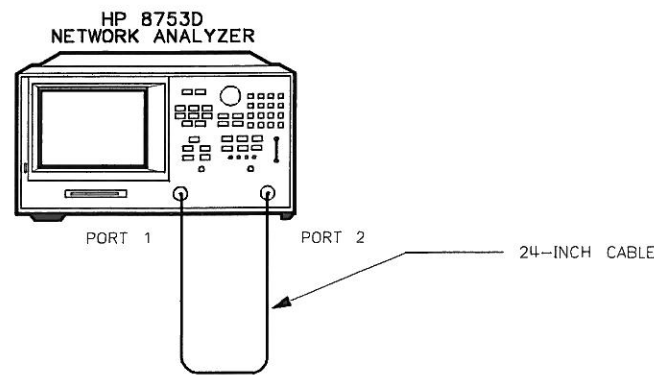


Test Port 2 Input Frequency Response from 300 kHz to 3GHz

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



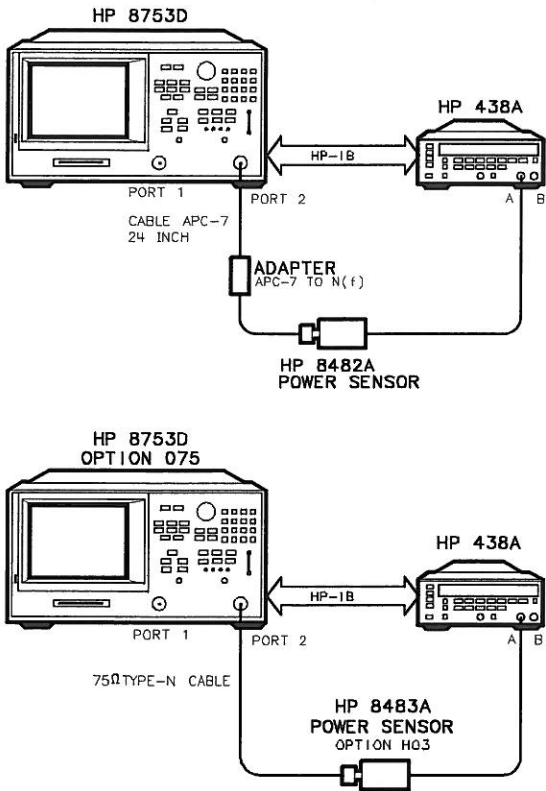
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Figure 1-24. Test Port 2 Input Frequency Response Test Setup

- 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.



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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.

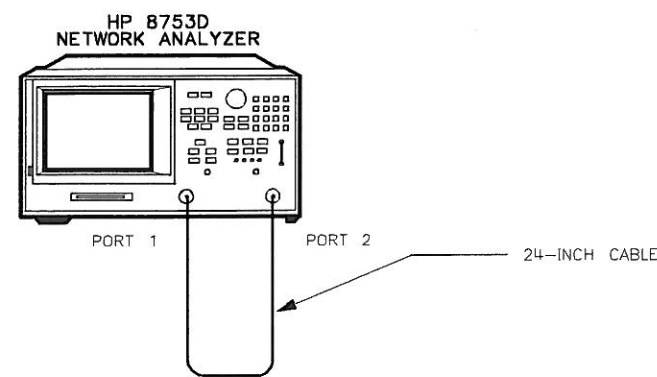


Figure 1-26. Test Port 1 Input Frequency Response Test Setup

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.

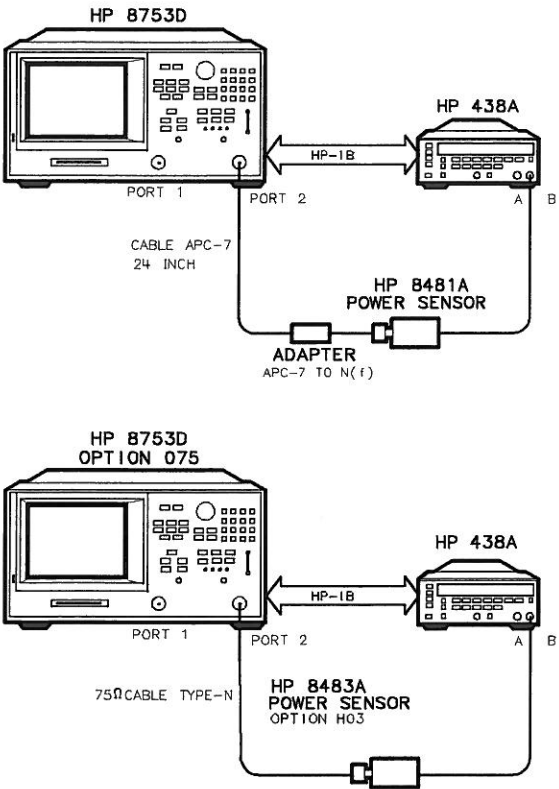


Figure 1-27. Setup for Power Meter Calibration on Test Port 2

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.

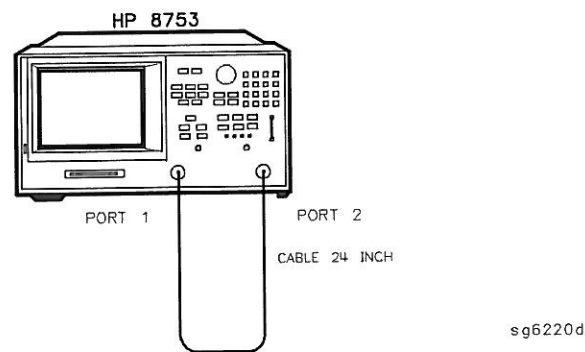


Figure 1-28. Setup for Test Port 1 Input Frequency Response

- 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.

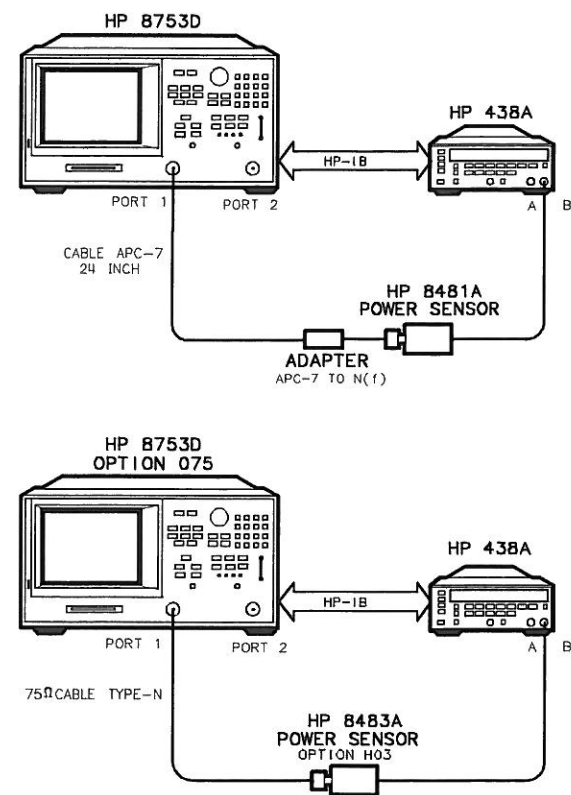


Figure 1-29. Setup for Power Meter Calibration on Test Port 1

- 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.

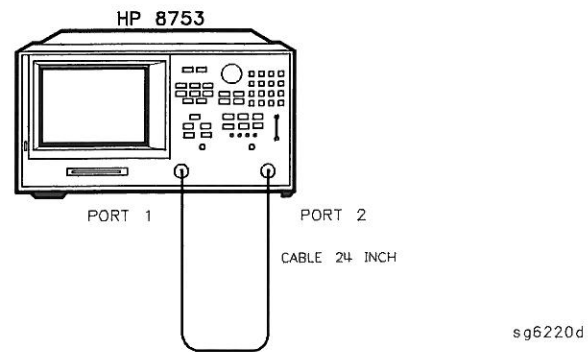


Figure 1-30. Test Port 2 Input Frequency Response Test Setup

- 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.

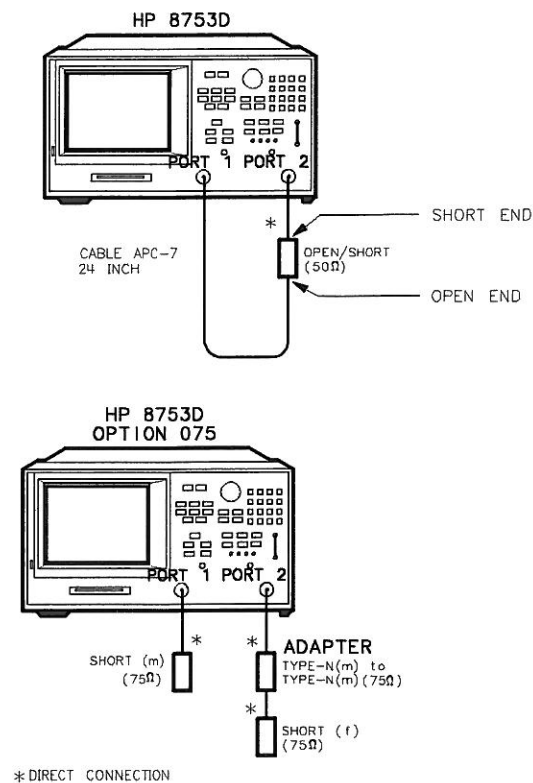


Figure 1-31. Test Port Crosstalk Test Setup

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.

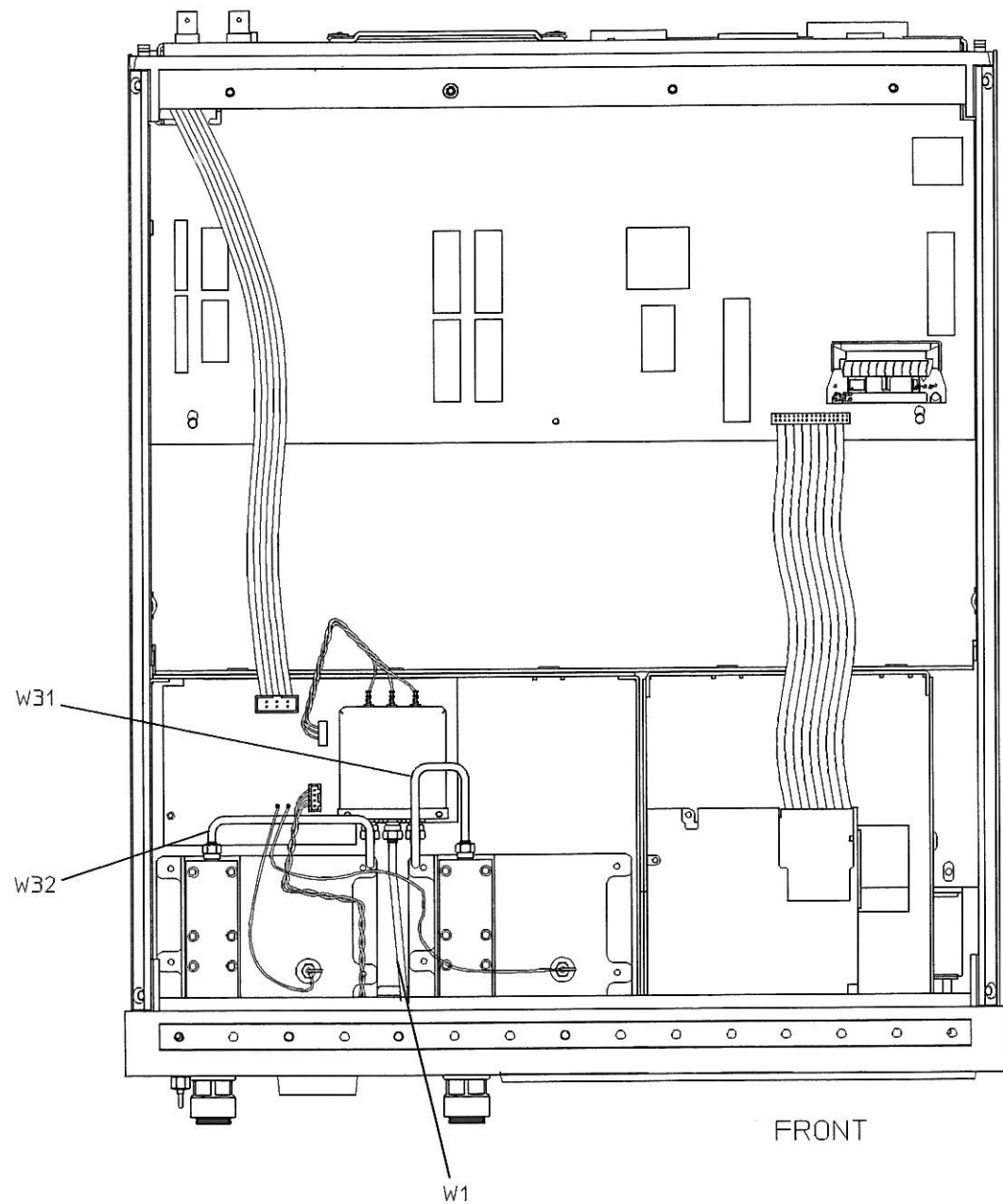


Figure 1-32. HP 8753D Bottom View

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.

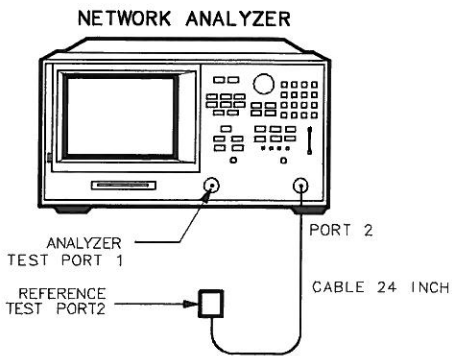


Figure 1-33. First Full 2-Port Calibration Test Setup

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.

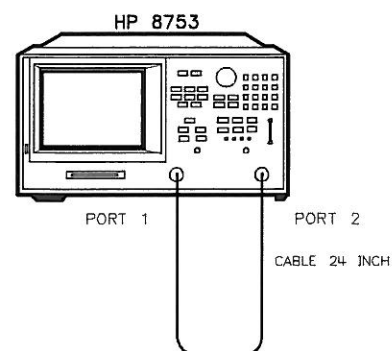


Figure 1-34. Transmission Calibration Test Setup

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

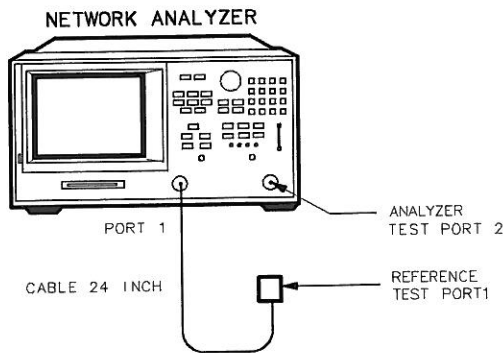
35. Press **SYSTEM** **SERVICE MENU** **TESTS** **42** **x1** **EXECUTE TEST**.
36. When the analyzer finishes the test, repeat steps 25 through 28.

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.

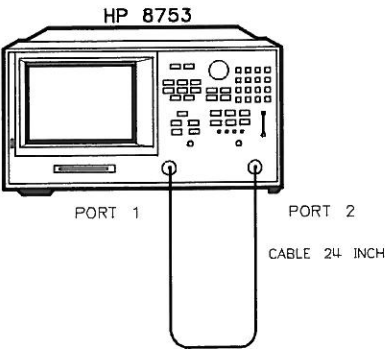


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Figure 1-35. Second Full 2-Port Calibration Test Setup

- 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.



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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

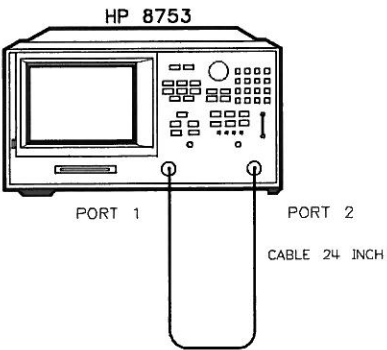
Required Equipment for 75Ω Analyzers

Cable, 75Ω, Type-N 24-inchHP 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.



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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.

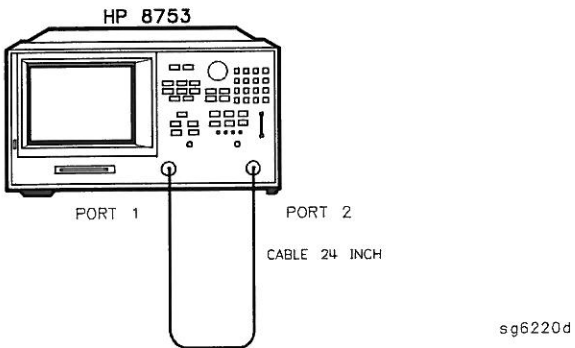


Figure 1-38. System Trace Noise Test Setup

- 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.