HEWLETT PACKARD

HP 8562A/B High Performance Portable Spectrum Analyzer

Operation Verification Software

Revision B.00.00

Includes Options 001 and 026

Serial Numbers

This manual applies directly to analzers with the following serial number prefixes:

HP 8562A: 2805A
HP 8562B: 2809A

Manual Part Number 08562-90039
Microfiche Part Number 08562-90040
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1212 Valley House Drive, Rohnert Park, CA 94928-4999

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HOW TO USE THIS MANUAL

Where to Start

If you have just received the HP 8562A/B Operation Verification Software and want to get ready to use it for the first time:

Read Chapter 1, "Introducing the HP 8562A/B Operation Verification Software", for an introduction to the software and its capabilities. Focus especially on the equipment necessary to perform each Operation Verification test.

Read Chapter 2, "Preparation For Use", and follow its instructions for loading the program. Carefully read the Program Operation section.

Skim Chapter 3, "Menu Softkeys", to familiarize yourself with the different softkey functions.

Refer to Chapter 4, "Test Descriptions" for detailed information on the specification the test is verifying, the related manual performance test, how the test is performed, and important information on using alternate equipment.

Refer to Chapter 5, "Error Messages" if a message beginning with "ERROR:..." is displayed on the computer screen. Appropriate corrective action is explained for each error message.

If the HP 8562A/B Operation Verification Software has been in use:

Use Chapter 3, "Menu Softkeys", as a "quick-reference guide" of program operation.

Refer to Chapter 4, "Test Descriptions", for more information regarding a specific test.

Refer to Chapter 5, "Error Messages", to learn what error was detected and the appropriate corrective action.

Manual Terms and Conventions

Words in this manual that appear in [BRACKETS] refer to the computer's softkeys. Words that appear CAPITALIZED refer either to a key on the computer's keyboard or a jack on a piece of test equipment; the context will make the meaning clear.

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.

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CHAPTER 1

INTRODUCTION TO OPERATION VERIFICATION

1-1. Operation Verification is an automatic performance test designed to give a high confidence level in the operation of the HP Model 8562A/B Portable Spectrum Analyzer in a reasonable time. It performs 80% to 85% of the manual performance tests in less than 60 minutes and is designed to test an instrument operating within a temperature range of 20 to 30 degrees Centigrade. Refer to Table 1-1 for a list of tests performed.

1-2. Passing Operation Verification assures that the spectrum analyzer is performing within the specifications tested. Other results indicate the need to perform the related manual test located in the Installation Manual (HP part number 08562-90007).

1-3. Operation Verification can be used to test the majority of the manual performance tests for a performance verification. Listed in Table 1-2 are the tests not covered.

1-4. Getting Started

1-5. The first step in using this Operation Verification is making sure you have a compatible controller (computer), the proper test equipment, and a printer for a record of the test results. The following paragraphs describe what is needed in the way of a controller, test equipment, and a printer. Once the proper equipment has been determined, proceed to Equipment Connections.

1-6. Controller

1-7. The Operation Verification program requires an HP Model 216, Model 236, or Model 310 computer. Operating systems can be either HP BASIC 2.0 with Extensions 2.1, BASIC 3.0, or BASIC 4.0. At least 250K of free memory is required for the program. The computer can have either single or dual HP-IB busses. Refer to Program Operation for using this program with dual HP-IB busses.

1-8. Test Equipment

1-9. Table 1-1 lists the test equipment required for each test. It is only necessary to have present the test equipment for a particular test in order to run that test. Table 1-3 lists all the equipment required to run all fourteen tests. Some tests, such as 10 MHz Reference Accuracy, can use one of two or three model numbers for a particular equipment type. Refer to Setting HP-IB Addresses for information on selecting the desired model number you wish to use.

NOTE

The validity of the measurements in the Operation Verification program is based in part on the accuracy of the test equipment used to perform the test. Therefore, proper calibration of the test equipment must be verified before instrument operation can be checked using the Operation Verification program.

1-10. The use of a high quality, high frequency test cable is strongly recommended. The high frequency test cable specified in Table 1-3 (HP P/N 8120-4921) was chosen for its ruggedness, repeatability, and low-loss above 18 GHz.

Table 1-1. Tests Performed

Test Number and Test Name	Equipment Required
1. 10 MHz Reference Accuracy	HP 5342A or HP 5343A
2. Calibrator Amplitude Accuracy	HP 8902A or HP 436A or HP 438A HP 8481A or HP 8482A
3. Displayed Average Noise Level	HP 909D
4. RES BW Switching Uncertainty	HP 3335A, HP 8340A or HP 8662/63A
5. RES BW Accuracy/ Selectivity	HP 3335A, HP 8340A or HP 8662/63A
6. Input Attenuator Accuracy	HP 3335A
7. IF Gain Uncertainty	HP 3335A
8. Scale Fidelity	HP 3335A
9. Residual FM	HP 8662/63A or HP 3335A
10. Noise Sidebands	HP 8662/63A or CAL OUTPUT signal
11. Frequency Readout/ Counter Accy	HP 8340A HP 8120-4921
12. Second Harmonic Distortion	HP 8340A HP 8902A or HP 436A or HP 438A HP 8485A or HP 8481A HP 11667B HP 360D (2 required) HP 0955-0306 HP 8120-4921
13. Frequency Response	HP 8340A HP 3335A HP 8902A or HP 436A or HP 438A HP 8485A HP 11667B HP 8120-4921
14. Frequency Span Accuracy	Two HP 8340A's or one HP 8340A and one HP 3335A HP 11667B HP 8120-4921 (2 required)

Table 1-2. Tests Not Performed

Calibrator Frequency Accuracy
Image, Multiple, and Out-of-Band Responses
Pulse Digitization Uncertainty
Third Order Intermodulation Distortion
Gain Compression
1ST LO OUTPUT Amplitude
Sweep Time Accuracy
Residual Responses
IF Input Amplitude Accuracy

Table 1-3. Equipment Summary

HP Model Number	Type of Equipment
HP Model 216 (HP 9816), 236 (HP 9836), or 310	Controller *
HP 3335A	Synthesizer/ Level Generator
HP 8340A	Synthesized Sweeper
HP 8662A/8663A	Synthesized Signal Generator
HP 8902A	Measuring Receiver
HP 436A or HP 438A (Alternate)	Power Meter
HP 5343A	Microwave Frequency Counter
HP 5342A (Alternate)	Microwave Frequency Counter
HP 8485A	Power Sensor (50 MHz to 26.5 GHz)
HP 8482A	Power Sensor (100 kHz to 4.2 GHz)
HP 8481A (Alternate)	Power Sensor (10 MHz to 18 GHz)
HP 11667B	Power Splitter (DC to 26.5 GHz)
HP 360D	4.1 GHz Low Pass Filter (2 required)
HP 909D	50 Ohm Termination
HP 0955-0306	50 MHz Low Pass Filter
HP 8120-4921	High Frequency Test Cable
HP-IB Printer	Miscellaneous Cables and Adapters

* 250K of free memory is required for the test program

1-11. Printers

1-12. All test results are sent to an HP-IB printer. The tests will not run if an HP-IB printer is not available. Virtually any HP-IB graphics workstation printer will will work. This program has been tested using the ThinkJet, HP 2671G, HP 82906A, and HP 9876G.

1-13. Warm-Up Time

1-14. Test Equipment Warm-Up

1-15. Allow sufficient warm-up time for the test equipment as indicated in their individual operating and service manuals.

1-16. HP 8562A/B Warm-Up

1-17. The HP 8562A/B should be allowed to warm-up for at least five minutes before performing the first test. Allow a thirty minute warm-up at 20 to 30 degrees Centigrade before performing the Frequency Response test, since the preselector is not peaked during this test. If you start performing "All Tests" after a five-minute warm-up, the spectrum analyzer will have warmed-up for thirty minutes before starting the Frequency Response test.

1-18. Equipment Connections

1-19. Controller Setup

1-20. For the HP Model 216 or Model 236 Computer, set up the computer following the instructions in Chapter 1, "Computer Installation", in the BASIC Operating Manual (HP Part Number 09826-90000). For the HP Model 310 Computer, set up the computer following the instructions in the Configuration Reference Manual (HP Part Number 98561-90020) for Series 300 computers.

1-21. HP-IB Cables

1-22. All HP-IB-controlled test equipment should be connected to the controller's internal HP-IB bus (Select Code 7). If the controller has only one HP-IB bus, also connect the HP 8562A/B to this bus. If the controller has dual HP-IB busses, connect the HP 8562A/B to the second HP-IB bus (typically Select Code 8).

1-23. 10 MHz Reference

1-24. The 10 MHz REF IN/OUT on the HP 8562A/B should be connected to the FREQUENCY STANDARD EXT of the HP 8340A(s) and the 40/N MHz REF INPUT of the HP 3335A. To streamline the tests, also connect the 10 MHz REF IN/OUT to the 10 Hz - 500 MHz input of the HP 5343A or HP 5342A Microwave Frequency Counter. DO NOT connect the 10 MHz REF IN/OUT to the external frequency reference input of the HP 8663A; doing so will invalidate the Noise Sidebands test results.

1-25. Test Setups

1-26. The test setup for each test is given in the TEST DESCRIPTION chapter. The program will prompt the operator to make an equipment connection if the program cannot verify a proper connection.

NOTE

When connecting signals from the HP 8340A Synthesized Sweeper to the test setup, it is necessary to use a high frequency test cable with minimum attenuation to 22 GHz. HP Part Number 8120-4921 is recommended for it ruggedness, repeatability, and low-loss above 18 GHz.

CHAPTER 2

PREPARATION FOR USE

2-1. Loading the Program

2-2. Load the BASIC language into the computer. Possible language options are:

BASIC 2.0 and Extensions 2.1
BASIC 3.0 or 4.0 which must include the following binaries:
- MAT 3.0 or 4.0
- IO 3.0 or 4.0
- GRAPH 3.0 or 4.1
- PDEV 3.0 or 4.0
- HPIB 3.0 or 4.0
- MS 3.0 or 4.0

2-3. For configuration instructions, refer to the BASIC Operating Manual. Next, insert the disc containing the Operation Verification software and type:

LOAD "VERIFY_62",1

and press the EXECUTE key (Series 200 computer) or the RETURN key (Series 300 computer). The software will load and begin to run.

2-4. Program Operation

2-5. The Operation Verification program has three menus; the Conditions Menu, the Test Menu, and the Sensor Utilities Menu, which is accessed from the Conditions Menu. Program operation is controlled through a combination of softkeys and user prompts. Some prompts, primarily in the Conditions and Sensor Utilities Menus, require keyboard entries. Terminate keyboard entries with either the RETURN or ENTER key. Most prompts, however, tell the user what to do next or provide informational messages.

2-6. If the message "(any key)" follows a prompt, pressing any key on the keyboard will cause the program to continue. If the message "(any key or 'Q' to quit)" follows a prompt, pressing any key except "Q" will cause the program to continue. Pressing "Q" will terminate the current procedure at the next most logical point.

2-7. Conditions Menu

2-8. The first menu screen is the Conditions Menu. There is a pointer along the left edge of the screen. This pointer may be moved by either the knob (if one is present) or the up and down arrow keys. Notice that this is a two-page menu; moving the pointer below the last entry on the first page will bring up the second page. Similarly, moving the pointer above the first entry on the second page will bring up the first page. The two pages of the Conditions Menu have a four-line overlap; the last four lines of page one appear as the first four lines of page two.

2-9. Test Record Header Information

2-10. The information in the first six entries of this menu will be printed out as part of the Operation Verification Test Record. The spectrum analyzer has its model number and serial number stored in memory. The program queries these numbers via HP-IB and displays them. If the HP 8562A/B does not respond at the address listed under HP-IB Addresses, or no address is listed, a message will appear where the model and serial numbers are normally displayed.

2-11. The program also queries the time and date from the computer. If a Series 200 computer is used, it might be necessary to reset the time and date; Series 300 computers have a built-in real-time clock.

2-12. Entries for Operator, Test Conditions, and Other Comments is optional; blank spaces will be provided on the Test Record if no entry is made. To make or change an entry, move the pointer to the line where the entry is to be made or changed. Press [Change Entry] and type in your new entry. Entries for Operator, Test Conditions, and Other Comments can be up to 37 characters long, but only the first 25 characters of the Operator entry will be printed on the Test Record.

2-13. System mass storage file location

2-14. Cal Factor data for several different power sensors and a customized set of conditions may be stored on disc. The mass storage unit specifier (msus) for the disc containing this information should be entered as the System mass storage file location. Refer to the BASIC Operating Techniques Manual for information on the syntax of the msus.

2-15. The Operation Verification program disc comes write-protected from the factory. If you would like to use this disc to store your power sensor and conditions data files, it will be necessary to remove the write-protect mechanism.

2-16. Power Sensors

2-17. The Operation Verification program supports three different models of power sensors, but only two models are necessary to run all the tests. The HP 8481A and HP 8482A can be used interchangeably. The HP 8485A is necessary to perform the Frequency Response test. Refer to Sensor Utilities for more information regarding storing, viewing, editing, and purging Cal Factor data for power sensors.

2-18. To select a particular sensor of a certain model number, move the pointer to the desired model number and press [Change Entry]. Enter the last five digits of the power sensor's serial number (i.e. the serial number suffix). The program will check to see that a data file containing the Cal Factor data for that particular sensor exists.

2-19. A "WARNING" message will be displayed if the program could not find a data file for the sensor. If this occurs, check that the System mass storage file location specifies the disc where the power sensor data resides. If the System mass storage file location is correct, the Cal Factor data for that particular sensor has not been stored. Refer to Sensor Utilities Menu for more information.

2-20. Setting HP-IB Addresses

2-21. The last eleven lines of the Conditions menu are for selecting the HP-IB addresses of the test equipment the Operation Verification program will use. It is not necessary to use all the test equipment listed; some of the model numbers listed are "alternates". Table 1 lists the test equipment required for each test and Table 3 lists the allowable model numbers for a particular type of test equipment.

2-22. Entering a 0 as a test equipment address will result in that model number being not available ("NA" is displayed in the address field). Enter a 0 for the address of each piece of test equipment that is not available; this will minimize confusion later.

2-23. Enter the address for each piece of test equipment which is available, including the HP 8562A/B. Addresses must include both the select code of the bus to which the equipment is connected followed by the equipment's address on that bus. For example, if the HP 8902A is at address 14 on a bus with a select code of 7, enter an address of 714 If the 8902A were on a bus with a select code of 12, you should enter an address of 1214.

2-24. A question mark ("?") next to an HP-IB address indicates that the address has not been checked to verify a response. An asterisk ("*") next to an HP-IB address indicates that the address was checked and that address responds. If there is neither an asterisk or a question mark next to an address, the address has been checked and no response was detected.

2-25. Storing and Loading the CONDITIONS File

2-26. The information in the Conditions Menu may be stored for future use by pressing [Store Conds]. A file named CONDITIONS will be created on the disc specified by the System mass storage file location.

2-27. When running the Operation Verification program in the future, set the System mass storage file location to read the disc where the CONDITIONS file is located and press [Load Conds]. If the CONDITIONS file resides on the default System mass storage file location, the CONDITIONS file will be loaded automatically the next time the program is run.

2-28. The default System mass storage file location is computer-dependent. For the Model 216 (HP 9816) and the Model 310 it is :,700,1. For the Model 236 (HP 9836) it is :INTERNAL,4,0.

2-29. Getting to the Test Menu

2-30. Once all the necessary items in the Conditions Menu have been selected, you can select the tests to be run by pressing [Test Menu] Before the Test Menu is displayed, several things occur; the appropriate power sensor data files are loaded, the HP-IB is checked for a response at each address, the HP 8562A/B serial and model number are queried, and a reference level calibration is performed. Refer to Test Menu for more details on running the tests.

2-31. If a printer is not found, the Conditions Menu will be displayed again instead of the Test Menu. This is because all test results must be sent to the printer; without a printer, the tests cannot run.

2-32. Verifying the HP-IB

2-33. To check what test equipment responds on the HP-IB, press [Verify Bus]. This check only verifies that there is a response at the address listed; it cannot tell that a particular piece of equipment is at a particular address. This is useful for verifying HP-IB connections without going to the Test Menu.

2-34. Querying the HP 8562A/B Serial Number

2-35. The Operation Verification program automatically queries the HP 8562A/B serial and model number on three occasions: at program initiation, when loading the CONDITIONS file, and when going to the Test Menu. If it is necessary to query the analyzer's serial and model numbers at any other time, press [Query DUT S/N]. This can be helpful when testing several HP 8562A/Bs without having to re-load the CONDITIONS file or re-start the program.

2-36. Power Sensors

2-37. To create, edit, view, or purge power sensor Cal Factor data files, press [Sensor Utils]. This will bring up the Sensor Utilities Menu. Refer to Sensor Utilities Menu for more information.

2-38. Exiting the Operation Verification Program
Press [Exit Program] to exit the Operation Verification program.

2-39. Dual-Bus Operation

2-40. The Operation Verification program can be used on a dual-HP-IB-bus system, such as the Microwave Test Set (MTS). In the MTS, all the test equipment is connected to the HP-IB at select code 7 and the device under test (the HP 8562A/B, in this case) is connected to the HP-IB at select code 8.

2-41. To run this program in a dual-bus configuration, enter equipment addresses as described in Setting HP-IB Addresses above, making sure that each address properly identifies the select code of the bus to which it is connected. Program operation is the same as when a single-bus configuration is used.

2-42. Sensor Utilities Menu

2-43. The Operation Verification program needs to know the Cal Factors of each power sensor it uses. The Sensor Utilities Menu is used to create, edit, view, and delete the data files containing the Cal Factors for each power sensor. The power sensor data filenames include the last five digits of the power sensor serial number, as indicated below:

For HP 8481A Power Sensors, the filename is: SEN81NNNNN
For HP 8482A Power Sensors, the filename is: SEN82NNNNN
For HP 8485A Power Sensors, the filename is: SEN85NNNNN
Where "NNNNN" are the last five digits of the power sensor serial number (i.e. the serial number suffix).

Note that the first two digits in the filename correspond to the last two digits of the power sensor model number.

2-44. All power sensor data files available on the System mass storage location file are listed upon entering the Sensor Utilities Menu.

2-45. Adding a Power Sensor Data File

2-46. To add a new power sensor data file, press [Add File], and enter the power sensor's model number as requested. An error message will be displayed if there is no disc at the current System mass storage file location.

2-47. When prompted for the power sensor's serial number, enter only the last five digits (the serial number suffix). You will then be prompted for a Cal Factor frequency and then for the Cal Factor itself. These frequency/ Cal Factor pairs do not need to be entered in order of increasing frequency; the program inserts the pairs in their proper place. All frequencies entered should be in MHz.

2-48. A 50 MHz Cal Factor must be entered in order to calibrate the power sensor. Some power sensors do not include a 50 MHz Cal Factor on their chart or calibration record; it is listed as part of the Calibration Procedure on the case of the power sensor.

2-49. If a mistake is made in entering a Cal Factor, enter the frequency of the erroneous Cal Factor at the next frequency prompt. Enter the correct Cal Factor at the next prompt. If the frequency was in error, enter the erroneous frequency at the next frequency prompt and enter a zero for the Cal Factor. This will delete that frequency point.

2-50. Once all Cal Factor data for a power sensor is entered, enter an "S" at the next frequency prompt. The power sensor data will then be stored on disc.

2-51. Viewing and Editing a Power Sensor Data File

2-52. Press [View/ Edit] to view or edit a power sensor data file. Only data files listed on the screen can be viewed or edited. If a file was created but the data was not stored, the filename will be listed, but there will be no data to view or edit.

2-53. To change the Cal Factor at a particular frequency, enter that frequency at the frequency prompt and then enter the new Cal Factor. To delete a frequency/ Cal Factor pair, enter the frequency of the pair to be deleted and enter a Cal Factor of zero. To add a frequency/ Cal Factor pair, enter the new frequency at the frequency prompt and the new Cal Factor.

2-54. Deleting a File

2-55. Press [Delete File] to eliminate one of the files listed. At the prompt, enter the filename exactly as it appears on screen. You will be asked for confirmation to delete the file.

2-56. Changing the System Mass Storage File Location

2-57. To add, edit, or view power sensor data on a disc other than the one currently specified by the System mass storage file location, press [System File]. Enter the msus of the new System mass storage file location. All the power sensor files residing on that disc will be listed. Upon returning to the Conditions Menu, the System mass storage file location will be the one set in the Sensor Utilities Menu.

2-58. Listing Available Power Sensor Data Files

2-59. Press [List Files] for a list of all the power sensor data files on the currently specified System mass storage file location.

2-60. Returning to the Conditions Menu

2-61. Press [Cond Menu] to return to the Conditions Menu.

2-62. Test Menu

2-63. The Test Menu displays all the tests which can be performed by the Operation Verification program. Tests can be run in any of five different modes:

All Tests - Runs all fourteen tests in the sequence shown on screen
Single Sequence - Runs a user-defined sequence of tests once
Single Test - Runs one test once
Repeat Sequence - Runs a user-defined sequence of tests until the testing is aborted
Repeat Test - Runs a single test until the testing is aborted

2-64. If the HP-IB controlled equipment for a given test does not respond over HP-IB, that test will be flagged "MISSING ETE" (missing electronic test equipment). These tests cannot be run and, if they are included as part of a sequence (i.e. All Tests, Single Sequence, or Repeat Sequence), they will be ignored. See List Equipment.

2-65. Prompts to make equipment connections are displayed on the computer screen. Most tests check equipment connections and will only prompt the operator if a misconnection is detected.

2-66. If more than one power meter or the measuring receiver and one of the power meters are present, the program will ask which model to use as the power meter. Enter the model number without the alphabetic character (i.e. enter "8902" for an HP 8902A). Similarly, if both frequency counters are present, the program will ask which counter to use. Again, enter the model number without the alphabetic character.

2-67. The test currently being run and its test number is indicated in the screen title block of the HP 8562A/B.

2-68. All Tests

2-69. To run all fourteen tests in the sequence shown, press [All Tests]. The pointer will point to the test currently being run. All Tests can be run in less than sixty minutes.

2-70. Three softkeys will be displayed when running All Tests. Press [ABORT TEST] to abort the current test and continue with the next test. Press [ABORT SEQUENCE] to abort the All Test mode. Pressing [Restart] will abort and restart the current test. If the HP 8562A/B is in the middle of a sweep, no action will be taken until the sweep has been completed.

2-71. Single Sequence

2-72. This mode can be used to perform a subset of the tests, to run a particular test a specified number of times, or to run all fourteen tests in a different sequence than All Tests provides. After pressing [Single Sequenc(e)], you will be prompted for a test number. The sequence is displayed after each prompt. Up to 25 test numbers may be entered (test number duplication is permitted). Enter a zero to terminate building the sequence and to begin testing.

2-73. If an error was made in entering the sequence, enter a zero at the next prompt and press [ABORT SEQUENCE]. You can now press [Single Sequenc(e)] and enter the correct sequence.

2-74. The [ABORT TEST], [ABORT SEQUENCE], and [Restart] softkeys work the same as in the All Test mode.

2-75. Single Test

2-76. Pressing [Single Test] will run the test the pointer is currently pointing to. Once the test is running, pressing [Restart] will abort and restart the test.

2-77. Repeat Sequence

2-78. The Repeat Sequence mode can be used to perform a user-defined set of tests repeatedly until the sequence is aborted. For example, if the desired sequence is 6,7,8,6,7,8,6,7,8,..., press [Repeat Sequenc(e)] and enter in a sequence of 6,7,8. When the last test of this sequence has been completed, the sequence will be repeated.

2-79. The [ABORT TEST], [ABORT SEQUENCE], and [Restart] softkeys work the same as in the All Test mode.

2-80. Repeat Test

2-81. The Repeat Test mode is used to run a single test indefinitely. The pointer defines the test to be repeated. Testing can be halted only by pressing [ABORT REPEAT]. Pressing [ABORT TEST] will abort and restart the test.

2-82. Calibrate Power Sensor

2-83. The Operation Verification program keeps track of which power sensor is being used currently and how much time has elapsed since it was last calibrated. The program will prompt the user to recalibrate the power sensor if more than two hours has elapsed since it's last calibration. Also, if the power sensor has just been changed, the new power sensor must be calibrated.

2-84. If there has been a large change in the ambient temperature, or improved power meter accuracy is desired, it is advisable to recalibrate the sensor more often that the program would otherwise require. To do this, press [Cal Sensor] Follow the instructions on the computer screen to calibrate the power sensor.

2-85. List Equipment

2-86. To obtain a list of the required equipment to run a particular test, move the pointer to the desired test and press [List Equip]. All HP-IB controlled equipment and passive devices except cables and adapters required for the selected test will be listed. If a test is flagged "MISSING ETE" but it is suspected that all the test equipment is present, press [List Equip] to see what equipment is needed and return to the Conditions Menu to verify that that equipment is present.

2-87. Returning to the Conditions Menu

2-88. Press [Cond Menu] to return to the Conditions Menu from the Test Menu.

2-89. Test Results

2-90. At the end of each test, a "PASS", "SHORT PASS" or "MEASUREMENT IS OUT OF TOLERANCE" message will be printed and displayed next to the test on the computer display.

2-91. PASS indicates that the test was fully completed and all measurements were within the specification limits.

2-92. SHORT PASS indicates that the test was abbreviated, usually due to equipment limitations, but the measurements made were within the specification limits. Not all tests can be performed in an abbreviated manner. The meaning of SHORT PASS is different for each test; refer to the Test Descriptions chapter for more detail.

NOTE

A SHORT PASS is sufficient for passing Operation Verification alone. If Operation Verification is used as part of a performance verification, all tests must yield a PASS result.

2-93. MEASUREMENT IS OUT OF TOLERANCE indicates that one or more of the measurements made during the test was found to be outside of the specification limits. If the data is shown in tabular form, the symbol "< < < <" will be placed next to the data which was found to be out of tolerance. In the event of a "MEASUREMENT IS OUT OF TOLERANCE" condition, it is recommended that the related manual performance test be performed to verify the out of tolerance condition. The Test Description chapter lists the related performance test for each operation verification test.

NOTE

As a change of the results for each test is expected over a period of time, Hewlett-Packard warrants only the specification range and not the repeatability of the data for any given specification.

MENU SOFTKEYS

3-1. This chapter provides a brief description of each softkey in each menu. For more detailed information, refer to the corresponding menu descriptions in the Program Operation chapter. The order of softkeys shown below is not necessarily the same as what appears on the computer display; the order will be different depending upon whether a Series 200 or Series 300 computer is used.

3-2. Conditions Menu

[Test Menu] Displays the Test Menu. The Test Menu allows tests to be run once, repeatedly, or in a user-defined sequence. Refer to Test Menu.

[Load Conds] Loads the CONDITIONS file from the disc specified by the System mass storage file location.

[Sensor Utils] Displays the Sensor Utilities Menu. The Sensor Utilities Menu allows viewing, editing, and adding of power sensor data files. Refer to Sensor Utilities Menu.

[Change Entry] Permits changing a Conditions Menu entry, indicated by the pointer along the left edge of the computer display. Press the RETURN or ENTER keys to terminate an entry.

[Verify Bus] Checks each of the HP-IB addresses listed for a response. Verify Bus does not verify that a particular piece of equipment is at a particular address.

[Query DUT S/N] Queries the serial number and model number of the HP 8562A/B over HP-IB.

[Store Conds] Stores the present set of conditions in the CONDITIONS file on the disc specified by the System mass storage file location.

[Exit Program] Exits the Operation Verificaton program.

3-3. Sensor Utilities Menu

[View/Edit] Allows user to view and edit power sensor data files.

[Add File] Creates a new power sensor data file.

[Delete File] Deletes a power sensor data file. User is asked for confirmation before deletion takes place.

[List Files] Lists all power sensor data files on the disc currently specified by the System mass storage file location.

[System File] Allows user to change the currently specified System mass storage file location.

[Cond Menu] Returns to the Conditions Menu.

3-4. Test Menu

[All Tests]	Runs all fourteen tests listed in the order shown.
[Single Sequenc(e)]	Allows entry of a sequence of tests and runs this sequence once.
[Single Test]	Runs the test indicated by the pointer once.
[Repeat Sequenc(e)]	Allows entry of a sequence of tests and runs this sequence repeatedly until testing is aborted.
[Repeat Test]	Runs the test indicated by the pointer repeatedly until testing is aborted.
[Cal Sensor]	Allows user to recalibrate the currently-selected power sensor and resets the internal "time-since-last-calibrated" clock.
[List Equip]	Lists the equipment necessary for the test indicated by the pointer.
[Cond Menu]	Returns to the Conditions Menu

CHAPTER 4

TEST DESCRIPTIONS

The following test descriptions list the Specifications, Related Performance Test, Test Description, and Test Setup for each test performed by the Operation Verification program. Operation Verification is designed to test an HP 8562A/B Spectrum Analyzer operating within a temperature range of 20 to 30 degrees Centigrade.

4-1. 10 MHz Reference Accuracy

Specification

Frequency: $< \pm 4 \times 10^{-6}$/year

Related Performance Test

10 MHz Reference Output Accuracy

Test Description

The frequency of the 10 MHz REF IN/OUT of the spectrum analyzer is counted by the Microwave Frequency Counter and is compared to the specification.

Test Setup

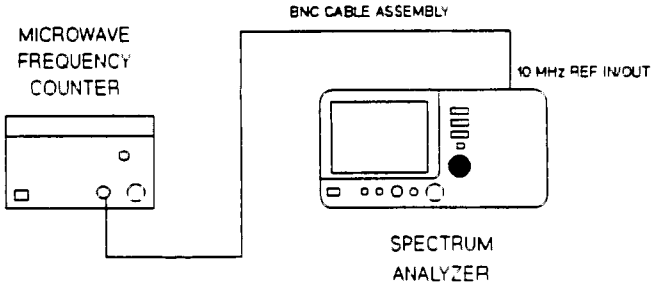

Figure 4-1. 10 MHz Reference Accuracy Test Setup

4-2. Calibrator Amplitude Accuracy

Specification

Amplitude: −10 dBm ± 0.3 dB

Related Performance Test

Calibrator Amplitude and Frequency Accuracy

Test Description

The amplitude of the CAL OUTPUT signal is measured using a power sensor and either the measuring receiver or the power meter. The measured amplitude is compared to the specification.

Test Setup

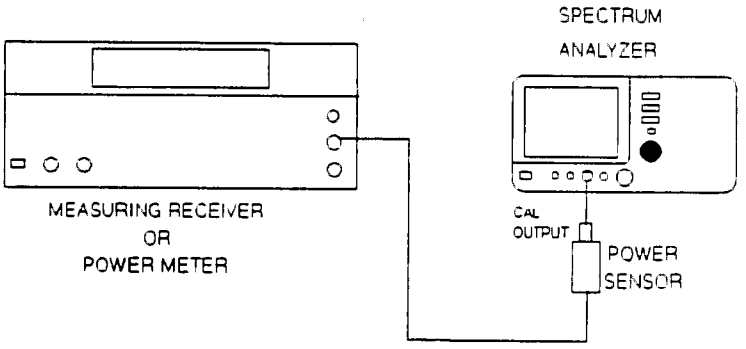

Figure 4-2. Calibrator Amplitude Accuracy Test Setup

4-3. Displayed Average Noise Level

Specification:

With no signal at input, 100 Hz resolution bandwidth, 1 Hz video bandwidth, and 0 dB input attenuation:

Frequency Range	Noise Level
10 kHz	-90 dBm
100 kHz	-100 dBm
1 MHz to 2.9 GHz	-121 dBm
2.9 GHz to 6.46 GHz	-121 dBm
6.46 GHz to 13.0 GHz	-110 dBm
13.0 GHz to 19.7 GHz	-105 dBm
19.7 GHz to 22.0 GHz	-100 dBm
Option 026:	
19.7 GHz to 26.5 GHz	*-100 dBm*

Related Performance Test

Displayed Average Noise Level

Test Description

The INPUT 50 ohms of the spectrum analyzer is terminated with a 50 ohm load. The resolution bandwidth, video bandwidth, and input attenuation are set according to the specification. The displayed average noise level is measured at several points in each band and the results are compared to the specification.

Test Setup

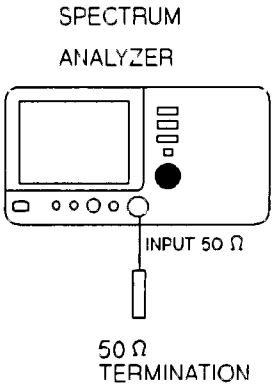

Figure 4-3. Displayed Average Noise Level Test Setup

4-4. RES BW Switching Uncertainty (Including IF Alignment Uncertainty)

Specification

Resolution Bandwidth Switching Uncertainty:
(Referenced to 300 kHz resolution bandwidth)
< ±0.5 dB

IF Alignment Uncertainty:
300 Hz resolution bandwidth < ±0.5 dB
100 Hz resolution bandwidth < ±2.0 dB

Related Performance Test

Resolution Bandwidth Switching and IF Alignment Uncertainty

Test Description

A signal is applied to the input of the spectrum analyzer and the signal amplitude is measured in each resolution bandwidth setting. The amplitude variation with respect to the 300 kHz resolution bandwidth is calculated and compared to the specifications. The 2 MHz RES BW will be checked, if available, but a measurement-out-of-tolerance condition will be flagged only if the analyzer has a serial prefix greater than 2750A.

Test Setup

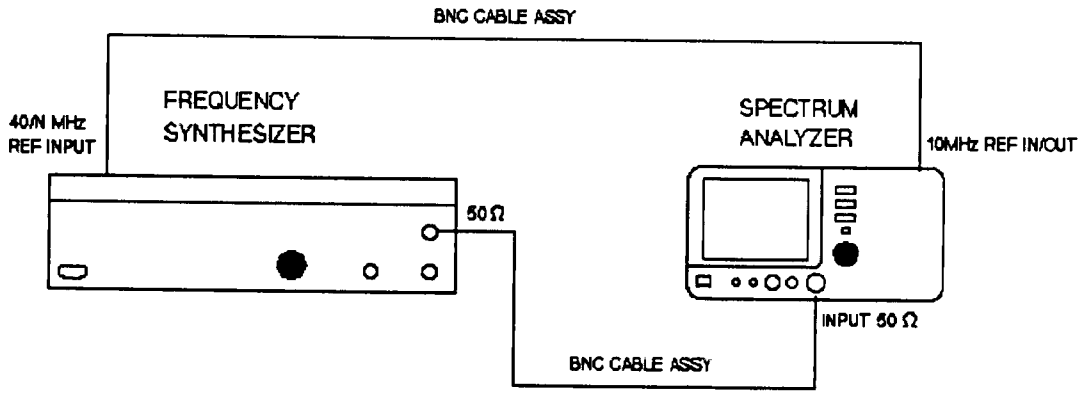

Figure 4-4. RES BW Switching Uncertainty Test Setup

4-5. RES BW Accuracy and Selectivity

Specification

Resolution Bandwidth Accuracy (-3 dB points)	
1 MHz resolution bandwidth	< ±25%
2 MHz resolution bandwidth (serial prefixes greater than 2750A)	< ±25%
300 kHz to 300 Hz resolution bandwidths	< ±10%
100 Hz resolution bandwidth	< ±30%
Resolution Bandwidth Selectivity	
Shape Factor (60 dB/3 dB bandwidth ratio)	< 15:1

Related Performance Test

Resolution Bandwidth Accuracy and Selectivity

Test Description

A signal from the synthesizer is applied to the input of the spectrum analyzer with the analyzer in zero span. For each resolution bandwidth setting, the synthesizer is tuned to find the center frequency of the chosen bandwidth filter. The synthesizer is then tuned above and below the center frequency until the -3 dB and -60 dB points are found. The difference between the -3 dB points determines the 3 dB bandwidth of the chosen resolution bandwidth filter. The 3 dB bandwidth accuracy is calculated and compared to the specification.

The 60 dB bandwidth is determined by taking the difference between the -60 dB points. The ratio of the 60 dB bandwidth to the measured 3 dB bandwidth is calculated and compared to the specification.

The 2 MHz RES BW will be checked, if available, but a measurement-out-of-tolerance condition will be flagged only if the analyzer has a serial prefix greater than 2750A.

Test Setup

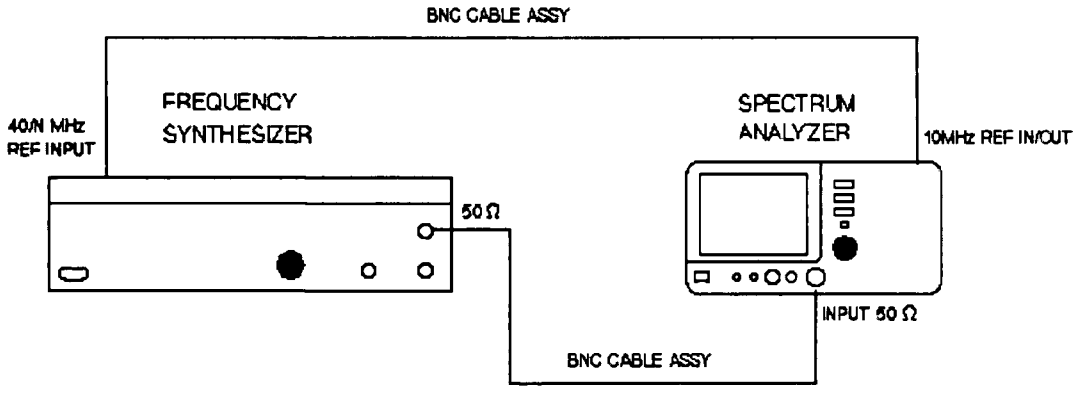

Figure 4-5. RES BW Accuracy and Selectivity Test Setup

4-6. Input Attenuator Accuracy

Specification

20 to 70 dB settings, referenced to 10 dB input attenuation:
1 kHz to 2.9 GHz < ± 0.6 dB/10 dB step, ± 1.8 dB max

Related Performance Test

Input Attenuator Accuracy

Test Description

The output of the HP 3335A is applied to the input of the spectrum analyzer and an amplitude reference is set. The spectrum analyzer's IF gain uncertainty is characterized using the HP 3335A as the reference. The HP 3335A is then reset to a fixed amplitude and the input attenuator is stepped from 10 dB to 70 dB. At each step, the amplitude is measured using the marker functions. The input attenuator accuracy is calculated from the marker value and the characterized IF gain uncertainty. The input attenuator accuracy is then compared to the specification.

Test Setup

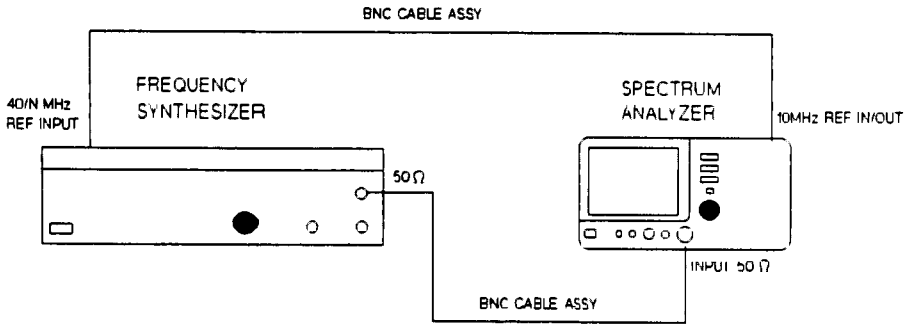

Figure 4-6. Input Attenuator Accuracy Test Setup

4-7. IF Gain Uncertainty

Specification

0 dBm to −80 dBm reference levels with 10 dB input attenuation

< ± 1.0 dB

Related Performance Test

IF Gain Uncertainty

Test Description

A signal source of known amplitude is connected to the spectrum analyzer and an amplitude reference is set. The signal source amplitude is stepped down as the spectrum analyzer is stepped down and the signal amplitude is measured at each point. The amplitude variation with respect to the reference is compared to the specification. The test is performed in 1 dB steps from 0 dBm to −12 dBm reference levels and in 10 dB steps from 0 dBm to −80 dBm reference levels. The 10 dB steps are tested in both log and linear scale factors.

Test Setup

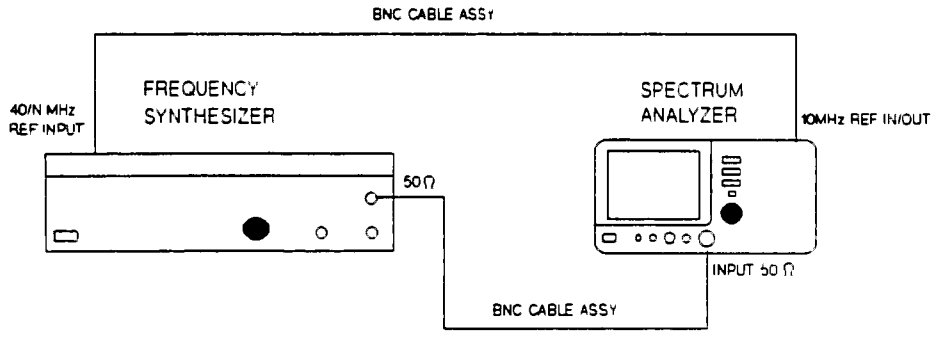

Figure 4-7. IF Gain Uncertainty Test Setup

4-8. Scale Fidelity

Specification

LOG mode: < ± 1 dB/ 10 dB to a maximum of 1.5 dB over 0 to 90 dB range

LINEAR mode: < ± 3% of Reference Level

Related Performance Test

Scale Fidelity

Test Description

A signal source of known amplitude is connected to the spectrum analyzer and the source amplitude is adjusted for a top-screen reference. The source amplitude is stepped down and the displayed amplitude is measured at each step. The scale fidelity is tested in 2 dB steps in 2 dB/ division and Linear, and in 10 dB steps in 10 dB/ division.

The amplitude variation with respect to the reference is measured and compared to the specification. In log mode, the amplitude difference between adjacent steps is calculated and compared to the specification.

Test Setup

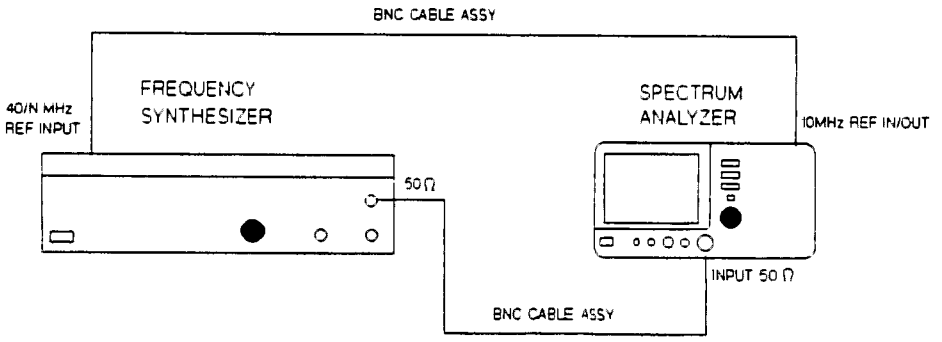

Figure 4-8. Scale Fidelity Test Setup

4-9. Residual FM

Specification

< 50 Hz x N peak-to-peak in 100 ms in zero span

Related Performance Test

Residual FM

Test Description

A clean signal source is connected to the spectrum analyzer and the analyzer's resolution bandwidth is set to 1 kHz. The slope of the signal is measured for use in calculating the residual FM. The source is tuned to the middle of the slope just measured and the peak-to-peak amplitude is measured. The amplitude is multiplied by the slope (in Hz/ dB) to obtain the peak-to-peak residual FM. The residual FM is then compared to the specification

Test Setup

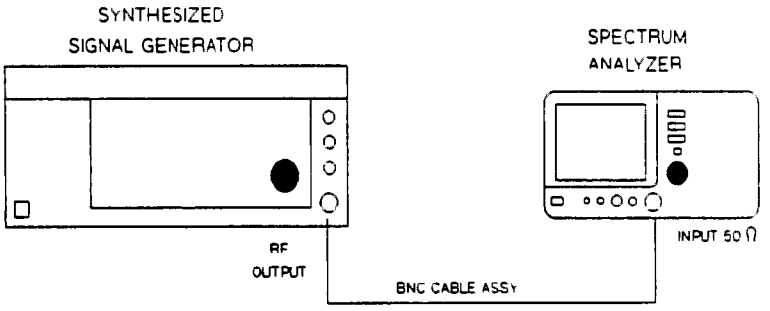

Figure 4-9. Residual FM Test Setup

4-10. Noise Sidebands

Specification

< (−100 + 20 Log N) dBc/ Hz at 30 kHz offset from carrier

Related Performance Test

Noise Sidebands

Test Description

A clean signal source is applied to the input of the spectrum analyzer and the noise level at an offset of 30 kHz above and below the carrier are measured. These sideband levels are compared to the specification.

If the CAL OUTPUT signal is used as the source, the test must pass with at least a 6 dB margin for the test result to be valid. This is due to the phase-coherency of the CAL OUTPUT signal and the internal local oscillators. A Short Pass will occur if the test results are within specification using the CAL OUTPUT signal.

NOTE

Test results will be invalid if the source and the spectrum analyzer utilize the same frequency reference.

Test Setup

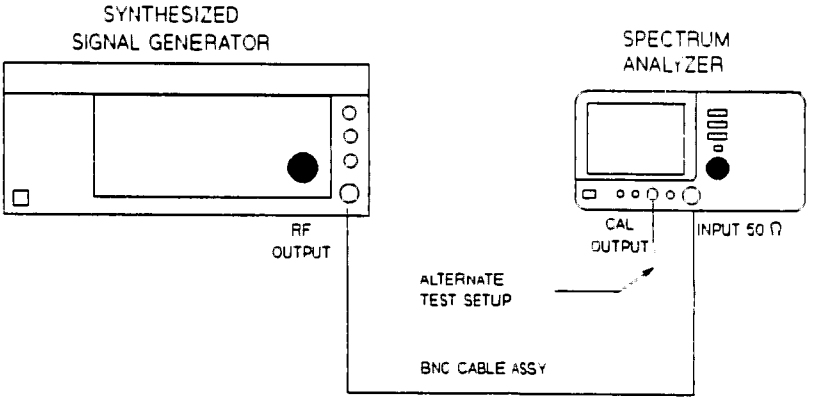

Figure 4-10. Noise Sidebands Test Setup

4-11. Frequency Readout/ Frequency Counter Accuracy

Specification

Frequency Readout

< ±(frequency readout x frequency reference accuracy + 5% of frequency span + 15% of resolution bandwidth + 250 Hz)

Frequency Counter

< ±(marker frequency x frequency reference accuracy + 50 Hz x N + 1 LSD)

Where N is the harmonic mixing mode

Related Performance Test

Frequency Readout Accuracy/ Frequency Count Marker Accuracy

Test Description

The frequency of the synthesized sweeper signal is measured using both the normal marker and the frequency count marker. The "frequency readout x frequency reference accuracy" and "marker frequency x frequency reference accuracy" terms of the specification are zero since the spectrum analyzer provides the frequency reference for the synthesized sweeper. The marker frequencies are compared to the specification.

Test Setup

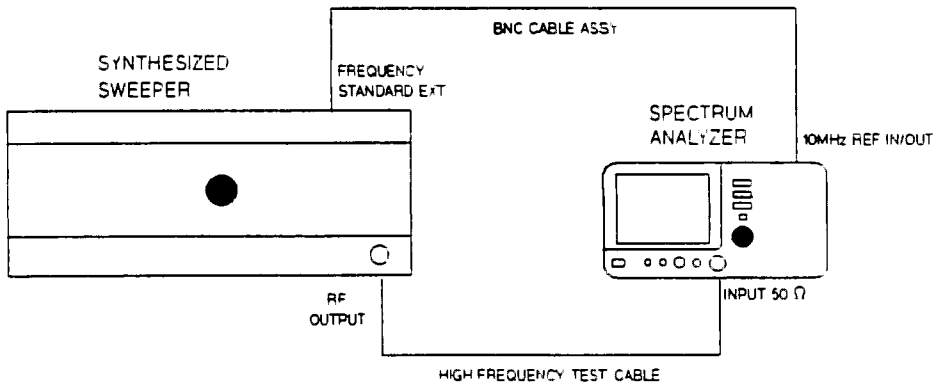

Figure 4-11. Frequency Readout/ Counter Accuracy Test Setup

4-12. 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 *

* Mixer level= input level − input attenuation

Related Performance Test

Second Harmonic Distortion

Test Description

This test consists of two parts; a low band distortion test and a high band distortion test. The low band distortion test can be performed using either the frequency synthesizer or the synthesized sweeper. The high band distortion test can only be performed using a synthesized sweeper. After the low band distortion test has been completed, and a synthesized sweeper is available, the operator may choose whether or not to perform the high band distortion test.

Before making the second harmonic distortion measurement, the filters are checked for sufficient rejection at the second harmonic. A warning message will be displayed if the filter has insufficient rejection. If the filter is OK, the test will proceed. The test is performed at 50 MHz for low band and at 2.95 GHz for high band (these are the fundamental frequencies).

Before checking the second harmonic distortion in high band, a frequency response check is made first to reduce the measurement uncertainty due to the spectrum analyzer's frequency response. Two filters are necessary for the high band distortion test to ensure sufficient rejection at the second harmonic.

A Short Pass will occur if the low band distortion test is within specification and the high band test is not performed.

Test Setup

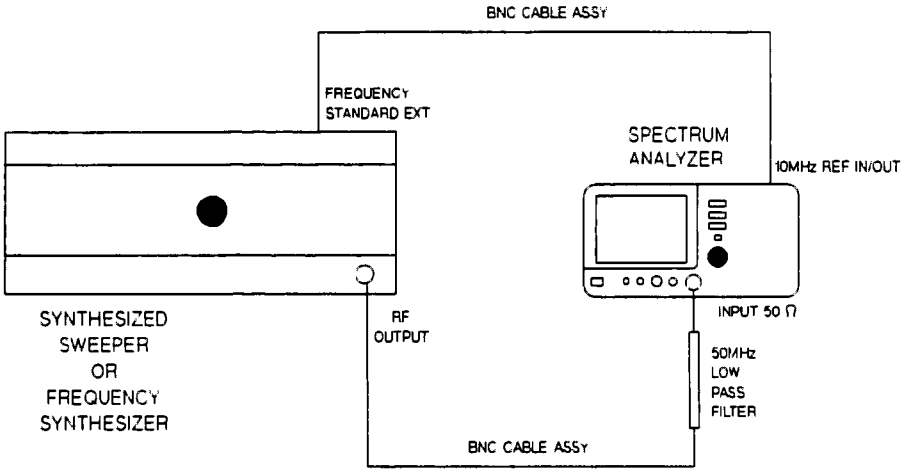

Figure 4-12. Low Band Second Harmonic Distortion Test Setup

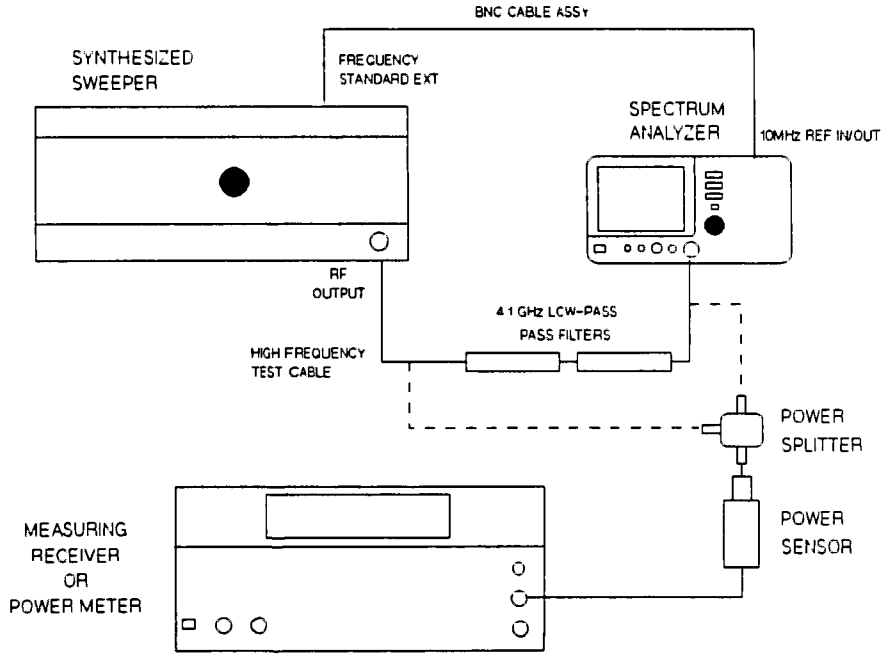

Figure 4-13. High Band Second Harmonic Distortion Test Setup

4-13. Frequency Response

Specification

With 10 dB input attenuation -
Referenced to CAL OUTPUT (300 MHz): < ±5.1 dB

In-Band:

Frequency Range	8562A	8562B
1 kHz to 2.9 GHz	< ±1.2 dB	< ±1.2 dB
2.9 GHz to 6.46 GHz	< ±2.5 dB	< ±2.0 dB
6.46 GHz to 13.0 GHz	< ±3.5 dB	< ±2.5 dB
13.0 GHz to 19.7 GHz	< ±4.0 dB	< ±3.0 dB
19.7 GHz to 22.0 GHz	< ±4.3 dB	< ±4.3 dB
Option 026:		
19.7 GHz to 26.5 GHz	*< ±4.3 dB*	*< ±4.3 dB*

Band Switching Uncertainty: <0.5 dB

Related Performance Test

Frequency Response

Test Description

The spectrum analyzer's frequency response is tested with two setups; one, using the frequency synthesizer, for frequencies between 1 kHz and 50 MHz, and the second, using the synthesized sweeper and a measuring receiver or power meter, for frequencies between 50 MHz and 22 GHz. If the frequency synthesizer is not available, the frequency response from 50 MHz to 22 GHz can still be tested. If the frequency synthesizer is available, but it is not desired to perform the test below 50 MHz, enter a "Q" at the prompt to connect the HP 3335A output to the spectrum analyzer input.

In both parts of this test, a signal of known amplitude is applied to the input of the spectrum analyzer and the analyzer's marker amplitude is read. The frequency response relative to the calibrator frequency (300 MHz) and within a given frequency band is calculated and compared to specification. The band switching uncertainty specification is verified by calculating the band-to-band frequency response. The band-to-band frequency response specification is equivalent to the the sum of the in-band frequency response specifications of the two bands in question and the band switching uncertainty specification.

While the >50 MHz part of the test is running, a graph of frequency response relative to the CAL OUTPUT signal will be plotted on the computer's display. This graph will be dumped to the printer when the test has been completed.

If one of the band-to-band frequency response entries is out-of-tolerance, the "< < < <" symbol will be placed to the right of the row where the out-of-tolerance condition was detected. It will not necessarily be placed directly to the right of the out-of-tolerance entry. Check each entry in that row against the specification (listed in parentheses) to find the entry which is out of tolerance.

A Short Pass will occur if the >50 MHz part of the test is within specification but the <50 MHz part of the test was not performed.

Test Setup

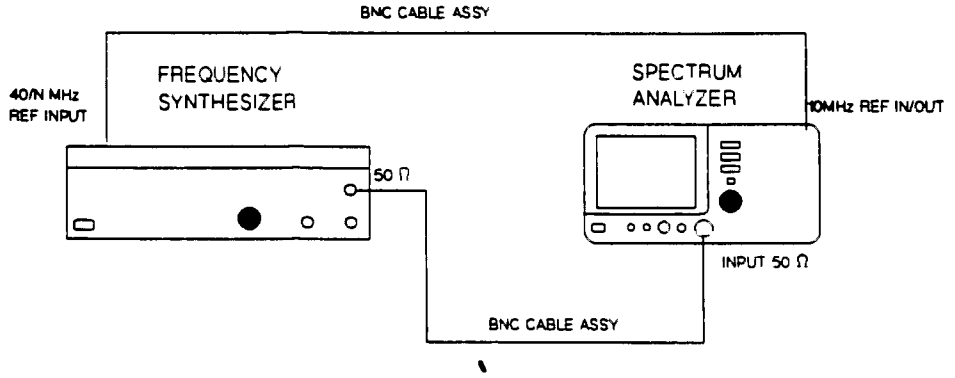

Figure 4-14. Frequency Response Test Setup (< 50 MHz)

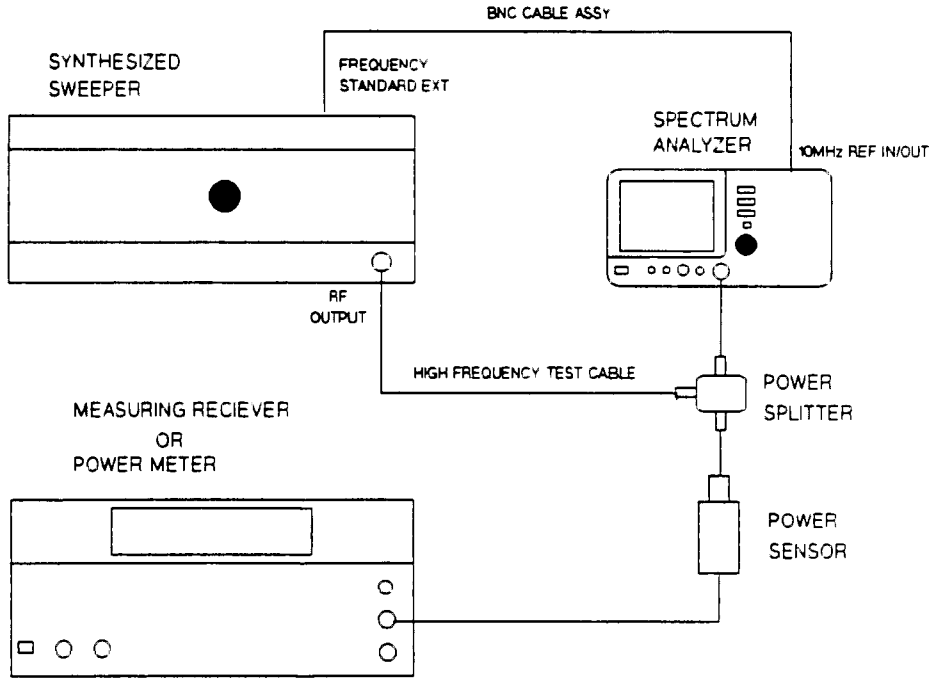

Figure 4-15. Frequency Response Test Setup (50 MHz to 22 GHz)

4-14. Frequency Span Accuracy

Specification

< ± 5%

Related Performance Test

Frequency Span Accuracy

Test Description

Two synthesized sources provide two signals of precise freqeuncy separation. One source is a synthesized sweeper and the second source may be either a second synthesized sweeper or the frequency synthesizer. The frequency separation is measured using the spectrum anlayzer's delta marker function and compared to the specification. The frequency reference for both synthesized sources is provided by the spectrum anlayzer.

Only spans up to 500 MHz will be tested if the frequency synthesizer is used as the second source. The 19.25 GHz span is not tested on HP 8562B Spectrum Analyzers. A Short Pass will occur in either of these two cases if the spans tested are within specification.

Test Setup

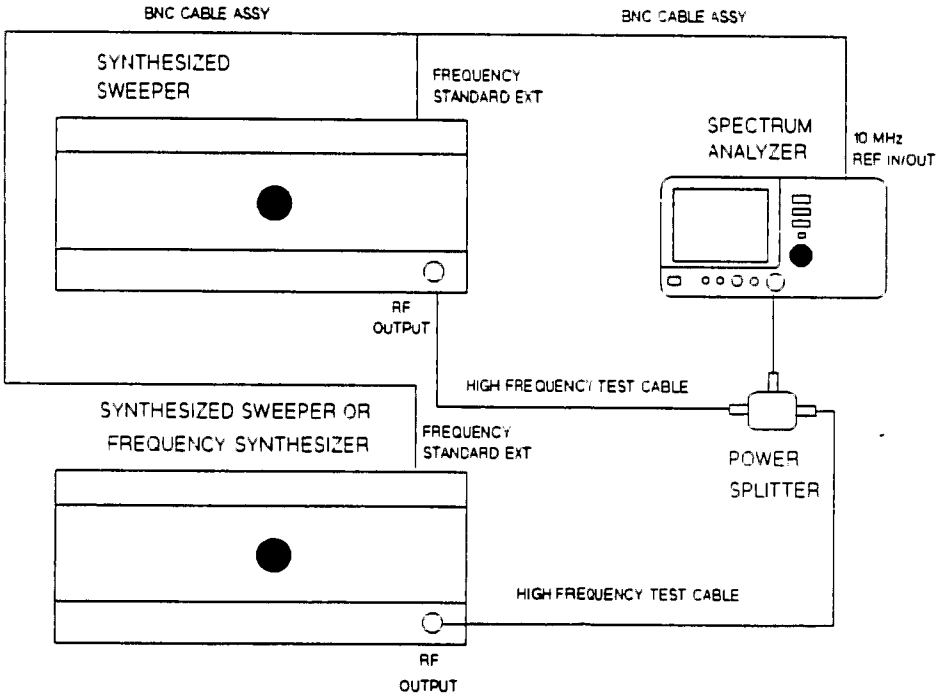

Figure 4-16. Frequency Span Accuracy Test Setup

CHAPTER 5

ERROR MESSAGES

5-1. The HP 8562A/B Operation Verification program displays prompts and error messages on the computer display. Error messages are preceded with "ERROR:". For more information on prompts, refer to the Program Operation chapter.

5-2. The error messages below are listed in three groups; messages beginning with alphabetic characters, messages beginning with numeric characters, and messages beginning with variables such as filenames or instrument model numbers. If an error message cannot be found in one of the first two groups, it probably begins with a variable; consult the variable group.

5-3. The description of each error message also recommends corrective action.

5-4. Error Messages Beginning with Alphabetic Characters

Address must be from 0 to 30 inclusive.

HP-IB addresses must be in the range from 0 to 30. Press any key and enter a new address in this range.

Cal Factor outside of 0 to 150% range entered.

Cal Factor entries must be within this range. Press any key and enter the frequency again and a Cal Factor in the proper range.

Conditions Menu DUT ID disagrees with responding DUT ID.

The model and/or serial number of the HP 8562A/B (DUT) listed in the Conditions Menu does not agree with that of the DUT which is responding over HP-IB. Press any key and follow the instructions in the next three prompts.

Could not set calibrator signal to −10.00 or −10.17 dBm.

While attempting the noise sidebands test using the CAL OUTPUT signal, the amplitude the CAL OUTPUT signal could not be set to one of the values indicated. Check the CAL OUTPUT amplitude and the range of the reference level calibration adjustment.

Counter reads <frequency value> Hz. Check counter setup.

The microwave frequency counter read a frequency far exceeding the specification of the 10 MHz reference. Check the test setup and press any key. The counter will read the frequency once more and assume the value is correct.

Data not accepted, check entry format.

The data just entered was not valid. Press any key and try again, checking for the proper entry format.

File <filename> not found

The filename of the power sensor data file entered could not be found on the currently-specified System mass storage file location. Check the filename and the System mass storage file location.

Insufficient equip. to do test <test number>: <test name>.

The required HP-IB-controlled test equipment for the test indicated is not available. Press any key and choose another test.

Low pass filter(s) don't have at least <value> dB rejection.

The low pass filters are checked for rejection at the second harmonic in the Second Harmonic Distortion test. If insufficient rejection is detected, the part of the test using the tested filter cannot be run.

Maximum cal amplitude < -10 dBm.

Program checked that CAL OUTPUT was connected to INPUT 50 ohms and found that the REF LVL CAL adjustment could not be set for a marker amplitude of > = -10 dBm. Check CAL OUTPUT amplitude and REF LVL CAL adjustment range.

No HP-IB address listed for DUT.

Program attempted to address the HP 8562A/B (DUT) but no HP-IB address was listed for it. Press any key and enter an address for the HP 8562A/B.

No more tests may be linked; enter 0 at next prompt.

When entering a sequence of tests, the sequence string (including commas) cannot exceed 78 characters. Press any key and then a 0 at the next prompt. The testing sequence will begin.

Non-numeric entry other than 'S' entered, or frequency <=0.

When entering a frequency of a frequency/ Cal Factor pair to be added, edited, or deleted, the entry must either be a number > 0 or 'S' to store the current data.

No sensor file found for <sensor model #> S/N <sensor serial #>.

A power sensor data file for the indicated power sensor could not be found on the currently-specified System mass storage file location specifier. Check the sensor's model and serial numbers and the System mass storage file location.

No 8662/63 reference oscillator. Check INT-EXT switches.

No 10 MHz reference oscillator for the HP 8662A/63A was detected. Check the INTernal/ EXTernal frequency reference switches on its rear panel.

Power meter reads <value> dBm.

The power meter has read a value far exceeding the specification of the CAL OUTPUT amplitude; check that power sensor is connected to CAL OUTPUT and press any key. The power will be read once more and assumed to be valid.

Printer not available; cannot perform tests.

All test results are sent to the printer. If a printer is not available, tests cannot be performed.

REF LVL CAL adjustment range < 5 dB.

In checking that the CAL OUTPUT was connected to INPUT 50 ohms, the REF LVL CAL adjustment was found to have insufficient range. Check REF LVL CAL range manually.

Select code <value> does not currently support HP-IB operations.

The address just entered specified a select code which is not an HP-IB interface. Check the address entered and the select code of the appropriate interface.

Sensor serial number must be from 1 to 99999.

The power sensor serial number entered was not in the range indicated. Enter the serial number correctly.

System mass storage file location catalog cannot be read.

Program attempted to read the catalog of the System mass storage file location. Check the msus of the System mass storage file location.

Test number must be be between 0 and 14.

Valid test numbers are in the range 0 and 14 for entering a sequence. Entering a 0 will terminate sequence entry and begin testing sequence. Press any key and enter a valid test number at the next prompt.

Unable to load CONDITIONS file from listed system file location

Program attempted to load the CONDITIONS file from the listed System mass storage file location. Check the msus of the System mass storage file location and the presence of the CONDITIONS file.

Unable to load data from <sensor filename>.

Program found power sensor data file, but could not read the data from the file. Use the Sensor Utilities to delete the file and enter new data.

Unable to obtain catalog from <System mass storage file location>.

The system could not verify that the System mass storage file location entered was available. Check the msus of the System mass storage file location.

Unable to reach power level of <value> dBm

Program was unable to set the source amplitude for a desired power meter reading. Check the test setup.

5-5. Error Messages Beginning with Numeric Characters

8481A Sensor cal data minimum frequency not <= 50 MHz.

Program requires the HP 8481A Power Sensor to have a Cal Factor at or below 50 MHz. Use Sensor Utilities to add a Cal Factor at or below 50 MHz.

8481A Sensor cal data maximum frequency not >= 300 MHz.

Program requires the HP 8481A Power Sensor to have a Cal Factor at or above 300 MHz. Use Sensor Utilities to add a Cal Factor at or above 300 MHz.

8482A Sensor cal data minimum frequency not <= 50 MHz.

Program requires the HP 8482A Power Sensor to have a Cal Factor at or below 50 MHz. Use Sensor Utilities to add a Cal Factor at or below 50 MHz.

8482A Sensor cal data maximum frequency not >= 300 MHz.

Program requires the HP 8482A Power Sensor to have a Cal Factor at or above 300 MHz. Use Sensor Utilities to add a Cal Factor at or above 300 MHz.

8485A Sensor cal data minimum frequency not = 50 MHz.

Program requires the HP 8485A Power Sensor to have a Cal Factor at 50 MHz. Use Sensor Utilities to add a Cal Factor at 50 MHz.

8485A Sensor cal data maximum frequency not >= 22 GHz.

Program requires the HP 8485A Power Sensor to have a Cal Factor at or above 22 GHz. Use Sensor Utilities to add a Cal Factor at or above 22 GHz.

8562A/B Doesn't respond at address listed.

Program attempted to address the HP 8562A/B at the address listed but the spectrum analyzer did not respond. Check the HP-IB connections and the address listed.

8662/63 Error # <error number>.

The HP 8662A/63A generated the error listed. Consult the HP 8662A or HP 8663A manual.

8662/63 Frequency reference out of tolerance.

The HP 8662A/63A frequency reference is out of tolerance. Consult the HP 8662A or HP 8663A manual.

8662/63 Malfunction Origin unknown

The HP 8662A/63A has detected a malfunction. Consult the HP 8662A or HP 8663A manual.

8662/63 Oven not yet warmed up.

The HP 8662A/63A 10 MHz oven oscillator is cold. Allow the oven to warmup.

8662/63 Should be on INTernal reference.

The HP 8662A/63A is in EXTernal frequency reference mode. Set the HP 8662A/63A to INTernal frequency reference.

5-6. Error Messages Beginning with Variables

<filename> file not found.

The file indicated could not be found at the listed System mass storage file location. Check the filename and the System mass storage file location.

<keyboard entry> is a non-numeric entry.

The program expected a numeric entry but did not receive one. Enter a numeric entry.

<number of instruments> instruments have HP-IB addresses of <HP-IB address>.

The indicated number of instruments have all been set to the same HP-IB address. Review the addresses and eliminate the duplicity.

<power meter model number> doesn't read signal to be in -1 +/- 5 dBm range.

The power meter (or measuring receiver) does not read a power level within the range indicated. Check for loose connections.

<source model number> +5 dBm signal not in +5 +/- 5 dBm range.

The source indicated was set for +5 dBm output, but the HP 8562A/B measured the amplitude to be outside the +/- 5 dB range. Check test setup.

<source model number> +5 dBm signal not in -1 +/- 5 dBm range.

The source indicated was set for + 5 dBm output and the source output is fed through a power splitter to the HP 8562A/B. The HP 8562A/B should measure the amplitude to be within 5 dB of -1 dBm (6 dB loss through power splitter). Check test setup.

<source model number> +10 dBm signal not in +10 +/- 8 dBm range.

The source indicated was set for a +10 dBm output and the source output is fed through a low-pass filter(s) to the HP 8562A/B. The HP 8562A/B should measure the amplitude to be within 8 dB of +10 dBm (the filters have some insertion loss). Check test setup.

<source model number> has a cold oven.

The 10 MHz reference oven oscillator has not warmed up yet. Allow to warm up.

<source model number> is unlevelled.

The source indicated has been programmed for an amplitude which results in an unlevelled condition. Check the test setup for loose connections.