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325EV VoP Service Responder

User Guide

Preliminary

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Overview

The Sage 325EV Responder

The Sage 325EV Responder is a component of the Sage Voice over Packet Test System (VTS). The 325EV can be located at a central office or customer premise, and connected to any 2-wire or 4-wire access point. It performs cooperative far end responder test functions with a near end 925VST hand held unit, and sends the measurement data back to the 925VST for review, processing (pass/fail), and storage. The 325EV is designed to be continuously powered by a small wall transformer/power supply.

The 325EV comes equipped with the Sage Next Generation VoP Test suite. Including SMOS, Packet Voice Impairment Test (PVIT), and Echo Sounder tests.

VoP Test System (VTS)

The 325EV Responder and companion 925VST hand held unit are designed to qualify VoP service installations and support on-site field maintenance. Tests are useful to confirm proper IAD (Integrated Access Device) installation, softswitch DN translation, end-to-end voice quality, and detect and isolate echo, packet impairments, and poor network performance.

VoP Test System has two components:

- The Sage 925VST hand-held unit used in the field
- A Sage far end responder that can be located at any telephony 2-wire or 4-wire, termination point.

VTS Features

The Sage VoP Test System can:

- Test End-to-End Voice Quality (QoS)
  - Mean Opinion Score (MOS)
  - Comfort Noise Level
  - Audio Level

- Troubleshoot and Isolate Echo Impairments
  - Detect up to 4 echoes
  - Echo Level
  - Echo Delay

- Troubleshoot and isolate Packet Impairments
  - Voice Frame Slips & Duration
  - Voice Frame Loss & Duration
  - Voice Clips & Duration
  - Latency (delay)
  - Noise Hits

Getting Started

Unpacking

The following items should arrive with your 325EV:

- 325EV Responder
- AC adapter/power cord
- Test interface connector cable (RJ-48 plug on one end; RJ-11 and RJ-22 plugs on the other end)

Interfaces

The 325EV Responder has the following three interfaces:

- **Test Interface**
  The test interface consists of an RJ48 female connector at the rear panel.

- **Power Supply Interface**
  This interface consists of a female coaxial power plug

- **Serial Interface**
  This interface is a DB9 RS-232 female connector

Connecting to the Line Under Test

In most cases, you connect the 325EV to the line at any 2-wire access point. Use the supplied test cord to connect the 325EV to the access point:

1. Plug the RJ-48 connector (the larger end) into the rear of the 325EV.

2. Plug the appropriate RJ-xx cable into the customer's connection. For a 2-wire connection, use the RJ-11 cable. For a 4-wire connection, use the RJ-22 cable.

Sage 325EV Administration

The 325EV is administered using its RS-232 serial interface. The administrative commands provide limited ability to configure, start, or abort tests, using the serial port. There is also a command to change the default Responder type.

Prepare the 325EV for Serial Port Communication

1. To complete this procedure, you must have a Windows 95/98/NT/2000/ME PC compatible computer with an available serial port, straight through serial cable, and the 325EV Responder.
2. Make sure your computer has an available COM port.
3. Connect one end of a standard straight through (NOT a null modem) serial cable between your PC and the DB9 connector located at the rear of the 325EV.
4. Connect the other end to an available PC serial port configured for 38400 baud, 8 data bits and no parity (8N1).

5. Since the 325EV will not echo received characters, configure your PC terminal emulation to echo local characters.
6. Turn on the 325EV. Your PC should display a screen similar to the example below:

```
925VST Revision 2.5006 - 24-NOV-2003
©) 1997~2003 SAGE Instruments Inc.


Ready...


Login>
```

7. No login username or password is required.
8. To insure the 325EV is ready to receive a command, transmit one or more carriage returns. You should see a "Login>" response.

Serial Port Commands

Once the login prompt is visible, the following commands are available:

interface	Changes the circuit interface parameters
tlstart	Forces a test line to start
tstop	Forces a test line to stop and reset for the next incoming call
settl	Sets the type of test line the 325EV will be when it answers an incoming call in responder mode (factory default is SMOS Responder)
tldur	Sets the time out timer that causes "continuous" test lines (i.e., Echo Generator and PVIT) to stop and reset when the timer expires
smos	Used to set the TPT (test progress tone) duration, Send TLP (test level point) and Receive TLP for the SMOS test line
pvit	Used to set the filter type and transmit signal level of the PVIT test line
egen	Used to set the inserted loss and inserted delay of up to two echoes generated by this test line

Interface

interface

Changes the signaling and impedance parameters of the circuit interface. After running this command, you MUST remove power from the unit for at least 30 seconds.

Usage: interface [loop600|loop900|gnd600|gnd900|4wire]
Example: interface loop600

```
Current interface is 2 wire, Normal Start,  600 ohms
```

Typing just the command “interface” will report the current interface settings.
Example: interface

```
Current interface is 2 wire, Normal Start,  600 ohms
```

Test Line Start

tlstart

Forces the test line to start, takes no parameter, only applies to 4 wire mode.

Test Line Stop

tlstop

Stops the currently running test and waits for the next incoming call. This command takes no additional parameter.

Set Default Test Line Type

settl

Sets the type of test line the 325EV will be when it answers an incoming call in responder mode. You can use a command modifier of simply s, p, or e, where: p=PVIT, s=SMOS, and e=Echo Generator. If the 325EV is not in any kind of responder mode, this command will place it in the specified mode. If it is already in some kind of responder mode, the unit must be rebooted for the change to take place.

Usage: settl [smos|pvit|egen] or settl [s|p|e]

Example: settl smos

```
Test  line will be SMOS.
Please reboot to take effect.
```

Typing just the command “settl” will report the current default test line type.
Example: settl

```
Current Test line is    SMOS Responder
```

Set Test Line Duration (applies only to Echo Generator Test line and PVIT Test line)

tldur

The SMOS test line automatically stops and restarts for the next call when the test finishes. However, the Echo Generator and PVIT tests are “continuous” tests and will not stop even if the calling end hangs up. The tldur command sets the value of a time out timer that causes these “continuous” test lines to stop and reset when the timer expires.

Usage: tldur [duration]
The allowable range, in seconds, of [duration] is 1 to 999

Example: tldur 300
Test will time out in 300s

Set SMOS Test Line Parameters

smos

Used to set the TPT (test progress tone) duration, Send TLP (test level point) and Receive TLP

Usage: smos [TPTlength [SendTLP [ReceiveTLP]]]
Allowable range: TPTlength (in seconds)=1 to 99, Send TLP and Receive TLP=-50 to 0 dBm

Example: smos 5 -10 -10

```
Current SMOS test line parameter is
TPT burst length:       5s
Send TLP:               -10dBm
Receive TLP:            -10dBm
```

Typing just the command "smos" will report the current SMOS test line parameters.

Example: smos

```
Current SMOS test line parameter is
TPT burst length:       10s
Send TLP:               0dBm
Receive TLP:            0dBm
```

Set PVIT Test Line Parameters

pvit

Used to set the filter type and transmit signal level.

Usage: pvit [filtertype [level]]
Allowable values/ranges: filtertype= c or p Where 'c' is C-Message and 'p' is Psophometric, and level in dBm= integer -30 to 0

Example: pvit c -10

```
Current PVIT Sender test line parameter is
filter: C-message
Test signal level is -10dBm
```

Typing just the command "pvit" will report the current PVIT test line parameters.

Example: pvit

```
Current PVIT Sender test line parameter is
filter: C-message
Test signal level is -16dBm
```

Set EGEN Test Line Parameters

egen

Used to set the inserted loss and inserted delay of up to two echoes generated by this test line.

Usage: egen [level_1 delay_1 [level_2 delay_2]]
Allowable ranges: level_1 and level_1 in dB= integer -60 to 9 for 4-wire, -40 to 9 for 2-wire; delay_1 and delay_2 in milliseconds= integer 16 to 600

Example: egen -6 30 -10 60

```
Current echo generator parameter is
level_1: -6dB, delay_1: 30ms
level_2: -10dB, delay_2: 60ms
```

Typing just the command “egen” will report the current egen test line parameters.

Example: egen

```
Current echo generator parameter is
level_1: -10dB, delay_1: 30ms
```

DTMF Commands

The 325EV will respond to a limited number of DTMF commands from the calling end. This section briefly describes those commands.

Force the 325EV to Answer as a Specific Responder Type

When answering an incoming call from the far end, a 325EV in responder mode will pause for 10 seconds. During that period, you can command it to answer as an SMOS test line, Echo Generator test line, or PVIT test line. Note that the responder will return to its default responder mode at the end of the test call. To change the default responder mode, use the serial port “settl” Set Default Test Line Type command described in the *Serial Port Commands* section of this manual.

The following is a list of DTMF commands to change responder type:

DTMF Digit		Test Line Type
1	—	SMOS
2	—	Echo Generator
3	—	PVIT

Force the 325EV Responder Mode to Answer When in 4-Wire Mode

When in 4-wire mode, the 325EV can be started remotely by transmitting the DTMF digit string 7243 (“SAGE” on a telephone keypad).

Change Echo Generator Delay and Loss Parameters

This section describes how to use a telephone keypad (or other device) to remotely program Echo Generator parameters on a remote 325EV when an EGEN Test Line call is in progress. Sample DTMF digit sequences are provided at the end of this section. Note that the responder will return to its default Echo Generator settings at the end of the test call. To change the default delay and loss parameters, use the serial port "egen" (Set EGEN Test Line Parameters) command described in the Serial Port Commands section of this manual.

NOTE In all cases described below, begin the remote programming sequence with a * key press, and end with a # key press.

Minimum DTMF Digit On and Off Requirements
To recognize DTMF digits, Echo Generator requires that DTMF digits remain on for a minimum of 50 milliseconds.

Except following the * key, the pause between all DTMF digits (the off time) must be at least 50 milliseconds. The * key initiates remote programming, and is followed by a 480 millisecond prompt tone. The minimum off time following a * key press must be at least 530 milliseconds (i.e., 480 plus 50).

Correcting DTMF Digit Mistakes
Incorrect digit sequences produce an alert signal. If you make a mistake during remote programming, simply start over. Each * key press begins a new programming sequence.

Using DTMF Digits to Disable All Echoes
Use the steps in this section to remotely disable all 325EV echo generation. Use these steps after there is a call in progress on the EGEN Test Line.

Follow these steps to remotely disable both Echo-1 and Echo-2.
1. Dial the remote 325EV that is configured as an EGEN Test Line.
2. Press the * key, and wait for the prompt tone to cease.

   The * digit indicates to the remote 325EV that remote programming follows. Echo generation temporarily suspends.

3. Press the # key and wait for the prompt tone to cease.

   The # indicates to the remote 325EV that this remote programming sequence is complete. This two-key sequence disables both Echo-1 and Echo-2.

   NOTE To remotely enable both echoes on an EGEN Test Call in progress, follow the steps below to remotely set echo level and delay.

Using DTMF Digits to Set Level and Delay
Follow the steps in this section to remotely set the level and delay for Echo-1 or for both Echo-1 and Echo-2. Use these steps on an Echo Generator call in progress.

The pattern for DTMF digits to set Echo-1 only is *-L-L-D-D-D-# where L is a level digit, and D is a delay digit.

The pattern for DTMF digits to set both Echo-1 and Echo-2 is *-L-L-D-D-D-L-L-D-D-D-# where L is a level digit, and D is a delay digit.

1. Dial the remote 325EV that is configured as an EGEN Test Line.
2. Press the * key, and wait for the prompt tone to cease.
3. Press the number keypad to set level and delay.

   NOTE In most cases, echo level should be set at a decibel value less than zero. To set the value at zero or greater than zero, precede the number with 9.

4. Press the # key and wait for the prompt tone to cease.

Sample DTMF Digit Sequences
The table below provides DTMF digit sequence examples:

Desired Result	*Digit Sequence*	*Notes*
End an EGEN Test Line call connection	*-8-#	This sequence ends the call connection. The EGEN Test Line on the remote 325EV is ready to answer another call.
Set level and delay of Echo-1 only (level less than 0 dB)	*-L-L-D-D-D-#	where L=level in negative dB, D=delay in milliseconds
Set level and delay of Echo-1 only (level greater than 0 dB)	*-9-L-D-D-D-#	To set a level between 0 dB and 9 dB, precede the level with 9
Set level of Echo-1 and Echo-2 (both levels less than 0 dB)	*-L-L-D-D-D-L-L-D-D-D-#	where L=level in negative dB, D=delay in milliseconds
Set level and delay of Echo-1 and Echo-2 (both levels greater than 0 dB)	*-9-L-D-D-D-9-L-D-D-D-#	To set a level between 0 dB and 9 dB, precede the level with 9
Set call connection time	*-8-M-M-—#	where M = minute

Using DTMF Digits to Override the Default Call Connection Duration

The Echo Generator and PVIT tests are "continuous" tests and will not stop even if the calling end hangs up. The Default Call Connection Duration parameter sets the value of a time out timer that causes these "continuous" test lines to stop and reset when the timer expires.

Follow the steps in this section to remotely set the duration of the incoming call connection from 1 to 999 minutes. This remotely set call duration temporarily overrides the 10 minute factory default for the duration of the call. To permanently modify the default value, use the serial port "tldur" (Set Test Line Duration) command described in the Serial Port Commands section of this manual.

1. Dial the remote 325EV that is configured as an EGEN or PVIT Test Line.
2. Press the * key, and wait for the prompt tone to cease.
3. Press the 8 number key followed by the desired number of minutes. The valid range is 1 to 999 minutes.
4. Press the # key.

Call duration is now temporarily redefined on the far end 325EV.