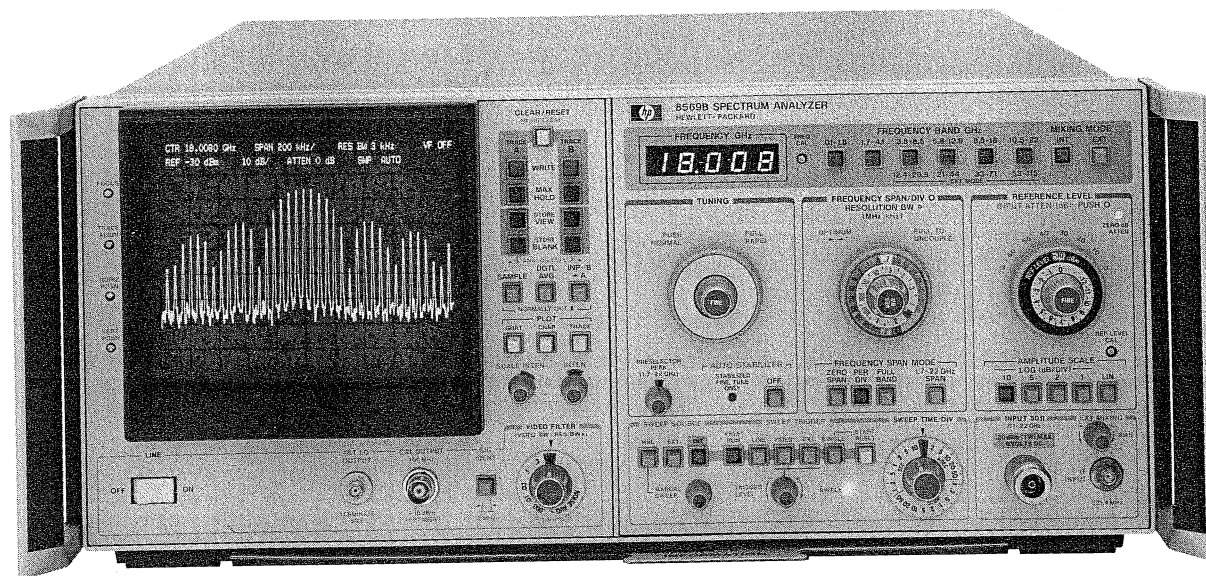


- 0.01 to 22 GHz, external mixing to 115 GHz & above
- Internal preselection, 1.7 to 22 GHz
- Wide resolution range, 100 Hz to 3 MHz

- Simple three knob operation
- Digital display of dual traces and control settings
- Direct plotter output - no controller needed



HP 8569B



HP 8569B Spectrum Analyzer

High performance and simple operation are combined with unique microprocessor-controlled capabilities in the HP 8569B Microwave Spectrum Analyzer. Excellent sensitivity and internal preselection assure the wide, spurious-free measurement range necessary for production applications, while the digital display and coupled controls speed measurement routines. The internal frequency range of 10 MHz to 22 GHz is extended using external mixers: to 40 GHz in two bands with the HP 8569B Option E02; to 71 GHz with HP 11971 series mixers; and to 115 GHz with other commercially available mixers. For more information on external harmonic mixers see page 141. For semi-automatic operation, connect a desktop computer to the HP 8569B via HP-IB to allow access to the displayed trace data and the control settings necessary to analyze or record measurements, or display operator messages and prompts on the CRT. Direct, hard copy output to a digital plotter is possible without the need of a controller or any programming.

Wide Range of Signal Resolution

Optimum resolution is possible for a wide range of signal characteristics with ten IF filters available from 100 Hz to 3 MHz. Fully automatic stabilization in narrow spans reduces residual FM to allow accurate measurements of closely spaced signals using the narrow bandwidths. The wide 1 and 3 MHz resolution bandwidths allow fast sweeps in wide spans and increased dynamic range for pulsed RF applications. All resolution filters are Gaussian-shaped for repeatable measurements, faster undistorted sweeps, and best pulse-response.

High Accuracy and Wide Dynamic Range

Absolute signal levels from -123 to $+30$ dBm are easily and accurately measured using IF substitution because the HP 8569B displays the reference level value directly on the CRT above the graticule. Damage to the mixer is prevented for signal levels of $+30$ dBm with a built-in limiter below 1.8 GHz and a preselector from 1.7 to 22 GHz. The internal preselector also ensures maximum use of this wide measurement range by reducing internal distortion products as much as 120 dB. In addition, flat frequency response ensures accuracy for relative as well as absolute power measurements.

Convenient Operation with Digital Display

Preset the HP 8569B to the color-coded, "basic operation" settings and use the coupled controls to make most measurements in three

easy steps: tune to the signal, select a span and raise it to the reference level. While in the AUTO sweeptime position, a calibrated amplitude display is ensured. However, the microprocessor also monitors manually-selected sweeptimes and displays a warning if the sweep speed chosen is too fast for calibrated measurements. Signals are displayed on either of two independent digitally stored traces with all major control settings annotated above the graticule area. Display processing capabilities include Max Hold, digital averaging and trace normalization for extended measurement capability.

HP-IB Includes Direct Plotter Control

A hard-copy record of the displayed traces, control settings and graticule can be made on a digital plotter via HP-IB quickly and simply using the HP 8569B's front-panel pushbuttons without need for a controller. For maximum capability, attach a controller to the HP 8569B to read the trace data and control settings for a measurement analysis. Also, you can illustrate the test parameters for each measurement with display lines and instruct the operator with messages on the analyzer CRT. The controller can verify correct control settings before taking the test data or going on to the next step.

HP 8570A Spectrum Analyzer

The HP 8570A is identical to the HP 8569B except for a lower price and some specification differences. The HP 8570A minimum resolution bandwidth is 1 kHz. There is no provision for the use of external mixers. The minimum displayed average noise level is -110 to -85 dBm, and some other specifications have been reduced such as frequency span accuracy, noise sidebands and frequency response.

HP 8569B and HP 8570A Specifications

Frequency Specifications

Frequency Range: 10 MHz to 22 GHz.

The HP 8569B is extendable to 40 GHz with Option E02, to 71 GHz with the HP 11971Q/U/V Mixers, and to 115 GHz with commercially available mixers. See page 141 for more information on external mixers.

SIGNAL ANALYZERS

Microwave Spectrum Analyzers (cont'd)

Models 8569B and 8570A

Center Frequency Accuracy

HP 8569B: $\pm(5$ MHz or 0.02% of center frequency, whichever is greater; + 20% of Frequency Span/Div).

HP 8570A: $\pm(9$ MHz or 0.03% of center frequency, whichever is greater; + 20% of Frequency Span/Div).

Frequency Spans

1.7 to 22 GHz: multiband span from 1.7 to 22 GHz in one sweep.

Full Band: displays spectrum of entire band selected.

Per division: 1 kHz to 500 MHz/div in a 1, 2, 5 sequence.

Accuracy: $\pm 5\%$, 20 kHz to 500 MHz/div unstabilized.

HP 8569B: $\pm 15\%$, 1 kHz to 100 kHz/div stabilized.

HP 8570A: $\pm 20\%$, 1 kHz to 100 kHz/div stabilized.

Stability

Total residual FM

HP 8569B: < 100 Hz p-p in 0.1 sec. stabilized.

HP 8570A: < 200 Hz p-p in 0.1 sec. stabilized.

Noise sidebands

HP 8569B: > 75 dB down, at 30 kHz offset.

HP 8570A: > 70 dB down, at 30 kHz offset.

Resolution Bandwidths (-3 dB)

HP 8569B: 100 Hz to 3 MHz, in 1, 3 sequence.

HP 8570A: 1 kHz to 3 MHz, in 1, 3 sequence.

Resolution Bandwidth Accuracy

HP 8569B: $\pm 15\%$.

HP 8570A: $\pm 20\%$.

Amplitude Specifications

Maximum Safe Input Power

Total average continuous power: +30 dBm.

Peak pulse power: +50 dBm (<10 μ s pulse width, 0.01% duty cycle) with ≥ 20 dB input attenuation.

Gain Compression: ≤ -7 dBm at the mixer for <1 dB compression.

Input Attenuator

Range: 0 to 70 dB, in 10 dB steps.

Step Accuracy: ≤ 1.0 dB to 18 GHz, ≤ 1.5 dB to 22 GHz.

Displayed Average Noise Level: (1 kHz RBW, 3 Hz VBW, 0 dB input attenuation).

Frequency (GHz)	Average Noise (dBm)	
	HP 8569B	HP 8570A
0.01-1.8	-113	-110
1.7-4.1	-110	-105
3.8-8.5	-107	-100
5.8-12.9	-100	-95
8.5-18	-95	-90
10.5-22	-90	-85

Amplitude Accuracy

Frequency response: (Ref. to 100 MHz, -10 dBm with 10 dB attenuation).

Frequency (GHz)	Frequency Response* (\pm dB max)	
	HP 8569B	HP 8570A
0.01-1.8	1.2	1.5
0.01-4.1	1.5	2.0
0.01-12.9	2.5	3.0
0.01-18	3.0	3.5
0.01-22	4.5	5.5

*Frequency response includes input attenuator, preselector and mixer frequency response plus mixing mode gain variation (band to band).

Reference Level

Range: +60 dBm to -112 dBm in 10 dB steps and continuous 0 to -12 dB vernier.

IF Step Gain

HP 8569B: ≤ 0.5 dB, -10 to -70 dBm; 1.0 dB, -80 to -100 dBm.

HP 8570A: ≤ 1.5 dB, -10 to -100 dBm.

Calibrator Output: 100 MHz ± 10 kHz; -10 dBm ± 0.3 dB.

Display Range

Log: 1, 2, 5, 10 dB/div over 8 divisions.

Linear: 0.56 μ V to 224 V in 50 ohm.

Display Accuracy

Log: $< \pm 0.1$ dB/dB to ± 1.5 dB max, 0 to 70 dB range.

Linear

HP 8569B: $< \pm 3\%$ over full 8 division deflection.

HP 8570A: $< \pm 5\%$ of reference level.

Residual Responses: < -90 dBm, with 0 dB input atten. and no signal at input.

Sweep Specifications

Sweep Time

Auto: sweep time is automatically controlled by Frequency Span/Div, Resolution Bandwidth and Video Filter controls to maintain an absolute amplitude calibrated display.

Calibrated sweep times: 2 μ s to 10 s/div in 1,2,5 sequence.

Input Output Characteristics

RF Input

Connector type: Precision type N female.

Input Impedance: 50 ohms nominal.

SWR (with > 10 dB input atten.)

HP 8569B: < 1.3, 0.01 to 1.8 GHz; < 2.0, 1.7 to 22 GHz.

HP 8570A: typically < 2.0 to 18 GHz.

LO Emission (2.0 to 4.46 GHz): < -60 dBm, 0.01 to 1.8 GHz; < -80 dBm, 1.7 - 22 GHz.

HP-IB

Direct Plotter Control: all displayed information can be transferred to an HP-IB plotter by using only front-panel pushbuttons.

Interface Functions: AH1, C0, DC1, DT0, E2, L4, PP0,

RL0, SH1, SR0, T7.

Auxiliary Inputs: Blanking, External Sweep and Trigger, Retrace.

Auxiliary Outputs: Blanking, Horiz. Sweep, 21.4 MHz IF, Vertical.

General Specifications

Operating Temperature

HP 8569B: 0 to 55°C

HP 8570A: 0 to 45°C

Operating Humidity: 95% R.H., 0 to 40°C.

Warm-up Time: 1 hour.

EMI: Conducted and radiated interference is in compliance with MIL-STD 461A methods CE03 and RE02, CISPR Publication 11 (1975), and Messempefaenger-Poostverfuergung 526/527/79 (Kennzeichnung Mit F-Nummer/Funkschutzzeichen).

Power-Line Requirements

Operating Voltage: 100, 120, 220, or 240 (+5%, -10%) VAC.

Operating Frequency: 48 to 66 Hz.

Maximum Power: 280 VA.

Weight

Net

HP 8569B: 29.2 kg (64 lb).

HP 8570A: 26.8 kg (59 lb).

Shipping

HP 8569B: 41 kg (90 lb)

HP 8570A: 38.6 kg (85 lb)

Standard Options Available

Opt 001, Internal Comb Generator: 100 MHz comb signals visible through 22 GHz for increased frequency accuracy (error <0.007%, typically ± 1 MHz at 22 GHz) and preselector peaking verification.

Opt 002, Delete 100, 300 Hz Bandwidths (HP 8569B only): standard specifications apply except minimum resolution bandwidth is 1 kHz with 15:1 shape factor, residual FM <200 Hz when stabilized.

Opt 003, High Power LO Output (HP 8569B only): provides $\geq +14$ dBm for direct use with HP 11971 series external mixers.

Opt 400, 400 Hz Power Line Operation: Extends line frequency operation for 100 and 120 VAC lines; 48 to 440 Hz.

HP Part No. 1450-0654 — Transit Case. For casters order HP Part No. 1490-0913.

Ordering Information

HP 8569B Spectrum Analyzer

Opt 001: Internal Comb Generator

Opt 002: Delete 100,300 Hz Bandwidths

Opt 003: High Power LO Output

Opt 400: 400 Hz Power Line Operation

Opt 908: Rack Flange Kit Without Handles

Opt 910: Extra Operating & Service Manual

Opt 913: Rack Flange Kit with Handles

Opt E02: Extended Frequency Range to 40 GHz

HP 8444A Opt 059 Tracking Generator

HP 11971 Series Harmonic Mixers extend frequency range to 71 GHz. See page 141.

HP 8570A Spectrum Analyzer

Opt 001: Internal Comb Generator

Opt 400: 400 Hz Power Line Operation

Opt 908: Rack Flange Kit Without Handles

Opt 910: Extra Operating & Service Manual

Opt 913: Rack Flange Kit With Handles