
HP 11876D Upgrade Kit

Converts an HP 8753D network analyzer into an HP 8702D lightwave component analyzer.



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HP Part No. 11876-90006
Printed in USA
October 1997

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The *caution* sign denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in damage to or destruction of the product. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

WARNING

The *warning* sign 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 sign until the indicated conditions are fully understood and met.



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



The laser radiation symbol. This warning symbol is marked on products which have a laser output.



The AC symbol is used to indicate the required nature of the line module input power.



The ON symbols are used to mark the positions of the instrument power line switch.



The OFF symbols are used to mark the positions of the instrument power line switch.



The CE mark is a registered trademark of the European Community.



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

ISM1-A This text denotes the instrument is an Industrial Scientific and Medical Group 1 Class A product.

Typographical Conventions.

The following conventions are used in this book:

Key type for keys or text located on the keyboard or instrument.

Softkey type for key names that are displayed on the instrument's screen.

Display type for words or characters displayed on the computer's screen or instrument's display.

User type for words or characters that you type or enter.

Emphasis type for words or characters that emphasize some point or that are used as place holders for text that you type.

General Safety Considerations

This product has been designed and tested in accordance with IEC Publication 1010, Safety Requirements for Electronic Measuring Apparatus, and has been supplied in a safe condition. The instruction documentation contains information and warnings which must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

WARNING

If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.

WARNING

No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock, do not remove covers.

HP 11876D Upgrade Kit—At a Glance

This book provides instructions for upgrading an HP 8753D network analyzer into an HP 8702D lightwave component analyzer.

Kit number: HP 11876D
Product affected: HP 8753D, HP 8753D Option 011
Serial numbers: All serials
To be performed by: HP service personnel
Estimated installation time: 40 minutes (2 hours if modification required)

What you'll find in this book

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General Safety Considerations

WARNING

There are many points in the instrument which can, if contacted, cause personal injury. Be extremely careful. Any adjustments or service procedures that require operation of the instrument with protective covers removed should be performed only by trained service personnel.

WARNING

These servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing unless you are qualified to do so.

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.

WARNING

The power cords on instruments are connected to internal capacitors that may remain live for five seconds after disconnecting the plug from its power supply.

CAUTION

This installation guide is intended for HP personnel only. The analyzer warranty will be *VOID* if this firmware installation is performed by anyone other than HP personnel.

Parts, Tools, and Equipment

Table 1. Contents of the Kit

Component	HP Part Number	Quantity
Front-panel nameplate Standard (30 kHz–3 GHz)	11876-80001	1
Option 006 (30 kHz–6 GHz)	11876-80002	1
A9U4 EPROM	08702-80025	1
A9U5 EPROM	08702-80026	1
A9U24 EPROM	08702-80027	1
A9U25 EPROM	08702-80028	1
Installation guide	11876-90006	1
HP 8702D manual set	08702-91021	1
Electrolytic capacitor	0180-4316	1

Parts, Tools, and Equipment

Table 2. Required Equipment and Tools for the 50Ω HP 8753D

Item	HP Part/Model Number
Power meter	HP 437B or HP 438A
Power sensor	HP 8482A
24-in APC-7 cable (2)	8120-4779
HP-IB cable assembly	HP 10833A
APC-7 to type-N (f) adapter	85054-60031
3.5-inch floppy disk	HP 92192A (box of 10)
T-10 TORX screwdriver	8710-1623
T-15 TORX screwdriver	8710-1622
Medium flat-blade screwdriver	—
Anti-static wrist strap	9300-1367
Anti-static wrist strap cord	9300-0980
Static-control table mat and earth ground wire	9300-0797
Additional equipment required for the HP 8753D with Option 006	
Power sensor	HP 8481A

Table 3. Required Equipment and Tools for the 75Ω HP 8753D

Item	HP Part/Model Number
Power meter	HP 437B or HP 438A
Power sensor	HP 8483A Option H03
24-in (75Ω) type-N (m) to type-N (m) cable (2)	8120-2408
Adapter (75 Ω) type-N (f) to type-N (f)	1250-1529
HP-IB cable assembly	HP 10833A
3.5-inch floppy disk	HP 92192A (box of 10)
T-10 TORX screwdriver	8710-1623
T-15 TORX screwdriver	8710-1622
Medium flat-blade screwdriver	—
Anti-static wrist strap	9300-1367
Anti-static wrist strap cord	9300-0980
Static-control table mat and earth ground wire	9300-0797

Table 4. Required Equipment and Tools for the HP 8753D Option 011

Item	HP Part/Model Number
Power meter	HP 437B or HP 438A
Power sensor	HP 8482A
Power splitters (2)	HP 11667A Option 001
Cables (2)	HP 11500B
RF cable set	HP 11851B
HP-IB cable assembly	HP 10833A
Type-N (f) to type-N (f) adapter	1250-1472
Type-N (m) to type-N (m) adapter	1250-1475
20 dB attenuator	HP 8491A Option 020
3.5-inch floppy disk	HP 92192A (box of 10)
T-10 TORX screwdriver	8710-1623
T-15 TORX screwdriver	8710-1622
Medium flat-blade screwdriver	—
Anti-static wrist strap	9300-1367
Anti-static wrist strap cord	9300-0980
Static-control table mat and earth ground wire	9300-0797
Additional equipment required for the HP 8753D Option 011 with Option 006	
Power sensor	HP 8481A

Installation

This installation procedure should require approximately 40 minutes to complete. If however, you need to perform “Step 4. Modify the power supply” on page 12, reserve an additional 2 hours of time. This step only applies to analyzers with an instrument serial number of 0000A00000 to 3410A06400 and a firmware revision number less than 6.12.

WARNING

Before you disassemble the instrument, turn the power switch OFF and unplug the instrument. Failure to unplug the instrument can result in personal injury.

CAUTION

Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe workstation. Refer to “Electrostatic Discharge Information” on page 33 for information about static-safe workstations and ordering static-safe accessories.

The following steps are included in this section:

- Step 1. Verify operation 9
- Step 2. Change the EEPROMs 10
- Step 3. Test instrument operation 11
- Step 4. Modify the power supply 12
- Step 5. Change the front-panel nameplate 16

Step 1. Verify operation

- 1 Turn on the HP 8753D.
- 2 Press PRESET, SYSTEM, *SERVICE MENU*, *TESTS*, 21, x1, *EXECUTE TEST*.
- 3 Follow the displayed prompts for making the necessary connections.
- 4 Press *CONTINUE*. When the analyzer passes the test, it will display:
 - Standard model display: PORT 1 Op Chk DONE.
 - Option 011 instruments display: R&A Op Chk DONE.
- 5 Press *RETURN*, *TESTS*, 22, x1, *EXECUTE TEST*.
- 6 Follow the displayed prompts for making the necessary connections.
- 7 Press *CONTINUE*. When the analyzer passes the test, it will display:
 - Standard model display: PORT 2 Op Chk DONE.
 - Option 011 instruments display: R&B Op Chk DONE.
- 8 Turn off the HP 8753D.

NOTE

If either check did not pass, the instrument must be adjusted or repaired before being upgraded. Notify the customer of the costs involved and obtain permission to proceed before doing so. Repairs are *not* part of the upgrade installation.

Step 2. Change the EEPROMs

- 1 Place the HP 8753D at a static-safe workstation. Refer to “Electrostatic Discharge Information” on page 33 for information on setting up a static-safe workstation.
- 2 Record the instrument serial number and the firmware revision number.
Instrument serial number _____
Firmware revision number _____
- 3 Remove the power line cord from the analyzer.
- 4 Set the analyzer on its side.
- 5 Remove the two corner bumpers from the bottom of the instrument with the T-15 TORX screwdriver.
- 6 Loosen the captive screw on the bottom cover’s back edge with the T-15 TORX screwdriver.
- 7 Slide the cover toward the rear of the instrument.
- 8 Carefully pry the EPROMs from their sockets on the A9 CPU board assembly with a flat blade screwdriver. The labels have the revision number and the reference designator printed on them. Their locations are shown in Figure 1. Although this operation requires moderate force, avoid bending the pins.

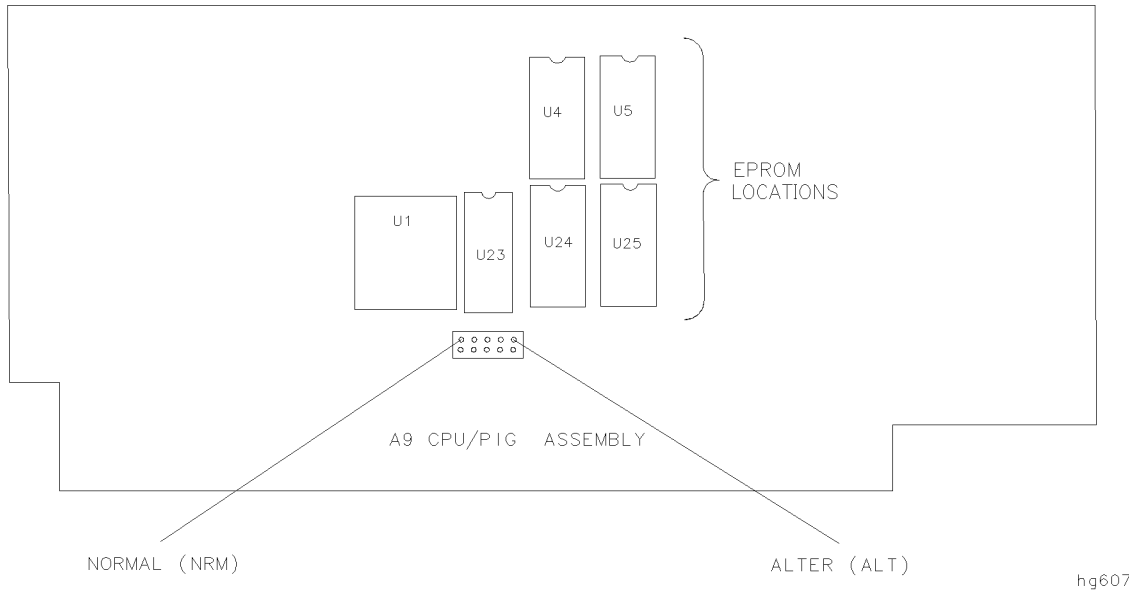


Figure 1. Component Location Diagram

- 9 Insert the EPROMs, provided in this kit, into the sockets. Refer to Figure 1 for correct placement and orientation. Visually confirm that all the pins of each EPROM are correctly seated in the socket and that the EPROMs have the correct revision.

Step 3. Test instrument operation

- 1 Reinstall the bottom cover and corner bumpers, reconnect the power line cord, and switch on the instrument. At the completion of the self-test, the displayed revision number should match the revision number on the EPROMs. If not, recheck all EPROMs for correct location, the correct insertion (no pins folded inside or outside sockets), and the correct revision number on the label.

If the display is blank, has unusual colors, or lack of colors after the power has been cycled twice following the installation of the firmware, replace capacitor C7 on the power supply. Refer to "Step 4. Modify the power supply" on page 12.

- 2 Press SYSTEM, *SERVICE MENU*, *PEEK/POKE*, *RESET MEMORY*, PRESET, then switch the instrument off and back on again.
- 3 Press SYSTEM, *SERVICE MENU*, *PEEK/POKE*, *PEEK/POKE ADDRESS*, 5243326, x1, *POKE*, 30, x1. These key presses enable the power overrange/underrange feature.
- 4 To verify that the instrument is functioning correctly, press PRESET, SYSTEM, *SERVICE MENU*, *TESTS*, 0, x1, *EXECUTE TEST*.

When the test is complete, the analyzer should display: ALL INT PASS. If it does not, refer to the *HP 8753D Network Analyzer Service Guide* for troubleshooting information.

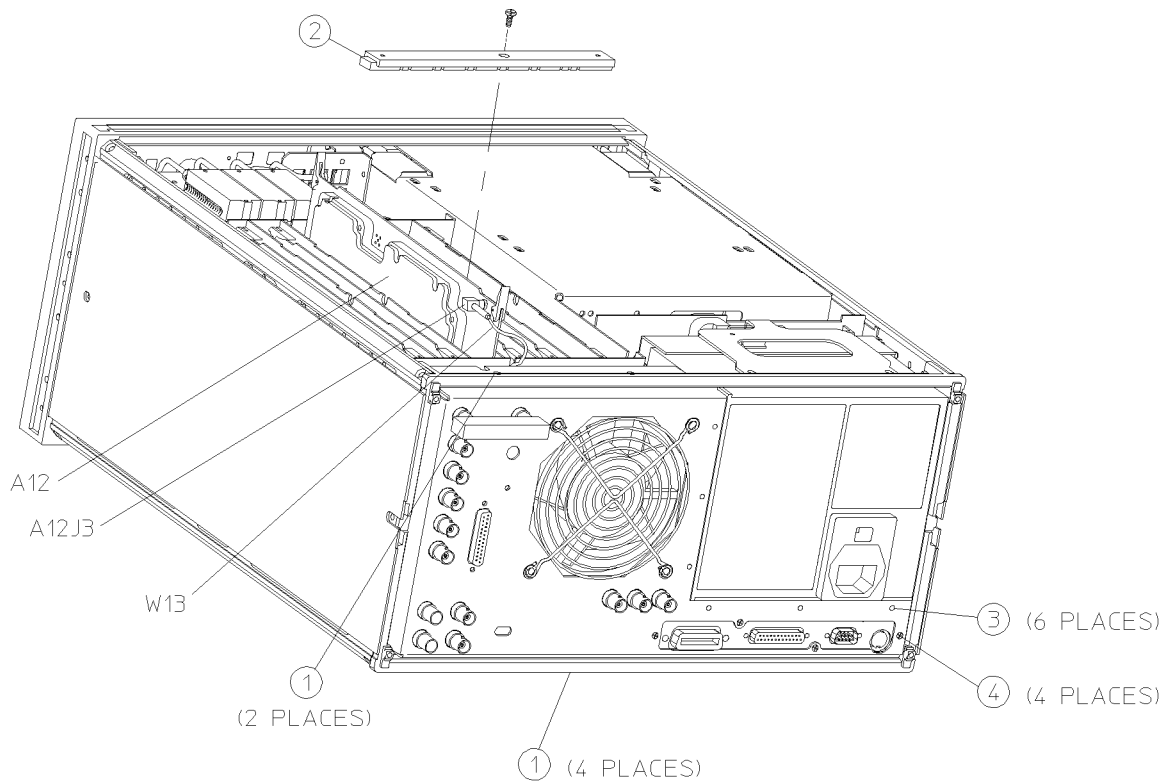
Step 4. Modify the power supply

This section only applies to analyzers with an instrument serial number of 0000A00000 to 3410A06400 and a firmware revision number less than 6.12.

- 1 Is the instrument's serial number between 0000A00000 and 3410A06400? And, is the instrument's old firmware revision number less than 6.12? If the answer is yes to these two questions, continue with the following steps to replace capacitor C7 on the power supply.

Remove the Analyzer Rear Panel

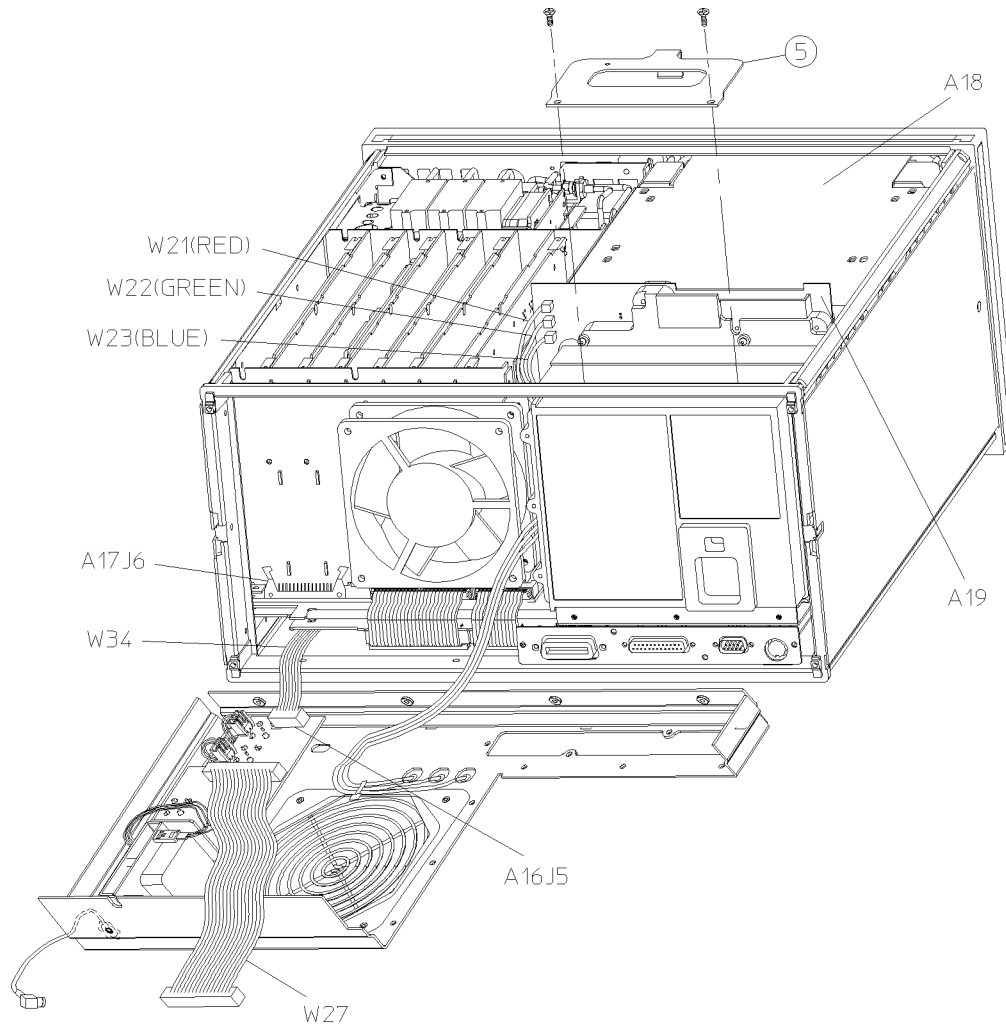
- 2 Remove the analyzer top cover.
- 3 Remove six screws (refer to Figure 2, item 1) from the rear frame: two from the top edge and four from the bottom edge.
- 4 Remove the screw from the PC board stabilizer (item 2) and remove the stabilizer.
- 5 Lift the reference board (A12) from its motherboard connector and disconnect W13 from A12J3.
- 6 Remove the six screws (item 3), next to the preregulator, from the rear panel as shown.
- 7 Remove the four screws (item 4), surrounding the connector interfaces, from the rear panel as shown.



sg658d

Figure 2. Rear Panel

- 8 Pull the rear panel away from the frame.
- 9 Remove the bracket (refer to Figure 3, item 5) that secures the graphics board (A19), removing the two screws that attach it to the rear frame. *The preregulator is now sitting loosely in the instrument.* Gently press the top of the graphics board (A19) towards the display (A18) then lift up.



sg659d

Figure 3. Rear Panel

Installation

Remove the Preregulator

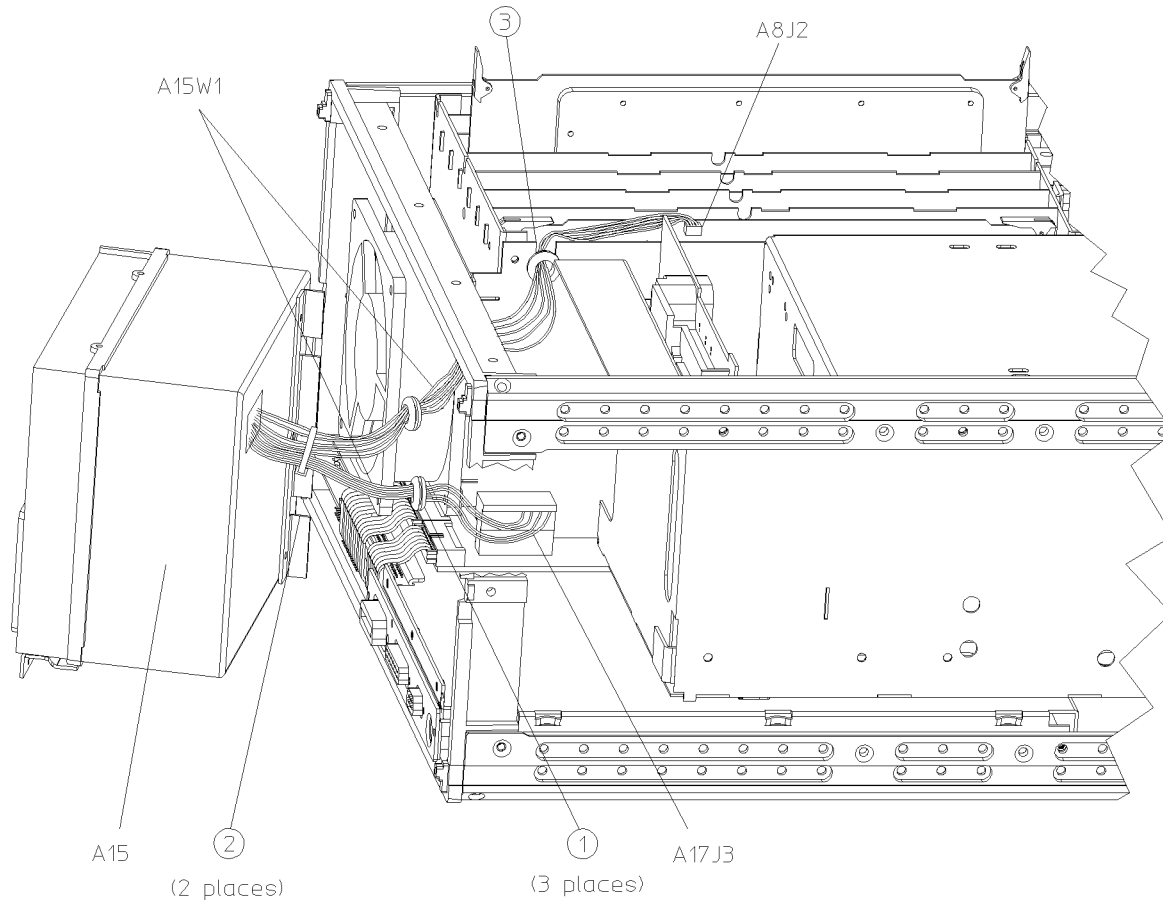
- 10 Disconnect the wire bundle (A15W1) from A8J2 and A17J3. Refer to Figure 4.
- 11 Remove the preregulator (A15) from the frame.

CAUTION

When reinstalling the preregulator (A15), make sure the three grommets (Figure 4, item 1) on A15W1 are seated in the two slots (item 2) on the back side of the preregulator and the slot (item 3) in the card cage wall.

CAUTION

After reinstalling the preregulator (A15), be sure to set the line voltage selector to the appropriate setting, 115 V or 230 V.



sg660d

Figure 4. Preregulator

- 12 Find the power supply serial number, located on the underside of the preregulator. If the serial number is less than 53224159, it is necessary to continue this procedure.

If you have determined that it is *not* necessary to modify the power supply, reassemble the instrument and continue with “Step 5. Change the front-panel nameplate” on page 16.

Modify the Power Supply

- 13 Remove the four large screws and lock-washers from the housing of the preregulator. Separate the preregulator housing, being careful not to break the white plastic activator switch.
- 14 Remove the four standoffs from the AC-input board (HP 08753-60215). Refer to Figure 5.
- 15 Disconnect the J1 and J2 connectors.
- 16 Locate the two spade connectors on the receptacle for the AC power cable. Note that the polarity of each connector is distinguished by a color-coded wire. Record the correct polarity for each spade connector and then disconnect them.
- 17 Remove the PC board from the housing and replace C7, using the 220 μ F, 50 V electrolytic capacitor provided in the upgrade kit.

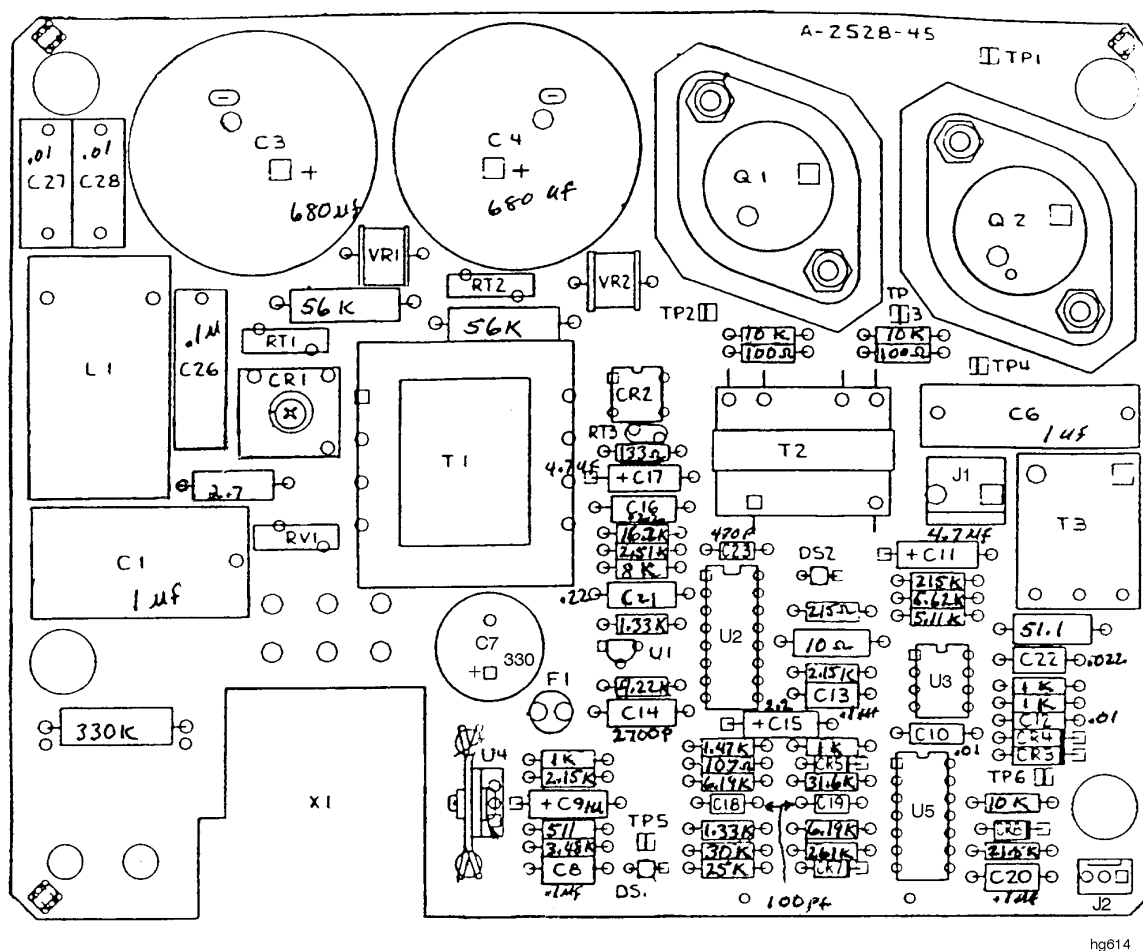


Figure 5. AC-Input Board

CAUTION

When reassembling the preregulator housing, be sure that the J1 and J2 connector wires are made to fit into the area of U2, U3, and U5.

- 18 Reverse the order of the removal procedure to reassemble the instrument.

Step 5. Change the front-panel nameplate

- 1 Locate the front-panel nameplate, which is located beneath the display. Refer to Figure 6.
- 2 Using a thin-bladed knife, gently pry up one end of the nameplate. It is glued onto the display's bezel. Use caution to avoid scratching the instrument.



Figure 6. Lifting One End of the Nameplate

- 3 Remove the nameplate using pliers as shown in Figure 7 on page 17.
- 4 Use Oil-Flo 141 Safety Solvent Cleaner¹ to clean any residual glue off of the display's bezel. Allow the surface to dry.
- 5 Remove the paper backing from the new HP 8702D front-panel nameplate.
- 6 Carefully position the new nameplate on the bezel. Apply gentle pressure with your fingers to fully seat the nameplate.
- 7 If the instrument's old firmware revision is lower than revision 5.30 (for example, 5.24), you must perform one of the following adjustment procedures:
 - "HP 8753D Adjustments" on page 18, or
 - "HP 8753D Option 011 Adjustments" on page 26.

If the instrument's old firmware revision is 5.30 or higher, you have completed the instrument upgrade.

1. Oil-Flo 141 Safety Solvent Cleaner is a product of Titan Laboratories. It can be purchased from Titan Laboratories, 2235 Mora Drive, Mountain View, CA 94040, (800) 475-3300.

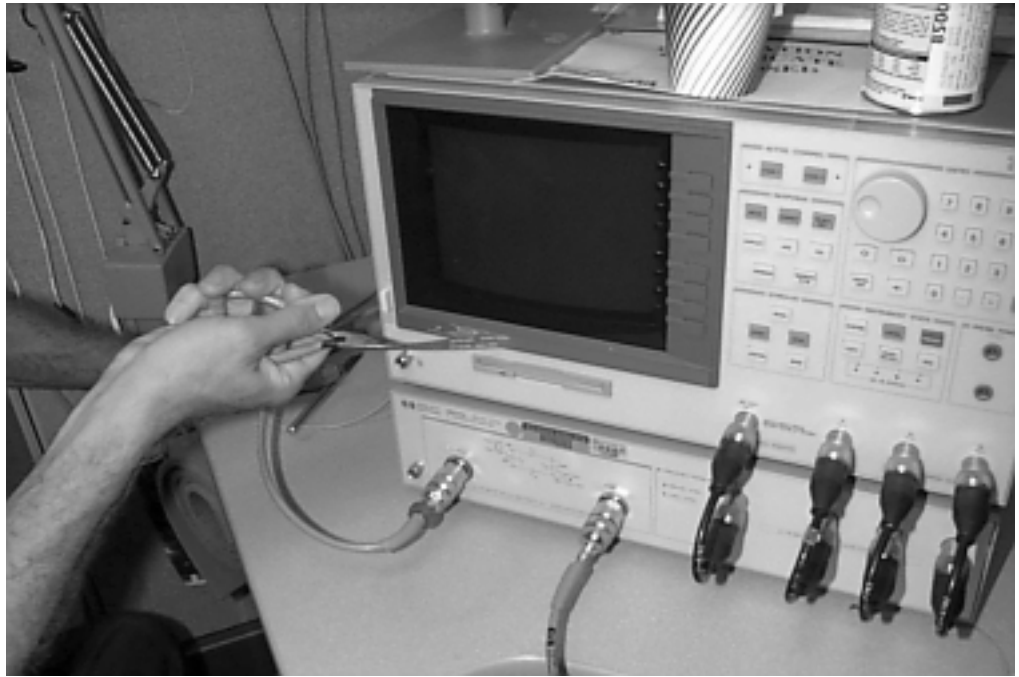


Figure 7. Removing the Nameplate

HP 8753D Adjustments

Perform this adjustment only if indicated in Step 7 on page 16.

The following steps are included in this section:

- Step 1. Write correction constants (Test 44) 18
- Step 2. Correct flatness constants (50 Ω HP 8753D) 18
- Step 3. Correct flatness constants (75 Ω HP 8753D) 22
- Step 4. Adjust RF output power correction constants (Test 47) 24
- Step 5. Backup the new correction constants 25

Step 1. Write correction constants (Test 44)

- 1 Move the A9 CC jumper to the ALT position, as shown in Figure 1 on page 10.
- 2 Press PRESET, SYSTEM, *SERVICE MENU*, TESTS, 44, x1. When the display shows: *Source Def, press *EXECUTE TEST*. Press *YES* at the query to alter the correction constants.
- 3 The test is complete when the display shows: *Source Def DONE.

If the message: *Source Def FAIL appears on the analyzer display, refer to "Source Troubleshooting" in the *HP 8753D Network Analyzer Service Guide*.

Step 2. Correct flatness constants (50 Ω HP 8753D)

- 1 For Option 075 (75 Ω) instruments only, skip to "Step 3. Correct flatness constants (75 Ω HP 8753D)" on page 22.
- 2 Allow the instrument to warm up for 30 minutes.
- 3 Press PRESET, LOCAL, *SYSTEM CONTROLLER*.
- 4 Press LOCAL, *SET ADDRESSES*, ADDRESS: P MTR/HPIB. The default power meter address is 13. Refer to the power meter manual, as required, to observe or change its HP-IB address.
- 5 Press *POWER MTR*: to toggle between the HP 438A/437 and 436A power meters. Choose the appropriate model number.

NOTE

If you are using the HP 438A power meter, connect the HP 8482A power sensor to channel A, and the HP 8481A power sensor to channel B.

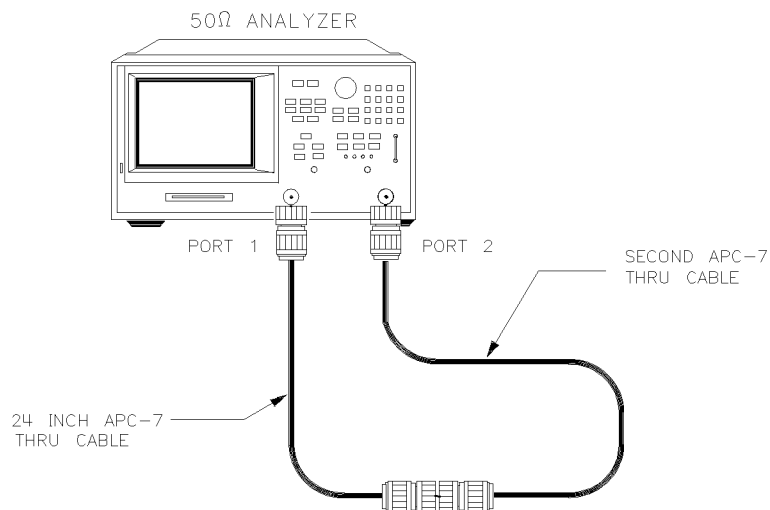
- 6 Press SYSTEM, *SERVICE MENU*, TEST OPTIONS, LOSS/SENSE R LISTS, CAL FACTOR SENSOR A to access the calibration factor menu for power sensor A (HP 8482A).

- 7 Build a table of up to twelve points (twelve frequencies with their calibration factors):
 - a Input a frequency value and then press the appropriate key (G/n, M/ μ , or k/m).
 - b Enter the calibration factor percentage that corresponds to the frequency you entered.

The cal factor and frequency values are found on the back of the sensor. If you make a mistake, press \leftarrow and re-enter the correct value.

The following terms are part of the sensor calibration menu:	
<i>SEGMENT</i>	allows you to select a frequency point.
<i>EDIT</i>	allows you to edit or change a previously entered value.
<i>DELETE</i>	allows you to delete a point from the sensor cal factor table.
<i>ADD</i>	allows you to add a point into the sensor cal factor table.
<i>CLEAR LIST</i>	allows you to erase the entire sensor cal factor table.
<i>DONE</i>	allows you to complete the points entry of the sensor cal factor table.

- 8 For Option 006 instruments only: Press *CAL FACTOR SENSOR B* to create a power sensor calibration table for power sensor B (HP 8481A), using the softkeys mentioned above.
- 9 Press *PRESET, MEAS, Trans: FWD S21(B/R)*.
- 10 Press *CENTER, 1, G/n, SPAN, 50, M/ μ* .
- 11 Press *CAL, CAL KIT, SELECT CAL KIT, CAL KIT: 7mm, RETURN, RETURN, CALIBRATE MENU, RESPONSE*.
- 12 Connect the 24-inch APC-7 cable from Port 1 to Port 2 and press *THRU*.
Press *DONE: RESPONSE* when the analyzer is done measuring the thru.
- 13 Press *SAVE/RECALL, SAVE STATE* to save the calibration that you just made.
- 14 Make the connections as shown in Figure 8.



hg611

Figure 8. Connections for a 50 Ω Analyzer Insertion Loss Measurement

- 15 Press *SCALE REF, SCALE/DIV, .1, MARKER, MARKER 1, 1, G/n, x1*. Record the insertion loss of the second thru cable as shown in the upper-right corner of the analyzer display.

HP 8753D Adjustments

- 16 Press **PRESET**, **SYSTEM**, *SERVICE MENU*, *TESTS*, 53, x1, *EXECUTE TEST* and answer *YES* at the prompt.
- 17 Using the APC-7 to type-N adapter, connect the HP 8482A power sensor to the analyzer Port 1, as shown in Figure 9, when the message: *CONNECT <3 GHz SENSOR A TO PORT 1* appears. Press *CONTINUE* to start the test. This part of the test will take about 7 minutes.
If the message: *Sampler Cor - FAIL* appears on the analyzer display, check the following:
 - a The HP-IB address of your power meter is set at 13. Rerun this routine, beginning at Step 16 of this procedure.
 - b The HP 8482A power sensor is connected to Port 1. Rerun this routine, beginning at Step 16 of this procedure.

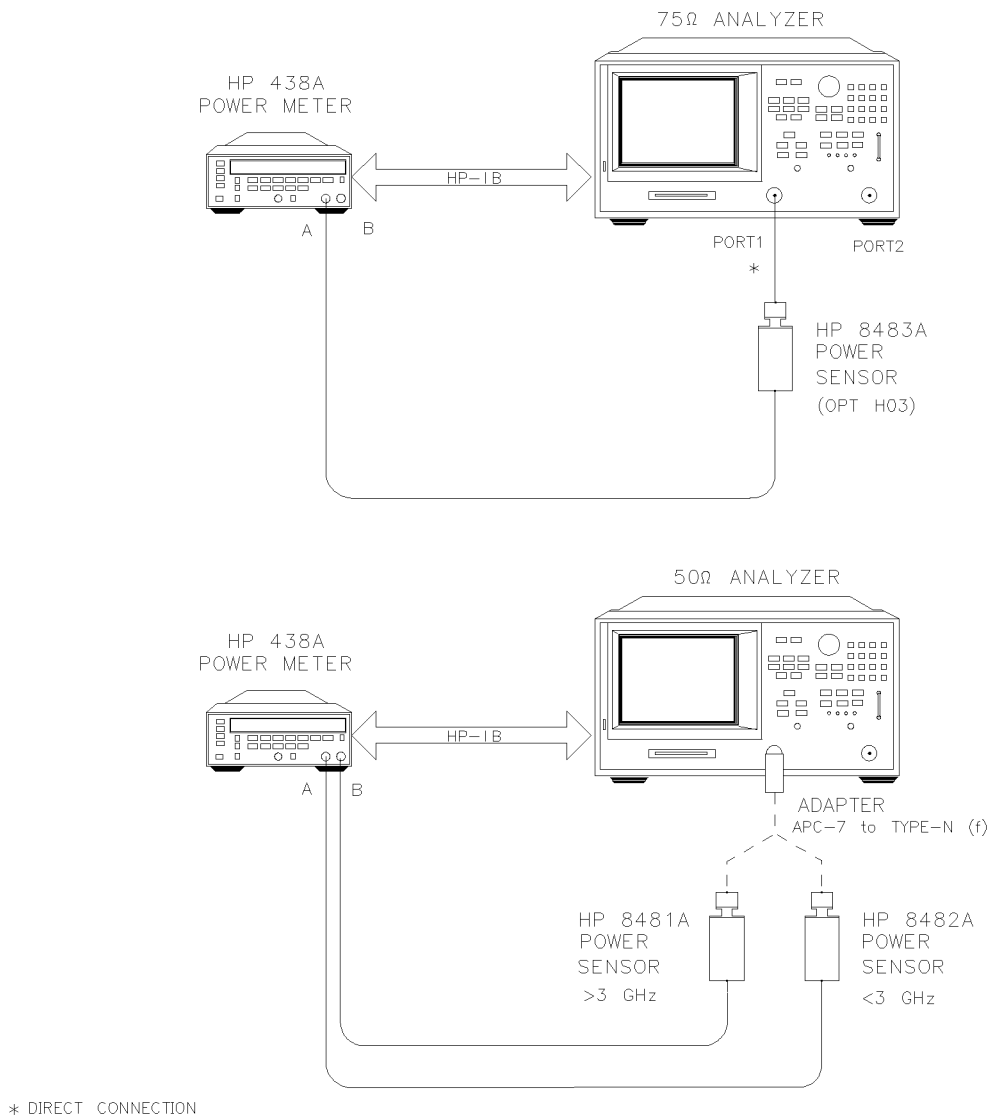


Figure 9. Connections for Sampler Correction Routine

- 18** For Option 006 instruments only: Using the APC-7 to type-N adapter, connect the HP 8481A power sensor to the analyzer Port 1, as shown in Figure 9 on page 20, when the message: *CONNECT 6 GHz SENSOR B TO PORT 1* appears. Press *CONTINUE* to start the test. This part of the test will take about 20 seconds.
- 19** Using the APC-7 to type-N adapter, connect the HP 8482A power sensor to the analyzer Port 2 when the message: *CONNECT <3 GHz SENSOR A TO PORT 2* appears. Press *CONTINUE* to start the test. This part of the test will take about 10 minutes.
- 20** For Option 006 instruments only: Using the APC-7 to type-N adapter, connect the HP 8481A power sensor to the analyzer Port 2 when the message: *CONNECT 6 GHz SENSOR TO PORT 2* appears. Press *CONTINUE* to start the test. This part of the test will take about 20 seconds.
- 21** Connect the second thru cable from Port 1 to Port 2 when the message: *CONNECT PORT 1 TO PORT 2* appears. Press *CONTINUE*.
- 22** Enter the insertion loss of the second thru cable (determined in Step 15 of this procedure) and press *CONTINUE*.
- For example, if the insertion loss of the thru cable at 1 GHz is found to be 0.25 dB, then press: *.25, x1*.
- 23** When the analyzer completes the test, observe the display for the results:
- If you see: *Sampler Cor - DONE*, the adjustment is done.
 - If you see: *Sampler Cor - FAIL*, it is necessary to adjust the sampler gain offset values, which are stored in EEPROM.
 - a** Access the first address by pressing *SYSTEM, SERVICE MENU, PEEK/POKE, PEEK/POKE ADDRESS, 5242936, x1*.
 - b** Enter the new value at the accessed address by pressing *POKE, 46, x1*.
 - c** Access the second address by pressing *PEEK/POKE ADDRESS, 5242940, x1*.
 - d** Enter the new value at the accessed address by pressing *POKE, 46, x1*.
 - e** Press *PRESET* for the analyzer to use the new values.
 - f** Repeat this routine, beginning with Step 16 of this procedure.
- 24** Continue with "Step 4. Adjust RF output power correction constants (Test 47)" on page 24.

NOTE

If the analyzer still displays: *Sampler Cor - FAIL*, refer to the manual adjustment in "Adjustments" located in the *HP 8753D Network Analyzer Service Guide*.

Step 3. Correct flatness constants (75Ω HP 8753D)

- 1 For instruments that are 50Ω (not Option 075), skip to “Step 4. Adjust RF output power correction constants (Test 47)” on page 24.
- 2 Allow the instrument to warm up for 30 minutes.
- 3 Press PRESET, LOCAL, *SYSTEM CONTROLLER*.
- 4 Press LOCAL, *SET ADDRESSES, ADDRESS: P MTR/HPIB*. The default power meter address is 13. Refer to the power meter manual, as required, to observe or change its HP-IB address.
- 5 Press *POWER MTR*: to toggle between the HP 438A/437 and 436A power meters. Choose the appropriate model number.

NOTE

If you are using the HP 438A power meter, connect the HP 8482A power sensor to channel A, and the HP 8481A power sensor to channel B.

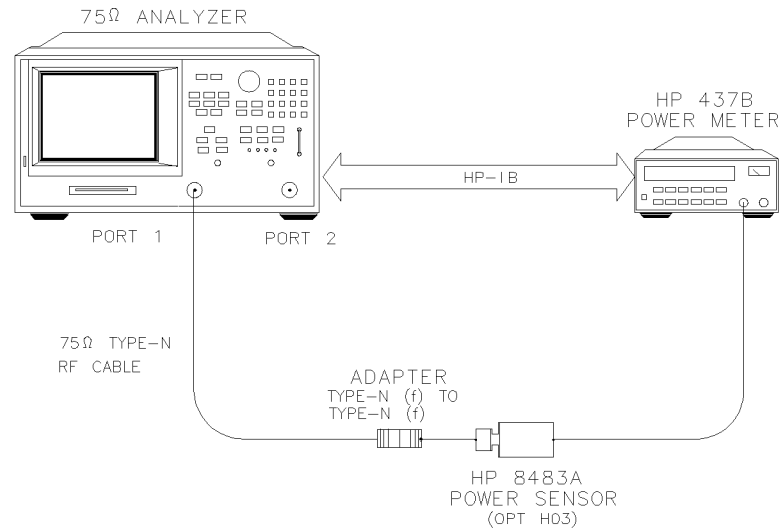
- 6 Press SYSTEM, *SERVICE MENU, TEST OPTIONS, LOSS/SENSRLISTS, CAL FACTOR SENSOR A* to access the calibration factor menu for power sensor A (HP 8482A).
- 7 Build a table of up to twelve points (twelve frequencies with their calibration factors):
 - a Input a frequency value and then press the appropriate key (G/n, M/μ, or k/m).
 - b Enter the calibration factor percentage that corresponds to the frequency you entered.

The cal factor and frequency values are found on the back of the sensor. If you make a mistake, press ← and re-enter the correct value.

The following terms are part of the sensor calibration menu:

<i>SEGMENT</i>	allows you to select a frequency point.
<i>EDIT</i>	allows you to edit or change a previously entered value.
<i>DELETE</i>	allows you to delete a point from the sensor cal factor table.
<i>ADD</i>	allows you to add a point into the sensor cal factor table.
<i>CLEAR LIST</i>	allows you to erase the entire sensor cal factor table.
<i>DONE</i>	allows you to complete the points entry of the sensor cal factor table.

- 8 For Option 006 instruments only: Press *CAL FACTOR SENSOR B* to create a power sensor calibration table for power sensor B (HP 8481A), using the softkeys mentioned above.
- 9 Zero and calibrate the power meter and sensor.
- 10 Press PRESET, MENU, *CW FREQ, 1, G/n*.
- 11 Connect the HP 8483A power sensor to the analyzer Port 1 and press REFERENCE on the HP 437B power meter.
- 12 Connect the equipment as shown in Figure 10 on page 23.



hg613

Figure 10. Connections for a 75Ω Analyzer Insertion Loss Measurement

- 13** Record the power meter reading. This is the insertion loss of the RF cable.
- 14** Press **PRESET**, **SYSTEM**, **SERVICE MENU**, **TESTS**, 53, x1, **EXECUTE TEST** and answer **YES** at the prompt.
- 15** Connect the HP 8483A power sensor to the analyzer Port 1, as shown in Figure 9 on page 20, when the message: **CONNECT <3 GHz SENSOR A TO PORT 1** appears.
- 16** Press **CONTINUE** to start the test. This part of the test will take about 7 minutes. If the message: **Sampler Cor - FAIL** appears on the analyzer display, check the following:
 - a** The HP-IB address of your power meter is set at 13. Rerun this routine, beginning with Step 14 of this procedure.
 - b** The HP 8483A power sensor is connected to Port 1. Rerun this routine, beginning with Step 14 of this procedure.
- 17** Connect the HP 8483A power sensor to the analyzer Port 2 when the message: **CONNECT <3 GHz SENSOR A TO PORT 2** appears. Press **CONTINUE** to start the test. This part of the test will take about 10 minutes.
- 18** Connect the RF cable from Port 1 to Port 2 when the message: **CONNECT PORT 1 TO PORT 2** appears. Press **CONTINUE**.
- 19** Enter the insertion loss of the RF cable (determined in Step 13 of this procedure) and press **CONTINUE**.
For example, if the insertion loss of the RF cable at 1 GHz is found to be 0.25 dB, then press: .25, x1.
- 20** When the analyzer completes the test, observe the display for the results:
 - If you see: **Sampler Cor - DONE**, the adjustment is done.
 - If you see: **Sampler Cor - FAIL**, it is necessary to adjust the sampler gain offset values, which are stored in EEPROM.
 - a** Access the first address by pressing **SYSTEM**, **SERVICE MENU**, **PEEK/POKE**, **PEEK/POKE ADDRESS**, 5242936, x1.
 - b** Enter the new value at the accessed address by pressing **POKE**, 46, x1.
 - c** Access the second address by pressing **PEEK/POKE ADDRESS**, 5242940, x1.

HP 8753D Adjustments

- d** Enter the new value at the accessed address by pressing *POKE*, 46, x1.
- e** Press *PRESET* for the analyzer to use the new values.
- f** Repeat the routine, beginning with Step 14 of this procedure.

NOTE

If the analyzer still displays: *Sampler Cor - FAIL*, refer to the manual adjustment in "Adjustments" located in the *HP 8753D Network Analyzer Service Guide*.

Step 4. Adjust RF output power correction constants (Test 47)

This procedure adjusts several correction constants that can improve the output power level accuracy of the internal source. They are related to the power level, power slope, power slope offset, and the ALC roll-off factors, among others.

- 1** Allow the instrument to warm up for 30 minutes.
- 2** Press *PRESET*, *LOCAL*, *SYSTEM CONTROLLER*, *SET ADDRESSES*, *ADDRESS: P MTR/HPIB* to see the address at which the analyzer expects to find the power meter (the default address is 13). Refer to the power meter manual, as required, to observe or change its address.
- 3** Connect the equipment as shown in Figure 9 on page 20.
- 4** Press *SYSTEM*, *SERVICE MENU*, *TESTS*, 47, x1.
- 5** Press *EXECUTE TEST* and *YES* at the prompt to alter the correction constants.
- 6** Follow the instruction at the prompt and press *CONTINUE*.
- 7** When the analyzer completes the test, observe the display for the results:
 - If you see: *DONE*, the adjustment is done. Press *PRESET* and then move the A9 CC jumper back to its *NRM* (normal) operating position.
 - If you see: *FAIL*, re-run this routine in the following order:
 - a** Press *PRESET*.
 - b** Repeat "Step 1. Write correction constants (Test 44)" on page 18.
 - c** Repeat "Step 4. Adjust RF output power correction constants (Test 47)" on page 24.

Step 5. Backup the new correction constants

The correction constants, that are unique to your instrument, are stored in EEPROM on the A9 controller assembly. By creating an EEPROM backup disk, you will have a copy of all the correction constant data should you need to replace or repair the A9 assembly.

- 1 Insert a 3.5-inch disk into the analyzer disk drive.
- 2 If the disk is not formatted, follow these steps:
 - a Press *SAVE/RECALL*, *FILE UTILITIES*, *FORMAT DISK*.
 - b Select the format type:
 - To format a LIF disk, select *FORMAT:LIF*
 - To format a DOS disk, select *FORMAT:DOS*
 - c Press *FORMAT INT DISK* and answer *YES* at the query.

- 3 Press the following keys:

SYSTEM, *SERVICE MENU*, *SERVICE MODES*, *MORE*, *STORE EEPR ON*,
SAVE/RECALL, *SELECT DISK*, *INTERNAL DISK*, *RETURN*, *SAVE STATE*.

NOTE

The analyzer creates a default file: "FILE0". The filename appears in the upper-left corner of the display. The file type: "ISTATE(E)", indicates that the file is an instrument-state with EEPROM backup.

- 4 Press *FILE UTILITIES*, *RENAME FILE*, *ERASE TITLE*. Use the front panel knob and the *SELECT LETTER* softkey (or an external keyboard) to rename the file "FILE0" to "N12345" where *12345* represents the last 5 digits of the instrument's serial number. (The first character in the filename must be a letter.)

When you are finished renaming the file, press *DONE*.

- 5 Write the following information on the disk label:
 - Analyzer serial number
 - Today's date
 - "EEPROM Backup Disk"

HP 8753D Option 011 Adjustments

The HP 8753D Option 011 does *not* have the built-in test set. Perform this adjustment only if the firmware revision number of the HP 8753D network analyzer is lower than revision 5.30 (for example, 5.24). Always perform these adjustments after installing the hardware described in "Installation" on page 8.

The following steps are included (for Option 011) in this section:

- Step 1. Write correction constants (Test 44) 26
- Step 2. Correct flatness constants 26
- Step 3. Adjust RF output power correction constants (Test 47) 29
- Step 4. Backup the new correction constants 32

Step 1. Write correction constants (Test 44)

- 1 Move the A9 CC jumper to the ALT position, as shown in Figure 1 on page 10.
- 2 Press PRESET, SYSTEM, *SERVICE MENU*, TESTS, 44, x1. When the display shows: *Source Def, press EXECUTE TEST. Press YES at the query to alter the correction constants.

The test is complete when the display shows: *Source Def DONE.

If the message: *Source Def FAIL appears on the analyzer display, refer to "Source Troubleshooting" in the *HP 8753D Option 011 Network Analyzer Service Guide*.

Step 2. Correct flatness constants

- 1 Allow the instrument to warm up for 30 minutes.
- 2 Press PRESET, LOCAL, *SYSTEM CONTROLLER*.
- 3 Press LOCAL, *SET ADDRESSES*, ADDRESS: P MTR/HPIB. The default power meter address is 13. Refer to the power meter manual, as required, to observe or change its HP-IB address.
- 4 Press *POWER MTR*: to toggle between the HP 438A/437 and 436A power meters. Choose the appropriate model number.

NOTE

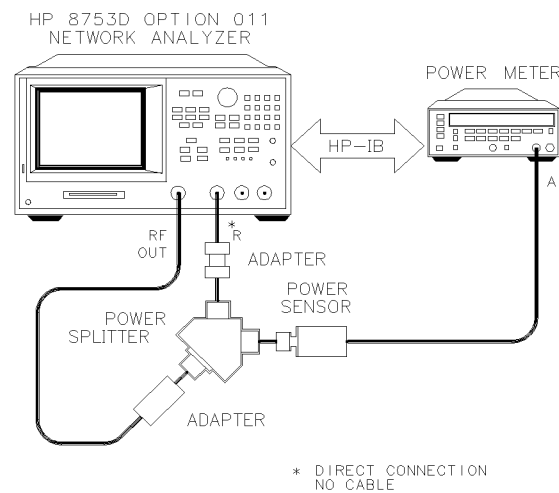
If you are using the HP 438A power meter, connect the HP 8482A power sensor to channel A, and for Option 006, connect the HP 8481A power sensor to channel B.

- 5 Press SYSTEM, *SERVICE MENU*, TEST OPTIONS, LOSS/SENSRLISTS, CAL FACTOR SENSOR A to access the calibration factor menu for power sensor A (HP 8482A).
- 6 Build a table of up to twelve points (twelve frequencies with their calibration factors):
 - a Input a frequency value and then press the appropriate key (G/n, M/ μ , or k/m).
 - b Enter the calibration factor percentage that corresponds to the frequency you entered.

The calibration factor and frequency values are found on the back of the sensor. If you make a mistake, press ← and re-enter the correct value.

The following terms are part of the sensor calibration menu:	
<i>SEGMENT</i>	allows you to select a frequency point.
<i>EDIT</i>	allows you to edit or change a previously entered value.
<i>DELETE</i>	allows you to delete a point from the sensor cal factor table.
<i>ADD</i>	allows you to add a point into the sensor cal factor table.
<i>CLEAR LIST</i>	allows you to erase the entire sensor cal factor table.
<i>DONE</i>	allows you to complete the points entry of the sensor cal factor table.

- 7 For Option 006 instruments only: Press *CAL FACTOR SENSOR B* to create a power sensor calibration table for power sensor B (HP 8481A), using the softkeys mentioned above.
- 8 Press *SYSTEM, SERVICE MENU, TESTS, 53, x1, EXECUTE TEST, YES*.
- 9 Connect the equipment as shown in Figure 11.



sg617d

Figure 11. Input R Sampler Correction Setup

- 10 Press *CONTINUE*.

The analyzer starts the first part of the automatic adjustment. This part of the adjustment will take about 7 minutes.

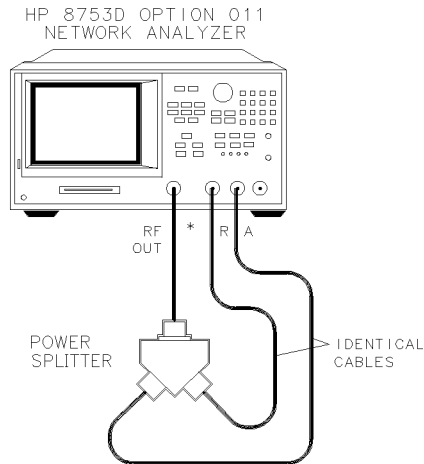
- 11 For Option 006 instruments only: After the analyzer has finished the first part of the adjustment, disconnect the HP 8482A sensor from the power splitter, and replace it with the HP 8481A.

If you are using the HP 438A power meter, the HP 8481A should be connected to the meter's channel B.

- 12 Press *CONTINUE*.

HP 8753D Option 011 Adjustments

- 13 Connect the equipment as shown in Figure 12. Use two cables of equal electrical length at the power splitter outputs.



* DIRECT CONNECTION
NO CABLE

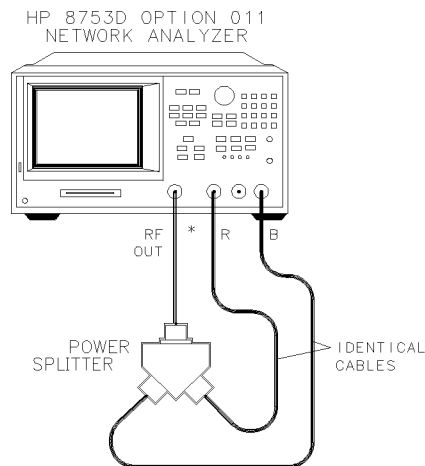
sg618d

Figure 12. Input A Sampler Correction Setup

- 14 Press *CONTINUE*.

The analyzer starts the second part of the automatic adjustment.

- 15 Follow the analyzer prompt to move the cable from input A to input B, as shown in Figure 13.



* DIRECT CONNECTION
NO CABLE

sg616d

Figure 13. Input B Sampler Correction Setup

- 16 Press *CONTINUE*.

The analyzer starts the third part of the automatic adjustment.

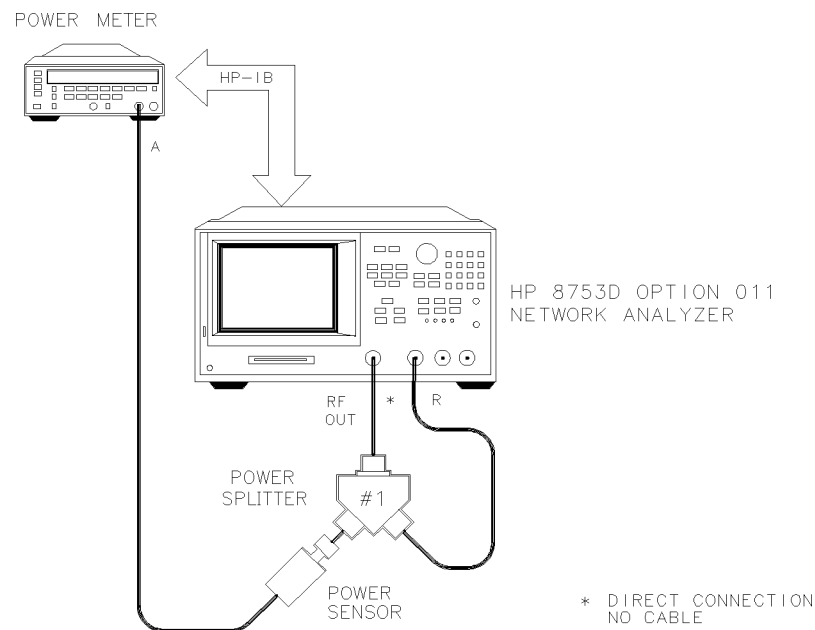
17 When the analyzer completes the adjustment, observe the display:

- If the analyzer shows: **DONE**, this procedure is complete.
- If the analyzer shows: **FAIL**, press **PRESET** and then repeat this entire procedure (“Step 2. Correct flatness constants” on page 26).

If the analyzer shows: **FAIL** again, refer to "Receiver Troubleshooting" in the *HP 8753D Option 011 Network Analyzer Service Guide* for troubleshooting information.

Step 3. Adjust RF output power correction constants (Test 47)

- 1 Press **PRESET**, **LOCAL**, **SYSTEM CONTROLLER**, **SET ADDRESSES**, **ADDRESS: P MTR/HPIB** to see the address at which the analyzer expects to find the power meter (the default address is 13). Refer to the power meter manual, as required, to observe or change its address.
- 2 Connect the equipment as shown in Figure 14, using splitter #1.



sg619d

Figure 14. Setup A for the HP 8753D Option 011 RF Output Correction Constants

- 3 Press **MENU**, **CW FREQ**, 300, k/m.
- 4 Record the power meter reading in the first column of Table 5 on page 30.

Table 5. Loss Through the Power Splitter

Setup A Reading (First Reading)	Setup B Reading (Second Reading)	Power Loss of #2 (Enter in Analyzer)
300 kHz: _____ dB	minus _____ dB	equals _____ dB
50 MHz: _____ dB	minus _____ dB	equals _____ dB
1.5 GHz: _____ dB	minus _____ dB	equals _____ dB
3 GHz: _____ dB	minus _____ dB	equals _____ dB
6 GHz ^a : _____ dB	minus _____ dB	equals _____ dB

a. For Option 006 instruments only.

5 Repeat the previous steps at 50 MHz, 1.5 GHz, 3 GHz, and 6 GHz (for Option 006).

6 Reconfigure the equipment as shown in Figure 15.

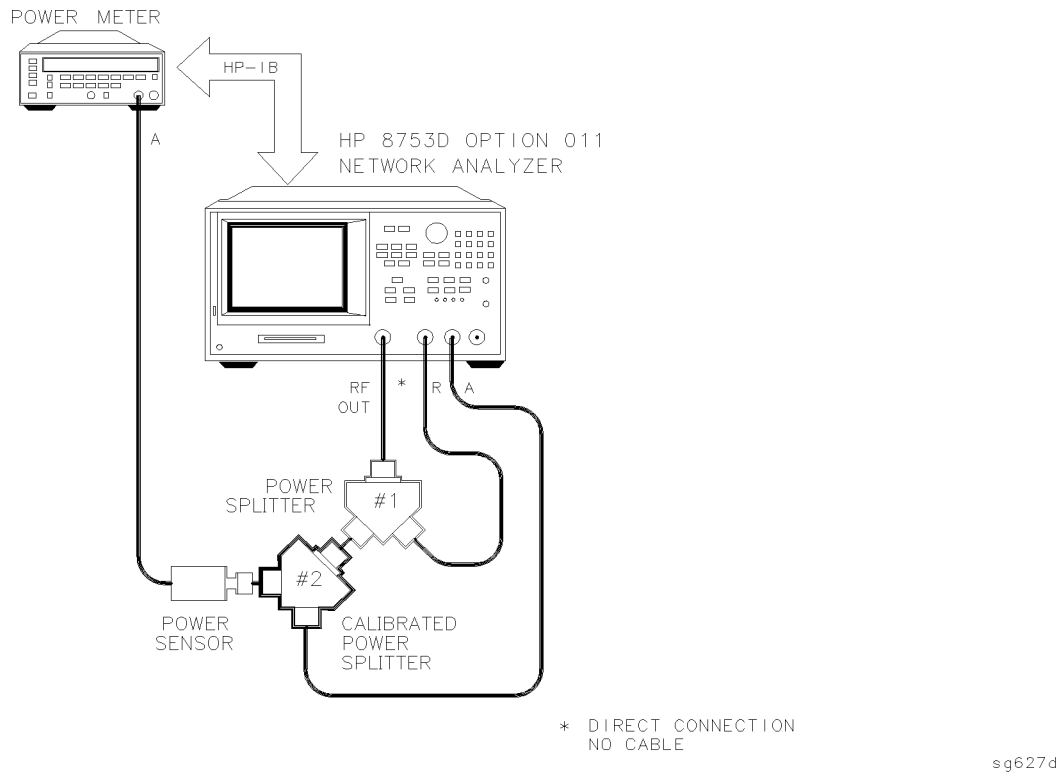


Figure 15. Setup B for the HP 8753D Option 011 RF Output Correction Constants

7 Repeat the measurements at the same frequencies (300 kHz, 50 MHz, 1.5 GHz, 3 GHz, and 6 GHz), and record the power meter readings in the second column of Table 5.

8 Subtract the value of each frequency in the second column from the value in the first column, and enter the difference in the third column of Table 5.

9 Press SYSTEM, SERVICE MENU, TEST OPTIONS, LOSS/SENSR LISTS, POWER LOSS and enter the power loss data in the same way you entered the calibration factors (see the previous section titled “Step 2. Correct flatness constants” on page 26).

- 10 Press SYSTEM, SERVICE MENU, TESTS, 47, x1, EXECUTE TEST, YES.
- 11 Connect the equipment as shown in Figure 16, using splitter #2.

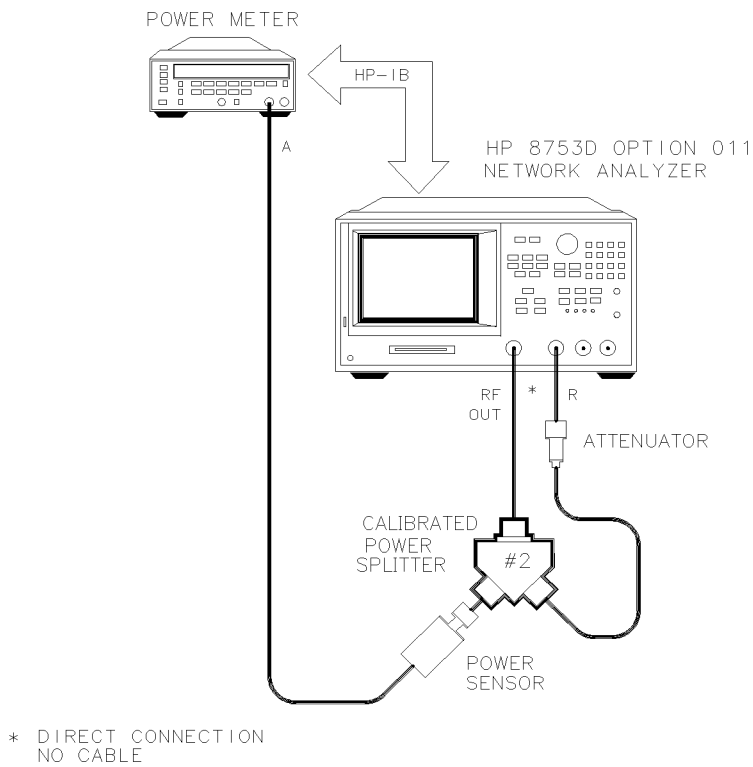


Figure 16. Setup C for the HP 8753D Option 011 RF Output Correction Constants

- 12 Follow the instruction at the prompt and press CONTINUE.
- 13 Observe the analyzer display for the results of the adjustment routine:
 - If the analyzer shows: DONE, press PRESET and move the A9 CC jumper back to the NRM (normal operating) position.
 - If the analyzer fails this routine, refer to "Source Troubleshooting" in the *HP 8753D Option 011 Network Analyzer Service Guide*.

Step 4. Backup the new correction constants

The correction constants, that are unique to your instrument, are stored in EEPROM on the A9 controller assembly. By creating an EEPROM backup disk, you will have a copy of all the correction constant data should you need to replace or repair the A9 assembly.

- 1 Insert a 3.5-inch disk into the analyzer disk drive.
- 2 If the disk is not formatted, follow these steps:
 - a Press *SAVE/RECALL*, *FILE UTILITIES*, *FORMAT DISK*.
 - b Select the format type:
 - To format a LIF disk, select *FORMAT:LIF*
 - To format a DOS disk, select *FORMAT:DOS*
 - c Press *FORMAT INT DISK* and answer *YES* at the query.

- 3 Press the following keys:

SYSTEM, *SERVICE MENU*, *SERVICE MODES*, *MORE*, *STORE EEPR ON*,
SAVE/RECALL, *SELECT DISK*, *INTERNAL DISK*, *RETURN*, *SAVE STATE*

NOTE

The analyzer creates a default file: "FILE0". The filename appears in the upper-left corner of the display. The file type: "ISTATE(E)" indicates that the file is an instrument-state with EEPROM backup.

- 4 Press *FILE UTILITIES*, *RENAME FILE*, *ERASE TITLE*. Use the front panel knob and the *SELECT LETTER* softkey to rename the file "FILE0" to "N12345" where 12345 represents the last 5 digits of the instrument's serial number. (The first character in the filename must be a letter.)

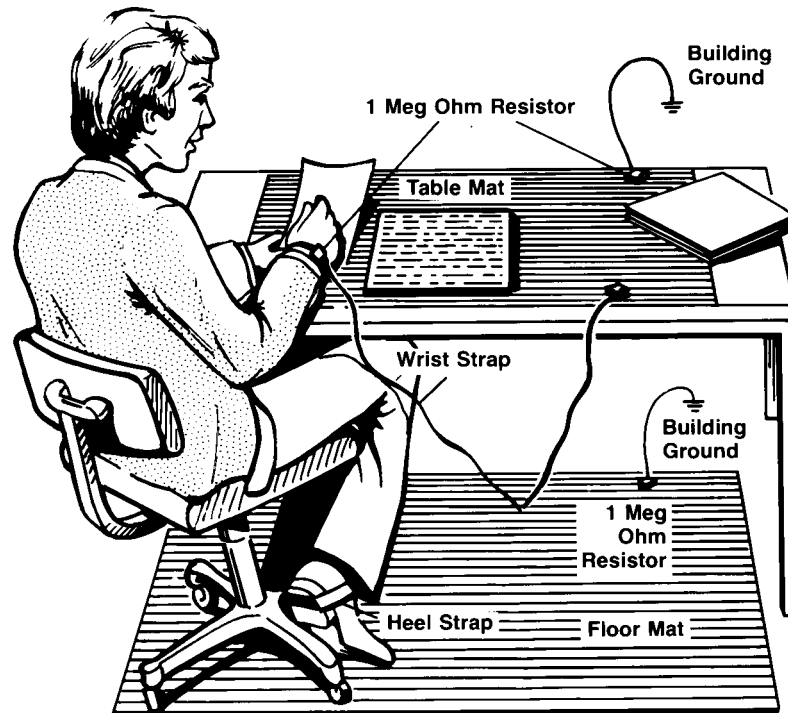
When you are finished renaming the file, press *DONE*.

- 5 Write the following information on the disk label:
 - Analyzer serial number
 - Today's date
 - "EEPROM Backup Disk"

Electrostatic Discharge Information

Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe work station. The following figure shows an example of a static-safe work station using two types of ESD protection:

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



Both types, when used together, provide a significant level of ESD protection. Of the two, only the table-mat and wrist-strap combination provides adequate ESD protection when used alone.

To ensure user safety, the static-safe accessories must provide at least 1 M Ω of isolation from ground. Refer to Table 6 on page 34 for information on ordering static-safe accessories.

WARNING

These techniques for a static-safe work station should not be used when working on circuitry with a voltage potential greater than 500 volts.

Reducing ESD Damage

The following suggestions may help reduce ESD damage that occurs during testing and servicing operations.

- Personnel should be grounded with a resistor-isolated wrist strap before removing any assembly from the unit.
- Be sure all instruments are properly earth-grounded to prevent a buildup of static charge.

Table 6. Static-Safe Accessories

HP Part Number	Description
9300-0797	Set includes: 3M static control mat 0.6 m × 1.2 m (2 ft× 4 ft) and 4.6 cm (15 ft) ground wire. (The wrist-strap and wrist-strap cord are not included. They must be ordered separately.)
9300-0980	Wrist-strap cord 1.5 m (5 ft).
9300-1383	Wrist-strap, color black, stainless steel, without cord, has four adjustable links and a 7 mm post-type connection.
9300-1169	ESD heel-strap (reusable 6 to 12 months).

Returning the Instrument for Service

The instructions in this section show you how to properly package the instrument for return to a Hewlett-Packard service office. If the instrument is still under warranty or is covered by an HP maintenance contract, it will be repaired under the terms of the warranty or contract (the warranty is at the front of this manual). If the instrument is no longer under warranty or is not covered by an HP maintenance plan, Hewlett-Packard will notify you of the cost of the repair after examining the unit.

When an instrument is returned to a Hewlett-Packard service office for servicing, it must be adequately packaged and have a complete description of the failure symptoms attached.

When describing the failure, please be as specific as possible about the nature of the problem. Include copies of additional failure information (such as instrument failure settings, data related to instrument failure, and error messages) along with the instrument being returned.

Please notify the service office before returning your instrument for service. Any special arrangements for the instrument can be discussed at this time. This will help the HP service office repair and return your instrument as quickly as possible.

Preparing the instrument for shipping

- 1 Write a complete description of the failure and attach it to the instrument. Include any specific performance details related to the problem. The following information should be returned with the instrument.
 - Type of service required.
 - Date instrument was returned for repair.
 - Description of the problem:
 - Whether problem is constant or intermittent.
 - Whether instrument is temperature-sensitive.
 - Whether instrument is vibration-sensitive.
 - Instrument settings required to reproduce the problem.
 - Error codes.
 - Performance data.
 - Company name and return address.
 - Name and phone number of technical contact person.
 - Model number of returned instrument.
 - Full serial number of returned instrument.
 - List of any accessories returned with instrument.

Returning the Instrument for Service

- 2 Pack the instrument in the original shipping containers. Original materials are available through any Hewlett-Packard office. Or, use the following guidelines:

CAUTION

Instrument damage can result from using packaging materials other than the original materials. Never use styrene pellets as packaging material. They do not adequately cushion the instrument or prevent it from shifting in the carton. They may also cause instrument damage by generating static electricity.

- Wrap the instrument in antistatic plastic to reduce the possibility of damage caused by electrostatic discharge.
 - For instruments weighing less than 54 kg (120 lb), use a double-walled, corrugated cardboard carton of 159 kg (350 lb) test strength.
 - The carton must be large enough to allow 3 to 4 inches on all sides of the instrument for packing material, and strong enough to accommodate the weight of the instrument.
 - Surround the equipment with 3 to 4 inches of packing material, to protect the instrument and prevent it from moving in the carton. If packing foam is not available, the best alternative is S.D-240 Air Cap™ from Sealed Air Corporation (Commerce, California 90001). Air Cap looks like a plastic sheet filled with air bubbles. Use the pink (antistatic) Air Cap™ to reduce static electricity. Wrapping the instrument several times in this material will protect the instrument and prevent it from moving in the carton.
- 3 Seal the carton with strong nylon adhesive tape.
 - 4 Mark the carton "FRAGILE, HANDLE WITH CARE".
 - 5 Retain copies of all shipping papers.

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