

# Option Menu #76 SMOS Director and #77 SMOS Test Line on the Sage 930A-L3, 930i, and 935AT

## SMOS Purchase Option

Sage 93X Model	SMOS Purchase Option
Sage 930A-L3	Option 930A76
Sage 930i	Option 930i-76
Sage 935AT	Option 935AT-576

## SMOS Option Description

SMOS stands for Sage Mean Opinion Score. It provides an objective method of estimating the subjective quality of voice transmission systems. The SMOS algorithm is used to rate voice transmission systems. The ratings range from 1.00 to 5.00 with 5.00 being a perfect rating. The rating is given in terms of Mean Opinion Score (MOS) and is derived from a mathematical modeling of the average human's perception of sound. In addition, SMOS provides several measurements that can be helpful in understanding a system's MOS rating. Sage Instruments has implemented the SMOS algorithm in a test line format, where a complete SMOS test is performed in both the Near to Far and the Far to Near directions.

## SMOS Option Menu Access

### Option Menu #76 SMOS Test Director

The Near End function is accessed in Option Menu #76. It places a call to the SMOS Test Line, conducts the test and reports the results back to the user.

### Option Menu #77 SMOS Test Line

The Far End function is accessed in Option Menu 77. It waits for an incoming call from the SMOS Director. When an incoming call is detected it answers and sends a test progress tone. The Director will then initiate a test. When the test is complete the responder will hang up and await another call.

## Performing the SMOS Test



## Select a Trunk Type

Set up and perform the SMOS Test at any two access points along the network. The Sage 93X units must be properly configured for the circuit type found at the chosen access points.

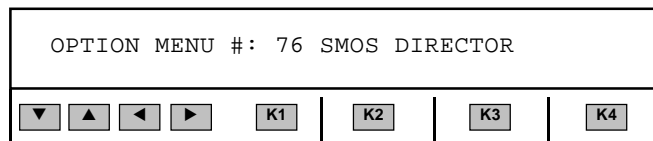
- 1 Press the Trunk Type function key to display the trunk type screen.
- 2 Select the appropriate trunk type.
- 3 Connect the phone line to the appropriate jacks. Refer to trunk type section of the manual for details.
- 4 This is a good time to manually confirm that a call can be placed by the near end unit and answered by the far end unit.. Use send and measure tone in each direction to confirm talk path.

**NOTE** The set-up steps that follow are an example. The actual screens may differ depending on chosen Trunk Type.

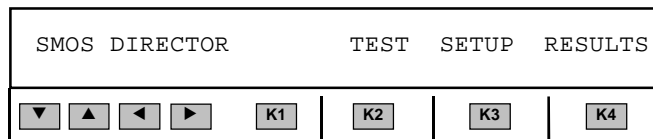
## Near End Setup

To set up the **SMOS Director**:

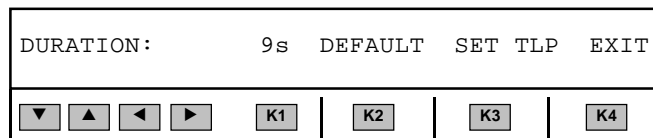
- 1 Press the **Option Menu** function key.
- 2 Use the **Up/Down Arrow** keys to scroll through the option menus, **OR** select **76** using the **numeric keypad** and press the **Option Menu** function key. The display reads:



- 3 Press **ENT** or any softkey (**K1-K4**). The display reads:



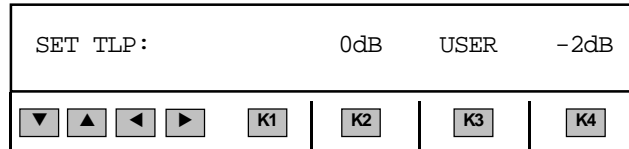
- 4 Press **K3** under **SETUP**. The display reads:



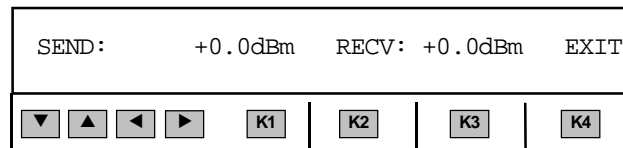
**5** Use the **numeric keypad** to change the duration of the active voice segment. The overall test time will be twice the selected duration time plus some overhead.

- Valid test durations are between **3 and 60 secs**. The default is **9 sec**.
- Press **K2** to set the Default duration.

**6** Press **K3** to set the TLPs. The display reads:



**7** Press **K2** to select 0dB, **K3** under **USER** to define a new TLP, or **K4** to select a -2 dB TLP. If you select **K3** under **USER**, the display reads:



**8** Press **K1** to change the **SEND TLP** or **K3** to change the **RECV TLP**.

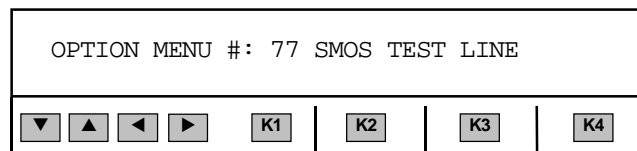
**9** Use the **Numeric Keypad** to enter the desired TLP.

- A valid SEND TLP is between -30 dBm and +10 dBm. The default is 0 dBm.
- A valid RECV TLP is between -30 dBm and +10 dBm. The default is 0 dBm.

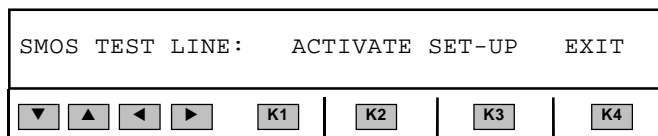
## Test Line Setup

To set up the **SMOS Test Line**:

- 1** Press the **Option Menu** function key.
- 2** Use the **Up/Down Arrow** keys to scroll through the option menus, **OR** select **77** using the **numeric keypad** and press the **Option Menu** function key. The display reads:



**3** Press **Ent** or any soft key (**K1 - K4**) to enter option.



4 Press **K3** to set up the **SMOS Test Line**. The display reads:

SET-UP:	TPT	TLP	EXIT
▼ ▲ ◀ ▶	K1	K2	K3 K4

5 Press **K2** to set **TPT Burst Length**. The display reads:

TPT BURST LENGTH	3.5 SEC	DEFAULT	EXIT
▼ ▲ ◀ ▶	K1	K2	K3 K4

6 Use the **Numeric Keypad** to enter the desired **TPT Burst Length**.

- A valid **TPT** is between 0.1 sec and 10.0 Sec The default is 3.5 sec.
- Press **K2** to set the Default TPT Burst Length.

7 Press **K4** under **Exit**. The display reads:

SET-UP:	TPT	TLP	EXIT
▼ ▲ ◀ ▶	K1	K2	K3 K4

8 Press **K3** to set **TLP's**. The display reads:

SET TLP:	0dB	USER	-2dB
▼ ▲ ◀ ▶	K1	K2	K3 K4

9 Press **K2** to select 0dB, **K3** under **USER** to define a new TLP, or **K4** to select a -2 dB TLP. If you select **K3** under **USER**, the display reads:

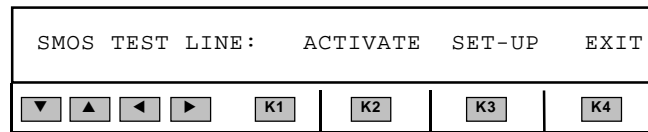
SEND:	+0.0dBm	RECV: +0.0dBm	EXIT
▼ ▲ ◀ ▶	K1	K2	K3 K4

10 Press **K1** to change the **SEND TLP** or **K3** to change the **RECV TLP**.

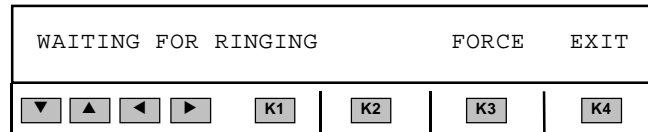
11 Use the **Numeric Keypad** to enter the desired **TLP**.

- A valid **SEND TLP** is between -30 dBm and +10 dBm. The default is 0 dBm.
- A valid **RECV TLP** is between -30 dBm and +10 dBm. The default is 0 dBm.

**12** Press **K4** under **Exit**. The display reads:



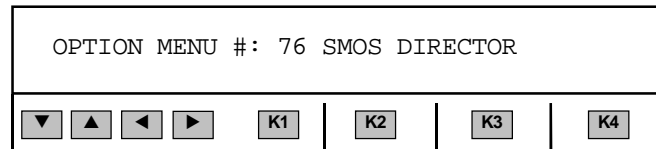
**13** Press **K2** to **Activate**. The display reads:



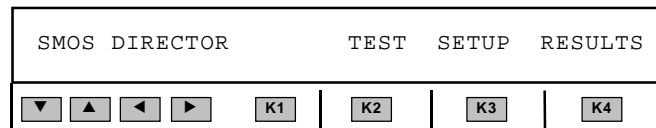
## SMOS Test

To begin an **SMOS** test:

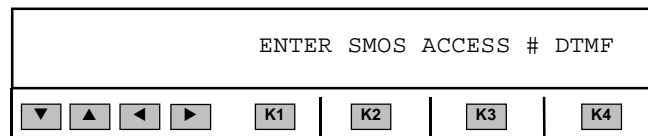
- 1** Press the **Option Menu** function key.
- 2** Use the **Up/Down Arrow** keys to scroll through the option menus, **OR** select **76** using the **numeric keypad** and press the **Option Menu** function key. The display reads:



- 3** Press **ENT** or any softkey (**K1-K4**). The display reads:



- 4** Press **K2** under **TEST**. The display reads:



- The number most recently entered in the **DIAL/RING** menu will be displayed in place of the word **ENTER**. Press the **CLR** key to remove any previous entry, if a new access number is desired.
- 5** Press **K4** under **DTMF** to select a DTMF, DP, or MF out pulsing format.
  - 6** Use the **numeric keypad** to enter a new access number.
  - 7** **To start the test** go off hook with the front panel hookswitch. The **935AT** will seize the line, send any digits you have entered in the window, and expect the test line at the far-end to answer the call.

8 When the far end answers, the Director display will read:

CALL COMPLETION TIME: 1.2 sec 11:20							
▼	▲	◀	▶	K1	K2	K3	K4

9 The far end test line display will change to:

CALL IN PROGRESS.....				EXIT			
▼	▲	◀	▶	K1	K2	K3	K4

## Test Results

When test results become available the display on the Director will change to:

NF MOS: 4.51				FN MOS: 4.54			
▼	▲	◀	▶	K1	K2	K3	K4

At this time you can hang up on the Director side, or remain off-hook to collect additional results.

Once you hang up, the display reads:

SMOS DIRECTOR				TEST SETUP RESULTS			
▼	▲	◀	▶	K1	K2	K3	K4

After hanging up, press softkey (K4). The display reads:

ABORT: ABANDONED				09:58			
▼	▲	◀	▶	K1	K2	K3	K4

Press any softkey or the up or down arrow to scroll through the following result displays.

NF NOISE: 22dBrc		FN NOISE: 18dBrc					
▼	▲	◀	▶	K1	K2	K3	K4

NF +FS: 0mS		FN +FS: 0mS					
▼	▲	◀	▶	K1	K2	K3	K4

NF -FS: 0mS		FN -FS: 0mS					
▼	▲	◀	▶	K1	K2	K3	K4

NF BW: 98.1%		FN BW: 98.5%					
▼	▲	◀	▶	K1	K2	K3	K4

:

NF GAIN: -5dB		FN GAIN: -5dB					
▼	▲	◀	▶	K1	K2	K3	K4

NF CODEC: PCM		FN CODEC: PCM					
▼	▲	◀	▶	K1	K2	K3	K4

DELAY: 0.3mS							
▼	▲	◀	▶	K1	K2	K3	K4

**NOTE** Press the Down arrow to navigate display screens in reverse order. The right arrow brings up the Delay screen and the left arrow brings up the MOS screen.

## Results Printout Format

If the 930i is set to **PRINTER** mode under **Option Menu #: 3 REMOTE CONTROL**, or if you send an upper case **W** from a remote terminal while in **COMPUTER** mode, the results from your printer will have the following format:

## Computer Mode Printout

```
----- SMOS REPORT -----
DURATION:      9s
SEND TLP:    +0.0          RECV TLP:    +0.0

NF_MOS: 4.56              FN_MOS: 4.55
NF_NOISE: 24dBrnC        FN_NOISE: 24dBrnC
NF_+FS: 0mS              FN_+FS: 0mS
NF_-FS: 0mS              FN_-FS: 0mS
NF_BW: 99.0%            FN_BW: 98.5%
NF_GAIN: +0dB           FN_GAIN: +0dB
NF_CODEEC: PCM          FN_CODEEC: PCM
DELAY: 0.0mS
```

## Printer Mode Printout

```
Friday 12-01-03 17:19:50
CALL COMPLETION TIME:    1.1 SEC.  17:19

----- SMOS REPORT -----
DURATION:      9s
SEND TLP:    +0.0          RECV TLP:    +0.0
DATE,TIME,NF_MOS, FN_MOS,NF_NOISE, FN_NOISE, NF_+FS, FN_+FS, NF_-FS,
FN_-FS, NF_BW, FN_BW, NF_GAIN, FN_GAIN, NF_CODEEC, FN_CODEEC, DELAY
12-01-03,17:20:29,4.55,4.55,24,24,0,0,0,0,99.0,98.5,+0,+0,PCM,P
CM,0.0
12-01-03,17:21:07,4.55,4.55,24,24,0,0,0,0,99.0,98.5,+0,+0,PCM,P
CM,0.0
12-01-03,17:21:45,4.55,4.55,24,24,0,0,0,0,99.0,98.5,+0,+0,PCM,P
CM,0.0
12-01-03,17:22:23,4.55,4.55,24,23,0,0,0,0,99.0,98.5,+0,+0,PCM,P
CM,0.0
12-01-03,17:23:01,4.55,4.55,24,24,0,0,0,0,99.0,98.6,+0,+0,PCM,P
CM,0.0
12-01-03,17:23:39,4.55,4.55,24,24,0,0,0,0,99.0,98.5,+0,+0,PCM,P
CM,0.0
12-01-03,17:24:16,4.55,4.55,24,24,0,0,0,0,99.0,98.5,+0,+0,PCM,P
CM,0.0
12-01-03,17:24:54,4.55,4.55,24,24,0,0,0,0,99.0,98.5,+0,+0,PCM,P
CM,0.0
```