FLUKE
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TS®1200
ADSL/POTS Test Set

Users Guide

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Table of Contents

Chapter 1
Introduction

Description

The TS1200 ADSL/POTS Test Set is an analog test telephone used by installers, repair technicians, and other authorized personnel for the testing of copper wire, voice subscriber, and ADSL lines. The TS1200 can test ADSL lines for throughput, noise margin, and other parameters. It can monitor ADSL and POTS lines simultaneously and can test ADSL service in either a snapshot or a continuous mode.

The same circuitry that allows the TS1200 to test POTS services without downing ADSL also prevents the test set from disrupting other types of digital data services (xDSL, ISDN) to which the test set may have been unintentionally connected.

Unpacking

Provided in the TS1200 Test Set shipping box are the following items:

- AC Adapter/Charger, 12 VDC, 10%, 600 mA
- Batteries, NiMH, 1.2V (4)
- Line Cord, RJ-45 to ABN
- Modular Adapter, DB9/RJ11
- Cable, RJ-11 to RJ-11, 7.0 ft
- Vehicle Adapter
- Users Guide

General Safety Information

Table 1-1 describes the international electrical symbols used on the Test Set and in this manual.

Table 1-1. International Electrical Symbols

⚠	Warning: Risk of personal injury. See the manual for details.
	Caution: Risk of damage or destruction to equipment or software. See the manual for details.
⚡	Warning: Risk of electric shock.
⏚	Earth ground
ℂ🄢ᵤₛ	CAN/CSA-C22.2 No. 60950-1-03 CAN/CSA-C22.2 No. 1010.1-92 + CSA-C22.2 No. 1010.1B-97 UL/ANSI 3111-1
🚫	Do not put products containing circuit boards into the garbage. Dispose of circuits boards in accordance with local regulations.

⚠ ⚡ Warning

Good safety practices prohibit the connection of the TS1200 and similar test sets to 117 VAC commercial electrical power. Should the TS1200 Test Set be connected to commercial power, all warranties are immediately voided.

When connecting to metallic network wires, handle alligator clips by insulated boots.

Do not use the test set if it is damaged. Before you use the test set, inspect the case. Look for cracks or missing plastic. Pay particular attention to the insulation surrounding the connectors.

If this product is used in a manner not specified by the manufacturer, the protection provided by the product may be impaired.

Registration

Registering your product with Fluke Networks gives you access to valuable information on product updates, troubleshooting tips, and other support services. To register, fill out the online registration form on the Fluke Networks website at **www.flukenetworks.com/registration**.

Contacting Fluke Networks

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- Hong Kong: 852 2721-3228
- Japan: 03-3434-0510
- Korea: 82 2 539-6311
- Singapore: 65 6799-5566
- Taiwan: (886) 2-227-83199
- USA: 1-800-283-5853
- Anywhere in the world: +1-425-446-4519

Visit our website for a complete list of phone numbers.

<div align="right">

Chapter 2
Operation

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⚠ ⚠ Warning

When connecting to metallic network wires, handle alligator clips by insulated boots.

Keys

Table 2-1 describes the TS1200 Test Set keys. Figure 2-1 shows icons associated with some of the keys.

Table 2-1. TS1200 Keys

Key	Description
Power	Allows the user to apply power to and remove power from the test set. The Power key is recessed to avoid accidental power down. To turn the test set off, press and hold the Power key. The test set automatically powers down after the user-selected timeout period without activity.
Home	The Home key offers the user a quick return to the Home menu. This allows the user to select POTS or ADSL mode, and to set or check the system's configuration.
Light	Press the Light key to backlight the menu display (LCD) and the keypad for easier viewing in dark areas. Press the Light key again to turn the backlight off. The backlight turns off automatically if the keypad isn't used for the user-selected period.
POTS/ADSL	The POTS/ADSL key allows the user to toggle between POTS and ADSL modes.
SPD Dial	The TS1200 allows the storage of 10 speed dialing numbers in ten memory locations (1 through 9 and zero). Each location will store up to 23 digits. If an attempt is made to store more than 23 digits, only the first 23 are stored. The number field is capable of displaying 19 digits. When more than 19 digits are stored, the digits shift to the next row with each digit entered.

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Table 2-1. TS1200 Keys (continued)

Key	Description
Up/Down Arrow Keys	The Up/Down arrow keys have two functions: to move the user through options and to control the speaker volume.
	In Speed Dial, Saving Reports, or Bits per Bin screens, the Up/Down arrow keys are used to move the cursor through a list of options depending on the context on the display.
	In all other displays, pressing the Up/Down arrow keys toggles the sound level of the test set's active receiver between Normal and High volume. Changing volume only affects the volume of received signals. It does not affect the volume of transmitted signals.
Soft Function Keys	The three soft function keys are located below the LCD and their function changes depending on the context on the display. The three soft keys are labeled **F1**, **F2**, and **F3**.
Speaker	The Speaker key is labeled SPKR. Pressing the Speaker Key allows the user to turn the speakerphone on or off.
	Note
	The transmitter is muted when the speaker is on.
Pause/Mute	The Pause/Mute key is a dual function key which can be used to mute the microphone or insert a pause (comma) into speed dialing numbers.
	The Pause feature allows the user to insert a pause (comma) into speed dialing numbers. This is required when dialing out through a system that provides a second dial tone (e.g., PBX). To obtain a pause (comma), press and release the Pause/Mute key.
	To mute the microphone (handset or speaker), press and hold the Pause/Mute key for one second or more.
Numeric Keypad	The numeric keypad is used to dial telephone numbers and make menu selections. The numeric keypad includes 12 standard dialing keys including the asterisk (✻) and pound (#) keys.

Icons

Figure 2-1 shows the icons used on the TS1200 Test Set screens, and Table 2-2 describes the icons.

bdx01.eps
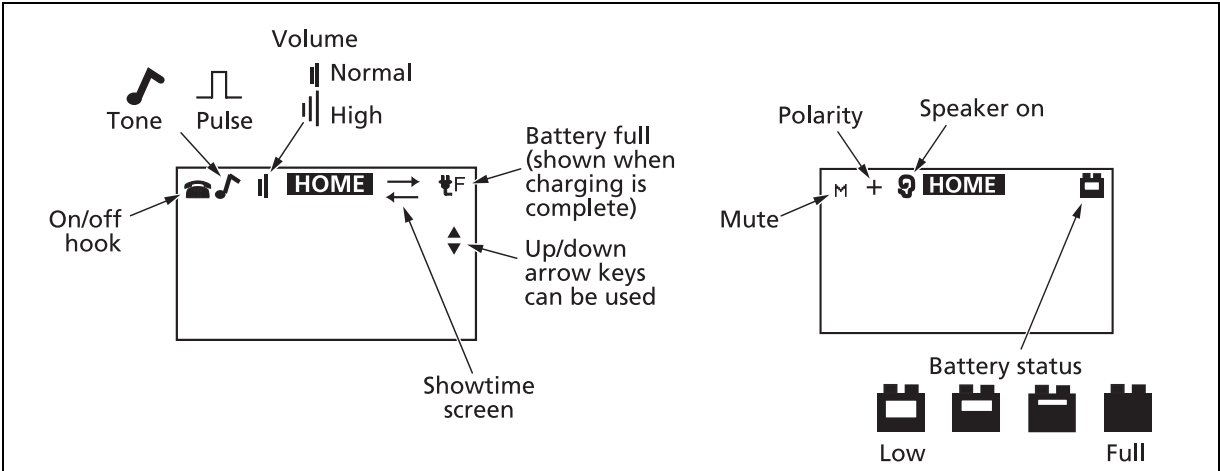
Figure 2-1. TS1200 Test Set Icons

Table 2-2. Icon Descriptions

Icon	Description
Polarity	When the test set is connected to a line with DC voltage, one of the two Polarity icons indicates the DC polarity of the line. The plus (+) icon indicates the red test lead is connected to the Ring (negative) side of the line and the black test lead is connected to the Tip (positive) side of the line. The minus (-) icon indicates the test leads are reversed; that is, with the red test lead connected to the Tip (positive) side and with the black test lead connected to the Ring (negative) side. Nothing is shown when the leads are disconnected or the line is not powered.
Battery	Battery icons indicate the battery status. The lowest battery level icon is accompanied by a short beeping sound. When this battery icon appears, you have approximately 15-20 seconds of operating time left before the test set automatically powers off. Refer to Chapter 3 for more information on the low battery condition.
Battery full	The charging screen is displayed when batteries are being charged (4 to 5 hours to charge when batteries are completely dead). When charging is complete, the full charge icon (F) is displayed in the upper right-hand corner of the LCD display.

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<div align="center">**Table 2-2. Icon Descriptions (continued)**</div>

Icon	Description
Speaker	A speaker icon appears when the Speaker is on.
On/Off Hook	The test set displays a telephone in the upper left-hand corner of the LCD screen that indicates when the test set is on or off hook.
Volume	Normal volume is represented by two parallel lines on the LCD screen. High volume is represented by three parallel lines.
Mute	Mute is represented by an M in the upper left-hand corner of the LCD screen.
Tone/Pulse	Tone is represented by a musical note at the top of the LCD screen. Pulse is represented by a square wave at the top of the LCD screen.

Connecting the TS1200 to an ADSL Line

Figure 2-2 shows a typical ADSL over POTS connection from a Central Office (CO) to the customer's premises. A TS1200 in Monitor mode may be connected to the Tip and Ring pair, at any point in the connection, without interfering with the services on the line while ADSL tests are not running.

The TS1200 may be used in Talk mode at locations on the line carrying only voice or voice and data. Attempting to put the TS1200 in Talk mode on the portion of the line carrying voice and data will result in a data lockout. The test set will not go off hook until the data lockout is overridden (See POTS Mode Features).

The ADSL test functions in the TS1200 may be used at locations on the line carrying only data or voice and data. However, the TS1200 ADSL tests will not run properly if the ATU-R is active. Running the ADSL tests while the ATU-R is active may cause it to loose synchronization.

<div align="center">*Notes*</div>

Running the ADSL tests in the middle of a line may result in low data rates or no showtime, depending upon the length and condition of the line between the TS1200 and the customer's premises. Open the line between the TS1200 and the customer's premises to improve the ADSL connection.

Data rates obtained in the middle of a line will not be the same as data rates obtained at the customer's premises.

Achieving showtime in the middle of a line does not guarantee that showtime can be achieved at the customer's premises.
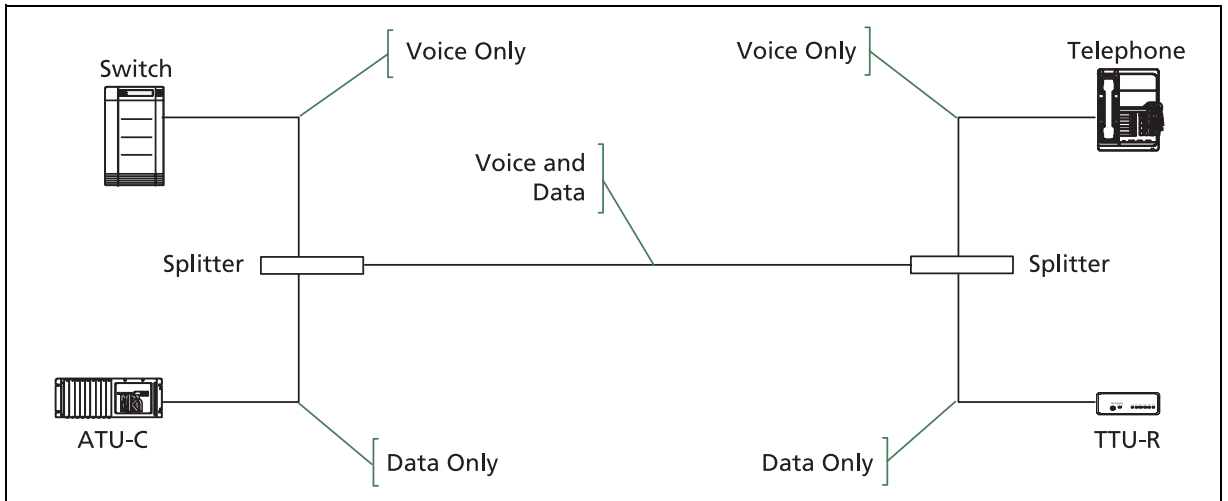
bdx02.eps

Figure 2-2. Line with Both ADSL and POTS

Using ADSL Mode

The TS1200 performs either Auto or Manual ADSL tests.

In ADSL mode, the user can maintain an active POTS call.

To enter ADLS mode, press **2** on the Home Screen (the first screen displayed upon powering up the unit) or press the **POTS/ADSL** key.

Note

*Pressing the **Home** key at any screen will return you to the Home screen.*

Change ADSL Mode	1 Press **F2 - MODE**.
	2 Press either **1 - Multi-Mode** or **2 - G.LITE**.
Auto Test	Auto test allows the user to take a snapshot of the ADSL line status at a particular time. Once data is collected, the test is terminated and results are displayed.
	To start Auto test, press **F1** - **Auto**. The screen indicates that test set is attempting a connection.
	To stop Auto test, press **F2** - **Discon**.

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Auto Test Showtime	Once a connection is made and the test is complete, the ADSL test results are shown on the screen. The user can scroll through the test data using the **Up/Down** arrow keys. The user may also transition to screens displaying either Bits Per Bin Graphs or Alarm Status.
Manual Test	Manual test allows the user to test the ADSL service until manually terminated. The results are continuously updated and displayed until the user terminates the test.
	To start Manual test, press **F3** - **Manual**. The screen indicates that the test set is attempting a connection.
	To stop Manual test, press **F2** - **Discon**.
Manual Test Showtime	Once a connection is made and the results have been collected, the data is shown on the screen. There is an activity counter that is an elapsed time counter. The maximum time allowed for the elapsed counter is 99:59. The user can:
	1 Scroll through the test data using the **Up/Down** arrow keys.
	2 Make a selection from the Showtime Display screen to transition to screens displaying Bits Per Bin Graphs or Alarm Status.
Auto and Manual ADSL Test Results	The following obtained upstream and downstream results are shown on both the Showtime Display screens for Manual Test and Auto Test:
	MaxB/R (Maximum Bit Rate): Displays the maximum attainable bit rate. Results are presented in kbits/s. The measured values for upstream and downstream should be greater than or equal to the minimum bit rate set in the ATU-C.
	B/Rate (Bit Rate): Displays the achieved Fast bit rate data path. Results are presented in kbits/s. The measured values for upstream and downstream should be greater than or equal to the minimum bit rate set in the ATU-C. The result may be 0 if the Interleaved data path has been enabled by the ATU-C
	Capac: Displays the capacity of the line as a ratio of achieved bit rate (B/Rate or IntB/R) over the maximum attainable bit rate. Results are presented as a percentage (%). A lower capacity reading generally implies greater noise immunity.
	IntB/R (Interleaved Bit Rate): Displays the achieved interleaved bit rate. Results are presented in kbits/s. The measured values for upstream and downstream should be greater than the minimum bit rate set in the ATU-C. The result may be 0 if the Fast data path is turned on in the ATU-C.
	NseMar (Noise Margin): Displays the realized noise margin. This is the amount of increased noise relative to the measured noise power that the system would be able to tolerate to maintain a bit error rate less than 10^7. Results are presented in dB. The industry standard is for a minimum value of 6 dB.

Auto and Manual ADSL Test Results (continued)	**Out Pwr (Output Power):** Displays the aggregate power which is a measure of total output power. Results are presented in dBm. Typically the power output is the minimum required to achieve the noise margin that the ATU-C had been configured for.
	Atten (Attenuation): Displays the total attenuation. The attenuation is the measured difference in dB between the power transmitted at the near end and received at the far end. Any value reported by the TS1200 that is greater than 31 dB should be interpreted as 31 dB or higher.
Alarm Status	The Alarm Display provides information on loss of signal (LOS), loss of frame (LOF), loss of power (LOP), and loss of margin (LOM). Information is provided for both Near and Far end of the line, if available. Alarm status can be viewed from either Auto or Manual Test. The user can also clear all alarms.
	To access the Alarm Status display press **F1** - **Alarm**.
	To clear an active alarm, press the **F1** - **Clear**.
	To return to the previous screen, press **F3** - **Prev**.
Bits Per Bin Graph	A Bits Per Bin Plot is displayed. The user can scroll through the plot using the **Up/Down** arrow keys. A bin cursor is provided at the bottom of the display screen. The Bits Per Bin Graph can be selected from either Auto or Manual Showtime screens.
	Each bin represents a 4.1 KHz frequency range and may be used to transfer up to 15 bits in a single direction. Bins 0 through 6 separate ADSL from the POTS band and carry no data. Bins 7 through 31 carry upstream data. Bins 32 through 37 separate the upstream and down-stream data. Bins 38 through 255 may carry downstream data.
	To display a data graph from the Showtime Test Results screen, press **F2** - **Graph**. The graph is displayed.
	To indicate the desired Bin, press **F1** - **<** and move the screen to the left or press **F3** - **>** and move the screen to the right. The cursor will move below the graph.
	To pan to the right, press the **Up** arrow key for full page. To pan to the left, press the **Down** arrow key for full page.
	To return to the previous screen, press **F2** - **Prev**.

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Saving Test Results	The user can save the test results or print out the results. Save Results can be selected from either Auto or Manual Test.
	To save or print the results:
	1 From the Showtime Test Results screen, press **F3 - Exit.**
	2 Press **F1 - Yes.**
	3 Press **F2 - Edit.**
	4 Move cursor to either Name or Number using **Up/Down** arrow keys.
	5 Make entry and press **F1 - Save**. The results are automatically saved.
	See "Downloading Stored Results to a PC" for instructions on sending stored results to a PC.

Using POTS Mode

Note

*Pressing the **Home** key at any screen returns you to the Home screen.*

POTS mode can be entered by selecting **1** on the Home Screen (the first screen displayed upon powering up the unit) or by pressing the **POTS/ADSL** key.

POTS Mode Features

Monitor Mode

Monitor mode is for audio monitoring of the Tip and Ring pair while on hook. In Monitor mode, the test set has a high input impedance, which allows monitoring of the line without disrupting conversations or data signaling if present. The test set draws no direct current from the line and it transmits no signals to the line.

In the Monitor mode, the test set is typically used to perform one or more of the following procedures:

- Verification that a line is idle when looking for a line to borrow
- Listening for noise on the line
- Hunting for tracer tones
- Performing a test for the presence of high frequency data on the line

⚠Caution

When testing circuits that are close to a battery source, the pops in the handset receiver that result from clipping onto a line may be quite loud. Although there is protection against acoustic shock built into the test set, if the receiver is held tightly against the ear, acoustical shock may occur. The TS1200 Test Set is designed to rest comfortably on the shoulder with the receiver away from the ear. It should be used in this position when working close to a battery source.

Talk Mode

When switched to Talk mode, the TS1200 goes off hook and draws dial tone. When off hook, the test set operates like a standard telephone; it is typically used to verify the proper operation of a voice telephone line or to establish temporary communications on a "borrowed pair".

Data Lockout

During the transition between Monitor and Talk modes, a sub-mode may be entered if data is present on the line. This sub-mode is referred to as Data Lockout mode. In the Data Lockout mode, the unit is kept on hook, or locked out, despite having been switched to Talk mode. Data Lockout mode is provided to help prevent accidental corruption of a data transmission while working on the lines. The lockout may be overridden and the test set taken off hook, despite the presence of data, if the user desires to.

Note

When the TS1200 ADSL modem is active, data lockout will not occur.

Data Lockout Override

The following are scenarios where the operator may wish to override a data lockout:

- When there is false data detection due to RF pickup on a line that is near an AM radio broadcast antenna. The RF induced in the line may appear to be data.

- When accessing POTS on a subscriber line that carries both ADSL and POTS.

Telephone lines near AM radio broadcast facilities, pick up the RF signals from the broadcast antennas. Normally this isn't a problem for the TS1200. If the line is well balanced, the TS1200 will not see the RF signal because it is a common mode (longitudinal) signal. But if the line isn't well balanced, a portion of the RF signal will be converted to a differential (metallic) signal. If the signal amplitude is high enough, it may be detected as high-speed data by the TS1200. If you know for sure you are on such a line, use the unit's override capability to go off hook.

Note

Lockout override can be activated only when the test set is locked out.

To activate data lockout override, press **F1 - Ovride** from the Data Lockout screen. If DC voltage is present on the line, the test set stops alarming and goes off hook, allowing the user to perform normal Talk mode functions.

To go back on hook, select **F2 - Hangup**. This puts the test set back in Monitor mode. The override must be manually reactivated each time the user wants to take a locked-out test set off hook.

⚠ Caution

Shorting the Tip and Ring leads together while connected to a data line causes disruption to the data.

POTS Mode Operations

Making a call on the POTS portion of the line	You can make calls on lines that have ADSL as well as those that do not. You can also make calls while simultaneously testing the ADSL portion of a line. Use the POTS/ADSL key to toggle between POTS and ADSL.
Originating a Call	To originate a call:
	1 Clip the test set to Tip and Ring of a powered subscriber loop.
	2 Monitor (listen to) the line to verify it is idle.
	3 If not idle, disconnect the test set from the line.
	4 If idle, go to the POTS screen.
	5 Press **F2 - Talk**. The test set automatically tests for high-speed data and talk battery on the line.
	6 If data is detected, the test set will not go off hook (will lockout) and will beep indicating the presence of data. Try another line, or if you are sure the data detection is false, you can override the data lockout (see Data Lockout Override).
	7 If no data is detected, the test set will go off hook.
	8 The numeric keypad, LNR (F3), or SPD Dial may be used to dial a number for originating a call.
	To disconnect a call, press **F2 - Hangup**.

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Answering a Call	To answer an incoming call: **1** If a ringing signal is received, go to the POTS screen and press **F2 - Talk**. The test set automatically tests for high-speed data on the line. **2** If no data is detected, the test set will go off hook. **3** If data is detected, the test set will lock out and alarm. **4** To go off hook with data present (this would most likely be an ADSL line), press **F1 - Ovride**. To disconnect a call, press **F2** - **Hangup**.
Speed Dial	To use speed dial: **1** Press **SPD Dial** key. **2** Highlight desired location with **Up/Down** arrow keys or number keys. **3** Press **F1** - **Dial**. The test set will go off hook and dial the selected number. *Note* *Pressing and holding **F3 - ERASE** will erase the speed dial entry.* To edit an existing stored number: **1** Select number to be edited with **Up/Down** arrow keys or number keys. **2** Press **F2** - **Edit**. **3** Move cursor to either Name or Number using **Up/Down** arrow keys. **4** Press **F2** - **Bkspce**. Cursor moves backward to delete existing information. *Note* *For alphanumeric entry, use the standard phone keypad. Q and Z are assigned to the 0 key, and a SPACE key assigned to the asterisk (✻) key. To select between the 3 letters of a key, the user presses the key multiple times (e.g., to obtain a **C**, the 2 key is pressed three times).* **5** After the entry is complete, press **F1 - Save**. *Note* *Speed Dial numbers DO NOT automatically go into LNR memory. For example, you call someone who is not in speed dial, hang up, and call someone using speed dial. When you hang up again and press LNR you will dial the first person who was not in speed dial.*

Speed Dial (continued)	To store a new speed dial number: **1** Select an empty number using **Up/Down** arrow keys or number keys. **2** Press **F2 - Edit**. **3** Enter the name in the **NAME** field and the telephone number in the **NUMBER** field. *Note* *For alphanumeric entry, use the standard phone keypad.* *Q and Z are assigned to the 0 key, and a SPACE key* *assigned to the asterisk (∗) key. To select between the 3* *letters of a key, the user presses the key multiple times* *(e.g., to obtain a **C**, the 2 key is pressed three times).* After the entry is complete, press **F1 - Save**.
Hook/Flash	When the test set is in Talk mode, press **F1 - Flash.** A timed interruption of the loop current occurs. Hook flashing is commonly used for call waiting functions on residential lines. Some PBX setups or telephone office switches may use this signal to put a call on hold or to activate some special function. One flash is indicated for each press of **F1**. The default hook flash duration is 600 ms. Holding **F1** <u>does not</u> repeatedly flash the switch hook.
Last Number Redial	Press **F3 - LNR** (Last Number Redialed), while in Talk mode. The last number dialed is displayed on the screen as it is dialed. The last number dialed may be recalled even after powering down the unit. The redial memory has a 23-digit capacity. LNR is not available once off hook dialing has begun. *Note* *Speed Dial numbers DO NOT automatically go into LNR* *memory. For example, you call someone who is not in* *speed dial, hang up, and call someone using speed dial.* *When you hang up again and press LNR you will dial the* *first person who was not in speed dial.*

Load Coil (Optional)	Allows the user to detect unwanted or misplaced loads. To activate load coil detection:
	
	1 At the Home screen, press **1 - POTS.**
	
	2 Press **F3 - LdCoil**. One of the following messages is displayed:
	
	    • Load Coil Not Found
	    • Load Coil Found
	    • Noise/Data on Line
	
	3 If the Load Coil detecting line cord is not installed, the following message is displayed: Detector Not Found.

Configuring Your Test Set

Note

*Pressing the **Home** key at any screen will return you to the Home screen.*

Your test set can be configured by selecting either **3 - POTS CONFIG, 4 - ADSL CONFIG,** or **5 - System CONFIG** on the Home Screen (the first screen displayed upon powering up the unit).

POTS Configuration

The following options can be accessed from the POTS Configuration screen.

Pause Duration	Different systems may require different pause durations to allow enough time for the second dial tone to be returned. On the TS1200 the pause duration can be programmed. The default pause duration is 4 seconds.
	To change PBX Pause duration:
	1 Press **1** - **Pause Duration**.
	2 Use the number keys to select the desired pause length.
	3 Press **F1** - **Accept**.
Flash Duration	The hook flash duration default value is 600 ms. To change the flash duration value:
	1 Press **2** - **Flash Duration**.
	2 Use the number keys to select the desired hook flash length.
	3 Press **F1** - **Accept**.
Speaker Timeout	The loud speaker is one of the largest sources of battery drain in the test set. The battery will be drained quickly if the loud speaker is left on continuously. To extend battery life, the test set has a timeout function that automatically turns off the loud speaker after the timeout period. A timer is started whenever the test set's speaker is turned on. The timer operates in both Monitor and Talk modes.
	The speaker default timeout duration is 1 minute. Remember, the longer the selected timeout duration the shorter the battery life. To change the speaker timeout duration:
	1 Press **3** - **Speaker Timeout**.
	2 Use the number keys to select the desired duration.
	3 Press **F1** - **Accept**.

Tone/Pulse	The Tone/Pulse feature is used to switch between tone and pulse dialing. It is only active when the test set is off hook. Any time the test set goes off hook, the TS1200 is automatically set to tone dialing. To change the tone/pulse selection:
	1 Press **4** - **Tone/Pulse**.
	2 Press either **1** -**Tone** or **2 - Pulse**.
	3 Press **F1** - **Accept**.
Factory Defaults	The Defaults function allows the user to restore all programmable features to their original factory settings. Performing this function does not clear stored telephone numbers.
	The defaults are:
	• Pause Duration: 4 seconds
	• Hook Flash Duration: 600 ms
	• Speaker Timeout: 5 minutes
	• Tone/Pulse: Tone
	To reset factory default values:
	1 Press **5** - **Defaults**.
	2 At the prompt **Erase Your Data?,** use the number keys to select either **1** - **No** or **2** - **Yes**.
	3 Press **F1** - **Accept**.

System Configuration

The following options can be accessed from the System Configuration screen.

Light Timeout	The default light timeout is 5 seconds. To change the light timeout length: **1** Press **1** - **Light**. **2** Use the number keys to select the desired light duration. **3** Press **F1** - **Accept**.
Contrast Control	To adjust the LCD contrast from darker to lighter: **1** Press **2** - **Contrast**. **2** Press **Up** arrow key - **Darker** or **Down** arrow key - **Lighter**. **3** Press **F1** - **Accept**.
Power Timeout	The default value is 2 minutes. To change power timeout length: **1** Press **3** - **Power Timeout**. **2** Use the number keys to select the desired light duration. **3** Press **F1** - **Accept**.
Factory Defaults	The Defaults function allows the user to restore all programmable features to their original factory settings. Performing this function does not clear stored telephone numbers. The defaults are: • Light Timeout: 5 seconds • Power Timeout: 2 minutes To reset factory default values: **1** Press **5** - **Defaults**. **2** At the prompt **Erase Your Data?**, use the number keys to select either **1** - **No** or **2** - **Yes**. **3** Press **F1** - **Accept**.

ADSL Configuration

The following options can be accessed from the ADSL Configuration screen.

Firmware Version	To view current Firmware versions: **1** Press **1 - Firmware Version**. The ADSL, POTS, and Bootloader versions are displayed. **2** Press **3 - Prev**.

Stored Results	To view, erase, or send stored results to a PC:
	1 Press **2 - Stored Results**.
	2 Press **F1 - Send**.
	3 Press **F2 - View**.
	4 Press **F3** - **Prev**.
	5 If **F2** - **View** is selected,
	
	    • Press **F1** - **Send**.
	    • Press **F2** - **Erase**.
	    • Press **F3** - **Prev**.
	
	See "Downloading Stored Results" from the TS1200 to a PC for more information.
	To erase stored results, **F2 - Erase** must be held for at least one second.

Downloading Stored Results to a PC

Connecting to a PC

To prepare your TS1200 Test Set for downloading test results to a PC:

1   Loosen the four retaining screws on the back cover of the TS1200 and remove the cover.

2   The TS1200 comes with a RS-232 plug and a 7 foot long RJ-11 to RJ-11 cord. Attach the RS-232 plug to the RJ-11 to RJ-11 cord. Insert the other RJ-11 plug into the RJ-11 jack located above the battery housing on the TS1200.

3   Connect the RS-232 plug to a COM port on the back of your PC (if you have a PalmPilot™ or other device hooked up to your COM port, you will have to remove it first).

Setting Up the PC Port

The TS1200 can transfer test results to a PC configured to receive data at 9600/8/N/1 without flow control. This section describes how to use Windows® HyperTerminal to configure a PC to receive data from a TS1200.

To prepare a Windows PC for uploading test results from your TS1200:

1   Start the HyperTerminal application on the PC. For example, on Windows 95 select **Start, Programs, Accessories, HyperTerminal**, then select the HyperTerminal icon. For other Windows versions, see the Windows online help for the location of Hyperterminal.

2   In the Hyperterminal **Connection Description** dialog, enter a name for the TS1200 connection, select an icon from the list of icons, then click **OK**.

3   In the **Connect To** dialog, for the **Connect Using** field, select the port the TS1200 is connected to, then click **OK**.

4   In the COM1 properties dialog, enter the following settings then click **OK: Baud=9600, Data Bits=8, Parity=None, Stop Bits=1, Flow Control=None**.

Downloading Results

To download results from the TS1200:

1   Turn on the TS1200

2   Select **4 - ADSL Config, 2 - Stored Results**.

3   Use the arrow keys or the numeric keypad to select the results you would like to transfer (1-5). Optionally, select **F2 - View** to view the results on your TS1200 (see Figure 2-3).

4   On the TS1200, press **F1 - Send** for each result you want sent. The results will be sent to the PC.

5   If no data is seen, make sure that HyperTerminal is set up correctly. Retry downloading the data again. If there is still no data showing in HyperTerminal, make sure that the correct cable and RJ-11 to DB-9 serial adapter are being used.

6   When data is showing in HyperTerminal, you may print or store the results.
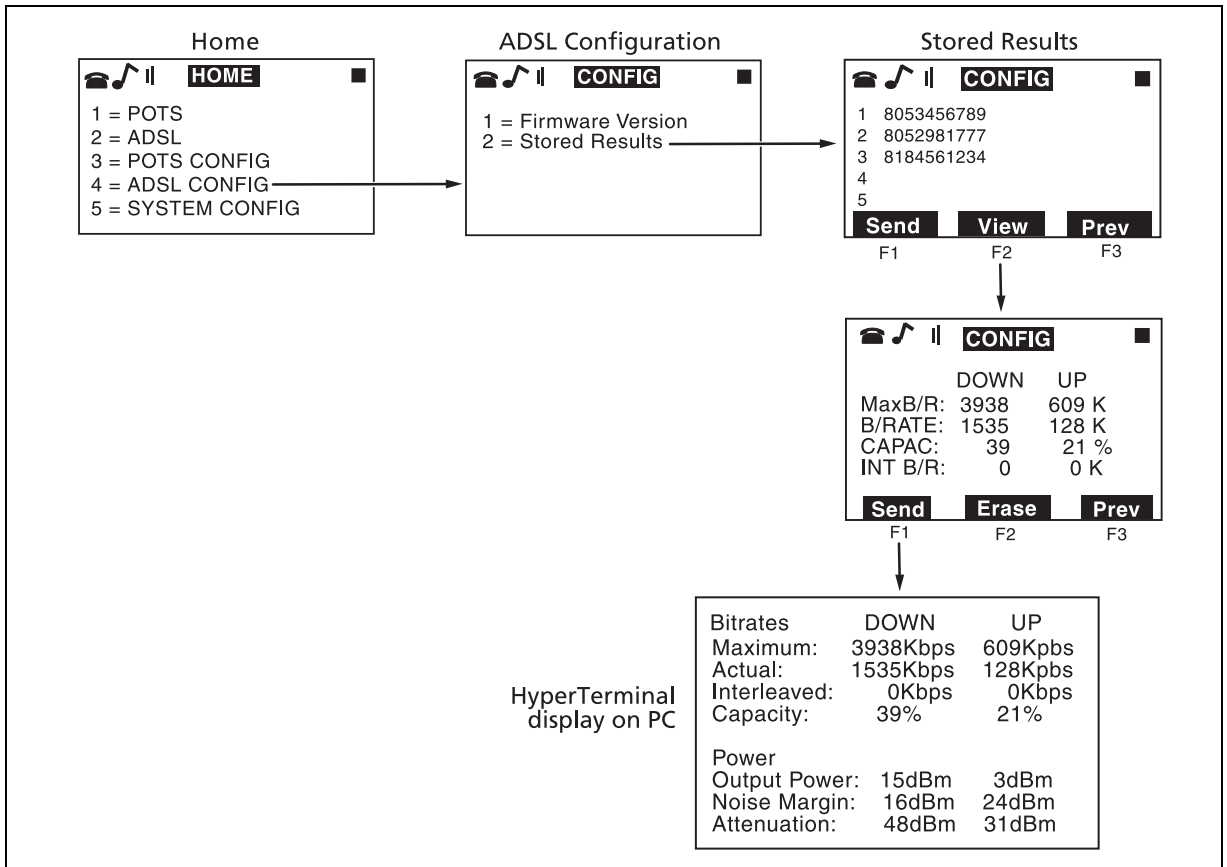
bdx03.ups

Figure 2-3. Selecting and Downloading Stored Results

Chapter 3
Maintenance and Specifications

Safety Information for Maintenance

⚠️⚠️Warning

Disconnect clips from any metallic connections before performing any maintenance. Read all instructions completely and understand possible hazards to end user if service is not performed by authorized service personnel.

Use only specified replacement parts for maintenance.

Cleaning

Clean the display with glass cleaner and a soft, lint-free cloth.

Clean the case with a soft cloth dampened with water or water and a mild soap.

Clean the keypad with a soft toothbrush and soap and water.

⚠️Caution

Do not use CRC Cable Clean® or any similar chlorinated solvent on the TS1200 Test Set. Doing so will damage the Test Set.

Do not use a petroleum-based cleaning agent on the keypad as it will harm the keypad.

Safety with Batteries

♻*Note*

Dispose of batteries in accordance with local regulations.

⚠ Warning

To reduce the risk of fire or injury when recharging, replacing, or otherwise handling the batteries:

Do not allow the terminals to be shorted together. Severe burns or explosions can result. Handle and dispose of batteries properly to ensure contacts cannot short.

Do not mix batteries of different types, sizes, or from different manufacturers in this product.

Do not mix old and new batteries in this product.

Do not dispose of batteries in a fire. The batteries may explode. Check with local codes for special instructions.

Do not attempt to recharge alkaline batteries. The batteries may leak corrosive electrolyte or explode.

Do not open or mutilate the batteries. Released battery electrolyte is corrosive and may damage the eyes or skin. Released electrolyte may be toxic and can cause poisoning if swallowed.

⚠ Caution

Do not charge batteries when the temperature is below 0°C (32°F) or above 45°C (113°F). Charging outside this temperature range may shorten the life of the batteries.

Remove the batteries if the Test Set will be unused for 60 days or more. Batteries may leak in the Test Set during long-term storage.

Charging the Batteries

The TS1200 Test Set is designed to operate on either four NiMH batteries or four AA alkaline batteries. An AC adapter (12 VDC ±10%, 600 mA) or a car adapter may be used to charge the NiMH batteries.

If NiMH batteries are installed, charging begins when the AC or car adapter is connected. Do not use the Test Set while the batteries are charging. The charger cannot supply enough power under certain modes of operation.

The NiMH batteries should be cycled (fully charged, then fully discharged) two or three times before first use. When fully charged, the NiMH batteries can power the test set for 8 to 10 hours of standard operation. A single charge should last the user an entire day assuming the test set is turned off much of the time.

To prolong battery life, connect the adapter/charger while the test set is not in use. If the test set will not be used for at least 1 day, remove the batteries or connect the charger.

To charge the NiMH batteries:

1   Connect the AC adapter/charger to the TS1200 Test Set; then plug the AC adapter/charger into a 120 VAC wall plug (ordinary household current).

    While the test set is charging, the Home screen displays this message: **Charging. To use TS1200 unplug the charger.**

Note
When the adapter/charger is plugged in, the test set cannot be used.

2   When the batteries are full, the **F** icon appears on the screen next to the charger plug icon.

Replacing the Batteries

Use one of the following types of batteries:

• 4 NiMH rechargeable batteries supplied with the TS1200 Test Set
• 4 AA alkaline batteries

To replace the batteries:

1   Turn the test set off and disconnect the AC adapter/charger from the test set, if attached.

2   Place the test set on a protected work surface, face down.

-continued-

3   Using a flat-blade screwdriver, loosen the four battery door screws; then remove the battery door.

Note

Battery door screws are captive.

4   Remove the old batteries and dispose of them properly.

5   If replacing NiMH batteries with alkaline batteries, first pull the movable wall out of its slot (see Figure 3-1) and move the wall forward to the first slot. Make sure the wall fits correctly into the slot. Be careful not to break the leads of the white cable ribbon behind the wall.

6   Insert 4 new NiMH or 4 alkaline batteries, placing them so that their positive contacts point towards the plus (+) symbol in the case. Reversing one or more batteries can create a charging circuit for the other batteries, which may result in leakage or explosion.

7   Place the battery door on the test set and fasten the four screws securely.
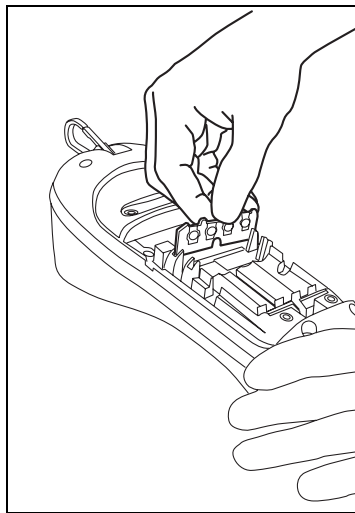
bdx05.eps

Figure 3-1. Removing the Movable Wall

Replacing the Belt Clip

The TS1200 Test Set belt clip can be replaced by the user if it becomes damaged or worn. To get a replacement belt clip, contact your local Fluke Networks distributor.

To replace the belt clip:

1   Using a Phillips screwdriver, remove the two screws that secure the belt clip to the test set housing (see Figure 3-2).

2   Remove the old belt clip and replace with a new one.

3   Secure the belt clip assembly to the test set housing with the original screws. Be careful not to over tighten the screws.
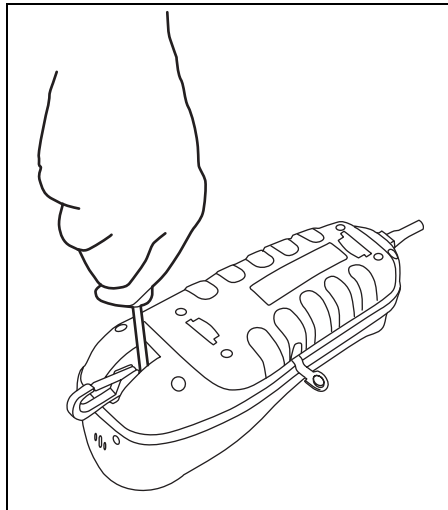
bdx06.eps

Figure 3-2. Replacing the Belt Clip

Replacing the Line Cord

⚠️⚡**Warning**

Disconnect from the telephone network when replacing the line cord.

The line cord can be replaced by the user. To get a replacement line cord, contact your local Fluke Networks distributor.

To remove the old line cord:

1   Turn the Test Set off and disconnect the AC adapter/charger from the test set, if attached.

2   Place the Test Set on a protected work surface, face down.

Note

Cover screws are captive.

3   Using a flat-blade screwdriver, loosen the four battery door screws; then remove the battery door.

4   Remove one battery on each side of the line cord relief strap.

5   Using a screwdriver or needle-nose pliers, pry up the plastic clip that holds the line cord relief strap in place (Figure 3-3, left); then remove the clip (Figure 3-3, right).

6   Disconnect the RJ-45 modular connector from housing on test set (see Figure 3-4, left).

7   Slip the line cord out through the hole in the end of the test set.
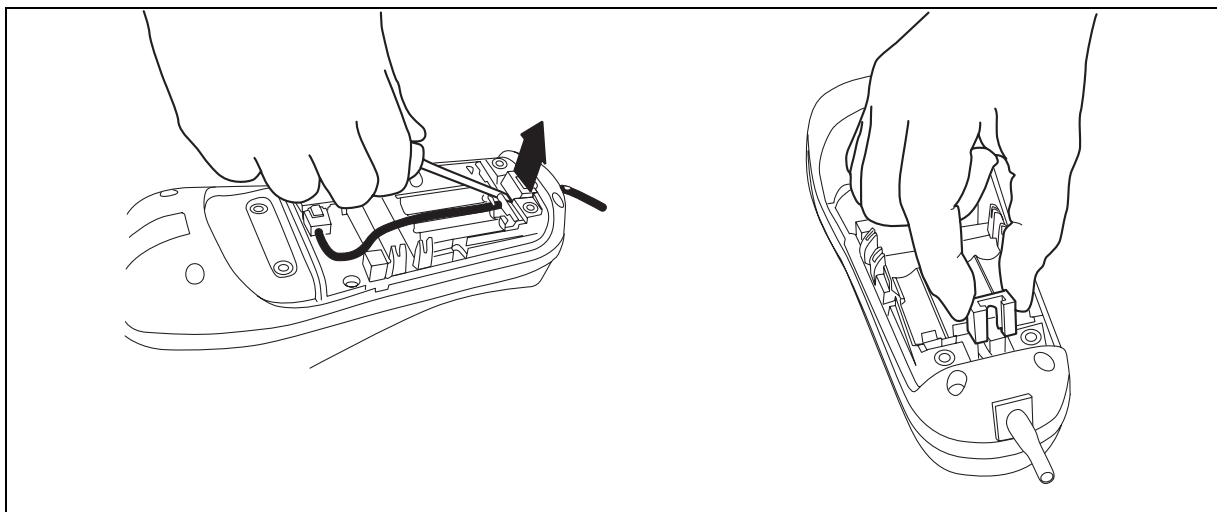
bdx07.eps

Figure 3-3. Prying Up and Removing/Installing the Plastic Clip

To install a new line cord:

1   Carefully slide the modular connector of a new line cord through the hole in the end of the test set. Do not damage the connector pins or plastic tab.

2   Lay the line cord inside the groove in the bottom of the test set housing (see Figure 3-4, right).

3   Connect the RJ-45 modular connector of the line cord in the housing on the test set (see Figure 3-4, left).

4   Insert the plastic clip over the line cord strain relief at the base of the test set housing (see Figure 3-3, right) and snap tightly into place.

5   Replace the batteries on each side of the line cord strain relief.

6   Place the battery door back on the test set and fasten the four screws.
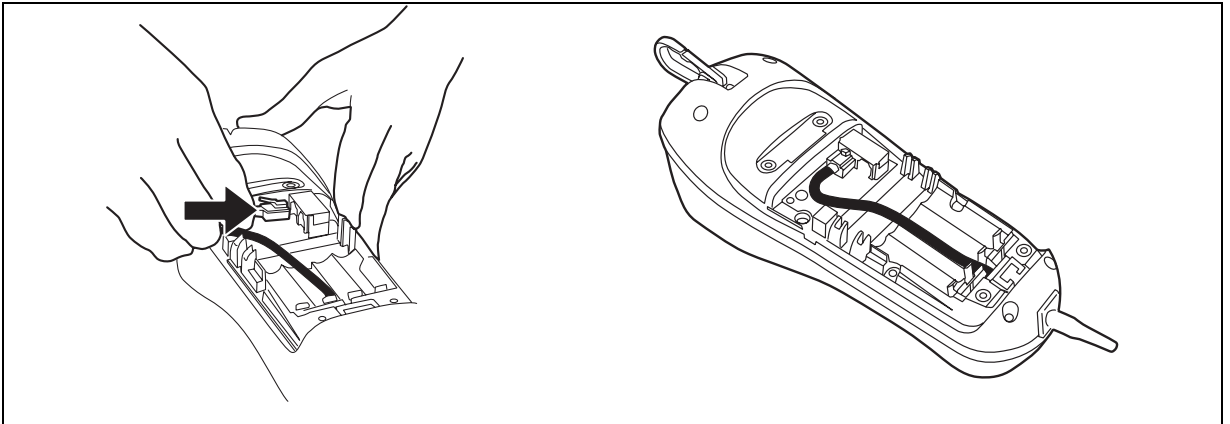
bdx08.eps

Figure 3-4. Line Cord Connector and Cord Placement

Accessories

Table 3-1 shows accessories available for the TS1200. To order accessories, contact your local distributor or Fluke Networks as described in Chapter 1.

Table 3-1. TS1200 Accessories

Description	Fluke Networks Model Number
Angled Bed-of-Nails Cord (ABN)	P3218234
Load Coil Standard Line Cord (STD) with Piercing Pin Clips	P2583019
Load Coil Line Cord (LC/OSP)	P2583119
Load Coil Line Cord (LC/CO)	P2583124
Belt Clip	P3218249

Specifications

Table 3-2 lists the specifications for the TS1200 Test Set.

Table 3-2. Specifications

Electrical	
Current Range (Off-Hook)	15 mA to 100 mA
DC Resistance	
Off-Hook	150 Ω nominal
On-Hook	>1 MΩ
AC Impedance	
Off-Hook	600 Ω nominal; 300 Hz to 3400 Hz
On-Hook	>120 kΩ; 300 Hz to 3400 Hz
Rotary Dial Output	
Pulsing Rate	10 pps ±1 pps
Break/Make Ratio	60/40 ± 5%
Interdigit Interval	>300 ms
Resistance During Break	>100 kΩ

Table 3-2. Specifications (continued)

DTMF Output	
Tone Frequency Error	±1.5 % maximum
Tone Level	-3 dBm combined (typical)
High versus Low Tone Difference	2 dB ± 2 dB
Memory Capacity	
Memory Capacity	10 speed dial memories plus one last number redial memory
Digit Capacity	23 digits per memory
PBX Pause Duration	User programmable; default = 4 seconds
Hook Flash Duration	User programmable; default = 600 ms
Automatic Speaker Shut Off Duration	User programmable; default = 5 minutes
System Power Timeout	User programmable; default = 30 minutes
Battery Type and Life	NiMH: 8 to 10 hours standard operation Alkaline battery (AA): 10 to 12 hours standard operation
Charge Time	Approximately 4 to 5 hours
Data Detection and Lockout Capability	Twisted pair data services including: T1, E1, ISDN PRI, IDSN BRI, HDSL, SW56, ADSL, IDSL, and SDSL
Physical	
Length	10 in
Width	3.75 in
Height	4.25 in
Weight	2.5 lb
Environmental	
Water Resistance	Designed to be rain and moisture resistant under conditions of inclement weather.
Temperature Range	
Operating Storage	0 °C to +50 °C -20 °C to +70 °C
Altitude	To 10,000 ft (3000 m) max.
Relative Humidity	Noncondensing, 5 % to 95 % RH
Drop	Designed to exceed 6 ft drop.

Table 3-2. Specifications (continued)

Certifications and Compliance
CAN/CSA-C22.2 No. 60950-1-03 CAN/CSA-C22.2 No. 1010.1-92 + CSA-C22.2 No. 1010.1B-97 UL/ANSI 3111-1
Specifications subject to change without notice.

Chapter 4
Troubleshooting

Information Gathering

Problems discovered during or after ADSL service installation may require the technician to locate failures in either the CPE or wiring. When trouble is reported, it is critical that a detailed description of the problem be documented before troubleshooting. For example, customers have been known to forget to turn on the modem. On other occasions, problem resolution may require cutting over a new line because of marginal quality on the original line.

Table 4-1 summarizes four basic questions that should be answered before troubleshooting ADSL service problems.

Potential Failures at the Customer Premises

Once the basic problems covered in Table 4-1 have been ruled out, further troubleshooting should start at the customer premises. If the modem maintains a good connection with the DSLAM, begin by looking for the problem on the PC. The customer may have changed a setting or the IP address accidentally — a common problem when installing a network-related application using the "default" configuration option. If the problem still exists, verify that the account is still active and check for any recent deactivations or work done on the network in the same neighborhood.

<div style="text-align: center">Table 4-1. Basic Troubleshooting Questions</div>

Question	If No	If Yes
Is voice service still functioning on the line?	The problem is probably limited to the ADSL service.	The problem is on the line (i.e., an open circuit).
Does the modem indicate synchronization with the DSLAM?	Isolate the failure using an ADSL test set.	The problem is probably an incorrect configuration on the PC, or a failure in the ISP network.
Does the modem work sporadically or only at certain times of the day?	Isolate the failure using an ADSL test set.	There may be periodic radio frequency (RF) interference from equipment or other high frequency sources. Contact the ADSL help desk and try reconfiguring the line with better noise margin (this may also decrease the maximum connection speed and effective bit rate.
(External Modem only) Is the modem correctly connected to the PC and the power turned on?	Reconnect the modem and turn it on.	Isolate the failure using an ADSL test set.

If a problem with the PC can be ruled out, disconnect the modem from the wall jack, terminate the line with the test set and run a modem emulation test. If the test set synchronizes with the DSLAM, the customer's ADSL modem may be defective. Connect another ADSL modem and try to establish a connection.

If terminating the line with the test set fails to establish synchronization with the DSLAM (when connected at the same point as the customer's modem), try to isolate the failure between the wall jack and the Network Interface Device (NID). If the test set synchronizes with the DSLAM when connected at the NID, the inside wiring is the problem. Confirm the severity of the failure with a test meter and run new wire to the wall jack, if necessary.

Poor bit rate performance may be caused by an excessive number or length of bridged taps in the house. This is especially common with splitterless ADSL, which uses bridged taps for voice service. The bit rate can be improved by shortening or reducing the number of bridged taps, or by installing a permanent ADSL/POTS splitter, as shown in Figure 4-1. However, the bit rate should first be verified at the NID and the ADSL jack to determine if the limitation is caused by inside wiring or the outside plant loop conditions.

If the exhibited bit rate is significantly better at the NID, then inside wiring or bridged taps are most likely the problem, and installing a splitter may help (Figure 4-1). G.lite requires the connection of bridged taps, or laterals from the main line for voice service, whereas G.DMT isolates data from the voice service.

Potential Failures in the Copper Loop

If problems at the customer premises can be ruled out, and the test set fails to synchronize with the DSLAM at the NID, the problem is probably in the outside plant. Perform a modem emulation test with the test set terminated on the line at the next upstream access point on the loop (i.e., probably a cross-connection box, a pedestal, or an MPOLE). Continue to the next upstream access point until a successful connection is acquired. At the point where a successful connection is established, check the downstream portion of the loop for loading, bridged taps, resistive faults, or unbalanced capacitance pair.

When all else fails, and the decision is made to cut over another line to repair the problem, ensure that the line has been prequalified for bridged taps and other required conditions, and that load coils are not present. Basic conditioning and supervision tests should then be run on the new line.

As a rule of thumb, run a modem emulation test with the test set at the customer site before closing the repair ticket. This will ensure the line has been properly terminated for service.

Poor POTS Performance on an ADSL Line

If the telephone service is inactive, but the ADSL service is working properly, verify the dial tone with a portable ADSL splitter and the TS1200 at the next upstream access point. Reduce the trouble area and look for continuity on the pair. In the case of one open line, the ADSL service may still be functioning. The DSLAM and the ADSL modem are self-powered, unlike POTS service, which relies on power from the CO (typically 48V DC) and requires the Tip and Rings to be grounded. The short range TDR can be used to locate the fault.
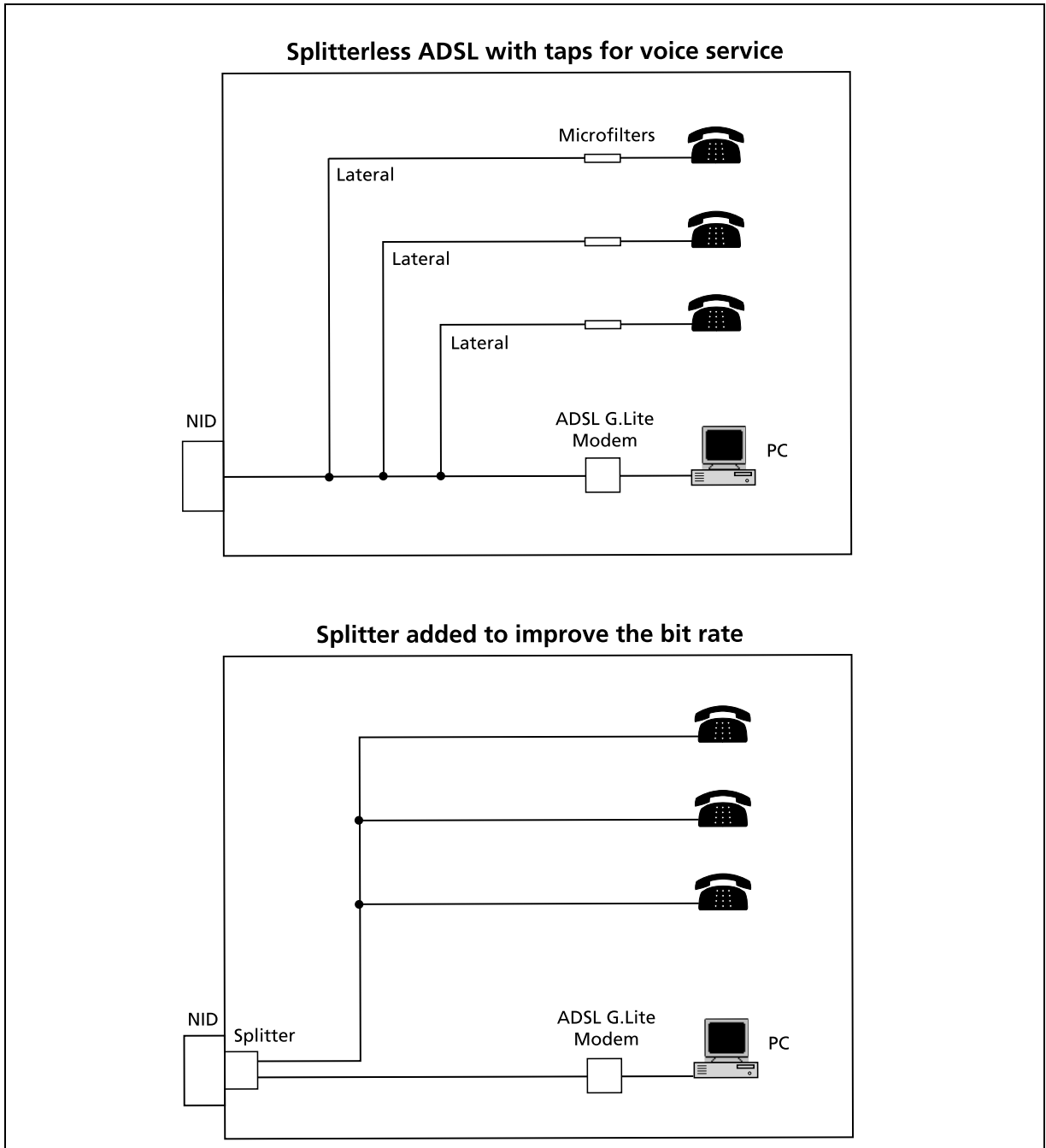
Splitterless ADSL with taps for voice service

Microfilters

Lateral

Lateral

Lateral

NID

ADSL G.Lite
Modem

PC

Splitter added to improve the bit rate

NID

Splitter

ADSL G.Lite
Modem

PC

bdx04.eps

Figure 4-1. ADSL with and without a Splitter

Data Safe Practices

When going from pair to pair searching for tracer tone or dial tone it is best to connect the test set to Tip and Ring of the pairs. Avoid the practice, either in Talk or Monitor mode, of clipping one lead of the test set to ground, and using the other lead to search for tracer tone or dial tone on a block. This may create an electrical imbalance on a data line that will disrupt service. Once you find the voice line you are searching for then it is OK to test Tip to ground or Ring to ground on that line.

Be careful not to short the test leads together if you are connecting to a data line (or any line for that matter), as this could bring down the service.

In general it is best to put the test set in Monitor mode when troubleshooting a line, searching for capacitance kicks, RF signals, craft provided tones, etc.