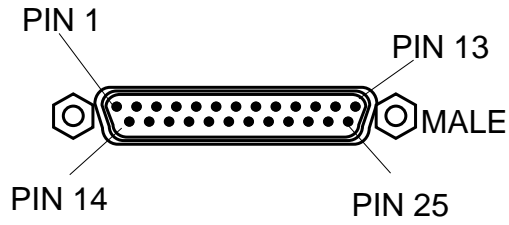
Figure E-2
Modem Interface

Table E-B
Modem Interface

Pin	Name	I/O	Description
1	Shield	I/O	Shield for cable
2	RD	O	Received Data
3	TD	I	Transmitted Data
4	RTS	O	Request to Send
5	CTS	I	Clear To Send
7	SG	I/O	Signal Ground
8	CD	I	Carrier Detect
20	DTR	O	Data Terminal Ready

I = Input   O = Output

The RJ-11 POTS ports apply to the Express XRT only.

Table E-C

RJ-11 POTS Port Interfaces

POTS 1 Interface	Pin 1	
	Pin 2	
	Pin 3	R1
PIN 1 PIN 6	Pin 4	T1
	Pin 5	
	Pin 6	

POTS 2 Interface	Pin 1	
	Pin 2	
	Pin 3	R2
PIN 1 PIN 6	Pin 4	T2
	Pin 5	
	Pin 6	

Table E-D

RJ-45 ISDN Line Interface

PIN 1 PIN 8		
ISDN	Pin 4	Ring
	Pin 5	Tip

GND $\overset{-}{\quad}\!\!\!-\!\!\!\!-\!\!\!\!-\bigodot\!\!\!-\!\!\!\!-\overset{+}{\quad}$ 9v (XR)

GND $\overset{-}{\quad}\!\!\!-\!\!\!\!-\!\!\!\!-\bigodot\!\!\!-\!\!\!\!-\overset{+}{\quad}$ 48v (XRT)

Figure E-3

Express XR and XRT Ground Pinouts

fold

ADTRAN

Register now to be included in our
Preferred Customer Database!
You'll receive new product information and
product updates. Take a few minutes to fill out
this registration card-postage is paid.
Thank you!

ADTRAN provides a broad line of end-user equipment that supports a wide range of business applications for host and remote sites including: ISDN terminal adapters, inverse multiplexers, NT1s, 56k DDS DSU/CSUs, T1 DSU/ CSUs, and multiplexers. ADTRAN is also a leading supplier of DDS, ISDN, and T1/HDSL digital loop products for the telephone operating companies and many well known OEMs. For more information, select the appropriate box.

End-User Equipment
☐ ISDN
☐ DDS
☐ T1

Telephone Company Equipment
☐ ISDN
☐ DDS
☐ T1/HDSL
☐ Wireless

ADTRAN **Express XR/XRT™ Warranty Registration Card**

First Name   Middle Initial   Last Name

Company Name

Address

City   State   Zip Code   Country

Daytime Phone   Fax

E-mail Address

Date Purchased: _____

Part Number: _____

Model purchased: ☐ XR ☐ XRT

Serial Number: _____

Where did you purchase: _____

Where do you use a computer: (check all that apply)
☐ Office ☐ Home ☐ On the Road

Where will this ISDN modem be used:
☐ Business   ☐ Home
☐ Home business   ☐ Elementary School
☐ High School   ☐ College/University
☐ Federal Government   ☐ State/Local Government

What is the primary business of your company:
☐ Business services/Legal/Other services
☐ Finance/Real Estate/Insurance
☐ Manufacturing
☐ Agriculture/Mining/Construction
☐ Transportation/Utilities/Communications
☐ Retail trade   ☐ Wholesale trade
☐ Health   ☐ Government
☐ Education   ☐ Disability service
☐ Other

What Primary application will this product be used for: (check all that apply)
☐ Internet Access   ☐ Work at home
☐ Modem Replacement
☐ Other

How many employees are located at your company:
☐ 1-19   ☐ 20-49
☐ 50-99   ☐ 100-499
☐ 500-999   ☐ 1,000 or more

What operating system do you use:
☐ OS/2   ☐ DOS
☐ Windows 3.1   ☐ Windows 95
☐ Windows NT   ☐ Mac OS
☐ Other

What type of computer do you use:
☐ Apple   ☐ Gateway
☐ Packard-Bell   ☐ AST
☐ HP   ☐ Toshiba
☐ Compaq   ☐ IBM
☐ Dell   ☐ NEC
☐ Other

Number of ADTRAN products you own or use: ___

Which products: _____

How did you learn about ADTRAN:
☐ Advertisement
☐ Article/review
☐ Value Added Reseller
☐ Catalog
☐ Friend/colleagues
☐ ADTRAN Home Page
☐ **Retail Store**
☐ Other _____

Did you use the Quick Start Guide for:
Installation   ☐ Yes ☐ No
Configuration   ☐ Yes ☐ No
Applications   ☐ Yes ☐ No
Troubleshooting   ☐ Yes ☐ No

Was the Quick Start Guide easy to use: ☐ Yes ☐ No

Do you own a CD ROM drive: ☐ Yes ☐ No

Did shipping container arrive in good condition: ☐ Yes ☐ No

Did equipment arrive in good condition: ☐ Yes ☐ No

Did you receive all the accessories: ☐ Yes ☐ No

Did the equipment operate properly: ☐ Yes ☐ No
First try: ☐ Yes ☐ No
Successive attempts: ☐ Yes ☐ No

Which features do you like: _____
_____
_____
_____
_____

Which features do you dislike: _____
_____
_____
_____