

SIGNAL ANALYZERS

15 Hz to 50 kHz wave analyzer

Model 3581A



Description

Hewlett-Packard's 3581A Wave Analyzer resolves and measures the amplitude and frequency of spectral components. This instrument offers accurate amplitude and good frequency resolution in the form of a portable, easy to use measuring tool. Since not all signals originate from a stable frequency source, the 3581A incorporates an AFC circuit which locks to a drifting signal for stable, accurate measurements.

HP's 3581A has other important features that are necessary when making measurements of small voltages from transducers and harmonic signals. Its 30 nV sensitivity becomes important for these measurements. Battery operation can be used to reduce the line related interference common in low level measurements so only the real spectrum is measured.

Digital readout of tuned frequency is located above the analog meter. It has been grouped with the meter for ease of reading. Resolution of the digital readout is 1 Hz for any frequency between 15 Hz and 50 kHz. Readout is updated five times per second so delay between tuning and reading is minimized.

Four meter scales are used to provide a wide range of displays. Two scales are used for linear voltage readings. Two log scales provide either a 90 dB or 10 dB display. In any case, the large meter with its mirror backing can present readings in dBV, dBm or volts. A meter was specifically chosen for amplitude display rather than digital readout because it is easier to peak a meter reading and because it's much easier to get a feel for noise or other amplitude variations by watching the meter. The same voltage used to drive the meter is also available on the rear panel for driving X-Y recorders.

Specifications*

Frequency Characteristics

Range: 15 Hz to 50 kHz.

Display: 5 digit LED readout.

Resolution: 1 Hz.

Accuracy: ± 3 Hz.

Typical stability: ± 10 Hz/hr after 1 hour and ± 5 Hz/ $^{\circ}$ C.

Automatic frequency control (AFC) hold-in range: ± 800 Hz.

Amplitude Characteristics

Instrument range

Linear: 30 V to 100 nV full scale.

Log: +30 dBm or dBV to -150 dBm or dBV.

Amplitude accuracy:

Frequency response,

15 Hz-50 kHz

Log
 ± 0.4 dB

Linear
 $\pm 4\%$

Dynamic range: > 80 dB.

Noise sidebands: greater than 70 dB below CW signal. 10 bandwidths away from signal.

Spurious responses: > 80 dB below input reference level.

Sweep Characteristics

Scan width: 50 Hz to 50 kHz, adjustable in a 1-2-5 sequence from 50 Hz to the full frequency range.

Sweep error light: this LED indicates a sweep that is too fast to capture full response. When the light is on, response will be lower than it should be.

External trigger: a short to ground stops the normal sweep. Opening the short then enables a sweep.

Input Characteristics

Impedance: 1 M Ω , 30 pF.

Maximum input level: 100 V rms, ± 100 V dc.

Output Characteristics

Tracking generator output: (also known as BFO or tracking oscillator output).

Range: 0 to > 1 V rms into 600 Ω .

Frequency response: $\pm 3\%$ 15 Hz to 50 kHz.

X-Y recorder analog outputs

Vertical: 0 to +5 V $\pm 2.5\%$.

Horizontal: 0 to +5 V $\pm 2.5\%$.

Impedance: 1 k Ω .

Pen lift: contact closure to ground during sweep.

Restored output: acts as a narrow band amplifier.

General

Power requirements: 100 V, 120 V, 220 V, or 240 V $\pm 5\%$ -10%, 48 Hz to 440 Hz, 10 VA typical.

Size: 412.8 mm H x 203.2 mm W x 285.8 mm D (16 $\frac{1}{4}$ " x 8" x 11 $\frac{1}{4}$ ").

Weight: 11.5 kg (23 lb). Opt 001: 13.5 kg (30 lb).

Options

001: Internal battery 12 hours from full charge. Internal battery is protected from deep discharge by an automatic turnoff. Useful life of this battery is over 100 cycles.

910: Extra set manuals

Price
add \$405

add \$20

3581A Wave Analyzer

\$3500

*Note: for complete specifications, refer to page 576 (HP 3581C selective voltmeter) which is a dedicated telecommunication version of the HP 3581A wave analyzer.