

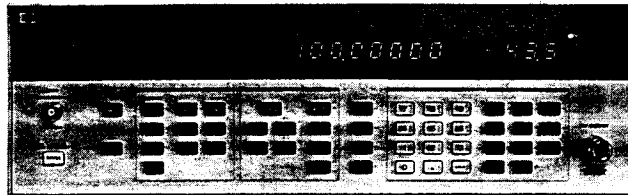


SIGNAL SOURCES

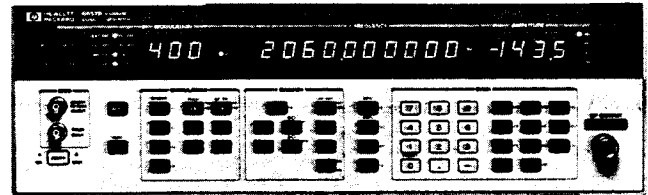
Economy RF

HP 8656B, 8657A/B

- 100 kHz up to 2060 MHz
- Electronic attenuator on HP 8657A
- ± 1.0 dB level accuracy (typically ± 0.5 dB on HP 8657A)



HP 8657A



HP 8657B



HP 8656B Synthesized Signal Generator

The HP 8656B is a programmable synthesized signal generator that combines performance, quality, and economy, covering the 0.1 to 990 MHz frequency range.

Precise Output Control

The HP 8656B provides ± 1.0 dB absolute level accuracy and 0.1 dB resolution with calibrated power levels over +13 to -127 dBm. The output level can be offset to compensate for losses external to the generator. RF leakage is well-shielded at < 1.0 μ V and 25 W reverse power protection guards against accidental damage.

Versatile Modulation

The HP 8656B is capable of simultaneous AM and FM modulation. The instrument provides internal 1 kHz and 400 Hz sources and also accepts external sources. AM is ac-coupled, while FM can be either ac- or dc-coupled. The dc-coupling is exceptionally stable (< 10 Hz/hour drift) and accurate (± 500 Hz center frequency accuracy).

HP 8657A/B Synthesized Signal Generators

The HP 8657A and 8657B offer excellent performance at an affordable price. The HP 8657A covers a 100 kHz to 1040 MHz frequency range while the L-Band HP 8657B covers 100 kHz to 2060 MHz.

High-Performance Spectral Purity and Output Power

The low residual FM (< 4 Hz at frequencies < 1040 MHz) and the excellent phase noise performance of these signal generators make them ideal for almost all measurements requiring test signals at adjacent or out-of-channel offsets. Features such as carrier phase adjust allow you to characterize phase-sensitive devices such as phase detectors or phase interferometers, using precise 1-degree phase offsets with respect to another signal source. Display blanking and nonvolatile memory-clear are also available for operation in secure environments.

- 50W reverse power protection on HP 8657A/B
- AM, FM, and optional pulse modulation

These signal generators offer wide dynamic output range, from +13 to -143.5 dBm, with unparalleled accuracy of ± 1.0 dB. The solid-state electronic attenuator in the HP 8657A is so reliable, it is backed with a five-year warranty against failure. The HP 8657A/B also have extremely low radiated emissions for making sensitivity measurements on your receiver or for design work on extremely sensitive circuitry. Reverse power protection is provided standard for protection up to 50 W.

High-Performance Versatile Modulation

The HP 8657A and 8657B can combine modulation modes for AM/AM, FM/FM, and AM/FM from both internal and external modulation sources. AM is ac-coupled, while FM can be either ac- or dc-coupled. The patented dc-coupling technique provides excellent long term stability (< 10 Hz/hour drift) as well as center frequency accuracy (± 500 Hz worst case). When dc FM is enabled, SSB phase noise and residual FM performance are not degraded as with other generators.

Pulse modulation is available with the HP 8657B Option 003. This option offers fast rise time and high isolation. Rise times are 35 to 50 ns (typically 10 to 18 ns) and on/off ratios are 70 to 95 dB. For pulse modulation coverage to 1040 MHz only, order the HP 8657B Option H60.

Ease of Operation for Improved Productivity

Up to 100 complete front-panel setups can be stored in the signal generator's memory for recall during testing. These setups can be accessed sequentially by pushing one front-panel key or by using the rear-panel SEQ port. The SEQ port can be connected to a foot switch or other operator-controlled device.

HP 8656B, 8657A/B Specification Summary

Specifications	HP 8656B	HP 8657A	HP 8657B
Frequency			
Range:	100 kHz to 990 MHz	100 kHz to 1040 MHz	100 kHz to 2060 MHz
Resolution:	10 Hz	10 Hz	1 Hz
Timebase aging rate:	± 2 ppm/year (typ.)	± 2 ppm/year (typ.)	± 2 ppm/year (typ.)
Option 001:	1.5×10^{-4} parts/day after 10 days (typ.)	1.5×10^{-4} parts/day after 10 days (typ.)	1×10^{-4} parts/day after 45 days (typ.)
Switching speed (w/i 100 Hz):	< 35 ms (25 ms typ. at 25° C)	< 35 ms (30 ms typ. at 25° C)	< 35 ms (30 ms typ. at 25° C)
Spectral Purity			
SSB phase noise ($f_c = 500$ MHz, 20 kHz offset):	< -114 dBc/Hz	< -130 dBc/Hz	< -130 dBc/Hz
Nonharmonics (> 5 kHz offset, CW):	< -60 dBc	< -60 dBc	< -60 dBc, < 1030 MHz < -54 dBc, ≥ 1030 MHz
Harmonics (at levels $\leq + 7$ dBm):	< -30 dBc	< -30 dBc	< -30 dBc, < 1030 MHz < -25 dBc, ≥ 1030 MHz
Subharmonics	None	None	None, 100 kHz to 1030 MHz
Residual FM (0.3 to 3 kHz $f_c = 500$ MHz, CW)	< 7 Hz rms	< 4 Hz rms	< -35 dBc, 1030 to 2060 MHz < 2 Hz rms (< 6 Hz > 1040 MHz)

SIGNAL SOURCES

Specifications	HP 8656B	HP 8657A	HP 8657B
Output Level Range: Resolution: Absolute accuracy: Reverse power protection:	+13 to -127 dBm into 50 Ω 0.1 dB <±1 dB, ≥123 MHz, +7 to -124 dBm <±1.5 dB, <123.5 MHz and <-124 dBm or >+7 dBm 25 W	+12 to -143.5 dBm into 50 Ω, +10 dBm, 100 kHz to 1 MHz 0.1 dB <±1 dB, ≥-127 dBm <±1.5 dB, >+7 dBm 50 W	+13 to -143.5 dBm into 50 Ω, +10 dBm, <1030 MHz w/Option 003 0.1 dB <±1 dB, ≥-127 dBm <±1.5 dB, ≥+3.5 dBm 50 W
Amplitude Modulation Depth (output at ≤+7 dBm): Resolution: Bandwidth (1 dB): Accuracy (internal rates): (<90% AM <+7 dBm) Distortion (internal rates): (0 to 30% AM, <+7 dBm)	0 to 99% 1% 20 Hz to 40 kHz <±(2% ± 4% of setting) <1.5% THD + noise	0 to 99% f _c ≥400 kHz 1% 20 Hz to 40 kHz <±(2% + 6% of setting) <1.5% THD + noise	0 to 100% f _c ≥400 kHz 1% 20 Hz to 40 kHz <±(2% + 6% of setting) <1.5%, <1030 MHz <4%, >1030 MHz
Frequency Modulation Maximum peak deviation ¹ : Resolution: Bandwidth (1 dB): Indicator accuracy: Distortion (internal rates, deviation 3 kHz):	99 kHz, f _c <123.5 and >247 MHz 50 kHz, f _c 123.5 to 247 MHz 100 Hz, deviations <10 kHz, 1 kHz, deviations ≥10 kHz dc/20 Hz to 50 kHz <±5% of setting <0.5% THD + noise	99 kHz, f _c <130 and >260 MHz 50 kHz, f _c 130 to 260 MHz 100 Hz, deviations <10 kHz, 1 kHz, deviations ≥10 kHz dc/20 Hz to 50 kHz <±5% of setting <0.5% THD + noise	50 kHz to 200 kHz, f _c <1040 MHz 400 kHz, f _c 1040 to 2060 MHz 100 Hz, <1040 MHz, dev. <20 kHz 200 Hz, >1040 MHz, dev. <20 kHz dc/20 Hz to 50 kHz <±5% of setting <0.5% THD + noise, (≥6 kHz dev. for f _c ≥1040 MHz)
Pulse Modulation On/off ratio: Rise/fall time, 10% to 90%: Repetition rate: Duty cycle:	Not applicable	Not applicable	Option 003 >70 dB (>95 dB, f _c ≥1030 MHz) <35 ns (<50 ns, f _c ≥1030 MHz) dc to 30 MHz, typical 0% to 100%
Remote Programming Interface: IEEE-488 functions:	HP-IB (HP's implementation of IEEE-488) SH0, AH1, T0, L2, SR0, RL1, PPO, DC1, DTO, CO, E1		
General Save/recall/sequence registers: Operating temperature: Power requirements: Size: Weight:	100 nonvolatile registers to save front-panel settings 0° to 55° C 100 V, 120 V, 220 V or 240 V (+5, -10%) from 48 to 440 Hz HP 8656B: 125 VA maximum; HP 8657A: 175 VA maximum; HP 8657B: 200 VA maximum HP 8656B, 8657A: 133 mm H x 425 mm W x 520 mm D (5.25 in x 16.75 in x 20.5 in) HP 8657B: 133 mm H x 425 mm W x 574 mm D (5.25 in x 16.75 in x 22.6 in) HP 8656B: 18.1 kg (40 lb); HP 8657A: 18.2 kg (40 lb); HP 8657B: 20.5 kg (45 lb)		

¹Deviations reduced for low-rate modulation; not specified for f_c-(f_m) <100 kHz.

Key Literature

HP 8656/57 Series Economy Synthesized Signal Generators Technical Data, p/n 5091-1556E
HP 8656/57 Series Economy Synthesized Signal Generators Brochure, p/n 5091-1555E

Ordering Information

Base Price	HP 8656B	\$7,490	HP 8657A	\$9,760	HP 8657B	\$14,200
Options						
001 High-Stability Timebase		+\$1,110		+\$1,080		+\$1,080
002 RF Connectors on Rear Panel Only		+\$285		+\$280		+\$280
003 Pulse Modulation		N/A		N/A		+\$925
022 0.3 GMSK Modulation (Includes Option 909, N/A w/Option 002)		N/A		+\$4,080		+\$4,360
H46 0.5 GMSK Modulation		N/A		+\$7,000		+\$7,000
H60 Pulse Modulation, Frequencies to 1040 MHz		N/A		N/A		-\$1,800
907 Front Handle Kit (5061-9689)		+\$59		+\$58		+\$58
908 Rack Flange Kit (5061-9677)		+\$34		+\$35		+\$35
909 Combined Front/Rack Flange Kit (5061-9683)		+\$85		+\$84		+\$84
910 Extra Operation/Calibration and Two Service Manuals		+\$375		+\$365		+\$365
915 Add Service Manual	(08656-90205)	+\$160	(08657-90004)	+\$157	(08657-90007)	+\$157
W30 Three-year Repair Service		+\$155		+\$190		+\$310
W32 Three-year Calibration Service		+\$810		+\$810		+\$1,485
W34 Three-year Standard Compliant Cal. Service		+\$980		+\$980		+\$1,770
W50 Five-year Repair Service		+\$310		+\$380		+\$620