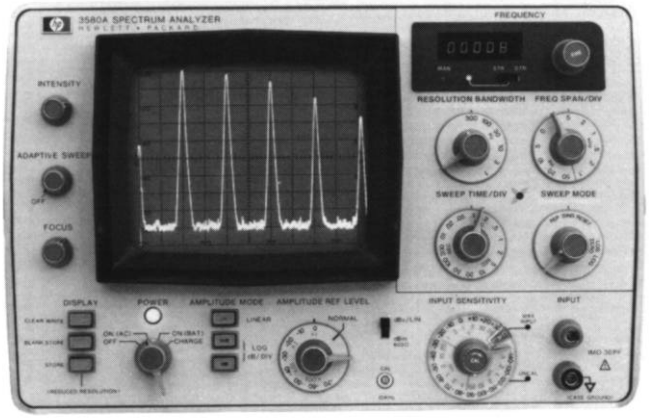
HP3580 SPECTRUM ANALYZER SPECIFICATIONS



SECTION I
GENERAL INFORMATION

1-1. DESCRIPTION.

1-2. The Hewlett-Packard Model 3580A Spectrum Analyzer is a low frequency instrument that has been optimized for use in the 5 Hz to 50 kHz range. The 3580A functions as a signal analyzer or as a network analyzer. When used as a signal analyzer, the 3580A provides a graphical display of the spectral components of an input signal. When used as a network analyzer, the 3580A plots the amplitude vs. frequency characteristics of 2-port networks such as amplifiers, attenuators and filters.

1-3. The major features of the 3580A include a digitally stored display, adaptive sweep, six selectable bandwidths (1 Hz - 300 Hz), 30 nV sensitivity and 80 dB dynamic range. These standard features, along with optional balanced inputs and an internal rechargeable battery pack, make the 3580A ideally suited for communications, geophyical, oceanography and metrology applications.

1-4. SPECIFICATIONS.

1-5. Table 1-1 is a complete list of the Model 3580A critical specifications that are controlled by tolerances. Table 1-2 contains general information describing the operating characteristics of the 3580A.

1-6. Any changes in specifications due to manufacturing, design, or traceability to the U.S. National Bureau of Standards are included in Table 1-1 in this manual. Specifications listed in this manual supersede all previous specifications for the Model 3580A.

1-7. OPTIONS.

1-8. There are three options available for the 3580A. Option 001 and Option 002 are listed in the following table. For further information concerning those options, refer to Table 1-2 or Section III in this manual or contact the nearest -hp- Sales and Service Office. Option 910 is an additional Operating and Service Manual.

3580A Option (Factory Installed)	Description
001*	Internal rechargeable battery pack and front panel cover for complete portability
002	Balanced inputs; balanced tracking oscillator output

*Field Installation Kit -hp- 11195A Battery Pack only. Front Panel Cover Accessory -hp- 10101B.

1-9. Warranty Exceptions.

1-10. Batteries in Option 001 instruments are warranted for 90 days.

1-11. ACCESSORIES SUPPLIED.

1-12. The following is a list of accessories supplied with the 3580A.

Item	Qty.	-hp- Part No.
Accessory Kit Includes the following:	1 ea.	03580-84401
PC Board Extender (15 pin)	2 ea.	5060-0049
PC Board Extender (10 pin)	2 ea.	5060-5917
Fuse: 0.25 A, 250 V Normal Blo (for 220 V/240 V operation)	1 ea.	2110-0004

1-13. ACCESSORIES AVAILABLE.

1-14. The following is a list of Hewlett-Packard accessories available for use with the Model 3580A:

-hp- Model	Description
10004B	Voltage Divider Probe
10101B	Front Panel Cover Assembly
7035B Opt. 020	X/Y Recorder
197A or 198A	Oscilloscope Camera

1-15. INSTRUMENT AND MANUAL IDENTIFICATION.

1-16. The instrument serial number is located on the rear panel. Hewlett-Packard uses a two-section serial number consisting of a four-digit prefix and a five-digit suffix. A letter between the suffix and prefix identifies the country in which the instrument was manufactured (A = USA, G = West Germany, J = Japan, U = United Kingdom). All correspondence with Hewlett-Packard should include the complete serial number.

1-17. If the serial number of your instrument is lower than the one on the title page of this manual, refer to Section VIII for backdating information that will adapt this manual to your instrument.

Table 1-2. General Information.

INPUT CHARACTERISTICS (Standard 3580A)

Connector: female banana plug

Impednace: 1 megohm, 30 pF

Maximum (ac) Input Level:

Input Sensitivity	Maximum Input
+ 30 dB (20 V) to -10 dB (0.2 V)	100 V rms
-20 dB (0.1 V to -70 dB (0.2 mV)	50 V rms

Maximum (dc) Input Voltage: ± 100 Vdc

Coupling: capacitive

DC Isolation: none (input common referenced to frame ground)

INPUT CHARACTERISTICS (Option 002)

Selectable Input Configurations:

Unbalanced
Balanced Bridged
Balanced Terminated

Connector: female banana plug

Impedance:

Unbalanced: 1 megohm, 40 pF
Greater than 12 K (typically 14 K at 1 kHz)
Terminated: 600 ohms or 900 ohms

Maximum Input Levels:

Unbalanced: same as Standard 3580A
Bridge: 100 V dc max, 35 V rms ac max
Terminated: + 27 dBm at 0 V dc. (see Paragraph 3-187)

DC Isolation:

Unbalanced: none (input common referenced to frame ground)
Bridged and Terminated: floating input

AMPLITUDE CHARACTERISTICS:

Amplitude Modes:

Linear: Absolute measurements in rms volts (average responding): relative measurements in percent of full scale.

Log 10dB/div.: Absolute measurements in dBV (1 V rms = 0 dBV) or dBm/600 ohms; relative measurements in dB. Display sensitivity is 10 dB per division; display range is > 80 dB.

Log 1 dB/div.: Display sensitivity is 1 dB per division; display range is 10 dB. Any 10 dB portion of 80 dB range can be displayed by changing the AMPLITUDE REF LEVEL control setting.

Full-Scale Sensitivity:

Linear Mode:
Calibrated: 20 V rms to 0.1 μV rms (18 ranges)
Uncalibrated: 100 V rms to 0.2 μV rms

Log 10 dB Mode:
Calibrated: + 30 dBV/dBm to -70 dBV/dBm (11 ranges)
Uncalibrated: + 40 dBV/dBm to -60 dBV/dBm

Overload Indicator: An LED Overload indicator on the front panel lights to indicate that the input signal exceeds the maximum (full scale) input level set by the INPUT SENSITIVITY switch and amplitude VERNIER.

Internal Calibration Signal: An internally generated calibration signal can be used to calibrate the amplitude section (following input attenuator) to an accuracy of ± 1.5% at 10 kHz. The calibration signal can also be used to verify the frequency accuracy of the instrument.

FREQUENCY CHARACTERISTICS:

Frequency Range: 5 Hz to 50 kHz

Frequency Control: The front panel FREQUENCY control tunes the frequency of the analyzer over the 0 Hz to 50 kHz range. The control can be used to set either the start or center frequency of linear sweeps.

Δ16 **Course and Fine Tuning:** Course and fine tuning is performed by using the concentric knobs in the upper right corner of the front panel. The knob closest to the front panel controls the course tuning. The knob furthest from the front panel controls the fine tuning. The fine tuning knob is also used to set the displayed frequency to 20 Hz in the LOG ZERO sweep mode.

Frequency Display: Indicates start or center frequency in Hz. In the Manual Mode, the Frequency Display indicates the marker frequency.

Range: 00.0 kHz to approximately 50.8 kHz.

Resolution: 20 Hz (one minor division)

Typical Frequency Stability: ± 10 Hz/hr. after 1 hour; ± 5 Hz/°C

Bandwidth Settings: 1 Hz, 3 Hz, 10 Hz, 30 Hz, 100 Hz, 300 Hz

Bandpass Characteristic: closely approximates a gaussian response.

Shape Factor: 10:1 on 1 Hz thru 100 Hz bandwidths; 8:1 on 300 Hz bandwidth

Equivalent Noise Bandwidth: Typically 12% wider than *absolute* 3 dB bandwidth.

Display Smoothing (noise filtering):

3 Settings: min, med, max

Response: determined by Bandwidth setting.

SWEEP CHARACTERISTICS:

Sweep Modes:

Repetitive: The instrument sweeps continuously over the selected frequency range.

Single: The instrument sweeps one time over the selected frequency range and stops at the end frequency

Reset: Sweep is reset to left-hand side of screen; instrument remains at start frequency of sweep.

Manual: The electronic sweep is disabled and a front panel potentiometer is used to manually sweep the frequency and the refresh trace on the CRT. The manual sweep fully duplicates the span of the electronic sweep.

Log Zero: Used to set the correct starting point for log sweep.

Log: Front panel frequency and sweep controls are disabled. The instrument sweeps logarithmically from 20 Hz

Table 1-2. General Information (Cont'd).

to 43 kHz. The log sweep is repetitive; sweep time is approximately 5 seconds.

Typical Sweep Linearity: ± 1%

Frequency Span Settings: 0 Hz, 5 Hz/div to 5 kHz/div.

When the 0 Hz span setting is selected, the frequency sweep is disabled and the instrument remains at the frequency indicated on the frequency display. The display continues to sweep at the panel-selected rate. This provides a graphical display of amplitude vs. time.

Overall Span: 50 Hz to 50 kHz (10 span settings)

Sweep Time Settings: 0.01 sec/div. to 200 sec/div. (14 settings)

Overall Sweep Time: 0.1 sec to 2,000 sec

Sweep Error Light: A front panel LED indicator lights when sweep rate is too fast.

Out of Range Indication: The CRT display is cleared in areas where the sweep goes below 0 Hz or above 50 kHz.

Adaptive Sweep: The front panel Adaptive Sweep control is used to set a baseline threshold on the CRT. In areas where responses are below the baseline threshold, the instrument sweeps 20 to 25 times faster than the panel-selected rate. When the sweep reaches a response that rises above the baseline threshold, it backs up slightly, pauses to allow the IF Filter to settle and then sweeps slowly over the response at the panel-selected rate. By sweeping rapidly through unused portions of the spectrum, the Adaptive Sweep greatly reduces the measurement time for certain applications.

External Triggering: A rear panel External Trigger Input connector is provided to allow the frequency sweep to be remotely triggered by a contact closure or TTL logic levels. External triggering can be used in the Repetitive, Single or Log sweep mode.

OUTPUTS:

Recorder Outputs:

X-Axis: Supplies dc voltage corresponding to position of frequency sweep on CRT.

Output Voltage: 0 V (left-hand edge) to + 5 V (right-hand edge)

Output Resistance: 1 kilohm

Y-Axis: Supplies dc voltage proportional to amplitude.

Output Voltage: 0 V (bottom of screen) to + 5 V (top of screen).

Output Resistance: 1 kilohm

Pen Lift: Provides a contact closure during single sweeps. If Adaptive Sweep is used, closure is present only when instrument is sweeping slowly over a response.

Tracking Oscillator Output:

Frequency: 5 Hz to 50 kHz; tracks turned or swept frequency of instrument.

Output Level: 0 V to > 1 V rms into 600 Ω (adjustable)

Output Impedance: 600 ohms

Tracking Oscillator Input: Tracking oscillator output signal can be offset or frequency modulated by applying an external reference signal (about 100 kHz) to the rear panel Tracking Oscillator Input connector.

L.O. Output:

Frequency: Varies from 1.0 MHz to 1.5 MHz as 3580A frequency is tuned from 0 Hz to 50 kHz.

Output Level: Varies from about 300 mV p-p to 600 mV p-p depending on frequency.

Output Impedance: 1 kilohm

GENERAL:

Operating Temperature Range:

Standard 3580A: 0°C to 55°C

Option 001: 0°C to + 40°C

Storage Temperature Range:

Standard 3580A: -40°C to + 75°C

Option 001: -40°C to + 50°C

Charge Temperature Range (Option 001): 0°C to + 40°C

Power Requirements: 100 V, 120 V, 220 V or 240 V + 5% -10%, 48 Hz to 440 Hz, 35 watts maximum

Battery Characteristics (Option 001):

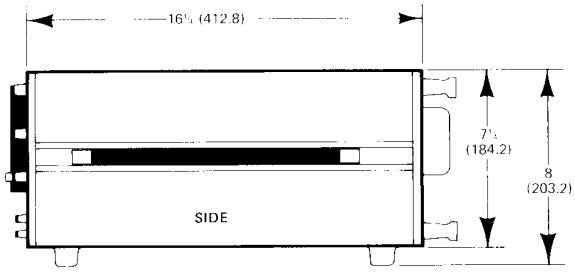
Operating Time: 5 hours from full charge

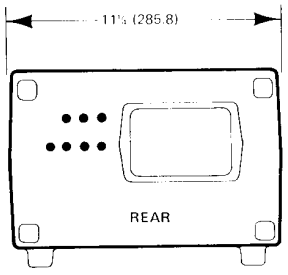
Charge Time: 14 hours to recharge fully discharged battery pack

Battery Life: more than 100 charge/discharge cycles

Protection: The batteries are protected from excessive discharge by an automatic cut out.

Dimensions:





DIMENSIONS SHOWN IN INCHES AND (MILLIMETERS)

Weight:

Standard 3580A: Net 27 lbs.

Option 001: Net 35 lbs.