Agilent Technologies
E8257D/67D, E8663D
PSG Signal Generators

Key Reference

Agilent Technologies

Notices

Manual Part Number

E8251-90354

Edition

Warranty

Technology Licenses

Restricted Rights Legend

Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

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1 Key Reference

Symbols

of Carriers

Supported   E8267D with Option 601 or 602

This softkey accesses a menu from which you can set the number of carriers for initialization in the multicarrier table.

Points

Supported   All Models

This softkey enables you to define the number of points in a step sweep. When you press this key, the current value is shown in the active entry area.

A step sweep must have a minimum of 2 points.

Preset   2

Range   2–1601

Skipped Points

Supported   E8267D with Option 601 or 602

Use this softkey, in conjunction with the **First Mkr Point** and **Last Mkr Point** softkeys, to determine the marker signal pulse pattern within the range. A zero value means the marker points occur consecutively across the range. This produces a single marker pulse at the event output that spans the range. A value greater than zero creates a repeating marker pulse pattern across the range, where the gap between the marker points is equal to the # Skipped Points value. For example, a skip value of two leaves two waveform points between each marker point. The gaps begin after the first marker point. Each marker point in the pattern, which is only one point wide, produces a marker pulse. To configure a clock signal, set the skip value to one. For more information on markers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Preset   0

Range   0 to (last mkr point – first mkr point)

In the Dual ARB

The waveform is the waveform highlighted in the Set Markers display.

In All Other ARB Formats

This softkey is not available unless the ARB format is on.

ΦM Dev

Supported   All with Option UNT

This softkey enables you to set the deviation of the phase modulation for the currently selected modulation path. Deviation limits depend on the carrier frequency. Limiting occurs only when the modulation is on.

Preset	0.000 rad		
Range	*Frequency*	*Normal Bandwidth*	*High Bandwidth*
	100 kHz–250 MHz	0–10 rad	0–1 rad
	> 250–500 MHz	0–5 rad	0–0.5 rad
	> 500 MHz–1 GHz	0–10 rad	0–1 rad
	> 1–2 GHz	0–20 rad	0–2 rad
	> 2–3.2 GHz	0–40 rad	0–4 rad
	> 3.2–10.0 GHz	0–80 rad	0–8 rad
	> 10.0–20.0 GHz	0–160 rad	0–16 rad
	> 20.0–28.1 GHz	0–242.4 rad	0–24.2 rad
	> 28.1–40.0 GHz	0–400 rad	0–40 rad

ΦM Dev Couple Off On

Supported   All with Option UNT

This softkey toggles the state for phase modulation deviation coupling.

Off   The ΦM Path 1 and ΦM Path 2 deviation values are independent of each other.

On   The ΦM Path 1 and ΦM Path 2 deviation values are linked. Any change you make to the modulation value for one standard path is automatically applied to both paths.

Preset   Off

ΦM Off On

Supported   All with Option UNT

This softkey toggles the operating state of the currently selected phase modulation. When phase modulation is on, the ΦM annunciator is displayed.

Off   Use this setting to turn off the currently selected phase modulation.

On   Use this setting to turn on the currently selected phase modulation.

Preset   Off

ΦM Path 1 2

Supported   All with Option UNT

This softkey toggles the selection between ΦM Path 1 and ΦM Path 2.

ΦM Path 1   This selection enables you to configure the modulation characteristics for ΦM Path 1, using the remaining softkeys in the ΦM menu.

ΦM Path 2   This selection enables you to configure the modulation characteristics for ΦM Path 2, using the remaining softkeys in the ΦM menu.

ΦM Path 1 and ΦM Path 2 define two standard phase modulation configurations which can be used together.

ΦM Path 1 and ΦM Path 2 are summed internally for composite modulation. Either path can be switched to any one of the modulation sources: Internal, Ext1, or Ext2.

ΦM Path 2 must be set to a deviation less than ΦM Path 1.

Preset   ΦM Path 1

ΦM Rate

Supported   All with Option UNT

This softkey enables you to change the frequency of the phase modulation.

Preset   400.0 Hz

Range   500.0 MHz–1.0 MHz

ΦM Source

Supported   All with Option UNT

Use this softkey to access a menu of choices that enables you to select either an internally generated or an externally applied modulation input for the phase modulation source. The internal modulation is always ac-coupled. For externally applied signals, you can choose between ac- and dc-coupled modulation.

A 1.0 volt peak voltage input is required for calibrated ΦM deviation settings. The EXT 1 LO/HI and EXT 2 LO/HI display annunciators will turn on if the peak input voltage differs from 1.0 volt by more than 3%. (The LO/HI annunciators function only for ac-coupled external inputs.)

ΦM Start Rate

Supported   All with Option UNT

This softkey enables you to change the starting frequency of the internally generated modulation source for swept-sine phase modulation.

This softkey is coupled to the **FM Rate** softkey in the initial FM menu and the **FM Tone 1 Rate** softkey in the FM Dual-Sine menu. Any value set for FM Start Rate is reflected in the **FM Rate** and **FM Tone 1 Rate** softkeys.

Preset   400.0 Hz

Range   1.0 Hz–1.0 MHz (minimum increment/decrement is 1.0 Hz)

ΦM Stop Rate

Supported   All with Option UNT

This softkey enables you to change the ending frequency of the internally generated modulation source for swept-sine phase modulation.

This softkey is coupled to the **FM Tone 2 Rate** softkey in the FM Dual-Sine menu. Any value set for FM Stop Rate is reflected in the **FM Tone 2 Rate** softkey.

Preset   400.0 Hz

Range   1.0 Hz–1.0 MHz (minimum increment/decrement is 1.0 Hz)

ΦM Sweep Rate

Supported   All with Option UNT

This softkey enables you to set the sweep rate for swept-sine phase modulation.

Preset   400.0 Hz

Range   0.5 Hz–100.0 kHz

ΦM Sweep Trigger

Supported   All with Option UNT

Use this softkey to access a menu of choices that enables you to select the triggering mode for swept-sine phase modulation.

You can also configure the polarity of the TTL signal output at the TRIGGER IN connector using the **Trigger In Polarity Neg Pos** softkey on this menu.

Preset   Free Run

ΦM Tone 1 Rate

Supported   All with Option UNT

This softkey enables you to set the internal modulation frequency for the phase modulation tone 1 rate of the dual-sine waveform.

This key is coupled to the **ΦM Rate** softkey in the initial ΦM menu and the **ΦM Start Rate** softkey in the ΦM swept-sine menu. Any value set for **ΦM Tone 1 Rate** is reflected in the **ΦM Rate** and **ΦM Start Rate** softkeys.

Preset   400.0 Hz

Range   0.5 Hz–1.0 MHz (minimum increment is 0.5 Hz)

ΦM Tone 2 Ampl Percent Of Peak

Supported   All with Option UNT

This softkey enables you to adjust the amplitude of the alternate frequency as a percentage of the peak LF analog modulation amplitude. For example, if the tone 2 amplitude is set to 30.0% of the total amplitude, then the primary frequency is 70.0% of the total amplitude.

This is applicable for the dual-sine function only.

Preset   50.0%

Range   0.0%–100.0%

ΦM Tone 2 Rate

Supported   All with Option UNT

This softkey enables you to set the internal modulation frequency for the phase modulation tone 2 rate of the dual-sine waveform.

This key is coupled to the **ΦM Stop Rate** softkey in the ΦM swept-sine menu. Any value set for **ΦM Tone 2 Rate** is reflected in the **ΦM Stop Rate** softkey.

Preset   400.0 Hz

Range   0.5 Hz–1.0 MHz (minimum increment is 0.5 Hz)

ΦM Waveform

Supported   All with Option UNT

Use this softkey to access a menu of choices that enables you to select the phase modulation waveform that can be produced by the internal modulation source.

This softkey is enabled only when Internal is selected in the ΦM Source menu.

π/4 DQPSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations and enables you to select either a modulation or load an I/Q map into the I/Q table editor.

Selecting a π/4 DQPSK Modulation

Use this softkey to select π/4 differential quadrature phase shift keying (π/4 DQPSK) to modulate a continuous stream of the selected data pattern. π/4 DQPSK modulation transmits data at the rate of 2 bits per symbol.

Loading a π/4 DQPSK I/Q Map into the Table Editor

Use this softkey to load a π/4 differential quadrature phase shift keying (π/4 DQPSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Numerics

0 deg

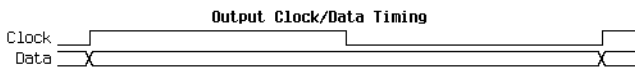**Supported**   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, aligns the transition edge of the clock with the beginning of each sample for parallel or parallel interleaved data transmission and with each bit for a serial data transmission. This is the factory preset phase selection.

Figure 1-1   **Clock Relative to the Data at 0 Degrees**

1

Supported   E8267D with Option 601 or 602 and Option 003

This softkey, for the N5102A module, selects one clock per sample for a parallel or parallel interleaved port configuration. This is the factory preset selection. With either a serial port configuration or an IF signal type, or when in input mode, this softkey is not accessible.

1.5V CMOS

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey sets the N5102A module logic type to a 1.5 volt CMOS signal.

CAUTION	Changing the logic type changes the voltage levels. To avoid potential damage to your device or the N5102A module, first verify that the new logic type and voltage are appropriate.

1 kHz

Supported   All Models

Use this softkey to select an automatic leveling control bandwidth of 1.0 kHz.

1.8V CMOS

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey sets the N5102A module logic type to a 1.8 volt CMOS signal.

CAUTION	Changing the logic type changes the voltage levels. To avoid potential damage to your device or the N5102A module, first verify that the new logic type and voltage are appropriate.

2

Supported   E8267D with Option 601 or 602 and Option 003

This softkey, for the N5102A module, selects two clocks per sample and is used in the parallel or parallel interleaved port configuration in the output mode. With either a serial port configuration, or an IF signal type, this softkey is not accessible.

2's Complement

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey sets the N5102A module data format to a two's complement representation of the data values. This is the factory preset selection.

2–Lvl FSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations and enables you to select either a modulation or load a default pattern into the FSK (frequency shift keying) table editor.

Selecting a 2–Level FSK Modulation

Use this softkey to select 2-level frequency shift keying (FSK) for modulating a continuous stream of the selected data pattern. Two-level FSK modulation transmits data at the rate of 1 bit per symbol. The selected modulation is displayed under the **Modulation Type** softkey in the Modulation Type menu.

Loading a 2–Level FSK Pattern into the FSK Table Editor

Use this softkey to load a 2-level frequency shift keying (FSK) modulation pattern into the FSK table editor. Two-level FSK modulation transmits data at the rate of 1 bit per symbol. For more information on using the FSK table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

2.5V CMOS

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey sets the N5102A module logic type to a 2.5 volt CMOS signal.

CAUTION	Changing the logic type changes the voltage levels. To avoid potential damage to your device or the N5102A module, first verify that the new logic type and voltage are appropriate.

3.3V CMOS

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey sets the N5102A module logic type to a 3.3 volt CMOS signal. This is the factory preset logic type.

CAUTION	Changing the logic type changes the voltage levels. To avoid potential damage to your device or the N5102A module, first verify that the new logic type and voltage are appropriate.

4

Supported   E8267D with Option 601 or 602 and Option 003

This softkey, for the N5102A module, selects four clocks per sample and is used in the parallel or parallel interleaved port configuration in the output mode. With either a serial port configuration, or an IF signal type, this softkey is not accessible.

4 1's & 4 0's

Supported   E8267D with Option 601 or 602

This softkey selects a binary data pattern that consists of four ones followed by four zeroes. Use this selection to generate unframed data patterns or for use with framed data transmissions. When you select **4 1's & 4 0's**, both the **Data** and the **Other Patterns** softkeys show this selection. In addition, P4 (where "P" refers to Pattern and "4" refers to four ones and four zeroes) appears in the Data field of the table. A single output of a framed P4 data pattern consists of enough repetitions of four ones followed by four zeroes to fill the data fields in TDMA timeslots.

4-Lvl FSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations and enables you to select either a modulation or load a default pattern into the FSK (frequency shift keying) table editor.

Selecting a 4-Level FSK Modulation

Press this softkey to select 4–level frequency shift keying (FSK) for modulating a continuous stream of the selected data pattern. Four–level FSK modulation transmits data at the rate of 2 bits per symbol, and conforms with FLEX variants of paging standards.

The selected modulation is displayed under the **Modulation Type** softkey in the Modulation Type menu.

Loading a 4–Level FSK Pattern into the FSK Table Editor

Press this softkey to load a 4–level frequency shift keying (FSK) modulation pattern into the FSK table editor. Four–level FSK modulation transmits data at the rate of 2 bits per symbol. For more information on using the FSK table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

4QAM

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations and enables you to select either a modulation or load a default I/Q map into the I/Q table editor.

Selecting a 4QAM Modulation

Press this softkey to select 4-state quadrature amplitude modulation (4QAM) to modulate a continuous stream of the selected data pattern. 4QAM transmits data at the rate of 2 bits per symbol.

The selected modulation is displayed under the **Select** and **QAM** softkeys in the Modulation Type menu.

Loading a 4QAM I/Q Map into the I/Q Table Editor

Press this softkey to load a 4-state quadrature amplitude modulation (4QAM) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

8 1's & 8 0's

Supported E8267D with Option 601 or 602

Use this softkey to select a binary data pattern that consists of eight ones followed by eight zeroes. Select this function to generate unframed data patterns or for use with framed data transmissions.

When you select **8 1's & 8 0's**, both the **Data** and the **Other Patterns** softkeys show this selection. In addition, P8 (where "P" refers to Pattern and "8" refers to eight ones and eight zeroes) appears in the Data field of the table.

A single output of a framed P8 data pattern consists of enough repetitions of eight ones followed by eight zeroes to fill the data fields in TDMA timeslots.

8-Lvl FSK

Supported E8267D with Option 601 or 602

This softkey appears in two different locations and enables you to select either a modulation or load a default pattern into the FSK (frequency shift keying) table editor.

Selecting a 8-Level FSK Modulation

Press this softkey to select 8–level frequency shift keying (FSK) for modulating a continuous stream of the selected data pattern. Eight–level FSK modulation transmits data at the rate of 3 bits per symbol.

The selected modulation is displayed under the **Modulation Type** softkey in the Modulation Type menu.

Loading a 8–Level FSK Pattern into the FSK Table Editor

Press this softkey to load an 8–level frequency shift keying (FSK) modulation pattern into the FSK table editor. Eight–level FSK modulation transmits data at the rate of 3 bits per symbol. For more information on using the FSK table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

8PSK

Supported E8267D with Option 601 or 602

This softkey appears in two different locations and enables you to select either a modulation or load an I/Q map into the I/Q table editor.

Selecting an 8PSK Modulation

Use this softkey to select 8-state phase shift keying (8PSK) to modulate a continuous stream of the selected data pattern. 8PSK modulation transmits data at the rate of 3 bits per symbol.

The modulation selection appears under the **Select** and **PSK** softkeys in the Modulation Type menus.

Loading an 8PSK I/Q Map into the Table Editor

Use this softkey to load an 8-state phase shift keying (8PSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

10 kHz

Supported   All Models

Use this softkey to select an automatic leveling control bandwidth of 10.0 kHz.

16 1's & 16 0's

Supported   E8267D with Option 601 or 602

Use this softkey to select a binary data pattern that consists of 16 ones followed by 16 zeroes. Use this selection to generate unframed data patterns or for use with framed data transmissions.

When you select **16 1's & 16 0's**, both the **Data** and the **Other Patterns** softkeys show this selection. In addition, P16 (where "P" refers to Pattern and "16" refers to 16 ones and 16 zeroes) appears in the Data field of the table.

A single output of a framed P16 data pattern consists of enough repetitions of 16 ones followed by 16 zeroes to fill the data fields in TDMA timeslots.

16-Lvl FSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation or load a default pattern into the frequency shift keying (FSK) table editor.

Selecting a 16-Level FSK Modulation

Press this softkey to select 16–level FSK for modulating a continuous stream of the selected data pattern. 16–level FSK modulation transmits data at the rate of 4 bits per symbol.

The selected modulation is displayed under the **Modulation Type** softkey in the Modulation Type menu.

Loading a 16–Level FSK Pattern into the FSK Table Editor

Press this softkey to load a 16–level FSK modulation pattern into the FSK table editor. 16–level FSK modulation transmits data at the rate of 4 bits per symbol. For more information on using the FSK table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

16PSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to select either a modulation or load an I/Q map into the I/Q table editor.

Selecting a 16PSK Modulation

Use this softkey to select 16-state phase shift keying (16PSK) to modulate a continuous stream of the selected data pattern. 16PSK modulation transmits data at the rate of 4 bits per symbol.

The modulation selection appears under the **Select** and **PSK** softkeys in the Modulation

Type menus.

Loading a 16PSK I/Q Map into the Table Editor

Use this softkey to load a 16-state phase shift keying (16PSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

16QAM

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to select either a modulation or load a default I/Q map into the I/Q table editor.

Selecting a 16QAM Modulation

Press this softkey to select 16-state quadrature amplitude modulation (16QAM) to modulate a continuous stream of the selected data pattern. 16QAM transmits data at the rate of 4 bits per symbol.

The selected modulation is displayed under the **Select** and **QAM** softkeys in the Modulation Type menu.

Loading a 16QAM I/Q Map into the I/Q Table Editor

Press this softkey to load a 16-state quadrature amplitude modulation (16QAM) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

25 Hz

Supported   All with Option UNR/UNX

This softkey enables you to select an internal or external reference oscillator bandwidth of 25 Hz.

32 1's & 32 0's

Supported   E8267D with Option 601 or 602

Use this softkey to select a binary data pattern that consists of 32 ones followed by 32 zeroes. Use this selection to generate unframed data patterns or for use with framed data transmissions.

When you select **32 1's & 32 0's**, both the **Data** and the **Other Patterns** softkeys show this selection. In addition, P32 (where "P" refers to Pattern and "32" refers to 32 ones and 32 zeroes) appears in the Data field of the table.

A single output of a framed P32 data pattern consists of enough repetitions of 32 ones followed by 32 zeroes to fill the data fields in TDMA timeslots.

32QAM

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation or load a default I/Q map into the I/Q table editor.

Selecting a 32QAM Modulation

Press this softkey to select 32‑state quadrature amplitude modulation (32QAM) to modulate a continuous stream of the selected data pattern. 32QAM transmits data at the rate of 5 bits per symbol.

The selected modulation is displayed under the **Select** and **QAM** softkeys in the Modulation Type menu.

Loading a 32QAM I/Q Map into the I/Q Table Editor

Press this softkey to load a 32‑state quadrature amplitude modulation (32QAM) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

40.000 MHz

Supported   E8267D

Use this softkey to apply a 40.000 MHz filter to signals that are routed to the I/Q modulator or to the external outputs. This filter eliminates spurs above 40.000 MHz.

53 Hz

Supported   All with Option UNR/UNX

This softkey enables you to select an internal or external reference oscillator bandwidth of 53 Hz.

64 1's & 64 0's

Supported   E8267D with Option 601 or 602

Use this softkey to select a binary data pattern that consists of 64 ones followed by 64 zeroes. Use this selection to generate unframed data patterns or for use with framed data transmissions.

When you select **64 1's & 64 0's**, both the **Data** and the **Other Patterns** softkeys show this selection. In addition, P64 (where "P" refers to Pattern and "64" refers to 64 ones and 64 zeroes) appears in the Data field of the table.

A single output of a framed P64 data pattern consists of enough repetitions of 64 ones followed by 64 zeroes to fill the data fields in TDMA timeslots.

64QAM

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to select either a modulation or load a default I/Q map into the I/Q table editor.

Selecting a 64QAM Modulation

Press this softkey to select 64‑state quadrature amplitude modulation (64QAM) to modulate a continuous stream of the selected data pattern. 64QAM transmits data at the rate of 6 bits per symbol.

The selected modulation is displayed under the **Select** and **QAM** softkeys in the Modulation Type menu.

Loading a 64QAM I/Q Map into the I/Q Table Editor

Press this softkey to load a 64QAM (64-state quadrature amplitude modulation) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*

90 deg

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, provides a 90 degree phase adjustment for the clock signal. The phase adjustment moves the clock transition edge relative to the beginning of each sample for parallel or parallel interleaved data transmission and to each bit during a serial data transmission.

This softkey is grayed out (unavailable) when the clock rate is less than 10 MHz or greater than 200 MHz. If 90 degrees is the phase setting when the clock rate is changed to a value that is less than 10 MHz or greater than 200 MHz, the phase setting becomes zero degrees.

Figure 1-2   **Clock Relative to the Data at 90 Degrees**
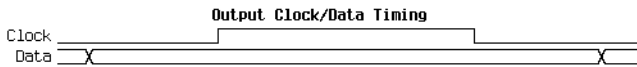
100 Hz

Supported   All Models

Use this softkey to select an automatic leveling control bandwidth of 100.0 Hz.

100 kHz

Supported   All Models

Use this softkey to select an automatic leveling control bandwidth of 100.0 kHz.

126 Hz

Supported   All with Option UNR/UNX

This softkey enables you to select an internal or external reference oscillator bandwidth of 126 Hz.

128QAM

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation or load a default I/Q map into the I/Q table editor.

Selecting a 128QAM Modulation

Press this softkey to select 128-state quadrature amplitude modulation (128QAM) to modulate a

continuous stream of the selected data pattern. 128QAM transmits data at the rate of 7 bits per symbol.

The selected modulation is displayed under the **Select** and **QAM** softkeys in the Modulation Type menu.

Loading a 128QAM I/Q Map into the I/Q Table Editor

Press this softkey to load a 128-state quadrature amplitude modulation (128QAM) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

180 deg

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, provides a 180 degree phase adjustment for the clock signal. The phase adjustment is relative to the beginning of each sample for a parallel or parallel interleaved data transmission and to each bit during a serial data transmission. This functions the same as selecting the negative clock polarity using the **Clock Polarity Neg Pos** softkey.

Figure 1-3   **Clock Relative to the Data at 180 Degrees**
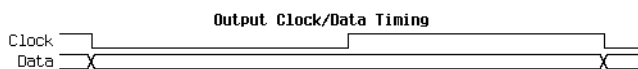
256QAM

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation or load a default I/Q map into the I/Q table editor.

Selecting a 256QAM Modulation

Press this softkey to select 256-state quadrature amplitude modulation (256QAM) to modulate a continuous stream of the selected data pattern. 256QAM transmits data at the rate of 8 bits per symbol.

The selected modulation is displayed under the **Select** and **QAM** softkeys in the Modulation Type menu.

Loading a 256QAM I/Q Map into the I/Q Table Editor

Press this softkey to load a 256-state quadrature amplitude modulation (256QAM) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

270 deg

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, provides a 270 degree phase adjustment for the clock signal. The phase adjustment moves the clock transition edge relative to the beginning of each sample for

parallel or parallel interleaved data transmission and to each bit during a serial data transmission.

This softkey is grayed out (unavailable) when the clock rate is less than 10 MHz or greater than 200 MHz. If 270 degrees is the phase setting when the clock rate is changed to a value that is less than 10 MHz or greater than 200 MHz, the phase becomes 180 degrees.

Figure 1-4   **Clock Relative to the Data at 270 Degrees**
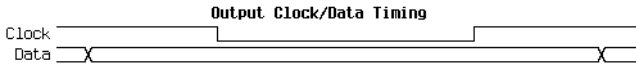
300

Supported   All Models

This softkey selects 300 as the baud rate for RS-232 data communication.

The baud rate is not affected by a preset or by a power cycle.

300 Hz

Supported   All with Option UNR/UNX

This softkey enables you to select an internal or external reference oscillator bandwidth of 300 Hz.

650 Hz

Supported   All with Option UNR/UNX

This softkey enables you to select an internal or external reference oscillator bandwidth of 650 Hz.

800MHz Base

Supported   All Models

This softkey selects 800 MHz Base as the frequency band for Personal Digital Cellular (PDC). The output frequency depends on both the channel band and channel number selections.

Range   *Channels*: 0–640   *Frequency*: 810.000–826.000 MHz

800MHz Mobile

Supported   All Models

This softkey selects 800 MHz Mobile as the frequency band for Personal Digital Cellular (PDC). The output frequency depends on both the channel band and channel number selections.

Range   *Channels*: 0–640   *Frequency*: 940.000–956.000 MHz

1200

Supported   All Models

This softkey selects 1200 as the baud rate for RS-232 data communication. The baud rate is not affected by a preset or by a power cycle.

1500MHz Base

Supported　　　All Models

This softkey selects 1500 MHz Base as the frequency band for Personal Digital Cellular (PDC). The output frequency depends on both the channel band and channel number selections.

Range　　　*Channels*: 0–480　　　*Frequency*: 1.477–1.493 GHz

1500MHz Mobile

Supported　　　All Models

This softkey selects 1500 MHz Mobile as the frequency band for Personal Digital Cellular (PDC. The output frequency depends on both the channel band and channel number selections.

Range　　　*Channels*: 0–480　　　*Frequency*: 1.429–1.445 GHz

2400

Supported　　　All Models

This softkey selects 2400 as the baud rate for RS-232 data communication. The baud rate is not affected by a preset or by a power cycle.

4800

Supported　　　All Models

This softkey selects 4800 as the baud rate for RS-232 data communication. The baud rate is not affected by a preset or by a power cycle.

8340B,8341B

Supported　　　All Models

This softkey selects 8340B or 8341B compatible commands for remote operation of the signal generator, using the GPIB interface only. The selection appears in the Preset Language softkey menu and the Remote Language softkey menu.

The **8340B,8341B** softkey is a language choice for the signal generator and is compatible with the remote language commands used by the 8340B and the 8341B. Choosing this softkey in the Preset Language menu allows you to select this remote language as the default after you preset the signal generator. Choosing this softkey in the Remote Language menu allows you to immediately use 8340B and 8341B commands for remote operation of the signal generator.

8360 Series

Supported　　　All Models

This softkey selects 8360 series-compatible commands for remote operation of the signal generator. The selection appears in two places; the **Preset Language** softkey menu and the **Remote Language** softkey

menu.

The **8360 Series** softkey is a language choice for the signal generator and is compatible with the remote language commands used by the 8360 series. Choosing **8360 Series** in the Preset Language menu allows you to select this remote language as the default after you preset the signal generator. Choosing **8360 Series** in the Remote Language menu allows you to immediately use 8360 series commands for remote operation of the signal generator.

The selection is not affected by an instrument preset or power cycle.

9600

Supported   All Models

This softkey selects 9600 as the baud rate for RS-232 data communication.

The baud rate is not affected by a preset or by a power cycle.

19200

Supported   All Models

This softkey selects 19200 as the baud rate for RS-232 data communication.

The baud rate is not affected by a preset or by a power cycle.

38400

Supported   All Models

This softkey selects 38400 as the baud rate for RS-232 data communication.

The baud rate is not affected by a preset or by a power cycle.

57600

Supported   All Models

This softkey selects 57600 as the baud rate for RS-232 data communication.

The baud rate is not affected by a preset or by a power cycle.

83711B,83712B

Supported   All Models

This softkey selects 83711B or 83712B compatible commands for remote operation of the signal generator, using the GPIB interface only. The selection appears in the Preset Language softkey menu and the Remote Language softkey menu.

The **83711B,83712B** softkey is a language choice for the signal generator and is compatible with the remote language commands used by the 83711B and the 83712B. Choosing this softkey in the Preset Language menu allows you to select this remote language as the default after you preset the signal generator. Choosing this softkey in the Remote Language menu allows you to immediately use 83711B and 83712B commands for remote operation of the signal generator.

83731B,83732B

Supported   All Models

This softkey selects 83731B or 83732B compatible commands for remote operation of the signal generator, using the GPIB interface only. The selection appears in the Preset Language softkey menu and the Remote Language softkey menu.

The **83731B,83732B** softkey is a language choice for the signal generator and is compatible with the remote language commands used by the 83731B and the 83732B. Choosing this softkey in the Preset Language menu allows you to select this remote language as the default after you preset the signal generator. Choosing this softkey in the Remote Language menu allows you to immediately use 83731B and 83732B commands for remote operation of the signal generator.

83751B,83752B

Supported   All Models

This softkey selects 83751B or 83752B compatible commands for remote operation of the signal generator, using the GPIB interface only. The selection appears in the Preset Language softkey menu and the Remote Language softkey menu.

The **83751B,83752B** softkey is a language choice for the signal generator and is compatible with the remote language commands used by the 83751B and the 83752B. Choosing this softkey in the Preset Language menu allows you to select this remote language as the default after you preset the signal generator. Choosing this softkey in the Remote Language menu allows you to immediately use 83751B and 83752B commands for remote operation of the signal generator.

87570 System

Supported   All Models

This softkey selects 87570-compatible commands for remote operation of the signal generator, using the GPIB interface only. The selection appears in the Preset Language softkey menu and the Remote Language softkey menu.

The **87570 System** softkey is a language choice for the signal generator and is compatible with the remote language commands used by the 87570 system. Choosing this softkey in the Preset Language menu allows you to select this remote language as the default after you preset the signal generator. Choosing this softkey in the Remote Language menu allows you to immediately use 87570 commands for remote operation of the signal generator.

A

Abort

Supported   All Models

Use this softkey to stop the selected test.

Abort Cal

Supported   E8267D with Option 601 or 602

Use this softkey to abort a calibration in process. If you abort the calibration, the previous calibration data is restored.

Activate Secure Display

Supported   All Models

This softkey blanks the display, except for the message *** SECURE DISPLAY ACTIVATED ***, and disables the front panel keys. The **Confirm Secure Display** softkey must be selected in order to activate the secure display mode. Once this function is activated, the power must be cycled to re‑enable the display and front panel keys. For more information about security functions, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Add Comment To Seq[*n*] Reg[*nn*]

Supported   All Models

This softkey enables you to add a comment that is associated with a register in use. The register number is listed in the text area of the display and the comment is shown immediately following the register.

The **Add Comment to Seq[n] Reg[nn]** softkey changes to **Edit Comment In Seq[n] Reg[nn]** after adding a comment to the selected state.

The comment line is limited to 55 alpha‑numeric and special characters.

Adjust Phase

Supported   All Models

This softkey enables you to change the phase of the RF output signal. The change is relative to whatever phase the signal generator locked to the last time a frequency change was performed. For this reason, the phase adjustment does not survive changes in frequency and must be readjusted. If you first press **Phase Ref Set**, the current output phase is set as a zero reference and any subsequent phase adjustment is displayed as relative to the zero reference.

Phase adjustment cannot be used with frequency or phase modulation. Adjustments to phase can be made in 0.1 degree increments.

Preset   0.000 radians

Range   ± 3.142 radians or ±180.0 degrees

Agilent 8355x Source Module

Supported   All Models

Use this softkey to set the signal generator to operate with an Agilent 83550 series millimeter‑wave source module. Communication between the source module and the signal generator can be established once the source module interface cable is connected to the signal generator's rear‑panel SOURCE MODULE INTERFACE connector. This connection allows the signal generator to display the frequency of the source module. It also provides automatic ALC leveling at the output of the source module.

Preset   On

ALC BW

Supported   All Models

This softkey accesses a menu from which you can select a bandwidth for the ALC loop. In Auto mode, the PSG hardware selects a bandwidth to optimize performance with the current settings. Selecting a bandwidth overrides the Auto setting.

For waveforms with varying amplitudes and/or a high crest factor, it is recommended that the ALC loop bandwidth be set to 100 Hz, which is the default bandwidth set when an ARB format is turned on. Limiting the loop bandwidth of the ALC circuit will prevent the ALC from sampling the fast rising edges of high-crest pulsed waveforms.

Use this softkey to access a menu of choices for automatic leveling control (ALC) bandwidth. In Auto mode, the hardware selects an appropriate bandwidth to optimize performance with the current settings. You can also manually choose an ALC bandwidth and override the Auto setting.

This softkey is inactive when internal I/Q modulation is turned on.

Preset   Auto

ALC Hold

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you select one of four markers to enable the automatic leveling control (ALC) hold function for the output signal, or select None to disable the hold feature. The hold selection remains until you reconfigure it, preset the signal generator, or cycle the PSG power. When enabled (ALC On), the ALC levels the RF output signal while the marker is high and holds the ALC (does not respond to RF output signal amplitude changes) while the marker signal is low. For more detailed information on the ALC hold function, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

A high marker signal enables the ALC hold when the marker polarity is positive; a low marker signal disables the ALC Hold. The ALC Hold marker function holds the I/Q modulator at the amplitude of the sample point(s) where the marker signal occurs. Primarily used for bursted signals to maintain power accuracy.

| **CAUTION** | Incorrect ALC sampling (response) can create a sudden unleveled condition that may create a spike in the RF output potentially damaging a DUT or connected instrument. Ensure that you set markers to let the ALC sample over an amplitude that accounts for the high power levels within the signal. |

| **NOTE** | Do not use the ALC hold for more than 100 ms, because it can affect the waveform's output amplitude. |

The ALC hold setting is part of the file header information, so saving the setting to the file header saves the current marker routing for the waveform file. For more information on file headers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

| **NOTE** | A waveform file that has unspecified settings in the file header uses the previously played or configured waveform's routing settings. |

Remarks   If the Pulse Routing function has been selected, it will automatically incorporate ALC Hold. The current ALC Hold mode is shown in parenthesis below the softkey. For more information on file headers

ALC Off On

Supported   All Models

This softkey toggles the operating state of the automatic leveling control (ALC) circuit. The RF output power of the signal generator is constantly monitored and controlled by the ALC circuit. Its purpose is to maintain output power at a desired level by eliminating power drift due to temperature and time.

There are some modulation conditions which the ALC circuit cannot handle properly which lead to output level errors. In these conditions, better power level accuracy can be obtained by turning the ALC off and using power search. ALC Off is useful with pulse modulation if the pulse width is narrower than 2 μs and with certain external I/Q modulation formats. Refer to "Power Search" on page 152 for more information on the power search function.

Pulse modulation is accomplished using a modulator that precedes the ALC detector. The ALC must therefore measure a pulsed signal, and it can do this if the pulse width exceeds 2 μs. For narrower pulses, set the **ALC Off On** softkey to Off. Refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide* for more information on using the ALC.

With external I/Q modulation, the ALC loop acts to hold the signal generator's average output power constant, even though variations in the I/Q input power $(I^2 + Q^2)$ occur. Rapid variations of $(I^2 + Q^2)$ propagate to the output, while slow variations are removed by the ALC loop, with a high-pass corner of 1 kHz. If you do not want this high-pass filtering, set the **ALC Off On** softkey to Off. With ALC off, the I/Q modulation will be DC-coupled. Using power search, power level accuracy is preserved if

$$\sqrt{I^2 + Q^2} = 0.5 \ V_{rms}.$$

When ALC is off, the ALC OFF display annunciator will turn on. An alternative to setting the ALC off is to set the ALC to a narrow bandwidth

Off   The output power level is not controlled.

On   The output power level is constantly monitored and controlled.

Preset   On

Alignment Left Cent Right

Supported   E8267D with Option 601 or 602

This command will align the two tones either left, center or right of the carrier frequency.

Left   This selection aligns the upper tone to the carrier frequency, resulting in a waveform that is left-aligned.

Cent   This selection centers the tones on the carrier frequency.

Right   This selection aligns the lower tone to the carrier frequency, resulting in a waveform that is right-aligned.

Preset   Cent

All

Supported   All Models

This softkey enables you to list all signal generator file types stored in the user file system.

All Timeslots

Supported   This softkey is not active at this time

Alternate Sweep Off On

Supported   All with Option 007

This softkey toggles the operating state of the alternate sweep function. Turn on alternate sweep to alternate between the current sweep and a previously saved sweep, selected with **Alternate Sweep Register** softkey.

Preset   Off

Alternate Sweep Register

Supported   All with Option 007

Use this softkey to select a previously saved ramp sweep state to alternate with the current sweep. Ramp sweep states are saved with the **Save** hardkey. You are limited to saving ramp sweep states to registers 1 through 9 to in sequence 0.

Preset   1

AM

Supported   All with Option UNT

Use this hardkey to access a menu of choices that enables you to configure the amplitude modulation type, path, depth and depth coupling, rate, source, mode, and waveform.

AM Depth

Supported   All with Option UNT

This softkey enables you to set the amplitude modulation depth for the selected modulation path. The AM depth for both AM Path 1 and 2 can be user-defined. If AM Path WB is selected, the depth is set at 100% and is not user-defined. This softkey also appears in the Dual-Sine menu and will set the AM depth for both tone one and tone two.

The new value of AM depth applies only to the AM path selected.

Preset   0.1% *Linear*
40 dB *Exponential*

Range   0.0–100.0% Linear (minimum increment is 0.1%)
0–40 dB Exponential

AM Depth Couple Off On

Supported   All with Option UNT

This softkey toggles the operating state for AM depth coupling. AM depth coupling links the depth values of AM Path 1 and AM Path 2.

When the values are coupled, any change you make to one AM depth value is applied to both.

On   AM depth is coupled and applied to both AM Path 1 and AM Path 2.

Off   AM depth coupling is disabled.

Preset   Off

AM Mode Normal Deep

Supported   All with Option UNT

This softkey toggles the amplitude modulation mode between normal and deep.

Normal   This selection maintains the standard amplitude modulation behavior.

Deep   This mode provides an amplitude modulation depth with a greater dynamic range than the normal mode when the ALC is enabled.

Preset   Normal

AM Off On

Supported   All with Option UNT

This softkey turns amplitude modulation either off or on for the AM path selected.

Two paths for amplitude modulation can be simultaneously enabled provided that different sources (for example, Internal, Ext1, or Ext2) are used. When amplitude modulation is on, the front panel AM annunciator is displayed.

Although you can enable amplitude modulation with this key, the RF carrier is modulated only when you set **Mod On/Off** to on and is available at the RF Output connector only after **RF On/Off** is set to on.

On   AM is turned on with this key. If two or more paths are enabled then the modulation signals from the paths are summed internally for composite

                  modulation.

Off   AM for a path(s) is turned off with this key.

Preset   Off

AM Path 1 2 WB

Supported   All with Option UNT

This softkey enables you to select an amplitude modulation path. AM Path 1, 2, and WB define standard amplitude modulation configurations which can be used together.

AM Path 1, AM Path 2, and AM WB (wide band) can be summed internally for composite modulation. Either path can be switched to any of the modulation sources: Internal 1, Internal 2, Ext1, or Ext2,

for example. All modulation types can be simultaneously enabled, except FM with ΦM. The AM, FM, and ΦM can sum inputs from any two sources. Any source can be routed to one modulation type.

The RF carrier is available at the RF OUTPUT connector when you set **RF On/Off** to on. Set **Mod On/Off** to enable the modulation that you have selected.

AM Path 1	This selection enables you to configure the modulation characteristics for AM Path 1, using the remaining softkeys in the AM menu.
AM Path 2	This selection enables you to configure the modulation characteristics for AM Path 2, using the remaining softkeys in the AM menu.
AM WB	This selection enables you to configure the modulation characteristics for AM WB, using the remaining softkeys in the AM menu.
Preset	AM Path 1

AM Polarity Norm Inv

Supported   Option UNT

This softkey determines how a negative or positive AM input voltage will effect the RF ouput amplitude.

Normal	A negative AM input voltage will reduce the RF output amplitude.
Inverted	A positive AM input voltage will reduce the RF output amplitude. (This is the default.)

AM Rate

Supported   All with Option UNT

This softkey enables you to change the frequency of the internal modulation source.

The new value for the AM rate applies only to the AM path selected.

Preset	400.0 Hz
Range	0.5 Hz–100.0 kHz (minimum increment/decrement allowed is 0.5 Hz) 0.5 Hz–1.0 MHz if a sine wave is selected as the internal waveform

AM Source

Supported   All with Option UNT

Use this softkey to access a menu of available sources for internally generated and externally applied modulation formats. Internal modulations are always ac-coupled. When an externally-applied modulation is selected you can choose between 50 Ohm and 600 Ohm impedances using the Ext Impedance softkey.

A 1.0 volt peak voltage input is required for calibrated AM depth settings. The EXT 1 LO/HI and EXT 2 LO/HI display annunciators will turn on if the peak input voltage differs from 1.0 by more than 3%. (The LO/HI annunciators function only for ac-coupled external inputs.)

Preset	Internal

AM Start Rate

Supported   All with Option UNT

This softkey enables you to change the start frequency of the swept-sine modulation.

This softkey is coupled to the **AM Rate** softkey in the AM menu and the **AM Tone 1 Rate** softkey in the AM Dual-Sine menu. Any value set for the AM start rate is reflected in the **AM Rate** and **AM Tone 1 Rate** softkeys.

Preset   400.0 Hz

Range   1.0 Hz–1.0 MHz (minimum increment/decrement allowed is 1.0 Hz)

AM Stop Rate

Supported   All with Option UNT

This softkey enables you to change the stop frequency of the swept-sine modulation.

This softkey is coupled to the **AM Tone 2 Rate** softkey in the AM Dual-Sine menu. Any value set for the AM stop rate is coupled to the
AM Tone 2 Rate softkey.

Preset   400.0 Hz

Range   1.0 Hz–1.0 MHz (minimum increment/decrement allowed is 1.0 Hz)

AM Sweep Rate

Supported   All with Option UNT

This softkey enables you to set the sweep rate for the swept-sine modulation.

Preset   400.0 Hz

Range   0.5 Hz–100.0 kHz

AM Sweep Trigger

Supported   All with Option UNT

Use this softkey to access a menu of choices enabling you to select a triggering mode for the swept-sine modulation.

Preset   Free Run

AM Tone 1 Rate

Supported   All with Option UNT

This softkey enables you to set the frequency for AM tone 1 of the dual-sine modulation.

This softkey is coupled to the **AM Rate** softkey in the AM menu and the
AM Start Rate softkey in the AM Dual-Sine menu. Any value set for the AM tone 1 rate is reflected in the **AM Rate** and **AM Start Rate** softkeys.

Preset   400.0 Hz

Range   0.5 Hz–1.0 MHz (minimum increment/decrement allowed is 0.5 Hz)

AM Tone 2 Ampl Percent of Peak

Supported   All with Option UNT

This softkey enables you to adjust the tone 2 amplitude of the dual-sine modulation, as a percentage of the total amplitude. For example, if the tone 2 amplitude is set to 30% of the total amplitude, then the tone 1 amplitude is 70% of the total amplitude. This key is available for the dual-sine mode only.

Preset   50.0%

Range   0.1%–99.9%

AM Tone 2 Rate

Supported   All with Option UNT

This softkey enables you to set the internal modulation frequency for tone 2 of the dual-sine modulation. This key is available for the dual-sine mode only.

Preset   400.0 Hz

Range   0.5 Hz–1.0 MHz (minimum increment/decrement allowed is 0.5 Hz)

AM Type LIN EXP

Supported   All with Option UNT

This softkey toggles the amplitude modulation scale type between linear (percent/volt) and exponential (dB/volt).

LIN   This selection uses a linear (percent/volt) amplitude modulation depth scale.

EXP   This selection uses an exponential (dB/volt) amplitude modulation depth scale.

Preset   LIN

AM Waveform

Supported   All with Option UNT

Use this softkey to access a menu of choices enabling you to select an amplitude modulation waveform that can be produced by the internal modulation source. This softkey is available after selecting Internal 1 or Internal 2 as the AM source or after presetting the signal generator.

The waveform selection applies only to the AM path selected and the AM Waveform softkey is available for the internal source only.

Preset   Sine

Ampl

Supported   All Models

This softkey enables you to set the signal generator to sweep amplitude data only. The frequency is set at a constant value determined by the **Frequency** hardkey.

You can define a sweep containing both amplitude and frequency information and still choose to sweep only amplitude.

Ampl Offset

Supported   All Models

This softkey enables you to change the value for amplitude offset. An amplitude offset changes the value shown in the amplitude area of the display but does not affect the output power. For example, if the current output power is 0.0 dBm and you enter an amplitude offset of −3.0 dBm, the output power will remain at 0.0 dBm but the display will show an amplitude of −3.0 dBm. This feature lets you simulate the power level at a test point beyond the RF OUTPUT connector.

An amplitude offset can be entered at any time during normal operation and also when you are operating in amplitude reference mode. Changes to this value affect the displayed amplitude value only, the actual RF output power amplitude is not changed.

Preset   0.00 dB

Range   −200 dB to 200 dB

Ampl Ref Off On

Supported   All Models

This softkey toggles the operating state of the amplitude reference mode.

Off   The amplitude value displayed is equal to the current hardware output power plus the amplitude offset, if any.

On   The amplitude value displayed is equal to the current hardware output power minus the reference value set by the **Ampl Ref Set** softkey. All subsequent amplitude parameters are then relative to the reference value.

Amplitude offsets can be used with amplitude reference mode. In this situation, the display will show the amplitude calculated as the current hardware output power minus the reference value plus the amplitude offset. Amplitude reference mode changes the display only, it does not change the RF output power.

Preset   Off

Ampl Ref Set

Supported   All Models

This softkey enables you to set the current output power as an amplitude reference value. It also causes the **Ampl Ref Off On** key to toggle to the On position, turning on amplitude reference mode. All subsequent output power settings are then relative to the reference value.

This key sets the reference value equal to the current output power. If you have not yet set the reference value, the normal preset value for amplitude reference is 0.0 dBm.

Preset   0.00 dBm

Range   −136 to 20 dBm

Ampl Start

Supported   All Models

This softkey enables you to set the amplitude of the first point in the sweep.

Preset   −135.00 dBm

Range   You can set the value anywhere in the range of the PSG's specified output power.

Ampl Stop

Supported   All Models

This softkey enables you to set the amplitude of the last point in the sweep.

Preset   −135.00 dBm

Range   You can set the value anywhere in the range of the signal generator's specified output power.

Amplitude

Supported   All Models

This hardkey enables you to change the RF output power. In addition, the key accesses a menu of choices that enables you to configure the automatic leveling control (ALC), power search, user flatness, and amplitude options. The current RF output power level is always shown in the amplitude area of the display except under the following conditions:

- amplitude reference mode is turned on
- an offset is applied
- a step or list amplitude sweep is in process

The amplitude area of the display is blanked whenever an amplitude sweep is selected.

Preset

E8257D/E8663D: −20dBm
E8257D/E8663D with Option 1E1: −135dBm
E8257D Option 550/567: −110 dBm
E8267D: −130 dBm

Range   The output power range of the signal generator depends on the option configuration. Power is also a function of frequency range. For more information, refer to your signal generator's data sheet.

Amplitude Markers Off On

Supported   All with Option 007

This softkey toggles the amplitude marker state for the currently activated markers. When the state is switched on, the RF output signal exhibits a spike with a magnitude relative to the power level at each marker's set frequency. (Use the **Marker Amplitude** softkey to set the magnitude of the spike.) The width of the amplitude spike is a nominal eight buckets, based on 1601 buckets per sweep.

Preset   Off

APCO 25 C4FM

Supported   E8267D with Option 601 or 602

Use this softkey to select an APCO 25-specified C4FM filter in the Select filter menu. This is a Nyquist filter with an alpha of 0.200 which is combined with a shaping filter.

APCO 25 w/C4FM

Supported   E8267D with Option 601 or 602

Use this softkey to set up a predefined APCO 25-compliant personality with compatible 4-level frequency modulation (C4FM) as the modulation type to modulate a continuous stream of the selected data pattern. The maximum deviation is 1.8 kHz. C4FM uses frequency shift keying (FSK) modulation, which transmits data at the rate of 2 bits per symbol (4.8 ksps).

APCO 25 w/CQPSK

Supported   E8267D with Option 601 or 602

Use this softkey to set up a predefined APCO 25-compliant personality with compatible quadrature phase shift keying (CQPSK) as the modulation type to modulate a continuous stream of the selected data pattern. CQPSK uses $\pi/4$ differential quadrature phase shift keying ($\pi/4$ DQPSK) modulation, which transmits data at the rate of 2 bits per symbol (4.8 ksps).

Apply Bit Errors

Supported   E8267D with Option 601 or 602

This softkey has two uses and appears in multiple locations.

In the Create File/Edit File Menu

In this menu, use the **Apply Bit Errors** softkey to access a menu that enables you to enter a specific number of bit errors or a percentage of bit errors to be applied to the current file.

In the Apply Bit Errors Menu

In this menu, use the **Apply Bit Errors** softkey to apply the currently selected bit-error percentage or number of bit errors to the current file.

Apply Multicarrier

Supported   E8267D with Option 601 or 602

Use this softkey to apply the current settings in the Custom Multicarrier table editor.

Apply Multitone

Supported   E8267D with Option 601 or 602

Use this softkey to apply, to the signal, any changes you have made in the phase or state parameters.

Apply Settings

Supported   E8267D with Option 601 or 602

Use this softkey to regenerate the two-tone waveform whenever you make changes to the frequency separation parameter.

Apply to Waveform

Supported   E8267D with Option 601 or 602

This softkey applies the current settings to the waveform.

In the Clipping and Scale Waveform Data menus

The waveform is the waveform highlighted in the Waveform Utilities display. Once you apply clipping, it can not be undone. Repeated clipping applications are cumulative.

In the Set Markers Menus

The waveform is the waveform highlighted in the Set Markers display. Except for the dual ARB player, this key is not available unless the ARB format is on.

ARB AWGN Off On

Supported   E8267D with Option 403

This softkey toggles the operating state of the ARB (arbitrary waveform generator) average white gaussian noise (AWGN) function.

Off   AWGN is turned off.

On   AWGN is turned on.

Preset   Off

ARB Catalog Types

Supported   E8267D with Option 601 or 602

This softkey selects a menu of ARB (arbitrary waveform generator) type files that can be listed in the user file system.

ARB Off On

Supported   E8267D with Option 601 or 602

This softkey selects the on and off operating state of the ARB (arbitrary waveform generator).

Off   The arbitrary waveform generator is turned off.

On   The arbitrary waveform generator is turned on and a waveform, if present and
                       selected, in the signal generator's WFM1 (volatile memory) is played.

Preset   Off

ARB Reference Ext Int

Supported   E8267D with Option 601 or 602

This softkey selects the reference for the waveform clock.

Ext	If you select Ext, you must enter the reference frequency (as described under the **Reference Freq** softkey) and the signal must be applied to the BASEBAND GEN REF IN rear panel connector.
Int	If you select Int, the internal clock is used for the arbitrary waveform generator (ARB) frequency reference.
Preset	Int

ARB Sample Clock

Supported   E8267D with Option 601 or 602

This softkey enables you to adjust the sample clock rate. After entering the desired clock rate, terminate the entry with **GHz**, **MHz**, **kHz**, or **Hz**.

Preset   100.0 MHz

Range   1.0 Hz–100.0 MHz

ARB Setup

Supported   E8267D with Option 601 or 602

This softkey accesses a menu from which you can select arbitrary waveform generator (ARB) settings and parameters. In addition, there are menu items that access marker and waveform utilities.

Arb Waveform Generator

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can select and configure custom digital modulation types for the arbitrary waveform generator (ARB).

Atten/ALC Control

Supported   E8257D/E8663D with Option 1E1 and E8267D

Use this softkey to access a menu from which you can set attenuation and ALC parameters.

Atten Hold Off On

This softkey toggles the operating state of the attenuator hold function.

Supported   E8257D/E8663D with Option 1E1 and E8267D

Off   In this state, the automatic level control (ALC) controls the attenuator level setting and will switch the attenuator as needed to maintain RF power levels.

On   In this state the attenuator level setting is static: it remains at its current setting. You can use this function at any time to insure that no power discontinuity occurs during power adjustments.

Preset   Off

There will be no attenuator switching during power adjustments when the attenuator hold is enabled (On). The maximum power adjustment range will vary. However, you will have a minimum range of +4 dB to −13 dB. The E8257D/E8663D with Option 1EA/1EU has a high power attenuator. An attenuator is standard for the E8267D.

Atten Hold Off On

Supported   E8257D/E8663D with Option 1E1 and E8367D

This softkey toggles the operating state of the attenuator hold function.

Off   When this function is off, the attenuator is in a dynamic state and will automatically adjust settings in response to ALC requirements.

On   When this function is on, the attenuator is frozen at its current setting. Use this function when you want to guarantee that there will be no power discontinuity normally associated with the attenuator switching during power adjustments.

There is no attenuator switching during power adjustments. The maximum power adjustment range varies.

Preset   Off

Auto

Supported   E8267D

Use this softkey to enable the signal generator to automatically choose a filter based on the current digital modulation settings.

Aux Fctn

Supported   E8267D

This hardkey accesses a menu of auxiliary functions related to options and accessories.

B

Bandwidth

Supported   E8267D with Option 403

This softkey appears in the Real-Time I/Q Baseband AWGN menu and the Arb Waveform Generator AWGN menu.

In the Arb Waveform Generator AWGN Menu

This softkey selects the noise bandwidth for the waveform file played by the ARB waveform generator.

Preset   1 MHz

Range   50 kHz – 15 MHz

In the Real Time I/Q Baseband AWGN menu

This softkey selects the noise bandwidth for the AWGN (additive white gaussian noise) data generated by the baseband generator.

Preset   1 MHz

Range   50 kHz – 80 MHz

Baseband Frequency Offset

Supported   E8267D with Option 601 or 602

Use this softkey to specify a frequency offset in the signal at baseband. When modulated onto the carrier this frequency offset will shift the signal off of the carrier by the offset value. This feature is useful to move the signal such that the carrier feedthrough is not in the center of the signal.

Note: The I/Q signal is scaled down by the square root of 2 to avoid potential overflow when this value is non-zero. Also, frequency offset cannot be on at the same time as additive noise or I/Q timing skew.

Default   0 Hz

Baseband Setup

Supported   E8267D with Option 601 or 602 and Option 004

This softkey, for the N5102A module, accesses a menu that enables you to adjust the scaling of the IQ data, and select filtering when the data type is Pre-FIR Samples.

This menu is only available in the input mode with Real-Time Custom turned on. For more information on scaling and filtering, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

BBG 1

Supported   E8267D with Option 601 or 602

This softkey appears in the Source 1 and I/Q Out menus.

In the Source 1 menu

Use this softkey to route the internal baseband generator I and Q signals to the internal I/Q modulator.

The **Source 1** selection is independent of the **I/Q Out** selection.

In the I/Q Out menu

Use this softkey to route the internal baseband generator I and Q signals to the rear panel I and Q output connectors.

The **I/Q Out** selection is independent of the **Source 1** selection.

BBG Data Clock Ext Int

Supported   E8267D with Option 601 or 602

Use this softkey to select the internal data clock for the baseband generator or to select an externally supplied data clock. For more information on input and output signals, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Ext   In external mode, the baseband generator will use an external data clock as its

data clock input, unless the external BBG reference is selected. A data clock or symbol sync input must be supplied through the DATA CLOCK or SYMBOL SYNC input connector when external mode is selected.

Int   In internal mode, the baseband generator will use the internal data clock as its data clock input.

Preset   Int

BBG Ref Ext Int

Supported   E8267D with Option 601 or 602

Use this softkey to select the internal baseband generator reference or to select an externally supplied reference.

Ext   In external mode, an external signal will be used as the reference frequency for the baseband I/Q signal. A signal must be supplied through the rear panel BASEBAND GEN REF IN connector, and the frequency of the signal must be entered using the **Ext BBG Ref Freq** softkey.

Int   In internal mode, an internally generated 10 MHz signal will be used as the reference source, unless the **BBG Data Clock Ext Int** softkey is set to Ext. In this case, the external data clock signal is used as the reference.

Preset   Int

Begin Pattern

Supported   E8267D with Option 601 or 602

Use this softkey to output a 1-bit pulse to the EVENT 1 rear panel connector that is synchronized to the first bit of an unframed data pattern.

The synchronizing pulse occurs with each repetition of the pattern. If you enter a value for Sync Out Offset, the synchronizing pulse is offset by the number of bits specified.

Begin Timeslot

Supported   This softkey is not functional at this time

Beta

Supported   E8267D with Option 601 or 602

This softkey is activated automatically when you select the Kaiser windowing function. The default Beta factor provides a good solution for optimizing out-of-band performance Adjacent Channel Power (ACP), without seriously compromising passband performance error voltage magnitude (EVM).

Changing the Beta factor adjusts the trade-off between ACP and EVM:

- Decreasing the value improves EVM.
- Increasing the value improves ACP.

Preset   4.000

Range   1.000–10.000

Binary

Supported   All Models

This softkey enables you to specify that only signal generator binary files be listed in the catalog of files.

Bit

Supported   E8267D with Option 601 or 602

This softkey enables you to specify that only signal generator bit files be listed in the catalog of files.

Bit Errors
(numeric value)

Supported   E8267D with Option 601 or 602

This softkey enables you to specify the number of bit errors applied to the current file when you press the **Apply Bit Errors** terminator softkey. The percent **Bit Errors** softkey also updates to reflect the percentage of bit errors you have chosen.

Bit Errors
(percent value)

Supported   E8267D with Option 601 or 602

This softkey enables you to specify the percentage of bit errors applied to the current file when you press the **Apply Bit Errors** terminator softkey. The numeric value **Bit Errors** softkey also updates to reflect the number of bit errors you have chosen.

Bit Order MSB LSB

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, selects the bit ordering of the data that is transmitted through the N5102A module.

MSB   This selection transmits the most significant bit (MSB) on data line zero for both I and Q for a parallel or parallel interleaved port configuration, and transmits the MSB as the first bit in a sample for a serial port configuration.

LSB   This selection transmits the least significant bit (LSB) on data line zero for both I and Q for a parallel or parallel interleaved port configuration, and transmits the LSB as the first bit in a sample for a serial port configuration.

For information on selecting the port configuration, see "Port Config" on page 151.

Preset   LSB

Black Pixels Screen Test

Supported   All Models

This softkey enables you to set all the pixels on the display to black. Pressing the **Local** hardkey returns the display to normal operation.

This key is provided for factory use in testing the display.

Bluetooth

Supported   E8267D with Option 601 or 602

Press this softkey to set up a pre-defined Bluetooth digital modulation format to modulate a continuous stream of the selected data pattern with the default maximum deviation set to 157.5 kHz. Bluetooth uses 2-level frequency shift keying (FSK) modulation that transmits data at the rate of 1 bit per symbol (1 Msps).

BPSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor.

Selecting a BPSK Modulation

Use this softkey to select binary phase shift keying (BPSK) to modulate a continuous stream of the selected data pattern. BPSK modulation transmits data at the rate of 1 bit per symbol.

The modulation selection appears under the **Select** and **PSK** softkeys in the Modulation Type menus.

Loading a BPSK I/Q Map into the Table Editor

Use this softkey to load a binary phase shift keying (BPSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Brightness

Supported   All Models

Use this softkey to adjust the display brightness (intensity). The value shown in the active entry area is a relative value for brightness. Increasing the number increases the brightness; decreasing the number decreases the brightness.

The brightness intensity is not affected by a preset or power cycle.

Range   1–50

Build New Waveform Sequence

Supported   E8267D with Option 601 or 602

This softkey accesses a menu that enables you to create a new waveform sequence file.

Burst Envelope Off On

Supported   E8267D with Option 601 or 602

This softkey toggles the operating state of the internal burst envelope modulator.

Bursting is only used with internal I/Q modulation.

Off   When the burst envelope softkey is set to Off, there is no modulation applied to the carrier.

On   When the burst envelope softkey is set to On, burst modulation is applied to the carrier.

Preset   Off

Burst Gate In Polarity Neg Pos

Supported   E8267D with Option 601 or 602

Use this softkey to select the polarity for the TTL signal at the BURST GATE IN connector.

Neg   Selecting Neg configures the TTL logic high at 0 volts.

Pos   Selecting Pos configures the TTL logic high as +5 volts.

Burst Shape

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can modify the rise and fall time and delay of the burst shape. In addition, you can select the shape and type of the burst or restore the default burst shape values.

Burst Shape Type

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can select the burst shape type. You can choose Sine or a user-defined burst shape that is stored in the signal generator's catalog of burst shapes.

Preset   Sine

Bus

Supported   All Models

This softkey sets the trigger source to occur over the bus lines through the GPIB, LAN, or AUXILIARY INTERFACE (RS-232) connectors. For GPIB, use the *TRG or GET commands, and for LAN and RS-232, use the *TRG command.

C

C4FM

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, allowing you to either select a modulation or load a default pattern into the frequency shift keying (FSK) table editor.

Selecting a C4FM FSK Modulation

Use this softkey to select C4FM as the modulation for the selected data pattern. C4FM is an APCO 25-compliant, 4-level FSK modulation that transmits data at the rate of 2 bits per symbol. The modulation selection is displayed under the **Select** softkey in the Modulation Type menu.

Loading a C4FM FSK Pattern into the FSK Table Editor

Use this softkey to load a C4FM FSK modulation pattern into the FSK table editor. C4FM FSK modulation transmits data at the rate of 2 bits per symbol. For more information on using the FSK table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Calibration Type DC User Full

Supported   All Models

This softkey selects an I/Q calibration type. The User and Full I/Q calibration settings are not affected by an instrument preset or power cycle.

DC   In this mode the signal generator will calibrate I/Q offset errors for a single frequency at the current signal generator settings. The DC calibration is volatile and must be repeated with each signal generator setting change. A DC calibration can be done while the RF On/Off is set to off; the calibration will still be valid when the RF is enabled. This calibration will take less than two seconds.

User   In this mode the signal generator will calibrate I/Q offset, gain, and quadrature error for all signal generator settings over a user defined set of frequencies. This calibration is valid only for the frequencies defined by the user.

Full   In this mode the signal generator will calibrate I/Q offset, gain, and quadrature error for all settings over the full frequency range of the signal generator.

Capture current HW configuration

Supported   All Models

Use this softkey to load the current hardware configuration, through consecutive boots, and compare it with all installed devices; discrepancies are reported. This overwrites the previous configuration.

Carrier Phases Fixed Random

Supported   E8267D with Option 601 or 602

This softkey selects the carrier phase operating mode.

Fixed   This selection sets the phase of all carriers to 0.

Random   This selection sets random phase values for all carriers.

Carrier Setup

Supported   E8267D with Option 601 or 602

This softkey displays a menu from which you can select a modulation format for initialization in the multicarrier table.

Preset   NADC

Carrier Bandwidth

Supported   E8267D with Option 403

Use this softkey to set the bandwidth over which noise power is integrated for the purposes of calculating the carrier to noise ratio. The carrier bandwidth is limited to the ARB sample clock rate or 80 MHz.

Preset   1.0 Hz

Range   1 Hz – 80 MHz

Carrier to Noise Ratio

Supported   E8267D with Option 403

This softkey allows you to select the noise power to be applied to a waveform. Noise can be applied in real time while the waveform is being played by the dual ARB player. The noise power is set as a ratio of carrier power to noise power (C/N). Carrier power is defined as the total modulated signal power before noise is added. When noise is added, the power output from the signal generator will not change; the output power level is the sum of carrier power and the added noise power. Noise bandwidth can be specified using the **Carrier Bandwidth** softkey.

Preset   0.00 dB

Range   −100.00 through 100.00 dB

Catalog Type

Supported   All Models

Use this softkey to access a menu of choices enabling you to select the catalog type for displaying files. When you have made your selection, the display is updated and your choice appears below the **Catalog Type** softkey. Catalog type selection is not affected by a preset or by a power cycle.

CDPD

Supported   E8267D with Option 601 or 602

Press this softkey to set up a predefined Cellular Digital Packet Data (CDPD) digital modulation format to modulate a continuous stream of the selected data pattern. CDPD uses minimum shift keying (MSK) modulation that transmits data at the rate of 1 bit per symbol (19.2 ksps).

Channel Band

Supported   All Models

Use this softkey to display a menu of softkeys where you can assign channel bands based on the current device settings. The output frequency depends on both the channel band and channel number selections.

Preset   P-GSM Base

Channel Number

Supported   All Models

This softkey selects channel numbers (the frame carrier frequency) as the active function based on frequency channels defined in the selected format. The output frequency depends on both the channel band and channel number selections.

Preset   1

Supported   Depends on selected band

Clear Error Queue(s)

Supported   All Models

This softkey enables you to delete all messages that are stored in the error message queues. When the error message queues are empty, the ERR annunciator is turned off.

You cannot undo this action; once the messages are deleted, they cannot be recalled. There are two error message queues: one for front panel operation and one for remote operation.

Clear Header

Supported   E8267D with Option 601 or 602

This softkey enables you to clear the information stored in the currently displayed header. When this softkey is pressed the settings in the Saved Header Settings fields are set to Unspecified. The actual settings used when the header field is Unspecified are the settings listed in the Current Inst. Settings column.

To activate this softkey, the modulation format must be enabled and the waveform file being displayed must be the active file.

Clear Text

Supported   All Models

Use this softkey to delete all characters and digits in the active entry area. This key is especially useful when you want to clear the current entry so you can create a new entry.

Clip |I| To

Supported   E8267D with Option 601 or 602

Use this softkey to make the modulation level of the I component the active function. You can then

clip (limit) the level to a percentage of full scale. A level of 100.0% equates to no clipping. Clipping type must be set to |I|,|Q| for this softkey to be active. For more information about clipping, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Preset   100.0%

Range   10.0 through 100.0%, in 0.1% increments

Clip |I+jQ| To

Supported   E8267D with Option 601 or 602

Use this softkey to make the modulation level of the combined I and Q waveform the active function. You can then clip (limit) the level to a percentage of full scale. A level of 100.0% equates to no clipping. Clipping type must be set to |I+jQ| for this key to be active. For more information about clipping, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Preset   100.0%

Range   10.0 through 100.0%, in 0.1% increments

Clip |Q| To

Supported   E8267D with Option 601 or 602

Use this softkey to make the modulation level of the Q component the active function. You can then clip (limit) the level to a percentage of full scale. A level of 100.0% equates to no clipping. Clipping type must be set to |I|,|Q| for this softkey to be active. For more information about clipping, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Preset   100.0%

Range   10.0 through 100.0% in 0.1% increments

Clipping

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu of options for limiting the modulation level. The current clipping type is displayed under the **Clipping** softkey. For more information about clipping, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Clipping Type |I+jQ| |I|, |Q|

Supported   E8267D with Option 601 or 602

Use this softkey to select either |I+jQ| or |I|,|Q| as the clipping type. For more information about clipping, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

|I+jQ| The combined I and Q waveform is clipped (circular clipping).

|I|,|Q| The I and Q components of the waveform are clipped independently (rectangular clipping), so you can clip I and Q to different levels.

Preset |I+jQ|

Clock Phase

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, accesses a menu that enables you to select the phase adjustment (in 90 degree increments) of the clock edge relative to the start of each sample for a parallel or parallel interleaved data transmission, and to each data bit for a serial data transmission.

In addition to making coarse adjustments, a fine-skew adjustment is available. See "Clock Skew" on page 44 for more information.

Preset   0 deg

Clock Polarity Neg Pos

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, selects which clock edge (rising or falling) is aligned with the start of a sample for a parallel or parallel interleaved data transmission, and with the start of each bit for a serial data transmission. The Neg selection functions the same as selecting the 180 degree phase adjustment using the **180 deg** softkey.

Preset   Pos

Clock Rate

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, enables you to adjust the clock rate (frequency) when the internal clock is used, or to enter the expected clock rate of an external clock source (connected at the Ext Clock In connector or supplied through the Device Interface connector). The value set with this softkey is also the rate for the output clock signal at the Clock Out connector and the Device Interface connector. See "Clock Source" on page 45 for information on selecting the clock source.

The clock rate range depends on the port configuration, logic type, signal type, and clocks per sample. Signal type and clocks per sample apply to parallel and parallel interleaved transmissions.

Preset   100.000000000 MHz

Clock Setup

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, accesses a menu that enables you to select the clock and external frequency reference parameters that are used to synchronize the transmitted data.

Clock Skew

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, provides a fine-adjustment for aligning the clock to the valid portion of the data relative to the coarse adjustment associated with the **Clock Phase** softkey. Because this is a fine adjustment, it provides greater benefit at higher clock rates. When the clock rate is less than 25 MHz, this softkey is grayed out (inactive). Skew is displayed in nanoseconds with a maximum range and a maximum number of discrete steps. Both the range and the number of steps are

variable, and depend on the clock rate. The skew range decreases as the clock rate increases, and increases as the clock rate decreases. The maximum skew range is reached at a clock rate of approximately 99 MHz and is maintained down to a clock rate of 25 MHz.

Preset   0.000 ns

Clock Source

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, accesses a menu where the clock source is selected. The selected clock source also provides the output clock signal at the Clock Out and Device Interface connectors.

CAUTION	It is important that the signal generator, the interface module, and the DUT are locked to a common frequency reference. Failure to have a common frequency reference may result in a loss of data.

Preset   Internal

Clocks Per Sample

Supported   E8267D with Option 601 or 602 and Option 003 or 004

For a digital IQ signal, this softkey, for the N5102A module, accesses a menu that enables you to select the number of clock cycles per sample, and is active for a parallel or parallel interleaved port configuration (see "Port Config" on page 151). For a serial port configuration or an IF signal, or while in input mode, this softkey is grayed out (inactive).

Some devices require multiple clocks per sample. The N5102A module provides multiple clocks per sample choices (1x, 2x, or 4x). When you select a clocks per sample that is greater than one, the sample is held for the selected number of clock cycles. This reduces the sample rate relative to the clock rate by a factor equal to the clocks per sample value.

Figure 1-5   **Four Clock Cycles per Sample**
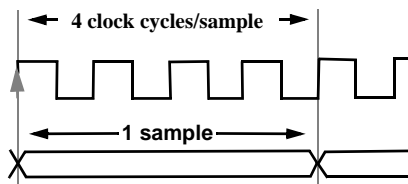
For more information on clock rates, see "Clock Rate" on page 44.

Preset   1

Common Mode I/Q Offset

Supported   E8267D

Use this softkey to enter an origin offset voltage for in-phase and quadrature-phase signals that are routed to the external output ports. This offset adjusts the I, I-bar, Q, and Q-bar output signal levels equally, relative to ground.

Preset   0.000 V

Range   −3.000 to 3.000 V

Configure Auto External I/Q Atten Settings

Supported   E8267D

Use this softkey to access a menu of softkeys for optimizing the automatic external I/Q attenuator.

This softkey becomes active only when **Modulator Atten Manual Auto** is set to Auto, the Source 1 selection is **Ext 50 Ohm** or **Ext 600 Ohm**, and I/Q is on.

Configure Cal Array

Supported   All Models

Use this softkey to access a menu of softkeys for defining a user flatness list sweep. Each point in this sweep will contain a frequency and amplitude correction pair.

Configure Differential Encoding

Supported   E8267D with Option 601 or 602

Press this softkey to display a menu and editor (a differential state map) where you can create user-defined differential encoding for the current user-defined modulation table. Use this table to enter the symbol table offset for each binary data bit. For more information on differential encoding and the Differential State Map editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Configure Hardware

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can set a particular latch or hardware configuration to meet user-specific needs.

Configure List Sweep

Supported   All Models

Use this softkey to access a menu of softkeys for defining a list sweep. In this menu, you can insert and delete points in a sweep. Each point can contain frequency, amplitude, and dwell time information.

Configure Ramp/Step Sweep

Supported   All with Option 007

Use this softkey to access a menu of softkeys for defining a ramp or step sweep. The available selections depend upon the sweep type selected.

In step mode, you can set the frequency and power range, number of points, and dwell time at each point.

In ramp mode, you can set the frequency range, power range, sweep time, or enable an alternate sweep.

Configure Step Array

Supported   All Models

Use this softkey to access a menu of softkeys that enables you to define a step sweep with a user flatness corrections. In this menu, you can set the start frequency, stop frequency, and the number of points for the sweep.

Configure Step Sweep

Supported   All Models

Use this softkey to access a menu of softkeys for defining a step sweep. In this menu, you can set the start and stop frequencies and power levels for a sweep, and you can set the number of points in the sweep with the dwell time at each point.

Confirm

Supported   All Models

Press this softkey to activate the selected security level. This softkey appears after pressing the **Enter Secure Mode** softkey.

CAUTION   Once the secure mode is entered, the security level can only be increased. After this function is activated, the power must be cycled to return to normal operation mode.

Confirm Change

Supported   All Models

Use this softkey to confirm re‑configuration of a selected signal generator option. After modifying the license key and proceeding with a re‑configuration, pressing this key will implement the change. Pressing this key re‑boots the signal generator.

Confirm Delete

Supported   All Models

Use this softkey to continue to delete the selected file. Deletions cannot be recovered. If you want to cancel confirmation, press the **Return** hardkey.

Confirm Delete Of All Rows

Supported   E8267D with Option 601 or 602

Use this softkey to complete the deletion of all rows in the current table. Deletions cannot be recovered. If you want to cancel the confirmation, press the **Return** hardkey.

Confirm Delete of NVWFM Files

Supported   E8267D with Option 601 or 602

Use this softkey to complete the deletion of all non-volatile waveform memory (NVWFM) files. Deletions of NVWFM files cannot be recovered. If you want to cancel confirmation, press the **Return** hardkey.

Confirm Delete of WFM1 Files

Supported   E8267D with Option 601 or 602

Use this softkey to complete the deletion of all volatile waveform memory (WFM1) files. Deletions cannot be recovered. If you want to cancel confirmation, press the **Return** hardkey.

Confirm Load From File

Supported   E8267D with Option 601 or 602

Use this softkey to complete the loading of the highlighted file into the current table.

Confirm Load From Step Data

Supported   All Models

Use this softkey to complete the loading of step data into the user flatness table or the list sweep table.

Confirm Load Mirror Image of Fall Shape

Supported   E8267D with Option 601 or 602

Use this softkey to complete the loading of the Rise Shape Editor with a mirror image of the Fall Shape Editor when editing a burst shape.

Confirm Load Mirror Image of Rise Shape

Supported   E8267D with Option 601 or 602

Use this softkey to complete the loading of the Fall Shape Editor with a mirror image of the Rise Shape Editor when editing a burst shape.

Confirm Restore Sys Defaults

Supported   All Models

Use this softkey to restore the signal generator to preset system conditions.

Pressing this key re-boots the signal generator.

Continuous

Supported   E8267D with Options 601 or 602

This softkey enables the continuous transmission of a waveform after the PSG receives a trigger. This softkey appears in multiple menus with some differences in behavior as described in the following subsections. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

In the Trigger Menus and Pattern Trigger Menu

This softkey selects the continuous triggering mode, which enables the signal generator to repeat the modulating signal indefinitely until you turn off the modulation format, change triggers, or select another waveform for an ARB format or another data pattern for the Real Time I/Q Baseband format. To configure the modulating signal's response to triggers, use the softkeys in the Continuous Mode menu.

In the Seg Advance Menu

This softkey selects the waveform's response to triggers when segment advance is the dual ARB trigger mode. On the initial trigger, the first segment begins playing indefinitely. A subsequent trigger causes the segment's playback to complete to the end of the segment file. Then the sequence advances to the next segment, and that segment begins playing indefinitely. This behavior continues

to the last segment. When the last segment in the sequence receives a trigger during its playback, the segment completes playing, the sequence resets to the first segment, and the first segment begins playing indefinitely.

Continuous Mode

Supported   E8267D with Options 601 or 602

This softkey accesses a menu from which you select the waveform's response to triggers when Continuous is the triggering mode (continuous waveform transmission.). The menu offers two to three

choices depending on whether you are in an ARB format or real-time custom.

Format	Waveform Response Selection
ARB	**Free Run**, page 87—A sequence or segment plays immediately and continuously without a trigger when you turn the format on
	Trigger & Run, page 199— A sequence or segment waits for a trigger and then runs continuously and does not respond to subsequent triggers
	Reset & Run, page 166—A sequence or segment waits for a trigger and then runs continuously and responds to subsequent triggers by restarting back at the start of the sequence or segment
Real-Time	**Free Run**, page 87—immediately triggers when you turn the format on
	Trigger & Run, page 199—waits for and starts on the first trigger; ignores subsequent triggers

For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Copy File

Supported   All Models

This softkey enables you to copy and rename a file in the displayed catalog of files. When you have entered the new file name, press the **Enter** terminator softkey. If you have changed your mind, press the **Return** hardkey. Once you press **Enter**, the new file is stored and displayed immediately in the catalog list.

NOTE   File names are limited to 23 characters.

Create File

Supported   E8267D with Option 601 or 602

Use this softkey to create a new bit file. After the new file is automatically opened by the Bit File Editor, you can edit bits individually, or select from a menu of editing tools. The Bit File Editor automatically assigns a generic file name, which you can change using the **Rename** softkey.

NOTE   File names are limited to 23 characters.

Custom

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can select the Real Time I/Q Baseband generator or the Arbitrary Waveform Generator to create a custom digital modulation.

Custom Digital Mod State

Supported   E8267D with Option 601 or 602

This softkey accesses a menu to select a user defined modulation state setup for the ARB Digital Modulation format. The user defined file is a file created in the Digital Mod Define menu and stored with the **Store Custom Dig Mod State** softkey. You can also create an external file and download it to the PSG. For information on file downloads, see the *Agilent Signal Generators Programming Guide*.

Custom Off On

Supported   E8267D with Option 601 or 602

This softkey toggles the operating state of the real time custom modulator.

Off	When the **Custom Off On** softkey is set to Off, the real time custom modulator is disabled.
On	When the **Custom Off On** softkey is set to On, the real time custom modulator builds a modulation that is specified by the user. You can create custom modulation formats for transmitting continuous streams of unframed data patterns.

Preset   Off

D

D8PSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor.

Selecting a D8PSK Modulation

Use this softkey to select differential 8-state phase shift keying (D8PSK) to modulate a continuous stream of the selected data pattern. D8PSK modulation transmits data at the rate of 3 bits per symbol.

The modulation selection appears under the **Select** and **PSK** softkeys in the Modulation Type menus.

Loading a D8PSK I/Q Map into the Table Editor

Use this softkey to load a differential 8-state phase shift keying (D8PSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Data

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu of choices from which you can select pseudorandom bit patterns, fixed 4-bit repeating sequences, alternating bit patterns, user files or external data.

The current selection is displayed under the **Data** softkey.

Data

In the Real Time GPS Menu

Supported   E8267D with Option 409

Use this softkey to access a menu of choices from which you can select pseudorandom bit patterns, fixed 4-bit repeating sequences, or user files as the data source for the GPS navigation message.

Preset   PN9

Remarks   This softkey is grayed out when **Ranging Code** is set to **P** or when **Data Mode** is set to **TLM**.

Data Clock Out Polarity Neg Pos

Supported   E8267D with Option 601 or 602

This softkey is used to configure the polarity of the TTL signal for the data clock out signal. The data clock out signal is available from the AUXILIARY I/O connector on the rear panel of the signal generator.

Neg   Selecting Neg uses the falling edge of the TTL signal.

Pos   Selecting Pos uses the rising edge of the TTL signal.

Data Clock Polarity Neg Pos

Supported   E8267D with Option 601 or 602

This softkey is used to configure the polarity of the TTL signal at the DATA CLOCK connector.

Neg   Selecting Neg uses the falling edge of the TTL signal.

Pos   Selecting Pos uses the rising edge of the TTL signal.

This softkey is disabled during external data pattern input and external clock input.

Preset   Pos

Data Mode Raw Enc TLM

Supported   E8267D with Option 409

This softkey sets the data generation mode for the GPS navigation message.

Raw   This selection sets the navigation message mode to raw. Raw data is modulated onto the code at 50 bits per second, and no parity bits are computed by the PSG. The data source must be selected using the **Data** menu.

Enc   This selection sets the navigation message mode to encoded. Data is modulated onto the code at 50 bits per second, and the PSG computes 6 parity bits for every 24 data bits from the selected data source. The data source must be selected using the **Data** menu.

TLM   This selection sets the navigation message mode to TLM (telemetry). The PSG computes a standard default navigation transmission (see Remarks) for 50 bps

modulation onto the C/A carrier. The default navigation transmission includes a telemetry word (TLM), a handover word (HOW), and default navigation data.

Preset   Raw

Remarks   For more information about data modes and the default navigation data transmission, see the *User's Guide* or the *GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION*, 2nd Edition, June 2, 1995.

Data Out Polarity Neg Pos

Supported   E8267D with Option 601 or 602

This softkey is used to configure the polarity of the TTL signal for the data out signal. The data out signal is available from the AUXILIARY I/O connector on the rear panel of the signal generator.

Neg   Selecting Neg configures the CMOS logic high as 0 volts.

Pos   Selecting Pos configures the CMOS logic high as +3.3 volts.

Preset   Pos

Data Polarity Neg Pos

Supported   E8267D with Option 601 or 602

This softkey is used to configure the polarity of the TTL compatible input signal at the DATA connector.

Neg   This choice configures the TTL logic high as 0 volts.

Pos   This choice configures the TTL logic high as +5 volts.

Data/Clk/Sync Rear Outputs Off On

Supported   E8267D with Option 601 or 602

This softkey is used to disconnect the output signals from the rear panel AUXILIARY I/O data out, data clock out and symbol sync out connectors. Normally, these output signals should be connected (softkey set to On position). However, disconnecting these outputs will decrease spurious signals that are sometimes present when you are operating at high symbol rates.

Off   Selecting Off disconnects rear panel output signals.

On   Selecting On connects rear panel output signals.

Data Negation

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, accesses a menu that enables you to select either I or Q data negation. Negation changes the affected sample by expressing it in two's complement form, multiplying by negative one, and converting back to the selected numeric format.

Data Setup

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, accesses a menu that enables you to set the parameters for transmitted data.

Data Type

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, accesses a menu that enables you to select either filtered or unfiltered baseband data to be transmitted through the digital module.

When an ARB modulation format is on, this softkey is grayed out (inactive) and the data type is samples.

Preset   Samples

Date Format MDY DMY

Supported   All Models

This softkey is used to set the display format for the date.

MDY   Use this format to display the date as month-day-year.

DMY   Use this format to display the date as day-month-year.

DC

Supported   All Models

Use this softkey to specify a dc level as the modulation waveform for the internally generated signal. This softkey is available after selecting the internal source to operate as a function generator.

DCFM/DCΦM Cal

Supported   All with Option UNT

This softkey enables you to initiate a DCFM or a DCΦM calibration, depending upon which type of modulation is currently active. This calibration eliminates the offset in DCFM or DCΦM so that the carrier frequency remains the same with no modulation applied.

Use this calibration for externally applied signals. While the calibration can also be performed for internally generated signals, dc offset is not a normal characteristic for them.

NOTE   If the calibration is performed with a dc signal applied, any deviation provided by the dc signal will be removed and the new zero reference point will be at the applied dc level. The calibration will have to be performed again when the dc signal is disconnected to reset the carrier signal to the correct zero reference.

DCS Base

Supported   All Models

This softkey selects DCS 1800 Base as the channel band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset	*Channel*: 512
	Frequency: 1.805 GHz
Range	*Channels*: 512–885
	Frequency: 1.805–1.879 GHz

DCS Mobile

Supported   All Models

This softkey selects DCS 1800 Mobile as the channel band for GSM. The output frequency depends on both the channel band and channel number selections. The Device softkey must be set to MS before this softkey is available.

Preset	*Channel*: 512
	Frequency: 1.710 GHz
Range	*Channels*: 512–885
	Frequency: 1.710–1.784 GHz

DECT

Supported   E8267D with Option 601 or 602

Use this softkey to select a predefined Digital European Cordless Telecommunications (DECT) personality as the custom digital modulation format.

DECT Standard

Supported   All Models

This softkey selects a frequency band for Digital European Cordless Telecommunications (DECT). The output frequency depends on both the frequency band and channel selection.

Preset	*Channel*: 9
	Frequency: 1.881 GHz
Range	*Channels*: 0–9
	Frequency: 1.897–1.881 GHz

Default Gateway

Supported   All Models

Use this softkey to enter a gateway for LAN access to the signal generator from outside the current sub-network. The entry can remain empty, which allows the signal generator to be accessed only by

local hosts on the LAN. Your IT service can set up the default gateway.

Define User Burst Shape

Supported   E8267D with Option 601 or 602

Press this softkey to display a table editor where you can edit the rise and fall shapes of waveforms, and save them for later use. For more information on user burst shapes, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Define User FIR

Supported   E8267D with Option 601 or 602

This softkey displays a table editor from which you can create and modify FIR (Finite Impulse Response) filters. The FIR table editor allows a maximum filter length of 1024 coefficients, but the signal generator hardware is limited to 64 symbols for real-time and 512 symbols for arbitrary waveform generation. The number of symbols equals the number of coefficients divided by the oversample ratio.

If you enter more than 64 symbols for real-time and 512 symbols for arbitrary waveform generation, the signal generator cannot use the filter.

Define User FSK

Supported   E8267D with Option 601 or 602

Use this softkey to display the FSK (frequency shift keying) table editor, where you can define custom asymmetric (or symmetric) FSK modulation patterns. The FSK table editor enables you to define a frequency deviation and load a default symmetric FSK pattern (2-Lvl, 4-Lvl, 8-Lvl, 16-Lvl, or C4FM) or create a modulation pattern based on user-defined frequency values.

Define User I/Q

Supported   E8267D with Option 601 or 602

Use this softkey to display the I/Q table editor, where you can directly define symbol positions. The I/Q table editor enables you to create custom constellation diagrams that you can save to an I/Q file catalog. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Delete

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can select different methods of removing bits from the current bit file.

Delete All Files

Supported   All Models

Use this softkey to delete all of the files in the displayed catalog of files. The files will not be deleted until you press **Confirm Delete All Files**. If you change your mind and do not want to delete the files, press

the **Return** hardkey before confirming the deletion.

Delete All NVWFM Files

Supported   E8267D with Option 601 or 602

Use this softkey to delete all files of the currently displayed catalog type from the non-volatile waveform memory. Note that confirmation is required, by pressing **Confirm Delete of NVWFM Files**, before the segment will be deleted. This will delete all non-volatile marker (NVMKR) files as well.

To activate this key, the **Load Store** softkey on page 1 of this menu must be set to Load. Deletions cannot be recovered. If you want to cancel confirmation, press the **Return** hardkey.

Delete All Regs in Seq [*n*]

Supported   All Models

This softkey enables you to delete the data saved in all of the registers of the selected sequence. Do not press this key until you have selected the correct sequence using the **Select Seq** key.

You cannot recover data after this step. If you do not want to delete the data, press the **Return** hardkey.

Delete All Rows

Supported   E8267D with Option 601 or 602

Use this softkey to delete all rows in the current table. The rows will not be deleted until you press the **Confirm Delete Rows softkey**. If you do not want to delete the rows, press the **Return** hardkey before confirming the deletion.

Delete All Sequences

Supported   All Models

This softkey enables you to delete all of the data in all saved registers of all sequences.

You cannot recover data after this step. If you do not wish to delete the data, press the **Return** hardkey.

Delete All Waveforms

Supported   E8267D with Option 601 or 602

Use this softkey to delete all waveforms from the sequence currently being edited. To save the changes, highlight the sequence and store.

Deletions cannot be recovered. If you want to cancel confirmation, press the **Return** hardkey.

Delete All WFM1 Files

Supported   E8267D with Option 601 or 602

Use this softkey to delete all files from volatile waveform memory (WFM1). Note that confirmation is required, by pressing **Confirm Delete of WFM1 Files**, before the files will be deleted.

To activate this key, the **Load Store** softkey on page 1 of this menu must be set to Store. Deletions cannot be recovered. If you want to cancel confirmation, press the **Return** hardkey.

Delete Bits

Supported   E8267D with Option 601 or 602

Use this softkey to delete bits from the selected bit file, including the currently highlighted bit and continuing to the next bit to the right. The number of bits is specified using the Number of Bits softkey.

Delete File

Supported   All Models

This softkey enables you to delete a file in the catalog listing. Use the up and down arrow keys until the file you wish to delete is highlighted. Press **Delete File** and then press the **Confirm Delete** softkey. If you do not want to delete the file, press **Return** instead of **Confirm Delete**.

Delete Previous Comment

Supported   All Models

This softkey will appear when you overwrite a previously saved register that contains comments. Press this key if you want to delete the comment for the newly saved state. Press the **Keep Previous Comment** softkey if you want to keep the comment.

Delete Row

Supported   All Models

This softkey enables you to delete a selected row in the list. Use the up and down arrow keys until any item is selected in the row you wish to delete. Press **Delete Row** and the entire row is deleted. If the last row in a list is deleted, it is replaced by the default value.

You cannot recover data after this step. If you do not wish to delete the row, press the **Return** hardkey.

Delete Segment

Supported   E8267D with Option 601 or 602

Use this softkey to delete the selected waveform segment in the displayed catalog. Note that confirmation is required, by pressing **Confirm Delete**, before the segment will be deleted.

Deletions cannot be recovered. If you want to cancel confirmation, press the **Return** hardkey.

Delete Selected Waveform

Supported   E8267D with Option 601 or 602

Use this softkey to delete the highlighted waveform. Deletions cannot be recovered. If you want to cancel the delete process, press the **Return** hardkey.

Delete Seq[*n*] Reg[*nn*]

Supported   All Models

Use this softkey to delete the contents of a specified register in a specified sequence, once you have selected the correct sequence and register using the **Select Seq** and **Select Reg** softkeys.

You cannot recover the data after this step. If you do not wish to delete the data, press the **Return** hardkey.

Delete To Beginning

Supported   E8267D with Option 601 or 602

Use this softkey to delete all bits to the beginning of the file, not including the currently highlighted bit.

Delete To End

Supported   E8267D with Option 601 or 602

Use this softkey to delete all bits to the end of the file, including the currently highlighted bit.

Delete Waveform Sequence

Supported   E8267D with Option 601 or 602

Use this softkey to delete the highlighted waveform sequence from the displayed catalog. Deletions cannot be recovered. Note that confirmation is required, by pressing **Confirm Delete**, before the sequence will be deleted.

Deletions cannot be recovered. If you want to cancel confirmation, press the **Return** hardkey.

Delta Ref Set

Supported   All with Option 007

Use this softkey to designate the reference marker when using markers in delta mode. The frequency values for all other markers become relative to the reference marker. Ref appears in the far right column (also labeled Ref) of the marker table editor to indicate which marker is the reference.

Range   0–9

Preset   0

Device

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, selects the external clock signal that is provided through the Device Interface connector as the clock source for the N5102A module. You must also set the interface module clock rate to match that of the external clock signal (see "Clock Rate" on page 44). With this selection, the supplied clock is available as an output clock signal at the Clock Out and Device Interface connectors on the N5102A module.

CAUTION	It is important that the signal generator, the interface module, and the DUT are locked to a common frequency reference. Failure to have a common frequency reference may result in a loss of data.

Device Intfc

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, selects a comprehensive loop back test that validates the delivery of digital data from the digital bus connector on the PSG to the Device Interface output connector on the N5102A module. This test requires the LOOP BACK TEST SINGLE ENDED IO DUAL 40 PIN board be connected to the interface module with no connections to the two 40 pin connectors.

Use this test to verify that the system is functioning properly after installation, or whenever the need arises. Running any loop back test turns off all active formats and the module. If this test fails, there are three other diagnostic tests that can help isolate the problem to the N5102A module, the digital bus cable, or the PSG. For information on these tests, see "SigGen Dig Bus" on page 183, "Dig Bus Cable" on page 63, and "N5102A Dig Bus" on page 133. To run the test, see "Run Loop Back Test" on page 171.

Device BTS MS

Supported   All Models

This softkey sets the frequency band type.

BTS   This mode selects the base transceiver station as the frequency band type.

MS   This mode selects mobile as the frequency band type

The selected mode will be displayed under the **Channel Band** softkey.

Preset   BTS

Diagnostic Info

Supported   All Models

Use this softkey to access diagnostic information about the signal generator. Refer to the figure below for information on what is included in the display.

Figure 1-6   **Diagnostic Instrument Information**
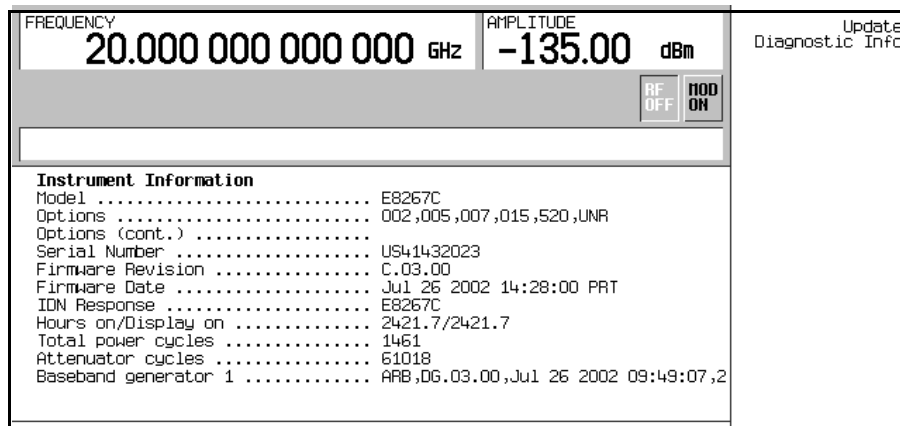
Model	the model number of the signal generator
Options	a list of installed hardware and software options
Serial Number	the factory assigned serial number
Firmware Revision	the revision number for the signal generator's firmware
IDN Response	the characters returned after a remote *IDN query
Total hours on	the number of hours that the signal generator has been powered on
Total hours display has been on	the number of hours the display has been active (value does not include hours using the screen saver)
Total power cycles	the number of times the line power has been switched on
Attenuator cycles	the number of times the attenuator has been switched
Reverse Power Protection Trips	the number of times the reverse power protection circuit has been tripped. Only for instruments with electronic attenuators.
Baseband generator 1	Revision number.

Diagnostics

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, accesses a menu where you can select and run N5102A module loop back tests.

Diff Data Encode Off On

Supported   E8267D with Option 601 or 602

This softkey toggles the operational state of the signal generator's differential data encoding.

Off   When the **Diff Data Encode Off On** softkey is set to Off, data bits are not encoded prior
                    to modulation.

On   When the **Diff Data Encode Off On** softkey is set to On, data bits are encoded prior to
                    modulation. Differential encoding uses an exclusive-OR function to generate a
                    modulated bit. Modulated bits will have a value of 1 if a data bit is different from
                    the previous bit, or they will have a value of 0 if a data bit is the same as the
                    previous bit.

For more information on differential data encoding, see the *E8257D/67D, E8663D PSG Signal
Generators User's Guide*.

Preset   Off

Diff Mode I Offset

Supported   E8267D

Use this softkey to enter a differential offset voltage for an in-phase signal that is routed to an
external output connector. For example, if you enter a 200.0 mV offset value, the I output signal will
have a 100.0 mV offset and the I-bar output signal will have a −100.0 mV offset.

Preset   0.000 V

Range   −3.000 to 3.000 V

Diff Mode Q Offset

Supported   E8267D

Use this softkey to enter a differential offset voltage for a quadrature-phase signal that is routed to
an external output connector. For example, if you enter a 200.0 mV offset value, the Q output signal
will have a 100.0 mV offset and the Q-bar output signal will have a −100.0 mV offset.

Preset   0.000 V

Range   −3.000 to 3.000 V

Differential Encoding Off On

Supported   E8267D with Option 601 or 602

Press this softkey to change the operational state of the user-defined differential encoding. For more
information on differential encoding, see the *E8257D/67D, E8663D PSG Signal Generators User's
Guide*.

This setting is not affected by a preset or by a power cycle.

Off   When differential encoding is set to Off, the user-defined differential encoding is
                    disabled.

On   When differential encoding is set to On, the user-defined differential encoding

table is applied to the current user-defined modulation table.

Dig Bus Cable

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, selects a loop back test that verifies the output capability from the PSG Digital Bus connector to the end of the digital bus cable. To run the test, see "Run Loop Back Test" on page 171.

Digital Bus Level

Supported   E8267D with Option 601 or 602 and N5102A

This command informs the instrument of the level (Vrms) of the input signal on the digital bus. The input signal level is used to determine the I/Q attenuation.

This function is active when LVDS is on and the LVDS data direction is set to INPUT.

Digital Mod Define

Supported   E8267D with Option 601 or 602

This softkey accesses a menu that enables you to set the symbol rate and assign a modulation type and filter for a custom digital modulation. This menu also allows you to store the custom state to a file.

This softkey is only available when the **Multicarrier Off On** softkey is toggled to Off.

Digital Modulation Off On

Supported   E8267D with Option 601 or 602

This softkey toggles the operating state of the digital modulation mode of the baseband generator.

Off   When the **Digital Modulation Off On** softkey is set to Off, the arbitrary waveform generator is disabled.

On   When the **Digital Modulation Off On** softkey is set to On, the arbitrary waveform generator builds a waveform based on signal generator settings that are specified by the user. You can create custom waveforms using predefined modulation types and filters by using the available softkeys and menus.

Preset   Off

Direction Input Output

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, selects the direction of the data flow through the digital module.

Display

Supported   All Models

Use this softkey to access a menu for adjusting and testing the display functions. In this menu you can set up the screen saver, change the display brightness, and perform black and white pixel screen tests. In addition, inverse video can be selected and update in remote turned on or off.

Display Burst Shape

Supported   E8267D with Option 601 or 602

Use this softkey to display a graph of the rise and fall burst shapes. For more information on burst shapes, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Display FFT

Supported   E8267D with Option 601 or 602

Use this softkey to display a graphical representation of the filter frequency response (calculated using a fast Fourier transform). This softkey is active when FIR (Finite Impulse Response) coefficients have been loaded into memory. The following is an example of the frequency response of a root Nyquist filter with an oversample ratio of 4.
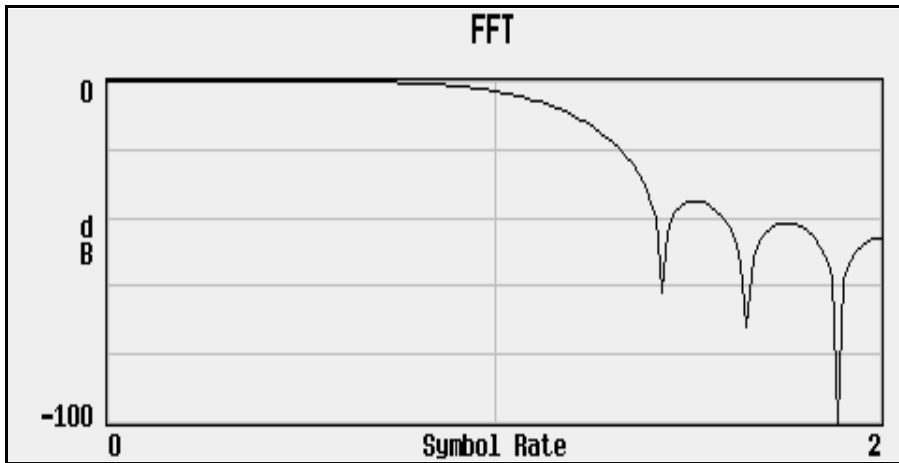
Display Impulse Response

Supported   E8267D with Option 601 or 602

Use this softkey to display a graphical representation of the filter impulse response in time. This softkey is active when FIR (Finite Impulse Response) coefficients have been loaded into memory. The following is an example of the impulse response of a root Nyquist filter with an oversample ratio of 4.
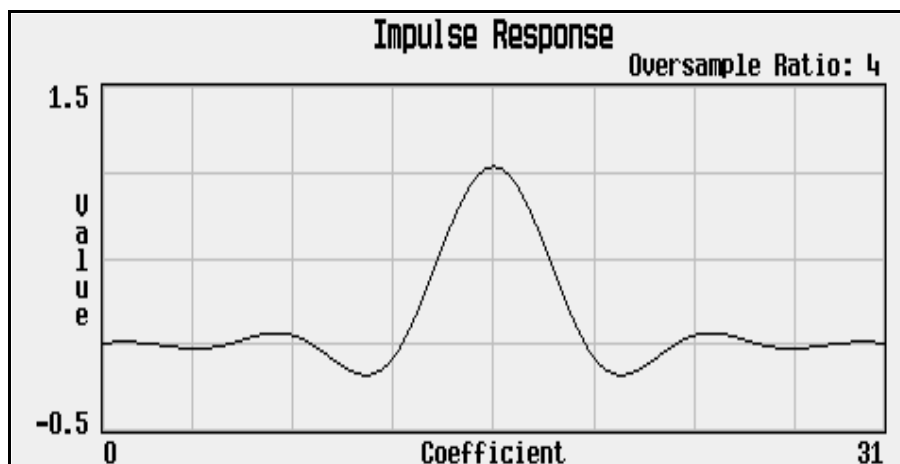
Display I/Q Map

Supported   E8267D with Option 601 or 602

Use this softkey to display an I/Q constellation map diagram of the current set of I/Q points. For more information on I/Q constellation map diagrams, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Display Markers

Supported   E8267D with Option 601 or 602

Use this softkey to access a graph and a menu for viewing marker points on the waveform segment. The display shows all markers (1–4) regardless of the active marker selection.

The marker display shows the waveform marker information with up to 460 evenly spaced sample points. A waveform with more than 460 points is still shown, but the display uses only 460 sample points to represent it. To view marker and waveform information, adjust the display using the various zoom softkeys (see the "Z" section on page 208) and "First Sample Point" on page 81.

In the Dual ARB Player

The waveform is the waveform highlighted in the Set Markers display.

In All Other ARB Formats

This softkey is not available unless the ARB format is on. When it is available, the waveform is the waveform highlighted in the Set Markers display.

DMOD

Supported   E8267D Option 601 or 602

Press this softkey to set the current catalog type to DMOD (Digital Modulation) and display the catalog of ARB (arbitrary waveform generator) DMOD files.

Do Cal

Supported   All Models

This softkey enables you to start a flatness calibration using the information from the user flatness list sweep table.

Do External Input Level Measurement

Supported   E8267D

Use this softkey to measure the voltage level at the external I/Q inputs. The measurement will be used to set the modulator attenuation level setting. This softkey becomes active only when **Ext Input Level Default Man Meas** is set to Meas.

Done

Supported   E8267D with Option 601 or 602

This softkey is a terminator key. Press it to accept the values currently entered.

Done Inserting

Supported   E8267D with Option 601 or 602

Use this softkey to exit the insertion mode and return to the edit menu.

Do Power Search

Supported   E8267D

Use this softkey to execute the power search calibration routine once. Power search is an internal calibration routine used to achieve calibrated output power when ALC is off. You can execute a power search at any time by pressing this softkey. The routine executes only if RF is on and ALC is off.

Doppler Shift

Supported   E8267D with Option 409

Use this softkey to compensate for the apparent change in the frequency of the GPS signal caused by the relative motion of the transmitter and receiver.

Preset   0.0 Hz

Range   −125 to 125 kHz

Remarks   The lower bound of the doppler shift is limited by the frequency set on the signal

generator. For example, if the signal generator frequency is set to 100 kHz, then the lower limit of the doppler shift would be 0.00 Hz. The doppler shift cannot extend below the limitations of the signal generator.

Dual ARB

Supported   E8267D with Option 601 or 602

This softkey accesses a menu of choices for generating data patterns using the ARB (arbitrary waveform generator). Within these menus, you will be able to select and/or modify the waveform, waveform segments, waveform sequences, as well as the waveform generator's sample clock rate, internal/external reference (and with an external reference, the reference frequency) and an I/Q modulation filter.

Dual-Sine

Supported   All with Option UNT

Use this softkey to select dual sine waves as the modulation for the signal. This softkey will access a menu of choices enabling you to set parameters for the dual-sine amplitude modulation waveform. You can set the rates for two separate tones according to the modulation type.

In the LF Out menu, this softkey is available after selecting the internal source to operate as a function generator.

Dwell Type List Step

Supported   All Models

This softkey selects the source data which defines the dwell times for the current sweep.

List   Choose List to sweep with dwell times that you have defined in the list sweep.

Step   Choose Step to sweep each point in the list with a dwell time set by the **Step Dwell** softkey in the Configure Step Sweep menu.

When you are sweeping using the step sweep dwell time, the list sweep dwell time values are grayed out to indicate that they are not being used.

Preset   List

E

E4416A

Supported   All Models

This softkey enables you to select an Agilent E4416A power meter to perform the automated user flatness correction process.

E4417A

Supported   All Models

This softkey enables you to select an Agilent E4417A power meter to perform the automated user flatness correction process.

E4418B

Supported   All Models

This softkey enables you to select an Agilent E4418B power meter to perform the automated user flatness correction process.

E4419B

Supported   All Models

This softkey enables you to select an Agilent E4419B power meter to perform the automated user flatness correction process.

EDGE

Supported   E8267D with Option 601 or 602

This softkey selects a pre-defined Enhanced Data Rates for GSM Evolution (EDGE) personality for the custom digital modulation format. Selecting EDGE automatically configures the format with an EDGE filter and digital modulation type.

Edit Comment In Seq[*n*] Reg[*nn*]

Supported   All Models

This softkey enables you to edit an existing comment that is associated with a register in use. The register number is listed in the text area of the display and the comment is shown immediately following the register.

The **Add Comment to Seq[n] Reg[nn]** softkey changes to **Edit Comment In Seq[n] Reg[nn]** after adding a comment to the selected state. The comment line is limited to 55 alpha-numeric and special characters.

Edit Description

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can create and edit text in the header description field for the currently displayed header. The maximum length of the header description field is 32 characters. For this softkey to be active, the modulation format must be enabled and the file being displayed must be the active file.

Edit Fall Shape

Supported   E8267D with Option 601 or 602

Use this softkey to make the Fall Shape Editor the active function when editing a burst shape. For more information on editing burst shapes, see the *E8257D/67D, E8663D PSG Signal Generators User's* .

Note that this softkey is available when the Rise Shape Editor is the active function; when the Fall Shape Editor is the active function, this softkey toggles to **Edit Rise Shape**.

Edit File

Supported   E8267D with Option 601 or 602

Use this softkey to begin editing the selected file. You can edit bits individually, or select from a menu of editing tools. Binary files are automatically converted to bit files for editing. There is no undo capability. Bit files are saved after every modification.

Edit Item

Supported   All Models

This softkey allows you to edit the currently highlighted field entry in any editor table. Once the edit has been made, the field will be updated with the selection.

Edit Repetitions

Supported   E8267D with Option 601 or 602

This softkey enables you to edit the number of repetitions of the highlighted sequence. Use the arrow keys, knob, or numeric keypad to enter the number of repetitions.

Edit Rise Shape

Supported   E8267D with Option 601 or 602

Use this softkey to make the Rise Shape Editor the active function when editing a burst shape. For more information on editing burst shapes, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Note that this softkey is available when the Fall Shape Editor is the active function; when the Rise Shape Editor is the active function, this softkey toggles to **Edit Fall Shape**.

Edit Selected Waveform Sequence

Supported   E8267D with Option 601 or 602

This softkey accesses a menu that enables you to edit the selected waveform sequence. This softkey is only active when a waveform sequence is highlighted.

Editing Keys

Supported   All Models

Use this softkey to access a menu from which you can create and edit text. In this menu you can delete the existing text in the active entry area, and you can toggle the editing mode from inserting text to replacing text.

Editing Mode Insert Replace

Supported   All Models

Use this softkey to toggle the editing mode between insert and replace modes.

Insert	Insertion mode causes text to be added directly to the left of the character that is highlighted by the cursor.
Replace	Replacement mode causes text to be entered in the position held by the cursor, overwriting any existing text in that position.
Preset	Insert

E-GSM Base

Supported   All Models

This softkey selects E-GSM 900 Base as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

Range   *Channels*: 0–124, 975–1023

                  Frequency: 935.000–959.800 MHz, 925.200–934.800 MHz

E-GSM Mobile

Supported   All Models

This softkey selects E-GSM 900 Mobile as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

Range   *Channels*: 0–124, 975–1023

                  Frequency: 890.000–914.800 MHz, 880.200–889.800 MHz

Enable/Disable Markers

Supported   E8267D with Option 601 or 602

This softkey accesses a menu from which you can enable or disable (toggle) markers 1,2,3 and 4 for the selected waveform segment.

Enter Secure Mode

Supported   All Models

When this softkey is enabled, by pressing **Enter Secure Mode** > **Confirm**, it activates the selected security level. Once the secure mode is entered, the security level can only be increased. For more information about security functions, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Erase

Supported   All Models

This softkey in the Utility menu removes all user files and user information. You must press **Enter Secure Mode** > **Confirm** to complete the Erase operation. For more information about security functions, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Erase All

Supported   All Models

This softkey removes all user files, table editor files, flatness correction files, and baseband generator files. For more information about security functions, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Erase and Overwrite All

Supported   All Models

This softkey removes all user files, table editor files, flatness correction files, and baseband generator files. The memory is then overwritten with random data as described below. For more information about security functions, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

SRAM   All addressable locations will be overwritten with random characters.

HARD DISK   All addressable locations will be overwritten with random characters.

FLASH MEMORY   The flash blocks will be erased.

Erase and Sanitize All

Supported   All Models

This softkey removes all user files, table editor files, flatness correction files, and baseband generator files. The memory is then overwritten with a sequence of data as described below. For more information about security functions, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

SRAM   All addressable locations will be overwritten with random characters.

HARD DISK   All addressable locations will be overwritten with a single character, its complement, and then a random character.

FLASH MEMORY   The flash blocks will be erased.

Error Info

Supported   All Models

Use this softkey to access a menu of choices enabling you to view and clear error messages. In this menu you can view any of the error messages in the queue, you can also clear all of the error messages in the queue.

The error queue will hold up to 30 error messages before deleting the oldest error message to make room for a new error message.

Execute Cal

CAUTION   Use only if directed to do so by the Service Center.

Supported   E82x7D or E8663D with Option 1EA or 1EU

Use this softkey to begin a particular calibration for the corresponding menu (e.g. I/Q calibration, etc.).

The calibration data is not affected by a preset or by a power cycle. Some of the calibrations can be aborted at any time during the procedure by pressing the **Abort Cal** softkey. If you abort a calibration, the previous calibration data is restored.

Ext

Supported   All Models

This softkey, depending on the current softkey menu, sets the signal generator to expect data or a trigger signal from an external source. It appears in multiple menus with some differences as described in the following subsections.

In Sweep Trigger (AM, FM, ΦM, LF, Sweep/List) and Point Trigger Menus

The external trigger signal connects to the rear-panel TRIGGER IN connector. For more information on the connector, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

In the Data Menu

Ext is one of the data selections available when using the real-time digital modulation format (real-time custom). The format takes the data stream and modulates it on to the carrier as with any factory-supplied data pattern. The external data signal connects to the DATA connector. The DATA connector appears on the front-panel for a standard instrument configuration, or on the rear-panel with Option 1EM. For more information on the connector, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

In the Trigger Source Menu

The **Ext** choice also enables other softkeys for configuring the external trigger.

- **Ext Source**, page 78, for selecting the rear-panel input connector
- **Ext Polarity Neg Pos**, page 77, for selecting which trigger signal state triggers the waveform
- **Ext Delay Off On**, page 75, for turning on or off a delay in the PSG's response to an external trigger signal
- **Ext Delay Time**, page 76, (ARB formats) or **Ext Delay Bits**, page 75, (real-time custom) for setting the amount of delay

For more information on using triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Ext1

Supported   All with Option UNT

Use this softkey to select an externally applied signal as the modulation waveform after a signal source has been connected to the EXT 1 INPUT connector.

The externally applied, ac-coupled input signal is tested for a voltage level and a display annunciator will indicate either a high or low condition if that voltage is > ±3% of 1 V_p.

Ext2

Supported   All with Option UNT

Use this softkey to select an externally applied signal as the modulation waveform after a signal source has been connected to the EXT 2 INPUT connector.

The externally applied, ac-coupled input signal is tested for a voltage level and a display annunciator will indicate a high or low condition if that voltage is > or $\pm3\%$ of 1 V_p.

Ext 50 Ohm

Supported   E8267D

This softkey appears in the Source 1 and I/Q Out menus.

In the Source 1 menu

Use this softkey to route external 50 ohm I and Q input signals to the internal I/Q modulator.

The **Source 1** selection is independent of the **I/Q Out** selection.

In the I/Q Out menu

Use this softkey to route external 50 ohm I and Q input signals to the rear panel I and Q output connectors.

The **I/Q Out** selection is independent of the **Source 1** selection.

Ext 600 Ohm

Supported   E8267D

This softkey appears in the Source 1 and I/Q Out menus.

In the Source 1 menu

Use this softkey to route external 600 ohm I and Q input signals to the internal I/Q modulator.

The **Source 1** selection is independent of the **I/Q Out** selection.

In the I/Q Out menu

Use this softkey to route external 600 ohm I and Q input signals to the rear panel I and Q output connectors.

The **I/Q Out** selection is independent of the **Source 1** selection.

Ext BBG Ref Freq

Supported   E8267D with Option 601 or 602

Use this softkey to enter the frequency of the baseband generator reference signal that is supplied to the rear panel BASEBAND GEN REF IN connector.

This softkey is used only when the **BBG Ref Ext Int** softkey is set to Ext.

Preset   13.0000000 MHz

Range   250.0000 kHz–100.0000000 MHz

Ext Data Clock Normal

Supported   E8267D with Option 601 or 602

Use this softkey to toggle the external data clock between Normal and Symbol.

This softkey has no effect in internal data mode.

Normal   When you select Normal, you must supply a bit clock signal to the DATA CLOCK
                input connector, and a one-shot or continuous signal to the SYMBOL SYNC input
                connector (an unlock occurs if you select external data without these signals).

Symbol   When you select Symbol, provide a symbol clock to the DATA CLOCK input,
                except when using a 2-bit-per-symbol modulation formats (such as π/4DQPSK). In
                this case the data is clocked on both the rising and falling edges of the SYMBOL
                SYNC signal.

                For 2-bit-per-symbol modulation formats (such as π/4DQPSK), no signal is
                required at the DATA CLOCK input connector. Instead, the data is clocked on both
                the rising and falling edges of the SYMBOL SYNC signal.

Preset   Normal

Ext Delay Bits

Supported   E8267D with Option 601 or 602

This softkey sets the number of bits for delaying the PSG's response to the external trigger when
using triggering in real-time custom. The delay is between when the PSG receives the trigger and
when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the
PSG receives the trigger and the set number of delay bits (clocks) occurs, the PSG transmits the data
pattern. The delay does not occur until you turn it on using the **Ext Delay Off On** softkey. You can set the
number of bits either before or after turning it on.

This softkey is active only after selecting **Ext** (external) as the trigger source. For more information on
triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Preset   0

Range   0-1,048,575 bits

Ext Delay Off On

Supported   E8267D with Option 601 or 602

This softkey turns the external trigger delay off or on when using triggering in an ARB format or
real-time custom. The softkey is active only after selecting **Ext** (external) as the trigger source. For
more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Off   There is no delay between when the PSG receives an external trigger and when it
                responds the trigger.

On   The PSG waits to respond to an external trigger by the delay set with the
                Ext Delay Bits (real-time custom) or the **Ext Delay Time** (ARB formats) softkeys.

Preset   Off

Ext Delay Time

Supported   E8267D with Option 601 or 602

This softkey sets the amount of time to delay the PSG's response to an external trigger when using triggering in an ARB format. The delay is a path (time) delay between when the PSG receives the trigger and when it responds to the trigger. For example, configuring a trigger delay of two seconds causes the PSG to wait two seconds after receipt of the trigger before it transmits the waveform. The delay does not occur until you turn it on using the **Ext Delay Off On** softkey. You can set the delay value either before or after turning it on.

The softkey is active only after selecting **Ext** (external) as the trigger source. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Preset   1.0 ms

Range   10.0 ns – 40s

Ext Detector

Supported   All Models

Use this softkey to select external ALC leveling. In this mode, a voltage applied to the ALC INPUT connector controls the signal generator's output power level.

Ext Detector Coupling Factor

Supported   All Models

Use this softkey to set the coupling factor for the external ALC leveling detector.

Ext Impedance 50 Ohm 600 Ohm

Supported   All Models

Use this softkey to set the external AM, FM, or ΦM input to either 50 Ohms or 600 Ohms. This softkey is available only after selecting an external AM, FM, or ΦM source.

Preset   50 Ohm

Ext In 600 Ohm I Offset

Supported   E8267D with Option 015

Use this softkey to enter an offset voltage for externally applied in-phase I signals. This offset is used to remove imperfections in the in-phase signal or to introduce calibrated impairments.

The offset voltage is applied only when Ext 600 Ohm is selected as the I/Q Source 1 input from the Mux hardkey menu.

The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.

Preset   0.000 V

Range   −5.000 to 5.000 V

Ext In 600 Ohm Q Offset

Supported   E8267D with Option 015

Use this softkey to set an origin offset voltage for externally applied quadrature-phase signals. This offset is used to remove imperfections in the quadrature-phase signal or to introduce calibrated impairments.

The offset voltage is applied only when Ext 600 Ohm is selected as the I/Q Source 1 input. This selection is in the Mux hardkey menu.

The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.

Preset   0.000 V

Range   −5.000 to 5.000V

Ext Input Level (nnn mV) Default Man Meas

Supported   E8267D with Option 015

Use this softkey to optimize the I/Q attenuation setting when an external I/Q input signal is used. The softkey is available when an external I/Q source (Ext 50 Ohm or Ext 600 Ohm) is selected from the Mux hardkey menu.

Default	Use this choice to optimize the I/Q attenuation setting for a 500.0 mV external I/Q input signal level.
Man	Use this choice to enable manual control of the I/Q attenuation setting.
Meas	This selection will enable the Do External Input Level Measurement softkey. Use this choice to measure the voltage level at the external I/Q inputs. The RMS voltage level will be used to calculate an optimum I/Q attenuation value.

Preset   Default (500.0 mV)

Range   100.0 mV rms to 1.0 V rms

Ext Polarity Neg Pos

Supported   E8267D with Option 601 or 602

This softkey sets which state (positive or negative) of the external trigger signal triggers the waveform when using triggering in an ARB format or real-time custom. For example, when you select Pos, the waveform responds during the high state of the trigger signal.

The external polarity selection applies to the continuous, single and segment advance (dual ARB player) triggering modes. To select the trigger state for the gating trigger mode, use the **Gate Active Low High** softkey.

The softkey is active only after selecting **Ext** (external) as the trigger source. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Preset   Neg

Ext Polarity Normal Inverted

Supported   All Models

Use this softkey to set the external pulse source polarity.

Normal   This selects the normal polarity for the external pulse source.

Inverted   This selects an inverted polarity for the external pulse source.

Preset   Normal

Ext Pulse

Supported   All Models

This softkey enables you to generate a pulse modulation that follows an external pulse signal applied to the PULSE/TRIG GATE INPUT connector.

Ext Source

Supported   E8267D with Option 601 or 602

This softkey accesses a menu from which you select the rear–panel input for the external trigger signal when using triggering in an ARB or real‑time custom format. You can select either the **Patt Trig In 1** softkey, (the PATTERN TRIG IN rear–panel BNC connector), or **Patt Trig In 2** softkey (the AUXILIARY I/O rear‑panel connector). The current input selection appears in parenthesis under this softkey.

The softkey is active only after selecting **Ext** (external) as the trigger source. For more information on the rear–panel connectors and triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

External

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey selects the external clock signal provided through the Ext Clock In connector as the clock source for the N5102A module. You must also set the interface module clock rate to match that of the external clock signal (see "Clock Rate" on page 44). With this selection, the external clock is available as an output clock signal at the Clock Out and Device Interface connectors on the N5102A module.

CAUTION	It is important that the signal generator, the interface module, and the device are locked to a common frequency reference. Failure to have a common frequency reference may result in a loss of data.

External Ref Bandwidth

Supported   All with Option UNR/UNX

This softkey enables you to adjust the bandwidth of the external reference oscillator.

F

Fall Delay

Supported   E8267D with Option 601 or 602

Press this softkey to adjust the burst shape fall delay.

Preset   0.000 bits

Range   Minimum and maximum values depend on the symbol rate.

Fall Time

Supported   E8267D with Option 601 or 602

Press this softkey to adjust the burst shape fall time.

Preset   5.000 bits

Range   Minimum and maximum values depend on the symbol rate.

Filter

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can select a filter type or default filter, define a unique finite impulse response (FIR) filter, or optimize the filter for the best error voltage magnitude (EVM) or adjacent channel power (ACP).

You can also adjust the filter alpha, when Nyquist or root Nyquist filters are selected, or the bandwidth time product if a Gaussian filter is selected.

Filter Alpha

Supported   E8267D with Option 601 or 602

Use this softkey to make the filter's alpha parameter active in either the Filter menu or the Load Default finite impulse response (FIR) menu.

In the Filter Menu

In this menu, the **Filter Alpha** softkey changes the alpha parameter of the selected root Nyquist or Nyquist filter. This key appears only after choosing a root Nyquist or Nyquist filter. If a Gaussian filter is in use, you will see **Filter BbT**. If any other filter is in use, this key is replaced with a grayed-out key labeled **Filter Factor N/A**.

Preset   0.350

Range   0.000–1.000

In the Load Default FIR Menu

In this menu, the **Filter Alpha** softkey changes the alpha parameter of the root Nyquist or Nyquist filter coefficients loaded into the FIR table editor. After entering the alpha value, you can press **Generate** to modify the filter coefficients in the table editor.

Preset	0.350
Range	0.000–1.000

Filter BbT

Supported   E8267D with Option 601 or 602

Use this softkey to make the bandwidth-multiplied-by-bit-time (BbT) filter parameter active in either the Filter menu or the Load Default FIR menu.

In the Filter Menu

In this menu, the **Filter BbT** softkey changes the BbT parameter of the selected Gaussian filter. This key appears only after choosing a Gaussian filter. If a root Nyquist or Nyquist filter is in use, you will see **Filter Alpha**. If any other filter is in use, this key is replaced with a grayed-out key labeled **Filter Factor N/A**.

Preset	0.350
Range	0.000–1.000

In the Load Default FIR Menu

In this menu, the **Filter BbT** softkey changes the BbT parameter of the Gaussian filter coefficients loaded into the FIR table editor. After entering the BbT value, press **Generate** to modify the filter coefficients in the table editor.

Preset	0.200
Range	0.000–1.000

Filter Factor N/A

Supported   E8267D with Option 601 or 602

This grayed-out softkey is displayed when a filter is in use that does not contain an adjustable alpha or BbT parameter, such as a user-defined FIR filter. This softkey changes to either **Filter Alpha** or **Filter BbT** when the appropriate root Nyquist, Nyquist or Gaussian filter is selected.

Filter Symbols

Supported   E8267D with Option 601 or 602

This softkey selects the number of symbols for the current FIR filter. The FIR table editor allows a maximum filter length of 1024 coefficients with a maximum oversample ratio of 32 and a maximum of 64 symbols. If you create a FIR filter with greater than 32 symbols, the maximum symbol rate decreases by one half. If you create a FIR filter with greater than 16 and less than or equal to 32 symbols, the maximum symbol rate decreases by one quarter.

Preset	8
Range	1–64

FIR

Supported   E8267D with Option 601 or 602

This softkey enables you to specify that only signal generator FIR filter files be listed in the catalog of files.

First Mkr Point

Supported   E8267D with Option 601 or 602

This softkey sets the first marker point in a range of marker points on a waveform segment for the active marker. If you enter a value for the first marker point that is greater than the last marker point, the last marker point automatically adjusts to match the first marker point. To select the active marker, use the **Marker 1 2 3 4** softkey. For more information on markers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Preset   1

Range   1–last waveform point

In the Dual ARB

The waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

In All Other ARB Formats

This softkey is not available unless the ARB format is on.

First Sample Point

Supported   E8267D with Option 601 or 602

This softkey sets the starting sample point for the ARB waveform marker display.

Preset   1

Range   1– last waveform point

In the Dual ARB

The waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

In All Other ARB Formats

This softkey is not available unless a waveform ARB format such as Custom real-time, is on.

FIX4

Supported   E8267D with Option 601 or 602

Use this softkey to select a 4-bit repeating sequence data pattern and make it the active function. The selected 4-bit pattern will be repeated as necessary to fill the data area.

Preset   0000

Range   0000–1111

Flatness Off On

Supported   All Models

This softkey toggles the application of user flatness corrections to the output power.

Off   When flatness is off, user flatness correction is not applied to the output power.

On   When flatness is on, user flatness correction is applied to the output power. You can use flatness correction to maintain a constant power level at the point of detection.

Preset   Off

FM/ΦM

Supported   All with Option UNT

Use this hardkey to access a menu from which you can configure modulation type (FM, normal phase modulation, or wideband phase modulation), path, deviation and deviation coupling, source, rate, waveform, and DCFM/DCΦM calibration.

FM ΦM Normal High BW

Supported   All with Option UNT

This softkey toggles between the menus for frequency modulation (FM), normal phase modulation (ΦM), and wideband phase modulation (ΦM High BW). Deviation limits depend on the carrier frequency; limiting occurs only after the modulation is turned on.

Normal   This choice enables you set the phase deviation as high as N x 80 radians with a 3.0 dB bandwidth at 100.0 kHz. Refer to the **FM Dev** softkey description for N values.

High BW   This choice provides increased bandwidth while restricting the maximum deviation to deviation settings up to N x 8 radians. Refer to the **FM Dev** softkey description for N values.

Preset   FM

FM Dev

Supported   All with Option UNT

This softkey enables you to set the frequency deviation for the currently selected modulation path. The range of values allowed depends on the carrier frequency. The following table lists maximum peak deviations.

Carrier Frequency	Maximum Peak Deviation
100 kHz to 250 MHz	2 MHz
> 250 MHz to 500 MHz	1 MHz
> 500 MHz to 1 GHz	2 MHz
> 1 GHz to 2 GHz	4 MHz
> 2 GHz to 3.2 GHz	8 MHz
> 3.2 GHz to 10 GHz	16 MHz
> 10 GHz to 20 GHz	32 MHz
> 20 GHz to 28.5 GHz	48 MHz
> 28.5 GHz to 44 GHz	80 MHz

The new value of FM deviation applies only to the FM path configuration you have selected. In addition, whenever FM Path 1 is used with FM Path 2, the deviation for FM Path 1 must be greater than or equal to the deviation for FM Path 2.

Preset   1.0 kHz

Range   Depends on the carrier frequency.

FM Dev Couple Off On

Supported   All with Option UNT

This softkey toggles the operating state for FM deviation coupling.

Off   The FM Path 1 and FM Path 2 deviation values are independent of each other.

On   The FM Path 1 and FM Path 2 deviation values are linked. Any change you make to one FM deviation value is applied to both.

Preset   Off

FM Off On

Supported   All with Option UNT

This softkey toggles the operating state of the currently selected frequency modulation.

Off   Use this setting to turn off the frequency modulation.

On   Use this setting to turn on the frequency modulation.

Whenever frequency modulation is enabled, the FM annunciator is turned on in the display. Although you can turn on frequency modulation with this key, the RF carrier is modulated only when you have set **Mod On/Off** to On.

Preset   Off

FM Path 1 2

Supported   All with Option UNT

This softkey toggles the selection between FM Path 1 and FM Path 2.

FM Path 1   This selection enables you to configure the modulation characteristics for FM Path 1, using the remaining softkeys in the FM menu.

FM Path 2   This selection enables you to configure the modulation characteristics for FM Path 2, using the remaining softkeys in the FM menu.

FM Path 1 and FM Path 2 define two standard frequency modulation configurations which can be used together. FM Path 1 and FM Path 2 are summed internally for composite modulation. Either path can be switched to any one of the modulation sources: Internal, Ext1, or Ext2.

FM Path 2 is limited to a maximum rate of 1 MHz. FM Path 2 must be set to a deviation less than FM Path 1.

Preset   FM Path 1

FM Rate

Supported   All with Option UNT

This softkey enables you to change the internal modulation frequency for the FM Path 1 and FM Path 2 configurations.

The new value for the FM rate applies only to the FM path configuration currently selected.

Preset   400.0 Hz

Range   500.0 MHz–100.0 kHz (minimum increment is 0.1 Hz)
                    500.0 MHz–1.0 MHz (if sinewave is selected as the internal waveform)

FM Source

Supported   All with Option UNT

Use this softkey to access a menu from which you can select an internally-generated or externally-applied modulation input as the frequency modulation source. The internal modulation is always ac-coupled. For externally applied signals, you can choose between ac- and dc-coupled modulation.

A 1.0 volt peak voltage input is required for calibrated FM deviation settings. The EXT 1 LO/HI and EXT 2 LO/HI display annunciators will turn on if the peak input voltage differs from 1.0 volt by more than 3%. (The LO/HI annunciators only function for ac-coupled external inputs.)

Preset   Internal

FM Start Rate

Supported   All with Option UNT

This softkey enables you to change the starting frequency of the internally generated modulation source for swept-sine frequency modulation.

This key is coupled to the **FM Rate** softkey in the initial FM menu and the **FM Tone 1 Rate** softkey in the FM dual-sine menu. Any value set for **FM Start Rate** is reflected in the **FM Rate** and **FM Tone 1 Rate** softkeys.

Preset   400.0 Hz

Range   1.0 Hz–1.0 MHz (minimum increment is 1.0 Hz)

FM Stop Rate

Supported   All with Option UNT

This softkey enables you to change the stop frequency for the internally generated modulation source for swept-sine frequency modulation.

This key is coupled to the **FM Tone 2 Rate** softkey in the FM dual-sine menu. Any value set for **FM Stop Rate** is reflected in the **FM Tone 2 Rate** softkey.

Preset   400.0 Hz

Range   1.0 Hz–1.0 MHz (minimum increment is 1.0 Hz)

FM Sweep Rate

Supported   All with Option UNT

Use this softkey to set the sweep rate of the swept sine analog modulation.

Preset   400.0 Hz

Range   0.5 Hz-100.0 kHz

FM Sweep Trigger

Supported   All with Option UNT

Use this softkey to access a menu from which you can select the triggering mode for the swept-sine frequency modulation.

You can also configure the polarity of the TTL trigger output at the TRIGGER IN connector using the **Trigger In Polarity Neg Pos** softkey on this menu.

Preset   Free Run

FM Tone 1 Rate

Supported   All with Option UNT

This softkey enables you to set the internal modulation rate for tone 1 of the dual-sine FM waveform.

This key is coupled to the **FM Rate** softkey in the initial FM menu and the **FM Start Rate** softkey in the FM swept-sine menu. Any value set for the FM Tone 1 Rate is reflected in the **FM Rate** and **FM Start Rate**

softkeys.

Preset   400.0 Hz

Range   0.5 Hz–1.0 MHz (minimum increment is 0.5 Hz)

FM Tone 2 Ampl Percent Of Peak

Supported   All with Option UNT

This softkey enables you to adjust the amplitude of the alternate frequency, FM tone 2, as a percentage of the peak analog modulation amplitude.

For example, if the tone 2 amplitude is set to 30.0% of the total amplitude, then the amplitude of the primary frequency is 70.0% of the total amplitude. This is applicable only for the dual-sine function.

Preset   50.0%

Range   0.0%–100.0%

FM Tone 2 Rate

Supported   All with Option UNT

This softkey enables you to set the internal modulation rate for tone 2 of the dual-sine FM waveform.

This key is coupled to the **FM Stop Rate** softkey in the FM swept-sine menu. Any value set for FM Tone 2 Rate is reflected in the **FM Stop Rate** softkey.

Preset   400.0 Hz

Range   0.5 Hz–1.0 MHz (minimum increment is 0.5 Hz)

FM Waveform

Supported   All with Option UNT

Use this softkey to access a menu of choices that enables you to select the frequency modulation waveform that can be generated by the internal modulation source.

This softkey is only enabled when Internal is selected in the FM Source menu.

Preset   Sine

Frame Polarity Neg Pos

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, sets the polarity of the frame marker that delineates the beginning of each sample during a serial data transmission.

Neg   The frame line is low while data for the first sample is available.

Pos   The frame line is high while data for the first sample is available.

The frame marker is not affected by phase and skew adjustments.

For a parallel port configuration, this softkey is grayed out (inactive). For information on selecting serial data, see "Port Config" on page 151.

Preset	Pos

Free Run

Supported   All Models

This softkey is a continuous mode waveform trigger response selection that causes the PSG to immediately trigger the waveform when you turn on the application. The PSG transmits the waveform continuously. For example, after you select **Free Run** in the AM Sweep Trigger menu, turning AM on triggers the waveform, which the PSG transmits continuously until you turn AM off.

When this is the point trigger response selection, the list or step sweep pauses at each point for the set dwell time. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Freq

Supported   All Models

This softkey enables you to set the signal generator to sweep frequency data only. The amplitude is set at a constant level determined by the **Amplitude** hardkey. You can define a sweep containing both amplitude and frequency information and choose frequency, amplitude, or frequency and amplitude sweeps.

Freq & Ampl

Supported   All Models

Use this softkey to set the signal generator to sweep both frequency and amplitude data when using ramp or step as the sweep type.

In a list sweep, both the frequency and the amplitude lists must have the same number of points or one must have only one point. If a list has only one point, then that point is used for each of the other list's points.

Freq Center

Supported   All with Option 007

This softkey sets the center frequency for a ramp sweep. The center frequency symmetrically divides the selected frequency span and is coupled to the start and stop frequency settings.

Preset	*Option 503*: 3.2 GHz
	Option 509: 9 GHz
	Option 520: 20 GHz
	Option 532: 31.8 GHz
	Option 540: 40 GHz
	Option 544: 44 GHz
	Option 550: 50 GHz
	Option 567: 67 GHz
Range	*Option 503*: 100kHz–3.2 GHz
	Option 509: 100kHz–9 GHz
	Option 520: 250kHz–20 GHz

Option 532: 250kHz–31.8 GHz
Option 540: 250 kHz–40 GHz
Option 544: 250 kHz–44 GHz
Option 550: 250 kHz–50 GHz
Option 567: 250 kHz–70 GHz (67–70 GHz performance not specified)

Freq Channels

Supported   All Models

Use this softkey to display a menu of softkeys from which you can assign frequency channels and
frequency bands.

Freq Channels Off On

Supported   All Models

This softkey sets the operating state of the frequency channel mode. When the frequency channel
mode is on, the selected channel band and channel number determine the signal generator's RF
output frequency.

Freq offset and Freq Multiplier still affect the real RF output frequency when Freq Channels is On.

Off   When you select off, the state of the RF output is set using the Freq CW softkey.

On   When you select on, the operating state of the RF output frequency is determined
                     by the frequency band and frequency channel settings.

Preset   Off

Freq CW

Supported   All with Option 007

This softkey activates the CW frequency mode and allows you to change the frequency value of the
CW signal.

Any currently running frequency sweeps are turned off and the current CW frequency settings
control the output frequency.

Preset   *Option 503: 3.2 GHz*
                     Option 509: 9 GHz
                     Option 520: 20 GHz
                     Option 532: 31.8 GHz
                     Option 540: 40 GHz
                     Option 544: 44 GHz
                     Option 550: 50 GHz
                     Option 567: 67 GHz

Range   *Option 503: 100kHz–3.2 GHz*
                     Option 509: 1000kHz–9 GHz
                     Option 520: 250kHz–20 GHz
                     Option 532: 250kHz–31.8 GHz
                     Option 540: 250kHz–40 GHz
                     Option 544: 250kHz–44 GHz

Option 550: 250kHz–50 GHz

Option 567: 250kHz–70 GHz (67–70 GHz performance not specified)

Freq Dev

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations. You can use this softkey to select the maximum frequency deviation for an frequency shift keying (FSK) modulation or to set a deviation for the FSK table editor.

Selecting a Symmetric FSK Modulation

Press this softkey to set the maximum frequency deviation for symmetric FSK modulation.

Preset   400.0 Hz

Range   0 Hz–4 times the current symbol rate setting (20 MHz maximum)

Loading a Symmetric FSK Pattern into the FSK Table Editor

Press this softkey to define a custom frequency deviation convention in the FSK table editor. For more information on using the FSK table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

This setting is not affected by a preset or by a power cycle.

Preset   3.1250000 Hz

Range   0 Hz–20 MHz

Freq Multiplier

Supported   All Models

This softkey enables you to multiply the frequency shown on the display without changing the frequency output at the RF OUTPUT connector (simulating the frequency at the output of a harmonic multiplier).

For any multiplier other than 1, the `MULT` indicator is shown in the frequency area of the display.

The displayed frequency value is equal to the actual frequency, minus the reference frequency, times the multiplier, plus the offset frequency.

Preset   1

Range   −1000 to +1000 (excluding 0)

Freq Offset

Supported   All Models

This softkey enables you to set a value for frequency offset. For example, if the current output frequency is 1.0 MHz and you enter a frequency offset of 3.0 MHz, the output frequency will remain at 1.0 MHz but the display will show a frequency of 4.0 MHz. This feature enables you to simulate the frequency at the output of a frequency translating device.

When an offset has been entered, the OFFS indicator is turned on in the frequency area of the display.

A frequency offset can be entered at any time during normal operation and also when you are operating in frequency reference mode.

A frequency offset changes the value shown in the frequency area of the display but does not affect the output frequency.

Preset   0.00 Hz

Range   −200.0 GHz to 200.0 GHz

Freq Ref Off On

Supported   All Models

This softkey toggles the operating state of the frequency reference mode.

Off   The frequency reference mode is turned off, and the output frequency is not affected by the reference value set by the **Freq Ref Set** softkey.

On   The frequency value displayed is equal to the current hardware output frequency minus the reference value set by the **Freq Ref Set** softkey. All frequency parameters will now be set as relative to the reference value.

          Frequency offsets can be used with frequency reference mode. In this situation, the display will show the frequency calculated as the current hardware output frequency minus the reference value plus the frequency offset.

Frequency reference mode only changes the display; it does not change the RF output frequency.

Preset   Off

Freq Ref Set

Supported   All Models

Use this softkey to set the current output frequency plus the offset frequency as the frequency reference value. Pressing this softkey also causes the **Freq Ref Off On** softkey to toggle to the On position, turning on frequency reference mode. All frequency parameters are then set as relative to the reference value.

Preset   0.00 Hz

Range   0.00 Hz–highest frequency (depends on the signal generator option)

Freq Separation

Supported   E8267D with Option 601 or 602

This softkey enables you to set the spacing between tones in a two-tone waveform. The mid point between the tones is placed at the carrier frequency. The range is limited by the 80 MHz bandwidth of the arbitrary waveform generator (ARB).

Preset   10.000 kHz

Range   100.0 Hz–80.0 MHz

Freq Spacing

Supported   E8267D with Option 601 or 602

This softkey enables you to set the spacing between tones in the multitone table editor. When there are an odd number of tones, the center tone is placed at the carrier frequency and the other tones are spaced incrementally, according to the set value. With an even number of tones, the mid-point of the two center tones is placed at the carrier frequency.

Preset   10.000 kHz

Range   100.0 Hz–80.0 MHz (depends on the number of tones)

Freq Span

Supported   All with Option 007

This softkey enables you to configure a sweep based on the span and the center frequency. In ramp sweep, this setting is coupled with the start frequency and stop frequency settings.

Preset   0.00 Hz

Range   00.0 Hz–highest frequency minus 100kHz (depends on the signal generator option)

Freq Start

Supported   All Models

This softkey enables you to set the frequency start point for a step sweep or ramp sweep (Option 007). In a ramp sweep setup, the selected value must be less than or equal to the value selected for the frequency stop point (**Freq Stop** softkey). In ramp sweep, this setting is coupled with the span and center frequency settings.

Preset   Highest frequency (depends on the signal generator option)

Range   0.00 Hz–highest frequency (depends on the signal generator option)

Freq Stop

Supported   All Models

This softkey enables you to set the frequency stop point for a step sweep or ramp sweep (Option 007). In a ramp sweep setup, the selected value must be greater than or equal to the value selected for the frequency start point (**Freq Start** softkey). In ramp sweep, this setting is coupled with the span and center frequency settings.

Preset   Highest frequency (depends on the signal generator option)

Range   0.00 Hz–highest frequency (depends on the signal generator option)

Frequency

Supported   All Models

This hardkey accesses a menu that enables you to change the RF output frequency and frequency configuration, control an external source module, and enable frequency markers.

| **Preset** | Highest frequency (depends on the signal generator option) |
| **Range** | 100 kHz–highest frequency (depends on the signal generator option) |

FSK

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu of frequency shift keying (FSK) modulation types for modulating a continuous stream of the selected data pattern. You can also change the default frequency deviation.

In the memory catalog, this softkey enables you to specify that only signal generator FSK files be listed in the catalog of files.

FTP Server Off On

Supported   All Models

This softkey enables or disables the file transfer protocol (FTP) service on the signal generator. FTP is used to download a file from a client or upload a file to a client. To enable the FTP service, you must toggle the softkey to On and then press the Proceed With Reconfiguration and Confirm Change softkeys. The signal generator will reboot and enable the FTP service. The FTP server state, off or on, survives a preset or instrument reboot.

Off   Disables the FTP server.

On   The FTP server is enabled and files can be transferred using this protocol.

Function Generator 1

Supported   All Models

This key configures the first internal source to operate as a function generator.

When you use the internal source in this capacity, any modulation with the internal source selected is turned off.

Function Generator 2

Supported   All Models

This key configures the second internal source to operate as a function generator.

When you use the internal source in this capacity, any modulation with the internal source selected is turned off.

G

Gate Active Low High

Supported   E8267D with Options 601 or 602

This softkey sets the active trigger state for the gated trigger mode. The modulating signal's response

to the low or high selection differs between the ARB formats and real-time custom.

Gate Active Selection	Trigger Signal State	ARB	Real-Time
High	High	Waveform file stops playing	Data pattern modulates the carrier signal
	Low	Waveform file plays	Data pattern stops modulating the carrier signal
Low	High	Waveform file plays	Data pattern stops modulating the carrier signal
	Low	Waveform file stops playing	Data pattern modulates the carrier signal

For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Gated

Supported   E8267D with Options 601 or 602

This softkey sets the signal generator to the gated trigger mode, which causes the waveform (modulating signal) to repeatedly start and stop in response to an externally applied trigger signal.

To use the gated trigger mode, you must also select **Ext** from the Trigger Source menu. The length of each transmission depends on the duty period of the trigger signal and the gate polarity selection, which is set with the **Gate Active Low High** softkey. The polarity selection also determines which state (negative or positive) of the trigger signal causes an interruption in the modulating signal.

The external trigger signal connects to either the PATTERN TRIG IN connector or the Auxiliary I/O connector (PATT TRIG IN 2 pin). To select the connector, use the **Ext Source** softkey.

The gated trigger mode functions differently for ARB and Real Time I/Q Baseband (real-time custom) signals.

ARB   The waveform waits for the first inactive trigger signal state to begin playing. After the first inactive trigger occurrence, the waveform stops playing during active states and plays during inactive states. The waveform stops at the last played sample point and restarts at the next sample point.

Real-Time Custom   The modulating signal waits for the first active trigger signal state, then begins transmission. After the initial trigger, the behavior depends on whether the signal incorporates framed or unframed data. Because the PSG provides only unframed data, to transmit a framed data signal you must create an external file that incorporates the framing and download it to the PSG. The following list describes the behavior differences between the two types of data transmissions:

- Unframed data transmits during active states and stops during inactive states. The signal stops at the last transmitted symbol and restarts at the next symbol.

- Framed data starts transmitting at the beginning of a frame during active states and stops at the end of a frame when the end occurs during inactive states. If the end of the frame extends into the next active state, the signal transmits continuously.

For more information on downloading files, see the *Agilent Signal Generators Programming Guide*;

for more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Gain, Offset & Scaling

Supported   E8267D with Option 601 or 602 and Option 003

This softkey, for the N5102A module, accesses a menu that enables you to adjust the gain, DC offset, scaling, and IQ rotation for the transmitted data.

Gaussian

Supported   All Models

This softkey selects a Gaussian pre‐modulation filter from the Select (filter) menu, the Load Default FIR (Finite Impulse Response) menu, or the Noise menu.

In the Select (filter) Menu

In this menu, use the **Gaussian** softkey to select this FIR filter for use in a modulation setup.

In the Load Default FIR Menu

In this menu, use the **Gaussian** softkey to access a menu from which you can change the filter BbT value, specify the number of symbols, apply a windowing function, and generate a new FIR table that is loaded with the coefficients for a Gaussian filter. If you change a parameter, you can press the **Generate** softkey again to reload the FIR table.

In the Noise Menu

This softkey enables you to specify noise with a Gaussian distribution as the modulation waveform for the internally generated, ac‐coupled signal.

Generate

Supported   E8267D with Option 601 or 602

Use this softkey to create a new finite impulse response (FIR) table that is based on the user‐specified alpha or filter Bbt value, number of symbols, and windowing selection.

Goto

Supported   All Models

Use this softkey to access a menu from which you can select a row or page in a table or list of items.

Goto Bottom Row

Supported   All Models

Use this softkey to move the selection bar to the last row in the current table or list of items.

Goto Middle Row

Supported   All Models

Use this softkey to move the selection bar to the middle row in the current table or list of items.

Goto Row

Supported   All Models

Use this softkey to access a menu from which you can select a row in the current table or list of items.

Goto Top Row

Supported   All Models

Use this softkey to move the selection bar to the first row in the current table or list of items.

GPIB Address

Supported   All Models

This softkey enables you to change the signal generator's GPIB address. The GPIB address is set to 19 at the factory. The GPIB address setting is not affected by a preset or by a power cycle.

Preset   19

Range   0–30

GPIB Listener Mode

Supported   All Models

Use this softkey to return the GPIB back to the listener mode after a user flatness calibration.

GPIB/RS-232/LAN

Supported   All Models

Use this softkey to access a menu of configuration choices for GPIB, RS-232, and LAN.

GPS

In the Mode menu

Supported   E8267D Option 409

Use the Global Positioning System (GPS) softkey to access a menu from which you can select **Real Time GPS** or **Real Time MSGPS**. The **Real Time GPS** selection enables you to set up a GPS signal that simulates the transmission from a single satellite. The **Real Time MSGPS** selection enables you to set up a GPS signal that simulates the transmissions from multiple satellites.

In the Catalog Type menu

Supported   E8267D Option 409

This softkey enables you to specify that only signal generator GPS scenario files be listed in the catalog of files.

GPS Ref (f0)

Supported   E8267D Option 409

Use this softkey to set the GPS reference clock signal frequency. If an external source is being used, its frequency must match the value set with this softkey.

Preset	10.230000 Mcps
Range	1.000 kcps–12.500000 Mcps (Real Time GPS)
	10.23 Mcps ± 10% (Real Time MSGPS)
Remarks	In Real Time GPS mode, a change to the **GPS Ref (f0)** value will cause the P code and C/A code chip rates to change.
	In Real Time MSGPS mode, a change to the **GPS Ref (f0)** value will cause the C/A code chip rate to change.

GPS Ref Clk Ext Int

Supported   E8267D Option 409

This softkey toggles the GPS reference clock (chip clock) source selection between internal and external.

Ext	This selection sets the signal generator to use an external reference clock, which is supplied to the DATA CLOCK INPUT connector.
Int	This selection sets the instrument to use the internal reference clock.
Preset	Int
Remarks	If an external reference clock is being used, its frequency must match the value set with the **GPS Ref (f0)** softkey.

Gray Coded QPSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor.

Selecting a Gray Coded QPSK Modulation

Use this softkey to select Gray Coded quadrature phase shift keying (QPSK) to modulate a continuous stream of the selected data pattern. Gray Coded QPSK modulation transmits data at the rate of 2 bits per symbol. The constellations for this modulation type are designed so that adjacent symbols differ by only one bit.The modulation selection appears under the **Select**, **QPSK and OQPSK**, and **PSK** softkeys in

the Modulation Type menus.

Loading a Gray Coded QPSK I/Q Map into the Table Editor

Use this softkey to load a Gray Coded quadrature phase shift keying (QPSK) I/Q map into the I/Q table editor.

For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

GSM

Supported   E8267D with Option 601 or 602

Use this softkey to select a predefined Global System for Mobile Communication (GSM) personality for the digital modulation format.

GSM/Edge Bands

Supported   E8267D with Option 601 or 602

This softkey accesses a menu from which you can select the frequency bands for GSM. The output frequency depends on both frequency band and channel selections.

GSM 450 Base

Supported   E8267D with Option 601 or 602

This softkey selects GSM 450 Base as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset   *Channel*: 259

                   Frequency: 460.600 MHz

Range   *Channels*: 259–293

                   Frequency: 460.600–467.400 MHz

GSM 450 Mobile

Supported   E8267D with Option 601 or 602

This softkey selects GSM 450 Mobile as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset   *Channel*: 259

                   Frequency: 450.600 MHz

Range   *Channels*: 259–293

                   Frequency: 450.600–457.400 MHz

GSM 480 Base

Supported   E8267D with Option 601 or 602

This softkey selects GSM 480 Base as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset	*Channel*: 306
	Frequency: 489.000 MHz
Range	*Channels*: 306–340
	Frequency: 489.000–495.800 MHz

GSM 480 Mobile

Supported   E8267D with Option 601 or 602

This softkey selects GSM 480 Mobile as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset	*Channel*: 306
	Frequency: 479.000 MHz
Range	*Channels*: 306–340
	Frequency: 479.000–485.800 MHz

GSM 850 Base

Supported   E8267D with Option 601 or 602

This softkey selects GSM 850 Base as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset	*Channel*: 128
	Frequency: 869.200 MHz
Range	*Channels*: 128–251
	Frequency: 869.200–893.800 MHz

GSM 850 Mobile

Supported   E8267D with Option 601 or 602

This softkey selects GSM 850 Mobile as the frequency band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset	*Channel*: 128
	Frequency: 824.200 MHz
Range	*Channels*: 128–251
	Frequency: 869.200–848.800 MHz

H

Hamming

Supported   E8267D with Option 601 or 602

Use this softkey to apply the Hamming windowing function to the selected filter.

Windowing can be applied to any default finite impulse response (FIR) filter that you load into the Define User FIR table. Windowing improves out of band performance adjacent channel power (ACP), but simultaneously degrades passband performance error voltage magnitude (EVM), by smoothing the filter's transition to zero.

Hamming is the windowing type applied when you toggle the **Optimize FIR For EVM ACP** softkey to the ACP selection.

Hann

Supported   E8267D with Option 601 or 602

Use this softkey to apply the Hann windowing function to the selected filter.

Windowing can be applied to any default finite impulse response (FIR) filter that you load into the Define User FIR table. Windowing improves out of band performance adjacent channel power (ACP), but simultaneously degrades passband performance error voltage magnitude (EVM), by smoothing the filter's transition to zero.

Header Utilities

Supported   E8267D with Option 601 or 602

This softkey accesses a menu in which you can view a waveform's header information.

From this menu you can edit the header description, clear the header file information or save the signal generator settings to the header file.

Help Mode Single Cont

Supported   All Models

The utility menu **Instrument Info/Help mode** softkey accesses the **Help Mode Single Cont** softkey. The help text is a short description of the signal generator's hardkeys and softkeys. There are two help modes available on the signal generator, which are described in the following list:

Single   In single mode, when you press the **Help** hardkey, help text is provided for the next key press. Pressing any key afterwards exits the help function and activates the key.

Cont   In continuous mode, when you press the **Help** hardkey, help text is provided for each key press and the key function will be activated. (except for the **Preset** hardkey). The help text continuous mode function remains active until either the **Help** softkey is pressed again or the help mode is toggled back to single mode.

Hostname

Supported   All Models

This softkey enables you to enter a hostname for the local area network (LAN) connection. No hostname is entered at the factory. The hostname is limited to 255 characters.

The hostname setting is not affected by a preset or by a power cycle.

I

I Gain

Supported   E8267D with Option 601 or 602 and Option 003

This softkey, for the N5102A module, enables you to adjust the gain for the I data. This is a fine adjustment that is independent of the Q data and can be used to complement the setting obtained using the **Scaling** softkey.

The gain is the gain of the digital sample. A sample is represented by a word size of 4–16 bits and represents an analog voltage. This voltage is adjusted by the gain which will change the bit values. If the signal gain cannot be represented by bit word size, it will be clipped. For example, the signal will be clipped if, after applying the gain, the amplitude exceeds the number of bits for the sample.

Preset   100.0%

Range   87.50–112.5%

I Offset

Supported   E8267D with Option 601 or 602 and Option 003

This softkey, for the N5102A module, enables you to adjust the DC offset for the I data. The offset can be used to compensate for an existing impairment or to introduce an impairment to the I data.

The offset is an adjustment to the analog level that is represented by the digital sample. The analog voltage is limited to a 16-bit data sample.

Preset   0.00%

Range   −100 to +100% of full scale

Immediate

Supported   E8267D with Option 601 or 602

This softkey sets immediate as the waveform's response to triggers when using the single trigger mode for an ARB format. The waveform waits for and starts with the first trigger. A subsequent trigger immediately resets the waveform, which starts playing from the beginning.

When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Initialize Phase Fixed Random

Supported   E8267D with Option 601 or 602

This softkey sets the initial phase relationship for the tones designated in the multitone table editor.

Fixed   When you select Fixed, the initial phase for all tones is set to 0 degrees.

Random   When you select Random, the initial phase of the tones is set to random phases based on the **Random Seed Fixed Random** softkey selection.

Preset   Fixed

Initialize Table

Supported   E8267D with Option 601 or 602

This softkey accesses a menu that enables you to set values for the tones configured in the Multitone Setup table.

Insert

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can select different methods of inserting bits, or to execute the insertion of a specified number of bits.

Insert 0's

Supported   E8267D with Option 601 or 602

Use this softkey to insert a specified number of zeros into the current position of the bit file editor.

Insert 1's

Supported   E8267D with Option 601 or 602

Use this softkey to insert a specified number of ones into the current position of the bit file editor.

Insert PN9

Supported   E8267D with Option 601 or 602

Use this softkey to adjust the seed value of a 9-bit pseudorandom bit sequence. You can then insert it into the current bit file.

Insert PN15

Supported   E8267D with Option 601 or 602

Use this softkey to adjust the seed value of a 15-bit pseudorandom bit sequence. You can then insert it into the current bit file.

Insert Row

Supported   All Models

Use this softkey to insert a copy of the highlighted row directly above that row in a table or list.

Insert Selected Waveform

Supported   E8267D with Option 601 or 602

Use this softkey to insert the highlighted waveform into the sequence you are building.

Insert Waveform

Supported   E8267D with Option 601 or 602

This softkey accesses a menu and table editor which enable you to insert a waveform into the current row of the table editor.

Insert Waveform Sequence Contents

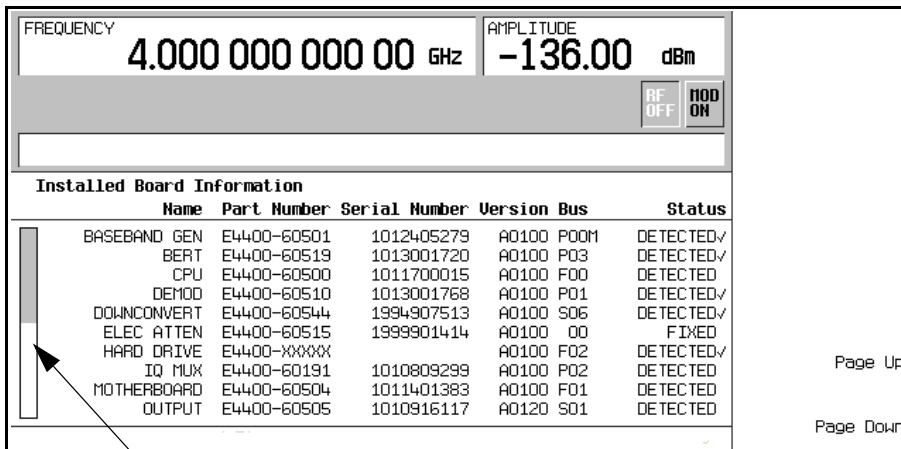**Supported**   E8267D with Option 601 or 602

Use this softkey to insert the contents of the highlighted sequence into the sequence you are building.

Installed Board Info

Supported   All Models

Use this softkey to display information about the installed boards in the signal generator. Refer to the following figure.

Figure 1-7

Additional Page Indicator

The gray and white vertical bar on the left side of the display indicates that there is an additional page of information. Use the **Page Down** softkey to display the next page. Use the **Page Up** softkey to return to the previous page.

A status of `DETECTED` means that the installed board was automatically detected.

A status of `INSTALLED` or `FIXED` means that the installed board is available for use.

Instrument Adjustments

Supported   All Models

Use this softkey to access a menu of front panel adjustments for the signal generator. This menu enables you to adjust the reference oscillator, set the value of the step keys and the front panel knob and so forth.

Instrument Info/Help Mode

Supported   All Models

Use this softkey to display a menu of softkeys detailing signal generator functions and operations.

Instrument Options

Supported   All Models

Use this softkey to access a menu from which you can install license keys and manage hardware options.

Int Doublet

Supported   All Models

Use this softkey to select an internal doublet pulse modulation. When doublet pulse is enabled, each trigger event will produce two pulses at the RF OUTPUT connector. The first pulse will follow the external trigger signal that is applied to the TRIGGER IN connector. The second pulse will have delay and width parameters as set via the front panel or with programming commands. Pulse delay is measured from the leading edge of the external trigger signal. Refer to the following figure.
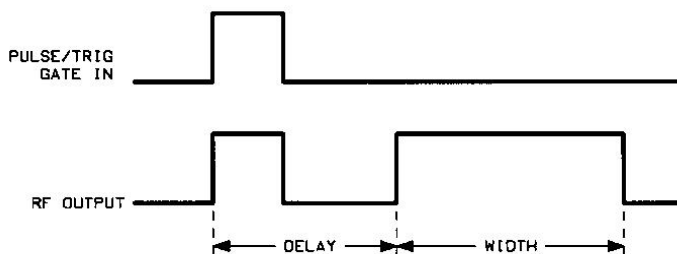
This modulation source requires an external trigger source.

Int Free Run

Supported   All with Option UNU or UNW

This softkey enables you to internally generate a continuously running pulse modulation with user-defined period, width and delay.

Int Gated

Supported   All with Option UNU or UNW

This softkey enables you to internally generate a gated pulse modulation. An RF pulse train will occur at the RF OUTPUT connector when a valid gate signal occurs at the TRIGGER IN connector. The generated pulse train will have a user-defined period and width.

Int I/Q Skew Correction RF BB Off

Supported   E8267D with Option 601 or 602

This softkey enables or disables internal I/Q timing skew corrections. You can enable I/Q timing skew corrections by selecting either the RF or baseband (BB) path. I/Q timing skew corrections and calibration must be performed at the Agilent factory or service center. If no corrections are present in the signal generator then this softkey is grayed out (inactive). When corrections are available, either the arbitrary waveform generator (ARB) or digital modulation must be on before the softkey is active.

The I/Q timing skew corrections are not available when BPSK or constant envelope modulation such as MSK (Minimum Shift Keying) in GSM (Global System for Mobile Communications) are used.

RF   When RF is selected, the skew is optimized for the I/Q signal applied to the RF Output. The BB (external I/Q) output will be functional, but the I/Q timing skew applied will be optimized for the RF path. When using this choice, seven symbols of latency are added to the ARB waveform. In real-time mode, the maximum number of user symbols for a FIR (Finite Impulse Response) filter is limited to 32.

BB   When BB is selected, the skew is optimized for the I/Q signal outputs on the rear panel. The RF output will be functional, but the I/Q timing skew applied is optimized for the BB path. When using this choice, seven symbols of latency are added to the ARB waveform. In real-time mode, the maximum number of user symbols for a FIR filter is limited to 32.

Off   When Off is selected, the factory I/Q timing skew is turned off. Using the signal generator in this mode does not add any latency symbols provided that skew adjustments or skew delay are not active.

Preset   RF

Range   N/A

Int Phase Polarity Normal Invert

Supported   E8267D

Use this softkey to invert the internal Q signal, reversing the rotation direction of the phase modulation vector.

Normal	When you choose Normal, the phase relationship between the I and Q signals is not altered by the phase polarity function.
Invert	When you choose Invert, the in-phase component lags the quadrature-phase component by 90° in the resulting modulation.
Preset	Normal

Int Triggered

Supported   All Models

This softkey enables you to internally generate a triggered pulse modulation. An RF pulse will occur at the RF OUTPUT connector when a valid trigger signal occurs at the TRIGGER IN connector. The generated pulse will have a user-defined period, width and delay.

Internal

Supported   All Models

Use this softkey to select internal ALC leveling.

In the Clock Source Menu (N5102A)

This softkey, for the N5102A module, selects the N5102A module internal clock as the clock source. This requires that the same external reference frequency be applied to both the Freq Ref connector and the PSG. You must also set the interface module reference frequency to match that of the applied signal (see "Reference Frequency" on page 164). This is the factory preset clock source selection. With this selection, the internal clock signal is available at the Clock Out and Device Interface connectors on the N5102A module.

| CAUTION | It is important that the signal generator, the interface module, and the device are locked to a common frequency reference. Failure to have a common frequency reference may result in a loss of data. |

Internal 1

Supported   All Models

This softkey selects the first internal source to generate an AC-coupled signal as the modulation output.

Internal 2

Supported   All Models

This softkey selects the second internal source to generate an AC-coupled signal as the modulation output.

Internal 1 Monitor

Supported　　　All Models

This softkey selects the first internal source as the low frequency output. The signal is available at the LF OUTPUT connector. The frequency and shape of the signal is internally configured.

Preset　　　The internal 1 monitor is selected after an instrument preset or when the on/off power-line switch is cycled.

Internal 2 Monitor

Supported　　　All Models

This softkey selects the second internal source as the low frequency output. The signal is available at the LF OUTPUT connector. The frequency and shape of the signal is internally configured.

Internal Ref Bandwidth

Supported　　　All with Option UNR/UNX

This softkey enables you to adjust the bandwidth of the internal reference oscillator.

Internal Square

Supported　　　All Models

This softkey enables you to internally generate a square wave as the modulation waveform.

Inverse Video Off On

Supported　　　All Models

This softkey selects the display mode, text and background, for the signal generator.

The inverse video state is not affected by a preset or by a power cycle.

Off　　　Inverse mode is off, the signal generator has dark text on a light background; the normal display mode for the signal generator.

On　　　Inverse mode is on, the signal generator display has light text on a dark background.

I Offset

Supported　　　E8267D with Option 015

This softkey adjusts the level of the in-phase signal. This key appears as a percentage of full scale for standard I/Q and as an offset voltage for wideband I/Q.

For Standard I/Q

Use this softkey to enter an origin offset for standard in-phase signals. An offset of 100% is equivalent to 500 mV DC at the input connector.

This offset is used to remove errors in the in-phase signal or to introduce calibrated impairments.

The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.

When using this key to minimize the LO feedthrough signal, optimum performance is achieved when the adjustment is made after all other I/Q path adjustments, such as those made with the **Int Phase Polarity Normal Invert** or **Modulator Atten nnn db Manual Auto** softkeys. If other adjustments are made after minimization is performed, the LO feedthrough signal may increase.

Preset 0.0%

Range −50% to 50%

For Wideband I/Q (Option 015)

Use this softkey to enter an origin offset for in-phase signals in wideband I/Q mode. This offset is used to remove imperfections in the in-phase signal or to introduce calibrated impairments.

For frequencies between 20 and 28.5GHz the I and Q signals are reversed. This is correct for internally generated signals but not for externally applied I and Q signals. In this frequency band you must switch the I and Q inputs to maintain the same phase relationship. Refer to the Troubleshooting chapter of the *E8257D/67D, E8663D PSG Signal Generators Service Guide* for more information.

The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.

Preset 0.0000 V

Range −1.0000 to 1.0000V

IP Address

Supported All Models

This softkey enables you to enter the internet protocol (IP) address for your IP network connection. No IP address is entered at the factory.

The IP address setting is not affected by a preset or by a power cycle.

I/Q

As the front panel hardkey

Supported E8267D

Use this hardkey to access a menu from which you can configure the internal I/Q modulator.

As a softkey in the Utility menu

Supported E8267D with Option 601 or 602

In the memory catalog, this softkey selects signal generator I/Q files to be listed in the catalog of files.

I/Q Adjustments

Supported E8267D with Option 015

Use this softkey to access a menu of I/Q adjustment choices for internally generated or externally applied I and Q signals. In this menu you can change the I/Q gain balance, I and Q offset voltages,

and quadrature angle adjustment. You can also toggle the operational state of these I/Q adjustments.

The operating state of the I/Q adjustments function is displayed under the **I/Q Adjustments** softkey.

I/Q Adjustments Off On

Supported   E8267D

This softkey toggles the operating state of the I/Q adjustments.

Off   When this softkey is in the off position, I/Q adjustment values are not applied to the I and Q signals.

On   When this softkey is in the on position, the values entered for I/Q gain balance, quadrature angle adjustment, I offset, and Q offset are applied to the I and Q signals.

Preset   Off

I/Q Calibration

Supported   E8267D

Use this softkey to access a menu from which you can configure and execute an I/Q calibration. You can set the start and stop frequency for a user–defined I/Q calibration, or choose an I/Q calibration over the entire frequency range of the signal generator. In this menu, you can also restore the original factory calibration data for the I/Q modulator.

Before running an I/Q calibration routine, the signal generator will save the instrument state and restore the state at the end of the calibration.

NOTE	The I/Q calibration can require a 20–45 minutes to complete (depending on the signal generator options). I/Q calibration data is not affected by a preset or power cycle.

You can perform an I/Q calibration on a frequency range without disturbing calibrations that have already been performed on other frequency ranges.

An I/Q calibration should be performed approximately every 30 days or if the temperature changes ± 5° C, but it can be performed at any time to peak the performance of the I/Q modulator.

I/Q Delay

Supported   E8267D

Use this softkey to change the phase of I and Q in relation to triggers and markers. A positive value advances the I and Q phase. This setting affects both the external I/Q output signals and the baseband signal modulated on the RF output.

This feature is not compatible with constant envelope modulations and signals connected to the external I/Q inputs. Delay limits are dependent on the current signal configuration. The units are seconds and the range depends on the signal format but is limited to ± 1 second.

Preset   0.0 sec

Range   ± 1 second

I/Q Gain Balance Source 1

Supported   E8267D

Use this softkey to change the I to Q gain balance for the **Source 1** selection. For example, if you enter a value of 1 dB, the I signal will have 1 dB more amplitude than the Q signal. The gain balance adjustment can be used with externally applied I and Q signals or with internally generated I and Q signals. Use the gain balance to remove imperfections in I and Q or to introduce calibrated impairments.

The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.

Preset   0.00 dB

Range   −4 dB to 4 dB

I/Q Mod Filter Manual Auto

Supported   E8267D

Use this softkey to access a menu from which you can either manually apply an I/Q modulation filter or select Auto to enable the signal generator to automatically choose a filter based on the active digital modulation settings. You can override the automatic mode at any time by manually selecting a filter from this menu. The selected filter type is displayed in parentheses.

Preset   Auto

I/Q Off On

Supported   E8267D

This softkey toggles the operating state of the internal I/Q modulator.

Off	This setting disables the internal I/Q modulator. You can turn off the I/Q modulation with this softkey even though the digital modulation mode is enabled. With this configuration, the RF output signal would not be modulated but the I/Q signals will be present at the rear panel I/Q outputs.
On	This setting enables the internal I/Q modulator. **I/Q Off On** is also toggled automatically to On when any of the digital modulation formats are enabled. When it is on, the PSG displays the I/Q annunciator.
	RF output power will be attenuated if the I/Q modulator is turned on and an I/Q signal is not applied.
	Although you can enable I/Q modulation with this softkey, the RF carrier is modulated only when you set **Mod On/Off** to On.

Preset   Off

I/Q Out

Supported   E8267D

Use this softkey to access a menu from which you can select a signal source to be routed to the rear panel I and Q output connectors.

When a digital modulation format is turned on, the **Source 1** and **I/Q Out** selections automatically switch to BBG1. When the digital modulation is turned off, the **Source 1** and **I/Q Out** selections automatically switch to Ext 50 Ohm. You can override the automatic settings by manually selecting a different source.

Preset   Ext 50 Ohm

I/Q Out Gain Balance

Supported   E8267D

Use this softkey to change the I to Q gain balance at the rear panel I and Q external outputs. For example, if you enter a value of 1 dB, the I signal will have 1 dB more amplitude than the Q signal. Use the gain balance to remove imperfections in I and Q or to introduce calibrated impairments.

Preset   0.00 dB

Range   −4 dB to 4 dB

I/Q Output Atten

Supported   E8267D

Use this softkey to set the attenuation level of the I/Q signal at the rear panel I and Q output connectors. A setting of 0.00 dB will result in 100 percent output signal power, while a setting of 40.00 dB will result in 0.01 percent output signal power.

Preset   6.00 dB

Range   0.00–40.00 dB

I/Q Output Control

Supported   E8267D

Use this softkey to access a menu from which you can change the parameters that control the I and Q output signals. In this menu you can control the I/Q output attenuation levels, I/Q output gain balance, and I and Q offset voltages. You can also select an I/Q output filter.

I/Q Output Filter Manual Auto

Supported   E8267D

Use this softkey to access a menu from which you can either manually apply an external I/Q output filter or select Auto to enable the signal generator to automatically choose an external filter based on the active settings. The filter is applied to the I/Q signal at the rear panel of the signal generator and does not affect the modulated RF signal.

This softkey is available in the dual ARB, Custom, and Multi–tone mode menus.

Preset　　　　Auto

I/Q Path Normal Wide

Supported　　　　E8267D with Option 015

This softkey toggles the I and Q modulator inputs between the mux source or the rear panel wide I and Q inputs.

Normal　　　　This choice sets the I and Q inputs to **Source 1** under the Mux hardkey.

Wide　　　　This choice sets the I and Q inputs to the external WIDE I and WIDE Q rear panel input connectors.

Preset　　　　Normal

IQ Phase Normal Invert

Supported　　　　E8267D with Option 409

In the Real Time GPS menu

This softkey toggles the phase relationship of the GPS I and Q signals.

Normal　　　　In this state, the C/A code phase is aligned with the in-phase component (I), and the P code phase is aligned with the quadrature-phase component (Q).

Invert　　　　In this state, the Q signal is inverted, and the I component lags the Q component by 90 degrees in the resulting modulation.

Preset　Normal

In the Real Time MSGPS menu

This softkey toggles the phase relationship of the MSGPS I and Q signals.

Normal　　　　In this state, the I and Q signals are transmitted with positive polarity (I leads Q by 90 degrees).

Invert　　　　In this state, the Q signal is inverted, and the I component lags the Q component by 90 degrees in the resulting modulation.

Preset　　　　Normal

IQ Polarity Neg Pos

Supported　　　　E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, sets the polarity of the I and Q data lines for the N5102A module.

Neg　　　　The data on both the I and Q data lines are inverted. A digital one is represented by a low logic level at the output.

Pos   The polarity of the output data matches the input data. A digital one is
                   represented by a high logic level at the output.

Preset   Pos

I/Q Scaling

Supported   E8267D with Option 601 or 602

This softkey adjusts the amplitude scaling of the I and Q signals.

In the Custom Real Time Menu

Use this softkey to adjust the amplitude of both the I and Q outputs for better adjacent channel
power (ACP) performance.

Preset   100%

Range   1- 200%

In the Baseband Setup Menu (N5102A, Option 004)

This softkey, for the N5102A module, enables you to adjust the scaling of both the I and the Q data
transmitted through the N5102A module. For Option 003, see "Scaling" on page 174.

Preset   70%

Range   −100 to +100%

I/Q Timing Skew

Supported   E8267D

Use this softkey to input skew changes to the I and Q paths. Equal and opposite skew is applied to
both paths (RF Output and I/Q outputs) simultaneously. A positive value delays the I signal relative
to the Q signal, and a negative value delays the Q signal relative to the I signal.

Adjusting the skew can optimize the error vector magnitude (EVM) of modulating signals with high
data rates such as wireless LAN.

If the **Int I/Q Skew Correction RF BB Off** softkey is active (RF or BB is On), the I/Q signals are already
optimized and adjusting I/Q timing skew would degrade signals. For signals routed to the rear panel
outputs (BB), you may want to adjust the I/Q timing skew to account for any mismatch in the cables
connected to the I/Q BNC connectors.

If the **Int I/Q Skew Correction RF BB Off** softkey is set to Off or there are no factory I/Q timing skew
corrections data, then adjusting the I/Q timing skew could improve the EVM of the signal.

I/Q timing skew adjustments are preserved when the instrument state is saved. I/Q timing skew
adjustments are also preserved when instrument settings are changed.

Using I/Q timing skew while playing a user- defined finite impulse response (FIR) filter file greater
than 32 symbols in a non- ARB personality will generate an error.

MSK, FSK, and C4FM are constant envelope modulations and skew cannot be applied (**Int I/Q Skew
Correction RF BB Off** softkey should be set to Off). Refer to "Int I/Q Skew Correction RF BB Off" on
page 104 and "I/Q Timing Skew Path RF BB" for more information.

The maximum skew time is dependent on the signal format but is limited to ±2 seconds. The I/Q timing skew function is not applicable for external IQ inputs.

Preset   0.000 sec

Range   ±2 sec

I/Q Timing Skew Path RF BB

Supported   E8267D

This softkey selects the path to which I/Q timing skew adjustments will be applied. The choices are the RF path or the I/Q output (BB) path. The I/Q timing skew affects both paths. Adjustments can affect the deselected path which may be delayed improperly due to internal polarity differences between the paths. For example, if the BB (baseband) path is selected then adjustments could adversely affect the RF path.

If the **Int I/Q Skew Correction RF BB Off** softkey is set to Off, or there are no factory I/Q timing skew corrections data, then adjusting the I/Q timing skew for the desired path could improve the EVM of the signal. Adjusting the skew can optimize the error vector magnitude (EVM) of modulating signals with high data rates such as wireless LAN. Refer to "Int I/Q Skew Correction RF BB Off" on page 104 and "I/Q Timing Skew" on page 112 for more information.

Preset   RF

Range   N/A

I/Q Source 1

Supported   E8267D

Use this softkey to access a menu from which you can select a signal source to be routed to the internal I/Q modulator.

When a digital modulation format is turned on, the **I/Q Source 1** and **I/Q Out** selections automatically switch to BBG1. When the digital modulation is turned off, the **I/Q Source 1** and **I/Q Out** selections automatically switch to Ext 50 Ohm. You can manually override these automatic settings.

Preset   Ext 50 Ohm

Range   N/A

I/Q Source 2

Supported   E8267D

Use this softkey to access a menu from which you can select an additional signal source to be summed with I/Q Source 1 and then routed to the internal I/Q modulator.

Preset   Off

Range   N/A

IS95 OQPSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor.

Selecting an IS95 OQPSK Modulation

Use this softkey to select IS95 offset quadrature phase shift keying (OQPSK) for modulating a continuous stream of the selected data pattern. IS95 OQPSK modulation transmits data at the rate of 2 bits per symbol.

The modulation selection appears under the **Select**, **QPSK and OQPSK**, and **PSK** softkeys in the Modulation Type menus.

Loading an IS95 OQPSK I/Q Map into the Table Editor

Use this softkey to load an IS95 offset quadrature phase shift keying (OQPSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

IS95 QPSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor.

Selecting an IS95 QPSK Modulation

Use this softkey to select IS95 quadrature phase shift keying (QPSK) for modulating a continuous stream of the selected data pattern. IS95 QPSK modulation transmits data at the rate of 2 bits per symbol.

The modulation selection appears under the **Select**, **QPSK and OQPSK**, and **PSK** softkeys in the Modulation Type menus.

Loading an IS95 QPSK I/Q Map into the Table Editor

Use this softkey to load an IS95 quadrature phase shift keying (QPSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

K

Kaiser

Supported   E8267D with Option 601 or 602

Use this softkey to apply the Kaiser windowing function to the selected filter. Selecting **Kaiser** also activates the Beta factor which you can adjust to change the trade-off between optimized adjacent channel power (ACP) or error voltage magnitude (EVM).

Windowing can be applied to any default FIR filter that you load into the Define User FIR table. Windowing improves out of band performance (ACP), but simultaneously degrades passband performance (EVM), by smoothing the filter's transition to zero.

Keep Previous Comment

Supported   All Models

This softkey will appear when you overwrite a previously saved register that contains comments. Press this key if you want to keep the comment for the newly saved state. Press the **Delete Previous Comment** softkey if you do not want to keep the comment.

L

LAN Config

Supported   All Models

Use this softkey to select either manual or dynamic host configuration protocol (DHCP) as the method for designating the internet protocol (IP) address for the signal generator. The IP address mode, DHCP or manual, survives a preset or instrument reboot.

Many of the softkeys in the LAN Config menu will be visible but inactive (grayed–out) in DHCP mode. The Hostname, IP Address, Subnet Mask, and Default Gateway assignments, as shown in the softkey labels are assigned by the domain name service (DNS). The hostname may not be valid if the DNS does not map a hostname to the IP address.

Manual   The user designates and enters a signal generator IP address.

DHCP   Network server software assigns a temporary, dynamic, IP address for the signal generator, which can change.

LAN Setup

Supported   All Models

Use this softkey to access a menu enabling you to enter a local area network (LAN) host name and IP address for communication over the LAN.

Last Mkr Point

Supported   E8267D with Option 601 or 602

This softkey sets the last marker point when you define a range of points on a waveform segment for the active marker. If you enter a value that is less than the first marker point, the last marker point automatically adjusts to match the first marker point. To set a single marker point at a specific sample point, make the first and last marker value the same. To select the active marker, use the **Marker 1 2 3 4** softkey. For more information on markers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Preset   last waveform point

Range   first marker point– last waveform point

In the Dual ARB

The waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

In All Other ARB Formats

This softkey is not available unless the ARB format is on. When it is available, the waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

Leveling Mode

Supported   All Models

Use this softkey to access a menu from which you can select a leveling mode.

LF Out

Supported   All with Option UNT

Use this hardkey to access a menu of softkeys that enable you to configure the internal, low frequency source.

LF Out Amplitude Into 50 Ohms

Supported   All with Option UNT

This softkey enables you to scale the output of the signal at the LF OUTPUT connector.

This softkey is available after selecting the internal source to operate as Function Generator 1 and selecting dual-sine as the waveform type.

Preset   0.0 V

Range   0.0–3.5 Vp

LF Out Freq

Supported   All with Option UNT

Pressing this key allows you to enter a frequency for the internal function generator.

This softkey is available after selecting Function Generator 1 or 2 as the LF Out Source.

Preset   400.0 Hz

Range   0.5 Hz–1.0 MHz if sine or dual sine is selected.
1.0 Hz–1.0 MHz if swept sine is selected.
0.5 Hz to 100.0 kHz if triangle, ramp or square wave is selected.

LF Out Off On

Supported   All with Option UNT

This softkey toggles the operating state of the source at the LF OUTPUT connector on and off.

Refer to **LF Out Source**, page 117, for more information on choosing the source.

Off   The low frequency output is disabled and no signal is available at the LF OUTPUT connector.

On   The selected source, for example function generator, is enabled and the signal is available at the LF OUTPUT connector.

Once you have toggled this state on, the signal is immediately available at the LF OUTPUT connector. The **RF On/Off** hardkey selection does not affect this state, however, the **Mod On/Off** hardkey selection does affect this state.

Preset   Off

LF Out Source

Supported   All with Option UNT

Use this softkey to access a menu of available sources for the low frequency output. You can choose to output the signal from one of the internal sources as it is being used by a modulation or you can use the internal source as a function generator and select that signal to output at the LF OUTPUT connector.

If you choose an internal source, the frequency and shape of the signal at the LF OUTPUT connector is set by the internal source. For example, if the internal source is assigned to an AM path configuration and AM is turned on, the signal output at the LF OUTPUT connector will have the frequency and shape of the amplitude modulating signal. You can scale the amplitude of the output signal using the **LF Out Amplitude Into 50 Ohms** softkey.

If you choose to set the internal source as a function generator, you can select a frequency and shape in addition to selecting the amplitude for the LF output signal. When you use an internal source as a function generator, any modulation on the internal source is turned off.

Preset   Internal 1 Monitor

LF Out Start Freq

Supported   All with Option UNT

This softkey enables you to change the starting frequency for the swept-sine low frequency output. This key is coupled to the **LF Out Freq** softkey in the LF Out menu and the **LF Out Tone 1 Freq** softkey in the LF Out dual-sine menu. An LF Out start frequency setting is reflected in the **LF Out Freq** and **LF Out Tone 1 Freq** softkeys. Conversely, if you change the value for either the **LF Out Freq** softkey or the **LF Out Tone 1 Freq** softkey, the value for the LF Out start frequency is changed.

This softkey is available after selecting the internal source to operate as Function Generator 1 and selecting swept-sine as the waveform type.

Preset   400.0 Hz

Range   1.0 Hz–1.0 MHz (minimum increment is 1.0 Hz)

LF Out Stop Freq

Supported   All with Option UNT

This softkey enables you to change the stop frequency for swept-sine low frequency output.

This key is coupled to the **LF Out Tone 2 Freq** softkey in the LF Out Dual-Sine menu. Any value set for the LF Out stop frequency is reflected in the **LF Out Tone 2 Freq** softkey.

This softkey is available after selecting the internal source to operate as Function Generator 1 and selecting swept-sine as the waveform type.

Preset   400.0 Hz

Range   1.0 Hz–1.0 MHz (minimum increment is 1.0 Hz)

LF Out Sweep Rate

Supported   All with Option UNT

This softkey enables you to set the sweep rate for the low frequency swept-sine output. The signal generator will sweep from the specified start frequency to the stop frequency at the rate set with this key.

This softkey is available after selecting the internal source to operate as Function Generator 1 and selecting swept-sine as the waveform type.

Preset   400.0 Hz

Range   0.5 Hz–100 kHz (minimum increment is 0.5 Hz)

LF Out Sweep Trigger

Supported   All with Option UNT

Use this softkey to access a menu of choices that enables you to select the triggering mode for the swept-sine low frequency output.

Free Run   The source will continue sweeping without a trigger signal.

Trigger Key   The source will sweep after the front panel **Trigger** hardkey is pressed.

Bus   The GPIB is used to trigger the source for a sweep.

Ext   An external trigger, either a positive or negative signal, is used to generate a sweep. Use the **Trigger In Polarity Neg Pos** softkey to set the external trigger polarity.

This softkey is available after selecting the internal source to operate as Function Generator 1 and selecting swept-sine as the waveform type.

Preset   Free Run

LF Out Tone 1 Freq

Supported   All with Option UNT

This softkey enables you to set the frequency for the low frequency output tone 1.

This key is coupled to the **LF Out Freq** softkey in the LF Out menu and the **LF Out Start Freq** softkey in the LF Out Swept-Sine menu. An LF Out tone 1 frequency setting is reflected in the **LF Out Freq** and **LF Out Start Freq** softkeys. This softkey is available after selecting the internal source to operate as Function Generator 1 and selecting dual-sine as the waveform type.

Preset   400.0 Hz

Range   0.5 Hz–1.0 MHz (minimum increment allowed is 0.5 Hz)

LF Out Tone 2 Amp Of Peak

Supported   All with Option UNT

This softkey enables you to set the amplitude of the alternate frequency as a percent of the peak

modulated amplitude. The sum of the two LF Out amplitudes results in the total LF Out amplitude set by the **LF Out Amplitude** softkey in the LF Out menu.

For example, if the total LF Out amplitude is 300 mVp and you set the LF Out tone 2 amplitude percent of peak to 33%, then the amplitude of LF Out tone 1 will be 200.0 mVp and the amplitude of LF Out tone 2 will be 100.0 mVp (33% of 300.0 mVp). The amplitude of the two tones will equal 300.0 mVp. This softkey is available after selecting the internal source to operate as Function Generator 1 and selecting dual-sine as the waveform type.

Preset   50.0%

Range   0.0–100% (minimum increment is 0.1%)

LF Out Tone 2 Freq

Supported   All with Option UNT

This softkey enables you to change the alternate frequency of the modulation source. The alternate frequency is the second frequency in the dual-sine mode or the stop frequency in swept-sine mode.

This key is coupled to the **LF Out Freq** softkey in the LF Out menu and the **LF Out Stop Freq** softkey in the LF Out Swept-Sine menu. This softkey is available after selecting the internal source to operate as Function Generator 1 and selecting dual-sine as the waveform type.

Preset   400.0 Hz

Range   0.5 Hz–1.0 MHz (minimum increment allowed is 0.5 Hz)

LF Out Waveform

Supported   All with Option UNT

This softkey accesses a menu from which you can choose a waveform to be generated by the internal modulation source.

This softkey is only enabled when Function Generator 1 or 2 is selected in the LF Out Source menu.

List

In the Sweep Type Menu

Supported   All Models

Use this softkey to select list as the sweep type.

In Catalog Type Menu

Supported   All Models

This softkey enables you to specify that only signal generator list sweep files be included in the catalog of files.

Load All from NVWFM Memory

Supported   E8267D with Option 601 or 602

This softkey enables you to load all of the files from non-volatile waveform memory (NVWFM) to waveform memory (WFM1). A waveform file must be loaded into WFM1 memory before it can be played.

Load Cal Array From Step Array

Supported   All Models

This softkey enables you to set up a table that includes the start frequency, stop frequency, and number of points that are defined in the Configure User Flatness Step Array menu.

Load Default FIR

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu for automatically filling the finite impulse response (FIR) table editor with coefficient values from pre-defined filters such as root Nyquist, Nyquist, Gaussian and rectangle. The default filter parameters can also be selected in this menu allowing you to choose the filter alpha or BbT and the number of filter symbols.

Load Default FSK

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can select a default symmetric frequency shift keying (FSK) modulation and configure the frequency deviation for that modulation.

Load Default I/Q Map

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can select a standard I/Q mapping from a set of either PSK or QAM modulations.

Load From Selected File

Supported   All Models

Use this softkey to replace the current information in a table editor with the information in the highlighted file. You will be prompted for confirmation. This key is inactive unless at least one file has been stored to memory.

Load List From Step Data

Supported   All Models

This softkey enables you to copy the step sweep data points into the list sweep data points. You can have only one sweep list at a time so be certain that you wish to overwrite the existing list.

Load Mirror Image of Fall Shape

Supported   E8267D with Option 601 or 602

Use this softkey to load the Rise Shape Editor with a mirror image of the Fall Shape Editor when editing a burst shape. This softkey is available when the Rise Shape Editor is the active function; when the Fall Shape Editor is the active function, this softkey toggles to Load Mirror Image of Rise Shape. For more information on editing burst shapes, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Load Mirror Image of Rise Shape

Supported   E8267D with Option 601 or 602

Use this softkey to load the Fall Shape Editor with a mirror image of the Rise Shape Editor when editing a burst shape. This softkey is available when the Fall Shape Editor is the active function; when the Rise Shape Editor is the active function, this softkey toggles to Load Mirror Image of Fall Shape. For more information on editing burst shapes, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Load Segment from NVWFM Memory

Supported   E8267D with Option 601 or 602

This softkey enables you to load the selected waveform segment from non-volatile waveform memory (NVWFM) to waveform memory (WFM1) where it can be played by the signal generator.

Load/Store

Supported   All Models

Use this softkey to access a menu for loading tables from, and storing tables to, non-volatile memory. Non-volatile memory enables you to retain files for future use after an instrument power cycle.

Load Store

Supported   All Models

This softkey enables you to navigate between WFM1 (volatile waveform memory) and non-volatile waveform memory (NVWFM). The load softkey accesses NVWFM and the store softkey accesses WFM.

Load   This softkey enables you to select a segment or waveform from the NVWFM catalog of files. You can then use other softkeys in the menu to delete, rename the file, or load it into WFM1.

Store   This softkey enables you to select a segment or waveform from WFM1. You can then use other softkeys in the menu to delete, rename, or store the file in NVWFM

Logic Type

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey accesses a menu that enables you to select the logic type for the N5102A module data.

CAUTION   Changing the logic type changes the voltage levels. To avoid potential damage to your device or the N5102A module, check the new logic type and voltage levels.

Preset   3.3V CMOS

Loop Back Test Type

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, accesses a menu where you can select different loop back tests to verify the operation of the PSG digital output and the N5102A module.

To run the tests, see .

Preset   Device Intfc

Loop Selected Tests

Supported   All Models

This softkey is provided for self test diagnostics. Refer to the troubleshooting chapter of the *E8257D/67D, E8663D PSG Signal Generators Service Guide* for more information.

This key is included for use by service personnel.

Low Pass Filter below 2 GHz

Supported   All Models with Option 1EH

This softkey is used to switch the low band filters in or out of the RF path. When enabled On the low band filters reduce harmonic distortion.

Default   Off

LVDS

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, sets the logic type for the N5102A module to low voltage differential signaling (LVDS).

CAUTION	Changing the logic type changes the voltage levels. To avoid potential damage to your device or the N5102A module, first verify that the new logic type and voltage are appropriate.

LVTTL

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, sets the logic type for the N5102A module to a low voltage TTL signal.

CAUTION	Changing the logic type changes the voltage levels. To avoid potential damage to your device or the N5102A module, first verify that the new logic type and voltage are appropriate.

M

M1->Start M2->Stop

Supported   All with Option 007

This softkey sets the start and stop frequencies for a ramp sweep to be equal to the current frequencies of marker 1 and marker 2, respectively. This action cannot be undone.

MAC

Supported   All Models

The media access control (MAC) softkey is inactive and displays the ethernet address for the signal generator. You can not modify the MAC address.

Manual Freq

Supported   All with Option 007

This softkey enables you to choose an individual frequency value in a frequency-only ramp sweep to control the RF output. This softkey is active when the **Manual Mode Off On** is set to On.

Preset   Depends on the model of signal generator

Range   Freq Start to Freq Stop

Manual Mode Off On

Supported   All Models

This softkey toggles the operating state for manual mode in a step, list, or ramp sweep (Option 007). This key is active after selecting one of the softkeys: **Freq**, **Ampl**, or **Freq & Ampl**, and disabled when the **Sweep** softkey is Off.

Off   Normal sweeping occurs in accordance with current sweep parameters.

On   When manual mode is selected along with a step or list sweep, the selected manual sweep point controls the RF output. The sweep point is selected with the **Manual Point** softkey.

                     When manual mode is turned on in ramp sweep, the selected manual frequency value controls the RF output. This value is selected with the **Manual Freq** softkey.

Preset   Off

Manual Point

Supported   All Models

This softkey enables you to choose an individual point in a step or list sweep to control the RF output. **Manual Mode Off On** must be set to On for this key to be active.

If list or step mode is controlling frequency and/or power, then the indexed point in the respective list(s) will be used.

If the point selected is beyond the maximum number in current sweep configuration, then the point will be set to the maximum possible point, and an error will be generated.

Preset   1

Range   1-maximum number in current sweep configuration

Marker 1 2 3 4

Supported   E8267D with Option 601 or 602

This softkey selects the active marker (1–4) to set or clear marker points. Each press of the softkey highlights a different marker number. The highlighted number is the active maker. Except for the Display Markers menu, all marker settings within the Set Markers menu apply to the highlighted marker number. Each marker routes an output signal to the rear-panel event connector number (EVENT 1, EVENT 2, EVENT 3, or EVENT 4) that corresponds to the marker number. For more information on markers and the rear-panel connectors, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Preset   1

Marker 1 Polarity Neg Pos

Supported   E8267D with Option 601 or 602

This softkey selects negative or positive polarity for marker 1. The marker polarity setting remains until you reconfigure it, preset the signal generator, or cycle the PSG power. It is also part of the file header information, so saving the file header saves the current marker polarity. Changing polarity inverts the output marker signal.

Neg   The marker signal is high during the period of no marker points.

Pos   The marker signal is high during the set marker points.

For more information on markers and file headers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Marker 2 Polarity Neg Pos

Supported   E8267D with Option 601 or 602

This softkey selects negative or positive polarity for marker two. The marker polarity setting remains until you reconfigure it, preset the signal generator, or cycle the PSG power. It is also part of the file header information, so saving the file header saves the current marker polarity. Changing polarity inverts the output marker signal.

Neg   The marker signal is high during the period of no marker points.

Pos   The marker signal is high during the set marker points.

For more information on markers and file headers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Marker 3 Polarity Neg Pos

Supported   E8267D with Option 601 or 602

This softkey selects negative or positive polarity for marker 3. The marker polarity setting remains until you reconfigure it, preset the signal generator, or cycle the PSG power. It is also part of the file header information, so saving the file header saves the current marker polarity. Changing polarity inverts the output marker signal.

Neg   The marker signal is high during the period of no marker points.

Pos   The marker signal is high during the set marker points.

For more information on markers and file headers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Marker 4 Polarity Neg Pos

Supported   E8267D with Option 601 or 602

This softkey selects negative or positive polarity for marker 4. The marker polarity setting remains until you reconfigure it, preset the signal generator, or cycle the PSG power. It is also part of the file header information, so saving the file header saves the current marker polarity. Changing polarity inverts the output marker signal.

Neg   The marker signal is high during the period of no marker points.

Pos   The marker signal is high during the set marker points.

For more information on markers and file headers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Marker Amplitude

Supported   All with Option 007

Use this softkey to set the relative power for the amplitude spikes at each marker's set frequency when the amplitude marker mode is activated. (Use the **Amplitude Markers Off On** softkey to activate the amplitude marker mode.)

Preset   2.0 dB

Range   −10.0 dB to 10 dB

Marker->Center Freq

Supported   All with Option 007

This softkeys sets the center frequency to the frequency value in the highlighted marker row of the marker table editor. The marker does not have to be turned on for this function to work. This action cannot be undone.

Marker Delta Off On

Supported   All with Option 007

Use this softkey to display the marker frequency values relative to the designated reference marker. The reference marker must be designated before this mode can be selected. (Use the **Delta Ref Set** softkey to select the reference marker.)

Marker Freq

Supported   All with Option 007

Use this softkey to set the frequency for the highlighted marker. The frequency value must be within the sweep range.

Preset   525 MHz

Range   equivalent to current sweep range

Marker On/Off

Supported   All with Option 007

Use this softkey to toggle the state of the highlighted marker in the marker table editor.

Preset   Off

Marker Polarity

Supported   E8267D with Option 601 or 602

This softkey accesses a menu from which you can select the polarity (positive or negative) for each of the waveform markers. Marker polarity settings remain until you reconfigure them, preset the signal generator, or cycle the PSG power. After setting the marker polarities, it is recommended that you save the settings to the file header. Saving the marker polarities in the header ensures that the waveform (segment or sequence) uses the correct marker polarity when it is played. This is especially important when a waveform playback follows another waveform playback, because the previously played waveform could have a different polarity configuration. For more information on markers and file headers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Marker Routing

Supported   E8267D with Option 601 or 602

This softkey accesses a menu from which you can select a marker for each of the marker routings (functions). The functions are Pulse/RF Blanking or ALC Hold. The routing settings remain until you reconfigure them, preset the signal generator, or cycle the PSG power. After setting the marker routings, it is recommended that you save the settings to the file header. Saving the marker routings in the header, ensures that the waveform (segment or sequence) uses the correct marker routings when played. This is especially important when a waveform playback follows another waveform playback, because the previously played waveform could have different routing configurations.

For example, if you play a waveform that has marker 2 set for Pulse/RF Blanking and then play a different waveform that has unspecified header settings for marker routings, the second waveform also uses RF blanking for marker 2. If the marker points for marker 2 on the second waveform are not set, the marker 2 signal remains low causing a continuous RF blanking condition (no RF output).

CAUTION	A spike in the RF output can occur if the marker routings and marker points (set marker points in the Set Markers menu) are not properly configured.

For more information on markers and file headers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Markers

Supported All with Option 007

Use this softkey to access a menu of marker function softkeys and a table editor that enables you to configure the markers on the signal generator for viewing on a 8757D.

Marker Utilities

Supported E8267D with Option 601 or 602

This softkey accesses a menu from which you can configure waveform markers. The marker menu includes setting the polarity for markers, routing markers to functions (such as RF blanking, Alternate Amplitude, and ALC Hold,) and for setting markers for a specified waveform.

Master

Supported All with Option 007

Use this softkey to select this instrument as the master in a dual-signal generator ramp sweep setup. The signal generator in master mode provides the triggering for the setup.

Max Band Freq

Supported All Models

Use this softkey to set the stop frequency or maximum band frequency for the external millimeter-wave source module. If the WR (waveguide rectangular) settings are selected, this softkey will display the pre-defined ending frequency for the selected WR band.

Preset 75GHz (WR15)

Range 75–325GHz

MDMOD

Supported E8267D with Option 601 or 602

Press this softkey to set the current catalog type to multi-carrier digital modulation (MDMOD) and display the catalog of MDMOD files. Catalog type selection is not affected by a preset or by a power cycle.

Memory Catalog

Supported All Models

Use this softkey to access a menu of choices enabling you to display a catalog of user files. In addition, the menu displays file management functions and a menu for choosing file types.

Meter Address

Supported All Models

This softkey enables you to select the external power meter GPIB address for use during the user flatness calibration.

The power meter is controlled only through a GPIB cable. The power meter address is not affected by a preset or by a power cycle.

Range   0–30

Meter Channel A B

Supported   All Models

Use this softkey to toggle external power meter monitoring between channel A and channel B.

A   The external power meter is instructed to monitor channel A for input.

B   The external power meter is instructed to monitor channel B for input.

This softkey is available only when a dual-channel external power meter is connected to the signal generator via a GPIB cable.

The power meter channel selection is not affected by a preset or by a power cycle.

Meter Timeout

Supported   All Models

This softkey enables you to select the remote timeout length of the external power meter during user flatness calibration.

The meter timeout setting is not affected by a preset or by a power cycle.

The power meter is controlled only through a GPIB cable.

Range   1.0 ms–100.0 s

Min Band Freq

Supported   All Models

Use this softkey to set the start frequency or minimum band frequency for the external millimeter-wave source module. If the WR (waveguide rectangular) settings are selected this softkey will display the pre-defined starting frequency for the selected WR band.

Preset   50GHz (WR15)

Range   50–140GHz

Mirror Table

Supported   E8267D with Option 601 or 602

Use this softkey to mirror the finite impulse response (FIR) table entries such that the table doubles in size and the values in the top half of the table are duplicated in the bottom half of the table in reverse order.

Mkr 2 To RF Blank Off On

Supported   E8267D with Option 601

This softkey enables you to select the operating state of the RF blanking function.

Off   When you select Off, RF blanking is turned off when marker 2 is set low.

On   When you select On, RF blanking is turned on when marker 2 is set low.

Preset   Off

Mod Status Info Off On

Supported   All Models

This softkey turns the Modulation Status Information listing on or off.

On   When the modulation status is on, modulation information displays when you
                    access one of the modulation menus, for example AM as shown below.

Off   When the modulation status is off, information about the status of the modulation
                    is not displayed.

Preset   On

Mode

Supported   E8267D

Use this hardkey to access a menu of digital modulation formats.

Mode Setup

Supported   E8267D

Use this hardkey to quickly return to the main menu of the most recently accessed signal generator mode. Signal generator mode selections are available from the menu accessed by the **Mode** hardkey.

After a power cycle, if you have not yet accessed a signal generator operating mode, the **Mode Setup** hardkey will duplicate the **Mode** hardkey menu.

Modify License Key

Supported   All Models

Press this softkey to enter the license key for the highlighted software option. Software options may require specific hardware options that must be installed before the software option is valid. Adding new software options requires the use of a license key provided by Agilent Technologies at the time of purchase.

Once the license key is entered, the software option will be enabled when you press the **Proceed with Reconfiguration** softkey. If you enable an option that does not have the required hardware installed, the menus for that option will be activated but the option *cannot* operate, regardless of what the menus may indicate.

Modulation Catalog Types

Supported   All Models

Press this softkey to reveal a menu of real time I/Q modulation file types that can be selected.

Modulation Type

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can select predefined or custom modulation types, create user-defined I/Q and FSK (frequency shift keying) modulations, or restore the default modulation type.

Modulator Atten (nnn dB) Manual Auto

Supported   E8267D

This softkey toggles the attenuation mode for the internal I/Q modulator between manual and automatic. This softkey appears in all arbitrary waveform generator (ARB) modulation menus, and under the **Mux** front panel hardkey. When an ARB modulation format is turned on and the I/Q source is internal, the **Modulator Atten Manual Auto** softkey under the **Mux** hardkey is greyed out (inactive).

In Auto mode the modulator attenuation level will change depending on signal configuration and settings.

The Auto mode will not function if an external I/Q source, Ext 50 Ohm or Ext 600 Ohm, is selected. You must press the Do External Input Level Measurement softkey in order to set the attenuation level when using an external I/Q input. Auto mode is reserved for internal digital modulation formats.

Manual	In the manual mode, you can manually set the attenuation level of the I/Q modulator. A setting of 0.00 dB results in 100 percent signal power, while a setting of 40.00 dB results in 0.01 percent signal power.
Auto	In the automatic mode, the attenuation level is automatically adjusted for best performance based on settings such as tone separation and baseband frequency.
Preset	Auto
Range	*Manual:* 0.00–40.00 dB *Auto:* N/A

MSK

Supported   E8267D with Option 601 or 602

Use this softkey to select minimum shift keying (MSK) modulation for modulating a continuous stream of the selected data pattern. MSK modulation transmits data at the rate of 1 bit per symbol.

The current phase deviation value appears under the **MSK** softkey in the Modulation Type menu.

MTONE

Supported   E8267D with Option 601 or 602

Press this softkey to set the current catalog type to MTONE and display the catalog of MTONE files.

Multicarrier Define

Supported   E8267D with Option 601 or 602

This softkey accesses a menu of softkeys that enables you to select different modulation formats, parameters, and table editing keys. This softkey is visible only when the Multicarrier softkey is set to On.

Multicarrier Off On

Supported   E8267D with Option 601 or 602

This softkey toggles the operating state of the multicarrier mode.

Off   In this state, the selected modulation format has a single carrier.

On   In this state, you can select a user-defined custom multicarrier signal.

Preset   Off

Multitone

Supported   E8267D with Option 601 or 602

This softkey accesses a menu of softkeys that enables you to create multitone signals using the arbitrary waveform generator (ARB). Within these menus, you will be able to create, select, and/or modify the waveform. Multitone setups can not be saved using the Save hardkey. You must save a multitone configuration to a file name in the signal generator's memory catalog. Refer to "Save" on page 172 for more information.

NOTE	Multitone setups can be saved to the signal generator's memory catalog. You can not use the **Save** hardkey to save a setup.

Multitone Off On

Supported   E8267D with Option 601 or 602

This softkey sets the operating state for the multitone function of the arbitrary waveform generator (ARB).

Off   When you select Off, the multitone signal is turned off.

On   When you select On, the multitone signal is turned on.

Preset   Off

Mux

Supported   E8267D

Use this hardkey to access a menu from which you can configure the I/Q multiplexer. Items in this menu can be used to route I/Q signals to the external I/Q outputs and the internal RF modulator.

N

N5102A Dig Bus

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey selects a loop back test that verifies the connection and data transfer capability between the PSG and the N5102A module. The loop back for this test occurs at the input of the N5102A module and ensures that the Digital Bus input connector is functioning properly. To verify the operation of the N5102A module Device Interface output connector, see "Device Intfc" on page 60.

N5102A Interface

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey accesses menus that enable you to control and set the N5102A module parameters.

N5102A Off On

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, enables or disables the N5102A module.

In the output mode (Option 003), the interface module can only be turned on while a modulation format is active. If the modulation format is turned off while the module is on, the module will turn off and an error will be reported.

When the N5102A Interface is on, the PSG continuously polls the N5102A module to ensure it is connected. If the PSG determines that the N5102A module is not connected, it reports an error. This also occurs if power is not supplied to the N5102A module via the included power supply. If the module is disconnected while on, the interface turns off and reports an error.

NOTE	If the N5102A softkey is set to On while setting PSG parameters, the device under test may be subject to output variations caused by changing PSG parameters.

Preset   Off

NADC

Supported   E8267D with Option 601 or 602

Use this softkey to select a predefined North American Digital Cellular (NADC) personality as the digital modulation format.

NADC Base

Supported　　　　E8267D with Option 601 or 602

This softkey selects Standard Base as the frequency band for NADC. The output frequency depends on both the channel band and channel number selections.

Range　　　　*Channels*: 1–799, 990–1023

　　　　　　　　Frequency: 870.030–893.970 MHz, 869.010–870.000 MHz

NADC Mobile

Supported　　　　E8267D with Option 601 or 602

This softkey selects Standard Mobile as the frequency band for NADC. The output frequency depends on both the channel band and channel number selections.

Range　　　　*Channels*: 1–799, 990–1023

　　　　　　　　Frequency: 825.030–848.970 MHz, 824.010–825.000 MHz

Name And Store

Supported　　　　All Models

This softkey enables you to store and rename (if necessary) the highlighted sequence.

Negate I Data Off On

Supported　　　　E8267D with Option 601 or 602 and Option 003 or 004

This softkey, available for the N5102A module, enables or disables negation of the I data sample. Negation changes the sample by expressing it in two's complement form, multiplying by negative one, and converting back to the selected numeric format. This can be done for I samples, Q samples, or both.

The sample or word represents a quantized analog voltage level. For a 16-bit sample, the range is from 0 to 65535 in offset binary or –32768 to + 32767 in 2's complement mode.

On　　　　　　　The I data is negated.

Off　　　　　　　No negation is performed.

Preset　　　　Off

Negate Q Data Off On

Supported　　　　E8267D with Option 601 or 602 and Option 003 or 004

This softkey, available for the N5102A module, enables or disables negation of the value of each sample of the Q data. Negation changes the affected sample by expressing it in two's complement form, multiplying by negative one, and converting back to the desired numeric format. This can be done for I samples, Q samples, or both.

The sample or word represents a quantized analog voltage level. For a 16-bit sample, the range is from 0 to 65535 in offset binary or –32768 to + 32767 in 2's complement mode.

On	The Q data is negated.
Off	No negation is performed.
Preset	Off

Negative

Supported   All Models

This key enables you to select a negatively sloped ramp, or sawtooth, as the modulation waveform for the internally-generated, ac-coupled, signal.

Noise

Supported   All with Option UNT

This softkey accesses a menu from which you can select noise as the carrier modulation. You can specify noise with a gaussian distribution or noise with a uniform distribution as the modulation for the internally generated, AC-coupled signal.

The noise modulation applies to the path configuration you have selected. In the LF Out menu this softkey is available after selecting the internal source to operate as a function generator. In the FM and ΦM menus noise modulation is available from the waveform menu.

Noise is generated as a peak to peak value; the RMS value is about 80.0% of the displayed value.

Noise Bandwidth Factor

Supported   E8267D with Option 403

This softkey enables you to set the flat noise bandwidth to a minimum of 0.8 times the ARB sample clock rate when the noise factor is 1, or 1.6 times the ARB sample rate if the factor is 2. The maximum bandwidth for noise is limited to 80 megahertz.

For example, if the ARB sample clock rate is set to 50 MHz, a noise bandwidth factor of 1 will give a flat noise bandwidth of 40 MHz, whereas a noise bandwidth factor of 2 will give a flat noise bandwidth of 80 MHz.

Any oversampling in the waveform will effectively make the noise bandwidth be that many times wider than the signal bandwidth.

Preset	1
Range	1or 2

Noise Seed Fixed Random

Supported   E8267D with Option 403

This softkey selects a seed value used by the additive white gaussian noise (AWGN) generator.

Fixed	When you select Fixed, the noise seed will produce a repeatable noise signal.
Random	When you select Random, the noise seed changes and the noise signal will be random.
Preset	Fixed

None

Supported   E8267D with Option 601 or 602

In the Predefined Mode Menu

In this menu, use the **None** softkey to set up **Custom** based on no particular format.

In the Security Level Menu

The **None** softkey presets the signal generator to the factory state. You must press
Enter Secure Mode > **Confirm** to activate the None security level. For more information about security
functions, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

In the Window Menu

No windowing function is used for the selected filter. The filter is optimized for maximum passband
performance: error vector magnitude (EVM).

In the ALC Hold Menu

This selection will free a marker that was previously dedicated to the signal generator's ALC Hold
function.

Number of Bits

Supported   E8267D with Option 601 or 602

Use this softkey to specify the number of bits that will be affected by the current operation. Press
the **Enter** softkey to apply the specified value.

Preset   1

Number of Satellites

Supported   E8267D with Option 409

This softkey enables you to set the number of satellites in view to use in the generated MSGPS signal.

Preset   8

Range   1–8

Number of Tones

Supported   E8267D with Option 601 or 602

This softkey enables you to set the number of tones in the multitone table editor. This is done as
part of initializing the table editor.

Preset   10

Range   2–64

Numeric Format

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, accesses a menu that enables you to select the binary format (representation) for the data values that are transmitted.

Preset   2's Complement

NVARB Catalog Types

Supported   E8267D with Option 601 or 602

This softkey accesses a menu from which you can select a non-volatile arbitrary waveform generator (ARB) waveform file type.

NVMKR

Supported   E8267D with Option 601 or 602

This softkey specifies that only non-volatile marker file types be listed in the catalog of files.

NVWFM

Supported   E8267D with Option 601 or 602

This softkey specifies that only NVWFM (non-volatile waveform) file types be listed in the catalog of files.

Nyquist

Supported   E8267D with Option 601 or 602

This softkey selects a Nyquist (raised cosine) pre-modulation filter from either the Select (filter) menu or the Load Default finite impulse response (FIR) menu.

In the Select (filter) Menu

In this menu, use the **Nyquist** softkey to select this FIR filter for use in a modulation setup.

In the Load Default FIR Menu

In this menu, use the **Nyquist** softkey to access a menu from which you can change the filter alpha value, specify the number of symbols, apply a windowing function, and generate a new FIR table that is loaded with the coefficients for a Nyquist filter. If you change a parameter, you can press the **Generate** softkey again to reload the FIR table.

O

OEM Freq Mult

Supported   All Models

Use this softkey to select an external millimeter-wave source module multiplier factor. This softkey is

valid when an OEM Source Module is used. Setting a frequency multiplier will cause the signal generator's front-panel frequency display to indicate the frequency at the output of the external source module. The displayed frequency is:

Displayed Freq = (Actual Freq − Freq Ref) * OEM Freq Mult + Freq Offset.

Preset   4.000 X

Range   −1000.00 to 1000.00 X

OEM Source Module Config

Supported   All Models

This softkey accesses a menu from which you can select start and stop frequencies for the external millimeter-wave source module, a multiplier for the external source, and a softkey that provides a menu of pre-defined standard WR (waveguide rectangular) bands choices.

OEM Source Module Off On

Supported   All Models

Use this softkey to select any external millimeter-wave source module. With this selection, there is no control or interaction between the source module and the signal generator. All frequency start, stop, and range settings and multiplier values must be manually entered into the signal generator.

Preset   Off

Off

This softkey's function varies depending on the current menu, as described in the following subsections.

In the I/Q Out Menu

Supported   E8267D

This softkey turns off the I/Q Out signal routing function, which stops signals from being routed to the rear-panel I and Q output connectors. The **I/Q Out** selection is independent of the **Source 1** and **Source 2** selections.

In the I/Q Source 1 and I/Q Source 2 Menus

Supported   E8267D

This softkey turns off the Source 1and Source 2 signal routing function, which stops signals from being routed to the internal I/Q modulator. The **Source 1** and **Source 2** selections are independent of the **I/Q Out** selection.

In the Ramp Sweep Control Menu

Supported   All with Option 007

Use this softkey to turn off master or slave mode when using the PSG in a dual signal generator ramp sweep setup.

In the Retrigger Mode Menu

Supported   E8267D with Option 601 or 602

This softkey is a waveform response selection that sets the waveform to ignore triggers while it is playing. The waveform waits for and starts with the first trigger occurrence. After the waveform playback finishes, it responds to a subsequent trigger by restarting.

When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

In the Sweep Menu

Supported   All

Use this softkey to turn off all sweep functions. The output signal is then set according to the current frequency and amplitude settings defined by the **Frequency** and **Amplitude** hardkeys.

Offset Binary

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey sets the N5102A module data format to an offset binary representation of the data values.

Offset Q Off On

Press this softkey to change the state of the user I/Q offset Q. This setting is not affected by a preset or by a power cycle.

Supported   E8267D with Option 601 or 602

Off   When this softkey is set to Off, the Q output is not delayed from the I output.

On   When this softkey is set to On, the Q output is delayed by 1/2 symbol from the I output.

On

Supported   E8267D with Option 601 or 602

This softkey lets the waveform respond to subsequent triggers, either while playback occurs or after completion, when using the single trigger mode for an ARB format. The waveform waits for and starts with the first trigger and responds to subsequent triggers in the following manner:

- A trigger received during playback causes the current play to finish and the waveform restarts.

- A trigger received after a waveform play finishes, causes the waveform to restart.

When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Optimize FIR For EVM ACP

Supported   E8267D with Option 601 or 602

Use this softkey to optimize the FIR (Finite Impulse Response) filter for minimized error vector magnitude (EVM) or for minimized adjacent channel power (ACP).

EVM   The EVM selection provides the most ideal passband.

ACP   The ACP selection improves stopband rejection.

This feature applies only to root Nyquist, and Nyquist filters; the softkey is grayed out when any other filter is selected.

Preset   EVM

Optimize for (nnn sps) Bandwidth

Supported   E8267D

Use this softkey to set the expected bandwidth of the external I/Q signal. The automatic external I/Q attenuator will use this setting to determine the proper attenuation level.

Preset   1.0 Msps

Range   1.0 ksps–100.0 Msps

Optimize S/N Off On

Supported   All Models

This softkey enables the S/N state on or off. The optimize signal-to-noise optimizes the attenuator and ALC setting to provide optimal signal-to-noise ratio performance; it does not change the RF output power.

Note: This mode is mutually exclusive with attenuator hold (Atten Hold), and any modulation type. A settings conflict error will be generated if attenuator hold or any modulation is activated when optimize signal–to–noise is active (On).

Preset   1.0 Msps

Range   1.0 ksps–100.0 Msps

Option 521 Detector Calibration

Supported   Option 521

CAUTION   Using the Option 521 Detector Calibration softkey changes the factory calibration. Avoid using this feature unless following a service center's recommendations.

          This calibration should be done whenever the instrument temperature changes beyond specified parameters or and when greater amplitude flatness is required around the 500 MHz frequency transition. Refer to the *Data Sheet*.

NOTE   If the Option 521 Detector Calibration is inadvertently used, the PSG has the ability to recall the factory amplitude flatness calibration. Refer to the *User's Guide*.

Use this softkey to access a calibration menu to improve the 500 MHz frequency transition to compensate for changes in temperature. The 500 MHz frequency transition can degrade as the temperature changes. By using the detector calibration, when the instrument temperature change occurs, the PSG's flatness performance can be optimized. Use this softkey if any of the PCBs have been repaired/replaced. Refer to the *Data Sheet* (for power specifications) and to the *Service Guide* (for the correct usage of this calibration).

Options Info

Supported   All Models

Use this softkey to display all available options and associated hardware. Refer to the following figure.
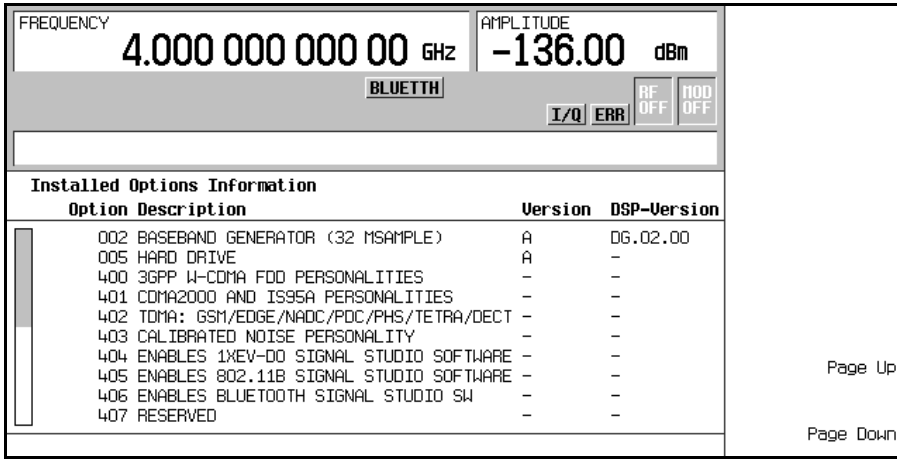
Option	The option number
Option Version	An alphabetic representation of the option revision
DSP Version	Version number of additional DSP code used with some hardware options

OQPSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor.

Selecting a OQPSK Modulation

Use this softkey to select offset quadrature phase shift keying (OQPSK) for modulating a continuous stream of the selected data pattern. OQPSK modulation transmits data at the rate of 2 bits per symbol.

The modulation selection appears under the **Select**, **QPSK and OQPSK**, and **PSK** softkeys in the Modulation Type menus.

Loading a OQPSK I/Q Map into the Table Editor

Use this softkey to load an offset quadrature phase shift keying (OQPSK) I/Q map into the I/Q table

editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Other Patterns

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can select a data pattern. Each pattern contains an equal number of ones and zeroes. The selected pattern will be repeated as necessary to fill the data area.

Output Blanking Off On Auto

Supported   All Models

This softkey sets the state for RF Output blanking. Blanking occurs when the RF output is momentarily turned off as the sweep transitions from one frequency segment (band) to another, allowing the signal to settle. Blanking also occurs during the retrace, so the signal can settle before the next sweep. In CW mode, blanking occurs whenever you change the frequency.

Off	Blanking is always disabled. When blanking is disabled (Off), momentary loss of RF power will still occur while the hardware is being reset at band crossings. When the RF power returns after dropping out, the power level will exceed the set power level until the ALC loop can respond. The length of time from the signal dropping out, reappearing, and the ALC leveling occurring is shorter than the period of time the signal is turned off when Output Blanking set to On or Auto.
On	Blanking occurs on all frequency changes, including segment transitions and retrace. The effects on the RF output signal is that no RF signal will be present with Blanking On is at band crossings and switch points. Whenever RF power is present, it is leveled and is at the set power level.
Auto	The signal generator determines the blanking occurrences for optimum performance. See On, the affects on the RF output signal is the same for Auto and On.

Preset   Auto

Output MUX

Supported   E8267D with Option 601 or 602 and 403

This softkey enables diagnostic control of additive noise, so that only the noise, only the carrier, or the sum of both the noise and the carrier are output from the internal baseband generator. With the ALC off, this feature enables direct measurement of the carrier or the noise contributions to the total power. The system will still behave as if both the noise and the carrier are present on the output when it comes to determining the Auto Modulation Attenuation and the RMS level for RMS Power Search.

Default   Carrier+Noise

Oversample Ratio

Supported   E8267D with Option 601 or 602

This softkey enables you to set the oversample ratio (number of filter coefficients per symbol) to be applied to a custom Finite Impulse Response (FIR) filter design. Acceptable values range from 1 through 32, where the maximum combination of symbols and oversample ratio is 1024 coefficients.

Generally, the higher the symbol rate, the lower the oversample ratio of the resampled filter. The following table describes the signal generator's maximum oversample ratio capabilities for each real-time modulation type:

Modulation Type	BPS	Maximum Oversample Ratio
BPSK MSK 2-LVL FSK	1	16
QPSK IS95 QPSK ISAT QPSK OQPSK IS95 OQPSK	2	16
8PSK D8PSK 8-LVL FSK	3	15
16PSK 16QAM	4	16
32QAM	5	15
64QAM	6	15
256QAM	8	16

When the filter is selected for use, the signal generator may resample the filter with an oversample ratio between 2 and 16, based on the number of symbols, the symbol rate, and the number of bits per symbol of the modulation type.

This oversample ratio setting is not affected by a preset or by a power cycle.

Range   1–32

Overwrite

Supported   All Models

This softkey removes all user files, table editor files, flatness correction files, and baseband generator files. The memory is then overwritten with random data as described below. You must press **Enter Secure Mode** > **Confirm** to activate the Overwrite security level. For more information about security functions, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

SRAM	All addressable locations will be overwritten with random characters.
HARD DISK	All addressable locations will be overwritten with random characters.
FLASH MEMORY	The flash blocks will be erased.
Preset	N/A
Range	N/A

P

Page Down

Supported   All Models

This softkey enables you to move down in the display one page at a time.

Page Up

Supported   All Models

This softkey enables you to move up in the display one page at a time.

Par IQ Intrlvd

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, enables parallel interleaving of the data samples transmitted, where the I sample is transmitted on the rising edge and the Q sample is transmitted on the falling edge.

For more information on parallel interleaved data transmissions, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Par QI Intrlvd

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, enables parallel interleaving of the data samples transmitted, where the Q sample is transmitted on the rising edge and the I sample is transmitted on the falling edge.

For more information on parallel interleaved data transmissions, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Parallel

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, enables parallel data transmission. This is the factory preset port configuration.

Pass Through Preset

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey enables you to transmit data through the N5102A module with no modifications to the data format. The resample ratio is set to 1 by adjusting the clock rate to match the baseband sample rate and all of the formatting functions are set so that the data is not modified. This softkey is grayed out (inactive) until a modulation format is activated.

For Option 004 input mode, the baseband clock rate is set to match the clock rate settings of the N5102A digital module.

Patt Trig In 1

Supported   E8267D with Option 601 or 602

This softkey selects the rear-panel PATTERN TRIG IN connector as the input for an external trigger signal to trigger waveforms in the ARB formats and in real-time custom. It is one of the selections in in the Ext Source menu and available only when **Ext**, page 73, is the trigger source selection. For more information on rear-panel connectors and triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Patt Trig In 2

Supported   E8267D with Option 601 or 602

This softkey selects the rear-panel AUXILIARY I/O connector, PATT TRIG IN 2 pin, as the input for an external trigger signal to trigger waveforms in the ARB formats and in real-time custom. It is one of the selections in the Ext Source menu and available only when **Ext**, page 73, is the trigger source selection. For more information on rear-panel connectors and triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Pattern Trigger

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can choose continuous, single or gated as the triggering mode in real-time custom. The menu also contains a **Trigger Setup** softkey that enables you to select the trigger source, the waveform's response to triggers while using the continuous trigger mode, and the gate-active polarity. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Pause

Supported   E8267D with Option 409

Use this softkey to pause the currently playing MSGPS scenario.

P Code Pwr

Supported   E8267D with Option 409

Use this softkey to set the P code power level, relative to the C/A code power level.

Preset	−3.00 dB
Range	−40.00 to 0.00 dB
Remarks	This softkey is grayed out when **Ranging Code** is set to **C/A**.

PCS Base

Supported   E8267D with Option 601 or 602

This softkey selects PCS 1900 Base as the channel band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset	*Channel*: 512
	Frequency: 1.930 GHz
Range	*Channels*: 512–810
	Frequency: 1.930–1.989 GHz

PCS Mobile

Supported   E8267D with Option 601 or 602

This softkey selects PCS 1900 Mobile as the channel band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset	*Channel*: 512
	Frequency: 1.930 GHz
Range	*Channels*: 512–810
	Frequency: 1.850–1.909 GHz

PDC

Supported   E8267D with Option 601 or 602

Use this softkey to select a pre-defined Personal Digital Cellular (PDC) personality for the digital modulation format.

PDC Bands

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can select the frequency bands for PDC. The output frequency depends on both frequency band and channel selections.

P-GSM Base

Supported   E8267D with Option 601 or 602

This softkey selects P-GSM 900 Base as the channel band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset	*Channel*: 1
	Frequency: 935.2 MHz
Range	*Channel*: 1–124
	Frequency: 935.2–959.8 MHz

P-GSM Mobile

Supported   E8267D with Option 601 or 602

This softkey selects P-GSM 900 Mobile as the channel band for GSM. The output frequency depends on both the channel band and channel number selections.

Preset	*Channel*: 1
	Frequency: 890.2 MHz
Range	*Channel*: 1–124
	Frequency: 890.2–913.8 MHz

Phase Dev

Supported   E8267D with Option 601 or 602

Use this softkey to set the phase deviation for minimum shift keying (MSK) modulation.

The current phase deviation value appears under the **MSK** softkey in the Modulation Type menu.

| **Preset** | 90° |
| **Range** | 0°- 100° |

Phase Polarity Normal Invert

Supported   E8267D with Option 601 or 602

Use this softkey to invert the internal Q signal, reversing the rotation direction of the phase modulation vector.

Normal	When you choose Normal, the phase relationship between the I and Q signals is not altered by the phase polarity function.
Invert	When you choose Invert, the in-phase component lags the quadrature-phase component by 90° in the resulting modulation. Inverted phase polarity is required by some radio standards, and it is useful for lower sideband mixing applications. The inverted selection also applies to the I, I-bar, Q, and Q-bar output signals.
Preset	Normal

Phase Ref Set

Supported   All Models

This softkey enables you to define the current relative phase of the RF output signal as zero. Then all phase parameters are set relative to this zero reference.

PHS

Supported   E8267D with Option 601 or 602

Use this softkey to select a predefined Personal Handy Phone System (PHS) personality for the digital modulation format.

PHS Standard

Supported   E8267D with Option 601 or 602

This softkey selects a frequency band for PHS. The output frequency depends on both the frequency band and channel selection.

| **Preset**	*Channel*: 1
	Frequency: 1.895 GHz
Range	*Channels*: 1–82, 251–255
	Frequency: 1.895–1.919 GHz, 1.893–1.894 GHz

Plot CCDF

Supported   E8267D with Option 601 or 602

This softkey displays a plot of the complementary cumulative distribution function for the selected waveform. The plot displays the probability that the instantaneous envelope power is x dB above the average power, where x is the number on the horizontal axis.
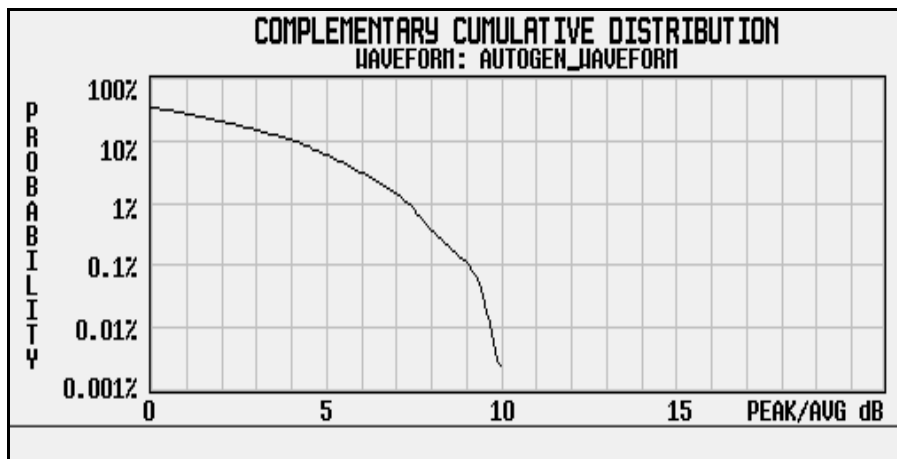
PN9

In the Baseband Generator Menu

Supported   E8267D with Option 601 or 602

This softkey selects an internally generated, ITU standard PN9 pseudorandom bit pattern.

In the Real Time GPS Menu

Supported   E8267D with Option 409

This softkey selects an internally generated, ITU standard PN9 pseudorandom bit pattern.

PN9 Mode Preset Normal Quick

Supported   All Models

This softkey selects the preset value for PN9 mode.

Normal   The PN9 sequence is continuous from ONE timeslot to a matching timeslot.

Quick   The PN9 sequence is reset at the beginning of each timeslot.

PN11

Supported   E8267D with Option 601 or 602

This softkey selects an internally generated, ITU standard PN11 pseudorandom bit pattern.

PN15

In the Baseband Generator Menu

Supported   E8267D with Option 601 or 602

This softkey selects an internally generated, ITU standard PN15 pseudorandom bit pattern.

In the Real Time GPS Menu

Supported   E8267D with Option 409

This softkey selects an internally generated, ITU standard PN15 pseudorandom bit pattern.

PN20

Supported   E8267D with Option 601 or 602

This softkey selects an internally generated, ITU standard PN20 pseudorandom bit pattern.

PN23

Supported   E8267D with Option 601 or 602

This softkey selects an internally generated, ITU standard PN23 pseudorandom bit pattern.

PN Sequence

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu of choices for pseudorandom internal data generation.

Preset   PN23

Point Trigger

Supported   All Models

Use this softkey to access a menu from which you can select a triggering mode for a point-by-point sweep. You can also configure the polarity of the TTL signal output at the TRIGGER IN connector using the **Trigger In Polarity Neg Pos** softkey in this menu. This softkey is active for list or step sweep types and disabled when ramp (Option 007) is the selected sweep type.

Preset   Free Run

Port Config

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey accesses a menu that enables you to select a parallel, serial, parallel interleaved IQ, or parallel interleaved QI data transmission between the N5102A module and the connected DUT.

Preset   Parallel

Positive

Supported   All Models

This key enables you to select a positively sloped ramp as the modulation waveform for the internally generated, ac-coupled signal.

Power Meter

Supported   All Models

Use this softkey to access a menu from which you can select the external power meter model for use during the user flatness calibration.

The power meter is controlled only through a GPIB cable.

The power meter selection is not affected by a preset or by a power cycle.

Power On Last Preset

Supported   All Models

This softkey selects the power-on operating state for the signal generator. You can select either last or preset.

Last   Each time you cycle power to the signal generator, it will turn on using the same settings as when last turned off.

Preset   Each time you cycle power to the signal generator, it will turn on in either the

factory-defined preset condition or in a user-defined preset condition. You make the choice between factory and user-defined preset with the **Preset Normal User** softkey.

If Last is active, the signal generator must not receive commands for at least 3 seconds before the power is turned off to guarantee that the most recent state is saved. The power-on state is not affected by a preset or by a power cycle.

Power On/Preset

Supported   All Models

Use this softkey to access a menu of choices for power on and preset conditions. Refer to "Power On Last Preset" on page 151, "Preset Normal User" on page 154, and "Save User Preset" on page 173.

Power Search

Supported   All Models

This softkey enables you to select the power search mode. The **ALC Off On** softkey must be set to Off to enable the power search mode.

Power search is an internal calibration routine that improves output power accuracy when the automatic leveling control circuit (ALC) is off. A power search is recommended for pulse-modulated signals with pulse widths less than two microseconds. The power search function briefly turns on the ALC and uses the ALC to take a snapshot of the power level at the signal generator's RF output. The ALC level, as measured by the ALC circuitry, is stored in memory. This stored ALC value is used to bias the RF circuitry, thereby maintaining the RF output power level. This value is refreshed each time a power search is initiated.

If you are using external I/Q modulation, the power search routine assumes that the I/Q input level is $\sqrt{I^2 + Q^2}$ = 0.5 V_{rms}. Actual output amplitude will scale directly with $\sqrt{I^2 + Q^2}$.

The power search mode softkey selections are **Manual**, **Auto** and **Span.** They are described below.

Manual   The routine is not run until the **Do Power Search** softkey is pressed.

Auto   The routine will run automatically with each change to the RF frequency or power, and with each change to the AM, burst, pulse, or I/Q modulation state.

Span   The **Do Power Search** softkey becomes active and enables you to perform power searches over a range of frequencies. The power search corrections are then stored and used whenever the signal generator is tuned within the selected range.

Preset   Manual

Power Search Reference

NOTE   The power search reference softkeys are only active with I/Q modulation. (The softkeys are not active when analog modulation is used: AM, FM, and pulse).

Supported   E8267D

Use this softkey to select the reference used by the power search mode. The **ALC Off On** softkey must be

set to Off to enable the power search mode.

ARB RMS   In ARB RMS mode, the RMS is selected as the I/Q modulation bias type used
                  during a power search.

Fixed   A 1.0V bias reference is used in this mode.

Manual RMS   Use the Manual RMS softkey, if the 1.0V fixed reference value is not appropriate
                  for the external I/Q signal level or when the internal RMS calculated value is not
                  representative of the desired power level. In Manual RMS mode, the user is
                  required to specify the DC bias level applied to the I/Q modulator during the
                  power search.

Modulated   In modulated mode, the actual internal or external modulated signal to provide an
                  AC bias on the I/Q modulator.

Preset   Fixed

PRAM File

Supported   E8267D with Option 601 or 602

This softkey selects a Pattern RAM (PRAM) file. PRAM files are binary arrays in byte format. Each
byte consists of a data bit (LSB/bit 0), a burst bit (bit 2), and an Event 1 output bit (bit 6). The
PRAM internal format consist of 4 bytes for each PRAM byte. PRAM files are useful for specifying
custom framing structures with fixed data.

Pre-FIR Samples

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey selects unfiltered data as the data type to be transferred through the N5102A module.
When an ARB modulation format is on, this softkey is not accessible. In the Input mode, this data
type limits the clock rate to 50 MHz for filters with a width 16 symbols, and 25 MHz for filters with
a symbol width.

If this command is executed while an ARB modulation format is active, the parameter choice is
changed, but it is not *used* by the signal generator until a real-time modulation format is turned on.

Because a query returns the current choice, regardless of whether or not an ARB format is active,
you must query both states (data type and the modulation format) to know the signal generator's
current setup.

Predefined Mode

Supported   E8267D with Option 601 or 602

This softkey accesses a menu of single-keypress setups for various formats. When you select a format,
default values for components of the format (such as modulation type, filter, and bits per symbol) are
automatically set up.

Preset Language

Supported   All Models

Use this softkey to access a menu of choices for selecting the programming language that is

implemented after the **Preset** key is pressed. The preset language selection is not affected by a preset or by a power cycle.

You can choose between SCPI, which is the language used by the signal generator for remote implementation of all features, 8648-compatible, and four versions of 8656/57-compatible languages. The 8648- and 8656/67-compatible languages are provided for remote implementation of some features so that the signal generator can be compatible with systems using those instruments. Refer to the *Agilent Signal Generators Programming Guide* for information about commands and programming languages.

Preset List

Supported   All Models

This softkey enables you to delete the current sweep list and replace it with a new list consisting of one point at a default frequency, amplitude, and dwell time. Be certain that you want to delete the current sweep list; you cannot recover the information once you press **Preset List**.

Preset Normal User

Supported   All Models

This softkey enables you to select a factory-defined preset or user-defined preset state for the signal generator. A user-defined preset state is saved with the **Save User Preset** softkey.

Normal   A factory-defined preset is used if **Normal** is selected.

User   A user-defined preset is used if **User** is selected.

Proceed With Reconfiguration

Supported   All Models

Press this softkey to enable the selected hardware or software options. In the Hardware Options menu, selected options are indicated by an X in the column to the left of the option number. In the Software Options menu, selected options include any options that have a license key entered. After pressing this softkey, press the **Confirm Change** softkey to verify that you want to reconfigure the signal generator with the options selected. Pressing the Confirm Change softkey also reboots the signal generator. If you do not want to continue, press the **Return** key.

If you enable an option that does not have the required hardware installed, the menus for that option will be activated but the option *cannot* operate, regardless of what the menus may indicate.

PSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor.

Selecting a PSK Modulation

Use this softkey to display a menu of phase shift keying (PSK) modulation types to modulate a continuous stream of the selected data pattern. You can choose from QPSK and OQPSK, BPSK, $\pi/4$ DQPSK, 8PSK, 16PSK, D8PSK and EDGE.

Loading a PSK I/Q Map into the I/Q Table Editor

Use this softkey to display a menu of phase shift keying (PSK) modulation types that you can load into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Pulse

Supported   All with Option UNU or UNW

Use this hardkey to access a menu of choices that enables you to configure the pulse modulation.

Pulse/RF Blank

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you select one of four markers to enable RF blanking of the output signal, or select None to disable the blanking feature. This function automatically incorporates ALC hold, so there is no need to select the ALC hold routing function for the same marker. The routing setting remains until you reconfigure it, preset the signal generator, or cycle the PSG power. When enabled, RF blanking (no RF output) occurs while the marker signal is low.

CAUTION	The pulse function incorporates ALC hold. Incorrect ALC sampling can create a sudden unleveled condition that may create a spike in the RF output potentially damaging a DUT or connected instrument. Ensure that you set markers to let the ALC sample over an amplitude that accounts for the high power levels within the signal. Refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide* for more information on the ALC.

The RF blanking setting is part of the file header information, so saving the setting to the file header saves the current marker routing for the waveform file.

NOTE	A waveform file that has unspecified settings in the file header uses the previous waveform's routing settings. This could create the situation where there is no RF output signal, because the previous waveform used RF blanking.

For more information on the RF blanking function and file headers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Pulse Delay

Supported   All with Option UNU or UNW

This softkey enables you to change the pulse delay of the internally generated pulse modulation source.

The pulse delay applies only to internal pulse modulation; when external pulse modulation or internal square pulse modulation is selected, this key is disabled.

Preset   0.0 s

Range   Depends on pulse period and pulse width settings.

Pulse Off On

Supported   All with Option UNU or UNW

This softkey toggles the operating state for the currently selected pulse modulation source.

When pulse modulation is on, the PULSE annunciator is shown in the display. The RF carrier is modulated by the enabled modulation only when you have set **Mod On/Off** to On.

Preset   Off

Pulse Period

Supported   All with Option UNU or UNW

This softkey enables you to change the pulse period for internally generated pulse modulation.

If the value for pulse period is less than the value for pulse width, pulse width is changed to be 20 us less than pulse period.

The pulse period applies only to internal free-run and gated pulse modulation.

Preset   2.0 μs

Range   70.0 ns–42.0 s

Pulse Rate

Supported   All with Option UNU or UNW

This softkey enables you to change the pulse rate for the internal square pulse modulation.

The new value of pulse rate applies only to internal square pulse modulation; when external pulse modulation or internal pulse modulation is selected, this key is disabled.

Preset   400.0 Hz

Range   100.0 MHz–10.0 MHz

Pulse Source

Supported   All with Option UNU or UNW

Use this softkey to access a menu of choices that enables you to select the pulse source for modulation inputs.

The RF carrier is modulated by the enabled modulation only when you have set **Mod On/Off** to On.

Preset   Internal Pulse

Pulse Width

Supported   All with Option UNU or UNW

This softkey enables you to change the pulse width for the internally generated pulse modulation source.

If the value for the pulse period is less than the pulse width value then the pulse width is changed to be 20 ns less than the pulse period.

The pulse width applies only to internal pulse modulation; when external pulse modulation or internal square pulse modulation is selected, this key is disabled.

NOTE	A power search is recommended for signals with pulse widths less than one microsecond. Refer to "Power Search" on page 152.

Preset   1.0 µs

Range   10.0 ns–41.99999998 s

PWT

Supported   E8267D with Option 601 or 602

This softkey selects a predefined personal wireless telephone (PWT) personality for the digital modulation format. The PWT standard is an adaptation of the DECT air-interface with a π/4 DQPSK modulation to reduce radio channel bandwidth.

Q

QAM

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation, or load a default I/Q map into the I/Q table editor.

Selecting a QAM Modulation

Use this softkey to display a menu of quadrature amplitude modulation (QAM) types to modulate a continuous stream of the selected data pattern. The modulation selection appears under the **Select** and **QAM** softkeys in the Modulation Type menus.

Loading a QAM I/Q Map into the I/Q Table Editor

Use this softkey to display a menu of quadrature amplitude modulation (QAM) types that you can load into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Q Gain

Supported   E8267D with Option 601 or 602 and Option 003

This softkey enables you to adjust the gain for the N5102A module Q data. This is a fine adjustment, independent of the I data, that can be used to complement the setting obtained using the **Scaling** softkey.

The gain is the gain of the digital sample. A sample is represented by a word size of 4–16 bits and represents an analog voltage. This voltage is adjusted by the gain which will change the bit values. If the signal gain cannot be represented by bit word size, it will be clipped. For example, the signal will be clipped if, after applying the gain, the amplitude exceeds the number of bits for the sample.

Preset 100.0%

Range 87.50–112.5%

Q Offset

Supported E8267D

This softkey adjusts the amplitude level of the quadrature-phase signal. This key appears as a percentage of full scale for standard I/Q and as an offset voltage for wideband I/Q.

For Standard I/Q

Use this softkey to enter an origin offset for standard quadrature-phase signals. 100% offset is equivalent to 500 mV DC at the input connector. This offset is used to remove imperfections in the quadrature-phase signal or to introduce calibrated impairments.

The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.

When using this key to minimize the LO feedthrough signal, optimum performance is achieved when the adjustment is made after all other I/Q path adjustments, such as those made with the **Int Phase Polarity Normal Invert** or **Modulator Atten nnn db Manual Auto** softkeys. If other adjustments are made after minimization is performed, the LO feedthrough signal may increase.

Preset 0.0%

Range −50% to 50%

For Wideband I/Q (Option 015)

Use this softkey to enter an origin offset for quadrature-phase signals in wideband I/Q mode. This offset is used to remove imperfections in the quadrature-phase signal or to introduce calibrated impairments. The **I/Q Adjustments Off On** softkey must be set to On to enable this adjustment.

For frequencies between 20 and 28.5GHz the I and Q signals are reversed. This is correct for internally generated signals but not for externally applied I and Q signals. In this frequency band you must switch the I and Q in, iputs to maintain the same phase relationship. Refer to the Troubleshooting chapter of the *E8257D/67D, E8663D PSG Signal Generators Service Guide* for more information.

Preset 0.0000 V

Range −1.0000 V to 1.0000 V

In the Gain, Offset & Scaling Menu (N5102A, Option 003)

This softkey enables you to adjust the DC offset for the N5102A module Q data. The offset can be used to compensate for an existing impairment or to introduce an impairment to the Q data.

The offset is an adjustment to the analog level that is represented by the digital sample. The analog voltage is limited to a 16-bit data sample.

Preset 0.00%

Range −100 to 100% of full scale

QPSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation, or load an I/Q map into the I/Q table editor.

Selecting a QPSK Modulation

Use this softkey to select quadrature phase shift keying (QPSK) to modulate a continuous stream of the selected data pattern. QPSK modulation transmits data at the rate of 2 bits per symbol. The modulation selection appears under the **Select**, **QPSK and OQPSK**, and **PSK** softkeys in the Modulation Type menus.

Loading a QPSK I/Q Map into the Table Editor

Use this softkey to load a quadrature phase shift keying (QPSK) I/Q map into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

QPSK and OQPSK

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations, enabling you to either select a modulation, or load a default I/Q map into the I/Q table editor.

Selecting a QPSK and OQPSK Modulation

Use this softkey to access a menu of quadrature phase shift keying (QPSK) and offset quadrature phase shift keying (OQPSK) modulation types to modulate a continuous stream of the selected data pattern. QPSK and OQPSK modulations transmit data at the rate of 2 bits per symbol.

Loading a QPSK and OQPSK I/Q Map into the Table Editor

Use this softkey to access a menu of quadrature phase shift keying (QPSK) and offset quadrature phase shift keying (OQPSK) modulation types that you can load into the I/Q table editor. For more information on mapping symbol positions with the I/Q table editor, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Quadrature Angle Adjustment

Supported   E8267D

Use this softkey to adjust the phase angle between the I and Q vectors. When the quadrature angle adjustment is zero, the phase angle between the I and Q vectors is 90 degrees. Positive angle settings increase the angle from 90 degrees while negative phase values decrease the angle from 90 degrees. The phase settings only apply to the RF path not the external I/Q output.

Preset   0.00 degrees

Range   ±10 degrees, minimum increment of 0.01 degrees

R

Ramp

In the Sweep Type Menu

Supported   All with Option 007

Use this softkey to select ramp as the sweep type.

In All Other Menus

Supported   All Models

Use this softkey to access a menu from which you can select ramp as the modulating waveform with either a positive or negative slope.

In the LF Out menu, this key is available after selecting the internal source to operate as a function generator.

Ramp Sweep Control

Supported   All with Option 007

This softkey accesses a menu enabling you to designate the signal generator as a master or slave in a dual-signal generator ramp sweep setup.

Preset   Off

Random Seed Fixed Random

Supported   E8267D with Option 601 or 602

This softkey sets the mode of the signal generator's random seed generator. The randomly generated numbers are used to set the phase relationships of the tones in the multitone setup table. This is done as part of initializing the multitone table editor.

Fixed   When you select Fixed, the same random phases will be generated after each
                   initialization.

Random   When you select Random, new phase relationships will be generated after each
                   initialization. Use this softkey when the **Initialize Phase Fixed Random** softkey is set to
                   the Random selection.

Preset   Fixed

Ranging Code C/A P C/A+P

Supported   E8267D with Option 409

This softkey sets the ranging code type for the modulated GPS carrier.

C/A   This choice selects a 1023-bit pseudorandom C/A (coarse acquisition)
                   code that is BPSK modulated onto the L1 (1575.42 MHz) carrier. The C/A
                   code factory-set chip rate is 1.023 Mcps using a 10.23 Mcps reference

clock.

P   This choice selects the precise (P) code which is a very long
             pseudorandom sequence that is BPSK modulated onto the L2 (1227.6
             MHZ) carrier. The P code factory-set chip rate is 10.23 Mcps using a
             10.23 Mcps reference clock.

C/A+P   This choice permits the C/A (coarse acquisition) and P (precise) codes to
             modulate the L1 carrier (1575.42 MHz) simultaneously by providing the
             C/A code on the I component and the P code in quadrature on the Q
             component.

Preset   C/A

Real-time AWGN Off On

Supported   E8267D with Option 403

This softkey toggles the operating state for the real-time additive white gaussian noise (AWGN)
generator. The noise can be configured using the **Bandwidth** softkey.

Off   The real-time AWGN generator is turned off.

On   The AWGN generator is turned on.

Preset   Off

Real Time GPS

Supported   E8267D with Option 409

Use this softkey to access a menu from which you can set up simulated Global Positioning System
(GPS) single satellite signals.

Real Time GPS Off On

Supported   E8267D with Option 409

This softkey sets the operating state of the real time GPS personality.

Off   This selection turns off the GPS personality.

On   This selection turns on the GPS personality. The GPS personality simulates the signal produced by an individual GPS satellite.

Preset   Off

Real Time I/Q Baseband

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can build customized unframed data formats using the real time I/Q baseband generator.

Real Time MSGPS

Supported   E8267D with Option 409

Use this softkey to access a menu from which you can set up simulated multiple-satellite Global Positioning System (MSGPS) signals.

Real-time MSGPS Off On

Supported   E8267D with Option 409

This softkey sets the operating state of the real time MSGPS personality.

Off   This selection turns off the MSGPS personality.

On   This selection turns on the MSGPS personality. The MSGPS personality simulates the signals produced by multiple GPS satellites. Select a scenario file before turning MSGPS on.

Preset   Off

Real-time Noise Off On

Supported   E8267D with Option 403

This softkey toggles the operating state for the dual ARB real-time noise generator. When toggled On, real-time noise is applied to the waveform being played by the dual ARB player. The additive white gaussian noise (AWGN) is non-repeating. Noise bandwidth and carrier to noise ratio parameters can be defined using the **Carrier to Noise Ratio**, **Carrier Bandwidth**, and **Noise Bandwidth Factor** softkeys.

Off   The real-time noise generator is turned off.

On   Real-time noise is applied to the waveform currently being played by the dual ARB player.

Preset   Off

Real-time Noise Setup

Supported   E8267D with Option 403

Use this softkey to access a menu from which you can select noise parameters that can be applied to a waveform file in real time. Noise bandwidth and carrier to noise ratio parameters can be defined using the **Carrier to Noise Ratio**, **Carrier Bandwidth**, and **Noise Bandwidth Factor** softkeys.

Recall

Supported   All Models

This hardkey restores a previously saved instrument state. The recall hardkey also accesses a menu of softkeys that enable you to select or delete registers and sequences.

Preset   N/A

Recall Ref Osc Setting

Supported   All Models

Use this softkey to recall the last saved reference oscillator coarse and fine adjustment setting.

This adjustment is intended for use by service personnel. Refer to the calibration guide for more information.

RECALL Reg

Supported   All Models

Use this softkey to recall an instrument state from a saved register. Recalling a register also selects that register number for all keys which specify a register number in this menu. You can use the front panel knob and the up and down arrow keys to scroll through all saved registers for the selected sequence.

Rectangle

Supported   E8267D with Option 601 or 602

Use this softkey to select a rectangular pre-modulation filter from either the Select menu or the Load Default finite impulse response (FIR) menu.

In the Select (filter) Menu

In this menu, pressing the **Rectangle** softkey selects this FIR filter for use in a modulation setup.

In the Load Default FIR Menu

In this menu, use the **Rectangle** softkey to access a menu from which you can specify the number of symbols, apply a windowing function, and generate a new FIR table that is loaded with the coefficients for a rectangular filter. If you change a parameter, you can press the **Generate** softkey again to reload the FIR table.

Ref Osc Coarse

Supported   All Models

This softkey is provided for adjusting the internal reference oscillator. Refer to the calibration guide for more information.

This adjustment is intended for use by service personnel.

Ref Osc Fine

Supported   All Models

This softkey is provided for adjusting the internal reference oscillator. Refer to the calibration guide for more information.

This adjustment is intended for use by service personnel.

Ref Oscillator Source Auto Off On

Supported   All Models

This softkey toggles the automatic oscillator source selection state. The signal generator is capable of automatically selecting an external reference oscillator when an external reference is detected.

Off   The signal generator uses the internal reference only, even if an external reference
             is connected.

On   The signal generator detects when a valid reference signal is present at the
             10 MHz IN connector and automatically switches from internal to external
             reference operation.

Preset   On

Reference Freq

Supported   E8267D with Option 601 or 602

This softkey enables you to set the reference frequency of the external clock.

This softkey is active only after selecting Ext as the ARB Reference. The reference is applied to the rear panel BASEBAND GEN REF IN connector.

Preset   10.0000000 MHz

Range   250.0000 kHz–100.0000000 MHz

Reference Frequency

Supported   E8267D with Option 601 or 602 and Option 004

This softkey, for the N5102A module, enables you to specify the frequency of the external reference supplied to the Freq Ref connector. The specified frequency enables the internal source of the N5102A module to lock onto the externally supplied reference.

CAUTION   The module can lock onto a signal that is close to the specified reference frequency.

Specifying a frequency that is different from what is being supplied may result in data errors.

This softkey is grayed out (inactive) for the External and Device clock source selections.

Preset   10.0000000 MHz

Range   1–100 MHz

Reference Oscillator Adjustment

Supported   All Models

Use this softkey to access a menu of keys that are provided for adjusting the internal reference oscillator. This adjustment is intended for use by service personnel. Refer to the calibration guide for more information.

Remote Language

Supported   All Models

Pressing this softkey reveals a menu of choices for the signal generator's remote language. The language selected will be implemented immediately without presetting the signal generator.

Instrument-specific languages such as 8657D NADC are available for compatibility with the signal generator. The SCPI language implements all of the signal generator's functions.

Numerous instrument-compatible languages are available for use by the signal generator. Refer to the *Agilent Signal Generators Programming Guide* for information about commands and information on programming languages.

Rename

Supported   E8267D with Option 601 or 602

Use this softkey to rename the current bit file.

Rename File

Supported   All Models

This softkey enables you to rename the highlighted file in the displayed catalog of files. After entering the new file name, press the **Enter** terminator softkey. If you do not want to rename the file, press the **Return** hardkey. Once you press **Enter**, the new file is stored and displayed in the catalog list.

NOTE   File names are limited to 23 characters.

Rename Segment

Supported   E8267D with Option 601 or 602

This softkey enables you to rename the selected waveform segment in the displayed catalog.

Re-SAVE Seq[*n*] Reg[*nn*]

Supported   All Models

This softkey enables you to save the current instrument state in the specified register within the selected sequence. If data has already been stored in this location, it will be overwritten. The instrument state includes all of your setup selections except list sweep data and functions that do not change by the preset function or by a power cycle. The **SAVE Seq[n] Reg[nn]** softkey changes to **Re-SAVE Seq[n] Reg[nn]** when an instrument state has been saved or selected.

Reset & Run

Supported   E8267D with Option 601 or 602

This softkey, available in only the ARB formats, is a waveform response selection for the continuous trigger mode. It enables the a waveform to accept a trigger while it is playing. The following list describes the waveform behavior for this choice:

*   The waveform waits for and plays with the first trigger occurrence.

*   For each subsequent trigger, the waveform resets to the beginning of the file and plays. For a waveform sequence, this means resetting to the first segment.

The waveform plays continuously until you turn the format off, select another trigger mode or response, or select another waveform if using the dual ARB.

When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide.*

Reset RS-232

Supported   All Models

Use this softkey to clear the RS-232 read/write buffer. Any unprocessed data is cleared and the buffer is readied for sending and receiving data over the RS-232 interface. All other RS-232 communication parameters are unaffected.

Restart

Supported   E8267D with Option 409

Use this softkey to set the scenario to the beginning without turning off the RF. If **Resume** is active, the scenario immediately starts playing; if **Pause** is active, press **Resume** to start playing the scenario.

Restore Default Burst Shape

Supported   E8267D with Option 601 or 602

Use this softkey to reset the burst shape parameters to their preset values.

Restore Default Filter

Supported   E8267D with Option 601 or 602

Use this softkey to replace the current finite impulse response (FIR) filter with the default filter for the selected format.

Preset   Root Nyquist α = 0.350

Restore Default Modulation Type

Supported   E8267D with Option 601 or 602

Use this softkey to restore the default modulation type for the current real time custom digital modulation setup.

Restore Default Signal Polarities

Supported   All Models

This softkey is used to restore the signal generator's default signal polarities.

Restore Default Symbol Rate

Supported   E8267D with Option 601 or 602

Use this softkey to replace the current symbol rate with the default symbol rate for the selected format.

Preset   24.300000 ksps

Restore Factory Defaults

Supported   All with Option UNR/UNX

This softkey re-sets the bandwidth of the reference oscillator to the factory-defined default state. The default value for the internal reference bandwidth is 125 Hz. The default value for the external reference bandwidth is 25 Hz.

Restore Sys Defaults

Supported   All Models

This softkey is used to restore the signal generator's system defaults.

Resume

Supported   E8267D with Option 601 or 602

Use this softkey to continue playing the MSGPS scenario when it has been stopped with the **Pause** softkey. The scenario resumes from the point at which it was paused.

Retrace Source Settled State Norm Inv

Supported   All models

Use this softkey to select a normal or inverted settled state for the step or list sweep when waiting for an external trigger.

Normal	The source settled output is Settled when a step or list sweep is armed and waiting for an external trigger input.
Inverted	The source settled output is Not Settled when a step or list sweep is armed and waiting for an external trigger input. (This is the default.)

Retrigger Mode

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu to configure the waveform's response to triggers while using the single trigger mode for an ARB format. The response selections determine whether the waveform accepts a trigger during playback, and if it does, how it responds to that trigger. The following is a list of the response selections:

- **Off**, page 138, causes the waveform to ignore triggers during playback.
- **On**, page 140, causes a waveform to accept a trigger during playback and to restart after the current play finishes.
- **Immediate**, page 100, causes a waveform to accept a trigger during playback and to restart immediately after receiving the trigger.

When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Revert to Default Cal Settings

Supported   E8267D

Use this softkey to restore the original factory calibration data for the internal I/Q modulator.

RF During Power Search

Supported   All Models

This softkey enables you to select between **Normal** and **Minimum** power search modes. The minimum mode is used to protect devices that are sensitive to high power levels or high power fluctuations.

In normal mode, the attenuator is not used during a power search. In minimum mode the attenuator will switch to its maximum level during a power search. Power search operations can occur frequently and, if the minimum mode is used, can decrease attenuator life.

NOTE   Continual or excessive use of the power search protection function can decrease attenuator life.

Normal	When set to **Normal**, a power search is performed without setting the internal step attenuator to its maximum setting.
Minimum	When set to **Minimum**, the internal step attenuator is set to its maximum setting during power search to protect sensitive circuits.
Preset	Normal
Range	N/A

RF Off Source Settled Polarity Norm Inv

Supported   All models

Use this softkey to select a normal or inverted polarity setting when the RF is off.

Normal   The source settled output annunciator indicates Settled when the RF is off.

Inverted   The source settled output annunciator indicates Not Settled when the RF is off. (This is the default.)

R-GSM Base

Supported   All Models

This softkey selects R-GSM 900 Base as the channel band for GSM. The output frequency depends on both the frequency band and channel selection.

Preset   *Channel*: 1

          Frequency: 935.200 MHz

Range   *Channels*: 0–124, 975–1023

          Frequency: 935.000–959.800 MHz, 921.200–934.800 MHz

R-GSM Mobile

This softkey selects R-GSM 900 Mobile as the channel band for GSM. The output frequency depends on both the frequency band and channel selection.

Supported   All Models

Preset   *Channel*: 1

          Frequency: 890.200 MHz

Range   *Channels*: 0–124, 975–1023

          Frequency: 890.000–914.800 MHz, 876.200–889.800 MHz

Rise Delay

Supported   E8267D with Option 601 or 602

Press this softkey to adjust the burst shape rise delay.

Preset   0.000 bits

Range   Minimum and maximum values depend on modulation type and symbol rate.

Rise Time

Supported   E8267D with Option 601 or 602

Press this softkey to adjust the burst shape rise time.

Preset: 5.000 bits

Range   Minimum and maximum values depend on modulation type and symbol rate.

Root Nyquist

Supported   E8267D with Option 601 or 602

This softkey selects a root Nyquist (root-raised cosine) pre-modulation filter from either the Select menu or the Load Default finite impulse response (FIR) menu.

In the Select (filter) Menu

In this menu, use the **Root Nyquist** softkey to select this FIR filter for use in a custom modulation setup.

In the Load Default FIR Menu

In this menu, use the **Root Nyquist** softkey to access a menu from which you can change the filter alpha value, specify the number of symbols, apply a windowing function, and generate a new FIR table that is loaded with the coefficients for a root Nyquist filter. If you change a parameter, you can press the **Generate** softkey again to reload the FIR table.

Rotation

Supported   E8267D with Option 601 or 602 and Option 003

This softkey enables you to adjust the rotation of the IQ constellation for the N5102A module data.

Preset   0.0 deg

Range   0–360 degrees

RS-232 Baud Rate

Supported   All Models

Use this softkey to access a menu of choices enabling you to set the baud rate for data communication over the RS-232 interface.

The baud rate is not affected by a preset or by a power cycle.

Range   300 – 57600 baud

RS-232 Echo Off On

Supported   All Models

This softkey selects the operating state of the RS-232 echo function.

On   Characters sent to the signal generator are echoed to the controller display.

Off   Characters sent to the signal generator are not echoed to the controller display.

The echo state is not affected by a preset or by a power cycle.

RS-232 Setup

Supported   All Models

Use this softkey to access a menu of choices enabling you to configure communication protocol over the RS-232 interface.

RS-232 Timeout

Supported　　All Models

This softkey enables you to set the RS-232 interface timeout period. If further input is not received within the assigned timeout period while a SCPI command is being processed, then the command is aborted and the RS-232 input buffer is cleared.

The timeout period value is not affected by a preset or by a power cycle.

Run Complete Self Test

Supported　　All Models

Use this softkey to run an automated, internal diagnostic test that checks for detectable hardware failures. If there are hardware failures in the signal generator, refer to the Troubleshooting chapter of the *E8257D/67D, E8663D PSG Signal Generators Service Guide*.

This key is included for use by service personnel for troubleshooting or by the user as part of an operation verification.

Run Highlighted Tests

Supported　　All Models

This softkey is provided for self-test diagnostics. If any tests fail then refer to the Troubleshooting chapter of the *E8257D/67D, E8663D PSG Signal Generators Service Guide*.

This key is included for use by service personnel.

Run Loop Back Test

Supported　　E8267D with Option 601 or 602 and Option 003 or 004

This softkeys, for the N5102A module, starts the selected diagnostic loop back test and returns the results of the test as a pass or fail.

Run Selected Tests

Supported　　All Models

This softkey is provided for self-test diagnostics. If any tests fail then refer to the Troubleshooting chapter of the *E8257D/67D, E8663D PSG Signal Generators Service Guide*.

This key is included for use by service personnel.

S

Samples

Supported　　E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, selects PSG filtered samples as the baseband data. This is the factory preset data type. When an ARB modulation format is on, this softkey is not accessible.

Sanitize

Supported   All Models

This softkey removes all user files, table editor files, flatness correction files, and baseband generator files. You must press **Enter Secure Mode** > **Confirm** to activate the Sanitize security level. Memory is overwritten with a sequence of data as described below. For more information about security functions, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

SRAM	All addressable locations will be overwritten with random characters.
HARD DISK	All addressable locations will be overwritten with a single character, its complement, and then a random character.
FLASH MEMORY	The flash blocks will be erased.

Satellite ID

Supported   E8267D Option 409

Use this softkey to set the identification number of the simulated GPS satellite or ground transmitter. The signal generator uses the unique pseudorandom noise (PRN) code assigned to the selected ID number to generate the C/A and P codes.

Preset   1

Range   1–37

Save

Supported   All Models

Use this hardkey to save an instrument state. This hardkey accesses a menu from which you can save and delete registers (instrument states) and sequences (groups of registers). The menu displays the registers in use and any comments associated with the registers from the most recently accessed sequence. The menu is updated whenever you make any changes to the registers or to the comments.

The save function does not actually save waveform or modulation data, or table entries such as list sweep data. You must store these data files to the signal generator's memory catalog.

The save function saves references to data files along with instrument settings associated with the file. If the data you are working with is not stored to a file, the save function will not write the modified data to the file. Store the modified data file then execute the save function. The file name and instrument settings will be saved.

NOTE   The Save function does not save waveform or modulation data, or table entries such as list sweep data. It only saves a reference to the file stored in memory.

The signal generator can save up to 10 sequences with 100 registers available for each sequence. Refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide* for more information on save and recall states.

Save Reg

Supported   All Models

Use this softkey to save the current instrument settings and setups. Use the signal generator's memory catalog to save list sweep data or multitone arb setups.

SAVE Seq[*n*] Reg[*nn*]

Supported   All Models

This softkey enables you to save the current instrument state and setup to a register within a selected sequence. Waveform or modulation data or table entries such as list sweep data are not saved with this softkey, only a reference to the file name is saved. Refer to for more information.

NOTE	The Save function does not save waveform or modulation data, or table entries such as list sweep data. It only saves a reference to the file stored in memory.

Do not press this key until you have specified the correct sequence and register using the **Select Seq** and **Select Reg** softkey. The **SAVE Seq[n] Reg[nn]** softkey changes to **Re-SAVE Seq[n] Reg[nn]** when an instrument state has been saved or selected.

Save Setup to Header

Supported   E8267D with Option 601 or 602

This softkey enables you to save the header information displayed in the `Current Inst. Settings` field of the table editor to a header file for the modulation format currently being used. Once this softkey is pressed, the instrument settings of the `Current Inst. Settings` field will be displayed in the `Saved Header Settings` field.

For this softkey to be active, the modulation format must be enabled and the file being displayed must be the active file.

Save User Preset

Supported   All Models

Use this softkey to establish a user-defined preset state. Set up the signal generator for conditions that you want to use for your unique preset state. Once defined, press the **Save User Preset** softkey to save the state. Only one user-defined preset state is allowed, any previously-saved state will be over-written. Press the **Preset Normal User** softkey to select **User**, and your instrument state will be recalled by the signal generator any time you press **Preset**. Refer to for more information.

The user's state definition is a state file; it is not affected by an instrument preset or by a power cycle.

Scalar

Supported   All Models

This selection in the **Pulse Source** menu internally generates a 27 kHz square wave, which is required

for sweep setups using a scalar network analyzer and DC detector. To activate the pulse signal, you must set **Pulse Off On** to On. This pulse signal can also be activated using the Scalar Pulse Off On softkey, which is accessed from the **Sweep/List** front-panel key. If the PSG is controlled by an 8757D through a GPIB connection, the scalar pulse automatically turns on when DC detection is selected on the 8757D.

Scalar Pulse Off On

Supported   All Models

This softkey sets the state of the scalar pulse signal. When turned on, the signal generator internally generates a 27 kHz square wave, which is required for sweep setups using a scalar network analyzer and DC detector. The Pulse annunciator also appears on the display, indicating that a pulse modulation is activated. This pulse signal can also be activated using softkeys accessed through the **Pulse** front-panel key (see **Scalar**, page 173). If the PSG is controlled by an 8757D through a GPIB connection, the scalar pulse automatically turns on when DC detection is selected on the 8757D.

Scale Waveform Data

Supported   E8267D with Option 601 or 602

This softkey accesses a menu of selections that enable you to permanently scale an arbitrary waveform file. Unlike runtime scaling, which scales a playing waveform, this type of scaling is applied to a selected waveform file residing in volatile memory. After scaling, the waveform file can then be stored in non-volatile memory for future use.

For best results, a waveform should only be scaled enough to achieve the best dynamic range without overflowing the I and Q digital-to-analog converters. This ensures that the integrity of the waveform is maintained. If a waveform is scaled down too much, it can lose bits of resolution. Once a bit of resolution is lost, it *cannot* be recovered by increasing the scaling value of the waveform. Repeated scaling is cumulative and cannot be undone. For more information about scaling, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*. See also "Waveform Runtime Scaling" on page 204.

Scaling

Supported   E8267D with Option 601 or 602

This softkey enables you to change the scaling percentage of the selected waveform or I and Q signals. It appears in two menus.

In the Scale Waveform Data Menu (Dual ARB)

This softkey enables you to change the scaling percentage of the selected waveform. Use this softkey to set the scaling percentage to a resolution of 0.01% within the specified range. After entering the desired scaling percentage, terminate the entry with the % softkey. For more information about scaling, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide* and "Waveform Runtime Scaling" on page 204.

Preset   100.00%

Range   1.00%–100.00%

In the Gain, Offset & Scaling Menu (N5102A, Option 003)

This softkey adjusts the scaling of the I and Q data for the N5102A module. This feature is primarily used to remove over-range errors.

The scaling value changes the analog voltage level represented by the digital sample or word. A sample is usually represented by 16 bits. If the analog voltage cannot be represented by 16 bits then the output will be clipped. Scaling will adjust the analog voltage level and can be used to prevent clipping.

Preset   70.00%

Range   -100 to 100%

Scenario

Supported   E8267D with Option 409

Use this softkey to access a catalog of MSGPS scenario files.

SCPI

Supported   All Models

This softkey is available in the Preset Language menu and the Remote Language menu. All signal generator features can be accessed using SCPI (Standard Commands for Programmable Instruments). Choosing **SCPI** in the Preset Language menu allows you to select this remote language as the default after a normal preset. Choosing **SCPI** in the Remote Language menu allows you to immediately use this language to control the signal generator.

Screen Saver Delay:

Supported   All Models

This softkey enables you to set a time interval before the screen saver is activated. This event, activating the screen saver, occurs after the specified time interval if there is no input from the front panel.

The screen saver delay state is not affected by a preset or by a power cycle.

Range   1–12 hours

Screen Saver Mode

Supported   All Models

This softkey selects **Light Only** or **Light & Text** for the screen saver. When you set the screen saver to Light Only, the display light is turned off after screen saver delay time has expired. When you set the screen saver to Light & Text, the display light and the text are turned off.

The screen saver mode is not affected by a preset or by a power cycle. If you are leaving the display unchanged for long periods of time, set the mode to light & text; this prevents text burn-in on the signal generator's display.

Screen Saver Off On

Supported   All Models

This softkey selects the screen saver mode.

Off   With the screen saver off, the display remains on indefinitely.

On   With the screen saver on, the display is turned off after a specified time interval
                       when no input from the front panel has occurred. The display will turn back on
                       when any front panel signal generator key is pressed

The screen saver mode is not affected by a preset or by a power cycle.

Security

Supported   All Models

This softkey accesses a menu of security functions that enable you to protect and remove classified
proprietary information stored or displayed in the instrument. For more information about these
security functions, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Security Level

Supported   All Models

This softkey selects the secure mode and enables you to select a level of security. The **Enter Secure Mode**
softkey must be selected and set to **Confirm** to activate the selected security level. Power must be
cycled to perform selected cleaning operations. Selecting **None** will preset the signal generator to the
factory state. For other cleaning operation descriptions, see **Erase**, **Overwrite**, and **Sanitize**. You must press
Enter Secure Mode > **Confirm** to activate the selected security level. For more information about security
functions, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Preset   None

Range   N/A

Seed

Supported   E8267D with Option 601 or 602

Use this softkey to enter the initial value for the pseudorandom bit sequence.

Segment Advance

Supported   E8267D with Option 601 or 602

This softkey sets segment advance as the dual ARB player trigger mode. The segment advance mode
controls the way the signal generator plays segments within a sequence. This includes determining
whether a segment plays once or continuously, and when the sequence advances to the next segment.
To set these parameters, use the softkeys located in the Seg Advance Mode menu.

The first segment in the sequence starts to play after the signal generator receives an initial trigger.
Subsequent triggers cause the next segment in a sequence to play. If a segment is playing when the
trigger is received, the current segment completes playing before the sequence advances to the next
segment.

When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide.*

Select

Supported   E8267D with Option 601 or 602

This softkey appears in two different locations: the Filter menu and the Modulation Type menu. In the Filter menu, you can select a pre-modulation filter type; in the Modulation type menu, you can select a modulation.

Selecting a Filter

In the Filter menu, use this softkey to access a menu for selecting the pre-modulation filter type. You can choose from root Nyquist, Nyquist, Gaussian, Rectangle, APCO 25 C4FM, and UN3/4 GSM Gaussian (for backward compatibility with previous models of signal generator). In addition to the pre-defined filters, you can access the catalog of files stored in the signal generator memory. You can select any filter that you have either created externally and downloaded into memory, or that you have created internally in the Define User finite impulse response (FIR) menu and then stored.

The selected filter type is displayed under the **Select** softkey.

Preset   Root Nyquist

Selecting a Modulation

In the Modulation Type menu, use this softkey to access a menu for defining modulation types. In addition to the pre-defined modulations, you can access a catalog of FSK or I/Q files and select a modulation previously created and stored in either the Define User FSK or Define User I/Q menu.

The selected modulation type is displayed under the **Select** softkey.

Preset   p/4 DQPSK

Select/Deselect All

Supported   All Models

This softkey is provided for self-test diagnostics. Refer to the Troubleshooting chapter of the *E8257D/67D, E8663D PSG Signal Generators Service Guide.*

NOTE   This key is intended for use by service personnel.

Select/Deselect Test

Supported   All Models

This softkey is provided for self-test diagnostics. Refer to the Troubleshooting chapter of the *E8257D/67D, E8663D PSG Signal Generators Service Guide.*

NOTE   This key is intended for use by service personnel.

Select File

Supported   E8267D with Option 601 or 602

Use this softkey to select a file in the displayed catalog of files. If you select a custom file as a data pattern for modulated transmissions, UserFile appears in the Data field of the text display. If you select a custom file as the modulation type, UserFile appears in the Mod Type field of the text display. **Select File** is located in each of the catalogs of files.

Select Reg

Supported   All Models

Use this softkey to select a specific register to be highlighted in the list of saved states. If you use the front panel knob, each state is automatically activated as you pass over it.

Select Reg:

Supported   All Models

This softkey enables you to select a register for all softkeys that specify a register in this menu. For example, if you want to select register 5, press **Select Reg:**. The currently selected register is displayed in the active entry area. Change the number to 5 and press the **Select Reg** terminator softkey. Register 5 is now displayed in all softkeys which specify a register in this menu.

You can also use this softkey to select a register and save the current instrument state to that register. For example, if you want to select and save to register 6, press **Select Reg:**. The currently selected register is displayed in the active entry area. Change the number to 6 and press the **Save Reg** terminator softkey. Register 6 is now displayed in all softkeys which specify a register in this menu and the current instrument state has been saved to register 6.

This setting is not affected by a preset or by a power cycle.

Range   00–99

Select Scenario

Supported   E8267D Option 409

Use this softkey to select the currently highlighted scenario file.

Select Seq

Supported   All Models

This softkey enables you to select a sequence for all softkeys which specify a sequence in this menu. For example, if you want to select sequence 4, press **Select Seq:**. The currently selected sequence is displayed in the active entry area. Change the number to 4 and press the **Enter** terminator softkey. Sequence 4 is now displayed in all softkeys that specify a sequence in this menu.

This setting is not affected by a preset or by a power cycle.

Range   0–9

Select Waveform

Supported   E8267D with Option 601 or 602

This softkey enables you to select the type of waveform for the arbitrary waveform generator to play. If there are no waveforms or sequences, this softkey selects None.

Preset   None

Self Test

Supported   All Models

This softkey accesses an automatic, internal diagnostic test that checks for detectable hardware failures. If there are hardware failures in the signal generator, refer to the Troubleshooting chapter of the *E8257D/67D, E8663D PSG Signal Generators Service Guide*.

NOTE	This key is intended for use by service personnel for troubleshooting or by the user as part of an operation verification.

Seq

Supported   All Models

Press this softkey to set the current catalog type to Seq and display the catalog of sequence files.

Serial

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey enables serial data transmission through the N5102A module.

Set ALC Level

Supported   All Models

This softkey enables you to change the ALC level. The output power is the ALC level minus the attenuator setting.

This key is active only when you have toggled the **Atten Hold Off On** key to On.

Preset   −20.00 dBm

Range   −20.00 dBm to 25.00 dBm

Set Atten

Supported   All with Option 1E1

This softkey enables you to set the attenuation level when the attenuator hold is active. For the E8267D, the attenuation is set in increments of 5 dB. For the E8257D/E8663D with Option 1E1, the progression is 0, 5, 15, 25 and continues in 10 dB increments. The output power is the ALC level minus the attenuator setting.

This key is active only when you have toggled the **Atten Hold Off On** key to On.

Preset	115.00 dB
Range	0.00 dB–115.00 dB

Set Date

Supported   All Models

This softkey is used to set the date of the display clock. Enter the date in the year-month-day (YYYYMMDD) format and terminate the entry by pressing the **Enter** softkey.

Set Markers

Supported   E8267D with Option 601 or 602

This softkey accesses a menu that lets you configure waveform markers for waveform segments. The PSG provides four markers that work independently of each other. Each marker routes an output dual signal to the rear-panel event connector number (EVENT 1, EVENT 2, EVENT 3, or EVENT 4) that corresponds to the marker number. A marker consists of marker points placed at defined sample points in a waveform segment. This means that a marker point cannot be less than one or greater than the last sample point in the waveform. For more information on markers and the rear panel connectors, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

In the Dual ARB

The waveform segment is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey. To configure markers on a waveform, the waveform file must reside in volatile (WFM1) memory. For instructions on loading waveform files from non-volatile memory (NVWFM), refer to the **Load Store** *softkey, available in the dual ARB mode, and the E8257D/67D, E8663D PSG Signal Generators User's Guide.*

In All Other ARB Formats

This softkey is greyed out unless the ARB format is on. When it is available, the waveform segment is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

Set Marker Off All Points

Supported   E8267D with Option 601 or 602

This softkey clears all marker points on the waveform for the active marker. To clear a single marker point or a range of marker points, use the **Set Marker off Range Of Points** softkey. To select the active marker, use the **Marker 1 2 3 4** softkey. For more information on markers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

In the Dual ARB

The waveform segment is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

In All Other ARB Formats

This softkey is not available unless the ARB format is on. When it is available, the waveform is the

waveform highlighted in the Set Markers display.

Set Marker Off Range Of Points

Supported   E8267D with Option 601 or 602

This softkey accesses a menu that lets you remove either a single marker point or a range of marker points on a waveform segment for the active marker. Using keys in the menu, you can select any points previously placed on the waveform by designating the first and last points in a range of points. To clear a single marker point, enter the same value for the first and last marker points.While you can use the range method to clear all marker points on the waveform, it is faster to use the **Set Marker Off All Points** softkey. For more information on markers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

In the Dual ARB

The waveform segment is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

In All Other ARB Formats

This softkey is not available unless the ARB format is on. When it is available, the waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

Set Marker On First Point

Supported   E8267D with Option 601 or 602

This softkey sets a marker point on the first sample point of the selected waveform for the active marker. For waveforms generated on the signal generator, the PSG automatically places a marker point at the first waveform sample point for markers 1 and 2. For downloaded waveform files without markers, the PSG creates a default marker file, but does not set any marker points. To select the active marker, use the **Marker 1 2 3 4** softkey. For more information on markers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*, and for information on downloading files, see the *Agilent Signal Generators Programming Guide*.

In the Dual ARB

The waveform segment is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

In All Other ARB Formats

This softkey is not available unless the ARB format is on. When it is available, the waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

Set Marker On Range Of Points

Supported   E8267D with Option 601 or 602

This softkey accesses a menu that lets you set either a single marker point or a range of marker points on a waveform segment for the active marker. For waveforms generated on the signal generator, the PSG automatically places a marker point at the first waveform sample point for

markers 1 and 2. For downloaded waveform files without markers, the PSG creates a default marker file, but does not set any marker points. To select the active marker, use the **Marker 1 2 3 4** softkey. For more information on markers, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*, and for information on downloading files, see the *Agilent Signal Generators Programming Guide*.

Marker points are cumulative, so setting multiple marker point ranges with different range values without first clearing the existing points places additional marker points on the waveform. Because of this cumulative behavior, it is a good practice to clear existing marker points prior to setting new points. This eliminates unexpected marker pulses. See **Set Marker Off All Points**, page 180 and **Set Marker Off Range Of Points**, page 181 for information on removing marker points.

NOTE	You can set markers for either positive or negative polarity. The following discussion assumes positive marker polarity. When using negative marker polarity, the marker pulses occur during the periods of no marker points.

There are three ways to place marker points using range values:

- consecutive marker points over a range that collectively create a single marker pulse that spans the range

- equally spaced marker points over a range, so that a marker pulse occurs at each sample point that coincides with a marker point (Using this method, you can configure a clock signal by setting the **# Skipped Points** softkey to one.)

- a single marker point placed at a specific sample point on the waveform, which outputs a single pulse relative to the marker point location (To configure a single marker point, set the first and last
range points to the same number.)

In the Dual ARB

The waveform segment is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

In All Other ARB Formats

This softkey is not available unless the ARB format is on. When it is available, the waveform is the waveform highlighted in the `Catalog of WFM1 Files` which is accessed from the **Set Markers** softkey.

Set Time

Supported   All Models

This softkey is used to set the time of the display clock in the 24 hour format. Enter the hour values (00–23), minute and seconds values (00–59), and terminate the entry by pressing the **Enter** softkey.

Setup Select

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu of modulation types that are available for modulating the carrier. This softkey is only available when the **Multicarrier Off On** softkey is toggled to Off.

Preset   NADC

Shape

Supported   E8267D with Option 601 or 602

This softkey enables you to specify that only signal generator shape files be listed in the catalog of files.

Show Waveform Sequence Contents

Supported   E8267D with Option 601 or 602

This softkey displays the contents of the selected waveform sequence in a table format. The content information displayed is a list of the waveforms and corresponding repetitions for that sequence. This softkey is only active when a sequence is highlighted.

SigGen Dig Bus

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, selects a loop back test that verifies the output capability of the PSG Digital Bus connector. This test requires the use of the DIG BUS LOOP BACK FIXTURE (supplied with the N5102A module). This is the factory preset loop back test selection. To run the test, see "Run Loop Back Test" on page 171.

Signal Polarity Setup

Supported   E8267D with Option 601 or 602

This softkey accesses a menu of external signals and choices for selecting the polarity of those signals.

Signal Type IQ IF

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, is applicable for only the output direction with parallel and parallel interleaved data transmissions. The signal type softkey enables you to select the digital signal type for the output of the N5102A module. For a serial port configuration and input mode, this softkey is grayed out (inactive) and IQ shows as the signal type.

IQ	The output of the N5102A module is digital IQ data, which is applicable to both parallel/parallel interleaved and serial port configurations.
IF	The digital I and Q samples are combined and modulated on an intermediate frequency (IF) carrier. The frequency of the IF (the center frequency of the modulated IF signal) is set to one-fourth of the sample rate (for example, for a 400 MHz clock rate, the IF is 100 MHz). This is available for only the output direction with parallel and parallel interleaved data transmissions.
Preset	IQ

Sine

Supported   All Models

This softkey appears in two different locations, enabling you to either select a sine burst shape, or specify sine as a modulation waveform.

Selecting Sine as a Burst Shape

Use this softkey to specify sine for the timeslot burst shape. Sine, as it is modified by the default burst rise and fall values, is the default burst shape.

Specifying Sine as a Modulation Waveform

This softkey enables you to specify sine as the modulation waveform for the internally generated, ac-coupled signal.

The selected waveform applies only to the path configuration you have currently selected.

Single

Supported   E8267D with Option 601 or 602

This softkey sets the signal generator to play a waveform or output a data pattern only once after receiving a trigger. The softkey appears in multiple menus with some differences in behavior as described in the following subsections.

In the Trigger Menu (ARB Formats)

This softkey selects the single trigger mode, which sets up a waveform to play once after receiving a trigger. In addition to selecting the mode, you can also configure the waveform's response to triggers using the selections found by pressing the **Retrigger Mode** softkey. The response parameters determine whether the waveform accepts a trigger during playback or not, and if it does, how it responds to that trigger.

In the Pattern Trigger Menu (Real-Time Custom)

This softkey selects the single trigger mode, which sets up a waveform to play once after receiving a trigger. Unlike the single mode selection in the ARB formats, there are no further settings for the single triggering mode.

In the Seg Advance Mode Menu (Dual ARB Player)

The **Single** softkey is one of two waveform response selections while using the segment advance trigger mode. Its selection provides the following waveform responses to triggers:

- After receiving the first trigger, the first segment plays to completion.
- When the waveform receives a trigger after a segment completes, the sequence advances to the next segment and plays that segment to completion.
- When the waveform receives a trigger during play, the current segment plays to completion. Then the sequence advances to the next segment, and it plays to completion.
- When the waveform receives a trigger either during or after the last segment in a sequence plays, the sequence resets and the first segment plays to completion.

When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Single Sweep

Supported   All Models

Use this softkey to set up the signal generator to perform a single sweep operation. The signal generator will begin the sweep as soon as the sweep trigger is received. When single sweep is selected, the signal generator sets the power and the frequency on the first or starting point of the sweep. If the sweep trigger was set to **Free Run**, a sweep is initiated immediately. In the Sweep/List menu this softkey is active when Freq, Ampl or Freq & Amp are the sweep types and disabled when Sweep is set to Off.

The ARMED annunciator appears in the display, unless the sweep trigger is set to **Free Run**

Slave

Supported   All with Option 007

Use this softkey to select the signal generator as the slave in a dual-signal generator ramp sweep setup. In slave mode, this signal generator responds to the triggering parameters provided by the master signal generator in a dual-signal generator ramp sweep setup. However, you must set the slave signal generator triggering to continuous.

Sockets SCPI Off On

Supported   All Models

This softkey turns the socket port based SCPI service on or off. A socket port is an endpoint in a connection and is a method, using function calls (SCPI commands), of communicating over a network. The PSG provides two socket ports:

- 5023 for user input over a telnet connection
- 5025 for automated communications

To enable or disable the service, press this softkey and then press **Proceed With Reconfiguration** > **Confirm Change**. The signal generator reboots to complete the process. The sockets SCPI service state, off or on, survives a preset or system reboot.

Software Options

Supported   All Models

This softkey accesses a menu from which you can configure your signal generator to enable any software option that you have purchased. Software options are linked to specific optional hardware that must first be installed before the software option can be used. Adding new software options requires the use of a license key that is provided by Agilent Technologies at the time of purchase.

Do not modify the license key for enabled software options: you will disable the option.

NOTE   If a previously installed software option becomes disabled, verify the following three items:

- the optional hardware is present/installed.
- the hardware option is enabled.
- the software option is enabled with the correct license key.

Refer to your License Key Certificate for the correct license key or, if the option was

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installed by Agilent Technologies, contact your local service office and tell them the instrument's model number, the host ID number, and the software option that should be enabled

Source Settled Polarity

Supported   All models

Use this softkey to select a normal or inverted output for a source settled output.

Normal   The source settled output is asserted low (0.0V) when the source is settled to a new frequency or power level, and is asserted high (5.0V) when the source is not settled.

Inverted   The source settled output is asserted high (5.0V) when the source is settled to a new frequency or power level, and is asserted low (0.0V) when the source is not settled. (default)

Source Module

Supported   All Models

Use this softkey to select an external source module for leveling control.

Source Module Off On

Supported   All Models

Use this softkey to toggle the state of the external source module. Turning the source module on automatically selects **Source Module** as the leveling mode.

Preset   Off

Span Type User Full

Supported   All Models

This softkey enables you to select the frequency range for a span power search. You can specify the range by selecting **User**, or you can select the full range of the signal generator by selecting **Full**.

Square

Supported   All with Option UNT

This softkey enables you specify a square wave as the modulating waveform. In the LF Out menu, this softkey is available after selecting the internal source to operate as a function generator. The modulation applies only to the path configuration you have selected

Start Frequency

In the I/Q Calibration Menu:

Supported   All Models

Use this softkey to set the start frequency for an I/Q calibration.

You can select a portion of the frequency range for an I/Q calibration by setting the **Calibration Type User Full** softkey to User and entering new start and stop frequencies.

This softkey is automatically set to the minimum specified frequency of the signal generator if you have set the **Calibration Type User Full** softkey to Full. If you toggle back to User from the Full setting, the User value for **Start Frequency** will be restored.

This softkey is grayed out (not available) until the calibration type is set to User, and its setting is not affected by an instrument preset or by a power cycle.

Preset   N/A

Range   100 kHz‑stop frequency setting (up to maximum frequency of instrument)

In the Power Search Menu:

Supported   All Models

This softkey sets the start frequency for a span power search over a user specified range.

Step

Supported   All with Option 007

Use this softkey to select Step as the sweep type.

Step Dwell

Supported   All Models

This softkey enables you to set the dwell time for each point of a step sweep. The dwell time is the amount of time the sweep is guaranteed to pause after setting the frequency and power for the current sweep/list point.

Dwell time is used when the point trigger is set to **Free Run**.

Preset   2.0 ms

Range   1.0 ms–60.0 s (in 1.0 ms increments)

Step/Knob Ratio

Supported   All Models

This softkey enables you to set the ratio between the increment value of the step keys and the front panel knob. For example, make frequency the active function and then set the increment value for frequency to 1.0 MHz and the step/knob ratio to 10/1. The up and down arrow keys will change the frequency in 1.0 MHz steps and the front panel knob will change the frequency by 100kHz (1/10th of increment value).

When you press **Step/Knob Ratio** the number displayed in the active entry area represents the arrow keys step size in the ratio. To enter a new value, rotate the front panel knob until the desired value is displayed, use the up and down arrow keys, or enter the value using the numeric keypad and press the **Enter** terminator key.

This ratio applies only when you have an active function that has an associated increment value. The step/knob ratio is not affected by a preset or by a power cycle.

Range   1–10,000

Stop Frequency

In the I/Q Calibration Menu:

Supported   All Models

Use this softkey to set the stop frequency for an I/Q calibration.

You can select a portion of the frequency range for an I/Q calibration by setting the **Calibration Type User Full** softkey to User and entering new start and stop frequencies. This softkey is automatically set to the maximum specified frequency of the signal generator if you have set the **Calibration Type User Full** softkey to Full. If you toggle back to User from the Full setting, the User value for **Stop Frequency** will be restored.

This softkey is grayed out (disabled) until the calibration type is set to User, and its setting is not affected by an instrument preset or by a power cycle.

Preset   N/A

Range   Current start frequency setting to the maximum frequency of instrument

In the Power Search Menu:

Supported   All Models

This softkey sets the stop frequency for a span power search over a user-specified range.

Preset   N/A

Range   N/A

Store All To NVWFM Memory

Supported   E8267D with Option 601 or 602

This softkey enables you to store all of the files from waveform memory (WFM1) to non-volatile waveform memory (NVWFM).

Store Custom Dig Mod State

Supported   E8267D with Option 601 or 602

This softkey accesses a menu that enables you to store the current custom digital modulation state into a user-defined file. To recall a custom state from the memory, use the **Custom Digital Mod State** softkey. This softkey is available only when **Multicarrier Off On** is toggled to Off.

This softkey stores the following signal generator state information to the memory catalog:

* filter information
* symbol rate
* modulation type
* frequency shift keying (FSK) deviation

Store Ref Osc Setting

Supported   All Models

This softkey enables you to store the current coarse and fine reference oscillator adjustment settings. Refer to the calibration guide for more information.

NOTE   This adjustment is intended for use by service personnel.

Store Segment To NVWFM Memory

Supported   E8267D with Option 601 or 602

This softkey enables you to store the selected segment from waveform memory (WFM1) to non-volatile waveform memory (NVWFM).

Store To File

Supported   All Models

Use this softkey to store the current data to a file in the internal non-volatile memory for later recall and use. The file name can consist of up to 23 alpha-numeric and special characters.

NOTE   File names are limited to 23 characters.

Subnet Mask

Supported   All Models

This softkey is used to configure the LAN subnet mask. Your IT service department can define a subnet mask for the signal generator.

Summing Ratio (SRC1/SRC2) x.xx dB

Supported   All Models

This softkey enables you to set the power level difference (ratio) between the source one and the source two signals when the two signals are summed. A positive ratio value reduces the amplitude for source two, while a negative ratio value reduces the amplitude for source one.

The range for the summing ratio depends on the modulator attenuator setting for the signal generator that is summing the signals. The minimum range is achieved when the modulator attenuator setting is zero, and the maximum range is reached when the maximum attenuator value is used. The range can be calculated using the formula: ± Range = 50 dB + Modulator Attenuation.

When an arbitrary waveform generator (ARB) modulation format is active, the modulator attenuator is set using the **Modulator Atten Manual Auto** softkey. This softkey in the Mux menu is grayed out when an ARB format is active. See **Modulator Atten (nnn dB) Manual Auto**, page 130 for more information.

Preset   0.00 dB

Range   *Min*: ± 50 dB   *Max*: ± 90 dB

Swap IQ Off On

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, enables and disables the IQ swap feature. When this feature is on, the I data is available on the Q data bus and the Q data is available on the I data bus.

Preset   Off

Sweep

Supported   All Models

This softkey accesses a menu that enables you to configure the sweep parameters. In this menu you can choose to sweep frequency only, amplitude only, or both frequency and amplitude. You can also choose to turn off all sweep functions.

Preset   Off

Sweep Direction Down Up

Supported   All Models

This softkey is active for list or step sweeps and disabled for ramp sweep (Option 007). The softkey enables you to change the direction of a list or step sweep.

Down   Sweeps from the last point in the list sweep to the first point, or from the step sweep stop frequency and amplitude to the start frequency and amplitude.

Up   Choose Up to sweep from the first point in the list sweep to the last point, or from the step sweep start frequency and amplitude to the stop frequency and amplitude.

Preset   Up

Sweep/List

Supported   All Models

Use this hardkey to access a menu of softkeys that enable you to configure step, list, and ramp (Option 007) sweeps.

Sweep Repeat Single Cont

Supported   All Models

This softkey toggles the sweep repetition between single sweep and continuous sweep types. The sweep and point triggers will then trigger the sweep.

Single   Choose Single to configure the instrument to perform a single sweep upon triggering.

Cont   Choose Cont to configure the instrument to perform a continuous sweep loop upon triggering.

Preset   Cont

Sweep Retrace Off On

Supported   All Models

This softkey enables or disables a sweep retrace. When set to On, the signal generator, upon completion of a sweep, will reset the sweep to the first sweep point. When set to Off, the signal generator, upon completion of a sweep, will not retrace the sweep but remain on the last sweep point.

On   At completion of the sweep, the sweep retraces and stops at the first sweep point.

Off   The sweep does not retrace but remains on the last sweep point.

Preset   On

Sweep Time Manual Auto

Supported   All with Option 007

Use this softkey to set the sweep time mode for a ramp sweep.

The sweep time is the duration of the sweep from the start frequency to the stop frequency. It does not include the bandcross time that occurs during a sweep or the retrace time that occurs between sweep repetitions.

Manual   This choice enables you to manually set the sweep time for a ramp sweep. The sweep time cannot be set to a value faster than what the automatic mode provides.

Auto   This choice enables the signal generator to automatically calculate and set the fastest allowable sweep time.

Preset   Auto

Range   13 ms–99 s

Sweep Trigger

Supported   All Models

Use this softkey to access a menu from which you can select a triggering mode for a full sweep. You can select from the following choices: Free Run, Bus (software triggering), Trigger Key (used with the front-panel trigger hardkey), or Ext (for using a TTL-level signal supplied to the TRIGGER IN connector).

Free Run   The source will continue sweeping without waiting for a trigger signal. For the point trigger, the sweep pauses for the dwell time.

Trigger Key   The source will sweep after the front-panel **Trigger** hardkey is pressed.

Bus   The GPIB or LAN interface is used to trigger the source for a sweep.

Ext   An external trigger, applied to the TRIGGER IN connector, triggers an event. For pattern or frame triggering, the trigger is applied to the PATTERN TRIG IN connector. You can configure the signal generator to respond to a positive (rising edge) or negative (falling edge) TTL signal at the TRIGGER IN or PATTERN TRIG IN connector using the **Trigger In Polarity Neg Pos** softkey.

Preset   Free Run

Sweep Type

Supported   All Models

This softkey accesses a menu that enables you select between the following sweep types:

Ramp   You can create a ramp sweep by supplying the frequency, amplitude, and sweep
                    time for the sweep. (Option 007 only).

List   You can create a list sweep by supplying the frequency, amplitude, and dwell time
                    for each point in the sweep.

Step   You can create a step sweep by supplying the start and stop frequency and
                    amplitude, the number of points, and a dwell time. The signal generator then
                    calculates the points between the first and last point in a linear manner.

Preset   Ramp

Sweep Type List Step

Supported   E8257D/67D, E8663D without Option 007

This softkey toggles the sweep type between list sweep and step sweep.

List   You can create a list sweep by supplying the frequency, amplitude, and dwell time
                    for each point in the sweep.

Step   You can create a step sweep by supplying the start and stop frequency and
                    amplitude, the number of points, and a dwell time. The signal generator then
                    calculates the points between the first and last point in a linear manner.

Swept-Sine

Supported   All Models

This softkey selects a swept-sine wave for the modulation waveform. A menu of choices for setting
the parameters is also available with this softkey. The menu selections are dependent on the
modulation format.

The signal generator can be configured to respond to either a positive or negative edge polarity at the
TRIGGER IN or PATTERN TRIG IN connector.

In the LF Out menu this softkey is available after selecting the internal source to operate as a
function generator. The signal polarity at the TRIGGER OUT connector can be set to either a positive
or negative edge.

Symbol Rate

This softkey appears in different locations.

As a menu

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu from which you can set a new transmission symbol rate or restore
the default symbol rate.

As a Setting

Supported   E8267D with Option 601 or 602

Use this softkey to set a new transmission symbol rate value. If the data pattern is FIX4, the frequency of the signal generated by the signal generator will be scaled to 1/8 of the displayed symbol rate. For all other random data patterns the displayed symbol rate is shown with no scaling applied.

The current symbol rate is displayed under the **Symbol Rate** setting softkey.

Preset   24.300 ksps

Range   *Arb Custom:* 1.000 ksps-50.000000 Msps
Real Time Custom: 45.000 sps-50.000000 Msps

Symbol Sync Out Polarity Neg Pos

Supported   E8267D with Option 601 or 602

This softkey is used to configure the polarity of the TTL signal at the SYM SYNC OUT pin of the AUXILIARY I/O connector.

Neg   Selecting Neg sets the active level at 0 volts.

Pos   Selecting Pos sets the active level at +5 volts.

Symbol Sync Polarity Neg Pos

Supported   E8267D with Option 601 or 602

This softkey is used to configure the polarity of the TTL signal at the SYMBOL SYNC connector.

Neg   Selecting Neg sets the active level 0 volts.

Pos   Selecting Pos sets the active level +5 volts.

Preset   Pos

Sync Out

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu of choices for outputting a 1-bit synchronization signal to the EVENT 1 rear panel connector. You can set the synchronization signal to occur at various points, relative to the selected data pattern.

Preset   Begin Pattern

Sync Out Offset

Supported   This softkey is inactive at this time

T

TETRA

Supported   E8267D with Option 601 or 602

Use this softkey to select a predefined Trans European Trunked Radio (TETRA) personality for the digital modulation format.

TETRA Bands

Supported   All Models

Use this softkey to access a menu from which you can select the frequency bands for TETRA. The output frequency depends on both frequency band and channel selections.

TETRA Base 390/400

Supported   All Models

This softkey selects Base 390–400 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset	*Channel*: 3600
	Frequency: 390.000 MHz
Range	*Channels*: 3600–4000
	Frequency: 390.000–400.000 MHz

TETRA Base 420/430

Supported   All Models

This softkey selects Base 420-430 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset	*Channel*: 800
	Frequency: 420.000 MHz
Range	*Channels*: 800–1200
	Frequency: 420.000–430.000 MHz

TETRA Base 460/470

Supported   All Models

This softkey selects Base 460-470 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset	*Channel*: 2400
	Frequency: 460.000 MHz
Range	*Channels*: 2400–2800

Frequency: 460.000–470.000 MHz

TETRA Base 915/921

Supported   All Models

This softkey selects Base 915-921 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 600

                    Frequency: 915.000 MHz

Range   *Channels*: 600–840

                    Frequency: 915.000–921.000 MHz

TETRA Mobile 380/390

Supported   All Models

This softkey selects Mobile 380–390 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 3600

                    Frequency: 380.000 MHz

Range   *Channels*: 3600–4000

                    Frequency: 380.000–390.000 MHz

TETRA Mobile 410/420

Supported   All Models

This softkey selects Mobile 410-420 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 800

                    Frequency: 410.000 MHz

Range   *Channels*: 800–1200

                    Frequency: 410.000–420.000 MHz

TETRA Mobile 450/460

Supported   All Models

This softkey selects Mobile 450-460 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 2400

                    Frequency: 450.000 MHz

Range   *Channels*: 2400–2800

Frequency: 450.000–460.000 MHz

TETRA Mobile 870/876

Supported   All Models

This softkey selects Mobile 870–876 as the frequency band for TETRA. The output frequency depends on both frequency band and channel selections.

Preset   *Channel*: 600

                    Frequency: 870.000 MHz

Range   *Channels*: 600–840

                    Frequency: 870.000–876.000 MHz

Through

Supported   E8267D

Use this softkey to enable a path selection that bypasses all filters. This is useful for using external filters at frequencies different to those supplied internally.

Time/Date

Supported   All Models

This softkey to opens a menu from which you can set the time and date functions of the clock display.

Time/Date Off On

Supported   All Models

Use this softkey to set the state of the display clock.

Off   When you select Off, the display clock is off.

On   When you select On, the display clock is turned on.

Preset   Off

Toggle Marker 1

Supported   E8267D with Option 601 or 602

This softkey enables or disables marker 1 for the selected segment in a waveform sequence. When enabled, the segment uses the marker 1 settings configured for that segment in the Set Markers menu.

The PSG enables all markers for the segments in the first waveform sequence built since the last signal generator power on. Subsequent sequences carry over the segment marker settings from the last segment in the previous sequence. To change the current marker 1 setting for the selected waveform segment, press this softkey. This also sets or removes the numeric 1 from the Mkr column in the waveform list. If enabled, a numeric 1, corresponding to marker 1, appears in the Mkr column on the right side of the waveform list. If disabled, the numeric 1 is removed from the Mkr column,

making marker 1 inactive (disabled). For more information on setting marker points for a waveform segment and then enabling the maker within a sequence, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

NOTE   Ensure that marker routings and polarities are correct for each waveform sequence. Marker information is unspecified if not declared for a waveform sequence file, and all files, whether created on or downloaded to the signal generator, have unspecified marker/header settings until you configure and save the marker information in the file header. When unspecified, the waveform uses the previous waveform's settings. Incorrect settings can create a condition where there is no RF output.

To view marker routing information for a selected waveform sequence, use the Header Utilities softkey.

Toggle Marker 2

Supported   E8267D with Option 601 or 602

This softkey enables or disables marker 2 for the selected segment in a waveform sequence. When enabled, the segment uses the marker 2 settings configured for that segment in the Set Markers menu.

The PSG enables all markers for the segments in the first waveform sequence built since the last signal generator power on. Subsequent sequences carry over the segment marker settings from the last segment in the previous sequence. To change the current marker 2 setting for the selected waveform segment, press this softkey. This also sets or removes the numeric 2 from the Mkr column in the waveform list. If enabled, a numeric 2, corresponding to marker 2, appears in the Mkr column on the right side of the waveform list. If disabled, the numeric 2 is removed from the Mkr column, making marker 2 inactive (disabled). For more information on setting marker points for a waveform segment and then enabling the maker within a sequence, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

NOTE   Ensure that marker routings and polarities are correct for each waveform sequence. Marker information is unspecified if not declared for a waveform sequence file, and all files, whether created on or downloaded to the signal generator, have unspecified marker/header settings until you configure and save the marker information in the file header. When unspecified, the waveform uses the previous waveform's settings. Incorrect settings can create a condition where there is no RF output.

To view marker routing information for a selected waveform sequence, use the Header Utilities softkey.

Toggle Marker 3

Supported   E8267D with Option 601 or 602

This softkey enables or disables marker 3 for the selected segment in a waveform sequence. When enabled, the segment uses the marker 3 settings configured for that segment in the Set Markers menu.

The PSG enables all markers for the segments in the first waveform sequence built since the last signal generator power on. Subsequent sequences carry over the segment marker settings from the

last segment in the previous sequence. To change the current marker 3 setting for the selected waveform segment, press this softkey. This also sets or removes the numeric 3 from the Mkr column in the waveform list. If enabled, a numeric 3, corresponding to marker 3, appears in the Mkr column on the right side of the waveform list. If disabled, the numeric 3 is removed from the Mkr column, making marker 3 inactive (disabled). For more information on setting marker points for a waveform segment and then enabling the maker within a sequence, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

NOTE	Ensure that marker routings and polarities are correct for each waveform sequence. Marker information is unspecified if not declared for a waveform sequence file, and all files, whether created on or downloaded to the signal generator, have unspecified marker/header settings until you configure and save the marker information in the file header. When unspecified, the waveform uses the previous waveform's settings. Incorrect settings can create a condition where there is no RF output.
	To view marker routing information for a selected waveform sequence, use the Header Utilities softkey.

Toggle Marker 4

Supported   E8267D with Option 601 or 602

This softkey enables or disables marker 4 for the selected segment in a waveform sequence. When enabled, the segment uses the marker 4 settings configured for that segment in the Set Markers menu.

The PSG enables all markers for the segments in the first waveform sequence built since the last signal generator power on. Subsequent sequences carry over the segment marker settings from the last segment in the previous sequence. To change the current marker 4 setting for the selected waveform segment, press this softkey. This also sets or removes the numeric 4 from the Mkr column in the waveform list. If enabled, a numeric 4, corresponding to marker 4, appears in the Mkr column on the right side of the waveform list. If disabled, the numeric 4 is removed from the Mkr column, making marker 4 inactive (disabled). For more information on setting mark *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

NOTE	Ensure that marker routings and polarities are correct for each waveform sequence. Marker information is unspecified if not declared for a waveform sequence file, and all files, whether created on or downloaded to the signal generator, have unspecified marker/header settings until you configure and save the marker information in the file header. When unspecified, the waveform uses the previous waveform's settings. Incorrect settings can create a condition where there is no RF output.
	To view marker routing information for a selected waveform sequence, use the Header Utilities softkey.

Toggle State

Supported   E8267D with Option 601 or 602

In the multitone editor, this key enables you to turn the individually selected tone on and off. This determines whether or not a particular tone is generated.

Triangle

Supported   All with Option UNT

This softkey selects a triangle wave as the modulation. In the LF Out menu this softkey is available after selecting the internal source to operate as a function generator. The modulation applies only to the path configuration you have currently selected.

Trigger

Supported   E8267D with Option 601 or 602

Trigger softkey

Use this softkey to access menus from which you can select and configure signal generator trigger modes:

- **Continuous**,
- **Single**,
- **Gated**,
- **Segment Advance**, (available for the Dual ARB only)

Trigger hardkey

Pressing this hardkey immediately initiates one of the following events when it is the current trigger source selection:

- A ramp (Option 007), step or list sweep

- A point to point list or step sweep

- A swept-sine waveform for AM, FM, and ΦM (requires Option UNT)

- A swept-sine waveform for LF Output

- A waveform using the ARB formats or real-time custom (Option 601 or 602)

The **Trigger** hardkey has auto-repeat capability. Holding the key down repeatedly triggers the waveform. When the PSG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Trigger & Run

Supported   E8267D with Option 601 or 602

This softkey is one of the continuous trigger mode waveform response selections found in the Continuous Mode menu. This response selection causes the waveform to wait for a trigger. After receiving the initial trigger, the waveform plays continuously and ignores all subsequent triggers. The signal generator plays the waveform or transmits the data pattern until you turn off the modulation format, change triggers, or select another waveform for an ARB format or another data pattern for the Real Time I/Q Baseband format (real-time custom). For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Trigger In Polarity Neg Pos

Supported   All Models

This softkey toggles the polarity of the TTL trigger signal at the TRIGGER IN connector and is active when the sweep trigger is set to Ext.

Pos   The swept-sine sweep will start on the rising edge of the trigger signal and stop with the falling edge of the trigger signal.

Neg   The swept-sine sweep will start on the falling edge of the trigger signal and stop with the rising edge of the trigger signal.

This key is used in the swept-sine FM, ΦM, and LF Out, and the Sweep/List menus. When the polarity is changed in any one of these menus, it is changed in all the menus. In the LF Out menu, this key appears after first selecting the internal source to operate as a function generator and then selecting Ext as the LF Out sweep trigger.

Preset   Pos

Trigger Key

Supported   All Models

This softkey selects the front-panel **Trigger** hardkey as the trigger source. After making this selection, press the **Trigger** hardkey to trigger a waveform. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide.*

Trigger Out Polarity Neg Pos

Supported   All Models

This softkey toggles the polarity of the TTL signal at the rear panel TRIGGER OUT connector.

Pos   The trigger out signal is asserted high (+5.0 V) at the start of the swept-sine modulation sweep and low (0.0 V) when the sweep is concluded.

Neg   The trigger out signal is low (0.0V) at the start of the swept-sine modulation sweep and high (5.0V) when the sweep ends.

This key is used in the swept-sine FM, ΦM, and LF Out, and the Sweep/List menus. When the polarity is changed in any one of these menus, it is changed in all the menus.

In the LF Out menu this key is available after selecting the internal source to operate as Function Generator 1.

Preset   Pos

Trigger Setup

Supported   E8267D with Options 601 or 602

This softkey accesses a menu from which you select the trigger source, configure the waveform's response to triggers, and set the polarity for the gated mode trigger signal. For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide.*

Trigger Source

Supported   E8267D with Options 601 or 602

This softkey accesses a menu from which you select a trigger source. From this menu, you also configure the signal generator for an external trigger signal, applied to the PATT TRIG IN or AUX I/O connectors, when **Ext** is the trigger source selection. The following list shows the available trigger sources:

- **Trigger Key**, page 200, selects the front-panel **Trigger** hardkey as the trigger source. Pressing the hardkey provides the trigger.
- **Bus**, page 39, enables the sending of a command through the GPIB, LAN, or AUXILIARY I/O (RS-232) input connector to trigger a waveform.
- **Ext**, page 73, causes a waveform to trigger from an externally applied trigger signal.

For more information on triggering, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

Turn Off Markers

Supported   All Models

This softkey turns off all active markers in the marker table editor.

Two Tone

Supported   E8267D with Option 601 or 602

This softkey accesses a menu of softkeys that enables you to create two-tone signals using the arbitrary waveform generator.

Two Tone Off On

Supported   E8267D with Option 601 or 602

This softkey sets the operating state for the two-tone function of the arbitrary waveform generator.

Off   When you select Off, the two-tone signal is turned off.

On   When you select On, the two-tone signal is turned on.

Preset   Off

U

Update Diagnostic Info

Supported   All Models

This softkey refreshes the Diagnostic Info display (described on page 61).

Update in Remote Off On

Supported   All Models

This softkey turns display updating on and off. The signal generator's display updates and displays the results of remote commands when this softkey is set to on. However, command processing time is faster when the softkey is set to off.

On   When on, remote commands update the signal generator's display.

Off   When off, remote commands will not update the display.

This key is not affected by a preset. However, it resets to off when the power is cycled. This mode affects the signal generator when it is in remote mode.

Uniform

Supported   All Models

This softkey enables you specify noise with a uniform distribution as the modulation waveform.

User File

Supported   E8267D with Option 601 or 602

Use this softkey to display the catalog of binary/bit files stored in the signal generator's memory. You can select a custom file from this catalog for a data pattern or burst shape. User files should exactly fill the data fields in a framed transmission (create the files to fill an integer number of frames). If the end of a user file does not coincide with the end of a frame, data is truncated. For more information, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

User FIR

Supported   E8267D with Option 601 or 602

Use this softkey to display the catalog of user-defined finite impulse response (FIR) filter files stored in the signal generator's memory, and to access a menu for selecting a file.

User Flatness

Supported   All Models

Use this softkey to configure user flatness or to select the user flatness catalog type.

In the Amplitude Menu

This softkey accesses a menu of softkeys for setting up user flatness corrections.

In the Catalog Type Menu

This softkey enables you to specify that only user flatness correction files be listed in the catalog of files currently displayed.

User FSK

Supported   E8267D with Option 601 or 602

Use this softkey to display the catalog of frequency shift keying (FSK) files stored in the signal generator's memory. You can select a custom file from this catalog for an FSK modulation by

scrolling through the listed files, highlighting the desired file, and pressing the **Select File** softkey.

The selected file name and type is displayed under the **Select** softkey.

User I/Q

Supported   E8267D with Option 601 or 602

Use this softkey to display the catalog of I/Q files stored in the signal generator's memory. You can select a custom file from this catalog for an I/Q modulation by scrolling through the listed files, highlighting the desired file, and pressing the **Select File** softkey.

The selected file name and type is displayed under the **Select** softkey.

Utility

Supported   All Models

Use this softkey to access a menu of selections enabling you to configure and view signal generator settings and hardware, view and erase error messages, and access the memory catalog menu.

V

View Details

Supported   All Models

This softkey enables you to view detailed information about the highlighted test. Refer to the Troubleshooting chapter in the *E8257D/67D, E8663D PSG Signal Generators Service Guide* for more information.

This is intended for use by service personnel.

View Different Header

Supported   E8267D with Option 601 or 602

This softkey accesses a menu from which you can select another header file to view.

View Next Error Message

Supported   All Models

Use this softkey to display the next error message in the queue. (The first error message is the oldest error.) There may be more than one error message in the queue; the number of error messages is displayed along with the first message. Press any key to exit the Error Info menu.

View Previous Error Message

Supported   All Models

Use this softkey to display the newest error message first. Continue pressing this key to view additional error messages in order of newest to oldest. Press any key to exit the Error Info menu.

View Test Info

Supported   All Models

Use this softkey to display details of the self tests. Refer to the calibration guide for more information.

This is intended for use by service personnel.

VXI-11 SCPI

Supported   All Models

This softkey enables or disables the VXI-11 SCPI (Standard Commands for Programmable Instruments) protocol for communication with the signal generator. To enable the VXI-11 SCPI protocol you must turn the capability on and then press the Proceed With Reconfiguration and Confirm Change softkeys. The signal generator will reboot and enable the VSI-11 SCPI protocol.

This softkey allows the use of the VXI-11 standard for instrument communication over the LAN (Local Area Network) interface.

Off   The VXI-11 SCPI protocol is not enabled.

On   The VXI-11 SCPI protocol is enabled and files can be transferred using this protocol.

The VXI-11 SCPI protocol state (off or on) survives a preset or system reboot.

W

Waveform Catalog Types

Supported   All Models

This softkey accesses a menu from which you can select an arbitrary waveform generator (ARB) waveform file type.

Waveform Length

Supported   E8267D with Option 403

This softkey accesses a menu from which you can select waveform lengths. Longer waveform lengths are statistically more accurate but require more memory and take a longer time to generate. The current waveform length is displayed under the **Waveform Length** softkey.

Preset   524288

Waveform Runtime Scaling

Supported   E8267D with Option 601 or 602

This softkey enables you to apply the scaling value to a currently playing waveform. Unlike scaling a waveform file, which has permanent and cumulative effects, this type of scaling enables you to make continual real-time adjustments. This is because the scaling value is always relative to the original waveform data, not the playing data.

For best results, only scale a waveform enough to achieve the best dynamic range without overflowing the I and Q digital-to-analog converters. This maintains the integrity of the waveform. Scaling a waveform too much can cause it to lose bits of resolution. With runtime scaling, bit resolution is easily recovered by increasing the scaling value. For more information about scaling, refer to the *E8257D/67D, E8663D PSG Signal Generators User's Guide*. See also "Scale Waveform Data" on page 174.

Preset   70.00%

Range   1.00–100.00%

Waveform Segments

Supported   E8267D with Option 601 or 602

This softkey accesses a menu and table editor from which you can store and load waveform segments to or from the non-volatile waveform memory (NVWFM) and perform various waveform utilities such as markers, scaling, and clipping.

Waveform Sequences

Supported   E8267D with Option 601 or 602

This softkey accesses a menu and table editor from which you can build waveform sequences, edit existing sequences, and/or delete sequences.

Waveform Statistics

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu for viewing the available statistics for the selected waveform. To activate the softkey, make sure that the selected arbitrary waveform generator (ARB) option (such as Multitone, Digital Modulation, and so on) is turned on.

Waveform Utilities

Supported   E8267D with Option 601 or 602

This softkey accesses a menu of operations that can be applied to the selected waveform segment. Waveform utilities include: markers, scaling, and clipping. To activate this softkey, the waveform segment must be selected from volatile waveform memory (WFM1) and the **Load Store** softkey must be set to Store.

Web Server Off On

Supported   All Models

This softkey enables or disables the signal generator's web server capabilities. The web server state, off or on, survives a preset or system reboot.

Off   The web server is not enabled.

On   The web server is enabled and the signal generator can be accessed using this protocol. Press the Proceed With Reconfiguration and Confirm Change softkeys to complete the process. The signal generator will reboot and enable the web server.

WFM1

Supported   All with Option 601 or 602

Press this softkey to specify that only ARB waveform files residing in volatile waveform memory be listed in the catalog of files. Catalog type selection is not affected by a preset or by a power cycle.

White Pixels Screen Test

Supported   All Models

This softkey enables you to set all of the pixels on the display to white. Press the **Local** hardkey to return the display to normal operation. This key is provided for factory use in testing the display.

Window

Supported   E8267D with Option 601 or 602

Use this softkey to access a menu for applying a windowing function to the selected filter. The default is to use no windowing which optimizes the passband response error voltage magnitude (EVM) Several windowing selections are provided in this menu which can be applied to smooth the filter's transition to zero. Windowing improves out of band performance adjacent channel power (ACP) but simultaneously degrades EVM. The selected window type is displayed under the **Window** softkey.

Word Alignment

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey, for the N5102A module, enables you to align bits when the word size is less than 16 bits. When MSB is selected, the MSB of the data will always be on the same data line and the LSB will move depending on the number of bits in the word. When LSB is selected, the LSB of the data will always be on the same data line and the MSB will move depending on the number of bits in the word. This feature is only available in parallel modes.

Preset   MSB

Word Size

Supported   E8267D with Option 601 or 602 and Option 003 or 004

This softkey sets the number of bits in each sample transmitted through the N5102A module.

A word is defined as an integer number of bits from 4 to 16. For parallel and parallel interleaved data, Word is synonymous with sample. Any unused data lines are driven low.

Preset   16

Range   4–16

WR3 220GHz–325GHz

Supported   All Models

This softkey selects a standard WR3 (waveguide rectangular) frequency band. The frequency band

applies to the external millimeter-wave source module that you are using.

WR5 140GHz–220GHz

Supported   All Models

This softkey selects a standard WR5 (waveguide rectangular) frequency band. The frequency band applies to the external millimeter-wave source module that you are using.

WR6 110GHz–170GHz

Supported   All Models

This softkey selects a standard WR6 (waveguide rectangular) frequency band. The frequency band applies to the external millimeter-wave source module that you are using.

WR8 90GHz–140GHz

Supported   All Models

This softkey selects a standard WR8 (waveguide rectangular) frequency band. The frequency band applies to the external millimeter-wave source module that you are using.

WR10 75GHz–110GHz

Supported   All Models

This softkey selects a standard WR10 (waveguide rectangular) frequency band. The frequency band applies to the external millimeter-wave source module that you are using.

WR12 60GHz–90GHz

Supported   All Models

This softkey selects a standard WR12 (waveguide rectangular) frequency band. The frequency band applies to the external millimeter-wave source module that you are using.

WR15 50GHz–75GHz

Supported   All Models

This softkey selects a standard WR15 (waveguide rectangular) frequency band. The frequency band applies to the external millimeter-wave source module that you are using.

Y

YIG Pretune Calibration

CAUTION   Use only if directed to do so by the Service Center.

Supported   All Models

Use this softkey to access a menu to execute a calibration for the signal generator, if a 521 YO loop message is displayed or if the A5 Sampler's YO Phase detector circuit loop has been repaired or replaced. Refer to the *Service Guide*.

Z

Zoom In

Supported   E8267D with Option 601 or 602

This softkey decreases the number of waveform sample points shown on the marker display, enabling a closer view of the marker points relative to the waveform points. Each press of the softkey reduces the display sample range by approximately a factor of two. The marker display shows a maximum of 460 points. Displayed waveforms with a sample point range greater than 460 points may not show the marker locations. For information on using the marker display, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

In the Dual ARB

The waveform is the waveform highlighted in the Set Markers display.

In All Other ARB Formats

This softkey is not available unless the ARB format is on. When it is available, the waveform is the waveform highlighted in the Set Markers display.

Zoom Out

Supported   E8267D with Option 601 or 602

This softkey increases the number of waveform sample points shown on the marker display after using the zoom in feature. Each press of the softkey increases the display sample range by approximately a factor of two until the display shows the waveform in its entirety. The marker display shows a maximum of 460 points. Displayed waveforms with a sample point range greater than 460 points may not show the marker locations. For information on using the marker display, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

In the Dual ARB

The waveform is the waveform highlighted in the Set Markers display.

In All Other ARB Formats

This softkey is not available unless the ARB format is on. When it is available, the waveform is the waveform highlighted in the Set Markers display.

Zoom In Max

Supported   E8267D with Option 601 or 602

This softkey decreases the number of waveform sample points on the marker display to 28, enabling the closest view of the marker points relative to the waveform points. For information on using the

marker display, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

In the Dual ARB

The waveform is the waveform highlighted in the Set Markers display.

In All Other ARB Formats

This softkey is not available unless the ARB format is on. When it is available, the waveform is the waveform highlighted in the Set Markers display.

Zoom Out Max

Supported   E8267D with Option 601 or 602

This softkey increases the number of waveform sample points on the marker display to 460, which is the maximum number of samples points for the display. The display may show N/A as the last marker point. Displayed waveforms with more than 460 sample points may not show the marker locations. For information on using the marker display, see the *E8257D/67D, E8663D PSG Signal Generators User's Guide*.

In the Dual ARB

The waveform is the waveform highlighted in the Set Markers display.

In All Other ARB Formats

This softkey is not available unless the ARB format is on. When it is available, the waveform is the waveform highlighted in the Set Markers display.