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## Sage 923LTS User's Guide

## Automated Local Loop Test System

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# Section 1 Introduction

## The Sage Instruments 923LTS

The Sage 923LTS is the field component of the Sage Automated Local Loop Test System (ALTS). The 923LTS initiates loop qualification and benchmark tests between a subscriber site (or any two-wire access point) and a Sage responder located with the telephone equipment at the central office. The Sage 950RTS (or the Sage 356Eplus) performs farend responder functions for the 923LTS.

The 923LTS is designed to be portable and durable, and can function just like a telephone handset.

The 923LTS comes equipped to perform 100 and 102 test line measurements, and performs Perceptual Speech Quality Measurement (PSQM) tests.



## Automated Local Loop Test System (ALTS)

The Automated Local Loop Test System (ALTS) is designed to automatically test local loops. Tests are useful to confirm proper line installation, and to monitor ongoing performance.

ALTS has two components:

1. the Sage 923LTS hand-held unit used in the field
2. a Sage 950RTS (or 356Eplus) responder located in the central office.

A local subscriber can be served by a copper loop, a hybrid fiber coax loop, cable, or a wireless loop. The 923LTS initiates tests, and displays results immediately upon completion. Once a test is selected on the 923LTS, it runs automatically. Test templates installed on the responder determine which tests the 923LTS performs, and each test's pass or fail criteria.

The Sage ALTS system can:

- Test transmission characteristics (e.g., loop voltage, ring voltage, call back verification, connect time)
- Perform a 23 Tones test (e.g., attenuation distortion, 2-wire envelope delay distortion, signal to noise, intermodulation distortion)
- Measure noise and delay (e.g., C-message, C-notched, absolute delay)
- Perform voice quality measurements (using PSQM)
- Perform 100 and 102 test line measurements
- Measure echo return loss

# Automated Local Loop Tests

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The Sage 923LTS performs tests (individually or as part of a test suite) based on the test templates supplied by the Sage responder. These local loop test suites may include the following:

- Ring voltage and frequency
- 3-Tone Gain Slope
- C-Measure Noise
- C-Notch Noise
- Return Loss
- 3kHz Flat Noise
- Phase and Amplitude Jitter
- Impulse Noise and Hits and Droupouts
- 23 Tones
  - Level
  - 23 Tone Loss
  - Envelope Delay Distortion
  - Signal-to-Noise
  - Signal-to-Total Distortion
  - Intermodulation Distortion
- Perceptual Speech Quality Measurement (PSQM)

## Other Tests

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The 923LTS may come equipped with other tests that do not require an ALTS responder. They provide detailed results that can be viewed only on the 923LTS (i.e., results are not collected in the ALTS database). Built-in tests may include:

### 100 Responder Noise Measurement

The 100 responder noise measurement operates with a type 100 quiet termination test line.

### 102 Responder Loss Measurement

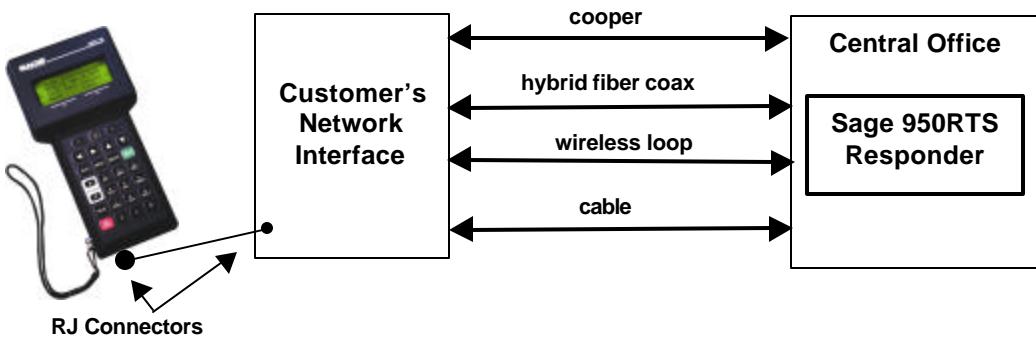
The 102 responder loss test operates with the type 100 milliwatt test line.

### Perceptual Speech Quality Measurement (PSQM)

The built-in PSQM test operates with a Sage PSQM responder.

# The 923LTS Test Environment

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Use the Sage 923LTS hand-held unit in the field to connect to the line being tested. The Interface can be at a customer premises or at any two-wire access point. The 923LTS can connect to customers served by:

- copper loop
- hybrid fiber coax loop
- wireless loop

Using menus on the 923LTS, the technician selects the test or test suite, and then initiates a call to the farend responder (either the Sage 950RTS or 356Eplus). The Sage responder contains instructions for the test sequence, and each test's pass/fail parameters. The selected test runs automatically. At the conclusion of the test, the 923LTS displays an immediate, overall pass/fail notification.

Using menus on the 923LTS, the technician can view the detailed results of each portion of the test. During the test, the technician can listen to the dial tone, progress tones, and other audible sounds. Typically, a test suite takes less than a minute to complete.

The 923LTS stores the results of the 10 most recent tests. Complete test data is stored on the responder.



# Section 2 Getting Started

## Unpacking

In addition to this User's Guide, the following items should arrive with your 923LTS system:

- 923LTS hand-held unit
- AC adapter/power cord
- Connector cable (RJ-48 plug on one end, RJ-11 plug on the other end)
- Banana plug to alligator clip ground cable

## Options

Additional items may be included with your shipment:

- RJ-48 to alligator clips cable/adapter
- RS-232 cable
- padded case with belt loop
- Sage Instruments 923LTS Automated Local Loop Testing System Quick Reference Guide (a laminated card)

## Charging the Batteries

**WARNING:** Use only the AC/DC transformer supplied with the 923LTS to charge the batteries. Other transformers may damage the 923LTS, and void the warranty.

### Initial Charge

The 923LTS comes with rechargeable batteries installed at the factory. Before using the 923LTS for the first time, charge the batteries for two hours.

Calibrating  
Please wait . . .

Battery: 

Do not turn on the 923LTS while the batteries charge for the first time.

3. Make sure the 923LTS is off (i.e., the display is blank and dark).
4. Plug the AC adapter power cord into a 110V AC outlet.
5. Plug in the cord from the AC adapter into the power port on the bottom of the 923LTS. Leave the power cord plugged in for at least two hours to allow the batteries to fully charge.

### Recharging

Each time the 923LTS is turned on, the system checks the batteries.

To fully recharge the battery:

1. Turn off the 923LTS.

2. Plug in the AC adapter to a 110V AC outlet.
3. Plug in the cord from the AC adapter to the power connector on the 923LTS.
4. Allow the 923LTS to charge for two hours.

**NOTE:** You can use the 923LTS while it is connected to the AC adapter unless it is being charged for the very first time.

To ensure that the battery is fully charged:

1. Turn off the 923LTS.
2. Disconnect the AC adapter from the 923LTS.
3. Turn on the 923LTS and note the indicator bars during the booting process.  
Indicator bars reach across the full display when the batteries are fully charged.

## Viewing the Display

The viewing area on the 923LTS displays alphabetic and numeric information on four rows, 20 characters wide. Navigate the screens and menu selections using the keypad.

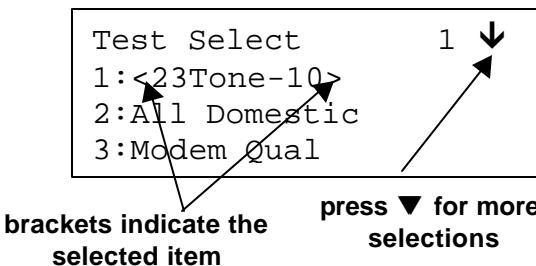
At any time, press the INFO key to display help text or directions.

Sage Instruments
923LTS 1.1400
Self Test Passed
Hit Next to Continue

## Special Screen Display Characters

### Arrows

An  $\uparrow$  (up) or  $\downarrow$  (down) arrow in the upper right corner of the display indicates that additional selections or data are available on other screens. The number next to the arrow indicates which screen is currently displayed. Use the  $\blacktriangle$  or  $\blacktriangledown$  key as indicated in the display to see more selections.



### Blinking Cursor

The blinking cursor indicates an active field waiting for data entry from the keypad.

### < Bracketed Selection >

Brackets indicate the active selection or field. An option enclosed in angle brackets is the default or last option that was chosen. Bracketed options appear on numbered lists as well as F1 and F2 function key selections.

In numbered lists with multiple screens, the bracketed option might not appear on the currently displayed screen. Use the  $\blacktriangle$  or  $\blacktriangledown$  keys to locate the bracketed option.

To select the bracketed option, press NEXT.

The NEXT key advances to the next screen based on the bracketed option, even when the bracketed option is not on the current screen.

# Using the Keypad

## F1 and F2

Use the F1 and F2 function keys for various data entry tasks. For example, F1 and F2 toggle between numeric and alphabetic data entry. In some cases, screen text describes the functions of the F1 and F2 keys. Brackets (<>) indicate the active selection.



## Light Bulb Key

Use the light bulb key to control the display light. While the unit is on, press the key to toggle the light on or off. The light automatically turns off after a few seconds. Define the number of seconds the light remains on using the Backlight Timeout option on the Setup menu.



## ◀▶ Backspace, Delete, and Forward

Press the ▲ key to delete the character to the left of the cursor.

Press the ▶ key to enter a blank space and move the cursor to the right. A blank space in a telephone number represents a 1-second pause in the dialing sequence.

## ▲▼ Up, Down, and Escape

Use the ▲ (Up) and ▼ (Down) keys to scroll through lists that span several screens, or to move to the previous or next screen. You can use the ▲ and ▼ keys whenever an up or down arrow ( $\uparrow$  or  $\downarrow$ ) appears in the upper right corner of the screen display.

In the last screen of a list, only the  $\uparrow$  symbol appears in the display. The final down press returns to the top of the list.

Also use the ▲ and ▼ keys to escape from a data entry field without saving your changes. If you enter data and then press the ▲ or ▼ key, the field reverts to the last saved entry.

## CLR (Clear)

Use the CLR key to erase the current data in a data entry field. Press and hold down the CLR key to display the Main Menu. When a test is in progress, use the CLR key to abort the test.

## INFO

Press the INFO key to display help for the current screen.

## BACK

Press the BACK key to move back one screen or level. Repeated presses on the BACK key eventually display the Main Menu.

## NEXT

From the introductory screens, the NEXT key moves to the next screen or to the first data entry screen.

From a data entry screen, press NEXT to accept the current selection or field contents, and move to the next data entry screen or function.

### Volume Control

During tests, you can hear the sounds produced (e.g., dial tone, call progress tones, etc.). Use the volume control keys to adjust the volume of these sounds. To adjust a sound, press and hold the key *while the sound is audible*. Release the key when you reach the desired level.

### TALK

Use the TALK key when you use the 923LTS as a telephone. (A speaker and microphone are located on the back side of the unit.)

When you press the TALK key, the 923LTS goes off hook and the keyboard functions as a telephone keypad. Press the TALK key again to toggle back to on-hook, and to disable the telephone speaker and microphone.

### ON/OFF

Press the ON/OFF key to turn on the 923LTS. To turn off the 923LTS, *press and hold down* the ON/OFF key until the display darkens.

## Using the Telephone Keypad

The 923LTS telephone keypad performs many functions, and can be used for both alphabetic and numeric data entry. Use the keypad for:

- making menu selections
- entering telephone numbers
- entering other information (e.g., your identification number, names for responder phone lists, and selecting display options)

### Alphabetic and Numeric Data Entry

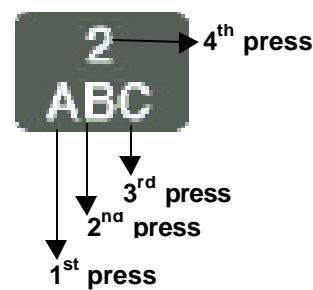
Some data entry fields accept both alphabetic and numeric characters. While the cursor is in a field that accepts both types of characters, use the F1 and F2 function keys to toggle the keypad between the two.

There are two ways to enter alphabetic and numeric characters in a field:

1. toggle the keypad between Alpha and Numeric modes using F1 and F2,  
- or -
2. leave the keypad in Alpha mode and press the same key repeatedly to enter the desired letter or number.

For example, when the keypad is set to alphabetic character entry, the 2 key provides four characters: A, B, C, and 2. The first time you press the 2 key, the "A" displays at the cursor position. A second press within one second displays the "B," a third press a "C," and the fourth press a "2."

Press NEXT to store an entry and move the cursor to the next space. Press **◀** or **▶** to move the cursor without storing.



When the correct character appears, press the NEXT key to accept it and move the cursor to the next position. If the next character is entered by the same key, wait for the cursor to automatically advance to the next character space, or press the ► key.

## Setting Up the Basic Operating Features

Basic operating features include selecting the type of line used, enabling audible alerts, and brightening or darkening the display screen. From the Main Menu, press 2 to display the Setup menu. Use the Setup screens to change some of the basic operating features of the 923LT, including:

- Interfaces (line types and ports)
- Environment (light and sound levels)
- Phone lists (responder phone numbers)

Setup  
1:<Interfaces>  
2:Environment  
3:Phone Lists

### Interfaces

Use the Interfaces screens to select the type of line to be tested (i.e., the customer's line), and to set up the 923LTS' serial port.

To access the Interfaces screen from the Setup screen, press 1.

Interfaces  
1:<Test Interface>  
2:Serial Port

### Test Interface

Use the Test Interface screen to set the parameters for the phone line being tested.

Choose the impedance and signaling type for the phone line interface.

1:<Loop 600>  
2:Loop 900  
3:Gnd-Start 600  
4:Gnd-Start 900

### Serial Port

Use the serial port to transfer test results data to a personal computer, or to a printer.. Connecting to computer or a printer allows you to print test results.

NOTE: For best results, select the 923LTS defaults:

- 38400 bps (this is the baud rate)
- 8 data bits
- No Parity

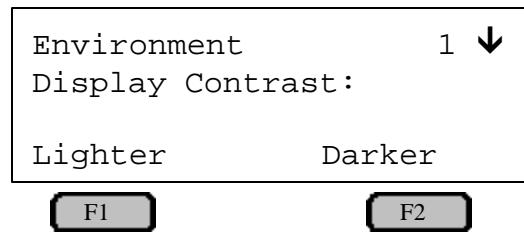
*For more information, contact your Sage Instruments customer service representative.*

## Environment

Use the five Environment settings to adjust the 923LTS display contrast, how long it will wait to hear dial tone, how long it will wait for an outgoing call to be answered, how long the screen light remains on after each press of the light button, and the volume of sounds. To access the Environment screens from the Set up screen, press 2.

### Display Contrast

At the Display Contrast screen, press F1 (lighter) or F2 (darker) to adjust the display contrast. Repeated presses to continue adjust contrast. The default contrast is dark.



### Maximum Wait for Dial Tone

When the 923LTS is connected to the line under test, and the desired responder phone number is selected, the 923LTS listens for a dial tone before dialing the responder. At the Max Wait Dial-Tone screen, use the keypad to enter the desired number of seconds the 923LTS will wait for a dial tone before dialing the responder. The 923LTS dials the responder number even if no dial tone is detected. The maximum wait allowed is 99 seconds; the default is 40 seconds.

### No Answer Time Out

While the 923LTS dials the responder to begin a test, the display reads Calling Test Line, Please wait... If the responder does not answer the call, the test is aborted and the display reads Test Aborted.

To view the No Answer Time Out screen, press NEXT or ▼ at the Display Contrast screen. Enter the number of seconds the 923LTS waits for an outgoing call to be answered. The maximum wait allowed is 99 seconds; the default is 40 seconds.

### Backlight Time Out

The backlight illuminates the display when you press the light bulb key. The light goes out automatically after the number of seconds you specify.

To view the Backlight Time Out screen, press NEXT or ▼ at the No Answer Time Out screen. Enter the number of seconds the display light is on before it automatically shuts off. The maximum illumination time is 99 seconds; the default is 15 seconds.

### Audible Alert

Audible alerts indicate test activities such as an aborted test. To view the Audible Alert screen, press NEXT or ▼ at the Backlight Timeout screen.

Press 1 or 2 to enable or disable audible alerts. The default is enabled.

## Phone Lists (for Responders)

The phone list contains the phone numbers to responders that the 923LTS calls to conduct tests. The list works like a speed dial function on a telephone.

You can enter new responders or modify the current entries. The 923LTS can store up to 9 phone numbers, each with 18 digits.

To access the Phone List screen from the Setup screen, press 3.

To view the responders that are already in the list, press the ▲ or ▼ keys.

Follow these steps to add or change phone numbers:

1. Use the ▲ or ▼ keys to locate the number to change, or to display a new, empty screen.
2. Press F1 to place the cursor on the number field.
3. Use the keypad to enter digits.
4. Use the ► key to enter a one second pause in the dialing sequence. Press the CLEAR key to delete all data in the current field.
5. Press the F2 key to move the cursor to the Name field.
6. Use the keypad to enter alphabetic or numeric characters. For best results, use a name that describes the type of responder. For example, to call the 100 test line, name the responder 100 Responder.
7. Press NEXT to store the data.
8. If necessary, press F1 (for Yes) to overwrite the prior name and number. Press F2 (for No) to go back to the Edit Phone List screen.
9. When you are finished, press BACK to return to the Setup menu.

Edit Phone List		6 ↑↓
# :		
Name :		
<Number>	Name	
F1		F2

Edit Phone List		1 ↓
# :	17074328878	
Name :	100 RESPONDER	
<Number>	Name	
F1		F2

# Loading Tests

New 923LTS units are equipped to perform three tests that do not operate with an ALTS responder. They are:

1. 100 responder noise measurement
2. 102 responder loss measurement
3. Perceptual Speech Quality Measurement (PSQM) test

All other tests (and test suites) are downloaded from the ALTS farend responder (either the Sage 950RTS or 356Eplus).

## Loading ALTS Test Templates for the First Time

New 923LTS units are not equipped with test templates (except for 100, 102, and PSQM tests that do not operate with an ALTS responder). To download templates to a new 923LTS, select Update Tests from the Test menu, and then call the responder. The first time a new 923LTS unit connects with the responder, all available templates are automatically downloaded.

To download loop test templates from a responder to a new 923LTS, follow these steps:

1. From the Main Menu, select Test to display the Test Select screen.
2. From the Test Select screen, select Update Tests. This displays the available responder names and phone numbers.
3. Use the ▲ or ▼ keys to locate the desired responder, and press NEXT. This initiates the call to the responder.

**NOTE:** You can also use the manual entry screen to enter the responder phone number. To store a phone number on the 923LTS, use the Phone Lists feature from the Setup menu. See Phone Lists (for Responders) on page 15.

Main Menu  
1:<Test>  
2:Environment  
3:Phone Lists

Test Select  
1:<Update Tests>  
2:100 Responder  
3:102 Responder

When the responder answers the call from the 923LTS, loop test templates automatically download. When the transfer is complete, the 923LTS display reads New Templates Received. Press NEXT to display the Main Menu.

To view the newly downloaded test suites, select Test from the Main Menu.

**NOTE:** To update the 923LTS with new or changed ALTS responder tests, see Updating Test Suites on page 22.

# Section 3 Using the 923LTS

This section describes using the Sage 923LTS to conduct local loop tests. See Section 1, Getting Started for instructions about initial setup, charging the batteries, and loading test software.

# Test Steps in Brief

In brief, these are the steps to use the 923LTS in the field to test subscriber lines:

1. Turn on the 923LTS and select the desired test (or test suite).
  2. Enter the phone number of the subscriber line.
  3. If desired, enter your identification number and the order or trouble ticket number.
  4. Using the supplied RJ-connectors cord, connect the 923LTS to the line.
  5. Select the desired Sage 950RTS responder to call; testing begins automatically.
  6. Review results, if desired.

## Field Testing Prerequisites

The 923LTS is ready to perform tests in the field when:

- the batteries are charged
  - responder phone numbers are stored or available for entry
  - test suites are available on the Sage 950RTS responder
  - if required, a service order number or trouble ticket number is available for entry

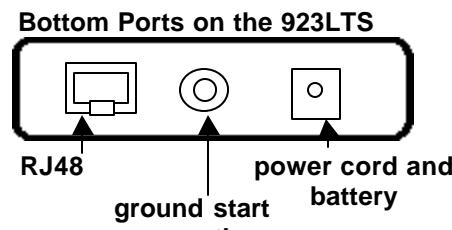
# Connecting to the Line Under Test

In most cases, you connect the 923LTS to the line at the demarcation point or inside the subscriber's premises. Alternately, connect to the line at any two-wire access point along the circuit.

# RJ Connections

Use the supplied cords to connect the 923LTS to the line being tested (either the cord with RJ connectors, or the cord with alligator clips). To use the RJ connection cord:

1. Plug the RJ-48 (the larger end) into the bottom of the 923LTS.
  2. Plug the RJ-11 (the smaller end) into the customer's connection.



## Ground Connection

Connect the 923LTS to ground if:

- the line being tested uses ground start signaling
  - a noise-to-ground measurement is part of the test sequence

You can establish the ground connection via the ground cable supplied with the 923LTS. The ground cable has a banana plug at one end and a large alligator clip housed in an insulating boot at the other end.

1. Insert the banana plug into the round jack in the center of the bottom of the 923LTS.
2. Connect the alligator clip (on the other end of the cable) to the grounding connection on the network interface attached to the line being tested.

## How to Perform a Test or Test Suite

---

Use the steps in this section to perform tests that are downloaded from the farend responder. To perform 100 or 102 tests, see How to Perform a 100 or 102 Test on page19.

1. Turn on the 923LTS.
2. Press NEXT to display the Main Menu.
3. Press 1 to view the Test Select screen.
4. Choose a test (or test suite) from the Test Select menu.  
To choose a test, press the numeric key that corresponds to the test name. If you don't see the desired test, press the ▲ or ▼ key to scroll through additional screens.
5. Enter the phone number for the subscriber premises you are testing.  
This step is important if the test includes a call from the responder back to the 923LTS. If this screen is left blank, then the call from the responder will not be performed.
6. Press NEXT to display the technician identification screen.
7. Enter your identification number. An example identification number is Ed50.
8. Press NEXT to display the Order Number screen.  
Enter an appropriate number. For example, enter the service order number on a new line installation, or enter a trouble ticket number.
9. Connect the 923LTS to the line being tested.  
Insert the larger RJ48 connector into the port on the 923LTS. Insert the smaller RJ11 connector into the jack for the line to test.
10. From the Enter Order Number screen, press NEXT to display the responders screens. Use the ▲ or ▼ keys to locate the desired responder.  
If the desired responder phone number is not already stored on the 923LTS, enter the number on the Manual # Entry screen.
11. When the desired responder appears in the display, press NEXT to start the test.  
The testing process lasts from about one minute to several minutes, depending on the types and number of tests in the selected test suite. If enabled, you can hear the audible tones and test signals during the test. Use the volume keys to adjust the volume.

When the test is complete, the display indicates pass or fail. Press NEXT to return to the Main Menu.

# How to Perform a 100 or 102 Test

If the 923LTS is equipped with 100 or 102 responder tests, follow the steps below to perform them.

1. Turn on the 923LTS.
2. Press NEXT to display the Main Menu.
3. Press 1 to view the Test Select screen.
4. Use the ▲ or ▼ keys to scroll through the Test Select screens until the desired test displays, then use the numeric keypad to select the test number.  
**NOTE:** If installed, the 100 and 102 responder menu options are found immediately following the Update Tests option.
5. Connect the 923LTS to the line being tested.

Insert the larger RJ48 connector into the port on the 923LTS. Insert the smaller RJ11 connector into the jack for the line to test.

6. Press NEXT to display the Responder screens. Use the ▲ or ▼ keys to locate the desired responder (i.e., the responder that calls either the 100 test line or the 102 test line).
7. Press NEXT to start the test.
8. When testing is complete, the 923LTS immediately displays complete detailed results.

## 100 Test Line Results

Results:	
Cmsg:	8 dBrnC
3K FLAT:	13 dBrn
ERL:	9 dB

**NOTE:** The 923LTS stores only the results of the most recent 100 or 102 tests.

## Aborting a Test

While a test is in progress, you can end it and return to the Main Menu. To abort a test while in progress, follow these steps:

1. Press the CLR (clear) key. A warning screen displays, and the test continues.
2. At the warning screen, press F1 to stop the test and return to the Main Menu.
3. To continue the test, press F2.

Test in Progress!  
Do You Want to Abort

Yes

No

F1

F2

## Viewing Test Results

Results for up to ten tests are stored on the 923LTS. Immediately following, or at any time after completion of a test, you can view results using the 923LTS display.

You can view the following test information:

- General test information
  - Test ID
  - Test call
  - Call back

- Near results pass/fail summary
- Far results pass/fail summary
- Far results test details
- Near results test details

**NOTE:** The 923LTS stores only the results of the most recent 100 and 102 tests.

## Viewing Results on the 923LTS

To view test results for any test or test suite (except for 100 and 102 test line tests), follow these steps:

1. From the Main Menu, select 3. View Results. The Select Call screen displays the date and time (in 24 hour notation) of test calls.
2. Use the keypad to select the desired call. Use the ▲ and ▼ keys to scroll to more screens. Up to ten calls can be stored on the 923LTS.
3. Use the keypad to select results for either the near or far end of the call.
  - **Near results** are results of measurements made at the customer site.
  - **Far results** are results of measurements made at the central office.

Select Call	1 ↓
1:09/14/00	16:01
2:09/14/00	15:54
3:09/14/00	09:54

View Results
1:<Near>
2:Far
3:Print Results

Indicates near results

Test Results	N1 ↓
1:<Test ID>	
2:Test Call	PASS
3:Call Back	PASS

### Test ID Screen

Use the 1:**Test ID** option to verify that the call selected is correct. The Test ID screen displays a summary of the test call, including:

- test suite name
- date and time of test call
- the phone number of the line tested
- the order number or trouble ticket number.

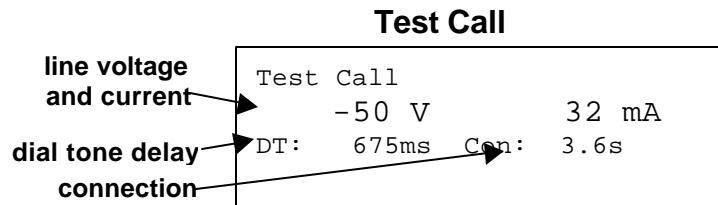
test suite name	All Domestic
date and time call was	09/14/00 15:54:08
line under test	7618407
order number or trouble ticket	0002

### Test ID Screen

## Test Call Screen

Select **2:Test Call** to see details about the connection from the 923LTS to the Sage 950RTS responder, including:

- line voltage and current
- number of milliseconds before the 923LTS detected a dial tone
- number of seconds before the responder answered the call



## Call Back Screen

Select **3:Call Back** to see details about the call from the Sage 950RTS responder to the 923LTS, including:

- ring voltage
- ring frequency

**NOTE:** The call back option is applicable only if the test included a call initiated by the 950RTS responder in the Central Office to the 923LTS in the field.

## Test Measurement Details

From the Test Results screen, press the ▼ key to display a list of tests completed for the selected call.

Press the number that corresponds to the desired test to view the measurement data.

For example, press 2 to view jitter measurements.

press ▼ to view the list of tests

Test Results	N	1	▼
1:<Test ID>			
2:Test Call		PASS	
3:Call Back		PASS	

press 2 to view jitter measurements

Test Results	N	2	↑↓
1:23 Tones			
2:Jitter		PASS	
3:Noise		PASS	

## 23 Tones Measurement Data

The measurement data for each of the 23 Tones tests are grouped into three selections. Use the keypad to select the desired category.

23 Tones measurements are grouped by:

- Loss
- Absolute Delay
- Noise

# Updating Test Suites

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Test templates, along with their pass/fail criteria, are maintained by the ALTS database on the Sage responder at the central office. There are two ways to update the 923LTS with new or changed test templates:

- Manually
- Automatically

At any time, you can manually update tests. Use the Update Tests option on the Test menu, and follow the steps below.

## Automatic Test Updates

The Sage responder at the central office maintains test templates and test results. The responder automatically updates the 923LTS with new or changed templates if a test requested by the 923LTS is not on the ALTS responder.

## Manually Updating Tests

Use the manual updating method to download a new test to the 923LTS. During the updating process, the responder downloads all test templates (both those that already reside on the 923LTS and new ones that have never been downloaded).

To manually update all of the tests on the 923LTS, follow these steps:

1. From the Main Menu, select 1:Test.
2. Use the ▼ or ▲ keys to scroll to the Update Tests option.
3. Use the ▼ or ▲ keys to scroll to the desired responder.

**NOTE:** To download test suites from a new responder that does not appear on the display, enter the phone number for the new responder. See Phone Lists (for Responders) in Getting Started on page 15.

4. Press NEXT to call the responder and initiate the automatic downloading process.

When the process is complete, the display reads New Templates Received.

# Using the 923LTS as a Telephone

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When the 923LTS is connected to a working phone line, you can use it as a telephone handset. A telephone speaker and microphone are located on the back of the 923LTS. The speaker volume is automatically adjusted to a level suitable for use as an earphone.

**NOTE:** When the 923LTS is connected to a working phone line, it can receive telephone calls even when it is turned off.

To use the 923LTS as a telephone, follow these steps:

1. Use the supplied cord to connect the 923LTS to an operating phone line.
2. Press the TALK key, and listen for a dial tone. The display shows the last number dialed.

When you press the TALK key, the 923LTS goes off hook and the functions of the alpha-numeric keypad become just like a telephone. At any time, press the TALK key again to disable the telephone function.

3. Dial the desired number, or press NEXT to dial the displayed number.
4. Dial access numbers and area codes just as you would from a regular telephone on the line.
5. To hang up, press TALK.

The 923LTS reverts back to a automated loop test tool, and displays the last screen prior to pressing TALK.



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# Section 4 Technical Support

## 923LTS Technical Support

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Telephone and email technical support for the 923LTS is available from a qualified Sage Instruments engineer every business day, from 9:00 AM to 5:00 PM, Pacific Time. If you think your 923LTS is not working properly, or if you have questions, contact Sage Instruments.

Email: [techsupport@sageinst.com](mailto:techsupport@sageinst.com)

Telephone **(831) 761-1000** (Monday - Friday, 9 AM to 5 PM, Pacific Time)

Post: Sage Instruments, 240 Airport Blvd., Freedom, CA 95019

Internet: <http://www.sageinst.com>

### Internet Support

Sage Instruments maintains a web site at <http://www.sageinst.com>. The site contains technical information from Sage instruments, and from users in the field. Technical information is available for download and printing. Click on Service, Literature, or App Notes to locate information.

You can also request repair service from <http://www.sageinst.com>. Use the Repairs and Service link to access electronic forms to submit your request.

## Frequently Asked Questions

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### Why does the display light go out?

The display light automatically turns itself off to conserve power. Press the backlight key to turn it back on. If you find that the light shuts off too frequently, adjust the timeout in the Setup menu under Environment settings (see page14).

### Why does the 923LTS automatically shut off?

The 923LTS automatically turns completely off after approximately 10 minutes of inactivity. To keep the unit on longer during a period of inactivity, press the BACK and NEXT key to start the 10 minute timer over again, while retaining the current settings and display.

To turn the 923LTS on again after it automatically shuts down, press the ON/OFF button.

### Failing Battery Power

The 923LTS automatically shuts completely off after approximately 10 minutes. This is true when it is using battery power or it is plugged into a power supply. If the unit has been active in the past 10 minutes and it shuts down, the batteries need to be recharged. See Charging the Batteries in Getting Started.

## **Does the 923LTS need to be calibrated?**

Only in very rare situations does the 923LTS require calibration. The 923LTS uses test parameters supplied by the Sage 950RTS responder (or from the Sage 356Eplus responder). To download updated tests, see Loading Tests in Getting Started.

## **How can I restore the original defaults?**

You may want to remove all the custom data you have entered into the 923LTS, and restore it to its original, “new” state. This is accomplished by performing a cold boot.

### **Cold Boot**

A cold boot erases all stored test results, test suite names, and responder phone lists. It returns the 923LTS to its original, “new” state. To perform a cold boot, follow these steps:

1. Turn off the 923LTS.
2. Press and hold the CLR key.
3. While holding down the CLR key, press and hold the ON/OFF key.  
Continue holding both the CLR and the ON/OFF keys until two lines of bars appear in the display.
4. When the bars appear, release the ON/OFF key.  
Continue to hold down the CLR key until the display goes blank.
5. When the display goes blank, release the CLR key.  
The cold boot is now complete, and settings are returned to their factory default settings.

### **Confirming a Successful Cold Boot**

After you perform a cold boot, you can confirm that the 923LTS is in its original, “new” state. Follow these steps to confirm a cold boot:

1. Press the ON/OFF key to turn on the 923LTS.
2. Press NEXT to display the Main Menu.  
The Main Menu should contain only two options: 1: <Test> 2: Setup.
3. Press 1 (or NEXT).
4. The Test Select screen should appear with only one selection: 1: <Update Tests>.

## **What are the 923LTS' default settings?**

There are three categories of default settings on the 923LTS:

- Interfaces (to connect the 923LTS to phone lines and to a computer or printer)
- Environment (to adjust the display light or volume of audible alerts)
- Phone Lists (to enter responder telephone numbers)

The following are the factory default settings for each category:

### Interfaces

Test Interface: Loop 600 ohm

Serial Port: 9600 bps, 8 Data Bits, No Parity

### Environment

Display Contrast: Dark

Max Wait Dial-Tone: 40 seconds

No Answer Timeout: 40 seconds

Backlight Timeout: 15 seconds

Audible Alert: enabled

### Phone Lists

The responder phone number screens are empty. No responder phone numbers are supplied by Sage Instruments.

# Sage 923LTS Warranty

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## Product Warranty

Sage Instruments products are warranted to be free from defects in materials or workmanship for a period of one year from the date of shipment. Sage Instruments further warrants that each product will execute its software programming instructions. During the one year warranty period, Sage will, at its option and expense, either repair or replace products which prove to be defective.

## Limitation Of Warranty

This warranty does not cover repairs for damages from accident, misuse (including modification to or addition of software), tampering, improper maintenance, repair by anyone not authorized by Sage Instruments, or shipment in unapproved packaging. Out-of-warranty repairs performed by Sage Instruments are billed to the customer. Sage Instruments does not warrant that the operation of its products will be continuous or error free.

## Exclusive Remedies

The remedies provided in this warranty are available exclusively to the original buyer of the Sage Instruments product. Sage Instruments is not liable for consequential damages or damages to any party other than the original buyer. Sage Instruments specifically disclaims any implied warranty of merchantability or fitness for a particular purpose. No other warranty is expressed or implied.

## Repaired Products Warranty

Sage Instruments products that are repaired during the initial one year warranty period by Sage Instruments or its authorized representative are further warranted for a period of 90 days from the date of shipment from the repair facility. All out-of-warranty repairs performed by Sage Instruments are warranted for a period of 90 days.

## Shipping Instructions

To exercise the Sage Instruments warranty, contact a Sage Instruments customer service representative and obtain a returned material authorization number (RNA). Include a detailed description of the problem and the conditions and circumstances under which the symptoms occurred. Ship the product in its original packaging, or in packaging approved by Sage Instruments. If unapproved packaging is used, this warranty is void. Shipping charges, duties, and taxes must be prepaid. Return shipping to the customer is paid by Sage Instruments.

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