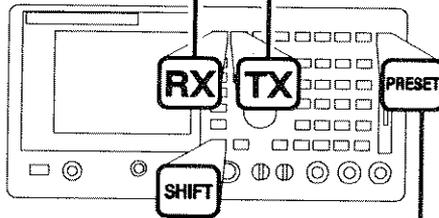




## The Instrument -At A Glance

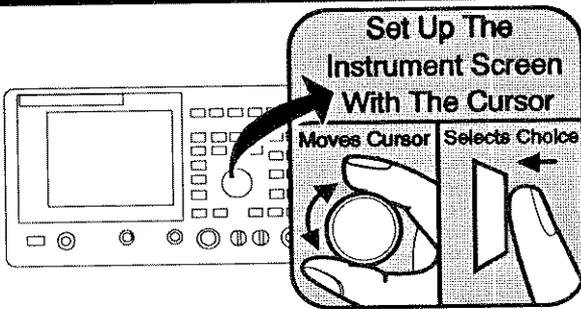
Use this key to perform a receiver test or to generate a modulated RF signal.

Use this key to perform a transmitter test or to monitor and measure an RF signal.



Use this key to activate the blue labeled functions. Press and release, then press the key below the blue label.

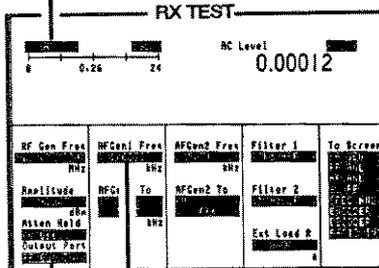
Use this key to reset all instrument settings.



### Some Of The Choices Made On The Screen

#### One-of-many:

Pushing the knob will display a list of choices in the lower-right corner of the screen. Turning the knob moves the cursor through the list. Pushing the knob again selects the choice adjacent to the cursor.



#### Numeric Entry:

Pushing the knob will highlight the data. The highlighted data can be changed by turning the knob. Pushing the knob again enters the data.

#### Underlined:

Pushing the knob will move the underline below a choice. The underlined choice is active.

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### TX Test And RF Analyzer

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- To measure RF frequency.....22
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- 
- 
- 

<input type="checkbox"/>	<b>AF Generators</b>	
	To output an AF sine wave.....	25
<input type="checkbox"/>	To output sine, square, triangle, or sawtooth waves.....	26

<input type="checkbox"/>	<b>AF Analyzer</b>	
<input type="checkbox"/>	To measure audio distortion.....	27
<input type="checkbox"/>	To measure audio frequency.....	28
<input type="checkbox"/>	To measure audio voltage.....	29

<input type="checkbox"/>	<b>Oscilloscope</b>	
<input type="checkbox"/>	To change the scope input.....	30
<input type="checkbox"/>	To change the scope vertical units per division.....	31
<input type="checkbox"/>	To change the scope horizontal units per division.....	33
<input type="checkbox"/>	To use the scope marker.....	33
<input type="checkbox"/>	To display a scope waveform before the trigger point....	34

<input type="checkbox"/>	<b>Spectrum Analyzer(Optional in HP 8920)</b>	
<input type="checkbox"/>	To use the spectrum analyzer marker.....	35
<input type="checkbox"/>	To set up the spectrum analyzer tracking generator.....	36

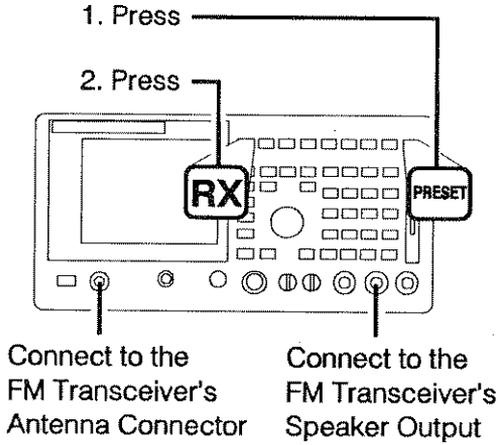
<input type="checkbox"/>	<b>Signaling (Optional in HP 8920)</b>	
<input type="checkbox"/>	To output tone sequential signaling.....	38
<input type="checkbox"/>	To output a DTMF sequence.....	40
<input type="checkbox"/>	To decode a signaling sequence.....	42

<input type="checkbox"/>	<b>Reference Information</b>	
<input type="checkbox"/>	Instrument terms and abbreviations.....	45
<input type="checkbox"/>	Index.....	63

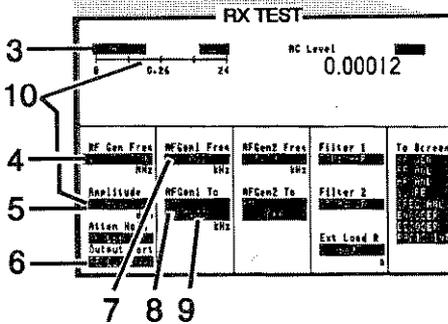
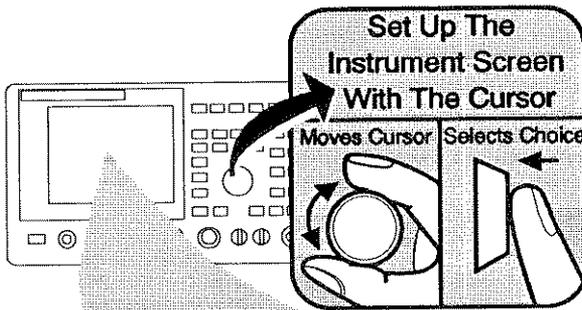
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## An Example Of How To Make An FM Radio SINAD Check

### Front Panel Set Up



## Screen Set Up



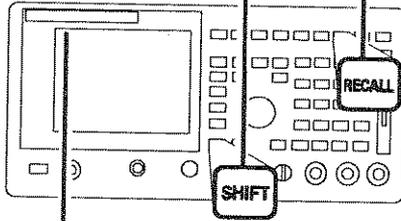
3. Verify that SINAD is displayed.
4. Enter the RF frequency.
5. Enter the RF amplitude.
6. Verify that RF Out is underlined.
7. Verify that the modulation frequency displayed is 1 kHz.
8. Verify that the modulation type displayed is FM.
9. Enter the deviation.
10. Adjust the RF amplitude for a SINAD reading of 12 dB.

## To Save Instrument Settings

1. Set up the instrument as desired.

2. Press

3. Press for SAVE



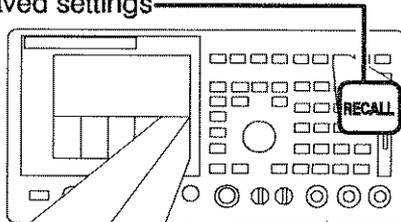
4. Enter number or name to identify, then press ENTER

**NOTE:** The number of changes made to the screen determines memory consumption.

If memory capacity is exceeded, you will get an error message. Refer to the User's Guide and Reference manual.

## To Recall Instrument Settings

1. Press recall to list the saved settings

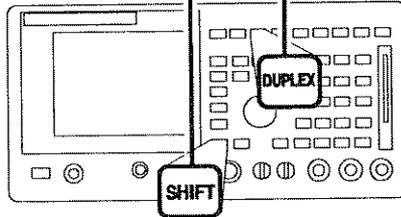


Recall:

2. Use the Knob to choose the saved setting from list of choices.

## To Adjust The Screen Brightness

1. Press
2. Press for CONFIG



3. Vary the screen intensity with the knob

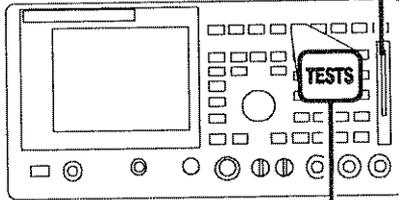
**CONFIGURE**

EXTRN Cntrl	Intensity	HP-IB Adrs	Serial Baud	Firmware
Off	0-100	0-15	1200	A-05-01
15 Offct	Beeper	Mode	Parity	
(Lan)-(Lan)	On	Print Adrs	Data Len	
Hz	Low Battery	Print Sp	Stop Len	
HPDn Volts	0-100	Print	Rev Pace	
0-100	Date	Print	Print	
Range Hold	MMDDYY	Serial In	18RSIC Echo	To Screen
StatoAuto	Time	Print Echo	Print Echo	0-100
	MM:RR			0-100
Print Tstie				0-100
External Dist Specification				0-100
				0-100



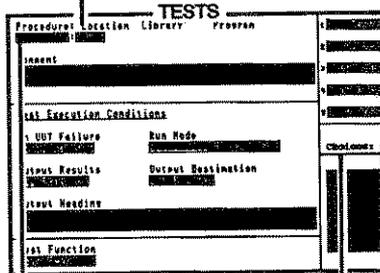
## To Run A Memory Card Program

1. Insert a memory card



2. Press

3. List the choices



4. Choose Card

5. List the choices

6. Choose a program

## 7. Test Configuration

Edit the test specifications

Edit the test frequencies

Edit the test sequence

Edit the test configuration and/  
or Edit the test parameters

TESTS		
Pract	Test Location	Library Program
Conn		
Test Execution Conditions		
On BU	Failure	Run Mode
Output	Results	Output Destination
Output	Heading	
Test Function		

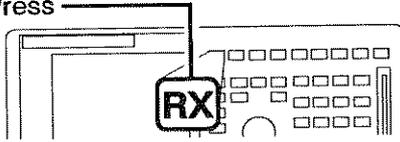
NOTE: Press the TESTS key  
to exit an editing screen.

## 8. Run the program

TESTS		
Procedural	Location	Library Program
Comment		
Test Execution Conditions		
On BU	Failure	Run Mode
Output Results		Output Destination
Output Heading		
Test Function		

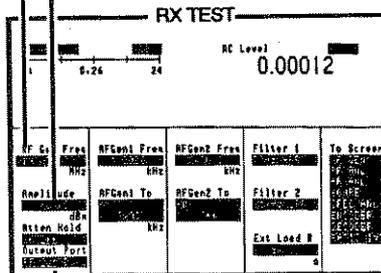
## To Set Up Single-Tone Modulation

1. Press



2. Enter the carrier frequency

3. Enter the carrier amplitude



4. Select the Output Port

5. Enter the modulation frequency

7. Choose the modulation type

RX TEST

AC Level 0.0001

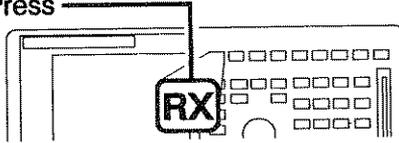
RF Gen Freq MHz	RFGen1 Freq MHz	RFGen2 Freq MHz	Filter 1 MHz	Channel1
Amplitude dBm	RFGen1 To MHz	RFGen2 To MHz	Filter 2 MHz	
Atten Hold dB	Output Port dBm		Ext Load R dB	

6. List the modulation choices

8. Enter the depth or deviation

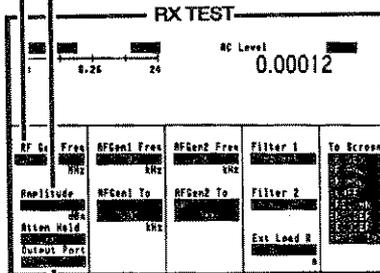
## To Set Up Single-Tone Modulation With Signaling

1. Press



2. Enter the carrier frequency

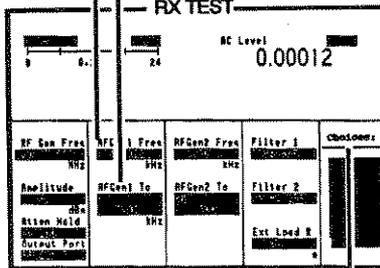
3. Enter the carrier amplitude



4. Select the Output Port

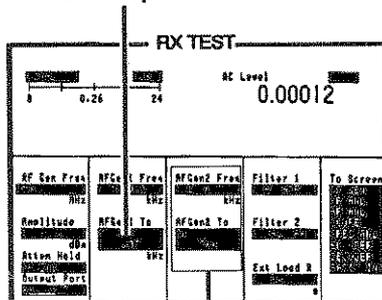
5. Enter the modulation frequency

6. List the modulation choices



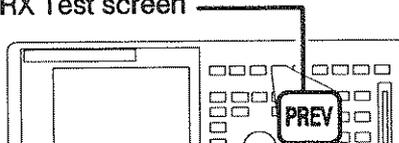
7. Choose the modulation type

8. Enter the depth or deviation

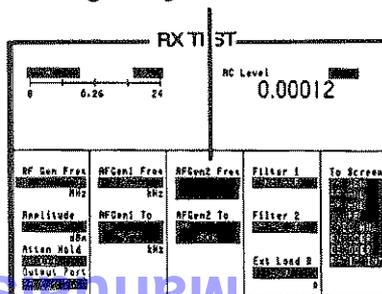


9. Refer to page 38 to set up the signaling then return to step 10  
NOTE: The modulation type must be the same in AFGen 1 and AFGen 2.

10. Press to return to the RX Test screen



11. Turn signaling on/off



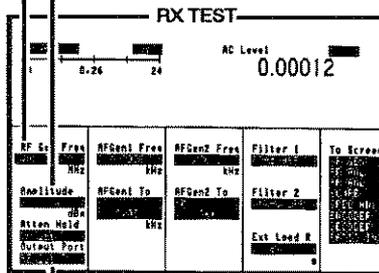
## To Set Up Two-Tone Modulation

1. Press



2. Enter the carrier frequency

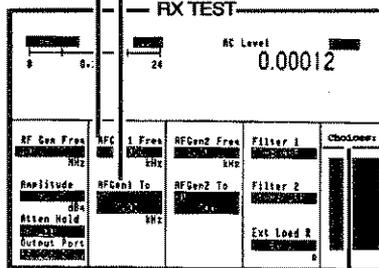
3. Enter the carrier amplitude



4. Select the Output Port

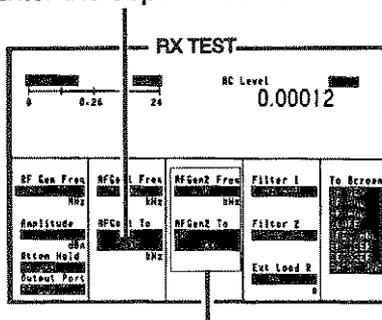
5. Enter the modulation frequency

6. List the modulation choices



7. Choose the modulation type

8. Enter the depth or deviation

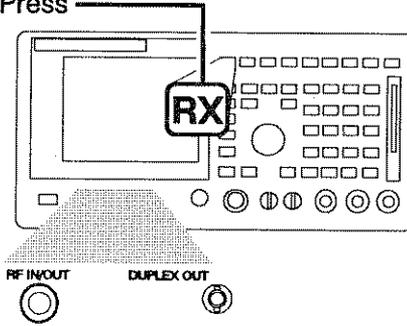


9. Repeat steps 2 thru 5 for AFGen 2

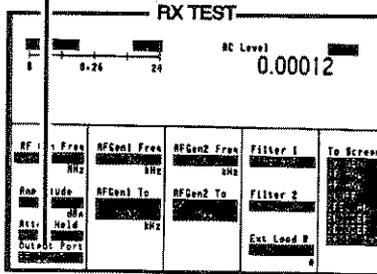
NOTE: The modulation type must be the same in AFGen 1 and AFGen 2.

## To Choose An RF Output Port

1. Press

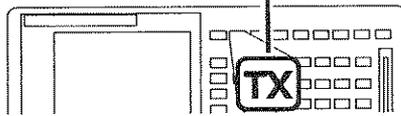


2. Underline RF Out or Dupl



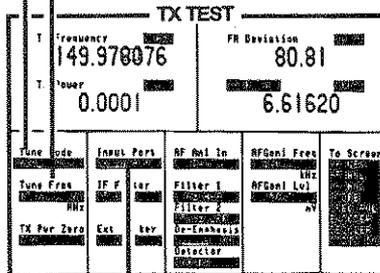
## To Measure Modulation

1. Press



2. Select the Tune Mode

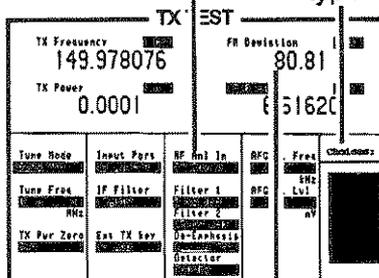
2a. Enter the Tune Freq if  
Manual Tune Mode is used



3. Select the Input Port

4. List the demodulation choices

5. Choose the demodulation type



6. Read

## To Measure RF Frequency

1. Press



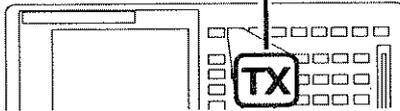
2. Underline Auto

3. Read

TX TEST				
Frequency		FR Deviation		
149.978076		80.81		
Power		S/N Ratio		
0.0001		6.61620		
Tune Mode	Input Port	RF Att In	RFCont Freq	To Screen
Tune Freq	IF Filter	Filter 1	RFCont Lvl	
MHz		Filter 2		
Tx Bar Zero	Ext TX Lev	Sp-Inhibit		
		Detector		

## To Measure RF Frequency Error

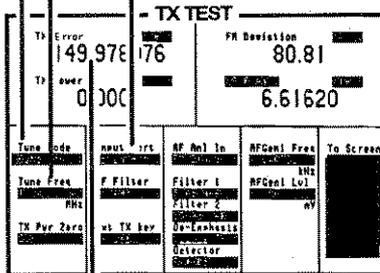
1. Press



2. Underline Manual

3. Enter the Tune Freq

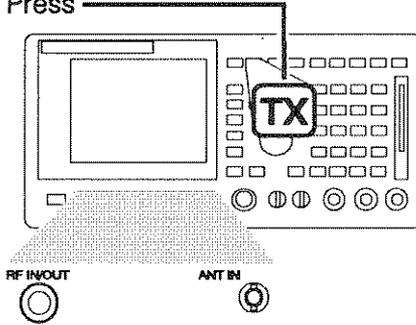
4. Select the Input Port



5. Read

## To Choose An RF Input Port

1. Press

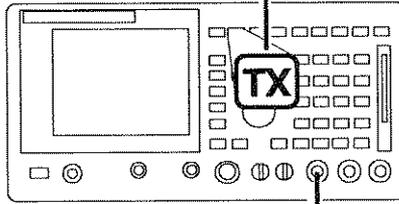


2. Underline RF In or Ant

TX TEST				
TX Frequency	149.97	076	FR Deviation	80.81
TX Power	0.00			6.61620
Tune Mode	Input Port	RF In1 In	RFGen1 Freq	To Screen
Tune Freq	IF Filter	Filter 1	RFGen1 Lvl	
MHz		Filter 2		
TX Per Zero	Est TX lev	On-Emphasis		
		Detector		

## To Output An AF Sine Wave

1. Press



2. Connect to AUDIO OUT

3. Enter the audio level

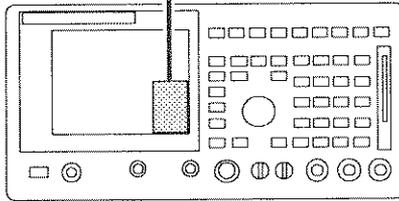
4. Enter the audio frequency

TX TEST					
TX Frequency	149.978076	FR 0	81	81	
TX Power	0.0001		5.6	620	
Tune Mode	Input Ports	AF Mod In	AFCont1	AF	To Screen
Tune Freq	IF Filter	Filter 1	AFCont1	Hz	Hz
TX Per Zero	Ext TX Rev	Filter 2	AFCont1	Hz	Hz
		Disturbance			
		Selector			

## To Output A Sine, Square, Triangle, Or Sawtooth Waveform\*

\*Option 004 required in HP 8920

1. Choose ENCODER from the To Screen



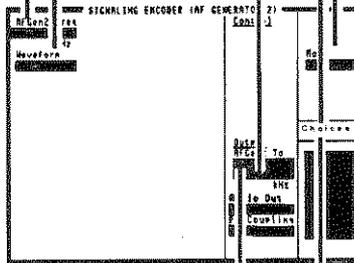
2. Set the Mode to Func Gen

3. Enter the frequency

4. List the choices

5. Choose the waveform

8. Enter the level

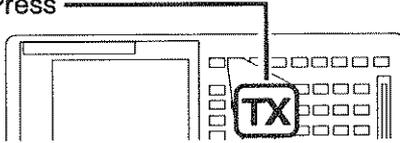


6. List the choices

7. Choose Audio Out

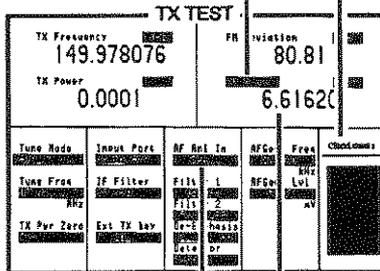
## To Measure Audio Distortion

1. Press



2. List the choices

3. Choose Distn

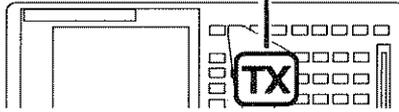


4. Read

NOTE: Measures the distortion on a 1 kHz tone using the input displayed here.

## To Measure Audio Frequency

1. Press



2. List the choices

3. Choose  
AF Freq

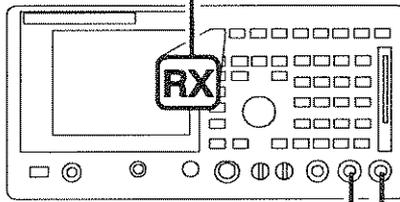
TX TEST					
TX Frequency		FR rejection			
149.978076		80.81			
TX Power		6.61620			
0.0001					
Tune Mode	Input Port	AF In/Ex	AFc	Freq	Cholesterol
Tune Freq	IF Filter	Filt	AFc	Lvl	
MHz		Filt		AV	
TX Pwr Zero	Est. TX lev	1=0	Swit		
		0=1	Swit		
		0=0	Swit		
		0=0	Swit		

4. Read

NOTE: Measures the frequency of the input displayed here.

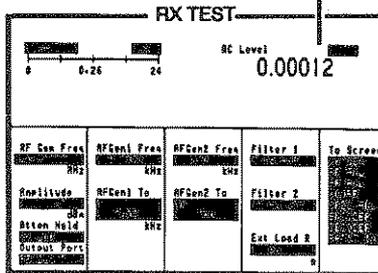
## To Measure Audio Voltage

1. Press



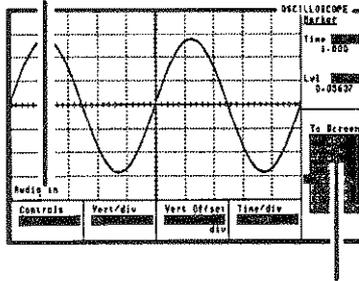
2. Connect to AUDIO IN

3. Read



## To Change The Scope Input

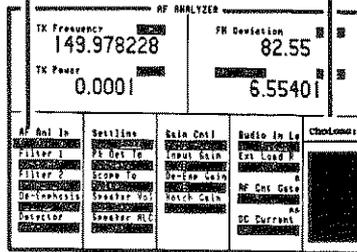
1. Verify which input is selected



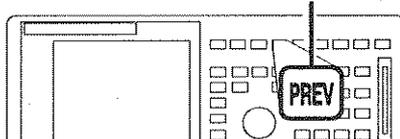
2. Select AF Anl from To Screen:

3. List the choices

4. Choose the input

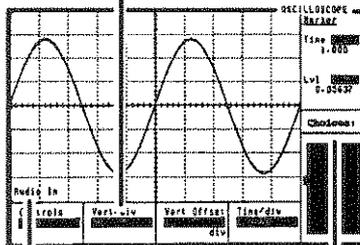


5. Press PREV to return to the scope



## To Change The Scope Vertical Units Per Division

1. List the choices



2. Choose a vertical units per division

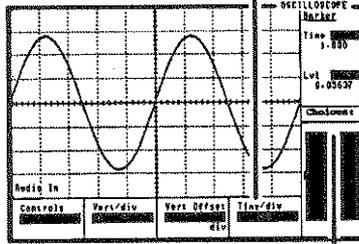
Scope Input Determines Unit of Measure

Scope Input	Unit of Measure
Audio In	V
FM	kHz
AM	%
SSB	mV

NOTE: To change the scope input see page 30.

## To Change The Scope Horizontal Units Per Division

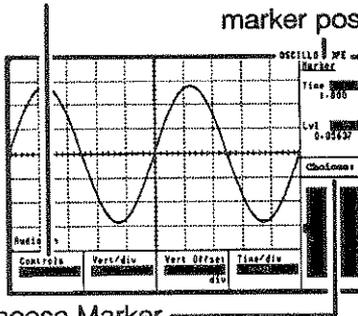
1. List the choices



2. Choose a time

## To Use The Scope Marker

1. List the choices
4. Read the marker position



2. Choose Marker

3. Marker position

Manually position the marker with the knob

OSCILLOSCOPE  
Marker  
Time 1.000  
Lvl 0.02637  
To Screen  
Position Marker To: Marker To:  
div

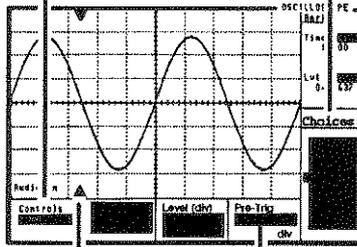
Push the knob to move the marker to the peak of the signal

Push the knob to change the center frequency or ref level to marker's position

## To Display A Scope Waveform Before The Trigger Point

1. List the choices

2. Choose Trigger

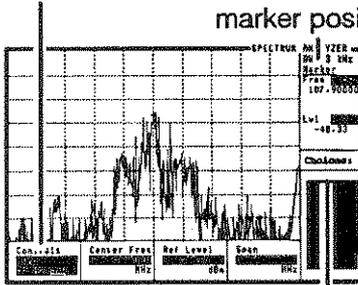


3. Adjust the pre-Trigger position with the knob

Pre-trigger cursor

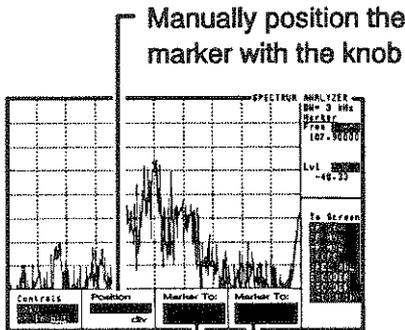
## To Use The Spectrum Analyzer Marker

1. List the choices
4. Read the marker position



2. Choose Marker

3. Marker position

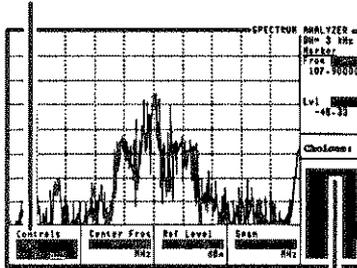


Push the knob to move the marker to the peak of the signal

Push the knob to change the center frequency or ref level to marker's position

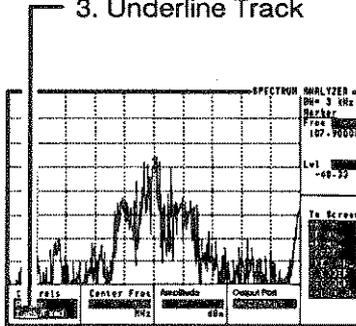
## To Set Up The Spectrum Analyzer Tracking Generator

1. List the choices



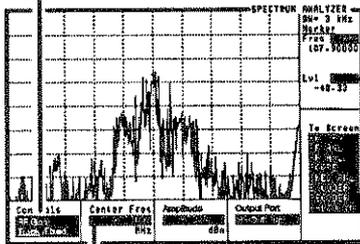
2. Choose RF Gen

3. Underline Track





4. Adjust the offset frequency using the Knob

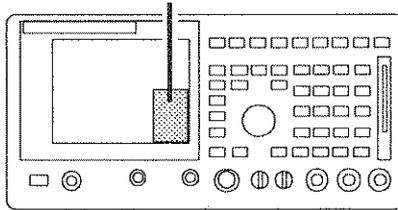


5. Enter the amplitude

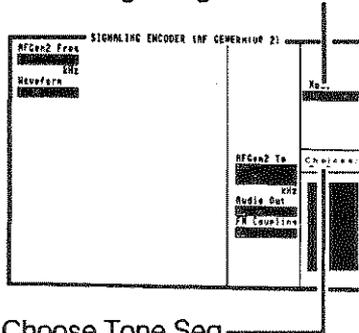
## To Output Tone Sequential Signaling\*

\*Option 004 Required in HP 8920

1. Choose ENCODER from the To Screen

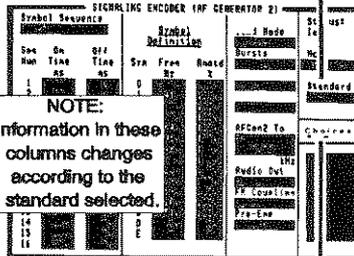


2. List the signaling mode choices



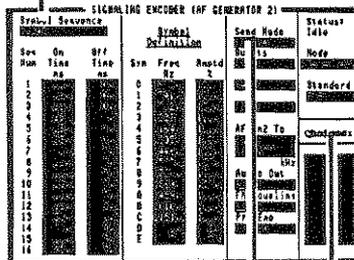
3. Choose Tone Seq

4. List the standard choices



5. Choose a standard

6. Enter a tone sequence using the symbols 0-9, A-E, and space

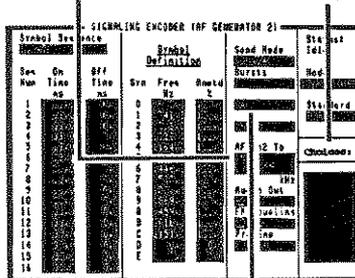


7. List the Send Mode choices

8. Choose the mode

9. List the output choices

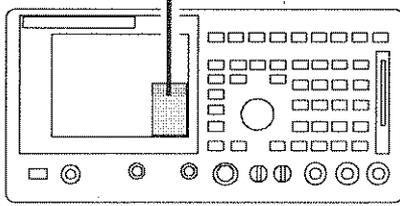
10. Choose the output



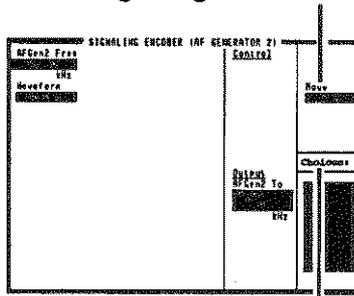
11. Select Send

## To Output A DTMF Sequence

1. Choose ENCODER from the To Screen



2. List the signaling mode choices

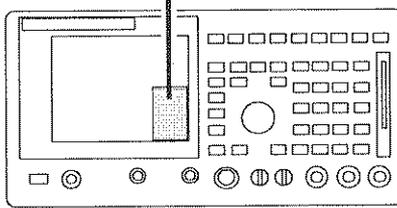


3. Choose DTMF

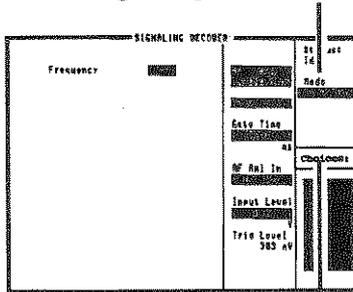


## To Decode A Signaling Sequence

1. Choose DECODER from the To Screen

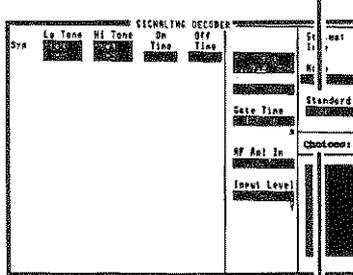


2. List the signaling mode choices

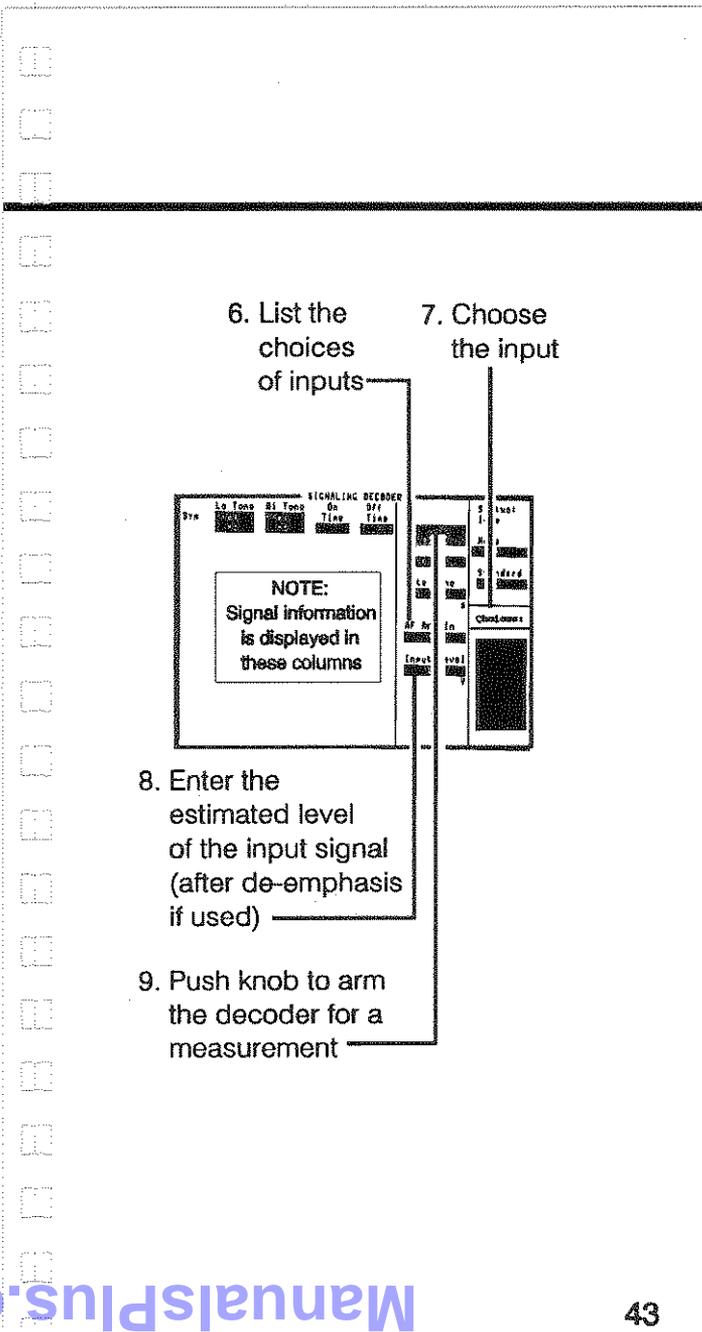


3. Choose the signaling mode

4. List the standard choices

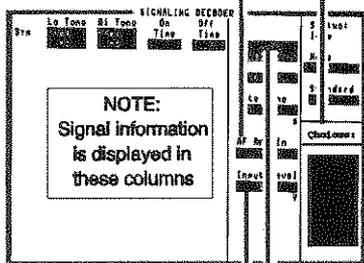


5. Choose a standard



6. List the choices of inputs

7. Choose the input



8. Enter the estimated level of the input signal (after de-emphasis if used)

9. Push knob to arm the decoder for a measurement



## Instrument Terms And Abbreviations

Refer to the Instrument User's Guide  
if more information is needed.

AF Anl- Audio Frequency Analyzer.

AF Anl In- Audio Frequency Analyzer  
Input.

AF Cnt Gate- Audio Frequency Counter  
Gate Time.

AF Gen1- Audio Frequency Generator 1.

AF Gen2- Audio Frequency Generator 2.  
Also used as the signaling  
Encoder.

Ant- Antenna.

## Instrument Terms And Abbreviations

---

**ANT IN-** Antenna Input. An alternate input connector for the RF Analyzer and Spectrum Analyzer for low level measurements. RF power **CANNOT** be measured from this connector.

**ASSIGN.** The key used to assign USER keys to instrument settings. To assign a USER key, position the cursor adjacent to the setting, press SHIFT, ASSIGN, and then one of the user keys k1-k5 or k1'-k3'.

**Atten Hold - Attenuator Hold.** A setting that prevents the RF Generator output attenuator from changing ranges, limiting the amplitude adjustment range.

**AUDIO IN (HI).** External input connector for audio measurements.

**AUDIO IN (LO).** External input connector for floating measurements. To ground or float the connector use the Audio In Lo field on the AF ANL screen.

**AUDIO OUT.** External output connector for AF Gen1 and/or AFGen2 (Encoder).

**AVG-** Average. The key used to do measurement averaging. When used it smooths out the measurement of rapidly fluctuating signals. To activate averaging, position the cursor adjacent to the unit of measure of the measurement. Then press SHIFT, AVG, ENTER. To cancel averaging, press SHIFT, AVG, ON/OFF.

**CONFIG-** Configure. The key used to access the CONFIGURE screen to change the HP-IB address, define the printer type, setup serial communications, and several other instrument settings.

## Instrument Terms And Abbreviations

---

**DC FM Zero.** This function removes DC offset when using DC-coupled FM.

**DECODER.** Signaling decoder.

**Dupl- Duplex.**

**DUPLEX.** The key used to access the DUPLEX TEST screen for simultaneous transmitter/receiver testing.

**DUPLEX OUT.** An alternate output connector for the RF Generator and Spectrum Analyzer Tracking Generator.

**ENCODER.** Signaling encoder.

**Ext Load R-** External Load Resistance.

This function is used to specify the impedance of the device connected to the AUDIO IN connector for calibrated audio power measurements.

**Ext TX Key-** External Transmitter Key.

This function keys a transmitter through the MIC/ACC connector.

**Filter 1.** The AF Analyzer high-pass and optional filters.

**Filter 2.** The AF Analyzer low-pass and optional filters.

## Instrument Terms And Abbreviations

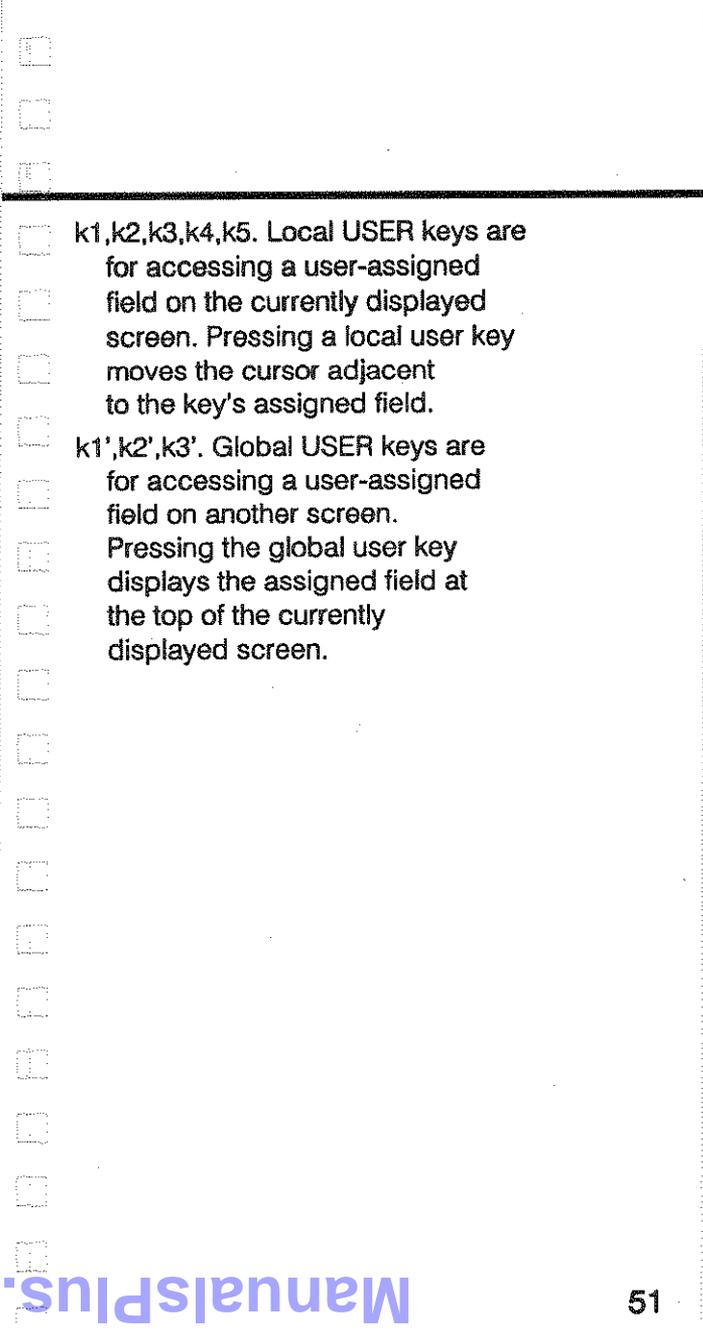
**Gain Cntl- Gain Control.** This function selects the automatic or manual AF Analyzer input, De-Emp, and Notch gains. Auto is normally used.

**HI LIMIT/LO LIMIT.** The keys used to set high and low measurement limits. To enter the limits, position the cursor adjacent to the unit-of-measure of the measurement, then press SHIFT, LO or HI LIMIT, a value, ENTER. To cancel limits, press SHIFT, LO or HI LIMIT, ON/OFF.

**HOLD.** The key used to freeze information displayed on the screen. Select HOLD again to release the display.

**IF Filter- Intermediate Frequency Filter.** A field that selects the RF Analyzer IF bandwidth.

**Input Atten- Input Attenuator.**



k1,k2,k3,k4,k5. Local USER keys are for accessing a user-assigned field on the currently displayed screen. Pressing a local user key moves the cursor adjacent to the key's assigned field.

k1',k2',k3'. Global USER keys are for accessing a user-assigned field on another screen. Pressing the global user key displays the assigned field at the top of the currently displayed screen.

## Instrument Terms And Abbreviations

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**MEAS RESET-** Measurement Reset.

**METER.** The key used to display the analog meter. To set up the meter, position the cursor adjacent to the unit of measure of the measurement to display, then press SHIFT, METER.

**MIC/ACC-** Microphone/Accessory. A connector that is used to key a transmitter and/or modulate a carrier with a microphone.

**Mic Pre-Emp (Auto)-** Microphone Pre-Emphasis. This function automatically switches in and out the pre-emphasis network (750us).

**Mic Pre-Emp (Hold)-** Microphone Pre-Emphasis. This function allows manual switching in and out of the pre-emphasis network when FM modulation is used.

**Mod In To- Modulation In To.** This function selects the RF Generator's modulation type when using the Modulation Input and MIC/ACC connectors for external modulation.

**Normalize (A-B).** A Spectrum Analyzer entry to display the difference between the current screen and a previously saved screen.

**Normalize (A Only).** A Spectrum Analyzer entry to select a normal display

**Normalize (Save B).** A Spectrum Analyzer entry to save the current display.

## Instrument Terms And Abbreviations

---

**Pk Det To (De-Emp)- Peak Detector To (De-Emphasis).** This function sets up the AF Analyzer to measure the peak voltage after the de-emphasis network.

**Pk Det To (Filters)- Peak Detector To (Filters).** This function sets up the AF Analyzer to measure the peak voltage after audio filters 1 and 2 and before the de-emphasis network.

**PREV-** Previous screen. The key used to toggle between the currently displayed screen and the previously accessed screen.

**PRESET.** The key used to reset the instrument's settings to the factory-defined default states.



## Instrument Terms And Abbreviations

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**Range Hold.** This function selects the automatic or manual control of all AF Analyzer and RF Analyzer gain, and tuning adjustments.

**RECALL.** The key used to recall previously saved settings.

**REF SET- Reference Set.** The key used enter a measurement reference level. To enter a reference level, position the cursor adjacent to the unit of measure of the measurement. Then press SHIFT, REF SET, enter the ref level\*, and complete the entry by pressing ENTER. To cancel ref set, press SHIFT, REF SET, ON/OFF.

\*The currently displayed measurement value is used as the reference if you do not enter a specific value.



**RELEASE.** The key used to clear a user key's assignment.

**RF Anl-** Radio Frequency Analyzer.

**RF Cnt Gate-** Radio Frequency Counter Gate Time.

**RF Gen-** Radio Frequency Generator.

**RF Offset (Gen-Anl)-** Radio Frequency Offset (Generator-Analyzer). An entry that sets up the difference between the RF Generator and RF Analyzer frequencies. Automatically offsets the RF Analyzer tune frequency from the RF Generator frequency.

## Instrument Terms And Abbreviations

**RX-** Receiver Test. The key used to access the RX TEST screen for performing tests on a radio receiver.

**RX/TX Cntl (Auto)-** RX TEST/TX TEST screen Control (Auto). This function enables automatic switching between the RX TEST and TX TEST screens.

**RX/TX Cntl (Carrier)-** Receiver/Transmitter Control (Carrier). This function automatically switches RX TEST and TX TEST screens when a signal is detected at the RF IN/OUT or ANT IN connector and Auto is selected in the RX/TX Cntl field.



## Instrument Terms And Abbreviations

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**SAVE.** The key used to save settings displayed on the screen. The number of settings that can be saved depends on the number of entries made since the default settings.

**SCOPE-** Oscilloscope. This selection accesses the OSCILLOSCOPE screen.

**Sensitivity.** A field that sets up the RF Analyzer's input sensitivity at the ANT IN connector. Measurements may not be as accurate when using High sensitivity.

**Settling (Fast).** This function sets up the AF Analyzer for fast settling. Use for measurements above 200 Hz.

**Settling (Slow).** This function sets up the AF Analyzer for slow settling. Use for measurements below 200 Hz.



**SPEC ANL- Spectrum Analyzer.** This selection accesses the **SPECTRUM ANALZER** screen.



**Squelch (Fixed).** The instrument is set to the factory defined squelch level.



**Squelch (Open).** The instrument is set for no squelch.



**Squelch (Pot).** The instrument is set to manually adjust the squelch with the knob.



## Instrument Terms And Abbreviations

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- TESTS.** The key used to access the TESTS screen for running IBASIC programs.
- Tune Mode (Auto).** This function sets up the RF Analyzer to tune to the input signal and displays the signal's frequency.
- Tune Mode (Manual).** This function sets up the RF Analyzer to tune to the manually-entered frequency and displays the difference between the input signal and the manually entered frequency.
- TX- Transmitter Test.** The key used to access the TX TEST screen for performing tests on a radio transmitter.
- TX Pwr Meas- Transmitter Power Measurement Zero.** This function zeros the RF power meter.

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