EXPRESS 6503
SHDSL ATM DSU
User Manual

1200296L1 Express 6503 SHDSL ATM DSU

61200296L1-1A
May 2001

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(256) 963-8000

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. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Avoid using a telephone (other than a cordless-type) during an electrical storm. There is a remote risk of shock from lightning.
4. Do not use the telephone to report a gas leak in the vicinity of the leak.
5. 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.
6. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
7. Use caution when installing or modifying telephone lines.

Save These Important Safety Instructions

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference 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.

Shielded cables must be used with this unit to ensure compliance with Class B FCC limits.

CAUTION

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

Limited Product Warranty

ADTRAN warrants that for 5 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.

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Customer Service, Product Support Information, and Training

ADTRAN will replace or repair this product within five years from the date of shipment if the product does not meet its published specification, or if it 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, see the toll-free contact numbers given below.

Presales Inquiries and Applications Support

Please contact your local distributor, ADTRAN Applications Engineering, or ADTRAN Sales:

Applications Engineering	(800) 615-1176
Sales	(800) 827-0807

Post-Sale Support

Please contact your local distributor first. If your local distributor cannot help, please contact ADTRAN Technical Support and have the unit serial number available.

Technical Support	(888) 4ADTRAN

The Custom Extended Services (ACES) program offers multiple types and levels of service plans which allow you to choose the kind of assistance you need. For questions, call the ACES Help Desk.

ACES Help Desk	(888) 874-2237

Repair and Return

If ADTRAN Technical Support determines that a repair is needed, Technical Support will coordinate with the Custom and Product Service (CAPS) department to issue an RMA number. For information regarding equipment currently in house or possible fees associated with repair, contact CAPS directly at the following number:

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.
Huntsville, Alabama 35806
RMA # _____

Training

The Enterprise Network (EN) Technical Training 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 by phone at 800-615-1176 ext. 7500, by fax at 256-963-6700, or by email at training@adtran.com.

Training	(800) 615-1176, ext. 7500

EXPRESS 6503 USER INTERFACE GUIDE

This document contains Express 6503 overview information, information on configuring the Express 6503, and information about navigating the VT 100 user interface.

CONTENTS

FIGURES

1. EXPRESS 6503 OVERVIEW

The Express 6503 is a serial (DCE) to SHDSL data service unit (DSU) designed for small offices and branch offices to provide cost-effective access to high-speed SHDSL services. The Express 6503 preserves the customer's investment in existing business class routers, allowing them to take advantage of New World applications and Packet Telephony. It offers an economical migration path utilizing ATM and Frame Relay over SHDSL without requiring replacement of existing networking equipment.

The Express 6503 provides small offices and branch offices with fast, affordable, and easy-to-use access to the Internet and corporate network. The Express 6503 makes DSL services and applications accessible to the office router or to the desktop. It supports an integrated SHDSL WAN interface and a serial interface to the router and can operate at symmetric speeds of up to 2312 kbps.

On the Express 6503, the terminal menu is the access point to all other operations. Each terminal menu item has several functions and submenus that identify and provide access to specific operations and parameters. These menu selections are described later in this User Interface Guide (pages 18 and following).

NOTE

See Appendix A. Navigating the Terminal Menus on page 32 for instructions about navigating the terminal menus.

Express 6503 Features and Benefits

- SHDSL WAN Support (ITU-T G.991.2) - The Express 6503 supports serial full duplex bidirectional data transport of up to 2312 kbps.
- ITU G.hs (ITU-T G.994.1) Support
- TC PAM Line Encoding - Compliant with the SHDSL standard.
- Back-to-back operation for Campus LAN applications.
- Synchronous Serial Interface - The serial interface can support either V.35 or X.21 protocols.
- AAL5 ATM Adaptation Layer Type 5 Support.
- FRF.8 Frame Relay to ATM Interworking Support - The Express 6503 supports FRF.8 Frame/ATM service interworking. It maps Frame data-link connection identifiers (DLCIs) to ATM permanent virtual circuits (PVCs); up to four VCs can be configured in the Express 6503.
- FRF.5 Frame Relay to ATM Interworking Support - DLCIs can be assigned automatically or provisioned.
- Priority Queues - The Express 6503 supports high and low priority traffic queues for prioritizing traffic across the WAN link.
- Management Support - The Express 6503 is managed through a command-line interface accessible locally through the management serial port or remotely through Layer 3 in-band management features.
- Safety and Compliance - The Express 6503 is designed for worldwide safety and electromagnetic certifications (EMC).

Front Panel

Figure 1 shows the Express 6503 front panel, which contains eight LEDs. Table 1 describes these LEDs.

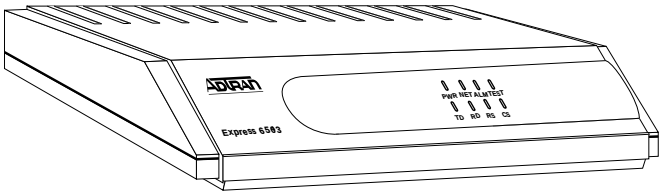

Figure 1. Express 6503 Front Panel

Table 1. Front Panel LEDs

LABEL	COLOR	DESCRIPTION
PWR	Green	Power Indication
NET	Green	On solid to indicate the ATM interface is ready to pass data. Fast blinking to indicate that the network is training. Slow blinking to indicate DSL layer is up.
ALM	Red	Indication of Network not ready.
TEST	Amber	Indication of test in progress.
TD	Green	Transmit Data (TxD)
RD	Green	Receive Data (RxD)
RS	Green	Request to Send
CS	Green	Clear to Send

Rear Panel

The Express 6503 rear panel (Figure 2) contains the following connectors:

- **NETWORK** SHDSL interface
- **X.21** serial interface
- **V.35** serial interface
- **CRAFT** management/control
- **90-240/VAC 50/60Hz .1A** power input

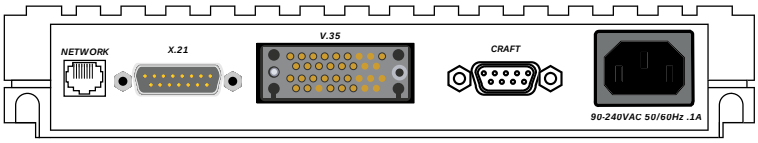

Figure 2. Rear Panel

Connector Pinouts

Table 2 below and Table 3 on page 14 give the pinouts for the V.35 and X.21 connectors.

Table 2. X.21 Interface

Pin	Name	I/O	Description
1	Shield	I/O	Shield for cable
2	TD-A	I	Transmitted Data
3	RTS-A	I	Request to Send
4	RD-A	O	Received Data
5	CD-A	O	Carrier Detect
6	CLK-A	O	Signal Timing
7	ETC-A	I	External Transmit Clock
8	SG	I/O	Signal Ground
9	TD-B	I	Transmit Data (return)
10	RTS-B	I	Request To Send (return)
11	RD-B	O	Receive Data (return)
12	CD-B	O	Carrier Detect (return)
13	CLK-B	O	Signal Timing (return)
14	ETC-B	I	External Transmit Clock (return)
15	NC	N/A	No Connection
I= Input, O= Output, N/A= Not Applicable			

Table 3. V.35 Interface

Pin	Name	I/O	Description
A	Shield	I/O	Shield for cable
B	SG	I/O	Signal Ground
C	RTS	I	Request To Send
D	CTS	O	Clear To Send
E	DSR	O	Data Set Ready
F	CD	O	Carrier Detect
H	DTR	I	Data Terminal Ready
J*	RI	O	Ring Indicator
P	SD-A	I	Send Data
R	RD-A	O	Receive Data
S	SD-B	I	Send Data (return)
T	RD-B	O	Receive Data (return)
U	TC-A	I	External Transmit Clock
V	RC-A	O	Receive Clock
W	TC-B	I	External Transmit Clock (return)
X	RC-B	O	Receive Clock (return)
Y	ST-A	O	Send Timing
AA	ST-B	O	Send Timing (return)
K,L	NC	N/A	No Connection
M,N	NC	N/A	No Connection
BB	NC	N/A	No Connection
CC	NC	N/A	No Connection
DD	NC	N/A	No Connection
EE	NC	N/A	No Connection
FF	NC	N/A	No Connection
HH	NC	N/A	No Connection
JJ	NC	N/A	No Connection
KK	NC	N/A	No Connection
LL	NC	N/A	No Connection
MM	NC	N/A	No Connection
NN	NC	N/A	No Connection

**Pin J (ring indicator) is needed for most video conferencing applications.*

I= Input, O= Output, N/A= Not Applicable

2. SPECIFICATIONS

Hardware

Table 4. Express 6503 Specifications

Characteristic	Description
SHDSL Interface	SHDSL (ITU-T G.991.2),TCPAM encoding: 200-2312 kbps (3-36 DS0s) RJ-45 connector, unshielded twisted pair copper wire
ATM PVCs	Up to 4 VPI/VCI mappings
User Interface	V.35 or X.21 serial interface
Protocols/Standards Supported	ATM Forum UNI 3.1, ITU-TI.432 Frame Relay Forum FRF.8, FRF. 5
Data Rate	200 - 2312 kbps
Flash memory	8 Megabits
DRAM	64 Megabits
Power Source	110-240 VAC, 50-60 Hz
G.handshake	G.hs (ITU-T G.994.1) for rate negotiation

Table 5. Express 6503 Power and Environmental Specifications and Approvals

Characteristic	Description
AC input voltage	110-240 VAC
AC input current	~.1 Amps
Operating Temperature Range	32 to 122 deg F (0 to 50 deg C)
Operating humidity	Humidity: 5 to 90% noncondensing
Power Requirements	110-240 VAC @ ~.1 Amps
Dimensions (H x W x D)	1.5 in. x 9.0 in. x 6.25 in.
Weight (average shipping)	1.5 lbs (0.68 kg)
Regulatory Approvals and Compliance	FCC Part 15, Class B EN55022, CISPR 22 UL/CUL 1950 3rd edition CE marked for EMC and safety

Standards Compliance

- ATM Forum
- Frame Relay FRF.5 and FRF.8

Management

- Command Line Interface

3. SHDSL APPLICATIONS

Figure 3 below, Figure 4 on page 17, and Figure 5 on page 17 show some typical applications for the Express 6503.

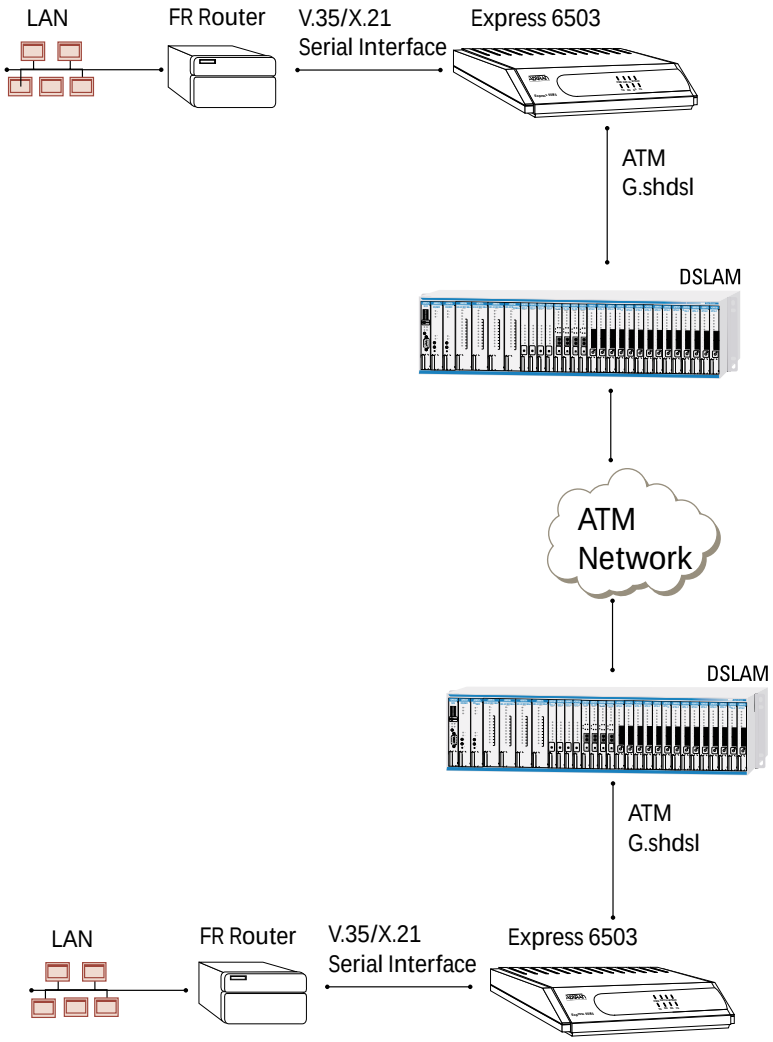

Figure 3. FRF5 Application

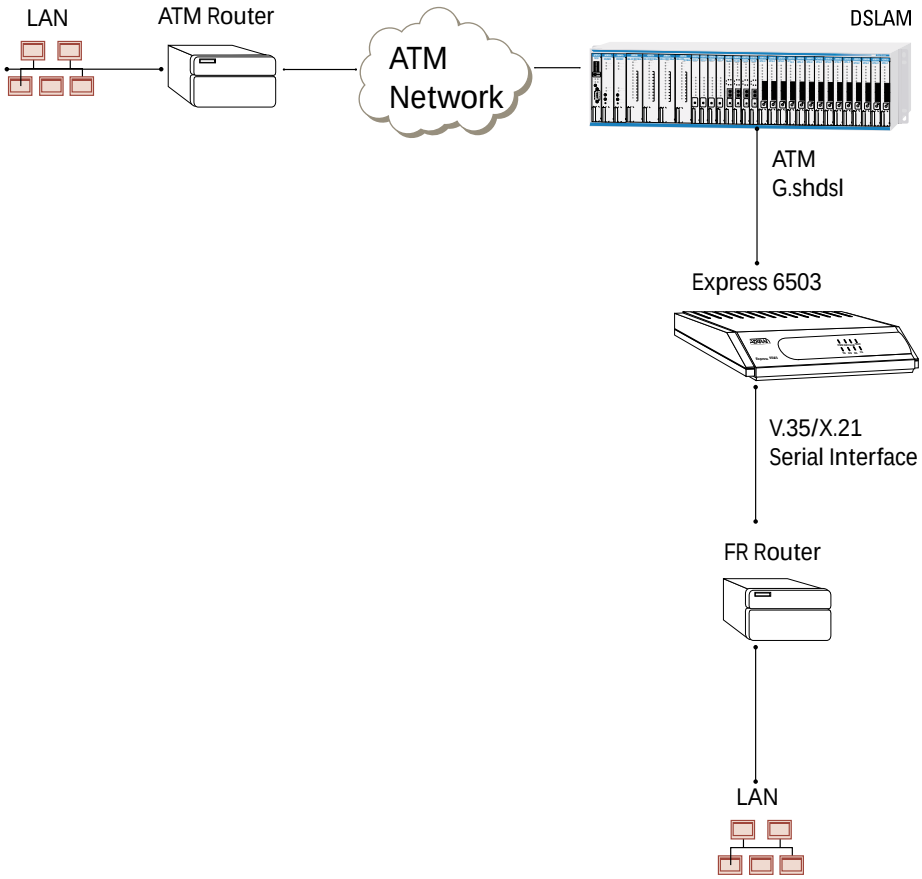

Figure 4. FRF8 Application

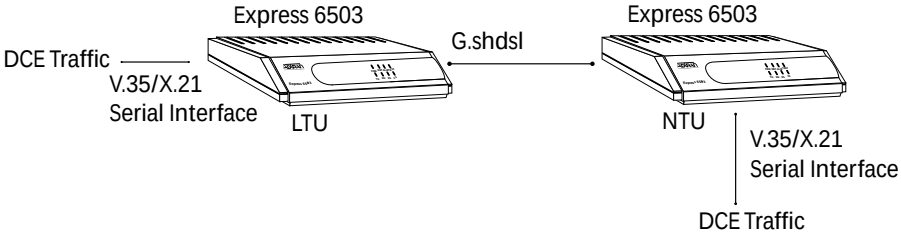

Figure 5. LDM Application

4. CONFIGURING THE EXPRESS 6503

System Info

The **SYSTEM INFO** menu provides basic information about the unit and contains data fields for editing information. Figure 6 displays the items available when you select this menu item.

```
Express 6503/System Info
System Info     System Name
System Config   System Location
System Utility  System Contact
System Tests    Unit Name          Express 6503
                CLEI Code          ??????????
                Part Number        1200296L1
                Serial Number      --------
                Firmware Revision  a.00.18
                Bootcode Revision  A.06
                System Uptime      9 mins, 46 secs
                Date/Time          Monday January  1  00:09:46  1900

MODE: NTU                                                  NET: Down
                                                          *Z=help  0:09
```

Figure 6. System Information Menu

>System Name

Provides a user-configurable text string for the name of the Express 6503. This name can help you distinguish between different installations. You can enter up to 40 alpha-numeric 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 Express 6503. This field is to help you keep track of the actual physical location of the unit. You can enter up to 40 alphanumeric 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 Express 6503. You can enter up to 40 alpha-numeric characters in this field, including spaces and special characters (such as an underbar).

>Unit Name

Product-specific name for the Express 6503.

>CLEI Code

CLEI code for the Express 6503.

> Part Number

ADTRAN part number for the Express 6503.

>Serial Number

Serial number of the Express 6503.

>Firmware Revision

Displays the current firmware revision level of the Express 6503.

>Bootcode Revision

Displays the bootcode revision.

>System Uptime

Displays the length of time since the Express 6503 reboot.

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

>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, 10-30-2001).

System Config

Set up the Express 6503 operational configuration from the **SYSTEM CONFIG** menu. Figure 7 shows the items included in this menu.

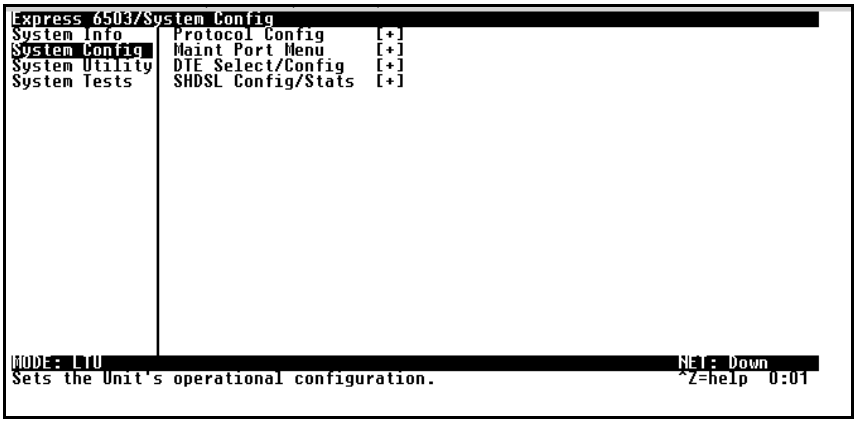

Figure 7. System Configuration Menu

>Protocol Config

Use this menu (Figure 8) to access ATM menus.

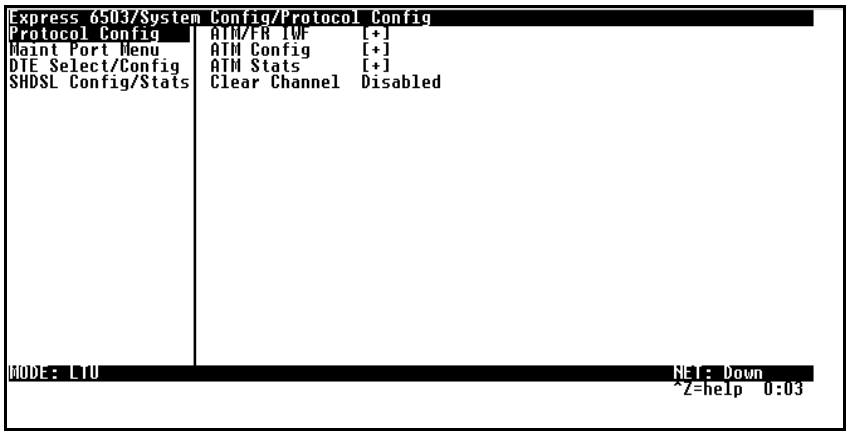

Figure 8. Protocol Configuration Menu

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 Express 6503 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 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.
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.
PCR	Peak Cell Rate for ATM.
QOS	Quality of Service for ATM UBR, VBR, VBR non-real time.
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	Specifies the maintenance protocol
MUX MODE	Many DLCIs or one DLCI mapping over this port.
DLCI MAP	Actual DLCI mappings.

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.
PCR	Peak Cell Rate for ATM.
QOS	Quality of Service for ATM UBR, VBR, VBR non-real time.
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 toATM EFCI bit, Always 0, Always 1 or Convert each other.

Status

Frame Relay

PORTS

PORT INDEX	Port number.
SIGNAL STATE	Frame relay state.
TX FRAMES	Number of frames transmitted.
RX FRAMES	Number of frames received.
TX BYTES	Number of bytes transmitted.
RX BYTES	Number of bytes received.

PVCs

PORT	Port number.
DLCI	DLCI number.
STATE	Frame relay state.
TX FRAMES	Number of frames transmitted.
RX FRAMES	Number of frames received.
TX BYTES	Number of bytes transmitted.
RX BYTES	Numberof bytes received.

ATM Config

Use the **ATM CONFIG** menu (Figure 9) to set the parameters listed below.

Figure 9. 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 **ATM STATS** menu (Figure 10) to set the parameters listed below.

```
Express 6503/System Config/Protocol Config/ATM Stats
ATM/FR IWF   AP: TxCells                      0
ATM Config   AP: RxCells                      0
ATM Stats    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
             SAR: Intr Tx GUN                 0
             ATM: Queue Unused                498
             ATM: Min Num Cells               800
             AAL5: Tx SAR Seg                 0
             Clear Stats                      <+>

MODE: NTU                                     NET: DOWN
                                              ^Z=help  0:02
```

Figure 10. 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 for an unconfigured PVC.

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

AP: Sync
This indicates cell delineation at theATM 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.

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

>Maint Port Menu

The Express 6503 VT 100 **CRAFT** port is located on the rear panel. The setup for this port is under this menu (Figure 11).

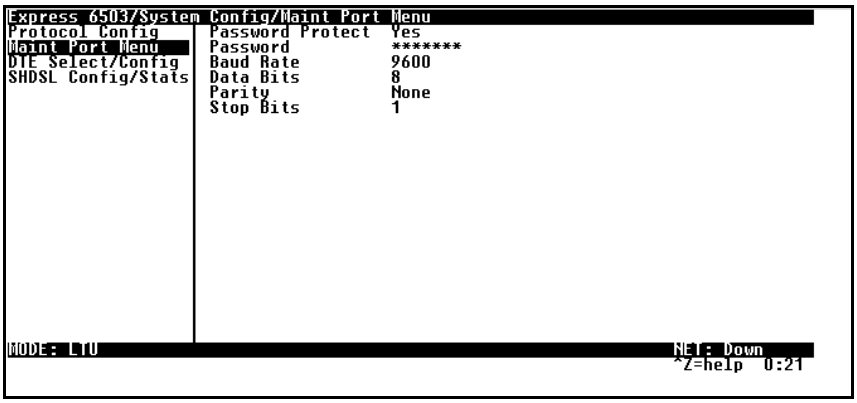

Figure 11. Maintenance Port Menu

Password Protect
When set to **NO**, the maintenance port is not password protected. When **ON** (def), the Express 6503 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** *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.

>DTE Select/Config

Figure 12 shows this menu.

Figure 12. DTE Select/Config Menu

DTE Select (V.35/X.21)

DTE Configuration

CTS
Can be set to normal or forced.

DCD
Can be set to normal or forced.

DSR
Can be set to normal or forced.

>SHDSL Config/Stats

Figure 13 below shows this menu.

Figure 13. shdsl Config/Stats Menu

SHDSL Config

NTU/LTU Mode

NTU
Network termination unit or remote device.

LTU
Line termination unit or host device.

Data Rate
Bit rate for the WAN and DCE interfaces.

Frame Mode
Type of framing required.

SHDSL Framed
SHDSL framed synchronous operation.

SHDSL Framed Plesio w/bit stuffing
SHDSL framed plesiosynchronous with bit stuffing.

Annex=A/B
Choices are: **ANNEX A, ANNEX B,** or **ANNEX A/B.**

ITU-991.2/GSpan
Choices are: **ITU-T G.991.2,** or **GLOBESPAN.**

SHDSL Stats

Signal State
Used for debugging SHDSL training.

NTU/LTU Mode
Indicates current mode.

Data Rate
Indicates current rate.

Frame Mode
Indicates type of framing.

G.hs State
Indicates state of G.hs.

G.hs Event
Indicates G.hs of previous event.

System Utility

Use the **SYSTEM UTILITY** menu (Figure 14) to upgrade firmware.

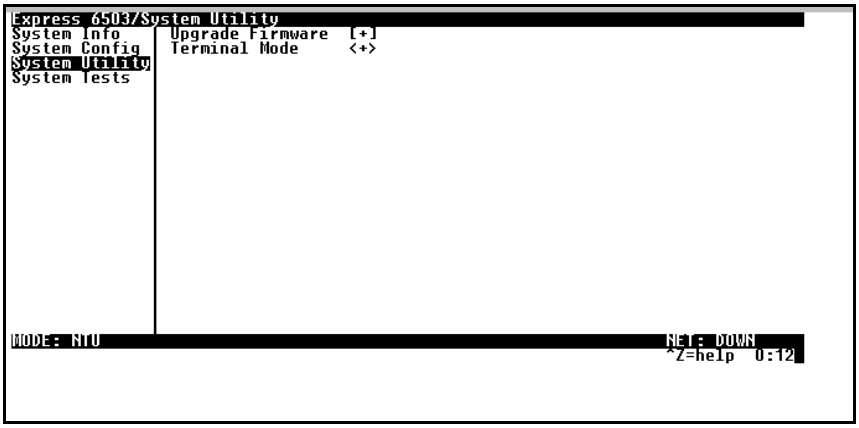

Figure 14. System Utility Menu

>Upgrade Firmware

Updates firmware when Express 6503 enhancements are released.

Transfer Method

Use **XMODEM** to load the upgrade code through the **CRAFT** port using any PC terminal emulator with xmodem capability. (See *Appendix B. Updating Express 6503 Firmware using XMODEM* on page 36 for more information.)

Filename

Enter filename to download.

Start Transfer

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

System Test

Use the **SYSTEM TEST** menu (Figure 15) to test and debug typical applications.

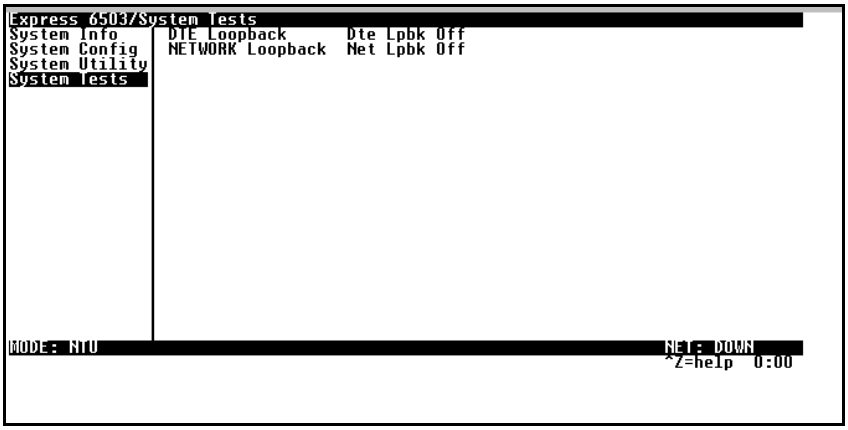

Figure 15. System Test Menu

>DTE Loopback

All data is looped back to the serial interface.

>Network Loopback

All data is looped back to the network interface.

APPENDIX A. NAVIGATING THE TERMINAL MENUS

Terminal Menu Window

The Express 6503 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 Express 6503 (see Figure 16).

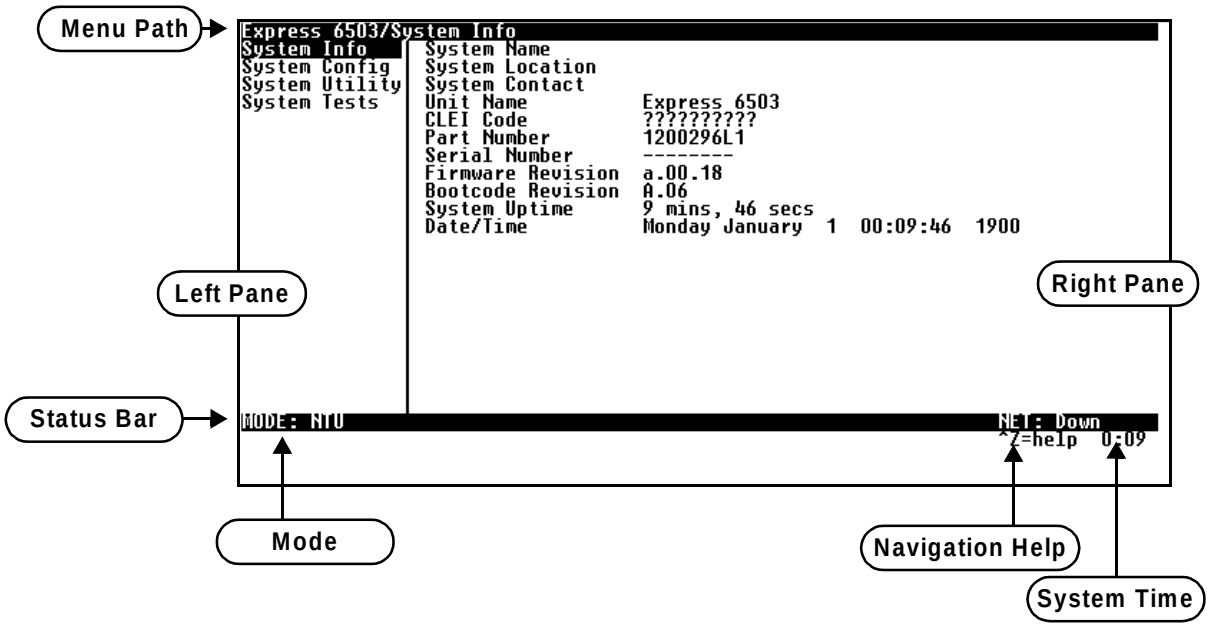

Figure 16. Top-level Terminal Menu Window

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 16 shows the top-level menu with the cursor on the **SYSTEM INFO** submenu; therefore, the menu path reads **EXPRESS 6503 SYSTEM INFO**.

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 Express 6503 base unit (system).
Navigation Help	Lists characters used for navigating the terminal menu (**Ctrl-Z**). See also *Moving through the Menus* on page 34.
System Time	Displays current time. See *Date/Time* on page 19 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.	**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 B. UPDATING EXPRESS 6503 FIRMWARE USING XMODEM

The Express 6503 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 being 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 pressing B and cycling power to the unit 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.*

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.*

Updating Firmware

Perform the Steps Below in the Order Listed

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

2. Press B while powering up the Express 6503.

> NOTE
> *To shorten transmit time, select the option from the menu to change the transmit rate to 115.2 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** *until the menu appears.*

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

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

> NOTE
> *When Express 6503 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.*

5. 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 Express 6503 will be inoperable from the* **CRAFT** *port.*

6. 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.

7. After the TRANSFER COMPLETE message has been displayed, cycle the power to the Express 6503.

8. **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 XMODEM protocol support, log in to Express 6503.**

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 Express 6503 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 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 Express 6503 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 Technical Support.**

