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Errata

Title & Document Type:

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HP References in this Manual

This manual may contain references to HP or Hewlett-Packard. Please note that Hewlett-Packard's former test and measurement, semiconductor products and chemical analysis businesses are now part of Agilent Technologies. We have made no changes to this manual copy. The HP XXXX referred to in this document is now the Agilent XXXX. For example, model number HP8648A is now model number Agilent 8648A.

About this Manual

We've added this manual to the Agilent website in an effort to help you support your product. This manual provides the best information we could find. It may be incomplete or contain dated information, and the scan quality may not be ideal. If we find a better copy in the future, we will add it to the Agilent website.

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Search for the model number of this product, and the resulting product page will guide you to any available information. Our service centers may be able to perform calibration if no repair parts are needed, but no other support from Agilent is available.

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HEWLETT PACKARD

Quick Reference Guide

HP 8656B/57A/57B
Synthesized Signal Generator

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HP 8656B/57A/57B Quick Reference Guide

General Operating Instructions

Warning



Before the Signal Generator is switched on, all protective earth terminals, extension cords, autotransformers, and devices connected to it should be connected to a protective earth grounded socket. Any interruption of the protective earth grounding will cause a potential shock hazard that could result in personal injury or loss of life.

For continued protection against fire hazard, replace the line fuse only with a 250V fuse of the same rating. Do not use repaired fuses or short circuited fuse holders.

Caution



Before the Signal Generator is switched on, it must be set to the same line voltage as the power source being used, and a correctly rated line fuse must be fitted.

The Signal Generator is protected against reverse power applications up to 50 watts. However, for maximum protection of expensive internal components, ensure that you do not apply any reverse power to the RF OUTPUT connector.

Power ON Instructions

1. Ensure that the Signal Generator has the correct line voltage selected and that the correct fuse has been installed. (Refer to Section 2)
2. Plug in the power cable. (The Option 001 High Stability Timebase is turned on when the power cable is plugged in.)
3. Press the POWER switch to the ON position. (All front-panel annunciators and LED segments momentarily turn on for a visual inspection.)
4. The Signal Generator is now ready for use.

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Power STBY Instructions

Press the POWER switch to the STBY position.

All Signal Generator settings and storage register contents are saved in RAM. When the Signal Generator is turned back ON, the instrument functions last displayed will be active, even if the plug has been disconnected.

Note 

If the Signal Generator is switched to STBY with RF ON/OFF set to off, the RF will be turned on when the Signal Generator is turned back ON.

Detailed Operating Instructions

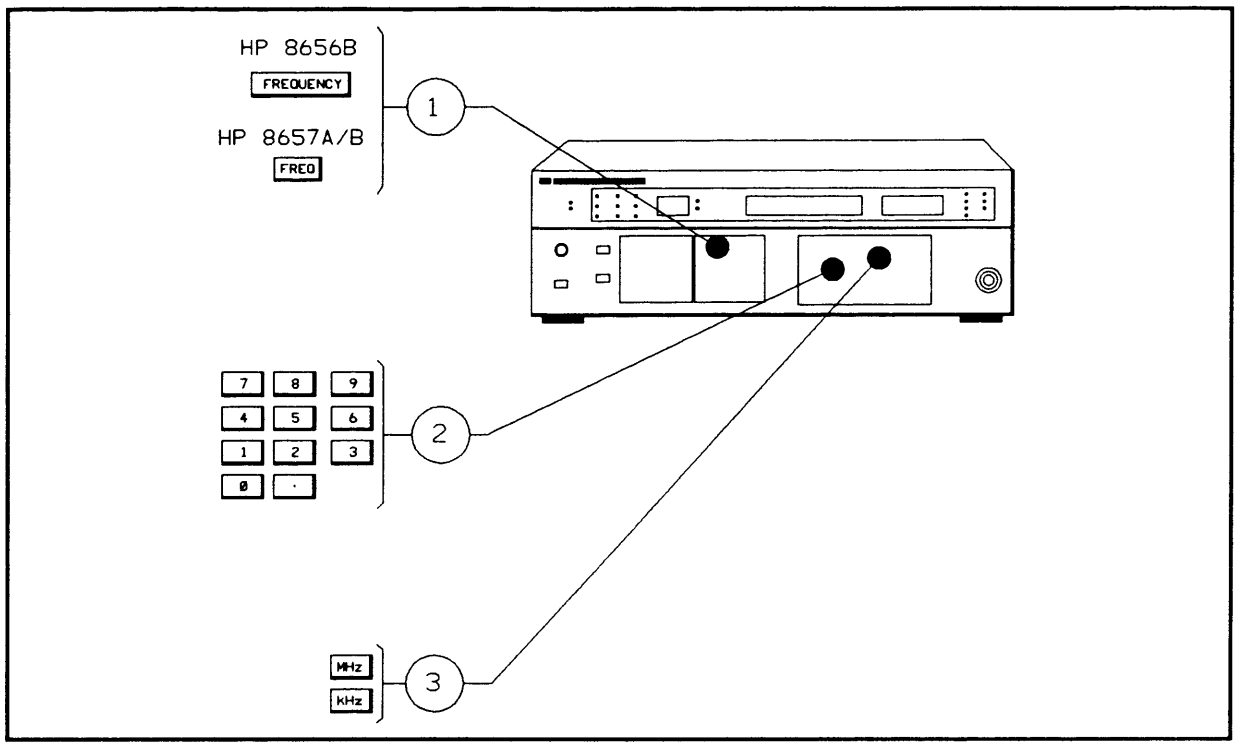
Illustrations in this section of the manual provide you with detailed operating instructions for setting the following Signal Generator features:

- Setting Frequency (page 3-3).
- Setting Amplitude (page 3-4).
- Setting Modulation, AM and FM (page 3-5).
- Setting Modulation, Pulse (HP 8657B only) (page 3-6).
- Storing or Recalling Front-Panel Settings (page 3-8).
- Creating and Recalling Sequences (page 3-9).
- Modifying Front-Panel Settings (page 3-10).
- Miscellaneous Operating Features (page 3-12).

Each illustration is accompanied with directions and comments to provide further information.

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Setting Frequency



Setting Frequency

Directions:

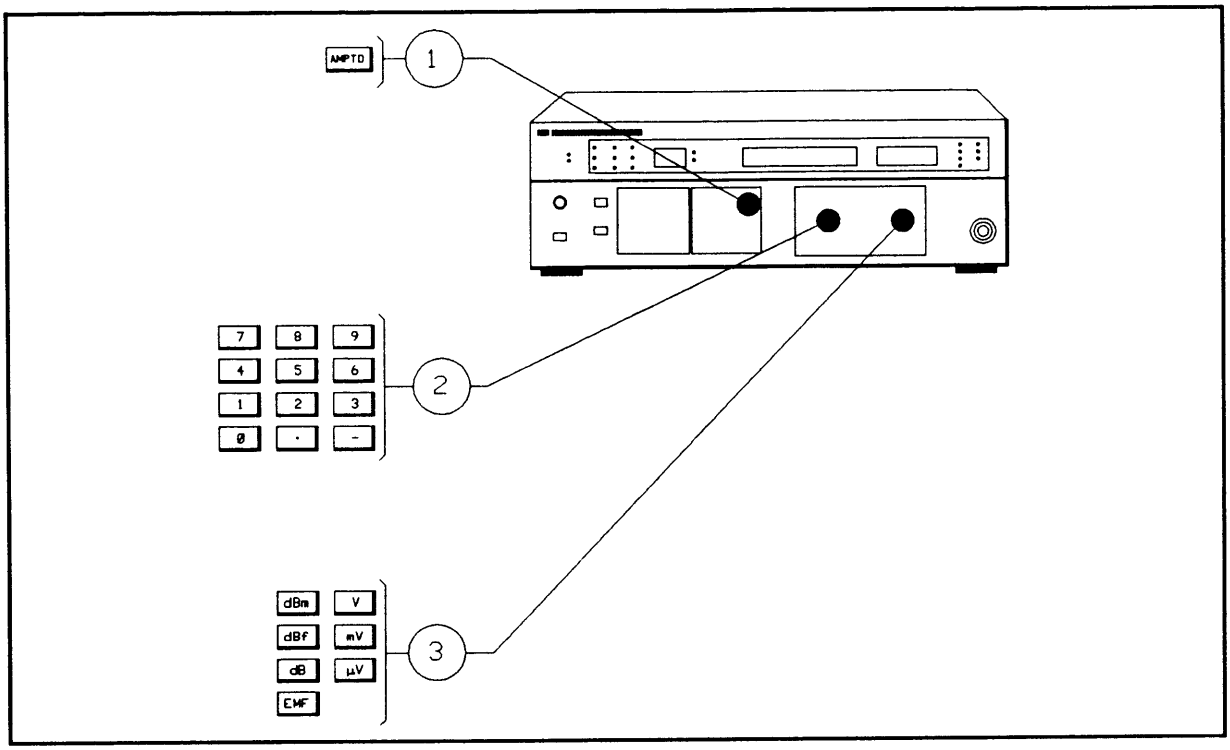
1. Press the FREQUENCY key on the HP 8656B or the FREQ key on the 8657A/B.
2. Enter the numeric frequency value.
3. Complete the entry in MHz or kHz.

Comments:

- Skip step 1 (above) for subsequent frequency changes.
- Carrier frequencies below 100 kHz result in an uncalibrated output amplitude.
- The **MODULATION** display flashes if you enter a carrier frequency outside of the Signal Generator's operating limits for the selected FM peak deviation. Change the carrier frequency or the FM peak deviation to correct the error.

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Setting Amplitude



Setting Amplitude

Directions:

1. Press the AMPTD key.
2. Enter the numeric amplitude value.
3. Complete the entry in any one of the following 14 entries:

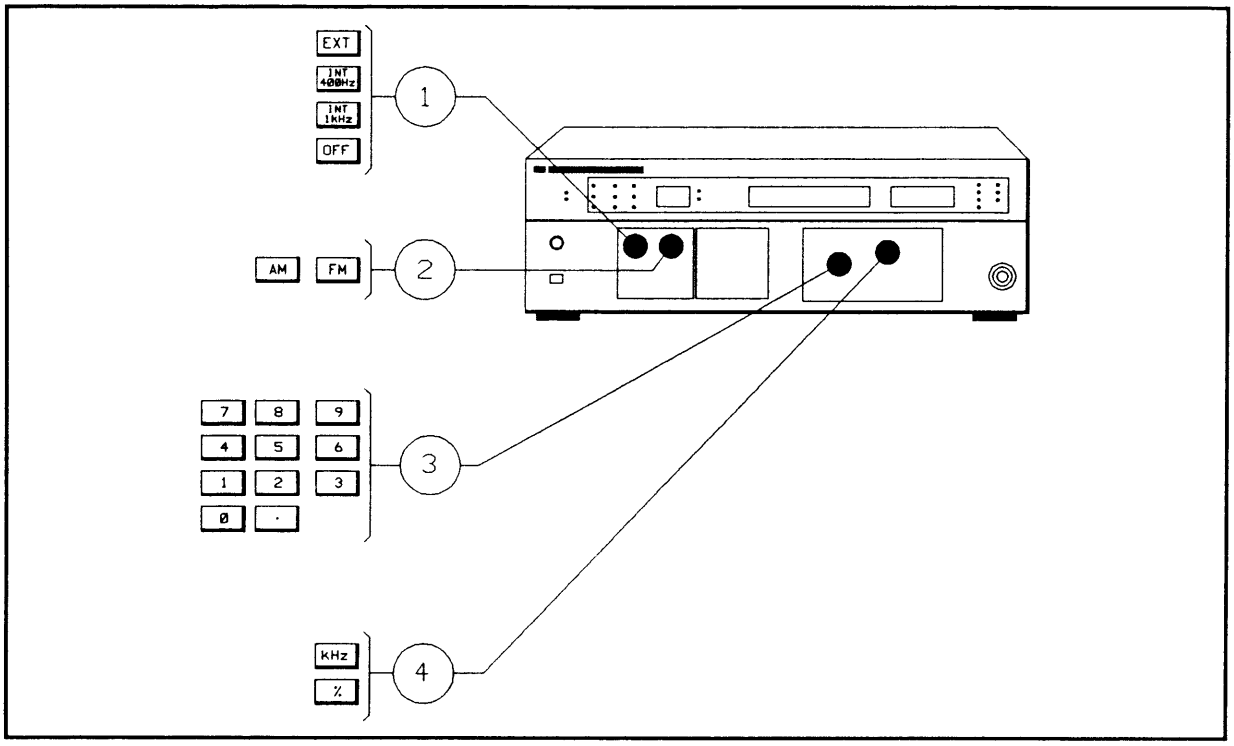
dBm	dBµV	V	EMF mV
dBf	dB EMF V	mV	EMF µV
dBV	dB EMF mV	µV	
dBmV	dB EMF µV	EMF V	

Comments:

- Minus sign may be entered at any time before completing the entry.
- Digits selected beyond the specified resolution of the **AMPLITUDE** display are truncated.
- Whenever a reverse power condition is detected, the **AMPLITUDE** display and its associated annunciators flash until the source of reverse power is removed and the AMPTD key is pressed.

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Setting Modulation, AM and FM



Setting Modulation, AM and FM

Directions:

1. Press one of the **MODULATION SOURCE** keys (for either internal or external source).
2. Press either the [AM] or [FM] key.
3. Enter the numeric modulation depth or deviation value.
4. Complete the entry in percent for AM, or kHz for FM.

(Turn modulation off by first pressing the [AM] or [FM] key, and then the **MODULATION SOURCE** [OFF] key).

Comments:

- DCFM is turned on by first pressing the blue [SHIFT] key, and then the [FM] key.

Caution Maximum Allowable input level for DCFM is ±15 Vdc. Exceeding this limit may cause damage to the Signal Generator.

- Only one internal modulation source can be selected at any time, either 400 Hz or 1 kHz.
- The modulation value is retained when modulation is switched off.

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Setting Modulation, Pulse (HP 8657B only)

There are two Pulse modulation modes:

- Pulse modulation (normal mode), and
- Pulse modulation (fast mode).

Use Pulse modulation (normal mode) for:

General purpose bench use.
Testing sensitive loads.

Use Pulse modulation (fast mode) for:

Non-50 Ω loads.
Best level accuracy.
ATE applications to maximize the attenuator's lifespan.

For both Pulse modulation modes, if frequency or amplitude is changed when the carrier frequency is ≥1030 MHz, the HP 8657B performs an internal-leveling routine creating a 15 ms (approximately) pulse at the same output level as the RF output.

Based upon the following information about each Pulse modulation mode (normal and fast), decide if the 15 ms internal-leveling pulse should appear at the RF output:

Pulse Modulation (normal mode). This mode switches in all of the attenuator pads to prevent the internal-leveling pulse from appearing at the **RF OUTPUT**. *In high-cycle applications where frequency or amplitude is constantly modified, the attenuator's lifetime may be reduced.*

With Pulse Modulation (normal mode), the internal-leveling routine is calibrated into the attenuator. This means that any impedance mismatch between the load and the attenuator's impedance of 50Ω, will cause a level difference between the CW RF output and the Pulsed RF output. Typically, for a 50Ω load, the error will be <±0.25 dB.

Note



The impedance mismatch error is only significant for RF output levels >+3.9 dBm. Below this level, the HP 8657B's attenuator minimizes the effect of any impedance mismatch.

Pulse Modulation (fast mode). This mode allows the internal-leveling pulse to reach the **RF OUTPUT**. *This mode would present a problem with any device under test that is designed to accept pulses only in the µs range.*

Caution



The HP 8657B also generates an internal-leveling pulse whenever Pulse modulation (fast mode) is first selected. This happens regardless of the carrier frequency setting. Ensure that the pulse does not cause any damage to the device under test.

With Pulse modulation (fast mode), the internal-leveling routine is calibrated directly into the load. Therefore, the level difference between the CW RF output and the Pulsed RF output is typically <±0.1 dB.

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Directions:

1. **For Pulse Modulation (normal mode)**, press the blue [SHIFT] key and then the [AM] key.

   For Pulse Modulation (fast mode), press the blue [SHIFT] key and then the ⇑ key below the [AM] key.

2. Connect an external modulation source to the **PULSE INPUT** connector. When a pulse waveform from the external modulation source goes high, the Pulse output from the HP 8657B turns on.

3. Vary the external pulse's waveform rate, amplitude, and width to simulate the pulse signal you require.

Caution



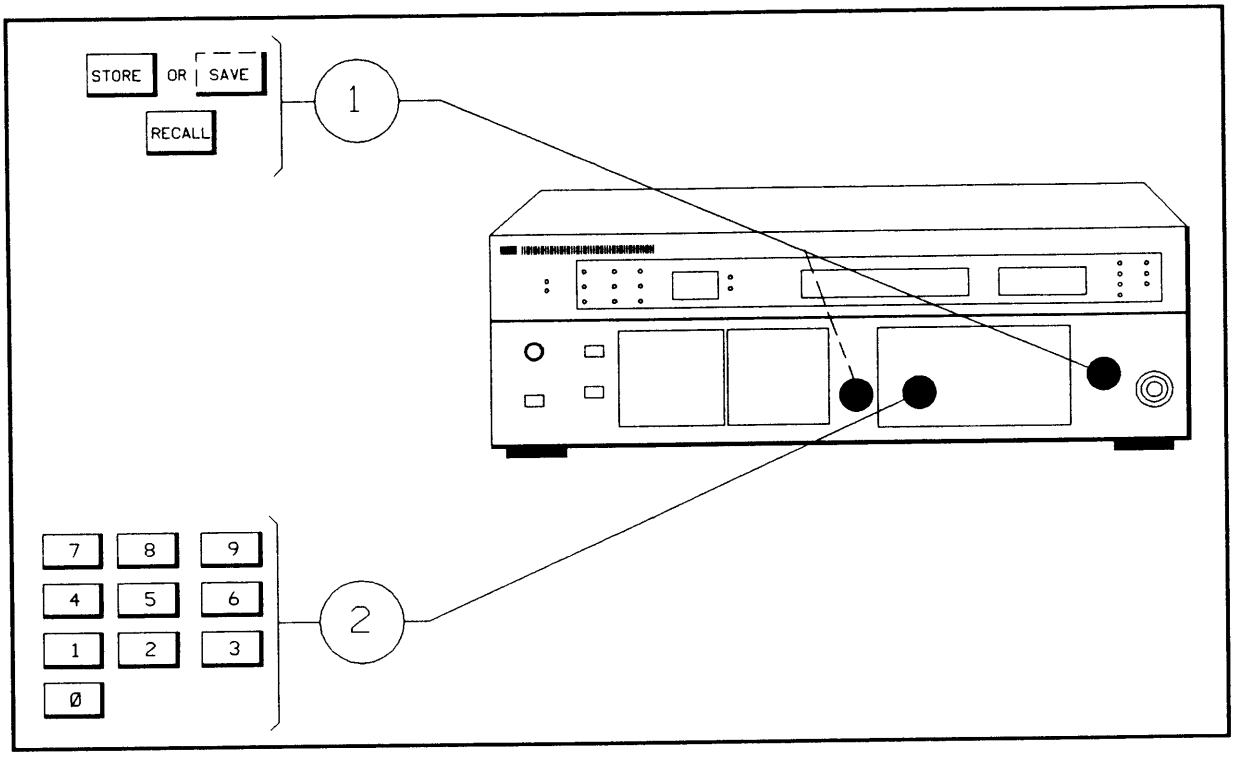
The maximum allowable input level for Pulse modulation is ±15 Vdc. Exceeding this limit may cause damage to the HP 8657B.

Comments:

- Pulse specifications are described Section 1 of the *Operation and Calibration Manual*.
- The **PULSE INPUT** impedance can be selected for 50Ω, or for high impedance. The HP 8657B is set at the factory for high impedance, refer to section 2 of the *Operation and Calibration Manual* if you want to set the input impedance to 50Ω.

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Storing/Saving and Recalling Front-Panel Set-Ups



Storing/Saving and Recalling Front-Panel Set-Ups

Directions for Storing/Saving:

1. Set the Signal Generator to the set-up you want to Store/Save
2. Press the [STORE] key (for the HP 8656B) or the [SAVE] key (for the HP 8657A/B).
3. Enter the memory location number (0-99).

Directions for Recalling:

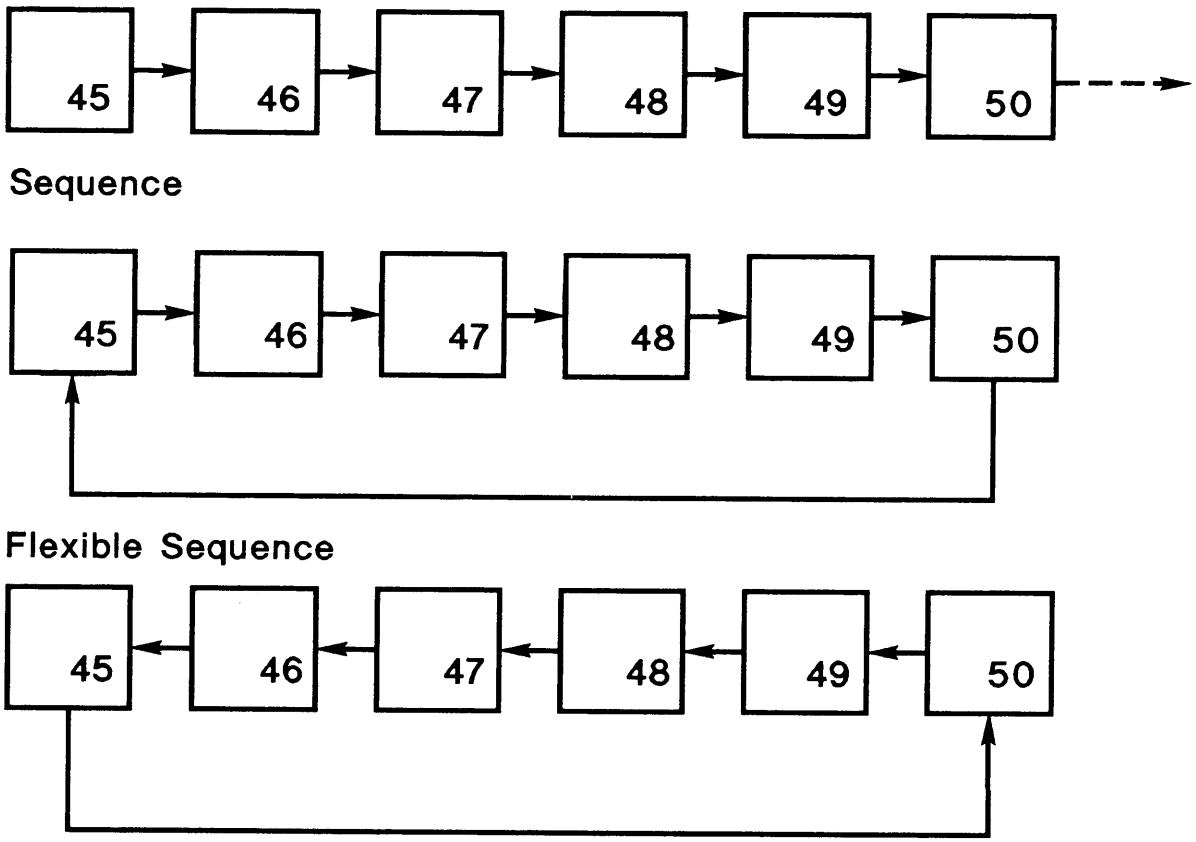
- Press the [RECALL] key.
- Enter the memory location number (0-99).

Comments:

- The Signal Generator has 100 memory locations (0-99), for storing/saving front-panel set-ups (exclusive of increment settings).

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Creating and Recalling Sequences



Creating and Recalling Sequences

Directions for Creating a Sequence

1. Set the Signal Generator to the set-up you want.
2. Press the [STORE] key (for the HP 8656B) or the [SAVE] key (for the HP 8657A/B). Enter the memory location number (0-99).
3. Repeat step 1 and 2 until all the set-ups are saved.

Directions for Recalling a Sequence

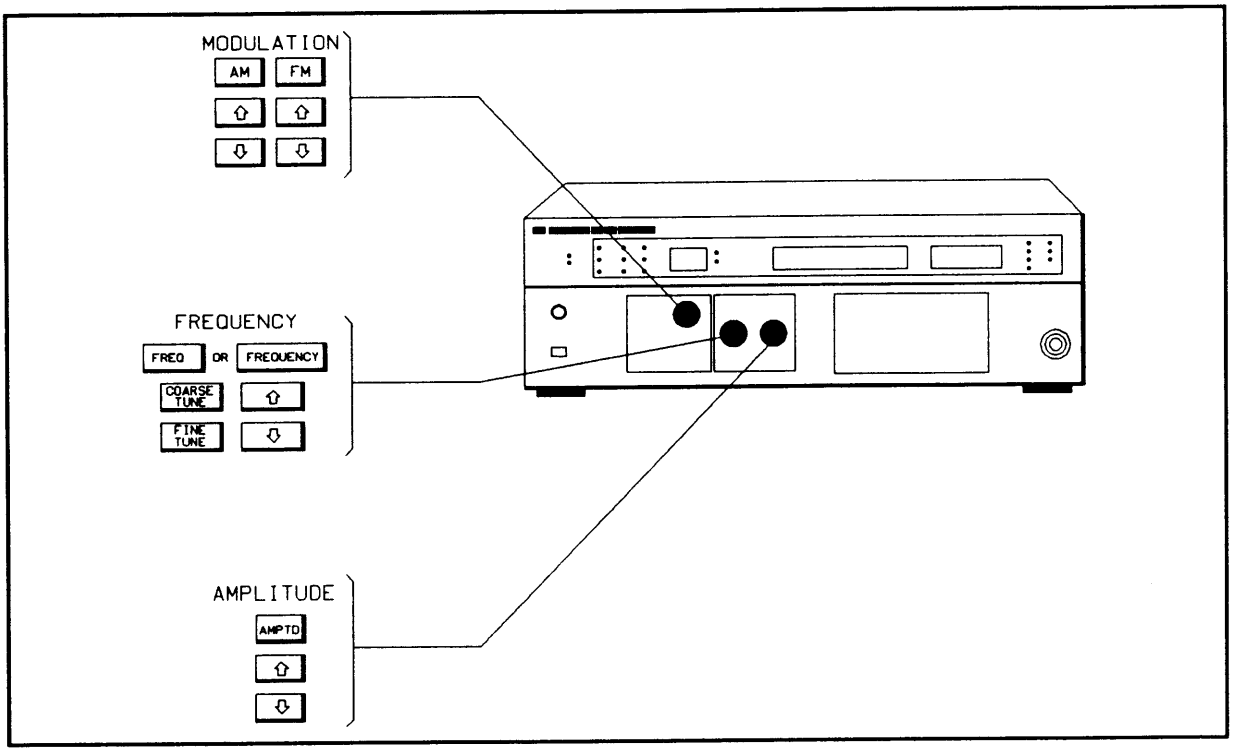
1. Use the [RECALL] key and the data keys to recall the set-up you want the sequence to start at.
2. Press the [SEQ] key to recall the next set-up.
3. To reverse the sequence, press the [SHIFT], [SEQ] then the [RECALL] keys.

Directions for Creating a Flexible Sequence

1. Use the the [RECALL] key and the data keys to recall the last set-up in the sequence.
2. Press the [SHIFT] key then four data keys. In the above example the keys would be [5], [0], [4] and [5].

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Modifying Front-Panel Settings



Modifying Front-Panel Settings

Directions to Modify Modulation:

1. Press the [AM] or [FM] key.
2. Press the ⇑ or ⇓ key as many times as needed. The AM depth or FM deviation changes each time you press the ⇑ or ⇓ key by the value in its increment register.

Directions to Modify Frequency:

1. Press the [FREQUENCY] or [FREQ] key (depending upon your Signal Generator).
2. Press the ⇑ or ⇓ key as many times as needed. The frequency changes each time you press the ⇑ or ⇓ key by the value in its increment register.
3. Press the [COARSE TUNE] or [FINE TUNE] key and change the Signal Generator's frequency using the ⇑ or ⇓ keys. ([COARSE TUNE] and [FINE TUNE] value settings are lost when an instrument preset is done.)

Directions to Modify Amplitude:

- Press the [AMPTD] key.
- Press the ⇑ or ⇓ key as many times as needed. The amplitude value of the RF output changes each time you press the ⇑ or ⇓ key by the value in its increment register.

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Comments to Modifying Front-Panel Settings:

- Press and hold the (INCR SET) key to view the contents of the increment register. You can modify the contents of the increment register after it has been pressed.
- Increment entries are checked against maximum and minimum allowable increment limits. If a limit is exceeded, the increment entry is either truncated or rejected.
- If the increment register is set to a value that would cause the Signal Generator to exceed its operating range for modulation, frequency, or amplitude, the ⇑ and ⇓ keys would become inoperative. A correct decrease in the increment setting re-enables the ⇑ and ⇓ keys.

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Miscellaneous Operating Features

The Signal Generator has the following miscellaneous operating features:

- Amplitude offset.
- Display a memory location.
- Display the HP-IB address.
- Frequency phase up and down.
- HP-IB to local.
- Instrument preset.
- RF on and off.

Directions for Amplitude Offset:

The following directions show you how to change the RF output amplitude without altering the valued shown in the **AMPLITUDE** display.

1. Press the blue [SHIFT] key, and then press the [AMPTD (AP OFS)] key.
2. Enter the numeric amplitude offset value, and then press the [dB] key.
3. You can verify the amplitude offset value by first pressing the blue [SHIFT] key, and then pressing and holding the [AMPTD] key.

Directions to Display a Memory Location:

The following directions show you how to display the contents of any memory location without affecting the actual output of the Signal Generator.

1. Press the blue [SHIFT] key, and then the [SEQ (DSPL)] key.
2. Press the first data key then press and hold the second data key.

Directions to Display the HP-IB Address:

The following directions show you how to display the internally set, decimal HP-IB address.

1. Press the blue [SHIFT] key, and then press and hold the [LOCAL (ADRS)] key.
2. The decimal HP-IB address is shown in the **MODULATION** display for as long as you hold the [LOCAL (ADRS)] key.

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Directions for Frequency Phase Up and Down:

The following directions show you how to change the carrier frequency's phase in one-degree steps, referenced to the internal or external timebase.

1. Press the blue [SHIFT] key, and then either the $\phi\Uparrow$ or the $\phi\Downarrow$ associated with the [FREQUENCY] key on the HP 8656B or the [FREQ] key on the HP 8657A/B.
2. Holding the $\phi\Uparrow$ or $\phi\Downarrow$ key down continually changes the carrier frequency in one-degree steps.

Directions to go from HP-IB to Local Control:

Simply press the [LOCAL] key to make the Signal Generator go from HP-IB to local control (that is, front-panel control). You'll notice that the **RMT** annunciator turns off when local control is returned.

Directions for Performing an Instrument Preset:

Simply press the blue [SHIFT] key, and then press the [0 (PRESET)] key. All front-panel annunciators and LED segments will momentarily light up for a visual inspection.

Directions to Turn the RF On and Off:

Simply press the [RF ON/OFF] key to turn the carrier frequency at the **RF OUTPUT** connector on and off.

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