Hotwire® TDM SDSL Standalone Termination Units

Models 7974-A2, 7975-A2, and 7976-A2

User's Guide

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PARADYNE®

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About This Guide

Document Purpose and Intended Audience

This guide contains information needed to set up, configure, and operate Hotwire Time Division Multiplexer Symmetric Digital Subscriber Line (TDM SDSL) Standalone Termination Units, Models 7974-A2, 7975-A2 and 7976-A2, and is intended for installers and operators.

New Features for this Release

This version of the *Hotwire TDM SDSL Standalone Termination Units, Models 7974-A2, 7975-A2, and 7976-A2, User's Guide* adds new payload rates for the Model 7976-A2.

Document Summary

Section	Description
Chapter 1, *About Standalone TDM SDSL Termination Units*	Describes the unit's features and capabilities.
Chapter 2, *Using the Asynchronous Terminal Interface*	Provides instructions for accessing the user interface and navigating through the screens.
Chapter 3, *Initial Startup and Configuration*	Provides procedures for setting up the user interface and for configuring the unit using the asynchronous terminal interface.
Chapter 4, *Configuring the Unit Using the Internal Switches*	Provides procedures for configuring the unit using the internal switches instead of the asynchronous terminal interface.
Chapter 5, *IP Addressing*	Provides information and examples regarding IP addresses.
Chapter 6, *Security*	Presents procedures for creating a login, setting the effective access levels, and controlling SNMP access.

Section	Description
Chapter 7, *Monitoring and Troubleshooting*	Describes using the LEDs, status messages, and network statistics to monitor the unit and detect and correct problems.
Chapter 8, *Testing*	Provides information about available tests and test setup.
Appendix A, *Configuration Options*	Contains all configuration options, possible settings, and default settings.
Appendix B, *Standards Compliance for SNMP Traps*	Contains SNMP trap compliance information.
Appendix C, *Connectors, Cables, and Pin Assignments*	Contains connector and interface information.
Appendix D, *Technical Specifications*	Contains physical and regulatory specifications, network and port interfaces, power consumption values, and accessory part numbers.
Index	Lists key terms, acronyms, concepts, and sections in alphabetical order.

A master glossary of terms and acronyms used in Paradyne documents is available on the World Wide Web at **www.paradyne.com**. Select *Library* → *Technical Manuals* → *Technical Glossary.*

Product-Related Documents

Document Number	Document Title
7900-A2-GN11	*Hotwire TDM SDSL Standalone Termination Units, Models 7974-A2, 7975-A2, and 7976-A2, Installation Instructions*
8700-A2-GB20	*Hotwire TDM SDSL Termination Units, Models 8777 and 8779, User's Guide*
8700-A2-GB25	*Hotwire TDM SDSL Termination Units, Models 8775 and 8785, User's Guide*

Contact your sales or service representative to order additional product documentation.

Paradyne documents are also available on the World Wide Web at **www.paradyne.com**. Select *Library* → *Technical Manuals.*

About Standalone TDM SDSL Termination Units

1

TDM SDSL Overview

Hotwire® Time Division Multiplexer Symmetric Digital Subscriber Line (TDM SDSL) products maximize customer service areas by varying the DSL line rate. This ensures symmetric DSL connectivity over a wide range of telephone line distances and transmission line qualities.

Hotwire products support autorate. Units first synchronize to the highest line rate that the 2-wire loop supports, then automatically configures the unit to the highest multiple of 64 Kbps supported by that line rate. Eight line rates are available. At all rates, a 16 Kbps management channel is available, which enables functions such as firmware downloads to remote units. Units can also be configured manually to full or fractional T1 or E1 rates.

Hotwire products transport data over a 2-wire, full-duplex circuit over varying distances based on the conditions of the loop. Using 24 AWG cable, these TDM SDSL products have a loop reach greater than 14,000 feet (4.6 km) at 2.048 Mbps.

Standalone TDM SDSL Features

Hotwire 797x Standalone Termination Units are endpoints for the chassis-mounted Hotwire 877x Termination Unit that is housed in the Hotwire 8600 or 8800 Series Digital Subscriber Line Access Multiplexer (DSLAM).

Two Hotwire Standalone Termination Units can also be configured to operate in a central office Line Termination Unit (LTU)-to-customer premises Network Termination Unit (NTU) environment.

Standalone termination units have these standard features:

- **Embedded Operations Channel (EOC).** Provides remote management and download capabilities via an SNMP or Telnet session over the DSL network.
- **Asynchronous Terminal Interface (ATI).** Provides a menu-driven VT100-compatible terminal interface for configuring and managing the termination unit locally or remotely by Telnet session.
- **Local Management (standalone unit).** Provides local management using a:
  - — Terminal or equivalent through the COM port of the unit
  - — Telnet through the COM port of the unit
- **Remote Management (DSLAM card).** Provides remote management using:
  - — VT100-compatible terminal or PC via the Management Serial port of the DSLAM
  - — NMS through the MCC port of the DSLAM
  - — Telnet over the EOC
- **Alarm Indication.** Provides front panel status LEDs.
- **Diagnostic Testing.** Provides the capability to diagnose device and network problems and perform digital loopbacks, pattern tests, and self-test.
- **Device and Performance Monitoring.** Provides the capability of tracking and evaluating the unit's operation, including health and status, and error-rate monitoring.
- **SNMP (Simple Network Management Protocol) Management.** Provides network management via an industry-standard SNMP management system.
- **Automatic Configuration Capability.** Simply connecting the units to the line automatically configures the customer for the maximum data rate supported by the local loop. Units can also be configured at fixed line speeds to achieve maximum distances.

Network Configuration

Figure 1-1, Sample Configurations, shows a network application using a termination unit in a central office (CO). In this configuration, a frame relay switch and router are connected through the termination unit to partner units supporting a host or router and frame relay encapsulated or unframed data. The figure also shows a standalone-to-standalone configuration. Supported standalone-to-standalone configurations are shown in Table 1-1, Supported Standalone NTU/LTU Combinations.

Table 1-1. Supported Standalone NTU/LTU Combinations

LTU (CO):	NTU (CP)			
	DSX-1	**Synchronous**	**G.703 Framed**	**G.703 Unframed**
DSX-1	✓	✓	Not Supported	Not Supported
Synchronous	Not Supported	✓	Not Supported	✓
G.703 Framed	Not Supported	✓	✓	Not Supported
G.703 Unframed	Not Supported	✓	Not Supported	✓

✓=Supported

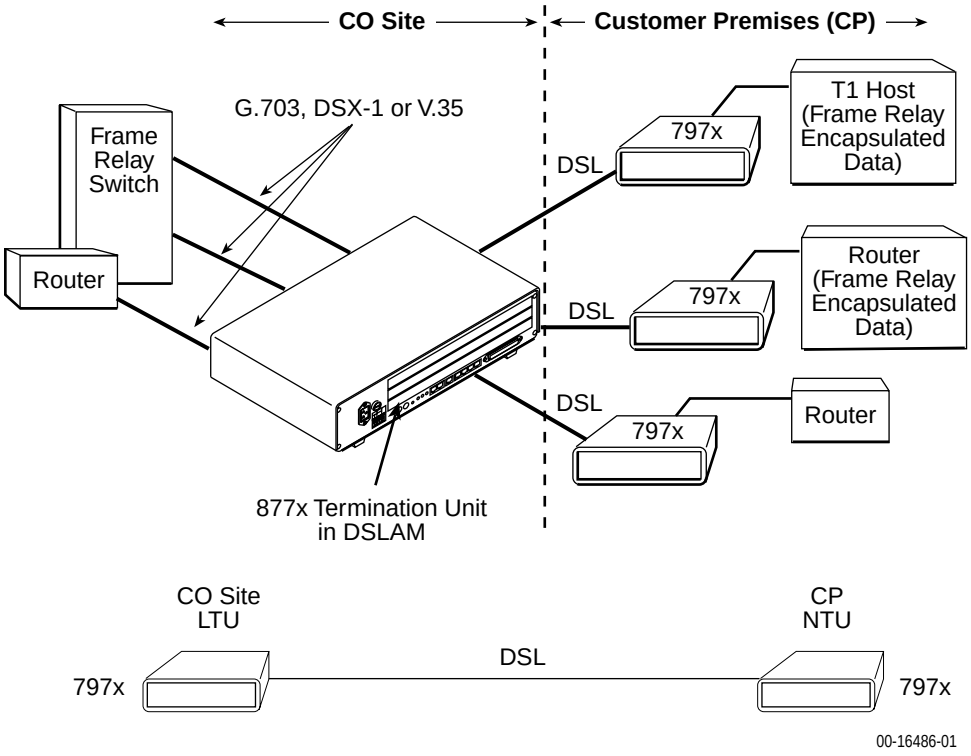


Figure 1-1. Sample Configurations

Front Panel LED Status Indicators

Figures 1-2 through 1-4 show the front panels of the Hotwire Standalone Termination Units. For more information about the front panel LEDs, refer to *Front Panel LEDs* in Chapter 7, *Monitoring and Troubleshooting*.

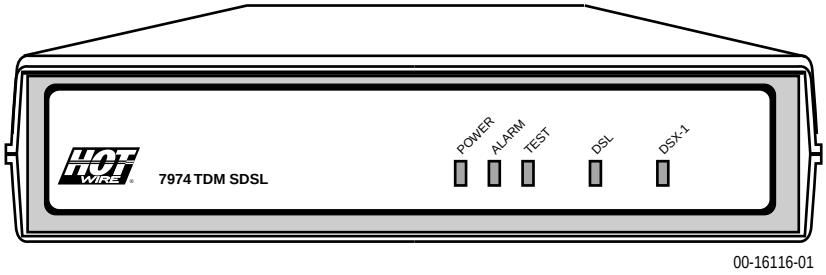


Figure 1-2. Hotwire Standalone Termination Unit with DSX-1 Interface Front Panel

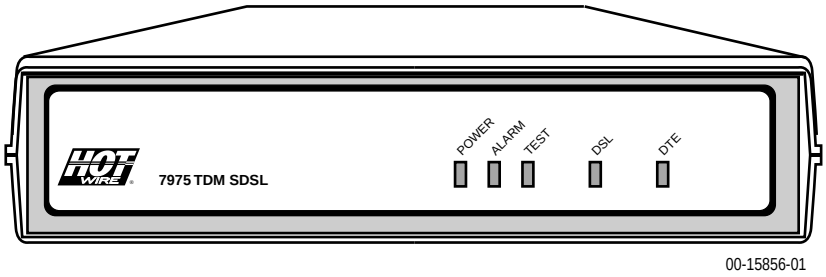


Figure 1-3. Hotwire Standalone Termination Unit with Synchronous Interface Front Panel

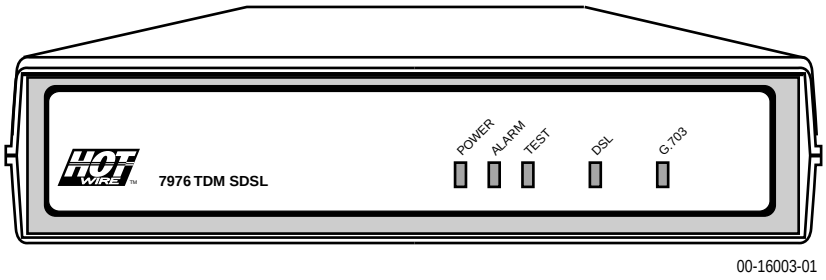


Figure 1-4. Hotwire Standalone Termination Unit with G.703 Interface Front Panel

Rear Panel Interfaces

Figures 1-5 through 1-7 show the physical interfaces of the termination units. For more information about the rear panel interfaces, refer to Appendix C, *Connectors, Cables, and Pin Assignments*.

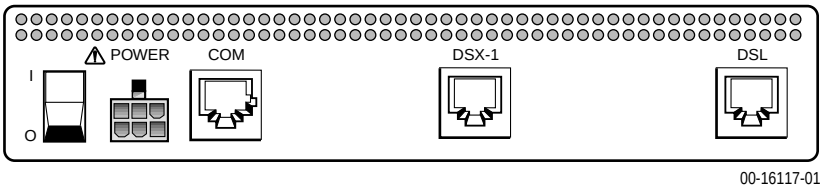


Figure 1-5. Hotwire Standalone Termination Unit with DSX-1 Interface Rear Panel

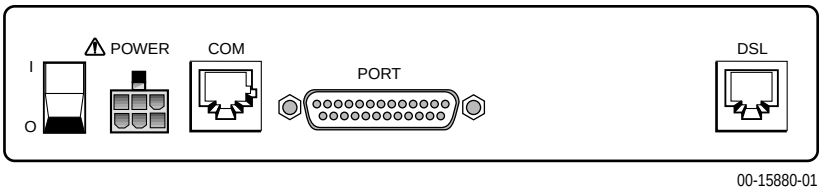


Figure 1-6. Hotwire Standalone Termination Unit with Synchronous Interface Rear Panel

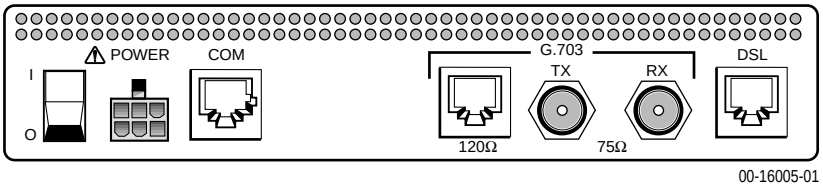


Figure 1-7. Hotwire Standalone Termination Unit with G.703 Interface Rear Panel

SNMP Management Capabilities

Hotwire 797x Standalone Termination Units support SNMP Version 1, and can be managed by any industry-standard SNMP manager and accessed by external SNMP managers using SNMP.

Management Information Base (MIB) Support

For a detailed description of the supported MIBs, visit Paradyne's Web site at **www.paradyne.com**. Select *Technical Support → MIBs.*

The following MIBs are supported:

- **MIB II (RFC 1213 and RFC 1573)** – Defines the general objects for use with a network management protocol in TCP/IP internets and provides general information about the unit. MIB II is backward-compatible with MIB I.
- **DS1/E1 MIB (RFC 1406)** – Models 7974 and 7976. Reports the performance status of the DSX-1 or G.703 interface and supports the features found on the DSX-1 or G.703 Performance Statistics screen.
- **RS-232-Like MIB (RFC 1659)** – Defines objects for managing RS-232-type interfaces (e.g., V.35, RS-422, RS-423, etc.) and supports the synchronous data port on the DSU.
- **Paradyne Enterprise MIB** – Supports configuration, status, statistics, and tests.

SNMP Trap Support

Hotwire 797x Standalone Termination Units support traps as defined in RFC 1215. Figure 1-8, DSL SNMP Configuration, illustrates a typical DSL SNMP configuration. Figure 1-9, DSL Local SNMP Configuration, shows a DSL SNMP configuration where the NMS is connected directly to the termination unit's Communications Port.

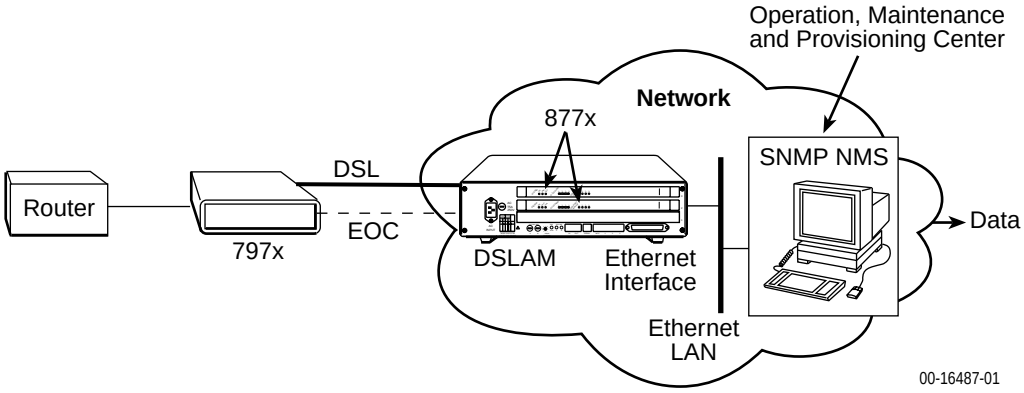


Figure 1-8. DSL SNMP Configuration

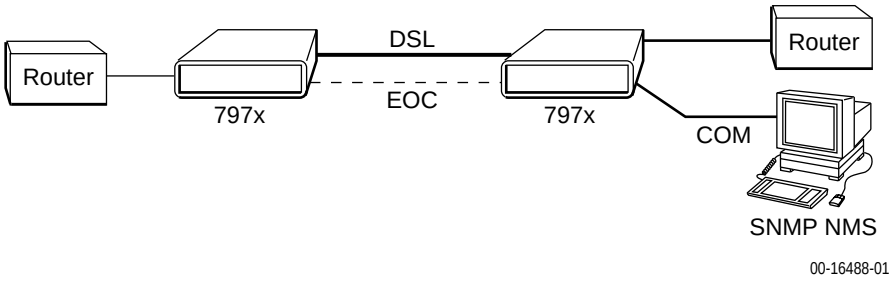


Figure 1-9. DSL Local SNMP Configuration

For additional information, refer to Chapter 5, *IP Addressing*, and Appendix B, *Standards Compliance for SNMP Traps*.

Using the Asynchronous Terminal Interface

2

User Interface Access

You can communicate with the Hotwire Standalone Termination Unit with an asynchronous terminal interface (ATI) using one of the following methods:

- Direct connection through the COM port of the standalone unit or through the serial port of the DSLAM management card.
- Telnet session through the Embedded Operations Channel (EOC).

NOTE:

Only one terminal interface session can be active at a time, and another user's session cannot be forced to end. To automatically log out a user due to inactivity, enable the Inactivity Timeout option (see Table A-10, Telnet Session Options, in Appendix A, *Configuration Options*).

Security can limit ATI access several ways. To limit user access or set up login IDs, refer to Chapter 6, *Security*.

Communication Port Settings

Ensure that the device you connect communicates using these settings:

- Data rate set to 9.6 Kbps.
- Character length set to 8.
- Parity set to None.
- Stop Bits set to 1.

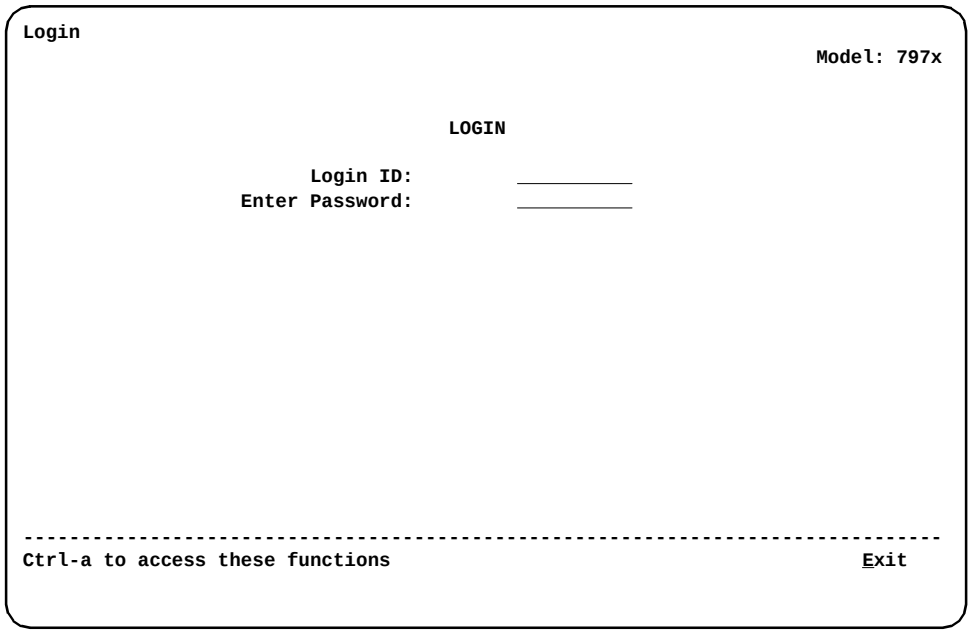
Initiating an ATI Session

The Main Menu screen is displayed unless a login ID and password is required or the ATI is already in use.

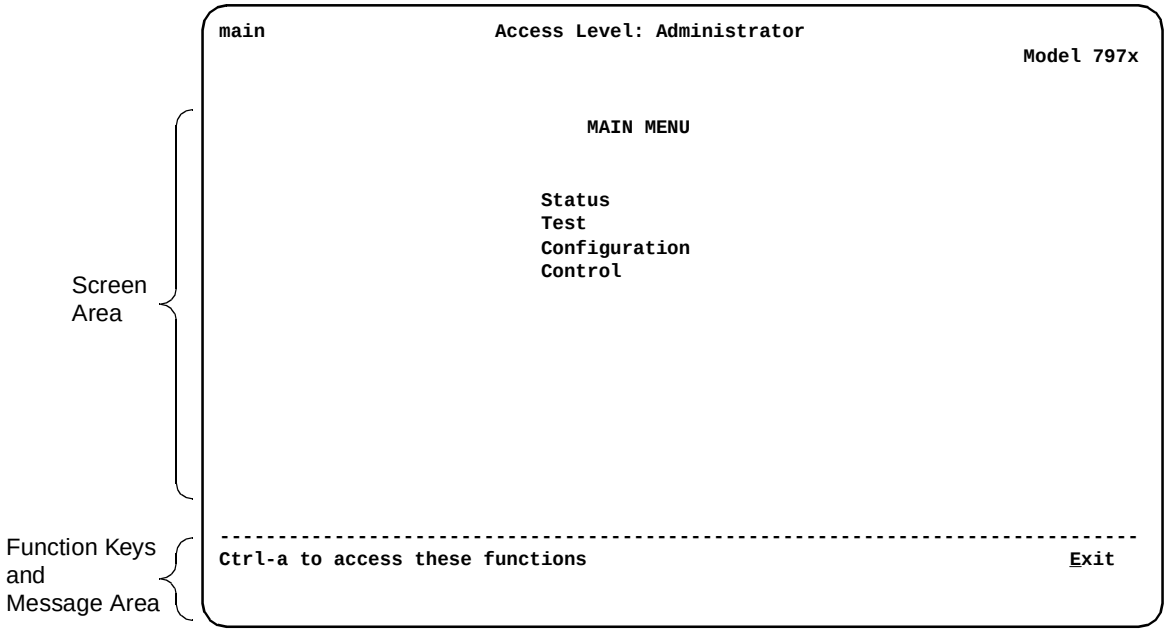
If the ATI is already in use, you will see:

- A **`connection refused`** or **`connection failed`** message (if you are using a Telnet session), or
- The IP address of the other user (if you are using the Management Serial port).

If security is enabled on the unit and you used Telnet to access it directly (you did not log in through the DSLAM management card), the system prompts you for a login ID and password.



After you enter a valid login ID and password, the Main Menu appears. If you enter an invalid login ID and password after three attempts, the Telnet session closes or the terminal connection returns to an idle state. Refer to Chapter 6, *Security*.



Entry to all of the Hotwire 797x Standalone Termination Unit's tasks begins at the Main Menu screen. The four branches of the Main Menu are as follows:

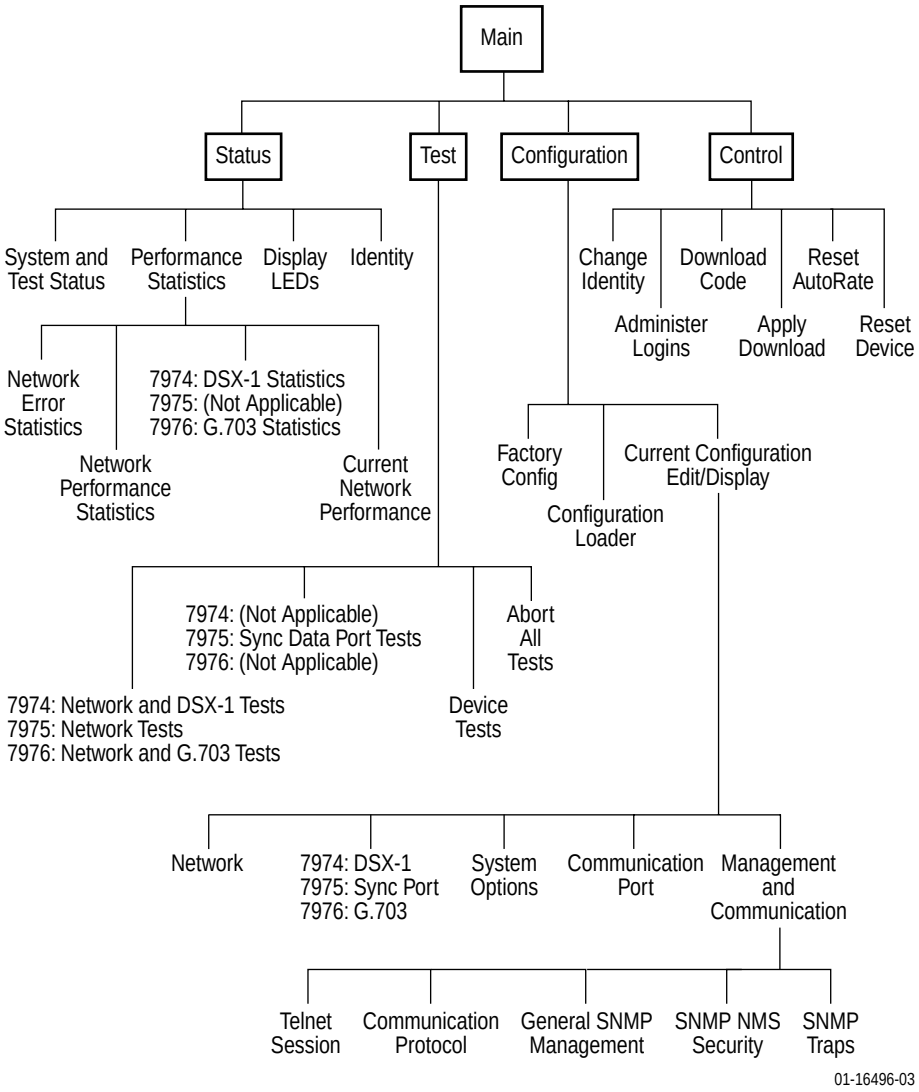
Select . . .	To . . .
Status	View system status, diagnostic test results, statistics, LEDs, and device identity information.
Test	Select and cancel tests for the termination unit's interfaces.
Configuration	Display and edit the configuration options.
Control	Change the device identity, administer logins, download new firmware, or initiate a power-on reset of the termination unit.

After selecting an option, what appears on the screens depends on the:

- **Current configuration** – How your unit is currently configured.
- **Effective security access level** – An access level that is typically set by the system administrator for each interface and each user.
- **Data selection criteria** – What you entered in previous screens.

Menu Hierarchy

The following illustration shows the menu paths to the different ATI screens.



Screen Work Areas

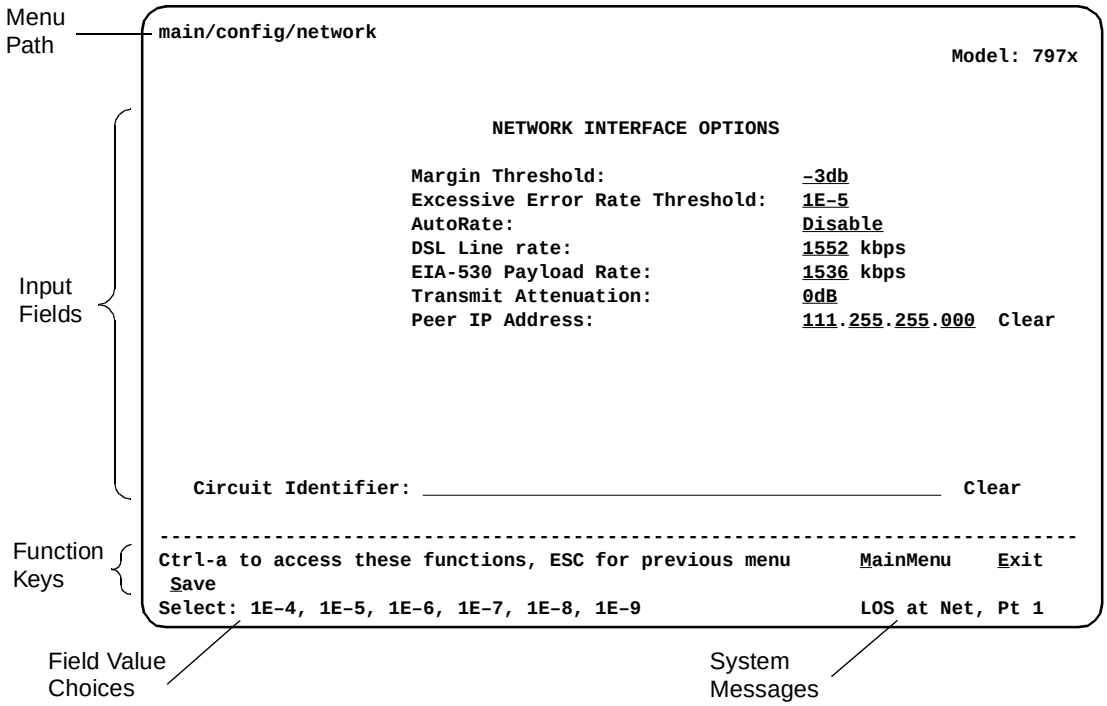
There are two user work areas:

- **Screen area** – This is the area above the dotted line that provides the menu path, menus, and input fields.

  The menu path appears as the first line on the screen. In this manual, the menu path is presented as a menu selection sequence:

  Main Menu→Configuration→ Current Configuration→Network

- **Function key and message area** – This is the area below the dotted line that lists function keys specific to the screen, field value choices, and system messages.



Navigating the Screens

You can navigate the screens by:

- Using keyboard keys
- Using function keys
- Switching between the two screen work areas

Keyboard Keys

Use the following keyboard keys to navigate within the screen.

Press . . .	**To . . .**
Backspace	Move cursor to the previous field on the screen.
Ctrl-a	Move cursor between the screen area and the function key and message area below the dotted line at the bottom of the screen.
Ctrl-k	Tab backwards (move cursor one field to the left).
Ctrl-l	Redraw the screen display, clearing information typed in but not yet entered.
Delete (Del)	Delete character that the cursor is on.
Down Arrow or Ctrl-d	Move cursor down one field within a column on the same screen.
Esc	Return to the previous screen.
Left Arrow or Ctrl-b	Move cursor one character to the left if in edit mode.
Return (Enter)	Accept entry or display valid options on the last row of the screen when pressed before entering data or after entering invalid data.
Right Arrow or Ctrl-f	Move cursor one character to the right if in edit mode.
Spacebar	Select the next valid value for the field.
Tab	Move cursor to the next field on the screen.
Up Arrow or Ctrl-u	Move cursor up one field within a column on the same screen.

▶ Procedure

To make a menu or field selection:

1. Press the Tab key or the right arrow key to position the cursor on a menu or field selection. Each selection is highlighted as you press the key to move the cursor from position to position.
2. Press Enter.

   The selected menu or screen appears.
3. Continue Steps 1 and 2 until you reach the screen you want.

The current setting or value appears to the right of the field name. You can enter information into a selected field by:

- Typing in the first letter(s) of a field value or command.
- Switching from the screen area to the function key and message area below the dotted line and selecting or entering the designated function key.

If a field is blank and the Field Values screen area displays valid selections, press the spacebar. The first valid value for the field will appear. Continue pressing the spacebar to scroll through other valid values.

Function Keys

All function keys located below the dotted line operate the same way (upper- or lowercase) throughout the screens.

For the screen function . . .	Select . . .	And press Enter to . . .
ClrFar	F or f	Clear far-end network statistics and refresh the screen.
ClrNear	N or n	Clear near-end network statistics and refresh the screen.
ClrStats	S or s	Clear DSX-1 statistics and refresh the screen.
Delete	L or l	Delete data.
Exit	E or e	Terminate the asynchronous terminal session.
MainMenu	M or m	Return to the Main Menu screen.
New	N or n	Enter new data.
PgDn	D or d	Display the next page or group of entries.
PgUp	U or u	Display the previous page or group of entries.
ResetMon	R or r	Reset an active Monitor 511 test counter to zero.
Save	S or s	Save information.

Switching Between Screen Work Areas

Select Ctrl-a to switch between the two screen work areas to perform all screen functions.

▶ Procedure

To access the screen function area below the dotted line:

1. Press Ctrl-a to switch from the screen area to the function key and message area below the dotted line.
2. Select either the function's designated (underlined) character or press the Tab key until you reach the desired function key.

   Example:
   To save the current screen, type **s** or **S** (Save).
3. Press Enter.
4. To return to the screen area above the dotted line, press Ctrl-a again.

```
main/config/network
                                                          Model: 797x

                          NETWORK INTERFACE OPTIONS

                  Margin Threshold:                -3db
                  Excessive Error Rate Threshold:  1E-5
                  AutoRate:                        Disable
                  DSL Line Rate:                   1552 kbps
                  EIA-530 Payload Rate             1536 kbps
                  Transmit Attenuation             0dB
                  Peer IP Address:                 111.255.255.000  Clear


   Circuit Identifier: ____________________________________________  Clear

--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
 Save
```

Ending an ATI Session

Use the Exit function key from any screen to terminate the session.

▶ Procedure

To end a session with the asynchronous terminal interface:

1. Press Ctrl-a to go to the function key and message area below the dotted line.
2. Save changes if required. A confirmation message appears if you have made but not saved changes to your configuration.
3. Tab to Exit (or type **e** or **E**) and press Enter.

Initial Startup and Configuration

3

Overview

This chapter provides instructions on how to access and configure your Hotwire TDM SDSL Standalone Termination Unit for the first time, displaying configuration options, disabling or resetting the AutoRate feature, and downloading firmware. These procedures include:

Connecting Power

If your package includes a power pack: Plug the power pack into an AC outlet having a nominal voltage rating between 100 – 240 VAC. Connect the output cable of the power pack to the connector marked POWER on the rear panel.

If your package includes a direct-connection DC power cable: Connect the unit to an external +24 or –48 VDC power source as described in *Connecting to an Optional External DC Power Source*.

Connecting to an Optional External DC Power Source

Using the DC power cable, the TDM SDSL unit is capable of operating on a +24 or –48 VDC power supply.

▶ Procedure

To use the DC power cable with +24 VDC:

1. Connect the green wire to a suitable ground.
2. Connect the orange wire to the +24 VDC source.
3. Connect the white wire to the return.
4. Cut the black, red, and blue wires off at the outer insulation.
5. Plug the power connector into the Power receptacle of the unit.

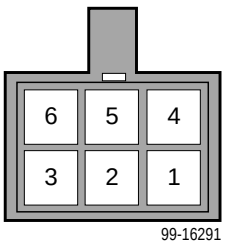
▶ Procedure

To use the DC power cable with –48 VDC:

1. Connect the green wire to a suitable ground.
2. Connect the orange wire to the –48 VDC source.
3. Connect the black wire to the return.
4. Cut the red, white, and blue wires off at the outer insulation.
5. Plug the power connector into the Power receptacle of the unit.

Table 3-1. Power Input Connector

Pin Number	Wire Color	Signal
1	Black	–48 VDC Return
2	Red	–48 VDC Return
3	Green	Ground
4	White	+24 VDC Return
5	Orange	–48 VDC +24 VDC
6	Blue	No Connection



Connecting to the Network

▶ Procedure

To connect the unit to the network:

1. Plug one end of the network cable into the rear panel DSL jack.
2. Connect the other end to the DSL network interface.

NOTE:

Do *not* use a flat VF network cable as this may severely degrade the performance of the unit. Only use a Cat 5 twisted-pair network cable.

Connecting to a DTE

The DTE interface varies from model to model.

Model	DTE Connection
7974	The DSX-1 interface is an RJ48C, 8-position, unkeyed modular connector. An RJ48C-to-DB15 T1 network interface adapter cable is available from Paradyne.
7975	The synchronous interface is a 25-pin EIA-530-A interface. Depending on the cable used, the interface can be adapted to an X.21, RS-449, or V.35 interface.
7976	The G.703 interface is either two BNC connectors (Transmit and Receive) for a 75-ohm unbalanced interface or an RJ48C, 8-position, unkeyed modular connector for a 120-ohm balanced interface.

See Appendix C, *Connectors, Cables, and Pin Assignments*, for more information.

Connecting to a System Terminal

An optional system maintenance terminal may be attached to the standalone termination unit through the modular jack on the rear panel. The terminal allows you to view the status of the unit and change configuration options. It must be a VT100-compatible terminal or a PC running terminal emulation software.

▶ Procedure

To connect the unit to a system terminal:

1. Connect the 9-pin end of the terminal cable into a COM port on your PC.
2. Plug the other end into the modular jack on the rear panel.
   - If your PC requires a 25-pin connector to the COM port, see Appendix C, *Connectors, Cables, and Pin Assignments*, for the correct cable pinouts.
3. Set the communication parameters on your PC or terminal to:
   - 9600 baud
   - 8 bit characters
   - No parity
   - 1 stop bit
   - No flow control

Entering Identity Information

After accessing the unit for the first time, use the Change Identity screen to determine SNMP administrative system information that will be displayed on the Identity screen of the Status branch. To access the Identity screen, follow this menu selection sequence:

Main Menu→Control→Change Identity

```
main/control/change_identity
                                                                Model: 797x


                                IDENTITY

   System Name:      Fess lllQJ98-001_____________________________       Clear
   System Location:  Bldg. A412, 2nd Floor, Left cabinet_______       Clear
   System Contact:   R. Byrd 800-727-2396 pager 888-555-1212          Clear

--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu        MainMenu   Exit
 Save
```

The three System entry fields are alphanumeric and provide up to 128 characters per field. These SNMP System entry fields are:

- **System Name:** The general SNMP system name.
- **System Location:** The physical location of the SNMP-managed device.
- **System Contact:** Identification information, such as contact name, phone number, or mailing address.

Valid entry values are any printable ASCII character. ASCII printable characters include:

- Numeric 0–9
- Upper- or lowercase A–Z
- Space
- All ASCII symbols except the caret (^)

Select Clear to reset a field to a null value.

▶ Procedure

To change Identity information:

1. Position the cursor in the System Name field. Enter a name unique in your network to identify the SNMP managed node (or unit).
2. Position the cursor in the System Location field. Enter the physical location of the unit.
3. Position the cursor in the System Contact field. Enter the name and contact information of the person responsible for the unit.
4. Press Ctrl-a to switch to the function key and message area below the dotted line.
5. Select Save and press Enter.

Choosing a Configuration Method

You can make configuration changes through a VT100-compatible terminal using the unit's Configuration menus or by manually changing switches on the board.

The unit is shipped with the switchpacks disabled to allow settings to be made through the Configuration menus. To use the switches, see Chapter 4, *Configuring the Unit Using the Internal Switches*.

Configuring the Unit Using Configuration Menus

Configuration option settings determine how the standalone TDM SDSL termination unit operates. Use the Configuration menus to select, display, or change configuration option settings.

NOTE:

The Hotwire 797x TDM SDSL Standalone Termination Unit is preconfigured as an NTU. If using the unit as an NTU, you may not need to change any configuration option settings.

The termination unit is shipped with factory settings in the Default Factory Configuration area. You can find default information by:

- Referring to Appendix A, *Configuration Options*.
- Accessing the Configuration branch of the standalone termination unit's menu.

The termination unit has two sets of configuration option settings.

Configuration Option Area	Configuration Option Set
Current Configuration	The unit's currently active set of configuration options.
Default Factory Configuration	A read-only configuration area containing the factory default configuration options.

The Current Configuration matches the Default Factory Configuration until modified and saved by the user. If the factory default settings do not support your network's configuration, you can customize the configuration options for your application.

Accessing and Displaying Configuration Options

To display configuration options, you must first load a configuration into the edit area.

To load a configuration option set into the configuration edit area, follow this menu selection sequence:

Main Menu→Configuration (Load Configuration From)

```
main/configuration
                                                              Model: 797x


                        LOAD CONFIGURATION FROM:

                      Current Configuration
                      Configuration Loader
                      Default Factory Configuration









--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu       MainMenu    Exit
```

Make a selection by placing the cursor at your choice and pressing Enter.

If you select . . .	Then . . .
Current Configuration	The selected configuration option set is loaded and the Configuration Edit/Display menu screen appears.
Configuration Loader	The Configuration Loader screen is displayed allowing you to upload or download configurations from a TFTP server.
Default Factory Configuration	The factory-set configuration option set is loaded and the Configuration Edit/Display menu screen appears.

Current and Default Factory Configurations

The Configuration Edit/Display screen appears when the current or default configuration is loaded. To access the Configuration Edit/Display screen, follow this menu selection sequence:

Main Menu→Configuration →Current Configuration

– or –

Main Menu→Configuration →Default Factory Configuration

```
main/config/edit
                                                              Model: 797x


                        CONFIGURATION EDIT/DISPLAY

                            Network
                            DSX-1 | SYNC Port | G.703
                            System Options
                            Communication Port
                            Management and Communication









--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu        MainMenu   Exit
 Save
```

In the menu selection sequences contained in this manual, Current Configuration is assumed and shown.

See Appendix A, *Configuration Options*, for a list and explanation of the configuration options.

Select . . .	To Access the . . .	To Configure the . . .
Network	Network Interface Options (Table A-1)	DSL network interface on the unit.
DSX-1 or SYNC Port or G.703	DSX-1 Interface Options for Model 7974 (Table A-5) Synchronous Data Port Options for Model 7975 (Table A-6) G.703 Interface Options for Model 7976 (Table A-7)	DSX-1 interface (Model 7974) Synchronous DTE interface (Model 7975) G.703 interface (Model 7976)
System Options	System Options (Table A-8)	General system options of the unit.
Communication Port	Communication Port Options (Table A-9)	COM port options of the unit.
Management and Communication	■ Telnet Session Options (Table A-10) ■ Communication Protocol Options (Table A-11) ■ General SNMP Management Options (Table A-12) ■ SNMP NMS Security Options (Table A-13) ■ SNMP Traps Options (Table A-14)	Management support of the unit through SNMP and Telnet.

Configuration Loader

The Configuration Loader screen allows you to upload configurations to and download configurations from a TFTP server. To access the Configuration Loader screen, follow this menu selection sequence:

Main Menu→Configuration →Configuration Loader

```
main/configuration/config_loader
                                                                Model: 797x

                        CONFIGURATION LOADER

    Configuration File Name:   _____________________________________ Clear
     TFTP Server IP Address:   000.000.000.000                       Clear
    TFTP Transfer Direction:   Download from Server
                Destination:   DSL

              Start Transfer:  Yes

                 Packets Sent:  0000000
              Packets Received: 0000000
                    Bytes Sent:  0000000
                Bytes Received:  0000000
               Transfer Status:  Transfer Pending

             Activate new configuration? No

--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
```

▶ Procedure

To upload or download a configuration:

1. Position the cursor in the Image File Name field. Type the name of the file to be downloaded, or the name to be used for the file to be uploaded.

   The filename may be a regular path name expression of directory names separated by a forward slash (/) ending with the filename. The total path name length can be up to 128 characters.

   — **DOS machine:** If the TFTP server is hosted by a DOS machine, then directory and filenames must consist of eight or less characters with an optional suffix of up to three characters. The system will automatically upload the configuration file and create directories and filenames, as needed.

   — **UNIX machine:** If your server is hosted by a UNIX machine, the configuration file you name must already exist. It will not be created on the UNIX system by the TFTP server. It is critical that you work with your system administrator to plan the naming conventions for directories, filenames, and permissions so that anyone using the system has read and write permissions.

2. Position the cursor in the TFTP Server IP Address field. Enter the TFTP server IP address.
3. Position the cursor in the Destination field. Use the spacebar to select a network destination for the TFTP server. Select DSL if the TFTP server destination is the DSL link or COM if the TFTP destination is the COM port.
4. Position the cursor in the TFTP Transfer Direction field. Use the spacebar to select Download from Server or Upload to Server.
5. Position the cursor at the Start Transfer field. Use the spacebar to select Yes. Press Enter.

   When the data transfer is complete, the Transfer Status field changes to **`Completed successfully`**.
6. Position the cursor at the **`Activate new configuration?`** prompt and select Yes to activate a new downloaded configuration. Press Enter.

NOTE:

Configuration options DSL Mode and Telnet Session are **not** changed when a new configuration is loaded. You must change these settings with the appropriate configuration menus after the new configuration is activated. See Table A-8, System Options, and Table A-10, Telnet Session Options, in Appendix A, *Configuration Options*.

Saving Configuration Options

When changes are made to the configuration options through the Configuration Edit/Display branch, the changes must be saved to take effect. Use the Save key or Save Configuration screen.

▶ Procedure

To save configuration options changes:

1. Press Ctrl-a to switch to the function key and message area.
2. Select Save and press Enter.

NOTE:

When Exit is selected before Save, or Save has been selected from any menu in the Configuration/Edit branch, a Save Configuration screen appears requiring a Yes or No response.

```
main/config/saveprompt
                                                                    Model: 797x

                               SAVE CONFIGURATION

                               Save Changes? No









------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit

Command Complete
```

If the Telnet Session configuration option is changed, a message appears on the Save Configuration screen warning that an answer of Yes will cause the Telnet session to disconnect. Do not answer Yes unless you are prepared to disconnect.

If the DSL Mode configuration option is changed, a message is appears on the Save Configuration screen warning that an answer of Yes will cause the system to be reset. Do not answer Yes unless you are prepared to reset the unit.

If you select . . .	Then . . .
Yes	The configuration is saved.
No	The Main Menu appears and changes are not saved.

Resetting the Device

If the user interface is functional, you can perform a power-on reset of the unit from the Control menu.

▶ Procedure

To reset the unit from the Control menu:

1. Follow this menu selection sequence:

   Main Menu→Control→Reset Device

2. The message **`Are you sure?`** appears.
3. Enter **Yes**.

Disabling AutoRate

The AutoRate function is controlled from the Network Interface Options screen and allows you to enable or disable the AutoRate feature. The AutoRate option is only available if the unit is configured as an LTU.

To access the Network Interface screen, follow this menu selection sequence:

Main Menu→ Configuration → Current Configuration → Network

```
main/config/network
                                                          Model: 797x

                        NETWORK INTERFACE OPTIONS

                  Port Status                       Enable
                  Margin Threshold:                 -3db
                  Excessive Error Rate Threshold:   1E-5
                  AutoRate:                         Disable
                  DSL Line Rate:                    1552 kbps
                  EIA-530 Payload Rate              1536 kbps
                  Transmit Attenuation              0dB
                  Peer IP Address:                  111.255.255.000  Clear




   Circuit Identifier: _____________________________________________  Clear

------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu        MainMenu    Exit
 Save
```

The AutoRate option defaults to Enable.

▶ Procedure

To disable AutoRate:

1. Position the cursor in the AutoRate field and press the spacebar.

   The AutoRate field toggles to Disable and the DSL Line Rate field appears.

2. Enter a DSL Line Rate and press Enter.

Resetting AutoRate

The Reset AutoRate function of the Control branch causes the unit to repeat the AutoRate sequence. The unit attempts to establish the DSL link at the highest rate (or the value of DSL Line Rate, which represents the AutoRate ceiling when AutoRate is enabled). If the link fails, the next lower rate is tried until the link is established.

To access the Reset AutoRate screen, follow this menu selection sequence:

Main Menu→ Control → Reset AutoRate

Downloading Firmware

The Download Code screen allows you to download firmware from a TFTP server. To access the Download Code screen, follow this menu selection sequence:

Main Menu→Control →Download Code

```
main/control/download_code
                                                              Model: 797x


                          DOWNLOAD CODE

           Image File Name:  ____________________________________________ Clear
    TFTP Server IP Address:  000.000.000.000                               Clear
               Destination:  DSL
 Immediately Apply Download:  Yes
             Start Transfer:  No

              Packets Sent:  0000000
          Packets Received:  0000000
                Bytes Sent:  0000000
            Bytes Received:  0000000
           Transfer Status:  Transfer Pending




--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu       MainMenu    Exit
```

▶ Procedure

To download firmware:

1. Position the cursor in the Image File Name field. Type the name of the file to be downloaded.

   The file name may be a regular path name expression of directory names separated by a forward slash (/) ending with the file name. The total path name length can be up to 128 characters.

2. Position the cursor in the TFTP Server IP Address field. Enter the TFTP server IP address.

3. Position the cursor in the Destination field. Use the spacebar to select a network destination for the TFTP server. Select DSL if the TFTP server destination is the DSL link or COM if the TFTP destination is the COM port.

4. Position the cursor in the Immediately Apply Download field. If you would like the download to be effective immediately, select **Yes**.

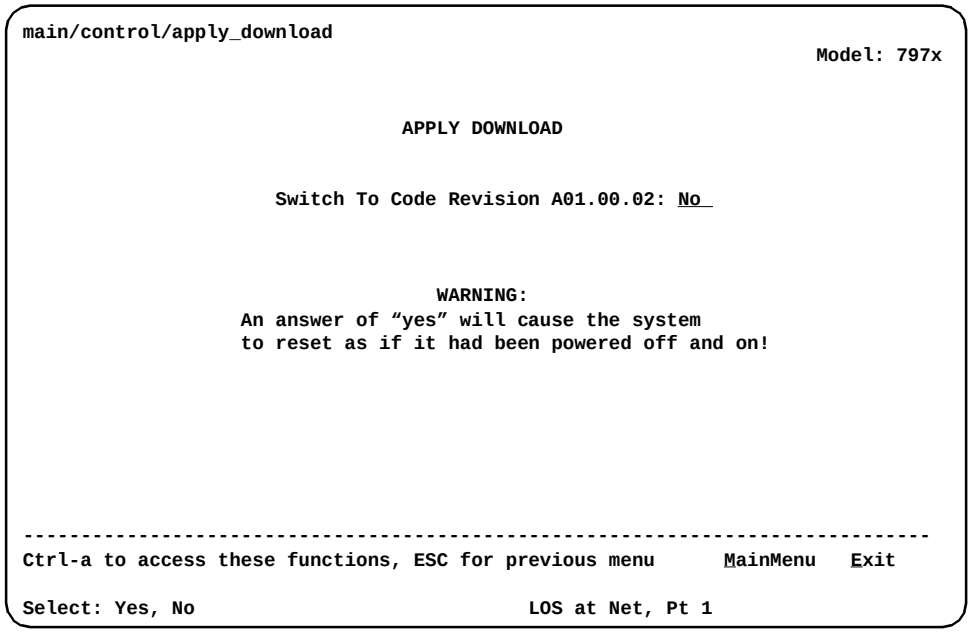
5. Position the cursor at the Start Transfer field. Use the spacebar to select Yes. Press Enter.

   When the data transfer is complete:

   — If you selected Yes in Step 4, the unit is reset.

   — If you selected No in Step 4, the Transfer Status field changes to **`Completed successfully`**.

   If you specified **No** (the default) in the Immediately Apply Download field in Step 4 above, you must now apply the download.



▶ Procedure

To apply the downloaded firmware:

1. Press the Escape key to return to the Control menu. Select Apply Download.
2. On the Apply Download screen, type **Yes** to reset the card and activate the code.

   Selecting Yes causes the termination unit to reset.

   ### NOTE:

   The termination unit has two flash memory banks to hold executable firmware. You can switch between these two firmware versions by applying the firmware listed on the Apply Download screen.

Configuring the Unit Using the Internal Switches

4

Overview

You can make configuration changes through a VT100-compatible terminal and the unit's Configuration menus or by manually changing switches on the board.

The unit is shipped with the switchpacks disabled to allow settings to be made through the Configuration menus. To use the Configuration menus, refer to *Configuring the Unit Using Configuration Menus* in Chapter 3, *Initial Startup and Configuration.*

Configuring the Unit Using Internal Switches

Use internal Switchpacks S3 and S4 to manually configure the unit. Use Figure 4-1, Hotwire Standalone Termination Unit's Switchpack Locations, to locate Switchpacks S3 and S4.

⚠ HANDLING PRECAUTIONS FOR STATIC-SENSITIVE DEVICES

This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control precautions, contact your nearest sales or service representative.

▶ Procedure

To configure the unit using internal Switchpacks S3 and S4:

1. Power off the unit.
2. Remove the enclosure cover:
   - — Use a Phillips screwdriver to remove the two screws from the top of the unit.
   - — Push a flat-blade screwdriver through the slots on both sides of the housing to free the four inner latches.
3. Locate Switchpack S4 on the circuit board using Figure 4-1, Hotwire Standalone Termination Unit's Switchpack Locations.
4. Set Switch 1 on Switchpack S4 to ON to enable Switchpacks S3 and S4.
5. Set the switches to the desired configuration. Refer to Figure 4-1, Hotwire Standalone Termination Unit's Switchpack Locations, and Tables 4-1 through 4-11.
6. Replace the cover and fasten it with the two screws.
7. Power on the board to reset the unit and enable the new configuration.

Switchpack Locations

To locate Switchpacks S3 and S4, refer to Figure 4-1, Hotwire Standalone Termination Unit's Switchpack Locations.

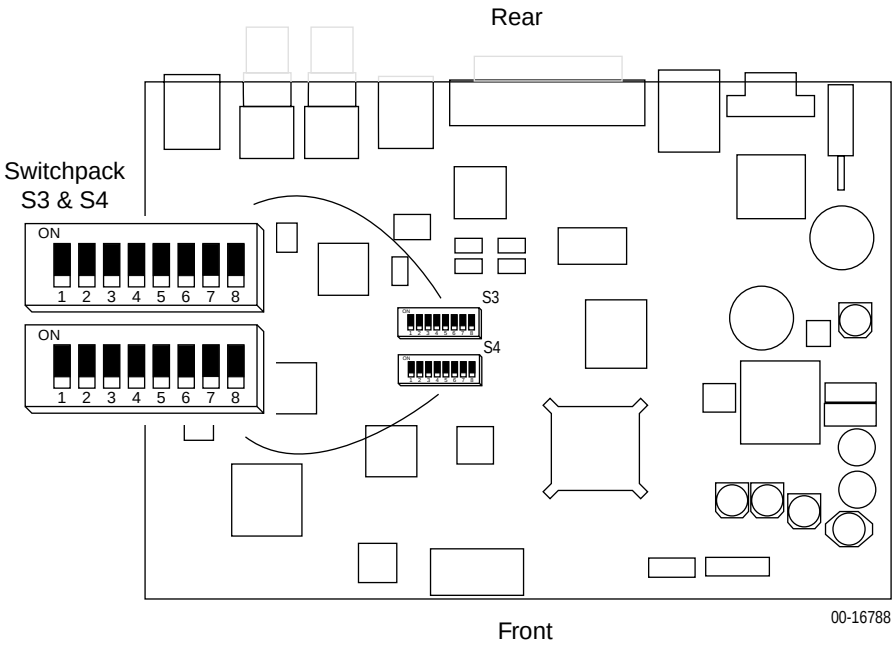


Figure 4-1. Hotwire Standalone Termination Unit's Switchpack Locations

Model 7974 Switchpack Definitions

For Switchpack S4 definitions, refer to Table 4-1, Switchpack S4 Definitions (Model 7974).

Table 4-1. Switchpack S4 Definitions (Model 7974)

Switch # . . .	Allows you to . . . *Default in **Bold***
1	Enable or disable Switchpacks S3 and S4. **OFF = Switchpacks Disabled** ON = Switchpacks Enabled
2	Not used
3	Select the unit's primary timing source. Valid only for a unit configured as the LTU. **OFF = Internal Clock** ON = DSX-1 Clock
4	Control the unit's T1 line coding. **OFF = B8ZS** ON = AMI
5	Control the unit's framing format **OFF = ESF** ON = D4
6, 7, 8	Control the unit's line equalization. Refer to Table 4-2, Line Equalization, Switches 6–8 on Switchpack S4 (Model 7974), to set Line Equalization. The three switches form a binary value used as an index to the table of equalization values. Off denotes 0 (zero) and On denotes 1 (one). **000 (all OFF) = 0–133 feet**

Table 4-2. Line Equalization, Switches 6–8 on Switchpack S4 (Model 7974)

Switch Position			Line Equalization *Default in **Bold***
8	**7**	**6**	
OFF	**OFF**	**OFF**	**0–133 feet**
OFF	OFF	ON	133–266 feet
OFF	ON	OFF	266–399 feet
OFF	ON	ON	399–533 feet
ON	OFF	OFF	533–655 feet
ON	OFF	ON	0–133 feet
ON	ON	OFF	0–133 feet
ON	ON	ON	0–133 feet

For Switchpack S3 definitions, refer to Table 4-3, Switchpack S3 Definitions (Model 7974).

Table 4-3. Switchpack S3 Definitions (Model 7974)

Switch # . . .	Allows you to . . . *Default in **Bold***
1	Control whether the unit is an LTU or an NTU. **OFF = NTU** ON = LTU
2	Control whether the unit automatically adjusts to the best line rate for conditions, or is fixed at the rate set by Switches S3-3 through S3-5. **OFF = Fixed Rate** ON = AutoRate Enabled
3, 4, 5	Control the DSL line rate of the unit. Refer to Table 4-4, DSL Line Rate, Switches 3–5 on Switchpack S3 (Model 7974), to set the DSL Line Rate. If AutoRate is enabled, this switch represents the maximum DSL AutoRate value. **000 (all OFF) = 1552 Kbps**
6	Control whether Telco loopbacks are supported. **OFF = Enabled** ON = Disabled
7	Control whether remote Telco loopbacks are supported. **OFF = Disabled** ON = Enabled
8	**Emergency Use Only** – Switch between two versions of firmware. The unit has two banks of flash memory used to hold executable firmware. This switch allows you to change between the two versions of firmware. This switch is independent from the position of Switch 1 on Switchpack S4 (switchpack enable/disable). **OFF = Current Firmware** ON = Previous Firmware

Table 4-4. DSL Line Rate, Switches 3–5 on Switchpack S3 (Model 7974)

Switch Position			DSL Line Rate *Default in **Bold***
5	4	3	
OFF	**OFF**	**OFF**	**1552 Kbps**
OFF	OFF	ON	144 Kbps
OFF	ON	OFF	272 Kbps
OFF	ON	ON	400 Kbps
ON	OFF	OFF	528 Kbps
ON	OFF	ON	784 Kbps
ON	ON	OFF	1040 Kbps
ON	ON	ON	1552 Kbps

Model 7975 Switchpack Definitions

For Switchpack S4 definitions, refer to Table 4-5, Switchpack S4 Definitions (Model 7975).

Table 4-5. Switchpack S4 Definitions (Model 7975)

Switch # . . .	Allows you to . . . *Default in **Bold***
1	Enable or disable Switchpacks S3 and S4. **OFF = Switchpacks Disabled** ON = Switchpacks Enabled
2	Control Sync Port Type. **OFF = EIA-530, RS-449, or X.21** ON = V.35
3	Select the unit's timing source. Valid only for a unit configured as the LTU. **OFF = Internal clock** ON = External Clock
4, 5, 6, 7, 8	Control Sync Port Data Rate. Refer to Table 4-6, Selectable Payload Rates (Model 7975), to set the Sync Port Payload Rate. NOTE: Switches 4 through 8 are only used when the unit is configured as an LTU and AutoRate is disabled. **All OFF = 2048 Kbps (1024 Kbps for 1 Mbps units)**

NOTE:

Sync Port and DSL Line Rates can only be selected from a unit configured as the LTU (Switchpack S3 #1) with AutoRate disabled (Switchpack S3 #2).

Table 4-6. Selectable Payload Rates (Model 7975)

Sync Port Payload Rate	Switchpack S4 Switch Number						Associated DSL Line Rate
	8	7	6	5	4		
2048 Kbps (32 x 64)	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**		**2064 Kbps**
1984 Kbps (31 x 64)	ON	ON	ON	ON	ON		2064 Kbps
1920 Kbps (30 x 64)	ON	ON	ON	ON	OFF		2064 Kbps
1856 Kbps (29 x 64)	ON	ON	ON	OFF	ON		2064 Kbps
1792 Kbps (28 x 64)	ON	ON	ON	OFF	OFF		2064 Kbps
1728 Kbps (27 x 64)	ON	ON	OFF	ON	ON		2064 Kbps
1664 Kbps (26 x 64)	ON	ON	OFF	ON	OFF		2064 Kbps
1600 Kbps (25 x 64)	ON	ON	OFF	OFF	ON		2064 Kbps
1536 Kbps (24 x 64)	ON	ON	OFF	OFF	OFF		1552 Kbps
1472 Kbps (23 x 64)	ON	OFF	ON	ON	ON		1552 Kbps
1408 Kbps (22 x 64)	ON	OFF	ON	ON	OFF		1552 Kbps
1344 Kbps (21 x 64)	ON	OFF	ON	OFF	ON		1552 Kbps
1280 Kbps (20 x 64)	ON	OFF	ON	OFF	OFF		1552 Kbps
1216 Kbps (19 x 64)	ON	OFF	OFF	ON	ON		1552 Kbps
1152 Kbps (18 x 64)	ON	OFF	OFF	ON	OFF		1552 Kbps
1088 Kbps (17 x 64)	ON	OFF	OFF	OFF	ON		1552 Kbps
1024 Kbps (16 x 64)	ON	OFF	OFF	OFF	OFF		1040 Kbps
960 Kbps (15 x 64)	OFF	ON	ON	ON	ON		1040 Kbps
896 Kbps (14 x 64)	OFF	ON	ON	ON	OFF		1040 Kbps
832 Kbps (13 x 64)	OFF	ON	ON	OFF	ON		1040 Kbps
768 Kbps (12 x 64)	OFF	ON	ON	OFF	OFF		784 Kbps
704 Kbps (11 x 64)	OFF	ON	OFF	ON	ON		784 Kbps
640 Kbps (10 x 64)	OFF	ON	OFF	ON	OFF		784 Kbps
576 Kbps (9 x 64)	OFF	ON	OFF	OFF	ON		784 Kbps
512 Kbps (8 x 64)	OFF	ON	OFF	OFF	OFF		528 Kbps
448 Kbps (7 x 64)	OFF	OFF	ON	ON	ON		528 Kbps
384 Kbps (6 x 64)	OFF	OFF	ON	ON	OFF		400 Kbps
320 Kbps (5 x 64)	OFF	OFF	ON	OFF	ON		400 Kbps
256 Kbps (4 x 64)	OFF	OFF	ON	OFF	OFF		272 Kbps
192 Kbps (3 x 64)	OFF	OFF	OFF	ON	ON		272 Kbps
128 Kbps (2 x 64)	OFF	OFF	OFF	ON	OFF		144 Kbps
64 Kbps (1 x 64)	OFF	OFF	OFF	OFF	ON		144 Kbps

2 Mbps Units Only

NOTE:

The 1 Mbps unit Payload Rate defaults to 1024 Kbps (all OFF).

For Switchpack S3 definitions, refer to Table 4-7, Switchpack S3 Definitions (Model 7975).

Table 4-7. Switchpack S3 Definitions (Model 7975)

Switch # . . .	Allows you to . . . *Default in **Bold***
1	Control whether the unit is an LTU or an NTU. **OFF = NTU** ON = LTU
2	Control enabling and disabling of the AutoRate capability. **OFF = AutoRate Enabled** ON = AutoRate Disabled
3, 4, 5	Select one of eight preset DSL line rates. Refer to Table 4-8, DSL Line Rate, Switches 3–5 on Switchpack S3 (Model 7975), to set the DSL Line Rate. If AutoRate is enabled, DSL Line Rate represents the AutoRate ceiling. **All OFF = 2064 (1040 for 1 Mbps units)**
6	Control enabling and disabling of the Elastic Store feature. **OFF = Elastic Store Enabled** ON = Elastic Store Disabled
7	Not used
8	**Emergency Use Only** – The unit has two banks of flash memory used to hold executable firmware. This switch allows you to change between the two versions of firmware. This switch is independent from the position of Switch 1 on Switchpack S4 (switchpack enable/disable). **OFF = Current Firmware** ON = Previous Firmware

Table 4-8. DSL Line Rate, Switches 3–5 on Switchpack S3 (Model 7975)

Switch Position			DSL Line Rate *Default in **Bold***
5	4	3	
OFF	**OFF**	**OFF**	**2064 Kbps (2 Mbps unit only)**
OFF	OFF	ON	144 Kbps
OFF	ON	OFF	272 Kbps
OFF	ON	ON	400 Kbps
ON	OFF	OFF	528 Kbps
ON	OFF	ON	784 Kbps
ON	ON	OFF	1040 Kbps
ON	ON	ON	1552 Kbps (2 Mbps unit only)

NOTE:

On 1 Mbps units the DSL line rate defaults to 1040 Kbps (all OFF).

Model 7976 Switchpack Definitions

For Switchpack S4 definitions, refer to Table 4-9, Switchpack S4 Definitions (Model 7976).

Table 4-9. Switchpack S4 Definitions (Model 7976)

Switch # . . .	Allows you to . . . *Default in **Bold***
1	Enable or disable Switchpacks S3 and S4. **OFF = Switchpacks Disabled** ON = Switchpacks Enabled
2	Control line termination. **OFF = 120 Ohm** ON = 75 Ohm
3	Select the unit's primary timing source. Valid only for a unit configured as the LTU. **OFF = Internal Clock** ON = External Clock
4	Control the unit's E1 line coding. **OFF = HDB3** ON = AMI
5	Determine whether the unit will use G.704 framing. Unframed mode (ON) is valid only when switches 3–5 of Switchpack S3 are set to full rate (all OFF). **OFF = Framed** ON = Unframed
6	Enable CRC-4 generation and monitoring. Valid only for a unit configured as the LTU. The NTU is automatically configured to match the LTU setting. **OFF = Disable CRC-4 generation and monitoring** ON = Enable CRC-4 generation and monitoring
7	Control whether Channel 16 contains signaling information or data. **OFF = Channel 16 is used for signaling (voice mode)** ON = Channel 16 is used for data (data mode)
8	Not used

For Switchpack S3 definitions, refer to Table 4-10, Switchpack S3 Definitions (Model 7976).

Table 4-10. Switchpack S3 Definitions (Model 7976)

Switch # . . .	**Allows you to . . .** *Default in **Bold***
1	Control whether the unit is an LTU or an NTU. **OFF = NTU** ON = LTU
2	Control enabling and disabling of the AutoRate capability. Valid only for a unit configured as the LTU. **OFF = Fixed Rate** ON = AutoRate Enabled
3, 4, 5	Select one of eight preset DSL line rates. Refer to Table 4-11, DSL Line Rate, Switches 3–5 on Switchpack S3 (Model 7976), to set the DSL Line Rate. If AutoRate is enabled, DSL Line Rate represents the AutoRate ceiling. **All OFF = 2064**
6, 7	Not used
8	**Emergency Use Only** – The unit has two banks of flash memory used to hold executable firmware. This unit allows you to change between the two versions of firmware. This switch is independent from the position of Switch 1 on Switchpack S4 (switchpack enable/disable). **OFF = Current Firmware** ON = Previous Firmware

Table 4-11. DSL Line Rate, Switches 3–5 on Switchpack S3 (Model 7976)

Switch Position			
5	**4**	**3**	**DSL Line Rate** *Default in **Bold***
OFF	**OFF**	**OFF**	**2064 Kbps**
OFF	OFF	ON	144 Kbps
OFF	ON	OFF	272 Kbps
OFF	ON	ON	400 Kbps
ON	OFF	OFF	528 Kbps
ON	OFF	ON	784 Kbps
ON	ON	OFF	1040 Kbps
ON	ON	ON	1552 Kbps

IP Addressing

5

Selecting an IP Addressing Scheme

Your IP addressing scheme depends in part upon whether the Hotwire 797x Standalone Termination Unit is connected to a DSLAM card running in IP Conservative mode.

Configurations Not Running IP Conservative Software

For a configuration not running IP Conservative software, the NTU's network interface IP address is assigned through the peer IP address of the LTU's Network Interface menu.

A DSLAM-mounted termination unit is assigned an IP address and subnet through the DSLAM *Configuration* → *DSL Cards* → *Set IP Address* menu. Once the address is assigned, you can use the ATI to assign:

- Peer IP address. This address is used as the IP address of the remote unit. See Table A-1, Network Interface Options, in Appendix A, *Configuration Options*.
- An IP address for each NMS to act as a trap manager. See Table A-14, SNMP Traps Options, in Appendix A, *Configuration Options*.

All Configurations

The NTU obtains its IP address when the PPP link is established over the EOC.

Use the ATI to assign:

- An IP address for each NMS. See Table A-13, SNMP NMS Security Options, in Appendix A, *Configuration Options*.
- An IP address for the TFTP server you wish to use to upload and download configurations. See *Configuration Loader* in Chapter 3, *Initial Startup and Configuration*, and the documentation for your TFTP server.

The Peer IP Address refers to the EOC interface IP address of the unit configured as an NTU. When the LTU and NTU negotiate a connection, the NTU receives its address from the LTU.

Review the following information in preparation for selecting an IP addressing scheme.

- Any legal host address is allowed for a given subnet. The address choice within the subnet is arbitrary.
- The Peer IP Address must be unique within the MCC backplane subnet.
- A single route to a subnet is all that is needed to reach every device on a subnet. The unit's routing table supports a maximum of 20 routes.

IP Addressing Example

See Figure 5-1, Peer IP Address Assignments, for an example of an IP addressing scheme. In the example, the Peer IP Address:

- Refers to the IP address of the unit configured as an NTU.
- Is assigned by the LTU.

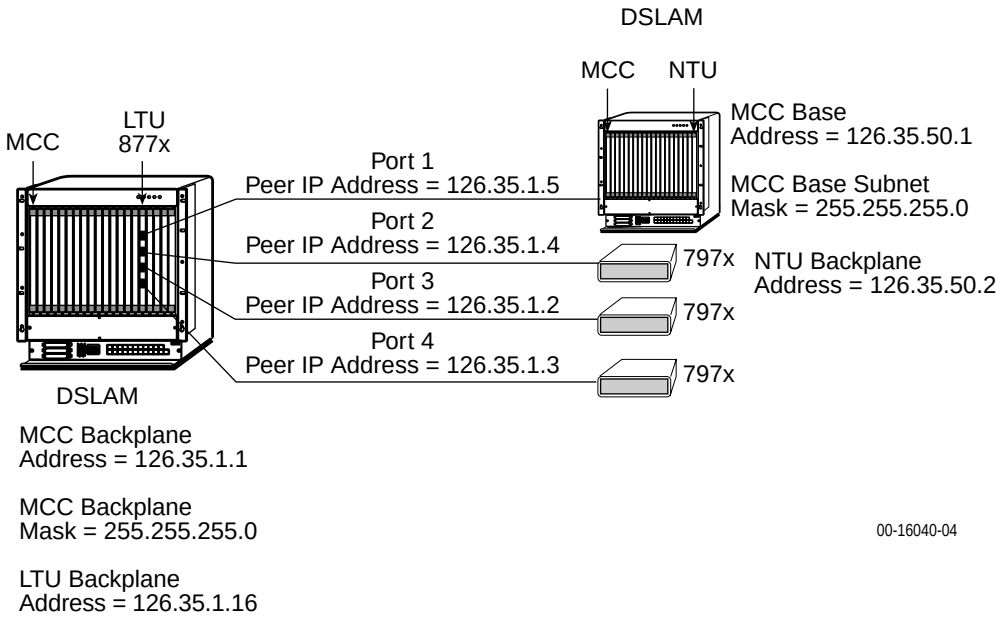


Figure 5-1. Peer IP Address Assignments

Security

6

Overview

Security on the standalone Hotwire 797x Standalone Termination Unit is implemented by limiting user access to the ATI through option settings. You can:

- Enable the Telnet Login Required option.
- Enable the COM port Login Required option.
- Limit access by setting a Session Access Level option of Operator for the Telnet session.
- Limit access by setting a Session Access Level option of Operator for the COM port.
- Disable Telnet access with the Telnet Session option.

See Table A-9, Communication Port Options, and Table A-10, Telnet Session Options, in Appendix A, *Configuration Options*.

ATI Access Levels

The unit has two access levels: Administrator and Operator. The access level determines what functions are accessible, as shown in Table 6-1, Access Levels.

Table 6-1. Access Levels

ATI Access to Menu Functions	Administrator	Operator
Status	Read-Only	Read-Only
Test	Full Access	No Access
Configuration	Full Access	Read-Only
Control	Full Access	No Access

Access levels can be applied to Login IDs, the COM port, and Telnet sessions. The effective access level is always the most restrictive:

- When access is through the COM port and a login is required on the COM port, the effective access level is the more restrictive of the COM port access level or the login access level. (See Table A-9, Communication Port Options, in Appendix A, *Configuration Options*.)
- When access is through Telnet and a login is required for a Telnet session, the effective access level is the more restrictive of the Telnet session access level or the login access level. (See Table A-10, Telnet Session Options, in Appendix A, *Configuration Options*.)

When an access level of Operator is applied to the COM port and Telnet sessions, a Login ID with Administrator authority is effectively reduced to Operator. It is no longer possible to change configuration options, and full access can only be restored by reloading factory defaults. (See *Resetting the Unit's COM Port or Factory Defaults* on page 6-5.)

Creating a Login

Logins apply to the terminal directory connected to the communication port or Telnet access directly to the ATI of the unit.

Six login ID/password combinations are available. Each Login ID and Password must be unique and include an access level.

▶ Procedure

1. To create a login record, follow this menu selection sequence:

   Main Menu→Control→Administer Logins

```
main/control/admin_logins
                                                                Model: 797x


                          ADMINISTER LOGINS                     Page 1 of x

                    Login ID:           newuser
                    Access Level:       Administrator









--------------------------------------------------------------------------------
                              ESC for previous menu       MainMenu   Exit
 Save                                                     New        Delete
```

2. Select New and press Enter. The Login Entry screen appears.

```
main/control/admin_logins/entry
                                                                Model: 797x


                                LOGIN ENTRY

                        Login ID:           newuser2___
                        Password:           es342_____
                        Re-enter Password:  es342_____
                        Access Level:       Administrator

                                 WARNING
                  New logins will not become permanent until saved
                     through the "ADMINISTER LOGINS" screen!

--------------------------------------------------------------------------------
Ctrl-a to access these functions,    ESC for previous menu      MainMenu   Exit
 Save
```

3. Create the login by entering the following fields. Login IDs and passwords are case-sensitive.

On the Login Entry screen, for the . . .	Enter . . .
Login ID	1 to 10 ASCII printable characters (hex21 through 7E). Blanks are not allowed.
Password	1 to 10 ASCII printable characters that can consist of 0–9, a–z, A–Z, # (pound), . (period), – (dash), and / (slash).
Re-enter Password	1 to 10 ASCII printable characters that can consist of 0–9, a–z, A–Z, # (pound), . (period), – (dash), and / (slash).
Access Level	Administrator, Operator

NOTE:

Assign at least one Administrator-level Login ID. Full access is necessary to make configuration option changes and administer logins.

4. Press Ctrl-a to switch to the screen function key area below the dotted line. Select Save and press Enter.
5. When Save is complete, **`Command Complete`** appears at the bottom of the screen.
6. If additional logins are required, repeat Steps 2 through 5.
7. When all logins are entered, press Esc to return to the Administer Logins screen.
8. Select Save and press Enter.

Deleting a Login

▶ Procedure

1. To delete a login record, follow this menu selection sequence:

   Main Menu→Control→Administer Logins

2. Select PgUp or PgDn and press Enter to page through login pages/records until you find the one to be deleted.
3. Once the correct record is displayed, select Delete and press Enter.
4. To complete the delete action, select Save and press Enter.

   When the deletion is complete, **`Command Complete`** appears at the bottom of the screen. The number of login pages/records reflects one less record, and the record following the deleted record appears.

Resetting the Unit's COM Port or Factory Defaults

The user interface can be rendered inaccessible with a faulty configuration. Two methods can be used to restore it:

- **Reset COM Port** – Allows you to reset the configuration options related to COM port usage. It also causes a device reset, where the termination unit performs a Device Self-Test. No security-related configuration options are changed.
- **Reload Factory Defaults** – Allows you to reload the Default Factory Configuration, resetting all of the configuration and control settings which causes the current configuration to be destroyed and a device reset. This method is also useful when the user's password(s) have been forgotten.

▶ Procedure

To reset COM port settings:

1. At a terminal directly connected to the unit's COM port, configure the terminal to operate at 9.6 Kbps, using a character length of 8 bits, with one stop bit, and no parity.
2. Reset the unit, then immediately and repeatedly press Enter at a rate of at least once per second until the System Paused screen appears.
3. Tab to the desired method, and enter **yes** (or **y**) for the selected prompt.

If entering yes to prompt . . .	Then . . .
Reset COM Port usage	■ Port type is set to Terminal. ■ Data Rate (Kbps) is set to 9.6. ■ Character Length is set to 8. ■ Stop Bits is set to 1. ■ Parity is set to None.
Reload Factory Defaults	Yes (or y) will restore all factory-loaded configuration, and control settings contained in the Default Factory Configuration area are loaded.

If no (or n) is entered, or if no selection is made within 30 seconds, the unit returns to the condition or operation it was in when the system reset was initiated, with the COM port rate returning to its configured rate.

The termination unit resets itself, going through a self-test. Connectivity is restored and the Main Menu screen appears.

Controlling SNMP Access

There are three methods for limiting SNMP access:

- Disable the SNMP management option. Refer to Table A-12, General SNMP Management Options, in Appendix A, *Configuration Options*.
- Assign SNMP community names and access types.
- Limit SNMP access through validation of the IP address of each allowed SNMP manager.

Assigning SNMP Community Names and Access Types

The unit can be managed by an SNMP manager supporting SNMP. The community name must be supplied by an external SNMP manager accessing an object in the MIB.

To define SNMP community names, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration→ Management and Communication→General SNMP Management

Refer to Table A-12, General SNMP Management Options, in Appendix A, *Configuration Options*, to:

- Enable SNMP Management.
- Assign the SNMP community names of the SNMP Managers that are allowed to access the unit's Management Information Base (MIB).
- Specify Read or Read/Write access for each SNMP community name.

Limiting SNMP Access through the IP Addresses of the Managers

The unit provides an additional level of security through validation of the IP addresses.

The SNMP Management option must be enabled. To control SNMP access with IP addresses, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration→ Management and Communication→SNMP NMS Security

Refer to Table A-13, SNMP NMS Security Options, in Appendix A, *Configuration Options*. The SNMP access can be limited by:

- Enabling NMS IP address checking.
- Add each IP address and access level.

NOTES:

— Do not change or delete the IP address or access level of the NMS performing the sets, or enable IP address checking prior to adding the NMS to the table.

— The SNMP NMS Security Options screen is not available if the unit is connected to a DSLAM card running in IP Conservative mode.

Monitoring and Troubleshooting

7

What to Monitor

This chapter presents information on how to access and monitor standalone Hotwire termination units. You can monitor a unit's operations by referencing the following sections:

Table 7-6, Troubleshooting, includes suggested actions for correction and recovery.

Viewing System and Test Status

To view System and Test Status information, follow this menu selection sequence:

Main Menu→Status→System and Test Status

```
main/status/system
                                                              Model: 797x

                          SYSTEM AND TEST STATUS              Page 1 of 1

HEALTH AND STATUS          SELF-TEST RESULTS          TEST STATUS
-------------------------------------------------------------------------------
System Operational         Passed                     No Test Active









-------------------------------------------------------------------------------
                                 ESC for previous menu      MainMenu   Exit
PgUp      PgDn
```

The System and Test Status screen has three sections:

- **Health and Status** – Displays messages in priority order (highest to lowest). Refer to Table 7-1, Health and Status Messages.
- **Self-Test Results** – Results of the Diagnostic test run on the device itself. Refer to Table 7-2, Self-Test Results Messages.
- **Test Status** – Currently active tests. Refer to Table 7-3, Test Status Messages.

Health and Status Messages

The following messages can appear in the first column of the System and Test Status screen. The highest priority Health and Status message also appears on all ATI screens on the bottom right.

Table 7-1. Health and Status Messages (1 of 3)

Message	What Message Indicates	What To Do
AIS at DSX-1 AIS at G.703	An Alarm Indication Signal (AIS) is being received by the DSX-1 or G.703 interface.	A fault exists in the network connected to the DSX-1 port. Contact network provider.
DeviceFailed *yyyyyyyy*	An internal error has been detected by the operating software. *yyyyyyyy* indicates the 8-digit hexadecimal failure code.	1. Provide the 8-digit failure code shown (*yyyyyyyy*) to your service representative. 2. Reset the unit to clear the condition and message.
Download Failed	A firmware download was interrupted.	Ensure that the file exists on the TFTP server. Repeat the download.
EER at DSX-1 EER at G.703	An EER (Excessive Error Rate) condition has been detected on the DSX-1 or G.703 interface.	1. Verify the attached equipment coding is compatible. 2. Verify the clock configuration. 3. Contact network provider.
EER at Net	An EER (Excessive Error Rate) condition has been detected on the network interface at Port 1. The condition is cleared when the error rate falls below the threshold value currently configured.	1. Check the Network Performance Statistics screen for possible line impairments. 2. Set the unit to run at a lower DSL line rate.
Fallback Rate	The LTU had a loss of signal, and when the line was restored it did not resynchronize to the last known rate, but to a lower rate.	1. Verify that the network cable is securely attached at both ends. 2. From the Control screen, select Reset AutoRate to see if the unit will retrain at a higher rate. 3. Contact network provider.

Table 7-1. Health and Status Messages (2 of 3)

Message	What Message Indicates	What To Do
LOF at DSX-1 LOF at G.703	An LOF (Loss Of Frame) condition has been detected on the DSX-1 or G.703 interface.	1. Verify that the network cable is securely attached at both ends. 2. Verify the unit's line framing and line coding are compatible with the attached equipment. 3. Contact network provider.
LOS at DSX-1 LOS at G.703	An LOS (Loss Of Signal) condition has been detected on the DSX-1 or G.703 interface.	1. Verify that the network cable is securely attached at both ends. 2. Contact network provider.
LOS at Net, Pt 1	An LOS (Loss Of Signal) condition has been detected on the network interface. No signal is being received on Port 1, possibly due to a local network problem.	1. Verify that the network cable is securely attached at both ends. 2. Verify proper NTU and LTU configuration. 3. Contact network provider.
Mismatch Rate	The LTU, set to a fixed DSL rate, is attempting to operate at a rate the NTU is not capable of.	Set the LTU to a compatible rate or replace the NTU.
Net Com Link Down	The Network communication link is down. Communications between the management system and the LTU/NTU is not possible.	1. Verify that the network cable is securely attached at both ends. 2. Verify the link protocol for the COM port is configured correctly. 3. Verify that no tests are active.
Net Margin Threshold	The signal-to-noise margin has dropped below the configured threshold.	1. Check the Network Performance Statistics screen for possible line impairments. 2. Set the unit to run at a lower DSL line rate. 3. Reconfigure the margin threshold (if appropriate). 4. Contact network provider.
NTU/LTU Mismatch	The NTU is not compatible with the LTU.	Contact network provider.

Table 7-1. Health and Status Messages (3 of 3)

Message	What Message Indicates	What To Do
NTU TS16 Not Supported	The LTU is configured for TS16 signaling and the NTU is not configured to support TS16 signaling.	1. Verify endpoint is a G.703 product. EIA-530-A products do not support signaling. 2. Replace endpoint or reconfigure TS16 to data.
OOF at Net	An Out Of Frame (OOF) condition has been detected. An OOF condition is declared when 2 out of 4 frame synchronization bits are in error.	1. Check the Transmit Clock on the unit and attached equipment. 2. Set the unit to run at a lower DSL line rate. 3. Contact network provider.
Payload Rate Mismatch	The endpoint device is an EIA-530-A model that does not support the configured EIA-530-A payload rate.	Reconfigure the EIA-530 Payload Rate configuration option to an acceptable rate. See *Network Interface Options Menu* in Appendix A, *Configuration Options* for acceptable rates.
Primary Clock Failed	A failure has occurred in the primary clock source configured from the Network, DSX, or from the card internal clock.	1. Verify that the network cable is securely attached at both ends. 2. Verify the clock configuration. 3. Contact network provider.
RAI (Remote Alarm Indication) at G.703 interface, Pt 1	A Remote Alarm Indication signal is being received by the G.703 interface.	1. Check the status of the attached device. 2. Verify the unit's line code and framing are compatible with the attached equipment.
SYNC Pt Down	The interchange circuits for the DTE port are configured to monitor DTR and/or RTS, and a monitored lead is not asserted.	Verify that the DTE is providing the monitored signals.
System Operational	There are no problems detected.	No action is needed.
Yellow Alarm at DSX-1	A Yellow Alarm Indication signal is being received by the DSX-1 interface.	1. Verify that the units line framing and line coding are compatible. 2. Contact network provider.

Self-Test Results Messages

The results of the last power-up or reset self-test appear in the middle column of the System and Test Status screen.

Table 7-2. Self-Test Results Messages

Message	What Message Indicates	What To Do
CPU Failed	The CPU failed internal testing.	1. Reset the unit and try again. 2. Call your service representative for assistance.
DataPath Failed	The unit failed to loop data between the DSX-1 Port and the DSL loop.	1. Reset the unit and try again. 2. Call your service representative for assistance.
Device Failed	One or more of the unit's integrated circuit chips failed device-level testing.	1. Reset the unit and try again. 2. Call your service representative for assistance.
DSX-1 Failed Sync Port Failed G.703 Failed	The unit failed to loop data on the DTE interface circuit.	
Failure *xxxxxxxx*	An internal failure occurred. (*xxxxxxxx* represents an 8-digit hexadecimal failure code for use by service personnel.)	Record the failure code and contact your service representative.
FPGA Download Failed	The download of a Field Programmable Gate Array (FPGA) failed.	1. Reset the unit and try again. 2. Call your service representative for assistance.
PLD Failed	A failure in a Programmable Logic Device (PLD) was detected.	1. Reset the unit and try again. 2. Call your service representative for assistance.
Memory Failed	The unit failed memory verification.	1. Reset the unit and try again. 2. Call your service representative for assistance.
Passed	No errors were detected.	No action is needed.

Test Status Messages

The Test Status messages in the following table appear in the right column of the System and Test Status screen.

Table 7-3. Test Status Messages

Test Status Message	Meaning
511 Test Active	A 511 Test and Monitor is active on the DSL network interface.
DCLB Test Active	A Data Channel Loopback test is active.
DLB Test Active	A DTE Loopback test is active.
DTLB Test Active	A Data Terminal Loopback test is active.
Lamp Test Active	The Lamp Test is active, causing the LEDs on the front panel to light.
LLB Test Active	A network Line Loopback test is active.
No Test Active	No tests are currently running.
Remote LLB Dn Active	A Remote Line Loopback Down command is being sent.
Remote LLB Up Active	A Remote Line Loopback Up command is being sent.
Remote DCLB Dn Active	A Remote Data Channel Loopback Down command is being sent.
Remote DCLB Up Active	A Remote Data Channel Loopback Up command is being sent.
RLB Test Active	A Repeater Loopback test is active.
Telco LLB Active	A Telco-initiated line loopback is active on the DSX-1 port.
Telco PLB Active	A Telco-initiated payload loopback is active on the DSX-1 port.

For further information on testing, refer to Chapter 8, *Testing*.

Entry Response Messages

The messages in Table 7-4, Entry Response Messages, can appear in response to commands or during data entry. They appear in the messages area at the bottom of the ATI screen and are listed in alphabetical order.

Table 7-4. Entry Response Messages (1 of 2)

Device Message	What Message Indicates	What To Do
0.0.0.0 is an invalid IP address	An IP address of all zeros was entered.	Enter a valid, non-zero IP address.
Access level is Operator. Configuration is read-only.	The operator requested that configuration options be loaded, but does not have authority to edit them.	If configuration options are to be edited, use a Login ID that has Administrator authority.
Cannot Save – no Login IDs with Access Administrator	All of the login IDs being saved have an access level below Administrator.	Change the access level of at least one Login ID to Administrator so that configuration changes can be made. (Operator-level users cannot make configuration changes.) Save the Login IDs.
Command Complete	Action requested has successfully completed.	No action is needed.
Invalid Character	A nonprintable ASCII character has been entered.	Reenter the information using valid characters.
Invalid – Data Terminal Initiated Loopback Active	Network-initiated loopback was in progress when the selection was made.	No action is needed.
Invalid entry at cursor	Invalid IP address for this function.	Enter a valid IP address. See the appropriate table in Appendix A, *Configuration Options*, to determine the permitted address range for this field.
Invalid Password	Login is required and an incorrect password or Login ID was entered; access is denied.	■ Enter the correct Login ID and password combination. ■ Contact your system administrator to verify your Login ID and password.
Invalid – *[Test]* Already Active	The described test was already in progress when the selection was made.	■ Allow the test to continue. ■ Select another test. ■ Stop the test.
Invalid Test Combination	A loopback or pattern test was in progress when Start was selected to start the test, or was active on the same interface when the test was selected.	■ Wait unit the other test ends. ■ Abort all tests from the Test menu screen. ■ Stop the test from the same screen from which the test was started.

Table 7-4. Entry Response Messages (2 of 2)

Device Message	What Message Indicates	What To Do
Limit of six Login IDs reached	An attempt to enter a new login ID was made, and the limit of six login/password combinations has been reached.	1. Delete another login/password combination. 2. Reenter the new login ID.
No Security Records to Delete	Delete was selected from the Administer Login screen, and no security records had been defined.	■ No action is needed. ■ Enter a security record.
Password Matching Error – Re-enter Password	Password entered in the Reenter Password field of the Administer Logins screen does not match what was entered in the Password field.	■ Try again.
Please Wait	Command takes longer than 5 seconds.	Wait until the message clears.
Test Active	A test is running and no higher priority health and status messages exist.	■ Contact the service provider if test initiated by the network. ■ Wait until the other test ends and the message clears. ■ Cancel all tests from the Test screen. ■ Stop the test from the same screen from which the test was started.

Viewing Network Error Statistics

The unit maintains error statistics on the network DSL interface.

Statistics are maintained for up to 96 15-minute intervals (24 hours).

To view the Network Error Statistics, follow this menu selection sequence:

Main Menu→Status→Performance Statistics→Network Error Statistics

```
main/status/performance/net_error
                                                                  Model: 797x
                          NETWORK ERROR STATISTICS

    Current Interval Timer: 002                     Error Events Counter: 0034
--------------------------------------------------------------------------------
               ---ES---        ---SES---         --FEBE--          -Complete-
               Near Far        Near Far          Near Far          Near Far
  Current Int: 000  000        000  000          000  000          Yes  No
  Interval 01  000  000        000  000          000  000          Yes  Yes
  Interval 02  000  000        000  000          000  000          Yes  Yes
  Interval 03  000  000        000  000          000  000          Yes  Yes
  Interval 04  000  000        000  000          000  000          Yes  Yes
  Interval 05  000  000        000  000          000  000          Yes  Yes
  Interval 06  000  000        000  000          000  000          Yes  Yes
  Interval 07  000  000        000  000          000  000          Yes  Yes

Worst Interval: 24   09         14   08           18   18
Near Tot(valid):  00010           00000             00000
 Far Tot(valid):  00010           00000             00000

--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu         MainMenu   Exit
 PgUp     PgDn    ClrNear   ClrFar
```

Select PgUp or PgDn to view more statistics.

Select ClrNear or ClrFar to clear the near- and far-end statistics to zero.

Network Error Statistics are collected for:

- **ES (Errored Seconds):** Seconds during which one or more CRC error events occurred.
- **SES (Severely Errored Seconds):** Seconds during which more than 320 cyclic redundancy check (CRC) error events or at least one Out of Frame (OOF) event occurred. A CRC value is calculated for each 24 frames or 4608 bits of data and is transmitted with the framing information. The receiving unit calculates a CRC value for the same 24 frames and compares the values. If the values are unequal a CRC error event is logged.
- **FEBE (Far-End Block Errors):** CRC errors reported by the remote equipment.
- **Complete:** Whether the interval register contains data for a complete 900-second interval.

Use the virtual function keys to page through the intervals and clear statistics.

This Field . . .	**Contains . . .**
Current Interval Timer	The number of seconds which have elapsed in the current 15-minute interval. Maximum value is 900 seconds (15 minutes). This counter is reset every 15 minutes.
Error Events Counter	A running total of CRC errors. Range 0–65535. This counter resets when the near-end data is cleared.
Current Int	Performance data for the current 15-minute interval.
Interval *xx*	Historical performance data for up to 96 15-minute intervals (24 hours).
Worst Interval	The number of the interval with the worst (highest) performance data for both the near- and far-end statistics. If two or more intervals are equal, the oldest interval is displayed.
Near and Far Tot	A running total of the near- and far-end performance statistics.

Viewing Network Performance Statistics

Network performance statistics allow you to monitor the current status of the network DSL operations. Performance statistics can assist you in determining the duration of specific conditions and provide a historical context for problem detection and analysis. Statistics are maintained for up to 96 15-minute intervals (24 hours).

To view the Network Performance Statistics, follow this menu selection sequence:

Main Menu→Status→Performance Statistics→ Network Performance Statistics

```
main/status/performance/net_perf
                                                                    Model: 797x
                      NETWORK PERFORMANCE STATISTICS
                                                      Payload Rate: 1536 Kbps
    Current Interval Timer: 2                         DSL Line Rate: 1552 Kbps
--------------------------------------------------------------------------------
               --Mrgn--          --XmtPw-          --RxGn--          -Complete-
               Near Far          Near Far          Near Far          Near Far
  Current Int: +02  +01          +03  +03          +02  +02          Yes  Yes
  Interval 01  +02               +03               +02               Yes  No
  Interval 02  +02  +01          +03  +03          +02  +02          Yes  Yes
  Interval 03  +02  +01          +03  +03          +02  +02          Yes  Yes
  Interval 04  +02  +01          +03  +03          +02  +02          Yes  Yes
  Interval 05  +02  +01          +03  +03          +02  +02          Yes  Yes
  Interval 06  +02  +01          +03  +03          +02  +02          Yes  Yes
  Interval 07  +02  +01          +03  +03          +02  +02          Yes  Yes




--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu         MainMenu   Exit
 PgUp     PgDn
```

Select PgUp or PgDn to view more statistics.

Network Performance Statistics are collected for:

- **Mrgn:** Signal to Noise Ratio (SNR) Margin is the difference of the SNR, measured every 10 seconds, and a set SNR reference value. The acceptable range for SNR Margin is 0 and above. However, it may be practical to tolerate values below 0 on bad lines or longer reaches.
- **XmtPw:** The transmit power level. The maximum level is 15 dBm.
- **RxGn:** The receiver gain level. This is the amount the unit must boost the receive signal. It is not a receive level measurement.
- **Complete:** Whether the interval register contains data for a complete 900-second interval

Use the virtual function keys to page through the intervals and clear statistics.

This Field . . .	**Contains . . .**
Current Interval Timer	The number of seconds which have elapsed in the current 15-minute interval. Maximum value is 900 seconds (15 minutes). This counter resets every 15 minutes.
Payload Rate	The Payload Rate across the DSL interface.
DSL Line Rate	The rate of the DSL line (400 to 155 Kbps).
Current Int	Performance data for the current 15-minute interval.
Interval *xx*	Historical performance data for up to 96 15-minute intervals (24 hours) where the value of *xx* is from 01 to 96.

Viewing DSX-1 Performance Statistics (Model 7974)

DSX-1 performance statistics allow you to monitor the current status of DSX-1 interface operations when ESF framing is selected. Performance statistics can assist you in determining the duration of specific conditions and provide a historical context for problem detection and analysis. Statistics are maintained for up to 96 15-minute intervals (24 hours).

To view the Network Performance Statistics, follow this menu selection sequence:

Main Menu→Status→Performance Statistics→DSX-1 Performance Statistics

```
main/status/performance/DSX-1
                                                                  Model: 7974
                      DSX-1 PERFORMANCE STATISTICS

    Current Interval Timer: 2                    Error Events Counter: 0000
--------------------------------------------------------------------------------
                --ES--  --UAS--  --SES--  --BES--  --CSS--  --LOFC--  -Status-

Current Int:      000     000      000      000      000       000     Y
Interval 01       000     000      000      000      000       000     none
Interval 02       000     000      000      000      000       000     none
Interval 03       000     000      000      000      000       000     none
Interval 04       000     000      000      000      000       000     none
Interval 05       000     000      000      000      000       000     none
Interval 06       000     000      000      000      000       000     none
Interval 07       000     000      000      000      000       000     none

Worst Interval:    24      14       14       09       18        12
Tot (valid 96):  00010   00000    00000    00000     0020      0000

--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu        MainMenu   Exit
 PgUp     PgDn    ClrStats
```

Select PgUp or PgDn to view the next or previous seven intervals.

Select ClrStats to clear all statistics to zero.

DSX-1 Performance Statistics are collected for:

- **ES (Errored Seconds):** Seconds during which one or more error events occurred.
- **UAS (Unavailable Seconds):** Seconds during which service is unavailable. UAS is received at the start of 10 consecutive SES and cleared at the start of 10 seconds with no SES.
- **SES (Severely Errored Seconds):** Seconds during which 320 or more cyclic redundancy check (CRC) error events or at least one Out of Frame (OOF) event occurred.
- **BES (Bursty Errored Seconds):** Contains the number of bursty errored seconds for the current interval. A bursty errored second is any second with more than one but less than 320 CRC errors.

- **CSS (Controlled Slip Seconds):** Seconds during which one or more controlled slips (as defined in TR 54016) occurred.
- **LOFC (Loss of Frame Count):** Contains the number of times that an LOF is declared.
- **Status:** Contains the contents of the status events register. The status events register maintains a history of specific events that have occurred during an interval. Values include:
  - **Y:** Remote alarm indication signal (yellow alarm) received at the DSX-1 interface
  - **L:** Loss of signal detected at the DSX-1 interface
  - **E:** Excessive error rate threshold exceeded
  - **F:** Frame synchronization bit error detected
  - **V:** Line code violation detected
  - **None:** No significant events have occurred

Use the virtual function keys to page through the intervals and clear statistics.

This Field . . .	**Contains . . .**
Current Interval Timer	The number of seconds which have elapsed in the current 15-minute interval. Maximum value is 900 seconds (15 minutes). This counter resets every 15 minutes.
Error Events Counter	A running total of CRC and OOF events. Total range = 0–65535. Counter resets when the statistics are cleared.
Current Int	Performance data for the current 15-minute interval.
Interval *xx*	Historical performance data for up to 96 15-minute intervals (24 hours) where the value of *xx* is from 01 to 96.
Worst Interval	The number of the interval with the worst (highest) performance data. If two or more intervals are equal, the oldest interval is displayed.
Tot	A 24-hour running total.

Viewing G.703 Performance Statistics (Model 7976)

G.703 performance statistics allow you to monitor the current status of the G.703 interface operations. Performance statistics can assist you in determining the duration of specific conditions and provide a historical context for problem detection and analysis. Statistics are maintained for up to 96 15-minute intervals (24 hours).

To view the Network Performance Statistics, follow this menu selection sequence:

Main Menu→Status→Performance Statistics→G.703 Performance Statistics

```
main/status/performance/G.703
                                                                Model: 7976
                      G.703 PERFORMANCE STATISTICS

    Current Interval Timer: 004                   Error Events Counter: 012
--------------------------------------------------------------------------------
                --ES--  --UAS--  --SES--  --BES--  --CSS--  --LOF--   -Status-

Current Int:      000     000      000      000      000      000      Y
Interval 01       000     000      000      000      000      000      none
Interval 02       000     000      000      000      000      000      none
Interval 03       000     000      000      000      000      000      none
Interval 04       000     000      000      000      000      000      none
Interval 05       000     000      000      000      000      000      none
Interval 06       000     000      000      000      000      000      none
Interval 07       000     000      000      000      000      000      none

Worst Interval:    24      14       14       09       18       12
Tot (valid 96):  00010   00000    00000    00000     0020     0000

--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu        MainMenu   Exit
 PgUp     PgDn    ClrStats
```

Select PgUp or PgDn to view the next or previous seven intervals.

Select ClrStats to clear all statistics to zero.

G.703 Performance Statistics are collected for:

- **ES (Errored Seconds):** Seconds during which one or more error events occurred.
- **UAS (Unavailable Seconds):** Seconds during which service is unavailable. UAS is received at the start of 10 consecutive SES and cleared at the start of 10 seconds with no SES.
- **SES (Severely Errored Seconds):** Seconds during which more than 805 cyclic redundancy check (CRC) error events, more than 16 FAS errors, or at least one Out of Frame (OOF) event occurred.
- **BES (Bursty Errored Seconds):** Contains the number of bursty errored seconds for the current interval. A bursty errored second is any second with more than one but less than 805 CRC errors (CRC Mode) or more than one but less than 16 FAS errors (non-CRC mode).

- **CSS (Controlled Slip Seconds):** Seconds during which one or more controlled slips (as defined in TR 54016) occurred.
- **LOF (Loss of Frame Seconds):** Contains the number of seconds that contain one or more LOF events.
- **Status:** Contains the contents of the status events register. The status events register maintains a history of specific events that have occurred during an interval. Values include:
  - **Y**: Remote alarm indication signal received at the G.703 interface
  - **L:** Loss of signal detected at the G.703 interface
  - **E:** Excessive error rate threshold exceeded
  - **F:** Frame synchronization bit error detected
  - **V:** Line code violation detected
  - **None:** No significant events have occurred

Use the virtual function keys to page through the intervals and clear statistics.

This Field . . .	Contains . . .
Current Interval Timer	The number of seconds which have elapsed in the current 15-minute interval. Maximum value is 900 seconds (15 minutes). This counter resets every 15 minutes.
Error Events Counter	A running total of CRC and OOF events. Total range = 0–65535. Counter resets when the statistics are cleared.
Current Int	Performance data for the current 15-minute interval.
Interval *xx*	Historical performance data for up to 96 15-minute intervals (24 hours) where the value of *xx* is from 01 to 96.
Worst Interval	The number of the interval with the worst (highest) performance data. If two or more intervals are equal, the oldest interval is displayed.
Tot	A 24-hour running total.

Viewing Current Network Performance

The Current Network Performance Statistics screen allows you to monitor selected current network status and error information for both the near- and far-end units from a single screen.

To view Current Network Performance Statistics for a port, follow this menu selection sequence:

Main Menu→Status→Performance Statistics→Current Network Performance

```
main/status/performance/current                                    Hotwire
Slot: 4:                                                         Model: 797x
Port: 3              CURRENT NETWORK PERFORMANCE STATISTICS
                                                    Payload Rate: 1536 kbps
    Current Interval Timer: 002                   DSL Line Rate: 1552 kbps
--------------------------------------------------------------------------------

             Near End      Far End
  Margin       +02           +01
  XmtPw        +03           +03
  RxGn         +02           +02

  ES           002           000
  SES          002           000
  FEBE         000           000









--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu         MainMenu   Exit
                ClrNear    ClrFar
Select: 1, 2, 3, 4                        LOS at Net, Pt 1
```

The following Network Performance Statistics are collected for the selected port:

- **Mrgn:** Signal to Noise Ratio (SNR) Margin, the amount (in dB) that the Receive signal has exceeded the value needed to maintain a Bit Error Rate (BER) of 10^{-7} or better.
- **XmtPw:** The transmit power level.
- **RxGn:** The receiver gain level.

The following Network Error Statistics are collected for the selected port:

- **ES (Errored Seconds):** Seconds during which one or more ESF error events occurred.
- **SES (Severely Errored Seconds):** Seconds during which more than 320 cyclic redundancy check (CRC) error events or at least one Out of Frame (OOF) event occurred.
- **FEBE (Far-End Block Errors):** Errors reported by the remote equipment.

Fields on this screen include:

Field . . .	Contains . . .
Current Interval Timer	The number of seconds which have elapsed in the current 15-minute interval. Maximum value is 900 seconds (15 minutes). This counter is reset every 15 minutes. When zero, the port is disabled.
Payload Rate	The rate of data transfer.
DSL Line Rate	The rate of the DSL line.

Using the Display LEDs Screen

The status of the front panel LEDs can be viewed locally and remotely on the Display LEDs Status screen.

There are three classes of LEDs:

- **General** LEDs display the status of the unit
- The **DTE** (DSX-1, Sync Port, or G.703) LED provides the status of the DTE interface
- The **DSL Loop** LED displays the activity on the DSL network

To view the Display LEDs status screen, follow this menu selection sequence:

Main Menu→Status→Display LEDs

```
main/status/leds
                                                          Model: 797x


                          DISPLAY LEDs

              GENERAL         [DTE Interface]      DSL LOOP
-------------------------------------------------------------------------------
              ALRM            Link Up              Link Up
              TEST




-------------------------------------------------------------------------------
                               ESC for previous menu       MainMenu    Exit
```

The LED status display screen is updated every 5 seconds. For information about the meaning of the LEDs, see *Front Panel LEDs* on page 7-21.

Front Panel LEDs

Table 7-5, Front Panel LEDs, describes the meaning and states of the LEDs on the front panels.

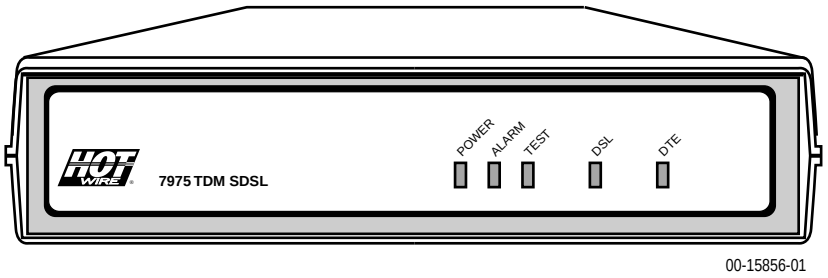


Table 7-5. Front Panel LEDs

Label	Color	LED is . . .*	Indicating . . .
POWER	Green	On	Normal operation.
		Off	No power to the unit.
		Slow Cycling	Unit is in minimum mode and a download is required.
ALARM	Red	On	Device failure, or self-test has failed.
		Off	Self-test passed.
TEST	Yellow	On	Loopback test or 511 test pattern in progress.
		Off	No tests in progress.
		Slow Cycling	Self-test in progress.
DSL	Green	On	DSL link is up.
		Off	The DSL link is down.
		Slow Cycling	DSL training in progress.
		Fast Cycling	An OOF condition.
DSX-1 DTE G.703	Green	On	DTE port is operational.
		Off	**DSX-1:** No signal on DTE port. **Sync DTE:** Configured control leads (DTR/RTS) are not asserted. **G.703:** No signal on DTE port.
		Slow Cycling	**DSX-1:** Yellow Alarm Indication received. **Sync DTE:** Not applicable. **G.703:** Remote Alarm Indication received.
		Fast Cycling	**DSX-1:** OOF, LOF, EER, or AIS condition. **Sync DTE:** Not applicable. **G.703:** OOF, LOF, EER, or AIS condition.

* Slow Cycling: LED turns off and on in equal duration once per second.
Fast Cycling: LED turns off and on in equal duration 5 times per second.
Pulsing: LED turns off momentarily once per second.

Troubleshooting

The unit is designed to provide many years of trouble-free service. If a problem occurs, however, refer to Table 7-6, Troubleshooting, for possible solutions.

Table 7-6. Troubleshooting (1 of 2)

Symptom	Possible Cause	Solutions
ALARM LED is on.	One of several alarm conditions exists. Health and Status displays the alarm condition.	Refer to Table 7-1, Health and Status Messages, for a recommended action.
An LED is not lit that should be lit.	LED is burned out.	■ Use Table 7-5, Front Panel LEDs, to determine the correct behavior of the LEDs. ■ Run the Lamp test. If the LED in question does not flash with the other LEDs, then contact your service representative.
Cannot access the unit via the ATI.	The terminal is not set up for the correct rate or data format, or the unit is configured so it prevents access.	■ Check the cable and connections. ■ Ensure the unit is configured properly. Verify IP address and communication port usage. ■ Reset the unit.
`Device Fail` appears on the System and Test Status screen under Self-Test results.	The unit detects an internal hardware failure.	■ Reset the unit. ■ Contact your service representative.
No power, or the LEDs are not lit.	The power cord is not securely plugged into the wall receptacle or into the rear panel connection.	Check that the power cord is securely attached at both ends.
	The wall receptacle has no power.	■ Check the wall receptacle power by plugging in some equipment that is known to be working. ■ Check the power switch on the unit's rear panel. ■ Check the circuit breaker. ■ Verify that your site is not on an energy management program.
	Power supply has failed.	Replace power supply.

Table 7-6. Troubleshooting (2 of 2)

Symptom	Possible Cause	Solutions
Not receiving data.	The network or data port cables are not connected (check front panel LEDs for more information).	■ Check network and data port cables. ■ Run loopback tests. Refer to Chapter 8, *Testing*.
	A test is being executed on the unit (check the TEST LED on the front panel).	Stop the test or wait for the test to end.
	The far-end unit is offline.	Make sure the far-end device is on.
	The far-end unit is running a test.	Stop the far-end test.
	An alarm condition exists in the far-end unit.	Check the far-end Health and Status messages.
Power-On Self-Test fails. Only POWER and ALARM LEDs are on after power-on.	The unit has detected an internal hardware failure.	■ Reset the unit and try again. ■ Contact your service representative.

Testing

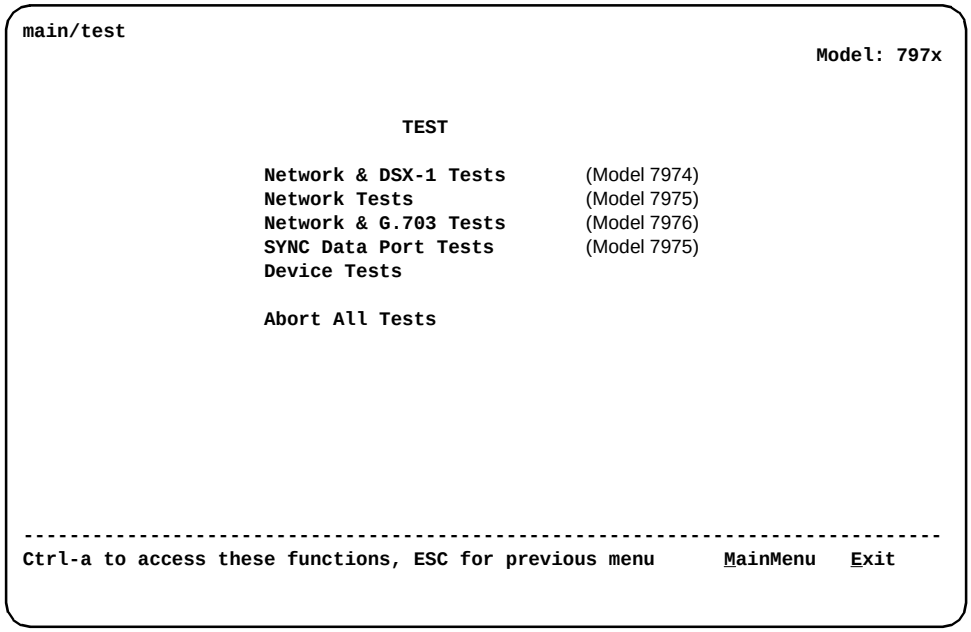
8

Accessing the Test Menu

From the Test menu, you can run network tests, data port tests, a lamp test for the front panel LEDs, or abort all tests.

To access the Test menu, follow this menu selection sequence:

Main Menu→Test



Select . . .	On . . .	To . . .
Network and DSX-1 Tests	Model 7974	Start and stop tests on the DSX-1 or network interface.
Network Tests	Model 7975	Start and stop tests on the network interface.
Network and G.703 Tests	Model 7976	Start and stop tests on the G.703 or network interface.
SYNC Data Port Tests	Model 7975	Start and stop tests on the SYNC Port interface.
Device Tests	All models	Start and stop lamp test.
Abort All Tests	All models	To abort all current tests excluding network-initiated loopback tests. An aborted test may continue to run for a few seconds as the abort command is sent to the remote end and processed.

Running Network Tests

Network tests require the participation of your network service provider. To access the Network Tests screen, follow this menu selection sequence:

Model 7974 (sample screen in *DSX-1 Tests (Model 7974)* on page 8-6)**:**
Main Menu→Test→Network & DSX-1 Tests

Model 7975 (sample screen below)**:**
Main Menu→Test→Network Tests

Model 7976 (sample screen in *G.703 Tests (Model 7976)* on page 8-14)**:**
Main Menu→Test→Network & G.703 Tests

```
main/test/network
                                                                  Model: 7975


                                NETWORK TESTS

Test                          Command    Status     Results
-------------------------------------------------------------------------------
Local Loopbacks
  Network Line Loopback:      Start      Inactive   00:00:00

Remote Loopbacks
  Send Line Loopback: Down    Send       Inactive   00:00:00

Network Pattern Tests
  Send and Monitor 511        Stop       Active     hh:mm:ss - Errors 99999+




-------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu        MainMenu    Exit
 ResetMon
```

Use the **Command** column to start or stop a test. When the **Status** column shows that a test is Inactive, Start is displayed; when a test is Active, Stop is displayed.

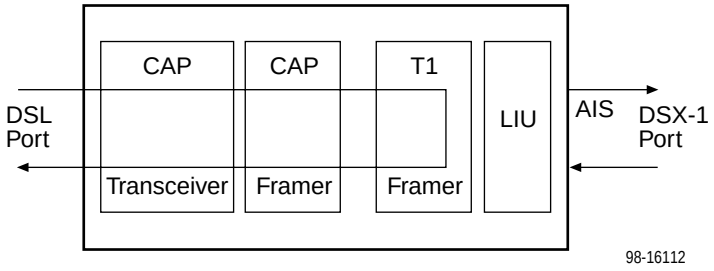
Position the cursor at the desired Start or Stop command and press Enter. The **Results** column displays the test duration.

NOTE:

Send and Monitor 511 is displayed on the screens but is not available in this release. When Send and Monitor 511 is enabled, ResetMon will be available to reset the error counter to zero.

Network Line Loopback

A Network Line Loopback loops the received signal on the network interface back to the network without change.



▶ Procedure

To run a Network Line Loopback:

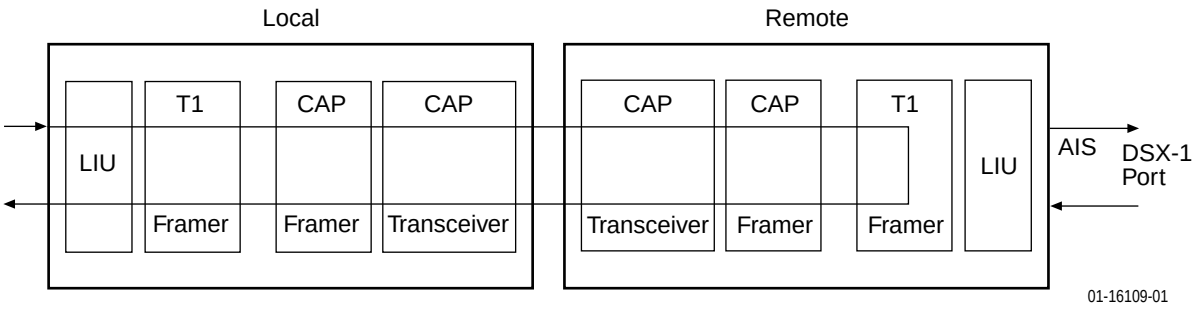
1. Position the cursor at the Start command next to Network Line Loopback on the Network & DSX-1, Network, or Network & G.703 Tests screen.
2. Press Enter.

   The Start command is changed to Stop.
3. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.

The Network Line Loopback cannot be started when a Repeater Loopback, DTE Loopback, Remote DCLB, network-initiated Line Loopback, or Telco-initiated test is in progress.

Remote Network Send Line Loopback

The local unit initiates this test by sending a line loopback Up or Down command to the remote unit for 10 seconds. When the remote unit detects the loopback Up command, it puts itself into line loopback and lights the front panel test LED. The remote unit remains in loopback until it receives a loopback Down command or the remote unit's test timeout value is exceeded. The Send Line Loopback tests both units. External equipment can be used to verify the link.



▶ Procedure

To run a Remote Network Send Line Loopback:

1. Position the cursor at the Up or Down selection next to Send Line Loopback on the Network & DSX-1, Network, or Network & G.703 Tests screen.
2. Press the spacebar to select either Up or Down.
3. Position the cursor at the Send command next to the Up or Down selection.
4. Press Enter.

   The local unit stops sending the loopback command automatically after 10 seconds. You cannot stop the Send Line Loopback test manually.

The Remote Network Send Line Loopback cannot be started when any other loopback test is active on the network interface.

DSX-1 Tests (Model 7974)

To access the Network & DSX-1 Tests screen, follow this menu selection sequence:

Main Menu→Test→Network & DSX-1 Tests

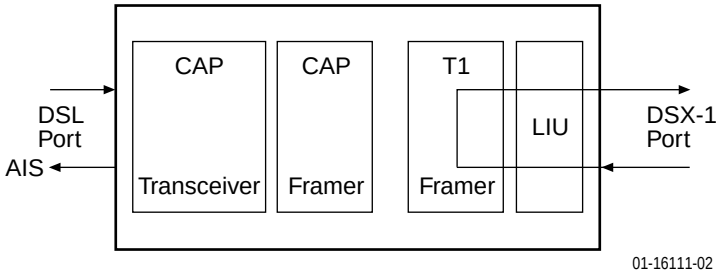
```
main/test/network_DSX-1
                                                                  Model: 7974


                              NETWORK & DSX-1 TESTS

Test                           Command    Status       Results
-------------------------------------------------------------------------------
Local Loopbacks
  Network Line Loopback:       Start     Inactive     00:00:00
  Network Repeater Loopback:   Start     Inactive     00:00:00
  DSX-1 DTE Loopback:          Start     Inactive     00:00:00

Remote Network Loopbacks
  Send Line Loopback: _Down    Send      Inactive     00:00:00

Network Pattern Tests
  Send and Monitor 511         Stop      Active    hh:mm:ss - Errors 99999+



-------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu       MainMenu    Exit
 ResetMon
```

Use the **Command** column to start or stop a test. When the **Status** column shows that a test is Inactive, Start is displayed; when a test is Active, Stop is displayed.

Position the cursor at the desired Start or Stop command and press Enter. The **Results** column displays the test duration.

Network Repeater Loopback (DSX-1)

A Network Repeater Loopback loops the signal being sent from the data port back to the data port. AIS (Alarm Indication Signal) is sent to the DSL port.



▶ Procedure

To run a DSX-1 Network Repeater Loopback:

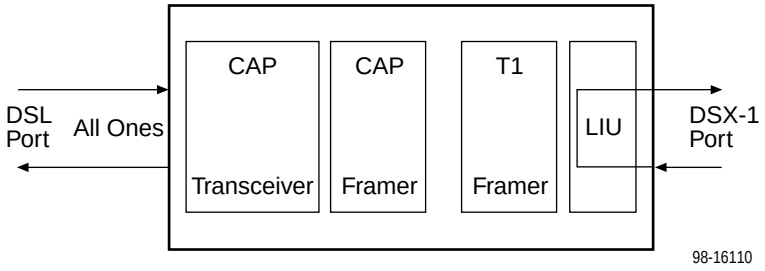
1. Position the cursor at the Start command next to Network Repeater Loopback on the Network & DSX-1 Tests screen.
2. Press Enter.

   The Start command is changed to Stop.
3. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.

The DSX-1 Network Repeater Loopback cannot be started when any other loopback test is in progress.

DSX-1 DTE Loopback

A DSX-1 DTE Loopback loops the DSX-1 signal back to itself before the signal is sent to the Framer.



▶ Procedure

To run a DSX-1 DTE Loopback:

1. Position the cursor at the Start command next to DSX-1 DTE Loopback on the Network & DSX-1 Tests screen.
2. Press Enter.

   The Start command is changed to Stop.
3. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.

The DSX-1 DTE Loopback cannot be started when any other loopback test is in progress.

SYNC Data Port Tests (Model 7975)

To access the SYNC Data Port Tests screen, follow this menu selection sequence:

Main Menu→Test→SYNC Data Port Tests

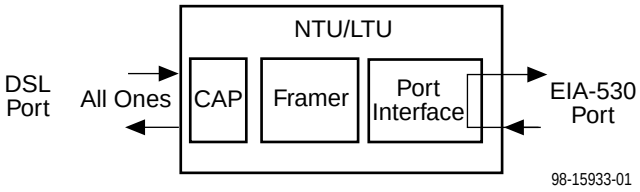
```
main/test/data
                                                              Model: 7975


                              SYNC DATA PORT TESTS

Test                          Command     Status        Results
-------------------------------------------------------------------------------
Local Loopbacks
  Data Terminal Loopback:     Start       Inactive      00:00:00
  Data Channel Loopback:      Start       Inactive      00:00:00
  Repeater Loopback:          Start       Inactive      00:00:00


Remote Loopbacks
  Send Remote DCLB:   Down    Send        Inactive      00:00:00









-------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
```

Use the **Command** column to start or stop a test. When the **Status** column shows that a test is Inactive, Start is displayed; when a test is Active, Stop is displayed.

Position the cursor at the desired Start or Stop command and press Enter. The **Results** column displays the test duration.

Data Terminal Loopback

A Data Terminal Loopback (DTLB) loops user data back to the DTE. This loopback is located as closely as possible to the user data port (DTE) interface.



▶ Procedure

To run a Data Terminal Loopback:

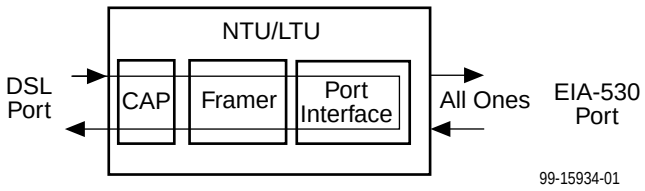
1. Position the cursor at the Start command next to Data Terminal Loopback on the SYNC Data Port Tests screen.
2. Press Enter.

   The Start command is changed to Stop.
3. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.

The Data Terminal Loopback cannot be started when a Repeater Loopback, Line Loopback, DCLB, or Remote DCLB is in progress on the data port.

Data Channel Loopback

A Data Channel Loopback (DCLB) loops the data from the network interface back to the network. This loopback is located as close as possible to the user data port (DTE) interface.



▶ Procedure

To run a Data Channel Loopback:

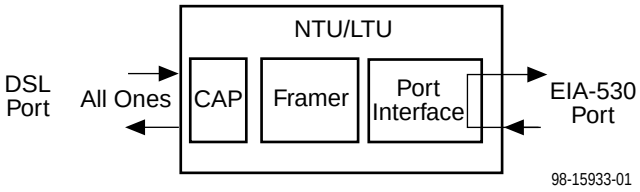
1. Position the cursor at the Start command next to Data Channel Loopback on the SYNC Data Port Tests screen.
2. Press Enter.

   The Start command is changed to Stop.
3. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.

The Data Channel Loopback cannot be started when a Line Loopback or Repeater Loopback is active on the network interface, or a Data Terminal Loopback is active on the data port.

Repeater Loopback (EIA-530)

A Repeater Loopback loops the signal being sent from the data port back to the data port. AIS is sent to the DSL port.



▶ Procedure

To run an EIA-530 Repeater Loopback:

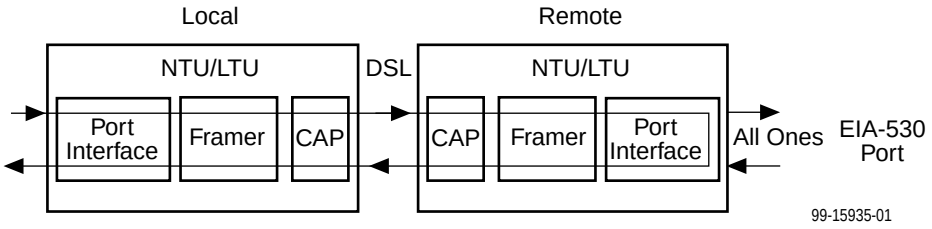
1. Position the cursor at the Start command next to Repeater Loopback on the SYNC Data Port Tests screen.
2. Press Enter.

   The Start command is changed to Stop.
3. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.

The Repeater Loopback cannot be started when any other loopback test is in progress.

Send Remote Data Channel Loopback

The local termination unit can send an Up or Down sequence to request the start or stop of a Data Channel Loopback (DCLB) on a remote unit.



▶ Procedure

To send a Remote DCLB:

1. Position the cursor at the Up or Down selection next to Send Remote DCLB on the SYNC Data Port Tests screen.
2. Press the spacebar to select the desired code (Up or Down).
3. Position the cursor at the Start command next to Send Remote DCLB on the SYNC Data Port Tests screen.
4. Press Enter.

   The Status field is changed to Sending. The Up or Down sequence transmission stops automatically after 10 seconds. You cannot stop the sequence manually.

G.703 Tests (Model 7976)

To access the Network & G.703 Tests screen, follow this menu selection sequence:

Main Menu→Test→Network & G.703 Tests

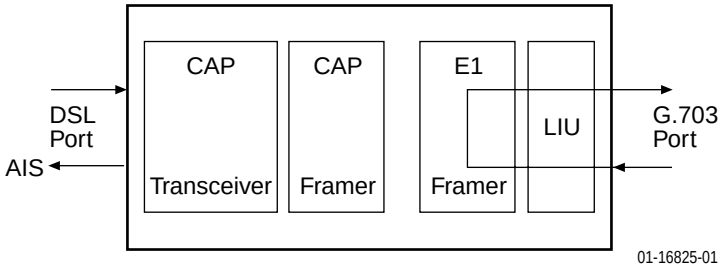
```
main/test/network_G.703
                                                                  Model: 7976


                              NETWORK & G.703 TESTS

Test                          Command    Status       Results
-------------------------------------------------------------------------------
Local Loopbacks
  Network Line Loopback:      Start      Inactive     00:00:00
  Network Repeater Loopback:  Start      Inactive     00:00:00
  G.703 DTE Loopback:         Start      Inactive     00:00:00

Remote Loopbacks
  Send Line Loopback: Down    Send       Inactive     00:00:00

Pattern Tests
  Send and Monitor 511        Stop       Active    hh:mm:ss - Errors 99999+



-------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
 ResetMon
```

Use the **Command** column to start or stop a test. When the **Status** column shows that a test is Inactive, Start is displayed; when a test is Active, Stop is displayed.

Position the cursor at the desired Start or Stop command and press Enter. The **Results** column displays the test duration.

Network Repeater Loopback (G.703)

A Network Repeater Loopback (RLB) loops the signal being sent from the data port back to the data port. AIS is sent to the DSL port.



▶ Procedure

To run a G.703 Network Repeater Loopback:

1. Position the cursor at the Start command next to Network Repeater Loopback on the Network & G.703 Tests screen.
2. Press Enter.

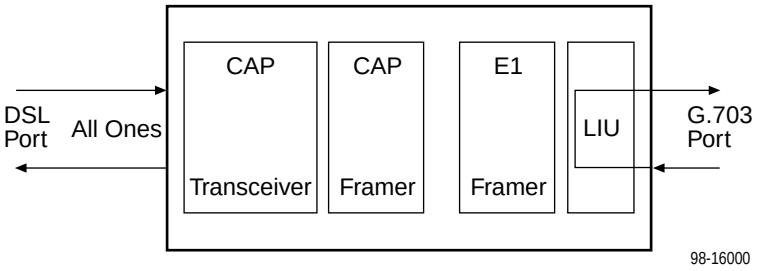
   The Start command is changed to Stop.
3. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.

The G.703 Network Repeater Loopback cannot be started when any other loopback test is in progress.

G.703 DTE Loopback

A G.703 DTE Loopback loops the G.703 signal back to itself before the signal is sent to the Framer.

Activating the G.703 DTE Loopback test causes the EOC, which is used for management, to be lost to the remote unit.



▶ Procedure

To run a G.703 DTE Loopback:

1. Position the cursor at the Start command next to G.703 DTE Loopback on the Network & G.703 Tests screen.
2. Press Enter.

   The Start command is changed to Stop.
3. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.

The G.703 DTE loopback cannot be started when any other loopback test is in progress.

Device Tests

The Device Tests branch is used to access the only card-level test, the Lamp Test. To access the Device Tests screen, follow this menu selection sequence:

Main Menu→Test→Device Tests

```
main/test/card
                                                                 Model: 797x

                                  DEVICE TESTS

                      Test         Command     Status
--------------------------------------------------------------------------------
                      Lamp Test:   Start       Inactive











--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu       MainMenu    Exit
```

Lamp Test

The Lamp Test determines whether all LEDs are lighting and functioning properly.

▶ Procedure

To test the LEDs:

1. Position the cursor at the Start command next to Lamp Test on the Device Tests screen.
2. Press Enter.

   The Start command is changed to Stop. During the Lamp Test, all LEDs blink simultaneously every second. When the Lamp Test is stopped, the LEDs are restored to their normal condition.
3. To stop the Lamp Test, position the cursor at the Stop command and press Enter.

Ending an Active Test

A test initiated by the user can be ended using:

- **Test Timeout option** – Enable the Test Timeout system option so the unit can automatically terminate tests, and set the Test Duration (min) option to specify the amount of time that tests can run before the unit terminates the test. The default is 10 minutes. Refer to Table A-8, System Options, in Appendix A, *Configuration Options*.
- **Command column** – Under the Command column on any test screen, position the cursor at Stop next to the active test and press Enter to stop a specific test.
- **Abort All Tests menu selection** – Select Abort All Tests from the Test menu to stop all tests running on all interfaces. **`Command Complete`** appears when all tests on all interfaces have been terminated. Network-initiated loopbacks cannot be stopped from the Test menu.

An aborted test may continue to run for a few seconds as the Stop command is sent to the remote end and processed.

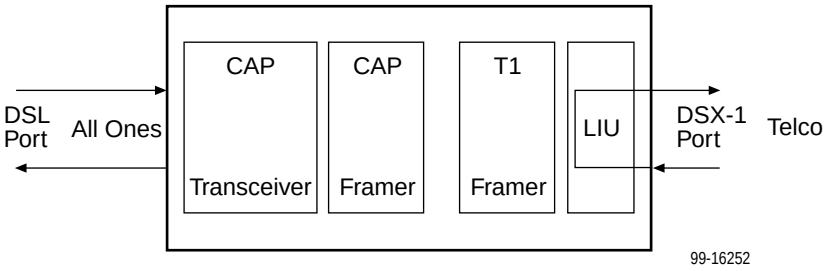
Telco-Initiated Tests (Model 7974)

The standalone Hotwire 7974 termination unit supports Telco-initiated tests, as shown in the following table.

Activation and Deactivation	Line Loopback	Payload Loopback	Remote Line Loopback
In-Band Signal	Supported	Not Applicable	Supported
Bit-Oriented	Supported	Supported	Supported
Message-Oriented	Not Applicable	Not Supported	Not Applicable

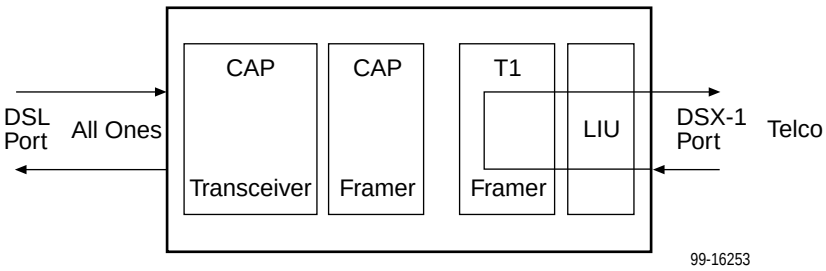
Telco-Initiated Line Loopback

The Model 7974 supports Line Loopback, as specified in AT&T TR 54016, AT&T TR 62411, and ANSI T1.403. A Telco-initiated Line Loopback loops the received signal on the DSX-1 interface back to the DSX-1 interface without modification. Framing, CRC, and FDL bits are returned unaltered, and no BPVs or other line coding errors are removed.



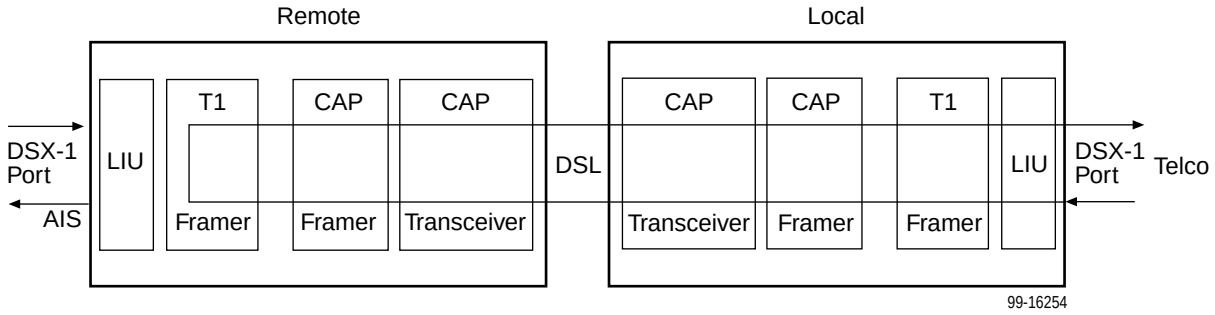
Telco-Initiated Payload Loopback

The Model 7974 supports Payload Loopback, as specified in AT&T TR 54016 and ANSI T1.403. A Telco-initiated Payload Loopback loops the received signal on the DSX-1 interface back to the DSX-1 interface. Framing, CRC, and FDL bits are regenerated at the point of the loopback, and BPVs are removed.



Telco-Initiated Remote Line Loopback

If the Remote Telco Line Loopback system option is enabled, a Telco-initiated Line Loopback loops received data at the remote unit and passes it back to the Telco through the local unit.



Configuration Options

A

Overview

The tables in this appendix summarize the configuration options accessed when you select the Configuration option on the Main Menu. The Configuration options are arranged into groups based upon functionality.

Select . . .	To Access the . . .	To Configure the . . .
Network	Network Interface Options (Table A-1)	DSL network interface on the unit.
DSX-1 or SYNC Port or G.703	DSX-1 Interface Options for Model 7974 (Table A-5) Synchronous Data Port Options for Model 7975 (Table A-6) G.703 Interface Options for Model 7976 (Table A-7)	DSX-1 interface (Model 7974) Synchronous DTE interface (Model 7975) G.703 interface (Model 7976)
System Options	System Options (Table A-8)	General system options of the unit.
Communication Port	Communication Port Options (Table A-9)	Unit's COM port options.
Management and Communication	■ Telnet Session Options (Table A-10) ■ Communication Protocol Options (Table A-11) ■ General SNMP Management Options (Table A-12) ■ SNMP NMS Security Options (Table A-13) ■ SNMP Traps Options (Table A-14)	Management support of the unit through SNMP and Telnet.

NOTE:

All changes to configuration options must be saved. Refer to *Saving Configuration Options* in Chapter 3, *Initial Startup and Configuration*.

Network Interface Options Menu

For Network Interface Options, refer to Table A-1, Network Interface Options. To access the Network Interface Options screen, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration→Network

```
main/config/network
                                                              Model: 797x


                          NETWORK INTERFACE OPTIONS

                    Port Status                        Enable
                    Margin Threshold:                  -3db
                    Excessive Error Rate Threshold:    1E-5
                    AutoRate:                          Disable
                    DSL Line Rate:                     1552 kbps
                    EIA-530 Payload Rate               1536 kbps
                    Transmit Attenuation               0dB
                    Peer IP Address:                   111.255.255.000  Clear




   Circuit Identifier: ____________________________________________  Clear

------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
 Save
```

Table A-1. Network Interface Options (1 of 3)

Margin Threshold
Possible Settings: **–5db**, **–4db**, **–3db**, **–2db**, **–1db**, **0db**, **1db**, **2db**, **3db**, **4db**, **5db**, **6db**, **7db**, **8db**, **9db**, **10db** Default Setting: **0db**
Determines the level, expressed in decibels, at which a signal-to-noise margin condition is recognized. **–5db** to **10db** – Sets the margin threshold to this value.
Excessive Error Rate Threshold
Possible Settings: **1E–4**, **1E–5**, **1E–6**, **1E–7**, **1E–8**, **1E–9** Default Setting: **1E–6**
Determines the error rate at which an excessive error rate (EER) condition is recognized. The rate is the ratio of the number of CRC errors to the number of bits received in a certain period.

Table A-1. Network Interface Options (2 of 3)

AutoRate
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Determines whether the unit automatically adjusts to the best line rate for conditions, or is fixed at the rate in the DSL Line Rate field. The automatically set rate cannot exceed DSL Line Rate. ■ AutoRate is only available when the unit is configured as an LTU. **Enable** – The LTU is set to adjust to the best line rate. **Disable** – The LTU Line rate is user selectable and is based on the DSL Line Rate selected.
DSL Line Rate
Possible Settings (Model 7974): **144, 272, 400,528, 784, 1040, 1552** Default Setting: **1552** Possible Settings (Models 7975, 7976): **144, 272, 400,528, 784, 1040, 1552, 2064** Default Setting: **2064**
Determines the fixed line rate of the LTU when AutoRate is disabled. See Table A-2, Payload Rates and DSL Line Rates for DSX-1 and Table A-3, Payload Rates and DSL Line Rates for G.703 for information about maximum payload rates for different DSL line rates. ■ DSL Line Rate is only available when the unit is configured as an LTU. **144** – **2064** – The fixed DSL Line Rate, in Kbps.
Max DSL AutoRate
Possible Settings (Model 7974): **144, 272, 400,528, 784, 1040, 1552** Default Setting: **1552** Possible Settings (Models 7975, 7976): **144, 272, 400,528, 784, 1040, 1552, 2064** Default Setting: **2064**
Determines the maximum rate to which the unit can AutoRate. See Table A-2, Payload Rates and DSL Line Rates for DSX-1, and Table A-3, Payload Rates and DSL Line Rates for G.703, for information about maximum payload rates for different DSL line rates. ■ Max DSL AutoRate is only available when the unit is configured as an LTU and AutoRate is enabled. **144** – **2064** – The AutoRate ceiling, in Kbps.

Table A-1. Network Interface Options (3 of 3)

EIA-530 Payload Rate
Possible Settings (Model 7974): **64, 128, 256, 384, 512, 768, 1024, 1536** Default Setting: [Highest multiple of 64 Kbps supported by the DSL Line Rate] Possible Settings (Model 7976): **64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 768, 960, 1024, 1536, 1920, 1984, 2048** Default Setting: [Highest multiple of 64 Kbps supported by the DSL Line Rate]
When the NTU has an EIA-530-A interface, the Payload Rate set on the LTU determines the port speed of the synchronous port of the NTU. See Table A-2, Payload Rates and DSL Line Rates for DSX-1, and Table A-3, Payload Rates and DSL Line Rates for G.703, for information about maximum payload rates for different DSL line rates. ■ Payload Rate is only available when the unit is configured as an LTU. ■ To achieve the payload rates listed above, the Model 7975-A2 endpoint must be operating with firmware V02.03.12 or greater and the Model 7976-A2 endpoint must be operating with firmware N02.03.12 or greater. In lower firmware versions (N.02.03.05 and below), the payload rate is only selectable at a DSL line rate of 144 Kbps while all other rates default to the maximum, depending on the DSL line rate selected. **64** – **2048** – The Payload Rate, in Kbps.
Transmit Attenuation
Possible Settings: **0dB – 15dB** Default Setting: **0dB**
Determines how much the unit's transmit power is reduced to accommodate a short line length. **0dB** – The unit's full transmit power is used (no attenuation). **1dB** – **15dB** – The unit's transmit power is reduced by the specified amount.
Peer IP Address
Possible Settings: **001.000.000.000 – 223.255.255.255, Clear** Default Setting: **000.000.000.000**
Specifies the peer IP address for the NTU, to provide remote management providing the remote management link on the DSL loop. ■ Peer IP Address is only available when the unit is configured as an LTU, and is not running in IP Conservative mode. **Address Field** – **(001.000.000.000** – **223.255.255.255)** – Enter an address for the peer unit. The range for the first byte is 001 to 223, with the exception of 127. The range for the remaining three bytes is 000 to 255. **Clear** – Clears the IP address field and sets to all zeros.
Circuit Identifier
Possible Settings: ***ASCII text field*, Clear** Default Setting: [blank]
Uniquely identifies the circuit number of the transmission vendor's DSL line for troubleshooting purposes. ***ASCII text field*** – Enter a maximum of 128 characters. All printable ASCII characters except the ^ (caret) are allowed. **Clear** – Clears the field.

Table A-2, Payload Rates and DSL Line Rates for DSX-1, and Table A-3, Payload Rates and DSL Line Rates for G.703, provide the payload rates achievable for each DSL line rate and the number of time slots required to achieve that payload rate. For G.703, the payload rate depends on whether you are using signaling (time slots 0 and 16) or data only (time slot 0). Table A-4, Payload Rates for EIA-530-to-EIA-530 Configurations, provides EIA-530-to-EIA-530 configuration payload rates.

Table A-2. Payload Rates and DSL Line Rates for DSX-1

DSL Line Rate (Kbps)	DSX-1-to-DSX-1		DSX-1- to-EIA-530-A	
	Payload Rate (Kbps)	Time Slots	Payload Rate (Kbps)	Time Slots
1552	1536	24	1536	24
1040	960	15	1024	16
784	704	11	768	12
528	448	7	512	8
400	320	5	384	6
272	192	3	256	4
144	64	1	64, 128	1, 2

Table A-3. Payload Rates and DSL Line Rates for G.703

DSL Line Rate (Kbps)	Voice Mode G.703-to-G.703		Data Mode G.703-to-G.703		Data Mode G.703-to-EIA-530-A	
	Payload Rate (Kbps)	Time Slots	Payload Rate (Kbps)	Time Slots	Possible Payload Rate (Kbps)*	Time Slots
2064	1920	30	1984	31	1920, 1984, 2048	30, 31, 32
1552	1408	22	1472	23	1536	24
1040	896	14	960	15	960, 1024	15, 16
784	640	10	704	11	576, 640, 768	9, 10, 12
528	384	6	448	7	448, 512	7, 8
400	256	4	320	5	320, 384	5, 6
272	128	2	192	3	192, 256	3, 4
144	N/A	N/A	64	1	64, 128	1, 2

* For firmware versions N2.03.05 and below, the payload rate is only selectable at a DSL line rate of 144 Kbps, while all other rates default to the maximum, depending on the DSL line rate selected.

Table A-4. Payload Rates for EIA-530-to-EIA-530 Configurations

DSL Line Rate (Kbps)	Supported Payload Rates
2064	1600, 1664, 1728, 1792, 1856, 1920, 1984, 2048
1552	1088, 1152, 1216, 1280, 1344, 1408, 1472, 1536
1040	832, 896, 960, 1024
784	576, 640, 704, 768
528	448, 512
400	320, 384
272	192, 256
144	64, 128

DSX-1 Interface Options for Model 7974

For DSX-1 Interface Options, refer to Table A-5, DSX-1 Interface Options for Model 7974. To access the DSX-1 Interface Options screen, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration →DSX

```
main/config/DSX-1
                                                              Model: 7974
                        DSX-1 INTERFACE OPTIONS

              Line Coding:                        B8BS
              Line Framing:                       ESF
              Line Equalization:                  0-133
              Excessive Error Rate Threshold:     1E-4
              Send (AIS) on Network Failure:      Enable


              Primary Clock Source:               Internal









--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
 Save
```

Table A-5. DSX-1 Interface Options for Model 7974 (1 of 2)

Line Coding
Possible Settings: **AMI, B8ZS** Default Setting: **B8ZS**
Specifies the line coding format to be used by the DSX-1 interface. **AMI** – Indicates the line coding format used by the DSX-1 interface is Alternate Mark Inversion (AMI). **B8ZS** – Indicates the line coding format used by the DSX-1 interface is B8ZS.
Line Framing
Possible Settings: **ESF, D4** Default Setting: **ESF**
Specifies the framing format to be used by the DSX-1 interface. ■ Line Framing is only available when the unit is configured as an LTU. The NTU is automatically configured to match the framing format used by the LTU. **ESF** – ESF framing formatting is used for transmitted and received data over the DSX-1 interface. **D4** – D4 framing format is used for transmitted and received data over the DSX-1 interface.

Table A-5. DSX-1 Interface Options for Model 7974 (2 of 2)

Line Equalization
Possible Settings: **0–133, 133–266, 266–399, 399–533, 533–655** Default Setting: **0–133**
Compensates for signal distortion for a DSX-1 signal over a given distance. **0–133 feet** – Provides equalization for a cable length up to 133 feet. **133–266 feet** – Provides equalization for a cable length up to 266 feet. **266–399 feet** – Provides equalization for a cable length up to 399 feet. **399–533 feet** – Provides equalization for a cable length up to 533 feet. **533–655 feet** – Provides equalization for a cable length up to 655 feet.
Excessive Error Rate Threshold
Possible Settings: **1E–4**, **1E–5**, **1E–6**, **1E–7**, **1E–8**, **1E–9** Default Setting: **1E–4**
Determines the error rate at which an excessive error rate (EER) condition is recognized. The rate is the ratio of the number of CRC errors to the number of bits received in a certain period.
Send (AIS) on Network Failure
Possible Settings: **Enable, Disable** Default Setting: **Enable**
Specifies the action taken on the signal transmitted to the DSX-1 interface when a valid signal cannot be recovered from the DSL network interface (LOS or conditions OOF or EER). **Enable** – An Alarm Indication Signal (AIS) is sent to the DSX-1 port in the event of an LOS, OOF, or EER condition on the DSL interface. **Disable** – The failed signal on the interface is passed through to the DSX-1 network unchanged.
Primary Clock Source
Possible Settings: **DSX-1, Internal** Default Setting: **Internal**
Specifies where the unit derives its timing from. ■ Primary Clock Source is available only when the unit is configured as an LTU. **Internal** – The clock source is derived from the internal oscillator. **DSX-1** – The clock source is derived from the DSX-1 interface.

Synchronous Data Port Options for Model 7975

For Synchronous Data Port Options, refer to Table A-6, Synchronous Data Port Options for Model 7975. To access the Synchronous Data Port Options screen, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration→SYNC Ports

```
main/config/sync_data
                                                              Model: 7975

                    SYNCHRONOUS DATA PORT OPTIONS

            Port Type:                                    E530A
            Payload Rate:                                 1040 Kbps
            Transmit Clock Source:                        Internal
            Send All Ones on Data Port Not Ready:         Both
            Action on Network LOS Alarm:                  Halt
            Network Initiated Data Channel Loopback:      Disable
            Port (DTE) Initiated Loopbacks:               Disable
            Elastic Store:                                Enable

--------------------------------------------------------------------------------
 Ctrl-a to access these functions, ESC for previous menu     MainMenu     Exit
```

Table A-6. Synchronous Data Port Options for Model 7975 (1 of 4)

Port Type
Possible Settings: **E530A, V.35, RS449, X.21** Default Setting: **E530A**
Determines the port type for the data port. **E530A** – The port is configured as an EIA-530-A compatible DCE. An EIA-530-A compatible DTE can be connected directly to the DB25 Port connector on the rear panel of the unit. **V.35** – The port is configured as a V.35 compatible DCE. A V.35 compatible DTE can be connected using an MS34-to-DB25 adapter cable to connect to the DB25 Port connector on the rear panel of the unit. **RS449** – The port is configured as an RS449 compatible DCE. An RS449 compatible DTE can be connected using a DB37-to-DB25 adapter cable to connect to the DB25 Port connector on the rear panel of the unit. **X.21** – The port is configured as an X.21 compatible DCE. An X.21 compatible DTE can be connected using a DB15-to-DB25 adapter cable to connect to the DB25 Port connector on the rear panel of the unit. NOTE: If X.21 is selected for Port Type, set Send All Ones on Data Port Not Ready to RTS or Disable (see *Send All Ones on Data Port Not Ready* on page A-11).

Table A-6. Synchronous Data Port Options for Model 7975 (2 of 4)

Payload Rate
Possible Settings: **64**, **128**, **192**, **256**, **320**, **384**, **448**, **512**, **576**, **640**, **704**, **768**, **832**, **896**, **960**, **1024**, **1088**, **1152**, **1216**, **1280**, **1344**, **1408**, **1472**, **1536**, **1600**, **1664**, **1728**, **1792**, **1856**, **1920**, **1984**, **2048** Default Setting: [Highest multiple of 64 Kbps supported by the DSL Line Rate] NOTE: Payload rates of 1088 Kbps and higher pertain only to 2 Mbps models.
Specifies the payload rate of the port. This option is not displayed on the unit when AutoRate is enabled or the unit is configured as an NTU. The LTU configures the payload rate for the NTU. The highest multiple of 64 Kbps is used when Autorate is enabled. **64** – **2048** – Sets the payload rate in Kbps when AutoRate is disabled (unit is configured as fixed rate).
Transmit Clock Source
Possible Settings: **Internal, External** Default Setting: **Internal**
Specifies whether the transmitted data for the synchronous data port is clocked using an internal clock provided by the LTU or an external clock provided by the DTE connected to the synchronous data port. ■ Transmit Clock Source is available only when the unit is configured as an LTU. **Internal** – Indicates the clock is provided internally by the termination unit on the TXC interchange circuit DB (CCITT 114). **External** – Indicates the clock is provided externally by the DTE on the XTXC interchange circuit DA (CCITT 113). Use this selection if the clock source is set to the data port.
Invert Transmit Clock
Possible Settings: **Disable, Enable** Default Setting: **Disable**
When configured as the LTU and Transmit Clock Source is set to External, specifies whether the clock supplied by the the unit on the TXC interchange circuit DB (ITU-T 114) is phase inverted with respect to the Transmitted Data interchange circuit BA (ITU-T 103). This configuration option is useful when an excessive cable length between the unit and the DTE causes errors. **Disable** – Indicates TXC supplied by the unit on this port is not phase inverted. **Enable** – Indicates XC supplied by the unit on this port is phase inverted.

Table A-6. Synchronous Data Port Options for Model 7975 (3 of 4)

Send All Ones on Data Port Not Ready
Possible Settings: **Both, Disable, DTR, RTS** Default Setting: **Both**
Specifies the conditions on the data port that determine when valid data is not being sent from the DTE. When this condition is detected, all ones are sent to the network. **Both** – Monitors both DTR and RTS. If either is interrupted, all ones are sent to the network. **Disable** – Disables the monitoring of interchange circuits from the DTE connected to the synchronous data port. **DTR** – Monitors the DTE Ready interchange circuit CD (CCITT 108/1/2). When DTR is interrupted, all ones are sent to the network. **RTS** – Monitors the Request-to-Send interchange circuit CA (CCITT 105). When RTS is interrupted, all ones are sent to the network. NOTE: Set Send All Ones on Data Port Not Ready to RTS or Disable if X.21 is selected for Port Type (see *Port Type* on page A-9).
Action on Network LOS Alarm
Possible Settings: **Halt, None** Default Setting: **Halt**
Specifies the action taken on the synchronous data port when an LOS (Loss Of Signal) alarm is received on the network interface. **Halt** – Stops the transmission of data on the data port and disables the data port when an LOS alarm is received on the network interface. When LOS alarms are received, all ones are sent on the Received Data interchange circuit BB (CCITT 104). The Clear-to-Send interchange circuit CB (CCITT 106) is interrupted. **None** – Makes the data port unaffected by LOS alarms received on the network interface.
Network Initiated Data Channel Loopback
Possible Settings: **Disable, Enable** Default Setting: **Disable**
Allows the initiation and termination of a Data Channel Loopback (DCLB) by the receipt of a DCLB-actuate sequence or DCLB-release sequence from the network or far-end device. **Disable** – Ignores the DCLB-actuate and DCLB-release sequences for this port. **Enable** – DCLB-actuate and DCLB-release sequences are recognized for this port.

Table A-6. Synchronous Data Port Options for Model 7975 (4 of 4)

Port (DTE) Initiated Loopbacks
Possible Settings: **Disable, DTLB, DCLB, Both** Default Setting: **Disable**
Allows the initiation and termination of a local Data Terminal Loopback (DTLB) or remote Data Channel Loopback (DCLB) by the DTE connected to this port. (DTLB is equivalent to a V.54 loop 3, and DCLB is equivalent to a V.54 loop 2.) Control of these loopbacks is through the DTE interchange circuits as specified by the V.54 standard. **Disable** – Disables control of local DTLBs and remote DCLBs by the DTE connected to this port. **DTLB** – Gives control of the local DTLBs for this port to the DTE attached to this port. This loopback is controlled by the Local Loopback interchange circuit LL (CCITT 141). **DCLB** – Gives control of the remote DCLBs for the far-end port connected to this port to the DTE attached to this port. This loopback is controlled by the Remote Loopback interchange circuit RL (CCITT 140). The far-end equipment must support in-band V.54 loopbacks. **Both** – Gives control of local DTLBs and remote DCLBs to the DTE connected to this port.
ElasticStore
Possible Settings: **Disable, Enable** Default Setting: **Enable**
Used to enable or disable a first-in, first-out (FIFO) buffer circuit for the incoming external clock. This circuit is used to compensate for the differences between the frequencies of the data clocks for the two units in the circuit. This option only applies if the unit is set for external timing. Do not enable Elastic Store if the attached DCE has an elastic store buffer larger than 32 bits. ■ ElasticStore is available only when the unit is configured as an LTU. **Disable** – Disables the Elastic Store FIFO. **Enable** – Enables the Elastic Store FIFO.

G.703 Interface Options for Model 7976

For G.703 Interface Options, refer to Table A-7, G.703 Interface Options for Model 7976. To access the G.703 Interface Options screen, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration→G.703

```
main/config/G.703
                                                              Model: 7976

                     G.703 INTERFACE OPTIONS

               Framing:                          Framed
               Line Coding:                      HDB3
               Line Framing:                     noCRC4
               Time Slot 16:                     Signaling
               Send (AIS) on Network Failure:    Enable

               Primary Clock Source:             G703


--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
 Save
```

Table A-7. G.703 Interface Options for Model 7976 (1 of 2)

Framing
Possible Settings: **Framed, Unframed** Default Setting: **Framed**
Specifies whether G.704 framing is used for the G.703 interface. **Framed** – The unit conforms to G.704 framing. **Unframed** – G.704 framing is disabled.
Line Coding
Possible Settings: **AMI, HDB3** Default Setting: **HDB3**
Specifies the line coding format to be used by the G.703 interface. **AMI** – Indicates the line coding format used by the G.703 interface is Alternate Mark Inversion (AMI). **HDB3** – Indicates the line coding format used by the G.703 interface is HDB3.

Table A-7. G.703 Interface Options for Model 7976 (2 of 2)

Line Framing
Possible Settings: **CRC4, noCRC4** Default Setting: **noCRC4**
Specifies the framing format to be used by the G.703 interface. ■ Line Framing is only available when the standalone unit is configured as an LTU. The NTU is automatically configured to match the framing format used by the LTU. **CRC4** – CRC4 framing formatting is used for transmitted and received data over the Network Interface. **noCRC4** – Non-CRC4 framing format is used for transmitted and received data over the Network Interface.
Time Slot 16
Possible Settings: **Signaling, Data** Default Setting: **Signaling**
Specifies whether the G.703 interface is used for voice or data. **Signaling** – Time slot 16 is used for signaling (the unit is in voice mode). **Data** – Time slot 16 is used for data (the unit is in data mode).
Send (AIS) on Network Failure
Possible Settings: **Enable, Disable** Default Setting: **Enable**
Specifies the action taken on the signal transmitted to the G.703 interface when a valid signal cannot be recovered from the network interface (LOS or conditions OOF or EER). **Enable** – An Alarm Indication Signal (AIS) is sent to the DTE in the event of an LOS, OOF, or EER condition on the DSL interface. **Disable** – The failed signal on the interface is sent to the DTE in the event an LOS, OOF, or EER condition on the DSL interface.
Primary Clock Source
Possible Settings: **G.703, Internal** Default Setting: **Internal**
Specifies where the unit derives its timing from. ■ Primary Clock Source is only available when the unit is configured as an LTU. When configured as an NTU, the clock source is derived from the DSL. **Internal** – The clock source is derived from the internal oscillator. **G.703** – The clock source is derived from the G.703 interface.

System Options Menu

For System Options, refer to Table A-8, System Options. To access the System Options screen, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration→System

```
main/config/system
                                                          Model: 797x


                              SYSTEM OPTIONS

                    DSL Mode:                    NTU
                    Test Timeout:                Enable
                    Test Duration (min):         10
                    Telco Initiated Loopback:    Enable      (Model 7974)
                    Remote Telco Line Loopback:  Disable     (Model 7974)
                    G.703 Line Termination:      120 Ohm     (Model 7976)









--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
 Save
```

Table A-8. System Options (1 of 2)

DSL Mode
Possible Settings: **LTU**, **NTU** Default Setting: **NTU**
Controls whether the unit is configured as a control unit or tributary unit. **LTU** – The unit is configured as a control unit (Line Termination Unit). **NTU** – The unit is configured as a tributary unit (Network Termination Unit). This unit requests its IP address from the LTU during establishment of the PPP link. NOTE: Changing this option resets the unit.
Test Timeout
Possible Settings: **Enable**, **Disable** Default Setting: **Enable**
Allows tests to end automatically. The feature should be enabled when the unit is remotely managed so that control can be regained after a test is accidentally executed. **Enable** – Loopback and pattern tests end when test duration is reached. **Disable** – Tests run until manually terminated from the Network Tests screen or remotely (network initiated tests). Refer to *Running Network Tests* in Chapter 8, *Testing*.

Table A-8. System Options (2 of 2)

Test Duration (min)
Possible Settings: **1** – **120** Default Setting: **10**
Number of minutes for a test to be active before automatically ending. ■ Test Duration (min) appears when Test Timeout is enabled. **1** – **120** – Amount of time in minutes a test runs before terminating.
Telco Initiated Loopback
(Model 7974) Possible Settings: **Enable**, **Disable** Default Setting: **Enable**
Determines if the unit responds to loopback commands on the DSX-1 interface. See *Telco-Initiated Line Loopback* in Chapter 8, *Testing*. **Enable** – The unit responds to loopback commands. **Disable** – The unit does not respond to loopback commands.
Remote Telco Line Loopback
(Model 7974) Possible Settings: **Enable**, **Disable** Default Setting: **Disable**
Determines if the unit performs a Telco-initiated loopback on just the local unit or if the loopback is performed on the remote DSL unit. See *Telco-Initiated Line Loopback* in Chapter 8, *Testing*. **Enable** – The loopback is performed on the remote unit. **Disable** – The loopback is restricted to the local unit.
G.703 Line Termination
(Model 7976) Possible Settings: **75 ohms, 120 ohms** Default Setting: **120 ohms**
Specifies which G.703 connections are being used by the unit, the 75 Ω TX and RX connectors or the 120 Ω interface. **75 ohms** – Line impedance is set for 75 ohms; the 75 Ω connectors are being used. **120 ohms** – Line impedance is set for 120 ohms; the 120 Ω interface is being used.

Communication Port

For Communication Port Options, refer to Table A-9, Communication Port Options. To access the Communication Port screen, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration→Communication Port

When Port Use is set to Terminal, the following screen appears:

```
main/config/com
                                                              Model: 797x


                          COMMUNICATION PORT OPTIONS

                    Port Use:                   Terminal
                    Port Type:                  Asynchronous
                    Data Rate (Kbps):           9.6
                    Character Length:           8
                    Parity:                     None
                    Stop Bits:                  1
                    Ignore Control Leads:       Enable

                    Login Required:             Disable
                    Port Access Level:          Administrator
                    Inactivity Timeout:         Enable
                    Disconnect Time (Minutes):  5


--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
```

When Port Use is set to Net Link, the following screen appears:

```
main/config/com
                                                              Model: 797x


                          COMMUNICATION PORT OPTIONS

                    Port Use:                Net Link
                    Port Type:               Synchronous
                    Data Rate (Kbps):        9.6




--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
```

Table A-9. Communication Port Options (1 of 3)

Port Use
Possible Settings: **Terminal**, **Net Link** Default Setting: **Terminal**
Specifies how the communications port is to be used. **Terminal** – The communication port is used for the asynchronous terminal interface. **Net Link** – The communication port is used as the network communication link to an IP network or device.
Port Type
Possible Settings: **Asynchronous**, **Synchronous** Default Setting: **Asynchronous**
When Port Use is set to Net Link, Port Type determines whether the communication port is asynchronous or synchronous. When Port Use is set to Terminal, Port Type is set to Asynchronous and cannot be changed. **Asynchronous** – Configures the communication port for asynchronous communication. **Synchronous** – Configures the communication port for synchronous communication.
Data Rate
Possible Settings: **9.6**, **14.4, 19.2, 28.8, 38.4, 57.6, 115.2** Default Setting: **9.6**
Specifies the communication port baud rate. **9.6** – Communication port rate is 9600 bps. **14.4** – Communication port rate is 14400 bps. **19.2** – Communication port rate is 19200 bps. **28.8** – Communication port rate is 28800 bps. **38.4** – Communication port rate is 38400 bps. **115.2** – Communication port rate is 115200 bps.
Character Length
Possible Settings: **7, 8** Default Setting: **8**
Determines the character length of the communication port. ■ Character Length only appears when Port Use is set to Terminal. **7** – The character length of the communication port is seven bits. **8** – The character length of the communication port is eight bits.

Table A-9. Communication Port Options (2 of 3)

Parity
Possible Settings: **None**, **Odd, Even** Default Setting: **None**
Specifies the parity of the communication port. ■ Parity only appears when Port Use is set to Terminal. **None** – No parity used. **Odd** – Odd parity used. **Even** – Even parity used.
Stop Bits
Possible Settings: **1, 1.5, 2** Default Setting: **1**
Specifies the number of stop bits for the communication port. ■ Stop Bits only appears when Port Use is set to Terminal. **1** – One stop bit. **1.5** – One and one half stop bits**.** **2** – Two stop bits used**.**
Ignore Control Leads
Possible Settings: **Disable, DTR** Default Setting: **Disable**
Specifies whether DTR is used. ■ Ignore Control Leads only appears when Port Use is set to Terminal. **Disable** – Control leads are treated as standard. **DTR** – DTR is ignored**.**
Login Required
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Specifies if an ID and password are required to access the asynchronous terminal interface on the communication port. Login IDs are created with a password and access level. Refer to *Creating a Login* in Chapter 6, *Security*. ■ Login Required only appears when Port Use is set to Terminal. **Enable** – Login ID and password are required to access the asynchronous terminal interface. **Disable** – No Login ID and password are required to access the asynchronous terminal interface.

Table A-9. Communication Port Options (3 of 3)

Port Access Level
Possible Settings: **Administrator**, **Operator** Default Setting: **Administrator**
Specifies the highest level of access allowed when accessing an ATI session through a Telnet session. ■ Port Access Level only appears when Port Use is set to Terminal. **Administrator** – This is the higher access level, permitting full control of the unit. Access level is determined by the Login ID. If Telnet Login Required is disabled, the session access level is Administrator. **Operator** – This is the lower access level, permitting read-only access to status and configuration screens.
Inactivity Timeout
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Provides automatic logoff of a Telnet session. ■ Inactivity Timeout only appears when Port Use is set to Terminal. **Enable** – The terminal session terminates automatically after the Disconnect Time. **Disable** – A terminal session is never closed due to inactivity.
Disconnect Time (Minutes) (Terminal Use Only)
Possible Settings: **1 – 6** Default Setting: **5**
Number of minutes of inactivity before the session terminates automatically. Timeout is based on no keyboard activity. ■ Disconnect Time (minutes) only appears when Port Use is set to Terminal and Inactivity Timeout is enabled. **1 – 60** – The session is closed after the selected number of minutes.

Management and Communication Options Menu

The Management and Communication Options Menu includes the following:

- Telnet Session Options (Table A-10)
- Communication Protocol Options (Table A-11)
- General SNMP Management Options (Table A-12)
- SNMP NMS Security Options (Table A-13)
- SNMP Traps Options (Table A-14)

Telnet Session Options

Telnet Session configuration options control whether a Telnet session is allowed through an interconnected IP Network. If allowed, these options determine what level of security to apply to the session to control access. Only one Telnet session is allowed at a time. Initial values are determined by the configuration you currently have loaded. To access the Telnet Session Options screen, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration→ Management and Communication→Telnet Session

```
main/config/telnet
                                                          Model: 797x


                          TELNET SESSION OPTIONS

                  Telnet Session:              Enable
                  Telnet Login Required:       Disable
                  Session Access Level:        Administrator
                  Inactivity Timeout:          Enable
                  Disconnect Time (Minutes)    5









--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
 Save
```

Table A-10. Telnet Session Options

Telnet Session
Possible Settings: **Enable, Disable** Default Setting: **Enable**
Specifies if the unit responds to a Telnet session request from a Telnet client on an interconnected IP network. **Enable** – Telnet sessions are allowed between the unit and a Telnet client. **Disable** – No Telnet sessions are allowed.
Telnet Login Required
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Specifies whether a user ID and password are required to access to the ATI through a Telnet session. Login IDs are created with a password and access level. Refer to *Creating a Login* in Chapter 6, *Security*. **Enable** – Security is enabled. When access is attempted via Telnet, the user is prompted for a Login ID and password. **Disable** – No Login required for a Telnet session.
Session Access Level
Possible Settings: **Administrator**, **Operator** Default Setting: **Administrator**
The Telnet session access level is interrelated with the access level of the Login ID. Refer to *ATI Access Levels* in Chapter 6, *Security*, for more information. **Administrator** – This is the higher access level, permitting full control of the unit. Access level is determined by the Login ID. If Telnet Login Required is disabled, the session access level is Administrator. **Operator** – This is the lower access level, permitting read-only access to status and configuration screens.
Inactivity Timeout
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Provides automatic logoff of a Telnet session. ■ Inactivity Timeout does not appear when the unit is connected to a DSLAM card running in IP Conservative mode. **Enable** – The Telnet session terminates automatically after the Disconnect Time. Set the Disconnect time (in minutes) after enabling Inactivity Timeout. **Disable** – A Telnet session is never closed due to inactivity.

Table A-10. Telnet Session Options

Disconnect Time (Minutes)
Possible Settings: **1 – 60** Default Setting: **5**
Number of minutes of user inactivity before a Telnet session terminates automatically. Time out is based on no keyboard activity. ■ Disconnect Time (minutes) appears only when the Inactivity Timeout option is enabled. It does not appear when the unit is connected to a DSLAM card running in IP Conservative mode. **1 – 60** – The Telnet session is closed after the selected number of minutes.

Communication Protocol Options

The Communication Protocol configuration options specify the information necessary to support the IP communication network, including IP address and link protocols. Initial values are determined by the configuration you currently have loaded.

To access the Communication Protocol Options screen, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration→ Management and Communication→Communication Protocol

```
main/config/management/communication
                                                              Model: 797x


                      COMMUNICATION PROTOCOL OPTIONS

       Node IP Address:                000.000.000.000       Clear
       Node Subnet Mask:               000.000.000.000       Clear

       Default Network Destination:    None

       Communication Port
         IP Address:                   000.000.000.000       Clear
         Subnet Mask:                  000.000.000.000       Clear
         Link Protocol:                PPP









--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
```

Table A-11. Communication Protocol Options (1 of 2)

Node IP Address
Possible Settings: **001.000.000.000** – **223.255.255.255** Default Setting: **000.000.000.000**
Specifies the Node IP address. The IP address is not bound to a particular port, and can be used for remote access over the EOC. ■ Node IP Address is only available when the unit is configured as an LTU. It does not appear when the unit is connected to a DSLAM card running in IP Conservative mode. **001.000.000.000** – **223.255.255.255** – Enter an IP address for the node. The range for the first byte is 001 to 223, with the exception of 127. The range for the remaining three bytes is 000 to 255. **Clear** – Clears the IP address field to all zeros.
Node Subnet Mask
Possible Settings: **000.000.000.000** – **255.255.255.255** Default Setting: **000.000.000.000**
Specifies the Node Subnet Mask. ■ Node Subnet Mask is only available when the unit is configured as an LTU. It does not appear when the unit is connected to a DSLAM card running in IP Conservative mode. **000.000.000.000** – **255.255.255.255** – Enter an address for the Node Subnet Mask. **Clear** – Clears the mask to all zeros.
Default Network Destination
Possible Settings: **None**, **COM, DSL** Default Setting: **None**
Specifies where the default management network is connected. For example, if your default network is connected to the COM port, select COM as the default management network destination. **None** – No default destination is defined. Data that cannot be routed is discarded. **COM** – The unit's COM port is the default network destination. ■ COM is only available when the Port Use option on the Communication Port Options menu is set to Net Link. **DSL** – The unit's DSL port is the default network destination.

Table A-11. Communication Protocol Options (2 of 2)

Communication Port IP Address
Possible Settings: **001.000.000.000** – **223.255.255.255** Default Setting: **000.000.000.000**
Specifies the unit's Communication Port IP Address when the unit is configured as a network communication link. ■ Communication Port IP Address is only used when the Port Use option on the Communication Port Options menu is set to Net Link. If the COM Port IP address is 000.000.000.000, the node IP address specified by the Node IP Port is used. **001.000.000.000** – **223.255.255.255** – Enter an IP address for the Communication Port. The range for the first byte is 001 to 223, with the exception of 127. The range for the remaining three bytes is 000 to 255. **Clear** – Clears the IP to all zeros.
Communication Port Subnet Mask
Possible Settings: **000.000.000.000** – **255.255.255.255** Default Setting: **000.000.000.000**
Specifies the unit's Communication Port Subnet Mask when the unit is configured as a network communication link. ■ Communication Port Subnet Mask is only used when the Port Use option on the Communication Port Options menu is set to Net Link. If the COM Port IP address is not set (000.000.000.000), the node IP Address and subnet mask are used. **000.000.000.000** – **255.255.255.255** – Enter an address for the Communication Port Subnet Mask. **Clear** – Clears the mask to all zeros.
Communication Port Link Protocol
Possible Settings: **PPP**, **SLIP** Default Setting: **PPP**
Specifies the unit's Communication Port link layer protocol when the unit is configured as a network communication link. ■ Communication Port Link Protocol is only used when the Port Use option on the Communication Port Options menu is set to Net Link. **PPP** – Defines Point-to-Point protocol for the link layer protocol for the network communication link. **SLIP** – Serial Line IP Protocol for the link layer protocol for the network communication link.

General SNMP Management Options

To access the General SNMP Management Options screen, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration→ Management and Communication→General SNMP Management

```
main/config/management/SNMP
                                                              Model: 797x


                        GENERAL SNMP MANAGEMENT OPTIONS

   SNMP Management:     Enable

   Community Name 1:    Public                              Clear
   Name 1 Access:       Read/Write
   Community Name 2:    Public                              Clear
   Name 2 Access:       Read/Write









--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
 Save
```

Table A-12. General SNMP Management Options

SNMP Management
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Enables or disables the SNMP management features. **Enable** – Enables SNMP management capabilities. **Disable** – Disables SNMP management capabilities.
Community Name 1
Possible Settings: ***ASCII text field*** Default Text: **public**
Identifies the name of the community allowed to access the unit's MIB. The community name must be supplied by an external SNMP manager when that manager attempts to access an object in the MIB. ***ASCII text field*** – Enter or edit a community name. **Clear** – Clears the community name field.
Name 1 Access
Possible Settings: **Read, Read/Write** Default Setting: **Read/Write**
Determines the access level for Community Name 1. **Read** – Allows read-only access (get) for Community Name 1. **Read/Write** – Allows read/write access (get) for Community Name 1.
Community Name 2
Possible Settings: ***ASCII text field*** Default Text: **[null string]**
Identifies the name of the second community allowed to access the unit's MIB. The community name must be supplied by an external SNMP manager when that manager attempts to access an object in the MIB. ***ASCII text field*** – Enter or edit a community name. **Clear** – Clears the community name field.
Name 2 Access
Possible Settings: **Read, Read/Write** Default Setting: **Read**
Determines the access level for Community Name 2. **Read** – Allows read-only access (get) for Community Name 2. **Read/Write** – Allows read/write access (get/set) for Community Name 2.

SNMP NMS Security Options

To access the SNMP NMS Security Options screen, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration→ Management and Communication →SNMP NMS Security

```
main/config/management/security
                                                                Model: 797x


                          SNMP NMS SECURITY OPTIONS

                        NMS IP Validation:    Enable
                        Number of Managers:   10

   NMS  1 IP Address:   135.014.040.001   Clear    Access Type:  Read/Write
   NMS  2 IP Address:   135.014.003.027   Clear    Access Type:  Read/Write
   NMS  3 IP Address:   135.014.001.008   Clear    Access Type:  Read
   NMS  4 IP Address:   135.014.002.024   Clear    Access Type:  Read
   NMS  5 IP Address:   204.128.146.035   Clear    Access Type:  Read
   NMS  6 IP Address:   135.014.002.005   Clear    Access Type:  Read
   NMS  7 IP Address:   135.014.003.026   Clear    Access Type:  Read
   NMS  8 IP Address:   204.128.144.037   Clear    Access Type:  Read
   NMS  9 IP Address:   135.014.005.008   Clear    Access Type:  Read
   NMS 10 IP Address:   135.014.006.029   Clear    Access Type:  Read


--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
 Save
```

Table A-13. SNMP NMS Security Options

NMS IP Validation
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Specifies whether security checking is performed on the IP address of SNMP management systems attempting to access the node. **Enable** – Security checking is performed on the IP address of SNMP management systems attempting to access the node. **Disable** – No security checking is performed.
Number of Managers
Possible Settings: **1, 2, 3, 4, 5, 6, 7, 8, 9, 10** Default Setting: **1**
Specifies the number of SNMP management systems that can send SNMP messages. **1** – **10** – Number of trap managers. An NMS IP address is required for each manager.
NMS *n* IP Address
Possible Settings: **001.000.000.000 – 223.255.255.255, Clear** Default Setting: **000.000.000.000**
Specifies the Internet Protocol address used to identify each SNMP trap manager. **001.000.000.000 – 223.255.255.255** – Enter an address for each SNMP trap manager. The range for the first byte is 001 to 223, with the exception of 127. The range for the remaining three bytes is 000 to 255. **Clear** – Clears the IP address to all zeros.
Access Level
Possible Settings: **Read, Read/Write** Default Setting: **Read**
Determines the access level allowed for an authorized NMS when IP address validation is being performed. **Read** – Allows read-only access (get) to the accessible objects in the MIB for this device. **Read/Write** – Allows read/write access (get/set) to the accessible objects in the MIB for this device.

SNMP Traps Options

An SNMP trap can be automatically sent out through the EOC or the Management port to an SNMP manager when the Hotwire 797x Standalone Termination Unit detects conditions set by the user. Refer to Appendix B, *Standards Compliance for SNMP Traps*, for details of SNMP traps supported by the unit.

To access the SNMP Traps Options screen, follow this menu selection sequence:

Main Menu→Configuration→Current Configuration→ Management and Communication→SNMP Traps

```
main/config/management/trap
                                                              Model: 797x

                            SNMP TRAPS OPTIONS

    SNMP Traps:          Enable            Number of Trap Managers: 9

    NMS 1 IP Address:   135.014.040.001   Clear
    NMS 2 IP Address:   135.014.003.027   Clear
    NMS 3 IP Address:   135.014.001.008   Clear
    NMS 4 IP Address:   135.014.002.024   Clear
    NMS 5 IP Address:   204.128.146.035   Clear
    NMS 6 IP Address:   135.014.003.028   Clear
    NMS 7 IP Address:   135.014.001.009   Clear
    NMS 8 IP Address:   135.014.002.025   Clear
    NMS 9 IP Address:   204.128.146.036   Clear

 General Traps:      Both       Enterprise Specific Traps:    Disable
 Link Traps:         Both       Link Traps Interfaces:        All


--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu       MainMenu    Exit
 Save
```

Some fields are not displayed if the unit is connected to a DSLAM card running in IP Conservative mode.

Table A-14. SNMP Traps Options (1 of 2)

SNMP Traps
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Controls the generation of SNMP trap messages. **Enable** – SNMP trap messages are sent out to SNMP managers. **Disable** – No SNMP trap messages are sent out.
Number of Trap Managers
Possible Settings: **1, 2, 3, 4, 5, 6, 7, 8, 9** Default Setting: **1**
Sets the number of SNMP management systems that receive SNMP traps. ■ This field does not appear if the unit is connected to a DSLAM card running in IP Conservative mode. **1** – **9** – Number of trap managers. An NMS IP address is required for each manager.
NMS *n* IP Address
Possible Settings: **001.000.000.000 – 223.255.255.255, Clear** Default Setting: **000.000.000.000**
Specifies the Internet Protocol address used to identify each SNMP trap manager. ■ This field does not appear if the unit is connected to a DSLAM card running in IP Conservative mode. **Address Field** – **(001.000.000.000 – 223.255.255.255)** – Enter an address for each SNMP trap manager. The range for the first byte is 001 to 223, with the exception of 127. The range for the remaining three bytes is 000 to 255. **Clear** – Clears the IP address and sets to all zeros.
NMS *n* Destination
Possible Settings: **DSL, COM** Default Setting: **DSL**
Provides the network destination path of each trap manager. ■ This field does not appear if the unit is connected to a DSLAM card running in IP Conservative mode. **DSL** – The DSL port is the network destination path. **COM** – The COM port is the network destination path.

Table A-14. SNMP Traps Options (2 of 2)

General Traps
Possible Settings: **Disable, Warm, AuthFail, Both** Default Setting: **Both**
Determines which SNMP traps are sent to each trap manager. **Disable** – No general trap messages are sent. **Warm** – Sends trap message for *warmStart* events. **AuthFail** – Sends trap message for *authenticationFailure* events. **Both** – Sends both trap messages. NOTE: Refer to Appendix B, *Standards Compliance for SNMP Traps*.
Enterprise Specific Traps
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Determines if SNMP traps are generated for enterprise-specific events. **Enable** – SNMP traps are generated for *enterpriseSpecific* events. NOTE: Refer to *Enterprise-Specific Traps* in Appendix B, *Standards Compliance for SNMP Traps*. **Disable** – No enterprise-specific event traps are sent.
Link Traps
Possible Settings: **Disable, Up, Down, Both** Default Setting: **Both**
Determines if SNMP traps are generated for link up and link down for one of the communication interfaces. **Disable** – No *linkUp* or *linkDown* SNMP traps are generated. **Up** – A *linkUp* trap is generated when the unit recognizes that one of the communication interfaces is operational. **Down** – A *linkDown* trap is generated when the unit recognizes a failure in one of the communication interfaces. **Both** – Sends trap messages for detection of both *linkUp* and *linkDown*. NOTE: Refer to *linkUp and linkDown* in Appendix B, *Standards Compliance for SNMP Traps*.
Link Traps Interfaces
Possible Settings: **Network, [DSX-1, SYNC, or G.703], All** Default Setting: **All**
Determines if the SNMP *linkUp*, SNMP *linkDown*, and interface-related *enterpriseSpecific* traps are generated for the network interface, DTE port, or both. Depending on the model, the DTE option appears as DSX-1, SYNC, or G.703. **Network** – SNMP trap messages are generated for the network interface. **DSX-1, SYNC, or G.703** – SNMP trap messages are generated for the DTE port. **All** – SNMP trap messages are generated for the network interface and the DTE ports.

Standards Compliance for SNMP Traps

B

SNMP Traps

This section describes the unit's compliance with SNMP standards and any special operational features for the SNMP traps supported. The unit supports the following traps:

ifIndex Variable Binding

The following ifIndex values are supported for Hotwire 797x Standalone Termination Units:

ifIndex	Description	Supported By
1	COM Port	All models
2	DSL Interface	All models
6	DSX-1 or G.703 Interface	Models 7974 and 7976
10	EIA-530-A Interface	Model 7975
14	EOC Management Link	All models

In general, all traps have at a minimum a variable binding of ifIndex. For a standalone NTU connected to a DSLAM running IP Conservative software, all traps have at a minimum a variable binding of the Super Overloaded ifIndex (SOI). The formula for the SOI is:

((LTU Slot Number) * 1,000,000)
+ ((LTU DSL Port Number) * 1,000)
+ the NTU's ifIndex.

warmStart

SNMP Trap	Description	Possible Cause
warmStart	The unit has reinitialized itself. The trap is sent after the unit resets and stabilizes. There are no variable bindings.	■ Reset command. ■ Power disruption.

authenticationFailure

SNMP Trap	Description	Possible Cause
authenticationFailure	Failed attempts to access the unit. Variable bindings: ■ devAuthentication FailureIPAddress (Health & Status MIB) Returns zero if the IP address is unknown or the failure came from the terminal port.	Three unsuccessful attempts were made to enter a correct login/password combination.

linkUp and linkDown

The link SNMP traps are:

- **linkUp** – The unit recognizes that one of the communication interfaces is operational.
- **linkDown** – The unit recognizes that one of the communication interfaces is not operational.

The network and synchronous port interfaces (physical sublayer) are represented by an entry in the MIB-II Interfaces table and supported by the DS1 MIB.

The following list describes the conditions that define linkUp and linkDown:

linkUp/Down variable bindings

- ifIndex (RFC 1573)

  This object provides the index into the ifTable and potentially into tables in other MIBs.

  The ifIndexes supported are:

  – 1COM Port
  – 2DSL Network Interface
  – 6DSX-1 or G.703 Port
  – 10EIA-530-A Port
  – 14EOC Management Link

- ifAdminStatus (RFC 1573)

  This object specifies the operational state of the interface:

  – up(1)
  The interface is enabled.
  – down(2)
  The interface is disabled.

- ifOperStatus (RFC 1573)

  This object specifies the operational state of the interface:

  – up(1)
  COM Port: Always up unless defined as a Net Link, in which case status is controlled by link layer protocol and control leads.
  DSL Port: DSL link is established and no alarms exist.
  DSX-1 or G.703 Port: No alarm conditions exist.
  EIA-530-A Port: Port is enabled and configured control leads are on.
  EOC: Based on the state of the link layer protocol.
  – down(2)
  COM Port: Down status is controlled by link layer protocol and control leads.
  DSL Port: DSL link is not established or alarms exist.
  DSX-1 or G.703 Port: Alarm condition exists.
  EIA-530-A Port: Port is disabled or a configured control lead is off.
  EOC: Based on the state of the link layer protocol.
  – testing(3)
  DSL, DSX-1, G.703, or EIA-530-A Port: A test is active on the port.
  – dormant(5)
  DSL Port: DSL link is negotiating.

linkUp/Down variable bindings *(continued)*

- ifType (RFC 1573)

  This object is the type of interface:

  – propPointToPointSerial(22)
  Used for the EOC.

  – ds1(18)
  Used for DSX-1 interface.

  – e1(19)
  Used for G.703 interface.

  – propPointToPointSerial(22)
  Used for EOC.

  – ppp(23)
  Used for the COM Port when configured for PPP.

  – slip(28)
  Used for the COM Port when configured for SLIP.

  – rs232(33)
  Used for the COM Port when configured for Terminal.

  – v35(45)
  Used for the EIA-530-A port.

  – sdsl(96)
  Used for the DSL network interface.

Enterprise-Specific Traps

The enterpriseSpecific trap indicates that an enterprise-specific event has occurred. The Specific-trap field identifies the particular trap that occurred. The following table lists the enterprise-specific traps supported by the unit:

SNMP Trap	Description	Possible Cause
enterprisePrimary-ClockFail(1)	The unit has lost its primary clock source. No variable bindings.	Hardware failure in the unit or the clock source.
enterpriseSelfTest-Fail(2)	A hardware failure of the unit is detected during the unit's self-test. The trap is generated after the unit completes initialization. Variable bindings: ■ devSelfTestResults	Failure of one or more of the unit's hardware components.
enterpriseDevice-Fail(3)	An internal device failure. No variable bindings.	Operating software has detected an internal device failure.
enterpriseSecondary-ClockFail(4)	The unit has lost its secondary clock source. No variable bindings.	Hardware failure in the unit or the clock source.
enterpriseTestStart(5)	A test is running. Variable bindings: ■ devSelfTestResults ■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573) ■ ifTestType (RFC 1573)	At least one test has been started on an interface.
enterpriseConfig-Change(6)	The configuration changed via the user interface. The trap is sent after 60 seconds have elapsed without another change. This suppresses the sending of numerous traps when multiple changes are made in a short period of time, as is typically the case when changing configuration options. No variable bindings.	Configuration has been changed via the ATI.

SNMP Trap	Description	Possible Cause
enterpriseFallback AutoRate(13)	After a loss of signal, the unit resynchronized to a lower rate than the last known rate. Variable bindings: ■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573)	Variable line conditions.
enterprisePrimary-ClockFailClear(101)	The LTU has recovered and is using its primary clock source. No variable bindings.	—
enterpriseSecondary-ClockFailClear(104)	The LTU has recovered and is using its secondary clock source. No variable bindings.	—
enterpriseTest-Stop(105)	All tests have been halted. Variable bindings: ■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573) ■ ifTestType (RFC 1573)	All tests on an interface have been stopped by timeout or an Abort All Tests command.
enterpriseFallback AutoRateClear(113)	After an AutoRate fallback condition, the unit resynchronized to the last known rate. Variable bindings: ■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573)	The units automatically retrained at the same rate, were reset, or placed in fixed rate.

Tests that affect the enterpriseTestStart and enterpriseTestStop traps and the variable bindings depend on the interface. The specific tests and variable bindings are described in the following table:

Interface	**enterpriseTestStart/Stop variable bindings**	**Possible Cause**
DSL Network	■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573) ■ ifTestType (RFC 1573) The following objects control tests in SNMP-managed devices: – noTest(0) – Stops the test in progress. – testLoopLLB(4) – Initiates a Local Loopback. – testSendMon511(6) – Initiates a Send and Monitor 511 test. – testSendLLBUp(7) – Initiates an LLB Up message to the remote unit. – testSendLLBDown(8) – Initiates an LLB Down message to the remote unit.	■ enterpriseTestStart – Any one of the following tests is active on the interface: – Line Loopback – Remote Line Loopback – Send and Monitor 511 ■ enterpriseTestStop – No tests currently running on the interface.

Interface	enterpriseTestStart/Stop variable bindings	Possible Cause
DSX-1 or G.703	■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573) ■ ifTestType (RFC 1573) The following objects control tests in SNMP-managed devices: – noTest(0) – Stops the test in progress. – testLoopDTLB(3) – Initiates a DTE Loopback. – testLoopPLB(1) – A Telco-initiated Payload Loopback is active on the interface (DSX-1 only). – testLoopRLB(5) – Initiates a Remote Loopback.	■ enterpriseTestStart – Any one of the following tests is active on the interface: – DTE Loopback – Repeater Loopback – Telco Payload Loopback (DSX-1 only) ■ enterpriseTestStop – No tests currently running on the interface.
EIA-530-A	■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573) ■ ifTestType (RFC 1573) The following objects control tests in SNMP-managed devices: – noTest(0) – Stops the test in progress. – testLoopDCLB(3) – Initiates a Data Channel Loopback. – testLoopDTLB(3) – Initiates a DTE Loopback. – testLoopRLB(5) – Initiates a Remote Loopback. – testSendDCLBUp(9) – Initiates a Data Channel Loopback Up message. – testSendDCLBDown(10) – Initiates a Data Channel Loopback Down message.	■ enterpriseTestStart – Any one of the following tests is active on the interface: – Data Channel Loopback – DTE Loopback – Repeater Loopback ■ enterpriseTestStop – No tests currently running on the interface.

Connectors, Cables, and Pin Assignments

C

Overview

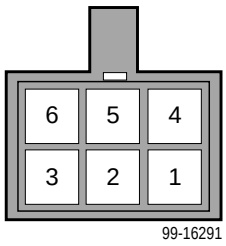
The following sections provide pin assignments for:

Power Input Connector

The input power connector leads are shown in Table C-1, Power Input Connector. Pin 1 is at the lower right of the connector and Pin 6 at the upper left as you face the back of the unit.

Table C-1. Power Input Connector

Pin Number	Wire Color	Signal
1	Black	–48 Vdc Return
2	Red	–48 Vdc Return
3	Green	Ground
4	White	+24 Vdc Return
5	Orange	–48 Vdc +24 Vdc
6	Blue	No Connection



COM Port Connector

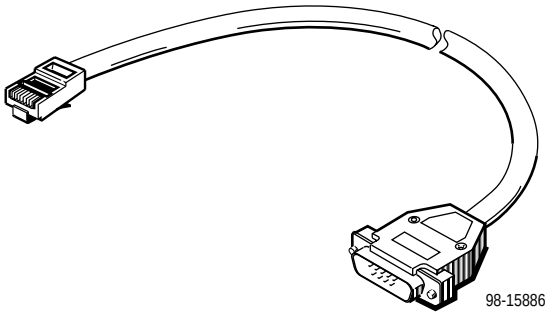
The COM port connector is an 8-position unkeyed modular jack (see Table C-2, COM Port Connector (J6)). The data signals on this port are referenced to a DTE interface.

Table C-2. COM Port Connector (J6)

Signal	Direction	Pin Number
Transmit Clock	to DTE (Out)	1
DCE Received Data	to DTE (Out)	2
Signal Ground	—	3
DCE Transmit Data	from DTE (IN)	4
DCE Data Terminal Ready	from DTE (IN)	5
DCE Carrier Detect	to DTE Out)	6
DCE Request to Send	from DTE (IN)	7
Receive Clock	to DTE (Out)	8

COM Port-to-PC Cable

The COM port can be connected to an asynchronous terminal or a PC running terminal emulation software. The COM port-to-PC cable is a 14-foot, 26 AWG, 8-conductor cable with an 8-position unkeyed modular connector and a DB9 socket connector. See Figure C-1, COM Port-to-PC Cable (Feature Number 3100-F2-550).



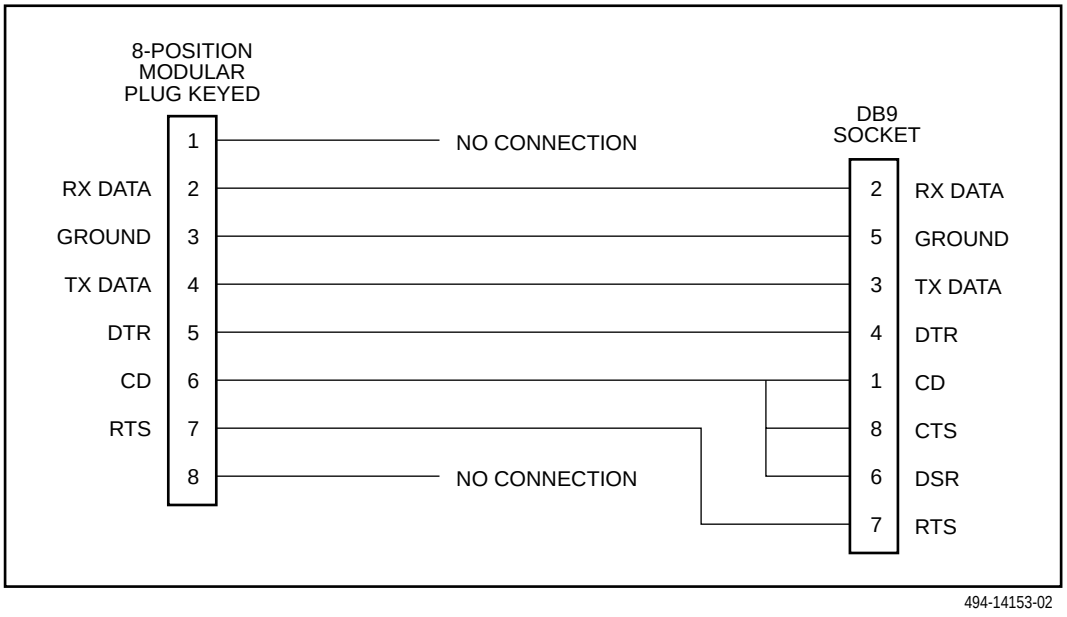


Figure C-1. COM Port-to-PC Cable (Feature Number 3100-F2-550)

COM Port-to-LAN Adapter Cable

The COM port can be configured for network management and attached to an Ethernet LAN adapter. The COM port-to-LAN adapter cable is a 14-foot, 24 AWG, 6-conductor cable with an 8-position unkeyed modular connector at either end. See Figure C-2, COM Port-to-PC Cable (Feature Number 3100-F2-910).

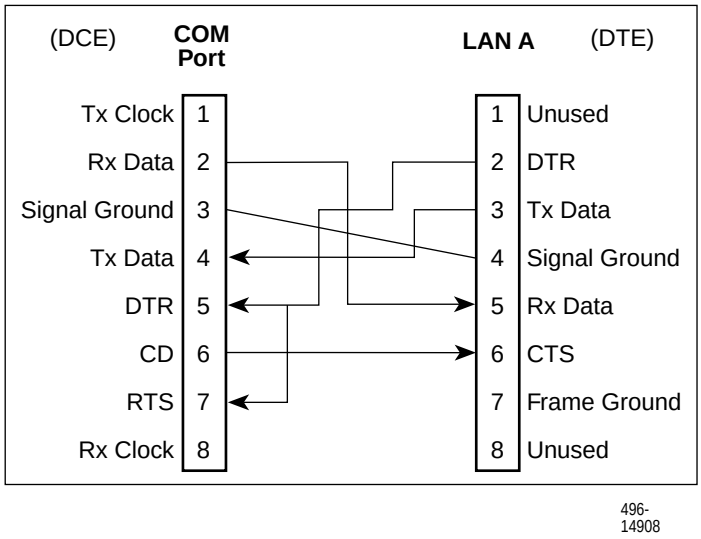


Figure C-2. COM Port-to-PC Cable (Feature Number 3100-F2-910)

DSX-1/G.703 Network Interface

The G.703 interface is either two BNC connectors (Transmit and Receive) for a 75-ohm unbalanced interface, or an RJ48C, 8-position, unkeyed modular connector for a 120-ohm balanced interface. See Table C-3, T1 100-Ohm/E1 120-Ohm Balanced Interface Connector, and Figure C-3, T1 100-Ohm/E1 120-Ohm Network Interface Adapter Cable (Feature Number 3100-F1-517).

The DSX-1 network interface is an RJ48C, 8-position, unkeyed modular connector for a 100-ohm balanced interface.

Table C-3. T1 100-Ohm/E1 120-Ohm Balanced Interface Connector

Signal	Pin Number
Receive Ring	1
Receive Tip	2
Receive Shield	3
Transmit Ring	4
Transmit Tip	5
Transmit Shield	6

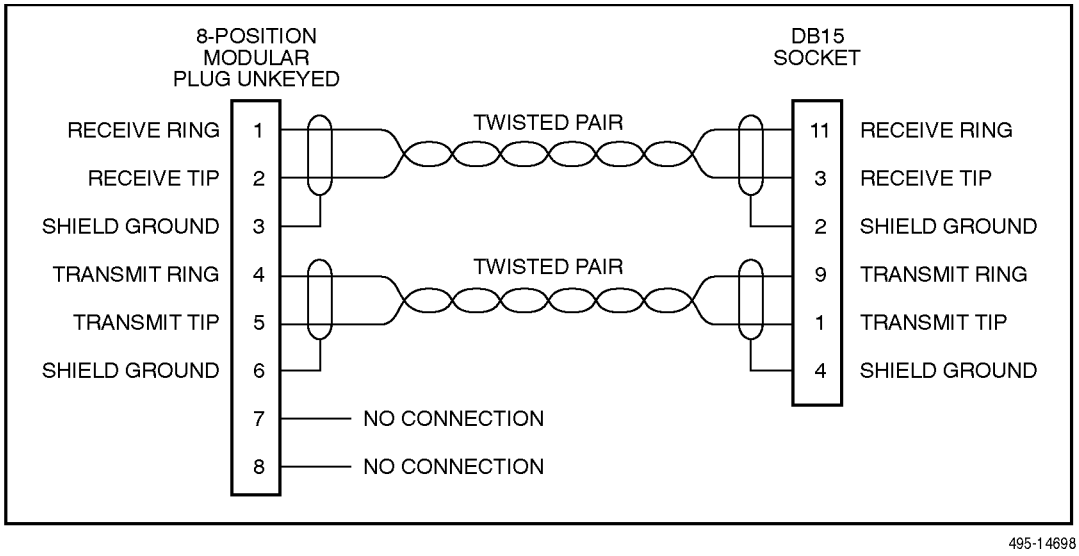


Figure C-3. T1 100-Ohm/E1 120-Ohm Network Interface Adapter Cable (Feature Number 3100-F1-517)

EIA-530-A Port

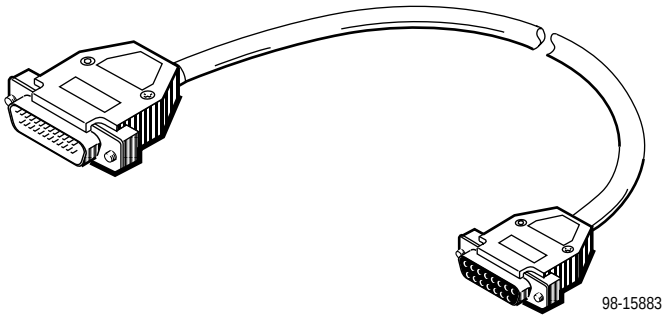
The EIA-530-A Port interface connector information is shown in Table C-4, EIA-530-A Port Interface Connector.

Table C-4. EIA-530-A Port Interface Connector

Signal	Circuit Mnemonic	ITU-T Number	Direction	Pin Number
Shield	—	—	—	1
Signal Common	AB	102A	—	7
Signal Common	AC	102B	—	23
Transmitted Data	BA	103	To DSU/CSU	2 (A) 14 (B)
Received Data	BB	104	From DSU/CSU	3 (A) 16 (B)
Request to Send	CA	105	To DSU/CSU	4 (A) 19 (B)
Clear to Send	CB	106	From DSU/CSU	5 (A) 13 (B)
Received Line Signal Detector	CF	109	From DSU/CSU	8 (A) 10 (B)
DCE Ready	CC	107	From DSU/CSU	6
DTE Ready	CD	108/1, /2	To DSU/CSU	20
Transmit Signal Element Timing (DTE Source)	DA	113	To DSU/CSU	11 (B) 24 (A)
Transmit Signal Element Timing (DCE Source)	DB	114	From DSU/CSU	12 (B) 15 (A)
Receiver Signal Element Timing (DCE Source)	DD	115	From DSU/CSU	17 (A) 9 (B)
Local Loopback	LL	141	To DSU/CSU	18
Remote Loopback	RL	140	To DSU/CSU	21
Test Mode	TM	142	From DSU/CSU	25

EIA-530-A-to-X.21 Interface

The EIA-530-A-to-X.21 adapter cable (Figure C-4, EIA-530-A-to-X.21 (Cable Feature Number 7900-F1-504)) provides the X.21 interface shown in Table C-5, X.21 Cable Interface.



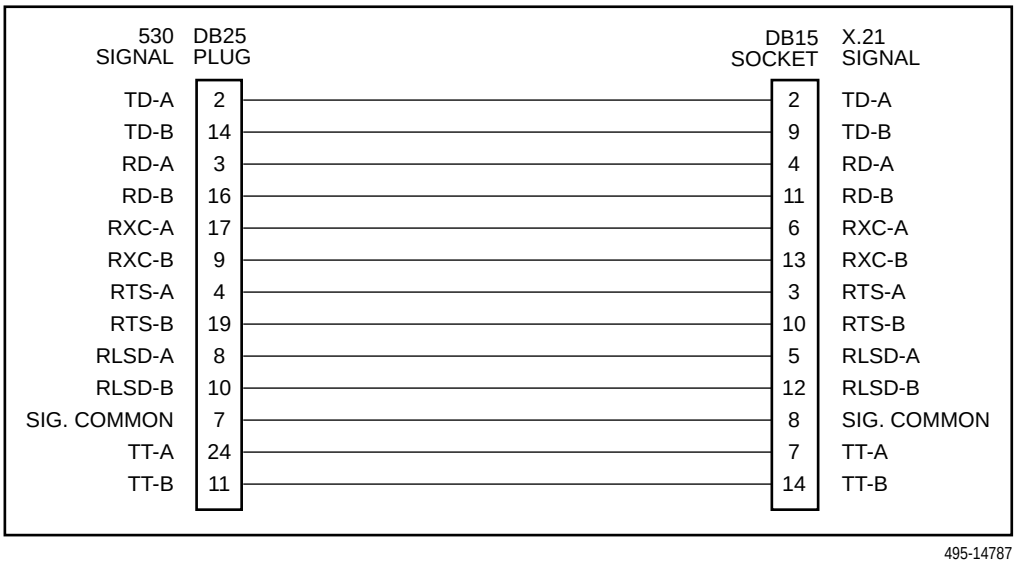


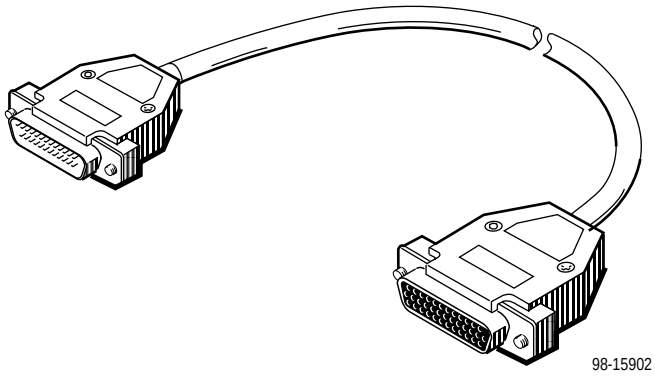
Figure C-4. EIA-530-A-to-X.21 (Cable Feature Number 7900-F1-504)

Table C-5. X.21 Cable Interface

Signal	ITU-T Number	Direction	Pin Number
Signal Common	102	—	8
Transmitted Data	103	To DSU/CSU	2 (A) 9 (B)
Received Data	104	From DSU/CSU	4 (A) 11 (B)
Request to Send	105	To DSU/CSU	3 (A) 10 (B)
Data Channel Received Line Signal Detector	109	From DSU/CSU	5 (A) 12 (B)
Transmit Signal Element Timing (DTE Source)	113	To DSU/CSU	7 (A) 14 (B)
Receiver Signal Element Timing (DCE Source)	115	From DSU/CSU	6 (A) 13 (B)

EIA-530-A-to-RS-449 Interface

The EIA-530-A-to-RS-449 adapter cable (Figure C-5, EIA-530-A-to-RS-449 Cable Pinouts (Feature Number 7900-F1-505)) provides the RS-449 interface shown in Table C-6, RS-449 Cable Interface.



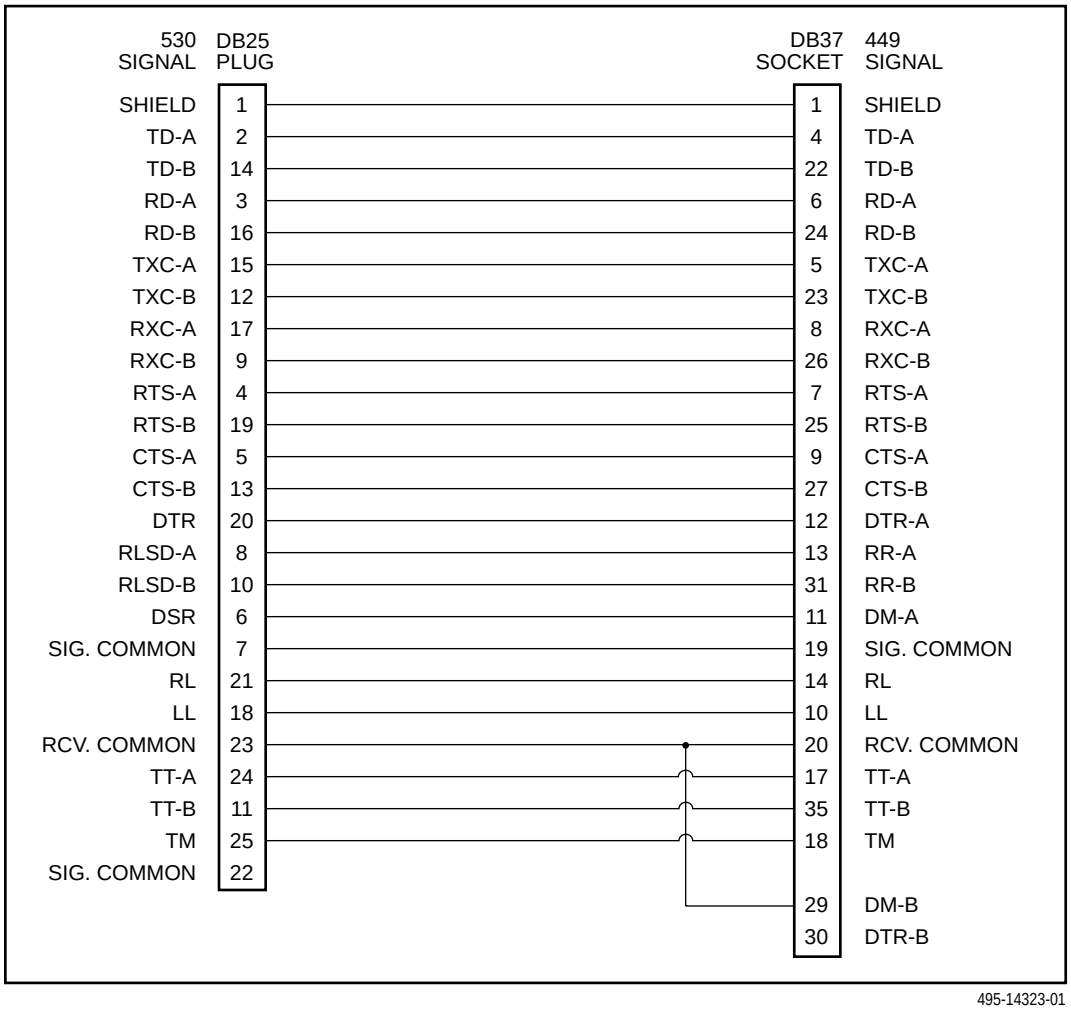


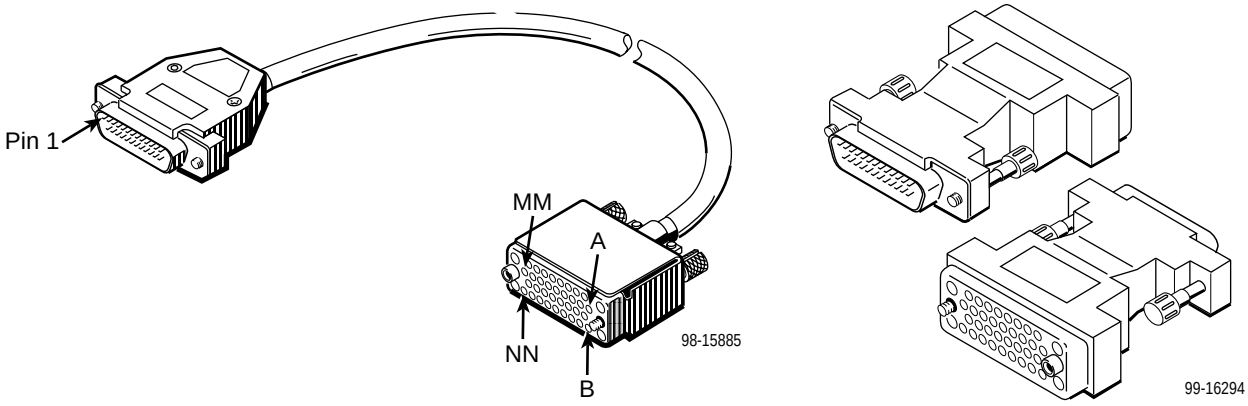
Figure C-5. EIA-530-A-to-RS-449 Cable Pinouts (Feature Number 7900-F1-505)

Table C-6. RS-449 Cable Interface

Signal	Circuit Mnemonic	ITU-T Number	Direction	Pin Number
Shield	—	—	—	1
Signal Ground	SG	102A	—	19
Receive Ground	RC	102B	—	20
Send Common	SC	—	—	37
Send Data	SD	103	To DSU/CSU	4 (A) 22 (B)
Receive Data	RD	104	From DSU/CSU	6 (A) 24 (B)
Request to Send	RS	105	To DSU/CSU	7 (A) 25 (B)
Clear to Send	CS	106	From DSU/CSU	9 (A) 27 (B)
Receiver Ready	RR	109	From DSU/CSU	13 (A) 31 (B)
Data Mode	DM	107	From DSU/CSU	11 (A) 29 (B)
Terminal Ready	TR	108/1, /2	To DSU/CSU	12 (A) 30 (B)
Terminal Timing	TT	113	To DSU/CSU	17 (A) 35 (B)
Send Timing	ST	114	From DSU/CSU	5 (A) 23 (B)
Receive Timing	RT	115	From DSU/CSU	8 (A) 26 (B)
Local Loopback	LL	141	To DSU/CSU	10
Remote Loopback	RL	140	To DSU/CSU	14
Test Mode	TM	142	From DSU/CSU	18

EIA-530-A-to-V.35 Interface

The EIA-530-A-to-V.35 adapter cable or adapter (Figure C-6, EIA-530-A-to-V.35 Adapter Cable (Feature Number 7900-F1-503) and EIA-530-A-to-V.35 Adapter (Feature Number 7900-F1-516) Pinouts) provides the V.35 interface shown in Table C-7, V.35 Cable Interface.



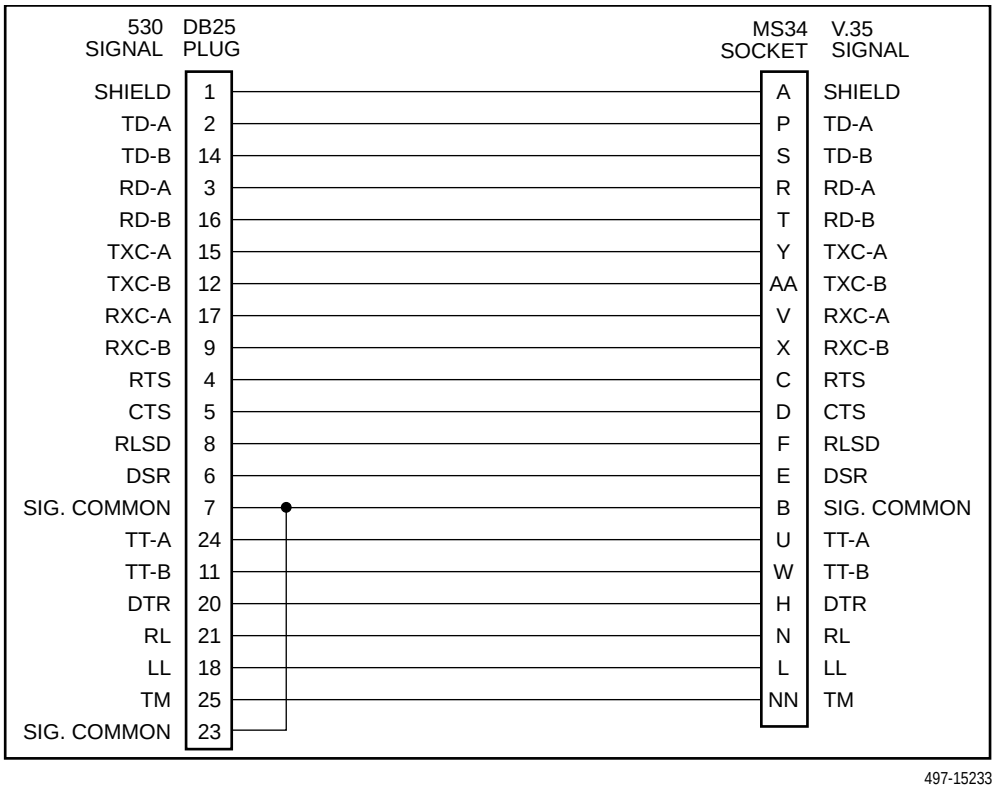


Figure C-6. EIA-530-A-to-V.35 Adapter Cable (Feature Number 7900-F1-503) and EIA-530-A-to-V.35 Adapter (Feature Number 7900-F1-516) Pinouts

Table C-7. V.35 Cable Interface

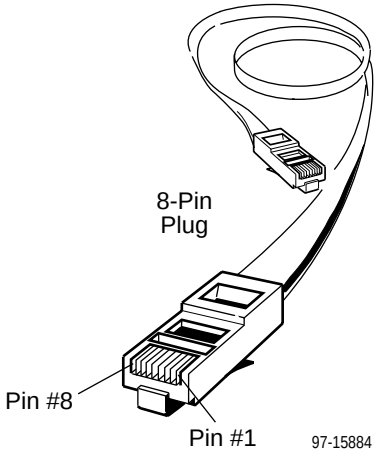
Signal	ITU-T Number	Direction	Pin Number
Shield	—	—	A
Signal Common	102	—	B
Transmitted Data	103	To DSU/CSU	P (A) S (B)
Received Data	104	From DSU/CSU	R (A) T (B)
Request to Send	105	To DSU/CSU	C
Clear to Send	106	From DSU/CSU	D
Data Channel Received Line Signal Detector	109	From DSU/CSU	F
Data Set Ready	107	From DSU/CSU	E
Data Terminal Ready	108/1, /2	To DSU/CSU	H
Transmit Signal Element Timing (DTE Source)	113	To DSU/CSU	U (A) W (B)
Transmit Signal Element Timing (DCE Source)	114	From DSU/CSU	Y (A) AA (B)
Receiver Signal Element Timing (DCE Source)	115	From DSU/CSU	V (A) X (B)
Local Loopback	141	To DSU/CSU	L
Loopback/Maintenance	140	To DSU/CSU	N
Test Indicator	142	From DSU/CSU	NN

DSL Network Interface Cable

The DSL line interface cable is a 20-foot, 24 AWG solid, 2-twisted-pair cable that is RJ48C-to-RJ48C. See Table C-8, DSL Network Interface Connector, and Figure C-7, DSL Network Interface Cable with RJ48C Connector (Feature Number 7900-F1-514).

Table C-8. DSL Network Interface Connector

Pin Number	DSL Signal
1	(Unused)
2	(Unused)
4	Ring
5	Tip



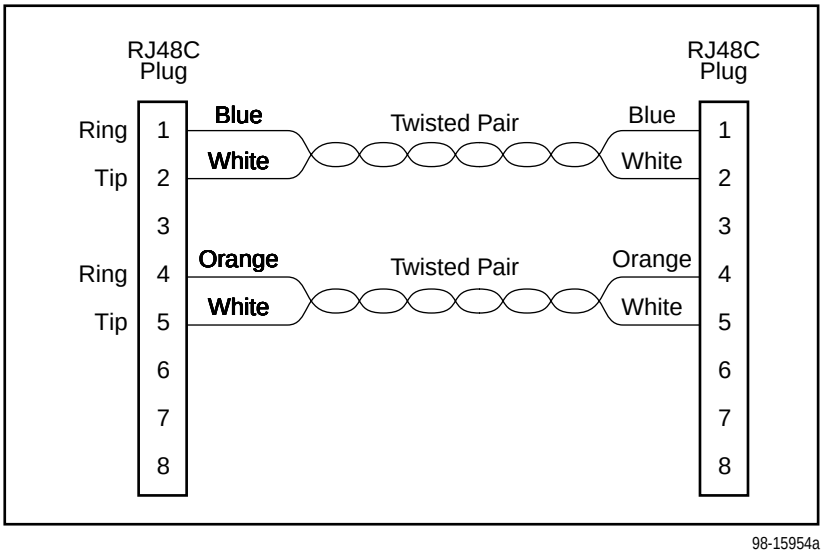


Figure C-7. DSL Network Interface Cable with RJ48C Connector (Feature Number 7900-F1-514)

Technical Specifications

D

Table D-1. Technical Specifications for Hotwire TDM SDSL Standalone Termination Units, Models 7974-A2, 7975-A2, and 7976-A2

Specifications	Criteria*
Size	Width: 7.25 inches (18.4 cm) Height: 1.5 inches (3.8 cm) Length: 9.4 inch (24.9 cm)
Weight	Approximately 1.25 lbs. (0.6 kg)
Approvals Safety Certifications	 Refer to the equipment's label for approvals on product.
Power	+24 VDC or –48 VDC Maximum Power Dissipation: 8.3 watts Result: 28.32 Btu/h
Cables	Feature Number — Description 3100-F1-517 — DSX-1/G.703 Network Interface Cable 3100-F2-550 — COM Port-to-PC Cable 3100-F2-910 — COM Port-to-LAN Adapter Cable 7900-F1-503 — EIA-530-A-to-V.35 Adapter Cable 7900-F1-504 — EIA-530-A-to-X.21 Adapter Cable 7900-F1-505 — EIA-530-A-to-RS-449 Adapter Cable 7900-F1-506 — Optional Power Cable 7900-F1-514 — DSL Network Interface Cable 7900-F1-516 — EIA-530-A-to-V.35 Adapter
Physical Environment Operating temperature Storage temperature Relative humidity	 32° to 122° F (0° to 50° C) –4° F (–20° C) to 158° F (70° C) 5% to 85% (noncondensing)

* Technical specifications are subject to change without notice.

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