QUICK REFERENCE GUIDE

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
00	NO ERROR
01	NO REFERENCE OSCILLATOR. Check INT-EXT switches or refer to Service Manual Sec. VIII).
09	REVERSE POWER AT RF OUTPUT. Remove source and press AMPLITUDE.
10	AMPLITUDE OUT OF SPEC. Refer to Service Manual (Sec. VIII).
11	FM OVERMODULATED. Reduce input level.
12	CRYSTAL OVEN NOT HEAT STABILIZED. Allow 1 hour.
13	EXTERNAL REFERENCE SELECTED
14	FREQUENCY OF REFERENCE OUT OF TOLERANCE.
15	AM OVERMODULATED. Reduce input level.
32	FREQUENCY SELECTION OUT OF RANGE. (1KHZ TO 1.28GHZ).
33	AMPLITUDE SELECTION > +16dBm. Entry ignored.
34	AMPLITUDE SELECTION < -139.9DBM. Entry ignored.
35	AMPLITUDE > +10DBM OR 710MV.AM accuracy is not specified.
36	AMPLITUDE SELECTION > 999mV or >0μV. Entry ignored.
37	AM SELECTION >95% OR <0%. Entry ignored.
38	FREQUENCY <150kHz. AM invalid.
39	FM >200kHz or >0.0kHz. INVALID.
40	FM >100KHZ INVALID for frequencies between 320 and 640MHz, or 1kHz and 120MHz.
41	FM >50kHz INVALID for frequencies between 160 and 320MHz.
42	FM >25kHz INVALID for frequencies between 120 and 160MHz.

Program Code	Parameter
43	WRONG ENTRY PROTOCOL. Entry ignored.
44	TOO MANY SIGNIFICANT DIGITS prior to decimal point.
45	START FREQ = STOP FREQ
46	PARAMETER UNDERFLOW. Defaulted to zero.
47	MARKER OUT OF LIMITS in start-stop sweep.
48	MARKER OUT OF LIMITS in span sweep.
49	STEP SIZE > SWEEP SPAN
50	STORE/RECALL ERROR. Register failed or nonexistent.
51	RECALL 0 INVALID. (1-9 only)
52	RAM DATA ALTERED. First good register recalled; special functions cleared. Re-enter data for store-recall registers.
53	RAM FAULTY. Generator initialized to 100 MHz and -30dBm. Re-enter data for all registers. Refer to Service Manual (Sec. VIII).
54	NO AMPLITUDE CORRECTION ABOVE +13dBm.
55	SWEEP STEPS >10,000. Staircase ramp disabled (SWEEP OUTPUT = OV).
56	SPECIAL FUNCTION CODE INVALID.
57	AMPLITUDE REFERENCE IN VOLTS INVALID
58	KEY INVALID IN MIXED MODULATION MODE
59	SWEEP SPAN OUT OF LIMITS
99	MALFUNCTION. See manual (Sec. VIII).

Function

Frequency

To set RF Signal Frequency tp 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 GHz

AMPTD OFF 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_{mod} x 500
120-160 MHz	25 kHz or f_{mod} x 125
160-320 MHz	50 kHz or f_{mod} x 250
320-640 MHz	100 kHz or f_{mod} x 500
640-1280 MHz	200 kHz or f_{mod} x 1000

FM Resolution

100 Hz (for deviations <10kHz)
1kHz (for deviations ≥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.

STORE 1 Stores entire front panel in register "1"

RECALL 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 STORE 1 2 9 2 STORE

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

SEQ SEQ SEQ SEQ

or continuously by pressing:

■ AUTO SEQ 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:

FREQUENCY INCR SET 1 2 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.

x10 HOLD retains the knob control for current function while allowing the remainder of the panel to be changed to another function.

÷10 INCR 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 Inrement):

SOURCE RECEIVER

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

MARKER 1 START FREQ

Sweep

Start/Stop

To set a frequency sweep from 10.2 MHz to 20.4 MHz: START FREQ 1 0 . 2 MHz; STOP FREQ 2 0 . 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: SPAN FREQ 1 2 . 4 MHz

Steps

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

LIN
- 100 ⊡ step size equals frequency span ÷100
- 1000 ⊡ step size equals frequency span ÷1000

SET SIZE ⊡ allows selection of step size via DATA section of the main panel (linear sweep)

LOG
- 10% ⊡ step size equals 10% of the present frequency
- 1% ⊡ step size equals 1% of the present frequency

Time/Step

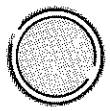
Sets the time interval between sweep steps. The shortest interval is 0.5 ms (nominal) for a simple linear sweep. This interval is longer for log sweeps, or markers, and sweeps with FM (0.9 ms maximum).

Markers

To set a SWEEP MARKER value of 15 MHz: MARKER ⊡ 1 5 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: MARKER ⊡ INCR SET DATA UNITS

The knob may be used to move a marker by: MARKER ⊡ x10 OR ÷10



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

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
Frequency	
Frequency	FR
Amplitude	
Amplitude	AP
Amplitude Off	AO
Modulation	
AM Depth	AM
FM	
Deviation	FM
Modulation Off	MO
Internal 400 Hz	M1
Internal 1 kHz	M2
External AC	M3
External DC	M4
Data	
Numerals 0-9	0-9
Decimal point	
Back Space	BS
Units	
dB	DB
dBm (with Sign on Data)	DM
+dBm	+D
-dBm	-D
mV	MV
µV	UV
%	PC
Hz	HZ
kHz	KZ
MHz	MZ
GHz	GZ
Sweep	
Sweep Off	W1
Auto Sweep	W2
Manual Sweep	W3
Single Sweep	W4
Start Frequency	FA
Stop Frequency	FB
Center Frequency	FR
Frequency Span	FS
100 Steps (Linear)	N1
1000 Steps (Linear)	N2
Set Step Size (Linear)	N3
Log 10%	N4

Parameter	Program Code
Sweep (Cont'd)	
Log 1%	N5
0.5 ms/Step	T1
1 ms/Step	T2
2 ms/Step	T3
10 ms/Step	T4
100 ms/Step	T5
Marker 1	X1
Marker 2	X2
Marker 3	X3
Marker 4	X4
Marker 5	X5
Selected Marker Off	X6
All Markers Off	X7 (or BLX6)
Remote Stepped Sweep (RSS) Clear	Y0
RSS with Display	Y1
RSS without Display	Y2
RSS Execute	Y3
Other	
Blue Key	BL
Up (↑)	UP
Down (↓)	DN
Increment Set	IS
Knob CW (Up)	RU
Knob CCW (Down)	RD
Resolution X10 (On)	R1
Resolution ÷10 (On)	R2
Knob, Off	R3
Knob, Hold	R4 (or BLR1)
Knob, Increment	R5 (or BLR2)
Sequence	SQ
Auto Sequence	AS (or BLSQ)
Set Sequence	SS (or BLST)
Store	ST
Recall	RC
Configure Trigger	CT
Trigger	TR
Write Require Service Mask	@1
Read Require Service Mask	RM
Read Status Key Message	MS
Learn Front Panel	L1
"Fast" Learn	L2
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	± 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).