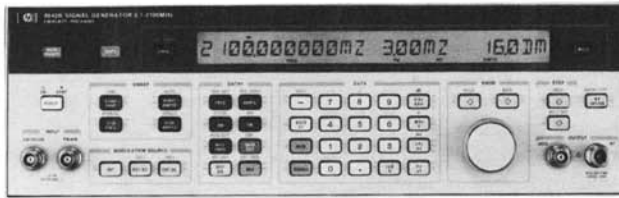
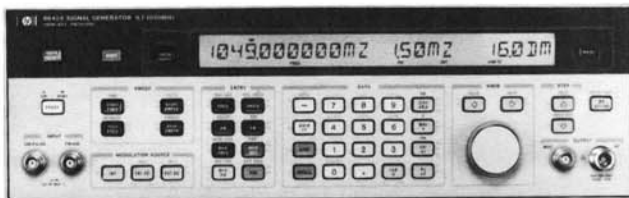


- 100 kHz to 2.115 GHz
- < -134 dBc/Hz SSB phase noise at 20 kHz offset
- -100 dBc nonharmonic spurious

- +20 dBm maximum output level
- AM, FM, Φ M and pulse modulation
- On-site repair and calibration



HP 8642A



HP 8642B

HP 8642A/B Synthesized Signal Generators

The HP 8642A and HP 8642B synthesized signal generators are high performance programmable signal generators intended for the most demanding out-of-channel RF receiver measurements and other stringent RF applications. The HP 8642A covers the frequency range from 100 kHz to 1057.5 MHz and the HP 8642B to 2115 MHz.

Low SSB Phase Noise

The HP 8642A/B provide state-of-the-art in SSB phase noise at 20 kHz offsets of -134 dBc/Hz at 1 GHz.

-100 dBc Spurious

Nonharmonic spurious are held to below -100 dBc on the HP 8642A/B up to 1 GHz and to below -94 dBc above 1 GHz. These two generators allow receiver spurious rejection tests to be fully automated with the utmost confidence in test results.

Repeatability and Level Accuracy

In addition to a high-reliability attenuator, absolute output level accuracy is ± 1 dB down to -127 dBm ($0.1 \mu\text{V}$). In R&D or on the production line, the HP 8642A/B will accurately measure receiver sensitivities.

Up to +20 dBm Output Level

Up to +20 dBm is available from the HP 8642A/B to perform a variety of high level measurements, often eliminating the need for external amplifiers.

This extra power can be used to overcome cabling losses. With the relative amplitude feature, the display can be offset to show correct output level at the end of the cable.

AM, FM, Φ M and Pulse Modulation

The HP 8642A/B offer AM, FM, Φ M and pulse modulation across their full frequency ranges.

A low distortion internal modulation oscillator can be used to modulate the HP 8642A/B up to 100 kHz rates. The internal audio oscillator can also be used as a stand-alone audio source with variable rates and levels.

HP 8642A/B Specifications

Frequency

Range: 100 kHz to 1057.5 MHz, HP 8642A; 100 kHz to 2115 MHz, HP 8642B.

Bands: Both generators cover their ranges in one continuous span. However, many other specifications are dependent on carrier frequency. To simplify such specifications, the HP 8642A and 8642B carrier frequency ranges are divided into bands shown in the table below.

Band	Carrier Frequency (MHz)	Band	Carrier Frequency (MHz)
10	1057.500001-2115 (HP 8642B)	4	16.523438- 33.046875
9	528.750001-1057.5	3	8.261719- 16.523437
8	264.375001- 528.75	2	4.130860- 8.261718
7	132.187501- 264.375	1	0.1 - 4.130859
6	66.093751- 132.1875	HET	0.1 -132.1875
5	33.046876- 66.09375		

Resolution: 1 Hz, 0.1 Hz with special function.

Stability: same as reference oscillator.

Internal Reference Oscillator

Standard: aging rate: ± 2 ppm/year; **Option 001:** $< 10^{-9}$ /day aging rate after 8 days warm-up.

Spectral Purity

Residual FM (in CW, AM or Angle Modulation $< 1/2$ Max. Dev.):

500 MHz: < 1.2 Hz (0.3 - 3 kHz BW), < 2 Hz (0.05 - 15 kHz BW);

1000 MHz: < 2 Hz (0.3 - 3 kHz BW), < 5 Hz (0.05 - 15 kHz BW);

2000 MHz: < 5 Hz (0.3 - 3 kHz BW), < 9 Hz (0.05 - 15 kHz BW).

SSB Phase Noise at 20 kHz offset (CW, AM or FM/ Φ M $< 1/60$ Maximum Deviation):

125 MHz: -144 dBc/Hz;

250 MHz: -141 dBc/Hz;

500 MHz: -137 dBc/Hz;

1000 MHz: -134 dBc/Hz;

2000 MHz: -125 dBc/Hz.

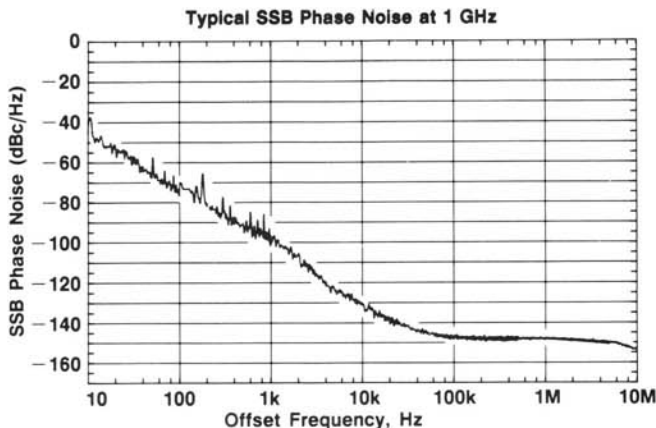
Residual AM: $< 0.01\%$ AM rms, 0.3 - 3 kHz BW.

Spurious

Harmonics: -30 dBc, level $\leq +10$ dBm, -25 dBc $f_c > 1057.5$ MHz.

Subharmonics: none, $f_c \leq 1057.5$ MHz, -45 dBc ($f_c > 1057.5$ MHz).

Nonharmonics (> 10 kHz offsets): -100 dBc, (-94 dBc $f_c > 1057.5$ MHz).



SIGNAL GENERATORS

Synthesized Signal Generators (cont'd)

Models 8642A and 8642B

Output

Level range: from maximum available to -140 dBm (0.023 μ V).

Maximum Level Available:

	HP 8642A	HP 8642B
+20 dBm (2.24V)	bands 1 thru 7	bands 1 thru 7
+19 dBm (2.00V)	n/a	band 8
+18 dBm (1.78V)	bands 8 & HET	HET
+17 dBm (1.58V)	n/a	band 9
+16 dBm (1.41V)	band 9	band 10

Resolution: 0.1 dB.

Absolute accuracy: ± 1 dB, output level ≥ -127 dBm.

Flatness: $\leq \pm 0.75$ dB, +10 dBm output level.

Impedance: 50 ohms nominal.

SWR: <1.5:1, level <0 dBm; <2.0:1, level ≥ 0 dBm.

Reverse power protection: 50W, from a 50 Ω source 25 Vdc, (25W, 50 Vdc, HP 8642B).

Third order intermodulation: <-55 dBc at +10 dBm, two generators 25 kHz apart into a resistive combiner. Typically decreases 10 dB for every 5 dB of combined level decrease.

Amplitude Modulation

AM depth: 0 to 99.9%, output level $\leq +10$ dBm.

AM resolution: 0.1%.

AM indicator accuracy at 1 kHz rate and up to 90% AM:

$\pm(3.5\%$ of setting +1% AM), $f_c \leq 528.75$ MHz;

$\pm(5\%$ of setting +1% AM), $f_c > 528.75$ MHz.

AM distortion at 1 kHz rate:

Depth	Distortion	
	8642A; $f_c \leq 528.75$ MHz 8642B; $f_c \leq 1057.5$ MHz	8642A; $f_c > 528.75$ MHz 8642B; $f_c > 1057.5$ MHz
0 to 30% AM	<1%	<2%
30 to 70% AM	<2%	<4%
70 to 90% AM	<4%	<6%

AM 3 dB bandwidth, depth $\leq 90\%$:

External dc/ac coupling: dc/20 Hz to 100 kHz, f_c : 01-4.13 MHz, 33.04-2115 MHz; dc/20 Hz to 20 kHz, f_c : 4.13-33.04

Internal: same as external ac.

Incidental θ M at 1 kHz rate and 30% AM: <0.2 radians peak.

Frequency Modulation

Maximum FM deviation:

Carrier Frequency Band	Maximum Deviation DC Coupled	Maximum Deviation AC Coupled or Internal
		(the smaller of)
10	3 MHz	3 MHz or $f_{mod} \times 2160$
9	1.5 MHz	1.5 MHz or $f_{mod} \times 1080$
8	750 kHz	750 kHz or $f_{mod} \times 540$
7	375 kHz	375 kHz or $f_{mod} \times 270$
6	187 kHz	187 kHz or $f_{mod} \times 135$
5	93.8 kHz	93.8 kHz or $f_{mod} \times 67.5$
4	46.9 kHz	46.9 kHz or $f_{mod} \times 33.75$
3	23.4 kHz	23.4 kHz or $f_{mod} \times 16.88$
2	11.7 kHz	11.7 kHz or $f_{mod} \times 8.44$
1	93.8 kHz	93.8 kHz or $f_{mod} \times 67.5$
HET	1.5 MHz	1.5 MHz or $f_{mod} \times 1080$

FM resolution: 0.7% of setting or 0.0004% of maximum deviation, whichever is larger.

FM indicator accuracy: $\pm(5\%$ of setting +10 Hz).

FM distortion: 4% for max. dev., 2% for $1/2$ max. dev., 0.4% for $1/10$ maximum dc coupled deviation.

FM 3 dB bandwidth: (dc/ac coupling): dc/20 Hz to 200 kHz.

Incidental AM: 0.3%, 20 kHz peak dev., 1 kHz rate, $f_c > 400$ kHz.

Test Equipment Depot www.testequipmentdepot.com
99 Washington Street 800-517-8431
Melrose, MA 02176-6024 781-665-0780 FAX

Phase Modulation

Maximum phase deviation:

Carrier Frequency Band	Maximum Deviation (Radians)
10	200
9	100
8	50
7	25
6	12.5
5	6.25
4	3.13
3	1.56
2	0.78
1	6.25
HET	100

θ M accuracy: $\pm(5\%$ of setting +0.09 radians), 1 kHz rate.

θ M resolution: Greater of 0.7% of setting or 0.0004% of max. dev.

θ M distortion: <0.4%, 1 kHz rate.

θ M 3 dB bandwidth: dc/20 Hz to 15 kHz.

Pulse Modulation (for output levels $\leq +15$ dBm)

Pulse on/off ratio: >40 dB; >80 dB, $f_c > 1057.5$ MHz.

Rise/fall time: <400 ns, 10% to 90%.

Maximum repetition frequency: 100 kHz.

Minimum pulse width: 2 μ s.

Internal Modulation Oscillator

Rates: 20 Hz to 100 kHz.

Frequency resolution: 1% of setting.

Frequency accuracy: 2% of setting.

Output level range: 0 to 3V peak into 600 ohms.

Output level resolution: 4 mV.

Distortion: <0.02%, 0.02 kHz to 15.8 kHz; <0.15%, >15.8 kHz.

Output level accuracy: $\pm(4\%$ +15 mV) within 1 second.

Output impedance: 600 ohms $\pm 10\%$.

Frequency Sweep

Modes: Start-Stop, Span, and Phase continuous.

X axis output: 0 to 10 Vdc, $\pm 10\%$.

Z axis output: TTL positive true for crt display blanking during retrace.

Remote Programming

Interface: HP-IB (IEEE-488-1978).

HP-IB functions: listener, talker, and controller. SH1, AH1, T5, TE0, L3, LE0, SR1, RL1, PP1, DC1, DT1, C1, C3, C28, E2.

General

Operating temperature range: 0° to 55° C.

Storage temperature: -55° C to +75° C.

Leakage: conducted and radiated interference is within the requirements of MIL STD 461B method RE02. Interference is also within the standards set by FTZ 1115. Also, RF leakage of <0.5 μ V is induced in a two turn loop 2.5 cm in diameter, held 2.5 cm away from any surface for output levels ≤ 0 dBm.

Power requirements: 100V, 120V, 220V, or 240V; +5%, -10%; 48 to 440 Hz; 300 VA max.

Size: 133H X 425W X 617D mm (5.25" X 16.75" X 24.3").

HP System II module size: 5/4H X 1MW X 23D.

Weight: Net, 32.7 kg (71.5 lb); shipping, 43 kg (95 lb).

Ordering Information

	Price
HP 8642A Synthesized Signal Generator	\$24,050
HP 8642B Synthesized Signal Generator	\$33,050
Opt 001 High stability time base	+\$2,100
Opt 002 RF connectors on rear panel only	+\$160
Opt 710 On-site repair manual	+\$72
Opt 907 Front handle kit (5061-9689)	+\$55
Opt 908 Rack flange kit (5061-9677)	+\$32.50
Opt 909 Front handle kit & rack flange kit (5061-9683)	+\$80
Opt 910 2 sets of operation/calibration and service manuals	+\$550
Opt 915 Service manual supplied with instrument	+\$250
Opt W03 90 day on-site warranty conversion	\$0
Opt W30 2 years additional hardware service	
HP 8642A Opt W30	+\$450
HP 8642B Opt W30	+\$600
HP 11801A On-site repair kit for HP 8642A	\$20,500
HP 11801B On-site repair kit for HP 8642B	\$27,000
HP 11801C On-site repair kit for HP 8642A/B	\$28,500