



**HOTWIRE
MODEL 7914 STANDALONE
T1 SDSL TERMINATION UNIT
USER'S GUIDE**

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Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
3. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.
4. General purpose cables are provided with this product. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer.
5. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
6. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are interconnected, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.
7. In addition, if the equipment is to be used with telecommunications circuits, take the following precautions:
 - Never install telephone wiring during a lightning storm.
 - Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
 - Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
 - Use caution when installing or modifying telephone lines.
 - Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
 - Do not use the telephone to report a gas leak in the vicinity of the leak.
8. Input power to the 24 Vdc and –48 Vdc voltage configurations of this product must be provided by one of the following: (1) a National Electrical Code (NEC)/Canadian Electrical Code (CEC) Class 2 circuit for use in North America, or (2) a Safety Extra Low Voltage (SELV)/Limited Power Source (LPS) input certified for use in the country of installation.

EMI Warnings

WARNING:

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

The authority to operate this equipment is conditioned by the requirements that no modifications will be made to the equipment unless the changes or modifications are expressly approved by Paradyne Corporation.

WARNING:

To Users of Digital Apparatus in Canada:

This Class A digital apparatus meets all requirements of the Canadian interference-causing equipment regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du règlement sur le matériel brouilleur du Canada.

Contents

About This Guide

- Document Purpose and Intended Audience v
- Document Summary v
- Product-Related Documents vi

1 About Hotwire Model 7914 Termination Units

- Hotwire 7914-A1 Models and Features 1-1
- Typical Configurations 1-3
- User Interface Types 1-5

2 Installing the Unit

- Overview 2-1
- Package Checklist for Hotwire Model 7914-A1 2-1
- Planning for Your SDSL Application 2-2
- Connecting to the Network 2-3
- Connecting Power to the Unit 2-4

3 Using Terminal and Switchpack Modes

- Choosing a Configuration Mode 3-1
- Connecting to a System Terminal 3-1
- Switching Between Terminal and Switchpack Modes 3-2

4 Customizing DSX-1-Compatible Units

- Accessing Configuration Options 4-1
- Making Changes from the Terminal Interface 4-2
- Making Changes in Switchpack Mode 4-4
 - Configuring Framed or Unframed Operation
(DSX-1-to-DSX-1 Configuration) 4-5
 - Configuring a Starting Time Slot (DSX-1-to-V.35/V.11 Configuration) 4-5
- Displaying Switchpack Definitions 4-5
 - Displaying Line Build-Out Definitions 4-6

5 Customizing V.35/V.11-Compatible Units

- Accessing Configuration Options 5-1
- Making Changes from the Terminal Interface 5-2
- Making Changes in Switchpack Mode 5-4
- Selecting V.35 or V.11 Signaling 5-4
- Displaying Switchpack Definitions 5-4

6 Monitoring the Unit

- What to Monitor 6-1
- Board Status 6-1
- Performance Statistics 6-3
- Remote Unit Information 6-5
- Front Panel LEDs 6-6

7 Testing

- Detecting a Problem 7-1
- Understanding Loopback Tests 7-1
 - Local Loopbacks 7-2
 - Remote Loopbacks 7-3
 - Starting and Ending Loopbacks 7-4
- Resetting the Unit 7-4

A Worksheets

- Overview A-1
- DSX-1-to-DSX-1 Configuration A-2
- DSX-1-to-V.35/V.11 Configuration A-3
- V.35/V.11-to-V.35/V.11 Configuration A-3
- DSX-1-Compatible Units Configuration Worksheet A-4
- V.35/V.11-Compatible Units Configuration Worksheet A-4

B Cable Pin Assignments

- Terminal Connection Cable B-1
- SDSL Connection Cable Pin Assignments B-2
- T1 Network Connection Cable Pin Assignments B-3
- V.35/V.11 Connection Cable Pin Assignments B-4
- DB25-to-V.35 Adapter Cable Pin Assignments B-5

C Switchpack Definitions

- DSX-1-Compatible Units C-1
- V.35/V.11-Compatible Units C-4

Glossary

Index

About This Guide

Document Purpose and Intended Audience

This guide contains information needed to set up, configure, and operate Hotwire Model 7914 T1 SDSL Termination Units. It is designed for central office installation technicians and network engineers who have an understanding of the deployment of Symmetric Digital Subscriber Loop (SDSL) transmission systems in a telephone company or private network environment.

The Hotwire 7914 may be ordered either as a standalone unit (7914-A1-xxx) or as a nest-mounted card (7914-B1-xxx) that fits in a Hotwire 7900 nest. This guide describes the installation and maintenance procedures for the standalone version, Model 7914-A1-xxx.

Document Summary

Section	Description
Chapter 1	<i>About Hotwire Model 7914 Termination Units.</i> Describes the features of each version of the Model 7914, and typical configurations.
Chapter 2	<i>Installing the Unit.</i> Describes how to install the unit and make connections.
Chapter 3	<i>Using Terminal and Switchpack Modes.</i> Provides instructions for connecting a VT100-compatible terminal user interface. Also describes how to make manual configuration changes directly on the board hardware.
Chapter 4	<i>Customizing DSX-1-Compatible Units.</i> Provides instructions for modifying configuration options by using the terminal interface or DIP switches and jumpers on the board.
Chapter 5	<i>Customizing V.35/V.11-Compatible Units.</i> Provides instructions for modifying configuration options by using the terminal interface or DIP switches and jumpers on the board.

Section	Description
Chapter 6	<i>Monitoring the Unit.</i> Describes how to monitor unit status, LEDs, and network statistics. Also describes how to monitor the status of the unit on the opposite side of the SDSL connection.
Chapter 7	<i>Testing.</i> Provides information about available loopback tests.
Appendix A	<i>Worksheets.</i> Contains all the configuration options, default settings, and possible settings to use for planning.
Appendix B	<i>Cable Pin Assignments.</i> Contains connector and interface details.
Appendix C	<i>Switchpack Definitions.</i> Defines switchpack location and usage.
Glossary	Defines acronyms and terms used in this document.
Index	Lists key terms, acronyms, concepts, and sections in alphabetical order.

Product-Related Documents

Document Number	Document Title
7900-A2-GB20	<i>Hotwire Model 7900 Basic Maintenance Processor User's Guide</i>
7900-A2-GN20	<i>Hotwire Model 7900 Nest and Options Installation Guide</i>
7910-A2-GB20	<i>Hotwire Models 7914 and 7915 T1 and E1 SDSL Nest Card Termination Unit User's Guide</i>
7915-A2-GB20	<i>Hotwire Model 7915 Standalone E1 SDSL Termination Unit User's Guide</i>
7920-A2-GB20	<i>Hotwire Models 7924 and 7925 T1 and E1 HDSL Nest Card Termination Units User's Guide</i>
7924-A2-GB20	<i>Hotwire Model 7924 Standalone T1 HDSL Termination Unit User's Guide</i>
7925-A2-GB20	<i>Hotwire Model 7925 Standalone E1 HDSL Termination Unit User's Guide</i>

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

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About Hotwire Model 7914 Termination Units

1

Hotwire 7914-A1 Models and Features

Products in the Hotwire 7914 family provide “last mile/last kilometer” transport of T1-compatible circuits between customer facilities and central site equipment over 2-wire copper lines. The units can be used over distances substantially exceeding traditional T1 spans and Canadian Standards Association (CSA) loop standards.

The Hotwire 7914 supports:

- V.35/V.11 or DSX-1 interface
- Fractional T1 using one twisted-copper pair
- Tolerance of bridged taps
- Local and remote alarm surveillance
- Local and remote T1 and SDSL performance monitoring

The Hotwire 7914 may be ordered either as a standalone unit (7914-A1-xxx) or as a nest-mounted card (7914-B1-xxx) that fits in a Hotwire 7900 nest. This guide describes the installation and maintenance procedures for the standalone version, Model 7914-A1-xxx.

To order additional product documentation, refer to *Product-Related Documents* on page vi.

There are several versions of the Model 7914-A1, each supporting a different interface (DSX-1 or V.35/V.11) and power supply (120 Vac or 220 Vac):

Model Number	Features
7914-A1-201	1.544 Mb/s DSX-1 compatible. Connection to 120 Vac power supply.
7914-A1-202	1.544 Mb/s V.35/V.11 compatible. Connection to 120 Vac power supply.
7914-A1-301	1.544 Mb/s DSX-1 compatible. Connection to 230 Vac power supply.
7914-A1-302	1.544 Mb/s V.35/V.11 compatible. Connection to 230 Vac power supply.

Typical Configurations

Hotwire Model 7914 standalone units can be used in campus applications where long loop distances normally require the campus to contract with the local telephone exchange carrier to deliver private line services across the campus.

Figure 1-1 shows two typical campus applications where remote PBXs or multiplexers are interconnected across a campus using two Hotwire Model 7914 standalone units. In each pair, one unit is configured as a central site or central office (CO) unit and the other is the remote or customer premises (CP) unit.

The Hotwire Model 7914 standalone unit is configured at the factory to operate at the CP side of a T1 SDSL connection. (Conversely, Hotwire Model 7914 nest cards are configured for CO operation.) The central site unit must be reconfigured for CO operation in these configurations.

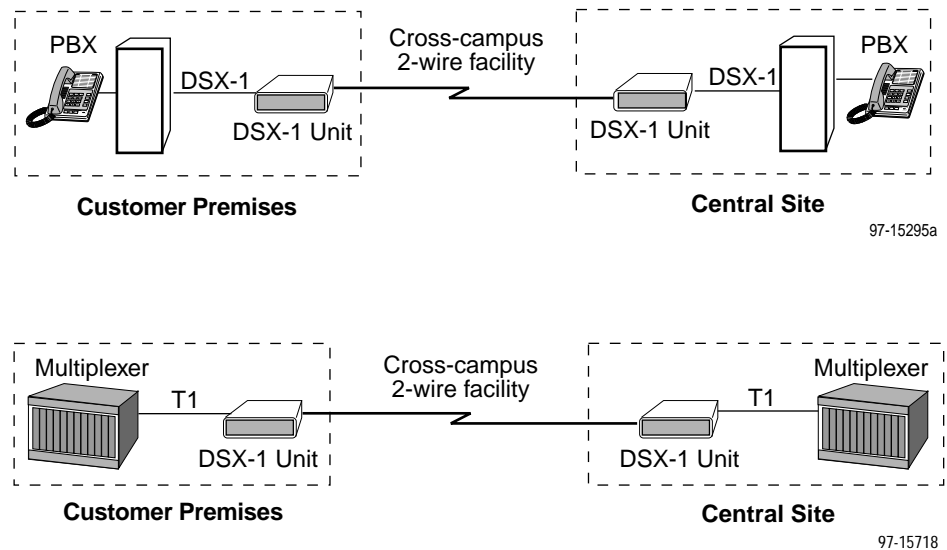


Figure 1-1. Campus Network Applications

Hotwire Model 7914 standalone units are also ideal for delivering T1 services from a central site to the customer premises over long loop distances without repeaters.

Figure 1-2 shows a central-site application with a Hotwire 7900 Nest containing Hotwire Model 7914 nest cards. The nest cards at the central site each terminate a single SDSL subscriber line. Each line is then converted to a DSX-1 interface for connection to other central office equipment, such as a digital cross-connect system (DCS).

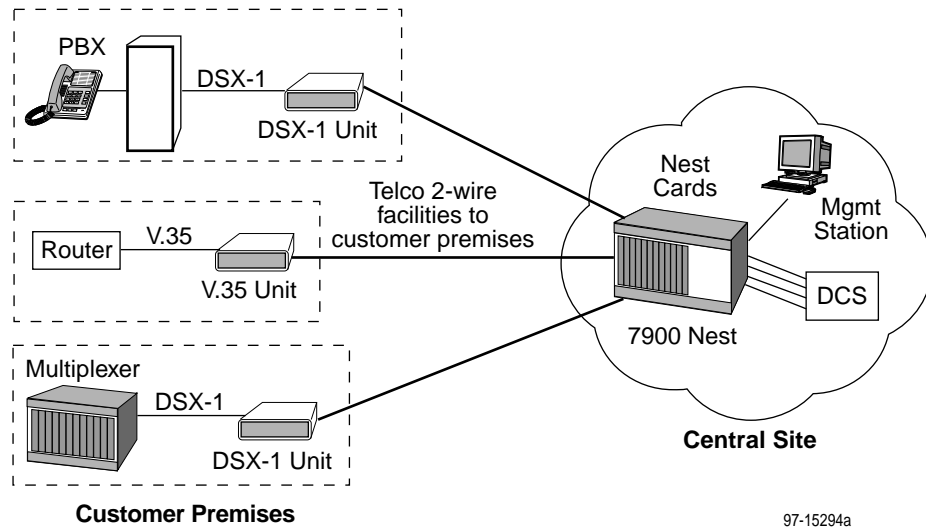


Figure 1-2. T1 Extension to Customer Premises

Cellular network providers must lease large numbers of T1 circuits in order to connect remote cell sites to mobile telephone switching offices (MTSOs). Hotwire Model 7914 products provide an alternative to standard repeated T1 services. [Figure 1-3](#) depicts a typical cellular network access application.

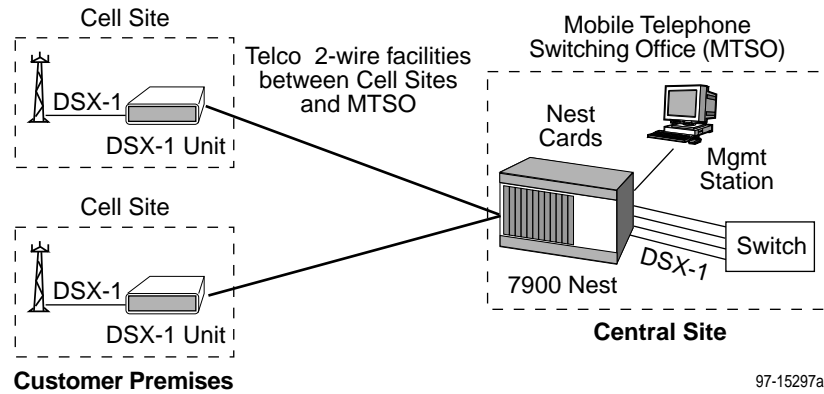


Figure 1-3. Cellular Network Access

User Interface Types

There are three types of user interfaces to the standalone units:

- VT100-compatible terminal interface (see [Chapter 3](#))
- Manual setting of switches and jumpers (see [Chapter 3](#))
- Front Panel LED status indicators (see [Chapter 6](#))

Installing the Unit

2

Overview

This chapter describes the procedure for installing a single standalone termination unit using a 120 Vac or 230 Vac power supply (Model 7914-A1-20x or 7914-A1-30x).

Package Checklist for Hotwire Model 7914-A1

Verify that your package contains the following:

- Hotwire Model 7914-A1 Termination Unit
- 10' VT100 terminal cable
- 14' CAT5 twisted-pair network cable
- Power cord with power transformer
- Warranty card
- User's Guide

Planning for Your SDSL Application

A pair of Hotwire 7914 Termination Units operates on a standard twisted-pair phone line. Observe the following restrictions for a successful installation:

- Be sure the line consists of twisted pair. Any flat cable has a major negative effect on loop length that can be supported.
- Use Category 5 cable for the user connections.
- Plan the phone line to be dedicated to SDSL. The same phone line used for the 7914 Termination Unit pair **cannot** also be used at the same time to carry other voice or data services. This is because the SDSL frequency spectrum overlaps with the voice band (including voice, fax and analog modems), as well as the higher spectrums of digital services (including ADSL, HDSL or ISDN).
- Measure or estimate the length of the phone line you plan to use. Hotwire 7914 Termination Units support connections as distant as 18,000 feet (over three miles) on noise-free 24 AWG wire.
- The actual loop length that can be supported will vary, depending on:
 - The loop cable gauge
 - Noise introduced from neighboring phone lines in the same binder group or cable (which can change over time)
 - Noise introduced at either termination unit, such as interference from a PC monitor if the phone line is too close by (which can change over time)
- Although the line rate is 1.54 Mbps downstream and upstream simultaneously, the actual throughput will vary depending on:
 - Any interfering loop noise present in the cable
 - Quality and wire gage of the connecting cable
- Handle the termination unit with care and use it in the proper environment.

NOTE:

Keep the cover on the termination unit for performance and for safety reasons.

Connecting to the Network

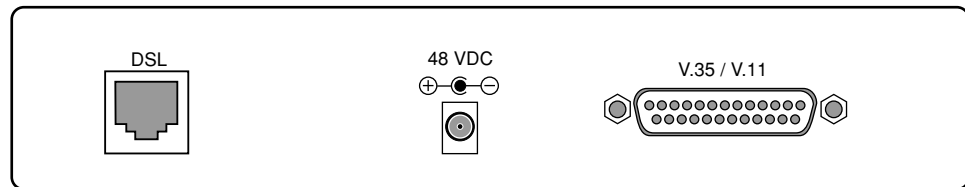
► Procedure

1. Connect one end of the supplied 14' twisted-pair network cable into the rear panel DSL jack. Connect the other end to your SDSL network interface.

NOTE:

Do *not* use a flat VF network cable, as this may severely degrade the performance of the termination unit. Use only twisted-pair network cable.

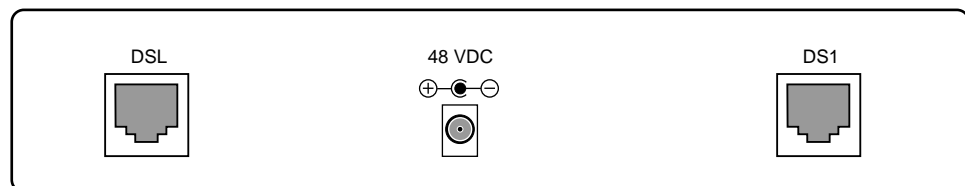
2. *V.35/V.11-compatible units only:* Use either a DB25-to-V.35 adapter cable (see *DB25-to-V.35 Adapter Cable Pin Assignments* in Appendix B for pin assignments) or a cable with DB25 connectors. Connect one end to the V.35/V.11 socket on the rear panel. Connect the other end to your V.35/V.11 equipment.



97-15530

V.35/V.11-Compatible Hotwire 7914 – Rear Panel

3. *DSX-1-compatible units only:* Connect a DSX-1 interface cable into the DS1 jack on the rear panel. Connect the other end to your DSX-1 equipment.



97-15714

DSX-1-Compatible Hotwire 7914 – Rear Panel

Connecting Power to the Unit

Plug the power transformer into the appropriate (115 or 230 Vac) power outlet. Connect the power lead into the –48 Vdc jack on the rear panel.

To obtain information on the power supplies and power cord adapters available, refer to *Warranty, Sales, and Service Information* on page A at the beginning of this User's Guide.

Using Terminal and Switchpack Modes

3

Choosing a Configuration Mode

You can make configuration changes either through the system terminal menus (Terminal Mode) or by manually changing switches on the board (Switchpack Mode). Terminal Mode is the default setting.

In Terminal Mode:

- You change configuration parameters by selecting menu options that appear on a VT100-compatible terminal attached to the front panel of the termination unit.
- The standalone unit is configured at the factory for CP (customer premises) operation.

In Switchpack Mode:

- You change configuration parameters by moving switches on the board.
- You can still display information about the unit from the terminal and run loopback tests.
- Any changes you made in Terminal Mode are lost when you change to Switchpack Mode.

Connecting to a System Terminal

An optional system maintenance terminal can be attached to your Model 7914 Termination Unit through the modular jack on the front panel. You can have terminals attached to both endpoints (CO and CP).

The system terminal must be a VT100-compatible terminal or a PC running terminal emulation software.

Connect the 9-pin end of the terminal cable into a COM port on your PC. Plug the other end into the modular jack on the front panel. If your PC requires a 25-pin connector to the COM port, see Appendix B, *Cable Pin Assignments*, for the correct cable pinouts.

Make sure the parameters on your terminal or PC are set to:

- 9600 baud
- 8 bit
- no parity
- 1 stop bit
- no flow control

Press Return at your terminal keyboard to activate the Main Menu for the attached unit. The system runs diagnostic tests as it comes up. After a few seconds, the Main Menu screen appears on your terminal.

Menus are described in [Chapters 4 and 5](#) for the DSX-1 and V.35/V.11 units, respectively.

Switching Between Terminal and Switchpack Modes

The following procedure is used to change the operating mode of the unit to either Terminal Mode (the default setting) or Switchpack Mode. Refer to [Chapter 4](#) (for DSX-1-compatible units) or [Chapter 5](#) (for V.35/V.11-compatible units) for information on changing configuration options using either of these modes.

► Procedure

Use electrostatic discharge (ESD) protection when handling the circuit board. To change the mode:

1. Power down the unit and expose the circuit board by loosening the two screws on the back panel of the unit and sliding off the cover.
2. See Appendix C, [Switchpack Definitions](#), for switchpack locations on your unit's board.
3. Locate switchpack **S4** by its label on the circuit card.
4. Place the mode switch in the correct position for the desired mode.

For DSX-1-compatible units:

- Switchpack Mode is configured by setting switches 3–7 for Starting Time Slot. See Table C-1 in Appendix C.
- Terminal Mode is configured by placing switches 3–7 in the ON position.

For V.35/V.11-compatible units:

- Switchpack Mode is configured by placing switch 8 in the ON position.
- Terminal Mode is configured by placing switch 8 in the Off position.

5. *If you are enabling Switchpack Mode:* You must set the switchpacks and jumpers to your desired configuration. Refer to Appendix C, [Switchpack Definitions](#).
6. Power up the board to reset and enable the new configuration.

Customizing DSX-1-Compatible Units

4

Accessing Configuration Options

This chapter provides instructions on how to change configuration options for Hotwire Model 7914 standalone units that are DSX-1-compatible. [Chapter 5](#) provides similar information for V.35/V.11-compatible units.

Configuration option settings determine how the unit operates. You can change a unit's configuration options by:

- Selecting the Board Configuration branch of the Main Menu while in Terminal Mode.
- Changing switch settings on the board while in Switchpack Mode.

The Main Menu for a DSX-1-compatible unit on the customer premises (CP) side appears as follows:

```
Command→ G123
ATTX - CP - T1 Rate

T1 SDSL STUR Main Menu
1) Board Status
2) Performance Monitor
3) Board Configuration
4) Local Loopback
5) Remote Loopback
6) STUC Menu
R) Board Reset
?) Redisplays this Menu

Command→
```

The G123 code denotes a successful startup

CP units are SDSL Termination Units – Remote (STUR)
CO units are SDSL Termination Units – Central Office (STUC)

This guide depicts the system terminal menus as they appear from a CP unit. This is the default configuration for Model 7914 standalone units.

Making Changes from the Terminal Interface

The Board Configuration menu displays the current board software and hardware settings. It also allows you to change certain parameters on the board.

This function is affected by the status of the switchpack (DIP switch control) setting.

- When operating in Terminal Mode (the system default) you can make configuration changes through the terminal menus.
- When operating in Switchpack Mode, you can display configuration parameters using the terminal menus, but any configuration changes must be made using the switches on the circuit board. Refer to *Making Changes in Switchpack Mode* on page 4-4.

To access the Board Configuration menu, enter **3** at the Main Menu Command prompt.

The following example shows the menu that appears for a CP unit.

```

Command→ 3

Board Configuration:
-----

  1) SDSL Card Type          - CP
     SDSL Rate Type         - T1
  2) T1 Line Encode         - B8ZS
  3) Framing                 - D4
  4) Line Build Out         - 0 to 133 feet, 0dB
     SDSL FW Rev            - 1.0
     Globespan FW Rev       - 1.12
     CP Serial #            - 088165

-----

1-4) Board Configuration
5) Switchpack Definitions
?) Prints Board Configuration and this menu
Q) Quit

Config→

```

The Switchpack Definitions screen, option **5** on the Config menu, displays the switchpack settings to use when changing configuration changes manually. Refer to *Displaying Switchpack Definitions* on page 4-5.

Possible values for each option are listed in [Table 4-1](#).

NOTE:

See Appendix A, *Worksheets*, for help in selecting the appropriate configuration options for your application.

Table 4-1. DSX-1-Compatible Units Configuration Options (1 of 1)

1) SDSL Card Type
Possible Settings: CP, CO Default Setting: CP
Indicates the placement of the unit in the network configuration. To toggle the card type, enter 1 at the Config prompt. CP – Unit is on the customer premises side of the SDSL connection. CO – Unit is on the central office (or central site) side of the SDSL connection. When SDSL Card Type is changed, a system message warns that the board will automatically be reset. Enter Y to reset the board and change the type.
2) T1 Line Encode
Possible Settings: B8ZS, AMI Default Setting: B8ZS
Specifies the type of line encoding used to ensure one's density in the transmission signal. To toggle the encoding method, enter 2 at the Config prompt. B8ZS – Bipolar eights-zeroes substitution. AMI – Alternate Mark Inversion.
3) Framing
Possible Settings: D4, Unframed, Extended Superframe Default Setting: D4
Specifies the type of framing to be used. To toggle the framing method, enter 3 at the Config prompt. D4 – Commonly used framing method on T1 circuits, consisting of 12 frames of 192 bits with the 193rd bit used for error checking and other functions. Also called Super Framing. Unframed – Framing is disabled. Extended Superframe – Framing method consisting of 24 frames of 192 bits each, with the 193rd bit providing timing and other functions. An enhanced version of D4.
4) Line Build Out
Possible Settings: 0 to 133 ft, 133 to 266 ft, 266 to 399 ft, 399 to 533 ft, 533 to 655 ft Default Setting: 0 to 133 ft
To change the line build-out length, enter 4 at the Config command prompt. You will then be prompted to select from the following options: 1) 0 to 133 ft 2) 133 to 266 ft 3) 266 to 399 ft 4) 399 to 533 ft 5) 533 to 655 ft N) No change NOTE: Additional options may be displayed on your terminal. These other options (for -7.5, -15, and -22.5 dB) are not for use with this product. Use of these options will cause a weak signal and degrade performance. Select from options 1 through 5 only.

Making Changes in Switchpack Mode

When operating in Switchpack Mode, you change configuration options by moving switches on the board hardware. Each switch in the switchpack controls a configuration parameter. To enable Switchpack Mode, refer to *Switching Between Terminal and Switchpack Modes* on page 3-2.

► Procedure

Use electrostatic discharge (ESD) protection when handling the circuit board. To open the unit and make changes while in Switchpack Mode:

1. Power down the unit and remove the enclosure cover, exposing the circuit board.
2. Find the switchpack labeled S4. Refer to the board layout illustration in Appendix C, *Switchpack Definitions*.
3. Place the switchpack in the correct position for each desired configuration option. The definition of each switch in the switchpack is also provided in Appendix C, *Switchpack Definitions*.
4. Replace the enclosure cover and power up the board to reset and enable the new configuration.

Configuring Framed or Unframed Operation (DSX-1-to-DSX-1 Configuration)

In Switchpack Mode, specify Unframed operation by setting switches 3 – 7 on switchpack S4 to OFF.

Configuring a Starting Time Slot (DSX-1-to-V.35/V.11 Configuration)

In Switchpack Mode, switches 3 – 7 on switchpack S4 determine the starting time slot, as shown in [Table C-1](#) on page C-2.

If the payload rate (configured on the V.35/V.11-compatible unit) is 1544 kbps, set switches 3 – 7 all to the OFF position. This is the factory default.

If the payload rate is *less than* 1544 kbps, use switches 3 – 7 to select a starting time slot (DS0). Make sure that there are enough subsequent time slots to accommodate the V.35/V.11 payload rate (refer to the Maximum Payload Rate column in [Table C-1](#) on page C-2). Contact your network administrator to verify your starting time slot selection, as some time slots may already be in use.

Displaying Switchpack Definitions

To display the definition of each position in switchpack S4, enter **5** at the Config prompt. Switchpack definitions are also listed in Appendix C, [Switchpack Definitions](#).

```

Config→ 4

Switch pack S4 definitions:

1 - CO/CP                OFF=CP, ON=CO
2 - AMI/B8ZS            OFF=AMI, ON=B8ZS
3-7 - Starting Time Slot (CO only)  1-24 = Starting Time Slot
                                       25-30 = Starting Time Slot = 24
                                       31 = Switchpack Disable
8 - D4/ESF              OFF=D4, ON=ESF

Switch pack S5 definitions:
1-3 - LBO                see table below
4-8 - N/A

<<Press a key to continue!>>

```

Possible values for each parameter are listed in [Table 4-1](#). See Appendix A, [Worksheets](#), for help in selecting the appropriate configuration options for your application.

Displaying Line Build-Out Definitions

Press any key at the <<Press a key to continue!>> prompt to display the switchpack S5 settings for line build-out. Use this information to change the line build-out parameter manually. (Switchpack definitions are also listed in Appendix C, *Switchpack Definitions*.)

S3	S2	S1	LBO SETTING
0	0	0	0 to 133 feet - 0dB
0	0	1	133 to 266 feet
0	1	0	266 to 399 feet
0	1	1	399 to 533 feet
1	0	0	533 to 655 feet
1	0	1	-7.5 dB
1	1	0	-15 dB
1	1	1	-22.5 dB

Config→

For example, to change the line build-out to 399 to 533 feet, while in Switchpack Mode, set position 3 OFF and positions 1 and 2 ON.

NOTE:

The switch combinations for -7.5, -15, and -22.5 dB line build-out are not for use with this product. Use of these settings will cause a weak signal and degrade performance.

Customizing V.35/V.11-Compatible Units

5

Accessing Configuration Options

This chapter provides instructions on how to change configuration options for Hotwire Model 7914 standalone units that are V.35/V.11-compatible. [Chapter 4](#) provides similar information for DSX-1-compatible units.

Configuration option settings determine how the unit operates. You can change a unit's configuration options by:

- Selecting the Board Configuration branch of the Main Menu while in Terminal Mode.
- Changing switchpack and jumper settings on the board hardware while in Switchpack Mode.

The Main Menu for a V.35/V.11-compatible unit on the customer premises (CP) side appears as follows:

```
Command→ G123
ATTX - CP - V.35/V.11

V.35/V.11 SDSL STUR Main Menu

1) Board Status
2) Performance Monitor
3) Board Configuration
4) Local Loopback
5) Remote Loopback
6) STUC Menu
R) Board Reset
?) Redisplays this Menu

Command→
```

The G123 code denotes a successful startup

CP units are SDSL Termination Units – Remote (STUR)
CO units are SDSL Termination Units – Central Office (STUC)

This guide depicts the system terminal menus as they appear from a CP unit. This is the default configuration for Model 7914 standalone units.

Making Changes from the Terminal Interface

The Board Configuration menu displays the current board software and hardware settings. It also allows you to change certain parameters on the board.

This function is affected by the status of the switchpack (DIP switch control) setting.

- When operating in Terminal Mode (the system default) you can make configuration changes through the terminal menus.
- When operating in Switchpack Mode, you can display configuration parameters using the terminal menus, but any configuration changes must be made using the switchpacks and jumpers on the board hardware. Refer to *Making Changes in Switchpack Mode* on page 5-4.

To access the Board Configuration menu, enter **3** at the Main Menu Command prompt.

```
Command→ 3

Board Configuration:

1) SDSL Card Type      - CP
   SDSL Interface      - V.35
2) Payload Rate       - 1544 Kbps (Unframed)
   Timing              - Loop
   SDSL FW Rev         - 1.2
   Globespan FW Rev   - 1.12
   CP Serial #        - 085561

-----
1-2) Board Configuration
3) Switchpack Definitions
?) Prints Board Configuration and this menu
Q) Quit

Config→
```

Possible values for each parameter are listed in [Table 5-1](#). See Appendix A, *Worksheets*, for help in selecting the appropriate configuration options for your application.

The S4 Switchpack setting is displayed only if the unit is in Switchpack Mode.

Table 5-1. V.35/V.11-Compatible Units Configuration Options

1) SDSL Card Type																																			
Possible Settings: CP, CO Default Setting: CP																																			
<p>Indicates the placement of the unit in the network configuration. To toggle the card type, enter 1 at the Config prompt.</p> <p>CP – Unit is on the customer premises side of the SDSL connection. This automatically sets the unit to use the SDSL local loop for timing.</p> <p>CO – Unit is on the central office (or central site) side of the SDSL connection. Timing is configurable to either internal or external (see option 3).</p> <p>When SDSL Card Type is changed, a system message warns that the board will automatically be reset. Enter Y to reset the board and change the type.</p>																																			
2) Payload Rate																																			
Possible Settings: 1 to 24 (64 to 1536 kbps), U (1544 kbps Unframed), N (No Change) Default Setting: 1544 kbps (Unframed)																																			
<p>Specifies the desired payload rate.</p> <table border="0"> <tr> <td>1 – 64 kbps (1 x 64)</td> <td>12 – 768 kbps (12 x 64)</td> <td>23 – 1472 kbps (23 x 64)</td> </tr> <tr> <td>2 – 128 kbps (2 x 64)</td> <td>13 – 832 kbps (13 x 64)</td> <td>24 – 1536 kbps (24 x 64)</td> </tr> <tr> <td>3 – 192 kbps (3 x 64)</td> <td>14 – 896 kbps (14 x 64)</td> <td>U – 1544 kbps (Unframed)</td> </tr> <tr> <td>4 – 256 kbps (4 x 64)</td> <td>15 – 960 kbps (15 x 64)</td> <td>N – No Change</td> </tr> <tr> <td>5 – 320 kbps (5 x 64)</td> <td>16 – 1024 kbps (16 x 64)</td> <td></td> </tr> <tr> <td>6 – 384 kbps (6 x 64)</td> <td>17 – 1088 kbps (17 x 64)</td> <td></td> </tr> <tr> <td>7 – 448 kbps (7 x 64)</td> <td>18 – 1152 kbps (18 x 64)</td> <td></td> </tr> <tr> <td>8 – 512 kbps (8 x 64)</td> <td>19 – 1216 kbps (19 x 64)</td> <td></td> </tr> <tr> <td>9 – 576 kbps (9 x 64)</td> <td>20 – 1280 kbps (20 x 64)</td> <td></td> </tr> <tr> <td>10 – 640 kbps (10 x 64)</td> <td>21 – 1344 kbps (21 x 64)</td> <td></td> </tr> <tr> <td>11 – 704 kbps (11 x 64)</td> <td>22 – 1408 kbps (22 x 64)</td> <td></td> </tr> </table> <p>If you change from a full T1 rate (1544 kbps) to a lower rate, and the far-end unit is DSX-1-compatible, you must set the starting time slot on the DSX-1-compatible unit. See Table C-1 in Appendix C.</p> <p>When Payload Rate is changed, a system message warns that the board will automatically be reset. Enter Y to reset the board and change the rate.</p>			1 – 64 kbps (1 x 64)	12 – 768 kbps (12 x 64)	23 – 1472 kbps (23 x 64)	2 – 128 kbps (2 x 64)	13 – 832 kbps (13 x 64)	24 – 1536 kbps (24 x 64)	3 – 192 kbps (3 x 64)	14 – 896 kbps (14 x 64)	U – 1544 kbps (Unframed)	4 – 256 kbps (4 x 64)	15 – 960 kbps (15 x 64)	N – No Change	5 – 320 kbps (5 x 64)	16 – 1024 kbps (16 x 64)		6 – 384 kbps (6 x 64)	17 – 1088 kbps (17 x 64)		7 – 448 kbps (7 x 64)	18 – 1152 kbps (18 x 64)		8 – 512 kbps (8 x 64)	19 – 1216 kbps (19 x 64)		9 – 576 kbps (9 x 64)	20 – 1280 kbps (20 x 64)		10 – 640 kbps (10 x 64)	21 – 1344 kbps (21 x 64)		11 – 704 kbps (11 x 64)	22 – 1408 kbps (22 x 64)	
1 – 64 kbps (1 x 64)	12 – 768 kbps (12 x 64)	23 – 1472 kbps (23 x 64)																																	
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10 – 640 kbps (10 x 64)	21 – 1344 kbps (21 x 64)																																		
11 – 704 kbps (11 x 64)	22 – 1408 kbps (22 x 64)																																		
3) Timing (on CO units only)																																			
Possible Settings: Internal, External Default Setting: Internal																																			
<p>Determines the timing source. To toggle the timing, enter 3 at the Config prompt. This option can only be changed on CO units. CP units always use the SDSL local loop for timing.</p> <p>Internal – The unit's internal clock is used as the clock source.</p> <p>External – The V.35/V.11 interface is used as the clock source.</p> <p>When Timing is changed, a system message warns that the board will automatically be reset. Enter Y to reset the board and change the timing.</p>																																			

Making Changes in Switchpack Mode

When operating in Switchpack Mode, you change configuration options by moving switches on the circuit board. To enable Switchpack Mode, refer to *Switching Between Terminal and Switchpack Modes* on page 3-2.

► Procedure

Use electrostatic discharge (ESD) protection when handling the circuit board. To open the unit and make changes in Switchpack Mode:

1. Power down the unit and remove the enclosure cover, exposing the circuit board.
2. Find the switchpack for the configuration options you wish to change. Refer to the board layout illustration in Appendix C, *Switchpack Definitions*.
3. Place the switchpack or jumpers in the correct position for each desired configuration option.
4. Replace the enclosure cover and power up the board to reset and enable the new configuration.

Selecting V.35 or V.11 Signaling

Jumpers P6 – P21 on the board determine whether the unit uses V.11 or V.35 signaling. The unit defaults to V.35. To switch between V.11 and V.35, you must move the position of jumpers P6 – P21. Refer Appendix C, *Switchpack Definitions*, for more information.

Displaying Switchpack Definitions

To display the definition of each position in switchpack S4, enter **3** (for CP units) or **4** (for CO units) at the Config prompt. Switchpack definitions are also listed in Appendix C, *Switchpack Definitions*.

```

Config→ 4

Switch pack S4 definition:
  1 - CO/CP                OFF=CP, ON=CO
  2 - Timing (CO Only)    OFF=Internal, ON=External
  2 - Unused
  3-7- Payload Rate      See table below
  8 - Configuration      OFF=Terminal, ON=Switchpack

<< Press a key to continue!>>

```

After you press a key to continue displaying the switchpack definitions, the following table appears. Use the table to set switches 3 through 7 for the desired payload rate.

Switch pack S4 definitions:			
SWPK SWITCHES		SWPK SWITCHES	
RATE (Kbps)	7,6,5,4,3	RATE (Kbps)	7,6,5,4,3
1544 (Unframed)	00000	1024 (16x64)	10000
64 (1x64)	00001	1088 (17x64)	10001
128 (2x64)	00010	1152 (18x64)	10010
192 (3x64)	00011	1216 (19x64)	10011
256 (4x64)	00100	1280 (20x64)	10100
320 (5x64)	00101	1344 (21x64)	10101
384 (6x64)	00110	1408 (22x64)	10110
448 (7x64)	00111	1472 (23x64)	10111
512 (8x64)	01000	1536 (24x64)	11000
576 (9x64)	01001	1536 (24x64)	11001
640 (10x64)	01010	1536 (24x64)	11010
704 (11x64)	01011	1536 (24x64)	11011
768 (12x64)	01100	1536 (24x64)	11100
832 (13x64)	01101	1536 (24x64)	11101
896 (14x64)	01110	1536 (24x64)	11110
960 (15x64)	01111	1536 (24x64)	11111

Config→

Examples:

- For 640 kbps, set switch 7 OFF, 6 ON, 5 OFF, 4 ON, and 3 OFF.
- For 1024 kbps, set switch 7 ON, and switches 6, 5, 4, and 3 OFF.
- For 1536 kbps, set switches 7 and 6 ON, and switches 5, 4, and 3 OFF. Settings from 11000 (24) through 11111 (31) are interpreted as a request for 1536 kbps.

If you change from 1544 kbps to a lower rate, and the far-end unit is DSX-1-compatible, you must set the starting time slot on the DSX-1-compatible unit and reset the units.

Monitoring the Unit

6

What to Monitor

This chapter presents information on how to access and monitor status and performance statistics for the unit and its network connection. You can monitor operations by viewing the:

- Board Status option from the Main Menu
- Performance Monitor option from the Main Menu
- Board Status and Performance Monitor options from the STUC (or STUR) Menu (for displaying information about the unit on the other end of the connection)
- Front Panel LEDs

Board Status

The Board Status option from the Main Menu displays the SDSL circuit operational status. Enter **1** at the Command prompt to display board status.

```
Command→ 1

Board Status
-----
T1 STATUS:      Network is UP

LOOPBACK STATUS: OFF

SDSL STATUS:    LOOP is UP

S/N RATIO:      44.0 dB

Command→
```

Board Status for DSX-1-Compatible Unit

```
Command→ 1

Board Status
-----
DTR:           ACTIVE
DSR:           ACTIVE

LOOPBACK STATUS: OFF

SDSL STATUS:   LOOP is UP

S/N RATIO:     43.5 dB.

Command→
```

Board Status for V.35/V.11-Compatible Unit

- T1 status displays one of the following:
 - Network is Up
 - Receive Carrier Loss
 - Receive Remote Alarm
 - Receive Unframed All 1's
- DTR and DSR are either Active or Inactive. DSR becomes active in response to DTR (with SDSL loop up and data transmission possible).
- Loopback status is either OFF, Local Loopback ON, or Remote Loopback ON.
- SDSL Status displays whether the loop is up or down.
- Signal to Noise (S/N) ratio is not displayed if the loop is down.

Performance Statistics

Performance monitoring allows more detailed observations of error conditions detected on the circuit. The Performance Monitor menu options provide statistics on errors received and recorded, in defined time periods from the previous minute to the previous 24 hours, plus a running total. These statistics can be cleared and restarted at any time.

Enter **2** at the Command prompt to display the Performance Monitor menu.

```
Command→ 2

Performance Monitor
-----
Time Since Board Power-Up or Reset:  0000d 00h 00m

  1 - 1 minute stats.
  2 - 15 minute stats.
  3 - 1 hour stats.
  4 - 12 hour stats.
  5 - 24 hour stats.
  6 - Running total.
  7 - Clear Statistics.
  Q - Quit

stats→
```

Select from the above list to display statistics for a specified time period.

NOTE:

There is no verification presented before statistics are deleted. Be sure you want to clear all statistics before pressing **7**.

For example, pressing **1** at the stats prompt yields a screen like the following:

```

stats→ 1

Current 1 minute:

    SDSL Errors:                T1 Errors:

    FAW - 0                    BPV - 0
    CRC - 0                    MOS - 0
    FEBE - 0                   FAS - 0 (D4 framing only)
                                CRC - 0 (ESF framing only)

Previous 1 minute:

    SDSL Errors:                T1 Errors:

    FAW - 0                    BPV - 0
    CRC - 0                    MOS - 0
    FEBE - 0                   FAS - 0 (D4 framing only)
                                CRC - 0 (ESF framing only)

stats→

```

- Performance statistics have a maximum value of 65,536. If the maximum value is reached, the statistic resets to zero.
- Performance statistics are updated every second.
- T1 Errors (BPV, MOS, FAS, and CRC) are only displayed for DSX-1-compatible units that are operating in framed mode.

Interface	Counter	Meaning
SDSL	FAW	Frame Alignment Word. Loss of synchronization was detected.
	CRC	Cyclic Redundancy Check. An invalid CRC value was detected.
	FEBE	Far End Bit Error. An error was reported by the remote equipment.
T1	BPV	Bipolar Violation. Two consecutive pulses of the same polarity were detected.
	MOS	Multiframe Out of Sync. Loss of synchronization was detected.
	FAS	Frame Alignment Signal. A loss of signal was detected. (Shown only when Framing is set to D4.)
	CRC	Cyclic Redundancy Check. An invalid CRC value was detected. (Shown only when Framing is set to ESF.)

Remote Unit Information

The same type of information provided for the locally attached unit (CP or CO) can also be displayed (but not changed) for the unit on the other side of the connection (CO or CP).

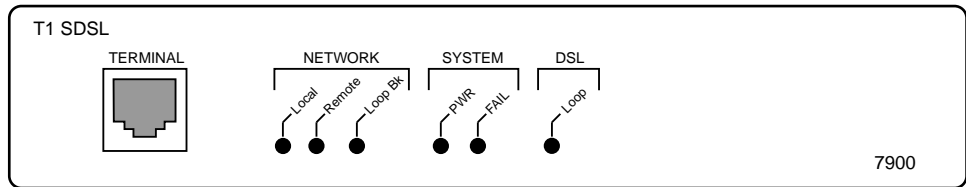
From a terminal attached to a CP unit, you can display information about the CO unit by using the STUC Menu options. Similarly, from a terminal attached to a CO unit, the STUR Menu allows you to display information about the CP unit.

To access the STUC (or STUR) Menu, enter **6** at the Command prompt.

```
***** STUC Menu *****
1) Board Status
2) Performance Monitor
3) Board Configuration
?) Redisplay this menu
Q) Quit

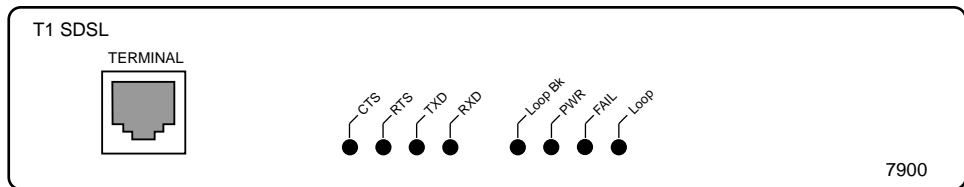
STUC Command→
```

Front Panel LEDs



97-15716

Front Panel LEDs for DSX-1-Compatible Unit



97-15717

Front Panel LEDs for V.35/V.11-Compatible Unit

LED	Meaning
Local	The local T1 interface has a loss of signal.
Remote	The remote T1 interface has a loss of signal.
Loop Bk	The unit is in loopback. Refer to Chapter 7, <i>Testing</i> , for more information.
PWR	Power is applied to the unit.
FAIL	The processor has halted and repairs are required.
Loop	A failure in the SDSL loop has been detected. NOTE: The Loop LED lights or blinks during power up, then goes out when the loop has been established.

Testing

7

Detecting a Problem

The unit can detect and report problem conditions and perform diagnostic tests. The unit offers a number of indicators to alert you to possible problems, as described in Chapter 6, *Monitoring the Unit*:

- Board Status and performance statistics
- Remote unit board status and performance statistics
- Front Panel LEDs

Understanding Loopback Tests

Loopback is a diagnostic function that enables a technician to isolate equipment on the SDSL circuit to determine where on the circuit trouble may be occurring. Loopback takes the system off-line. Data received from T1 or V.35/V.11 application equipment is looped back.

“Local” and “remote” refer to the point at which the data is looped back. In a local loopback the data is reflected back by the local unit (the unit that initiated the loopback). In a remote loopback, the data is passed on to the remote (far-end) unit and then reflected back.

Figures 7-1 through 7-4 illustrate how local and remote loopbacks operate in different configurations. The bold arrows indicate the direction of data flow.

Local Loopbacks

- When a local loopback is enabled, the red Loop Bk LED on the front panel of the local unit lights up and remains lit until the loopback is disabled.

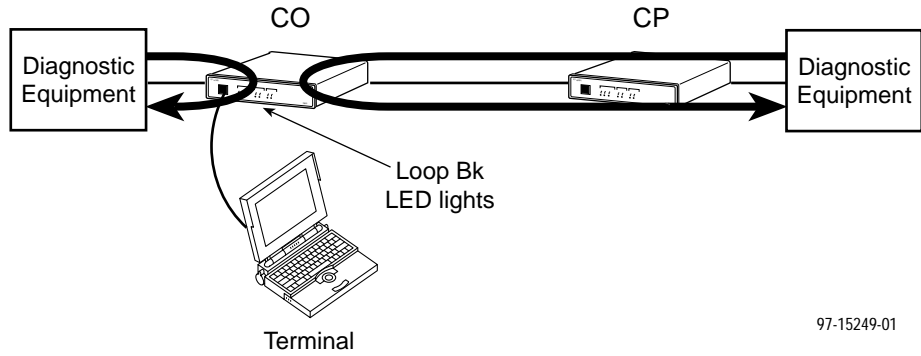


Figure 7-1. Local Loopback Initiated by the CO Unit

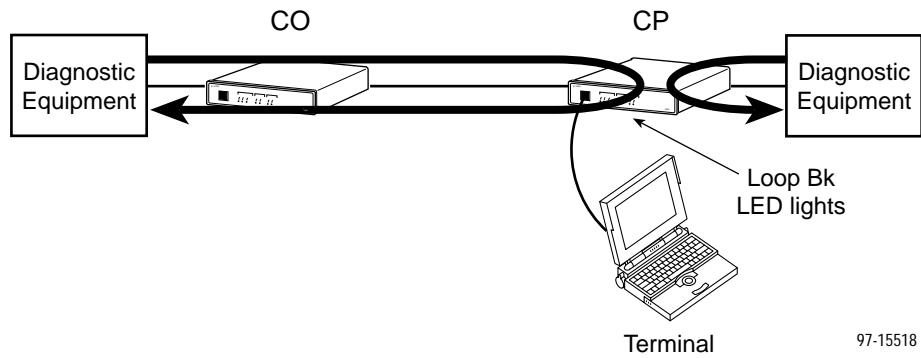


Figure 7-2. Local Loopback Initiated by the CP Unit

Remote Loopbacks

- When a remote loopback is enabled, the red Loop Bk LED on the front panel of the remote (far-end) unit lights up and remains lit until the loopback is disabled. The Loop Bk LED on the local (initiating) unit does not light.

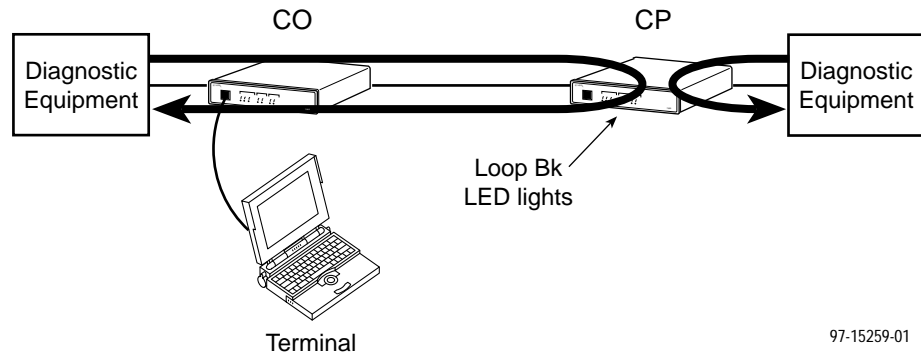


Figure 7-3. Remote Loopback Initiated by the CO Unit

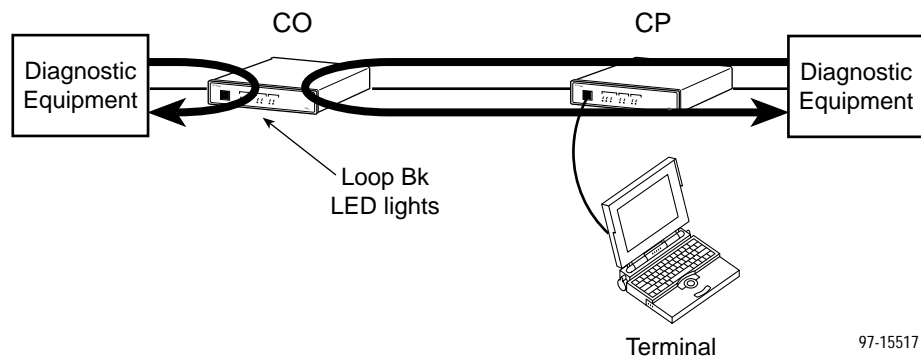


Figure 7-4. Remote Loopback Initiated by the CP Unit

Starting and Ending Loopbacks

To start or end a local loopback test, enter **4** at the Command prompt.

```
Command→ 4
Local Loopback is Enabled!
Command→ 4
Local Loopback is Disabled!
```

To start or end a remote loopback test, enter **5** at the Command prompt.

```
Command→ 5
Remote Loopback is Enabled!
Command→ 5
Remote Loopback is Disabled!
```

Resetting the Unit

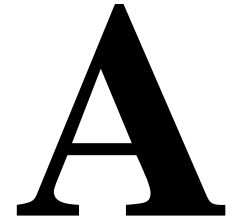
Enter **R** at the Command prompt to reset the board. This is equivalent to cycling the power.

```
Command→ R
Reset will bring the loop down. Are you sure? (y/n)
Command→
```

If “y” is selected, the Main Menu is displayed, the loop goes down, and the Loop LED blinks until the loop is restored.

Pressing any key other than “y” is interpreted as an “n”.

Worksheets

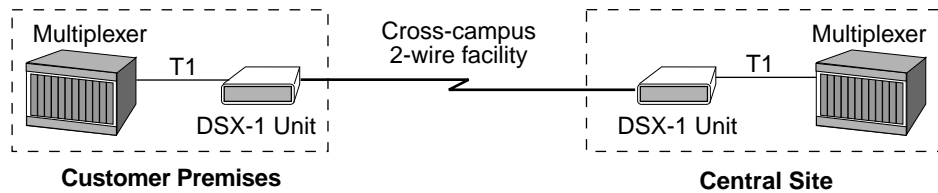


Overview

This appendix provides the correct configuration settings based on the types of units (DSX-1-compatible or V.35/V.11-compatible) on either end of the SDSL connection. There are three combinations of the two types of units:

- DSX-1-compatible units on both ends
- V.35/V.11-compatible CP unit, DSX-1-compatible CO unit
- V.35/V.11-compatible units on both ends

DSX-1-to-DSX-1 Configuration



97-15718

To connect two DSX-1-compatible units, configure the units as follows. Terminal Mode factory defaults are in bold (for Switchpack mode defaults, see Appendix C, *Switchpack Definitions*).

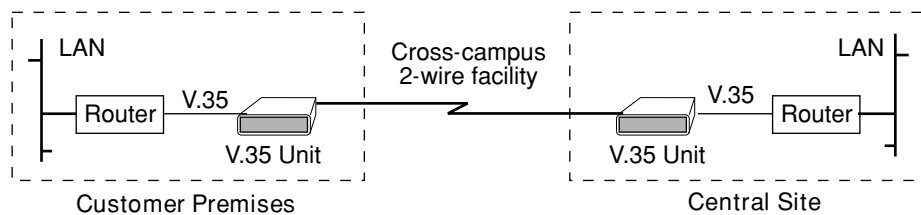
Configuration Option	DSX-1-Compatible Unit (Customer Premises)	DSX-1-Compatible Unit (Central Site)
Card Type	CP (default)	CO
T1 Line Encoding	B8ZS or AMI	Must be same as CP side
Framing	D4 , Extended Superframe, or Unframed	Must be same as CP side
Line Build-Out	Enter 4 at the Config command prompt. Select from the following options: 1) 0 to 133 ft 2) 133 to 266 ft 3) 266 to 399 ft 4) 399 to 533 ft 5) 533 to 655 ft	Enter 4 at the Config command prompt. Select from the following options: 1) 0 to 133 ft 2) 133 to 266 ft 3) 266 to 399 ft 4) 399 to 533 ft 5) 533 to 655 ft

DSX-1-to-V.35/V.11 Configuration

To connect a DSX-1-compatible unit on the CO side and a V.35/V.11-compatible unit on the CP side, configure the units as follows. Terminal Mode factory defaults are in bold (for Switchpack mode defaults, see Appendix C, *Switchpack Definitions*).

Configuration Option	V.35/V.11-Compatible Unit (Customer Premises)	DSX-1-Compatible Unit (Central Site)
Card Type	CP	CO
Payload Rate	U (Unframed 1544 kbps) 1 – 24 (64 – 1536 kbps)	See Table C-1 in Appendix C.
Framing	N/A	Use D4 , Extended Superframe, or Unframed.
T1 Line Encode	N/A	B8ZS or AMI
Line Build-Out	N/A	Enter 4 at the Config command prompt. Select from the following options: 1) 0 to 133 ft 2) 133 to 266 ft 3) 266 to 399 ft 4) 399 to 533 ft 5) 533 to 655 ft

V.35/V.11-to-V.35/V.11 Configuration



To connect two V.35/V.11-compatible units, configure the units as follows. Terminal Mode factory defaults are in bold (for Switchpack mode defaults, see Appendix C, *Switchpack Definitions*).

Configuration Option	V.35/V.11-Compatible Unit (Customer Premises)	V.35/V.11-Compatible Unit (Central Site)
Card Type	CP	CO
Payload Rate	U (Unframed 1544 kbps) 1 – 24 (64 – 1536 kbps)	Must be same as CP side
Timing	Loop (not configurable)	Internal or External

DSX-1-Compatible Units Configuration Worksheet

Board Configuration	
Configuration Option	Settings <i>Terminal Mode Defaults in Bold</i>
SDSL Card Type	CP, CO
T1 Line Encode	B8ZS , AMI
Framing	D4 , Unframed, Extended Superframe
Line Build Out	1) 0 to 133 feet – 0 dB 2) 133 to 266 feet 3) 266 to 399 feet 4) 399 to 533 feet 5) 533 to 655 feet

V.35/V.11-Compatible Units Configuration Worksheet

Board Configuration	
Configuration Option	Settings <i>Terminal Mode Defaults in Bold</i>
SDSL Card Type	CP, CO
Payload Rate	1 – 1 x 64 (64 kbps) 17 – 17 x 64 (1088 kbps) 2 – 2 x 64 (128 kbps) 18 – 18 x 64 (1152 kbps) 3 – 3 x 64 (192 kbps) 19 – 19 x 64 (1216 kbps) 4 – 4 x 64 (256 kbps) 20 – 20 x 64 (1280 kbps) 5 – 5 x 64 (320 kbps) 21 – 21 x 64 (1344 kbps) 6 – 6 x 64 (384 kbps) 22 – 22 x 64 (1408 kbps) 7 – 7 x 64 (448 kbps) 23 – 23 x 64 (1472 kbps) 8 – 8 x 64 (512 kbps) 24 – 24 x 64 (1536 kbps) 9 – 9 x 64 (576 kbps) U – Unframed (1544 kbps) 10 – 10 x 64 (640 kbps) 11 – 11 x 64 (704 kbps) 12 – 12 x 64 (768 kbps) 13 – 13 x 64 (832 kbps) 14 – 14 x 64 (896 kbps) 15 – 15 x 64 (960 kbps) 16 – 16 x 64 (1024 kbps)
Timing	Loop (for CP Units) Internal or External (for CO units)

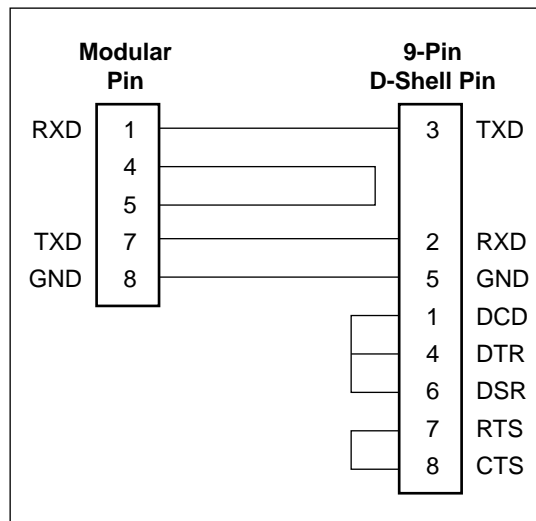
Cable Pin Assignments

B

Terminal Connection Cable

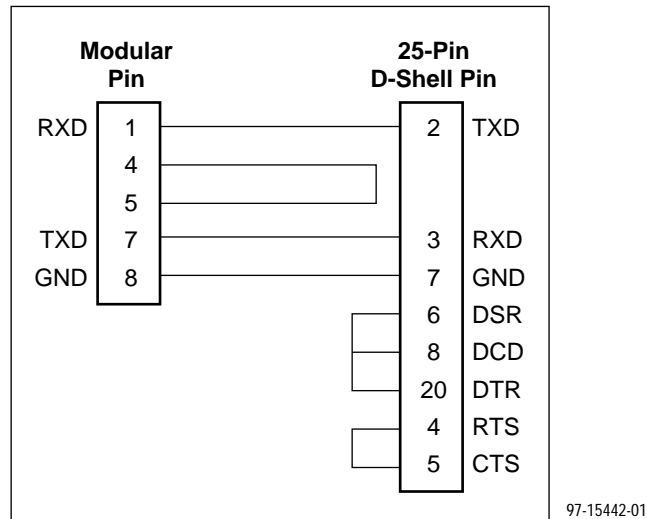
This section defines the pin assignments for the terminal cable from the front panel modular jack to your PC's COM port.

If your PC's COM port requires a 9-pin D-shell connector, the cable must use the following pin assignments.



97-15268-02

If your PC's COM port requires a 25-pin D-shell connector, the cable must use the following pin assignments.



SDSL Connection Cable Pin Assignments

The SDSL modular connector that plugs into the rear panel of the unit has the following pin assignments.

Pin	Signal
1	Loop Tip
2	Loop Ring
3 – 8	unused

NOTE:

Pin 1 is on the left when viewing the jack from its inserted position.

T1 Network Connection Cable Pin Assignments

The modular connector that plugs into the rear panel of DSX-1-compatible units has the following pin assignments.

Pin	Signal
1	Tx Ring
2	Tx Tip
3	open
4	Rx Ring
5	Rx Tip
6 – 8	open

NOTE:

Pin 1 is on the left when viewing the jack from its inserted position.

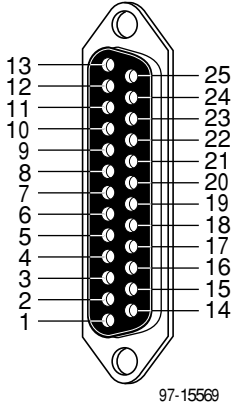
V.35/V.11 Connection Cable Pin Assignments

The connector that plugs into the rear panel of V.35/V.11-compatible units has the following pin assignments.

CCITT Code	Pin	Name	Direction DCE DTE	Function	Description
101	A	PG		Protective Ground	Machine ground
102	B	SG		Signal Ground	Ground reference for all circuits
105	C	RTS	←	Request to Send	DTE has message to send
106	D	CTS	→	Clear to Send	DCE is ready to accept and transmit DTE data
107	E	DSR	→	Data Set Ready	DCE is ready to operate
109	F	RLSD	→	Data Channel Received Line Signal Detector	DCE is receiving a carrier signal
108	H	DTR	←	Data Receiver Ready	DTE is ready to operate
141	L	LL	←	Local Loopback	Local loopback
140	N	RDL	←	Loopback/ Maintenance	Remote loopback
103	P	TXD	←	Transmit Data (A)	Data generated by DTE
104	R/D	RXD	→	Received Data (A)	Data received by DTE
103	S	TXD	←	Transmitted Data (B)	Data generated by DTE
104	R	RXD	→	Received Data (B)	Data received by DTE
113	U	EXT CLK	←	Transmitter Signal Element Timing (A)	To help detect center of signaling element on BA
115	V	RSET	→	Receiver Signal Element Timing (A)	To help detect center of signaling element on BB
113	W	EXT CLK	←	Transmitter Signal Element Timing (B)	To help detect center of signaling element on BA
115	X	RSET	→	Receiver Signal Element Timing (B)	To help detect center of signaling element on BB
114	Y	TSET	→	Transmit Signal Element Timing (A)	To help detect center of signaling element on BA
114	a	TSET	→	Transmit Signal Element Timing (B)	To help detect center of signaling element on BB
142	n	TST	→	Test Indicator	Reserved for test

DB25-to-V.35 Adapter Cable Pin Assignments

If you wish to connect a V.35/V.11-compatible unit to a 34-pin V.35 interface, use a DB25-to-V.35 adapter cable with the following pin assignments.



97-15569

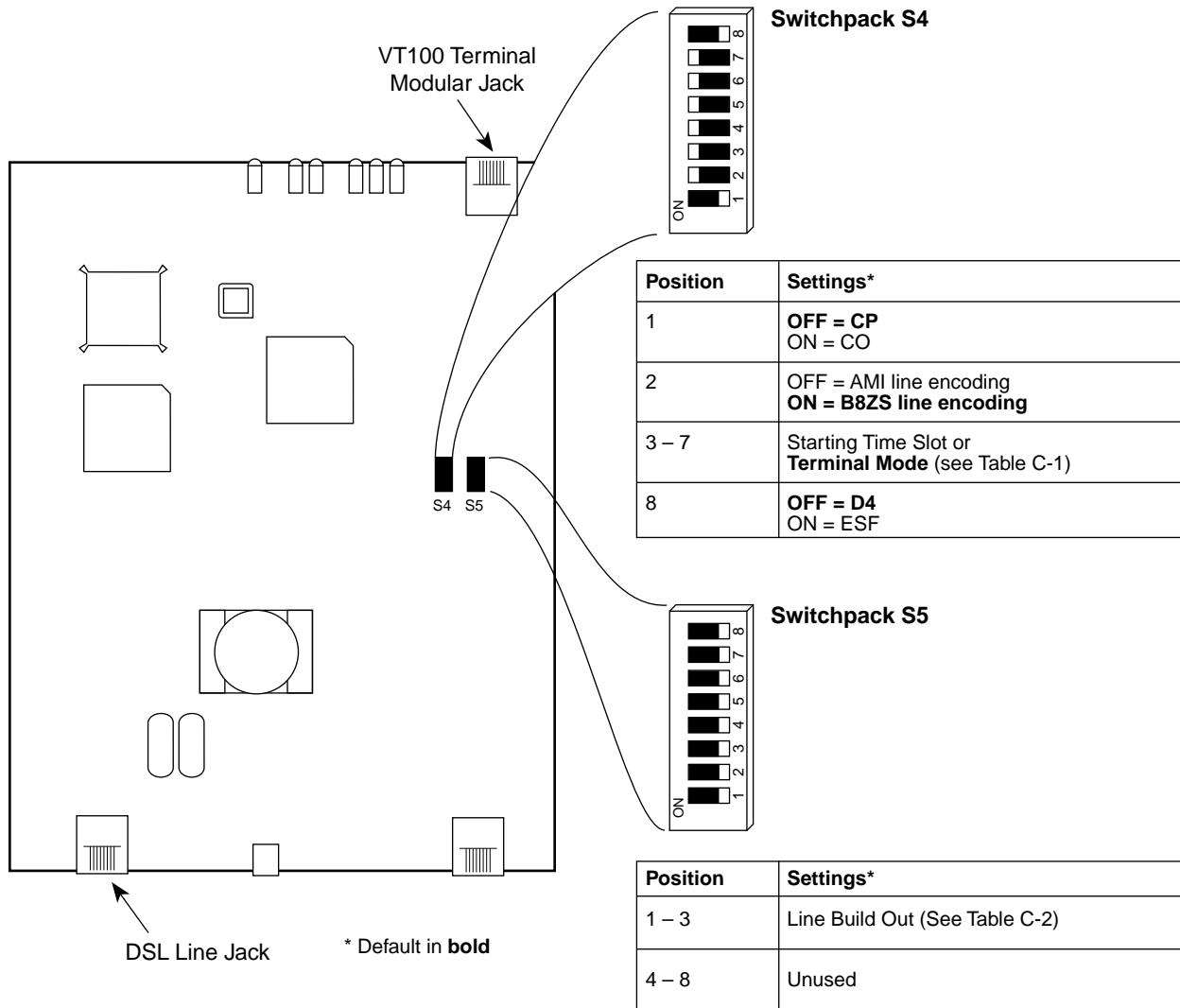
	DB25 PLUG		MS34 SOCKET	V.35 SIGNAL
SHIELD	1	—————	A	SHIELD
TD-A	2	—————	P	TD-A
TD-B	14	—————	S	TD-B
RD-A	3	—————	R	RD-A
RD-B	16	—————	T	RD-B
TXC-A	15	—————	Y	TXC-A
TXC-B	12	—————	AA	TXC-B
RXC-A	17	—————	V	RXC-A
RXC-B	9	—————	X	RXC-B
RTS	4	—————	C	RTS
CTS	5	—————	D	CTS
RLSD	8	—————	F	RLSD
DSR	6	—————	E	DSR
SIG. COMMON	7	—————	B	SIG. COMMON
TT-A	24	—————	U	TT-A
TT-B	11	—————	W	TT-B
DTR	20	—————	H	DTR
RL	21	—————	N	RL
LL	18	—————	L	LL
TM	25	—————	NN	TM

97-15670

Switchpack Definitions

C

DSX-1-Compatible Units



98-15719-01

DSX-1-Compatible Unit Switchpack Location

For DSX-1-to-V.35/V.11 Configurations: Table C-1 provides information on how to set switches 3 – 7 in order to select either Unframed operation (for a 1544 kbps payload rate) or a starting time slot (when the payload rate is less than 1544 kbps). Switches 3 – 7 can also be used to select Terminal Mode.

Refer to page 4-5 for more information.

Table C-1. Starting Time Slot: Switches 3 – 7 on Switchpack S4

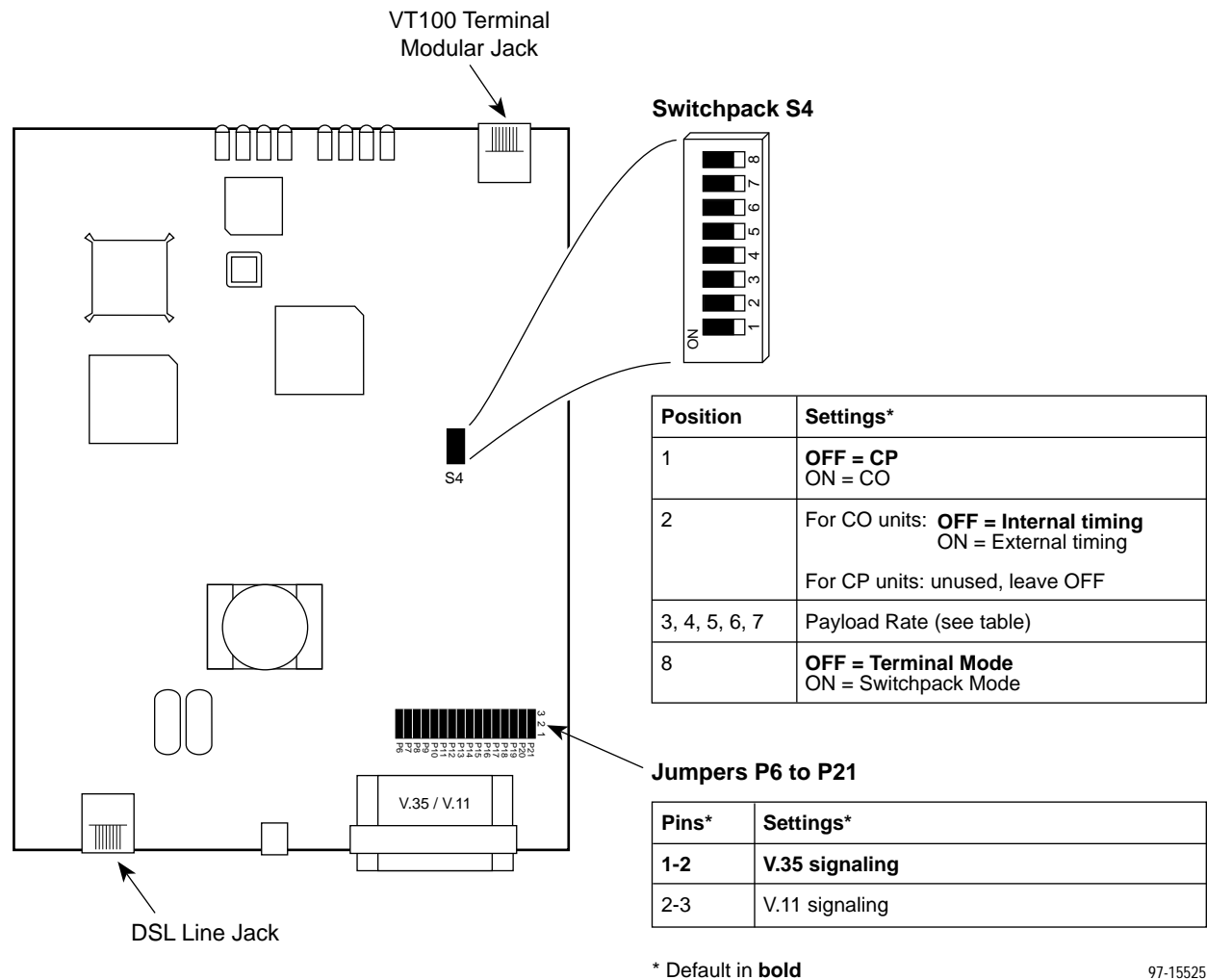
Starting Time Slot	Switch Position					Maximum Payload Rate Starting at Time Slot
	3	4	5	6	7	
[Not Applicable]	OFF	OFF	OFF	OFF	OFF	1544 kbps (Unframed)
1	ON	OFF	OFF	OFF	OFF	1536 kbps (24 x 64)
2	OFF	ON	OFF	OFF	OFF	1472 kbps (23 x 64)
3	ON	ON	OFF	OFF	OFF	1408 kbps (22 x 64)
4	OFF	OFF	ON	OFF	OFF	1344 kbps (21 x 64)
5	ON	OFF	ON	OFF	OFF	1280 kbps (20 x 64)
6	OFF	ON	ON	OFF	OFF	1216 kbps (19 x 64)
7	ON	ON	ON	OFF	OFF	1152 kbps (18 x 64)
8	OFF	OFF	OFF	ON	OFF	1088 kbps (17 x 64)
9	ON	OFF	OFF	ON	OFF	1024 kbps (16 x 64)
10	OFF	ON	OFF	ON	OFF	960 kbps (15 x 64)
11	ON	ON	OFF	ON	OFF	896 kbps (14 x 64)
12	OFF	OFF	ON	ON	OFF	832 kbps (13 x 64)
13	ON	OFF	ON	ON	OFF	768 kbps (12 x 64)
14	OFF	ON	ON	ON	OFF	704 kbps (11 x 64)
15	ON	ON	ON	ON	OFF	640 kbps (10 x 64)
16	OFF	OFF	OFF	OFF	ON	576 kbps (9 x 64)
17	ON	OFF	OFF	OFF	ON	512 kbps (8 x 64)
18	OFF	ON	OFF	OFF	ON	448 kbps (7 x 64)
19	ON	ON	OFF	OFF	ON	384 kbps (6 x 64)
20	OFF	OFF	ON	OFF	ON	320 kbps (5 x 64)
21	ON	OFF	ON	OFF	ON	256 kbps (4 x 64)
22	OFF	ON	ON	OFF	ON	192 kbps (3 x 64)
23	ON	ON	ON	OFF	ON	128 kbps (2 x 64)
24	OFF	OFF	OFF	ON	ON	64 kbps (1 x 64)
[Not Applicable]	ON	ON	ON	ON	ON	[Unit set for Terminal Mode]

Table C-2 shows how to set switches 1–3 on Switchpack S5 for the different Line Build Out values.

Table C-2. Line Build Out: Switches 1 – 3 on Switchpack S5

Line Build Out	Switch Position		
	1	2	3
0–133 Feet	OFF	OFF	OFF
133–266 Feet	ON	OFF	OFF
266–399 Feet	OFF	ON	OFF
399–533 Feet	ON	ON	OFF
533–655 Feet	OFF	OFF	ON
–7 dB	ON	OFF	ON
–15 dB	OFF	ON	ON
–22 dB	ON	ON	ON

V.35/V.11-Compatible Units



97-15525

V.35/V.11-Compatible Unit Switchpack and Jumper Locations

- Jumpers P6 – P21 must be set in the same position at all times. For V.35 signaling, each jumper must be placed on Pins 1 and 2. For V.11 signaling, each jumper must be placed on Pins 2 and 3.
- See [Table C-3](#) for switch positions to use for each supported payload rate.

Table C-3. Payload Rate: Switches 3 – 7 on Switchpack S4

Payload Rate	Switch Position				
	3	4	5	6	7
Unframed (1544 kbps)	OFF	OFF	OFF	OFF	OFF
1 x 64 (64 kbps)	ON	OFF	OFF	OFF	OFF
2 x 64 (128 kbps)	OFF	ON	OFF	OFF	OFF
3 x 64 (192 kbps)	ON	ON	OFF	OFF	OFF
4 x 64 (256 kbps)	OFF	OFF	ON	OFF	OFF
5 x 64 (320 kbps)	ON	OFF	ON	OFF	OFF
6 x 64 (384 kbps)	OFF	ON	ON	OFF	OFF
7 x 64 (448 kbps)	ON	ON	ON	OFF	OFF
8 x 64 (512 kbps)	OFF	OFF	OFF	ON	OFF
9 x 64 (576 kbps)	ON	OFF	OFF	ON	OFF
10 x 64 (640 kbps)	OFF	ON	OFF	ON	OFF
11 x 64 (704 kbps)	ON	ON	OFF	ON	OFF
12 x 64 (768 kbps)	OFF	OFF	ON	ON	OFF
13 x 64 (832 kbps)	ON	OFF	ON	ON	OFF
14 x 64 (896 kbps)	OFF	ON	ON	ON	OFF
15 x 64 (960 kbps)	ON	ON	ON	ON	OFF
16 x 64 (1024 kbps)	OFF	OFF	OFF	OFF	ON
17 x 64 (1088 kbps)	ON	OFF	OFF	OFF	ON
18 x 64 (1152 kbps)	OFF	ON	OFF	OFF	ON
19 x 64 (1216 kbps)	ON	ON	OFF	OFF	ON
20 x 64 (1280 kbps)	OFF	OFF	ON	OFF	ON
21 x 64 (1344 kbps)	ON	OFF	ON	OFF	ON
22 x 64 (1408 kbps)	OFF	ON	ON	OFF	ON
23 x 64 (1472 kbps)	ON	ON	ON	OFF	ON
24 x 64 (1536 kbps)	OFF	OFF	OFF	ON	ON
	ON	OFF	OFF	ON	ON
	OFF	ON	OFF	ON	ON
	ON	ON	OFF	ON	ON
	OFF	OFF	ON	ON	ON
	ON	OFF	ON	ON	ON
	OFF	ON	ON	ON	ON
	ON	ON	ON	ON	ON

Glossary

AMI	Alternate Mark Inversion coding format.
BPV	Bipolar Violation. A type of error detected by using a modified bipolar signaling method in which a control code is inserted.
B8ZS	Bipolar with eights and Zeroes Substitution. An encoding scheme for transmitting clear channel signals over a T1 line.
CD	Carrier Detect. A signal indicating that energy exists on the transmission circuit. Associated with Pin 8 on an EIA-232 interface.
CO	Central Office. As used in this manual, CO denotes any central site as distinguished from the Customer Premises site.
COM port	Communications port. A computer's serial communications port used to transmit to and receive data from a DCE. The DCE connects directly to this port.
CP	Customer Premises.
CPE	Customer Premises Equipment. Terminating equipment supplied by either the customer or some other supplier that is connected to the telecommunications network (e.g., DSUs, terminals, phones, routers, modems).
CRC	Cyclic Redundancy Check. A commonly used method of error detection.
CTS	Clear to Send. An EIA-lead standard for V.24 circuit CT 106; an output signal (DCE-to-DTE).
CV	Code Violation. This is equivalent to a BPV.
DCE	Data Communications Equipment. The equipment that provides the functions required to establish, maintain, and end a connection. It also provides the signal conversion required for communication between the DTE and the network.
DSR	Data Set Ready. A signal from the modem to the DTE that indicates the modem is turned ON and connected to the DTE.
DSX-1	Digital Signal cross-connection (of network equipment) at T1 rates.
DS1	Digital Signal level 1. A framing specification for T1 circuits.
DTE	Data Terminal Equipment. The equipment, such as computers and printers, that provides or creates data.
DTR	Data Terminal Ready. A signal from the DTE to the modem, sent via Pin 20 of the EIA-232 interface (V.24 circuit 108/1, /2), that indicates the DTE is turned ON and connected to the modem.
E1	A data signaling rate common outside the United States. A wideband interface operating at 2.048 Mbps defined by CCITT standards G.703 and G.704.
factory defaults	A predetermined set of configuration options for general operation.
FAS	Frame Alignment Signal . A loss of signal (LOS) error detection.
FAW	Frame Alignment Word. A loss of synchronization error detection.

FCC	Federal Communications Commission. Board of Commissioners that regulates all U.S. interstate, intrastate, and foreign electrical communication systems that originate from the United States.
FEBE	Far End Bit Error. Number of errors reported by the remote equipment.
HDB3	High Density Bipolar 3 coding format.
HDSL	High-bit-rate Digital Subscriber Loop. Provides high bandwidth, bi-directional transmission over copper wire for both T1 and E1 services.
LED	Light Emitting Diode. A status indicator that responds to the presence of a certain conditions.
loopback	Used to test various portions of a data link in order to isolate an equipment or data line problem. A diagnostic procedure that sends a test message back to its origination point.
MOS	Multiframe Out of Sync. An error was detected in the synchronization of a multiframe.
multiframe	An ordered, functional sequence of frames on a multiplexed digital circuit.
OOF	Out Of Frame. An error condition in which frame synchronization bits are in error. A network-reported condition.
reset	A reinitialization of the device that occurs at power-up or in response to a reset command.
RTS	Request to Send. An EIA-lead standard for V.24 circuit CT 105; an input signal (DTE-to-DCE).
RXD	Received Data. An EIA-lead standard for V.24 circuit CT 104; an output signal (DCE-to-DTE).
SDSL	Symmetrical Digital Subscriber Loop. Provides high bandwidth, bi-directional transmission over copper wire for both T1 and E1 services using 2 wires.
S/N	Signal to Noise. A ratio, expressed in decibels, of the usable signal and interference on a line.
STU	SDSL Termination Unit. A generic reference to either an STU-C or STU-R module.
STU-C	SDSL Termination Unit – Central. The module at the CO (central office) or central site end of an HDSL connection. Also known as a Line Termination Unit (LTU).
STU-R	SDSL Termination Unit – Remote. The module at the CP (customer premises) end of an HDSL connection. Also known as a Network Termination Unit (NTU).
T1	A data signaling rate common in the United States. A term for a digital carrier facility used to transmit a DS1 formatted signal of 1.544 Mbps.
TXD	Transmit Data. An EIA-lead standard for V.24 circuit CT 103; an input signal (DTE-to-DCE).
V.35	ITU-T standard for a high-speed, 34-pin, DCE/DTE interface.

Index

A

AMI line encoding, 4-3

B

B8ZS line encoding, 4-3

Board Configuration menu, 4-2, 5-2

board status, 6-1

 for remote unit, 6-5

C

cables

 connecting power, 2-4

 connecting to network, 2-3

 DB25-to-V.35 adapter, B-5

 pin assignments, B-1

 restrictions, 2-2

 SDSL connection, B-2

 T1 network connection, B-3

 terminal connection, B-1

 V.35/V.11 connection, B-4

card type

 DSX-1-compatible units, 4-3

 V.35-compatible units, 5-3

changing data rate, 5-5

changing switches

 DSX-1-compatible units, 4-4

 V.35-compatible units, 5-4

COM port settings, 3-1

configuration options

 Switchpack Mode, 4-4, 5-4

 Terminal Mode, 4-2, 5-2

 worksheets, A-1

configuration worksheets

 DSX-1-compatible unit, A-4

 V.35-compatible unit, A-4– A-6

configurations

 campus network, 1-3

 cellular, 1-5

 central site, 1-4

customer service, B

D

D4 framing, 4-3

data rate, 5-3, 5-5

DB25-to-V.35 adapter cable, installation, 2-3

display

 board status, 6-1

 line build-out definitions, 4-6

 performance statistics, 6-3

 remote unit information, 6-5

 switchpack definitions, 4-5, 5-4

documentation, related, vi

DS0 selection, 4-5

DSX-1 interface cable, installation, 2-3

DSX-1 to V.35 configuration, A-3

DSX-1-to-DSX-1 configuration, A-2

DTE cable, 2-3

E

examples

 CO and CP configuration options, A-1

 network configurations, 1-3

extended superframe, 4-3

F

framing options, 4-3, 4-5

front panel LEDs, 6-6

I

installation, 2-1

 network cable, 2-3

 power supply, 2-4

 preparation, 2-2

 system terminal, 3-1

L

- LEDs, 6-6
 - DSX-1-compatible unit, 6-6
 - V.35-compatible unit, 6-6
- line build-out
 - how to display, 4-6
 - options, 4-3
- line encoding, 4-3
- line encoding options, 4-3
- local loopback test, 7-2
- loop length, 2-2
- loopback tests, 7-1
 - local, 7-2
 - overview, 7-1
 - remote, 7-3
 - starting and ending, 7-4

M

- Main Menu
 - DSX-1-compatible unit, 4-1
 - V.35/V.11-compatible unit, 5-1
- menus
 - Board Configuration, 4-2, 5-2
 - Main, 4-1, 5-1
 - Switchpack definitions, 5-4
- model numbers, 1-2
- monitoring
 - board status, 6-1
 - performance statistics, 6-3

N

- network cable
 - installation, 2-3
 - pin assignments, B-3
- network performance statistics, 6-3

O

- overview
 - installation, 2-1
 - loopback tests, 7-1
 - of user interfaces, 1-5
 - of User's Guide, v

P

- packing list, 2-1
- part numbers
 - for user documentation, vi
 - of all models, 1-2
- payload rate
 - configuration options, 5-3
 - Switchpack definitions screen, 5-5
- PC requirements, 3-2
- performance statistics, 6-3
- pin assignments, B-1
- planning, 2-2
- power supplies
 - by model number, 1-2
 - installation, 2-4
- problems, detecting, 7-1

R

- rear panel diagram, 2-3
- related documents, vi
- remote loopback test, 7-3
- remote unit status, 6-5
- resetting the unit, 4-3, 5-3, 7-4

S

- SDSL cable, pin assignments, B-2
- service information, B
- site preparation, 2-2
- starting time slot, 4-5
- statistics, performance monitor, 6-3
- status
 - circuit card, 6-1
 - remote unit, 6-5
- summary
 - of chapters, v
 - of features, 1-1
 - of user interfaces, 1-5
- Switchpack Mode
 - DSX-1-compatible units, 4-4
 - V.35-compatible units, 5-4
 - overview, 3-1
 - switching to and from, 3-2
- switchpacks
 - DSX-1-compatible unit, C-1
 - V.35-compatible unit, C-4
 - how to display, 4-5, 5-4

T

T1 Line Encoding, 4-3
terminal cable, pin assignments, B-1
terminal interface, communication parameters, 3-2
Terminal Mode
 DSX-1-compatible unit, 4-2
 overview, 3-1
 switching to and from, 3-2
 V.35/V.11-compatible unit, 5-2
testing, 7-1
time slot selection, 4-5

U

unframed, 4-3
user interface, 1-5, 3-1

V

V.11, jumper settings for, C-4
V.35
 adapter cable, B-5
 jumper settings for, C-4
V.35 to DSX-1 configuration, A-3
V.35 to V.35 configuration, A-3
V.35/V.11 signaling, default, 5-4

W

warranty telephone number, B
worksheets, A-1