

**HP 8662A
SYNTHESIZED
SIGNAL
GENERATOR**



**HEWLETT
PACKARD**

Status Codes

STATUS



Errors, malfunctions, and faults are indicated by the lighted STATUS key. To display status codes, hold down the key. A two-digit code will appear at the far-right of the FREQUENCY display and refers to the status codes listed here.

SPECIAL FUNCTIONS currently selected are also displayed by holding down the STATUS key. The two-digit codes appearing at the far-left of the FREQUENCY display refer to the "SPECIAL FUNCTIONS" on page 8.

Program Code	Parameter	Program Code	Parameter
00	NO ERROR	43	WRONG ENTRY PROTOCOL. Entry ignored.
01	NO REFERENCE OSCILLATOR. Check INT-EXT switches or refer to Service Manual Sec. VIII).	44	TOO MANY SIGNIFICANT DIGITS prior to decimal point.
09	REVERSE POWER AT RF OUTPUT. Remove source and press AMPLITUDE.	45	START FREQ = STOP FREQ
10	AMPLITUDE OUT OF SPEC. Refer to Service Manual (Sec. VIII).	46	PARAMETER UNDERFLOW. Defaulted to zero.
11	FM OVERMODULATED. Reduce input level.	47	MARKER OUT OF LIMITS in start-stop sweep.
12	CRYSTAL OVEN NOT HEAT STABILIZED. Allow 1 hour.	48	MARKER OUT OF LIMITS in span sweep.
13	EXTERNAL REFERENCE SELECTED	49	STEP SIZE > SWEEP SPAN
14	FREQUENCY OF REFERENCE OUT OF TOLERANCE.	50	STORE/RECALL ERROR. Register failed or nonexistent.
15	AM OVERMODULATED. Reduce input level.	51	RECALL 0 INVALID. (1-9 only)
32	FREQUENCY SELECTION OUT OF RANGE. (1KHZ TO 1.28GHZ).	52	RAM DATA ALTERED. First good register recalled; special functions cleared. Re-enter data for store-recall registers.
33	AMPLITUDE SELECTION > +16dBm. Entry ignored.	53	RAM FAULTY. Generator initialized to 100 MHz and -30dBm. Re-enter data for all registers. Refer to Service Manual (Sec. VIII).
34	AMPLITUDE SELECTION < -139.9DBM. Entry ignored.	54	NO AMPLITUDE CORRECTION ABOVE +13dBm.
35	AMPLITUDE > +10DBM OR 710MV. AM accuracy is not specified.	55	SWEEP STEPS >10,000. Staircase ramp disabled (SWEEP OUTPUT = OV).
36	AMPLITUDE SELECTION > 999mV or >0μV. Entry ignored.	56	SPECIAL FUNCTION CODE INVALID.
37	AM SELECTION >95% OR <0%. Entry ignored.	57	AMPLITUDE REFERENCE IN VOLTS INVALID
38	FREQUENCY <150kHz. AM invalid.	58	KEY INVALID IN MIXED MODULATION MODE
39	FM >200kHz or >0.0kHz. INVALID.	59	SWEEP SPAN OUT OF LIMITS
40	FM >100KHZ INVALID for frequencies between 320 and 640MHz, or 1kHz and 120MHz.	99	MALFUNCTION. See manual (Sec. VIII).
41	FM >50kHz INVALID for frequencies between 160 and 320MHz.		
42	FM >25kHz INVALID for frequencies between 120 and 160MHz.		

Function

Frequency

To set RF Signal Frequency to 12.3 MHz:

FREQUENCY 1 2 . 3 MHz

Frequencies down to 1 kHz can be selected, but level accuracy is specified down to 10 kHz only.

Amplitude accuracy at 1 kHz is typically within 2 dB below the displayed amplitude.

Digits selected that are beyond the specified resolution are ignored.

Resolution: 0.1 Hz (below 640 MHz)

0.2 Hz (above 640 MHz)

Amplitude

To set RF Signal Amplitude to +10.2 dBm

AMPLITUDE 1 0 . 2 dBm



Enters a new (minimum) amplitude of -139.9 dBm

AM Modulation

To set AM at a Depth of 50%:

AM 5 0 % MHz

Selected values greater than resolution are ignored.

Depth: 0-95%

Resolution: 1% (at 10-95%) 0.1% (at 0-9.9%)

FM Modulation

To set FM Deviation at 75 kHz:

FM 7 5 kHz

Maximum Peak Deviation

Frequency	(the smaller of)
0.01-120 MHz	100 kHz or $f_{\text{mod}} \times 500$
120-160 MHz	25 kHz or $f_{\text{mod}} \times 125$
160-320 MHz	50 kHz or $f_{\text{mod}} \times 250$
320-640 MHz	100 kHz or $f_{\text{mod}} \times 500$
640-1280 MHz	200 kHz or $f_{\text{mod}} \times 1000$

FM Resolution

100 Hz (for deviations <10kHz)

1kHz (for deviations \geq 10kHz)

Modulation Source

- INT 400**
 Selects an internal modulation source with a rate of 400 Hz.
- INT 1k**
 Selects an internal modulation source with a rate of 1 kHz.
- EXT AC**
- EXT DC**
 Selects an external AC or DC modulation source entering the MODULATION INPUT port.
- External sources may be adjusted to the appropriate level for modulation calibration by using the EXTERNAL SOURCE HI-LO indicators.

Store, Recall and Sequence

Store/Recall

Any desired front panel setting may be stored in one of nine registers (1-9), and later recalled. Marker frequencies and Special Functions cannot be stored. However, a Marker's on-off status can be stored.

- Stores entire front panel in register "1"
- Recalls and activates front panel stored in register "1"

Sequence

A sequence of previously-stored front panel settings may be stored and later recalled. Maximum sequence length is ten settings. For example:

SET SEQ

stores a sequence of (1,2,9,2). The panel settings can be recalled individually by pressing:

or continuously by pressing:

AUTO SEQ

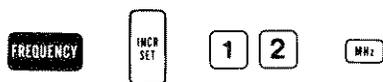
To stop AUTO SEQ, press a FUNCTION key.

To display sequence stored, press RECALL, then press and hold down SEQ. Read the sequence in the FREQUENCY display.

Increment

Increment

To set a frequency INCREMENT value of 12 MHz:



Increments of frequency, amplitude, AM depth, and FM deviation can be set.

Minimum Increment Size:

Frequency: 0.1 Hz below 640 MHz

0.2 Hz above 640 MHz

Amplitude: 0.1 dB

AM Depth: 1% (10-95%)

0.1% (0-9.9%)

FM Deviation: 100 Hz (for <10 kHz)

1 kHz (for ≥ 10 kHz)

The Knob

Steps the value of the present function in unit steps starting at a selected digit.

To enable the knob and display the digit of resolution, depress either the x10 or +10 key. The affected digit will flash.

To increase or decrease the resolution by a factor of ten, depress either x10 or +10 as desired.

-  retains the knob control for current function while allowing the remainder of the panel to be changed to another function.
-  allows you to select your own numeric value for the steps of the knob. (Refer to INCREMENT.)

Frequency Transfer

To transfer a frequency value from one parameter to another (except Frequency Increment):



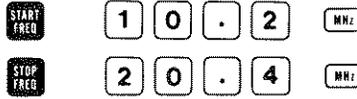
For example, to transfer the frequency value of Marker 1 to Start Frequency:



Sweep

Start/Stop

To set a frequency sweep from 10.2 MHz to 20.4 MHz:



The FREQUENCY display will show the numeric values as they are entered, but will return to and continue to show the current frequency until a SWEEP MODE is selected and an actual sweep begins.

Sweep Width: 1 kHz to 1279.9999998 MHz

Span (Δf)

To set a frequency span sweep with a span of 12.4 MHz centered about the last value entered for FREQUENCY:



Steps

Sets the size of the frequency increment used during the stepped sweep.

- 100 step size equals frequency span $\div 100$
- 1000 step size equals frequency span $\div 1000$
- SET SIZE allows selection of step size via DATA section of the main panel (linear sweep)
- 10% step size equals 10% of the present frequency
- 1% step size equals 1% of the present frequency

Time/Step

Sets the time interval between sweep steps. The shortest interval is 0.5 ms (nominal) for a simple linear sweep. This interval is longer for log sweeps, or markers, and sweeps with FM (0.9 ms maximum).

Markers

To set a SWEEP MARKER value of 15 MHz:



There are two ways to move a marker on an external sweep display. The INCREMENT keys may have a value entered for marker movement by:



The knob may be used to move a marker by:



MARKER 2 OFF removes MARKER 2 from display

ALL OFF removes all Markers from display

Mode

- OFF turns sweep off
- AUTO provides a continuous sweep
- MANUAL provides a manual sweep using the knob
- SINGLE provides a single sweep

HP-IB Operation

Syntax Characteristics

ENTRY FORMAT:

"Function", "Data", "Units"

DATA:

Arbitrary length numerical string with imbedded decimal point

PROTOCOL:

Same as front panel

ADDRESS:

Shown at HP-IB switches as five-bit equivalent decimal (0-30). New setting not recognized until new power-up. SPECIAL FUNCTION 82 displays address.

DEFERRED EXECUTION MODE:

Data message requires EOS (! or linefeed). Generator accepts data in blocks up to 82 characters.

IMMEDIATE EXECUTION MODE:

Data message does not require EOS. Generator accepts data one character at a time.

RETURN TO LOCAL:

Blue key.

HP-IB Program Codes

Parameter	Program Code	Parameter	Program Code
Frequency		Sweep (Cont'd)	
Frequency	FR	Log 1%	N5
Amplitude		0.5 ms/Step	T1
Amplitude	AP	1 ms/Step	T2
Amplitude Off	AO	2 ms/Step	T3
Modulation		10 ms/Step	T4
AM Depth	AM	100 ms/Step	T5
FM		Marker 1	X1
Deviation	FM	Marker 2	X2
Modulation Off	MO	Marker 3	X3
Internal 400 Hz	M1	Marker 4	X4
Internal 1 kHz	M2	Marker 5	X5
External AC	M3	Selected Marker Off	X6
External DC	M4	All Markers Off	X7 (or BLX6)
Data		Remote Stepped Sweep (RSS) Clear	Y0
Numerals 0-9	0-9	RSS with Display	Y1
Decimal point		RSS without Display	Y2
Back Space	BS	RSS Execute	Y3
Units		Other	
dB	DB	Blue Key	BL
dBm (with Sign on Data)	DM	Up (↑)	UP
+dBm	+D	Down (↓)	DN
-dBm	-D	Increment Set	IS
mV	MV	Knob CW (Up)	RU
μV	UV	Knob CCW (Down)	RD
%	PC	Resolution X10 (On)	R1
Hz	HZ	Resolution +10 (On)	R2
kHz	KZ	Knob, Off	R3
MHz	MZ	Knob, Hold	R4 (or BLR1)
GHz	GZ	Knob, Increment	R5 (or BLR2)
Sweep		Sequence	SQ
Sweep Off	W1	Auto Sequence	AS (or BLSQ)
Auto Sweep	W2	Set Sequence	SS (or BLST)
Manual Sweep	W3	Store	ST
Single Sweep	W4	Recall	RC
Start Frequency	FA	Configure Trigger	CT
Stop Frequency	FB	Trigger	TR
Center Frequency	FR	Write Require Service Mask	@1
Frequency Span	FS	Read Require Service Mask	RM
100 Steps (Linear)	N1	Read Status Key Message	MS
1000 Steps (Linear)	N2	Learn Front Panel	L1
Set Step Size (Linear)	N3	"Fast" Learn	L2
Log 10%	N4	Deferred Execution Mode	@2
		Immediate Execution Mode	@3
		Special Functions	SP (or BLAP)

Special Functions

The following special functions and commands may be selected by:



- 00 SYSTEM CLEAR. Re-initialize panel.
- 10 FREQ OFFSET OFF
- 11 +FREQ OFFSET
- 12 -FREQ OFFSET
- 30 AMPLITUDE REFERENCE OFF
- 31 \pm dBm AMPLITUDE REFERENCE
- 40 AM EXT OFF
- 41 FM INT + AM EXT AC
- 42 FM INT + AM EXT DC
- 50 AUX FM OFF
- 51 AUX FM (rear panel input)
- 60 PARAMETER SHIFT KEYING
INCREMENT OFF
- 61 PARAMETER SHIFT KEYING
INCREMENT UP/DOWN (two key)
- 62 PARAMETER SHIFT KEYING
INCREMENT TOGGLE (one key)
- 80 SPECIAL FUNCTIONS OFF (except 85).
- 81 AMPLITUDE CONVERSION (V -dBm)
- 82 HP-IB ADDRESS DISPLAY
- 83 ROM CHECK. See manual (Sec. III).
- 84 RAM CHECK. See manual (Sec. III).
- 85 AMPLITUDE CORRECTION OFF
- 86 AMPLITUDE CORRECTION ON
- 87 HP-IB OPERATOR RESPONSE
- 88 AUTO SEQ. See manual (Sec. III).