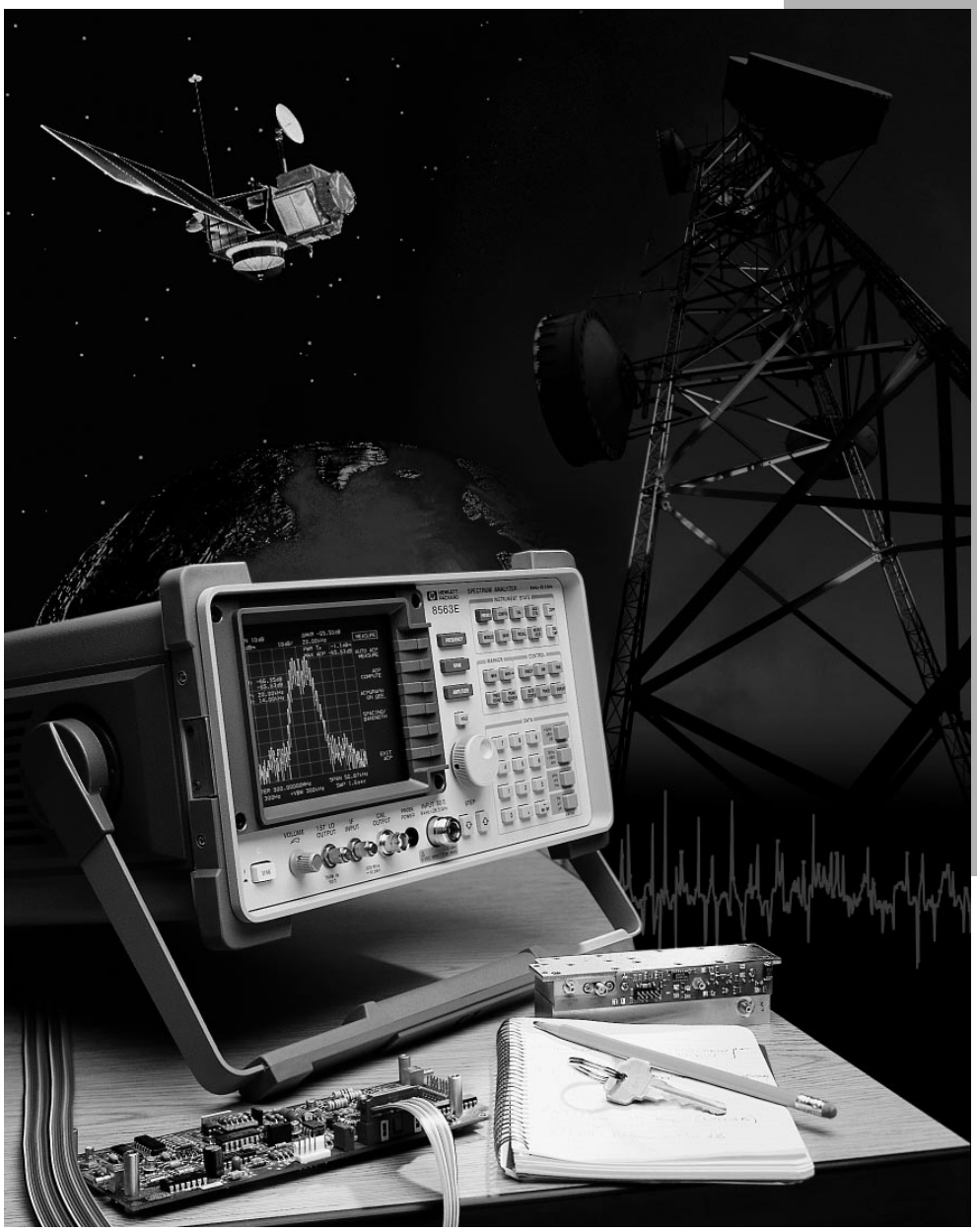
HEWLETT® PACKARD

HP 8560 E-Series
Spectrum Analyzers



Unlock the Measurement Performance

When measurement performance is key to your success, choose the spectru

Memory Card for storing trace data and downloadable programs.

Outstanding phase noise and sensitivity performance meet the demanding requirements of today's communication systems.

1 Hz minimum resolution bandwidth provides added sensitivity and selectivity. Narrow bandwidths are digitally implemented for fast sweep times.

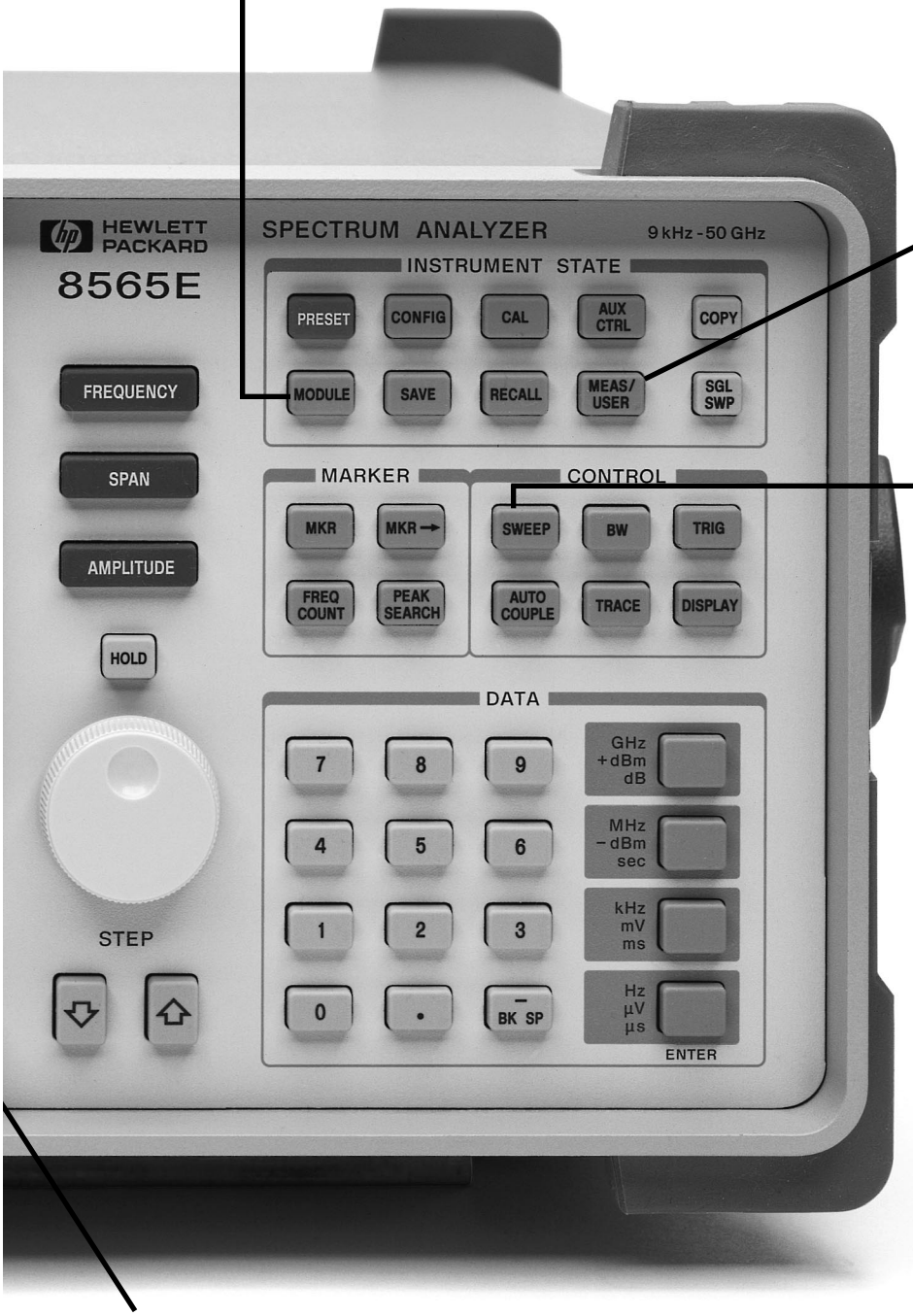
MIL-Rugged design provides the same high performance in harsh environmental conditions as it does on the R&D bench.

AM and FM demodulators with built-in speaker.

Preselection to 75 GHz available with external preselected mixers.

nalyzer that is packed with measurement capability and quality.

128 Kbytes of user RAM stores up to 100 traces and states or other user information.



Adjacent channel power, occupied bandwidth, and FFT functions provide measurement results quickly.

Time gating and delayed sweep simplify your measurements on time-varying signals.

Continuous sweeps of 9 kHz (optionally 30 Hz) **to 50 GHz** on the HP 8565E.

HP 8560 E-Series Spectrum Analyzers

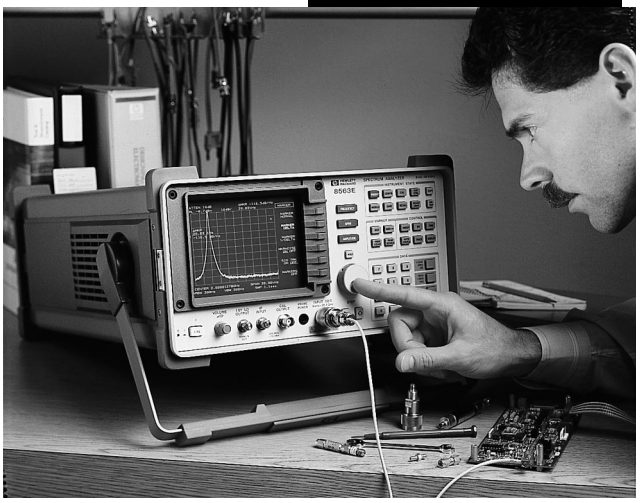
Your key to measurement performance, capability, and quality

Leading technology for high-performance applications

Optimized for high-performance, the HP 8560 E-Series meet the demanding test requirements of RF and microwave communications, satellite communications, radar, surveillance, signal monitoring applications, and more.

- 100 dB of third-order dynamic range
- –145 dBm sensitivity at 1 GHz, in a 1 Hz RBW
- –113 dBc noise sidebands at a 10 kHz offset from 1 GHz

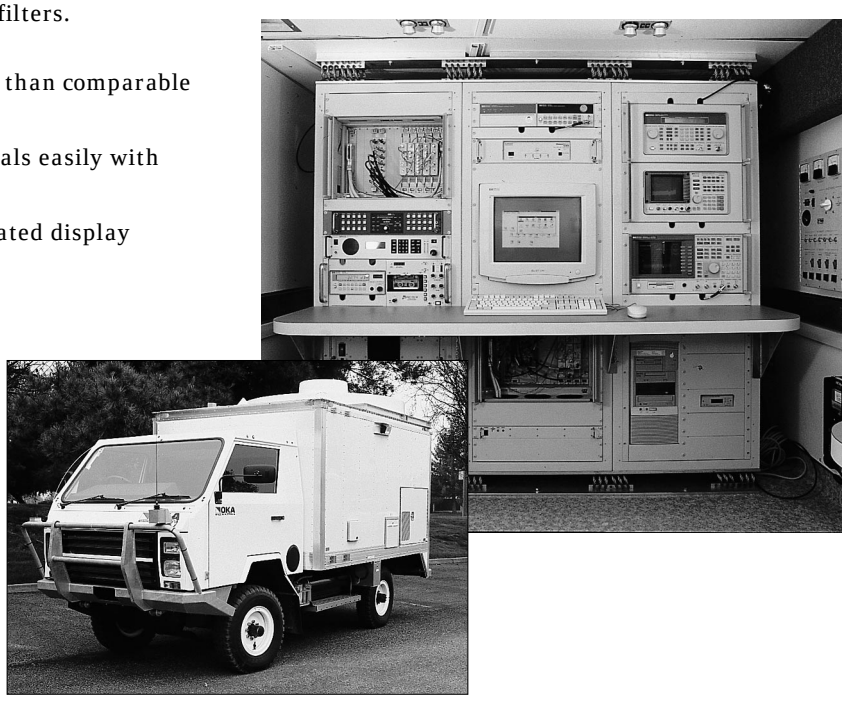
High performance extends to 26.5 GHz in the HP 8563E using state-of-the-art technology — an image-enhanced harmonic mixer. This component makes the HP 8563E a top performance value for microwave spectrum analysis.



Faster measurements with digital bandwidths — and more

Dramatically decrease your test times using the digitally implemented 1 Hz through 100 Hz resolution filters.

- Sweep up to 60 times faster than comparable analog filters
- View close-in, low-level signals easily with narrow 5:1 shape factor
- Full 100 dB onscreen calibrated display



Outstanding performance with many standard features

Description	HP 8560E	HP8561E	HP 8562E	HP 8563E	HP 8564E	HP 8565E
Frequency Range	30 Hz[1] to 2.9 GHz	30 Hz[1] to 6.5 GHz	30 Hz[1] to 13.2 GHz	30 Hz[1] to 26.5 GHz	30 Hz[1] to 40 GHz	30 Hz[1] to 50 GHz
Frequency Accuracy	< 135 Hz at 1 GHz, 15 minute warm-up, –10° to +55° C					
Noise Sidebands	< –113 dBc/Hz at 10 kHz offset from 1 GHz					
Resolution Bandwidth Range	1 Hz to 2 MHz (3 MHz in a 6 dB bandwidth)					
DANL in a 1 Hz RBW						
at 1 GHz	<151 dBm	< 145 dBm	< 151 dBm	< 151 dBm	< 145 dBm	< 145 dBm
at 5 GHz		< 145 dBm	< 148 dBm	< 148 dBm	< 147dBm	< 147 dBm
at 13.2 GHz			< 145 dBm	< 145 dBm	< 143 dBm	< 143 dBm
at 26.5 GHz				< 139 dBm	< 136 dBm	< 136 dBm
at 50 GHz						< 127 dBm
Dynamic Range	>103 dB third-order dynamic range					
Frequency Response, typical	< .8 dB	< 1.1 dB	< 1.5 dB	< 2.2 dB	< 2.4 dB	< 3.0 dB
Standard Features	1 Hz RBW, precision frequency reference, AM/FM demodulator, time-gating, ACP, occupied bandwidth, FFT measurements, HP-IB control, card reader, external mixer compatibility, MIL-rugged, 5 minute warm-up, direct print/plot, and more.					

[1] 30 Hz low-end frequency is available with Option 006.

HP quality and reliability reduces your cost of ownership

The analyzers meet MIL-T-28800, Type III Class 3 specifications, so you can take them anywhere.

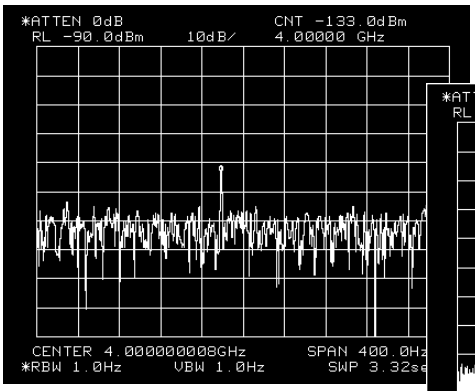
Continuously self-aligning IF ensures measurements you can rely on, even as environmental conditions change.

Two-year calibration interval reduces time away from important tasks.

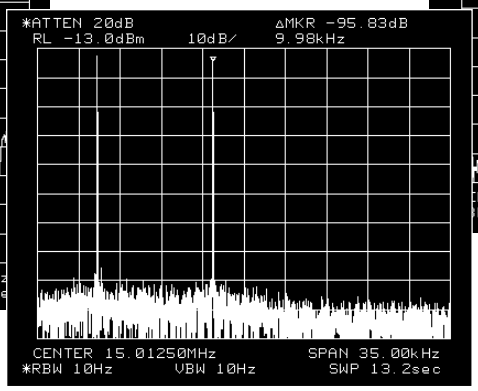
HP support options provide repair and/or calibration services for up to five years at over 40 service centers worldwide. MIL-STD 45662A calibrations are also available.

Designed for easy servicing, so downtime is reduced if servicing is necessary. User support is made easy with the HP 85629B test and adjustment module, component-level documentation (Option 915), and service training available from the factory.

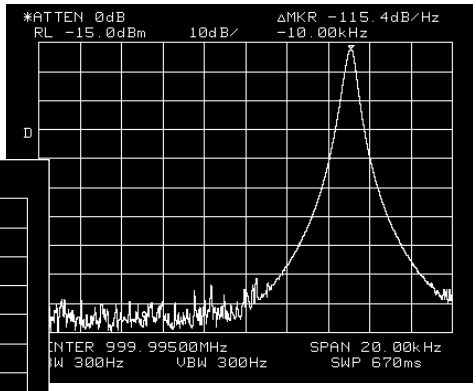
Application consulting is available worldwide from HP's application engineers.



View low-level signals to 50 GHz using a 1 Hz resolution bandwidth.



Easily measure 3rd-order distortion in devices with greater than 100 dB of spurious-free 3rd-order dynamic range.



Noise sidebands are typically less than –115 dBc/Hz at a 10 kHz offset from 1 GHz.

The Performance You Need ....

Stable 1 Hz bandwidth for sensitivity and selectivity

- Adds 10 dB more measurement range than a 10 Hz bandwidth
- < 1 Hz x N peak-to-peak residual FM gives stable results to 50 GHz
- Digital implementation sweeps faster than 10 Hz analog bandwidth

Digitally implemented bandwidths extend from 1 Hz to 100 Hz in a 1, 3, 10 sequence. All bandwidths are fully functional in zero-span and in swept-frequency measurements. Analog filters cover the resolution bandwidth range of 300 Hz to 2 MHz.

Spurious-free measurements over a wide dynamic range

Measure low levels of distortion produced by devices or systems under test - spectrum analyzer distortion will not interfere. With greater than 100 dB of spurious-free third-order dynamic range and a third-order intercept (TOI) of up to +15 dBm, these spectrum analyzers give you the performance you need.

Measure two signals having significantly different amplitudes in a single sweep. The HP 8560 E-Series provide a full 100 dB of onscreen, calibrated display range.

Spectral purity meets demanding requirements

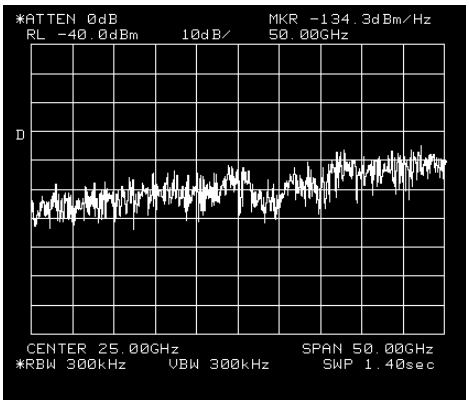
The close channel spacing and stringent leakage requirements of modern communications systems place tough demands on measurement equipment. The HP 8560 E-Series meet these demands head on, with noise sidebands typically less than –115 dBc/Hz at a 10 kHz offset from 1 GHz, and specified performance down to 100 Hz offsets.

Measure low-level signals with outstanding amplitude accuracy across a continuously sweeping 50 GHz span

HP's image-enhanced, double balanced harmonic mixer provides the breakthrough performance you get with the HP 8565E. The image-enhancing design allows the harmonically mixed front-end to achieve noise-figure performance similar to that of a fundamentally mixed front-end.

Specified pulse response

HP 8560 E-Series spectrum analyzers easily capture and accurately display short-duration radar pulses. You can be certain that sweep-to-sweep signal variations are due to the equipment under test, not the analyzer.



State-of-the-art design provides a nearly flat noise floor to 50 GHz.

When throughput is key to your success

Fast digital resolution bandwidths (RBWs)

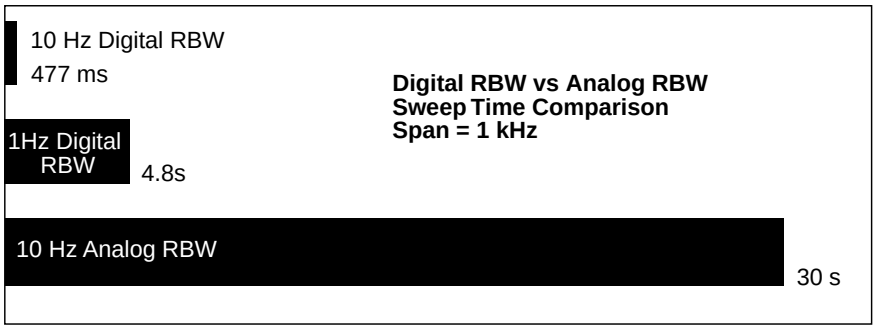
Digitally implemented narrow RBWs allow HP 8560 E-Series analyzers to sweep up to **60 times faster** than is possible using comparable analog filters.

Wider RBWs allow faster sweeps

Narrow digital filter shape factors, high TOI level, and superior microwave sensitivity allow you to use wider resolution bandwidths. For every factor often that you widen the bandwidth, you reduce sweep time by a factor of up to 100.

Automated measurements

Use the instrument-control capability of downloadable programs and the HP-IB interface to automate measurements.

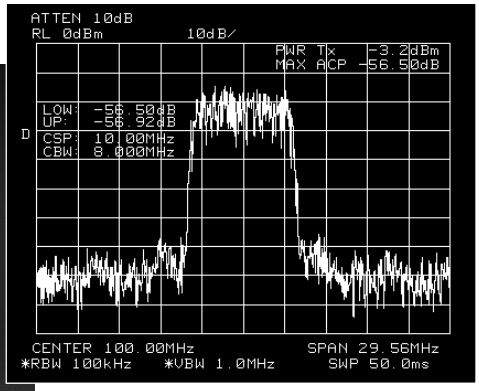


A 10 Hz digital resolution bandwidth sweeps much faster than a 10 Hz analog resolution bandwidth.

Fast-locking synthesizer routines

HP 8560 E-Series spectrum analyzers use time more efficiently, since they perform measurements rather than spend time preparing to make them. Dead-time between sweeps is typically less than 40 ms, so real-time adjustments are easily made, and you are more likely to capture intermittent signals.

Mass memory module is included.



Measure adjacent channel power at the push of a button.

... with Test Capabilities That Simplify Operation

Easy operation

With the HP 8560 E-Series spectrum analyzers you get fast access to such as frequently used functions as markers, save/recall, and direct output to printer or plotter. Softkeys provide additional measurement capability - with no shift functions to complicate operation.

Every analyzer comes standard with the HP 85620A mass memory module. This module plugs onto the rear panel to provide a memory card reader, internal memory, and computer capability without a controller.

Additionally it provides:

- 128 Kbytes of battery-backed RAM for storage of download-able programs and up to 100 traces with state information
- Limit-lines for pass/fail testing
- Clock/calendar with automatic execute and save functions for unattended operation

Spurious response measurements utility

The five most commonly made spectrum analyzer measurements are now automated with the HP 85672A spurious response measurements utility. Set-up and execution of each measurement is reduced to a few keystrokes--saving time, eliminating errors and optimizing the instrument to produce the best possible measurement results.

- Third-Order intermodultaion product and Third-Order Intercept (TOI/TP3)
- Harmonics and Total-Harmonic Distortion (THD)
- Discrete sideband spurs
- General spur search
- Mixing products

Built-in capability for measurements on communications systems

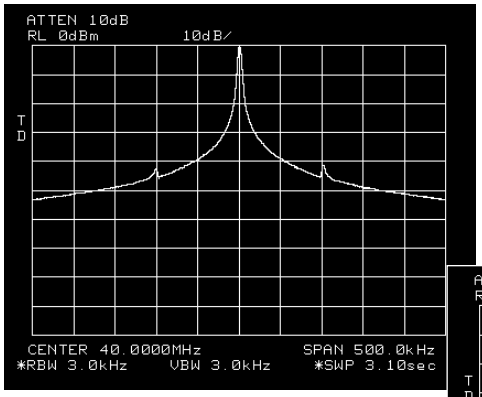
Adjacent channel power (ACP)

Quickly and easily measure the leakage of a modulated carrier into an adjacent channel of a mobile communications system. Simply access the ACP softkey menu, enter the channel band-width and channel spacing of the system you wish to measure, and activate the ACP auto-measure feature. The analyzer automatically optimizes the span, sweep time, resolution bandwidth, and video bandwidth. The computed total transmitted power and adjacent channel power are displayed in less than one second.

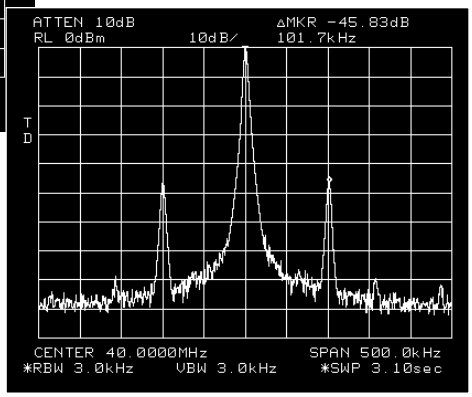
If you prefer to make measure-ments using specific settings, activate the ACP COMPUTE function. It computes ACP with-out changing your resolution-bandwidth, video-bandwidth, span, or sweep-time settings.

Occupied bandwidth

Measure the bandwidth that contains 99% of a transmitter's power (occupied bandwidth) at the push of a button. The analyzer places markers at the upper and lower frequencies, with the bounded frequency range indicating the 99% power bandwidth.



Before gating, side-bands are hidden.



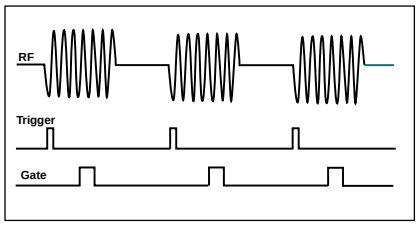
With gating, side-bands are clearly visible.

Time-gated spectrum analysis

Now you can view spectral information during specific, repetitive time-domain events, even if they last for only a few microseconds.

Use time-gated spectrum analysis to measure many devices:

- Communications modulators; pulsed RF and TDMA
- Video devices
- Read/write heads
- Other time-multiplexed devices



Time-domain view of RF and trigger signal with gate position shown.

Time domain measurements

View the time domain (zero span) response of your signal with sweep times from 50 µs up to 6000s. Option 007 provides digitization of fast time domain sweeps (< 30 ms). This feature simplifies measurements of TDMA or pulsed RF signals.

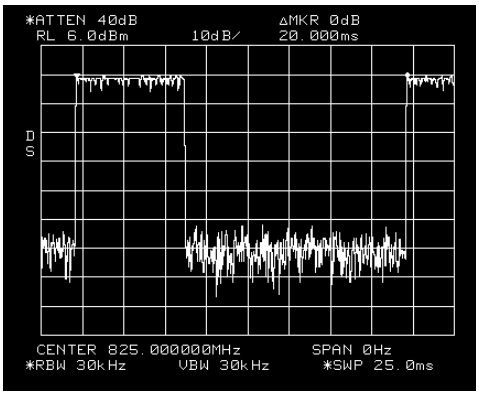
Use markers, trace math, and trace storage; and get hard copy output of measurements such as rise/fall times, pulse widths, and time between events.

Delayed sweep

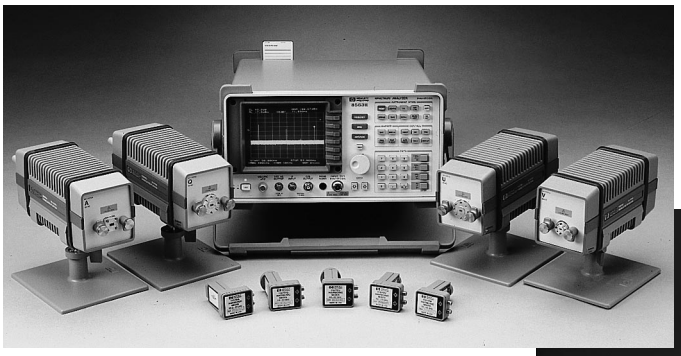
Use the delayed-sweep function in zero-span to zoom-in on signal transitions in the time domain. You can delay the start-of-sweep up to 65 ms from a trigger signal, with 1 µs resolution. Then you can analyze your signal both before and after triggering.

Digital radio

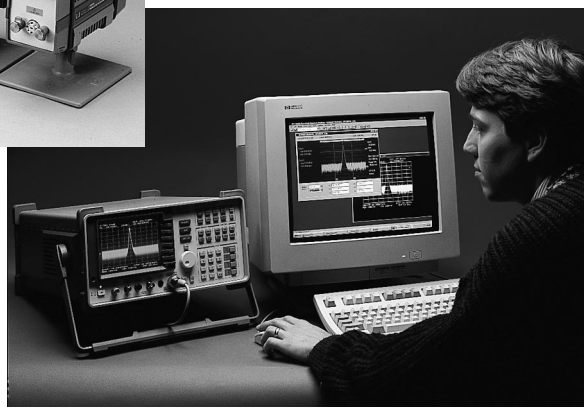
The HP 85710A digital-radio measurement personality lets you characterize with a compare-to-mask function. It includes five major agency masks for testing to U.S., F.C.C., U.K., and F.R.G. digital-radio specifications. Measurement functions include mean power level, transient-analysis monitoring, and frequency response measurement. You can create and store your own custom masks.



Easily measure time between events in TDMA signals with the digital markers.



Extend the frequency range of any HP 8560 E-Series using external mixers. Preselected capability is available to 75 GHz.



Capture screen images and trace data on a PC.

Accessories That Complete Your Solution

Preselected performance to 75 GHz and frequency extension to 325 GHz

Combine the HP 8560 E-Series with the HP 11974 series millimeter mixer and get preselected coverage to 75 GHz. Images and multiple responses are removed so you see only true signals.

Extend non-preselected coverage to 110 GHz using HP 11970 series external mixers or to 325 GHz using commercially available mixers. With optional Signal Identification, you can quickly determine if a displayed response is an image, a multiple, or a true signal.

Link to a PC

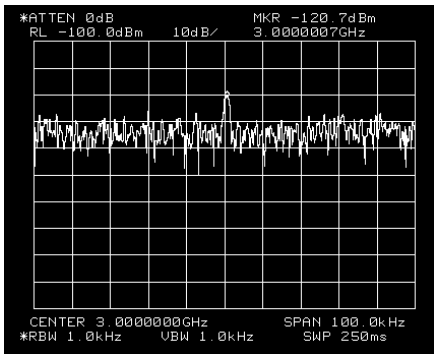
The HP E4444A BenchLink spectrum analyzer software lets you easily capture screen images and trace data, so you can readily archive, analyze, print, and e-mail measurement results, and incorporate the information into reports and presentations.

Simplify tests and adjustments

The HP 85629B test and adjustment module plugs onto the rear panel to automate high-level diagnostics, self-tests, and adjustment procedures.

Typical sensitivity of HP 8563E
(in a 1 Hz RBW) with HP 8449B preamplifier:

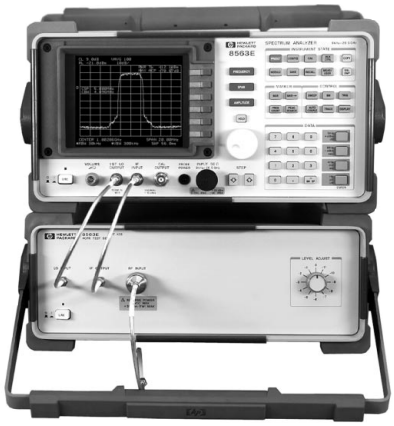
1.0 to 6.46 GHz -165 dBm
5.86 to 13.0 GHz -163 dBm
12.4 to 26.5 GHz -158 dBm



Detect very low-level signals with the addition of a preamplifier.

Preamplifiers maximize sensitivity

When your application calls for measurements of very low-level signals, add a preamplifier to your system, such as the HP 8449B (1 GHz to 26.5 GHz) or the HP 83051A (45 MHz to 50 GHz). These high-gain, low-noise preamplifiers increase the sensitivity of the spectrum analyzer, letting you widen bandwidths for faster sweep times.



HP 8563E with W-CDMA Option K35.

Applications

R&D wireless communications

For RF wireless communications companies who need to measure adjacent channel power for wideband CDMA (W-CDMA) components, the HP 8563E Option K35 provides superior dynamic range (>–70 dBc) for systems with a guard band between channels of 900 kHz or greater. This meets the emerging W-CDMA specifications.

Satellite manufacturing

For satellite manufacturers, HP 8560 E-Series spectrum analyzers provide wide bandwidth, high performance capabilities. Accurately and quickly measure key parameters including C/N, occupied bandwidth and E_B/N_O. You may also extend the frequency range of any HP 8560 E-Series using external mixers.

Defense communications R&D, manufacturing, and support

Do you belong to a defense communication manufacturer who spends hours trying to locate spurs qualifying RADAR receivers? The digitally filtered HP 8560 E-Series spectrum analyzers provide a 10 to 60 times speed improvement over traditional analog filtered spectrum analyzers when spur searching. These analyzers have a displayed average noise level (DANL) that is lower than –145 dBm at X-Band, for measuring the smallest spurious signals.

Ordering Information

Spectrum Analyzers

HP 8560E RF Spectrum Analyzer (30 Hz to 2.9 GHz)
HP 8561E RF Spectrum Analyzer (30 Hz to 6.5 GHz)
HP 8562E RF Spectrum Analyzer (30 Hz to 13.2 GHz)
HP 8563E Microwave Spectrum Analyzer (9 kHz to 26.5 GHz)
HP 8564E Millimeter-wave Spectrum Analyzer (9 kHz to 40 GHz)
HP 8565E Millimeter-wave Spectrum Analyzer (9 kHz to 50 GHz)

Options, measurement personalities and accessories

For complete ordering and compatibility information on available options, retrofit kits, and measurement personalities, please see the HP 8560 E-Series Spectrum Analyzers and Accessories Configuration Guide, Literature Number 5963-6908E.

General purpose information	Literature number
HP 8560E Series Spectrum Analyzer and Accessories	5963-6831E
HP 8560E Series Spectrum Analyzer Configuration Guide	5963-6908E
HP 8560E Series Spectrum Analyzer Technical Specifications	5965-8078E
HP 8560EL Series Spectrum Analyzers	5966-1496E
HP 8563E Option K35	5966-2913E
HP BenckLink Spectrum Analyzer	5966-0676E

Application notes

Amplitude and Frequency Modulation (Application note 150-1)	5954-9130
Spectrum Analysis Basics, (Application note 150)	5952-0292

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Test and Measurement Call Center
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Englewood, CO 80155-4026
1 800 452 4844

Canada:
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Mississauga, Ontario L4W 5G1
(905) 206 4725

Europe:
Hewlett-Packard
European Marketing Centre
P.O. Box 999
1180 AZ Amstelveen
The Netherlands
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Japan:
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