

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.

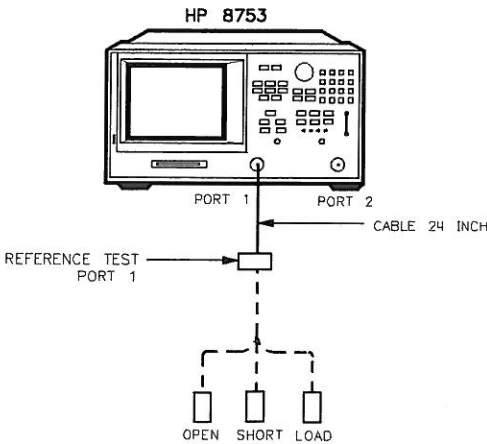
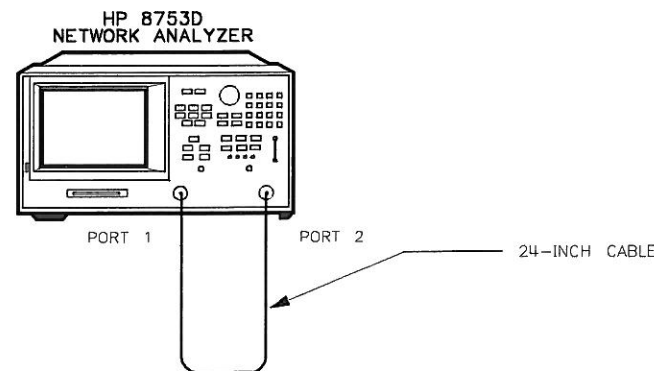


Figure 1-39. S11 1-Port Cal Test Setup

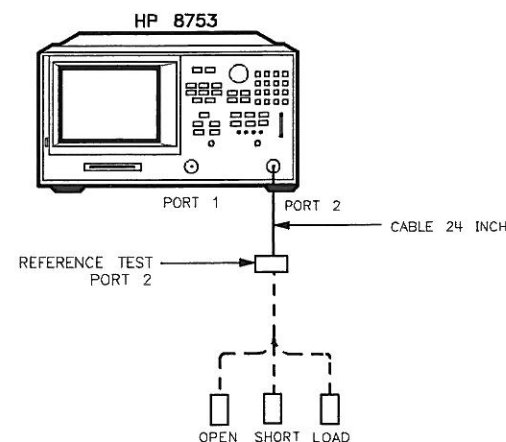
2. Press **PRESET** **MENU** **NUMBER of POINTS** **1601** **x1**.
3. **Only For Analyzers WITHOUT Option 006:** Press **START** **50** **k/m**. (OPT 006 START 300 MHz) SEE SECS PG 64
4. Press **CAL** **CAL KIT** and select the appropriate calibration kit:
- If your analyzer is 50Ω, press **CAL KIT: 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.



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

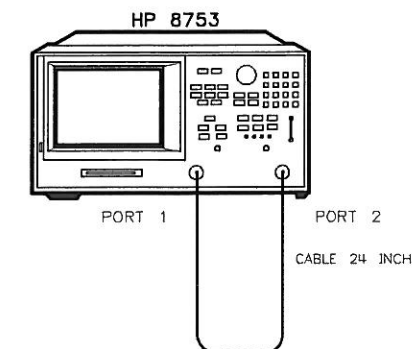
15. Press **MARKER** to turn the analyzer's marker 1 on. Use the front panel knob to locate the maximum value of the data trace for each of the frequency ranges listed in the "Performance Test Record."
16. Write these maximum values on the "Performance Test Record."
17. Connect the equipment as shown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



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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.



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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

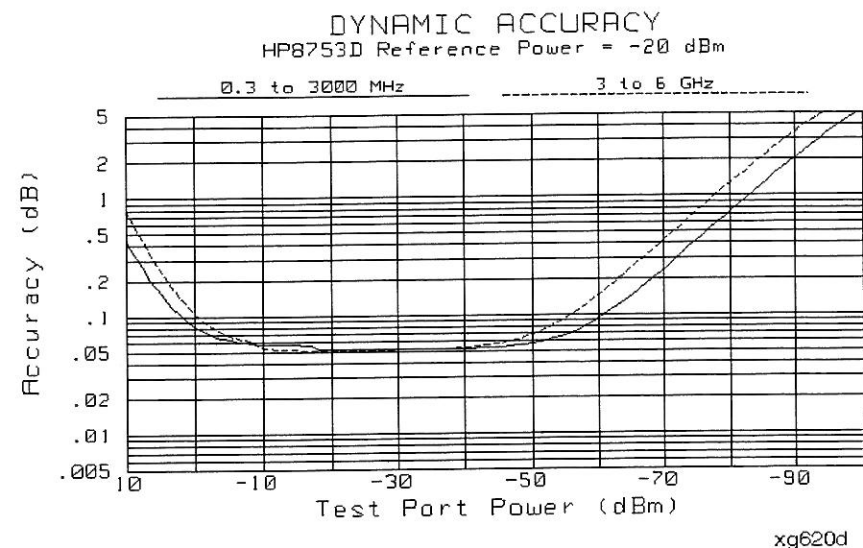


Figure 1-43. Receiver Magnitude Dynamic Accuracy

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
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Analyzer warm-up time: 1 hour

Test Port 2 Magnitude Dynamic Accuracy

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

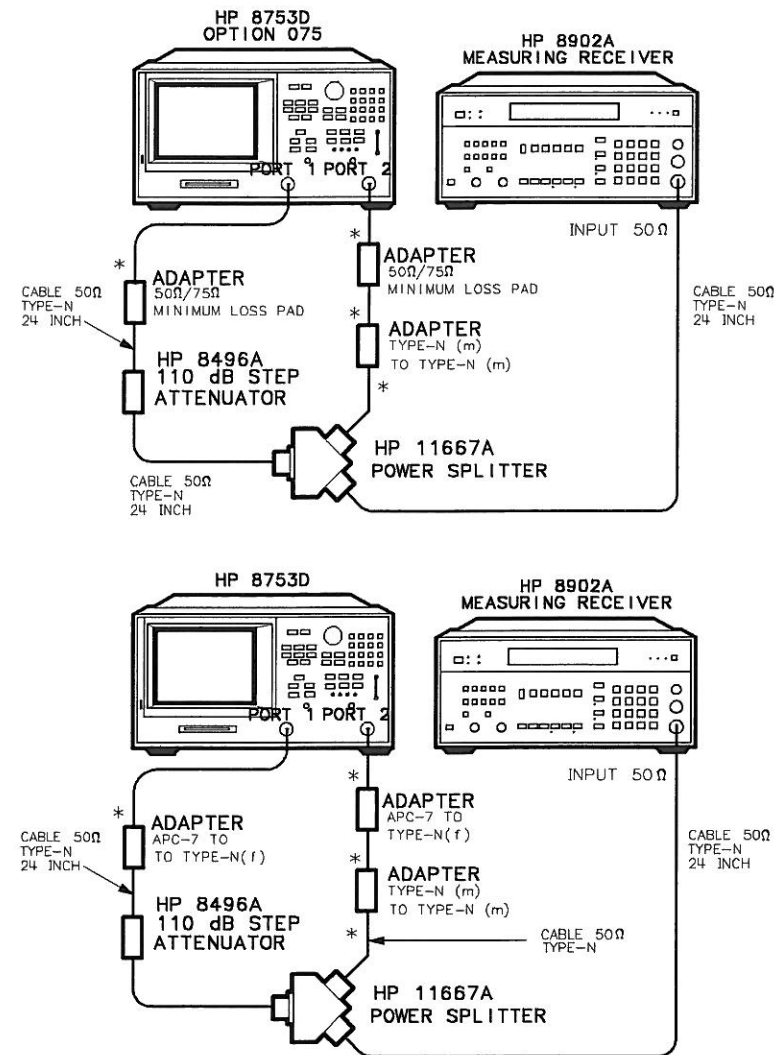


Figure 1-44. Test Port 2 Dynamic Accuracy Test Setup

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.

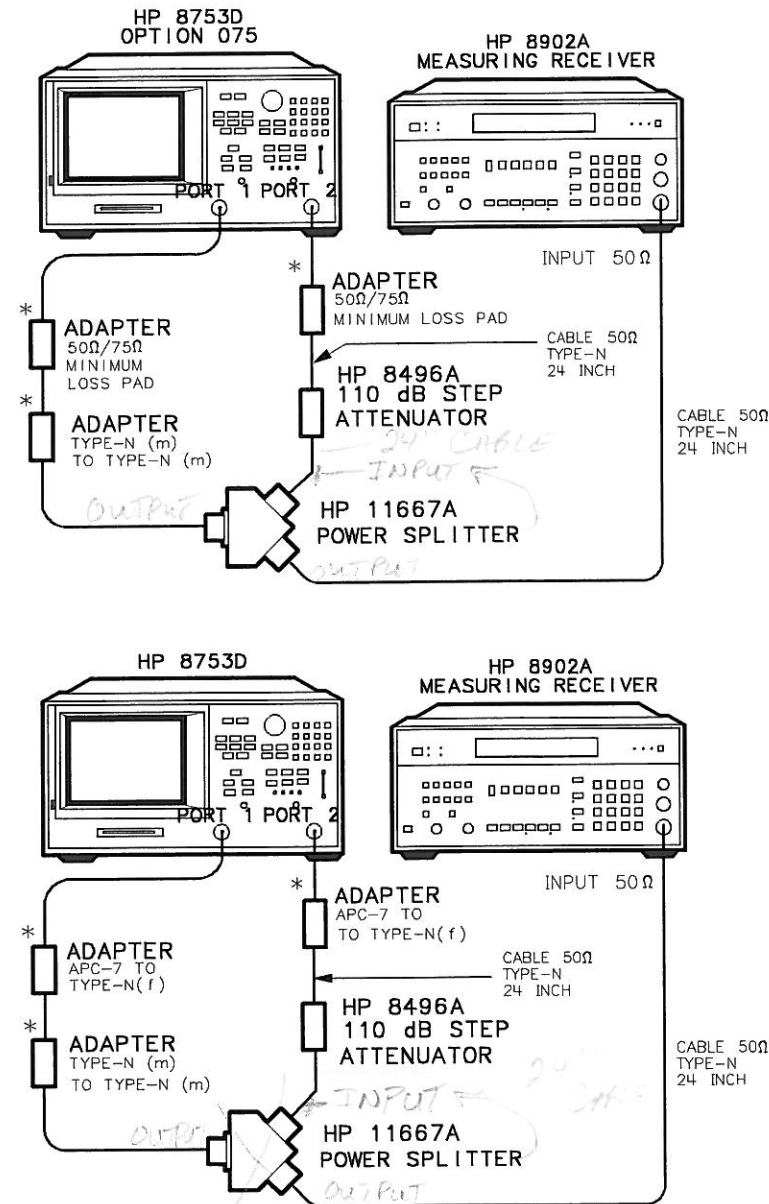
Note Ignore the UNCAL displayed on the HP 8902A. This indicates that you are making an approximate power level measurement. However, this is not a concern because you will be making a relative power measurement.

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.



* DIRECT CONNECTION

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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

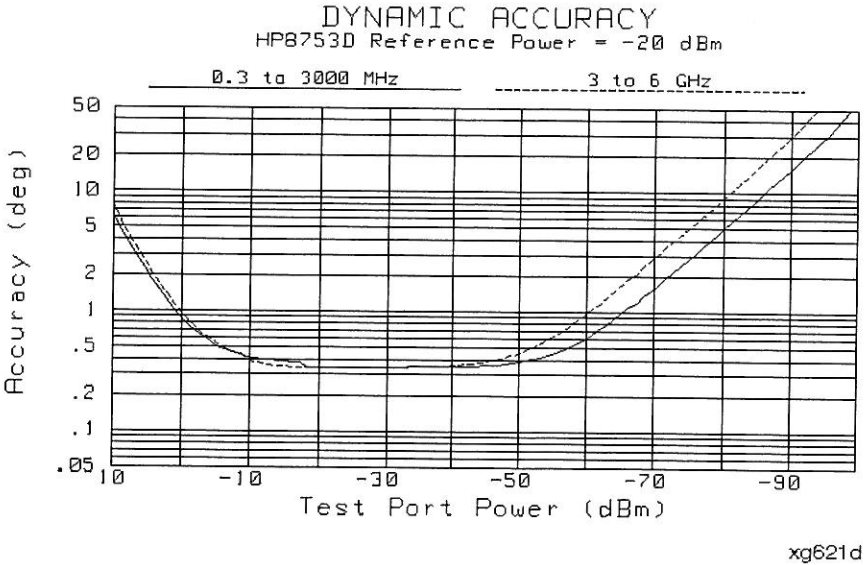


Figure 1-46. Dynamic Accuracy (Phase)

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:

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

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

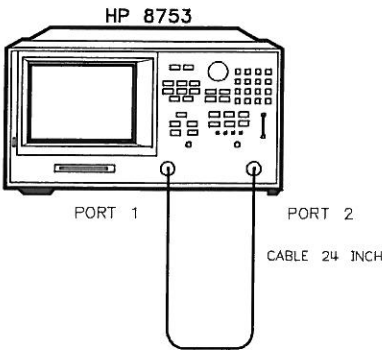
Cable, 75Ω, Type-N, 24-inch HP P/N 8120-2408

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.



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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-inchHP 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.

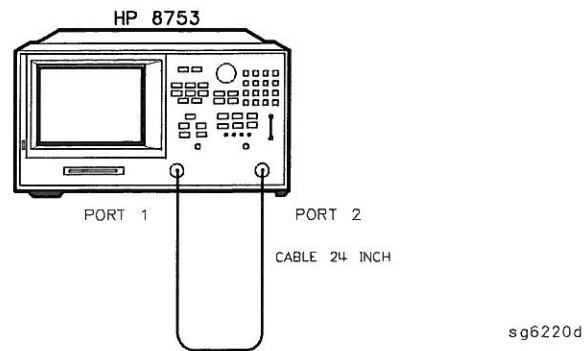


Figure 1-48. Test Port Phase Compression Test Setup

- 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

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

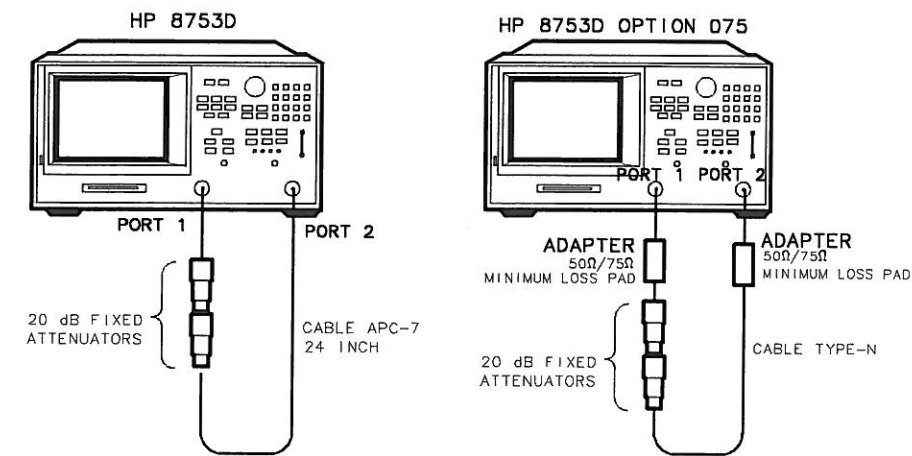


Figure 1-49. Test Port Output Harmonics Test Setup

- Press **MEAS** **Trans:REV S12 (A/R)** **INPUT PORTS A**.
- After one sweep, press **DISPLAY** **DATA→MEMORY** **DATA/MEM** to normalize the trace.
- Press **SYSTEM** **HARMONIC MEAS** **HARMONIC SECOND**.
- After one sweep, press **SCALE/REF** **AUTO SCALE** to get a better viewing of the trace.
- Press **MARKER FCTN** **MKR SEARCH** **SEARCH MAX**.
- 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.

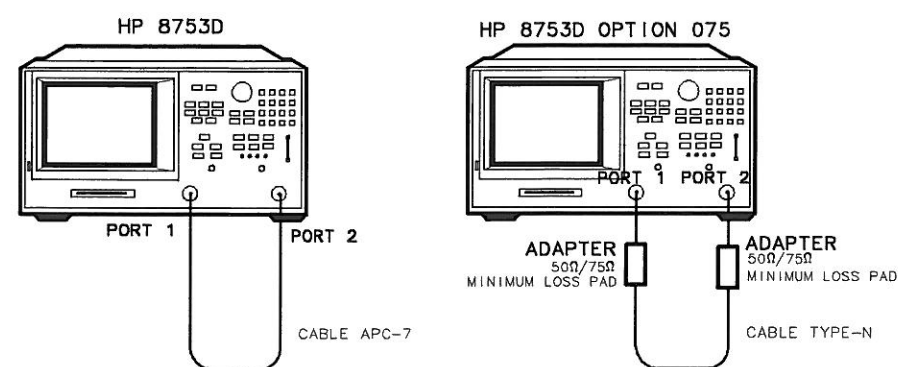


Figure 1-50. Receiver Harmonics Test Setup

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.

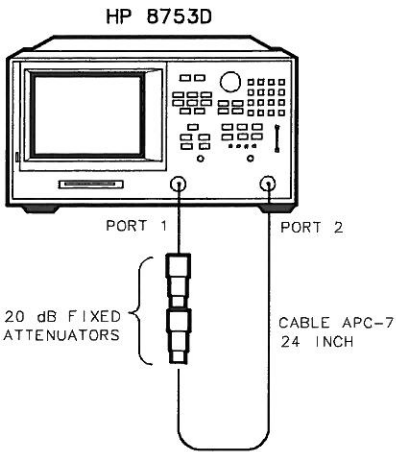


Figure 1-51. Test Port Output Harmonics Test Setup

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.

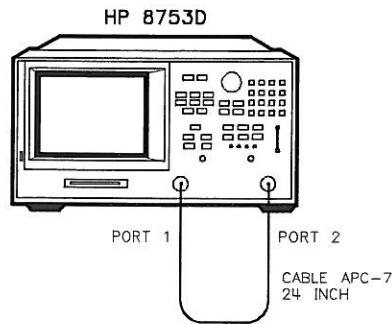


Figure 1-52. Receiver Harmonics Test Setup

- 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.”