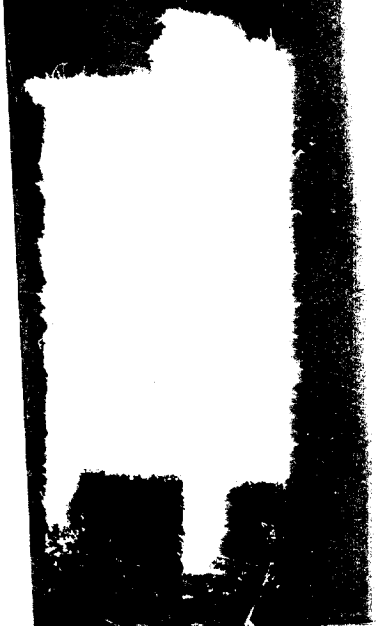
HEWLETT PACKARD

HP 8753D
Network Analyzer



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System Verification and Performance Test Guide

HP 8753D Network Analyzer

HP Part No. 08753-90308
Printed in USA August 1995

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Safety Notes

The following safety notes are used throughout this manual. Familiarize yourself with each of the notes and its meaning before operating this instrument.

Caution	Caution denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, would result in damage to or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.
Caution	Always use the three-prong ac power cord supplied with this instrument. Failure to ensure adequate earth grounding by not using this cord may cause instrument damage.
Warning	**Warning denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.**
Warning	**No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock, do not remove covers.**
Warning	**For continued protection against fire hazard replace line fuse only with same type and rating (F 3A/250V). The use of other fuses or material is prohibited.**
Warning	**This is a Safety Class I product (provided with a protective earthing ground incorporated in the power cord). The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. Any interruption of the protective conductor, inside or outside the instrument, is likely to make the instrument dangerous. Intentional interruption is prohibited.**
Warning	**The opening of covers or removal of parts is likely to expose dangerous voltages. Disconnect the instrument from all voltage sources while it is being opened.**

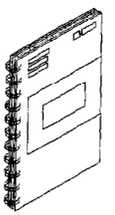
 The instruction documentation symbol. The product is marked with this symbol when it is necessary for the user to refer to the instructions in the documentation.

"CE" The CE mark is a registered trademark of the European Community. (If accompanied by a year, it is when the design was proven.)

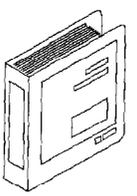
"ISM1-A" This is a symbol of an Industrial Scientific and Medical Group 1 Class A product.

"CSA" The CSA mark is a registered trademark of the Canadian Standards Association.

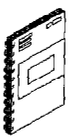
HP 8753D Network Analyzer Documentation Set



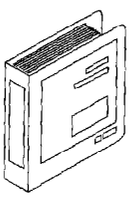
The **Installation and Quick Start Guide** familiarizes you with the HP 8753D network analyzer's front and rear panels, electrical and environmental operating requirements, as well as procedures for installing, configuring, and verifying the operation of the HP 8753D.



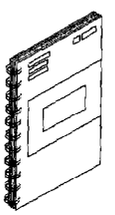
The **User's Guide** shows how to make measurements, explains commonly-used features, and tells you how to get the most performance from your analyzer.



The **Quick Reference Guide** provides a summary of all available user features.



The **Programmer's Guide** provides programming information including: an HP-IB command reference, an HP-IB programming reference, as well as programming examples.



The **System Verification and Test Guide** provides the system verification and performance tests and the Performance Test Record for your HP 8753D network analyzer.

Contents

Figures

System Verification and Performance Tests

How to Test the Performance of Your Analyzer

To obtain the same quality of performance testing that Hewlett-Packard has administered at the factory, you must perform:

- the system verification procedure

AND

- *all* of the performance test procedures.

This quality of performance testing guarantees that the analyzer is performing within *all* of the published specifications. Hewlett-Packard will issue a Certificate of Calibration for your analyzer if two conditions are met:

1. Your analyzer passes all the performed tests.
2. The equipment and standards that you used to perform the tests are traceable to a national standards institute.

Note If you have a particular type of measurement application that does not use all of the analyzer's measurement capabilities, you may ask your nearest Hewlett-Packard Sales and Service Office for a subset of specifications that you want verified. However, this does create a potential for making incorrect measurements, by using a different application than what was specified.

Sections in this Chapter

- **System Verification**
  - Automated Mode
  - Manual Mode
- **Performance Tests**

1. Test Port Output Frequency Range and Accuracy
2. External Source Mode Frequency Range
3. Test Port Output Power Accuracy
4. Test Port Output Power Range and Linearity
5. Minimum R Channel Level
6. Test Port Input Noise Floor Level
7. Test Port Input Frequency Response
8. Test Port Crosstalk
9. Calibration Coefficients
10. System Trace Noise (Only for Analyzers *without* Option 006)
11. System Trace Noise (Only for Analyzers *with* Option 006)
12. Test Port Input Impedance
13. Test Port Receiver Magnitude Dynamic Accuracy
14. Test Port Receiver Phase Dynamic Accuracy
15. Test Port Receiver Magnitude Compression
16. Test Port Receiver Phase Compression
17. Test Port Output/Input Harmonics (Option 002 Analyzers *without* Option 006 only)
18. Test Port Output/Input Harmonics (Option 002 Analyzers *with* Option 006 only)

Performance Test Record

Find and use the appropriate "Performance Test Record" in the following subchapters:

- **Performance Test Record For Analyzers with a Frequency Range of 30 kHz to 3 GHz**
- **Performance Test Record For Analyzers with a Frequency Range of 30 kHz to 6 GHz**

System Verification Cycle and Kit Re-certification

Hewlett-Packard recommends that you verify your network analyzer measurement system every six months. Hewlett-Packard also suggests that you get your verification kit re-certified annually. Refer to *HP 85029B 7 mm Verification Kit Operating and Service Manual* for more information.

Note The system verification procedures DO NOT APPLY to analyzers with Option 075 (75 ohm analyzers).

How to Select the System Verification Procedure

Check to see how the verification kit floppy disk is labeled:

- If the disk is labeled `HP 8753D Verification Data Disk`, proceed with the "HP 8753D Automated Mode System Verification."
- If the disk is labeled `HP 8753 Verification Data Disc`, proceed with the "HP 8753D Manual Mode System Verification" procedure, located later in this chapter.

Note If your verification disk is not labeled `HP 8753D Verification Data Disk`, you may send your HP 85029B 7-mm verification kit to the nearest service center for recertification, which includes a data disk that you can use with the HP 8753D.

HP 8753D Automated Mode System Verification

Equipment Required

Calibration Kit, 7 mm	HP 85031B
Verification Kit, 7 mm	HP 85029B
Test Port Extension Cable Set, 7 mm	HP 11857D
Printer	HP ThinkJet/DeskJet/LaserJet

Analyzer warm-up time: **1 hour**

This system verification consists of three separate procedures:

1. Initialization
2. Measurement Calibration
3. Device Verification

Initialization

1. Connect the equipment as shown in Figure 1-1. Let the analyzer warm up for one hour.

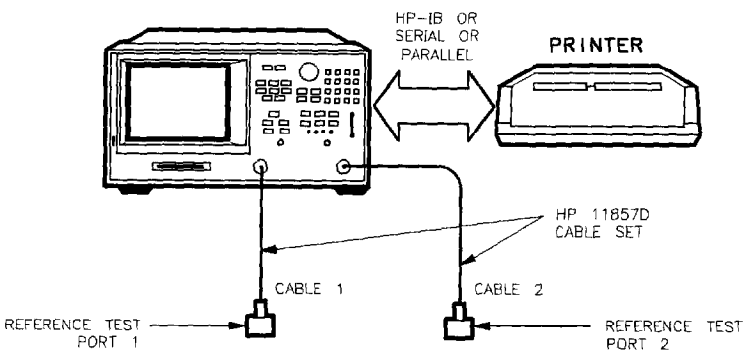


Figure 1-1. System Verification Test Setup

2. While the equipment is warming up, review the "Connector Care Quick Reference" information in the "Service Equipment and Analyzer Options" chapter of the *HP 8753D Network Analyzer Service Guide*. Good connections and clean, undamaged connectors are critical for accurate measurement results.
3. Insert the verification kit disk into the analyzer disk drive.
4. Press (PRESET) (SAVE/RECALL) SELECT DISK INTERNAL DISK.
5. If you want a printout of the verification data for all the devices, press (SYSTEM) SERVICE MENU TEST OPTIONS RECORD ON.

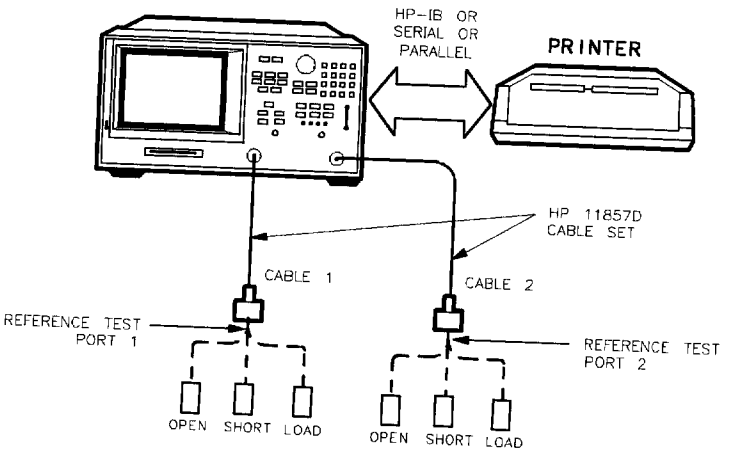
Note If you switch on the record function, you *CANNOT* switch it off during the verification procedure.

6. Position the paper in the printer so that printing starts at the top of the page.
7. If you have difficulty with the printer:
   - If the interface on your printer is HP-IB, verify that the printer address is set to 1 (or change the setting in the analyzer to match the printer).
   - If the interface on your printer is serial or parallel, be sure that you selected the printer port and the printer type correctly (refer to the *HP 8753D Network Analyzer User's Guide* for more information on how to perform these tasks).
8. Press (SYSTEM) SERVICE MENU TESTS SYS VER TESTS EXECUTE TEST .
9. The analyzer displays `Sys Ver Init DONE`, the initialization procedure is complete.

Caution *DO NOT* press (PRESET) or recall another instrument state. You must use the instrument state that you loaded during the initialization procedure.

Measurement Calibration

10. Press (CAL) CAL KIT CAL KIT:7mm RETURN CALIBRATE MENU FULL 2-PORT.
11. Press ISOLATION OMIT ISOLATION ISOLATION DONE.
12. Press REFLECTION.
13. Connect the "open" end of the open/short combination (supplied in the calibration kit) to reference test port 1, as shown in Figure 1-2.



xg614d

Figure 1-2. Connections for Measurement Calibration Standards

14. Press FORWARD:OPEN.
15. When the analyzer finishes measuring the standard, connect the "short" end of the open/short combination to reference test port 1.
16. Press FORWARD:SHORT.
17. When the analyzer finishes measuring the standard, connect the 50 ohm termination (supplied in the calibration kit) to reference test port 1.
18. Press FORWARD:LOAD.
19. When the analyzer finishes measuring the standard, connect the "open" end of the open/short combination to reference test port 2.
20. Press REVERSE:OPEN.
21. When the analyzer finishes measuring the standard, connect the "short" end of the open/short combination to reference test port 2.
22. Press REVERSE:SHORT.
23. When the analyzer finishes measuring the standard, connect the 50 ohm termination to reference test port 2.

24. Press REVERSE:LOAD .
25. When the analyzer finishes measuring the standard, press STANDARDS DONE .

    The analyzer briefly displays COMPUTING CAL COEFFICIENTS.
26. Connect the test port cables as shown Figure 1-3.

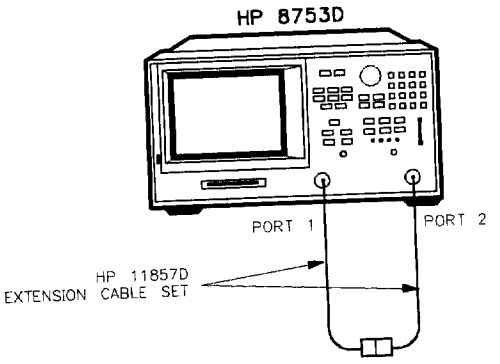


Figure 1-3. Transmission Calibration Setup

27. Press TRANSMISSION FWD TRANS THRU .
28. When the analyzer finishes the measurement, press FWD MATCH THRU .
29. When the analyzer finishes the measurement, press REV TRANS THRU .
30. When the analyzer finishes the measurement, press REV MATCH THRU .
31. When the analyzer displays PRESS 'DONE' IF FINISHED WITH STD(s), press STANDARDS DONE DONE 2-PORT CAL .
32. Press (SAVE/RECALL) SELECT DISK INTERNAL MEMORY RETURN SAVE STATE to save the calibration into the analyzer internal memory.
33. When the analyzer finishes saving the instrument state, press SELECT DISK INTERNAL DISK .

Device Verification

34. Press (SYSTEM) SERVICE MENU TESTS (28) (x1) EXECUTE TEST.

35. At the prompt, connect the 20 dB attenuator (supplied in the verification kit) as shown in Figure 1-4.

36. Press CONTINUE to run the test:

    - If you switched OFF the record function, you have to press CONTINUE after each S-parameter measurement.
    - If you switched ON the record function, the analyzer measures all S-parameters (magnitude and phase) without pausing. Also, the analyzer only displays and prints the PASS/FAIL information for the S-parameter measurements that are valid for system verification.

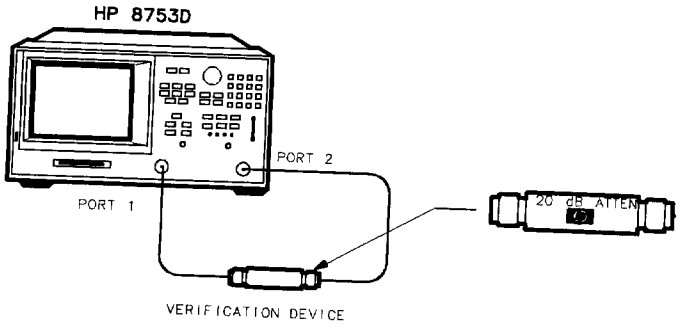


Figure 1-4. Connections for the 20 dB Verification Device

37. When the analyzer finishes all the measurements, connect the 50 dB attenuator (supplied in the verification kit), as shown in Figure 1-5.

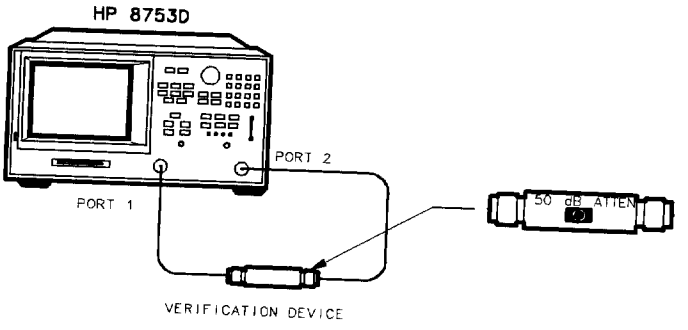


Figure 1-5. Connections for the 50 dB Verification Device

38. Press (↑) (29) (x1) EXECUTE TEST CONTINUE.

39. When all measurements are complete, replace the verification device with the verification mismatch, as shown in Figure 1-6. Be sure that you connect Port A of the verification mismatch to reference test port 1.

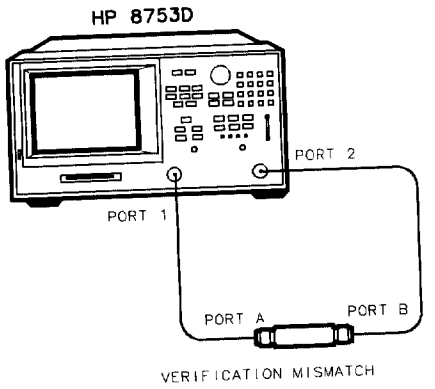


Figure 1-6. Mismatch Device Verification Setup

40. Press RETURN TESTS (30) (x1) EXECUTE TEST CONTINUE.

41. When the analyzer finishes all the measurements, connect the mismatch verification device, as shown in Figure 1-7. Notice that Port B is now connected to reference test port 1.

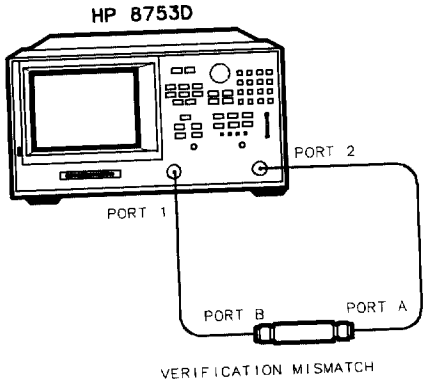


Figure 1-7. Mismatch Device Verification Setup

42. Press RETURN TESTS (31) (x1) EXECUTE TEST CONTINUE.

43. You have completed the system verification procedure when the analyzer displays `Ver Def 4 DONE`.

In Case of Difficulty

1. Inspect all connections. *DO NOT* disconnect the cables from the analyzer test ports. Doing so *WILL INVALIDATE* the calibration that you have done earlier.
2. Press (PRESET) (SAVE/RECALL) SELECT DISK INTERNAL MEMORY RETURN. Using the front panel knob, highlight the title of the full 2-Port calibration that you have done earlier, then press RECALL STATE.
3. Repeat the "Device Verification" procedure.
4. If the analyzer still fails the test, check the measurement calibration as follows:
   a. Press (PRESET).
   b. Recall the calibration by pressing (SAVE/RECALL) SELECT DISK INTERNAL MEMORY RETURN.
   c. Use the front panel knob to highlight the calibration you want to recall and press RECALL STATE.
   d. Connect the short to reference test port 1.
   e. Press (MEAS) S11 (MENU) TRIGGER MENU CONTINUOUS.
   f. Press (SCALE/REF) SCALE/DIV (.05) (x1).
   g. Check that the trace response is 0.00 ± 0.05 dB.
   h. Disconnect the short and connect it reference test port 2.
   i. Press (MEAS) Refl: REV S22(B/R).
   j. Check that the trace response is 0.00 ± 0.05 dB.
   k. If any of the trace responses are out of the specified limits, repeat the "Measurement Calibration" and "Device Verification" procedures.
5. Refer to the "Start Troubleshooting Here" chapter of the *HP 8753D Network Analyzer Service Guide* for more troubleshooting information.

HP 8753D Manual Mode System Verification

Equipment Required

Calibration Kit, 7 mm	HP 85031B
Verification Kit, 7 mm	HP 85029B
Test Port Extension Cable Set, 7 mm	HP 11857D
Printer	HP ThinkJet/DeskJet/LaserJet

Analyzer warm-up time: **1 hour**

This system verification consists of three separate procedures:

1. Initialization
2. Measurement Calibration
3. Device Verification

Initialization

1. Connect the equipment as shown in Figure 1-8. Let the analyzer warm up for one hour.

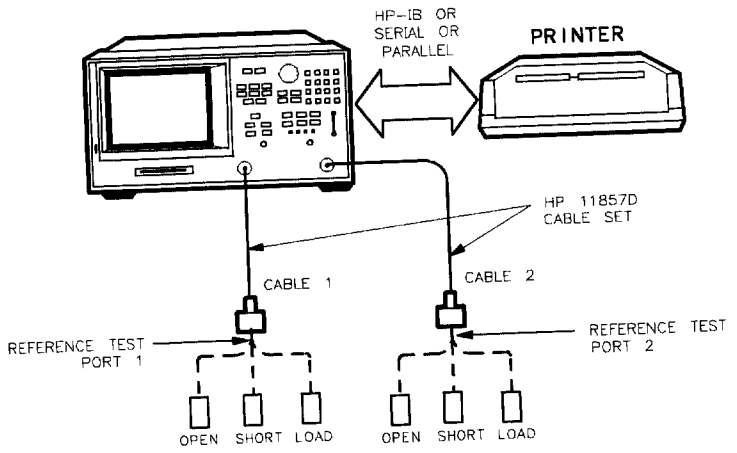


Figure 1-8. System Verification Test Setup

2. While the equipment is warming up, review the "Connector Care Quick Reference" information in the "Service Equipment and Analyzer Options" chapter of the *HP 8753D Network Analyzer Service Guide*. Good connections and clean, undamaged connectors are critical for accurate measurement results.
3. Set up the system to print the verification data:
   a. Press (LOCAL) SYSTEM CONTROLLER.
   b. Press SET ADDRESSES PRINTER PORT.
   c. Press the softkey that corresponds to your printer port.

d. If you have difficulty with the printer:

- If the interface on your printer is HP-IB, verify that the printer address is set to 1.
- If the interface on your printer is serial or parallel, be sure that you correctly selected the printer port AND printer type (refer to the *HP 8753D Network Analyzer User's Guide* for more information on how to do these tasks).

4. Insert the verification kit disk into the analyzer disk drive.
5. Press (PRESET) (SAVE/RECALL) SELECT DISK INTERNAL DISK.
6. Press (SYSTEM) SERVICE MENU TESTS SYS VER TESTS EXECUTE TEST.
7. When the analyzer displays Sys Ver Init DONE, the test is complete.

Caution Do *NOT* press (PRESET) or recall another instrument state. You must use the instrument state that you loaded during the initialization procedure.

Measurement Calibration

8. Press (MENU) POWER (-2) (x1) to set the analyzer test port power to −2 dBm.
9. Press (CAL) CAL KIT:7mm RETURN CALIBRATE MENU FULL 2-PORT.
10. Press ISOLATION OMIT ISOLATION ISOLATION DONE.
11. Press REFLECTION.
12. Connect the "open" end of the open/short combination (supplied in the calibration kit) to reference test port 1, as shown in Figure 1-8.
13. Press FORWARD:OPEN.
14. When the analyzer finishes measuring the standard, connect the "short" end of the open/short combination to reference test port 1.
15. Press FORWARD:SHORT.
16. When the analyzer finishes measuring the standard, connect the 50 ohm termination (supplied in the calibration kit) to reference test port 1.
17. Press REFLECTION FORWARD:LOAD.
18. When the analyzer finishes measuring the standard, connect the "open" end of the open/short combination to reference test port 2, as shown in Figure 1-8.
19. Press REVERSE:OPEN.
20. When the analyzer finishes measuring the standard, connect the "short" end of the open/short calibration standard to reference test port 2.
21. Press REVERSE:SHORT.
22. When the analyzer finishes measuring the standard, connect the 50 ohm termination to reference test port 2.
23. Press REVERSE: LOAD.
24. When the analyzer finishes measuring the standard, press STANDARDS DONE.
25. Connect the test port cables together as shown in Figure 1-9.

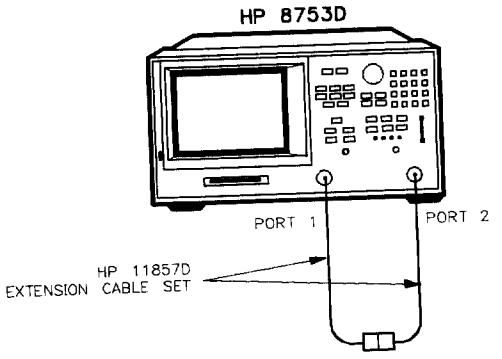


Figure 1-9. Transmission Calibration Setup

26. Press TRANSMISSION FWD TRANS THRU .
27. When the analyzer finishes measuring the standard, press FWD MATCH THRU .
28. When the analyzer finishes measuring the standard, press REV TRANS THRU .
29. When the analyzer finishes measuring the standard, press REV MATCH THRU .
30. When the analyzer finishes measuring the standard, press STANDARDS DONE DONE 2-PORT CAL .
31. Press (SAVE/ RECALL) SELECT DISK INTERNAL MEMORY RETURN SAVE STATE to save the measurement calibration into the analyzer internal memory.
32. Press SELECT DISK INTERNAL DISK .

Device Verification

33. Press (SYSTEM) SERVICE MENU TESTS (2) (8) (x1) EXECUTE TEST .

34. Connect the 20 dB attenuator (supplied in the verification kit) as shown in Figure 1-10.

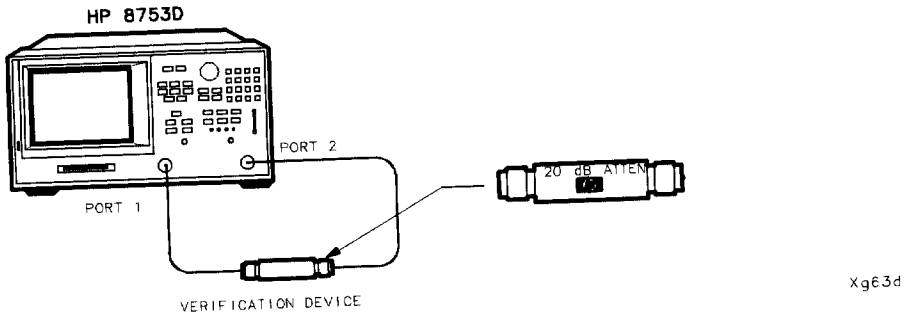


Figure 1-10. Connections for the 20 dB Verification Device

35. Press CONTINUE to run the test.

    Ignore the error message CAUTION: CALIBRATION REQUIRED.

36. Press (MENU) POWER (-2) (x1) (CAL) CORRECTION ON .

37. Press (COPY) PRINT MONOCHROME to obtain the graphical representation of the measurement.

38. Press (COPY) LIST PRINT ALL MONOCHROME if you prefer a tabular representation of the measurement.

39. Press (SYSTEM) SERVICE MENU TEST OPTIONS CONTINUE TEST .

    Ignore the error message CAUTION: CALIBRATION REQUIRED.

40. Press (MENU) POWER (-2) (x1) (CAL) CORRECTION ON .

Note For those S-parameter measurements with upper and lower point limits shown on the analyzer display, you will notice that when you press the CORRECTION ON softkey, the measurement test status changes from FAIL to PASS.

If the test status remains FAIL after you presses CORRECTION ON , refer to "In Case of Difficulty" at the end of this test for more troubleshooting information.

---

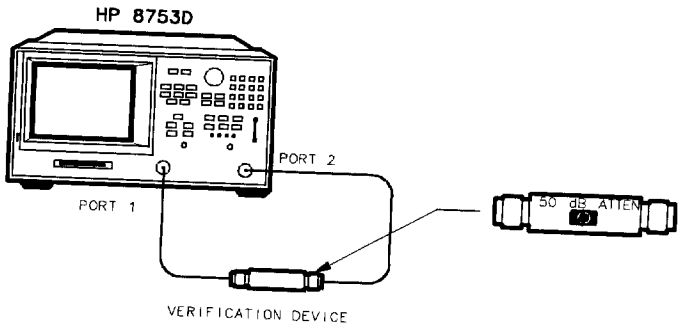
41. Repeat steps 37 through 40 until you have made all the S-parameter measurements for the verification device.

Note For each verification device, there are a total of eight measurements (magnitude and phase for the four S-parameters).

---

42. When the analyzer displays Ver Dev 1 FAIL, proceed to the next step only if ALL the tested S-parameter measurements show a PASS status after you activate error correction in step 40. Otherwise, refer to "In Case of Difficulty" at the end of this procedure.

43. Connect the 50 dB attenuator (supplied in the verification kit) as shown in Figure 1-11.



sg6201d

Figure 1-11. Connections for the 50 dB Verification Device

44. Press TESTS 29 x1 EXECUTE TEST CONTINUE.

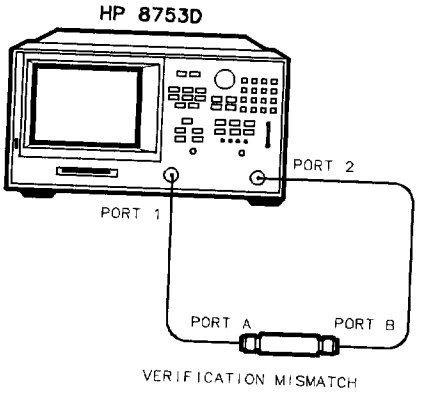
    Ignore the error message.

45. Press MENU POWER -2 x1 CAL CORRECTION ON.

46. Repeat steps 37 through 40 until you made all the S-parameter measurements for the verification device.

47. When the analyzer displays Ver Dev 2 FAIL, proceed to the next step only if *all* S-parameter measurements show a PASS status under the same condition mentioned in step 42.

48. Connect the verification mismatch (supplied in the kit) as shown in Figure 1-12. Be sure port A of the verification mismatch is connected to reference test port 1.



Xg64d

Figure 1-12. Mismatch Device Verification Setup

49. Press TESTS 30 x1 EXECUTE TEST CONTINUE.

    Ignore the error message.

50. Press MENU POWER -2 x1 CAL CORRECTION ON.

51. Repeat steps 37 through 40 until you have made all the S-parameter measurements for the verification device.

52. When the analyzer displays `Ver Dev 3 FAIL` proceed to the next step only if *all* S-parameter measurements show a `PASS` status under the same condition mentioned in step 42.

53. Connect the verification mismatch as shown in Figure 1-13. Notice that port B of the verification mismatch is now connected to the reference test port 1.

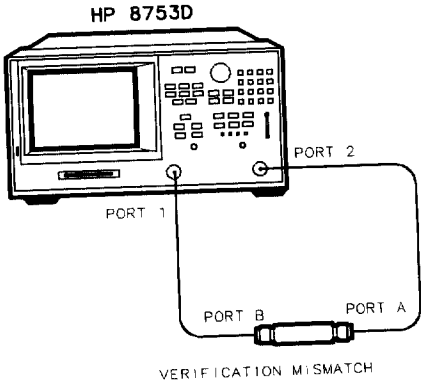


Figure 1-13. Mismatch Device Verification Setup

54. Press `TESTS` (31) (x1) `EXECUTE TEST CONTINUE`.

    Ignore the displayed error message.

55. Press (MENU) `POWER` (-2) (x1) (CAL) `CORRECTION ON`.

56. Repeat steps 37 through 40 until you have made all the S-parameter measurements for the verification device.

57. The test is complete when the analyzer displays `Ver Def 4 FAIL` and *all* S-parameter measurements show a `PASS` status under the same condition mentioned in step 42.

In Case of Difficulty

1. Inspect all connections. DO NOT disconnect the cables from the analyzer test ports. Doing so WILL INVALIDATE the calibration done earlier.
2. Press (PRESET) (SAVE/RECALL) SELECT DISK INTERNAL MEMORY RETURN. Using the front panel knob, highlight the full 2-Port cal done earlier and press RECALL STATE.
3. Repeat the "Device Verification" procedure.
4. If the test still fails, do the following to check the calibration:
   a. Press (PRESET) (SAVE/RECALL) SELECT DISK INTERNAL MEMORY RETURN.
   b. Use the front panel knob to highlight the calibration you want to recall and press RECALL STATE.
   c. Press (MENU) TRIGGER MENU CONTINUOUS to trigger the continuous sweeps.
   d. Connect the short to reference test port 1.
   e. Press (MEAS) S11 (MENU) TRIGGER MENU CONTINUOUS.
   f. Press (SCALE/REF) SCALE/DIV (.05) (x1).
   g. Check to be sure the trace response is 0.00 ± 0.05 dB.
   h. Disconnect the short and connect it the reference test port 2.
   i. Press (MEAS) Refl: REV S22(B/R).
   j. Check to be sure the trace response is 0.00 ± 0.05 dB.
   k. If any of the trace responses are out of the specified limits, repeat the "Measurement Calibration" and "Device Verification" procedures.
5. Refer to the "Start Troubleshooting Here" chapter of the *HP 8753D Network Analyzer Service Guide* for more troubleshooting information.

1. Test Port Output Frequency Range and Accuracy

Specifications

Frequency Range	Frequency Accuracy[1]
30 kHz to 3 GHz	±10 ppm
3 GHz to 6 GHz[2]	±10 ppm

1 At 25° C ±5° C.

2 Only for analyzers with Option 006.

Required Equipment

Frequency Counter ..... HP 5343A
Cable, 50Ω Type-N, 24-inch ..... HP P/N 8120-4781
Adapter, APC-3.5 (f) to Type-N (f) ..... HP P/N 1250-1745
Adapter, APC-7 to Type-N (f) ..... HP P/N 11524A
Adapter, Type-N (f) to BNC (m) ..... HP P/N 1250-1477

Additional equipment needed for an HP 8753D with Option 075

Minimum Loss Pad, 50Ω to 75Ω ..... HP 11852B

Analyzer warm-up time: **30 minutes**

Perform this test to verify the frequency accuracy of the HP 8753D over its entire operating frequency range.

1. Connect the equipment as shown in Figure 1-14.

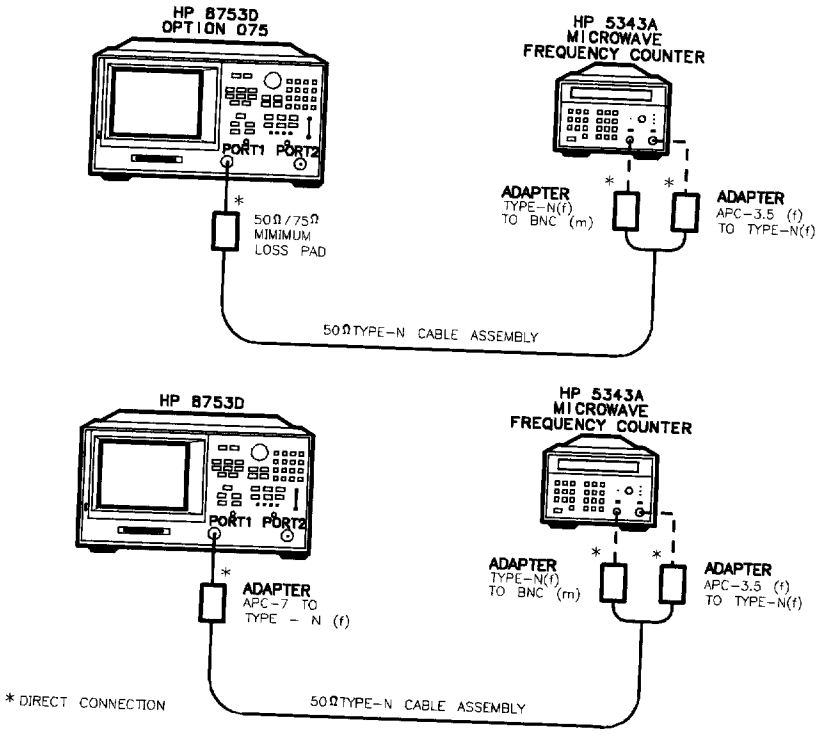


Figure 1-14. Test Port Output Frequency Range and Accuracy Test Setup

2. Press (PRESET) (MENU) CW FREQ .
3. Press (30) (k/m) and write the frequency counter reading on the "Performance Test Record."
4. Repeat step 3 for each instrument frequency listed in the "Performance Test Record."

In Case of Difficulty

1. If any measured frequency is close to the specification limits, check the time base accuracy of the counter used.
2. If the analyzer fails by a significant margin at *all* frequencies (especially if the deviation increases with frequency), the master time base probably needs adjustment. In this case, refer to the "Frequency Accuracy Adjustment" procedure, located in the "Adjustments and Correction Constants" chapter of the *HP 8753D Network Analyzer Service Guide*. The "Fractional-N Frequency Range Adjustment" also affects frequency accuracy.
3. Refer to the "Source Troubleshooting" chapter of the *HP 8753D Network Analyzer Service Guide* for related troubleshooting information.

2. External Source Mode Frequency Range

Specifications

Frequency Range
300 kHz to 3 GHz
30 kHz to 6 GHz[1]

1 Only for analyzers with Option 006.

Equipment Required

External Source	HP 83640A
Cable, APC-7, 24-inch	HP P/N 8120-4779
Adapter, APC-3.5 (f) to APC-7	HP P/N 1250-1747
Adapter, APC-3.5 (m) to APC-7	HP P/N 1250-1746

Analyzer warm-up time: **30 minutes**

Perform this test to verify that the analyzer's reference channel, input R, is capable of phase locking to an external CW signal.

1. On the external source, press [PRESET] [CW] [10] [MHz/μsec] [POWER LEVEL] [−/←] [20] [GHz/dB(m)].
2. Connect the equipment as shown in Figure 1-15.

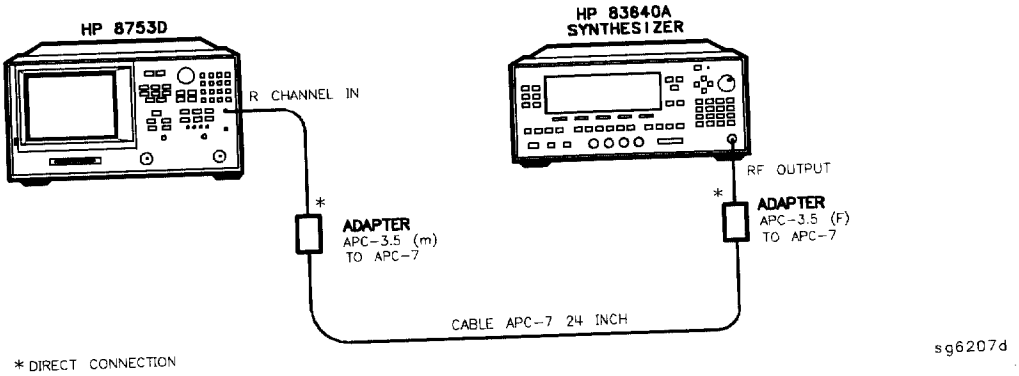


Figure 1-15. External Source Mode Frequency Range Test Setup

3. On the network analyzer, press (PRESET) (MEAS) INPUT PORTS R.
4. Press (SYSTEM) INSTRUMENT MODE EXT SOURCE AUTO (MENU) CW FREQ (10) (M/μ).
5. Check to see if the analyzer is phase locking to the external CW signal:
   - If the analyzer displays any phase lock error messages, write "unlock" in the "Performance Test Record" for the set CW signal.
   - If the analyzer does not display any phase lock error messages, write "lock" in the "Performance Test Record" for the set CW signal.
6. On the external source, press (CW) (50) (MHz/μ).
7. On the analyzer, press (50) (M/μ).
8. Repeat step 5 through 7 for the other external source CW frequencies listed in the "Performance Test Record." For analyzers with Option 006, change the power sensor to the HP 8481A for frequencies above 4 GHz.

In Case of Difficulty

1. Be sure the external source power is set within 0 to −25 dBm.
2. Make sure the analyzer's "Ext Source Auto" feature is selected. In addition, verify that the analyzer is set to measure its input channel R.
3. Verify that all connections are tight.

3. Test Port Output Power Accuracy

Specifications

Frequency Range	Test Port Output Power Accuracy[1]
300 kHz to 3 GHz	±1.0 dB
3 GHz to 6 GHz[2]	±1.0 dB

1 At 0 dBm and 25° C ±5° C

2 Only for analyzers with Option 006.

Equipment Required for 50Ω Analyzers

Power Meter ..... HP 436A/437B/438A
Power Sensor ..... HP 8482A
Adapter, APC-7 to Type-N (f) ..... HP 11524A

Additional Equipment Required for Analyzers with Option 006

Power Sensor ..... HP 8481A

Equipment Required for 75Ω Analyzers

Power Meter ..... HP 436A/437B/438A
Power Sensor ..... HP 8483A Option H03

Analyzer warm-up time: **30 minutes**

Perform this test to confirm the accuracy of the HP 8753D source output power.

1. Zero and calibrate the power meter. For more information of how to perform this task, refer to the power meter operating manual.
2. Connect the equipment as shown in Figure 1-16.

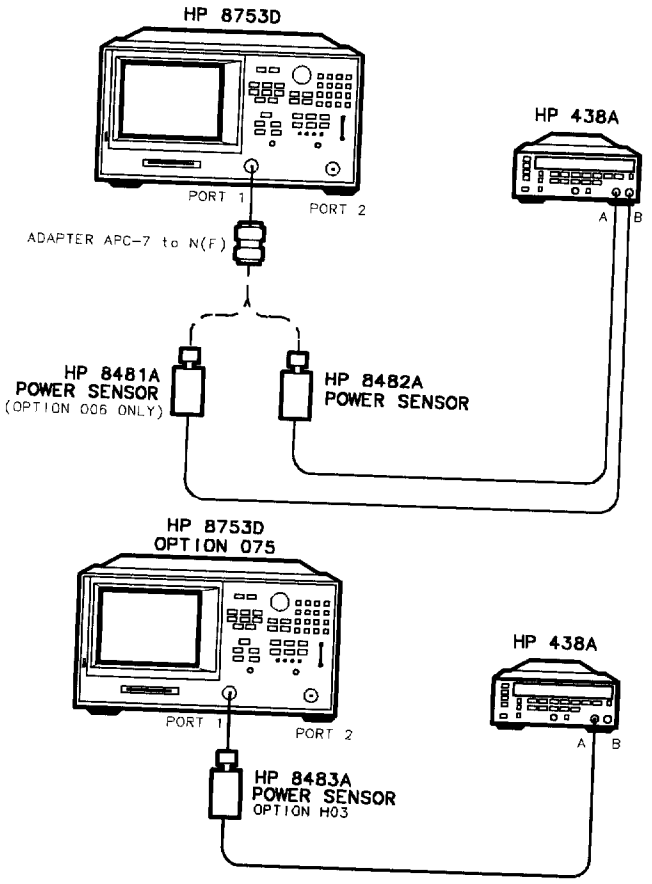


Figure 1-16. Source Output Power Accuracy Test Setup

3. Press (PRESET).

Note The factory preset test port power is 0 dBm.

---

4. Press (MENU) CW FREQ (300) (k/m). Set the calibration factor on the power meter for this CW frequency.
5. Write the power meter reading on the "Performance Test Record."
6. Repeat steps 4 and 5 for each CW frequency listed in the "Performance Test Record."

In Case of Difficulty

1. Be sure the source power is switched on. Press (MENU) POWER. Check the SOURCE PWR softkey, "on" *should* be highlighted. Otherwise, press SOURCE PWR to switch on the source power.
2. Refer to the "Source Troubleshooting" chapter of the *HP 8753D Network Analyzer Service Guide* for more troubleshooting information.

4. Test Port Output Power Range and Linearity

Specifications

Power Range	Power Level Linearity[1]
−15 to +5 dBm	±0.2 dB
+5 to +10 dBm	±0.5 dB

1 Relative to 0 dBm output level.

Required Equipment

Power Meter ..... HP 437B/438A
Power Sensor ..... HP 8482A
Adapter, APC-7 to Type-N (f) ..... HP 118524A

Additional Required Equipment for Analyzers with Option 006

Power Sensor ..... HP 8481A

Additional Required Equipment for Analyzers with Option 075

Power Sensor ..... HP 8483A Option H03

Analyzer warm-up time: **1 hour**

Perform this test to verify the analyzer's test port output power range and power level linearity at selected CW frequencies.

1. Zero and calibrate the power meter. Refer to the power meter operating and service manual for more information on how to do this task.
2. On the network analyzer, press [PRESET] [MENU] CW FREQ [300] [k/m]. Set the power meter calibration factor for this CW frequency.
3. Connect the equipment as shown in Figure 1-17.

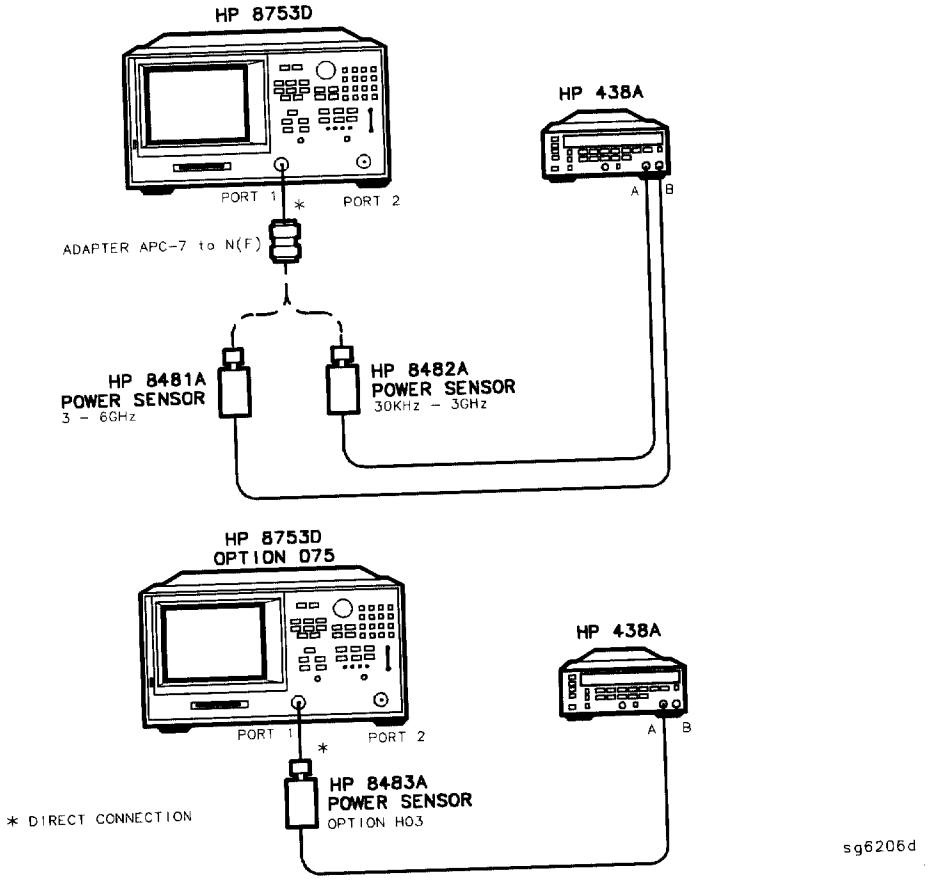


Figure 1-17. Test Port Output Power Range and Accuracy Test Setup

4. On the HP 438A, press (REL). This sets the current power level for relative power measurement.
5. On the network analyzer, press (MENU) POWER PWR RANGE MAN .
6. Write the power meter reading in the "Results Measured" column on the "Performance Test Record."
7. Calculate the difference between the analyzer test port power (which appears on the analyzer's display) and the power meter reading. Write the result in the "Power Level Linearity" column on the "Performance Test Record."
8. Repeat steps 5 through 7 for the other power levels listed in the "Performance Test Record."
9. Press CW FREQ (3) (G/n).
10. Set the power meter calibration factor for this CW frequency and press (REL) to set the reference at this new frequency.
11. Press (MENU) POWER (-15) (x1).
12. Write the power meter reading in the "Results Measured" column on the "Performance Test Record."
13. Calculate the difference between the analyzer test port power and the power meter reading. Write the result in the "Power Level Linearity" column of the "Performance Test Record."
14. Repeat steps 11 through 13 for the other power levels listed in the "Performance Test Record."

In Case of Difficulty

1. Ensure that the power meter and power sensor(s) are operating to specifications. Be sure you set the power meter calibration factor for the CW frequency that you are testing.
2. Verify that there is power coming out of the analyzer's test port 1. Be sure you did not accidently switch off the analyzer's internal source. If you did so, press (MENU) POWER SOURCE PWR ON .
3. Repeat this performance test.

5. Minimum R Channel Level

Specifications

Frequency Range	Minimum R Channel Level
300 kHz to 3 GHz	< −35 dBm
3 GHz to 6 GHz[1]	< −30 dBm

1 Only for analyzers with Option 006.

Required Equipment for 50Ω Analyzers

Adapter, APC-3.5 (m) to APC-7 ..... HP P/N 1250-1746
Cable, APC-7 24-inch ..... HP P/N 8120-4779

Required Equipment for 75Ω Analyzers (Option 075)

Minimum Loss Pad, 50Ω to 75Ω ..... HP 11852B
Cable, 50Ω Type-N, 24-inch ..... HP P/N 8120-4781
Adapter, APC-3.5 (m) to Type-N (f) ..... HP P/N 1250-1750

Analyzer warm-up time: **1 hour**

Perform this test to determine the minimum R channel input power level at which phase lock can be accomplished.

1. Connect the equipment as shown in Figure 1-18.

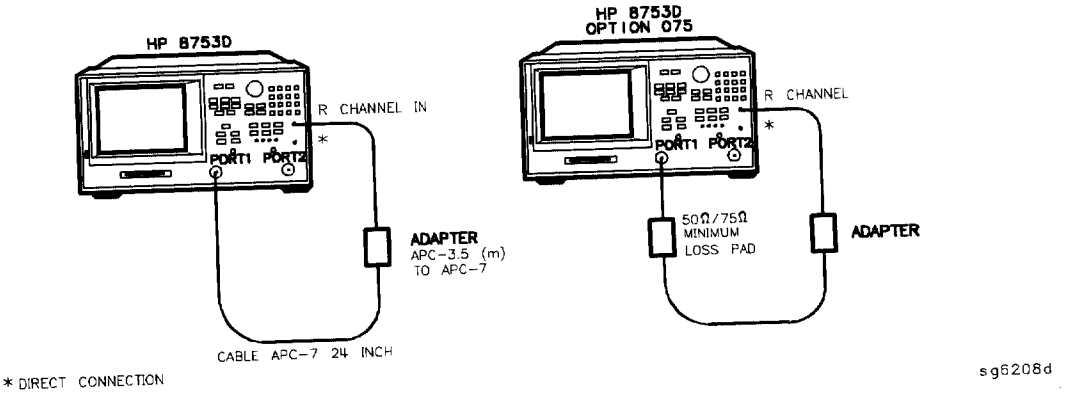


Figure 1-18. Minimum R Channel Level Test Setup

2. Press (PRESET) (MEAS) INPUT PORTS R.
3. Press (MENU) POWER PWR RANGE MAN POWER RANGES RANGE 4 −55 to −30.
4. Press (SCALE/REF) REFERENCE VALUE (-70) (x1).
5. Press (MENU) CW FREQ (300) (k/m).
6. Press (MENU) POWER (-65) (x1).

   The analyzer displays the message CAUTION: NO IF FOUND: CHECK R INPUT LEVEL.
7. Press (↑) to increase the test port power by 1 dBm.
8. If the analyzer displays a phase lock error message, continue increasing the test port power until phase lock is achieved.
9. Write the test port power, that is displayed on the analyzer, on the "Performance Test Record."
10. Repeat steps 5 through 9 for the other CW frequencies listed in the "Performance Test Record."

In Case of Difficulty

1. Check the flexible RF cable (W8, as shown in Figure 1-19) between the R sampler assembly (A4) and the A11 phase lock assembly. Make sure it is connected between A11J1 (PL IF IN) and 1st IF Out.

Caution Loop the W8 cable around the A5 sampler as shown in Figure 1-19. *Do not* push the cable down next to the A11 phase lock assembly.

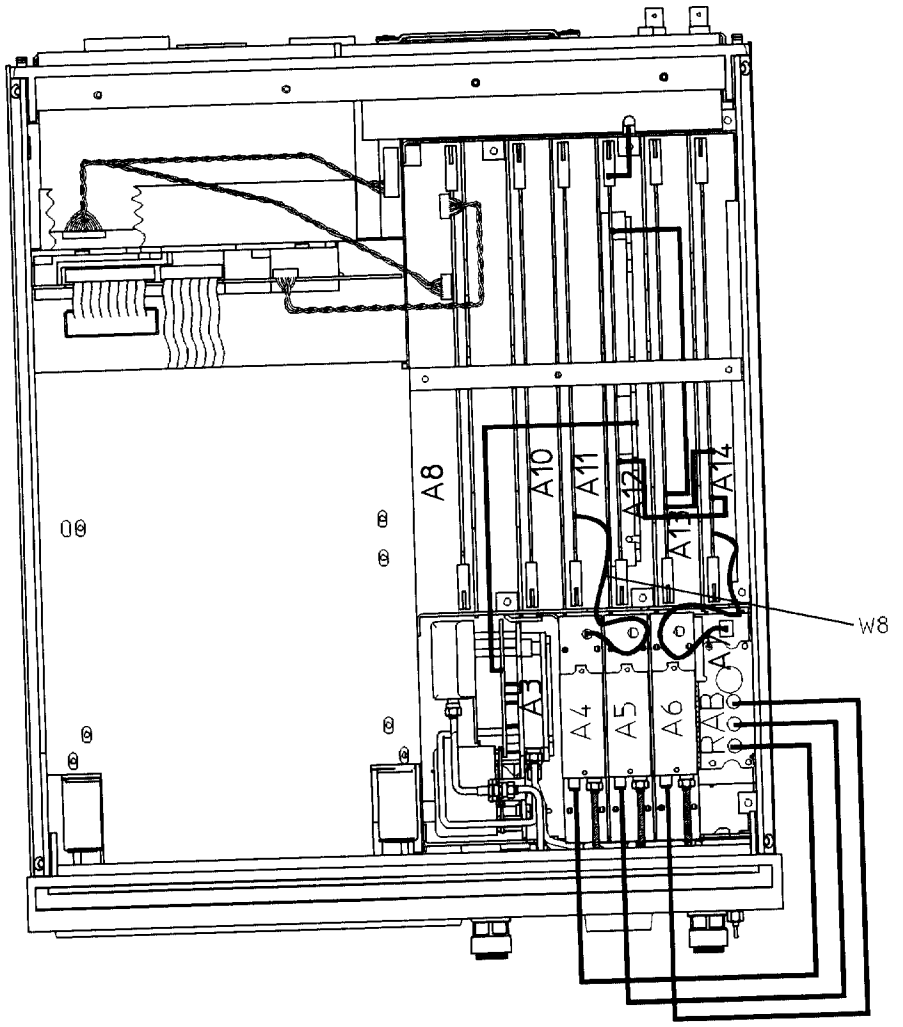


Figure 1-19. Flexible RF Cable Location

2. Using an ohmmeter, verify that the RF cable is not open. In addition, examine both the cable connectors - measure the resistance between the cable center pin and the cable connector and make sure it is *not* close to zero.
3. Check the R sampler by substituting it with the B sampler (A6).
   a. Move cable W8 to the B sampler (A6), as shown in Figure 1-20.

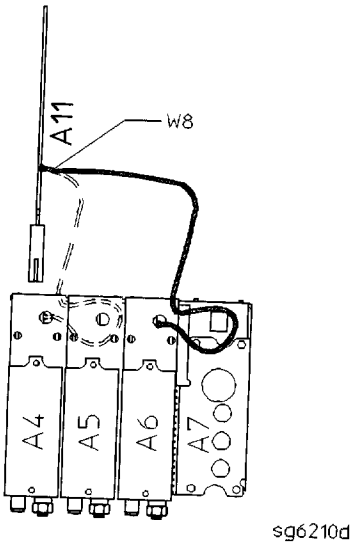


Figure 1-20. Connections for Substituting the R Sampler (A4)

4. Connect the equipment as shown in Figure 1-21.

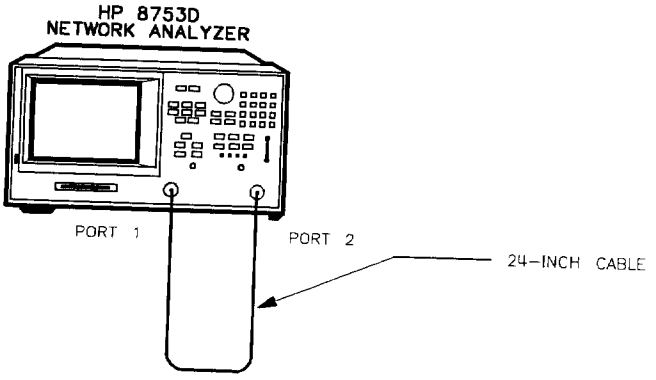


Figure 1-21. Setup for Checking the R Sampler (A4)

5. Repeat the test, but select the B sampler (A6) by pressing (MEAS) INPUT PORTS B in step 2. Use the following specifications:

   300 kHz to 3 GHz <−27 dBm
   3 GHz to 6 GHz <−22 dBm

6. If the analyzer fails the test, replace the A11 assembly.
7. Verify that the high/low band adjustments are still within specifications. For more information on how to perform this task, refer to the "High/Low Band Transition Adjustment" located in the "Adjustments and Correction Constants" chapter of the *HP 8753D Network Analyzer Service Guide*.
8. Refer to the "Source Troubleshooting" chapter of the *HP 8753D Network Analyzer Service Guide* for more troubleshooting information.

6. Test Port Input Noise Floor Level

Specifications

Frequency Range	Test Port	IF Bandwidth	Average Noise Level
50 kHz to 3.0 GHz	Port 1	3 kHz	−82 dBm
50 kHz to 3.0 GHz	Port 1	10 Hz	−102 dBm
50 kHz to 3.0 GHz	Port 2	3 kHz	−82 dBm
50 kHz to 3.0 GHz	Port 2	10 Hz	−102 dBm
3.0 GHz to 6.0 GHz[1]	Port 1	3 kHz	−77 dBm
3.0 GHz to 6.0 GHz[1]	Port 1	10 Hz	−97 dBm
3.0 GHz to 6.0 GHz[1]	Port 2	3 kHz	−77 dBm
3.0 GHz to 6.0 GHz[1]	Port 2	10 Hz	−97 dBm

1 Only for analyzer with Option 006.

Equipment Required for 50Ω Analyzers

Calibration Kit, 7 mm ..... HP 85031B

Equipment Required for 75Ω Analyzers

Calibration Kit, Type-N ..... HP 85036B

Analyzer warm-up time: **1 hour**

Perform this test to determine the HP 8753D port 1 and port 2 noise floor levels at the input test ports.

Port 1 Noise Floor Level from 50 kHz to 3 GHz (IF BW = 3 kHz)

1. Connect the equipment as shown in Figure 1-22.

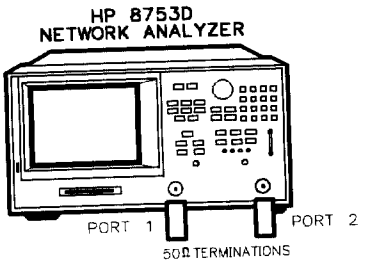


Figure 1-22. Source Input Noise Floor Test Setup

2. Press (PRESET) (MENU) POWER (-85) (x1) (STOP) (3) (G/n).
3. Press (MEAS) INPUT PORTS A TESTPORT 2 (FORMAT) LIN MAG (SCALE/REF) AUTO SCALE.
4. Press (MARKER FCTN) STATS ON (MENU) TRIGGER MENU SINGLE.
5. When the analyzer finishes the sweep, notice the mean value (which appears on the analyzer display).
6. Convert the measured linear magnitude mean value to log magnitude, using this equation.

$$Power\ (dBm) = 20 * [\log_{10}(linear\ magnitude\ mean\ value)]$$

Note Notice that the mean value that is displayed on the analyzer is in μUnits. So, for example, if the displayed value is 62 μU, the value that you would put in the equation is (62×10^{-6}).

7. Write this calculated value on the "Performance Test Record."

Port 1 Noise Floor Level from 50 kHz to 3 GHz (IF BW = 10 Hz)

8. Press (AVG) IF BW (10) (x1) to change the IF bandwidth to 10 Hz.
9. Press (MENU) TRIGGER MENU SINGLE.
10. When the analyzer finishes the sweep, notice the mean value.
11. Convert the measured linear magnitude mean value to log magnitude, using this equation.

$$Power\ (dBm) = 20 * [\log_{10}(linear\ magnitude\ mean\ value)]$$

12. Write this calculated value on the "Performance Test Record."

Port 2 Noise Floor Level from 50 kHz to 3 GHz (IF BW = 10 Hz)

13. Press (MEAS) INPUT PORTS B TESTPORT 1 (FORMAT) LIN MAG.
14. Press (MENU) TRIGGER MENU SINGLE.
15. When the analyzer finishes the sweep, notice the mean value.
16. Convert the measured linear magnitude mean value to log magnitude, using this equation.

$$Power\ (dBm) = 20 * [\log_{10}(linear\ magnitude\ mean\ value)]$$

17. Write this calculated value on the "Performance Test Record."

Port 2 Noise Floor Level from 50 kHz to 3 GHz (IF BW = 3 kHz)

18. Press (AVG) IF BW (3) (k/m) to change the IF bandwidth to 3 kHz.
19. Press (MENU) TRIGGER MENU SINGLE.
20. When the analyzer finishes the sweep, notice the mean value.
21. Convert the measured linear magnitude mean value to log magnitude, using this equation.

$$Power\ (dBm) = 20 * [\log_{10}(linear\ magnitude\ mean\ value)]$$

22. Write this calculated value on the "Performance Test Record."
23. This completes the "Test Port Input Noise Floor Level" procedure if your analyzer does not have Option 006. Otherwise continue with the next section.

Port 2 Noise Floor Level from 3 GHz to 6 GHz (IF BW = 3 kHz)

24. Press (START) (3) (G/n) (STOP) (6) (G/n).
25. Press (MENU) TRIGGER MENU SINGLE.
26. When the analyzer finishes the sweep, notice the mean value.
27. Convert the measured linear magnitude mean value to log magnitude, using this equation.

$$Power\ (dBm) = 20 * [\log_{10}(linear\ magnitude\ mean\ value)]$$

28. Write this calculated value on the "Performance Test Record."

Port 2 Noise Floor Level from 3 GHz to 6 GHz (IF BW = 10 Hz)

29. Press (AVG) IF BW (10) (x1) to change the IF bandwidth to 10 Hz.
30. Press (MENU) TRIGGER MENU SINGLE.
31. When the analyzer finishes the sweep, notice the mean value.
32. Convert the measured linear magnitude mean value to log magnitude, using this equation.

$$Power\ (dBm) = 20 * [\log_{10}(linear\ magnitude\ mean\ value)]$$

33. Write this calculated value on the "Performance Test Record."

Port 1 Noise Floor Level for 3 GHz to 6 GHz (IF BW = 10 Hz)

34. Press (MEAS) INPUT PORTS A TESTPORT 2.
35. Press (MENU) TRIGGER MENU SINGLE.
36. When the analyzer finishes the sweep, notice the mean value.
37. Convert the measured linear magnitude mean value to log magnitude, using this equation.

$$Power\ (dBm) = 20 * [\log_{10}(linear\ magnitude\ mean\ value)]$$

38. Write this calculated value on the "Performance Test Record."

Port 1 Noise Floor Level from 3 GHz to 6 GHz (IF BW = 3 kHz)

39. Press (AVG) IF BW (3) (k/m).
40. Press (MENU) TRIGGER MENU SINGLE.
41. When the analyzer finishes the sweep, notice the mean value.
42. Convert the measured linear magnitude mean value to log magnitude, using this equation.

$$Power\ (dBm) = 20 * [\log_{10}(linear\ magnitude\ mean\ value)]$$

43. Write this calculated value on the "Performance Test Record."

In Case of Difficulty

1. Perform the "ADC Linearity Correction Constants (Test 52)," located in the "Adjustments and Correction Constants" chapter of the *HP 8753D Network Analyzer Service Guide.*
2. Repeat the "Test Port Input Noise Floor Level" procedure.
3. Suspect the A10 Digital IF assembly if the analyzer fails both test port input noise floor tests.
4. Refer to the "Receiver Troubleshooting" chapter of the *HP 8753D Network Analyzer Service Guide* for more troubleshooting information.

7. Test Port Input Frequency Response

Specifications

Frequency Range	Test Port	Input Frequency Response
300 kHz to 3 GHz	Port 1	±1 dB
300 kHz to 3 GHz	Port 2	±1 dB
3 GHz to 6 GHz[1]	Port 1	±2 dB
3 GHz to 6 GHz[1]	Port 2	±2 dB

1 Only for analyzers with Option 006.

Equipment Required for 50Ω Analyzers

Power Meter ..... HP 436A/437B/438A
Power Sensor ..... HP 8482A
Cable, APC-7 24-inch ..... HP P/N 8120-4779
Adapter, APC-7 to Type-N (f) ..... HP 118524A

Additional Equipment Required for Analyzers with Option 006

Power Sensor ..... HP 8481A

Equipment Required for 75Ω Analyzers

Power Meter ..... HP 436A/437B/438A
Power Sensor ..... HP 8483A Option H03
Cable, Type-N ..... HP P/N 8120-2408

Analyzer warm-up time: **1 hour**

Perform this test to examine the vector sum of all test setup error vectors in both magnitude and phase change as a function of frequency.

Power Meter Calibration for Test Port 1 from 300 kHz to 3 GHz

1. Zero and calibrate the power meter.
2. Connect the equipment as shown in Figure 1-23.

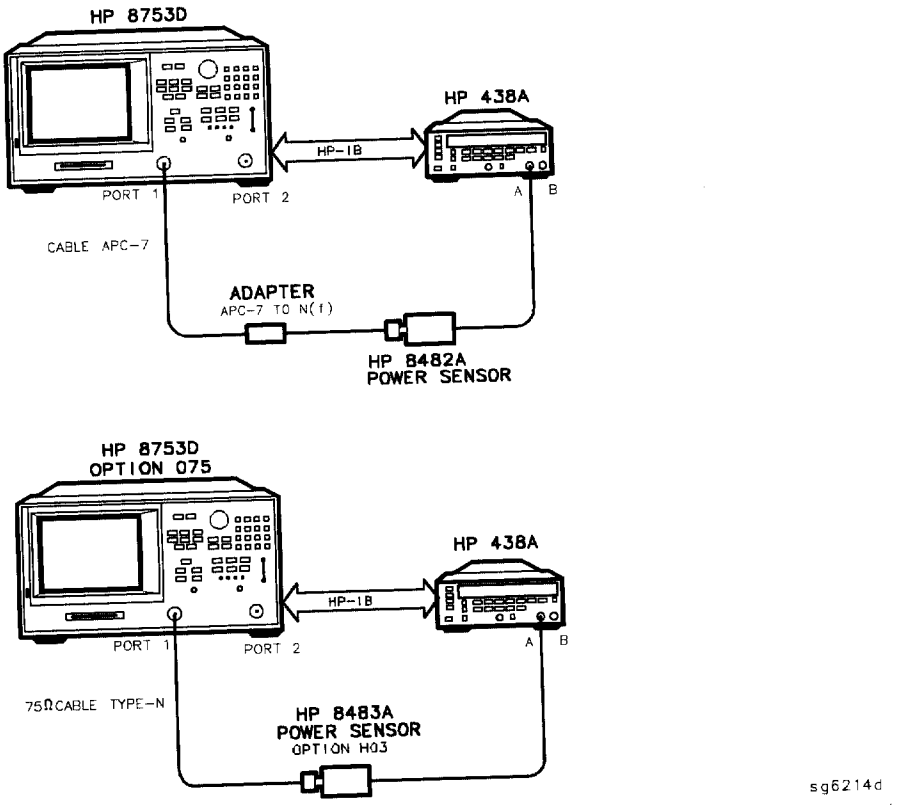


Figure 1-23. Setup for Power Meter Calibration on Test Port 1

3. Press (PRESET) (START) (300) (k/m).
4. **Only for Analyzers with Option 006:** Press (STOP) (3) (G/n).

5. Press (LOCAL) SYSTEM CONTROLLER .

6. Press SET ADDRESSES and POWER MTR until the analyzer shows the correct power meter model.

7. Press ADDRESS: P MTR/HPIB . The default power meter HP-IB address is 13. Make sure it is the same as your power meter HP-IB address. Otherwise, use the analyzer front panel keypad to enter the correct HP-IB address for your power meter.

8. Press (MENU) NUMBER of POINTS (51) (x1).

9. Press POWER PWR RANGE to turn the auto power range off.

Note The analyzer displays the PRm annotation, indicating that the analyzer power range is set to MANUAL.

---

10. Press PORT POWER to uncouple the test port output power.

11. Press (CAL) PWRMTR CAL .

12. Press LOSS/SENSR LISTS CAL FACTOR SENSOR A . Refer to the back of the power sensor to locate the different calibration factor values along with their corresponding frequencies.

Note The analyzer's calibration factor sensor table can hold a MAXIMUM of 12 calibration factor data points.

The following softkeys are included in the sensor calibration factor entries menu:

SEGMENT	press to select a point where you can use the front panel knob or entry keys to enter a value
EDIT	press to edit or change a previously entered value
DELETE	press to delete a point from the sensor calibration factor table
ADD	select this key to add a point into the sensor calibration factor table
CLEAR LIST	select this key to erase the entire sensor calibration factor table
DONE	select this key when done entering points to the sensor calibration factor table

As an example, the following are the keystrokes for entering the first two calibration factor data points for the HP 8482A power sensor (assuming CF% = 96.4 at 100 kHz and CF% = 98.4 at 300 kHz):

a. From the sensor calibration factor entries menu, press ADD .

b. Press FREQUENCY (100) (k/m). If you make an entry error, press (←) and re-enter the correct value again.

c. Press CAL FACTOR (96.4) (x1).

d. Press DONE to terminate the first calibration factor data point entry.

e. To enter the second cal factor data point, press ADD .

f. Press FREQUENCY (300) (k/m).

g. Press CAL FACTOR (98.4) (x1).

h. To terminate the second calibration factor data point entry, press DONE.

i. Press SEGMENT and use the front panel knob to scroll through the sensor calibration factors table. Check to be sure all values are entered correctly. If you spot an error, use the front panel knob to point to the data point you want to modify and press EDIT.

13. Press the appropriate softkeys to create a power sensor calibration factors table.

14. Press DONE to exit the sensor calibration factor entries menu.

15. Press RETURN ONE SWEEP TAKE CAL SWEEP to start the power meter calibration.

Wait until the analyzer finishes the sweep, then continue with this procedure.

Note The analyzer displays the PC annotation, indicating the power meter calibration is done and the error correction is active.

Test Port 2 Input Frequency Response from 300 kHz to 3GHz

16. Connect the equipment as shown in Figure 1-24.

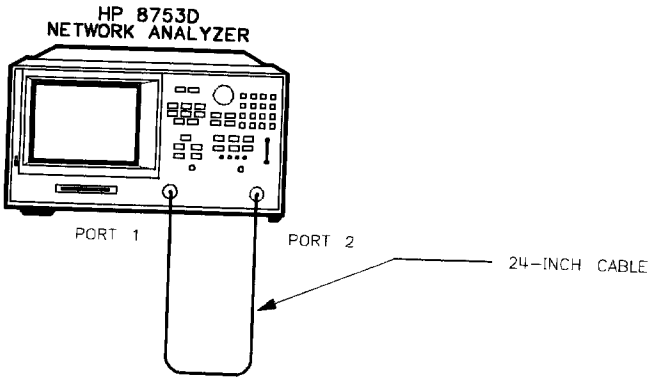


Figure 1-24. Test Port 2 Input Frequency Response Test Setup

17. Press (MEAS) INPUT PORTS B.
18. Press (SCALE/REF) SCALE/DIV (1) (x1).
19. Press (MARKER) MARKER 1 (MARKER FCTN) MKR SEARCH SEARCH:MIN to put marker 1 at the minimum magnitude location of the trace.
20. Press (MARKER) MARKER 2 (MARKER FCTN) MKR SEARCH SEARCH:MAX to position marker 2 at the maximum magnitude location of the trace.
21. Write the marker 1 or marker 2 value (which appears on the analyzer display), whichever has the larger absolute magnitude, in the "Performance Test Record."

Power Meter Calibration on Port 2 from 300 kHz to 3 GHz

22. Connect the equipment as shown Figure 1-25.

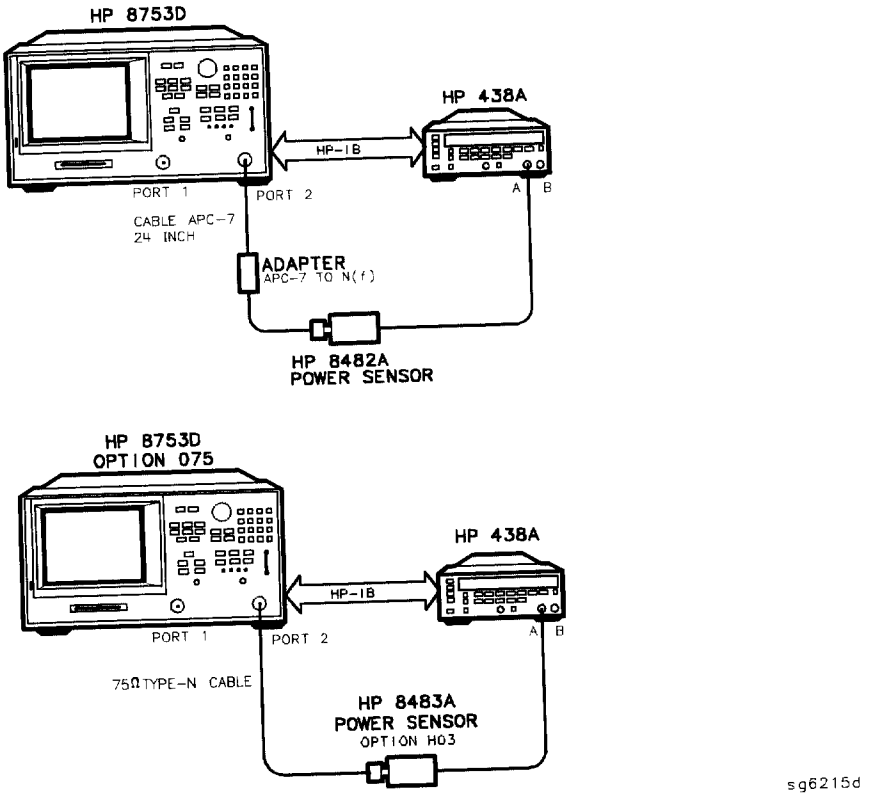


Figure 1-25. Setup for Power Meter Calibration on Test Port 2

23. Press (MEAS) `INPUT PORTS` `TESTPORT 2`.

24. Press (CAL) `PWRMTR` `ONE SWEEP` `TAKE CAL SWEEP` to start the power meter calibration for test port 2.

25. When the analyzer displays the message POWER METER CALIBRATION SWEEP DONE, connect the equipment as shown as in Figure 1-26.

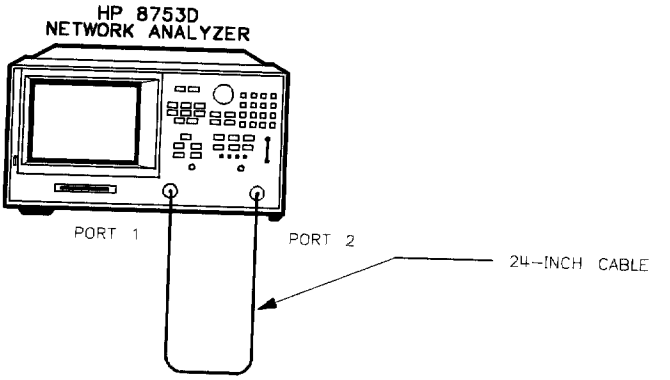


Figure 1-26. Test Port 1 Input Frequency Response Test Setup

Test Port 1 Input Frequency Response from 300 kHz to 3 GHz

26. Press (MEAS) INPUT PORTS A.
27. Press (MARKER) MARKER 1 (MARKER FCTN) MKR SEARCH SEARCH:MIN.
28. Press (MARKER) MARKER 2 (MARKER FCTN) MKR SEARCH SEARCH:MAX.
29. Write the marker 1 or marker 2 reading, whichever has the larger absolute magnitude, in the "Performance Test Record."
30. This completes the "Test Port Input Frequency Response" procedure if your analyzer does not have Option 006. Otherwise continue with the next sections.

Power Meter Calibration for Test Port 2 from 3 GHz to 6 GHz

31. Replace the power sensor with the HP 8481A, and then setup the power meter:
    - If the power meter is an HP 438A, press (LCL).
    - If the power meter is an HP 437B, press (PRESET/LOCAL).
    - If the power meter is an HP 436A, cycle the line power.
32. Connect the equipment as shown in Figure 1-27.

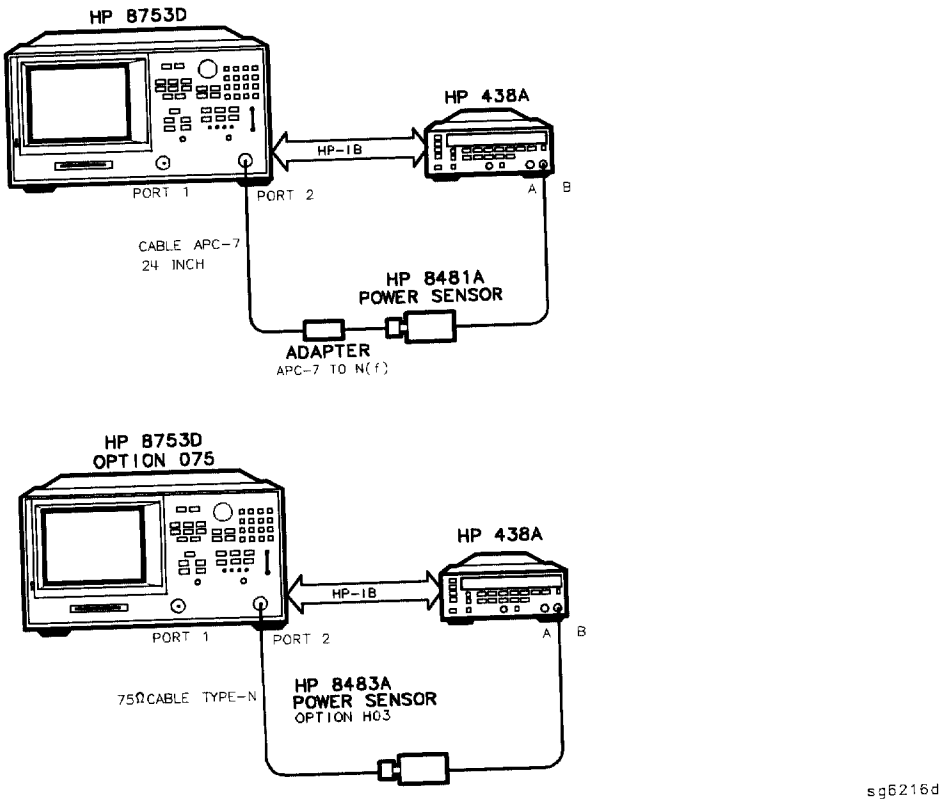


Figure 1-27. Setup for Power Meter Calibration on Test Port 2

33. Press START 3 G/n STOP 6 G/n.
34. Press CAL PWRMTR CAL .
35. Press LOSS/SENSR LISTS CAL FACTOR SENSOR B . Repeat step 10 to build a calibration factor sensor table for the HP 8481A power sensor.
36. Press DONE to exit the sensor calibration factor entries menu.
37. To select the HP 8481A power sensor, press USE SENSOR B .
38. Press RETURN TAKE CAL SWEEP to start the power meter calibration.

Test Port 1 Input Frequency Response from 3 GHz to 6 GHz

39. When the analyzer finishes the calibration sweep, connect the equipment as shown in Figure 1-28.

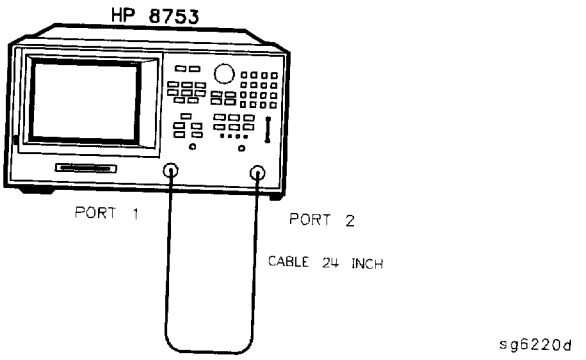


Figure 1-28. Setup for Test Port 1 Input Frequency Response

40. Press (MEAS) INPUT PORTS A.

41. Press (MARKER) MARKER 1 (MARKER FCTN) MKR SEARCH SEARCH:MIN to put marker 1 at the minimum magnitude location of the trace.

42. Press (MARKER) MARKER 2 (MARKER FCTN) MKR SEARCH SEARCH:MAX to position marker 2 at the maximum magnitude location of the trace.

43. Write the marker 1 or marker 2 reading, whichever has the largest absolute magnitude, in the "Performance Test Record."

Power Meter Calibration on Test Port 1 from 3 GHz to 6 GHz

44. Connect the equipment as shown in Figure 1-29.

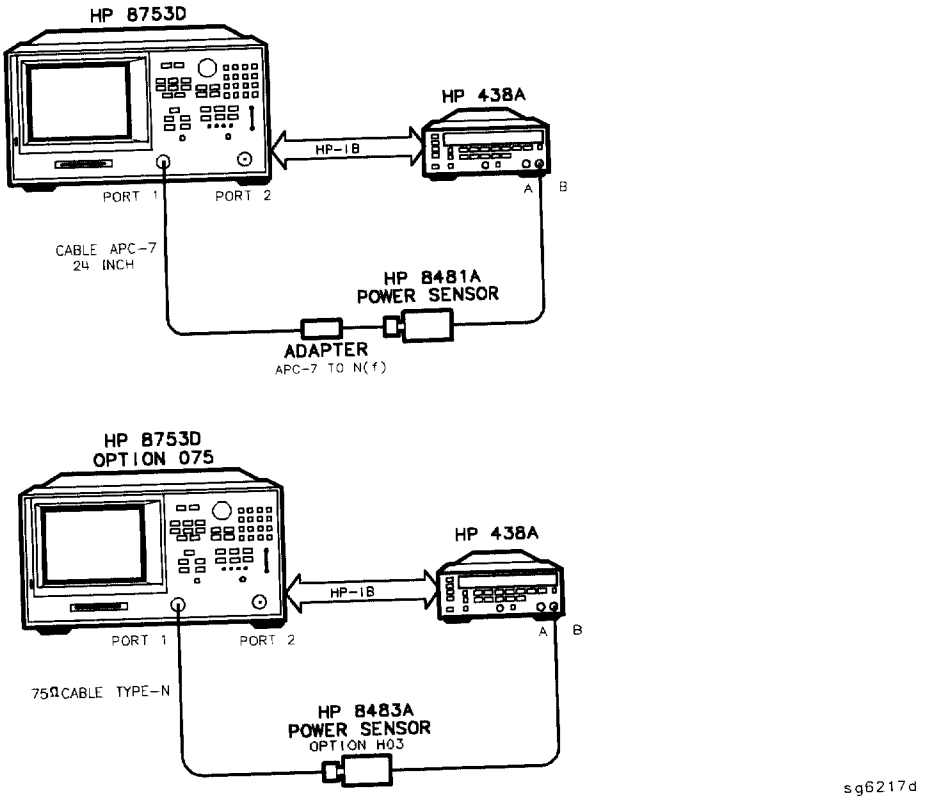


Figure 1-29. Setup for Power Meter Calibration on Test Port 1

45. Press (MEAS) `INPUT PORTS` `TESTPORT 1`.

46. Press (CAL) `PWRMTR` `ONE SWEEP` `TAKE CAL SWEEP` to start the power meter calibration for output test port 1.

Test Port 2 Input Frequency Response from 3 GHz to 6 GHz

47. When the analyzer displays the message POWER METER CALIBRATION SWEEP DONE, connect the equipment as shown as in Figure 1-30.

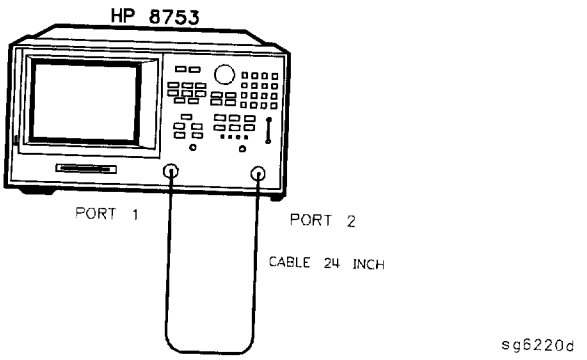


Figure 1-30. Test Port 2 Input Frequency Response Test Setup

48. Press (MEAS) INPUT PORTS B.
49. Press (MARKER) MARKER 1 (MARKER FCTN) MKR SEARCH SEARCH:MIN.
50. Press (MARKER) MARKER 2 (MARKER FCTN) MKR SEARCH SEARCH:MAX.
51. Write the marker 1 or marker 2 reading, whichever has the largest magnitude, in the "Performance Test Record."

In Case of Difficulty

1. Be sure you have used the correct power sensor for the frequency range.
2. Verify that the calibration factors that you have entered for the power sensors are correct.
3. Repeat this test with a "known good" thru cable.

8. Test Port Crosstalk

Specifications

Frequency Range	Crosstalk[1]
300 kHz to 3 GHz	100 dB
3 GHz to 6 GHz[2]	90 dB

1 At 25° C ±5° C.

2 Only for analyzers with Option 006.

Required Equipment for 50Ω Analyzers

Calibration Kit, 7 mm ..... HP 85031B
Cable, APC-7 24-inch ..... HP P/N 8120-4779

Required Equipment for 75Ω Analyzers

Calibration Kit, 75Ω, Type-N ..... HP 85036B

Analyzer warm-up time: **1 hour**

Perform this test to verify the signal leakage between the analyzer's test ports.

1. Connect the equipment as shown in Figure 1-31.

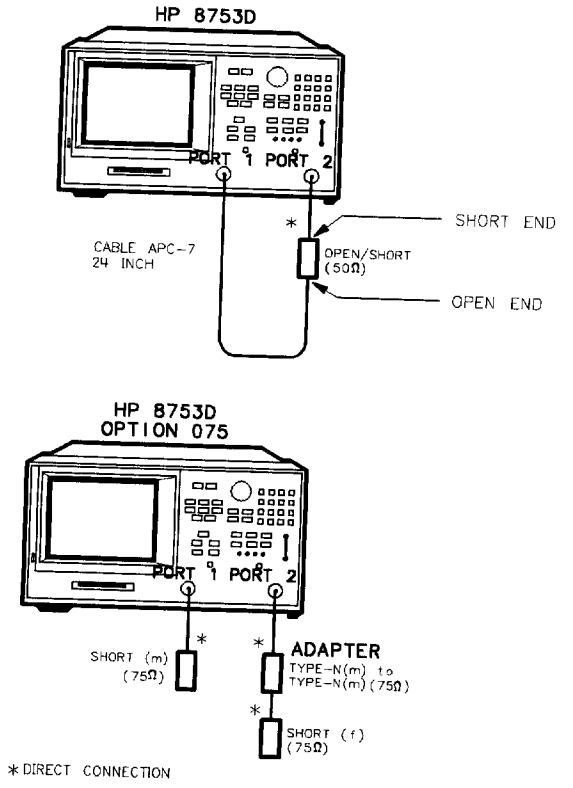


Figure 1-31. Test Port Crosstalk Test Setup

2. Press (PRESET) (MENU) POWER (10) (x1).
3. Press (AVG) IF BW (10) (x1).

Crosstalk to Test Port 2 from 300 kHz to 3 GHz

4. Press (START) (300) (k/m) (STOP) (3) (G/n).
5. Press (MEAS) Trans: FWD S21 (B/R).
6. Press (SCALE/REF) REFERENCE VALUE (-100) (x1).
7. Press (MENU) TRIGGER MENU SINGLE.
8. Press (MARKER FCTN) MKR SEARCH SEARCH: MAX.
9. Write the marker value (which appears on the analyzer display) in the "Performance Test Record."

Crosstalk to Test Port 1 from 300 kHz to 3 GHz

10. Press (MEAS) Trans: REV S12 (A/R).
11. Press (MENU) TRIGGER MENU SINGLE.
12. Press (MARKER FCTN) MKR SEARCH SEARCH: MAX.
13. Write the marker value (which appears on the analyzer display) in the "Performance Test Record."
14. This completes the "Test Port Crosstalk" performance test if your analyzer does not have Option 006. Otherwise, proceed to the next section.

Crosstalk to Test Port 1 from 3 GHz to 6 GHz

15. Press (START) (3) (G/n) (STOP) (6) (G/n).
16. Press (MENU) TRIGGER MENU SINGLE.
17. Press (MARKER FCTN) MKR SEARCH SEARCH: MAX.
18. Write the marker value (which appears on the analyzer display) in the "Performance Test Record."

Crosstalk to Test Port 2 from 3 GHz to 6 GHz

1. Press (MEAS) Trans: FWD S21 (B/R).
2. Press (MENU) TRIGGER MENU SINGLE.
3. Press (MARKER FCTN) MKR SEARCH SEARCH: MAX.
4. Write the marker value (which appears on the analyzer display) in the "Performance Test Record."

In Case of Difficulty

1. Remove the instrument top cover. Using an 8 lb-inch torque wrench, verify that ALL semi-rigid cables connected to the sampler/mixer assemblies are tight. In addition tighten any loose screws on the sampler/mixer assemblies (A4/5/6) and the pulse generator assembly (A7).
2. Remove the instrument bottom cover. Refer to Figure 1-32. Verify that cables W1, W31 and W32 are tight.
3. Repeat this test.

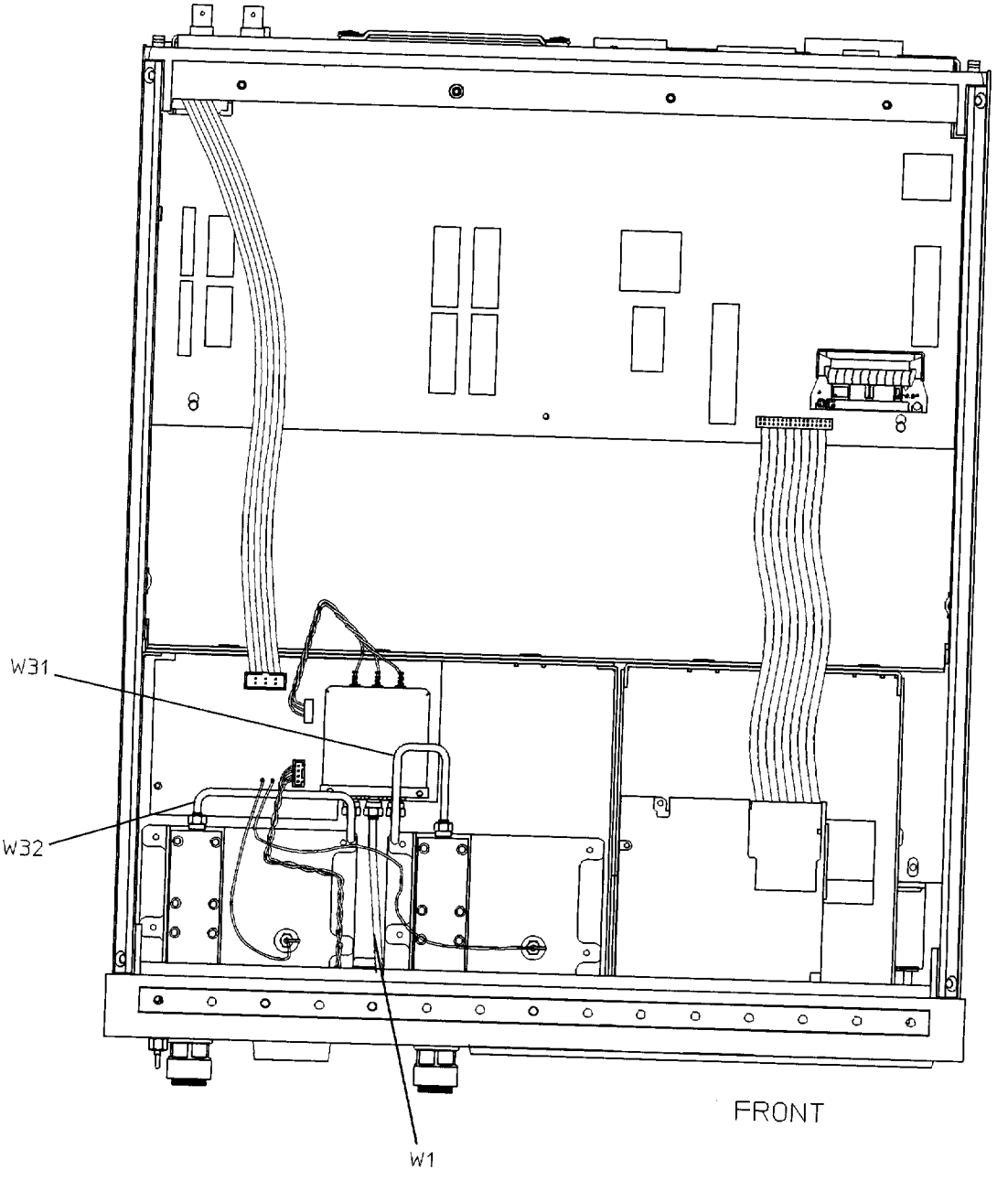


Figure 1-32. HP 8753D Bottom View

9. Calibration Coefficients

Specifications

Uncorrected[1] Error Terms	Frequency Range		
	300 kHz to 1.3 GHz	1.3 GHz to 3 GHz	3 GHz to 6 GHz[2]
Directivity	35 dB	30 dB	25 dB
Source Match	16 dB	16 dB	14 dB
Load Match	18 dB	16 dB	14 dB
Transmission Tracking	±1.5 dB	±1.5 dB	±2.5 dB
Reflection Tracking	±1.5 dB	±1.5 dB	±2.5 dB

1 At 25° ±5° C, with less than 1° C deviation from the measurement calibration temperature.

2 Only for analyzers with Option 006.

Equipment Required for 50Ω Analyzers

Calibration Kit, 7 mm ..... HP 85031B
Cable, APC-7, 24-inch ..... HP P/N 8120-4779

Equipment Required for 75Ω Analyzers

Calibration Kit, Type-N ..... HP 85036B
Cable, Type-N, 24-inch ..... HP P/N 8120-4781

Analyzer warm-up time: **30 minutes**

Perform this procedure to verify the analyzer uncorrected test port characteristics.

Note The crosstalk calibration coefficients are omitted in this procedure. They are covered in the "Test Port Crosstalk" performance test.

First Full 2-Port Calibration

1. Connect the equipment as shown in Figure 1-33.

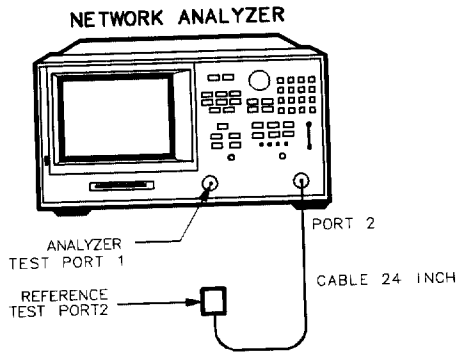


Figure 1-33. First Full 2-Port Calibration Test Setup

2. Press PRESET START 300 k/m.
3. Press CAL CAL KIT CAL KIT: 7mm RETURN CALIBRATE MENU FULL 2-PORT.
4. Press ISOLATION OMIT ISOLATION ISOLATION DONE.
5. Connect the "open" end of the open/short combination (supplied in the calibration kit) to analyzer test port 1.
6. Press REFLECTION FORWARD:OPEN.
7. Connect the "short" end of the open/short combination to analyzer test port 1.
8. Press FORWARD:SHORT.
9. Replace the open/short combination with the 50 ohm termination (supplied in the calibration kit).
10. Press FORWARD:LOAD.
11. Connect the "open" end of the open/short combination to the reference test port 2.
12. Press REVERSE:OPEN.
13. Connect the "short" end of the open/short combination to the reference test port 2.
14. Press REVERSE: SHORT.
15. Connect the 50 ohm termination to the reference test port 2.
16. Press REVERSE: LOAD.
17. At the prompt, PRESS 'DONE' IF FINISHED WITH STD(s), press STANDARDS DONE.

    Wait for the message COMPUTING CAL COEFFICIENTS to disappear from the analyzer display before proceeding to the next step.
18. Connect the equipment as shown in Figure 1-34.

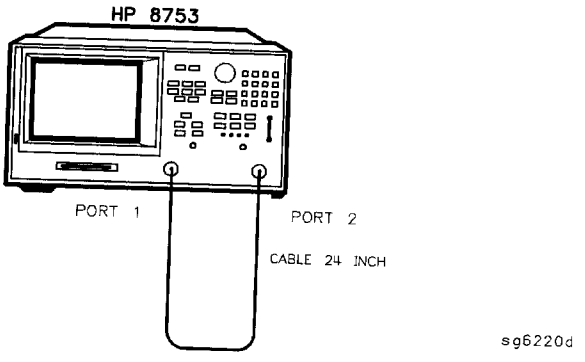


Figure 1-34. Transmission Calibration Test Setup

19. Press TRANSMISSION FWD TRANS THRU .
20. When the analyzer finishes the measurement, press FWD MATCH THRU .
21. When the analyzer finishes the measurement, press REV TRANS THRU .
22. After the analyzer finishes the measurement, press REV MATCH THRU .
23. After the analyzer finishes the measurement, press STANDARDS DONE DONE 2-PORT CAL .

Directivity (Forward) Calibration Coefficient

24. Press (SYSTEM) SERVICE MENU TESTS (32) (x1) EXECUTE TEST .
25. When the analyzer finishes the test, press (MARKER).
26. Using the front panel knob, locate the maximum value of the data trace for the 300 kHz to 1.3 GHz frequency range.
27. Write the maximum value in the "Performance Test Record."
28. Repeat the previous two steps for the other frequency range(s) listed on the "Performance Test Record."

Source Match (Forward) Calibration Coefficient

29. Press (SYSTEM) SERVICE MENU TESTS (33) (x1) EXECUTE TEST .
30. When the analyzer finishes the test, repeat steps 25 through 28.

Transmission Tracking (Forward) Calibration Coefficient

31. Press (SYSTEM) SERVICE MENU TESTS (37) (x1) EXECUTE TEST .
32. When the analyzer finishes the test, repeat steps 25 through 28.

Reflection Tracking (Forward) Calibration Coefficient

33. Press (SYSTEM) SERVICE MENU TESTS (34) (x1) EXECUTE TEST .
34. When the analyzer finishes the test, repeat steps 25 through 28.

Load Match (Reverse) Calibration Coefficient

35. Press (SYSTEM) SERVICE MENU TESTS (42) (x1) EXECUTE TEST .
36. When the analyzer finishes the test, repeat steps 25 through 28.

Transmission Tracking (Reverse) Calibration Coefficient

37. Press (SYSTEM) SERVICE MENU TESTS (43) (x1) EXECUTE TEST.

38. When the analyzer finishes the test, repeat steps 25 through 28.

Second Full 2-Port Calibration

39. Connect the equipment as shown in Figure 1-35.

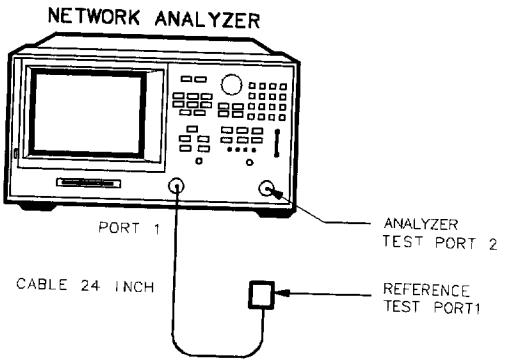


Figure 1-35. Second Full 2-Port Calibration Test Setup

40. Press (PRESET) (START) (300) (k/m).

41. Press (CAL) CAL KIT CAL KIT: 7mm RETURN CALIBRATE MENU FULL 2-PORT.

42. Press ISOLATION OMIT ISOLATION ISOLATION DONE.

43. Connect the "open" end of the open/short combination (supplied in the calibration kit) to reference test port 1.

44. Press REFLECTION FORWARD:OPEN.

45. Connect the "short" end of the open/short combination to reference test port 1.

46. Press FORWARD:SHORT.

47. Replace the open/short combination with the 50 ohm termination (supplied in the calibration kit).

48. Press FORWARD:LOAD.

49. Connect the "open" end of the open/short combination to the analyzer test port 2.

50. Press REVERSE:OPEN.

51. Connect the "short" end of the open/short combination to the analyzer test port 2.

52. Press REVERSE: SHORT.

53. Connect the 50 ohm termination to the analyzer test port 2.
54. Press REVERSE: LOAD .
55. When the analyzer displays PRESS 'DONE' IF FINISHED WITH STD(s), press STANDARDS DONE .

    Wait for the message COMPUTING CAL COEFFICIENTS to disappear from the analyzer display before proceeding to the next step.
56. Connect the equipment as shown in Figure 1-36.

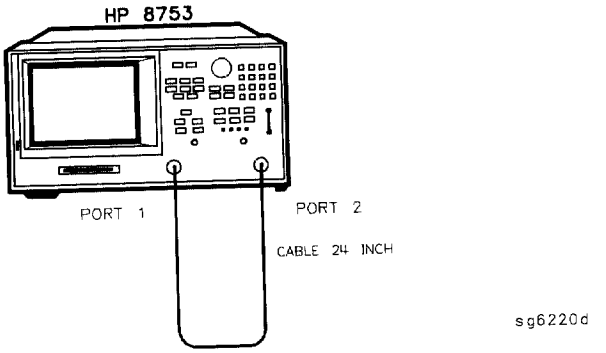


Figure 1-36. Transmission Calibration Test Setup

57. Press TRANSMISSION FWD TRANS THRU .
58. When the analyzer finishes the measurement, press FWD MATCH THRU .
59. When the analyzer finishes the measurement, press REV TRANS THRU .
60. When the analyzer finishes the measurement, press REV MATCH THRU .
61. When the analyzer displays PRESS 'DONE' IF FINISHED WITH STD(s), press STANDARDS DONE DONE 2-PORT CAL .

Load Match (Forward) Calibration Coefficient

62. Press (SYSTEM) SERVICE MENU TESTS (36) (x1) EXECUTE TEST .
63. When the test is done, press (MARKER) MARKER 1 .
64. Using the front panel knob, locate the maximum value of the data trace for the 300 kHz to 1.3 GHz frequency range.
65. Write the maximum value on the "Performance Test Record."
66. Repeat the previous three steps for the other frequency range(s) listed on the "Performance Test Record."

Directivity (Reverse) Calibration Coefficient

67. Press (SYSTEM) SERVICE MENU TESTS (38) (x1) EXECUTE TEST .

68. When the analyzer finishes the test, repeat steps 63 through 66.

Source Match (Reverse) Calibration Coefficient

69. Press (SYSTEM) SERVICE MENU TESTS (39) (x1). At the prompt, press EXECUTE TEST .

70. When the analyzer finishes the test, repeat steps 63 through 66.

Reflection Tracking (Reverse) Calibration Coefficient

1. Press (SYSTEM) SERVICE MENU TESTS (40) (x1) EXECUTE TEST .

2. When the analyzer finishes the test, repeat steps 63 through 66.

10. System Trace Noise (Only for Analyzers without Option 006)

Frequency Range	Ratio	System Trace Noise (Magnitude[1])	System Trace Noise (Phase[1])
30 kHz to 3 GHz	A/R	<0.006 dB rms	<0.038° rms
30 kHz to 3 GHz	B/R	<0.006 dB rms	<0.038° rms

1 At +5 dBm into test port, 3 kHz IF bandwidth, and CW sweep.

Required Equipment for 50Ω Analyzers

Cable, APC-7, 24-inch ..... HP P/N 8120-4779

Required Equipment for 75Ω Analyzers

Cable, 75Ω, Type-N 24-inch ..... HP P/N 8120-2408

Analyzer warm-up time: **1 hour**

Perform this test to measure the system trace noise at a designated frequency in both the A/R and B/R ratioed measurements.

1. Connect the equipment as shown in Figure 1-37.

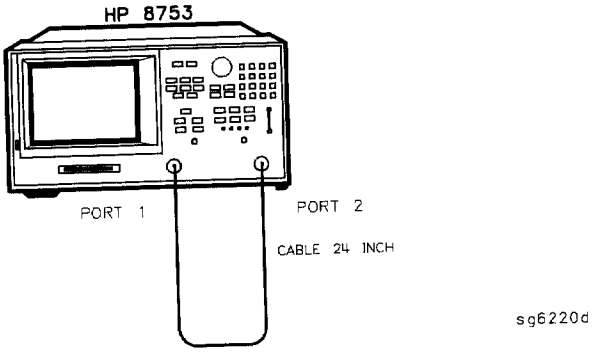


Figure 1-37. System Trace Noise Test Setup

2. Press (PRESET) (MENU) POWER (5) (x1).
3. Press RETURN CW FREQ (3) (G/n) NUMBER of POINTS (1601) (x1).
4. Press (MARKER FCTN) STATS ON to activate the instrument's statistic feature.

System Trace Noise for A/R Magnitude

5. Press (MEAS) Trans: REV S12 (A/R) .
6. Press (MENU) TRIGGER MENU NUMBER of GROUPS (5) (x1).
7. When the analyzer displays the "Hld" annotation, press (SCALE/REF) AUTO SCALE .
8. Write the s.dev (standard deviation) value, which appears on the analyzer display, on the "Performance Test Record."

System Trace Noise for A/R Phase

9. Press (FORMAT) PHASE .
10. Press (MENU) TRIGGER MENU NUMBER of GROUPS (5) (x1).
11. When the analyzer finishes the number of sweeps, press (SCALE/REF) AUTO SCALE .
12. Write the s.dev (standard deviation) value on the "Performance Test Record."

System Trace Noise for B/R Magnitude

13. Press (MEAS) Trans: FWD S21 (B/R) .
14. Press (MENU) TRIGGER MENU NUMBER of GROUPS (5) (x1).
15. When the analyzer finishes the number of sweeps, press (SCALE/REF) AUTO SCALE .
16. Write the s.dev (standard deviation) value on the "Performance Test Record."

System Trace Noise for B/R Phase

17. Press (FORMAT) PHASE .
18. Press (MENU) TRIGGER MENU NUMBER of GROUPS (5) (x1).
19. When the analyzer finishes the number of sweeps, press (SCALE/REF) AUTO SCALE .
20. Write the s.dev (standard deviation) value on the "Performance Test Record."

In Case of Difficulty

1. Perform the "ADC Offset Correction Constants" procedure, located in the "Adjustments and Correction Constants" chapter of the *HP 8753D Network Analyzer Service Guide.*
2. Repeat this performance test.
3. Suspect the A10 Digital IF board assembly if the analyzer still fails the test.

11. System Trace Noise (Only for Analyzers with Option 006)

Frequency Range	Ratio	System Trace Noise (Magnitude[1])	System Trace Noise (Phase[1])
30 kHz to 3 GHz	A/R	<0.006 dB rms	<0.038° rms
30 kHz to 3 GHz	B/R	<0.006 dB rms	<0.038° rms
3 GHz to 6 GHz	A/R	<0.010 dB rms	<0.070° rms
3 GHz to 6 GHz	B/R	<0.010 dB rms	<0.070° rms

1 At +5 dBm into test port, 3 kHz IF bandwidth, and CW sweep.

Required Equipment

Cable, APC-7, 24-inch ..... HP P/N 8120-4779

Analyzer warm-up time: **1 hour**

Perform this test to measure the system trace noise at designated CW frequencies in both the A/R and B/R ratioed measurements.

1. Connect the equipment as shown in Figure 1-38.

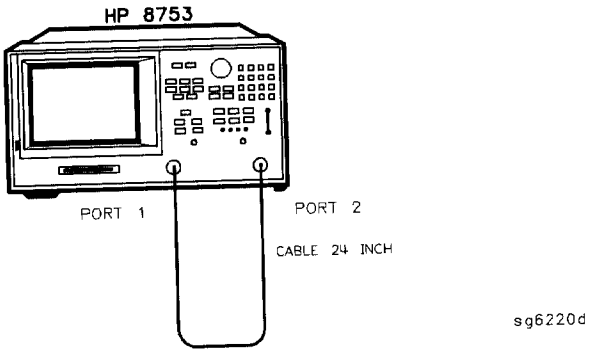


Figure 1-38. System Trace Noise Test Setup

2. Press (PRESET) (MENU) POWER (5) (x1) RETURN NUMBER of POINTS (1601) (x1).
3. Press (MARKER FCTN) STATS ON to activate the instrument's statistic feature.

System Trace Noise for A/R Magnitude from 30 kHz to 3 GHz

4. Press (MEAS) Trans: REV S12 (A/R).
5. Press (MENU) CW FREQ (3) (G/n) TRIGGER MENU NUMBER of GROUPS (5) (x1).
6. When the analyzer finishes the number of sweeps, press (SCALE/REF) AUTO SCALE.
7. Write the s.dev (standard deviation) value shown, which appears on the analyzer display, on the "Performance Test Record."

System Trace Noise for A/R Magnitude from 3 GHz to 6 GHz

8. Press (MENU) CW FREQ (6) (G/n) TRIGGER MENU NUMBER of GROUPS (5) (x1).
9. When the analyzer finishes the number of sweeps, press (SCALE/REF) AUTO SCALE.
10. Write the s.dev (standard deviation) value, which appears on the analyzer display, on the "Performance Test Record."

System Trace Noise for A/R Phase from 3 GHz to 6 GHz

11. Press (FORMAT) PHASE.
12. Press (MENU) TRIGGER MENU NUMBER of GROUPS (5) (x1).
13. When the analyzer finishes the number of sweeps, press (SCALE/REF) AUTO SCALE.
14. Write the s.dev (standard deviation) value, which appears on the analyzer display, on the "Performance Test Record."

System Trace Noise for A/R Phase from 30 kHz to 3 GHz

15. Press (MENU) CW FREQ (3) (G/n) TRIGGER MENU NUMBER of GROUPS (5) (x1).
16. When the analyzer finishes the number of sweeps, press (SCALE/REF) AUTO SCALE.
17. Write the s.dev (standard deviation) value, which appears on the analyzer display, on the "Performance Test Record."

System Trace Noise for B/R Magnitude from 30 kHz to 3 GHz

18. Press (MEAS) Trans: FWD S21 (B/R) (MENU) TRIGGER MENU NUMBER of GROUPS (5) (x1)
19. When the analyzer finishes the number of sweeps, press (SCALE/REF) AUTO SCALE.
20. Write the s.dev (standard deviation) value, which appears on the analyzer display, on the "Performance Test Record."

System Trace Noise for B/R Magnitude from 3 GHz to 6 GHz

21. Press (MENU) CW FREQ (6) (G/n) TRIGGER MENU NUMBER of GROUPS (5) (x1).
22. When the analyzer finishes the number of sweeps, press (SCALE/REF) AUTO SCALE.
23. Write the s.dev (standard deviation) value, which appears on the analyzer display, on the "Performance Test Record."

System Trace Noise for B/R Phase from 3 GHz to 6 GHz

24. Press (FORMAT) PHASE (MENU) TRIGGER MENU NUMBER of GROUPS (5) (x1).
25. When the analyzer finishes the number of sweeps, press (SCALE/REF) AUTO SCALE.
26. Write the s.dev (standard deviation) value, which appears on the analyzer display, on the "Performance Test Record."

System Trace Noise for B/R Phase from 30 kHz to 3 GHz

27. Press (MENU) CW FREQ (3) (G/n) TRIGGER MENU NUMBER of GROUPS (5) (x1).
28. When the analyzer finishes the number of sweeps, press (SCALE/REF) AUTO SCALE.
29. Write the s.dev (standard deviation) value, which appears on the analyzer display, on the "Performance Test Record."

In Case of Difficulty

1. Perform the "ADC Offset Correction Constants" procedure, located in the "Adjustments and Correction Constants" chapter of the *HP 8753D Network Analyzer Service Guide.*
2. Repeat this performance test.
3. Suspect the A10 Digital IF board assembly if the analyzer still fails the test.

12. Test Port Input Impedance

Specifications

Frequency Range	Test Port Input	Return Loss
50 kHz to 300 kHz[1]	Port 1	≥20 dB
300 kHz to 1.3 GHz	Port 1	≥18 dB
1.3 GHz to 3 GHz	Port 1	≥16 dB
3 GHz to 6 GHz[2]	Port 1	≥14 dB
50 kHz to 300 kHz[1]	Port 2	≥20 dB
300 kHz to 1.3 GHz	Port 2	≥18 dB
1.3 GHz to 3 GHz	Port 2	≥16 dB
3 GHz to 6 GHz[2]	Port 2	≥14 dB

1 Only for analyzers without Option 006.

2 Only for analyzers with Option 006.

Required Equipment for 50Ω Analyzers

Cable, APC-7, 24-inch ..... HP P/N 8120-4779
Calibration Kit, 7 mm ..... HP 85031B

Required Equipment for 75Ω Analyzers

Cable, 75Ω, Type-N, 24-inch ..... HP P/N 8120-2408
Calibration Kit, 75Ω, Type-N ..... HP 85036B

Analyzer warm-up time: **1 hour**

Perform this test to measure the return loss of each input test port.

1. Connect the equipment as shown in Figure 1-39.

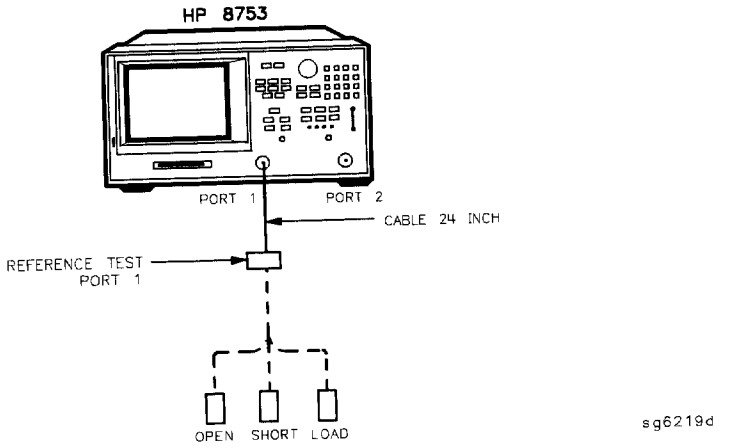


Figure 1-39. S11 1-Port Cal Test Setup

2. Press (PRESET) (MENU) NUMBER of POINTS (1601) (x1).
3. **Only For Analyzers WITHOUT Option 006:** Press (START) (50) (k/m).
4. Press (CAL) CAL KIT and select the appropriate calibration kit:
   - If your analyzer is 50Ω, press CAL KIT: 7mm.
   - If your analyzer is 75Ω, press CAL KIT: N 75Ω.
5. Press RETURN CALIBRATE MENU S11 1-PORT.
6. Connect an open to reference test port 1, as shown in Figure 1-39.
7. Press FORWARD: OPEN.
8. When the analyzer displays the prompt CONNECT STD THEN PRESS KEY TO MEASURE, connect a short to reference test port 1.
9. Press FORWARD: SHORT.
10. At the prompt, connect a load to reference test port 1.
11. Press FORWARD: LOAD.
12. When the analyzer displays 'DONE' IF FINISHED WITH CAL, press DONE 1-PORT CAL.
13. Press (SAVE/RECALL) SAVE STATE.
14. Connect the equipment as shown in Figure 1-40.

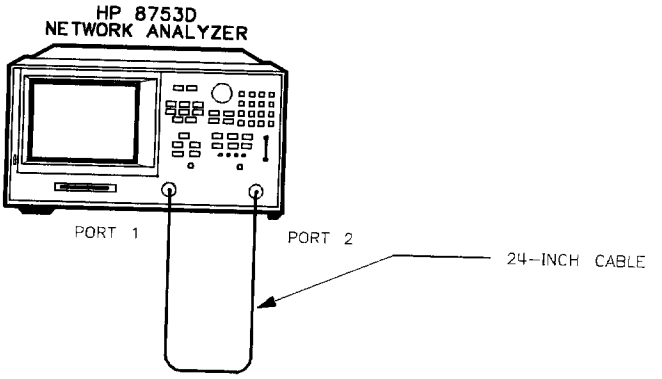


Figure 1-40. Test Port 2 Input Impedance Test Setup

15. Press (MARKER) to turn the analyzer's marker 1 on. Use the front panel knob to locate the maximum value of the data trace for each of the frequency ranges listed in the "Performance Test Record."
16. Write these maximum values on the "Performance Test Record."
17. Connect the equipment as shown in Figure 1-41.

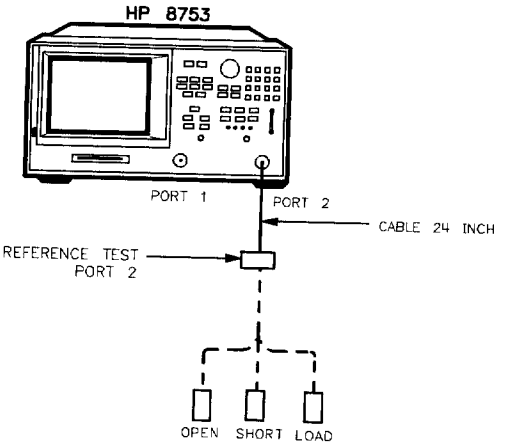


Figure 1-41. S22 1-Port Cal Test Setup

18. Press (CAL) CALIBRATE MENU S22 1-PORT .
19. At the prompt, connect an open to reference test port 2, as shown in Figure 1-41.
20. Press REVERSE: OPEN .
21. When the analyzer displays the prompt CONNECT STD THEN PRESS KEY TO MEASURE, connect a short to reference test port 2.
22. Press REVERSE: SHORT .
23. At the prompt, connect a load to reference test port 2.
24. Press REVERSE: LOAD .
25. When the analyzer displays 'DONE' IF FINISHED WITH CAL, press DONE 1-PORT CAL .
26. Press (SAVE/RECALL) SAVE STATE to save the 1-Port calibration.
27. Connect the equipment as shown in Figure 1-42.

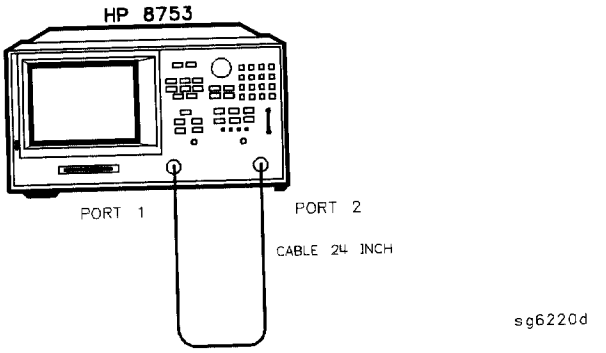


Figure 1-42. Test Port 1 Input Impedance Test Setup

28. Press (MARKER) to activate the analyzer's marker 1. Use the front panel knob to locate the maximum value of the data trace for each of the frequency ranges listed in the "Performance Test Record."
29. Write the maximum values on the "Performance Test Record."

In Case of Difficulty

1. Suspect the A10 digital IF board assembly if the analyzer fails BOTH test port tests.
2. Refer to the "Receiver Troubleshooting" chapter of the *HP 8753D Network Analyzer Service Guide* for more troubleshooting information.

13. Test Port Receiver Magnitude Dynamic Accuracy

Specifications

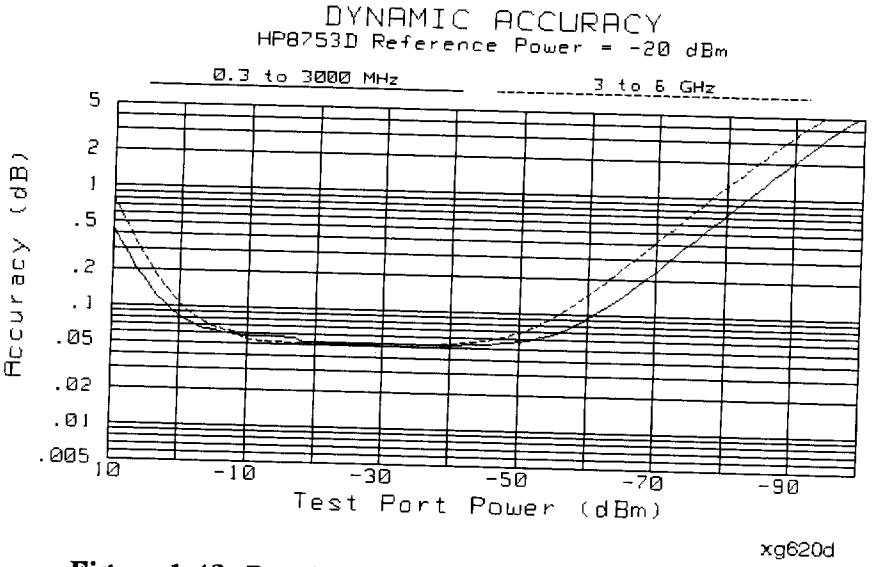


Figure 1-43. Receiver Magnitude Dynamic Accuracy

Required Equipment

Measuring Receiver ..... HP 8902A
Step Attenuator, 110 dB ..... HP 8496A
Adapter (2), APC-7 to Type-N (f) ..... HP 118524A
Adapter, Type-N (m) to Type-N (m) ..... HP P/N 1250-1528
2-Way Power Splitter, 50Ω ..... HP 11667A
Cable (3), 50Ω, Type-N, 24-inch ..... HP P/N 8120-4781

Additional Required Equipment for 75Ω Analyzers

Minimum Loss Pad (2), 50Ω to 75Ω ..... HP 11852B

Analyzer warm-up time: **1 hour**

Test Port 2 Magnitude Dynamic Accuracy

1. On the HP 8902A:
   a. Press the blue shift key and [INSTR PRESET] [CLEAR].
   b. Press the yellow shift key and [TUNED RF LEVEL].
   c. Press [LOG/LIN] to have the HP 8902A displayed linear readings (dBm).
   d. Press [32.1] [SPCL].
2. Set the HP 8496A to 10 dB.
3. On the HP 8753D:
   a. Press [PRESET] [MENU] CW FREQ [30] [M/μ].
   b. Press NUMBER of POINTS [51] [x1].
   c. Press [AVG] IF BW [10] [x1].
4. Connect the equipment as shown in Figure 1-44.

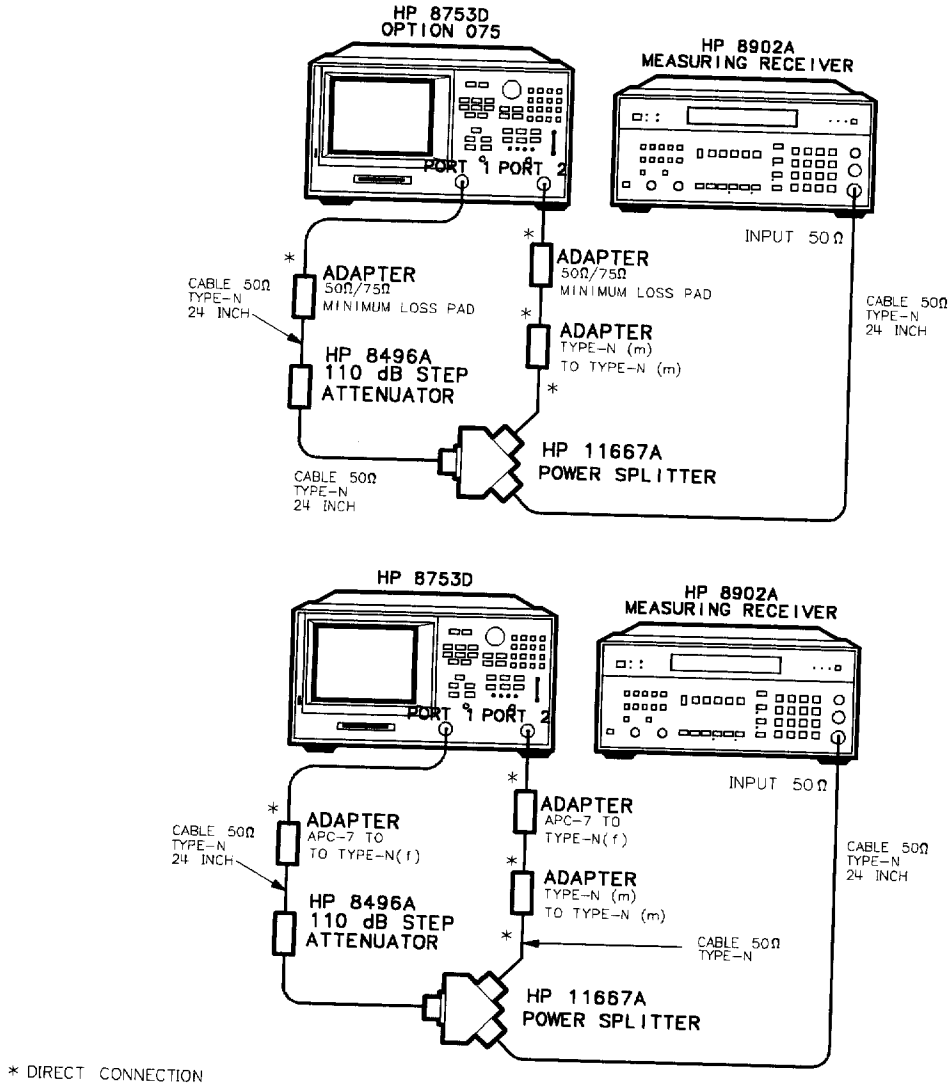


Figure 1-44. Test Port 2 Dynamic Accuracy Test Setup

5. On the HP 8753D:
   a. Press (MEAS) INPUT PORTS B (MENU) POWER (-4) (x1).
   b. Using the analyzer front panel knob, adjust the test port power for a reading of −20.000 dBm4 on the HP 8902A.
   c. Wait for the reading to stabilize.

Note Ignore the UNCAL displayed on the HP 8902A. This indicates that you are making an approximate power level measurement. However, this is not a concern because you will be making a relative power measurement.

6. On the HP 8902A, press the blue shift key and (SET REF).
   - If the HP 8902A has drifted, adjust the analyzer front panel knob for a power reading of 0.000 dBm on the HP 8902A.
7. On the HP 8753D:
   a. Press (CAL) CALIBRATE MENU RESPONSE THRU.
   b. After the analyzer finishes the measurement, press DONE: RESPONSE.

      Press (SAVE/RECALL) SAVE STATE.
   c. Press (MARKER FCTN) STATS ON.
8. Set the HP 8496A to 0 dB.
9. On the HP 8753D, press (MENU) TRIGGER MENU SINGLE.
10. Write the mean value (which appears on the analyzer's display) in the "Test Port" column of the "Performance Test Record."
11. Write the HP 8902A readout in the "8902A" column of the "Performance Test Record."
12. Calculate the difference between the "Test Port 2" and the "8902A".
13. Take the absolute value of the calculated difference, and enter the result in the "Calculated Value" column of the "Performance Test Record."
14. Set the HP 8496A to the other attenuation settings listed in the "Performance Test Record," while repeating steps 9 through 13.

Note When the HP 8902A displays the "RECAL" annunciation, press (CALIBRATE).

Test Port 1 Magnitude Dynamic Accuracy

15. Set the HP 8496A to 10 dB.
16. On the HP 8753D, press CONTINUOUS (MEAS) INPUT PORTS TESTPORT 2 A.
17. Connect the equipment as shown in Figure 1-45.

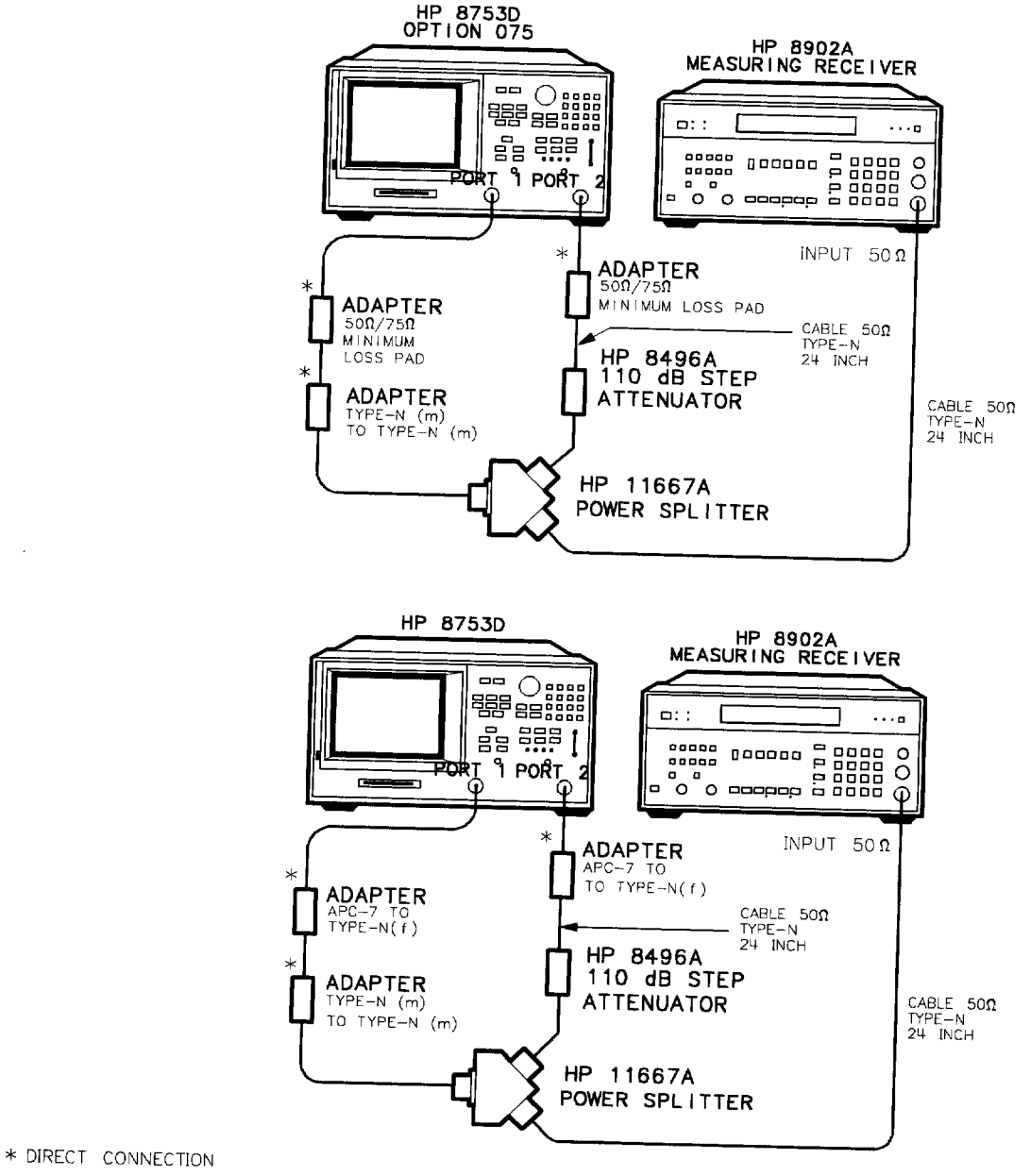


Figure 1-45. Test Port 1 Magnitude Dynamic Accuracy Test Setup

18. On the HP 8753D:
    a. Press (MENU) POWER.
    b. Using the analyzer front panel knob, adjust the test port power for a reading of 0.000 dB on the HP 8902A.
    c. Wait for the reading to stabilize.
19. On the HP 8902A, press the blue shift key and (SET REF).
20. On the HP 8753D:
    a. Press (CAL) CALIBRATE MENU RESPONSE THRU.
    b. After the analyzer finishes the measurement, press DONE: RESPONSE.
    c. Press (SAVE/RECALL) SAVE STATE.
21. Set the HP 8496A to 0 dB.
22. On the HP 8753D, press (MENU) TRIGGER MENU SINGLE.
23. Write the mean value in the "Test Port" column of the "Performance Test Record."
24. Write the HP 8902A readout in the "8902A" column of the "Performance Test Record."
25. Calculate the difference between the "Test Port 1" and the "8902A".
26. Take the absolute value of the calculated difference and enter the result in the "Calculated Value" column of the "Performance Test Record."
27. Set the HP 8496A to the other attenuation settings listed in the "Performance Test Record," while repeating steps 22 to 26.

Note When the HP 8902A displays the "RECAL" annunciation, press (CALIBRATE).

In Case of Difficulty

1. If the analyzer fails the test at ALL power levels, be sure you followed the recommended attenuator settings as listed in the "Performance Test Record." Repeat this performance test.
2. If both test port measured values are out of specifications:
   a. Recalibrate the HP 8902A.
   b. Press (CLEAR) on the HP 8902A.
   c. Repeat this performance test.
   d. Press (CALIBRATE) when either "ERROR 32" or "RECAL" is shown on the measuring receiver display.
3. If the analyzer fails either test port 2 or test port 1 dynamic accuracy at lower power levels:
   a. Perform the "IF Amplifier Correction Constants" and "ADC Offset Correction Constants" procedures (located in the "Adjustments and Correction Constants" chapter of the *HP 8753D Network Analyzer Service Guide*).
   b. Repeat this performance test.
   c. If it still fails, replace the A10 Digital IF assembly.
   d. Repeat the two adjustment procedures mentioned in this step and then repeat the this performance test.

14. Test Port Receiver Phase Dynamic Accuracy

Specification

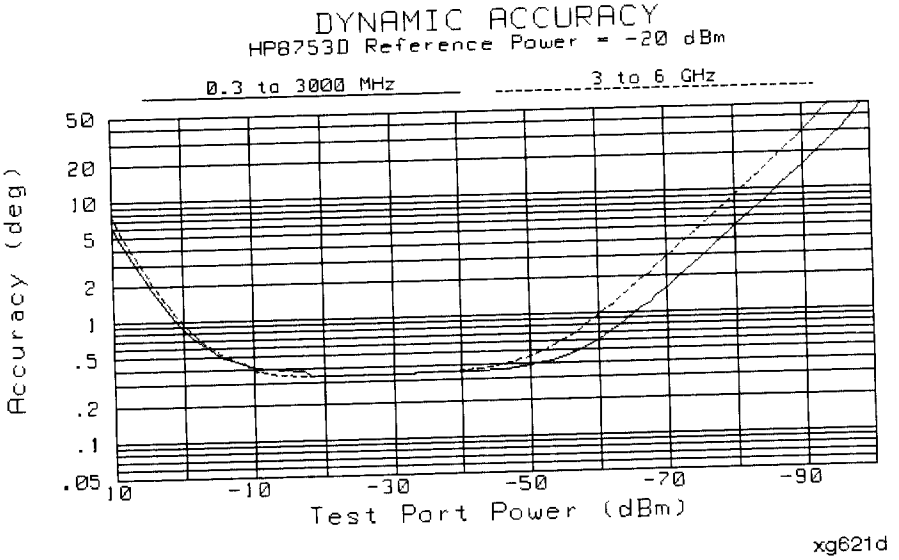


Figure 1-46. Dynamic Accuracy (Phase)

Test Port 2 Phase Dynamic Accuracy

1. Refer to the "Test Port Receiver Magnitude Dynamic Accuracy" portion of the "Performance Test Record," for the values in the "Calculated Value" column.
2. Copy the values in the "Magnitude Value" column to the "Calculated Value" column of the "Test Port Receiver Phase Dynamic Accuracy" portion of the "Performance Test Record."
3. For every test port input power level, calculate "A" using the following formula:

$$A = 10^{\left(\frac{\text{Calculated Value}}{20}\right)}$$

4. Write the result in the "A" column of the "Performance Test Record."
5. For every test port input power level, calculate "B" using the following formula:

$$B = 1 - A$$

6. Write the result in the "B" column of the "Performance Test Record."
7. For every test port input power level, calculate the receiver phase dynamic accuracy using the following formula:

$$\textit{Phase Dynamic Accuracy} = SIN^{-1}(B)$$

8. Write the value in the "Results Value" column of the "Performance Test Record."

Test Port 1 Phase Dynamic Accuracy

9. Repeat steps 1 to 8.

15. Test Port Receiver Magnitude Compression

Specifications

Frequency Range	Test Port	Magnitude[1]
300 kHz to 3 GHz	Port 1	≤0.45 dB
3 GHz to 6 GHz[2]	Port 1	≤0.80 dB
300 kHz to 3 GHz	Port 2	≤0.45 dB
3 GHz to 6 GHz[2]	Port 2	≤0.80 dB

1 With a 10 Hz IF bandwidth.

2 Only for analyzers with Option 006.

Required Equipment for 50Ω Analyzers

Cable, APC-7, 24-inch ..... HP P/N 8120-4779

Required Equipment for 75Ω Analyzers

Cable, 75Ω, Type-N, 24-inch ..... HP P/N 8120-2408

Analyzer warm-up time: **1 hour**

Perform this test to verify the compression/expansion magnitude levels of the analyzer's test port receiver samplers.

Test Port 2 Magnitude Compression

1. Connect the equipment as shown in Figure 1-47.

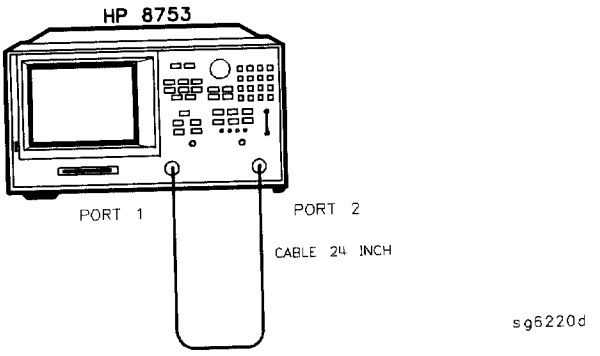


Figure 1-47. Test Port Magnitude Compression Test Setup

2. Press (PRESET) (MEAS) Trans: FWD S21 (B/R) .
3. Press (AVG) IF BW (10) (x1).
4. Press (MENU) CW FREQ (50) (M/μ).
5. Press SWEEP TYPE MENU POWER SWEEP START (-10) (x1).
6. Press (MENU) TRIGGER MENU SINGLE .
7. At the end of the sweep, press (SCALE/REF) AUTO SCALE .
8. Press (MARKER FCTN) MKR SEARCH SEARCH: MAX .
9. Press (MARKER) MARKER 2 (MARKER FCTN) MKR SEARCH SEARCH: MIN .
10. Press (MARKER) ΔMODE MENU ΔREF = 1 .
11. Write the absolute value of the marker 2 reading in the "Performance Test Record."
12. Press (MENU) CW FREQ (1) (G/n).
13. Press TRIGGER MENU SINGLE.
14. At the end of the sweep, press (SCALE/REF) AUTO SCALE .
15. Press (MARKER) MARKER ΔREF=1 (MARKER FCTN) MKR SEARCH SEARCH: MAX .
16. Press (MARKER) MARKER 2 (MARKER FCTN) MKR SEARCH SEARCH: MIN .
17. Write the absolute value of marker 2 in the "Performance Test Record."
18. Repeat steps 12 through 17 for the other frequencies listed for Port 2 on the "Performance Test Record."

Test Port 1 Magnitude Compression

19. Press (MEAS) Trans: REV S12 (A/R) .
20. Press (MENU) CW FREQ (50) (M/μ).
21. Press TRIGGER MENU SINGLE .
22. At the end of the sweep, press (SCALE/REF) AUTO SCALE .
23. Press (MARKER) MARKER ΔREF = 1 (MARKER FCTN) MKR SEARCH SEARCH: MAX .
24. Press (MARKER) MARKER 2 (MARKER FCTN) MKR SEARCH SEARCH: MIN .
25. Write the absolute value of the marker 2 reading in the "Measured Value" column of the "Performance Test Record."
26. Repeat steps 19 through 25 for the other CW frequencies listed for Port 1 in the "Performance Test Record."

In Case of Difficulty

1. If the analyzer fails "Test Port 2 Magnitude Compression":
   a. Repeat this test.
   b. Replace the A6 B sampler assembly if the analyzer still fails the test.
2. If the analyzer fails "Test Port 1 Magnitude Compression":
   a. Repeat this test.
   b. Replace the A5 A sampler assembly if the analyzer still fails the test.

16. Test Port Receiver Phase Compression

Specifications

CW Frequency	Test Port	Phase[1]
300 kHz to 3 GHz	Port 1	≤6°
3 GHz to 6 GHz[2]	Port 1	≤7.5°
300 kHz to 3 GHz	Port 2	≤6°
3 GHz to 6 GHz[2]	Port 2	≤7.5°

1 With 10 Hz IF bandwidth.

2 Only for analyzer with Option 006.

Required Equipment for 50Ω Analyzers

Cable, APC-7, 24-inch ..... HP P/N 8120-4779

Required Equipment for 75Ω Analyzers

Cable, 75Ω, Type-N, 24-inch ..... HP P/N 8120-2408

Analyzer warm-up time: **1 hour**

Perform this test to verify the compression/expansion phase relationships of the analyzer's test port receiver samplers.

Test Port 2 Phase Compression

1. Connect the equipment as shown in Figure 1-48.

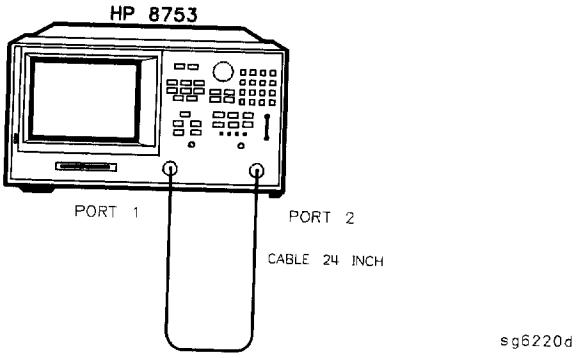


Figure 1-48. Test Port Phase Compression Test Setup

2. Press (PRESET) (MEAS) Trans: FWD S21 (B/R) (FORMAT) PHASE.
3. Press (AVG) IF BW (10) (x1).
4. Press (MENU) SWEEP TYPE MENU POWER SWEEP START (-10) (x1).
5. Press (MENU) CW FREQ (50) (M/μ)
6. Press (MENU) TRIGGER MENU SINGLE.
7. At the end of the sweep, press (SCALE/REF) AUTO SCALE.
8. Press (MARKER FCTN) MKR SEARCH SEARCH: MAX.
9. Press (MARKER) MARKER 2 (MARKER FCTN) MKR SEARCH SEARCH: MIN.
10. Press (MARKER) ΔMODE MENU ΔREF = 1.
11. Write the absolute value of the marker 2 reading in the "Measured Value" column of the "Performance Test Record."
12. Repeat steps 5 to 11 for the other CW frequencies listed for Port 2 in the "Performance Test Record."

Test Port 1 Phase Compression

13. Press (MEAS) Trans: REV S12 (A/R) (FORMAT) PHASE.
14. Press (MENU) CW FREQ (50) (M/μ)
15. Press (MENU) TRIGGER MENU SINGLE.
16. At the end of the sweep, press (SCALE/REF) AUTO SCALE.
17. Press (MARKER) MARKER ΔREF = 1 (MARKER FCTN) MKR SEARCH SEARCH: MAX.
18. Press (MARKER) MARKER 2 (MARKER FCTN) MKR SEARCH SEARCH: MIN.
19. Write the absolute value of the marker 2 reading in the "Measured Value" column of the "Performance Test Record."
20. Repeat steps 14 to 19 for the other CW frequencies listed for Port 1 in the "Performance Test Record."

In Case of Difficulty

1. If the analyzer fails the "Test Port 2 Phase Compression" test:
   a. Repeat this test.
   b. Replace the A6 B sampler assembly if analyzer still fails the test.
2. If the analyzer fails the "Test Port 1 Phase Compression" test:
   a. Repeat this test.
   b. Replace the A5 A sampler assembly if analyzer still fails the test.

17. Test Port Output/Input Harmonics (Option 002 Analyzers without Option 006 Only)

Specifications

Test Port	Harmonic	Limit
Output	2nd	< −25 dBc @ +10 dBm
Output	3rd	< −25 dBc @ +10 dBm
Input Port 1	2nd	< −15 dBc @ +8 dBm
Input Port 1	3rd	< −30 dBc @ +8 dBm
Input Port 2	2nd	< −15 dBc @ +8 dBm
Input Port 2	3rd	< −30 dBc @ +8 dBm

Equipment Required for 50Ω Analyzers

Cable, APC-7, 24-inch ..... HP P/N 8120-4779
Attenuator (2), 20 dB, APC-7 ..... HP 8492A Opt 020

Equipment Required for 75Ω Analyzers

Minimum Loss Pad (2) ..... HP 11852B
Cable, Type-N ..... HP P/N 8120-2408
Attenuator (2), 20 dB, Type-N ..... HP 8491A Opt 020

Analyzer warm-up time: **30 minutes**

Perform this test to determine the spectral purity of the HP 8753D input and output test ports.

Note The test port input 3rd harmonic specifications are *better* than the test port output 3rd harmonic specifications.

Test Port Output Worst Case 2nd Harmonic

1. Press (PRESET) (MENU) POWER (10) (x1).
2. Press (START) (16) (M/μ) (STOP) (1.5) (G/n) to set the frequency range.
3. Press (AVG) IF BW (10) (x1) to set the IF bandwidth to 10 Hz.
4. Connect the equipment as shown in Figure 1-49.

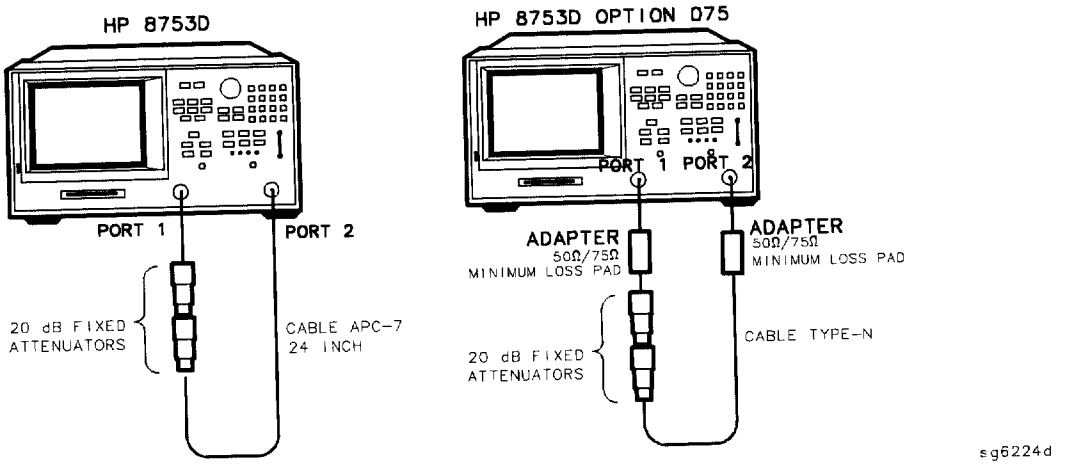


Figure 1-49. Test Port Output Harmonics Test Setup

5. Press (MEAS) Trans:REV S12 (A/R) INPUT PORTS A.
6. After one sweep, press (DISPLAY) DATA→MEMORY DATA/MEM to normalize the trace.
7. Press (SYSTEM) HARMONIC MEAS HARMONIC SECOND.
8. After one sweep, press (SCALE/REF) AUTO SCALE to get a better viewing of the trace.
9. Press (MARKER FCTN) MKR SEARCH SEARCH MAX.
10. Write the marker 1 value (which appears on the analyzer display) on the "Performance Test Record." This is the worst case test port output 2nd harmonic.

Test Port Output Worst Case 3rd Harmonic

11. Press [STOP] [1] [G/n] to change the stop frequency to 1 GHz.
12. Press [SYSTEM] HARMONIC MEAS HARMONIC OFF.
13. After one sweep, press [DISPLAY] DATA→MEMORY DATA/MEM to normalize the trace.
14. Press [SCALE/REF] AUTO SCALE SCALE/DIV [1] [x1] to get a better viewing of the trace.
15. Press [SYSTEM] HARMONIC MEAS HARMONIC THIRD.
16. After one sweep, press [SCALE/REF] AUTO SCALE.
17. Press [MARKER FCTN] MKR SEARCH SEARCH MAX.
18. Write the marker 1 value on the "Performance Test Record."

Port 1 Input Worst Case 2nd Harmonic

19. Connect the equipment as shown in Figure 1-50.

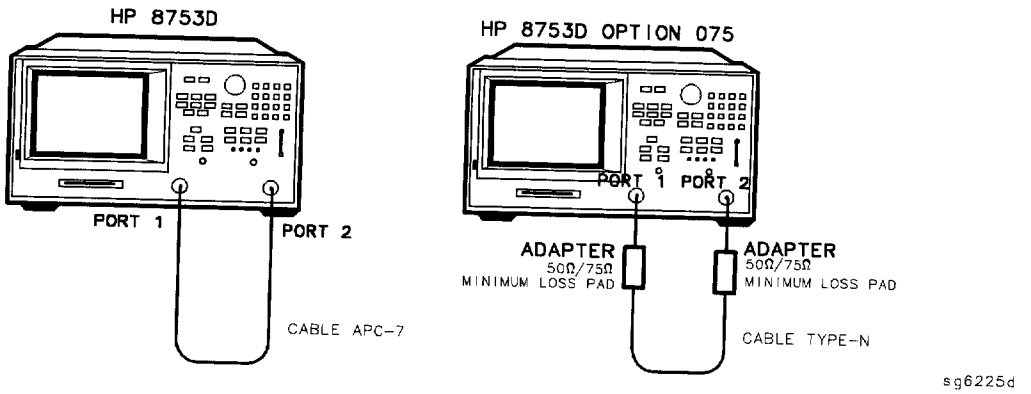


Figure 1-50. Receiver Harmonics Test Setup

20. Press [PRESET] [MENU] POWER [8] [x1].
21. Press [AVG] IF BW [1] [0] [x1].
22. Press [START] [16] [M/μ] [STOP] [1.5] [G/n] to set the frequency range.
23. Press [MEAS] Trans:REV S12 (A/R) INPUT PORTS A.
24. After one sweep, press [DISPLAY] DATA→MEMORY DATA/MEM to normalize the trace.
25. Press [SYSTEM] HARMONIC MEAS HARMONIC SECOND.
26. After one sweep, press [SCALE/REF] AUTO SCALE to get a better viewing of the trace.
27. Press [MARKER FCTN] MKR SEARCH SEARCH MAX.
28. Write the marker 1 value (which appears on the analyzer display) on the "Performance Test Record." This is the worst case port 1 input (receiver channel A) 2nd harmonic.

Port 1 Input Worst Case 3rd Harmonic

29. Press [STOP] [1] [G/n] to change the stop frequency for measuring the receiver 3rd harmonic.
30. Press [SYSTEM] HARMONIC MEAS HARMONIC OFF .
31. After one sweep, press [DISPLAY] DATA→MEMORY DATA/MEM to normalize the trace.
32. Press [SCALE/REF] AUTO SCALE SCALE/DIV [1] [x1] to get a better viewing of the trace.
33. Press [SYSTEM] HARMONIC MEAS HARMONIC THIRD .
34. After one sweep, press [SCALE/REF] AUTO SCALE .
35. Press [MARKER FCTN] MKR SEARCH SEARCH MAX .
36. Write the marker 1 value on the "Performance Test Record."
37. Press [SYSTEM] HARMONIC MEAS HARMONIC OFF .

Port 2 Input Worst Case 2nd Harmonic

38. Press [STOP] [1.5] [G/n] to set the stop frequency for measuring the 2nd harmonic.
39. Press [MEAS] Trans:FWD S21 (B/R) INPUT PORTS B .
40. After one sweep, press [DISPLAY] DATA→MEMORY DATA/MEM to normalize the trace.
41. Press [SYSTEM] HARMONIC MEAS HARMONIC SECOND .
42. After one sweep, press [SCALE/REF] AUTO SCALE to get a better viewing of the trace.
43. Press [MARKER FCTN] MKR SEARCH SEARCH MAX .
44. Write the marker 1 value (which appears on the analyzer display) on the "Performance Test Record." This is the worst case port 2 input (receiver channel B) 2nd harmonic.

Port 2 Input Worst Case 3rd Harmonic

45. Press [STOP] [1] [G/n] to change the stop frequency for measuring the receiver 3rd harmonic.
46. Press [SYSTEM] HARMONIC MEAS HARMONIC OFF .
47. After one sweep, press [DISPLAY] DATA→MEMORY DATA/MEM to normalize the trace.
48. Press [SCALE/REF] AUTO SCALE SCALE/DIV [1] [x1] to get a better viewing of the trace.
49. Press [SYSTEM] HARMONIC MEAS HARMONIC THIRD .
50. After one sweep, press [SCALE/REF] AUTO SCALE .
51. Press [MARKER FCTN] MKR SEARCH SEARCH MAX .
52. Write the marker 1 value on the "Performance Test Record."

18. Test Port Output/Input Harmonics (Option 002 Analyzers with Option 006 Only)

Specifications

Test Port	Harmonic	Limit
Output	2nd	< −25 dBc @ +10 dBm
Output	3rd	< −25 dBc @ +10 dBm
Input Port 1	2nd	< −15 dBc @ +8 dBm
Input Port 1	3rd	< −30 dBc @ +8 dBm
Input Port 2	2nd	< −15 dBc @ +8 dBm
Input Port 2	3rd	< −30 dBc @ +8 dBm

Equipment Required

Cable, APC-7, 24-inch ..... HP P/N 8120-4779
Attenuator (2), 20 dB ..... HP 8492A Opt 020

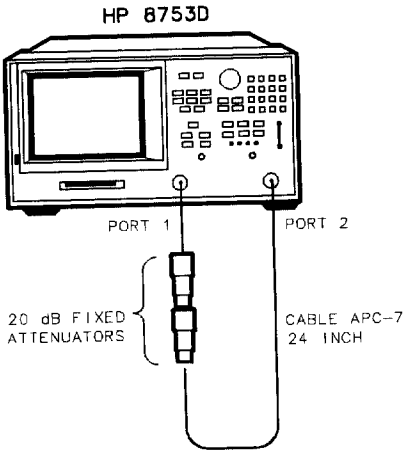
Analyzer warm-up time: **30 minutes**

Perform this test to determine the spectral purity of the HP 8753D input and output test ports.

Note The test port input 3rd harmonic specifications are *better* than the test port output 3rd harmonic specifications.

Test Port Output Worst Case 2nd Harmonic

1. Press (PRESET) (MENU) POWER (10) (x1) to set the test port power to +10 dBm.
2. Press (START) (16) (M/μ) (STOP) (3) (G/n) to set the frequency range.
3. Press (AVG) IF BW (10) (x1) to set the IF bandwidth to 10 Hz.
4. Connect the equipment as shown in Figure 1-51.



xg68d

Figure 1-51. Test Port Output Harmonics Test Setup

5. Press (MEAS) Trans:REV S12 (A/R) INPUT PORTS A.
6. After one sweep, press (DISPLAY) DATA→MEMORY DATA/MEM to normalize the trace.
7. Press (SYSTEM) HARMONIC MEAS HARMONIC SECOND.
8. After one sweep, press (SCALE/REF) AUTO SCALE to get a better viewing of the trace.
9. Press (MARKER FCTN) MKR SEARCH SEARCH MAX.
10. Write the marker 1 value (which appears on the analyzer display) on the "Performance Test Record." This is the worst case test port output 2nd harmonic.

Test Port Output Worst Case 3rd Harmonic

11. Press [STOP] [2] [G/n] to change the stop frequency to 1 GHz.
12. Press [SYSTEM] HARMONIC MEAS HARMONIC OFF.
13. After one sweep, press [DISPLAY] DATA→MEMORY DATA/MEM to normalize the trace.
14. Press [SCALE/REF] AUTO SCALE SCALE/DIV [1] [x1] to get a better viewing of the trace.
15. Press [SYSTEM] HARMONIC MEAS HARMONIC THIRD.
16. After one sweep, press [SCALE/REF] AUTO SCALE.
17. Press [MARKER FCTN] MKR SEARCH SEARCH MAX.
18. Write the marker 1 value on the "Performance Test Record."

Port 1 Input Worst Case 2nd Harmonic

19. Connect the equipment as shown in Figure 1-52.

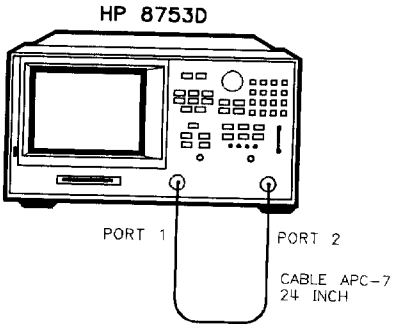


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Figure 1-52. Receiver Harmonics Test Setup

20. Press [PRESET] [MENU] POWER [8] [x1].
21. Press [AVG] IF BW [10] [x1].
22. Press [START] [16] [M/μ] [STOP] [3] [G/n] to set the frequency range.
23. Press [MEAS] Trans:REV S12 (A/R) INPUT PORTS A.
24. After one sweep, press [DISPLAY] DATA→MEMORY DATA/MEM to normalize the trace.
25. Press [SYSTEM] HARMONIC MEAS HARMONIC SECOND.
26. After one sweep, press [SCALE/REF] AUTO SCALE to get a better viewing of the trace.
27. Press [MARKER FCTN] MKR SEARCH SEARCH: MAX.
28. Write the marker 1 value (which appears on the analyzer display) on the "Performance Test Record." This is the worst case port 1 input (receiver channel A) 2nd harmonic.

Port 1 Input Worst Case 3rd Harmonic

29. Press [STOP] [2] [G/n] to change the stop frequency for measuring the receiver 3rd harmonic.
30. Press [SYSTEM] HARMONIC MEAS HARMONIC OFF .
31. After one sweep, press [DISPLAY] DATA→MEMORY DATA/MEM to normalize the trace.
32. Press [SCALE/REF] AUTO SCALE SCALE/DIV [1] [x1] to get a better viewing of the trace.
33. Press [SYSTEM] HARMONIC MEAS HARMONIC THIRD .
34. After one sweep, press [SCALE/REF] AUTO SCALE .
35. Press [MARKER FCTN] MKR SEARCH SEARCH: MAX .
36. Write the marker 1 value on the "Performance Test Record."
37. Press [SYSTEM] HARMONIC MEAS HARMONIC OFF .

Port 2 Input Worst Case 2nd Harmonic

38. Press [STOP] [3] [G/n] to set the stop frequency for measuring the 2nd harmonic.
39. Press [MEAS] Trans:FWD S21 (B/R) INPUT PORTS B .
40. After one sweep, press [DISPLAY] DATA→MEMORY DATA/MEM to normalize the trace.
41. Press [SYSTEM] HARMONIC MEAS HARMONIC SECOND .
42. After one sweep, press [SCALE/REF] AUTO SCALE to get a better viewing of the trace.
43. Press [MARKER FCTN] MKR SEARCH SEARCH MAX .
44. Write the marker 1 value (which appears on the analyzer display) on the "Performance Test Record." This is the worst case port 2 input (receiver channel B) 2nd harmonic.

Port 2 Input Worst Case 3rd Harmonic

45. Press [STOP] [2] [G/n] to change the stop frequency for measuring the receiver 3rd harmonic.
46. Press [SYSTEM] HARMONIC MEAS HARMONIC OFF .
47. After one sweep, press [DISPLAY] DATA→MEMORY DATA/MEM to normalize the trace.
48. Press [SCALE/REF] AUTO SCALE SCALE/DIV [1] [x1] to get a better viewing of the trace.
49. Press [SYSTEM] HARMONIC MEAS HARMONIC THIRD .
50. After one sweep, press [SCALE/REF] AUTO SCALE .
51. Press [MARKER FCTN] MKR SEARCH SEARCH: MAX .
52. Write the marker 1 value on the "Performance Test Record."

Performance Test Record

For Analyzers with a Frequency Range of 30 kHz to 3 GHz

Note See the next "Performance Test Record" section if your analyzer frequency range is from 30 kHz to 6 GHz (option 006).

HP 8753D Performance Test Record (1 of 13)

Calibration Lab Address:

Report Number _____

Date _____

_____ Last Calibration Date _____

_____ Customer's Name _____

_____ Performed by _____

Model HP 8753D

Serial No. _____ Option(s) _____

Firmware Revision _____

Ambient Temperature _____° C Relative Humidity _____%

Test Equipment Used:

Description	Model Number	Trace Number	Cal Due Date
Frequency Counter			
Power Meter			
Power Sensor			
Calibration Kit			
Verification Kit			

Notes/Comments: _____

_____

_____

HP 8753D Performance Test Record (2 of 13)
For 30 kHz—3 GHz Analyzers

Hewlett-Packard Company	**Report Number** _____
Model HP 8753D	**Date** _____
Serial Number _____	

▶▶ 1. Test Port Output Frequency Range and Accuracy

CW Frequencies (MHz)	Min. (MHz)	Results Measured (MHz)	Max. (MHz)	Measurement Uncertainty (MHz)
0.03	0.029 999 7	_____	0.030 000 3	± 0.000 000 036
0.3	0.299 997	_____	0.300 003	± 0.000 000 360
5.0	4.999 950	_____	5.000 050	± 0.000 006
16.0	15.999 840	_____	16.000 160	± 0.000 019
31.0	30.999 690	_____	31.000 310	± 0.000 037
60.999 999	60.999 390	_____	61.000 610	± 0.000 073
121.0	120.998 790	_____	121.001 210	± 0.000 145
180.0	179.998 200	_____	180.001 800	± 0.000 216
310.0	309.995 900	_____	310.003 100	± 0.000 372
700.0	699.930 000	_____	700.007 000	± 0.000 840
1 300.0	1 299.987	_____	1 300.013	± 0.001 560
2 000.0	1 999.980	_____	2 000.020	± 0.002 400
3 000.0	2 999.970	_____	3 000.030	± 0.003 600

▶▶ 2. External Source Mode Frequency Range

Test Frequencies (GHz)	Results
0.010	_____
0.020	_____
0.100	_____
1.000	_____
2.000	_____
3.000	_____

HP 8753D Performance Test Record (3 of 13)
For 30 kHz—3 GHz Analyzers

Hewlett-Packard Company	
Model HP 8753D	**Report Number** _____
Serial Number _____	**Date** _____

▶▶ 3. Test Port Output Power Accuracy

Test Frequencies	Test Port Output Power (dBm)	Specification (dB)	Measured Value (dB)	Measurement Uncertainty (dB)
Center Frequency				
300 kHz	0	± 1	_____	± 0.15
20 MHz	0	± 1	_____	± 0.10
50 MHz	0	± 1	_____	± 0.10
100 MHz	0	± 1	_____	± 0.10
200 MHz	0	± 1	_____	± 0.10
500 MHz	0	± 1	_____	± 0.10
1 GHz	0	± 1	_____	± 0.10
2 GHz	0	± 1	_____	± 0.10
3 GHz	0	± 1	_____	± 0.15

▶▶ 4. Test Port Output Power Range and Linearity

Test Settings	Results Measured (dB)	Power Level Linearity (dB)	Specification (dB)	Measurement Uncertainty (dB)
CW Frequency = 300 kHz				
− 15	_____	_____	± 0.2	± 0.15
− 13	_____	_____	± 0.2	± 0.15
− 11	_____	_____	± 0.2	± 0.15
− 9	_____	_____	± 0.2	± 0.15
− 7	_____	_____	± 0.2	± 0.15
− 5	_____	_____	± 0.2	± 0.15
− 3	_____	_____	± 0.2	± 0.15
− 1	_____	_____	± 0.2	± 0.15
+ 1	_____	_____	± 0.2	± 0.15
+ 3	_____	_____	± 0.2	± 0.15
+ 5	_____	_____	± 0.5	± 0.15
+ 7	_____	_____	± 0.5	± 0.15
+ 9	_____	_____	± 0.5	± 0.15
+ 10	_____	_____	± 0.5	± 0.15

HP 8753D Performance Test Record (4 of 13)
For 30 kHz—3 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 4. Test Port Output Power Range and Linearity (continued)

Test Settings	Results Measured (dB)	Power Level Linearity (dB)	Specification (dB)	Measurement Uncertainty (dB)
CW Frequency = 3 GHz				
− 15	_____	_____	± 0.2	± 0.15
− 13	_____	_____	± 0.2	± 0.15
− 11	_____	_____	± 0.2	± 0.15
− 9	_____	_____	± 0.2	± 0.15
− 7	_____	_____	± 0.2	± 0.15
− 5	_____	_____	± 0.2	± 0.15
− 3	_____	_____	± 0.2	± 0.15
− 1	_____	_____	± 0.2	± 0.15
+ 1	_____	_____	± 0.2	± 0.15
+ 3	_____	_____	± 0.2	± 0.15
+ 5	_____	_____	± 0.5	± 0.15
+ 7	_____	_____	± 0.5	± 0.15
+ 9	_____	_____	± 0.5	± 0.15
+ 10	_____	_____	± 0.5	± 0.15

HP 8753D Performance Test Record (5 of 13)
For 30 kHz—3 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 5. Minimum R Channel Level

CW Frequency	Specification (dB)	Test Port Power	Measurement Uncertainty (dB)
300 kHz	< −35	_____	± 1.0
3.29 MHz	< −35	_____	± 1.0
3.31 MHz	< −35	_____	± 1.0
15.90 MHz	< −35	_____	± 1.0
16.10 MHz	< −35	_____	± 1.0
30.90 MHz	< −35	_____	± 1.0
31.10 MHz	< −35	_____	± 1.0
1.6069 GHz	< −35	_____	± 1.0
1.6071 GHz	< −35	_____	± 1.0
3.000 GHz	< −35	_____	± 1.0

▶▶ 6. Test Port Input Noise Floor Level

Frequency Range	Test Port	IF Bandwidth	Specification (dBm)	Calculated Value	Measurement Uncertainty
50 kHz—3 GHz	Port 1	3 kHz	− 82	_____	N/A
50 kHz—3 GHz	Port 1	10 Hz	− 102	_____	N/A
50 kHz—3 GHz	Port 2	10 Hz	− 102	_____	N/A
50 kHz—3 GHz	Port 2	3 kHz	− 82	_____	N/A

HP 8753D Performance Test Record (6 of 13)
For 30 kHz—3 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 7. Test Port Input Frequency Response

Frequency Range	Test Port	Specification (dB)	Measured Value (dB)	Measurement Uncertainty (dB)
300 kHz—3 GHz	Port 2	± 1	_____	0.15
300 kHz—3 GHz	Port 1	± 1	_____	0.15

▶▶ 8. Test Port Crosstalk

Test Settings	Specification (dB)	Measured Value (dB)	Measurement Uncertainty
Crosstalk to Test Port 2 300 kHz—3 GHz	< −100	_____	N/A
Crosstalk to Test Port 1 300 kHz—3 GHz	< −100	_____	N/A

HP 8753D Performance Test Record (7 of 13)
For 30 kHz—3 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 9. Calibration Coefficients

Test Description	Frequency Range	Spec. (dB)	Measured Value (dB)	Measurement Uncertainty (dB)
Forward Direction				
Directivity	300 kHz—1.3 GHz	≥ 35	_____	± 0.9
Directivity	1.3 GHz—3 GHz	≥ 30	_____	± 0.8
Forward Direction				
Source Match	300 kHz—1.3 GHz	≥ 16	_____	± 0.2
Source Match	1.3 GHz—3 GHz	≥ 16	_____	± 0.2
Forward Direction				
Trans. Tracking	300 kHz—1.3 GHz	± 1.5	_____	± 0.006
Trans. Tracking	1.3 GHz—3 GHz	± 1.5	_____	± 0.009
Forward Direction				
Refl. Tracking	300 kHz—1.3 GHz	± 1.5	_____	± 0.001
Refl. Tracking	1.3 GHz—3 GHz	± 1.5	_____	± 0.005
Reverse Direction				
Load Match	300 kHz—1.3 GHz	≥ 18	_____	± 0.1
Load Match	1.3 GHz—3 GHz	≥ 16	_____	± 0.2

HP 8753D Performance Test Record (8 of 13)
For 30 kHz—3 GHz Analyzers

Hewlett-Packard Company	**Report Number** _____
Model HP 8753D	**Date** _____
Serial Number _____	

▶▶ 9. Calibration Coefficients (continued)

Test Description	Frequency Range	Spec. (dB)	Measured Value (dB)	Measurement Uncertainty (dB)
Reverse Direction				
Trans. Tracking	300 kHz—1.3 GHz	± 1.5	_____	± 0.006
Trans. Tracking	1.3 GHz—3 GHz	± 1.5	_____	± 0.009
Forward Direction				
Load Match	300 kHz—1.3 GHz	≥ 18	_____	± 0.1
Load Match	1.3 GHz—3 GHz	≥ 16	_____	± 0.2
Reverse Direction				
Directivity	300 kHz—1.3 GHz	≥ 35	_____	± 0.9
Directivity	1.3 GHz—3 GHz	≥ 30	_____	± 0.8
Reverse Direction				
Source Match	300 kHz—1.3 GHz	≥ 16	_____	± 0.2
Source Match	1.3 GHz—3 GHz	≥ 16	_____	± 0.2
Reverse Direction				
Refl. Tracking	300 kHz—1.3 GHz	± 1.5	_____	± 0.001
Refl. Tracking	1.3 GHz—3 GHz	± 1.5	_____	± 0.005

HP 8753D Performance Test Record (9 of 13)
For 30 kHz—3 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 10. System Trace Noise

CW Frequency (GHz)	Ratio	Specification	Measured Value	Measurement Uncertainty
3	A/R	< 0.006 dB rms	_____	N/A
3	A/R	< 0.038° rms	_____	N/A
3	B/R	< 0.006 dB rms	_____	N/A
3	B/R	< 0.038° rms	_____	N/A

▶▶ 12. Test Port Input Impedance

Frequency Range	Test Port	Return Loss (dB)	Specification (dB)	Measurement Uncertainty (dB)
50 kHz—300 kHz	Port 2	_____	≥ 20	± 1.5
300 kHz—1.3 GHz	Port 2	_____	≥ 18	± 1.5
1.3 GHz—3 GHz	Port 2	_____	≥ 16	± 1.5
50 kHz—300 kHz	Port 1	_____	≥ 20	± 1.5
300 kHz—1.3 GHz	Port 1	_____	≥ 18	± 1.5
1.3 GHz—3 GHz	Port 1	_____	≥ 16	± 1.5

HP 8753D Performance Test Record (10 of 13)
For 30 kHz—3 GHz Analyzers

Hewlett-Packard Company	**Report Number** _____
Model HP 8753D	**Date** _____
Serial Number _____	

▶▶ 13. Test Port Receiver Magnitude Dynamic Accuracy

Test Port Input Power	8496A Setting (dB)	Test Port (dB)	8902A (dB)	Calculated Value (dB)	Spec. (dB)	Meas. Uncer. (dB)
Test Port 2						
– 10	0				≤ 0.059	± 0.01
– 20	10				≤ 0.050	± 0.02
– 30	20				≤ 0.050	± 0.02
– 40	30				≤ 0.053	± 0.04
– 50	40				≤ 0.058	± 0.06
– 60	50				≤ 0.095	± 0.08
– 70	60				≤ 0.250	± 0.14
– 80	70				≤ 0.750	± 0.16
– 90	80				≤ 2.200	± 0.18
– 100	90				≤ 5.200	± 0.20
Test Port 1						
– 10	0				≤ 0.059	± 0.01
– 20	10				≤ 0.050	± 0.02
– 30	20				≤ 0.050	± 0.02
– 40	30				≤ 0.053	± 0.04
– 50	40				≤ 0.058	± 0.06
– 60	50				≤ 0.095	± 0.08
– 70	60				≤ 0.250	± 0.14
– 80	70				≤ 0.750	± 0.16
– 90	80				≤ 2.200	± 0.18
– 100	90				≤ 5.200	± 0.20

HP 8753D Performance Test Record (11 of 13)
For 30 kHz—3 GHz Analyzers

Hewlett-Packard Company	
Model HP 8753D	**Report Number** _____
Serial Number _____	**Date** _____

▶▶ 14. Test Port Receiver Phase Dynamic Accuracy

Test Port Input Power	Calculated Value (dB)	A	B	Results Value (degrees)	Spec. (degrees)	Meas. Uncert.
Test Port 2						
– 10	_____	_____	_____	_____	≤ 0.42	N/A
– 20	_____	_____	_____	_____	≤ 0.35	N/A
– 30	_____	_____	_____	_____	≤ 0.35	N/A
– 40	_____	_____	_____	_____	≤ 0.36	N/A
– 50	_____	_____	_____	_____	≤ 0.39	N/A
– 60	_____	_____	_____	_____	≤ 0.64	N/A
– 70	_____	_____	_____	_____	≤ 1.75	N/A
– 80	_____	_____	_____	_____	≤ 5.00	N/A
– 90	_____	_____	_____	_____	≤ 17.50	N/A
– 100	_____	_____	_____	_____	≤ 53.00	N/A
Test Port 1						
– 10	_____	_____	_____	_____	≤ 0.42	N/A
– 20	_____	_____	_____	_____	≤ 0.35	N/A
– 30	_____	_____	_____	_____	≤ 0.35	N/A
– 40	_____	_____	_____	_____	≤ 0.36	N/A
– 50	_____	_____	_____	_____	≤ 0.39	N/A
– 60	_____	_____	_____	_____	≤ 0.64	N/A
– 70	_____	_____	_____	_____	≤ 1.75	N/A
– 80	_____	_____	_____	_____	≤ 5.00	N/A
– 90	_____	_____	_____	_____	≤ 17.50	N/A
– 100	_____	_____	_____	_____	≤ 53.00	N/A

HP 8753D Performance Test Record (12 of 13)
For 30 kHz—3 GHz Analyzers

Hewlett-Packard Company	**Report Number** _____
Model HP 8753D	
Serial Number _____	**Date** _____

▶▶ 15. Test Port Receiver Magnitude Compression

CW Frequency	Test Port	Measured Value (dB)	Specification (dB)	Measurement Uncertainty
50 MHz	Port 2	_____	≤ 0.45	N/A
1 GHz	Port 2	_____	≤ 0.45	N/A
2 GHz	Port 2	_____	≤ 0.45	N/A
3 GHz	Port 2	_____	≤ 0.45	N/A
50 MHz	Port 1	_____	≤ 0.45	N/A
1 GHz	Port 1	_____	≤ 0.45	N/A
2 GHz	Port 1	_____	≤ 0.45	N/A
3 GHz	Port 1	_____	≤ 0.45	N/A

▶▶ 16. Test Port Receiver Phase Compression

CW Frequency	Test Port	Measured Value (degrees)	Specification (degrees)	Measurement Uncertainty
50 MHz	Port 2	_____	≤ 6°	N/A
1 GHz	Port 2	_____	≤ 6°	N/A
2 GHz	Port 2	_____	≤ 6°	N/A
3 GHz	Port 2	_____	≤ 6°	N/A
50 MHz	Port 1	_____	≤ 6°	N/A
1 GHz	Port 1	_____	≤ 6°	N/A
2 GHz	Port 1	_____	≤ 6°	N/A
3 GHz	Port 1	_____	≤ 6°	N/A

HP 8753D Performance Test Record (13 of 13)
For 30 kHz—3 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 17. Test Port Output/Input Harmonics (Option 002 without Option 006)

Test Description	Specification (dBc)	Measurement Value (dBc)	Measurement Uncertainty (dB)
Test Port Output Harmonics			
2nd	≤ 25	_____	± 1.0
3rd	≤ 25	_____	± 1.0
Port 1 Input Harmonics			
2nd	≤15	_____	± 1.0
3rd	≤30	_____	± 1.0
Port 2 Input Harmonics			
2nd	≤15	_____	± 1.0
3rd	≤30	_____	± 1.0

Performance Test Record

For Analyzers with a Frequency Range of 30 kHz to 6 GHz

Note See the previous "Performance Test Record" section if your analyzer frequency range is from 30 kHz to 3 GHz.

HP 8753D Performance Test Record (1 of 15)

Calibration Lab Address:

Report Number _____

Date _____

_____ Last Calibration Date _____

_____ Customer's Name _____

_____ Performed by _____

Model HP 8753D Option 006

Serial No. _____ Option(s) _____

Firmware Revision _____

Ambient Temperature _____° C Relative Humidity _____%

Test Equipment Used:

Description	Model Number	Trace Number	Cal Due Date
Frequency Counter			
Power Meter			
Power Sensor			
Calibration Kit			
Verification Kit			

Notes/Comments: _____

_____

_____

HP 8753D Performance Test Record (2 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D Option 006** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 1. Test Port Output Frequency Range and Accuracy

Test Frequencies (MHz)	Min. (MHz)	Results Measured (MHz)	Max. (MHz)	Measurement Uncertainty (MHz)
0.03	0.029 999 7	_____	0.030 000 3	± 0.000 000 036
0.3	0.299 997	_____	0.300 003	± 0.000 000 360
5.0	4.999 950	_____	5.000 050	± 0.000 006
16.0	15.999 840	_____	16.000 160	± 0.000 019
31.0	30.999 690	_____	31.000 310	± 0.000 037
60.999 999	60.999 390	_____	61.000 610	± 0.000 073
121.0	120.998 790	_____	121.001 210	± 0.000 145
180.0	179.998 200	_____	180.001 800	± 0.000 216
310.0	309.995 900	_____	310.003 100	± 0.000 372
700.0	699.930 000	_____	700.007 000	± 0.000 840
1 300.0	1 299.987	_____	1 300.013	± 0.001 560
2 000.0	1 999.980	_____	2 000.020	± 0.002 400
3 000.0	2 999.970	_____	3 000.030	± 0.003 600
4.0	3.999 960	_____	4.000 040	± 0.004 800
5.0	4.999 950	_____	5.000 050	± 0.006 000
6.0	5.999 940	_____	6.000 060	± 0.007 200

HP 8753D Performance Test Record (3 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D Option 006** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 2. External Source Mode Frequency Range

Test Frequencies (GHz)	Result
0.010	_____
0.020	_____
0.100	_____
1.000	_____
2.000	_____
3.000	_____
4.000	_____
5.000	_____
6.000	_____

▶▶ 3. Test Port Output Power Accuracy

Test Frequency	Test Port Output Power (dBm)	Specification (dB)	Measured Value (dB)	Measurement Uncertainty (dB)
300 kHz	0	± 1	_____	± 0.15
20 MHz	0	± 1	_____	± 0.10
50 MHz	0	± 1	_____	± 0.10
100 MHz	0	± 1	_____	± 0.10
200 MHz	0	± 1	_____	± 0.10
500 MHz	0	± 1	_____	± 0.10
1 GHz	0	± 1	_____	± 0.10
2 GHz	0	± 1	_____	± 0.10
3 GHz	0	± 1	_____	± 0.15
4 GHz	0	± 1	_____	± 0.18
5 GHz	0	± 1	_____	± 0.18
6 GHz	0	± 1	_____	± 0.18

HP 8753D Performance Test Record (4 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D Option 006** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 4. Test Port Output Power Range and Linearity

Test Settings	Results Measured (dB)	Power Level Linearity (dB)	Specification (dB)	Meas. Uncert. (dB)
CW Frequency = 300 kHz				
− 15	_____	_____	± 0.2	± 0.15
− 13	_____	_____	± 0.2	± 0.15
− 11	_____	_____	± 0.2	± 0.15
− 9	_____	_____	± 0.2	± 0.15
− 7	_____	_____	± 0.2	± 0.15
− 5	_____	_____	± 0.2	± 0.15
− 3	_____	_____	± 0.2	± 0.15
− 1	_____	_____	± 0.2	± 0.15
+ 1	_____	_____	± 0.2	± 0.15
+ 3	_____	_____	± 0.2	± 0.15
+ 5	_____	_____	± 0.5	± 0.15
+ 7	_____	_____	± 0.5	± 0.15
+ 9	_____	_____	± 0.5	± 0.15
+ 10	_____	_____	± 0.5	± 0.15
CW Frequency = 3 GHz				
− 15	_____	_____	± 0.2	± 0.15
− 13	_____	_____	± 0.2	± 0.15
− 11	_____	_____	± 0.2	± 0.15
− 9	_____	_____	± 0.2	± 0.15
− 7	_____	_____	± 0.2	± 0.15
− 5	_____	_____	± 0.2	± 0.15
− 3	_____	_____	± 0.2	± 0.15
− 1	_____	_____	± 0.2	± 0.15
+ 1	_____	_____	± 0.2	± 0.15
+ 3	_____	_____	± 0.2	± 0.15
+ 5	_____	_____	± 0.5	± 0.15
+ 7	_____	_____	± 0.5	± 0.15
+ 9	_____	_____	± 0.5	± 0.15
+ 10	_____	_____	± 0.5	± 0.15

HP 8753D Performance Test Record (5 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company	
Model HP 8753D Option 006	**Report Number** _____
Serial Number _____	**Date** _____

▶▶ 4. Test Port Output Power Range and Linearity (continued)

Test Settings	Results Measured (dB)	Power Level Linearity (dB)	Specification (dB)	Meas. Uncert. (dB)
CW Frequency = 6 GHz				
− 15	_____	_____	± 0.2	± 0.15
− 13	_____	_____	± 0.2	± 0.15
− 11	_____	_____	± 0.2	± 0.15
− 9	_____	_____	± 0.2	± 0.15
− 7	_____	_____	± 0.2	± 0.15
− 5	_____	_____	± 0.2	± 0.15
− 3	_____	_____	± 0.2	± 0.15
− 1	_____	_____	± 0.2	± 0.15
+ 1	_____	_____	± 0.2	± 0.15
+ 3	_____	_____	± 0.2	± 0.15
+ 5	_____	_____	± 0.5	± 0.15
+ 7	_____	_____	± 0.5	± 0.15
+ 9	_____	_____	± 0.5	± 0.15
+ 10	_____	_____	± 0.5	± 0.15

HP 8753D Performance Test Record (6 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D Option 006** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 5. Minimum R Channel Level

CW Frequency	Specification (dB)	Test Port Power	Measurement Uncertainty (dB)
300 kHz	< −35	_____	± 1.0
3.29 MHz	< −35	_____	± 1.0
3.31 MHz	< −35	_____	± 1.0
15.90 MHz	< −35	_____	± 1.0
16.10 MHz	< −35	_____	± 1.0
30.90 MHz	< −35	_____	± 1.0
31.10 MHz	< −35	_____	± 1.0
1.6069 GHz	< −35	_____	± 1.0
1.6071 GHz	< −35	_____	± 1.0
3.000 GHz	< −35	_____	± 1.0
4.000 GHz	< −30	_____	± 3.0
5.000 GHz	< −30	_____	± 3.0
6.000 GHz	< −30	_____	± 3.0

▶▶ 6. Test Port Input Noise Floor Level

Frequency Range	Test Port	IF Bandwidth	Specification (dBm)	Calculated Value	Measurement Uncertainty
50 kHz—3 GHz	Port 1	3 kHz	− 82	_____	N/A
50 kHz—3 GHz	Port 1	10 Hz	− 102	_____	N/A
50 kHz—3 GHz	Port 2	10 Hz	− 102	_____	N/A
50 kHz—3 GHz	Port 2	3 kHz	− 82	_____	N/A
3 GHz—6 GHz	Port 2	3 kHz	− 77	_____	N/A
3 GHz—6 GHz	Port 2	10 Hz	− 97	_____	N/A
3 GHz—6 GHz	Port 1	10 Hz	− 97	_____	N/A
3 GHz—6 GHz	Port 1	3 kHz	− 77	_____	N/A

HP 8753D Performance Test Record (7 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company	
Model HP 8753D Option 006	**Report Number** _____
Serial Number _____	**Date** _____

▶▶ 7. Test Port Input Frequency Response

Frequency Range	Test Port	Specification (dB)	Measured Value (dB)	Measurement Uncertainty (dB)
300 kHz—3 GHz	Port 2	± 1	_____	0.15
300 kHz—3 GHz	Port 1	± 1	_____	0.15
3 GHz—6 GHz	Port 1	± 2	_____	0.18
3 GHz—6 GHz	Port 2	± 2	_____	0.18

▶▶ 8. Test Port Crosstalk

Test Settings	Specification (dB)	Measured Value (dB)	Measurement Uncertainty
Crosstalk to Test Port 2 300 kHz—3 GHz	< −100	_____	N/A
Crosstalk to Test Port 1 300 kHz—3 GHz	< −100	_____	N/A
Crosstalk to Test Port 1 3 GHz—6 GHz	< −90	_____	N/A
Crosstalk to Test Port 2 3 GHz—6 GHz	< −90	_____	N/A

HP 8753D Performance Test Record (8 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company	
Model HP 8753D Option 006	**Report Number** _____
Serial Number _____	**Date** _____

▶▶ 9. Calibration Coefficients

Test Description	Frequency Range	Spec. (dB)	Measured Value (dB)	Measurement Uncertainty (dB)
Forward Direction				
Directivity	300 kHz—1.3 GHz	≥ 35	_____	± 0.9
Directivity	1.3 GHz—3 GHz	≥ 30	_____	± 0.8
Directivity	3 GHz—6 GHz	≥ 25	_____	± 0.8
Forward Direction				
Source Match	300 kHz—1.3 GHz	≥ 16	_____	± 0.2
Source Match	1.3 GHz—3 GHz	≥ 16	_____	± 0.2
Source Match	3 GHz—6 GHz	≥ 14	_____	± 0.3
Forward Direction				
Trans. Tracking	300 kHz—1.3 GHz	± 1.5	_____	± 0.006
Trans. Tracking	1.3 GHz—3 GHz	± 1.5	_____	± 0.009
Trans. Tracking	3 GHz—6 GHz	± 2.5	_____	± 0.021
Forward Direction				
Refl. Tracking	300 kHz—1.3 GHz	± 1.5	_____	± 0.001
Refl. Tracking	1.3 GHz—3 GHz	± 1.5	_____	± 0.005
Refl. Tracking	3 GHz—6 GHz	± 2.5	_____	± 0.020
Reverse Direction				
Load Match	300 kHz—1.3 GHz	≥ 18	_____	± 0.1
Load Match	1.3 GHz—3 GHz	≥ 16	_____	± 0.2
Load Match	3 GHz—6 GHz	≥ 14	_____	± 0.2

HP 8753D Performance Test Record (9 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company	
Model HP 8753D Option 006	**Report Number** _____
Serial Number _____	**Date** _____

▶▶ 9. Calibration Coefficients (continued)

Test Description	Frequency Range	Spec. (dB)	Measured Value (dB)	Measurement Uncertainty (dB)
Reverse Direction				
Trans. Tracking	300 kHz—1.3 GHz	± 1.5	_____	± 0.006
Trans. Tracking	1.3 GHz—3 GHz	± 1.5	_____	± 0.009
Trans. Tracking	3 GHz—6 GHz	± 2.5	_____	± 0.021
Forward Direction				
Load Match	300 kHz—1.3 GHz	≥ 18	_____	± 0.1
Load Match	1.3 GHz—3 GHz	≥ 16	_____	± 0.2
Load Match	3 GHz—6 GHz	≥ 14	_____	± 0.2
Reverse Direction				
Directivity	300 kHz—1.3 GHz	≥ 35	_____	± 0.9
Directivity	1.3 GHz—3 GHz	≥ 30	_____	± 0.8
Directivity	3 GHz—6 GHz	≥ 25	_____	± 0.8
Reverse Direction				
Source Match	300 kHz—1.3 GHz	≥ 16	_____	± 0.2
Source Match	1.3 GHz—3 GHz	≥ 16	_____	± 0.2
Source Match	3 GHz—6 GHz	≥ 14	_____	± 0.3
Reverse Direction				
Refl. Tracking	300 kHz—1.3 GHz	± 1.5	_____	± 0.001
Refl. Tracking	1.3 GHz—3 GHz	± 1.5	_____	± 0.005
Refl. Tracking	3 GHz—6 GHz	± 2.5	_____	± 0.020

HP 8753D Performance Test Record (10 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D Option 006** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 11. System Trace Noise

Frequency (GHz)	Ratio	Measured Value	Specification	Measurement Uncertainty
3	A/R (Magnitude)	_____	≤ 0.006 dB rms	N/A
6	A/R (Magnitude)	_____	≤ 0.010 dB rms	N/A
6	A/R (Phase)	_____	≤ 0.070° rms	N/A
3	A/R (Phase)	_____	≤ 0.038° rms	N/A
3	B/R (Magnitude)	_____	≤ 0.006 dB rms	N/A
6	B/R (Magnitude)	_____	≤ 0.010 dB rms	N/A
6	B/R (Phase)	_____	≤ 0.070° rms	N/A
3	B/R (Phase)	_____	≤ 0.038° rms	N/A

▶▶ 12. Test Port Input Impedance

Test Description	Test Port	Return Loss (dB)	Specification (dB)	Measurement Uncertainty (dB)
50 kHz—300 kHz	Port 2	_____	≥ 20	± 1.5
300 kHz—1.3 GHz	Port 2	_____	≥ 18	± 1.5
1.3 GHz—3 GHz	Port 2	_____	≥ 16	± 1.5
3 GHz—6 GHz	Port 2	_____	≥ 14	± 1.0
50 kHz—300 kHz	Port 1	_____	≥ 20	± 1.5
300 kHz—1.3 GHz	Port 1	_____	≥ 18	± 1.5
1.3 GHz—3 GHz	Port 1	_____	≥ 16	± 1.5
3 GHz—6 GHz	Port 1	_____	≥ 14	± 1.0

HP 8753D Performance Test Record (11 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company	
Model HP 8753D Option 006	**Report Number** _____
Serial Number _____	**Date** _____

▶▶ 13. Test Port Receiver Magnitude Dynamic Accuracy

Test Port Input Power	8496A Setting (dB)	Test Port (dB)	8902A (dB)	Calculated Value (dB)	Spec. (dB)	Meas. Uncer. (dB)
Test Port 2						
− 10	0				≤ 0.059	± 0.01
− 20	10				≤ 0.050	± 0.02
− 30	20				≤ 0.050	± 0.02
− 40	30				≤ 0.053	± 0.04
− 50	40				≤ 0.058	± 0.06
− 60	50				≤ 0.095	± 0.08
− 70	60				≤ 0.250	± 0.14
− 80	70				≤ 0.750	± 0.16
− 90	80				≤ 2.200	± 0.18
− 100	90				≤ 5.200	± 0.20
Test Port 1						
− 10	0				≤ 0.059	± 0.01
− 20	10				≤ 0.050	± 0.02
− 30	20				≤ 0.050	± 0.02
− 40	30				≤ 0.053	± 0.04
− 50	40				≤ 0.058	± 0.06
− 60	50				≤ 0.095	± 0.08
− 70	60				≤ 0.250	± 0.14
− 80	70				≤ 0.750	± 0.16
− 90	80				≤ 2.200	± 0.18
− 100	90				≤ 5.200	± 0.20

HP 8753D Performance Test Record (12 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company	
Model HP 8753D Option 006	**Report Number** _____
Serial Number _____	**Date** _____

▶▶ 14. Test Port Receiver Phase Dynamic Accuracy

Test Port Input Power	Calculated Value (dB)	A	B	Results Value (degrees)	Spec. (degrees)	Meas. Uncert.
Test Port 2						
– 10	_____	_____	_____	_____	≤ 0.42	N/A
– 20	_____	_____	_____	_____	≤ 0.35	N/A
– 30	_____	_____	_____	_____	≤ 0.35	N/A
– 40	_____	_____	_____	_____	≤ 0.36	N/A
– 50	_____	_____	_____	_____	≤ 0.39	N/A
– 60	_____	_____	_____	_____	≤ 0.64	N/A
– 70	_____	_____	_____	_____	≤ 1.75	N/A
– 80	_____	_____	_____	_____	≤ 5.00	N/A
– 90	_____	_____	_____	_____	≤ 17.50	N/A
– 100	_____	_____	_____	_____	≤ 53.00	N/A
Test Port 1						
– 10	_____	_____	_____	_____	≤ 0.42	N/A
– 20	_____	_____	_____	_____	≤ 0.35	N/A
– 30	_____	_____	_____	_____	≤ 0.35	N/A
– 40	_____	_____	_____	_____	≤ 0.36	N/A
– 50	_____	_____	_____	_____	≤ 0.39	N/A
– 60	_____	_____	_____	_____	≤ 0.64	N/A
– 70	_____	_____	_____	_____	≤ 1.75	N/A
– 80	_____	_____	_____	_____	≤ 5.00	N/A
– 90	_____	_____	_____	_____	≤ 17.50	N/A
– 100	_____	_____	_____	_____	≤ 53.00	N/A

HP 8753D Performance Test Record (13 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D Option 006** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 15. Test Port Receiver Magnitude Compression

CW Frequency	Test Port	Measured Value (dB)	Specification (dB)	Measurement Uncertainty
50 MHz	Port 2	_____	≤ 0.45	N/A
1 GHz	Port 2	_____	≤ 0.45	N/A
2 GHz	Port 2	_____	≤ 0.45	N/A
3 GHz	Port 2	_____	≤ 0.45	N/A
4 GHz	Port 2	_____	≤ 0.80	N/A
5 GHz	Port 2	_____	≤ 0.80	N/A
6 GHz	Port 2	_____	≤ 0.80	N/A
50 MHz	Port 1	_____	≤ 0.45	N/A
1 GHz	Port 1	_____	≤ 0.45	N/A
2 GHz	Port 1	_____	≤ 0.45	N/A
3 GHz	Port 1	_____	≤ 0.45	N/A
4 GHz	Port 1	_____	≤ 0.80	N/A
5 GHz	Port 1	_____	≤ 0.80	N/A
6 GHz	Port 1	_____	≤ 0.80	N/A

HP 8753D Performance Test Record (14 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D Option 006** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 16. Test Port Receiver Phase Compression

CW Frequency	Test Port	Measured Value (degrees)	Specification (degrees)	Measurement Uncertainty
50 MHz	Port 2	_____	≤ 6°	N/A
1 GHz	Port 2	_____	≤ 6°	N/A
2 GHz	Port 2	_____	≤ 6°	N/A
3 GHz	Port 2	_____	≤ 6°	N/A
4 GHz	Port 2	_____	≤ 7.5°	N/A
5 GHz	Port 2	_____	≤ 7.5°	N/A
6 GHz	Port 2	_____	≤ 7.5°	N/A
50 MHz	Port 1	_____	≤ 6°	N/A
1 GHz	Port 1	_____	≤ 6°	N/A
2 GHz	Port 1	_____	≤ 6°	N/A
3 GHz	Port 1	_____	≤ 6°	N/A
4 GHz	Port 1	_____	≤ 7.5°	N/A
5 GHz	Port 1	_____	≤ 7.5°	N/A
6 GHz	Port 1	_____	≤ 7.5°	N/A

HP 8753D Performance Test Record (15 of 15)
For 30 kHz—6 GHz Analyzers

Hewlett-Packard Company **Model HP 8753D Option 006** **Serial Number** _____	**Report Number** _____ **Date** _____

▶▶ 18. Output/Input Test Port Harmonics (Option 002 only)

Test Description	Specification (dBc)	Measurement Value (dBc)	Measurement Uncertainty (dB)
Test Port Output Harmonics			
2nd	≤ 25	_____	± 3.0
3rd	≤ 25	_____	± 3.0
Port 1 Input Harmonics			
2nd	≤15	_____	± 3.0
3rd	≤30	_____	± 3.0
Port 2 Input Harmonics			
2nd	≤15	_____	± 3.0
3rd	≤30	_____	± 3.0

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