

SIGNAL ANALYZERS

Spectrum Analyzers, 1 kHz to 325 GHz

Models 8562A and 8562B

- Synthesized tuning
- Frequency counter
- Factory adjusted preselector
- AM/FM demodulators

- Test and Adjustment Module
- One Year Calibration Cycle
- MIL-T-28800C Rugged
- Lightweight and Portable



HP 8562A

The new HP 8562A and 8562B spectrum analyzers put high-performance, synthesized technology into a lightweight, portable package. Ruggedized to military specifications, these analyzers are engineered to survive harsh field conditions. They perform a wide variety of jobs from communication-system and component testing to radar and millimeter measurements. Both models are packed with advanced HP technology and HP-IB is standard.

The Choice is Yours

The HP 8562A has a frequency range of 1 kHz to 22 GHz with microwave preselection. External mixers extend the range to 325 GHz. If measurements below 2.9 GHz are your main interest, order the economical HP 8562B, which covers the same frequency range as the HP 8562A but without preselection.

Use Them Anywhere

The compact size and shape of the HP 8562A/B make them easy to transport to remote sites. They even slide under an airplane seat. Of course, these portable analyzers also make good sense in the laboratory and on the production line. They fit easily onto crowded work benches or instrument racks. And if there's no room on your bench, they will operate upright on the floor.

Ease of Use

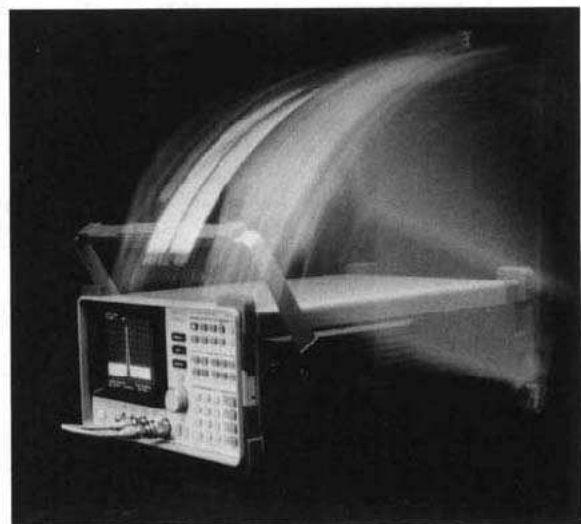
For over 20 years, Hewlett-Packard has been designing spectrum analyzers that are easy to use for both new and experienced operators. The HP 8562A/B represent the fifth generation of spectrum analyzers. Dedicated keys with large, easy-to-read lettering provide the basic tune, zoom, and measure steps. They allow fast access to frequently used functions such as markers, save/recall, and direct plotter output. In ten minutes or less, you'll become familiar enough with this analyzer to perform basic measurements.

Rugged and Dependable

The HP 8562A/B are built to perform in adverse conditions. They have been ruggedized to meet MIL-T-28800C requirements for temperature, pulse shock, and transit drop. These analyzers withstand 30

g's of shock, so there is no need to worry if they are knocked around. Climate isn't a problem either—these models warm up in five minutes in ambient temperatures from -10°C to $+55^{\circ}\text{C}$.

A removable impact cover fits over the front panel for maximum protection during transit. Inside the cover there are several convenient compartments for small accessories like adapters, BNC cables, and external mixers. You'll find a handy, pocket-size operating guide there too.



The HP 8562A/B meet MIL-T-28800C standards for ruggedness.

Test and Adjustment Module

The HP 85629A Test and Adjustment Module or "TAM" is a new approach to servicing spectrum analyzers. It plugs into the rear panel of the HP 8562A/B and performs high level diagnostics, self tests, and much more. The TAM is a must for anyone doing his own repair. And one module can service multiple spectrum analyzers.

Detect Fault

Automatic Fault Isolation makes functionality checks of the CPU, ADC, IF, LO, and RF sections. Just connect the CAL OUTPUT, press a few keys, and many failures can be isolated to a single board within minutes. No external test equipment is required.

Find Fault

Using the TAM's 8-input voltmeter and the twenty-six 16-pin test connectors spread throughout the analyzer, you can make more than 1000 measurements, isolating the faulty board or component quickly, without racks of equipment.

Readjustment

Once you've repaired the analyzer, readjustment is fast and accurate because the TAM controls both internal analyzer settings and external test equipment. For example, the TAM performs the frequency-response adjustment in 10 minutes. The same adjustment performed manually takes an hour. After readjustment, use the TAM's functional tests for immediate confidence that the repair was completed successfully.

Specifications

Frequency

Frequency Range: 1 kHz to 22 GHz (to 325 GHz with external mixers)

Harmonic mode (n)	Center frequency
1	1 kHz - 2.9 GHz
1	2.75 GHz - 6.46 GHz
2	5.86 GHz - 13.0 GHz
3	12.4 GHz - 19.7 GHz
4	19.1 GHz - 22.0 GHz

Frequency Readout Accuracy: Start, Center, Stop, or Marker: $\pm(\text{freq readout} \times \text{freq reference accuracy} + 5\% \text{ of span} + 15\% \text{ of res BW} + 250 \text{ Hz})$

Counter Resolution: 10 Hz - 1 MHz (selectable)

Counter Accuracy: $\pm(\text{marker freq} \times \text{freq reference accuracy} + 50 \text{ Hz} \times n + 1 \text{ LSD})$ for $S/N \geq 25 \text{ dB}$

Delta Counter Accuracy: $\pm(\text{delta freq} \times \text{freq reference accuracy} + 100 \text{ Hz} \times n + 2 \text{ LSD})$ for $S/N \geq 25 \text{ dB}$

Frequency Reference Accuracy: $< 4 \times 10^{-5} / \text{year}$ (includes aging, temperature drift, settability)

Frequency Stability

Residual FM: $< 50 \text{ Hz} \times n \text{ p-p}$ in 0.1 sec (zero span)

Spectral Purity

Noise Sidebands: $< (-100 + 20 \text{ Log } n) \text{ dBc/Hz}$ at 30 kHz offset

Frequency Span

Range: 0 Hz, 2.5 kHz to 19.25 GHz

Accuracy: $< 5\%$

Resolution Bandwidth (-3 dB)

Range: 100 Hz - 1 MHz in a 1,3,10 sequence

Accuracy: $\pm 30\%$ 100 Hz, $\pm 10\%$ 300 Hz to 300 kHz, $\pm 25\%$ 1 MHz

Selectivity: $< 15:1$ ($-60 \text{ dB}/-3 \text{ dB}$)

Shape: Synchronously-tuned, 4-pole filter

Video Bandwidth

Range: 1 Hz - 1 MHz in a 1,3,10 sequence

Amplitude Range

Amplitude Range: +30 dBm to displayed average noise level

Maximum Safe Input

Average Continuous Power: +30 dBm (1 Watt) with input atten $\geq 10 \text{ dB}$



The HP 85629A Test and Adjustment Module plugs into the rear panel to provide extensive servicing capability.

Peak Pulse Power: +50 dBm (100 Watt) with input atten $\geq 30 \text{ dB}$ for $< 10 \text{ usec}$ pulse width and $< 1\%$ duty cycle

DC: 0 Volts

Display Range

Display: 10×10 Division Graticule

Calibration: Log 10,5,2 and 1 dB per division, Linear 10% of Reference Level/division

Reference Level Range: Log, -119.9 to +30 dBm in 0.1 dB steps; linear 2.2 uVolts to 7.07 Volts in 1% steps

Input Attenuation Range: 0 to 70 dB in 10 dB steps

Dynamic Range

Maximum Dynamic Range

Compression to Noise: 118 dB

Signal to Distortion:

Harmonic: $\geq 2.9 \text{ GHz}$: 100 dB (77.5 dB unpreselected), $< 2.9 \text{ GHz}$: 77.5 dB

Intermodulation: 86 dB

Displayed Average Noise Level: With 100 Hz res BW, 0 dB Input Attenuator, 1 Hz video filter: -90 dBm, 10 kHz; -100 dBm, 100 kHz; -121 dBm, 1 MHz to 2.9 GHz; -121 dBm, 2.75 GHz to 6.46 GHz; -110 dBm, 5.86 GHz to 13.0 GHz; -105 dBm, 12.4 GHz to 19.7 GHz; -100 dBm, 19.1 GHz to 22.0 GHz.

1 dB Gain Compression: -3 dBm at input mixer above 10 MHz

Spurious Responses: Signals generated by the analyzer due to input signals. For mixer level $< -40 \text{ dBm}$: all harmonic and intermodulation distortion $> 60 \text{ dB}^1$ below input signal.

Second Harmonic Distortion: for mixer level $= -40 \text{ dBm}$: $< -72 \text{ dBc}$, 10 MHz to 2.9 GHz; $< -60 \text{ dBc}$ (8562B only) above 2.75 GHz. For mixer level $= -10 \text{ dBm}$: $< -100 \text{ dBc}$ (8562B unspecified) above 2.75 GHz.

¹to 6.46 GHz 8562A, to 2.9 GHz 8562B

SIGNAL ANALYZERS

Spectrum Analyzers, 1 kHz to 325 GHz (cont'd)

Models 8562A and 8562B

Third Order Intermodulation Distortion: for mixer level <-30dBm: <-70 dBc, 10 MHz to 2.9 GHz; <-75 dBc above 2.75 GHz.

Image, Multiple, and Out-of-Band Responses: <-70 dBc, <18 GHz (8562B unspecified); <-75 dBc, <22 GHz (8562B unspecified)

Residual Responses: No signal at input, 0 dB input atten. <-90 dBm, 200 kHz to 6.46 GHz.

Amplitude Accuracy

Frequency Response (flatness): 10 dB attenuation.

Frequency Range	8562A	8562B
1 kHz - 2.9 GHz	±1.2 dB	±1.2 dB
2.75 - 6.46 GHz	±2.5 dB	±2.0 dB
5.86 - 13.0 GHz	±3.6 dB	±2.5 dB
12.4 - 19.7 GHz	±4.0 dB	±3.0 dB
19.1 - 22.0 GHz	±4.3 dB	±4.3 dB

Calibrator Accuracy: ±0.3 dB

IF Gain Uncertainty: ±1 dB for 0 dBm to -80 dBm reference level

Scale Fidelity: 0.4 dB/4 dB to a maximum of ±1.5 dB over 0 to 90 dB range. Linear: ±3% of Reference Level

Input Attenuator Switching Accuracy: With 20 to 70 dB settings referenced to 10 dB. ±1.1 dB/10 dB step, 2.0 dB max, 0 to 12.4 GHz; ±1.3 dB/10 dB step, 2.5 dB max, 12.4 to 19.4 GHz; ±1.8 dB/10 dB step, 3.5 dB max, 19.4 to 22 GHz

Resolution Bandwidth Switching Uncertainty: ±0.5 dB reference to 300 kHz BW

Pulse Digitization Uncertainty: Pulse response mode, PRF>720/sweep time. Log (peak to peak): 1 dB; Linear (peak to peak): 4% of ref level, Nominal Standard deviation: 0.2 dB

Sweep

Sweep Time

Range: 50 usec to 60 sec for zero span, 50 msec to 100 sec for span ≥2.5 kHz

Sweep Trigger: Free Run, Line, Single, Video, External

Demodulation

Modulation Type: AM and FM

Audio Output: Speaker and phone jack with volume control

Inputs & Outputs

Front Panel Connectors

RF Input: Precision type N female, nominal impedance 50 ohm

VSWR: <1.5:1 for <2.9 GHz and ≥10 dB Input Attenuation (nominal); <2.3:1 for >2.9GHz and ≥10 dB Input Attenuation (nominal); <3.0:1 for 0 dB Input Attenuation (nominal)

LO Emission Level (average): With 10 dB input atten. <-80 dBm (8562A nominal), <-10 dBm (8562B nominal)

Second IF Input: SMA female, nominal frequency: 310.7 MHz; nominal impedance 50 ohms; NF: 7 dB (nominal); Gain Compression: -20 dBm (nominal)

First LO Output: SMA female, nominal impedance: 50 ohm; nominal frequency range: 3.0000 - 6.8107 GHz, amplitude +16.5 dBm ±2 dB

Calibrator Output: BNC female, nominal impedance: 50 ohm

Rear Panel Connectors

10 MHz Reference (Input/Output): BNC female, nominal impedance: 50 ohm; nominal input range: -2 to +10 dBm

Video Output: BNC female, nominal impedance: 50 ohms (DC coupled)

LO Sweep/0.5 V per GHz Output: Shared BNC female, nominal impedance: 2k ohm (DC coupled); nominal LO sweep output: 0 to +10V (no load)

External Trigger Input: BNC female, nominal impedance: >10k ohm; trigger level: rising edge of TTL level

HP-IB: Interface Functions: SH1, AH1, T6, L4, SR1, RL1, PPO, DC1, DT1, CO, E1. Direct plotter outputs: HP 7225A, 7440A, 7470A, 7475A, 7550A, 9872A/B/C/T

General Specifications

Environmental

Military Specification: Meets MIL-T-28800C, Type III, Class 3, Style C.

Calibration Interval: 1 year

Warmup: 5 minutes from ambient conditions

Temperature: Operating: -10° to +55°C. Non-operating: -62° to +85°C

Humidity: 95% @ 40°C for 5 days

Altitude: Operating: 15,000 ft. Non-operating: 50,000 ft.

Rain Resistance: Drip-proof at 16 liters/hour/square foot

Vibration: 5-15 Hz: 0.059 inch p-p excursion; 15-25 Hz: 0.039 inch p-p excursion; 25-55 Hz: 0.020 inch p-p excursion

Pulse Shock: half sine: 30 g's for 11 ms duration

Transit Drop: 8-inch drop on 6 faces and 8 corners

Electromagnetic Compatibility: Conducted and radiated interference is in compliance with CISPR publication 11 (1985), and FTZ 526/527/79. Meets MIL-STD-461B, Part 4 with the exceptions shown below.

Conducted Emissions. CE01 (Narrowband): 1 kHz to 15 kHz only. CE03 (Narrowband): Full limits. CE03 (Broadband): 20 dB relaxation from 15 kHz to 100 kHz.

Conducted Susceptibility. CS01: Full limits (limited to 36 Hz for HP 8562B). CS02: Full limits. CS06: Full limits.

Radiated Emissions. RE01: 15 dB relaxation to 28 kHz, and exceptioned from 28 kHz to 50 kHz. RE02: Full limits <1 GHz.

Radiated Susceptibility. RS01: Full limits. RS02: Exceptioned. RS03: Limited to 1 V/meter from 14 kHz to 1 GHz, with 20 dB relaxation at IF frequencies.

Power Requirements

115 VAC operation: Voltage: 90 - 140 V RMS; Current: 3.2 A RMS MAX; Frequency: 47 - 440 Hz

230 VAC operation: Voltage: 180 - 250 V RMS; Current: 1.8 A RMS Max; Frequency: 47 - 66 Hz

Maximum Power Dissipation: 180 Watts

Nominal Weight: 8562A: 20 kg (44 lbs.); 8562B: 19 kg (41.8 lbs.)

Dimensions: 163 mm high × 325 mm wide × 427 mm deep (nominal, without handle, feet, or cover).

Ordering Information

	Price
HP 8562A Spectrum Analyzer	\$35,000
HP 8562B Spectrum Analyzer	\$31,000
Option 001: Second IF Output	\$800
Option 908: Rackmount Kit with flanges	\$250
Option 909: Rackmount Kit with handles and flanges	\$300
Option 910: Extra Manual Set	\$165
Option 915: Technical Reference Manual	\$275
HP 8562A/B Option 916: Extra Pocket Operating Guide (English)	\$15
HP 8562A Option W30:	\$700
2 additional years Return-to-HP Service	
HP 8562B Option W30:	\$620
2 additional years Return-to-HP Service	
HP 85629A Test and Adjustment Module	\$2,000
Product Support Kit P/N 08562-60021	
HP 8562A/B +22C 1 year Return-to-HP CAL	\$180
HP 8562A/B +22X 1 year Return-to-HP MIL-STD CAL	\$276