TOTAL ACCESS 600 SERIES T1 ATM IAD
User Interface Guide (UIG)

4200681L2	T1 ATM Total Access 608
4200641L2	T1 ATM Total Access 604
4200612L1#ATM	T1 ATM Total Access 612
4200616L1#ATM	T1 ATM Total Access 616
4200624L1#ATM	T1 ATM Total Access 624

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To the Holder of the Manual

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NOTE *Notes provide additional useful information.*

CAUTION *Caution signify information that could prevent service interruption.*

WARNING *Warnings provide information that could prevent damage to the equipment or endangerment to human life.*

Safety Instructions

When using your telephone equipment, please follow these basic safety precautions to reduce the risk of fire, electrical shock, or personal injury:

1. Do not use this product near water, such as a bathtub, wash bowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.

2. Avoid using a telephone (other than a cordless-type) during an electrical storm. There is a remote risk of shock from lightning.

3. Do not use the telephone to report a gas leak in the vicinity of the leak.

4. Use only the power cord, power supply, and/or batteries indicated in the manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for special disposal instructions.

Save These Important Safety Instructions

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

1. This equipment complies with Part 68 of the FCC rules. On the side of the bottom of this equipment is a label that contains, among other information, the FCC Registration Number and Ringer Equivalence Number (REN), if applicable, for this equipment. If required, this information must be given to the telephone company.

2. An FCC-compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68-compliant. See installation instructions for details.

3. If your telephone equipment (TA 600) 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.

4. 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 to give you an opportunity to maintain uninterrupted service.

5. If you experience trouble with this equipment (TA 600), please contact ADTRAN 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.

6. This unit contains no user-serviceable parts.

7. The FCC recommends that the AC outlet to which equipment requiring AC power is to be installed is provided with an AC surge arrester.

8. The REN is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company.

9. The following information may be required when applying to your local telephone company for leased line facilities.

Service Type	REN/SOC	FIC	USOC
1.544 Mbps - ESF and B8ZS	6.0N	04DU9-1SN	RJ-48C
Analog Service (Life Line)	0.1B/9.0F	02LS2/02GS2	RJ-11C

Federal Communications Commission Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio frequencies. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

> **NOTE**   *Shielded cables must be used with this unit to ensure compliance with Class A FCC limits.*

> **WARNING**   *Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

Industry Canada Compliance Information

Notice: The Industry Canada label applied to the product (identified by the Industry Canada logo or the "IC:" in front of the certification/registration number) signifies that the Industry Canada technical specifications were met.

Notice: The Ringer Equivalence Number (REN) for this terminal equipment is supplied in the documentation or on the product labeling/markings. The REN assigned to each terminal device indicates the maximum number of terminals that can be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices should not exceed five (5).

Canadian Emissions Requirements

This digital apparatus does not exceed the Class A 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 numérique respecte les limites de bruits radioelectriques applicables aux appareils numériques de Class A prescrites dans la norme sur le materiel brouilleur: "Appareils Numériques," NMB-003 edictee par le ministre des Communications.

Warranty and Customer Service

ADTRAN will repair and return this product within ten years from the date of shipment if it does not meet its published specifications or fails while in service. For detailed warranty, repair, and return information refer to the ADTRAN Equipment Warranty and Repair and Return Policy Procedure.

Return Material Authorization (RMA) is required prior to returning equipment to ADTRAN.

For service, RMA requests, or further information, contact one of the numbers listed at the end of this section.

LIMITED PRODUCT WARRANTY

ADTRAN warrants that for ten years from the date of shipment to Customer, all products manufactured by ADTRAN will be free from defects in materials and workmanship. ADTRAN also warrants that products will conform to the applicable specifications and drawings for such products, as contained in the Product Manual or in ADTRAN's internal specifications and drawings for such products (which may or may not be reflected in the Product Manual). This warranty only applies if Customer gives ADTRAN written notice of defects during the warranty period. Upon such notice, ADTRAN will, at its option, either repair or replace the defective item. If ADTRAN is unable, in a reasonable time, to repair or replace any equipment to a condition as warranted, Customer is entitled to a full refund of the purchase price upon return of the equipment to ADTRAN. This warranty applies only to the original purchaser and is not transferable without ADTRAN's express written permission. This warranty becomes null and void if Customer modifies or alters the equipment in any way, other than as specifically authorized by ADTRAN.

EXCEPT FOR THE LIMITED WARRANTY DESCRIBED ABOVE, THE FOREGOING CONSTITUTES THE SOLE AND EXCLUSIVE REMEDY OF THE CUSTOMER AND THE EXCLUSIVE LIABILITY OF ADTRAN AND IS IN LIEU OF ANY AND ALL OTHER WARRANTIES (EXPRESSED OR IMPLIED). ADTRAN SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, INCLUDING (WITHOUT LIMITATION), ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.   SOME STATES DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES, SO THIS EXCLUSION MAY NOT APPLY TO CUSTOMER.

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Customer Service, Product Support Information, and Training

ADTRAN will repair and return this product if within ten years from the date of shipment the product does not meet its published specification or the product fails while in service.

A return material authorization (RMA) is required prior to returning equipment to ADTRAN. For service, RMA requests, training, or more information, use the contact information given below.

Repair and Return

If you determine that a repair is needed, please contact our Customer and Product Service (CAPS) department to have an RMA number issued. CAPS should also be contacted to obtain information regarding equipment currently in house or possible fees associated with repair.

CAPS Department   (256) 963-8722

Identify the RMA number clearly on the package (below address), and return to the following address:

ADTRAN Customer and Product Service
901 Explorer Blvd. (East Tower)
Huntsville, Alabama 35806

RMA # _____

Pre-Sales Inquiries and Applications Support

Your reseller should serve as the first point of contact for support. If additional pre-sales support is needed, the ADTRAN Support web site provides a variety of support services such as a searchable knowledge base, latest product documentation, application briefs, case studies, and a link to submit a question to an Applications Engineer. All of this, and more, is available at:

http://support.adtran.com

When needed, further pre-sales assistance is available by calling our Applications Engineering Department.

Applications Engineering   (800) 615-1176

Post-Sale Support

Your reseller should serve as the first point of contact for support. If additional support is needed, the ADTRAN Support web site provides a variety of support services such as a searchable knowledge base, updated firmware releases, latest product documentation, service request ticket generation and trouble-shooting tools. All of this, and more, is available at:

http://support.adtran.com

When needed, further post-sales assistance is available by calling our Technical Support Center. Please have your unit serial number available when you call.

Technical Support   (888) 4ADTRAN

Installation and Maintenance Support

The ADTRAN Custom Extended Services (ACES) program offers multiple types and levels of installation and maintenance services which allow you to choose the kind of assistance you need. This support is available at:

http://www.adtran.com/aces

For questions, call the ACES Help Desk.

ACES Help Desk   (888) 874-ACES (2237)

Training

The Enterprise Network (EN) Technical Training Department offers training on our most popular products. These courses include overviews on product features and functions while covering applications of ADTRAN's product lines. ADTRAN provides a variety of training options, including customized training and courses taught at our facilities or at your site. For more information about training, please contact your Territory Manager or the Enterprise Training Coordinator.

Training Phone   (800) 615-1176, ext. 7500
Training Fax   (256) 963-6700
Training Email   training@adtran.com

TOTAL ACCESS 600 SERIES T1 IAD USER INTERFACE GUIDE

This document is designed for use by network administrators and others who will configure and provision the Total Access 600 system. It contains overview information, configuration details for Voice Over ATM, menu descriptions, and instructions on navigating the VT 100 user interface.

CONTENTS

<center>**FIGURES**</center>

1. TOTAL ACCESS 600 OVERVIEW

The Total Access 600 is a complete solution Integrated Access Device (IAD) for Voice over ATM (VoATM) applications. The unit includes a modular network interface, Nx64 V.35 interface, 10/100BaseT interface, FXS ports, lifeline voice backup, and an optional battery back-up for added security. The Total Access 600 can provision, test, and provide status for any of the voice and data interfaces. All connections are made via the rear panel. In addition to a built-in IP router, the Total Access 600 contains an echo canceller and ADPCM compression modules necessary for VoATM applications.

Analog Lifeline

The **LIFE LINE** connector on the rear panel (see Figure 1) provides assured voice for port 1. When a connection to the Voice Gateway is not possible due to loss of power or some other reason, an on-board relay opens and the first port of the voice connector is provided with analog voice from the analog lifeline connection.

> **NOTE** *For the analog lifeline feature to work, the user must subscribe to an analog voice line and it must be connected via the lifeline connector.*

Figure 1. Total Access 600 Rear Panel

Firmware Updates

Firmware can be updated by using XMODEM transfer protocol via the unit's **CRAFT** port (see Figure 1) or by using TFTP from a network server. (See *Appendix A. Updating Total Access 600 Firmware using XMODEM* on page 55 and *Appendix B. Updating Total Access 600 Firmware using TFTP* on page 58.)

The terminal menu is the access point to all other operations. Each terminal menu item has several functions and sub-menus that identify and provide access to specific operations and parameters. These menu selections are described later in this User Interface Guide.

> **NOTE** *See Appendix C for instructions about navigating the terminal menus.*

> **NOTE** *See Appendix I for the **CRAFT** port connection pin-out.*

2. VOICE OVER ATM OVERVIEW

Voice over ATM (VoATM) is the technology used to transmit voice conversations over a data network using Asynchronous Transfer Mode (ATM). There are several potential benefits to moving voice over a data network using ATM. First, the small, fixed-length cells require lower processing overhead. Second, these small, fixed-length cells allow higher transmission speeds than traditional packet switching methods.

ATM allocates bandwidth on demand, making it suitable for high-speed connection of voice, data, and video services. Conventional networks carry data in a synchronous manner. Because empty slots are circulating even when the link is not needed, network capacity is wasted. ATM automatically adjusts the network capacity to meet the system needs.

3. VOICE OVER ATM APPLICATION

The echo canceller is used in ATM voice applications that require G.165 echo cancellation. The Total Access 600 also contains an integrated ADPCM encoder/decoder for voice compression.

Figure 2 shows a typical VoATM application. The Total Access 600 connects to the ATM Network to provide both voice and high speed data from a single platform.
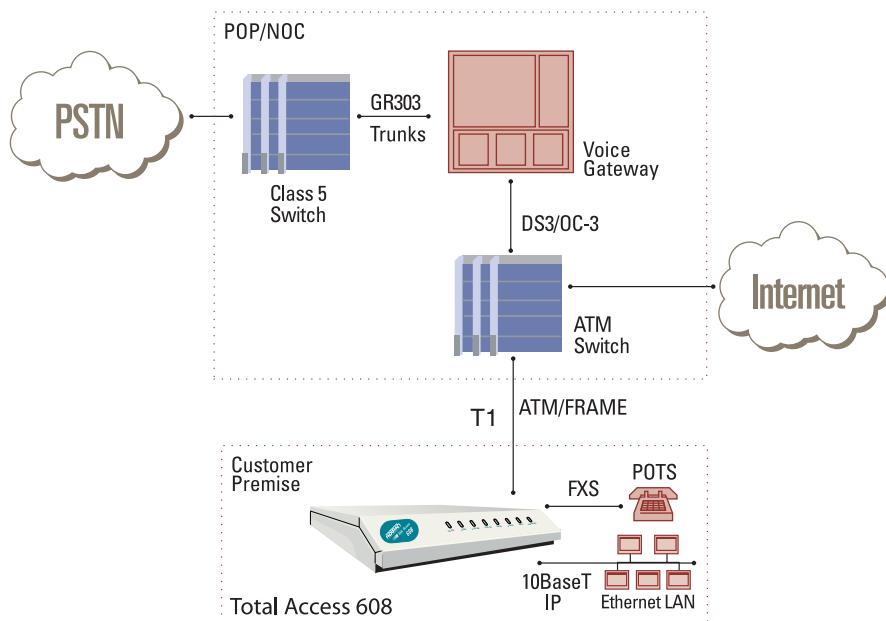
Figure 2. Voice over ATM

> *Refer to the next section, Configuring the Total Access 600, for general configuration instructions. Refer to the appendices at the end of this document for information on using the Total Access 600 in specific applications:*
>
> • *Appendix D. Voice Gateway Quick Start Procedure (Voice Turn up) on page 65.*
>
> • *Appendix E. RFC1483 Quick Start (IP Routing) on page 67.*
>
> • *Appendix F. RFC1483 Quick Start (IP Routing with NAT) on page 69.*
>
> • *Appendix G. RFC1483 Quick Start (Bridging) on page 70.*

4.   CONFIGURING THE TOTAL ACCESS 600

System Info

The **SYSTEM INFO** menu provides basic information about the unit and contains data fields for editing information. Figure 3 displays the submenus available when you select this menu item.

```
TA 608 IAD/System Info
System Info    System Name
System Config  System Location
System Utility System Contact
WAN            Unit Name        TA 608 IAD
Router         CLEI Code        SIM2P4ODRA
Voice          Part Number      1200680L2
Modules        Serial Number    A52A1388
               Firmware Revision D.01.03
               Bootcode Revision A.06
               System Uptime    30 mins, 14 secs
               Date/Time        Monday January  1  00:30:14  1900




MODE: T1 IAD                                              NET:  down
                                                          ^Z=help  0:30
```

Figure 3. System Information Menu

>System Name

Provides a user-configurable text string for the name of the TA 600. This name can help you distinguish between different installations. You can enter up to 31 characters in this field, including spaces and special characters (such as an underbar). This name will appear on the top line of all screens.

>System Location

Provides a user-configurable text string for the location of the TA 600. This field is to help you keep track of the actual physical location of the unit. You can enter up to 31 characters in this field, including spaces and special characters (such as an underbar).

>System Contact

Provides a user-configurable text string for a contact name. You can use this field to enter the name, phone number, or email address of a person responsible for the TA 600 system. You can enter up to 31 characters in this field, including spaces and special characters (such as an underbar).

>Unit Name

Product-specific name for the product assembly.

>CLEI Code

CLEI code for the product assembly.

> Part Number

ADTRAN part number for the product assembly.

>Serial Number

Serial number of the product assembly.

>Firmware Revision

Displays the current firmware revision level of the controller.

>Bootcode Revision

Displays the bootcode revision.

>System Uptime

Displays the length of time since the TA 600 system reboot.

>Date/Time

Displays the current date and time, including seconds. This field can be edited. Enter the time in 24-hour format (such as 23:00:00 for 11:00 pm). Enter the date in mm-dd-yyyy format (for example, 10-30-1998).

> **NOTE**   *Each time you reset the system, this value resets to 0 days, 0 hours, 0 min and 0 secs.*

System Config

Set up the Total Access 600 operational configuration from the **SYSTEM CONFIG** menu. Figure 4 shows the items included in this menu.

```
TA 608 IAD/System Config
System Info    | Operating Mode         T1 IAD
System Config  | Network Timing Mode    Network
System Utility | Telnet Access          On
WAN            | Telnet User List        [+]
Router         | SNMP Menu               [+]
Voice          | Maint Port Menu         [+]
Modules        | Network Time            [+]




MODE: T1 IAD                                        NET:  down
Sets the operational configuration.               ^Z=help  0:32
```
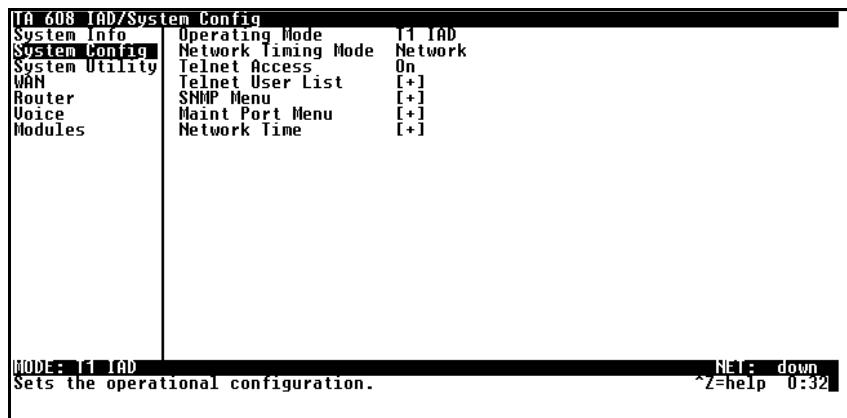
Figure 4. System Configuration Menu

>Network Timing Mode

Selects the timing source for the entire system. Network is the only timing option available.

Network
The system's clock is recovered from the network (WAN interface).

>Telnet Access

Sets Telnet access to **ON** or **OFF**.

>Telnet User List

Up to four users can be configured for access to the Total Access 600. Each user can be assigned a security level and time out.

Name
A text string of the user name for this session.

Authen Method
The user can be authenticated in two ways:

> **PASSWORD**   The Password field is used to authenticate the user.

> **RADIUS**   The Radius client is used for authenticating the user.

Password
When the authenticating method is **PASSWORD**, this text string is used for the password.

Idle Time   (1-255)
This sets the amount of time you can be idle before you are automatically logged off.

Level
This is the security level granted to the user.

>*Maint Port Menu*

The Total Access 600's VT 100 **CRAFT** port can be accessed via an RJ-48 located on the rear panel. The setup for these ports is under this menu.

Password Protect
When set to **NO**, the maintenance port is not password protected. When **YES** (def), the Total Access 600 will prompt for a password upon startup.

Password
This is the text string that is used for comparison when password protecting the maintenance port. By default, no password is entered.

NOTE	*If you forget your password, type CHALLENGE in all capital letters. Call technical support and have the displayed CHALLENGE code ready.*

NOTE	*The security level for the maintenance port is always set to 0. This gives full access to all menus.*

NOTE	*Passwords are case-sensitive.*

Instructions for Changing Passwords	
Step	**Action**
1	Select the **PASSWORD** field—a new **PASSWORD** field displays.
2	Type the new password in the **ENTER** field.
3	Type the new password again in the **CONFIRM** field.
NOTE	*The password can contain up to 12 alphanumeric characters. You can also use spaces and special characters in the password.*

Baud Rate

This is the asynchronous rate that the maintenance port will run. The possible values are 300, 1200, 2400, 4800, 9600 (def), 19200, 38400, 57600, and 115200.

Data Bits

This is the asynchronous bit rate that the maintenance port will run. The possible values are 7 or 8 (def) bits.

Parity

This is the asynchronous parity that the maintenance port will run. The possible values are **NONE** (def), **ODD,** or **EVEN**.

Stop Bits

This is the stop bit used for the maintenance port. The possible values are 1 (def), 1.5 or 2.

>Network Time

The Total Access 600 unit time can be entered manually from the **SYSTEM INFO** menu, or the unit can receive time from an NTP/SNTP server. The **NETWORK TIME** menu includes all parameters relating to how the unit communicates with the time server.

Server Type

The server type defines which port the Total Access 600 will listen on to receive timing information from the time server.

NT Time

The Total Access 600 will receive time from an NT server running SNTP software on its TIME port.

SNTP

The Total Access 600 will receive time directly from an SNTP server.

Active

This network timing feature can be turned on and off. It determines whether the unit will request and receive time from a time server.

Time Zone

There are several time zones available for the time to be displayed in. All time zones are based off of Greenwich Mean Time (GMT).

Adjust for Daylight Saving

Since some areas of the world use Daylight Savings Time, the Total Access 600 is designed to adjust the time on the first Sunday in April and the last Sunday in October accordingly if this option is turned on.

Host Address

This is the IP address of the time server that the Total Access 600 will request and receive time from.

Refresh

This is the interval of time between each request the Total Access 600 sends out to the time server. A smaller refresh time guarantees that the unit receives the correct time from the server and corrects possible errors more quickly, but it is more taxing on the machine. A range of refresh times is available for the user to decide which is best for their unit.

Status
This displays the current status of the time negotiation process. If an error is displayed, check all connections and configurations to try to resolve the problem.

System Utility

Use the **SYSTEM UTILITY** menu to view and set the system parameters shown in Figure 5.

```
TA 608 IAD/System Utility
System Info    Upgrade Firmware      [+]
System Config  Config Transfer       [+]
System Utility System Utilization    [+]
WAN            Ping                  [+]
Router         Terminal Mode         <+>
Voice
Modules




MODE: T1 IAD                              NET:  down
                                          ^Z=help  0:33
```
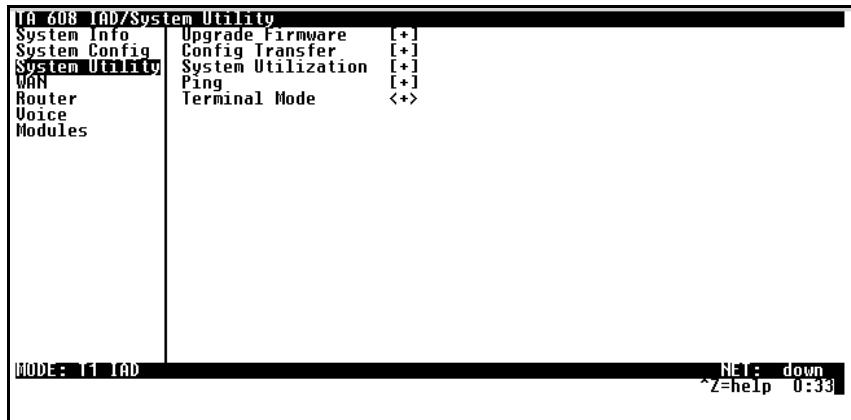
Figure 5. System Utility Menu

>Upgrade Firmware

Updates firmware when TA 600 enhancements are released. Two transfer methods are available for use in updating the Total Access 600 system controller.

Transfer Method
The two methods for upgrading are **XMODEM** and **TFTP.** (See *Appendix A. Updating Total Access 600 Firmware using XMODEM* on page 55 and *Appendix B. Updating Total Access 600 Firmware using TFTP* on page 58 for more information.) **TFTP** requires a TFTP server running somewhere on the network. The Total Access 600 starts a TFTP client function which gets the upgrade code from the TFTP server. Selecting **XMODEM** will load the upgrade code through the **CRAFT** port using any PC terminal emulator with xmodem capability.

TFTP Server Address
This is required when the transfer method is TFTP. It is the IP address or domain name (if DNS is configured) of the TFTP server.

TFTP Server Filename
This is required when the transfer method is TFTP. It is the case-sensitive file name which contains the upgrade code.

Transfer Status
This appears when TFTP is used. It displays the status of the transfer as it happens. Any error or success message will be displayed here.

Start Transfer
This activator is used when the configurable items in this menu are complete.

NOTE	*Before using* **START TRANSFER**, *the TA 600 should have a valid IP address, subnet mask, and default gateway (if required).*

Abort Transfer
Use this activator to cancel any TFTP transfer in progress.

>Config Transfer

Used only with TFTP transfers. Sends a file containing the TA 600 configuration to a file on a TFTP server using the TFTP protocol. **CONFIG TRANSFER** also lets you save the TA 600 configuration as a backup file, so you can use the same configuration with multiple TA 600 units. In addition, **CONFIG TRANSFER** can retrieve a configuration file from a TFTP server.

To support these transfers, ADTRAN delivers a TFTP program with the TA 600 called *TFTP Server*. You can config-ure any PC running Microsoft Windows with this software, and store a configuration file. See *Appendix B. Updating Total Access 600 Firmware using TFTP* on page 58 for details on how to use *TFTP Server*.

NOTE	*Before using* **CONFIG TRANSFER**, *the TA 600 should have a valid IP address, subnet mask, and default gateway (if required).*

Only one configuration transfer session (upload or download) can be active at a time.

Transfer Method
Displays the method used to transfer the configuration file to or from a server. Currently, you must use TFTP.

Transfer Type
Only **BINARY** transfers are currently supported.

TFTP Server IP Address
Specifies the IP address of the TFTP server. Get this number from your system administrator.

TFTP Server Filename
Defines the name of the configuration file that you transfer to or retrieve from the TFTP server. The default name is **Total Access 600.cfg**, but you can edit this name.

Current Transfer Status
Indicates the current status of the update.

Previous Transfer Status
Indicates the status of the previous update.

Load and Use Config
Retrieves the configuration file specified in the **TFTP SERVER FILENAME** field from the server. To start this command, enter **Y** to begin or enter **N** to cancel.

> **CAUTION**
>
> *If you execute this command, the TA 600 retrieves the configuration file, reboots, then restarts using the new configuration.*

Save Config Remotely
Saves the configuration file specified in **TFTP SERVER FILENAME** to the server identified in **TFTP SERVER IP ADDRESS**. To start this command, enter **Y** to begin or enter **N** to cancel.

> **CAUTION**
>
> *Before using this command, you must have identified a valid TFTP server in **TFTP SERVER IP ADDRESS**.*

>Ping
Allows you to send pings (ICMP requests) to hosts. The following items are under this menu:

> **NOTE**
>
> *Only one ping session can be active at a time.*

Start/Stop
Activator to start and cancel a ping test.

Host Address
IP address or domain name (if DNS is configured) of device to receive the ping.

Size (40-1500)
Total size of the ping to send. Range is 40 (64 is def) to 1500 bytes.

# of Packets
Total packets to send every 2 seconds. Setting this to **0** allows the client to ping continuously.

 # Transmits
Total packets sent (read only).

 # Receives
Total packets received (read only).

%Loss
Percentage loss based on ping returned from host (read only).

Configuring WAN Settings

>DSLAM Type

Set this to the type of DSLAM the Total Access 600 will be connecting to.

>Layer One Interface

This is the physical layer protocol used to connect the DSLAM to the Total Access 600.

>Layer Two Protocol

This is the data link layer protocol used to connect the DSLAM to the Total Access 600.

> **NOTE** *If the DSLAM Type is CopperMountain, refer to Appendix H. Routing in HDIA Mode on page 71 for information.*

>ATM Config

Use the **WAN** menu (Figure 6) to access the **ATM CONFIG** menu.

```
TA 608 IAD/WAN
System Info      DSLAM Type         Adtran TA3000
System Config    Layer One Interface T1
System Utility   Layer Two Protocol  ATM
WAN              ATM Config         [+]
Router           ATM Stats          [+]
Voice
Modules




MODE: T1 IAD                                    NET:  down
                                                ^Z=help  0:34
```
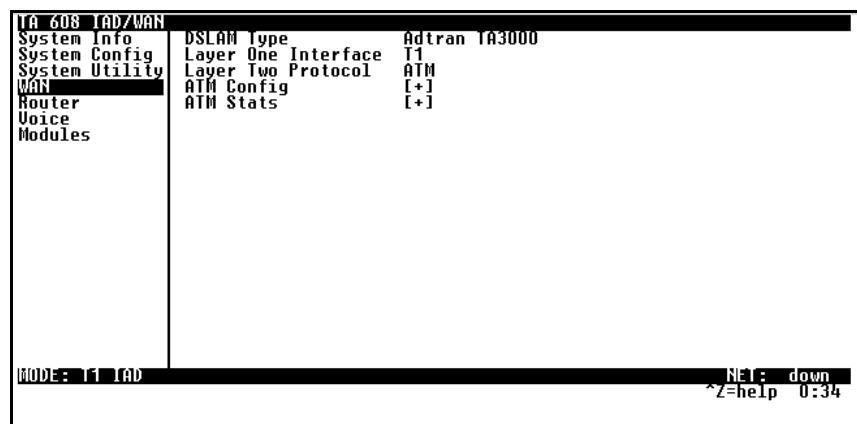
Figure 6. WAN Menu

Use the **ATM CONFIG** menu (Figure 7) to set the parameters listed below the figure.

```
TA 608 IAD/WAN/ATM Config
ATM Config  Idle Cells       ATM Forum (Unassigned)
ATM Stats   Data Scrambling  Disabled




MODE: T1 IAD                                          NET:  down
                                                     ^Z=help  0:35
```

Figure 7. ATM Config Menu

Idle Cells
The **IDLE CELLS** format must be configured for either **ATM FORUM** or **ITU**. Configuring this setting incorrectly for a particular circuit will cause poor performance at the ATM layer.

> **NOTE**   *This setting must match the configuration setting of the ATM switch or DSLAM at the other end of the circuit.*

Data Scrambling
DATA SCRAMBLING can be **ENABLED** or **DISABLED** for cell traffic. Configuring this setting incorrectly for a particular circuit will cause poor performance at the ATM layer.

> **NOTE**   *This setting must match the configuration setting of the ATM switch or DSLAM at the other end of the circuit.*

>ATM Stats

Use the **WAN** menu (Figure 6 on page 27) to access the **ATM STATS** menu (Figure 8) and view the parameters listed below the figure.

```
┌─────────────────────────────────────────────────────────┐
│TA 608 IAD/WAN/ATM Stats                                  │
│ATM Config  AP: TxCells                      0            │
│ATM Stats   AP: RxCells                      0            │
│            AP: RxOAMCells                   0            │
│            AP: ReceiveCellsDiscarded        0            │
│            AP: ReceiveCellErrors            0            │
│            AP: Sync                         Inactive     │
│            AP: OutOfCellDelineation         0            │
│            AAL5: TransmitFrames             0            │
│            AAL5: ReceiveFrames              0            │
│            AAL5: TransmitDiscardedFrames    0            │
│            AAL5: ReceiveErrors              0            │
│            AAL5: ReceiveDiscardedFrames     0            │
│            AAL5: NoAtmFrames                0            │
│            AAL5: NoDataPackets              0            │
│            Clear Stats                      <+>          │
│                                                          │
│                                                          │
│                                                          │
│MODE: T1 IAD                                 NET:  down   │
│                                             ^Z=help  0:37│
└─────────────────────────────────────────────────────────┘
```

Figure 8. ATM Stats Menu

AP: Tx Cells
This is the number of cells transmitted.

AP: Rx Cells
This is the number of cells received.

AP: Rx OAM Cells
This is the number of OAM cells received

AP: Receive Cells Discarded
This is the number of cells received and discarded. An incrementing count in this field could indicate a configuration problem with the ATM layer.

AP: Receive Cell Errors
This is the number of cells received with an HEC error.

AP: Sync
This indicates cell delineation at the ATM layer.

AP: Out Of Cell Delineation
This indicates loss of cell delineation at the ATM layer.

AAL5: Transmit Frames
This is the number of AAL5 frames transmitted.

AAL5: Receive Frames
This is the number of AAL5 frames received.

AAL5: Transmit Discarded Frames
This is the number of AAL5 frames discarded.

AAL5: Receive Errors
This is the number of AAL5 errors received.

AAL5: Receive Discarded Frames
This is the number of AAL5 frames discarded.

AAL5: No ATM Frames
This is for internal use only.

AAL5: No Data Packets
This is for internal use only.

DBG: DEBUG
This is for internal use only.

Clear Stats
This is used to clear the counters on this menu screen.

Configuring the Router – Configuration

Use the **ROUTER/CONFIGURATION** menu (Figure 9) to access the **GLOBAL**, **ETHERNET**, and **WAN** menus.

```
TA 608 IAD/Router/Configuration
Configuration  Global    [+]
Status         Ethernet  [+]
Logs           WAN       [+]




















MODE: T1 IAD                                      NET:  down
                                                 ^Z=help  0:38
```

Figure 9. Router/Configuration Menu

>*Global*

Use the **GLOBAL** menu (Figure 10) to set up general router functions.

```
TA 608 IAD/Router/Configuration/Global
Global    IP        [+]
Ethernet  Bridge    [+]
WAN       Security  [+]



















MODE: T1 IAD                                      NET:  down
                                                 ^Z=help  0:40
```

Figure 10. Global Menu

IP
This is used for general IP configuration.

Mode
This item controls how the 600 handles IP routes. When this option is set to **ON** (def), the 600 will advertise and listen to routes from other IP routers. If **OFF**, the route table is still used, but only static routes are used for routing IP packets and only the Ethernet port is used. IP packets can be sent over the WAN, but only when bridged.

Static Routes

Use this menu to enter static routes to other networks.

ACTIVE	Adds this static route entry to the IP routing table when set to **YES** (def) and removes it (if it was previously added) if set to **NO**.
IP ADDRESS	The IP address of the host or network address of the device being routed to.
SUBNET MASK	Determines the bits in the previous IP address that are used. *If this is to be a host route, it must be set to all ones* (255.255.255.255).
GATEWAY	The IP address of the router to receive the forwarded IP packet.
HOPS	The number of router hops required to get to the network or host. Maximum distance is 15 hops.
PRIVATE	When set to **NO**, the Total Access 600 will advertise this static route using RIP. Setting to **YES** means that the route is kept private.

DHCP Server

DHCP MODE	When set to **ON**, the Total Access 600 acts as a DHCP server and will dynamically assign IP, network mask, default gateway, and DNS addresses to any device which transmits a broadcast DHCP request. The addresses assigned are based on the Total Access 600's own IP address and will be within the same network.
DHCP RENEWAL TIME	The number of hours that the DHCP server should allow the device before it is required to send a new DHCP request. The default is 15 hours, and 0 represents an infinite lease.

Domain Names

Enter the 600's domain name and the primary and secondary DNS servers in this menu.

DOMAIN NAME	Text string used to represent the domain name used by the Total Access 600.
PRIMARY DNS	First server to which domain name requests are sent.
SECONDARY DNS	Server used as a backup, in case the primary address does not respond to the request.
PRIMARY NBNS/WINS	Server to which NT domain name requests are sent.
SECONDARY NBNS/WINS	Server used when there is no response from the primary server.

UDP Relay

This menu configures the 600 to act as a UDP relay agent for applications requiring a response from UDP hosts that are not on the same network segment as their clients.

Mode

When this option is set to **ON** (def), the Total Access 600 will act as a relay agent.

UDP Relay List

Up to four relay destination servers can be specified in this list.

RELAY ADDRESS	This is the IP address of the server that will receive the relay packet.
UDP PORT TYPE	
STANDARD (def)	The following standard UDP protocols are relayed when set: DHCP, TFTP, DNS, NTP (Network Time Protocol, port 123, NBNS (NetBios Name Server, port 137), NBDG (NetBIOS Datagram, port 138), and BootP.
SPECIFIED	When set, the UDP port (1 to 65535) can be specified in the UDP Port columns (up to three per server).
UDP PORT 1, 2, 3	Used for specifying UDP ports to be relayed. These fields only apply when **UDP PORT TYPE** is set to **SPECIFIED**.

Bridge

The **BRIDGE** menu is used to set up the bridge parameters for the 600. The bridging function runs at the Media Access Control (MAC) level which allows any protocol packets that run over Ethernet to be forwarded. Bridging can run concurrently with IP. However, when IP routing is active, IP packets (which include ARP packets) are not bridged.

Mode

This is used to enable the bridge function.

Address Table

The 600 automatically maintains a table of MAC addresses detected and associates those addresses with the LAN or WAN port from which they were received.

AGING	The maximum time an idle MAC address remains in the table before being removed. The value is in minutes.
FORWARD POLICY	When this parameter is set to **UNKNOWN** (def), any bridge packet with a destination MAC address that is not in the bridge table is forwarded to all other ports. When set to **KNOWN**, the packet with the unknown destination MAC address is dropped and is not forwarded.

Security

Filter Defines
The Total Access 600 can filter packets based on certain parameters within the packet. The method used by the Total Access 600 allows the highest flexibility for defining filters and assigning them to a PVC. The filters are set up in two steps: (1) defining the packet types, and (2) adding them to a list under the PVC. This menu is used to define the individual filter defines based on packet type.

Filter Defines /MAC Filter Defines
The MAC filter is applied to bridge packets only. Bridge packets which are forwarded by the bridge functionality of the Total Access 600 are defined here. Up to 32 MAC defines can be specified.

NAME	Identifies the filter entry.
SRC ADDR	48-bit MAC source address used for comparison. (hexadecimal format)
SRC MASK	Bits in the MAC source address which are compared. (hexadecimal format)
DEST ADDR	48-bit MAC destination address used for comparison. (hexadecimal format)
DEST MASK	Bits in the MAC destination address used for comparison. (hexadecimal format)
MAC TYPE	16-bit MAC type field used for comparison. (hexadecimal format)
TYPE MSK	Bits in the MAC type field used for comparison. (hexadecimal format)

Filter Defines /Pattern Filter Defines
The pattern filter is applied to bridge packets only. That is any packet which is forwarded by the bridge functionality of the Total Access 600. Up to 32 pattern defines can be specified.

NAME	Identifies the filter entry.
OFFSET	Offset from beginning of packet of where to start the pattern comparison.
PATTERN	64 bits used for comparison. (hexadecimal format)
MASK	Bits in the pattern to be compared. (hexadecimal format)

Filter Defines /IP Filter Defines
The IP filter defines apply to any IP packet, whether it is routed or bridged. Up to 32 IP defines can be specified.

NAME	Identifies the filter entry.
IP SRC	IP address compared to the source address. (dotted decimal format)

SRC MASK	Bits which are used in the source comparison. (dotted decimal format)
IP DEST	IP address compared to the destination address. (dotted decimal format)
DEST MASK	Bits which are used in the destination comparison. (dotted decimal format)
SRC PORT	IP source port number used for comparison Range: 0 to 65535. (decimal format)
SRC PORT CMPR	Type of comparison that is performed. = means ports equal to **not** = means port not equal to > means port greater than < means port less than **None** - means the source port is not compared
DST PORT	IP destination port number used for comparison Range: 0 to 65535. (decimal format)
DST PORT CMPR	Type of comparison that is performed = means ports equal to **not** = means port not equal to > means port greater than < means port less than **None -** means the destination port is not compared
PROTO	Protocol used for comparison. Range: 0 to 255. (decimal format)
PROTO CMPR	Type of comparison that is performed = means protocols equal to **not** = means protocols not equal to > means protocols greater than < means protocols less than **None** means the protocol is not compared

TCP Est	**Yes -** only when TCP established
	No - only when TCP not established
	Ignore - ignore TCP flags

>*Ethernet*

Use the **ETHERNET** menu (Figure 11) to configure the Ethernet port on the 600.


```
TA 608 IAD/Router/Configuration/Ethernet
Global    IP         [+]
Ethernet  MAC Address  00A0C807C75F
WAN




MODE: T1 IAD                                      NET: down
                                           ^Z=help  0:41
```

Figure 11. Ethernet Menu

IP

This is used to set up the IP addresses for the LAN on the 600

IP Address

The IP address assigned to the 600's Ethernet port is set here. This address must be unique within the network.

Subnet Mask

This is the IP network mask that is to be applied to the 600's Ethernet port.

Default Gateway

The default gateway is used by the 600 to send IP packets whose destination address is not found in the route table.

RIP

Use this menu to enable RIP on the LAN interface.

MODE	Enables or disables RIP.
PROTOCOL	Specifies the RIP protocol. Choices are **V1** (def) (which is RIP version 1) or **V2** (RIP version 2).
METHOD	Specifies the way the RIP protocol sends out its advertisements. Choices are given below.
NONE	All routes in the router table are advertised with no modification of the metrics.
SPLIT HORIZON (def)	Only routes not learned from this circuit are advertised.
POISON REVERSE	All routes are advertised, but the routes learned from this port are "poisoned" with an infinite metric.
DIRECTION	Allows the direction at which RIP advertisements are sent and listened to be specified.
TX AND RX (def)	RIP advertisements are periodically transmitted and are listened to on this port.
TX ONLY	RIP advertisements are periodically transmitted but are not listened to on this port.
RX ONLY	RIP advertisements are not transmitted on this port, but are listened.
V2 SECRET	Enter the secret used by RIP version 2 here.

Proxy ARP

This feature allows the network portion of a group of addresses to be shared among several physical network segments. The ARP protocol provides a way for devices to create a mapping between physical addresses and logical IP addresses. Proxy ARP makes use of this mapping feature by instructing a router to answer ARP requests as a "proxy" for the IP addresses behind one of its ports. The device which sent the ARP request will then correctly assume that it can reach the requested IP address by sending packets to the physical address that was returned. This technique effectively hides the fact that a network has been (further) subnetted. If this option is set to **YES**, when an ARP request is received on the Ethernet port the address is looked up in the IP routing table. If the forwarding port is not on the Ethernet port and the route is not the default route, the 600 will answer the request with its own hardware address.

MAC Address

This is a read-only MAC address programmed at ADTRAN.

>*WAN*

Use the **WAN** menu (Figure 12) to configure WAN settings on the 600.
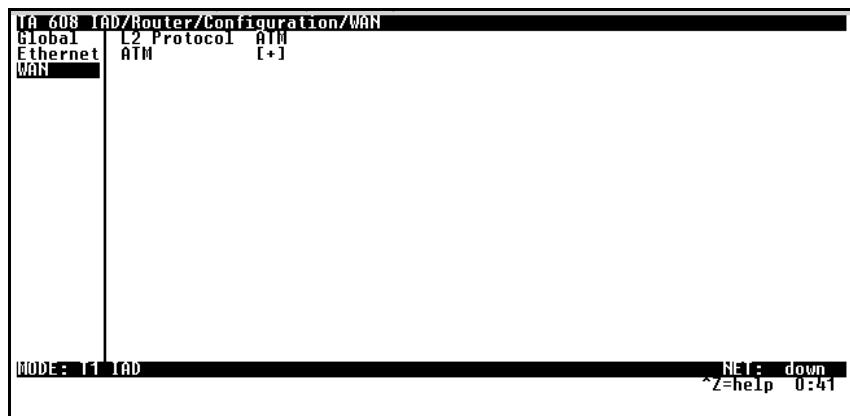
Figure 12. WAN Menu

L2 Protocol
Displays the current L2 protocol - ATM (Read Only).

ATM
Use the ATM menu to setup Data PVCs for the router.

Description
This is the text description for the PVC.

VPI
ATM virtual port identifier.

VCI
This is the ATM virtual channel identifier.

PCR
Peak Cell Rate. Limits transmitted cells.

QOS
Quality of Service. Indicates this PVC's traffic class.

Protocol
This is the protocol supported on the PVC.

RFC1483 IP
Use this selection to support IP on this PVC. (These settings only take effect when RFC1483 is the selected protocol.)

Active
This selection enables IP on this PVC.

Far - End IP Address

This is the address of the NEXT hop router on this interface.

IP netmask

This is the network mask used for this interface.

Local IP Address

This is the IP address for this PVC.

NAT

Use this menu to set up and use Network Address Translation on this interface.

NETWORK ADDRESS PORT TRANSLATION	By enabling port translation, IP packets are modified as they pass through this interface. During transmission, private addresses are translated into a single public (NAPT) IP address. Incoming packets are translated from the public to private address based on the protocol port numbers. Once enabled, you must set up NAT for use.
PUBLIC IP ADDRESS MODE	The port translation requires at least a single real IP address for translating. This value can use the IP assigned to the interface (or assigned via layer 2 protocol like PPP), obtained using DHCP client, or statically specified on this menu. If the address cannot be learned, then it must be specified in order for the translation to work.
TRANSLATION TABLE	Add translation entries to "fine tune" special protocols or specify private addresses.
PUBLIC ADDRESS MODE	The public IP address used for this translation entry can be the NAPT IP address assigned to the link or can be specified. You specify an address to direct packets with certain protocols to different servers.
PROTOCOL	The upper layer protocol that is to be monitored for translation. For TCP and UDP, a port number must also be specified.
PUBLIC PORT MODE	The public destination port associated with this entry can be specified to add more control over certain types of traffic. The default, **ANY PORT**, covers all port types.
PRIVATE ADDRESS MODE	The private IP address can be specified to steer certain protocols and ports to specific servers in the private network. Likewise, internal hosts can be steered to certain servers on the public network. A new request from the public network matching this entry's public parameters will be dropped if this mode is set to **ANY INTERNAL**.

PRIVATE PORT MODE		The private destination port associated with this entry can be specified to add more control over certain types of traffic. Leave as **ANY PORT** to cover all port types.
TRANSLATE BODY		By default, the application payload in the packet is scanned for occurrences of the private/public IP address in binary or ASCII form. Set this to **No** for applications where this will cause problems.
NAT VIEW	Shows the protocols that are actively being translated.
NAPT ADDRESS	Represents the public address that is being used as the NAPT address.
ENTRY COUNT	The number of entries in the NAT table.
ENTRY OVERFLOW COUNT	A count of the dropped entries due to low memory.

RIP

Use this menu to enable RIP on the WAN interface. (See *RIP* on page 37 for description of options.)

RFC 1484 Bridge

This is used to enable bridge mode on this PVC. (These settings only take effect when RFC1483 is the selected protocol.)

PPPoATM

The Total Access 600 uses the PPPoATM profile to specify the profile used when connected using PPP.

Authentication

The authentication menu contains the required parameters for the authentication of the PPP peer and for being authenticated by the PPP peer. Authentication is applied between the Total Access 600 and the PPP peer as follows:

TX Method

This parameter specifies how the Total Access 600 is to be authenticated by the PPP peer. There are four possible selections.

NONE (def)	The connection will not allow the PPP peer to authenticate it.
PAP, CHAP, OR EAP	The connection can be authenticated using PAP, CHAP or EAP.
CHAP OR EAP	The connection can be authenticated using CHAP or EAP only.
EAP	The connection will only allow authentication by the peer using EAP.

TX Username

This is the username that is used when being authenticated by the PPP peer.

TX Password

This is the password or secret that is used when being authenticated by the PPP peer.

RX Username
This is the username used to authenticate the PPP peer.

RX Password
This is the password or secret that is used to authenticate the PPP peer.

IP
The IP menu contains the parameters for exchanging IP data with the PPP peer.

Mode
Setting to **ON** (def) will permit this connection profile to negotiate PPP IPCP with the PPP peer for exchanging of IP packets.

Local IP
This is the IP address that is assigned to the PPP link when using numbered links. Leaving this as 0.0.0.0 means the Total Access 600 will determine its IP address using PPP IPCP. If the far end router does not assign an IP address, the PPP link is left unnumbered.

Netmask
This network mask is applied to the IP/Local IP address for determining the PPP peer's network. If left as 0.0.0.0, a standard network mask is used.

Remote IP
The PPP peer's IP address or network can be set here, if known. Leaving this at 0.0.0.0 means that the Total Access 600 will determine the PPP peer's IP and network using the PPP IPCP.

NAT
The Total Access 600 can perform Network Address Translation. This feature is most widely used when connecting to the Internet. The Ethernet network can consist of private network numbers. When this profile is connected, all IP addresses on the Ethernet side are translated into the one real IP address negotiated with the PPP peer (ISP). Multiple stations on the Ethernet side can access the Internet simultaneously. Setting this option to **ON** will cause the Total Access 600 to perform NAT. In the **OFF** (def) position, the unit will route across the connection normally.

Route
The IP parameters are configured in this menu. Usually the Total Access 600 will automatically discover the PPP peer's networks using PPP IPCP and/or RIP.

- **Route/Static Route**

Selecting yes will add a static route to the remote peer to the route table.

- **Route/Private**

Selecting yes will prevent this route from being advertised.

- **Route/Hops (1-16)**

This value is the metric or number of hops that RIP will use in advertising the static route. The range is 1 to 16, where 1 is the default. The value 16 is considered an infinite distance (poisoned route).

- **Route/Force IP**

When set to **YES**, the Total Access 600 will force the PPP peer to use the IP address in the **LOCAL IP** for this profile as its WAN IP address. Normally this is set in the **NO** (def) position.

RIP

The RIP parameters can be adjusted from their defaults under this menu.

• Mode

The Total Access 600 performs RIP over the WAN connection when this is set to **ON** (def).

• Protocol

The Total Access 600 performs version 1, **V1** (def), or version 2, **V2**, of RIP on this WAN connection.

• Method

SPLIT HORIZON	Only routes not learned on the WAN connection are advertised.
POISON REVERSE (def)	All routes are advertised, including routes learned from the WAN connection. These routes are poisoned.
NONE	All routes are advertised, including routes learned from the WAN connection. No attempt is made to poison these routes.

• Direction

TX AND RX (def)	RIP advertisements are transmitted and listened to on the WAN connection.
TX ONLY	RIP advertisements are transmitted and not listened to.
RX ONLY	RIP advertisements are listened to but not transmitted.

• Triggered

When set to **YES**, only IP RIP updates are sent when the routing table has changed and learned routes are not "aged." When set to **NO** (def), updates are sent periodically.

• Retain

When this Connection List entry is disconnected and this parameter is set to **YES**, all routes learned from this WAN connection are retained and their routing interface is set to idle.

PPP

The Total Access 600 supports the IETF standards for the Point-to-Point Protocol. The PPP state machine running in the Total Access 600 can be fine-tuned to support many applications that can be employed. The configurable items under this menu can be changed from their default values for special cases.

VJ Compression

When this item is set to **ON**, the Total Access 600 will perform TCP/IP header compression known as Van Jacobson compression to the PPP peer.

Max Config

This value is the number of unanswered configuration-requests that should be transmitted before giving up on a call. The possible values are 5, 10 (def), 15 and 20.

Max Timer

This value is the number of seconds to wait between unanswered configuration requests. The possible values are 1 sec, 2 secs (def), 3 secs, 5 secs and 10 secs.

Max Failure

Due to the nature of PPP, configuration options may not be agreed upon between two PPP peers. This value is the number of configuration-naks that should occur before an option is configuration-rejected. This allows a connection to succeed that might otherwise fail. The possible values are 5 (def), 10, 15 and 20.

Encapsulation

This is the PPP encapsulation. (LLC or VC-Mux)

Filters

The Total Access 600 can block packets in and out of a WAN port by use of the filters. They are set up in two steps: 1) define the types of packets that would be of interest in the **CONFIGURATION/GLOBAL/ SECURITY/FILTER DEFINES** menu, and 2) set up the filter type and combination of defines that will cause a packet block.

WAN-TO-LAN (In)

The packets which come into the Total Access 600 can be filtered in three ways:

DISABLED (def)	Turns off packet input filtering. No incoming packets are blocked.
BLOCK ALL	All incoming packets from the WAN are blocked except as defined in the **FILTERS/IN EXCEPTIONS** list.
FORWARD ALL	All incoming packets from the WAN are not blocked except as defined in the **FILTERS/IN EXCEPTIONS** list.

In Exceptions

This is a list of up to 32 filter entries which can be combined using the operations field. The operations are performed in the order they appear on the list.

ACTIVE	Turns this entry active when set to **ON.**
TYPE	Selects the filter define list to reference:
MAC	from the **CONFIGURATION/GLOBAL/SECURITY/FILTER DEFINES/MAC FILTER DEFINES** list.
PATTERN	from the **CONFIGURATION/GLOBAL/SECURITY/FILTER DEFINES/PATTERN FILTER DEFINES** list.
IP	from the **CONFIGURATION/GLOBAL/SECURITY/FILTER DEFINES/IP FILTER DEFINES** list.
IPX	from the **CONFIGURATION/GLOBAL/SECURITY/FILTER DEFINES/IPX FILTER DEFINES** list.
FILTER LIST NAME	Selects between filters defined in the list.
NEXT OPER	The next operation to use to combine with the next filter in the list:
END	the last filter to combination.

AND	logically AND this filter with the next filter in the list.
OR	logically OR this filter with the next filter in the list.

LAN-TO-WAN (Out)

The packets which come out toward the WAN from the TA600 can be filtered in three ways:

DISABLED **(def)**	Turns off packet input filtering. No outgoing packets are blocked.
BLOCK ALL	All outgoing packets to the WAN are blocked except as defined in the **FILTERS/OUT EXCEPTIONS** list.
FORWARD ALL	All outgoing packets to the WAN are not blocked except as defined in the **FILTERS/OUT EXCEPTIONS** list.

Out Exceptions

This is a list of up to 32 filter entries. The setup is exactly the same as the **FILTERS/IN EXCEPTIONS** list.

Configuring the Router – Status

Use the **ROUTER/STATUS** menu to view and set the parameters shown in Figure 13. The **ROUTER/STATUS** screens give the user useful information for debugging the current routes in the 600.


```
TA 608 IAD/Router/Status
Configuration  Session      [+]
Status         ARP Cache    [+]
Logs           Bridge Table [+]
               IP Routes    [+]
               LAN Stats    [+]
               IP Stats     [+]




MODE: T1 IAD                                 NET:  down
                                             ^Z=help  0:43
```
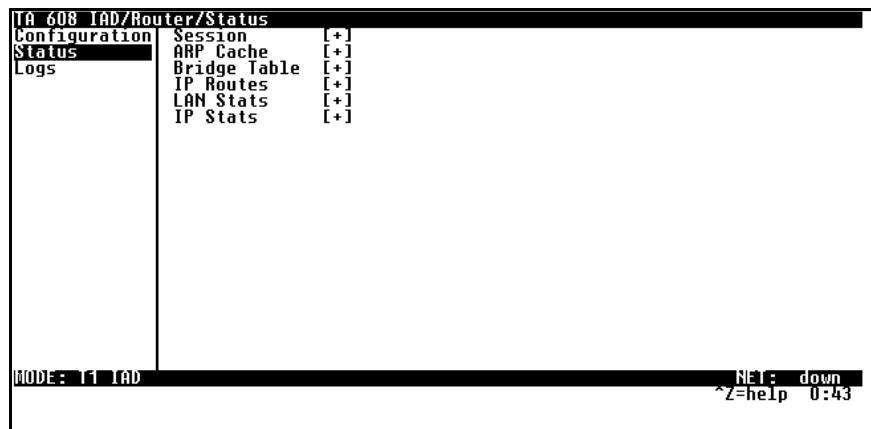
Figure 13. Router/Status Menu

>Session

This menu maintains statistics about the active ATM PVCs.

>ARP cache

This is a listing of the currently connected Ethernet port on the LAN.

>Bridge Table

This shows the detected MAC addresses and the interface to which they are associated.

>IP Routes

This shows the current routes in the 600 and their use.

>LAN Stats

This shows traffic over the LAN interface.

>IP Stats

This shows IP traffic through the 600.

Configuring the Router – Logs

The Logs menu (Figure 14) contains logs displaying important information about the running condition of the Total Access 600. The logs can be set to capture diagnostics of error conditions only by way of a log level. The levels are divided up as follows:

> level 0 - Fatal event (causes reset)
>
> level 1 - Critical event
>
> level 2 - Error event
>
> level 3 - Warning event
>
> level 4 - Notify event
>
> level 5 - Informational event
>
> level 6 - Debugging event

```
TA 608 IAD/Router/Logs
Configuration  Syslog Host
Status         PPP Log        [+]
Logs           Connection Log [+]
               Network Log    [+]




















MODE: T1 IAD                                    NET:  down
                                              ^Z=help  0:44
```
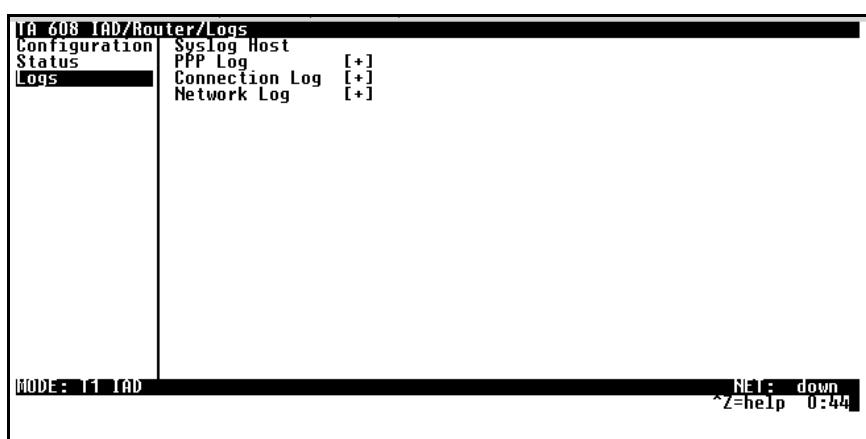
Figure 14. Router/Logs Menu

Sys log Host

Set this to the IP address or domain name (if DNS configured) of the sys log host device. All log events are sent to this device.

PPP Log

Information pertaining to the PPP negotiation and authentication is logged in the PPP log.

Connection Log

Information pertaining to the call placement and answering is logged in the Connection log.

Network Log

Information pertaining to routing protocols is placed in this log.

Each log (PPP log, Connection log, and Network log) contains the following elements.

Active

When set to **YES** (def), PPP events below or equal the log level are logged into the log.

Wrap

When set to **YES** (def), new PPP events will overwrite old PPP events when the log is full. All logging will stop when the log is full and set to **NO**.

Level

In order to log events, they must be at or below this level. Range is 0 to 6. The default is 3.

View

This menu displays the log list. The fields are as follows:

DATE/TIME	Date and time event occurred.
LEVEL	Level associated with this event (0-6).
MESSAGE	Text message for this event. If message is too long to fit on the line, another event appears below it continuing the message.

Clear

This clears the log when activated.

Configuring Voice Support – Config

Use the **VOICE/CONFIG** menu to view and set the parameters shown in Figure 15.


```
TA 608 IAD/Voice/Config
Config| Call Control  Jetstream
Status| VPI            0
       VCI            39




MODE: T1 IAD                                    NET:  down
                                                ^Z=help  0:46
```

Figure 15. Voice/Config Menu

>*Call Control*

The **CALL CONTROL** setting is used to configure the correct Voice Gateway protocol for voice signaling control be-
tween the Total Access 600 and the configured Gateway. The **CALL CONTROL** setting must be configured correctly
before the voice circuits will work correctly. The Total Access 600 supports Jetstream, Tollbridge, and CopperCom
Voice Gateways.

>*VPI*

The **VPI** setting is used to configure the Total Access 600 virtual path setting used to communicate with the configured
Voice Gateway.

>*VCI*

The **VCI** setting is used to configure the Total Access 600 virtual circuit setting used to communicate with the config-
ured Voice Gateway.

Configuring Voice Support – Status

Use the **VOICE/STATUS** menu to view and set the parameters shown in Figure 16.

```
TA 608 IAD/Voice/Status
Config  Gateway Stats  [+]
Status  PVC Stats      [+]
        POTS Stats     [+]
        Clear Stats    <+>




MODE: T1 IAD                                     NET:  down
                                               ^Z=help  0:47
```
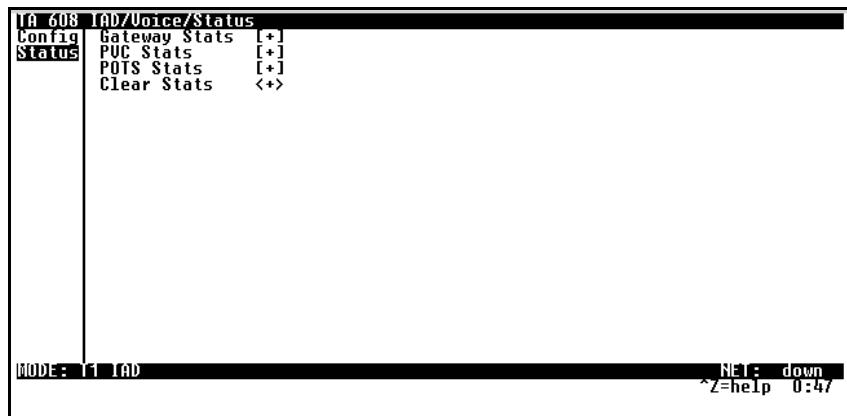
Figure 16. Voice/Status Menu

>Gateway Stats

The **GATEWAY STATS** menu shows the current state of the communication link between the Total Access 600 and the Voice Gateway. The Gateway Link is indicated as **UP** or **DOWN**. A count of management messages is indicated along with the number of active calls in progress.

>PVC Stats

The **PVC STATS** menu shows the current state of the virtual circuit used between the Voice Gateway and the Total Access 600 IAD for voice signaling and voice payload delivery.

>POTS Stats

The **POTS STATS** menu shows real-time indication status of each voice port on the Total Access 600. From this menu, on a per port basis, the user can determine which ports are active/inactive. Several statistics at this menu are used only for internal ADTRAN development. Task, Inserts, and Drops indicators are for internal use only.

>Clear Stats

The **CLEAR STATS** menu can be used to clear the counters used for Voice Status menus.

Managing the Modules – Modules

Use the **MODULES** menu to view and set the parameters shown in Figure 17. The Total Access 600 contains four fixed modules: The WAN/Network interface, FXS, Echo Canceller/ADPCM module, and the V.35 interface. The **MODULES** table allows management of the on-board modules in the Total Access 600.

The table contains **MENU**, **ALARM**, **TEST**, and **STATUS** indicators/menus customized for each module.

```
TA 608 IAD/Modules/Modules
Modules    Slt   Type      Menu     Alarm     Test     Status
V.35 Setup  0  NET (T1)    [+]      [+]       [+]      [+]
            1  FXS         [+]      [n/a]     [+]      [+]
            2  EC/ADPCM    [+]        -         -        -



















MODE: T1 IAD                                         NET:  down
Access module menus                              ^Z=help  0:51
```

Figure 17. Modules Menu

>NET (T1)

Menu

Format
Sets the frame format for the T1 interface. The setting must match the frame format of the circuit to which the interface is connected. Choices are **ESF** (extended superframe), **SF** (superframe), or **SLC96**.

> **NOTE** *SF is equivalent to the D4 frame format.*

Line Code
Sets the line code for the T1 interface. The setting must match the line code of the circuit to which the interface is connected. Choices are **B8ZS** (bipolar with 8-zero substitution) or **AMI** (alternate mark inversion).

Equalization
Sets the line build-out for the T1 interface. The setting of this field depends on whether the circuit is provisioned for DS1 by the telephone company. Choices are 0dB,-7.5dB,-15dB,-22dB,266FT,399FT,533FT,and 655 FT.

CSU Lpbk
Enables or disables far-end commanded loopbacks via the FDL channel.

Test
These options are used to initiate local and remote loopback tests and display the test status.

Loc LB
(Local Loopback) Causes loopback on near-end port.

None
No test/stop test.

Line
Metallic loopback

Payload
Payload loopback framing and clocking are regenerated.

Remote LB
(Remote Loopback) Sends a loopback code to a remote CSU.

None
No test/stop test.

Line
Metallic loopback

Payload
Payload loopback framing and clocking are regenerated.

Test Status
Indicates whether a test is underway.

Alarm

Loss of Signal (LOS)
No signal detected on port interface.

Red Alarm (RED)
Not able to frame data received on the port. Alternately referred to as Out of Frame (OOF).

Yellow Alarm (YELLOW)
Remote alarm indicator (RAI) being received on port.

Blue Alarm (BLUE)
Receiving unframed all ones from the port alarm indicator signal (AIS).

Status
Displays T1 performance data.

Time Frame

In the Time Frame menu, three options are available: **CURRENT** , **15 MIN** and **24 HR**. The performance data for the given window is stored.

CLR

Clears information for the selected port. Press **ENTER** when the cursor is over this field to clear the data.

ES

Errored Seconds. An ES is a second with one or more error events or one or more Out Of Frame events or one or more Controlled Slips.

SES

Severely Errored Seconds. An SES is a second with 320 or more er-ror events or one ormore OutOf-Frame events.

SEF

Severely Errored Frames.

FS

Frame Sync Errors.

LCV

Line Code Violations.

SLP

Slip Error Events.

UAS

Unavailable Seconds

>*FXS*

Refer to the Total Access 600 Series FXS Voice Ports User Interface Guide.

>*EC/ADPCM*

Refer to the Total Access 600 Series FXS Voice Ports User Interface Guide.

Managing the Modules – V.35 Setup

Use the **V.35 SETUP** menu to view and set the parameters shown in Figure 18.

```
TA 608 IAD/Modules/V.35 Setup
Modules      Channel Rate  64K
V.35 Setup   CTS           Normal
             DCD           Normal
             DSR           Normal
             ATM/FR IWF    [+]













MODE: T1 IAD                                   NET:  down
                                              ^Z=help  0:51
```

Figure 18. V.35 Setup Menu

CHANNEL RATE and **EIA** settings are supported via this menu option. For all typical applications, these settings are left in their default states.

>ATM/FR IWF

This menu contains the setup and status for the ATM/Frame Relay interworking functions.

Mode
The **MODE** setting configures the V.35 port for FRF5 or FRF8 operation, depending upon the application being supported.

FRF5
This is also known as Network Interworking. Use this mode for Frame Relay over ATM.

FRF8
This is also known as Service Interworking. In this mode, the Total Access 600 performs a translation between Frame Relay and ATM protocols.

Configuration
The **CONFIGURATION** menu is used to support the configuration of Frame-to-ATM interworking, signaling formats, timeout values, and PVC settings.

The following settings are used for FRF5.

LAN FR MAINT PROTOCOL	Frame Relay maintenance or signaling protocol between local V.35 port and the attached DTE port, support ANSI Annex A, CCITT Q933 An-nex D, CISCO LMI or Static (no signaling).
LAN FR POLL TIMEOUT T392 (5-30)	T392 for signaling protocol, typical value 15. No meaning if Maint Protocol is Static.
FRN PORT CONFIG	Logical Frame Relay ports over ATM. Up to 4 ports are supported with each port supporting up to 4 DLCI mappings. Go to **NUM** field. Typing "i" or "I" will insert another entry, and typing "d" or "D" will delete one entry.
NAME	To identify your port.
ATM VPI	Specifies the virtual path over which this logical port is running.
ATM VCI	Specifies the virtual circuit over which this logical port is running.
DE MAP	Frame Relay to ATM DE mapping; default value (Frn Only, ATM 0) suggested.
CLPI MAP	ATM to Frame Relay CLPI map; default value (Frn Only) suggested.
D/C	Set D/C field in the header to 0 or 1.
HEADER	Header format; only 2 bytes supported now.
MAINT PROTOCOL	Maintenance or signaling protocol over this logical Frame Relay port. Support Annex A, Annex D, CISCO LMI or Static.
MUX MODE	Many DLCIs or one DLCI mapping over this port.
DLCI MAP	Actual DLCI mappings.
LAN DLCI	The DLCI configured over local V.35 Frame Relay port.
NET DLCI	The DLCI configured over the WAN side logical Frame Relay port.
ACTIVE	Always active, not configurable.

The following settings are used for FRF8.

LAN FR MAINT PROTOCOL	Frame Relay maintenance or signaling protocol between local V.35 port and the attached DTE port, support ANSI Annex A, CCITT Q933 Annex D, CISCO LMI or Static (no signaling).
LAN FR POLL TIMEOUT T392 (5-30)	T392 for signaling protocol, typical value 15. No meaning if Maint Protocol is Static.
FR/ATM PVC MAPPING	Up to 4 mappings are supported.
FR DLCI	Frame Relay DLCI on V.35 port.
ATM VPI	Specifies the virtual path to which DLCI is mapped.
ATM VCI	Specifies the virtual circuit to which DLCI is mapped.
TRANSLATE	Translate or transparent mode between Frame Relay frames and ATM cells.
DE MAP	Map Frame Relay DE bit to ATM CLPI bit, Always 0, Always 1 or Convert each other.
FECN MAP	Map Frame Relay FECN bit to ATM EFCI bit, Always 0, Always 1 or Convert each other.

Appendix A. Updating Total Access 600 Firmware using XMODEM

The Total Access 600 supports firmware updating using XMODEM transfer protocol via the base unit's **CRAFT** port. XMODEM is found in the VT 100 terminal emulation application in the ADTRAN Utilities package and in most PC VT 100 communications software packages.

> **NOTE** *Make certain that the communications software package used has flow control turned off.*

Before beginning this procedure, you must obtain the appropriate update file from ADTRAN Technical Support at **(888) 4ADTRAN (423-8726)**.

An XMODEM download can be initiated by enabling a forced download or by using the console menus. The following materials are required.

• VT 100 terminal or PC with VT 100 terminal emulation software
• XMODEM software

> **WARNING** *To prevent electrical shock, do not install equipment in a wet location or during a lightning storm.*

Updating Firmware via a Forced Download

Perform the Steps Below in the Order Listed

1. **Using a VT 100 terminal emulation communication software package which contains XMODEM protocol support, log in to TA 600. Set the transmit rate of the emulation software to 9600 baud.**

2. **Unplug the unit to remove power. When power is reapplied, hold down the letter 'B' from the VT 100 terminal. Before the unit begins its boot-up sequence it will check for the letter 'B'. If present, the download menu will appear.**

> **NOTE** *Both uppercase and lowercase letters will work for the Forced Download. Make certain flow control is disabled for the VT 100 interface.*

3.   **Press Enter until a menu appears.**

> **NOTE**
>
> *To shorten transmit time, select the option from the menu to change the transmit rate to 115.2K baud or the highest rate supported by the terminal emulation software. If this transmit rate is changed, change emulation software properties to match this rate and disconnect and connect again. Press* **Enter** *again until the menu appears.*

4.   **Choose option 1, BEGIN XMODEM DOWNLOAD NOW, from the menu to start the XMODEM file download.**

5.   **Press Y at the START FLASH DOWNLOAD NOW prompt to continue with the XMODEM file transfer.**

> **NOTE**
>
> *When Total Access 600 is ready to receive the XMODEM upload, the menu screen will display* **Transmit Flash . . . download file now**. *If this does not appear, please review the steps above for possible configuration errors.*

6.   **From the terminal emulation software, begin the XMODEM upload by using the appropriate command sequence. (If necessary, refer to terminal emulation software documentation for help. Also, when specifying the filename, ensure that the file transferred is the one provided by ADTRAN. Otherwise, the update will not complete successfully.)**

> **NOTE**
>
> *Because XMODEM data is being transferred in-band through the menu interface, the VT 100 menus of Total Access 600 will be inoperable from the* **CRAFT** *port.*

7.   **When the update has successfully completed, TRANSFER COMPLETE appears in the terminal window. If an error occurs during the update, an error message will display in the terminal window. If this occurs, return to Step 3 and attempt the update again. If the same error occurs, contact ADTRAN Technical Support.**

8.   **After the TRANSFER COMPLETE message has been displayed, cycle power on the unit.**

9.   Change the emulation software properties to 9600 baud. Disconnect and connect to the
      unit at this transmit rate and continue configuring the unit as normal.

NOTE   *It is suggested that a factory default be conducted after the unit is updated with new firmware.*

Updating Firmware via the Console Menus

1.   Using a VT 100 terminal emulation communication software package which contains XMO-
      DEM protocol support, log in to TA 600.

2.   Select SYSTEM UTILITY/UPDATE FIRMWARE.

3.   Select XMODEM for TRANSFER METHOD.

4.   Press Enter on START TRANSFER <+>.

5.   When prompted, press Y to erase flash.

NOTE   *When Total Access 600 is ready to receive the XMODEM upload, the menu screen will clear and
        display* **Transmit Flash . . . download file now**. *If this does not appear, please review the steps
        above for possible configuration errors.*

6.   From the terminal emulation software, begin the XMODEM upload by using the appropriate
      command sequence. (If necessary, refer to terminal emulation software documentation for
      help. Also, when specifying the filename, ensure that the file transferred is the one pro-
      vided by ADTRAN. Otherwise, the update will not complete successfully.)

NOTE   *Because XMODEM data is being transferred in-band through the menu interface, the VT 100
        menus of Total Access 600 will be inoperable from the* **CRAFT** *port.*

7.   When the update has successfully completed, TRANSFER COMPLETE displays in TRANSFER
      STATUS. The module restarts immediately and resumes operation. If an error occurs during
      the update, an error message will display in the TRANSFER STATUS field. If this occurs, return
      to Step 3 and attempt the update again. If the same error occurs, contact ADTRAN Techni-
      cal Support.

Appendix B. Updating Total Access 600 Firmware using TFTP

TA 600 supports firmware updates via the IP network using TFTP from a network server. The network server must be capable of supporting TFTP server requests from the TFTP client within the TA 600.

You must have a level 2 password to perform updates to the Total Access 600. Please consult the Total Access 600 administrator if this password is not known.

You must obtain the appropriate update file from ADTRAN Technical Support at **(888) 4ADTRAN (423-8726)**.

You must copy the update file provided by ADTRAN to a network server that supports TFTP server requests. Record both the IP address of the server and the full path location of the update file to be downloaded.

The following materials are required.

* A PC with a Telnet client software
* A TFTP Server accessible on the local network (a TFTP Server is provided as part of the ADTRAN Utilities software)

WARNING *To prevent electrical shock, do not install equipment in a wet location or during a lightning storm.*

CAUTION *Electronic modules can be damaged by static electrical discharge. Before handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.*

Perform Steps Below in the Order Listed

1.   **Using a Telnet program, log in to Total Access 600.**

2.   **Select SYSTEM UTILITY / UPDATE FIRMWARE.**

3.   **Select TFTP for TRANSFER METHOD.**

4.   **Enter into TFTP SERVER IP ADDRESS, the IP address of the network server that was recorded earlier.**

5.   **Enter into TFTP SERVER FILENAME, the full path name and filename of the update file that was recorded earlier.**

6.   **Select START TRANSFER <+> to start the update process. Enter Y to confirm the transfer and to set up the module to receive the TFTP upload.**

> *During the TFTP upload process, various status messages display in CURRENT UPDATE STATUS to indicate progress. The table below describes these messages.*
>
> NOTE

When the update has successfully completed, **TRANSFER COMPLETE** displays in **TRANSFER STATUS**. The Total Access 600 restarts immediately and resumes operation.

If an error occurs during the update, an error message will display in the **TRANSFER STATUS** field. If this occurs, return to Step 3 and attempt the update again. If the same error occurs, contact ADTRAN Technical Support.

During the TFTP upload, various status messages display to indicate progress. The following table describes these messages.

Message	Meaning
Contacting Server	Indicates communication with the TFTP network server is trying to be established with the specified server address in the TFTP Server IP Address field.
Beginning TFTP Transfer	Indicates communication with the TFTP network server has been established and the update file is being transferred between Total Access 600 and the TFTP network server.
Completed	Indicates the Total Access 600 product successfully received the update file.

Message	Meaning
Error: File Not Found	Indicates the TFTP network server was unable to locate the specified file name or path in the TFTP Server File-name field.
Error: Access Violation	Indicates the TFTP network server denied Total Access 600 access to the given update file name and path. Please verify appropriate user rights are selected for the specified path.
Error: Illegal Operation	An unknown operation was detected by Total Access 600 when transferring the update file from the TFTP network server.
Error: User Aborted	Indicates the user selected **CANCEL UPDATE** to abort reception of the update file from the TFTP network server.

Appendix C. Navigating the Terminal Menus

Terminal Menu Window

The TA 600 uses a multilevel menu structure that contains both menu items and data fields. All menu items and data fields display in the terminal menu window, through which you have complete control of the TA 600 (see Figure 19).
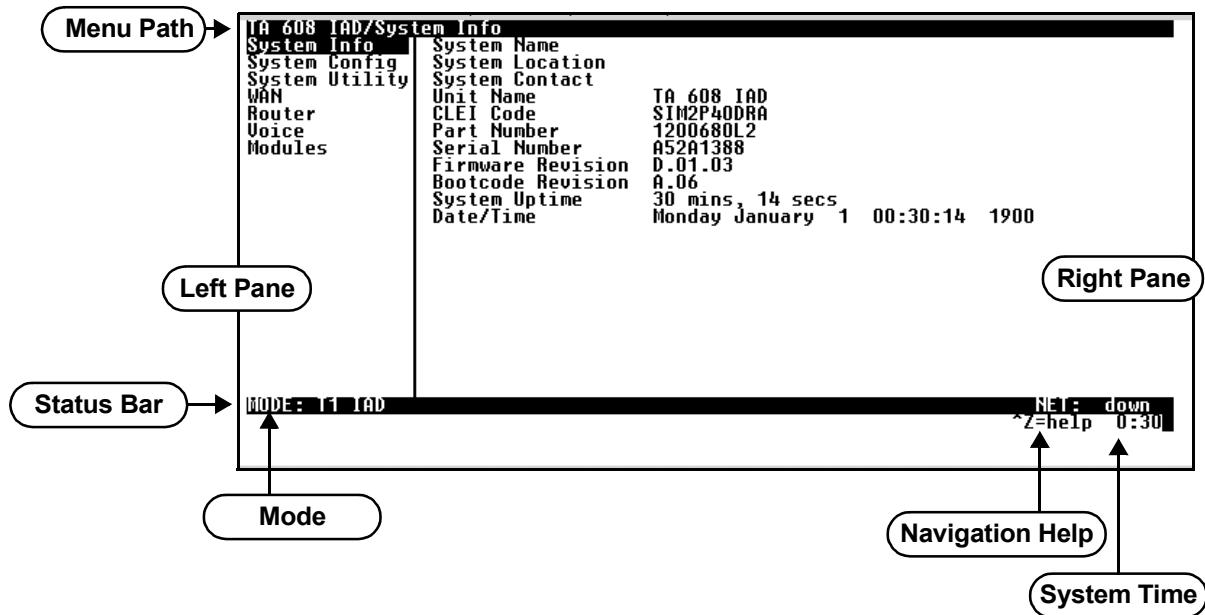

Figure 19. Top-level Terminal Menu Window

Menu Path

The first line of the terminal menu window (the menu path) shows the session's current position (path) in the menu structure. For example, Figure 19 shows the top-level menu with the cursor on the **SYSTEM INFO** submenu; therefore, the menu path reads **TOTAL ACCESS 600/SYSTEM INFO**.

> **NOTE**
>
> *The top level menu path will always display the specific product name from the Total Access 600 family.*

Window Panes

When you first start a terminal menu session, the terminal menu window is divided into left and right panes. The left pane shows the list of available submenus, while the right pane shows the contents of the currently selected submenu.

Window Pane Navigation

Use the following chart to assist you in moving between and within the two window panes.

To move...	Press one of these keys...
From left pane to right pane	**Tab** **Enter** **Right arrow**
From right pane to left pane	**Tab** **Escape** **Left arrow**
Within each pane	**Up arrow** **Down arrow** **Left arrow** **Right arrow**

Right Window Pane Notation

The right window pane shows the contents of the currently selected menu. These contents can include both submenu items and data fields. Some submenus contain additional submenus and some data fields contain additional data fields. The following chart explains the notation used to identify these additional items.

This notation...	Means that...
[+]	More items are available when selected.
[DATA]	More items are available when selected.
<+>	An action is to be taken, such as activating a test.
Highlighted menu item	You can enter data in this field.
Underlined field	The field contains read-only information.

Additional Terminal Menu Window Features

Mode	Describes the mode of the Total Access 600 base unit (system).
Port Status	Indicates the types of modules installed in ports 1—6.
Navigation Help	Lists characters used for navigating the terminal menu (**Ctrl-Z**). See also *Moving through the Menus* on page 63.
System Time	Displays current time. See *Date/Time* on page 20 for details on editing the time.

Navigating Using the Keyboard Keys

You can use various keystrokes to move through the terminal menus, to manage a terminal menu session, and to configure the system. Press **Ctrl-Z** to activate a pop-up screen listing the navigation keystrokes.

Moving through the Menus

To do this...	Press this key...
Return to the home screen.	**H**
Jump between two menu items. Press **J** while the cursor is located on a menu item, and you jump back to the main screen. Go to another menu item, press **J**, and you jump back to the screen that was displayed the first time you pressed **J.** Press **J** when you want to jump between these items.	**J**
Select items.	**Arrows**
Edit a selected menu item.	**Enter**
Cancel an edit.	**Escape**
Close pop-up help screens.	**Escape**
Move between the left and right panes.	**Tab or Arrows**
Move to the top of a screen.	**A**
Move to the bottom of a screen.	**Z**
Ascend one menu level.	**Backspace**

Session Management Keystrokes

To do this...	Press this...
Log out of a session.	**Ctrl-L**
Invalidate the password entry and return to the login screen.	**Ctrl-S**
Refresh the screen. To save time, only the portion of the screen that has changed is refreshed. This option should be necessary only if the display picks up incorrect characters.	**Ctrl-R**

Configuration Keystrokes

To do this...	Press this key...
Restore factory default settings. This setting restores the factory defaults based on the location of the cursor. If the cursor is on a module line (in the **MODULES** menu), then only the selected module is updated to factory defaults.	F
Copy selected items to the clipboard. The amount of information you can copy depends on the cursor location when you press **C**: • If the cursor is over an editable field, only that item is copied. • If the cursor is over the index number of a list, then all of the items in the row of the list are copied. For example, if the cursor is over the **SLOT #** field in the **MODULES** screen, all of the information associated with the slot is copied.	C
Paste the item stored in the clipboard, if the information is compatible. You must confirm all pastes—except those to a single editable field.	P
Increment the value of certain types of fields by one when you paste information into those fields.	>
Decrement the value of certain types of fields by one when you paste information into those fields.	<
Insert a new list item. For example, add a new item to the **DLCI MAPPING** by pressing **I** while the cursor is over an index number.	I
Delete a list item. For example, delete an item from the **DLCI MAPPING** by pressing **D** while the cursor is over the index number.	D

Getting Help

The bottom line of the terminal menu window contains context-sensitive help information. When the cursor is positioned over a set of configuration items, a help message displays (when available) providing a description of the item. When more detailed help is available for a particular item, **^A** displays at the bottom of the window. At this point, if you press **Ctrl-A,** a pop-up help screen displays with information about the item.

Press **Ctrl-Z** to activate the help screen that displays the available keystrokes you can use to navigate the terminal menus.

Appendix D. Voice Gateway Quick Start Procedure (Voice Turn up)

A typical VoATM application (see Figure 20) uses a Total Access 600 connected to an ATM network. For voice applications, a Voice Gateway is needed to interface with the PSTN. Jetstream, Tollbridge, and CopperCom are popular Gateway types.
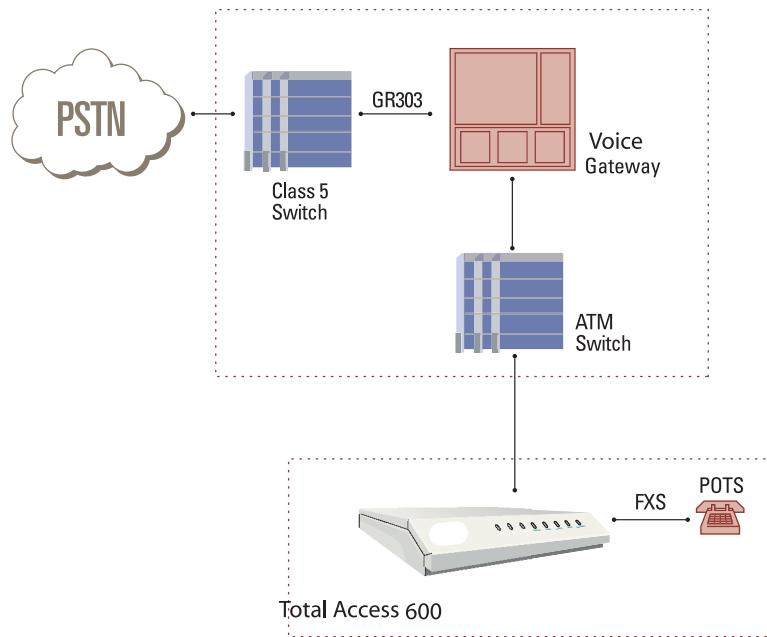

Figure 20. Application Diagram

To configure a Total Access 600 for use with the Voice Gateway, you need to know the VPI and VCI to be used on the ATM network to access the Gateway from this Total Access 600. You also need to know the format for Idle Cells and whether Data Scrambling is used on this ATM network. The following procedure will help you navigate the Total Access 600 menus for configuring the necessary elements for VoATM with the Voice Gateway.

Voice Turn Up	
Step	**Action**
1	From the Total Access 600 main menu, select the **WAN** menu. (Here you set up the ATM network.)
2	Select the **ATM CONFIG** menu.
3	Enter the **IDLE CELLS** format for your network.
4	Set **DATA SCRAMBLING** appropriately for your network.
5	Back all the way out to the top level Total Access 600 menu, and then select the **VOICE** menu. (From this menu, the appropriate Voice information for working with the Voice Gateway is entered.)
6	Select **CONFIG**, and from the **CONFIG** menu, enter the Gateway type under **CALL CONTROL** and enter the VPI and VCI values for communicating with that Gateway. **CALL CONTROL** should be set to the Gateway type and the VPI and VCI values should be set appropriately for your network.
7	To verify correct setup, use the **STATUS** menu (under the **VOICE** menu) to look at the current status of the voice connection. Under **STATUS**, you can view the **GATEWAY STATS** and information about the voice PVC along with information about the POTs ports available on the Gateway. The **GATEWAY STATS** menu should show the Gateway Link is up (if everything is configured correctly). A visual inspection of the **VOICE** LED on the front panel will also yield the status. Green = up. Red = Down.

Appendix E. RFC1483 Quick Start (IP Routing)

The Total Access 600 allows for complete integration of voice and data delivery from one compact platform (see Figure 21). Once you have completed the voice turn up procedure from the previous example, adding data to the circuit requires some additional setup.
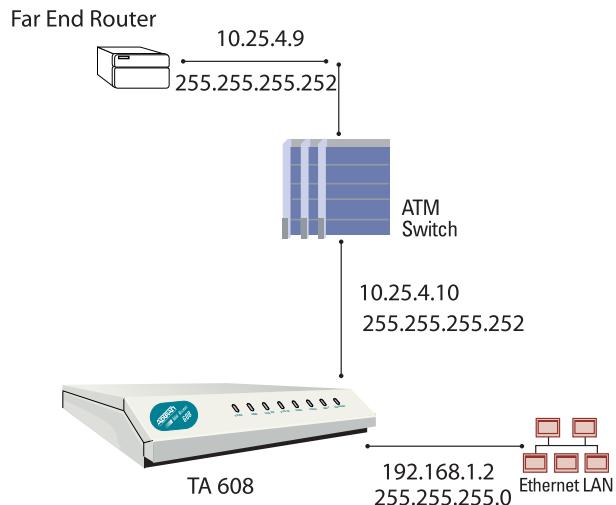

Figure 21. Application Diagram

To configure a Total Access 600 for IP routing, you need to know the VPI and VCI values for the data circuit on your network. You also need the IP address of the next hop router in the circuit.

The table on the next page shows how to configure the Total Access 600 for IP Routing.

.

IP Routing	
Step	**Action**
1	From the Total Access 600 main menu, select the **WAN** menu. (Here you set up the ATM network.)
2	Select the **ATM CONFIG** menu.
3	Enter the **IDLE CELLS** format for your network.
4	Set **DATA SCRAMBLING** appropriately for your network.
5	Back all the way out to the top level Total Access 600 menu, and then select the **ROUTER** menu.
6	Select **CONFIGURATION**. From the **CONFIGURATION** menu, you will set up addresses for your LAN and WAN. For basic IP routing, use all the default values from the **GLOBAL** menu.
7	From the **ETHERNET** menu, enter the **IP** menu to enter your LAN configuration.
8	Enter your LAN **IP ADDRESS**, **SUBNET MASK**, and **DEFAULT GATEWAY** information. For this example, the **IP ADDRESS** is 192.168.1.2, the **SUBNET MASK** is 255.255.255.0, and the **DEFAULT GATEWAY** is 10.25.4.10.
9	Arrow back to the main **ROUTER CONFIGURATION** menu, and select the **WAN** menu and then the **ATM** menu. (Here you will enter your data PVC information.)
10	Create a new PVC by entering the menu. Enter your VPI and VCI values.
11	From the **RFC1483 IP** menu, enter your LAN information. For this example, the **FAR END IP ADDRESS** is 10.25.4.9, the **IP NETMASK** is 255.255.255.252, and the **LOCAL IP ADDRESS** is 10.25.4.10.
12	Arrow back to the top level Total Access 600 menu to activate your changes.

Appendix F. RFC1483 Quick Start (IP Routing with NAT)

To illustrate the use of NAT, consider the example from Appendix E. To set up a single public address that will be used to access the public network, you will use the **NAT** menu on the **WAN/ATM/RFC1483 IP** menu.

IP Routing with NAT	
Step	**Action**
1	From the **NAT** menu, set NETWORK ADDRESS PORT TRANSLATION to ENABLED. (This will enable translation and allow you to enter the NAT options.)
2	Set PUBLIC IP ADDRESS MODE to SPECIFIED so you can enter your public address. During transmission, private addresses are translated into this public (NAPT) address.
	You will also need to set up the Translation Table to do translation on the body of the packets for certain protocols, such as FTP, to work correctly.
3	From the TRANSLATION TABLE menu, create a new entry by arrowing into the table.
4	For PUBLIC ADDRESS MODE, select **NAPT ADDRESS** to use the previously specified public address.
5	For PROTOCOL, select **TCP**.
6	Make sure that TRANSLATE BODY is set to YES.

Appendix G. RFC1483 Quick Start (Bridging)

The Total Access 600 allows for complete integration of voice and data delivery from one compact platform. Once you have completed the voice turn up procedure from the previous example, adding data to the circuit requires some additional setup.

To configure a Total Access 600 for Bridging, you need to know the VPI and VCI values for the data circuit on your network.

Bridging	
Step	**Action**
1	From the Total Access 600 main menu, select the **WAN** menu. (Here you set up the ATM network.)
2	Select the **ATM CONFIG** menu.
3	Enter the **IDLE CELLS** format for your network.
4	Set **DATA SCRAMBLING** appropriately for your network.
5	Back all the way out to the top level Total Access 600 menu, and then select the **ROUTER** menu.
6	Enter the **CONFIGURATION** menu. From this menu, you will set up addresses for your LAN and WAN. For basic IP routing, use all the default values from the **GLOBAL** menu.
7	From the **ETHERNET** menu, enter the **IP** menu to enter your LAN configuration.
8	Enter your LAN **IP ADDRESS** and **SUBNET MASK**. For this example, the **IP ADDRESS** is 192.168.1.2 and the **SUBNET MASK** is 255.255.255.0. This is not required, but will allow Telnet configuration and TFTP upgrades from the LAN.
9	Arrow back to the main **ROUTER CONFIGURATION** menu, and select the **WAN** menu and then the **ATM** menu. (Here you will enter your data PVC information.)
10	Create a new PVC by entering the menu. Enter your VPI and VCI values.
11	Disable IP on the **RFC1483 IP** menu and enable Bridging on the **RFC1483 BRIDGE** menu. (This enables the Total Access 600 as a bridge.)
12	Arrow back to the top level Total Access 600 menu to activate your changes. All packets that come in on the Ethernet will be forwarded on the WAN.

Appendix H. Routing in HDIA Mode

The Total Access 600 allows for complete integration of voice and data delivery from one compact platform. The CopperMountain DSLAM uses Frame Relay instead of ATM as their Layer 2 protocol. Once you have completed the Layer 1 configuration from the previous examples, you must configure the Layer 2 protocol. Refer to Figure 22 on page 72 as you complete the steps below.

Frame Relay Setup	
Step	**Action**
1	From the **IAD/WAN/FRAME RELAY CONFIG** menu, select **MAINTENANCE PROTOCOL.** Set **MAINTENANCE PROTOCOL** to **STATIC.**
2	From the **IAD/WAN/FRAME RELAY CONFIG** menu, select **DLCI MAPPING**.
3	On the **DLCI MAPPING** menu, DLCI 528 should be selected. Right arrow to the **IP MAP** menu.
4	On the **IP MAP** menu, set up the following: Set **ACTIVE** to **YES W/BRIDGE ENCAPSULATION.** Set **ADDRESS MODE** to either **USER SPECIFIED** or **DHCP CLIENT.** If **DHCP CLIENT** is selected, the link addresses will be learned through DHCP (skip to Step 5). Set **FAR-END IP ADDRESS** to the next hop router on the ATM interface connected to the Copper Mountain for this DSL line (10.100.2.145 in Figure 22). Set **IP NETMASK** appropriately for this interface. Set **LOCAL IP ADDRESS** to the Copper Mountain IP address for this line (10.100.2.148 in Figure 22).
5	On the **NAT** menu, set up the following: Set **NETWORK ADDRESS PORTTRANSLATION** to **ENABLED.** Set **PUBLIC IP ADDRESS MODE** to **SPECIFIED.** Set **PUBLIC IP ADDRESS** the same as **LOCAL IP ADDRESS** above. From the **TRANSLATION TABLE**, set up the following (create entries so that the appropriate protocols are translated): Right arrow to create an entry. Keep the defaults to enable TCP translation. Press **I** over the 1 in the first entry to create entry 2. Change the Protocol to ICMP for this entry. Continue creating entries as appropriate for each application.
6	Arrow back (left arrow) to the **IAD/WAN/FRAME RELAY CONFIG/DLCI MAPPING** menu.
7	From the **BRIDGE MAP** menu**,** set **ACTIVE** to **NO.**

| Frame Relay Setup	
8	Arrow back to the **IAD/ROUTER** menu. Select **CONFIGURATION**.

9	On the **GLOBAL** menu, set up the following:
	
	Select **IP.**
	
	Set **MODE** to **ON.**
	
	Select **DHCP SERVER.**
	
	Set **DHCP MODE** to **ON.**
	
	From **DOMAIN NAMES**, set up the following:
	    Set **PRIMARY DNS** appropriately (172.22.48.47 in Figure 22).
	    Set **SECONDARY DNS** appropriately (172.22.48.1 in Figure 22).
	
	Select **BRIDGE.**
	
	Set **MODE** to **OFF.**

10	Arrow back to the **ETHERNET** menu, and set up the following: Select **IP.** Set **IP ADDRESS** appropriately for your LAN (10.0.0.1 in Figure 22). Set **SUBNET MASK** appropriately**.** Set **DEFAULT GATEWAY** to the ATM router connected to the Copper Mountain (10.100.2.145 in Figure 22).
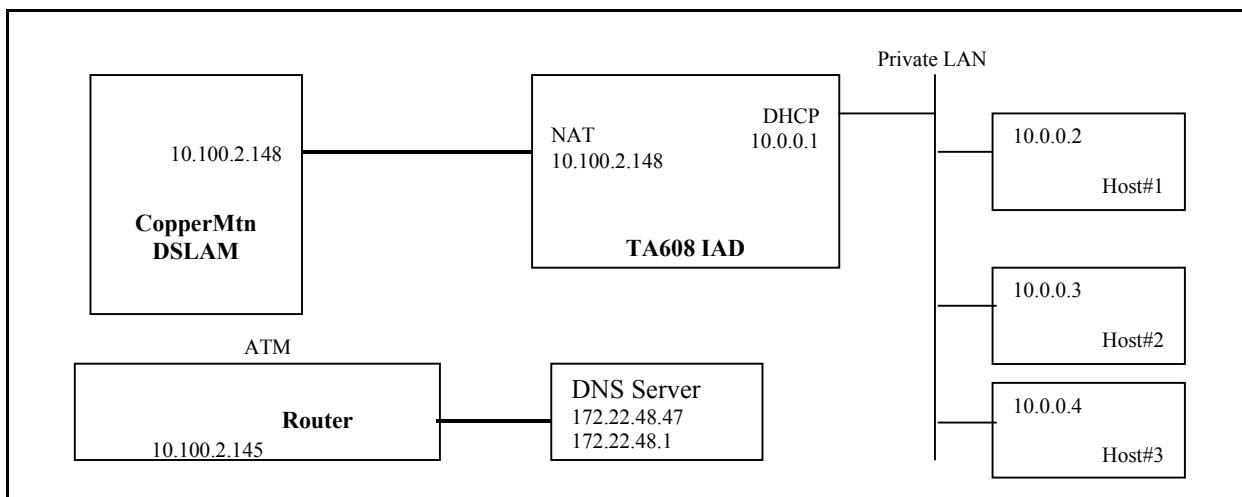
Figure 22. Routing with Copper Mountain

Appendix I. Craft Port Connection Pin-Out

DB-9	RJ-45	Description
2	5	TX Data
3	3	RX Data
5	1	GND
Note: All other pins are unused.		