Errata

Title & Document Type: 8562A/B Spectrum Analyzer Installation and Verification Manual

Manual Part Number: 08562-90192

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HP References in this Manual

This manual may contain references to HP or Hewlett-Packard. Please note that Hewlett-Packard's former test and measurement, semiconductor products and chemical analysis businesses are now part of Agilent Technologies. We have made no changes to this manual copy. The HP XXXX referred to in this document is now the Agilent XXXX. For example, model number HP8648A is now model number Agilent 8648A.

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Agilent Technologies

Installation and Verification Manual

HP 8562A/B High Performance Spectrum Analyzer

HEWLETT PACKARD

HP Part No. 08562-90192
Printed in USA August 1992

HP 8562A/B Documentation Description

Manuals Shipped With Your Analyzer

Installation Manual
HP part number 08562-90071

- Tells you how to install the spectrum analyzer.
- Tells you what to do in case of a failure.

Operating and Programming Manual
HP part number 08562-90086

- Tells you how to make measurements with your spectrum analyzer.
- Tells you how to program your spectrum analyzer.
- Describes analyzer features.

Quick Reference Guide
HP part number 08562-90006

- Provides you with a listing of all remote programming commands.

Options

Support Manual (Option 915)
HP part number 08562-90062

- Describes troubleshooting and repair of the analyzer.

How to Use This Manual

Where to Start

If you have just received the HP 8562A/B and want to get it ready to use for the first time, skim Chapter 1, "Introducing the HP 8562A/B," for a brief introduction to the unit and its capabilities. Thoroughly read Chapter 2, "Preparation for Use," and follow its instructions for:

- Initial inspection of the unit.
- Preparing it for use.
- Performing the Trace Alignment and Reference Level Calibration procedures.

If you need to verify that the unit is operating within its specifications, perform the operation verification tests in Chapter 3, "Performance Tests." Then use the Operating Manual to learn how to use the HP 8562A/B.

If the HP 8562A/B has been in use and you want to verify that it is operating correctly or to solve an apparent problem, perform the Trace Alignment and Reference Level Calibration procedures given in Chapter 2, "Preparation for Use." If you have the necessary test equipment, perform the operation verification tests in Chapter 3, "Performance Tests," to verify that the unit is operating within its specifications.

If there is an apparent problem, read Chapter 4, "Help?", for hints on what may be wrong and how to solve the problem, and instructions for calling HP for additional help.

Manual Terms and Conventions

- Keys that appear on the front panel of the analyzer are (BOXED).
- Keys that appear on the screen are SHADED .
- Other front- and rear-panel controls and adjustments are CAPITALIZED.
- SCREEN MESSAGES are shown as they appear on the analyzer CRT.

Printing History

Each new edition of this manual incorporates all material updated since the previous edition. Manual change sheets may be issued between editions, allowing you to correct or insert information in the current edition.

The part number of this manual changes only when a new edition is published. Minor corrections or additions may be made as the manual is reprinted between editions.

HP part number 08562-90071
First Printing, July 1989
Second Printing, January 1990

Electrostatic Discharge

Electrostatic discharge (ESD) can damage or destroy electronic components. Therefore, all work performed on assemblies consisting of electronic components should be done at a static-free work station. Figure 1 is an example of a static-safe work station using two types of ESD protection:

- Conductive table mat and wrist strap combination.
- Conductive floor mat and heel-strap combination

These methods may be used together or separately.

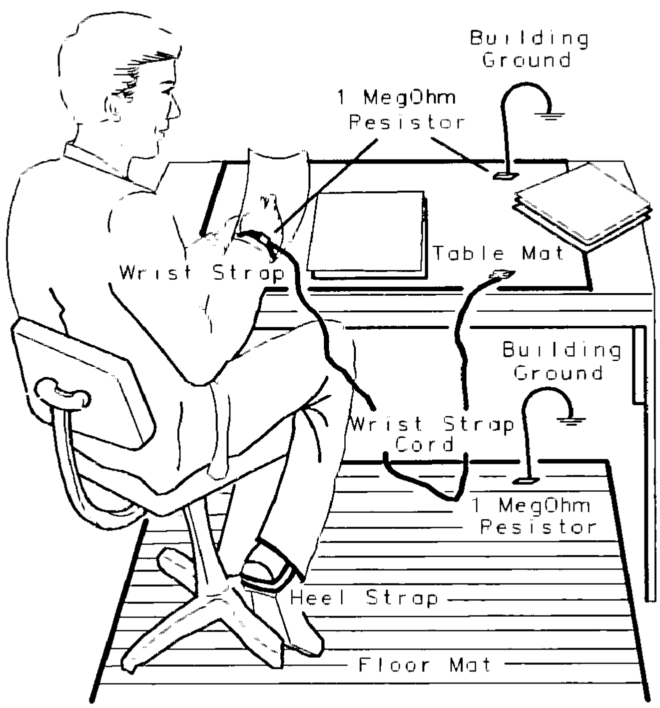

Figure 1. Example of a Static-Safe Work Station

Reducing Damage Caused by ESD

Following are suggestions that may help reduce ESD damage that occurs during testing and servicing operations.

- Before connecting any coaxial cable to an analyzer connector for the first time each day, momentarily ground the center and outer connectors of the cable.
- Personnel should be grounded with a resistor-isolated wrist strap before touching the center pin of any connector and before removing any assembly from the unit.
- Be sure all instruments are properly earth-grounded to prevent buildup of static charge.

Static-Safe Accessories

Table 1 lists static-safe accessories that can be obtained from Hewlett-Packard by using the HP part numbers shown.

Table 1. Static-Safe Accessories

Accessory	Description	HP Part Number
Static-control mat and ground wire	Set includes: 3M static-control mat, 0.6 m × 1.2 m (2 ft × 4 ft) ground wire, 4.6 m (15 ft) (The wrist strap and wrist-strap cord are *not* included. They must be ordered separately.)	9300-0797
Wrist-strap cord	1.5 m (5 ft)	9300-0980
Wrist strap	Black, stainless steel with four adjustable links and 7-mm post-type connector (The wrist-strap cord is *not* included.)	9300-1383
ESD heel strap	Reusable 6 to 12 months	9300-1169
Hard-surface static-control mat*	Large, black, 1.2 m × 1.5 m (4 ft × 5 ft) Small, black, 0.9 m × 1.2 m (3 ft × 4 ft)	92175A 92175C
Soft-surface static-control mat*	Brown, 1.2 m × 2.4 m (4 ft × 8 ft)	92175B
Tabletop static-control mat*	58 cm × 76 cm (23 in × 30 in)	92175T
Antistatic carpet*	Small, 1.2 m × 1.8 m (4 ft × 6 ft) natural color russet color Large, 1.2 m × 2.4 m (4 ft × 8 ft) natural color russet color	 92176A 92176C 92176B 92176D

* These accessories can be ordered either through a Hewlett-Packard Sales Office or through HP DIRECT Phone Order Service. In the USA, the HP DIRECT phone number is (800) 538-8787. Contact your nearest Hewlett-Packard Sales Office for more information about HP DIRECT availability in other countries.

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1. Introduction

1

Introduction

What You'll Find in This Chapter

This chapter introduces you to the HP 8562A/B spectrum analyzer and its options and accessories that tailor the unit to your specific needs. To acquaint you with the analyzer's full capabilities, the HP 8562A/B specifications and characteristics are also provided.

Introducing the HP 8562A/B

The HP 8562A/B High Performance Portable Spectrum Analyzer is a small, lightweight test instrument capable of measuring signals from −119.9 dBm to +30 dBm over a frequency range of 9 kHz to 22 GHz *(Option 026: 9 kHz to 26.5 GHz)*. The HP 8562A provides preselection from 2.75 to 22 GHz *(Option 026: 2.75 to 26.5 GHz)*, while the HP 8562B is unpreselected. The frequency range of the analyzer can be extended, unpreselected, to 110 GHz using HP 11970 Series mixers and to 325 GHz using other commercially available mixers.

The HP 8562A/B is a complete, self-contained instrument that needs only an external AC power source for operation. An AC power cable, suitable for use in the country to which the analyzer is originally shipped, is included with the unit.

Accessories Supplied

See Figure 1-1 for a listing of the accessories supplied with your HP 8562A/B spectrum analyzer. See the table below Figure 1-1 for a listing of accessories supplied with your HP 8562A/B, but not shown in the figure.

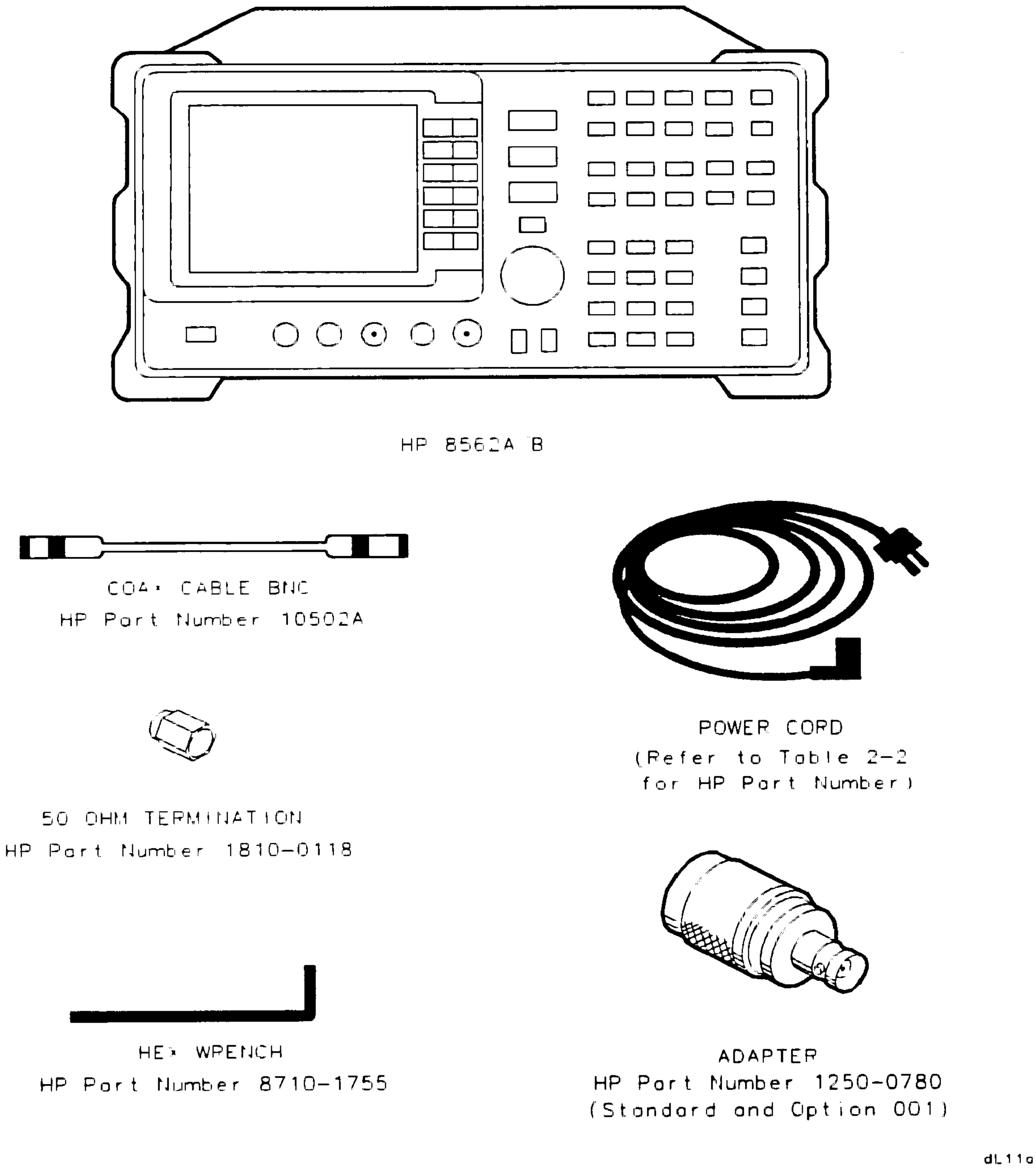


Figure 1-1. HP 8562A/B with Accessories Supplied

Accessories Supplied but Not Shown

Item	HP Part Number	Item	HP Part Number
Impact Cover Assembly	5063-0274	Adapter, BNC/SMA (Opt. 026)	1250-1200
Fuse 5 A, 250 V	2110-0709	Adapter, APC 3.5 (Opt. 026)	5061-5311

Options

Several options are available to tailor the HP 8562A/B to your needs. Options can be ordered by option number when you order the analyzer. Some of the options are also available as kits that can be ordered and installed after you have received your HP 8562A/B.

Second IF Output (Option 001)	This option provides an output for the second IF (310.7 MHz) at rear-panel connector J10.
Precision Frequency Reference (Option 003)	This option provides an ovenized crystal reference oscillator in place of the standard temperature-compensated crystal oscillator.
26.5 GHz Frequency Extension (Option 026)	This option extends the specified performance to 26.5 GHz in the HP 8562A. The INPUT 50Ω connector is changed to a male APC 3.5 connector.
Rack Mount Flange Kit (Option 908)	This option provides the parts necessary to mount the HP 8562A/B in an HP System II cabinet or in a standard 19 inch (482.6 mm) equipment rack. Option 908 is also available as a kit.
Rack Mount Flange Kit with Handles (Option 909)	Option 909 is the same as Option 908 but includes front handles for added convenience. Option 909 is also available as a kit (HP part number 5062-1900).
Additional Manual Set (Option 910)	Option 910 provides an additional set of the manuals shipped with the analyzer. This includes a copy of the *HP 8562A/B Installation Manual*, the *HP 8562A/B Operating and Programming Manual*, the *HP 8562A/B Pocket Operating Guide*, and the *HP 8562A/B Quick Reference Guide*. To order additional manuals after initial shipment, use the manual part number, which appears on the title page.
Service Documentation (Option 915)	Option 915 provides a copy of the *HP 8562A/B Service Manual*. The service manual documents troubleshooting and repair of the analyzer. To obtain a copy of the *HP 8562A/B Service Manual* after initial shipment, order by the manual part number.
Additional Pocket Operating Guide (Option 916)	Option 916 provides an additional copy of the *HP 8562A/B Pocket Operating Guide*. To obtain a copy of the pocket operating guide after initial shipment, order by the manual part number, which appears on the manual's title page.

Accessories Available

A number of accessories are available from Hewlett-Packard to help you configure your HP 8562A/B for your specific needs.

HP 85629B Test and Adjustment Module

The HP 85629B Test and Module, when connected to the rear panel of the HP 8562A/B, assists the user in testing and repairing the analyzer. Four procedures are made available to the user:

- Functional Tests
- Adjustment Procedures
- Diagnostic (troubleshooting) Procedures
- Automatic Alignment Routines

The module displays menus, procedures, and results on the spectrum analyzer CRT. During testing with the module, the spectrum analyzer controls other instruments over HP-IB, reads data, and formats that data for the user. In addition to a large program stored in ROM, the module has the necessary hardware for troubleshooting; this includes DC signal injection and detection.

Preamplifier

The HP 8447D Preamplifier provides a minimum of 26 dB gain from 100 kHz to 1.3 GHz to enhance measurements of very low-level signals.

Preamplifier

The HP 8449A Preamplifier provides a minimum of 28 dB gain from 2 to 22 GHz to enhance measurements of very low-level signals

Preamplifier

The HP 10855A Preamplifier provides a minimum of 22 dB gain from 2 MHz to 1300 MHz to enhance measurements of very low-level signals It operates conveniently from the PROBE POWER output of the HP 8562A/B.

External Harmonic Mixers

The HP 11970 Series harmonic mixers extend the frequency range of the HP 8562A/B up to 110 GHz.

Close Field Probe

The HP 11940A Close-Field Probe is a small, hand-held, electromagnetic-field sensor. The probe provides repeatable, absolute, magnetic-field measurements from 30 MHz to 1 GHz. When attached to the source, the probe generates a localized magnetic field for electromagnetic interference (EMI) susceptibility testing.

75 to 50 ohm Minimum-Loss Pad

The minimum-loss pad, HP part number 08568-60122, is a low-VSWR device required for measurements on 75-ohm devices.

75 to 50 ohm Adapter The HP 11687A allows you to make measurements in 75-ohm systems. Amplitude calibration is retained by using the reference level offset to compensate for the loss through the pad. It is effective over a frequency range of DC to 1300 MHz.

Microwave Limiter The HP 11693A Limiter protects the analyzer input circuits from damage due to high power levels and operates over a frequency range of 0.4 to 12.4 GHz.

HP-IB Cable Use HP 10833A/B/C/D HP-IB cables.

Controllers The HP 8562A/B is fully HP-IB programmable. The preferred controllers are HP 9000 Series 300 computers. Consult your local Hewlett-Packard service representative for other recommended controllers and available software.

Plotter The HP ColorPro 7440A Graphics Plotter adds color printout capability to the HP 8562A/B for permanent records of important measurements. The eight-pen HP ColorPro produces color plots with 0.025 mm (0.001 in.) resolution on either 8.5 × 11 inch paper or transparency film.

Rack Slide Kit This kit provides the hardware to adapt Rack Mount Kits (Options 908 and 909) for mounting the analyzer on slides in an HP System II cabinet.

Transit Case The transit case provides extra protection for your HP 8562A/B for frequent travel situations. The HP transit case protects your instrument from hostile environments, shock, vibration, moisture, and impact while providing a secure enclosure for shipping.

Testmobile The HP 1008A Testmobile provides a sturdy, mobile, platform for your analyzer.

Serial Numbers

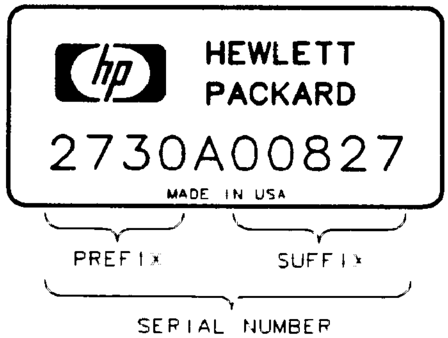
Hewlett-Packard makes frequent improvements to its products to enhance their performance, usability, or reliability. HP service personnel have access to complete records of design changes to each type of equipment, based on the equipment's serial number.

Whenever you contact HP about your analyzer, have the complete serial number available to ensure obtaining the most complete and accurate information possible.

A serial number label is attached to the rear of the analyzer. The serial number has two parts: the prefix (the first four numbers and a letter), and the suffix (the last five numbers). See Figure 1-2.

The first four numbers of the prefix are a code identifying the date of the last major design change incorporated in your analyzer.

The letter identifies the country in which the unit was manufactured. The five-digit suffix is a sequential number and is different for each unit. Whenever you list the serial number or refer to it in obtaining information about your analyzer, be sure to use the complete number, including the full prefix and the suffix.



FORMAT50

Figure 1-2. Typical Serial Number Label

Specifications and Characteristics

Table 1-1 lists the specifications of the HP 8562A/B. Unless stated otherwise, all specifications describe the analyzer's warranted performance under the following conditions:

- five-minute warmup for ambient conditions
- autocoupled controls
- preselector peaked at the signal of interest
- digital trace display
- IF ADJ ON
- REF LVL CAL adjusted
- 1ST LO OUTPUT terminated in 50 ohms
- 2ND IF OUTPUT (Option 001 analyzers) terminated in 50 ohms
- one-year calibration cycle
- environmental requirements met

After a 30-minute warmup at a temperature range of 20° to 30°C, the preselector does not have to be peaked at each signal of interest. Factory preselector peak values are sufficient to meet all specifications. Additionally, after a 20 minute warmup, IF Cal adjustment does not have to be performed for the instrument to meet all specifications.

Note

The REF LVL CAL adjustment uses the CAL OUTPUT signal to calibrate the reference level. How often this adjustment should be performed depends on internal temperature changes. Amplitude temperature drift is a nominal 1 dB/10°C. The nominal temperature drift is 10°C, most of which occurs during the first 30 minutes after power-on. Internal temperature equilibrium is reached after two hours of operation at a stable temperature.

Characteristics provide useful information in the form of typical, nominal, or approximate values for analyzer performance. See Table 1-2 for a list of HP 8562A/B characteristics.

Calibration Cycle

To ensure that the HP 8562A/B meets the specifications listed in Table 1-1, the performance verification listed in chapter 3 should be performed every 12 months.

Table 1-1. HP 8562A/B Specifications

FREQUENCY			
Frequency Range			
Internal Mixing	9 kHz* to 22 GHz		
Option 026	*9 kHz* to 26.5 GHz*		
Internal Mixing Bands	**Frequency Band**		**Harmonic Mixing Mode (N**)**
	9 kHz* to 2.9 GHz		1−
	2.75 GHz to 6.46 GHz		1−
	5.86 GHz to 13.0 GHz		2−
	12.4 GHz to 19.7 GHz		3−
	19.1 GHz to 22.0 GHz		4−
Option 026	*19.1 GHz to 26.5 GHz*		4−
External Mixing	18 GHz to 325 GHz		
External Mixing Bands	**Frequency Band**	**Frequency Range**	**Harmonic Mixing Mode (N**)**
	K	18.0 to 26.5	6−
	A	26.5 to 40.0	8−
	Q	33.0 to 50.0	10−
	U	40.0 to 60.0	10−
	V	50.0 to 75.0	14−
	E	60.0 to 90.0	16−
	W	75.0 to 110.0	18−
	F	90.0 to 140.0	24−
	D	110.0 to 170.0	30−
	G	140.0 to 220.0	36−
	Y	170.0 to 260.0	44−
	J	220.0 to 325.0	54−
Frequency Readout Accuracy			
(accuracy of START, CENTER, STOP or MARKER frequency)	<±(frequency readout × frequency reference accuracy*** + 5% of frequency span + 15% of resolution bandwidth + 250 Hz)		
Frequency Count Marker			
Frequency Count Marker Resolution	Selectable from 10 Hz to 1 MHz		
Frequency Count Marker Accuracy (for signal-to-noise ratio ≥25 dB)	<±(marker frequency × frequency reference accuracy*** + 50 Hz × N** + 1 LSD)		
Delta Frequency Count Accuracy (for signal-to-noise ratio ≥ 25 dB)	<±(delta frequency × frequency reference accuracy*** + 100 Hz × N** + 2 LSD)		

*1 kHz to 2.9 GHz for HP 8562A/B analyzers with serial prefix 2927A and below.
**N is the harmonic mixing mode. The desired 1st LO harmonic is always higher than the tuned frequency by the 1st IF frequency (3.9107 for the 9 kHz* to 2.9 GHz band, and 310.7 MHz for all other bands).
***Frequency reference accuracy for Option 003 = (aging rate × period of time since + initial achievable accuracy + temperature stability).

Table 1-1. HP 8562A/B Specifications (2 of 9)

FREQUENCY (continued)	
Frequency Reference Accuracy Includes aging, temperature drift, and settability	 ±4 × 10^{-6} per year
Frequency Reference Accuracy *Option 003 only* Aging Temperature Stability Settability	 <±1 × 10^{-7} per year <±1 × 10^{-8},−10 to +55° C, referenced to +25° C <±1 × 10^{-8}
Stability Residual FM (zero span) Spectral Purity/Noise Sidebands 10 kHz offset 30 kHz offset 100 kHz offset	 <50 Hz × N* peak-to-peak in 100 ms <(−86 + 20 log N*) dBc/Hz <(−100 + 20 log N*) dBc/Hz <(−110 + 20 log N*) dBc/Hz
Frequency Span Range Internal Mixing External Mixing Accuracy (spans ≥10 kHz)	 0 Hz, 2.5 kHz** × N* to 19.25 GHz *(Option 026: to 23.75 GHz)* over the 10-division CRT horizontal axis, variable in approximately 1% increments, or in a 1, 2, 5 sequence Minimum span = 2.5 kHz × N* <±5%
Resolution Bandwidths (−3 dB) Range Accuracy 1 and 2 MHz*** RES BW 300 kHz to 300 Hz RES BW 100 Hz RES BW Selectivity (60 dB/3 dB bandwidth ratio) Bandwidth Shape	 100 Hz to 1 MHz (selectable in a 1, 3, 10 sequence) and 2 MHz*** <±25% <±10% <±30% <15:1 Synchronously tuned, 4-pole filters

*N is the harmonic mixing mode. The desired 1st LO harmonic is always higher than the tuned frequency by the 1st IF frequency (3.9107 GHz for the 9 kHz to 2.9 GHz band, and 310.7 MHz for all other bands.

**Minimum span is 10 kHz for analyzers with serial prefix 2724A and below

***The 2 MHz resolution bandwidth is specified only for HP analyzers with serial prefix 2805A and above, and for HP 8562B analyzers with serial prefix 2809A and above

Table 1-1. HP 8562A/B Specifications (3 of 9)

AMPLITUDE/MEASUREMENT RANGE		
Video Bandwidth		
Post-detection low-pass filter averages displayed noise for a smooth trace.		
Range	1 Hz to 3 MHz in a 1, 3, 10 sequence	
Maximum Safe Input Power		
Average Continuous Power (input attenuation ≥10 dB)	+30 dBm (1 watt)	
Peak Pulse Power (input attenuation ≥30 dB)	+50 dBm (100 watts) for <10 μs and <1% duty cycle	
DC	0 volts	
Gain Compression	<1.0 dB	
10 MHz to 2.9 GHz (≤−5 dBm* at input mixer)		
2.9 GHz to 22 GHz (≤−3 dBm at input mixer)		
Option 026: 2.9 GHz to 26.5 GHz (≤−3 dBm at input mixer)		
Displayed Average Noise Level		
With no signal at input, 100 Hz RES BW, and 0 dB input attenuation		
Frequency Range	**HP 8562A**	**HP 8562B**
10 kHz	−90 dBm	<−90 dBm
100 kHz	<−100 dBm	<−100 dBm
1 MHz to 2.9 GHz	<−120 dBm	<−120 dBm
2.9 GHz to 6.46 GHz	<−121 dBm	<−121 dBm
6.46 GHz to 13.0 GHz	<−110 dBm	<−110 dBm
13.0 GHz to 19.7 GHz	<−105 dBm	<−105 dBm
19.7 GHz to 22.0 GHz	<−100 dBm	<−100 dBm
Option 026. 19.7 GHz to 26.5 GHz		
Spurious Responses	**HP 8562A**	**HP 8562B**
All input-related spurious responses, except as noted below, with ≤−40 dBm mixer level.**	<−60 dBc 10 MHz to 6.46 GHz	<−60 dBc 10 MHz to 2.9 GHz
Second Harmonic Distortion		
Frequency Range	**HP 8562A**	**HP 8562B**
10 MHz to 2.9 GHz	<−72 dBc, −40 dBm mixer level**	<−72 dBc, −40 dBm mixer level**
2.75 GHz to 22.0 GHz *Option 026 2.75 GHz to 26.5 GHz*	<− 100 dBc, −10 dBm mixer level**	<−60 dBc, −40 dbm mixer level**

*With ≤−3 dBm at input mixer for HP 8562A analyzers with serial prefix 2805A and below, and HP 8562B analyzers with serial prefix 2750A and below.
**Mixer level = input level − input attenuation

Table 1-1. HP 8562A/B Specifications (4 of 9)

AMPLITUDE/MEASUREMENT RANGE (continued)		
Third Order Intermodulation Distortion with two −30 dBm input signals at the input mixer*		
Frequency Range	**HP 8562A**	**HP 8562B**
10 MHz to 2.9 GHz	<−70 dBc	<−70 dBc
2.75 GHz to 6.5 GHz	<−75 dBc	<−75 dBc
Option 026: 2.75 GHz to 26.5 GHz		
Image, Multiple, and Out-of-Band Responses		
Frequency Range	**HP 8562A**	**HP 8562B**
10 MHz to 18 GHz	<−70 dBc	unspecified
10 MHz to 22 GHz	<−60 dBc	unspecified
Option 026: 10 MHz to 26.5 GHz		
Residual Responses 200 kHz to 6.46 GHz, with no signal at input, 0 dB input attenuation	<−90 dBm	

AMPLITUDE MEASUREMENT/DISPLAY RANGE	
Amplitude Scale	10 vertical CRT divisions, with the reference level (0 dB) at the top graticule line
Calibration	
LOG	10 dB/DIV for 90 dB display from reference level 5 dB/DIV for 50 dB display expanded from reference level** 2 dB/DIV for 20 dB display expanded from reference level 1 dB/DIV for 10 dB display expanded from reference level**
LINEAR	10% of reference level per div. when calibrated in voltage
Reference Level Range LOG, adjustable in 0.1 dB steps	
Frequency Band	**Range**
9 kHz*** to 2.9 GHz	−120 dBm to +30 dBm
2.75 GHz to 6.46 GHz	−120 dBm to +30 dBm
5.86 GHz to 13.0 GHz	−115 dBm to +30 dBm
12.4 GHz to 19.7 GHz	−105 dBm to +30 dBm
19.1 GHz to 22.0 GHz	−100 dBm to +30 dBm
Option 026: 19.1 GHz to 26.5 GHz	

*Mixer level = input level − input attenuation
**These scales are available only in sweeptimes ≥30 ms (digital display mode).
***1 kHz to 2.9 GHz for HP 8562A/B analyzers with serial prefix 2927A and below.

Table 1-1. HP 8562A/B Specifications (5 of 9)

AMPLITUDE ACCURACY/DISPLAY RANGE (continued)		
Reference Level Range (continued)		
LINEAR, settable in 1% steps		
9 kHz* to 2.9 GHz	2.2 μV to 7.07 V	
2.75 GHz to 6.46 GHz	2.2 μV to 7.07 V	
5.86 GHz to 13.0 GHz	4.0 μV to 7.07 V	
12.4 GHz to 19.7 GHz	12.6 μV to 7.07 V	
19.1 GHz to 22.0 GHz	22.0 μV to 7.07 V	
Option 026: 19.1 GHz to 26.5 GHz		

AMPLITUDE ACCURACY/REF LVL UNCERTAINTY		
Frequency Response		
with 10 dB input attenuation		
In-Band		
Frequency Range	**HP 8562A**	**HP 8562B**
9 kHz* to 2.9 GHz	<±1.0 dB	<±1.0 dB
2.9 GHz to 6.46 GHz	<±1.5 dB	<±1.0 dB
6.46 GHz to 13.0 GHz	<±2.0 dB	<±1.5 dB
13.0 GHz to 19.7 GHz	<±3.0 dB	<±1.5 dB
19.7 GHz to 22.0 GHz	<±3.0 dB	<±2.0 dB
Option 026: 19.7 GHz to 26.5 GHz		
Referenced to CAL OUTPUT (300 MHz)		
9 kHz* to 2.9 GHz	<±1.5 dB	<±1.5 dB
9 kHz* to 6.46 GHz	<±2.5 dB	<±2.0 dB
9 kHz* to 13.0 GHz	<±3.0 dB	<±3.0 dB
9 kHz* to 19.7 GHz	<±4.0 dB	<±3.0 dB
9 kHz* to 22.0 GHz	<±4.0 dB	<±3.5 dB
Option 026: 9 kHz to 26.5 GHz*		
Band Switching Uncertainty	**HP 8562A**	**HP 8562B**
Additional uncertainty added to In-Band Frequency Response for measurements between any two bands	<+1.0 dB	<+1.0 dB
Calibrator Uncertainty	<±0.3 dB	
−10 dBm, 300 MHz		
Input Attenuator Switching Uncertainty		
20 to 70 dB settings, referenced to 10 dB input attenuation		
Frequency Range		
9 kHz* to 2.9 GHz:	<±0.6 dB/10 dB step, 1.8 dB max.	

*From 1 kHz, rather than 9 kHz, for HP 8562A/B analyzers with serial prefix 2927A and below.

Table 1-1. HP 8562A/B Specifications (6 of 9)

AMPLITUDE ACCURACY/REF LVL UNCERTAINTY (continued)	
IF Gain Uncertainty 0 dBm to −80 dBm reference levels with 10 dB input attenuation	<±1.0 dB
Resolution Bandwidth Switching Uncertainty Referenced to 300 kHz RES BW	<±0.5 dB
IF Alignment Uncertainty uncertainty when using 100 Hz and 300 Hz RES BW	
100 Hz RES BW	<±2.0 dB
300 Hz RES BW	<±0.5 dB
Pulse Digitization Uncertainty Pulse response mode, PRF>720/sweeptime	
Log	<1.25 dB peak-to-peak for RES BW ≤1 MHz <3 dB peak-to-peak for RES BW of 2 MHz*
Linear	<4% of reference level peak-to-peak for RES BW ≤1 MHz <12% of reference level peak-to-peak for RES BW of 2 MHz*
AMPLITUDE ACCURACY/SCALE FIDELITY	
Log	<±0.4 dB/4 dB from reference level to a maximum of ±1.5 dB over 0 to 90 dB range
Linear	<±3% of reference level
SWEEP	
Sweep Time	
Range	
Span = 0	50 μs to <30 ms (analog display)
Span = 0	30 ms to 60 s (digital display)
Span ≥2.5 kHz** x N***	50 ms to 100 s (digital display)
Accuracy (Span = 0)	
30 ms ≤ sweep time ≤ 60 seconds	<±1%
Sweep time <30 ms	<±15%
Sweep Trigger	Free Run, Single, Line, Video, External

*The 2 MHz RES BW is specified only for HP 8562A analyzers with serial prefix 2805A and above, and HP 8562B analyzers with serial prefix 2809A and above.
**Minimum span is 10 kHz for HP 8562A/B analyzers with serial prefix 2724A and below.
***N is the harmonic mixing mode. The desired 1st LO harmonic is always higher than the tuned frequency by the 1st IF frequency (3.9107 GHz for the 9 kHz to 2.9 GHz band, and 310.7 MHz for all other bands).

Table 1-1. HP 8562A/B Specifications (7 of 9)

INPUTS AND OUTPUTS	
IF INPUT	
Connector	SMA female, front panel
Input level for full-screen deflection external mixing mode, 0 dBm reference level, 30 dB conversion loss	−30 dBm ±1 5 dB
HP-IB	
Connector	IEEE-488 bus connector
Interface Functions	SH1, AH1, T6, TE0, L4, LE0, SR1, RL1, PP1, DC1, DT0, C1, C28, E1
Direct Plotter Output	Supports HP 7225A, HP 7440A, HP 7470A, HP 7475A, HP 7550A
CAL OUTPUT	
Connector	BNC female, front panel
Frequency	300 MHz ±(300 Hz × frequency reference accuracy*)
Amplitude	−10 dBm ±0 3 dB
1ST LO OUTPUT	
Connector	SMA female, front panel
Amplitude	+16.5 dBm ±2.0 dB (20°C to 30°C)
10 MHz REF IN/OUT	
Connector	BNC female, rear panel
Frequency	10 MHz ±(10 MHz × frequency reference accuracy*)

GENERAL SPECIFICATIONS	
ENVIRONMENTAL SPECIFICATIONS	*Military Specification per MIL-T-28800C, Type III, Class 3, Style C, as follows:*
Calibration Interval	one year
Warmup Time	five minutes from ambient conditions**
Temperature	
Operating	−10°C to +55°C
Non-operating	−62°C to +85°C
Humidity	95% at 40°C for five days
Altitude	
Operating	15,000 feet
Non-operating	50,000 feet
Rain Resistance	Drip-proof at 16 liters/hour/square foot

*Frequency reference accuracy for Option 003 = (aging rate × period of time since + initial achievable accuracy + temperature stability)

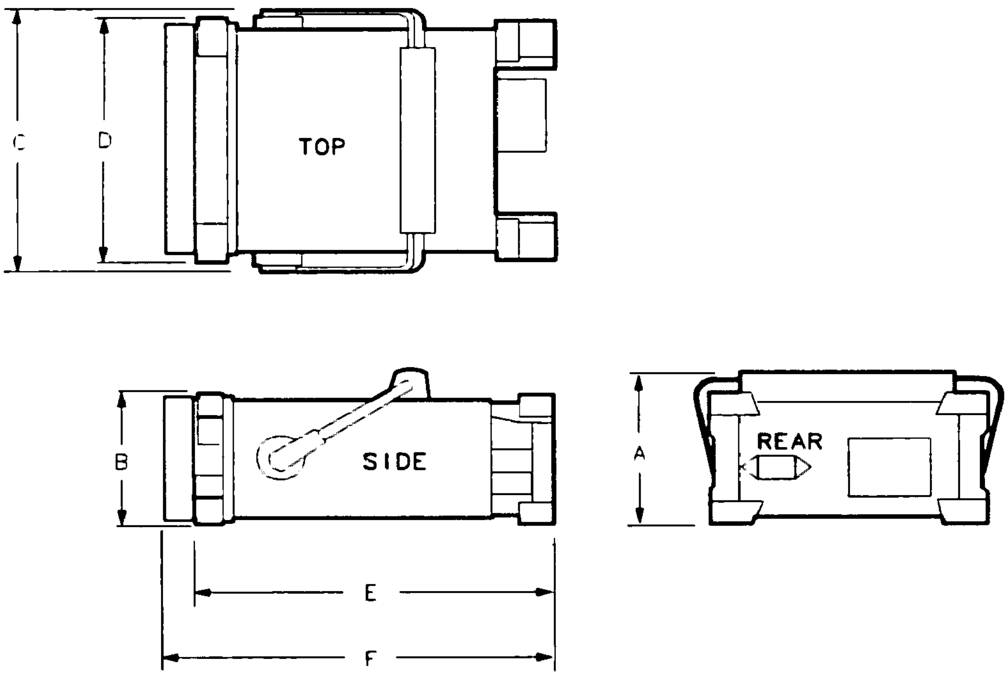
**Two hours for conditions of internal condensation, 30 minutes to meet frequency response specifications without preselector peaking. If operating outside the 20°C to 30°C ambient temperature range, preselector peaking is required to meet frequency response specifications All specifications are valid within the first 20 minutes of operation if Cal adjustment is performed first.

Table 1-1. HP 8562A/B Specifications (8 of 9)

GENERAL SPECIFICATIONS (continued)	
ENVIRONMENTAL SPECIFICATIONS (continued)	
Vibration	
5 to 15 Hz	0.059 inch peak-to-peak excursion
15 to 25 Hz	0.039 inch peak-to-peak excursion
25 to 55 Hz	0.020 inch peak-to-peak excursion
Pulse Shock	
Half Sine	30 g for 11 ms duration
Transit Drop	8-inch drop on six faces and eight corners
ELECTROMAGNETIC COMPATIBILITY	Conducted and radiated interference is in compliance with CISPR, Publication 11 (1990).
	Meets the standards of MIL-STD-461B, Part 4, with the exceptions shown below:
Conducted Emissions	
CE01 (Narrowband)	10 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 of 30 kHz (exceptioned from 30 kHz to 50 kHz)
RE02	Full limits to 1 GHz
Radiated Susceptibility	
RS01	Full limits
RS02	Exceptioned
RS03	Limited to 1 V/m from 14 kHz to 1 GHz, with 20 dB relaxation at IF frequencies (30 dB relaxation at IF frequencies for Option 001 instruments)
POWER REQUIREMENTS	
115 VAC Operation	
Voltage	90 to 140 V rms
Current	3.2 A rms max
Frequency	47 to 440 Hz
230 VAC Operation	
Voltage	180 to 250 V rms
Current	1.8 A rms max
Frequency	47 to 66 Hz
Maximum Power Dissipation	180 watts

Table 1-1. HP 8562A/B Specifications (9 of 9)

GENERAL SPECIFICATIONS (continued)	
PHYSICAL SPECIFICATIONS	
Weight	
HP 8562A	20 kg (44 lbs)
HP 8562B	19 kg (41.8 lbs)
Dimensions	
with handle and cover	200 mm high (A) × 373 mm wide (C) × 500 mm deep (F)
without handle and cover	184 mm high (B) × 337 mm wide (D) × 460.5 mm deep (E)



FORMAT1

Table 1-2. HP 8562A/B Characteristics

NOTE These are not specifications. Characteristics provide useful, but non-warranted, information about instrument performance.

FREQUENCY	
Frequency Reference Accuracy	
Aging	$<\pm 1 \times 10^{-6}$/year
Temperature drift (−10°C to +55°C)	$<\pm 2 \times 10^{-6}$
Settability	$<\pm 1 \times 10^{-6}$
Frequency Reference Accuracy *Option 003 only*	
Warmup	
5 minutes	$<\pm 1 \times 10^{-7}$ of final frequency (0°C to +55°C)
15 minutes	$<\pm 1 \times 10^{-6}$ of final frequency (−10°C)
Daily Aging (after 7 day warmup)	$<\pm 1 \times 10^{-8}$ of final frequency (−10°C to +55°C)
	$<\pm 5 \times 10^{-10}$ per day (7 day average)
Initial Achievable Accuracy (includes effects due to retrace, gravitational effects, temperature stability at room temperature, and settability)	$<\pm 2.2 \times 10^{-8}$

AMPLITUDE	
Nominal Sensitivity 100 Hz RES BW, 1 Hz Video BW, 0 dB input attenuation	
Frequency Range	**Nominal Sensitivity**
1 MHz to 2.9 GHz	−128 dBm
2.9 GHz to 6.46 GHz	−126.5 dBm
6.46 GHz to 13.0 GHz	−119 dBm
13.0 GHz to 19.7 GHz	−114 dBm
19.7 GHz to 22.0 GHz	−108 dBm
Option 026: 19.7 GHz to 26.5 GHz	

Radiated Immunity

When tested at 3 V/m according to IEC 801-3/1984, the displayed average noise level will be within specifications over the full immunity test frequency range of 27 MHz to 500 MHz, except at the immunity test frequency of 310.7 MHz ± selected resolution bandwidth. At these frequencies, the displayed average noise level may be up to −80 dBm. When the analyzer tuned frequency is identical to the immunity test signal frequency, there may be signals of up to −90 dBm displayed on the screen.

Table 1-2. HP 8562A/B Characteristics (2 of 4)

NOTE These are not specifications. Characteristics provide useful, but non-warranted, information about instrument performance.

AMPLITUDE ACCURACY

Band-to-Band Frequency Response

Frequency response uncertainty for measurements between any two bands. Equivalent to to the sum of two In-Band Frequency Response values plus Band Switching Uncertainty *(values in parenthesis apply to HP 8562B)*

Band-to-Band Frequency Response (dB)

Band	0	1	2	3	4
0	—	4.2	5.2	5.7	6.0
	—	(3.7)	(4.2)	(4.7)	(6.0)
1	4.2	—	6.5	7.0	7.3
	(3.7)	—	(5.0)	(5.5)	(6.8)
2	5.2	6.5	—	8.0	8.3
	(4.2)	(5.0)	—	(6.0)	(7.3)
3	5.7	7.0	8.0	—	8.8
	(4.7)	(5.5)	(6.0)	—	(7.8)
4	6.0	7.3	8.3	8.8	—
	(6.0)	(6.8)	(7.3)	(7.8)	—

Input Attenuator Repeatability	<±0.2 dB
Pulse Digitization Uncertainty	
Pulse response mode, PRF >720/sweeptime	
Standard Deviation	0.2 dB

SWEEP

Sweep Time	
Accuracy (span ≥2.5 kHz* × N**)	<±15%

DEMODULATION

Spectrum Demodulation	
Modulation Type	AM and FM
Audio Output	Internal speaker and phone jack with volume control
Marker Pulse Time	100 ms to 60 s

*Minimum span is 10 kHz for HP 8562A/B analyzers with serial prefix 2724A and below.
**N is the harmonic mixing mode. The desired 1st LO harmonic is always higher than the tuned frequency by the 1st IF frequency (3.9107 GHz for the 9 kHz to 2.9 GHz band, and 310.7 MHz for all other bands.)

Caution Any electrostatic discharge to the center pins of any of the connectors may cause damage to the associated circuitry (according to IEC 801-2/1991).

Table 1-2. HP 8562A/B Characteristics (3 of 4)

NOTE: These are not specifications. Characteristics provide useful, but non-warranted, information about instrument performance.		
INPUTS AND OUTPUTS		
INPUT 50 Ω		
Connector type	Precision Type N female, front panel *Option 026: APC 3.5 male*	
Impedance	50 ohms	
VSWR (at tuned frequency)	<1.5:1 for <2.9 GHz and ≥10 dB input attenuation <2.3:1 for >2.9 GHz and ≥10 dB input attenuation <3.0:1 for 0 dB input attenuation	
LO Emission Level		
(Average)	**HP 8562A**	**HP 8562B**
10 dB input attenuation	<−70 dBm	<−10 dBm
IF INPUT		
Connector Type	SMA female, front panel	
Impedance	50 ohms	
Frequency	310.7 MHz	
Noise Figure	7 dB	
1 dB Gain Compression Level	−23 dBm	
Full Screen Level	−30 dBm	
(Gain Compression and Full Screen Levels apply with 30 dB Conversion loss setting and 0 dBm reference level.)		
1ST LO OUTPUT		
Connector	SMA female, front panel	
Impedance	50 ohms	
Frequency Range	3.0000 GHz to 6.8107 GHz	
CAL OUTPUT		
Connector	BNC female, front panel	
Impedance	50 ohms	
10 MHz REF IN/OUT		
Connector	BNC female, rear panel	
Impedance	50 ohms	
Output Amplitude	0 dBm	
Input Amplitude	−2 to +10 dBm	

Table 1-2. HP 8562A/B Characteristics (4 of 4)

NOTE: These are not specifications. Characteristics provide useful, but non-warranted, information about instrument performance

INPUTS AND OUTPUTS (continued)				
VIDEO OUTPUT				
Connector	BNC female, rear panel			
Impedance (DC coupled)	50 ohms			
Amplitude (into 50 Ω load)	0 to +1 volt full-scale			
Scale	Linear or Log 100 dB/V			
LO SWP|0.5 V/GHz OUTPUT				
Connector	BNC female, rear panel			
Impedance (DC coupled)	2 kohms			
LO SWP OUTPUT (no load)	0 to +10 V			
0.5 V/GHz OUTPUT (no load)	0.5 V/GHz of tuned frequency			
BLANKING OUTPUT				
Connector	BNC female, rear panel			
Amplitude				
during SWEEP	Low TTL Level (sink 150 mA max.)			
during RETRACE	High TTL Level (source 0.5 mA max.)			
maximum input (high TTL state)	+40 V			
EXT TRIG INPUT				
Connector	BNC female, rear panel			
Impedance	10 kohms			
Trigger Level	Rising edge of TTL Level			
PROBE POWER (front panel)				
Voltage	+15 VDC, −12.6 VDC			
Current	150 mA max., each			
EARPHONE				
Connector	1/8 inch miniature monophonic jack, rear panel			
Power Output	0.25 watts into 4 ohms			
2ND IF OUT *(Option 001 only)*				
Connector	SMA female, rear panel			
Impedance	50 ohms			
Frequency	310.7 MHz			
Frequency Range	**3 dB BW**	**Noise Figure**		**Conversion Gain**
9 kHz* to 2.9 GHz	>30 MHz	24 dB		−5.6 dB
2.75 GHz to 6.46 GHz	>20 MHz	24 dB		−3.6 dB
5.86 GHz to 13.0 GHz	>30 MHz	33.6 dB		−3.7 dB
12.4 GHz to 19.7 GHz	>30 MHz	39.8 dB		−9.9 dB
19.1 GHz to 22.0 GHz	>35 MHz	44.4 dB		−14.8 dB
Option 026: 19.1 GHz to 26.5 GHz				

*1 kHz to 2.9 GHz for HP 8562A/B analyzers with serial prefix 2927A and below.

Regulatory Information

The information on the following pages apply to the HP 8560A, HP 8561B, HP 8562A, HP 8562B, and HP 8563A spectrum analyzers.

DECLARATION OF CONFORMITY
according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name:	Hewlett-Packard Co.
Manufacturer's Address:	1212 Valley House Drive Rohnert Park, California 94928-4999 U.S.A.

Declares that the product:

Product Name:	Spectrum Analyzer
Model Numbers:	HP 8560A, 8561B, 8562A, 8562B, 8563A
Product Options:	This declaration covers all options of the above products.

Conforms to the following product specifications:

Safety:	IEC 348(1978) / HD 401 S1
EMC:	EN 55011 / CISPR 11(1990) Group 1, Class A EN 50082-1(1992) IEC 801-2(1991), 8 kV AD IEC 801-3(1984), 3 V/m IEC 801-4(1988), 500 V signal, 1 kV ac power

Supplementary Information:

Rohnert Park, California	6/9/92	Dixon Browder
Location	**Date**	**Dixon Browder / QA Manager**

Notice for Germany: Noise Declaration

LpA < 70 dB
am Arbeitsplatz (operator position)
normaler Betrieb (normal position)
nach DIN 45635 T. 19 (per ISO 7779)

2. Preparation

2

Preparation for Use

What You'll Find in This Chapter

This chapter describes the process of getting the HP 8562A/B High Performance Portable Spectrum Analyzer ready to use. The process includes initial inspection procedures, setting up the unit for the selected AC power source, and performing the trace alignment and reference calibration procedures.

Initial Inspection

Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, keep it until you have verified that the contents are complete and you have tested the analyzer mechanically and electrically.

Contents of the shipment are shown in Figure 1-1 and Figure 2-1 and their accompanying legends. If the contents are incomplete or if the analyzer does not pass the operation verification tests (procedures are provided in Chapter 3), notify the nearest Hewlett-Packard office. If the shipping container is damaged or the cushioning material shows signs of stress, also notify the carrier. Keep the shipping materials for the carrier's inspection. The HP office will arrange for repair or replacement without waiting for a claim settlement.

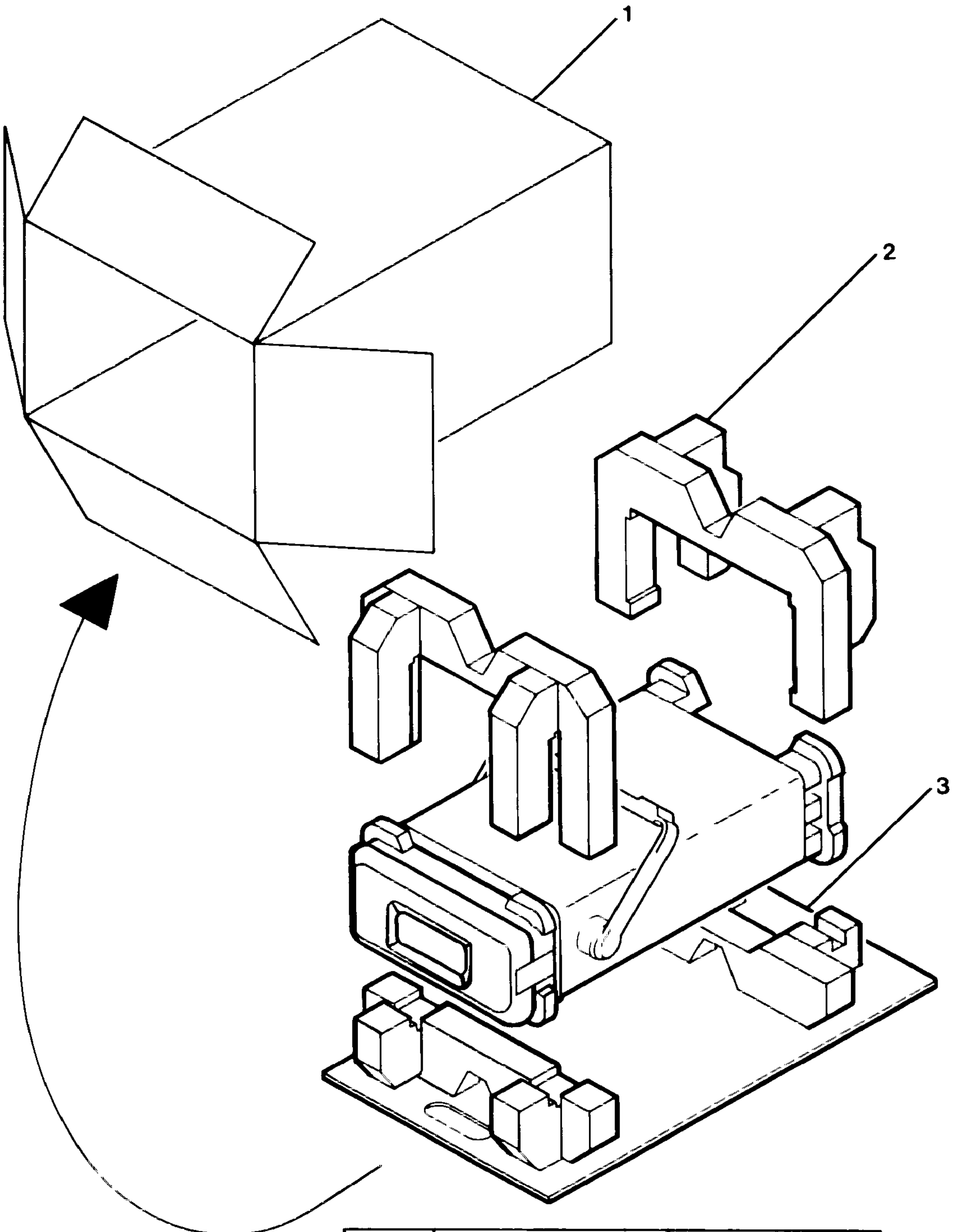
If the shipping container and cushioning material are in good condition, retain them for possible future use. You may wish to ship the analyzer to another location or to return it to Hewlett-Packard for service. Chapter 4 provides instructions for repackaging and shipping the analyzer.

Preparing the HP 8562A/B for Use

The HP 8562A/B is a portable instrument and requires no physical installation other than connection to a source of AC power. If you want to install your HP 8562A/B in an HP System II cabinet or a standard 19 inch (486.2 mm) equipment rack, complete instructions are provided in the Option 908 and Option 909 Rack Mounting Kits.

Caution

DO NOT connect AC power until you have verified that the line voltage is correct, the proper fuse is installed, and the line voltage selector switch is properly positioned, as described in the following paragraphs. Damage to the equipment could result.



Item	Description	Part Number
1	Outer Carton	9211-5636
2	Pads (2)	08590-80013
3	Bottom Tray	08590-80014

Figure 2-1. HP 8562A/B Shipping Container and Contents

Power Requirements

The power requirements for the HP 8562A/B Spectrum Analyzer are listed in Table 2-1.

Table 2-1. Power Requirements

Line Input	Power Requirements
115 VAC Operating	
Line Voltage	90-140 V rms
Current	3.2 A rms max.
Frequency	47-440 Hz
230 VAC Operation	
Line Voltage	180-280 V rms
Current	1.8 A rms max.
Frequency	47-66 Hz

Setting the Line Voltage Selector Switch

Caution BEFORE CONNECTING the HP 8562A/B to the power source, you must set the rear-panel voltage selector switch correctly to adapt the HP 8562A/B to the power source. An improper selector switch setting can damage the analyzer when it is turned on.

Set the instrument's rear-panel voltage selector switch to the line voltage range (115 V or 230 V) corresponding to the available AC voltage. See Figure 2-2. Insert a small screwdriver or similar tool in the slot and slide the switch so the proper voltage label is visible.

Checking the Fuse

The type of AC line input fuse will depend on the input line voltage. Use the following fuses:

115 V operation:	5A 125V UL/CSA (HP part number 2110-0756)
230 V operation:	5A 250V IEC (HP part number 2110-0709)

The line fuse is housed in a small container located on the rear-panel power connector. See Figure 2-2. The container provides space for storing a spare fuse, as shown in the figure.

To check the fuse, insert the tip of a screwdriver in the slot at the top of the container and pry gently to remover the container. When installing a new fuse, be sure to place the fuse in the proper position as illustrated in Figure 2-2.

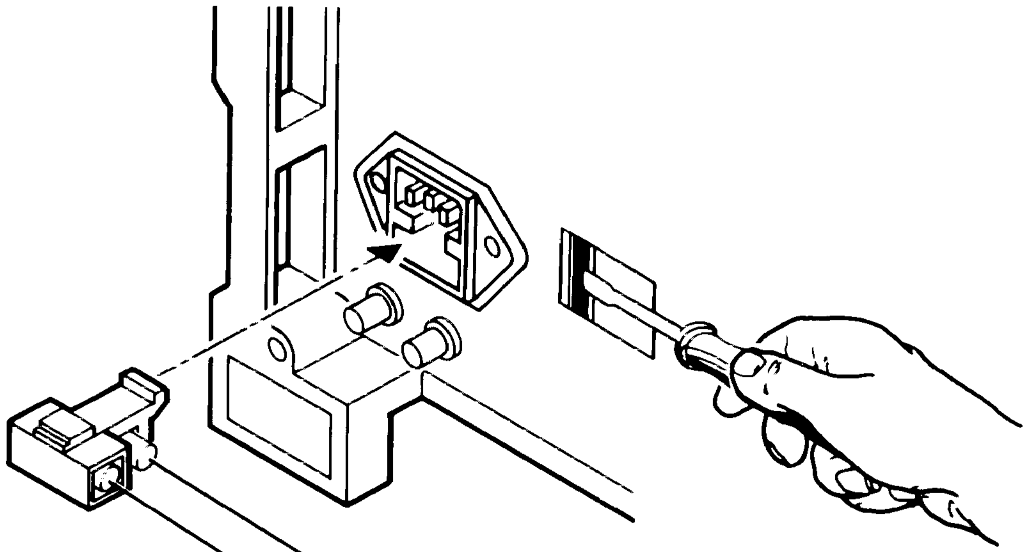


Figure 2-2. Voltage Selection Switch and Line Fuse Locations

Power Cable

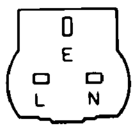
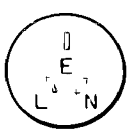
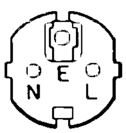
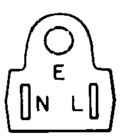
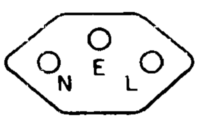
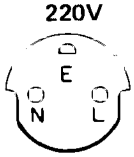
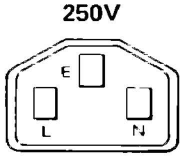
The HP 8562A/B is equipped with a three-wire power cable, in accordance with international safety standards. When connected to an appropriate power line outlet, this cable grounds the instrument cabinet.

Warning

Failure to ground the instrument properly can result in personal injury. Before turning on the HP 8562A/B, you must connect its protective earth terminals to the protective conductor of the main power cable. Insert the main power cable plug only into a socket outlet that has a protective earth contact. DO NOT defeat the earth-grounding protection by using an extension cable, power cable, or autotransformer without a protective ground conductor. If you are using an auto transformer, make sure its common terminal is connected to the protective earth contact of the power source outlet socket.

Various power cables are available to connect the HP 8562A/B to the types of AC power outlets unique to specific geographic areas. The cable appropriate for the area to which the analyzer is originally shipped is included in the unit. You can order additional AC power cables for use in different areas. Table 2-2 lists the available AC power cables, illustrates the plug configurations, and identifies the geographic area in which each cable is appropriate.

Table 2-2. AC Power Cables Available

Plug Type**	Cable HP Part Number	Plug Description	Cable Length cm (inches)	Cable Color	For Use In Country
250V 	8120-1351 8120-1703	Straight*BS1363A 90°	229 (90) 229 (90)	Mint Gray Mint Gray	Great Britain, Cyprus, Nigeria, Rhodesia, Singapore, So. Africa, India
250V 	8120-1369 8120-0696	Straight*NZSS198/ASC112 90°	201 (79) 221 (87)	Gray Gray	Australia, New Zealand
250V 	8120-1689 8120-1692	Straight*CEE7-Y11 90°	201 (79) 201 (79)	Mint Gray Mint Gray	East and West Europe, Saudi Arabia, United Arab Republic (unpolarized in many nations)
125V 	8120-1348 8120-1398 8120-1754	Straight*NEMA5-15P 90° Straight*NEMA5-15P	203 (80) 203 (80) 91 (36)	Black Black Black	United States Canada, Japan (100 or 200V), Mexico, Phillipines, Taiwan
	8120-1378 8120-1521 8120-1676	Straight*NEMA5-15P 90° Straight*NEMA5-15P	203 (80) 203 (80) 91 (36)	Jade Gray Jade Gray Jade Gray	
250V 	8120-2104	Straight*SEV1011 1959-24507 Type 12	201 (79)	Gray	Switzerland
220V 	8120-0698	Straight*NEMA6-15P			
250V 	8120-1860	Straight*CEEE22-VI			

* Part number shown for plug is industry identifier for plug only. Number shown for cable is HP Part Number for complete cable, including plug.

** E = Earth Ground; L = Line; N = Neutral.

Turning the HP 8562A/B On for the First Time

When you turn your analyzer on for the first time, you should perform the following trace alignment and reference level calibration procedures. The HP-IB address may also be set if needed. Perform the following three steps before continuing with the procedures:

1. Press (LINE).
2. The analyzer will take about half a minute to perform a series of self-diagnostic and calibration routines. Upon completion of the routines, the screen displays the analyzer's model number (HP 8562A/B) and the firmware date (for example, 880902 indicates September 2, 1988). Record the firmware date and keep it for reference. If you should ever need to call HP for service or with any questions regarding your analyzer, it will be helpful to have the firmware date readily available.
3. Allow the analyzer to warm up for five minutes. See the warmup specification in Table 1-1.

Trace Alignment Procedure

1. Press (PRESET) (RECALL) MORE CRT ADJ .
2. Adjust the rear-panel TRACE ALIGN until the leftmost line of the test pattern is parallel with the CRT bezel. See Figure 2-3.
3. Adjust the rear-panel X POSN until the leftmost @ characters and the softkey labels appear just inside the left and right edges of the CRT bezel.
4. Adjust the rear-panel Y POSN until the softkey labels align with the appropriate softkeys.
5. Press (PRESET) to return the analyzer to normal operation.

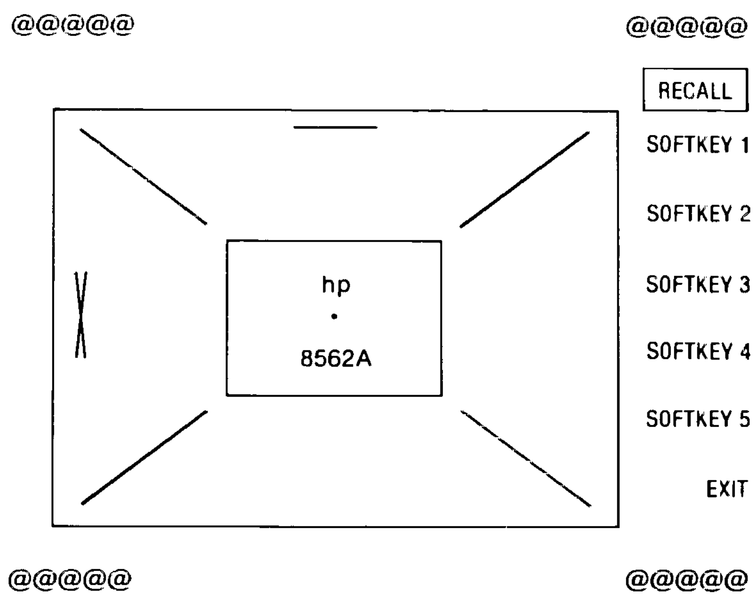


Figure 2-3. CRT Adjustment Pattern

Reference Level Calibration

1. Press (PRESET).
2. Connect a 50 ohm coaxial cable (such as HP 10503A) between the front-panel CAL OUTPUT and INPUT 50 Ω connectors.
3. Set the analyzer's center frequency to 300 MHz by pressing (FREQUENCY) (3) (0) (0) (MHz).
4. Set the analyzer's span to 20 MHz by pressing (SPAN) (2) (0) (MHz).
5. Press (PEAK SEARCH).
6. Set the analyzer's reference level to −10 dBm by pressing (AMPLITUDE) (1) (0) (−dBm).
7. Press MORE REF LVL CAL.
8. Rotate the analyzer's front-panel knob until the marker (MKR) reads −10.00 dBm ±0.17 dB. There is a slight delay in time between the adjusting of the knob and the change in marker value. Notice that the REF LEVEL CAL value displayed on the screen changes.
9. Press STORE REF LVL.
10. Press (PRESET).

HP-IB Address Selection

1. The HP-IB address for the analyzer is preset at the factory to a decimal value of 18. Valid address values range from 0 to 30. To view the HP-IB address, press (PRESET) HP-IB ADDRESS.
2. To change the address value, enter the new address number using the front-panel data keys, and terminate the entry by pressing a units key. For example, enter an address of 18 by pressing (PRESET) HP-IB ADDRESS (1) (8) (Hz) STORE HPIB ADR.
3. Press (PRESET).

When the trace alignment and reference level calibration procedures have been completed successfully, the analyzer is ready for normal operation.

3. Performance Tests

3

Performance Tests

What You'll Find in This Chapter

This chapter contains 23 procedures that test the electrical performance of the HP 8562A/B Spectrum Analyzer against the specifications in Table 1-1. None of the test procedures requires removing the cover of the spectrum analyzer. This chapter also provides instructions on using the HP 85629B functional tests.

What is Performance Verification?

The highest-level testing, called **performance verification,** verifies that analyzer performance is within all specifications of Table 1-1. It is time-consuming and requires extensive test equipment. Performance verification consists of all the performance tests. Table 3-1 is a complete listing of those tests.

Table 3-1. Performance Tests

Test Number	Test Name
1*	10 MHz Reference Output Accuracy (non-Option 003)
2	Calibrator Amplitude Accuracy
3	Displayed Average Noise Level
4	Resolution Bandwidth Switching and IF Alignment Uncertainty
5	Resolution Bandwidth Accuracy and Selectivity
6	Input Attenuator Switching Uncertainty
7	IF Gain Uncertainty
8	Scale Fidelity
9	Residual FM
10	Noise Sidebands
11	Image, Multiple, and Out-of-Band Responses
12	Frequency Readout Accuracy/Frequency Count Marker Accuracy
13	Pulse Digitization Uncertainty
14	Second Harmonic Distortion
15	Frequency Response
16	Frequency Span Accuracy
17	Third Order Intermodulation Distortion
18	Gain Compression
19	1ST LO OUTPUT Amplitude
20	Sweep Time Accuracy
21	Residual Responses
22	IF Input Amplitude Accuracy
23*	10 MHz Reference Output Accuracy (Option 003 only)

*Perform test number 1 if the spectrum analyzer does *not* have Option 003, Precision Frequency Reference, installed. Perform test number 23 if Option 003 *is* installed.

What is Operation Verification?

Operation verification consists of a subset of the performance tests that test only the most critical specifications of the analyzer. It requires much less time and equipment than performance verification, and is recommended for verification of overall instrument operation, either as part of incoming inspection or after repair. Table 3-2 lists the performance tests used for operation verification.

Table 3-2. Operation Verification

Test Number	Test Name
1	10 MHz Reference Output Accuracy (except Option 003)
2	Calibrator Amplitude Accuracy
3	Displayed Average Noise Level
4	Resolution Bandwidth Switching and IF Alignment Uncertainty
5	Resolution Bandwidth Accuracy and Selectivity
6	Input Attenuator Switching Uncertainty
7	IF Gain Uncertainty
8	Scale Fidelity
9	Residual FM
10	Noise Sidebands
12	Frequency Readout Accuracy/Frequency Count Marker Accuracy
14	Second Harmonic Distortion
15	Frequency Response
16	Frequency Span Accuracy

Before You Start

There are three things you must do *before* starting performance verification or operation verification:

1. Switch the analyzer on and let it warm up in accordance with warmup specifications in Table 1-1.
2. After the analyzer has warmed up as specified, perform "Trace Alignment Procedure and Reference Level Calibration" in Chapter 2, "Preparation for Use."
3. Read the rest of this section before you start any of the tests.

Test Equipment You'll Need

Table 3-10 lists the recommended test equipment for the performance tests. Any equipment that meets the critical specifications given in the table can be substituted for the recommended model(s). The table also lists the recommended equipment for the analyzer's adjustment procedures, which are located in the support documentation. Test equipment required for performance tests is indicated by a "P" in the "Use" column.

Recording the Test Results

Record the test results in table 3-7, "Performance Test Record," located at the end of this chapter. The table lists test specifications and acceptable limits. We recommend you make a copy of this table, record the complete test results on the copy, and keep the copy for your calibration test record. This record could prove invaluable in tracking gradual changes in test results over long periods of time.

If the Analyzer Doesn't Meet Specifications

If the analyzer doesn't meet one or more of the specifications, complete any remaining tests and record all test results on a copy of the test record. Then refer to Chapter 4, "Help?," for instructions how to solve the problem. If an error message is displayed, press (PRESET) and select REALIGN LO & IF. If the error message persists after the automatic RF, LO, and IF adjustments are completed, refer to Chapter 4 and to Appendix A, "Error Messages."

Calibration Cycle

To ensure that the HP 8562A/B Spectrum Analyzer meets the specifications listed in Table 1-1, performance verification should be performed every 12 months.

HP 85629B Functional Tests

The HP 85629B Test and Adjustment Module (TAM) can be used to perform several automatic functional tests on the HP 8562A/B Spectrum Analyzer. These tests provide increased confidence in analyzer operation while requiring very little equipment or operator attention. Hard-copy results are possible with an HP-IB printer. Because these functional tests have greater measurement uncertainties than their related performance tests, they should not be used as part of a calibration. The greater measurement uncertainties in the functional tests are a result of the limited set of test equipment.

Table 3-3 lists the functional tests, their corresponding performance tests, and the types of test equipment required for each test. The recommended test equipment for the functional tests is indicated in Table 3-10 by the letter "M" in the "Use" column.

Table 3-3. TAM Functional Tests

Functional Tests	Corresponding Performance Test	Equipment Required
Noise Sidebands	10	None
Residual FM	9	None
IF Gain Uncertainty	7	Source
Scale Fidelity	8	Source
Input Attenuator Accuracy	6	Source
Frequency Marker Accuracy	12	Source
Image, Mult, Out-of-Band Resp	11	Source
RES BW Accy and Selectivity	4, 5	Source, 20 dB Pad
2nd Harmonic Distortion	14	Source, 50 MHz LPF
Frequency Span Accuracy	16	Source
Gain Compression	18	Source
T. O. I. Distortion	17	Source
Frequency Response	15	Source, Power Meter
1ST LO OUTPUT Amplitude	19	Power Meter
Displayed Average Noise Level	3	50Ω Termination
Residual Responses	21	50Ω Termination

Spectrum Analyzer/TAM Compatibility

Table 3-4 and Table 3-5 list the compatibility rating of each analyzer serial prefix for each TAM firmware revision. A rating of 10 indicates that the analyzer and the TAM are fully compatible. If the rating is less than ten, the TAM still can be used, but the results of one or more of the tests will be invalid. Refer to Table 3-6 through Table 3-9 to determine which tests are valid for a particular TAM firmware revision. Make sure the analyzer's serial prefix matches the serial prefix listed in the table. New tables will be provided for analyzers with serial prefixes not listed on this manual's title page.

Table 3-4. Functional Test Compatibility Matrix (HP 85629A)

HP 8562A/B Serial Prefix(es)	Compatibility Rating* HP 85629A Firmware Revision								
	A	B	C	D	E	F	G	H	I
2642A to 2750A (A)	10	10	10	10	10	10			
2640A to 2750A (B)	10	10	10	10	10	10			
2805A, 2809A (A)	9	9	9	10	10	10			
2809A (B)	9	9	9	10	10	10			
2840A to 2929A (A)	7	7	7	8	8	8			
2840A to 2929A (B)	7	7	7	8	8	8			

*Compatibility is rated on a scale of 1 to 10 (0 = incompatible; 10 = fully compatible).

(A) identifies serial prefixes for HP 8562A analyzers.
(B) identifies serial prefixes for HP 8562B analyzers.

Table 3-5. Functional Test Compatibility Matrix (HP 85629B)

HP 8562A/B Serial Prefix(es)	Compatibility Rating* HP 85629B Firmware Revision								
	A	B	C	D	E	F	G	H	I
2642A to 2929A (A)	10	10							
2640A to 2929A (B)	10	10							

*Compatibility is rated on a scale of 1 to 10 (0 = incompatible; 10 = fully compatible).

(A) identifies serial prefixes for HP 8562A analyzers.
(B) identifies serial prefixes for HP 8562B analyzers.

Running the Functional Tests

Connect the TAM to the rear panel of the HP 8562A/B Spectrum Analyzer. The HP 8562A/B should be allowed to warm up for at least five minutes before running any functional test. Perform the following steps to run the tests:

1. Perform a REF LVL CAL (reference level calibration), as described in Chapter 2, before continuing.
2. Press (MODULE) to select the TAM's main menu. If any error message appears, refer to the "Error Messages" section of the *Test and Adjustment Module Supplement.* Error messages will be displayed either in the lower right corner of the CRT, on the bottom line of the main menu, or in the active function area.
3. Press `CONFIG` to enter the configuration menu. Verify that the TAM is properly configured and that any test equipment is properly connected to the HP-IB. Refer to the "System Configuration Menu" section of the *Test and Adjustment Module Supplement* for more information on configuring external test equipment. If a printer is configured and available, Functional Test results will be sent to the printer instead of to the screen. If everything is properly configured, return to the main menu and press `TEST`.
4. Pressing `ALL TEST` executes all the tests listed, in the order shown. If only one test is to be performed, rotate the knob until the arrow points to the desired test and press `EXECUTE`.
5. `REPEAT` can be used to find suspected intermittent problems. If a printer is configured and connected to HP-IB, `REPEAT` will perform the selected test continuously until `ABORT` is pressed. The results will be sent to the printer. If a printer is not available, the `REPEAT` test mode will pause at the end of each execution of the test to display the results. Testing will continue after pressing `RETURN`. This sequence will continue until `ABORT` is pressed.

Table 3-6. Functional Test Validity Matrix (HP 85629A) HP 8562A/B Serial Prefix 2640A to 2750A

	Functional Test Validity* HP 85629A Firmware Revision								
Functional Test	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Noise Sidebands	V	V	V	V	V	V			
Residual FM	V	V	V	V	V	V			
IF Gain Uncertainty	V	V	V	V	V	V			
Scale Fidelity	V	V	V	V	V	V			
Input Attenuator Accuracy	V	V	V	V	V	V			
Frequency Marker Accuracy	V	V	V	V	V	V			
Image, Mult, Out-of-Band Resp	V	V	V	V	V	V			
RES BW Accuracy and Selectivity	V	V	V	V	V	V			
2nd Harmonic Distortion	V	V	V	V	V	V			
Frequency Span Accuracy	V	V	V	V	V	V			
Gain Compression	V	V	V	V	V	V			
T. O. I. Distortion	V	V	V	V	V	V			
Frequency Response	V	V	V	V	V	V			
1ST LO OUTPUT Amplitude	V	V	V	V	V	V			
Displayed Average Noise Level	V	V	V	V	V	V			
Residual Responses	V	V	V	V	V	V			
*V = test results are valid; I = test results are invalid.									

Table 3-7. Functional Test Validity Matrix (HP 85629A) HP 8562A/B Serial Prefix 2805A to 2809A

	Functional Test Validity* HP 85629A Firmware Revision								
Functional Test	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Noise Sidebands	V	V	V	V	V	V			
Residual FM	V	V	V	V	V	V			
IF Gain Uncertainty	V	V	V	V	V	V			
Scale Fidelity	V	V	V	V	V	V			
Input Attenuator Accuracy	V	V	V	V	V	V			
Frequency Marker Accuracy	V	V	V	V	V	V			
Image, Mult, Out-of-Band Resp	V	V	V	V	V	V			
RES BW Accuracy and Selectivity	I	I	I	V	V	V			
2nd Harmonic Distortion	V	V	V	V	V	V			
Frequency Span Accuracy	V	V	V	V	V	V			
Gain Compression	V	V	V	V	V	V			
T. O. I. Distortion	V	V	V	V	V	V			
Frequency Response**	I	I	I	V	V	V			
1ST LO OUTPUT Amplitude	V	V	V	V	V	V			
Displayed Average Noise Level	V	V	V	V	V	V			
Residual Responses	V	V	V	V	V	V			

*V = test results are valid; I = test results are invalid.

**Firmware revisions A through C will test frequency response only up to 22 GHz on HP 8562As with Option 026 These revisions yield valid results on standard instruments.

Table 3-8.
Functional Test Validity Matrix (HP 85629A)
HP 8562A/B Serial Prefix 2840A to 2927A

	Functional Test Validity* HP 85629A Firmware Revision								
Functional Test	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Noise Sidebands	I	I	I	I	I	I			
Residual FM	V	V	V	V	V	V			
IF Gain Uncertainty	V	V	V	V	V	V			
Scale Fidelity	V	V	V	V	V	V			
Input Attenuator Accuracy	V	V	V	V	V	V			
Frequency Marker Accuracy	V	V	V	V	V	V			
Image, Mult, Out-of-Band Resp	V	V	V	V	V	V			
RES BW Accuracy and Selectivity	I	I	I	V	V	V			
2nd Harmonic Distortion	V	V	V	V	V	V			
Frequency Span Accuracy	V	V	V	V	V	V			
Gain Compression	V	V	V	V	V	V			
T. O. I. Distortion	V	V	V	V	V	V			
Frequency Response	I	I	I	I	I	I			
1ST LO OUTPUT Amplitude	V	V	V	V	V	V			
Displayed Average Noise Level	V	V	V	V	V	V			
Residual Responses	V	V	V	V	V	V			
*V = test results are valid, I = test results are invalid.									

Table 3-9.
Functional Test Validity Matrix (HP 85629B)
HP 8562A/B Serial Prefix 2640A to 2927A

	Functional Test Validity* HP 85629B Firmware Revision								
Functional Test	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Noise Sidebands	V	V	V						
Residual FM	V	V	V						
IF Gain Uncertainty	V	V	V						
Scale Fidelity	V	V	V						
Input Attenuator Accuracy	V	V	V						
Frequency Marker Accuracy	V	V	V						
Image, Mult, Out-of-Band Resp	V	V	V						
RES BW Accuracy and Selectivity	V	V	V						
2nd Harmonic Distortion	V	V	V						
Frequency Span Accuracy	V	V	V						
Gain Compression	V	V	V						
T. O. I. Distortion	V	V	V						
Frequency Response	V	V	V						
1ST LO OUTPUT Amplitude	V	V	V						
Displayed Average Noise Level	V	V	V						
Residual Responses	V	V	V						
*V = test results are valid, I = test results are invalid.									

Table 3-10. Recommended Test Equipment

Instrument	Critical Specifications for Equipment Substitution	Recommended Model	Use
Synthesized Sweeper *(two required)*	Frequency Range 10 MHz to 22 GHz Frequency Accuracy (CW): 1×10^{-9}/day Leveling Modes: Internal & External Modulation Modes: AM & Pulse Power Level Range: −35 to +16 dBm	HP 8340A*	P,A,T, M,V
Synthesizer/ Level Generator	Frequency Range 1 kHz to 80 MHz Frequency Accuracy: 1×10^{-7}/month Flatness: ±0.15 dB Attenuator Accuracy <±0.09 dB	HP 3335A*	P,A,T, M,V
Synthesized Signal Generator	Frequency Range: 100 kHz to 2.5 GHz Residual SSB Phase Noise at 10 kHz offset (320 MHz <fc <640 MHz): <−131 dBc/Hz	HP 8663A	P,V
Pulse/Function Generator	Frequency Range: 10 kHz to 50 MHz Pulse Width: 200 ns; Output Amplitude: 5 V peak-to-peak Functions: Pulse & Triangle TTL Sync Output	HP 8116A	P
AM/FM Signal Generator	Frequency Range: 1 MHz to 200 MHz Frequency Modulation Mode Modulation Oscillator Frequency: 1 kHz FM Peak Deviation: 5 kHz	HP 8640B	A
Microwave Frequency Counter	Frequency Range: 9 MHz to 22 GHz Timebase Accuracy (Aging): $<5 \times 10^{-10}$/day	HP 5343A* Option 001	P,A,M,V
Frequency Counter *(Option 003 only)*	Frequency Range: 9 MHz to 10 MHz Frequency Resolution: 1 mHz External Frequency Reference Input	HP 5334A/B	P
Universal Counter	Modes: TI A▶B, Frequency Count Time Interval Measurement Range: 45 μs to 120 s Timebase accuracy (Aging): $<3 \times 10^{-7}$/month	HP 5316A	P
Oscilloscope	Bandwidth (3 dB): DC to 100 MHz Minimum Vertical Deflection Factor ≤2 mV/div	HP 1980A/B*	A,T
Measuring Receiver	Compatible w/Power Sensors dB Relative Mode Resolution. 0.01 dB Reference Accuracy: <±1.2%	HP 8902A*	P,A,T, M,V

*Part of Microwave Workstation
P = Performance Tests, A = Adjustments; M = Test & Adjustment Module;
T = Troubleshooting; V = Operation Verification

Table 3-10. Recommended Test Equipment (continued)

Instrument	Critical Specifications for Equipment Substitution	Recommended Model	Use
Power Sensor	Frequency Range: 50 MHz to 22 GHz Maximum SWR: 1.15 (50 to 100 MHz) 1.10 (100 MHz to 2 GHz) 1.15 (2.0 to 6.5 GHz) 1.20 (12.4 to 18 GHz) 1.25 (18 to 22 GHz)	HP 8485A*	P,A,T, M,V
Power Sensor	Frequency Range 250 MHz to 350 MHz Power Range: 100 nW to 10 μW Maximum SWR: 1.15 (250 to 350 MHz)	HP 8484A	P,A
Power Sensor	Frequency Range. 100 kHz to 2.9 GHz Maximum SWR: 1.1 (1 MHz to 2.0 GHz) 1.30 (2.0 GHz to 2.9 GHz)	HP 8482A*	P,A,T, M,V
Amplifier	Frequency Range: 2.0 to 8.0 GHz Minimum Output Power (Leveled) 2.0 to 8.0 GHz, +16 dBm Output SWR (Leveled): <1.7	HP 11975A	P
Digital Voltmeter	Range: −15 VDC to +120 VDC Accuracy: <±1 mV on 10 V Range Input Impedance: ≥1 MΩ	HP 3456A*	A
DVM Test Leads	≥36 inches, alligator clips, probe tips	HP 34118A	A,T
10 dB Step Attenuator	Attenuation Range: 30 dB Frequency Range: DC to 80 MHz Connectors BNC(f)	HP 355D	P,V
1 dB Fixed Attenuator	Attenuation Range 12 dB Frequency Range: DC to 80 MHz Connectors: BNC(f)	HP 355C	P,V,A

*Part of Microwave Workstation
P = Performance Tests; A = Adjustments, M = Test & Adjustment Module;
T = Troubleshooting, V = Operation Verification

Table 3-10. Recommended Test Equipment (continued)

Instrument	Critical Specifications for Equipment Substitution	Recommended Model	Use
20 dB Fixed Attenuator	Frequency Range: DC to 6.5 GHz Attenuation Accuracy. <±1 dB Maximum SWR: 1.2 (DC to 6.5 GHz)	HP 8491B Option 020	P,V
10 dB Fixed Attenuator	Frequency Range: DC to 6.5 GHz Attenuation Accuracy: <±0.6 dB Maximum SWR: 1.2 (DC to 6.5 GHz)	HP 8491B Option 010	P,V
Signature Multimeter	Clock Frequency >10 MHz	HP 5005A/B	
Reference Attenuator	Supplied with HP 8484A	HP 11708A	P,A
Termination	Frequency Range: DC to 22 GHz Impedance: 50 Ω Maximum SWR. <1.22 Connector: APC 3.5	HP 909D	P,M,V
Low-Pass Filter	Cutoff Frequency: 50 MHz Rejection at 80 MHz: >50 dB	HP 0955-0306	P,M,V
Low-Pass Filter *(two required)*	Cutoff Frequency: 4.4 GHz Rejection at 5.5 GHz: >40 dB	HP 11689A	P,V
Directional Coupler	Frequency Range: 1.7 to 22 GHz Coupling: 16.0 dB (nominal) Maximum Coupling Deviation: ±1 dB Directivity 14 dB minimum Flatness: 0.75 dB maximum VSWR: <1.45 Insertion Loss: <1.3 dB	HP 0955-0125	P
Power Splitter	Frequency Range. 1 kHz to 22 GHz Insertion Loss: 6 dB (nominal) Output Tracking: <0.25 dB Equivalent Output SWR: <1.22	HP 11667B	P,A,M,V
Product Support Kit	No Substitute	HP 08562-60021	A

P = Performance Tests; A = Adjustments; M = Test & Adjustment Module;
T = Troubleshooting; V = Operation Verification

Table 3-10. Recommended Test Equipment (continued)

Instrument	Critical Specifications for Equipment Substitution	Recommended Model	Use
Adapter	Type N(f)-to-BNC(m)	HP 1250-1477	A
Adapter *(three required)*	Type N(m)-to-BNC(f)	HP 1250-1476	P,V
Adapter	Type N(f)-to-BNC(f)	HP 1250-1474	P,V
Adapter	Type N(f)-to-APC 3.5(m)	HP 1250-1750	A
Adapter *(two required)*	Type N(m)-to-APC 3.5(m)	HP 1250-1743	P,A,M,V
Adapter	Type N(m)-to-APC 3.5(f)	HP 1250-1744	P,A,V
Adapter *(two required)*	Type N(f)-to-APC 3.5(f)	HP 1250-1745	P,V
Adapter *(two required)*	Type N(m)-to-SMA(f)	HP 1250-1250	P,V
Adapter	Type N(f)-to-SMA(f)	HP 1250-1772	P,A
Adapter	BNC(f)-to-BNC(f)	HP 1250-0059	A
Adapter	BNC Tee(m)(f)(f)	HP 1250-1781	P,A,M,V
Adapter	BNC(f)-to-SMA(m)	HP 1250-1200	P,A,V
Adapter	BNC(f)-to-Dual Banana Plug	HP 1251-2816	A
Adapter *(two required)*	APC 3.5(f)-to-APC 3.5(f)	HP 5061-5311	P,A,M,V
RF Cable, Semi-rigid 50Ω	Connectors: SMA(m) Length: 6 in. to 8 in	HP 11975-20002	P
Test Cable	Connectors: BNC(m)-to-SMB(f) Length: ≥61 cm (24 in.)	HP 85680-60093	A,M
Cable, RG-214/U	Connectors: Type N(m) Length: ≥91 cm (36 in.)	HP 11500A	P,V
Cable, 50 Ω Coaxial *(five required)*	Connectors: BNC(m) Length: ≥ 122 cm (48 in.)	HP 10503A	P,A,V
Cable, HP-IB *(12 required)*	Required w/Performance Test Software Required w/HP 85629B Test & Adjustment Module Length: 2 m (6.6 ft.)	HP 10833B	P,A,M

P = Performance Tests; A = Adjustments; M = Test & Adjustment Module;
T = Troubleshooting; V = Operation Verification

Table 3-10. Recommended Test Equipment (continued)

Instrument	Critical Specifications for Equipment Substitution	Recommended Model	Use
Cable *(two required)*	Frequency Range: 10 kHz to 26.5 GHz Maximum SWR: <1.4 at 22 GHz Maximum Insertion Loss 2 dB Connectors: APC 3.5(m), both ends Length: ≥ 91 cm (36 in.)	HP 8120-4921	P,A,M,V
Controller	Required to run Operation Verification Software No substitute.	HP 9816A, HP 9836A/C, or HP 310	V
Spectrum Analyzer	Frequency Range: 1 MHz to 7 GHz	HP 8566A/B	A,T
Power Supply	Output Voltage: ≥24 VDC Output Voltage Accuracy: <±0.2 V	HP 6114A	A
Tuning Tool	N/A	HP 8710-1010	A
P = Performance Tests; A = Adjustments; M = Test & Adjustment Module; T = Troubleshooting, V = Operation Verification			

1. 10 MHz Reference Output Accuracy (non-Option 003)

Note This test applies only to spectrum analyzers *not* equipped with Option 003, Precision Frequency Reference. For spectrum analyzers with Option 003, refer to test 23.

Specification

Frequency: <±4 × 10^{-6}year

Related Adjustment

10 MHz Frequency Reference Adjustment (TCXO)

Description

The 10 MHz reference signal is measured for frequency accuracy by measuring the frequency of the 300 MHz CAL OUTPUT signal. The CAL OUTPUT signal is referenced to the 10 MHz reference. Measuring the CAL OUTPUT signal yields higher resolution than measuring the 10 MHz reference directly.

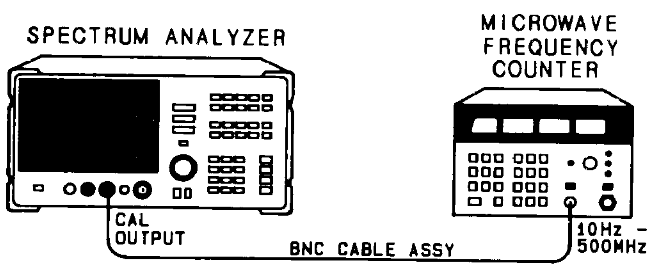


Figure 3-1. Frequency Reference Accuracy Test Setup

Equipment

Microwave Frequency Counter .... HP 5343A

Cable
BNC, 122 cm (48 in) .... HP 10503A

Procedure

1. Connect the equipment as shown in Figure 3-1.
2. Set the HP 5343A controls as follows:

SAMPLE RATE	midrange
50Ω-1 MΩ SWITCH	50Ω
10 Hz-500 MHz/500 MHz-26 5 GHz SWITCH	10 Hz-500 MHz

Note The HP 5343A should have either an Option 001 timebase or should be connected to a house standard with an aging rate better than 5×10^{-10}day.

3. On the HP 8562A/B, press (PRESET).

Note The HP 8562A/B Spectrum Analyzer must be allowed to warm up for at least ten minutes with the frequency reference set to INTERNAL. If the HP 8562A/B has warmed up, but the frequency reference has been set to EXTERNAL, wait at least five minutes after pressing (PRESET) before proceeding with step 4.

4. Wait for the frequency counter to settle. This may take two or three gate times.
5. Read the frequency counter display. The frequency should be within the following limits (±4 ppm with standard timebase):

299.998800 MHz ≤ ________________ ≤300.001200 MHz

Note The frequency reading will be invalid if any error message is displayed, especially a synthesizer-related error message.

2. Calibrator Amplitude Accuracy

Specification

Amplitude: −10 dBm ±0.3 dB

Related Adjustment

Calibrator Amplitude Adjustment

Description

The amplitude accuracy of the CAL OUTPUT signal is checked for −10 dBm ±0.3 dB. Performing the appropriate 10 MHz Reference Output Accuracy Test is sufficient for checking the calibrator frequency accuracy, since the calibrator frequency is a function of the 10 MHz reference.

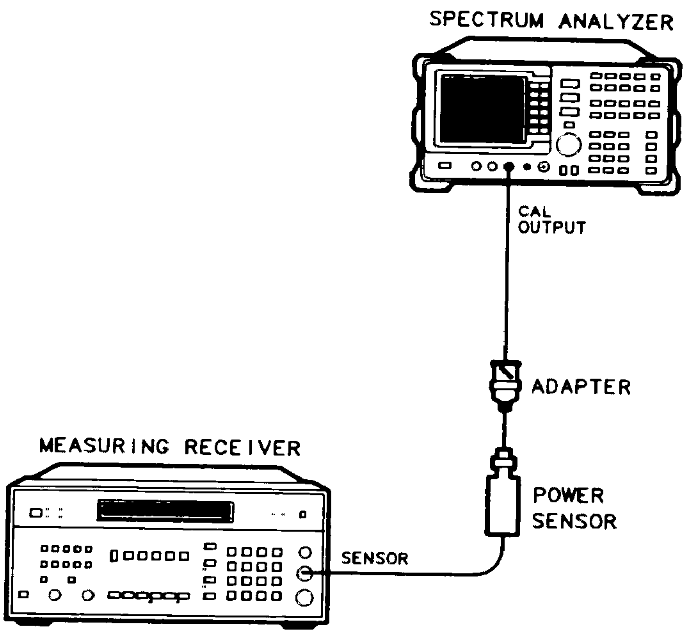


Figure 3-2. Calibrator Accuracy Test Setup

Equipment

Measuring Receiver .... HP 8902A
Power Sensor .... HP 8482A

Adapter
Type N(f)-to-BNC(m) .... HP 1250-1477

Procedure

1. Zero the HP 8902A and calibrate the HP 8482A power sensor at 300 MHz as described in the *HP 8902A Operation Manual.* Enter the power sensor's 300 MHz calibration factor into the HP 8902A.
2. Connect the power sensor through an adapter directly to the CAL OUTPUT connector. Read the power meter display. The power level should be within the following limits (±0.3 dB):

−10.3 dBm ≤ ____________________ ≤−9.7 dBm

3. Displayed Average Noise Level

Specification

Frequency	Average Noise Level
10 kHz	−90 dBm
100 kHz	−100 dBm
1 MHz to 2.9 GHz	−121 dBm
2.9 to 6.46 GHz	−121 dBm
6.46 to 13.0 GHz	−110 dBm
13.0 to 19.7 GHz	−105 dBm
19.7 to 22 GHz	−100 dBm
Option 026, 19.7 to 26.5 GHz	*−100 dBm*

Related Adjustment

Frequency Response Adjustment

Description

This test measures the displayed average noise level in all five frequency bands. The HP 8562A/B Spectrum Analyzer's input is terminated in 50 ohms. In Band 0, the test first measures the average noise at 10 and 100 kHz in zero span. For the rest of Band 0, and for all the remaining bands, the test tunes the analyzer frequency across the band, uses the marker to locate the frequency with the highest response, then reads the average noise in zero span.

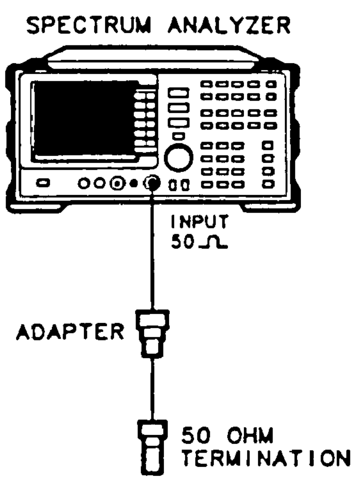


Figure 3-3. Displayed Average Noise Test Setup

Equipment

50 Ω Termination .... HP 909D

Adapters
Type N(m)-to-APC 3.5(f) .... HP 1250-1744
(not necessary for Option 026)
Type N(m)-to-BNC(f) .... HP 1250-1476
Option 026: APC 3.5(f)-to-APC 3.5(f) .... HP 5061-5311

Cable
BNC, 122 cm (48 in) .... HP 10503A

Procedure

Displayed Average Noise, Band 0

1. Connect CAL OUTPUT to INPUT 50Ω. On the HP 8562A/B, press (PRESET). Set the controls as follows:

SPAN	2.5 kHz (10 kHz if firmware revision is earlier than 870728)
CENTER FREQ	300 MHz
REF LVL	−10 dBm
ATTEN	0 dB
RES BW	100 Hz
VIDEO BW	30 Hz

2. Press MARKER (ON) (PEAK SEARCH) (AMPLITUDE) MORE REF LVL CAL .
3. Use the knob or step keys to adjust the REF LVL CAL number until the MKR amplitude is −10.00 dBm ±0.17 dB.
4. Connect the HP 909D 50Ω termination to the HP 8562A/B INPUT 50Ω as shown in Figure 3-3.
5. On the HP 8562A/B, press (AMPLITUDE). Set REF LVL to −50 dBm.

   Press (FREQUENCY). Set the controls as follows:

SPAN	0 Hz
CENTER FREQ	10 Hz
VIDEO BW	1 Hz

6. Press (TRIG) SINGLE SINGLE MARKER (ON). Read the marker amplitude and record it in Table 3-11 as the Displayed Average Noise Level at 10 kHz.

7. Change the HP 8562A/B center frequency to 99 kHz and press (TRIG) SINGLE.

Note A residual response exists at 100 kHz. Tuning to 99 kHz avoids this response being displayed, while yielding a displayed average noise reading worse than the noise at 100 kHz.

---

8. Read the marker amplitude displayed at the upper right corner of the screen and record it in Table 3-11 as the Displayed Average Noise Level at 100 kHz.
9. Set the HP 8562A/B controls as follows:

START FREQ	1 MHz
STOP FREQ	2.9 GHz
MARKER	OFF
RES BW	1 MHz
VIDEO BW	10 kHz

10. Trigger a single sweep and press MARKER (ON) MKRNOISE ON. Use the front-panel knob to move the marker to the highest average noise level.
11. Press (MKR▶) MARKER▶CF (SPAN) ZERO SPAN MARKER (OFF). Set RES BW to 100 Hz and VIDEO BW to 1 Hz.
12. Press (TRIG) SINGLE MARKER (ON).
13. Read the marker amplitude and record the amplitude in Table 3-11 as the Displayed Average Noise Level from 1 MHz to 2.9 GHz.

Displayed Average Noise, Band 1

14. Set the HP 8562A/B controls as follows:

START FREQ	2.9 GHz
STOP FREQ	6.46 GHz
MARKER	OFF
RES BW	1 MHz
VIDEO BW	10 kHz

15. Repeat steps 10 through 12.
16. Read the marker amplitude and record the amplitude in Table 3-11 as the Displayed Average Noise Level from 2.9 GHz to 6.46 GHz.

Displayed Average Noise, Band 2

17. Set the HP 8562A/B controls as follows:

START FREQ	6.46 GHz
STOP FREQ	13.0 GHz
MARKER	OFF
RES BW	1 MHz
VIDEO BW	10 kHz

18. Repeat steps 10 through 12.
19. Read the marker amplitude and record the amplitude in Table 3-11 as the Displayed Average Noise Level from 6.46 GHz to 13.0 GHz.

Displayed Average Noise, Band 3

20. Set the HP 8562A/B controls as follows:

START FREQ	13.0 GHz
STOP FREQ	19.7 GHz
MARKER	OFF
RES BW	1 MHz
VIDEO BW	10 kHz

21. Repeat steps 10 through 12.
22. Read the marker amplitude and record the amplitude in Table 3-11 as the Displayed Average Noise Level from 13.0 GHz to 19.7 GHz.

Displayed Average Noise, Band 4

23. Set the HP 8562A/B controls as follows:

START FREQ	19.7 GHz
STOP FREQ	22.0 GHz *Option 026: 26.5 GHz*
MARKER	OFF
RES BW	1 MHz
VIDEO BW	10 kHz

24. Repeat steps 10 through 12.
25. Read the marker amplitude and record the amplitude in Table 3-11 as the Displayed Average Noise Level from 19.7 GHz to 22.0 GHz. *(Option 026: 19.7 GHz to 26.5 GHz.)*

Table 3-11. Displayed Average Noise Level

Frequency	Displayed Average Noise Level	Specification (dBm)		Measurement Uncertainty
		HP 8562A	HP 8562B	
10 kHz	____________ dBm	−90	−90	+1.74/−1.98 dB
100 kHz	____________ dBm	−100	−100	+1.74/−1.98 dB
1 MHz to 2.9 GHz	____________ dBm	−121	−121	+1.74/−1.98 dB
2.9 GHz to 6.46 GHz	____________ dBm	−121	−121	+1.74/−1.98 dB
6.46 GHz to 13.0 GHz	____________ dBm	−110	−110	+1.74/−1.98 dB
13.0 GHz to 19.7 GHz	____________ dBm	−105	−105	+1.74/−1.98 dB
19.7 GHz to 22.9 GHz *Option 026:* *19.7 GHz to 26.5 GHz*	____________ dBm	−100	−100	+1.74/−1.98 dB

4. Resolution Bandwidth Switching and IF Alignment Uncertainty

Specification

Resolution Bandwidth Switching Uncertainty:
100 Hz to 2 MHz RES BW: <±0.5 dB (referenced to 300 kHz RES BW)

Note The 2 MHz RES BW setting is specified only for HP 8562A analyzers with serial prefix 2805A and above, and for HP 8562B analyzers with serial prefix 2809A and above. On earlier units, the widest specified RES BW setting is 1 MHz.

IF Alignment Uncertainty (additional uncertainty with narrow resolution bandwidths):
300 Hz RES BW: <±0.5 dB
100 Hz RES BW: <±2 dB

Related Adjustment

There is no related adjustment procedure for this performance test.

Description

This test utilizes the CAL OUTPUT signal for measuring the switching uncertainty and IF alignment uncertainty between resolution bandwidths. At each resolution bandwidth setting, the displayed amplitude variation of the signal is measured. All measurements are referenced to the 300 kHz bandwidth.

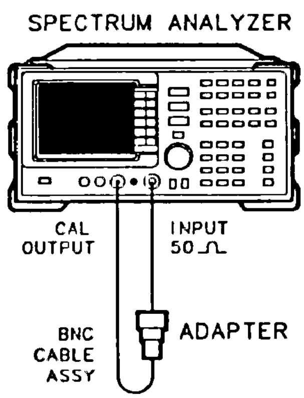


Figure 3-4. Resolution BW Switching and IF Alignment Uncertainty Test Setup

Equipment

Adapters

Type N(m)-to-BNC(f) .... HP 1250-1476
Option 026: Type N(f)-to-APC 3.5(f) .... HP 1250-1745

Cable

BNC, 122 cm (48 in) .... HP 10503A

Procedure

Setting the Reference

1. Connect the HP 8562A/B CAL OUTPUT to the INPUT 50Ω as shown in Figure 3-4.
2. Press (PRESET) (AMPLITUDE) MORE IF ADJUST FULL IF ADJ.

   Wait for the IF ADJUST STATUS message to disappear, and set the instrument controls as follows:

CENTER FREQ	300 MHz
SPAN	1 MHz
REF LVL	−5 dBm
dB/DIV	1 dB
RES BW	300 kHz
TRIGGER	SINGLE

3. Press (AMPLITUDE) MORE IF ADJUST IF ADJ OFF
   (TRIG) SINGLE (PEAK SEARCH) MARKER DELTA.

Measuring Switching Uncertainty

4. Set frequency SPAN and RES BW to the values listed in the second row of Table 3-12. *(SPAN 10 MHz, RES BW 2 MHz for HP 8562A analyzers with serial prefix 2805A and above, and for HP 8562B analyzers with serial prefix 2809A and above; SPAN 5 MHz, RES BW 1 MHz for HP 8562A/B analyzers with serial prefixes below 2750A.)*
5. Press (AMPLITUDE) MORE IF ADJUST ADJ CURR IF STATE.

   Wait for the IF ADJUST STATUS message to disappear. Press (TRIG) SINGLE (PEAK SEARCH). Record the Δ MKR amplitude in the Actual Δ MKR Reading column of Table 3-12. The Δ MKR reading should be within the limits shown.
6. Repeat step 5 for each set of frequency span and RES BW settings in Table 3-12.

Table 3-12. Resolution Bandwidth Switching and IF Alignment Uncertainty

HP 8562A/B		Δ MKR Reading			Measurement Uncertainty
SPAN	RES BW	Min (dB)	Actual (dB)	Max (dB)	(dB)
1 MHz	300 kHz	0	0 (Ref.)	0	0
10 MHz	2 MHz*	−0.5	________	+0.5	±0.06
5 MHz	1 MHz	−0.5	________	+0.5	±0.06
500 kHz	100 kHz	−0.5	________	+0.5	±0.06
100 kHz	30 kHz	−0.5	________	+0.5	±0.06
50 kHz	10 kHz	−0.5	________	+0.5	±0.06
10 kHz	3 kHz	−0.5	________	+0.5	±0.06
10 kHz	1 kHz	−0.5	________	+0.5	±0.06
10 kHz	300 Hz	−1.0	________	+1.0	±0.11
10 kHz	100 Hz	−2.5	________	+2.5	±0.27

*The 2 MHz RES BW setting is specified and tested only for HP 8562A analyzers with serial prefix 2805A and above, and for HP 8562B analyzers with serial prefix 2809A and above

5. Resolution Bandwidth Accuracy and Selectivity

Specification

Accuracy:
100 Hz RES BW: <±30%
300 Hz to 300 kHz RES BW: <±10%
1 MHz and 2 MHz RES BW: <±25%

Note The 2 MHz RES BW setting is specified and tested only for HP 8562A analyzers with serial prefix 2805A and above, and for HP 8562B analyzers with serial prefix 2809A and above.

Selectivity (60 dB BW/3 dB BW): <15:1

Related Adjustment

There is no related adjustment procedure for this performance test.

Description

The accuracy of each of the HP 8562A/B Spectrum Analyzer's 3 dB resolution bandwidths is measured. The 60 dB bandwidths are then determined and the results used to calculate the selectivity for each bandwidth (selectivity = 60 dB BW/3 dB BW). A frequency synthesizer, phase-locked to the spectrum analyzer's 10 MHz reference, provides a 40 MHz test signal.

The 2 MHz resolution bandwidth is specified and tested only for HP 8562A Spectrum Analyzers with serial prefix 2805A and above, and for HP 8562B Spectrum Analyzers with serial prefix 2809A and above.

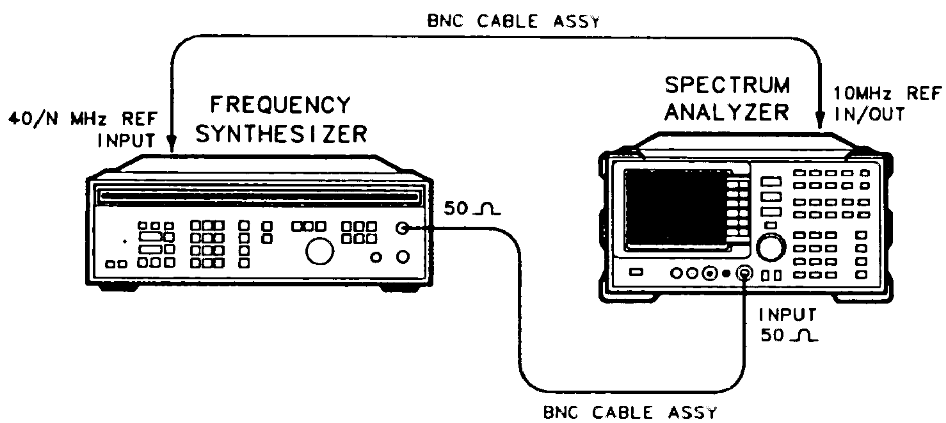


Figure 3-5. Resolution Bandwidth Accuracy and Selectivity Test Setup

Equipment

Frequency Synthesizer .... HP 3335A

Adapters
BNC(f)-to-Type N(m) .... HP 1250-1476
Option 026: Type N(f)-to-APC 3.5(f) .... HP 1250-1745

Cable
BNC, 122 cm (48 in) *(two required)* .... HP 10503A

Procedure

Resolution Bandwidth Accuracy

1. Connect the equipment as shown in Figure 3-5. The HP 8562A/B provides the frequency reference for the HP 3335A.
2. Set the HP 3335A controls as follows:

FREQUENCY	40 MHz
AMPLITUDE	−3 dBm
AMPTD INCR	1 dB

3. On the HP 8562A/B, press: (PRESET) (AMPLITUDE) MORE IF ADJUST IF ADJ OFF .

   Set the controls as follows:

CENTER FREQ	40 MHz
SPAN	0 Hz
LOG dB/DIV	1 dB
RES BW	2 MHz
(1 MHz if HP 8562A/B has serial prefix 2750A or below)	
VIDEO BW	300 Hz
SWEEPTIME	50 ms

4. Adjust the HP 3335A output amplitude to place the signal two to three divisions (2 dB to 3 dB) below the reference level. Set the HP 3335A AMPTD INCR to 3 dB.

5. Resolution Bandwidth Accuracy and Selectivity

5. On the HP 8562A/B, press: (AMPLITUDE) MORE IF ADJUST ADJ CURR IF STATE.

   Wait for the IF ADJUST STATUS message to disappear before continuing.

6. On the HP 8562A/B, press (SPAN) ZERO SPAN.
7. Adjust the HP 3335A frequency to peak the signal amplitude displayed on the HP 8562A/B.

Note

Several minor peaks might be observed when finding the peak signal amplitude for the 2 MHz RES BW setting. Be sure the peak found is the peak with the highest amplitude.

---

8. On the HP 3335A, press (AMPLITUDE) INCR (▼).
9. On the HP 8562A/B, press MARKER (ON) MARKER DELTA.
10. On the HP 3335A, press (▲).
11. Increase the HP 3335A frequency until the HP 8562A/B Δ MKR reads 0 dB ±0.02 dB. In Table 3-13, record the HP 3335A frequency as the Upper 3 dB Frequency for the current RES BW setting.
12. Decrease the HP 3335A frequency until the peak of the signal is found. Decrease the frequency further until the Δ MKR again reads 0 dB ±0.02 dB. In Table 3-13, record the HP 3335A frequency as the Lower 3 dB Frequency for the current RES BW setting.
13. Subtract the Lower 3 dB Frequency from the Upper 3 dB Frequency. Record the result as the Actual 3 dB Bandwidth in Table 3-13, and as the 3 dB Bandwidth in Table 3-14, for the current RES BW setting. The bandwidth should be within the limits shown in Table 3-13.
14. Set the HP 3335A frequency to 40 MHz.
15. On the HP 8562A/B, press MARKER (OFF).
16. Repeat steps 5 through 15 for the rest of the RES BW settings listed in the first column of Table 3-13. For RES BW settings of 10 kHz and below, change the VIDEO BW to 1 Hz.

Resolution Bandwidth Selectivity

17. Set the HP 8562A/B controls as follows:

RES BW	2 MHz
(1 MHz if HP 8562A/B has serial prefix 2750A or below)	
LOG dB/DIV	10 dB
VIDEO BW	300 Hz

18. Set the HP 3335A as follows:

AMPLITUDE	−3 dBm
AMPTD INCR	60 dB

19. On the HP 8562A/B, press: (AMPLITUDE) MORE IF ADJUST ADJ CURR IF STATE.

    Wait for the IF ADJUST STATUS message to disappear before continuing.

20. Adjust the HP 3335A frequency for peak signal amplitude on the HP 8562A/B display.

Note

Several minor peaks might be observed when finding the peak signal amplitude for the 2 MHz RES BW setting. Be sure the peak found is the peak with the highest amplitude.

21. On the HP 3335A, press INCR (▼).
22. On the HP 8562A/B, press MARKER (ON) MARKER DELTA.
23. On the HP 3335A, press INCR (▲).
24. Increase the HP 3335A frequency until the HP 8562A/B Δ MKR reads 0 dB ±0.2 dB. In Table 3-14, record the HP 3335A frequency as the Upper 60 dB Frequency for the current RES BW setting.
25. Decrease the HP 3335A frequency until the peak signal amplitude is reached. Decrease the frequency further until the HP 8562A/B Δ MKR again reads 0 dB ±0.2 dB. In Table 3-14, record the HP 3335A frequency as the Lower 60 dB Frequency for the current RES BW setting.
26. Subtract the Lower 60 dB Bandwidth from the Upper 60 dB Frequency. Record the result as the 60 dB Bandwidth in Table 3-14 for the current RES BW setting.
27. Divide the 60 dB Bandwidth by the 3 dB Bandwidth and record the result as the Actual Shape Factor in Table 3-14 for the current RES BW setting. The Actual Shape Factor should be less than the limit shown in Table 3-14.
28. On the HP 3335A, press (FREQUENCY) (4) (0) (MHz).
29. On the HP 8562A/B, press MARKER (OFF).
30. Repeat steps 19 through 29 for the rest of the RES BW settings listed in Table 3-14. For RES BW settings of 10 kHz and below, change the VIDEO BW to 1 Hz.

5. Resolution Bandwidth Accuracy and Selectivity

Table 3-13. Resolution Bandwidth Accuracy

RES BW Setting	HP 3335A Frequency		3 dB Bandwidth			Measurement Uncertainty
	Upper 3 dB	Lower 3 dB	Min	Actual	Max	
2 MHz*	______	______	1.5 MHz	______	2.5 MHz	+13.6/−14 kHz
1 MHz	______	______	750 kHz	______	1.25 MHz	+6.8/−7.0 kHz
300 kHz	______	______	270 kHz	______	330 kHz	+2.04/−2.1 kHz
100 kHz	______	______	90 kHz	______	110 kHz	+680/−700 Hz
30 kHz	______	______	27 kHz	______	33 kHz	+204/−210 Hz
10 kHz	______	______	9 kHz	______	11 kHz	+68/−70 Hz
3 kHz	______	______	2.7 kHz	______	3 3 kHz	+20.4/−21 Hz
1 kHz	______	______	900 Hz	______	1 1 kHz	+6.8/−7.0 Hz
300 Hz	______	______	270 Hz	______	330 Hz	+2.04/−2 1 Hz
100 Hz	______	______	70 Hz	______	130 Hz	+0.68/−0.7 Hz

*The 2 MHz RES BW setting is specified and tested only for HP 8562A analyzers with serial prefix 2805A and above, and for HP 8562B analyzers with serial prefix 2809A and above.

Table 3-14. Resolution Bandwidth Selectivity

RES BW Setting	HP 3335A Frequency		60 dB BW	3 dB BW	Shape Factor		Measurement Uncertainty (of 60 dB BW)
	Upper 60 dB	Lower 60 dB			Actual	Max	
2 MHz*	______	______	______	______	______	15	+126/−132 kHz
1 MHz	______	______	______	______	______	15	+63/−66 kHz
300 kHz	______	______	______	______	______	15	+19/−20 kHz
100 kHz	______	______	______	______	______	15	+6.3/−6.6 kHz
30 kHz	______	______	______	______	______	15	+1.9/−2.0 kHz
10 kHz	______	______	______	______	______	15	+630/−660 Hz
3 kHz	______	______	______	______	______	15	+190/−200 Hz
1 kHz	______	______	______	______	______	15	+63/−66 Hz
300 Hz	______	______	______	______	______	15	+19/−20 Hz
100 Hz	______	______	______	______	______	15	+6.3/−6.6 Hz

*The 2 MHz RES BW setting is specified and tested only for HP 8562A analyzers with serial prefix 2805A and above, and for HP 8562B analyzers with serial prefix 2809A and above.

6. Input Attenuator Switching Uncertainty

Specification

Switching Uncertainty (referenced to 10 dB input attenuation, for 20 to 70 dB settings):
10 kHz* to 2.9 GHz: <±0.6 dB/10 dB step to a maximum of ±1.8 dB

Related Adjustment

There is no related adjustment procedure for this performance test.

Description

This test measures the input attenuator's switching uncertainty and step-to-step accuracy over the full 70 dB range at 50 MHz. The frequency synthesizer is phase-locked to the HP 8562A/B Spectrum Analyzer's 10 MHz reference. Switching uncertainty is referenced to the 10 dB attenuator setting. The attenuator in the synthesizer/level-generator is the measurement standard. Step-to-step accuracy is calculated from switching uncertainty data.

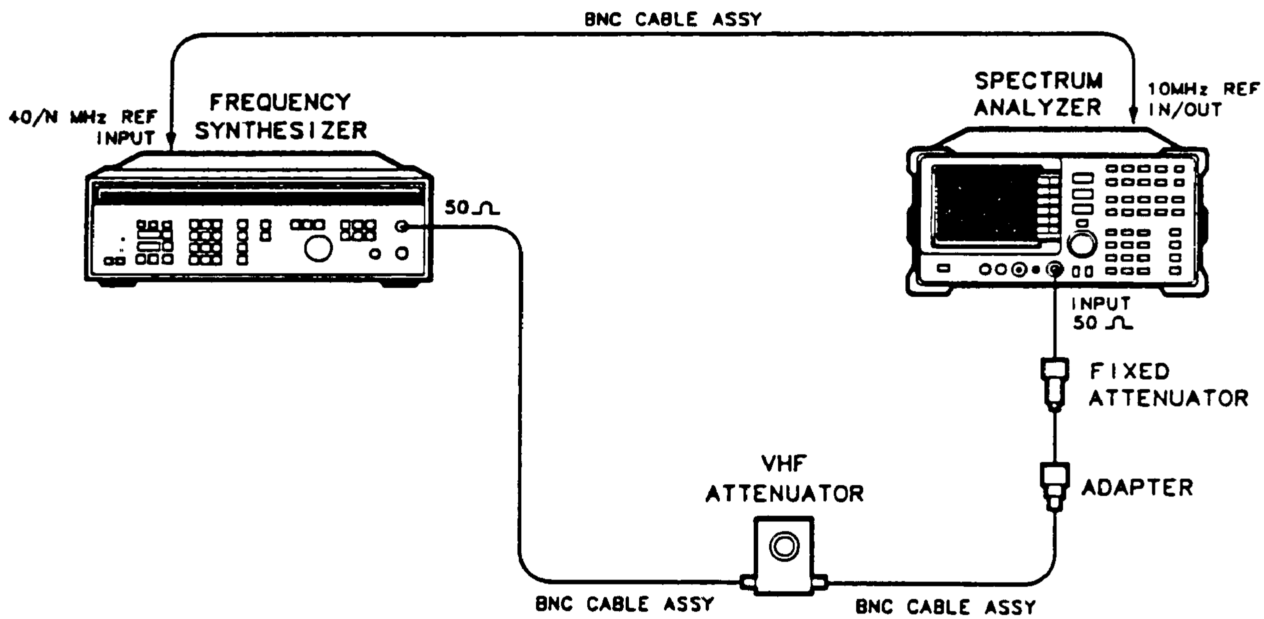


Figure 3-6. Input Attenuator Test Setup, 50 MHz

*1 kHz to 2.9 GHz for HP 8562A/B analyzers with serial prefix 2929A and below.

Equipment

Synthesizer/Level Generator .... HP 3335A
20 dB Coaxial Fixed Attenuator ....HP 8491B (Option 020)
1 dB VHF Step Attenuator ....HP 355C

Adapters
Type N(m)-to-BNC(f) .... HP 1250-1476
Option 026: Type N(f)-to-APC 3.5(f) .... HP 1250-1745

Cable
BNC, 122 cm (48 in) *(three required)* .... HP 10503A

Procedure

Attenuator Switching Uncertainty

1. Connect the equipment as shown in Figure 3-6. The HP 8562A/B provides the frequency reference for the HP 3335A.
2. Set the HP 3335A controls as follows:

FREQUENCY	50 MHz
AMPLITUDE	−50 dBm
AMPTD INCR	10 dB
OUTPUT	50 Ω

3. On the HP 8562A/B Spectrum Analyzer, press (PRESET) REALIGN LO & IF . Set the controls as follows:

CENTER FREQ	50 MHz
SPAN	0 Hz
REF LVL	−70 dBm
LOG dB/DIV	1 dB
RES BW	3 kHz
VIDEO BW	1 Hz

4. Set the HP 355C to 0 dB.
5. Adjust the HP 355C Step Attenuator to place the peak of the signal two to three divisions below the HP 8562A/B reference level.
6. On the HP 8562A/B, press (TRIG) SINGLE SINGLE . Wait for a new sweep to finish. Press MARKER (ON) MARKER DELTA .
7. Set the HP 3335A amplitude to −40 dBm as indicated in row 2 of Table 3-15. Press (AMPLITUDE) (4) (0) (−dBm).

8. On the HP 8562A/B, set:
   (AMPLITUDE) REF LVL (6) (0) (−dBm)
   ATTEN (2) (0) (dB) as indicated in row 2 of Table 3-15.
9. On the HP 8562A/B, press (TRIG) SINGLE. Wait for a sweep to finish. Record the Δ MKR amplitude in Table 3-15 as the Actual Δ MKR Reading. The Δ MKR amplitude reading should be within the limits shown.
10. Repeat steps 7 through 9 for each row of instrument settings in Table 3-15.
11. Calculate the Step-to-Step Accuracy as described in the following steps and record the results in Table 3-16. Step-to-Step Accuracy should be within the limits shown in Table 3-16.

Step-to-Step Accuracy Calculation

Note Step-to-Step Accuracy measures the accuracy of a 10 dB step. Its calculation is based upon the Actual Δ MKR readings in Table 3-15.

12. For the 20 dB ATTEN setting, subtract 10 dB from the Actual Δ MKR Reading, to obtain the Step-to-Step Accuracy:

$$\text{20 dB ATTEN: Step-to-step Accuracy} = \text{Actual } \Delta \text{ MKR Reading} - 10 \text{ dB}$$

13. For the 30, 40, 50, 60, and 70 dB ATTEN settings, subtract the previous Actual Δ MKR Reading from the correct Actual Δ MKR Reading. Subtract 10 dB from that result, to obtain the Step-to-Step Accuracy:

$$\text{Accuracy} = (\text{Current Actual } \Delta \text{ MKR} - \text{Previous Actual } \Delta \text{ MKR}) - 10 \text{ dB}$$

Table 3-15. Input Attenuator Switching Accuracy, 50 MHz

HP 3335A Amplitude	HP 8562A/B REF LVL	HP 8562A/B ATTEN	Δ MKR Reading		
(dBm)	(dBm)	(dB)	Min (dB)	Actual (dB)	Max (dB)
−50	−70	10	0 (Ref)	0 (Ref)	0 (Ref)
−40	−60	20	+8.2	________	+11.8
−30	−50	30	+18.2	________	+21.8
−20	−40	40	+28.2	________	+31.8
−10	−30	50	+38.2	________	+41.8
0	−20	60	+48.2	________	+51.8
+10	−10	70	+58.2	________	+61.8

Table 3-16. Input Attenuator Step-to-Step Accuracy, 50 MHz

HP 3335A Amplitude	HP 8562A/B REF LVL	HP 8562A/B ATTEN	Step-to-Step Accuracy		Measurement Uncertainty
(dBm)	(dBm)	(dB)	Actual (dB)	Spec (dB)	(dB)
−50	−70	10	0 (Ref)	0 (Ref)	0 (Ref)
−40	−60	20	________	0.6	±0.178
−30	−50	30	________	0.6	±0.178
−20	−40	40	________	0.6	±0.178
−10	−30	50	________	0.6	±0.178
0	−20	60	________	0.6	±0.178
+10	−10	70	________	0.6	±0.178

7. IF Gain Uncertainty

Specification

$<\pm 1.0$ dB, reference levels 0 dBm to -80 dBm with 10 dB input attenuation

Related Adjustment

IF Amplitude Adjustment

Description

This test measures the log (10 dB and 1 dB) and linear IF gain uncertainties. A 0 dBm signal is displayed near the reference level for each test. The input signal level is decreased as the HP 8562A/B Spectrum Analyzer's reference level is decreased (IF gain increased). Since the signal level decreases in accurate steps, any error between the reference level and the signal level is caused by the analyzer's IF gain. The frequency synthesizer is phase-locked to the spectrum analyzer's 10 MHz reference.

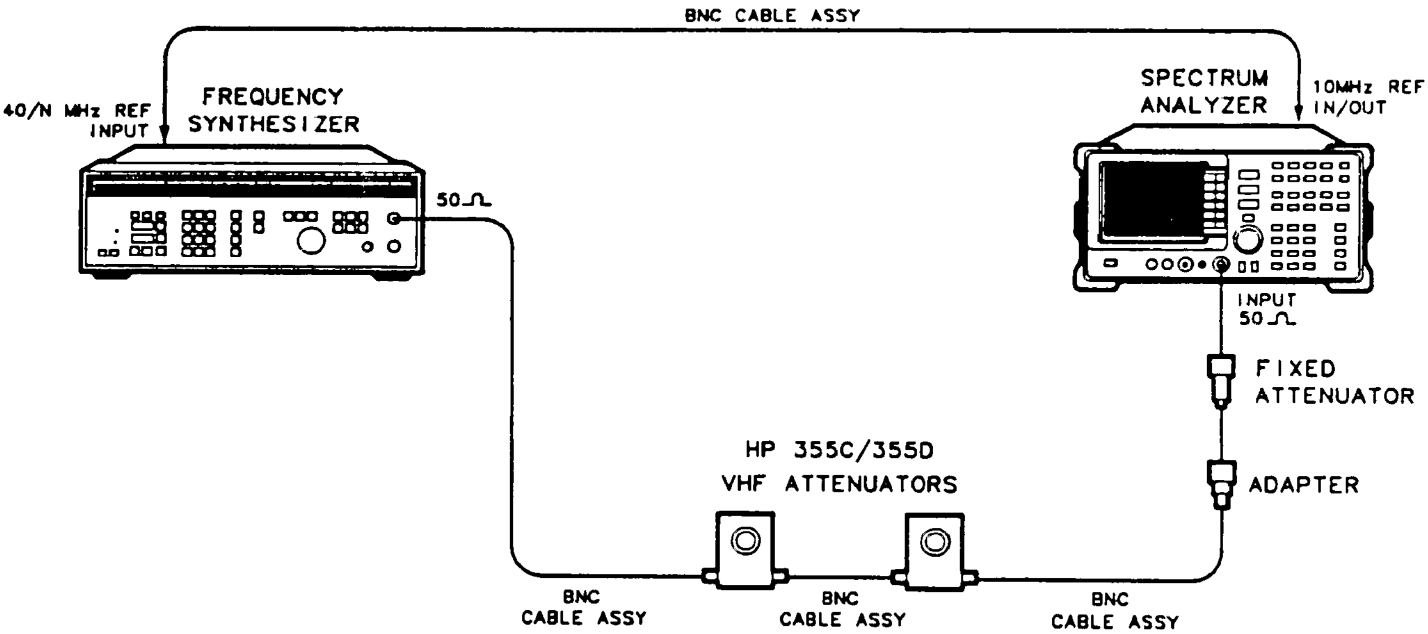


Figure 3-7. IF Gain Uncertainty Test Setup

Equipment

Frequency Synthesizer .... HP 3335A
10 dB Coaxial Fixed Attenuator ....HP 8491B, Option 010
1 dB VHF Step Attenuator ....HP 355C

Adapters
Type N(m)-to-BNC(f) .... HP 1250-1476
Option 026: Type N(f)-to-APC 3.5(f) .... HP 1250-1745

Cable
BNC, 122 cm (48 in) *(three required)* .... HP 10503A

Procedure

1. Connect the equipment as shown in Figure 3-7. The HP 8562A/B Spectrum Analyzer provides the frequency reference for the HP 3335A.

Log Gain Uncertainty (10 dB Steps)

2. Set the HP 3335A controls as follows:

FREQUENCY	50 MHz
AMPLITUDE	+10 dB
AMPTD INCR	10 dB
OUTPUT	50Ω

3. On the HP 8562A/B, press (PRESET) `REALIGN LO & IF` . Set the controls as follows:

CENTER FREQ	50 MHz
SPAN	0 Hz
dB/DIV	1 dB
RES BW	10 kHz
VIDEO BW	1 Hz

4. Set the HP 355C to 0 dB attenuation.
5. On the HP 8562A/B, press MARKER (ON)
6. Adjust the HP 355C to place the signal 2 or 3 dB (two to three divisions) below the HP 8562A/B reference level.
7. On the HP 8562A/B, press:
   (TRIG) `SINGLE SINGLE` MARKER (ON) `MARKER DELTA` .
8. On the HP 3335A, press (AMPLITUDE).
9. On the HP 3335A, press INCR (▼).

10. Set HP 8562A/B reference level:
    [AMPLITUDE] REF LVL [1] [0] [−dBm] [TRIG] SINGLE .
11. Record the HP 8562A/B Δ MKR amplitude reading in Table 3-17 as the Actual Δ MKR Reading. The Δ MKR reading should be within the limits shown.
12. Repeat steps 9 through 11 for the remaining HP 8562A/B REF LVL settings listed in Table 3-17.

Log Gain Uncertainty (1 dB Steps)

13. On the HP 3335A, press:
    [AMPLITUDE] [1] [0] [+dBm]
    [AMPTD INCR] [1] [dB].
14. Set the HP 8562A/B controls as follows:

MARKER	NORMAL
REF LVL	0 dBm
dB/DIV	1 dB
TRIGGER	CONT

15. Adjust the HP 355C to place the signal 2 to 3 dB (two to three divisions) below the HP 8562A/B reference level.
16. On the HP 8562A/B, press:
    [TRIG] SINGLE SINGLE MARKER [ON] MARKER DELTA .
17. On the HP 3335A, press [AMPLITUDE].
18. On the HP 3335A, press INCR [▼].
19. On the HP 8562A/B, press:
    [AMPLITUDE] [▼] [TRIG] SINGLE .
20. Record the HP 8562A/B Δ MKR amplitude reading in Table 3-18 as the Actual Δ MKR Reading. The Δ MKR reading should be within the limits shown.
21. Repeat steps 18 through 20 for the remaining HP 8562A/B REF LVL settings listed in Table 3-18.

Linear Gain Uncertainty

22. On the HP 3335A, press:
    [AMPLITUDE] [1] [0] [+dBm]
    [AMPTD INCR] [1] [0] [dB].

23. Set the HP 8562A/B controls as follows:

MARKER	NORMAL
REF LVL	0 dBm
AMPLITUDE SCALE	LINEAR
UNITS	dBm
TRIGGER	CONT

24. Adjust the HP 355C to place the signal two to three divisions below the HP 8562A/B reference level. The marker should read between −2 dBm and −3 dBm.
25. On the HP 8562A/B, press:
    (TRIG) SINGLE SINGLE MARKER (ON) MARKER DELTA .
26. On the HP 3335A, press (AMPLITUDE).
27. On the HP 3335A, press INCR (▼).
28. Set HP 8562A/B REF LVL to −10 dBm.
29. On the HP 8562A/B, press (TRIG) SINGLE .
30. Record the HP 8562A/B Δ MKR amplitude reading in Table 3-19 as the Actual Δ MKR Reading. The Δ MKR reading should be within the limits shown.
31. Repeat steps 27 through 30 for the remaining HP 8562A/B REF LVL settings listed in Table 3-19.
32. In Table 3-17, locate the Actual Δ MKR Reading with the greatest deviation from its corresponding REF LVL setting. Subtract the REF LVL setting from that Δ MKR reading, and record the result here:

Maximum Log IF Gain Uncertainty (10 dB Steps):________ dB

33. In Table 3-18, locate the Actual Δ MKR reading with the greatest deviation from its corresponding REF LVL setting. Subtract the REF LVL setting from that Δ MKR reading, and record the result here:

Maximum Log IF Gain Uncertainty (1 dB Steps): ________ dB

34. In Table 3-19, locate the Actual Δ MKR reading with the greatest deviation from its corresponding REF LVL setting. Subtract the REF LVL setting from that Δ MKR reading, and record the result here:

Maximum Linear Gain Uncertainty ________ dB

7. IF Gain Uncertainty

Table 3-17. Log IF Gain Uncertainty (10 dB Steps)

HP 8562A/B REF LVL	HP 3335A Amplitude	Δ MKR Reading			Measurement Uncertainty
(dBm)	(dBm)	Min (dB)	Actual (dB)	Max (dB)	(dB)
0	+10 (Ref)	0	0 (Ref)	0	±0.035
−10	0	−11	________	−9	±0.035
−20	−10	−21	________	−19	±0.035
−30	−20	−31	________	−29	±0.035
−40	−30	−41	________	−39	+0.038/−0.039
−50	−40	−51	________	−49	+0.038/−0.039
−60	−50	−61	________	−59	+0.093/−0.095
−70	−60	−71	________	−69	+0.093/−0.095
−80	−70	−81	________	−79	+0.093/−0.095

Table 3-18. Log IF Gain Uncertainty (1 dB Steps)

HP 8562A/B REF LVL	HP 3335A Amplitude	Δ MKR Reading			Measurement Uncertainty
(dBm)	(dBm)	Min (dB)	Actual (dB)	Max (dB)	(dB)
0	+10 (Ref)	0	0 (Ref)	0	±0.035
−1	+9	−2	________	0	±0.035
−2	+8	−3	________	−1	±0.035
−3	+7	−4	________	−2	±0.035
−4	+6	−5	________	−3	±0.035
−5	+5	−6	________	−4	±0.035
−6	+4	−7	________	−5	±0.035
−7	+3	−8	________	−6	±0.035
−8	+2	−9	________	−7	±0.035
−9	+1	−10	________	−8	±0.035
−10	0	−11	________	−9	±0.035
−11	−1	−12	________	−10	±0.035
−12	−2	−13	________	−11	±0.035

Table 3-19. Linear IF Gain Uncertainty

HP 8562A/B REF LVL	HP 3335A Amplitude	Δ MKR Reading			Measurement Uncertainty
(dBm)	(dBm)	Min (dB)	Actual (dB)	Max (dB)	(dB)
0	+10 (Ref)	0	0 (Ref)	0	±0 038
−10	0	−11	________	−9	±0 038
−20	−10	−21	________	−19	±0.038
−30	−20	−31	________	−29	±0 038
−40	−30	−41	________	−39	±0 041
−50	−40	−51	________	−49	±0 041
−60	−50	−61	________	−59	+0 094/−0.097
−70	−60	−71	________	−69	+0.094/−0.097
−80	−70	−81	________	−79	+0 094/−0.097

8. Scale Fidelity

Specification

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

Related Adjustment

IF Amplitude Adjustment

Description

The 10 dB, 2 dB, and linear scales are tested for fidelity. A −10 dBm signal is displayed at the reference level for each scale. As the input signal level is decreased, the displayed signal level is compared to the reference level. The test also measures the incremental step errors. The frequency synthesizer is phase-locked to the HP 8562A/B Spectrum Analyzer's 10 MHz reference.

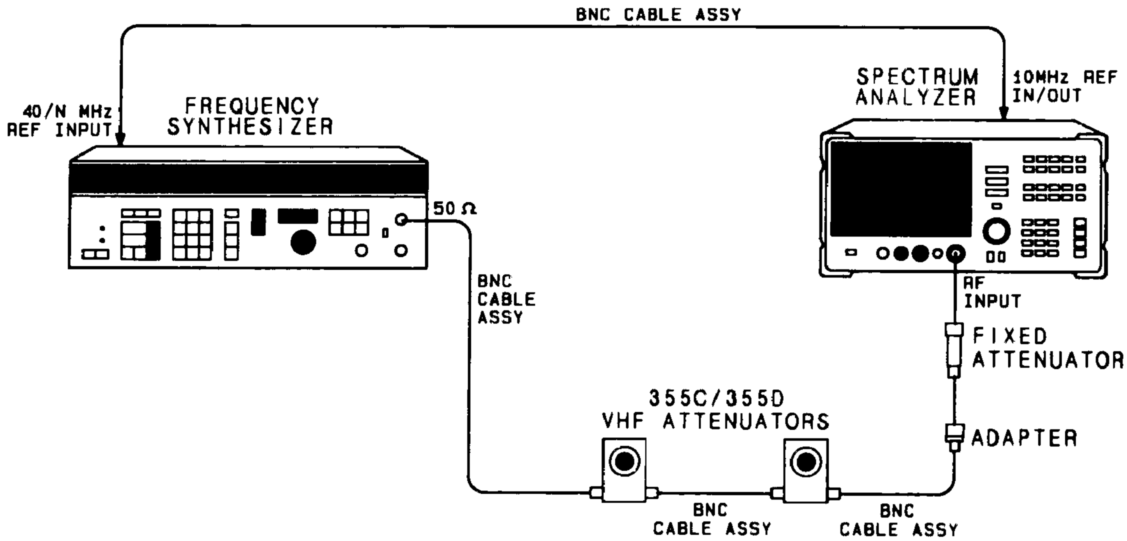


Figure 3-8. Scale Fidelity Test Setup

Equipment

Frequency Synthesizer .... HP 3335A
10 dB Coaxial Fixed Attenuator ....HP 8491B, Option 010
1 dB VHF Step Attenuator ....HP 355C
10 dB VHF Step Attenuator .... HP 355D

Adapters
Type N(m)-to-BNC(f) .... HP 1250-1476
Option 026: Type N(f)-to-APC 3.5(f) .... HP 1250-1745

Cables
BNC, 122 cm (48 in.) *(3 required)* .... HP 10503A

Procedure

1. Connect the equipment as shown in Figure 3-8. The HP 8562A/B Spectrum Analyzer provides the frequency reference for the HP 3335A.
2. Set the HP 3335A controls as follows:

FREQUENCY	50 MHz
AMPLITUDE	+10 dBm
AMPL INCR	0.05 dB
OUTPUT	50 Ω

3. On the HP 8562A/B, press [PRESET] `REALIGN LO & IF`. Set the controls as follows:

CENTER FREQ	50 MHz
SPAN	0 Hz
REF LVL	−10 dBm
ATTEN	0 dB
RES BW	10 kHz
VIDEO BW	30 Hz

4. Set the HP 355C and the HP 355D to 0 dB.
5. On the HP 8562A/B, press MARKER [ON].
6. Adjust the HP 355C and the HP 355D until the HP 8562A/B marker reads between −10 dBm and −11 dBm.

10 dB/DIV Log Scale

7. On the HP 3335A, press (AMPLITUDE) and use INCR (▲) and (▼) to adjust the amplitude until the HP 8562A/B marker reads exactly −10.00 dBm.
8. On the HP 3335A, set AMPL INCR to 4 dB, and press (AMPLITUDE).
9. On the HP 8562A/B, press:
   (TRIG) SINGLE SINGLE MARKER (ON) MARKER DELTA .
10. Using INCR (▼), set the HP 3335A amplitude to the next value listed in Table 3-20. Set AMPTD INCR to 2 dB before setting the HP 3335A amplitude to the last power level. On the HP 8562A/B, press (TRIG) SINGLE . Record the Δ MKR amplitude reading in Table 3-20, column 4. The Δ MKR amplitude should be within the limits shown. Repeat this step for each HP 3335A setting.
11. For each Δ MKR reading, subtract the previous Δ MKR reading. Add 4 dB to this number and record the result as the Incremental Error in Table 3-20. The Incremental Error should not exceed ±0.4 dB:

    Incremental Error = current Δ MKR − previous Δ MKR + 4 dB

    For the last step:

    Incremental Error = current Δ MKR − previous Δ MKR + 2 dB

2 dB/DIV Log Scale

12. Set the HP 8562A/B controls as follows:

TRIG	CONT
dB/DIV	2 dB

13. Set the HP 3335A controls as follows:

AMPLITUDE	+10 dBm
AMPL INCR	0.01 dB

14. On the HP 8562A/B, press MARKER (ON) MARKER NORMAL .
15. Adjust the HP 355C and the HP 355D until the HP 8562A/B marker reads between −10 dBm and −11 dBm.
16. On the HP 3335A, press (AMPLITUDE). Use the HP 3335A INCR keys to adjust the amplitude until the HP 8562A/B marker reads exactly −10.00 dBm.
17. Set the HP 3335A AMPL INCR to 4 dB, and press (AMPLITUDE).

18. On the HP 8562A/B, press:
(TRIG) SINGLE SINGLE MARKER (ON) MARKER DELTA.
19. Set the HP 3335A amplitude to the next value listed in Table 3-21, using INCR (▼). Set the AMPTD INCR to 2 dB before setting the HP 3335A amplitude to the last power level.
20. On the HP 8562A/B, press (TRIG) SINGLE. Record the Δ MKR amplitude reading in Table 3-21, column 4. The Δ MKR amplitude should be within the limits shown. Repeat this step for each HP 3335A setting.
21. For each Δ MKR reading in Table 3-21, subtract the previous Δ MKR reading. Add 4 dB to this number and record the result as the Incremental Error in Table 3-21. The Incremental Error should not exceed ±0.4 dB:

    Incremental Error = current Δ MKR − previous Δ MKR + 4 dB

    For the last step:

    Incremental Error = current Δ MKR − previous Δ MKR + 2 dB

Linear Scale

22. Set the HP 8562A/B controls as follows:

TRIG	CONT
LINEAR/LOG	LINEAR
UNITS	dBm

23. Set the HP 3335A controls as follows:

AMPLITUDE	+10 dBm
AMPL INCR	0.01 dB

24. On the HP 8562A/B, press MARKER (ON) MARKER NORMAL.
25. Adjust the HP 355C and the HP 355D until the HP 8562A/B marker reads between −10 dBm and −11 dBm.
26. On the HP 3335A, press (AMPLITUDE) and use INCR (▲) and (▼) to adjust the HP 3335A amplitude until the HP 8562A/B marker reads exactly −10.00 dBm.
27. On the HP 3335A, set AMPL INCR to 2 dB and press (AMPLITUDE).
28. On the HP 8562A/B, press:
(TRIG) SINGLE SINGLE MARKER (ON) MARKER DELTA.
29. Set the HP 3335A amplitude to the next value listed in Table 3-22, using INCR (▼).

30. On the HP 8562A/B, press (TRIG) SINGLE. Record the Δ MKR amplitude reading in Table 3-22, column 4. The Δ MKR amplitude should be within the limits shown. Repeat this step for each HP 3335A setting.

31. In Table 3-20, locate the Actual Δ MKR Reading with the greatest deviation from its corresponding "(nominal) dB from REF LVL." Add the dB from REF LVL to the Actual Δ MKR Reading, and record the result here:

Maximum Cumulative 10 dB Log Scale Fidelity: ________ dB

32. Also in Table 3-20, locate the Incremental Error with the greatest deviation from 0 dB, and record it here:

Maximum 10 dB Log Scale Incremental Error: ________ dB

33. In Table 3-21, locate the Actual Δ MKR Reading with the greatest deviation from its corresponding "(nominal) dB from REF LVL." Add the dB from REF LVL to the Actual Δ MKR Reading, and record the result here:

Maximum Cumulative 2 dB Log Scale Fidelity: ________ dB

34. Also in Table 3-21, locate the Incremental Error with the greatest deviation from 0 dB, and record it here:

Maximum 2 dB Log Scale Incremental Error: ________ dB

Table 3-20. 10 dB/Div Log Scale Fidelity

HP 3335A Amplitude	dB from REF LVL	Δ MKR Reading			Incremental Error	Measurement Uncertainty
(dBm, nominal)	(nominal)	Min (dB)	Actual (dB)	Max (dB)	(dB)	(dB)
+10	0	0	0 (Ref)	0	0 (Ref)	0
+6	−4	−4.4	________	−3.6	________	+0.24/−0.25
+2	−8	−8.8	________	−7.2	________	+0.24/−0.25
−2	−12	−13.2	________	−10.8	________	+0.24/−0 25
−6	−16	−17.5	________	−14.5	________	+0.24/−0.25
−10	−20	−21.5	________	−18.5	________	+0.24/−0 25
−14	−24	−25.5	________	−22.5	________	+0.24/−0.25
−18	−28	−29.5	________	−26.5	________	+0.24/−0.25
−22	−32	−33.5	________	−30.5	________	+0.241/−0 255
−26	−36	−37.5	________	−34.5	________	+0.241/−0.255
−30	−40	−41.5	________	−38.5	________	+0.241/−0 255
−34	−44	−45.5	________	−42.5	________	+0.241/−0 255
−38	−48	−49.5	________	−46.5	________	+0.241/−0.255
−42	−52	−53.5	________	−50.5	________	+0.255/−0 270
−46	−56	−57.5	________	−54.5	________	+0.255/−0 270
−50	−60	−61.5	________	−58.5	________	+0.255/−0.270
−54	−64	−65.5	________	−62.5	________	+0.255/−0 270
−58	−68	−69.5	________	−66.5	________	+0.255/−0 270
−62	−72	−73.5	________	−70.5	________	+0.255/−0 270
−66	−76	−77.5	________	−74.5	________	+0.255/−0 270
−70	−80	−81.5	________	−78.5	________	+0.255/−0 270
−74	−84	−85.5	________	−82.5	________	+0.255/−0 270
−78	−88	−89.5	________	−86.5	________	+0.255/−0 270
−80*	−90	−91.5	________	−88.5	________**	+0.255/−0 270

* INCR keys cannot be used to set this step; key in the AMPLITUDE from the previous step (−78 dBm, nominal), minus 2 dB.

** This value should not exceed ±0.2 dB

8. Scale Fidelity

Table 3-21. 2 dB/Div Log Scale Fidelity

HP 3335A Amplitude	dB from REF LVL	Δ MKR Reading			Incremental Error	Measurement Uncertainty
(dBm, nominal)	(nominal)	Min (dB)	Actual (dB)	Max (dB)	(dB)	(dB)
+10	0	0	0 (Ref)	0	0 (Ref)	0
+6	4	−4.4	________	−3.6	________	±0.06
+2	8	−8.8	________	−7.2	________	±0.06
−2	12	−13.2	________	−10 8	________	±0.06
−6	16	−17.5	________	−14.5	________	±0.06
−8	18	−19.5	________	−16 5	________	±0.06

Table 3-22. Linear Scale Fidelity

HP 3335A Amplitude	dB from REF LVL	Δ MKR Reading			Measurement Uncertainty
(dBm, nominal)	(nominal)	Min (dB)	Actual (dB)	Max (dB)	(dB)
+10	0	0	0 (Ref)	0	0
+8	2	−2.33	________	−1.68	+0.033/−0.033
+6	4	−4 42	________	−3.60	+0.034/−0 034
+4	6	−6.54	________	−5.50	+0.037/−0 037
+2	8	−8.68	________	−7.37	+0.041/−0.041
0	10	−10.87	________	−9.21	+0.046/−0 047
−2	12	−13.10	________	−11 02	+0.054/−0 054
−4	14	−15.42	________	−12 78	+0.064/−0 065
−6	16	−17.82	________	−14 49	+0.078/−0 079
−8	18	−20.36	________	−16 14	+0118/−0.12

9. Residual FM

Specification

Residual FM: <50 Hz × N peak-to-peak in 100 ms in zero span

Note N is the harmonic mixing mode

Related Adjustment

There is no related adjustment for this performance test.

Description

The Residual FM Test measures the inherent short-term instability of the HP 8562A/B Spectrum Analyzer's local oscillator system. The analyzer is placed in zero span. A stable signal is applied to the input, and slope-detected on the linear portion of the IF bandwidth filter skirt. Any instability in the LO system transfers to the IF signal in the mixing process. The test determines the slope of the IF filter in Hz/dB, then measures the signal amplitude variation caused by the residual FM. Multiplying these two values gives the residual FM in Hz.

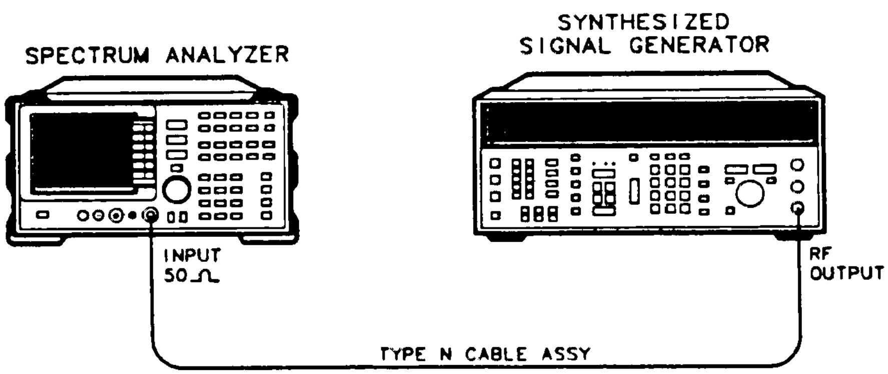


Figure 3-9. Residual FM Test Setup

Equipment

Synthesized Signal Generator .... HP 8663A

Adapter
Option 026: Type N(f)-to-APC 3.5(f) .... HP 1250-1745

Cable
Type N, 183 cm (72 in) .... HP 11500A

Procedure

Determining the IF Filter Slope

1. Connect the equipment as shown in Figure 3-9.
2. Set the HP 8663A controls as follows:

FREQUENCY	2500 MHz
CW OUTPUT	−10 dBm

3. On the HP 8562A/B, press (PRESET), and set the controls as follows:

CENTER FREQ	2.5 GHz
SPAN	1 MHz
REF LVL	−5 dBm
RES BW	3 kHz
dB/DIV	1 dB

4. On the HP 8562A/B, press:
   (PEAK SEARCH) SIGNAL TRK ON (SPAN) (1) (0) (kHz) MARKER (OFF)
   (BW) (1) (kHz) (PEAK SEARCH) (MKR ▸) MARKER ▸ CF MARKER ▸ REF LVL
   (TRIG) SINGLE (PEAK SEARCH) MARKER DELTA .
5. Rotate the HP 8562A/B data entry knob counterclockwise until the Δ MKR reads −1 dB ±0.1 dB. Press MARKER DELTA . Rotate the data entry knob counterclockwise until the Δ MKR reads −4 dB ±0.1 dB.
6. Divide the Δ MKR frequency in Hz by the Δ MKR amplitude in dB to obtain the slope of the RES BW filter. (For example, if the Δ MKR frequency is 380 Hz and the Δ MKR amplitude is 3.92 dB, the slope would equal 97 Hz/dB.) Record the result here:

Slope. ________ Hz/dB

Measuring the Residual FM

7. On the HP 8562A/B, press:
   MARKER (OFF) (PEAK SEARCH) MARKER DELTA .

   Rotate the data entry knob counterclockwise until the Δ MKR reads −3 dB ±0.1 dB.

8. On the HP 8562A/B, press:
   (MKR ▶) MARKER NORMAL MARKER ▶ CF (SPAN) ZERO SPAN .

   Set sweep time to 100 ms. Press (TRIG) SINGLE .

Note The displayed trace should be about three divisions below the reference level. If it is not, press CONT (FREQUENCY), then use the data entry knob to place the displayed trace about three divisions below the reference level. Press (TRIG) SINGLE , then continue with step 9.

---

9. On the HP 8562A/B, press (PEAK SEARCH) MARKER DELTA . Rotate the data entry knob to position the active marker at the lowest point on the displayed trace. Read the Δ MKR amplitude, take its absolute value, and record the result here as the Deviation:

   Deviation: ________ dB

10. Calculate the Residual FM by multiplying the Slope recorded in step 6 by the Deviation recorded in step 9. The Residual FM should be less than 50 Hz. Record the result here:

    Residual FM: ________ Hz

10. Noise Sidebands

Specification

Noise Sidebands:

<(−86 + 20 Log N) dBc/Hz at ±10 kHz offset
<(−100 + 20 Log N) dBc/Hz at ±30 kHz offset
<(−110 + 20 Log N) dBc/Hz at ±100 kHz offset

Related Adjustment

There is no related adjustment procedure for this performance test.

Description

The noise sidebands of a 2.5 GHz, −10 dBm signal are measured at offsets of 10 kHz, 30 kHz, and 100 kHz from the carrier with a 1 kHz resolution bandwidth.

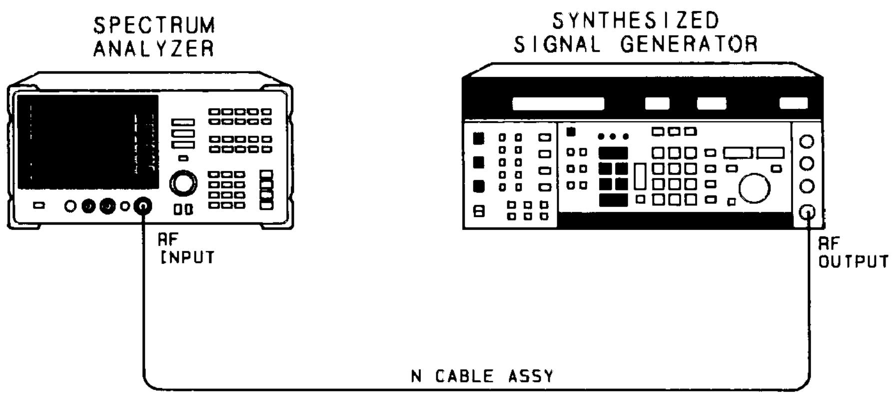


Figure 3-10. Noise Sidebands Test Setup

Equipment

Synthesized Signal Generator .... HP 8663A

Adapter
Option 026: Type N(f)-to-APC 3.5(f) HP1250-1745

Cable
Type N, 183 cm (72 in) .... HP 11500A

Procedure

1. Connect the equipment as shown in Figure 3-10.
2. Set the HP 8663 controls as follows:

FREQUENCY	2500 MHz
CW OUTPUT	−15 dBm

3. On the HP 8562A/B, press (PRESET). Set the controls as follows:

CENTER FREQ	2.5 MHz
SPAN	1 MHz
REF LVL	−10 dBm
ATTEN	0 dB
CF STEP	10 kHz

4. On the HP 8562A/B, press:
   (PEAK SEARCH) `SIG TRK ON`
   (SPAN) (1) (0) (kHz).

   Wait for the completion of two sweeps, then press:
   MARKER (ON) `SIG TRK OFF`
   (BW) `RES BW` (1) (kHz)
   (SPAN) `ZERO SPAN`
   (BW) `VIDEO BW` (1) (Hz).
5. Adjust the HP 8663A amplitude as necessary to place the peak of the signal at the HP 8562A/B reference level.
6. On the HP 8562A/B, press:
   (TRIG) `SINGLE SINGLE`.

   Wait for completion of the sweeps, then press:
   MARKER (ON) `MKR NOISE ON MARKER DELTA`.
7. On the HP 8562A/B, press:
   (FREQUENCY) (▲)
   (TRIG) `SINGLE`.

   Wait for completion of the sweep, then record the Δ MKR amplitude in Table 3-23, column 2, as Single Sideband Noise for +10 kHz offset.
8. On the HP 8562A/B, press (FREQUENCY) (▼) (▼).
9. On the HP 8562A/B, press (TRIG) `SINGLE`.

   Wait for completion of the sweep, then record the Δ MKR amplitude in Table 3-23, column 2, as the Single Sideband Noise for −10 kHz offset.

10. On the HP 8562A/B, press (▲).
11. Repeat steps 6 through 10 for a center frequency step of 30 kHz. Record the Δ MKR amplitudes in Table 3-23, column 2, as Single Sideband Noise for +30 kHz and −30 kHz.
12. Press (▲).
13. Repeat steps 6 through 10 for a center frequency step of 100 kHz. record the Δ MKR amplitudes in Table 3-23, column 2, as Single Sideband Noise for +100 kHz and −100 kHz.

Table 3-23. Noise Sidebands

Offset	Δ MKR Reading		Measurement Uncertainty
(kHz)	Actual (dBc/Hz)	Max (dBc/Hz)	(dB)
+10	________	−86	+1.51/−1.53
−10	________	−86	+1.51/−1.53
+30	________	−100	+1.51/−1.53
−30	________	−100	+1.51/−1.53
+100	________	−110	+1.51/−1.53
−100	________	−110	+1.51/−1.53

11. Image, Multiple, and Out-of-Band Responses

Specification

Image, Multiple, and Out-of-Band Responses:
<18 GHz: <−70 dBc
<22 GHz: <−60 dBc
Option 026: <26.5 GHz: <−60 dBc

Related Adjustment

YTF Adjustment (HP 8562A)

Description

This performance test applies only to HP 8562A analyzers. Image, multiple, and out-of-band responses are tested in each of the five frequency bands.

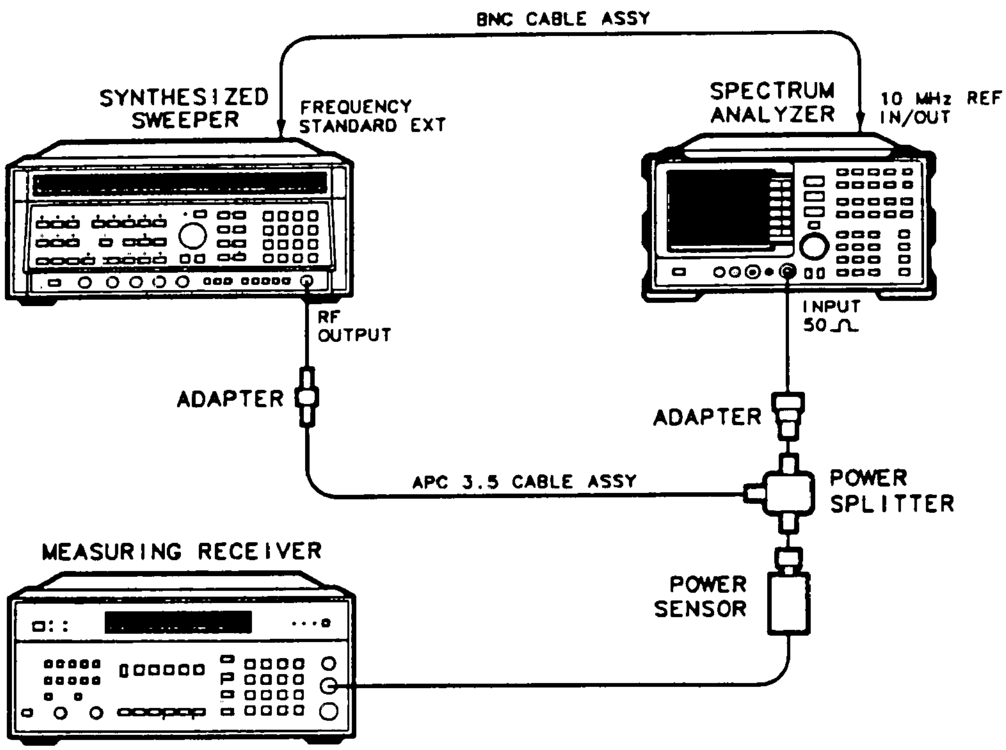


Figure 3-11. Image, Multiple, and Out-of-Band Responses Test Setup

Equipment

Synthesized Sweeper .... HP 8340A
Measuring Receiver .... HP 8902A
Power Sensor .... HP 8485A
Power Splitter ....HP 11667B

Adapters
Type N(m)-to-APC 3.5(m) .... HP 1250-1743
(not necessary for Option 026.)
Type APC 3.5(f)-to-APC 3.5(f) .... HP 5061-5311
(two required for Option 026)

Cables
BNC, 122 cm (48 in.) .... HP 10503A
APC 3.5, 91 cm (36 in.) .... HP 8120-4921

Procedure

Band 0

1. Connect the equipment as shown in Figure 3-11, but do not connect the power sensor to the power splitter.
2. On the HP 8340A, press (INSTR PRESET). Set the controls as follows:

CW	2 GHz
POWER LEVEL	−10 dBm
FREQUENCY STANDARD SWITCH (rear panel)	EXT

3. On the HP 8562A, press:
   (PRESET) (RECALL) MORE FACTORY PRESEL PK .

   Set the controls as follows:

CENTER FREQ	2 GHz
SPAN	10 kHz
REF LVL	−10 dBm
ATTEN	0 dB
RES BW	1 kHz

4. Zero and calibrate the HP 8902A and the HP 8485A. Enter the power sensor's 2 GHz calibration factor into the HP 8902A. Connect the HP 8485A to the HP 11667B Power Splitter.

5. Adjust the HP 8340A power level for a −10 dBm ±0.1 dB reading on the HP 8902A.
6. On the HP 8562A, press:
   (PEAK SEARCH) (MKR ▶) MKR ▶ REF LVL
   (TRIG) SINGLE (PEAK SEARCH) MARKER DELTA .
7. For each of the frequencies listed in Table 3-24 for Band 0, do the following:
   a. Set the HP 8340A to the listed CW key frequency.
   b. Enter the appropriate power sensor calibration factor into the HP 8902A.
   c. Set the HP 8340A power level for a −10 dB reading on the HP 8902A.
   d. On the HP 8562A, press (TRIG) SINGLE . Wait for completion of the sweep before continuing.
   e. On the HP 8562A, press (PEAK SEARCH), and record the Δ MKR amplitude in Table 3-24 as the Response Amplitude. The Response Amplitude should be less than the specification listed in that table.
8. On the HP 8562A, press:
   MARKER (OFF) (TRIG) CONT .

Band 1

9. On the HP 8562A, press:
   (FREQUENCY) CENTER FREQ (4) (GHz).
10. On the HP 8340A, set the CW to 4 GHz.
11. Enter the power sensor's 4 GHz calibration factor into the HP 8902A.
12. On the HP 8562A, press:
    (PEAK SEARCH) (INT) PRESEL AUTO PK .

    Wait for the PEAKING message to disappear. Press MARKER (OFF).
13. Repeat steps 5 through 8 for the HP 8340A frequencies listed in Table 3-24 for Band 1.

Band 2

14. On the HP 8562A, press:
    (FREQUENCY) CENTER FREQ (9) (GHz).
15. On the HP 8340A, set the CW to 9 GHz.
16. Enter the power sensor's 9 GHz calibration factor into the HP 8902A.

17. On the HP 8562A, press:
    PEAK SEARCH INT PRESEL AUTO PK .

    Wait for the PEAKING message to disappear. Press MARKER OFF.
18. Repeat steps 5 through 8 for the HP 8340A frequencies listed in Table 3-24 for Band 2.

Band 3

19. On the HP 8562A, press:
    FREQUENCY CENTER FREQ 15 GHz.
20. On the HP 8340A, set the CW to 15 GHz.
21. Enter the power sensor's 15 GHz calibration factor into the HP 8902A.
22. On the HP 8562A, press:
    PEAK SEARCH INT PRESEL AUTO PK .

    Wait for the PEAKING message to disappear. Press MARKER OFF.
23. Repeat steps 5 through 8 for the HP 8340A frequencies listed in Table 3-24 for Band 3.

Band 4

24. On the HP 8562A, press:
    FREQUENCY CENTER FREQ 21 GHz
25. On the HP 8340A, set the CW to 21 GHz.
26. Enter the power sensor's 21 GHz calibration factor into the HP 8902A.
27. On the HP 8562A, press:
    PEAK SEARCH INT PRESEL AUTO PK .

    Wait for the PEAKING message to disappear. Press MARKER OFF.
28. Repeat steps 5 through 8 for the HP 8340A frequencies listed in Table 3-24 for Band 4.
29. Record the maximum Response Amplitude from Table 3-24 for Bands 0, 1, 2, and 3 entries:

    Maximum Response Amplitude (<18.0 GHz): ________ dBc

30. Record the maximum Response Amplitude from Table 3-24 for Band 4:

    Maximum Response Amplitude (<22.0 GHz): ________ dBc
    (Option 026: <26.5 GHz)

Table 3-24. Image, Multiple, and Out-of-Band Responses

Band	HP 8562A/B Center Freq (GHz)	HP 8340A CW (MHz)	Response Amplitude (dBc)	Specification (dBc)	Measurement Uncertainty (dB)
0	2.0	1978.6*	________	−70	+1.52/−1.57
	2.0	2021.4*	________	−70	+1.52/−1.57
	2.0	1378.6*	________	−70	+1.52/−1.57
	2.0	2621.4*	________	−70	+1.52/−1.57
	2.0	9821.6***	________	−70	+1.52/−1.57
	2.0	7910.7***	________	−70	+1.52/−1.57
	2.0	1810.7**	________	−70	+1.52/−1.57
	2.0	289.3**	________	−70	+1.52/−1.57
1	4.0	3978.6*	________	−70	+1.52/−1.56
	4.0	4021.4*	________	−70	+1.52/−1.56
	4.0	3378.6*	________	−70	+1.52/−1.56
	4.0	4621.4*	________	−70	+1.52/−1.56
	4.0	289 3***	________	−70	+1.52/−1.56
	4.0	3721.4**	________	−70	+1.52/−1.56
2	9.0	8978.6*	________	−70	+1.52/−1.57
	9.0	9021.4*	________	−70	+1.52/−1.57
	9.0	8378.6*	________	−70	+1.52/−1.57
	9.0	9621.4*	________	−70	+1.52/−1.57
	9.0	289.3***	________	−70	+1.52/−1.57
	9.0	9921 4**	________	−70	+1.52/−1.57
3	15 0	14978 6*	________	−70	+1.53/−1.57
	15 0	15021 4*	________	−70	+1.53/−1.57
	15 0	14378.6*	________	−70	+1.53/−1.57
	15 0	15621 4*	________	−70	+1.53/−1.57
	15 0	289.3***	________	−70	+1.53/−1.57
	15 0	14721.4**	________	−70	+1.53/−1.57
4	21 0	20978.6*	________	−60	+1.53/−1.59
	21 0	21021.4*	________	−60	+1.53/−1.59
	21.0	20378 6*	________	−60	+1.53/−1.59
	21.0	21621.4*	________	−60	+1.53/−1.59
	21.0	289.3***	________	−60	+1.53/−1.59
	21.0	21921.4**	________	−60	+1.53/−1.59

* Image response

** Multiple response

*** Out-of-band response

12. Frequency Readout Accuracy/ Frequency Count Marker Accuracy

Specification

Frequency Readout Accuracy:
<±[(Frequency Readout × Frequency Reference Accuracy) + (5% of Span) + (15% of RES BW) + 250 Hz]

Frequency Count Marker Accuracy:
<±[(Marker Frequency × Frequency Reference Accuracy) + (50 Hz × N) + 1 LSD]

Note N is the harmonic mixing mode

Related Adjustment

YTO Adjustment

Description

The accuracy of the HP 8562A/B Spectrum Analyzer frequency readout and frequency count marker is tested with an input signal of known frequency. The spectrum analyzer provides the frequency reference for the synthesized sweeper, thus eliminating the (Frequency Readout × Frequency Reference Accuracy) term. Performing the appropriate 10 MHz Reference Output Accuracy test is sufficient for checking the effect of this term.

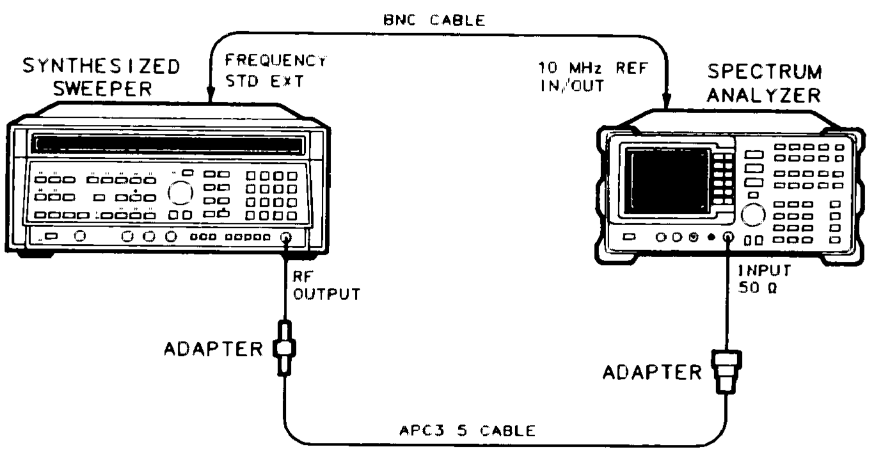


Figure 3-12. Frequency Readout and Frequency Count Marker Accuracy Test Setup

Equipment

Synthesized Sweeper .... HP 8340A

Adapters
Type N(m)-to-APC 3.5(f) .... HP 1250-1744
(Not necessary for Option 026)
APC 3.5(f)-to-APC 3.5(f) .... HP 5061-5311
(two required for Option 026)

Cables
APC 3.5, 91 cm (36 in) .... HP 8120-4921
BNC, 122 cm (48 in) .... HP 10503A

Procedure

1. Connect the equipment as shown in Figure 3-12. The spectrum analyzer provides the frequency reference for the synthesized sweeper.

Frequency Readout Accuracy

2. On the 8340A, Press (INSTR PRESET). Set the controls as follows:

CW	1.5 GHz
POWER LEVEL	−10 dBm
FREQUENCY STANDARD switch (rear panel)	EXT

3. On the HP 8562A/B, press (PRESET). Set the controls as follows:

CENTER FREQ	1.5 GHz
SPAN	1 MHz

4. *Omit this step if your spectrum analyzer is an HP 8562B.* On the HP 8562A, press: (RECALL) MORE FACTORY PRSEL PK
5. On the HP 8562A/B, press (PEAK SEARCH). Record the MKR frequency in Table 3-25 as the Actual Marker Reading. The reading should be within the limits shown.
6. Repeat steps 2 through 5 for all frequency/span combinations listed in Table 3-25. Peak the HP 8562A preselector after tuning the analyzer's center frequency and the HP 8340A (CW) frequency to frequencies of 4 GHz and above.

Frequency Count Marker Accuracy

7. On the HP 8562A/B, press:
   (SPAN) (1) (MHz)
   (FREQ COUNT) COUNTER RES (1) (0) (Hz).
8. Key in the HP 8340A CW frequencies and the HP 8562A/B center frequencies as indicated in Table 3-26. For each pair of settings, press (PEAK SEARCH), and record in Table 3-26 the MKR frequency at each point. The marker readings should be within the limits shown.

Table 3-25. Frequency Readout Accuracy

HP 8340A Frequency	HP 8562A/B		Marker Reading			Measurement Uncertainty
(GHz)	Span	Center Freq	Min (GHz)	Actual	Max (GHz)	(kHz)
1.5	1 MHz	1.5 GHz	1.499948	________	1.500051	±1
1.5	10 MHz	1.5 GHz	1.49948	________	1.50051	±1
1.5	20 MHz	1.5 GHz	1.49895	________	1.50104	±1
1.5	50 MHz	1.5 GHz	1.49745	________	1.50254	±1
1.5	100 MHz	1.5 GHz	1.4948	________	1.5052	±1
1.5	1 GHz	1.5 GHz	1.450	________	1.550	±1
4.0	1 MHz	4.0 GHz	3.999948	________	4.000051	±1
4.0	10 MHz	4.0 GHz	3.99948	________	4.00051	±1
4.0	20 MHz	4.0 GHz	3.99895	________	4.00104	±1
4.0	50 MHz	4.0 GHz	3.99745	________	4.00254	±1
4.0	100 MHz	4.0 GHz	3.9948	________	4.0051	±1
4.0	1 GHz	4.0 GHz	3.950	________	4.050	±1
9.0	1 MHz	9.0 GHz	8.999948	________	9.000051	±2
9.0	10 MHz	9.0 GHz	8.99948	________	9.00051	±2
9.0	20 MHz	9.0 GHz	8.99895	________	9.00104	±2
9.0	50 MHz	9.0 GHz	8.99745	________	9.00254	±2
9.0	100 MHz	9.0 GHz	8.9948	________	9.0051	±2
9.0	1 GHz	9.0 GHz	8.950	________	9.050	±2
16.0	1 MHz	16.0 GHz	15.999948	________	16.000051	±3
16.0	10 MHz	16.0 GHz	15.99948	________	16.00051	±3
16.0	20 MHz	16.0 GHz	15.99895	________	16.00104	±3
16.0	50 MHz	16.0 GHz	15.99745	________	16.00254	±3
16.0	100 MHz	16.0 GHz	15.9948	________	16.0051	±3
16.0	1 GHz	16.0 GHz	15.950	________	16.050	±3
21.0	1 MHz	21.0 GHz	20.999948	________	21.000051	±4
21.0	10 MHz	21.0 GHz	20.99948	________	21.00051	±4
21.0	20 MHz	21.0 GHz	20.99895	________	21.00104	±4
21.0	50 MHz	21.0 GHz	20.99745	________	21.00254	±4
21.0	100 MHz	21.0 GHz	20.9948	________	21.0051	±4
21.0	1 GHz	21.0 GHz	20.950	________	21.050	±4

Table 3-26. Frequency Count Marker Accuracy

HP 8340A Frequency	HP 8562A/B Frequency	Marker Frequency			Measurement Uncertainty
(GHz)	(GHz)	Min (GHz)	Actual (GHz)	Max (GHz)	(Hz)
1.5	1.5	1.49999994	________	1.50000006	±1
4.0	4.0	3.99999994	________	4.00000006	±1
9.0	9.0	8.99999989	________	9.00000011	±2
16.0	16.0	15.99999984	________	16.00000016	±3
21.0	21.0	20.99999979	________	21.00000021	±4

13. Pulse Digitization Uncertainty

Specification

Pulse digitization uncertainty (PDU) for pulse repetition frequency (PRF) >720/Sweep time

LOG: <1.25 dB for RES BW ≤1 MHz
<3 dB for 2 MHz RES BW

LINEAR: <4% of reference level for RES BW ≤1 MHz
<12% of reference level for 2 MHz RES BW

Note

Pulse digitization uncertainty is specified in the 2 MHz RES BW setting only for HP 8562A Spectrum Analyzers with serial prefix 2805A and above, and for HP 8562B Spectrum Analyzers with serial prefix 2809A and above.

Related Adjustment

There is no related adjustment procedure for this performance test.

Description

This test measures the ability of the HP 8562A/B Spectrum Analyzer's analog-to-digital circuitry to respond to pulsed RF signals. The synthesized sweeper is phase-locked to the spectrum analyzer's 10 MHz reference. The only log scale tested is 5 dB/DIV, because this is the worst case. Linear scale is also tested.

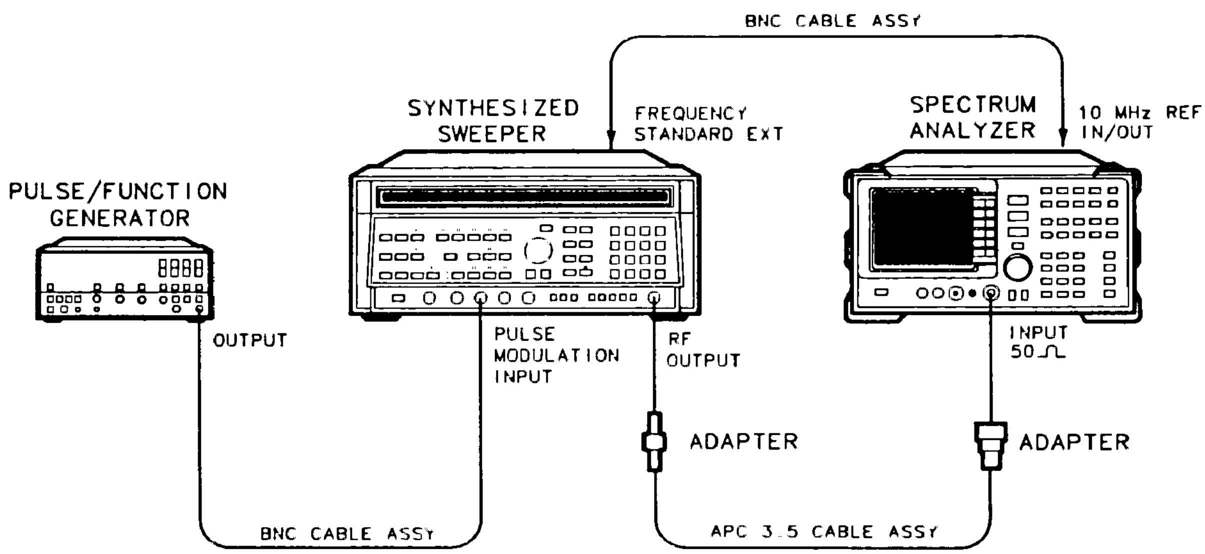


Figure 3-13. Pulse Digitization Uncertainty Test Setup

Equipment

Synthesized Sweeper .... HP 8340A
Pulse/Function Generator .... HP 8116A

Adapters
Type N(m)-to-APC 3.5(f) .... HP 1250-1744
(not necessary for Option 026)
APC 3.5(f)-to-APC 3.5(f) .... HP 5061-5311
(two required for Option 026)

Cables
BNC, 122 cm (48 in) *(two required)* .... HP 10503A
APC 3.5, 91 cm (36 in) .... HP 8120-4921

Procedure

1. Connect the equipment as shown in Figure 3-13.
2. On the HP 8340A, press (INSTR PRESET). Set the controls as follows:

CW	2500 MHz
MODULATION	PULSE
POWER LEVEL	−15 dBm
RF	ON
LEVELING	INT
FREQUENCY STANDARD SWITCH (rear panel)	EXT

3. Set the HP 8116A controls as follows:

FUNCTION	PULSE
FREQ	144 kHz
WID	200 ns
AMP	5.0 V
OFS	0.0 V
MODE	NORM
CTRL	OFF

4. On the HP 8562A/B, press:
   (PRESET) (TRACE) MORE DETECTOR MODES DETECTOR POS PEAK

   Set the controls as follows:

CENTER FREQ	2500 MHz
SPAN	0 Hz
REF LVL	−10 dBm
RES BW	1 MHz
VIDEO BW	3 MHz
SWEEPTIME	50 ms
dB/DIV	5 dB

5. On the HP 8116A, use the RANGE switch to set FREQ to 144 kHz.
6. On the HP 8562A/B, press:
   (TRIG) SINGLE SINGLE (PEAK SEARCH).
   In Table 3-27, record the Marker Amplitude Reading as the MAX level for 144 kHz PRF.
7. Press MARKER (ON). Using the knob (RPG), move the marker until it is at the lowest point on the trace. In Table 3-27, record the Marker Amplitude Reading as the MIN level for 144 kHz PRF.
8. On the 8116A, use the RANGE switch to set FREQ to 14.4 kHz.
9. On the HP 8562A/B, press:
   (TRIG) SINGLE SINGLE (PEAK SEARCH).

   In Table 3-27, record the Marker Amplitude Reading as the MAX level for 14.4 kHz PRF.
10. Press MARKER (ON). Using the knob (RPG), move the marker until it is at the lowest point on the trace. In Table 3-27, record the Marker Amplitude Reading as the MIN level for 14.4 kHz PRF.

    (Omit steps 11 and 12 if the spectrum analyzer has serial prefix 2750A or below)
11. On the HP 8562A/B, press:
    (BW) RES BW (2) (MHz).
12. Repeat steps 5 through 10.
13. On the HP 8562A/B, press:
    (BW) RES BW (1) (MHz)
    (AMPLITUDE) LINEAR.
14. Repeat steps 5 through 10.

(Omit steps 15 and 16 if the spectrum analyzer has serial prefix 2750A or below)

15. On the HP 8562A/B, press:
    (BW) RES BW (2) (MHz).
16. Repeat steps 5 through 10.
17. For each row of entries in Table 3-27 for the LOG 5 dB/DIV scale, subtract the lowest MIN Marker Amplitude Reading from the highest MAX Marker Amplitude Reading. Record the result as the PDU (pulse digitization uncertainty). The PDU should be less than the listed specification.
18. For each row of entries in Table 3-27 for the LINEAR scale, calculate the PDU as a percentage of reference using the equation below. The PDU should be less than the listed specification.

PDU = 100 × [(highest MAX Marker Amplitude/lowest MIN Marker Amplitude) −1]

Table 3-27. Pulse Digitization Uncertainty

		Marker Amplitude Readings					
		144 kHz PRF		14.4 kHz PRF			
RES BW	**Scale**	**Max**	**Min**	**Max**	**Min**	**PDU**	**Spec**
1 MHz	Log 5 dB/DIV	______dBm	______dBm	______dBm	______dBm	______dB	1.25 dB
2 MHz*	Log 5 dB/DIV	______dBm	______dBm	______dBm	______dBm	______dB	3 dB
1 MHz	Linear	______mV	______mV	______mV	______mV	______%	4%
2 MHz*	Linear	______mV	______mV	______mV	______mV	______%	12%

*Pulse digitization uncertainty is specified in the 2 MHz RES BW setting only for HP 8562A analyzers with serial prefix 2805A and above, and for HP 8561A analyzers with serial prefix 2809A and above.

14. Second Harmonic Distortion

Specification

For frequencies <2.9 GHz: <−72 dBc for a −40 dBm mixer level
(HP 8562A) For frequencies >2.9 GHz: <−100 dBc for a −10 dBm mixer level
(HP 8562B) For frequencies >2.9 GHz: <−60 dBc for a −40 dBm mixer level

Note mixer level = input level − input attenuation

Related Adjustment

There is no related adjustment procedure for this performance test.

Description

A synthesized sweeper and low-pass filter provide the signal for measuring second harmonic distortion. The low-pass filter eliminates any harmonic distortion originating at the signal source. The HP 8562A/B Spectrum Analyzer's frequency response is calibrated out for the >2.9 GHz test. The synthesized sweeper is phase-locked to the spectrum analyzer's 10 MHz reference.

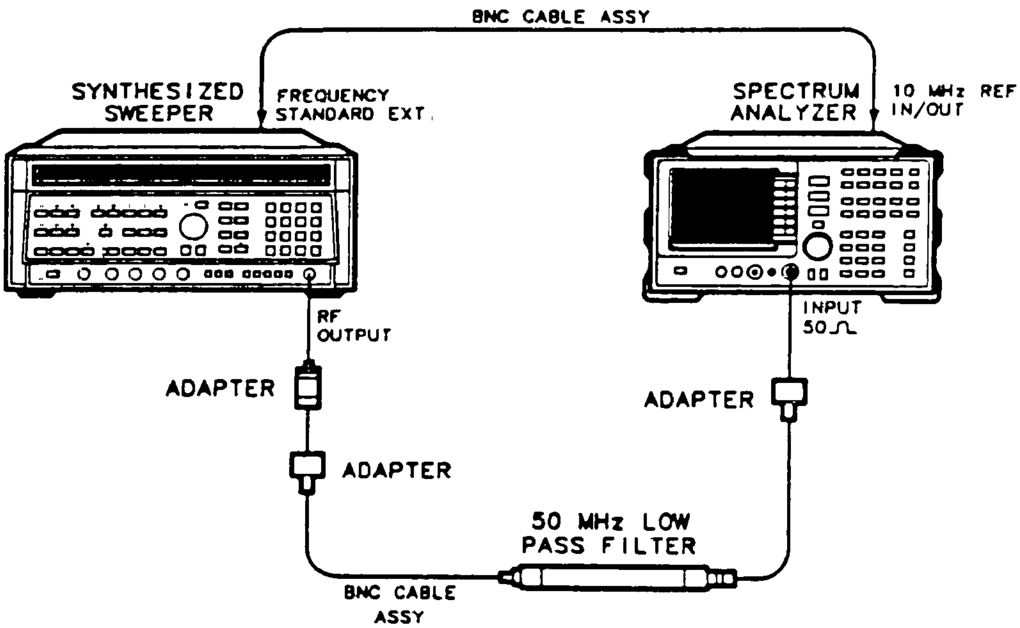


Figure 3-14. Second Harmonic Distortion Test Setup, <2.9 GHz

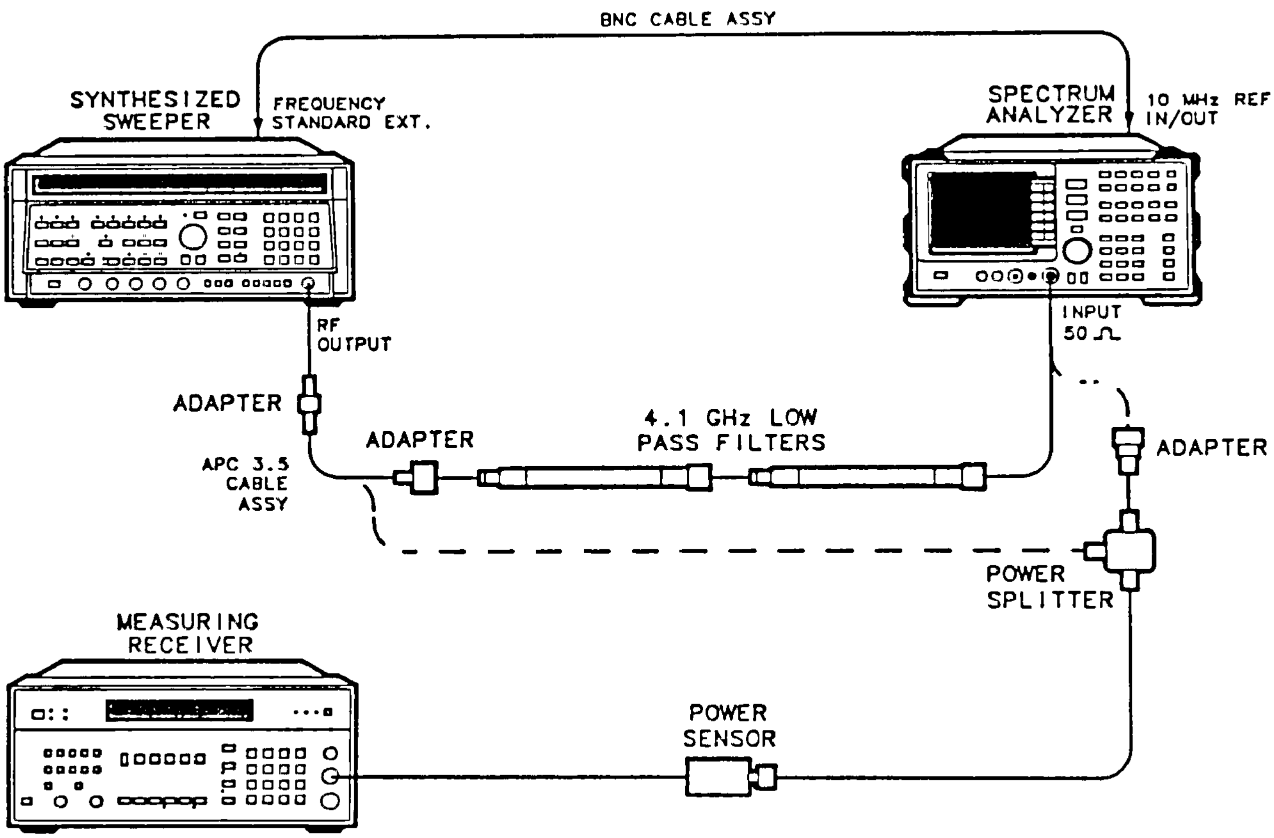


Figure 3-15. Second Harmonic Distortion Test Setup, >2.9 GHz

Equipment

Synthesized Sweeper .... HP 8340A
Measuring Receiver .... HP 8902A
Power Sensor .... HP 8485A
50 MHz Low-pass Filter .... HP 0955-0306
4.4 GHz Low-pass Filter *(two required)* .... HP 11689A
Power Splitter .... HP 11667B

Adapters
Type N(m)-to-BNC(f) *(two required)* .... HP 1250-1476
Type N(m)-to-SMA(f) .... ||HP 1250-1250
Type N(f)-to-APC 3.5(f) .... HP 1250-1745
Type N(m)-to-APC 3.5(m) .... HP 1250-1743
(not necessary for Option 026)
APC 3.5(f)-to-APC 3.5(f) .... HP 5061-5311
Option 026: Type N(f)-to-APC 3.5(f) .... HP 1250-1745

Cables
BNC, 122 cm (48 in) *(two required)* .... HP 10503A
APC 3.5, 91 cm (36 in) .... HP 8120-4921

Procedure

Distortion, <2.9 GHz

1. Connect the equipment as shown in Figure 3-14, using the 50 MHz low-pass filter and BNC cable.
2. On the HP 8340A, press (INSTR PRESET). Set the controls as follows:

CW	40 MHz
POWER LEVEL	−30 dBm
FREQUENCY STANDARD SWITCH (rear panel)	EXT

3. On the HP 8562A/B, press (PRESET). Set the controls as follows:

CENTER FREQ	40 MHz
SPAN	10 kHz
REF LVL	−30 dBm

4. On the HP 8562A/B, press (PEAK SEARCH). On the HP 8340A, adjust the power level for an HP 8562A/B marker amplitude reading of −30 dBm.
5. On the HP 8562A/B, press:
   (TRIG) SINGLE
   (PEAK SEARCH) (MARKER ▶) MARKER ▶ CF STEP MARKER DELTA
   (FREQUENCY) (▲).
6. Press (TRIG) SINGLE.

   After the HP 8562A/B completes a new sweep, press (PEAK SEARCH). The Δ MKR should read less than −72 dB (≤72 dBc). Record the reading here:

Second Harmonic Distortion (Band 0):________dBc

Distortion, >2.9 GHz

7. Zero and calibrate the HP 8902A/HP 8485A combination in LOG mode (readout in dBm). Enter the power sensor's 3 GHz calibration factor into the HP 8902A.
8. Connect the equipment as shown in Figure 3-15, without the filters in place.
9. On the HP 8562A/B, set the controls as follows:

CENTER FREQ	2.95 GHz
CF STEP	2.95 GHz
REF LVL	0 dBm

10. On the HP 8340A, set the controls as follows:

CW	2.95 GHz
POWER LEVEL	0 dBm

11. On the HP 8562A/B, press:
    (TRIG) CONT MARKER (OFF) (PEAK SEARCH)
12. *(Omit step 13 if the analyzer is an HP 8562B)* On the HP 8562A, press (INT) PRESEL AUTO PK. Wait for the PEAKING message to disappear before continuing to the next step.
13. On the HP 8340A, adjust the power level for an HP 8562A/B MKR reading of −5 dBm.
14. On the HP 8902, press (RATIO). Enter the power sensor's 6 GHz calibration factor into the HP 8902A.

15. Set the HP 8340A CW to 5.9 GHz.
16. On the HP 8562A/B, press:
    (FREQUENCY) (▲) (PEAK SEARCH)
17. *(Omit step 18 if the analyzer is an HP 8562B)* On the HP 8562A, press (INT) PRESEL AUTO PK. Wait for the PEAKING message to disappear before continuing to the next step.
18. On the HP 8340A, adjust the power level for an HP 8562A/B MKR reading of −5 dBm.
19. Record the HP 8902A reading here, as the Frequency Response Error:

Frequency Response Error:________dB

20. Connect the equipment as shown in Figure 3-15, with the filters in place.
21. On the HP 8340A, set the controls as follows:

CW	2.95 GHz
POWER LEVEL	−5 dBm
	(HP 8562B· −30 dBm)

22. On the HP 8562A/B, press (FREQUENCY) (▼) (PEAK SEARCH).
23. *(Omit step 24 if the analyzer is an HP 8562A)* On the HP 8562B, press (AMPLITUDE) (3) (0) (−dBm).
24. *(Omit step 25 if the analyzer is an HP 8562B)* On the HP 8562A, press (INT) PRESEL AUTO PK.

    Wait for the PEAKING message to disappear before continuing to the next step.
25. On the HP 8340A, adjust the power level for an HP 8562A/B marker amplitude reading of −0 dBm *(HP 8562B: −30dBm)*
26. On the HP 8562A/B, press:
    (TRIG) SINGLE SINGLE
    (PEAK SEARCH) MARKER DELTA (FREQUENCY) (▲).
27. *(Omit step 28 if the analyzer is an HP 8562B)* On the HP 8562A, press (AMPLITUDE) (3) (0) (−dBm).
28. On the HP 8562A/B, press (TRIG) SINGLE.

29. *(Omit step 30 if the analyzer is an HP 8562B)* On the HP 8562A, press (PEAK SEARCH) (INT) PRESEL AUTO PK .

    Wait for the PEAKING message to disappear before continuing to the next step.

30. Wait for completion of a new sweep, then press (PEAK SEARCH). Record the Δ MKR amplitude reading here:

Δ MKR Amplitude Reading__________dBc

31. Algebraically add the Frequency Response Error recorded in step 19 to the Δ MKR Amplitude Reading in step 28. The distortion should be less than −100 dBc *(HP 8562B: less than −60 dBc)*. Record the result here, as the Second Harmonic Distortion (>2.9 GHz).

Second Harmonic Distortion (>2 9 GHz) __________dBc

15. Frequency Response

Specification

In-Band Frequency Response (10 dB Input Attenuation):

	HP 8562A	HP 8562B
In-Band Frequency Response (10 dB Input Attenuation):		
9 kHz* to 2.9 GHz	±1.0 dB	±1.0 dB
2.75 GHz to 6.46 GHz	±1.5 dB	±1.0 dB
6.46 GHz to 13.0 GHz	±2.0 dB	±1.5 dB
13.0 GHz to 19.7 GHz	±3.0 dB	±1.5 dB
19.7 GHz to 22.0 GHz	±3.0 dB	±2.0 dB
Option 026:		
19.7 GHz to 26.5 GHz	*±3.0 dB*	*±2.0 dB*
Frequency Response relative to the calibrator (300 MHz):		
9 kHz* to 2.9 GHz	±1.5 dB	±1.5 dB
9 kHz* to 6.46 GHz	±2.5 dB	±2.0 dB
9 kHz* to 13.0 GHz	±3.0 dB	±3.0 dB
9 kHz* to 19.7 GHz	±4.0 dB	±3.0 dB
9 kHz* to 22.0 GHz	±4.0 dB	±3.5 dB
Option 026:		
9 kHz to 26.5 GHz*	*±4.0 dB*	*±3.5 dB*

Band Switching Uncertainty: <±1.0 dB

Related Adjustment

YTF Adjustment (HP 8562A)
Frequency Response Adjustment

Description

The output of the synthesized sweeper is fed through a power splitter to a power sensor and to the HP 8562A/B Spectrum Analyzer. The synthesized sweeper's power level is adjusted at 300 MHz to place the displayed signal at the center horizontal graticule line of the HP 8562A/B. The measuring receiver, used as a power meter, is placed in RATIO mode. At each new synthesized sweeper frequency and HP 8562A/B center frequency, the sweeper's power level is adjusted to place the signal at the center horizontal graticule line. The measuring receiver displays the inverse of the frequency response relative to the calibrator.

*From 1 kHz, rather than 10 kHz, for HP 8562A/B analyzers with serial prefix 2927A and below.

Equipment

Measuring Receiver	HP 8902A
Synthesized Sweeper	HP 8340A
Frequency Synthesizer	HP 3335A
Power Sensor	HP 8485A
Power Splitter	HP 11667B
Coaxial 50 Ω Termination	HP 909D

Adapters

Type N(m)-to-APC 3.5(m) *(two required)* *(Option 026: one required)*	HP 1250-1743
Type N(f)-to-BNC(f)	HP 1250-1474
APC 3.5(m)-to-APC 3.5(m)	HP 1250-1748

Cables

BNC, 122 cm (48 in)	HP 10503A
APC 3.5, 91 cm (36 in)	HP 8120-4921

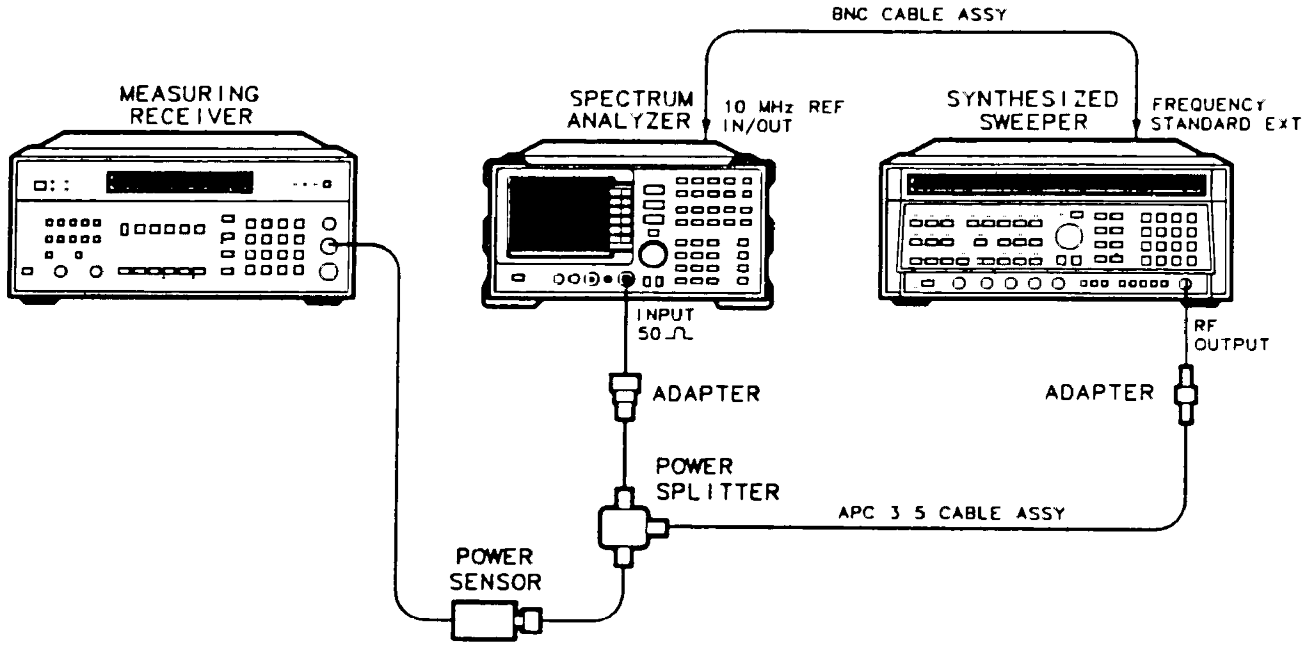


Figure 3-16. Frequency Response Test Setup, 50 MHz to 22.0 GHz

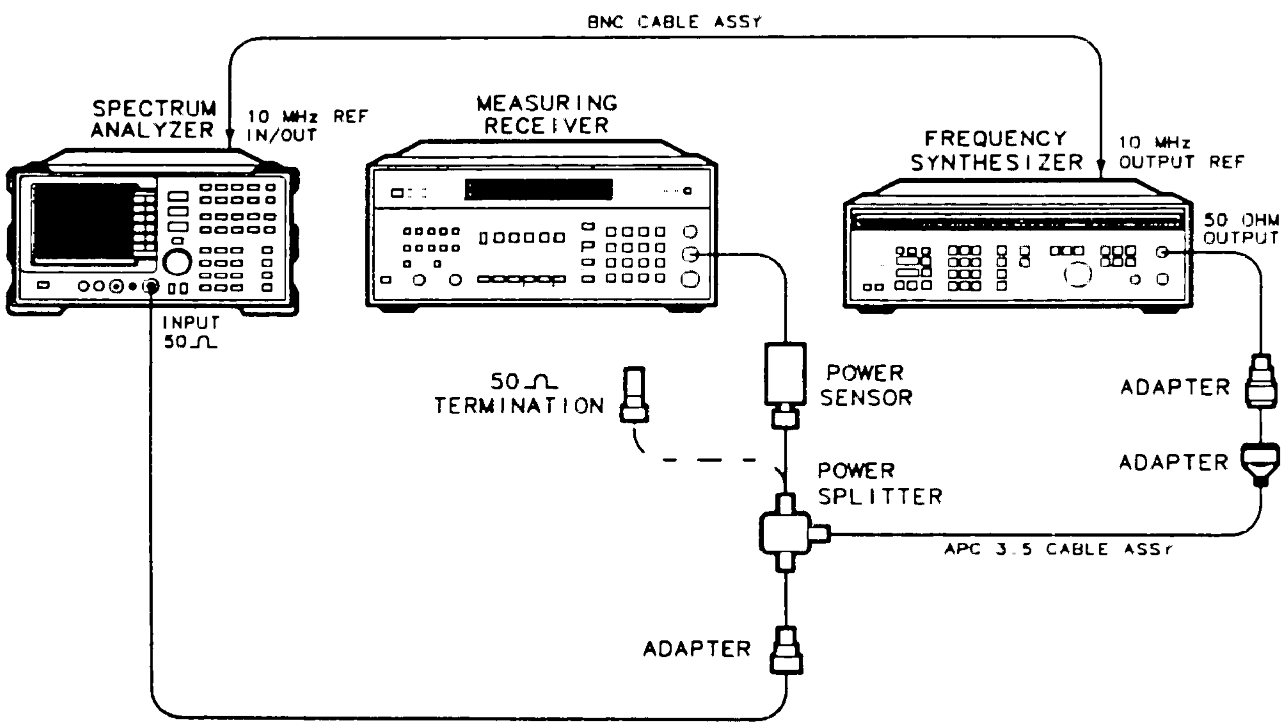


Figure 3-17. Frequency Response Test Setup, <50 MHz

Procedure

1. Zero and calibrate the HP 8902A and the HP 8485A in LOG mode, as described in the HP 8902A Operation Manual.
2. Connect the equipment as shown in Figure 3-16.
3. On the HP 8340A, press (INSTR PRESET). Set the controls as follows:

CW	300 MHz
FREQ STEP	100 MHz
POWER LEVEL	−4 dBm
FREQUENCY STANDARD SWITCH (rear panel)	EXT

4. On the HP 8562A/B, press (PRESET).
   If the analyzer is an HP 8562A, press (RECALL) `MORE` `FACTORY PRESEL PK` .

   Set the HP 8562A/B controls as follows:

CENTER FREQ	300 MHz
CF STEP	100 MHz
SPAN	0 Hz
REF LVL	−5 dBm
dB/DIV	1 dB
RES BW	300 kHz

5. On the HP 8562A/B, press:
   (AMPLITUDE) `MORE` `IF ADJUST` `IF ADJ ON` MARKER (ON).
6. On the HP 8340A, adjust the power level for a MKR amplitude of −10 dBm ±0.05 dB.
7. Press (RATIO) on the HP 8902A.

Frequency Response, Band 0 (≥50 MHz)

8. Set the HP 8340A CW to 50 MHz.
9. On the HP 8562A/B, press:
   (FREQUENCY) `CENTER FREQ` (5) (0) (MHz).
10. On the HP 8340A, adjust the power level for an HP 8562A/B MKR amplitude reading of −10 dBm ±0.05 dB.
11. Record the negative of the power ratio displayed on the HP 8902A in Table 3-28, column 2. Record the power ratio here:

HP 8902A reading at 50 MHz__________dB

12. Set the HP 8340A CW to 100 MHz.
13. On the HP 8562A/B, press:
    (FREQUENCY) CENTER FREQ (1) (0) (0) (MHz).
14. On the HP 8340A, adjust the power level for an HP 8562A/B MKR amplitude reading of −10 dBm ±0.05 dB.
15. Record the negative of the power ratio displayed on the HP 8902A, in Table 3-28, column 2.
16. On the HP 8340A, press (CW) (▲).
17. On the HP 8562A/B, press (FREQUENCY) (▲) to step through the remaining frequencies listed in Table 3-28. At each new frequency, repeat steps 14 through 16, entering the power sensor's calibration factors into the HP 8902A as indicated in Table 3-28.

Frequency Response, Band 1

18. On the HP 8562A/B, press:
    (FREQUENCY) (2) (.) (9) (5) (GHz).
19. Set the HP 8340A CW to 2.95 GHz.
20. *If the analyzer is an HP 8562A, press* (INT) PRESEL AUTO PK . Wait for the PEAKING message to disappear.
21. On the HP 8340A, adjust the power level for an HP 8562A/B MKR amplitude reading of −10 dBm ±0.05 dB.
22. Record the negative of the power ratio displayed on the HP 8902A in Table 3-29, column 2.
23. On the HP 8340A, press (CW) (▲).
24. On the HP 8562A/B, press (FREQUENCY) (▲) to step through the remaining frequencies listed in Table 3-29. At each new frequency, repeat steps 20 through 23, entering the power sensor's calibration factors into the HP 8902A as indicated in Table 3-29.

Frequency Response, Band 2

25. On the HP 8562A/B, press:
    (FREQUENCY) (6) (.) (5) (GHz)
    CF STEP (2) (0) (0) (MHz)
26. Set the HP 8340A CW to 6.5 GHz and the FREQ STEP to 200 MHz.
27. *If the analyzer is an HP 8562A, press* (INT) PRESEL AUTO PEAK . Wait for the PEAKING message to disappear.
28. On the HP 8340A, adjust the power level for an HP 8562A/B MKR amplitude reading of −10 dBm±0.05 dB.
29. Record the negative of the power ratio displayed on the HP 8902A in Table 3-30 as the HP 8902A Reading.

30. Set the HP 8340A CW and the HP 8562A/B CENTER FREQ to 6.6 GHz. Repeat steps 27 through 29.
31. On the HP 8340A, press (CW) (▲).
32. On the HP 8562A/B, press (FREQUENCY) (▲) to step through the remaining frequencies listed in Table 3-30. At each new frequency, repeat steps 27 through 29, entering the power sensor's calibration factors into the HP 8902A as indicated in Table 3-30.

Frequency Response, Band 3

33. On the HP 8562A/B, press:
(FREQUENCY) (1) (3) (.) (1) (GHz)
34. Set the HP 8340A CW to 13.1.
35. *If the analyzer is an HP 8562A, press* (INT) PRESEL AUTO PEAK . Wait for the PEAKING message to disappear.
36. On the HP 8340A, adjust the power level for an HP 8562A/B MKR amplitude reading of −10 dBm±0.05 dB.
37. Record the negative of the power ratio displayed on the HP 8902A in Table 3-31 as the HP 8902A Reading.
38. On the HP 8340A, press (CW) (▲).
39. On the HP 8562A/B, press (FREQUENCY) (▲) to step through the remaining frequencies listed in Table 3-31. At each new frequency, repeat steps 35 through 37, entering the power sensor's calibration factors into the HP 8902A as indicated in Table 3-31.

Frequency Response, Band 4

40. On the HP 8562A/B, press:
(FREQUENCY) (1) (9) (.) (7) (GHz)
CF STEP (1) (0) (0) (MHz)
41. Set the HP 8340A CW to 19.71 and FREQ STEP to 100 MHz. *If the analyzer has Option 026, set FREQ STEP to 200 MHz.*
42. *If the analyzer is an HP 8562A, press* (INT) PRESEL AUTO PEAK . Wait for the PEAKING message to disappear.
43. On the HP 8340A, adjust the power level for an HP 8562A/B MKR amplitude reading of −10 dBm ±0.05 dB.
44. Record the negative of the power ratio displayed on the HP 8902A in Table 3-32 as the HP 8902A Reading.
45. Set the HP 8340A CW and the HP 8562A/B CENTER FREQ to 19.8 GHz *(Option 026: 19.9 GHz).* Repeat steps 42 through 44.
46. On the HP 8340A, press (CW) (▲).
47. On the HP 8562A/B, press (FREQUENCY) (▲) to step through the remaining frequencies listed in Table 3-32. *(Option 026: Table 3-33).* At each new fiequency, repeat

steps 42 through 44, entering the power sensor's calibration factors into the HP 8902A as indicated in Table 3-32 *(Option 026: Table 3-33)*.

Frequency Response, Band 0 (<50 MHz)

48. Set the HP 8562A/B controls as follows:

CENTER FREQ	50 MHz
RES BW	100 Hz
MARKER	OFF
VIDEO BW	1 Hz

49. Connect the equipment as shown in Figure 3-17.
50. On the HP 3335A, set the controls as follows:

FREQUENCY	50 MHz
AMPLITUDE	−4 dBm
AMPTD INCR	0.1 dB

51. Enter the power sensor's 50 MHz calibration factor into the HP 8902A.
52. Adjust the HP 3335A AMPLITUDE until the HP 8902A display reads the same value as recorded in step 12. Record the HP 3335A amplitude here, and in Table 3-34:

HP 3335A Amplitude (50 MHz):_________dB

53. Replace the HP 8485A power sensor with the HP 909D 50 Ω termination.
54. On the HP 8562A/B, press MARKER [ON] `MARKER DELTA` .
55. Set the HP 8562A/B CENTER FREQ and the HP 3335A FREQUENCY to the frequencies listed in Table 3-34. At each frequency, adjust the HP 3335A amplitude for a Δ MKR amplitude reading of 0.00 ±0.05 dB. Record the HP 3335A amplitude setting in Table 3-34, column 2, as the HP 3335A Amplitude.
56. For each of the frequencies listed in Table 3-34, subtract the HP 3335A Amplitude Reading (column 2) from the HP 3335A Amplitude (50 MHz) recorded in step 53. Record the results as the Response Relative to 50 MHz in Table 3-34, column 3.
57. Add to each of the "Response Relative to 50 MHz" entries in Table 3-34 the HP 8902A Reading for 50 MHz listed in Table 3-28. Record the results as the Response Relative to 300 MHz, in Table 3-34, column 4.

Note

Test frequency response at 1 kHz only on HP 8562A/B analyzers with serial prefix 2929A and below. HP 8562A/B analyzers with serial prefixes greater than 2929A are specified only down to 10 kHz.

Test Results

58. Frequency Response, Band 0

a. Enter the most positive number from Table 3-34, column 4 ________ dB

b. Enter the most positive number from Table 3-28, column 2, column 2 ________ dB

c. Of (a) and (b), enter whichever number is *more* positive ________ dB

d Enter the most negative number from Table 3-34, column 4 ________ dB

e. Enter the most negative number from Table 3-28, column 2 ________ dB

f. Of (d) and (e), enter whichever number is *more* negative ________ dB

g Subtract (f) from (c). The result should be less than 2.0 dB ________ dB

The absolute values in (c) and (f) should be less than 1.5 dB.

59. Frequency Response, Band 1

a. Enter the most positive number from Table 3-29, column 2 ________ dB

The absolute value of this number should be less than 2.5 dB. *(HP 8562B: 2.0 dB)*

b. Enter the most negative number from Table 3-29, column 2 ________ dB

The absolute value of this number should be less than 2.5 dB. *(HP 8562B: 2.0 dB)*

c. Subtract (b) from (a) ________ dB

The result should be less than 3 0 dB *(HP 8562B: 2.0 dB)*

60. Frequency Response, Band 2

a. Enter the most positive number from Table 3-30, column 4 ________ dB

The absolute value of this number should be less than 3 0 dB. *(HP 8562B: 3.0 dB)*

b. Enter the most negative number from Table 3-30, column 2 ________ dB

The absolute value of this number should be less than 3.0 dB. *(HP 8562B: 3.0 dB)*

c. Subtract (b) from (a) ________ dB

The result should be less than 4.0 dB. *(HP 8562B. 3.0 dB)*

15. Frequency Response

61. Frequency Response, Band 3

a. Enter the most positive number from Table 3-31, column 2 __________ dB

The absolute value of this number should be less than 4.0 dB. *(HP 8562B: 3.0 dB)*

b. Enter the most negative number from Table 3-31, column 2 __________ dB

The absolute value of this number should be less than 4.0 dB. *(HP 8562B: 3.0 dB)*

c. Subtract (b) from (a) __________ dB

The result should be less than 6.0 dB. *(HP 8562B: 3.0 dB)*

62. Frequency Response, Band 4

a. Enter the most positive number from Table 3-32, column 2 __________ dB
(Option 026: Table 3-33, column 2)

The absolute value of this number should be less than 4.0 dB. *(HP 8562B: 3.5 dB)*

b. Enter the most negative number from Table 3-32, column 2 __________ dB
(Option 026: Table 3-33, column 2)

The absolute value of this number should be less than 4.0 dB. *(HP 8562B: 3.5 dB)*

c. Subtract (b) from (a) __________ dB

The result should be less than 6.0 dB. *(HP 8562: 4.0 dB)*

Band Switching Uncertainty

63. In the top row of Table 3-35, enter the values recorded in the indicated steps. For example, if step 61(a) has a value of 1.22 dB, enter "1.22 dB" in the top row of the "Band 2" column.
64. In the left column of Table 3-35, enter the values recorded in the indicated steps. For example, if step 60(b) has a value of −0.95 dB, enter "−0.95 dB" in the left column of the "Band 1" row.
65. Compute the other entries in Table 3-35 by taking the absolute value of the difference between the values in the left column and the top row.
66. Each computed entry should be less than the limit shown. Limits for HP 8562A analyzers appear in **bold** type; limits for HP 8562B analyzers appear in *italic* type.

Table 3-28. Frequency Response, Band 0 (≥50 MHz)

Column 1 Frequency (GHz)	Column 2 HP 8902A Reading (dB)	Column 3 Cal Factor Frequency (GHz)	Column 4 Measurement Uncertainty (dB)
50	______	0.05	+0.29/−0.31
100	______	0.05	+0.29/−0.31
200	______	0.05	+0.29/−0.31
300	______	0.05	0 (Ref)
400	______	0.05	+0.29/−0.31
500	______	0.05	+0.29/−0.31
600	______	0.05	+0.29/−0.31
700	______	0.05	+0.29/−0.31
800	______	0.05	+0.29/−0.31
900	______	0.05	+0.29/−0.31
1000	______	0.05	+0.29/−0.31
1100	______	2.0	+0.29/−0.31
1200	______	2.0	+0.29/−0.31
1300	______	2.0	+0.29/−0.31
1400	______	2.0	+0.29/−0.31
1500	______	2.0	+0.29/−0.31
1600	______	2.0	+0.29/−0.31
1700	______	2.0	+0.29/−0.31
1800	______	2.0	+0.29/−0.31
1900	______	2.0	+0.29/−0.31
2000	______	2.0	+0.29/−0.31
2100	______	2.0	+0.29/−0.31
2200	______	2.0	+0.29/−0.31
2300	______	2.0	+0.29/−0.31
2400	______	2.0	+0.29/−0.31
2500	______	3.0	+0.29/−0.31
2600	______	3.0	+0.29/−0.31
2700	______	3.0	+0.29/−0.31
2800	______	3.0	+0.29/−0.31
2900	______	3.0	+0.29/−0.31

Table 3-29. Frequency Response, Band 1

Column 1 Frequency (GHz)	Column 2 HP 8902A Reading (dB)	Column 3 Cal Factor Frequency (GHz)	Column 4 Measurement Uncertainty (dB)
2.95	________	3.0	+0.43/−0.47
3.05	________	3.0	+0.43/−0.47
3.15	________	3.0	+0.43/−0.47
3.25	________	3.0	+0.43/−0.47
3.35	________	3.0	+0.43/−0.47
3.45	________	3.0	+0.43/−0.47
3.55	________	4.0	+0.43/−0.47
3.65	________	4.0	+0.43/−0.47
3.75	________	4.0	+0.43/−0.47
3.85	________	4.0	+0.43/−0.47
3.95	________	4.0	+0.43/−0.47
4.05	________	4.0	+0.43/−0.47
4.15	________	4.0	+0.43/−0.47
4.25	________	4.0	+0.43/−0.47
4.35	________	4.0	+0.43/−0.47
4.45	________	4.0	+0.43/−0.47
4.55	________	5.0	+0.43/−0.47
4.65	________	5.0	+0.43/−0.47
4.75	________	5.0	+0.43/−0.47
4.85	________	5.0	+0.43/−0.47
4.95	________	5.0	+0.43/−0.47
5.05	________	5.0	+0.43/−0.47
5.15	________	5.0	+0.43/−0.47
5.25	________	5.0	+0.43/−0.47
5.35	________	5.0	+0.43/−0.47
5.45	________	5.0	+0.43/−0.47
5.55	________	6.0	+0.43/−0.47
5.65	________	6.0	+0.43/−0.47
5.75	________	6.0	+0.43/−0.47
5.85	________	6.0	+0.43/−0.47
5.95	________	6.0	+0.43/−0.47
6.05	________	6.0	+0.43/−0.47
6.15	________	6.0	+0.43/−0.47
6.25	________	6.0	+0.43/−0.47
6.35	________	6.0	+0.43/−0.47
6.45	________	6.0	+0.43/−0.47

Table 3-30. Frequency Response, Band 2

Column 1 Frequency (GHz)	Column 2 HP 8902A Reading (dB)	Column 3 Cal Factor Frequency (GHz)	Column 4 Measurement Uncertainty (dB)
6.5	________	6.0	+0.43/−0.48 dB
6.6	________	7.0	+0.43/−0.48 dB
6.8	________	7.0	+0.43/−0.48 dB
7.0	________	7.0	+0.43/−0.48 dB
7.2	________	7.0	+0.43/−0.48 dB
7.4	________	7.0	+0.43/−0.48 dB
7.6	________	8.0	+0.43/−0.48 dB
7.8	________	8.0	+0.43/−0.48 dB
8.0	________	8.0	+0.43/−0.48 dB
8.2	________	8.0	+0.43/−0.48 dB
8.4	________	8.0	+0.43/−0.48 dB
8.6	________	9.0	+0.43/−0.48 dB
8.8	________	9.0	+0.43/−0.48 dB
9.0	________	9.0	+0.43/−0.48 dB
9.2	________	9.0	+0.43/−0.48 dB
9.4	________	9.0	+0.43/−0.48 dB
9.6	________	10.0	+0.43/−0.48 dB
9.8	________	10.0	+0.43/−0.48 dB
10.0	________	10.0	+0.43/−0.48 dB
10.2	________	10.0	+0.43/−0.48 dB
10.4	________	10.0	+0.43/−0.48 dB
10.6	________	11.0	+0.43/−0.48 dB
10.8	________	11.0	+0.43/−0.48 dB
11.0	________	11.0	+0.43/−0.48 dB
11.2	________	11.0	+0.43/−0.48 dB
11.4	________	11.0	+0.43/−0.48 dB
11.6	________	12.0	+0.43/−0.48 dB
11.8	________	12.0	+0.43/−0.48 dB
12.0	________	12.0	+0.43/−0.48 dB
12.2	________	12.0	+0.43/−0.48 dB
12.4	________	12.0	+0.43/−0.48 dB
12.6	________	13.0	+0.43/−0.48 dB
12.8	________	13.0	+0.43/−0.48 dB
13.0	________	13.0	+0.43/−0.48 dB

Table 3-31. Frequency Response, Band 3

Column 1 Frequency (GHz)	Column 2 HP 8902A Reading (dB)	Column 3 Cal Factor Frequency (GHz)	Column 4 Measurement Uncertainty (dB)
13.1	________	13.0	0 (Ref)
13.3	________	13.0	+0.43/−0.48 dB
13.5	________	13.0	+0.43/−0.48 dB
13.7	________	14.0	+0.43/−0.48 dB
13.9	________	14.0	+0.43/−0.48 dB
14.1	________	14.0	+0.43/−0.48 dB
14.3	________	14.0	+0.43/−0.48 dB
14.5	________	14.0	+0.43/−0.48 dB
14.7	________	15.0	+0.43/−0.48 dB
14.9	________	15.0	+0.43/−0.48 dB
15.1	________	15.0	+0.43/−0.48 dB
15.3	________	15.0	+0.43/−0.48 dB
15.5	________	15.0	+0.43/−0.48 dB
15.7	________	16.0	+0.43/−0.48 dB
15.9	________	16.0	+0.43/−0.48 dB
16.1	________	16.0	+0.43/−0.48 dB
16.3	________	16.0	+0.43/−0.48 dB
16.5	________	16.0	+0.43/−0.48 dB
16.7	________	17.0	+0.43/−0.48 dB
16.9	________	17.0	+0.43/−0.48 dB
17.1	________	17.0	+0.43/−0.48 dB
17.3	________	17.0	+0.43/−0.48 dB
17.5	________	17.0	+0.43/−0.48 dB
17.7	________	18.0	+0.43/−0.48 dB
17.9	________	18.0	+0.43/−0.48 dB
18.1	________	18.0	+0.43/−0.48 dB
18.3	________	18.0	+0.43/−0.48 dB
18.5	________	18.0	+0.43/−0.48 dB
18.7	________	19.0	+0.43/−0.48 dB
18.9	________	19.0	+0.43/−0.48 dB
19.1	________	19.0	+0.43/−0.48 dB
19.3	________	19.0	+0.43/−0.48 dB
19.5	________	19.0	+0.43/−0.48 dB
19.7	________	20.0	+0.43/−0.48 dB

Table 3-32. Frequency Response, Band 4 *(without Option 026)*

Column 1 Frequency (GHz)	Column 2 HP 8902A Reading (dB)	Column 3 Cal Factor Frequency (GHz)	Column 4 Measurement Uncertainty (dB)
19.71	________	20.0	+0.55/−0.59
19.8	________	20.0	+0.55/−0.59
19.9	________	20.0	+0.55/−0.59
20.0	________	20.0	+0.55/−0.59
20.1	________	20.0	+0.55/−0.59
20.2	________	20.0	+0.55/−0.59
20.3	________	20.0	+0.55/−0.59
20.4	________	20.0	+0.55/−0.59
20.5	________	21.0	+0.55/−0.59
20.6	________	21.0	+0.55/−0.59
20.7	________	21.0	+0.55/−0.59
20.8	________	21.0	+0.55/−0.59
20.9	________	21.0	+0.55/−0.59
21.0	________	21.0	+0.55/−0.59
21.1	________	21.0	+0.55/−0.59
21.2	________	21.0	+0.55/−0.59
21.3	________	21.0	+0.55/−0.59
21.4	________	21.0	+0.55/−0.59
21.5	________	22.0	+0.55/−0.59
21.6	________	22.0	+0.55/−0.59
21.7	________	22.0	+0.55/−0.59
21.8	________	22.0	+0.55/−0.59
21.9	________	22.0	+0.55/−0.59
22.0	________	22.0	+0.55/−0.59

Table 3-33. Frequency Response, Band 4 *(Option 026 only)*

Column 1 Frequency (GHz)	Column 2 HP 8902A Reading (dB)	Column 3 Cal Factor Frequency (GHz)	Column 4 Measurement Uncertainty (dB)
19.71		20.0	+0.55/−0.59
19.9		20.0	+0.55/−0.59
20.1		20.0	+0.55/−0.59
20.3		20.5	+0.55/−0.59
20.5		20.5	+0.55/−0.59
20.7		20.5	+0.55/−0.59
20.9		21.0	+0.55/−0.59
21.1		21.0	+0.55/−0.59
21.3		21.5	+0.55/−0.59
21.5		21.5	+0.55/−0.59
21.7		21.5	+0.55/−0.59
21.9		22.0	+0.55/−0.59
22.1		22.0	+0.55/−0.59
22.3		22.5	+0.55/−0.59
22.5		22.5	+0.55/−0.59
22.7		22.5	+0.55/−0.59
22.9		23.0	+0.55/−0.59
23.1		23.0	+0.55/−0.59
23.3		23.5	+0.55/−0.59
23.5		23.5	+0.55/−0.59
23.7		23.5	+0.55/−0.59
23.9		24.0	+0.55/−0.59
24.1		24.0	+0.55/−0.59
24.3		24.5	+0.55/−0.59
24.5		24.5	+0.55/−0.59
24.7		24.5	+0.55/−0.59
24.9		25.0	+0.55/−0.59
25.1		25.0	+0.55/−0.59
25.3		25.5	+0.55/−0.59
25.5		25.5	+0.55/−0.59
25.7		25.5	+0.55/−0.59
25.9		26.0	+0.55/−0.59
26.1		26.0	+0.55/−0.59
26.3		26.5	+0.55/−0.59
26.5		26.5	+0.55/−0.59

Table 3-34. Frequency Response, Band 0 (<50 MHz)

Column 1 Frequency	Column 2 HP 3335A Amplitude (dBm)	Column 3 Response Relative to 50 MHz	Column 4 Response Relative to 300 MHz	Column 5 Measurement Uncertainty (dB)
50 MHz	______	0 (Ref)	______	+0.34/−0.37
20 MHz	______	______	______	+0.34/−0.37
10 MHz	______	______	______	+0.34/−0.37
1 MHz	______	______	______	+0.34/−0.37
100 kHz	______	______	______	+0.34/−0.37
9 kHz	______	______	______	+0.34/−0.37
1 kHz*	______	______	______	+0.34/−0.37

*Frequency response is specified to 1 kHz only for HP 8562A/B analyzers with serial prefix 2929A and below.

Table 3-35. Band Switching Uncertainty

	Band 0 step 58(c) ______	Band 1 step 59(a) ______	Band 2 step 60(a) ______	Band 3 step 61(a) ______	Band 4 step 62(a) ______
Band 0 step 58(f) ______		______ **3.5 dB** *3.0 dB*	______ **4.0 dB** *3.5 dB*	______ **5.0 dB** *3.5 dB*	______ **5.0 dB** *4.0 dB*
Band 1 step 59(b) ______	______ **3.5 dB** *3.0 dB*		______ **4.5 dB** *3.5 dB*	______ **5.5 dB** *3.5 dB*	______ **5.5 dB** *4.0 dB*
Band 2 step 60(b) ______	______ **4.0 dB** *3.5 dB*	______ **4.5 dB** *3.5 dB*		______ **6.0 dB** *4.0 dB*	______ **6.0 dB** *4.5 dB*
Band 3 step 61(b) ______	______ **5.0 dB** *3.5 dB*	______ **5.5 dB** *3.5 dB*	______ **6.0 dB** *4.0 dB*		______ **7.0 dB** *4.5 dB*
Band 4 step 62(b) ______	______ **5.0 dB** *4.0 dB*	______ **5.5 dB** *4.0 dB*	______ **6.0 dB** *4.5 dB*	______ **7.0 dB** *4.5 dB*	

16. Frequency Span Accuracy

Specification

<±5% of actual frequency separation

Related Adjustment

YTO Adjustment

Description

Two synthesized sweepers provide the precise signals required to test the HP 8562A/B Spectrum Analyzer's frequency span accuracy. Signal separation, measured with the delta marker function, is checked for accuracy. Span accuracy at several different frequencies is tested. Both sweepers are phase-locked to the analyzer's 10 MHz reference.

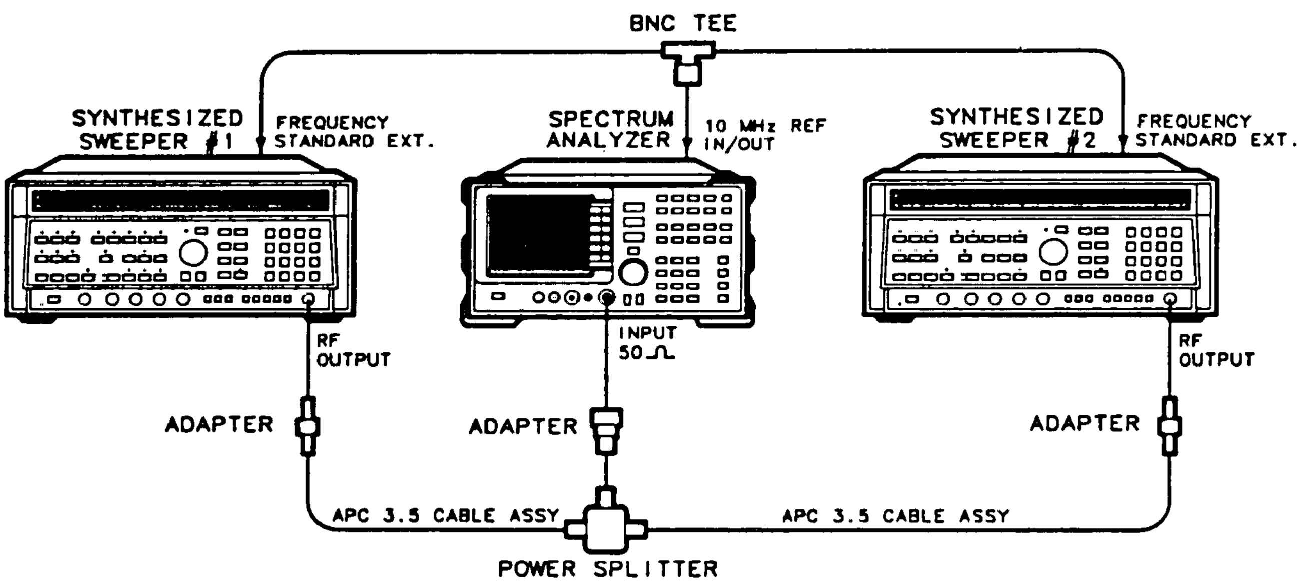


Figure 3-18. Frequency Span Accuracy Test Setup

Equipment

Synthesized Sweeper *(two required)* .... HP 8340A
Power Splitter ....HP 11667B

Adapters
Type N(m)-to-APC 3.5(m) .... HP 1250-1743
(not necessary for Option 026)
APC 3.5(f)-to-APC 3.5(f) *(two required)* ....HP 5061-5311
BNC Tee(m)(f)(f) .... HP 1250-0781

Cables
BNC, 122 cm (48 in) *(two required)* .... HP 10503A
APC 3.5, 91 cm (36 in) .... HP 8120-4921

Procedure

1. Connect the equipment as shown in Figure 3-18. Both HP 8340As should be set for EXT FREQUENCY STANDARD. Connect the power splitter directly to the analyzer's INPUT 50Ω. Do not use a cable.
2. Set the controls on HP 8340A #1 as follows:

CW	1.499996 GHz
POWER LEVEL	−5 dBm
FREQUENCY STANDARD SWITCH (rear panel)	EXT

3. Set the controls on HP 8340A #2 as follows:

CW	1.500004 GHz
POWER LEVEL	−10 dBm
FREQUENCY STANDARD SWITCH (rear panel)	EXT

4. On the HP 8562A/B, press (PRESET).
   If the analyzer is an HP 8562A, press (RECALL) MORE FACTORY PRESEL PK .

   Set the HP 8562A/B controls as follows:

CENTER FREQ	1.5 GHz
SPAN	10 kHz

Note

Use the procedure in steps 5 through 7 when testing all frequency spans of HP 8562A analyzers, and when testing spans up to 100 MHz of HP 8562B analyzers. Use the procedure in steps 8 through 19 when testing frequency spans of 5 GHz and above of HP 8562B analyzers.

5. On the HP 8562A/B, press:
   (TRIG) SINGLE SINGLE MARKER (OFF) (PEAK SEARCH) MARKER DELTA NEXT PEAK .

   The active and anchor markers should be on the peaks of the signals near the second and tenth vertical graticule lines.

6. Record the HP 8562A/B Δ MKR frequency reading as the Actual Δ MKR Reading in Table 3-36. The reading should be within the limits shown.

7. Repeat steps 5 and 6 for the combinations of HP 8340A CW frequencies and HP 8562A/B center frequencies and spans indicated in Table 3-36.

   When changing CENTER FREQ *on the HP 8562A, do the following:*

   a. *Set the HP 8340A #1 CW to the HP 8562A/B center frequency.*

   b. *On the HP 8562A, press:*
      (TRIG) CONT (PEAK SEARCH) (INT) PRESEL AUTO PK .

      Wait for the PEAKING *message to disappear before continuing to the next step.*

   c. *Press* (TRIG) SINGLE .

   d. *Proceed with steps 5 and 6, above.*

The following steps are for HP 8562B analyzers only.

8. *On the HP 8562B, press:*
   (TRIG) SINGLE SINGLE MARKER (OFF) (PEAK SEARCH).

9. *Press* (INT) SIG ID AT MKR . *Wait for the identification routine to finish.*

10. *If the frequency displayed in the active function block is within 50 MHz of HP 8340A #1 CW frequency, and the signal has not been identified as being an image, proceed to step 13.*

11. *If the frequency displayed in the active function block is more than 50 MHz from the CW frequency of HP 8340A #1, and/or is identified as being an image, press MARKER* (ON). *Rotate the knob to place the active marker on the peak of the next highest signal.*

12. *Repeat steps 9 through 11 until the conditions in step 10 are met.*

13. *Press MARKER* (ON) MARKER Δ . *Rotate the knob to place the active marker on a signal near the tenth vertical graticule line (one division from the rightmost graticule line).*

14. *Press* INT `SIG ID AT MKR`. *Wait for the signal identification routine to finish.*
15. *If the frequency displayed in the active function block is within 50 MHz of HP 8340A #2 CW frequency, and the signal has not been identified as being an image, press MARKER* ON. *Rotate the knob to place the active marker on the peak of the next highest signal.*
16. *Repeat steps 14 through 16 until the conditions in step 15 are met.*
17. *Record the HP 8562B Δ MKR frequency reading as the Actual Δ MKR reading in Table 3-36. The reading should be within the limits shown.*
18. *For all other frequency spans of 5 GHz or more on the HP 8562B, repeat steps 8 through 18 for the combinations of HP 8340A CW frequencies and HP 8562B center frequencies as indicated in Table 3-36.*

16. Frequency Span Accuracy

Table 3-36. Frequency Span Accuracy

HP 8340 #1 Frequency (GHz)	HP 8340 #2 Frequency (GHz)	HP 8562A/B Center Freq	HP 8562A/B Span Setting	Δ MKR Reading Min	Δ MKR Reading Actual	Δ MKR Reading Max	Measurement Uncertainty
1.499996	1.500004	1.5 GHz	10 kHz	7.60 kHz	________	8.40 kHz	33 Hz
1.499992	1.500008	1.5 GHz	20 kHz	15.2 kHz	________	16.8 kHz	66 Hz
1.499980	1.500020	1.5 GHz	50 kHz	38.0 kHz	________	42.0 kHz	165 Hz
1.499960	1.500040	1.5 GHz	100 kHz	76.0 kHz	________	84.0 kHz	330 Hz
1.499960	1.500040	1.5 GHz	101 kHz	76.0 kHz	________	84.0 kHz	333.3 Hz
1.499920	1.500080	1.5 GHz	200 kHz	152 kHz	________	168 kHz	660 Hz
1.499800	1.500200	1.5 GHz	500 kHz	380 kHz	________	420 kHz	1.65 kHz
1.499600	1.500400	1.5 GHz	1.0 MHz	760 kHz	________	840 kHz	3.3 kHz
1.499600	1.500400	1.5 GHz	1.01 MHz	760 kHz	________	840 kHz	3.333 kHz
1.499200	1.500800	1.5 GHz	2.0 MHz	1.52 MHz	________	1.68 MHz	6.6 kHz
1.498000	1.502000	1.5 GHz	5.0 MHz	3.80 MHz	________	4.20 MHz	16.5 kHz
1.496	1.504	1.5 GHz	10.0 MHz	7.60 MHz	________	8.40 MHz	33 kHz
1.492	1.508	1.5 GHz	20.0 MHz	15.2 MHz	________	16.8 MHz	66 kHz
1.480	1.520	1.5 GHz	50.0 MHz	38 MHz	________	42.0 MHz	165 kHz
1.460	1.540	1.5 GHz	100 MHz	76 MHz	________	84.0 MHz	330 kHz
1.420	1.580	1.5 GHz	200 MHz	152 MHz	________	168.0 MHz	660 kHz
1.300	1.700	1.5 GHz	500 MHz	380 MHz	________	420 MHz	1.65 MHz
1.100	1.900	1.5 GHz	1.0 GHz	760 MHz	________	840 MHz	3.3 MHz
0.700	2.300	1.5 GHz	2.0 GHz	1.52 GHz	________	1.68 GHz	6.6 MHz
8.999996	9.000004	9.0 GHz	10 kHz	7.6 kHz	________	8.4 MHz	33 Hz
8.992	9.008	9.0 GHz	20 MHz	15.2 MHz	________	16.8 MHz	66 kHz
8.98	9.020	9.0 GHz	50 MHz	38.0 MHz	________	42.0 MHz	165 kHz
7.0	11.0	9.0 GHz	5 GHz	3.8 GHz	________	4.2 GHz	16.5 MHz

Table 3-36. Frequency Span Accuracy (continued)

HP 8340 #1 Frequency	HP 8340 #2 Frequency	HP 8562A/B		Δ MKR Reading			Measurement Uncertainty
(GHz)	(GHz)	Center Freq	Span Setting	Min	Actual	Max	
15.999996	16.000004	16.0 GHz	10 kHz	7.6 kHz	________	8.4 kHz	33 Hz
15.98	16.02	16.0 GHz	50 MHz	38.0 MHz	________	42 MHz	165 kHz
15.96	16.04	16.0 GHz	100 MHz	76.0 MHz	________	84.0 MHz	330 kHz
14.0	18.0	16.0 GHz	5 GHz	3.8 GHz	________	4.2 GHz	16.5 MHz
20.499996	20.500004	20.5 GHz	10 kHz	7.6 kHz	________	8.4 kHz	33 Hz
20.48	20.52	20.5 GHz	50 MHz	38 MHz	________	42 MHz	165 kHz
20.46	20.54	12.40 GHz	100 MHz	76.0 MHz	________	84.0 MHz	330 kHz
3.0	21.0	12.40 GHz	19.25 GHz	17.1 GHz	________	18.9 GHz	63.525 MHz

17. Third Order Intermodulation Distortion

Specification

For two −30 dBm input signals at the input mixer:

10 MHz to 2.9 GHz: <−70 dBc
2.75 to 22 GHz: <−75 dBc
(Option 026, 2.75 to 26.5 GHz: <−75 dBc)

Note Mixer input level = input level − input attenuation

Related Adjustment

There is no related adjustment procedure for this performance test.

Description

Two synthesized sweepers provide the signals required for measuring third order intermodulation. Both synthesized sweepers are phase-locked to the HP 8562A/B Spectrum Analyzer's 10 MHz reference.

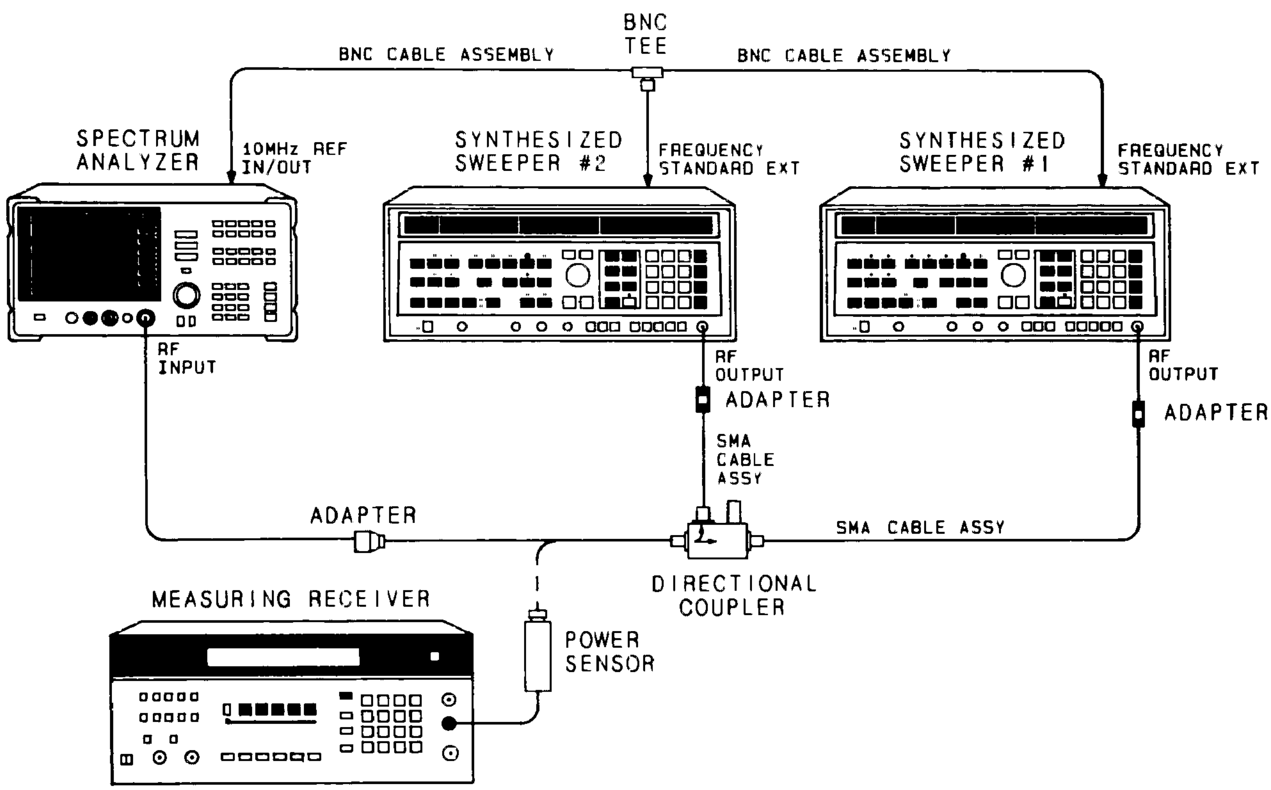


Figure 3-19. Third Order Intermodulation Test Setup

Equipment

Measuring Receiver	HP 8902A
Synthesized Sweeper *(two required)*	HP 8340A
Directional Coupler	HP 0955-0125
Power Sensor	HP 8485A

Adapters

Type N(m)-to-APC 3.5(m) *(not necessary for Option 026)*	HP 1250-1743
APC 3.5(f)-to-APC 3.5(f) *(two required)*	HP 5062-5311
BNC Tee(m)(f)(f)	HP 1250-0781

Cables

BNC, 122 cm (48 in) *(two required)*	HP 10503A
APC 3.5, 91 cm (36 in) *(two required)*	HP 8120-4921

Procedure

Third Order Intermodulation (10 MHz to 2.9 GHz)

1. Connect the equipment as shown in Figure 3-19.
2. On each HP 8340A, press (INSTR PRESET). Set the controls on each as follows:

POWER LEVEL	−20 dBm
MODULATION	OFF
RF	OFF
FREQUENCY STANDARD SWITCH (rear panel)	EXT

3. On HP 8340A #1, press:
   (CW) (2) (.) (8) (0) (0) (GHz)
4. On HP 8340A #2, press:
   (CW) (2) (.) (8) (0) (0) (0) (5) (GHz)
5. On the HP 8902A, set the controls as follows:

FUNCTION	RF POWER
LOG/LIN	LOG

6. On the HP 8562A/B, press (PRESET). *On HP 8562A analyzers, press* (RECALL) MORE FACTORY PRESEL PK .

   Set the HP 8562A/B controls as follows:

CENTER FREQ	2.8 GHz
REF LVL	−20 dBm
SPAN	10 kHz
CF STEP	50 kHz
RES BW	1 kHz
VIDEO BW	100 Hz

7. Zero the HP 8902A and calibrate the HP 8485A power sensor at 50 MHz, as described in the HP 8902A Operation Manual. Enter the power sensor's 3 GHz calibration factor into the HP 8902A.
8. Connect the HP 8485A Power Sensor to the output of the directional coupler.
9. On HP 8340A #1, press (RF) on. Adjust (POWER LEVEL) for a −20 dBm reading on the HP 8902A display.
10. Disconnect the power sensor from the directional coupler. Connect the directional coupler directly to the HP 8562A/B INPUT 50Ω using an adapter. Do not use a cable.
11. On the HP 8562A/B, press (PEAK SEARCH) (MKR ▶) MKR ▶ REF LVL

    Wait for a new sweep to finish, then press MARKER DELTA (FREQUENCY) (▲).
12. On HP 8340A #2, press (RF) on.
13. On the HP 8562A/B, press (PEAK SEARCH).
14. On HP 8340A #2, adjust (POWER LEVEL) for a Δ MKR reading of 0.0 dB ±0.17 dB on the HP 8562A/B.
15. On the HP 8562A/B, press:
    MARKER (OFF) (PEAK SEARCH) MARKER DELTA (FREQUENCY) (▲)

    Wait for a new sweep to finish, then press (PEAK SEARCH).
16. Record the HP 8562A/B Δ MKR reading in Table 3-37, as the Upper Product Suppression. The suppression should be greater than 70 dB.
17. On the HP 8562A/B, press:
    (FREQUENCY) (▼) (▼) (▼)

    Wait for a new sweep to finish, then press (PEAK SEARCH).
18. Record the HP 8562A/B Δ MKR reading in Table 3-37, as the Lower Product Suppression. The suppression should be greater than 70 dB.

Third Order Intermodulation, >2.9 GHz

19. Disconnect the directional coupler from the HP 8562A/B. Connect the directional coupler to the power sensor.
20. On HP 8340A #2, press (RF) off.
21. Using (CW), set each of the HP 8340A frequencies to the next values listed in Table 3-37. Enter the appropriate power sensor calibration factor into the HP 8902A.
22. On HP 8340A #1, adjust the power level for a −20 dBm reading on the HP 8902A display.
23. Disconnect the power sensor from the directional coupler. Connect the directional coupler directly to the HP 8562A/B INPUT 50Ω using an adapter. Do not use a cable.
24. Set the HP 8562A/B center frequency to the same frequency as HP 8340A #1. Press MARKER (OFF).
25. *Omit step 25 if the analyzer is an HP 8562B.* On the HP 8562A, press:
    (AMPLITUDE) REF LVL (2) (0) (−dBm)
    (PEAK SEARCH) (INT) PRESEL AUTO PK

    Wait for the PEAKING message to disappear.
26. Press (PEAK SEARCH) (MKR ▶) MARKER ▶ REF LVL

    Wait for completion of a new sweep, then press MARKER DELTA (FREQUENCY) (▲).
27. On HP 8340A #2, press (RF) on.
28. On the HP 8562A/B, press (PEAK SEARCH).
29. On HP 8340A #2, adjust the power level for a Δ MKR reading of 0.0 dB ±0.17 dB on the HP 8562A/B.
30. On the HP 8562A/B, press (FREQUENCY) (▲).

    Wait for completion of a new sweep, then press (PEAK SEARCH). Record the HP 8562A/B Δ MKR reading in Table 3-37, as the Upper Product Suppression. The suppression should be greater than 75 dB.
31. On the HP 8562A/B, press (FREQUENCY) (▼) (▼) (▼).

    Wait for completion of a new sweep, then press (PEAK SEARCH). Record the HP 8562A/B Δ MKR reading in Table 3-37, as the Lower Product Suppression. The suppression should be greater than 75 dB.

32. Record here the more positive of Lower Product Suppression and Upper Product Suppression for the 2.8 GHz entries in Table 3-37:

Third Order Intermodulation Distortion at 2.8 GHz _________ dBc

33. Record here the more positive of Lower Product Suppression and Upper Product Suppression for the 4.0 GHz entries in Table 3-37:

Third Order Intermodulation Distortion at 4.0 GHz: _________dBc

Table 3-37. Third Order Intermodulation Distortion

		Lower Product		Upper Product		
HP 8340A CW (GHz)	**HP 8340A CW (GHz)**	**Frequency (GHz)**	**Suppression (dB)**	**Frequency (GHz)**	**Suppression (dB)**	**Measurement Uncertainty (dB)**
2.8	2.80005	2.79995	_________	2.8001	_________	±2.83
4.0	4.00005	3.99995	_________	4.0001	_________	±2.83

18. Gain Compression

Specification

10 MHz to 2.9 GHz: <1.0 dB for total mixer power level of −5 dBm
2.9 GHz to 22.0 GHz: <1.0 dB for total mixer power level of −3 dBm
Option 026, 2.9 GHz to 26.5 GHz: <1.0 dB for total mixer power level of −3 dBm

For HP 8562A analyzers with serial prefix 2805A and below, and for HP 8562B analyzers with serial prefix 2750A and below: <1.0 dB for total mixer power level of −3 dBm.

Note Total mixer power level = total input power level − input attenuation.

Related Adjustment

There is no related adjustment procedure for this performance test.

Description

This test measures gain compression in low band and high band. Two signals, separated by 3 MHz, are used. First the test places a −30 dBm signal at the input of the HP 8562A/B spectrum analyzer (the analyzer's reference level is also set to −30 dBm). Then a +5 dBm or +7 dBm signal is input to the analyzer, overdriving its input. The decrease in the first signal's amplitude (gain compression) caused by the second signal is the measured gain compression.

18. Gain Compression

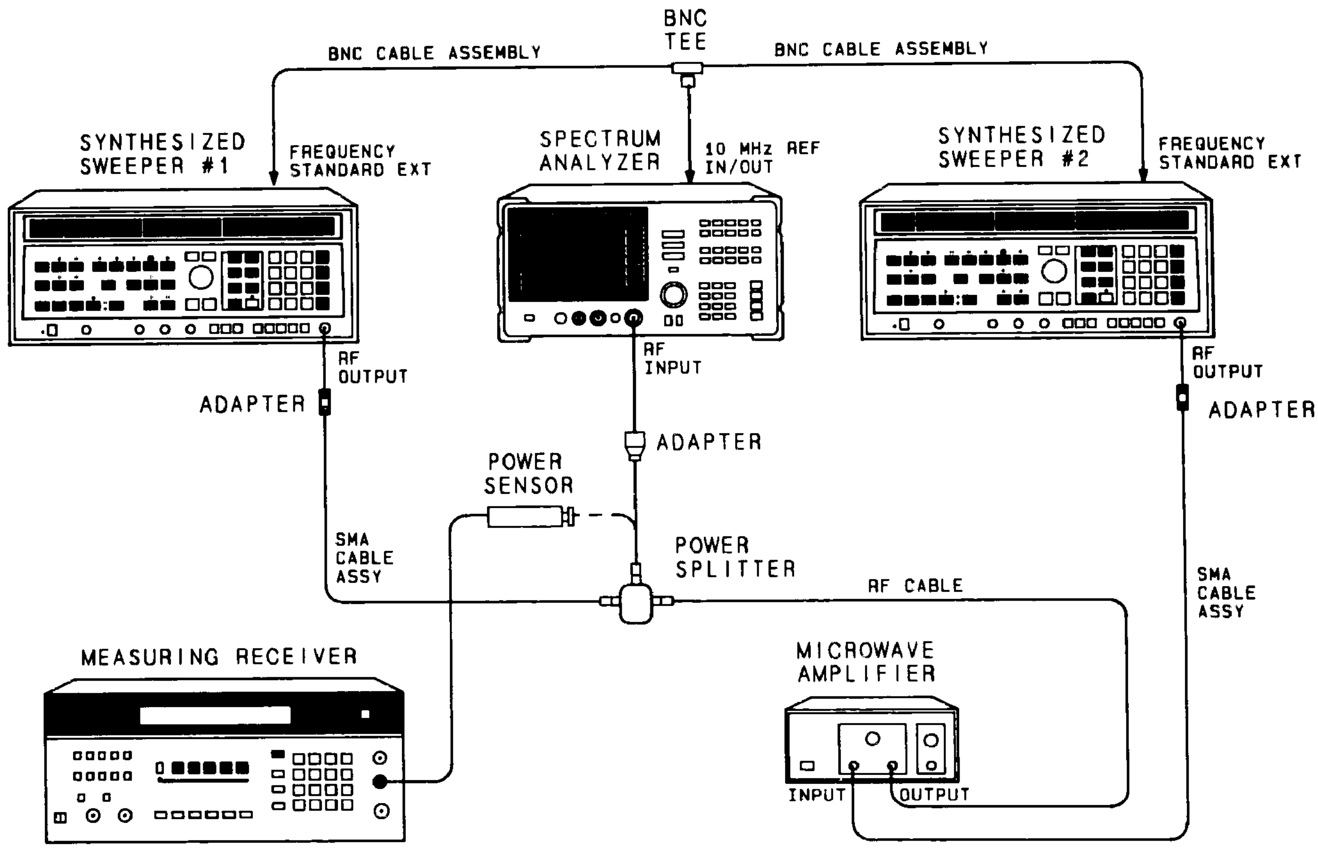


Figure 3-20. Gain Compression Test Setup

Equipment

Synthesized Sweeper *two required* .... HP 8340A
Measuring Receiver .... HP 8902A
Amplifier .... HP 11975A
Power Sensor .... HP 8485A
Power Splitter .... HP 11667B

Adapters

APC 3.5(f)-to-APC 3.5(f) *(two required)* .... HP 5061-5311
Type N(m)-to-APC 3.5(m) .... HP 1250-1743
(not necessary for Option 026)
BNC Tee(m)(f)(f) .... HP 1250-0781

Cables

BNC, 122 cm (48 in) *(two required)* .... HP 10503A
APC 3.5, 91 cm (36 in) .... HP 8120-4921
RF Cable .... HP 11975-20002

Procedure

<2.9 GHz

1. Zero the HP 8902A and calibrate the HP 8485A power sensor as described in the HP 8902A Operation Manual. Enter the power sensor's 2 GHz calibration factor into the HP 8902A.
2. Connect the equipment as shown in Figure 3-20, with the output of the power splitter connected to the HP 8485A Power Sensor.
3. On HP 8340A #1, press (INSTR PRESET). Set the controls as follows:

CW	2.0 GHz
POWER LEVEL	−24 dBm
FREQUENCY STANDARD SWITCH (rear panel)	EXT

4. On HP 8340A #2, press (INSTR PRESET). Set the controls as follows:

CW	2.003 GHz
POWER LEVEL	+8 dBm
FREQUENCY STANDARD SWITCH (rear panel)	EXT

5. On the HP 8562A/B, press (PRESET). *On the HP 8562A analyzer, press* (RECALL) MORE FACTORY PRESEL PK .
6. Set the HP 8562A/B controls as follows:

CENTER FREQ	2.0 GHz
REF LVL	−30 dBm
SPAN	10 MHz
RES BW	300 kHz
SCALE	1dB/DIV

7. Adjust the HP 11975A Output Power Level for a +5 dBm reading on the HP 8902A display.
8. On HP 8340A #2, adjust the power level to −80 dBm.
9. Remove the power sensor from the power splitter. Connect the power splitter to the HP 8562A/B INPUT 50Ω using an adapter. Do not use a cable.
10. On HP 8340A #1, adjust the power level for a signal 1 dB below the HP 8562A/B reference level.

11. On the HP 8562A/B, press (PEAK SEARCH) MARKER DELTA .
12. On HP 8340A #2, set the power level to +8 dBm.
13. On the HP 8562A/B, press (PEAK SEARCH) NEXT PEAK . The active marker should be on the lower amplitude signal, not on the signal that is off the top of the screen. If it is not on the lower amplitude signal, reposition the marker to this peak, using the front-panel function knob. Read the Δ MKR amplitude. The amplitude should read less than −1.0 dB. Record the Δ MKR amplitude in Table 3-38 as Gain Compression, Band 0.

>2.9 GHz

14. Set the HP 8562A/B, HP 8340A #1 and HP 8340A #2 to the frequencies indicated in Table 3-38 for Band 1.
15. Enter the HP 8485A calibration factor, for the selected HP 8562A/B center frequency, into the HP 8902A.
16. Disconnect the power splitter from the HP 8562A/B, and reconnect it to the HP 8485A Power Sensor.
17. Adjust the HP 11975A Output Power Level for a +7 dBm reading on the HP 8902A display.
18. On HP 8340A #2, set the power level to −80 dBm.
19. Reconnect the power splitter to the HP 8562A/B INPUT 50Ω.
20. On HP 8340A #1, adjust the power level to bring the signal 1 dB (one division) below the HP 8562A/B reference level.
21. On the HP 8562A/B, press MARKER (OFF) (PEAK SEARCH).
22. *Omit step 22 if the analyzer is an HP 8562B.* On the HP 8562A, press (INT) PRESEL AUTO PK . Wait for the PEAKING message to disappear before continuing to the next step.

    Press (PEAK SEARCH) MARKER DELTA .
23. On HP 8340A #2, set the power level to +8 dBm.
24. On the HP 8562A/B, press (PEAK SEARCH) NEXT PEAK . The active marker should be on the peak of the lower amplitude signal. If it is not, reposition the marker to this peak, using the front-panel function knob. Read the Δ MKR amplitude and record it as Gain Compression in Table 3-38. The gain compression should be less than 1 dB.
25. Repeat steps 14 through 24 until all the entries in Table 3-38 have been completed.

Table 3-38. Gain Compression

Band	HP 8562A/B Center Freq (GHz)	HP 8340A #1 CW (GHz)	HP 8340A #2 CW (GHz)	Gain Compression (dB)	Measurement Uncertainty (dB)
0	2.0	2.000	2.003	________	±0.23
1	4.0	4.000	4.003	________	±0.23
2	7.0	7.000	7.003	________	±0.23

19. 1ST LO OUTPUT Amplitude

Specification

Amplitude (3.0 to 6.7 GHz): +16.5 dBm ±2.0 dB, 20°C to 30°C

Related Adjustment

First LO Distribution Amplifier Adjustment

Description

1ST LO OUTPUT power is measured with a power meter. The HP 8562A/B Spectrum Analyzer is placed in external mixing mode and harmonic-locked to N = 6. This allows the broadest tuning range of the 1st LO.

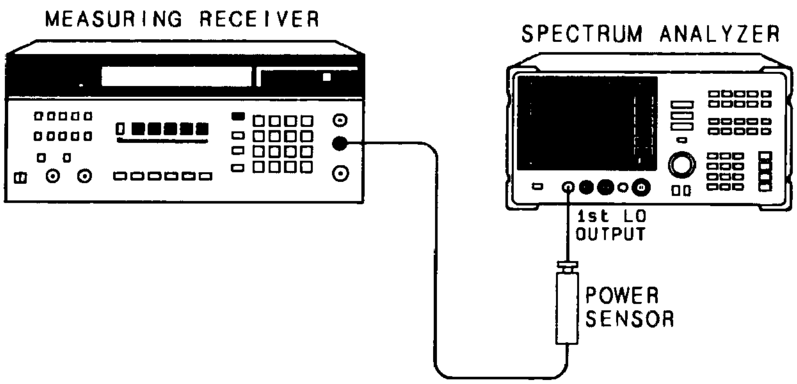


Figure 3-21. 1ST LO OUTPUT Amplitude Test Setup

Equipment

Measuring Receiver .... HP 8902A
Power Sensor .... HP 8485A

Note The results of this test are valid only if the ambient temperature is between 20°C and 30°C.

Procedure

1. Zero the HP 8902A and calibrate the HP 8485A Power Sensor at 50 MHz as described in the HP 8902A Operation Manual. Enter the power sensor's 3 GHz calibration factor into the HP 8902A. Set the HP 8902A for dBm output (LOG display).
2. Connect the equipment as shown in Figure 3-21.
3. On the HP 8562A/B, press (PRESET) (SPAN) ZERO SPAN . Set the controls as follows:

MIXING	EXT
LOCK HARMONIC	#6
CENTER FREQ	18 GHz
CF STEP	1200 MHz
SPAN	0 Hz

4. Read the RF Power displayed on the HP 8902A, and record it as the 3.000 GHz entry in Table 3-39, column 5.
5. On the HP 8562A/B, use CENTER FREQ and (▲) to step the 1ST LO frequency in 200 MHz steps (center frequency in 1200 MHz steps). Enter the appropriate power sensor calibration factor into the HP 8902A. At each step, record in Table 3-39 the power level displayed on the HP 8902A. The power levels measured should be within the limits shown in Table 3-39.
6. Record the maximum 1ST LO OUTPUT POWER here:

Maximum 1ST LO OUTPUT POWER: ________ dB

7. Record the minimum 1ST LO OUTPUT POWER here:

Minimum 1ST LO OUTPUT POWER: ________ dB

19. 1ST LO OUTPUT Amplitude

Table 3-39. 1ST LO OUTPUT Amplitude

1ST LO Freq* (GHz)	Center Freq (n=6) (GHz)	CAL Factor Frequency (GHz)	1ST LO OUTPUT Power			Measurement Uncertainty (dB)
(GHz)	(GHz)	(GHz)	Min (dBm)	Actual (dBm)	Max (dBm)	(dB)
3.0	18	3.0	+14.5	________	+18.5	±0.25
3.2	19.2	3.0	+14.5	________	+18.5	±0.25
3.4	20.4	3.0	+14.5	________	+18.5	±0.25
3.6	21.6	4.0	+14.5	________	+18.5	±0.25
3.8	22.8	4.0	+14.5	________	+18.5	±0.25
4.0	24.0	4.0	+14.5	________	+18.5	±0.25
4.2	25.2	4.0	+14.5	________	+18.5	±0.25
4.4	26.4	4.0	+14.5	________	+18.5	±0.25
4.6	27.6	5.0	+14.5	________	+18.5	±0.25
4.8	28.8	5.0	+14.5	________	+18.5	±0.25
5.0	30.0	5.0	+14.5	________	+18.5	±0.25
5.2	31.2	5.0	+14.5	________	+18.5	±0.25
5.4	32.4	5.0	+14.5	________	+18.5	±0.25
5.6	33.6	6.0	+14.5	________	+18.5	±0.25
5.8	34.8	6.0	+14.5	________	+18.5	±0.25
6.0	36.0	6.0	+14.5	________	+18.5	±0.25
6.2	37.2	6.0	+14.5	________	+18.5	±0.25
6.4	38.4	6.0	+14.5	________	+18.5	±0.25
6.6	39.6	7.0	+14.5	________	+18.5	±0.25
6.7	39.99997	7.0	+14.5	________	+18.5	±0.25

*Nominal. Actual 1st LO frequency is within 60 MHz of this frequency.

20. Sweep Time Accuracy

Specification

For SPAN = 0 Hz:
Sweep time <30 ms: <−15%
Sweep time ≤60 s but ≥30 ms: <−1%

Related Adjustment

Display Adjustments (Fast Zero Span Adjustments)

Description

For sweep times less than 30 ms, an amplitude-modulated signal is displayed on the HP 8562A/B Spectrum Analyzer in zero span, and the frequency of the modulating single (triangle wave) is adjusted to space the peaks evenly across the display. The frequency of the modulating signal is counted and the actual sweep time is calculated and compared to the specification.

For sweep times of 30 ms to 60 seconds, the time interval of the BLANKING OUTPUT's low state is measured. This time interval corresponds to the sweep time. The measured sweep time is compared to the specification.

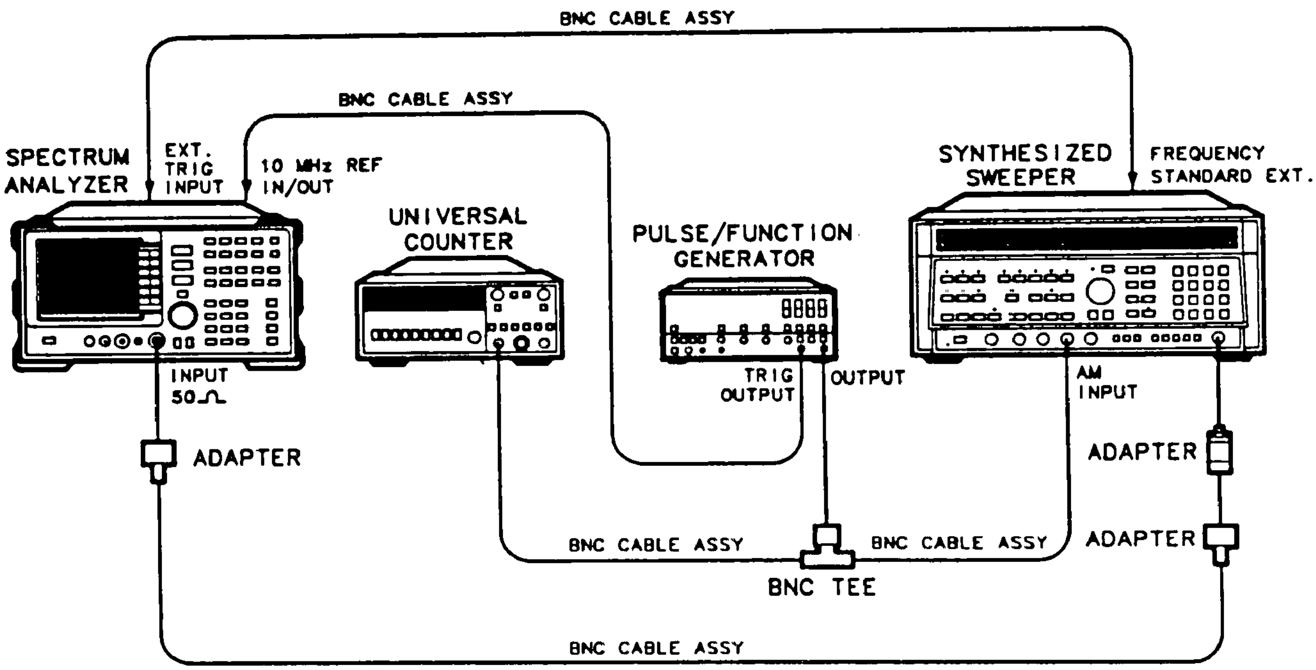


Figure 3-22. Sweep Time Accuracy Test Setup

Equipment

Synthesized Sweeper .... HP 8340A
Universal Counter .... HP 5316A
Pulse/Function Generator .... HP 8116A

Adapters
Type N(m)-to-BNC(f) *(two required)* .... HP 1250-1476
Type N(f)-to-APC 3.5-(f) .... *HP 1250-1745*
(two required for Option 026)
BNC tee(m)(f)(f) .... HP 1250-0781

Cable
BNC, 122 cm (48 in) *(five required)* .... HP 10503A

Procedure

1. Connect the equipment as shown in Figure 3-22, with the BNC cable from the HP 5316A connected to the HP 8562A/B EXT TRIG INPUT.
2. On the HP 8562A/B, press (PRESET). Set the controls as follows:

CENTER FREQ	300 MHz
SPAN	0 Hz
SWEEP TIME	50 μs
SCALE	LINEAR

3. On the HP 5316A, set all buttons out, including the blue SHIFT button. Set the LEVEL/SENS control for Channel A to midrange and the LEVEL/SENS control for Channel B fully counterclockwise. Set the GATE TIME control to MIN.
   a. Push the FREQ A button in.
   b. Push the AC/DC buttons for Channels A and B in.
   c. Push the Channel A TRIGGER LEVEL/SENSITIVITY button in.
4. On the HP 8116A, set the controls as follows:

FRQ	200 kHz
DTY	50%
AMP	500 mV
OFS	0 V
FUNCTION	TRIANGLE

5. On the HP 8340A, press (INSTR PRESET). Set the controls as follows:

CW	300 MHz
POWER LEVEL	−5 dBm
MODULATION	AM

6. On the HP 8562A/B, press (TRIG) EXTERNAL .
7. Adjust the HP 8116A frequency for 10 cycles evenly spaced relative to the vertical graticule lines on the analyzer. For example, if the peak of the first cycle is 0.2 divisions to the right of the first graticule line, the peak of the tenth cycle should be set 0.2 divisions to the right of the tenth graticule line.
8. Read the frequency displayed on the HP 5316A. Calculate the measured sweep time using the equation below. Record the result as the Measured Sweep Time in Table 3-40, for the 50 μs Sweep Time Setting. The Measured Sweep Time should lie within the limits shown in Table 3-40.

$$\text{Measured Sweep Time} = 10/\text{HP 5316A Frequency Reading}$$

9. Repeat steps 7 and 8 for sweep times between 100 μs and 20 ms, as listed in Table 3-40. Set the initial HP 8116A frequency according to this equation:

$$\text{Initial HP 8116A Frequency} = 10/\text{Sweep Time Setting}$$

10. Disconnect the BNC cable between the HP 5316A and the HP 8116A. Connect a BNC cable from the BLANKING OUTPUT on the HP 8562A/B to the Channel A input of the HP 5316A.
11. On the HP 8562A/B, press (TRIG) FREE RUN (SWEEP) (3) (0) (ms).
12. On the HP 5316A, set the controls as follows:
    a. Set the Channel A LEVEL/SENS control fully counterclockwise.
    b. Press TI A▶B.
    c. Push the SEP/COM A button in.
    d. Set the Channel A TRIGGER LEVEL/SENSITIVITY button out.
    e. Push the Channel A slope button in (negative edge trigger).
13. On the HP 5316A, set the Channel A LEVEL/SENS control fully clockwise. Repeat for the Channel B LEVEL/SENS control.
14. Perform the following steps for each of the 21 Sweep Time Settings listed in the first column of Table 3-40:
    a. Set the HP 8562A/B to the sweep time.
    b. Wait for the HP 5316A display to settle (usually about three sweeps). Record the HP 5316A reading as the Measured Sweep Time in the third column of Table 3-40. The Measured Sweep Time should fall within the limits shown in Table 3-40.

Note It might be necessary to readjust the LEVEL/SENS controls slightly for a stable display.

20. Sweep Time Accuracy

Table 3-40. Sweep Time Accuracy

Sweep Time Setting	Minimum Reading	Measured Sweep Time	Maximum Reading	Measurement Uncertainty
50 μs	42.5 μs	________	57 5 μs	±101 ns
100 μs	85 μs	________	115 μs	±101 ns
200 μs	170 μs	________	230 μs	±102 ns
500 μs	425 μs	________	575 μs	±103 ns
1 ms	850 μs	________	1 15 μs	±105 ns
2 ms	1.7 ms	________	2.3 ms	±108 ns
5 ms	4.25 ms	________	5.75 ms	±119 ns
10 ms	8.5 ms	________	11.5 ms	±137 ns
20 ms	17.0 ms	________	23.0 ms	±171 ns
30 ms	29.7 ms	________	30.3 ms	±209 ns
50 ms	49.5 ms	________	50.5 ms	±281 ns
100 ms	99.0 ms	________	101.0 ms	±461 ns
200 ms	198.0 ms	________	202.0 ms	±821 ns
500 ms	495.0 ms	________	505.0 ms	±1.901 μs
1 s	990.0 ms	________	1010.0 ms	±3.7 μs
2 s	1.98 s	________	2.02 s	±7.3 μs
5 s	4.95 s	________	5.05 s	±18.1μms
10 s	9 9 s	________	10.1 s	±36.1 μs
20 s	19.8 s	________	20.2 s	±72.1 μs
50 s	49.5 s	________	50.5 s	±180.1 μs
60 s	59.4 s	________	60.6 s	±216.1 μs

21. Residual Responses

Specification

200 kHz to 6.46 GHz: <−90 dBm with no signal at input and 0 dB input attenuation.

Related Adjustment

There is no related adjustment for this performance test.

Description

This test checks for residual responses in Bands 0 and 1 (N = 1). Any response located above the display line is measured in a narrow frequency span and resolution bandwidth. The HP 8562A/B Spectrum Analyzer INPUT 50Ω is terminated in 50 ohms.

Equipment

Coaxial 50 Ω Termination .... HP 909D

Adapters
Type N(m)-to-APC 3.5(f) .... HP 1250-1744
Type N(m)-to-BNC(f) .... HP 1250-1476
Type N(f)-to-APC 3.5(f) *Option 026* .... HP 1250-1745

Cable
BNC, 122 cm (48 in.) .... HP 10503A

Procedure

1. On the HP 8562A/B, press PRESET. Set the controls as follows:

CENTER FREQ	300 MHz
SPAN	10 kHz
RES BW	300 Hz
REF LVL	−10 dBm
ATTEN	0 dB

2. On the HP 8562A/B, connect a BNC cable between CAL OUTPUT and INPUT 50Ω. Press (PEAK SEARCH) (AMPLITUDE) MORE REF LEVEL CAL .

   Use the data entry knob or the step keys to change the REF LEVEL CAL value until the marker amplitude reads −10.00 dBm ±−0.17 dB.

Residual Responses, Band 0

3. Remove the BNC cable and adapter from INPUT 50Ω. Install the Type N-to-APC 3.5 adapter and 50 ohm termination on INPUT 50Ω. Press (PRESET). Set the controls as follows:

CENTER FREQ	15.2 MHz
SPAN	30 MHz
CF STEP	28.5 MHz
REF LVL	−50 dBm
ATTEN	0 dB
RES BW	10 kHz
TRIG	SINGLE
DISPLAY LINE	−90 dBm

4. Press (TRIG) SINGLE to trigger a sweep. The noise level should be at least 6 dB below the display line. If it is not, it will be necessary to reduce SPAN and RES BW to reduce the noise level. If SPAN is reduced, reduce CF STEP to no more than 95% of SPAN.
5. If a residual is suspected, press SINGLE again. A residual response will persist, but a noise peak will not. Make a note of the frequency and amplitude of any responses above the display line.
6. If a response is marginal, verify the response amplitude as follows:
   a. Press (SAVE) SAVE STATE STATE 0 .
   b. Press MARKER (ON). Place the marker on the peak of the response in question.
   c. Press (MKR ▶) and MARKER▶CF .
   d. Press (SPAN) (▼) (▼) (▼) (▼) (TRIG) CONT .
   e. Press (BW) RES BW AUTO .
   f. Continue to reduce SPAN until a RES BW of 300 Hz is reached. If the response is a synthesis-related residual, it might disappear as SPAN is reduced. If this is the case, measure the amplitude with the narrowest span possible and a 300 Hz RES BW.

g. Record the frequency and amplitude of any residual response above the display line.

h. Press (RECALL) RECALL STATE STATE 0 .

7. Check for residuals up to 2.9 GHz, following steps 4 through 6. To change the center frequency, press CENTER FREQ (▲).

Residual Responses, Band 1

8. On the HP 8562A/B, press:
(FREQUENCY) CENTER FREQ (2) (.) (9) (1) (5) (GHz).

9. Check for residuals from 2.9 GHz to 6.46 GHz, following steps 4 though 6. To change the center frequency, press CENTER FREQ (▲).

22. IF INPUT Amplitude Accuracy

Specification

For a signal at the reference level (EXTernal mixing mode, REF LVL of 0 dBm, CONVersion LOSS of 30 dB) the power applied to the IF INPUT shall be −30 dBm ±1.5 dB.

Related Adjustment

External Mixer Amplitude Adjustment

Description

The user-loaded conversion losses for K-band are recorded and reset to 30 dB. A 310.7 MHz signal is applied to the `IF INPUT`. The power level of the source is adjusted for a signal at the reference level. The power applied to the HP 8562A/B Spectrum Analyzer is measured with a power meter and the measured power is compared to the specification. The previously recorded conversion losses are reentered.

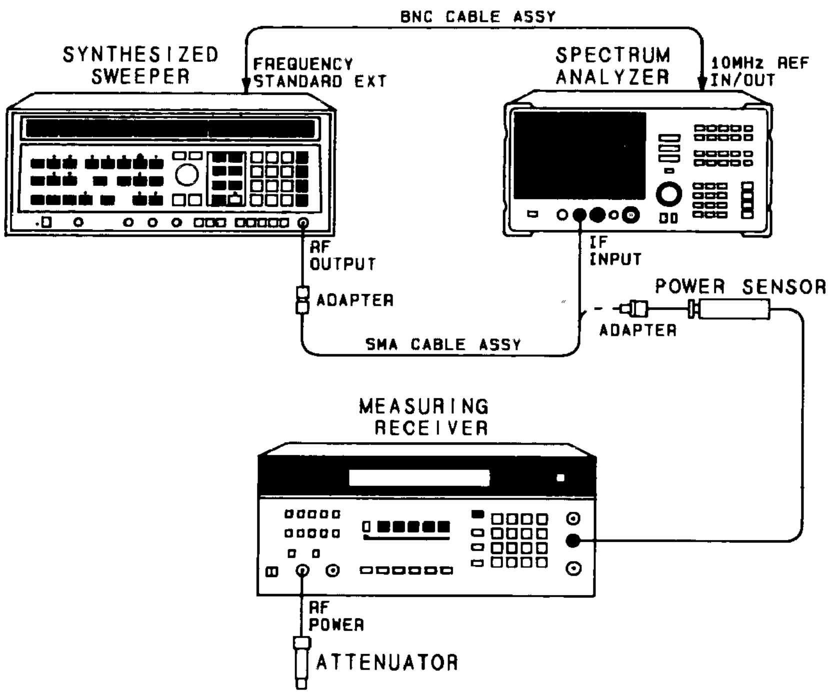


Figure 3-23. IF Input Amplitude Test Setup

Equipment

Synthesized Sweeper .... HP 8340A
Measuring Receiver .... HP 8902A
Power Sensor .... HP 8484A
50 MHz Reference Attenuator .... HP 11708A
(supplied with HP 8484A)

Adapters
Type N(f)-to-SMA(f) .... HP 1250-1772
APC 3.5(f)-to-APC 3.5(f) .... HP 5061-5311

Cables
BNC, 122 cm (48 in) .... HP 10503A
SMA, 61 cm (24 in) .... HP 8120-1578

Procedure

1. Connect the equipment as shown in Figure 3-23. The HP 8562A/B Spectrum Analyzer provides the frequency reference for the HP 8340A.
2. On the HP 8562A/B, press:
   (PRESET)
   (AMPLITUDE) `LOG dB/DIV` (1) (dB) MARKER (ON)
   `MIXER EXT` (SPAN) `ZERO SPAN`
   `MIXER EXT AMPTD CORRECT CNV LOSS VS FREQ`
3. Note the conversion loss displayed in the active function block. Use (▲) and (▼) to step through the conversion losses for the other frequencies. If all conversion losses are 30.0 dB, proceed to step 9.
4. On the HP 8562A/B, press `CNV LOSS VS FREQ`.
5. Record the 18 GHz conversion loss in Table 3-30.
6. Enter a conversion loss of 30 dB.
7. On the HP 8562A/B, press (▲).
8. Repeat steps 5 through 7 for the remaining frequencies listed in Table 3-30.
9. On the HP 8340A, press (INSTR PRESET). Set the controls as follows:

CW	310 7 MHz
POWER LEVEL	−30 dBm

10. Zero and calibrate the HP 8902A/HP 8484A combination in LOG mode. Enter the power sensor's 50 MHz calibration factor into the HP 8902A.
11. On the HP 8340A, adjust the power level until the marker amplitude reads 0 dBm ±0.05 dB.
12. Disconnect the SMA cable from the HP 8562A/B `IF INPUT`, and connect the cable, through an adapter, to the power sensor.

13. Read the power displayed on the HP 8902A. The displayed power should read −30 dBm ±1.5 dB. Record the value here:

IF INPUT Amplitude ________dBm

Note The following steps should be performed only if it is necessary to change the conversion loss values found in step 5. Conversion loss values all should be 30 dB. If they are not, perform steps 14 through 17.

14. On the HP 8562A/B, press CNV LOSS VS FREQ .
15. Enter the conversion loss at 18 GHz, as recorded in Table 3-41.
16. Press (▲).
17. Repeat steps 15 and 16 for the remaining frequencies listed in Table 3-41.

Table 3-41. IF Input Amplitude Accuracy

Frequency (GHz)	Conversion Loss (dB)
18	________
20	________
22	________
24	________
26	________
27	________

23. 10 MHz Reference Output Accuracy (Option 003 only)

Note

This test applies only to spectrum analyzers equipped with Option 003, Precision Frequency Reference. For spectrum analyzers without Option 003, refer to test 1.

Specification

Aging: $<\pm 1 \times 10^{-7}$ per year

Warmup *(Characteristic):*
after 5 minutes from cold start: $<\pm 1 \times 10^{-7}$ of final stabilized frequency
after 15 minutes from cold start: $<\pm 1 \times 10^{-8}$ of final stabilized frequency

Note

A "cold start" is defined as the analyzer being powered ON after being off for at least 60 minutes.

The "final stabilized frequency" is the frequency 60 minutes after being powered ON.

Related Adjustment

10 MHz Frequency Reference Adjustment (Option 003)

Description

This test measures the warmup characteristics of the 10 MHz reference oscillator. The ability of the 10 MHz oscillator to meet its warmup characteristics gives a high level of confidence that it will also meet its yearly aging specification.

A frequency counter is connected to the 10 MHz REF IN/OUT. After the analyzer has been allowed to cool for at least 60 minutes, the analyzer is powered ON. A frequency measurement is made five minutes after power is applied, and the frequency in recorded. Another frequency measurement is made ten minutes later (15 minutes after power is applied) and the frequency is recorded. A final frequency measurement is made 60 minutes after power is applied. The difference between each of the first two frequency measurements and the last frequency measurement is calculated and recorded.

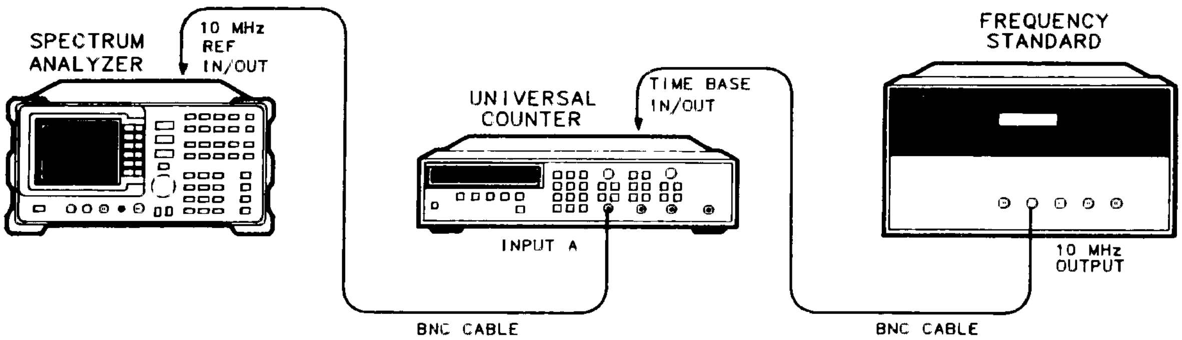


Figure 3-24. 10 MHz Reference Output Accuracy Test Setup (Option 003)

Equipment

Frequency Counter .... HP 5334A/B
Frequency Standard .... any 10 MHz frequency standard
with an aging rate of $<\pm 1 \times 10^{-10}$ per day,
such as the HP 5061B Cesium Beam Standard

Cable

BNC, 122 cm (48 in) *(two required)* .... HP 10503A

Note The spectrum analyzer must have been allowed to sit with the power off for at least 60 minutes before beginning this test. This adequately simulates a cold start.

Procedure

1. Allow the spectrum analyzer to sit with the power off for at least 60 minutes before proceeding.
2. Connect the equipment as shown in Figure 3-24.

3. Set the spectrum analyzer LINE switch ON. Record the Power ON Time below. If an X appears along the left side of the display, press (PRESET), and record the current time as the Power ON Time. An X indicates the analyzer is in external frequency reference mode (internal oscillator is turned off). Pressing (PRESET) sets the analyzer to the internal frequency reference.

Power ON Time ____________________

4. Set the counter controls as follows:

FUNCTION/DATA	FREQ A
INPUT A:	
X10 ATTN	OFF
AC	OFF
50 Ω Z	OFF
AUTO TRIG	ON
100 kHz FILTER A	OFF

5. On the frequency counter, select a 10 second gate time by pressing:

   GATE TIME (1) (0) GATE TIME

   Offset the displayed frequency by −10.0 MHz by pressing:

   (MATH) SELECT/ENTER CHS/EEX (1) (0)
   CHS/EEX (6) SELECT/ENTER SELECT ENTER

   The frequency counter should now display the difference between the INPUT A signal and 10.0 MHz, with 0.001 Hz resolution.

6. Proceed with the next step five minutes after the Power ON Time noted in step 3.
7. Wait at least two periods for the frequency counter to settle. Record the frequency counter reading below, as Reading #1 (with 0.001 Hz resolution).

Reading #1 ____________________ Hz

8. Proceed with the next step fifteen minutes after the Power ON Time noted in step 3.
9. Record the frequency counter reading below, as Reading #2 (with 0.001 Hz resolution).

Reading #2 ____________________ Hz

10. Proceed with the next step 60 minutes after the Power ON Time noted in step 3. During this waiting period, other performance tests may be executed under the following conditions:
    a. the analyzer is powered ON at all times
    b. the analyzer is always at room temperature
    c. the analyzer is never placed in EXT REFERENCE mode
11. Check that the equipment is connected as shown in figure 3-24.
12. Check that the frequency counter is set as shown in step 4.
13. On the frequency counter, select a 10 second gate time by pressing:

    GATE TIME (1) (0) GATE TIME

    Offset the displayed frequency by −10.0 MHz by pressing:

    (MATH) SELECT/ENTER CHS/EEX (1) (0)
    CHS/EEX (6) SELECT/ENTER SELECT ENTER

    The frequency counter should now display the difference between the INPUT A signal and 10.0 MHz, with 0.001 Hz resolution.
14. Wait at least two periods for the frequency counter to settle. Record the frequency counter reading below, as Reading #3 (with 0.001 Hz resolution).

    Reading #3 ____________________ Hz

15. Calculate the 5 Minute Warmup Error by subtracting Reading #3 from Reading #1, and dividing the result by 10 MHz. Record the result below.

    5 Minute Warmup Error = (Reading #1 − Reading #3) / 10.0×10^6

    5 Minute Warmup Error ____________________

16. Calculate the 15 Minute Warmup Error by subtracting Reading #3 from Reading #2, and dividing the result by 10 MHz. Record the result below.

    15 Minute Warmup Error = (Reading #2 − Reading #3) / 10.0×10^6.

    15 Minute Warmup Error ____________________

Performance Test Record

Table 3-42. Performance Test Record (1 of 11)

Hewlett-Packard Company

Address: ______________________ Report No. ______________________

____

______________________ Date ______________________

______________________ (e g. 10 SEP 1989)

Model HP 8562A/B

Serial No. ______________________

Options ______________________

Firmware Revision______________________

Customer ______________________ Tested by ______________________

Ambient temperature ____________ °C Relative humidity ____________ %

Power mains line frequency ____________ Hz (nominal)

Test Equipment Used

Description	Model No.	Trace No.	Cal Due Date
Synthesized Sweeper #1			
Synthesized Sweeper #2			
Synthesized Signal Generator			
Synthesized/Function Generator			
AM/FM Signal Generator			
Measuring Receiver			
Power Meter			
RF Power Sensor			
Low-Power Power Sensor			
Microwave Power Sensor			

Table 3-42. Performance Test Record (2 of 11)

Test Equipment Used

Description	Model No.	Trace No.	Cal Due Date
Pulse/Function Generator			
Microwave Frequency Counter			
Frequency Counter			
Universal Frequency Counter			
Amplifier			
Power Splitter			
4.4 GHz Low-Pass Filter			
50 MHz Low-Pass Filter			
50Ω Termination			
20 dB Fixed Attenuator			
10 dB Fixed Attenuators			
10 dB Step Attenuator			
1 dB Step Attenuator			

Notes/Comments

Table 3-42. Performance Test Record (3 of 11)

Hewlett-Packard Company	
Model HP 8562A/B	Report No ______________
Serial No. ______________	Date ______________

Test	Test Description	Results			Measurement
No.		Minimum	Measured	Maximum	Uncertainty
1	10 MHz Reference Output Accuracy (standard)	299 998800 MHz	______	300 0012 MHz	±300 Hz
2	Calibrator Amplitude Accuracy				
	Calibrator Amplitude	−10.3 dBm	______	−9.7 dBm	±0.19 dB
3	Displayed Average Noise Level				
	10 kHz		______	−90 dBm	+1.74/−1 98 dB
	100 kHz		______	−100 dBm	+1.74/−1 98 dB
	1 MHz to 2.9 GHz		______	−120 dBm	+1.74/−1 98 dB
	2.9 GHz to 6.46 GHz		______	−121 dBm	+1.74/−1 98 dB
	6.46 GHz to 13.0 GHz		______	−110 dBm	+1.74/−1 98 dB
	13.0 GHz to 19.7 GHz		______	−105 dBm	+1.74/−1 98 dB
	19.7 GHz to 22.0 GHz		______	−100 dBm	+1.74/−1 98 dB
	Opt 026				
	19.7 GHz to 26.5 GHz		______	−100 dBm	+1.74/− 1.98 dB
4	Resolution Bandwidth Switching and IF Alignment Uncertainty				
	2 MHz	−0.5 dB	______	+ 0.5 dB	±0.02 dB
	1 MHz	−0.5 dB	______	+0.5 dB	±0.06 dB
	100 kHz	−0.5 dB	______	+0.5 dB	±0.06 dB
	30 kHz	−0.5 dB	______	+0.5 dB	±0.06 dB
	10 kHz	−0.5 dB	______	+0.5 dB	±0.06 dB
	3 kHz	−0.5 dB	______	+0.5 dB	±0.06 dB
	1 kHz	−0.5 dB	______	+0.5 dB	±0.06 dB
	300 Hz	−0.5 dB	______	+0.5 dB	±0.11 dB
	100 Hz	−0.5 dB	______	+0.5 dB	±0.27 dB

Table 3-42. Performance Test Record (4 of 11)

Hewlett-Packard Company	
Model HP 8562A/B	Report No __________
Serial No. __________	Date __________

Test No.	Test Description	Results			Measurement Uncertainty
		Minimum	Measured	Maximum	
5	Resolution Bandwidth Accuracy and Selectivity				
	2 MHz	1.5 MHz	______	2.5 MHz	+13.6/−14 kHz
	1 MHz	750 kHz	______	1.25 MHz	+6.8/−7.0 kHz
	300 kHz	270 kHz	______	330 kHz	+2 04/−2.1 kHz
	100 kHz	90 kHz	______	110 kHz	+680/−700 Hz
	30 kHz	27 kHz	______	33 kHz	+204/−210 Hz
	10 kHz	9 kHz	______	11 kHz	+68/−70 Hz
	3 kHz	2.7 kHz	______	3.3 kHz	+20.4/−21 Hz
	1 kHz	900 Hz	______	1.1 kHz	+6 8/−7.0 Hz
	300 Hz	270 Hz	______	330 Hz	+2 04/−2.1 Hz
	100 Hz	70 Hz	______	130 Hz	+0 68/−0.7 Hz
	2 MHz		______	15	+126/−132 kHz
	1 MHz		______	15	+63/−66 kHz
	300 kHz		______	15	+19/−20 kHz
	100 kHz		______	15	+6 3/−6.6 kHz
	30 kHz		______	15	+1 9/−2.0 kHz
	10 kHz		______	15	+630/−660 Hz
	3 kHz		______	15	+190/−200 Hz
	1 kHz		______	15	+63/−66 Hz
	300 Hz		______	15	+19/−20 Hz
	100 Hz		______	15	+6 3/−6.6 Hz
6	Input Attenuator Accuracy				
	Switching Accuracy at 50 MHz				
	20 dB ATTEN	+8 2 dB	______	+11.8 dB	±0 178 dB
	30 dB ATTEN	+18.2 dB	______	+21.8 dB	±0 178 dB
	40 dB ATTEN	+28.2 dB	______	+31.8 dB	±0 178 dB
	50 dB ATTEN	+38.2 dB	______	+41.8 dB	±0 178 dB
	60 dB ATTEN	+48.2 dB	______	+51.8 dB	±0 178 dB
	70 dB ATTEN	+58.2 dB	______	+61.8 dB	±0 178 dB
	Step-to-Step Accuracy at 50 MHz				
	20 dB ATTEN	−0 6 dB	______	+0 6 dB	±0 178 dB
	30 dB ATTEN	−0 6 dB	______	+0 6 dB	±0 178 dB
	40 dB ATTEN	−0.6 dB	______	+0.6 dB	±0.178 dB
	50 dB ATTEN	−0.6 dB	______	+0 6 dB	±0 178 dB
	60 dB ATTEN	−0 6 dB	______	+0 6 dB	±0 178 dB
	70 dB ATTEN	−0 6 dB	______	+0 6 dB	±0 178 dB

Table 3-42. Performance Test Record (5 of 11)

Hewlett-Packard Company
Model HP 8562A/B — Report No. ______________

Serial No. ______________ Date ______________

Test No.	Test Description	Results Minimum	Results Measured	Results Maximum	Measurement Uncertainty
7	IF Gain Uncertainty				
	Log IF Gain Uncertainty (10 dB steps)				
	−10	−1.0 dB	______	+1.0 dB	±0.035 dB
	−20	−1.0 dB	______	+1.0 dB	±0.035 dB
	−30	−1.0 dB	______	+1.0 dB	±0.035 dB
	−40	−1.0 dB	______	+1.0 dB	±0.039 dB
	−50	−1.0 dB	______	+1.0 dB	±0.039 dB
	−60	−1.0 dB	______	+1.0 dB	+0.093/−0.095 dB
	−70	−1.0 dB	______	+1.0 dB	+0.093/−0.095 dB
	−80	−1.0 dB	______	+1.0 dB	+0.093/−0.095 dB
	Log IF Gain Uncertainty (1 dB steps)				
	−1	−1.0 dB	______	+1.0 dB	±0.035 dB
	−2	−1.0 dB	______	+1.0 dB	±0.035 dB
	−3	−1.0 dB	______	+1.0 dB	±0.035 dB
	−4	−1.0 dB	______	+1.0 dB	±0.035 dB
	−5	−1.0 dB	______	+1.0 dB	±0.035 dB
	−6	−1.0 dB	______	+1.0 dB	±0.035 dB
	−7	−1.0 dB	______	+1.0 dB	±0.035 dB
	−8	−1.0 dB	______	+1.0 dB	±0.035 dB
	−9	−1.0 dB	______	+1.0 dB	±0.035 dB
	−10	−1.0 dB	______	+1.0 dB	±0.035 dB
	−11	−1.0 dB	______	+1.0 dB	±0.035 dB
	−12	−1.0 dB	______	+1.0 dB	±0.035 dB

Table 3-42. Performance Test Record (6 of 11)

Hewlett-Packard Company Model HP 8562A/B	Report No. ______
Serial No. ______	Date ______

Test No.	Test Description	Results Minimum	Measured	Maximum	Measurement Uncertainty
	Linear IF Gain Uncertainty				
	−10	−1.0 dB	______	+1.0 dB	±0.038 dB
	−20	−1.0 dB	______	+1.0 dB	±0.038 dB
	−30	−1.0 dB	______	+1.0 dB	±0.038 dB
	−40	−1.0 dB	______	+1.0 dB	±0.041 dB
	−50	−1.0 dB	______	+1.0 dB	±0.041 dB
	−60	−1.0 dB	______	+1.0 dB	+0.094/−0.097 dB
	−70	−1.0 dB	______	+1.0 dB	+0.094/−0.097 dB
	−80	−1.0 dB	______	+1.0 dB	+0.094/−0.097 dB
8	Scale Fidelity				
	Linear Scale Fidelity				
	2 dB from REF LVL	−2.33 dB	______	−1.68 dB	±0.033 dB
	4 dB from REF LVL	−4.42 dB	______	−3.60 dB	±0.034 dB
	6 dB from REF LVL	−6.54 dB	______	−5.5 dB	±0.037 dB
	8 dB from REF LVL	−8.68 dB	______	−7.37 dB	±0.041 dB
	10 dB from REF LVL	−10.87 dB	______	−9.21 dB	+0.046/−0.047 dB
	12 dB from REF LVL	−13.10 dB	______	−11.02 dB	+0.054/−0.054 dB
	14 dB from REF LVL	−15.42 dB	______	−12.78 dB	+0.064/−0.065 dB
	16 dB from REF LVL	−17.82 dB	______	−14.49 dB	+0.078/−0.079 dB
	18 dB from REF LVL	−20.36 dB	______	−16.14 dB	+0.118/−0.12 dB
	Maximum Cumulative 10 dB Log Scale Fidelity	−1.5 dB	______	+1.5 dB	± 0.27 dB
	Maximum Incremental 10 dB Log Scale Fidelity	−0.4 dB	______	+0.4 dB	±0.27 dB
	Maximum Cumulative 2 dB Log Scale Fidelity	−1.5 dB	______	+1.5 dB	±0.06 dB
	Maximum Incremental 2 dB Log Scale Fidelity	−0.4 dB	______	+0.4 dB	±0.06 dB
9	Residual FM		______	50 Hz	±12 Hz
10	Noise Sidebands				
	−10 kHz Offset		______	−86 dBc/Hz	±1.53 dB
	+10 kHz Offset		______	−86 dBc/Hz	±1.53 dB
	−30 kHz Offset		______	−100 dBc/Hz	±1.53 dB
	+30 kHz Offset		______	−100 dBc/Hz	±1.53 dB
	−100 kHz Offset		______	−110 dBc/Hz	±1.53 dB
	+100 kHz Offset		______	−110 dBc/Hz	±1.53 dB

Table 3-42. Performance Test Record (7 of 11)

Hewlett-Packard Company Model HP 8562A/B	Report No. ______________
Serial No. ______________	Date ______________

Test No.	Test Description	Results			Measurement Uncertainty
		Minimum	Measured	Maximum	
11	Image, Multiple, and Out-of-Band Responses				
	Maximum Response Amplitude <18 GHz		________	−70 dBc	+1.53/−1.59 dB
	Maximum Response Amplitude <22 GHz		________	−60 dBc	+1.53/−1 59 dB
	<26.5 GHz (Option 026)				
12	Frequency Readout Accuracy and Frequency Count Marker Accuracy				
	1.5 GHz CENTER FREQ				
	1 MHz SPAN	1.499942 GHz	________	1.500058 GHz	±1 Hz
	10 MHz SPAN	1.49948 GHz	________	1.50052 GHz	±1 Hz
	20 MHz SPAN	1.49895 GHz	________	1.50105 GHz	±1 Hz
	50 MHz SPAN	1.49745 GHz	________	1.50255 GHz	±1 Hz
	100 MHz SPAN	1.4948 GHz	________	1.5052 GHz	±1 Hz
	1 GHz SPAN	1.45 GHz	________	1.55 GHz	±1 Hz
	4.0 GHz CENTER FREQ				
	1 MHz SPAN	3.999932 GHz	________	4.000068 GHz	±1 Hz
	10 MHz SPAN	3.99947 GHz	________	4.00053 GHz	±1 Hz
	20 MHz SPAN	3.99894 GHz	________	4.00106 GHz	±1 Hz
	50 MHz SPAN	3.99744 GHz	________	4.00256 GHz	±1 Hz
	100 MHz SPAN	3.9948 GHz	________	4.0052 GHz	±1 Hz
	1 GHz SPAN	3.95 GHz	________	4.05 GHz	±1 Hz
	9.0 GHz CENTER FREQ				
	1 MHz SPAN	8.999912 GHz	________	9.000088 GHz	±2 Hz
	10 MHz SPAN	8.99945 GHz	________	9.00055 GHz	±2 Hz
	20 MHz SPAN	8.99892 GHz	________	9.00108 GHz	±2 Hz
	50 MHz SPAN	8.99742 GHz	________	9.00258 GHz	±2 Hz
	100 MHz SPAN	8.9948 GHz	________	9.0052 GHz	±2 Hz
	1 GHz SPAN	8.950 GHz	________	9.050 GHz	±2 Hz

Table 3-42. Performance Test Record (8 of 11)

Hewlett-Packard Company	
Model HP 8562A/B	Report No. ______
Serial No. ______	Date ______

Test No.	Test Description	Results Minimum	Measured	Maximum	Measurement Uncertainty
	Frequency Readout Accuracy & Frequency Count Marker Accy				
	16.0 CENTER FREQ				
	1 MHz SPAN	15.99984 GHz	______	16.000116 GHz	±3 Hz
	10 MHz SPAN	15.99942 GHz	______	16.00058 GHz	±3 Hz
	20 MHz SPAN	15.99889 GHz	______	16.00111 GHz	±3 Hz
	50 MHz SPAN	15.99739 GHz	______	16.00261 GHz	±3 Hz
	100 MHz SPAN	15.9948 GHz	______	16.0052 GHz	±3 Hz
	1 GHz SPAN	15.950 GHz	______	16.050 GHz	±3 Hz
	21.0 GHz CENTER FREQ				
	1 MHz SPAN	20.999864 GHz	______	21.000136 GHz	±4 Hz
	10 MHz SPAN	20.99940 GHz	______	21.00060 GHz	±4 Hz
	20 MHz SPAN	20.99887 GHz	______	21.00113 GHz	±4 Hz
	50 MHz SPAN	20.99737 GHz	______	21.00263 GHz	±4 Hz
	100 MHz SPAN	20.9948 GHz	______	21.0052 GHz	±4 Hz
	1 GHz SPAN	20.950 GHz	______	21.050 GHz	±4 Hz
	Frequency Count Marker Accy				
	1.5 GHz CENTER FREQ	1.49999994 GHz	______	1.50000006 GHz	±1 Hz
	4.0 GHz CENTER FREQ	3.99999994 GHz	______	4.00000006 GHz	±1 Hz
	9.0 GHz CENTER FREQ	8.99999989 GHz	______	9.00000011 GHz	±2 Hz
	16.0 GHz CENTER FREQ	15.9999984 GHz	______	16.00000016 GHz	±3 Hz
	21.0 GHz CENTER FREQ	20.99999979 GHz	______	21.00000021 GHz	±4 Hz
13	Pulse Digitization Uncertainty				
	LOG, 1 MHz RES BW		______	1.25 dB	±0.13 dB
	LOG, 2 MHz RES BW		______	3.0 dB	±0.30 dB
	LINEAR, 1 MHz RES BW		______	4%	±.028 mV
	LINEAR, 2 MHz RES BW		______	12%	±.084 mV
14	Second Harmonic Distortion				
	<2.9 GHz		______	−72 dBc	±1.23 dB
	>2.9 GHz		______	−100 dBc HP 8562B: -60 dBc	±1.22 dB
15	Frequency Response (limits in parentheses apply to HP 8562B)				
	Band 0				
	Maximum Positive Response		______	+1.5 dB (+1.5)	+0.29/−0.31 dB
	Maximum Negative Response	−1.5 dB (−1.5)	______		
	Peak-to-Peak Response		______	+2.0 dB (+2.0)	+0.29/−0.31 dB

Table 3-42. Performance Test Record (9 of 11)

Hewlett-Packard Company Model HP 8562A/B	Report No ______
Serial No. ______	Date ______

Test No.	Test Description	Results			Measurement Uncertainty
		Minimum	Measured	Maximum	
	Band 1				
	Maximum Positive Response		______	+2.5 dB (+2.0)	+0.43/−0.47 dB
	Maximum Negative Response	−2.5 dB (−2.0)	______		
	Peak-to-Peak Response		______	+3.0 dB (+2.0)	+0.43/−0.47 dB
	Band 2				
	Maximum Positive Response		______	+3.0 dB (+3.0)	+0.43/−0.48 dB
	Maximum Negative Response	−3.0 dB (−3.0)	______		
	Peak-to-Peak Response		______	+4.0 dB (+3.0)	+0.43/−0.48 dB
	Band 3				
	Maximum Positive Response		______	+4.0 dB (+3.0)	+0.43/−0.48 dB
	Maximum Negative Response	−4.0 dB (−3.0)	______		
	Peak-to-Peak Response		______	+6.0 dB (+3.0)	+0.43/−0.48 dB
	Band 4				
	Maximum Positive Response		______	+4.0 dB (+3.5)	+0.55/−0.59 dB
	Maximum Negative Response	−4.0 dB (−3.5)	______		
	Peak-to-Peak Response		______	+6.0 dB (+4.0)	+0.55/−0.59 dB
	Band Switching Uncertainty				
	Band 0 to Band 1		______	3.5 dB (3.0)	+0.72/−0.78
	Band 0 to Band 2		______	4.0 dB (3.5)	+0.72/−0.79
	Band 0 to Band 3		______	5.0 dB (3.5)	+0.72/−0.79
	Band 0 to Band 4		______	5.0 dB (4.0)	+0.84/−0.90
	Band 1 to Band 2		______	4.5 dB (3.5)	+0.86/−0.95
	Band 1 to Band 3		______	5.5 dB (3.5)	+0.86/−0.95
	Band 1 to Band 4		______	5.5 dB (4.0)	+0.98/−1.06
	Band 2 to Band 3		______	6.0 dB (4.0)	+0.86/−0.96
	Band 2 to Band 4		______	6.0 dB (4.5)	+0.98/−1.07
	Band 3 to Band 4		______	7.0 dB (4.5)	+0.98/−1.07
	(limits in parentheses apply to HP 8562B)				
16	Frequency Span Accuracy				
	1.5 GHz CENTER FREQ				
	10 kHz SPAN	7.6 kHz	______	8.4 kHz	33 Hz
	20 kHz SPAN	15.2 kHz	______	16.8 kHz	66 Hz
	50 kHz SPAN	38.0 kHz	______	42.0 kHz	165 Hz
	100 kHz SPAN	76.0 kHz	______	84.0 kHz	330 Hz

Table 3-42. Performance Test Record (10 of 11)

Hewlett-Packard Company
Model HP 8562A/B — Report No. ____________

Serial No. ____________ Date ____________

Test No.	Test Description	Results Minimum	Results Measured	Results Maximum	Measurement Uncertainty
	101 kHz SPAN	76.0 kHz	________	84.0 kHz	333.3 Hz
	200 kHz SPAN	152.0 kHz	________	168.0 kHz	660 Hz
	500 kHz SPAN	380.0 kHz	________	420.0 kHz	1.65 kHz
	1 MHz SPAN	760 kHz	________	840 kHz	3.3 kHz
	1.01 MHz SPAN	760 kHz	________	840 kHz	3.333 kHz
	2 MHz SPAN	1.52 MHz	________	1.68 MHz	6.6 kHz
	5 MHz SPAN	3.8 MHz	________	4.2 MHz	16.5 kHz
	10 MHz SPAN	7.6 MHz	________	8.4 MHz	33 kHz
	20 MHz SPAN	15.2 MHz	________	16.8 MHz	66 kHz
	50 MHz SPAN	38 MHz	________	42 MHz	165 kHz
	100 MHz SPAN	76 MHz	________	84 MHz	330 kHz
	200 MHz SPAN	152 MHz	________	168 MHz	660 kHz
	500 MHz SPAN	380 MHz	________	420 MHz	1.65 MHz
	1 GHz SPAN	760 MHz	________	840 MHz	3.3 MHz
	2 GHz SPAN	1.52 GHz	________	1.68 GHz	6.6 MHz
	9.0 GHz CENTER FREQ				
	10 kHz SPAN	7.6 kHz	________	8.4 kHz	33 Hz
	20 MHz SPAN	15.2 MHz	________	16.8 MHz	66 kHz
	50 MHz SPAN	38.0 MHz	________	42.0 MHz	165 kHz
	5 GHz SPAN	3.8 GHz	________	4.2 GHz	16.5 MHz
	16.0 GHz CENTER FREQ				
	10 kHz SPAN	7.6 kHz	________	8.4 kHz	33 Hz
	50 MHz SPAN	38.0 MHz	________	42.0 MHz	165 kHz
	100 MHz SPAN	76.0 MHz	________	84.0 MHz	330 kHz
	5 GHz SPAN	3.8 GHz	________	4.2 GHz	16.5 MHz
	20.5 GHz CENTER FREQ				
	10 kHz SPAN	7.6 kHz	________	8.4 kHz	33 Hz
	50 MHz SPAN	38 MHz	________	42 MHz	165 kHz
	100 MHz SPAN	76.0 MHz	________	84.0 MHz	330 kHz
	12.40 GHz CENTER FREQ				
	19.25 GHz SPAN	17.1 GHz	________	18.9 GHz	63.525 MHz
17	Third Order Intermodulation Distortion				
	TOI Distortion				
	2.8 GHz		________	−70 dBc	±2.83 dB
	4.0 GHz		________	−75 dBc	±2.83 dB

Table 3-42. Performance Test Record (11 of 11)

Hewlett-Packard Company	
Model HP 8562A/B	Report No. ______
Serial No ______	Date ______

Test No.	Test Description	Results			Measurement Uncertainty
		Minimum	Measured	Maximum	
18	Gain Compression				
	Gain Compression at 2 GHz		______	1.0 dB	± 0.23 dB
	Gain Compression at 4 GHz		______	1 0 dB	± 0.23 dB
	Gain Compression at 7 GHz		______	1 0 dB	± 0.23 dB
19	1ST LO OUTPUT Amplitude				
	Max. 1ST LO OUTPUT Power		______	+18.5 dBm	±0.25 dB
	Max. 1ST LO OUTPUT Power	+14 5 dBm	______		±0.25 dB
20	Sweep Time Accuracy				
	50 μs SWEEP TIME	42.5 μs	______	57.5 μs	±101 ns
	100 μs SWEEP TIME	85 μs	______	115 μs	±101 ns
	200 μs SWEEP TIME	170 μs	______	230 μs	±102 ns
	500 μs SWEEP TIME	425 μs	______	575 μs	±103 ns
	1 ms SWEEP TIME	850 μs	______	1.15 ms	±105 ns
	2 ms SWEEP TIME	1 7 ms	______	2.3 ms	±108 ns
	5 ms SWEEP TIME	4 25 ms	______	5.75 ms	±119 ns
	10 ms SWEEP TIME	8 5 ms	______	11.5 ms	±137 ns
	20 ms SWEEP TIME	17 0 ms	______	23.0 ms	±171 ns
	30 ms SWEEP TIME	29 7 ms	______	30.3 ms	±209 ns
	50 ms SWEEP TIME	49 5 ms	______	50.5 ms	±281 ns
	100 ms SWEEP TIME	99 0 ms	______	101 0 ms	±461 ns
	200 ms SWEEP TIME	198.0 ms	______	202 0 ms	±821 ns
	500 ms SWEEP TIME	495.0 ms	______	505.0 ms	±1.901 μs
	1 s SWEEP TIME	990 0 ms	______	1010 0 ms	±3.7 μs
	2 s SWEEP TIME	1.98 s	______	2.02 s	±7.3 μs
	5 s SWEEP TIME	4.95 s	______	5.05 s	±18.1 μs
	10 s SWEEP TIME	9.9 s	______	10.1 s	±36.1 μs
	20 s SWEEP TIME	19 8 s	______	20.2 s	±72.1 μs
	50 s SWEEP TIME	49 5 s	______	50.5 s	±180.1 μs
	60 s SWEEP TIME	59.4 s	______	60.6 s	±216.1 μs
21	Residual Responses				
	200 kHz to 2 9 GHz		______	−90 dBm	±1.8 dB
	2.9 GHz TO 6.46 GHz		______	−90 dBm	±1.8 dB
22	IF INPUT Amplitude Accuracy	−31.5 dBm	______	−28.5 dBm	±0.2 dB
23	10 MHz Reference Output Accuracy (Opt. 003)				
	5 minute warmup	-1×10^{-7}	______	$+1\times10^{-7}$	$\pm5.10^{-10}$
	15 minute warmup	-1×10^{-8}	______	$+1\times10^{-8}$	$\pm5.10^{-10}$

4. Help?

4

Help?

What You'll Find in This Chapter

Your HP 8562A/B Spectrum Analyzer is built to provide dependable service. It is unlikely you will experience a problem with the HP 8562A/B. However, if you do, or if you desire additional information, or wish to order parts, options, or accessories, Hewlett-Packard's worldwide sales and service organization is ready to provide the support you need.

In general, a problem can be caused by a hardware failure, a software error, or a user error. Perform the quick checks listed in "Check the Basics." These checks may eliminate the problem altogether, or may give a clearer idea of its cause. If you have an HP 85629B Test and Adjustment Module, you can use its automatic fault isolation routine. See "Running the Automatic Fault Isolation Routine," below.

If the problem is a hardware problem, you have the following options:

- Repair it yourself. See "Service Options."
- Return the analyzer to HP for repair:
  - □ If the analyzer is still under warranty or is covered by an HP maintenance contract, it will be repaired under the terms of the warranty or maintenance contract (the warranty is printed in the front of this manual).
  - □ If the analyzer is no longer under warranty or covered by an HP maintenance contract, HP will notify you of the cost of the repair after examining the unit.

See "How to Call HP" and "How to Return Your Analyzer for Service" for more information.

Before You Call HP

Check the Basics

A problem often can be solved by rechecking what was being done when the problem occurred. A few minutes spent in performing some simple checks may save waiting for your instrument to be repaired. Before calling HP or returning the analyzer for service, please make the following checks:

- Is the analyzer plugged into the proper AC power source? Does the line socket have power?
- Is the rear-panel voltage selector switch set correctly? Is the line fuse good?
- Is the analyzer turned on?
- If other equipment, cables, and connectors are being used with the HP 8562A/B, are they connected properly and operating correctly?

- Review the procedure for the test being performed when the problem appeared. Are all the settings correct?
- Is the test being performed, and the results that are expected, within the specifications and capabilities of the HP 8562A/B? See Chapter 1, Table 1-1.
- Is the HP 8562A/B displaying an error message? If so, refer to Appendix A.
- Perform the Trace Alignment and Reference Level Calibration procedures in Chapter 2. If the necessary test equipment is available, perform the Operation Verification tests given in Chapter 3. Record all results in table 3-42, the Performance Test Record.

HP 85629B Test and Adjustment Module

A powerful feature of the Test and Adjustment Module (TAM) is the Automatic Fault Isolation routine. If a problem with the spectrum analyzer is suspected, in most cases Automatic Fault Isolation can determine whether or not a fault exists in the analyzer. There are some problems, such as excessive residual FM, that Automatic Fault Isolation will not be able to detect. As a minimum, the display and keyboard must be operational to execute Automatic Fault Isolation.

Running the Automatic Fault Isolation Routine

To start the Automatic Fault Isolation routine, press [MODULE] and DIAGNOSE. Rotate the front-panel knob until the arrow points to Automatic Fault Isolation. Press EXECUTE. The CAL OUTPUT must be connected to the INPUT 50Ω. A BNC cable and Type N-to-BNC adapter is shipped with each analyzer in the front cover. Press CONTINUE, and the Automatic Fault Isolation routine will begin.

The Automatic Fault Isolation routine will perform checks of five sections of the analyzer. The routine's progress is displayed on the CRT. The routine will stop as soon as it detects a failure. If no failures are detected, the Automatic Fault Isolation routine will take about 90 seconds to complete.

If a failure is detected, either continue troubleshooting using the service manual or return the analyzer to the nearest HP Service Center as described in "How to Return Your Analyzer for Service." If an HP-IB printer is available and properly connected and configured, a hard-copy printout of the Automatic Fault Isolation results can be obtained by pressing PRINT PAGE. Include a copy of this printout with the analyzer if it is being returned to an HP Service Center for repair.

Read the Warranty

The warranty for your HP 8562A/B is printed at the front of this manual. Please read it and become familiar with its terms. If your analyzer is covered by a separate maintenance agreement, please be familiar with its terms.

Service Options

HP offers several maintenance plans to service your analyzer after the warranty has expired. Call your HP Sales and Service Office for full details.

If you want to service the analyzer yourself after the warranty expires, contact your HP Sales and Service Office to obtain the most current test and maintenance information. A Product Support Kit, HP part number 08562-60021, is also available through the Sales and Service Office. The kit contains the following accessories:

- PC board prop
- Power Line Switch Assembly
- Power Line Assembly
- SMB cable puller
- Option Module extender cable
- Two test cables, BNC to SMB

How To Call HP

Hewlett-Packard has Sales and Service Offices around the world to provide you with complete support for your HP 8562A/B. To obtain servicing information or to order replacement parts, contact the nearest Hewlett-Packard Sales and Service Office listed in Table 4-1. In any correspondence or telephone conversations, refer to the analyzer by its model number and full serial number. With this information, the HP representative can quickly determine whether your unit is still within its warranty period.

How to Return Your Analyzer for Service

Service Tag

If you are returning the analyzer to Hewlett-Packard for servicing, fill in and attach a blue service tag. Several service tags are supplied at the rear of this manual.

Please be as specific as possible about the nature of the problem. If you have recorded any error messages that appeared on the screen, or have completed a Performance Test Record, or have any other specific data on the performance of the analyzer, please send a copy of this information with the unit.

Original Packaging

Before shipping, pack the unit in the original factory packaging materials if they are available. If the original materials were not retained, identical packaging materials are available through any Hewlett-Packard office. Descriptions of the packaging materials are listed in the legend for Figure 2-1.

Other Packaging

Caution

Analyzer damage can result from using packaging materials other than those specified. Never use styrene pellets in any shape as packaging materials. They do not adequately cushion the equipment or prevent it from shifting in the carton. They cause equipment damage by generating static electricity and by lodging in the analyzer fan.

You can repackage the analyzer with commercially available materials as follows:

1. Attach a completed service tag to the instrument.
2. Install the front-panel cover on the instrument.
3. Wrap the instrument in anti-static plastic to reduce the possibility of damage caused by electrostatic discharge.
4. Use a strong shipping container. A double-walled, corrugated cardboard carton with 159 kg (350 lb) bursting strength is adequate. The carton must be both large enough and strong enough to accommodate the analyzer. Allow at least three to four inches on all sides of the analyzer for packing material.
5. Surround the equipment with three to four inches of packing material and prevent the equipment from moving in the carton. If packing foam is not available, the best alternative is SD-240 Air Cap™ from Sealed Air Corporation (Commerce, CA 90001). Air Cap looks like a plastic sheet filled with 1-1/4 inch air bubbles. Use the pink-colored Air Cap to reduce static electricity. Wrapping the equipment several times in this materials should both protect the equipment and prevent it from moving in the carton.
6. Seal the shipping container securely with strong nylon adhesive tape.
7. Mark the shipping container "FRAGILE, HANDLE WITH CARE" to assure careful handling.
8. Retain copies of all shipping papers.

Table 4-1. Hewlett-Packard Sales and Service Offices

IN THE UNITED STATES

California
Hewlett-Packard Co
1421 South Manhattan Ave.
P.O. Box 4230
Fullerton, CA 92631
(714) 999-6700

Hewlett-Packard Co
301 E. Evelyn
Mountain View, CA 94039
(415) 694-2000

Colorado
Hewlett-Packard Co.
24 Inverness Place, East
Englewood, CO 80112
(303) 649-5000

Georgia
Hewlett-Packard Co.
2000 South Park Place
P.O Box 105005
Atlanta, GA 30339
(404) 955-1500

Illinois
Hewlett-Packard Co.
5201 Tollview Drive
Rolling Meadows, IL 60008
(312) 255-9800

New Jersey
Hewlett-Packard Co.
120 W. Century Road
Paramus, NJ 07653
(201) 265-5000

Texas
Hewlett-Packard Co.
930 E. Campbell Rd.
Richardson, TX 75081
(214) 231-6101

IN AUSTRALIA
Hewlett-Packard Australia Ltd.
31-41 Joseph Street
Blackburn, Victoria 3130
895-2895

IN CANADA
Hewlett-Packard (Canada) Ltd
17500 South Service Road
Trans-Canada Highway
Kirkland, Quebec H9J 2X8
(514) 697-4232

IN FRANCE
Hewlett-Packard France
F-91947 Les Ulis Cedex
Orsay
(6) 907-78-25

IN GERMAN FEDERAL REPUBLIC
Hewlett-Packard GmbH
Vertriebszentrale Frankfurt
Berner Strasse 117
Postfach 560 140
D-6000 Frankfurt 56
(0611) 50-04-1

IN GREAT BRITAIN
Hewlett-Packard Ltd.
King Street Lane
Winnersh, Wokingham
Berkshire RG11 5AR
0734 784774

IN OTHER EUROPEAN COUNTRIES
Hewlett-Packard (Schweiz) AG
Allmend 2
CH-8967 Widen (Zurich)
(0041) 57 31 21 11

IN JAPAN
Yokogawa-Hewlett-Packard Ltd.
29-21 Takaido-Higashi, 3 Chome
Suginami-ku Tokyo 168
(03) 331-6111

IN PEOPLE'S REPUBLIC OF CHINA
China Hewlett-Packard, Ltd.
P.O. Box 9610, Beijing
4th Floor, 2nd Watch Factory
Main Bldg.
Shuang Yu Shu,
Bei San Huan Rd.
Beijing
28-0567

IN SINGAPORE
Hewlett-Packard Singapore
Pte. Ltd.
#08-00 Inchcape House
450-2 Alexandra Road
Alexandra P.O. Box 58
Singapore, 9115
4731788

IN TAIWAN
Hewlett-Packard Taiwan
8th Floor, Hewlett-Packard
Building
337 Fu Hsing North Road
Taipei
(02) 712-0404

IN ALL OTHER LOCATIONS
Hewlett-Packard Inter-Americas
3200 Hillview Avenue
Palo Alto, California 94304

Appendices

A

Error Messages

The spectrum analyzer displays error messages in the lower right-hand corner of the CRT display. A number, or error code, is associated with each error message. Several different error codes can correspond to the same error message. These codes are used by service personnel to troubleshoot the spectrum analyzer.

It might be possible to eliminate some error messages by performing a REALIGN LO & IF sequence. Follow this procedure:

1. Press (SAVE) SAVE STATE .
2. Store the current state in a convenient STATE register.
3. Press (PRESET) REALIGN LO & IF . Wait for the sequence to finish.
4. Press (RECALL) RECALL STATE .
5. Recall the previously stored STATE.

If an error message is still displayed, refer to Chapter 4 of this manual, "Help?"

If it is necessary to send the spectrum analyzer in for repair, note any error messages by the error code. This will provide useful information to the person troubleshooting the analyzer.

The spectrum analyzer can display only one error message at one time, although more error messages may exist. To check for more error messages, proceed as follows:

1. Press (RECALL) MORE .
2. Press RECALL ERRORS . An error message will be displayed in the active function block.
3. Use (▲) (▼) to scroll through any other error messages which might exist, making note of each error code.

Error messages and their associated error codes are listed below, in numeric order.

ERR 100	NO PWRON	Power-on state is invalid; default state is loaded.
ERR 101	NO STATE	State to be RECALLed not valid or not SAVEd.
ERR 106	ABORTED!	Current operation is aborted; HP-IB parser reset.
ERR 107	HELLO ??	No HP-IB listener is present.
ERR 108	TIME OUT	Analyzer timed out when acting as controller.
ERR 109	CtrlFail	Analyzer unable to take control of the bus.
ERR 110	NOT CTRL	Analyzer is not system controller
ERR 111	# ARGMTS	Command does not have enough arguments.
ERR 112	??CMD??	Unrecognized command.
ERR 113	FREQ NO!	Command cannot have frequency units.
ERR 114	TIME NO!	Command cannot have time units.
ERR 115	AMPL NO!	Command cannot have amplitude units.
ERR 116	?UNITS??	Unrecognizable units.
ERR 117	NOP NUM	Command cannot have numeric units.
ERR 118	NOP EP	Enable parameter cannot be used.
ERR 119	NOP UPDN	UP/DN are not valid arguments for command.
ERR 120	NOP ONOF	ON/OFF are not valid arguments for command.
ERR 121	NOP ARG	AUTO/MAN are not valid arguments for command.
ERR 122	NOP TRC	Trace registers are not valid for command.
ERR 123	NOP ABLK	A-block format not valid here.
ERR 124	NOP IBLK	I-block format not valid here.
ERR 125	NOP STRNG	Strings are not valid for this command.
ERR 126	NO ?	This command cannot be queried.
ERR 127	BAD DTMD	Not a valid peak detector mode.
ERR 128	PK WHAT?	Not a valid peak search parameter.
ERR 129	PRE TERM	Premature A-block termination.
ERR 130	BAD TDF	Arguments are only for TDF command.
ERR 131	?? AM/FM	AM/FM are not valid arguments for this command.
ERR 132	!FAV/RMP	FAV/RAMP are not valid arguments for this command.
ERR 133	!INT/EXT	INT/EXT are not valid arguments for this command.
ERR 134	??? ZERO	ZERO is not a valid argument for this command.

ERR 135	??? CURR	CURR is not a valid argument for this command.
ERR 136	??? FULL	FULL is not a valid argument for this command.
ERR 137	??? LAST	LAST is not a valid argument for this command.
ERR 138	!GRT/DSP	GRT/DSP are not valid arguments for this command.
ERR 139	PLOTONLY	Argument can only be used with PLOT command.
ERR 140	?? PWRON	PWRON is not a valid argument for this command.
ERR 141	BAD ARG	Argument can only be used with FDIAG command.
ERR 142	BAD ARG	Query expected for FDIAG command.
ERR 143	NO PRESL	No preselector hardware to use command with. (HP 8562B)
ERR 200	SYSTEM	Hardware/Firmware interaction; check other errors.
ERR 201	SYSTEM	Hardware/Firmware interaction; check other errors.
ERR 250	OUTOF RG	ADC input is outside of ADC range.
ERR 251	NO IRQ	Microprocessor not receiving interrupt from ADC.
ERR 300	YTO UNLK	YTO (1ST LO) phase-locked loop (PLL) is unlocked.
ERR 301	YTO UNLK	YTO PLL is unlocked.
ERR 302	OFF UNLK	Offset Roller Oscillator PLL is unlocked.
ERR 303	XFR UNLK	Transfer Roller Oscillator PLL is unlocked.
ERR 304	ROL UNLK	Main Roller Oscillator PLL is unlocked.
ERR 305	FREQ ACC	Frequency accuracy error.
ERR 306	FREQ ACC	Frequency accuracy error.
ERR 307	FREQ ACC	Frequency accuracy error.
ERR 308	FREQ ACC	Frequency accuracy error.
ERR 309	FREQ ACC	Frequency accuracy error.
ERR 310	FREQ ACC	Frequency accuracy error.
ERR 311	FREQ ACC	Frequency accuracy error.
ERR 312	FREQ ACC	Frequency accuracy error.
ERR 313	FREQ ACC	Frequency accuracy error.
ERR 314	FREQ ACC	Frequency accuracy error.
ERR 315	FREQ ACC	Frequency accuracy error.
ERR 316	FREQ ACC	Frequency accuracy error.
ERR 317	FREQ ACC	Frequency accuracy error.
ERR 318	FREQ ACC	Frequency accuracy error.

ERR 321	FREQ ACC	Frequency accuracy error.
ERR 322	FREQ ACC	Frequency accuracy error.
ERR 324	FREQ ACC	Frequency accuracy error.
ERR 325	FREQ ACC	Frequency accuracy error.
ERR 326	FREQ ACC	Frequency accuracy error.
ERR 327	OFF UNLK	Offset Roller Oscillator PLL is unlocked.
ERR 328	FREQ ACC	Frequency accuracy error.
ERR 329	FREQ ACC	Frequency accuracy error.
ERR 331	FREQ ACC	Frequency accuracy error.
ERR 333	600 UNLK	600 MHz Reference Oscillator PLL is unlocked.
ERR 334	LO AMPL	YTO (1st LO) unleveled.

Note

Error codes 400 through 592 are generated when the automatic IF adjustment routine detects a fault. This routine adjusts amplitude parameters first, then resolution bandwidths in this sequence: 300kHz, 1 MHz, 100 kHz, 30 kHz, 10 kHZ, 3 kHz, 1 kHz, 300 Hz, and 100 Hz. The routine will restart from the beginning if a fault is detected. Parameters adjusted after the routine begins and before the fault is detected should be OK; parameters adjusted later in the sequence are suspect.

ERR 400	AMPL 100	Unable to adjust amplitude of 100 Hz RES BW.
ERR 401	AMPL 300	Unable to adjust amplitude of 300 Hz RES BW.
ERR 402	AMPL 1K	Unable to adjust amplitude of 1 kHz RES BW.
ERR 403	AMPL 3K	Unable to adjust amplitude of 3 kHz RES BW.
ERR 404	AMPL 10K	Unable to adjust amplitude of 10 kHz RES BW.
ERR 405	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 406	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 407	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 408	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 409	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 410	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 411	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 412	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 413	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 414	RBW 10K	Unable to adjust 10 kHz RES BW.

ERR 415	RBW	10K	Unable to adjust 10 kHz RES BW.
ERR 416	RBW	10K	Unable to adjust 10 kHz RES BW.
ERR 417	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 418	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 419	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 420	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 421	RBW	10K	Unable to adjust 10 kHz RES BW.
ERR 422	RBW	10K	Unable to adjust 10 kHz RES BW.
ERR 423	RBW	10K	Unable to adjust 10 kHz RES BW.
ERR 424	RBW	10K	Unable to adjust 10 kHz RES BW.
ERR 425	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 426	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 427	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 428	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 429	RBW	100	Unable to adjust 100 Hz RES BW.
ERR 430	RBW	300	Unable to adjust 300 Hz RES BW.
ERR 431	RBW	1K	Unable to adjust 1 kHz RES BW.
ERR 432	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 433	RBW	10K	Unable to adjust 10 kHz RES BW.
ERR 434	RBW	300	Unable to adjust 300 Hz RES BW.
ERR 435	RBW	300	Unable to adjust 300 Hz RES BW.
ERR 436	RBW	300	Unable to adjust 300 Hz RES BW.
ERR 437	RBW	300	Unable to adjust 300 Hz RES BW.
ERR 438	RBW	1K	Unable to adjust 1 kHz RES BW.
ERR 439	RBW	1K	Unable to adjust 1 kHz RES BW.
ERR 440	RBW	1K	Unable to adjust 1 kHz RES BW.
ERR 441	RBW	1K	Unable to adjust 1 kHz RES BW.
ERR 442	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 443	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 444	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 445	RBW	3K	Unable to adjust 3 kHz RES BW.
ERR 446	RBW	10K	Unable to adjust 10 kHz RES BW.

ERR 447	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 448	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 449	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 450	IF SYSTM	IF hardware failure. Check other error messages.
ERR 451	IF SYSTM	IF hardware failure. Check other error messages.
ERR 452	IF SYSTM	IF hardware failure. Check other error messages.
ERR 454	AMPL	Unable to adjust step gain amplifiers.
ERR 455	AMPL	Unable to adjust step gain amplifiers.
ERR 456	AMPL	Unable to adjust step gain amplifiers.
ERR 457	AMPL	Unable to adjust step gain amplifiers.
ERR 458	AMPL	Unable to adjust step gain amplifiers.
ERR 459	AMPL	Unable to adjust step gain amplifiers.
ERR 460	AMPL	Unable to adjust step gain amplifiers.
ERR 461	AMPL	Unable to adjust step gain amplifiers.
ERR 462	AMPL	Unable to adjust step gain amplifiers.
ERR 463	AMPL	Unable to adjust step gain amplifiers.
ERR 464	AMPL	Unable to adjust step gain amplifiers.
ERR 465	AMPL	Unable to adjust step gain amplifiers.
ERR 466	LIN AMPL	Unable to adjust linear amplitude scale.
ERR 467	LOG AMPL	Unable to adjust log amplitude scale.
ERR 468	LOG AMPL	Unable to adjust log amplitude scale.
ERR 469	LOG AMPL	Unable to adjust log amplitude scale.
ERR 470	LOG AMPL	Unable to adjust log amplitude scale.
ERR 471	RBW 30K	Unable to adjust 30 kHz RES BW.
ERR 472	RBW 100K	Unable to adjust 100 kHz RES BW.
ERR 473	RBW 300K	Unable to adjust 300 kHz RES BW.
ERR 474	RBW 1M	Unable to adjust 1 MHz RES BW.
ERR 475	RBW 30K	Unable to adjust 30 kHz RES BW.
ERR 476	RBW 100K	Unable to adjust 100 kHz RES BW.
ERR 477	RBW 300K	Unable to adjust 300 kHz RES BW.
ERR 478	RBW 1M	Unable to adjust 1 MHz RES BW.

ERR 483 RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 484 RBW 3K	Unable to adjust 3 kHz RES BW.
ERR 485 RBW 1K	Unable to adjust 1 kHz RES BW.
ERR 486 RBW 300	Unable to adjust 300 Hz RES BW.
ERR 487 RBW 100	Unable to adjust 100 Hz RES BW.
ERR 488 RBW 100	Unable to adjust 100 Hz RES BW.
ERR 489 RBW 100	Unable to adjust 100 Hz RES BW.
ERR 490 RBW 100	Unable to adjust 100 Hz RES BW.
ERR 491 RBW 100	Unable to adjust 100 Hz RES BW.
ERR 492 RBW 300	Unable to adjust 300 Hz RES BW.
ERR 493 RBW 1K	Unable to adjust 1 kHz RES BW.
ERR 494 RBW 3K	Unable to adjust 3 kHz RES BW.
ERR 495 RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 496 RBW 100	Unable to adjust 100 Hz RES BW.
ERR 497 RBW 100	Unable to adjust 100 Hz RES BW.
ERR 498 RBW 100	Unable to adjust 100 Hz RES BW.
ERR 499 CAL UNLK	A16 Cal Oscillator is unlocked.
ERR 500 AMPL 30K	Unable to adjust amplitude of 30 kHz RES BW.
ERR 501 AMPL .1M	Unable to adjust amplitude of 100 kHz RES BW.
ERR 502 AMPL .3M	Unable to adjust amplitude of 300 kHz RES BW.
ERR 503 AMPL 1M	Unable to adjust amplitude of 1 MHz RES BW.
ERR 504 AMPL 30K	Unable to adjust amplitude of 30 kHz RES BW.
ERR 505 AMPL .1M	Unable to adjust amplitude of 100 kHz RES BW.
ERR 506 AMPL .3M	Unable to adjust amplitude of 300 kHz RES BW.
ERR 507 AMPL 1M	Unable to adjust amplitude of 1 MHz RES BW.
ERR 508 AMPL 30K	Unable to adjust amplitude of 30 kHz RES BW.
ERR 509 AMPL .1M	Unable to adjust amplitude of 100 kHz RES BW.
ERR 510 AMPL .3M	Unable to adjust amplitude of 300 kHz RES BW.
ERR 511 AMPL 1M	Unable to adjust amplitude of 1 MHz RES BW.
ERR 512 RBW 100	Unable to adjust 100 Hz RES BW.
ERR 513 RBW 300	Unable to adjust 300 Hz RES BW.

ERR 514	RBW 1K	Unable to adjust 1 kHz RES BW.
ERR 515	RBW 3K	Unable to adjust 3 kHz RES BW.
ERR 516	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 517	RBW 100	Unable to adjust 100 Hz RES BW.
ERR 518	RBW 300	Unable to adjust 300 Hz RES BW.
ERR 519	RBW 1K	Unable to adjust 1 kHz RES BW.
ERR 520	RBW 3K	Unable to adjust 3 kHz RES BW.
ERR 521	RBW 10K	Unable to adjust 10 kHz RES BW.
ERR 522	RBW 10K	Unable to adjust 10 kHz RES BW symmetry in first XTAL pole.
ERR 523	RBW 10K	Unable to adjust 10 kHz RES BW symmetry in second XTAL pole.
ERR 524	RBW 10K	Unable to adjust 10 kHz RES BW symmetry in third XTAL pole
ERR 525	RBW 10K	Unable to adjust 10 kHz RES BW symmetry in fourth XTAL pole.
ERR 550	LOG AMPL	Unable to adjust amplitude of log scale.
ERR 551	AMPL	Unable to adjust step gain amplifiers.
ERR 552	LOG AMPL	Unable to adjust amplitude of log scale.
ERR 553	LOG AMPL	Unable to adjust amplitude of log scale.
ERR 554	LOG AMPL	Unable to adjust amplitude of log scale.
ERR 555	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 556	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 557	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 558	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 559	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 560	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 561	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 562	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 563	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 564	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 565	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 566	LOG AMPL	Unable to adjust amplitude in log scale.

ERR 567	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 568	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 569	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 570	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 571	AMPL	Unable to adjust step gain amplifiers.
ERR 572	AMPL 1M	Unable to adjust amplitude of 1 MHz RES BW.
ERR 573	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 574	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 575	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 576	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 577	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 581	AMPL	Unable to adjust 100 kHz and $\leq$10 kHz RES BWs.
ERR 582	AMPL	Unable to adjust 100 kHz and $\leq$10 kHz RES BWs.
ERR 583	RBW 30K	Unable to adjust 30 kHz RES BW.
ERR 584	RBW 100K	Unable to adjust 100 kHz RES BW.
ERR 585	RBW 300K	Unable to adjust 300 kHz RES BW.
ERR 586	RBW 1M	Unable to adjust 1 MHz RES BW.
ERR 587	RBW 30K	Unable to adjust 30 kHz RES BW.
ERR 588	RBW 100K	Unable to adjust 100 kHz RES BW.
ERR 589	RBW 300K	Unable to adjust 300 kHz RES BW.
ERR 590	RBW 1M	Unable to adjust 1 MHz RES BW
ERR 591	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 592	LOG AMPL	Unable to adjust amplitude in log scale.
ERR 600	SYSTEM	Hardware/firmware interaction; check other errors.
ERR 601	SYSTEM	Hardware/firmware interaction, check other errors.
ERR 650	OUTOF RG	ADC input is outside of the ADC range.
ERR 651	NO IRQ	Microprocessor is not receiving interrupt from ADC.
ERR 700	EEROM	Checksum error of EEROM A2U501
ERR 701	AMPL CAL	Checksum error of frequency response correction data.
ERR 702	ELAP TIM	Checksum error of elapsed time data.
ERR 703	AMPL CAL	Checksum error of frequency response correction data.

ERR 704	PRESELCT	Checksum error of customer preselector peak data.
ERR 705	ROM U306	Checksum error of Program ROM A2U306.
ERR 706	ROM U307	Checksum error of Program ROM A2U307.
ERR 707	ROM U308	Checksum error of Program ROM A2U308.
ERR 708	ROM U309	Checksum error of Program ROM A2U309.
ERR 709	ROM U310	Checksum error of Program ROM A2U310.
ERR 710	ROM U311	Checksum error of Program ROM A2U311.
ERR 711	RAM U303	Checksum error of System RAM A2U303.
ERR 712	RAM U302	Checksum error of System RAM A2U302.
ERR 713	RAM U301	Checksum error of System RAM A2U301.
ERR 714	RAM U300	Checksum error of System RAM A2U300.
ERR 715	RAM U305	Checksum error of System RAM A2U305.
ERR 716	RAM U304	Checksum error of System RAM A2U304.
ERR 717	BAD uP!!	Microprocessor not fully operational.
ERR 718	BATTERY?	Non-volatile RAM not working; check battery.
ERR 719	MODEL #?	Cannot read ID string from EEROM A2U501; contact service center.
ERR 750	SYSTEM	Hardware/Firmware interaction; check other errors.
ERR 751	SYSTEM	Hardware/Firmware interaction; check other errors.
ERR 752	SYSTEM	Hardware/Firmware interaction; check other errors.
ERR 753	SYSTEM	Hardware/Firmware interaction; check other errors.
ERR 754	SYSTEM	Hardware/Firmware interaction; check other errors.
ERR 755	SYSTEM	Hardware/Firmware interaction; check other errors.

Note Error codes 800 through 899, MODULE, are reserved for Option Modules, such as the HP 85629B Test and Adjustment Module. Refer to the option module's manual for a listing of error messages.