Keysight E8257D/67D PSG Signal Generators

Add Option 1EH (Improved Low Band Harmonics from 10 MHz to 3.2 GHz)
Kit Part Number: E8251-60382

NOTE: For the latest revision of this installation note, go to the following website:
http://www.keysight.com/find/psg

KEYSIGHT TECHNOLOGIES

Installation Note

Notices

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Add Option 1EH (Improved Low Band Harmonics from 10 MHz to 3.2 GHz) Kit Part Number: E8251-60382

Product Affected:	E8257D/67D
Serial Numbers:	E8257D Prefix < US/MY/SG4928 E8267D Prefix < US/MY/SG5042
Options:	
To Be Performed By:	(X) Keysight Technologies Service Center (X) Personnel Qualified by Keysight Technologies (X) Customer
Estimated Installation Time:	1.0 hour
Estimated Verification Time:	1.0 hour

Introduction

This upgrade kit adds Option 1EH (Improved Low Band Harmonics) to the E8257D (Analog) and E8267D (Vector) PSG Signal Generators.

Installation includes the following major steps, starting on page 4:

1. Check signal generator functionality.
2. Remove the outer and inner signal generator covers.
3. Install Option 1EH.
4. Activate Option 1EH.
5. Verify proper installation of Option 1EH.
6. Re-assemble the signal generator.
7. Verify signal generator calibration.

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Installation Kit Parts List

Item	Quantity	Description	Part Number
1	1	Installation Note	E8251-90382
2	1	A38 Low Band Switch Filter	E8251-60305
3	1	W76 Semi-Rigid Cable	E8251-20334
4	1	W118 Semi-Rigid Cable	E8251-20332
5	1	W119 Semi-Rigid Cable	E8251-20333
6	4	Cable Retainer Base	E8251-40001
7	4	Cable Retainer Top	E8251-40007
8	1	Entitlement Certificate	5964-5143
9	1	Entitlement Certificate Envelope	5967-7169

Tools Required

— TORX T-10 driver

— TORX T-15 driver

— TORX T-20 driver

— 5/16” open-ended wrench

— Needle-nose pliers

Safety Considerations

WARNING Before you disassemble the signal generator, turn the power switch off and unplug the power cord. Failure to unplug the signal generator 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.

Check Signal Generator Functionality

Use the following procedure to confirm that the signal generator powers up and the internal check identifies no errors. The internal check evaluates the operation of the signal generator and returns an error message if it detects a problem.

NOTE When the signal generator is first connected to ac line power, the error message `ERROR 514, Reference Oven Cold` occurs which causes both the `OVEN COLD` annunciator and the `ERR` annunciator to turn on.

After approximately five minutes, the `OVEN COLD` annunciator automatically clears, but the `ERR` annunciator remains on until all errors are cleared from the error queue.

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1. Turn on the signal generator and let it warm up for at least five minutes.
2. Run the signal generator self-test by pressing **Utility** > **Instrument Info/Help Mode** > **Self Test** > **Run Complete Self Test**. Upon completion, a summary of the self-test will be displayed. Use the E8257D/67D PSG Service Guide to troubleshoot any failures detected by the test.

NOTE Some circuits may require up to 50 minutes to warm up before passing the self-test. If self-tests continue to fail after 50 minutes of warm up, troubleshoot the instrument.

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3. Check to see if the `ERR` annunciator is on.
   - If the `ERR` annunciator is on, review the error messages in the error queue by pressing **Utility** > **Error Info**. The first page of error messages in the error queue appears in the display text area. (Refer to the signal generator error messages document for information about each error message.)

     After resolving all problems causing errors, press **Clear Error Queue(s)**.
   - If the `ERR` annunciator is off, the signal generator functionality check has passed.

Remove the Outer and Inner Signal Generator Covers

Remove the Outer Cover

Refer to Figure 1.

1. Disconnect the power cord.
2. Using a T-20 driver, loosen the two screws (1) and remove the strap handle (2).
3. Using a T-15 driver, remove the center screws (3) on the four rear-panel feet (4).
4. Remove the four bottom feet (5) from the cover by lifting the tab and sliding the foot toward the tab.
5. Place the signal generator on its side.
6. Tilt the signal generator forward and slide the outer cover (6) back to remove it from the frame.

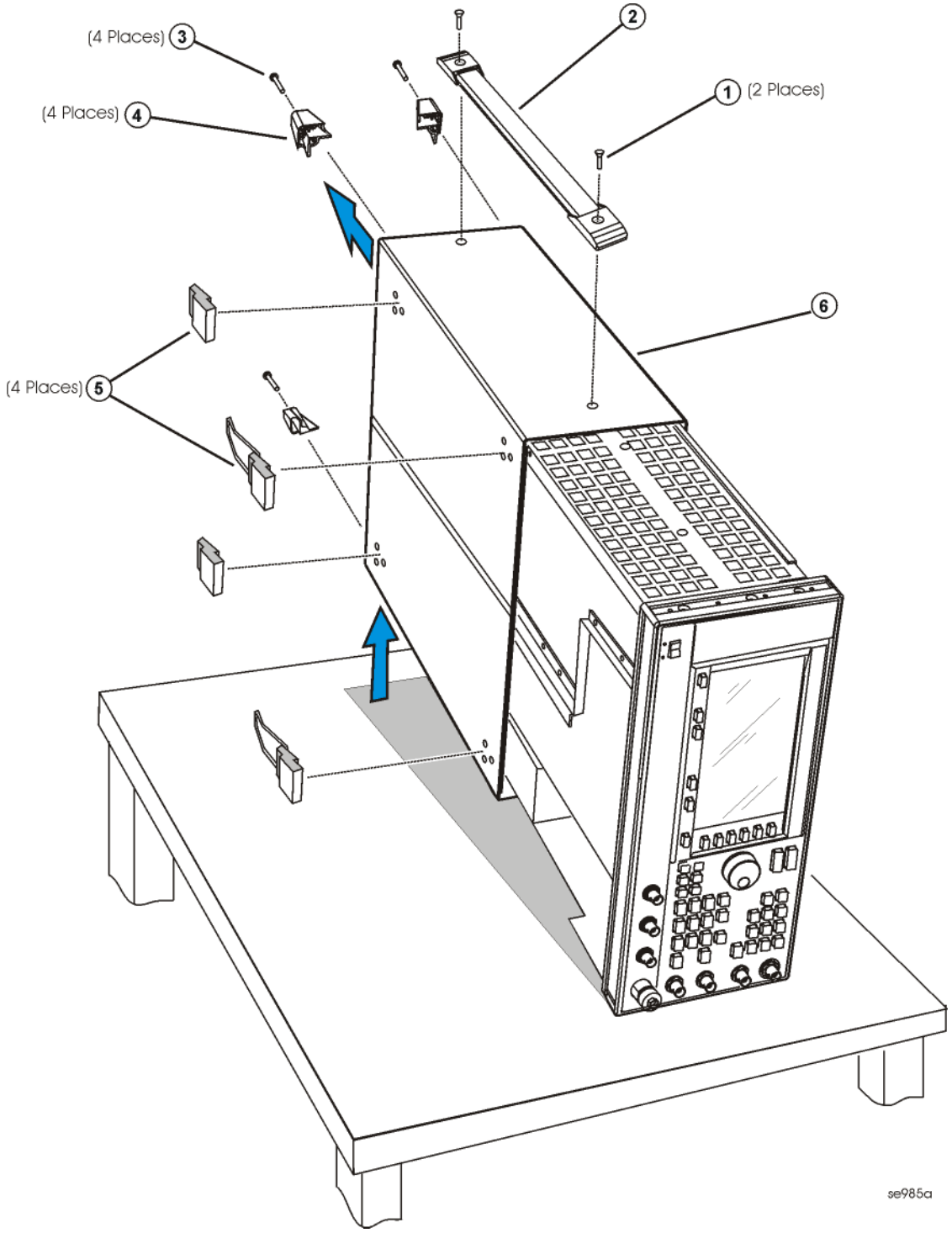
Add Option 1EH (Improved Low Band Harmonics from 10 MHz to 3.2 GHz) Kit Part Number: E8251-60382

Remove the Inner Top Cover

Refer to Figure 2.

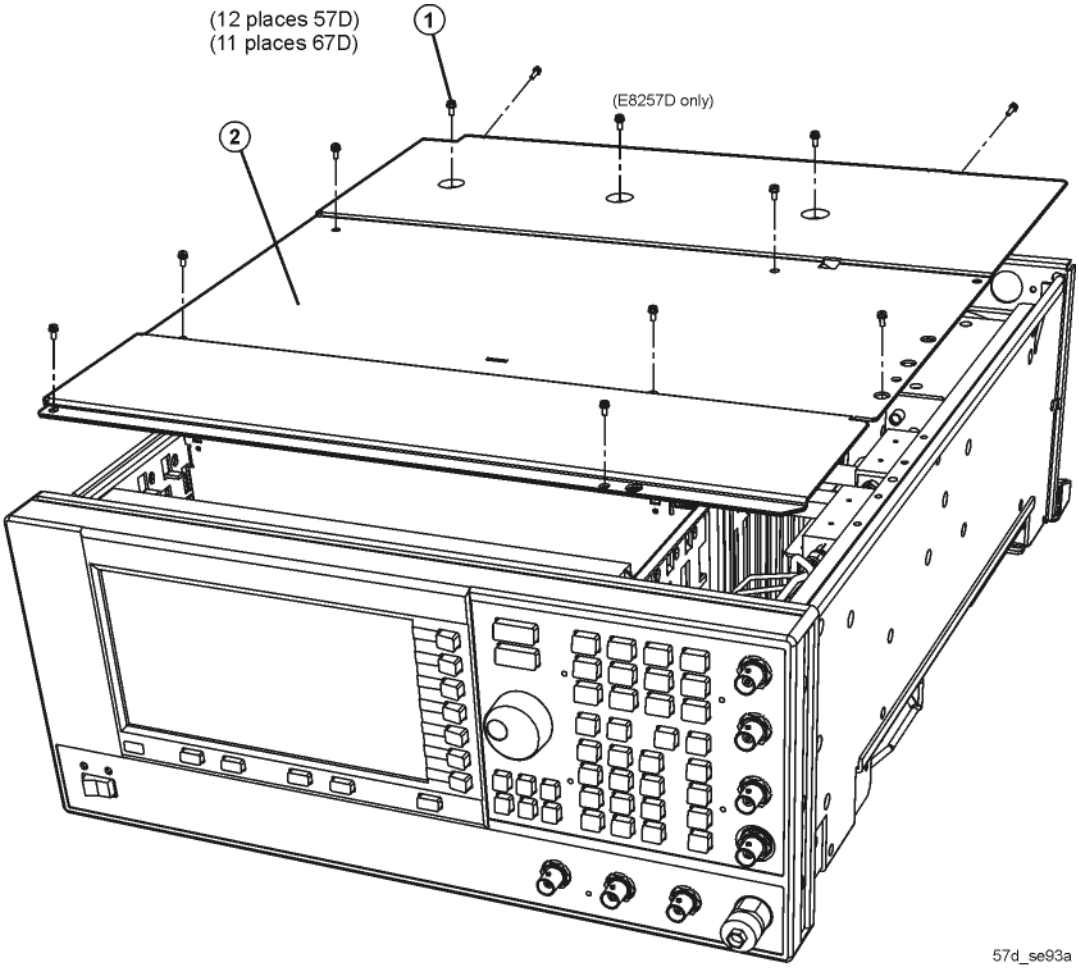
1. Using a T-10 driver, remove the screws (1) from the inner-top cover (2). There are twelve screws for E8257D and eleven screws for E8267D.
2. Remove the inner-top cover.

Figure 1 Outer Cover Removal



Add Option 1EH (Improved Low Band Harmonics from 10 MHz to 3.2 GHz) Kit Part Number: E8251-60382

Figure 2 Inner Top Cover Removal



Install Option 1EH (For Instruments without Option UNW)

Refer to Figure 3 for steps 1-3.

Refer to Figure 4 for steps 4-14.

Refer to for Figure 7 steps 15 and 16.

1. Remove A6 thru A8.
2. Using needle-nose pliers remove the cable retainer base for W37 (E8251-20225).
3. With the A31 Motherboard facing you, using the 5/16” open-ended wrench, remove the other end of semi-rigid cable W37.
4. Position the instrument on it’s side.
5. Place a cable retainer base on W118 (E8251-20332).
6. Insert W118 through the A31 Motherboard, at the A38 Lowband Switch Filter (IN) opening.
7. Using the needle-nose pliers, connect a cable retainer top to W118.

8. Place a cable retainer base on the other end of W118.

9. Insert W118 through the A31 Motherboard, at the A8 LB Output (OUT) opening.

10. Using the needle-nose pliers, connect a cable retainer top to W118.

11. Place a cable retainer base on W119 (E8251-20333).

12. Insert W119 through the A31 Motherboard, at the A38 Lowband Switch Filter (OUT) opening.

13. Using the needle-nose pliers, connect a cable retainer top to W119.

14. Using the 5/16” open-ended wrench, connect the other end of W119 to the A23 Lowband Coupler/Detector.

15. Position the instrument with the RF deck on top and the front panel facing you.

16. Install the A38 Lowband Switch Filter (Option 1EH) assembly.

Add Option 1EH (Improved Low Band Harmonics from 10 MHz to 3.2 GHz) Kit Part Number: E8251-60382

Figure 3 Placement of W37

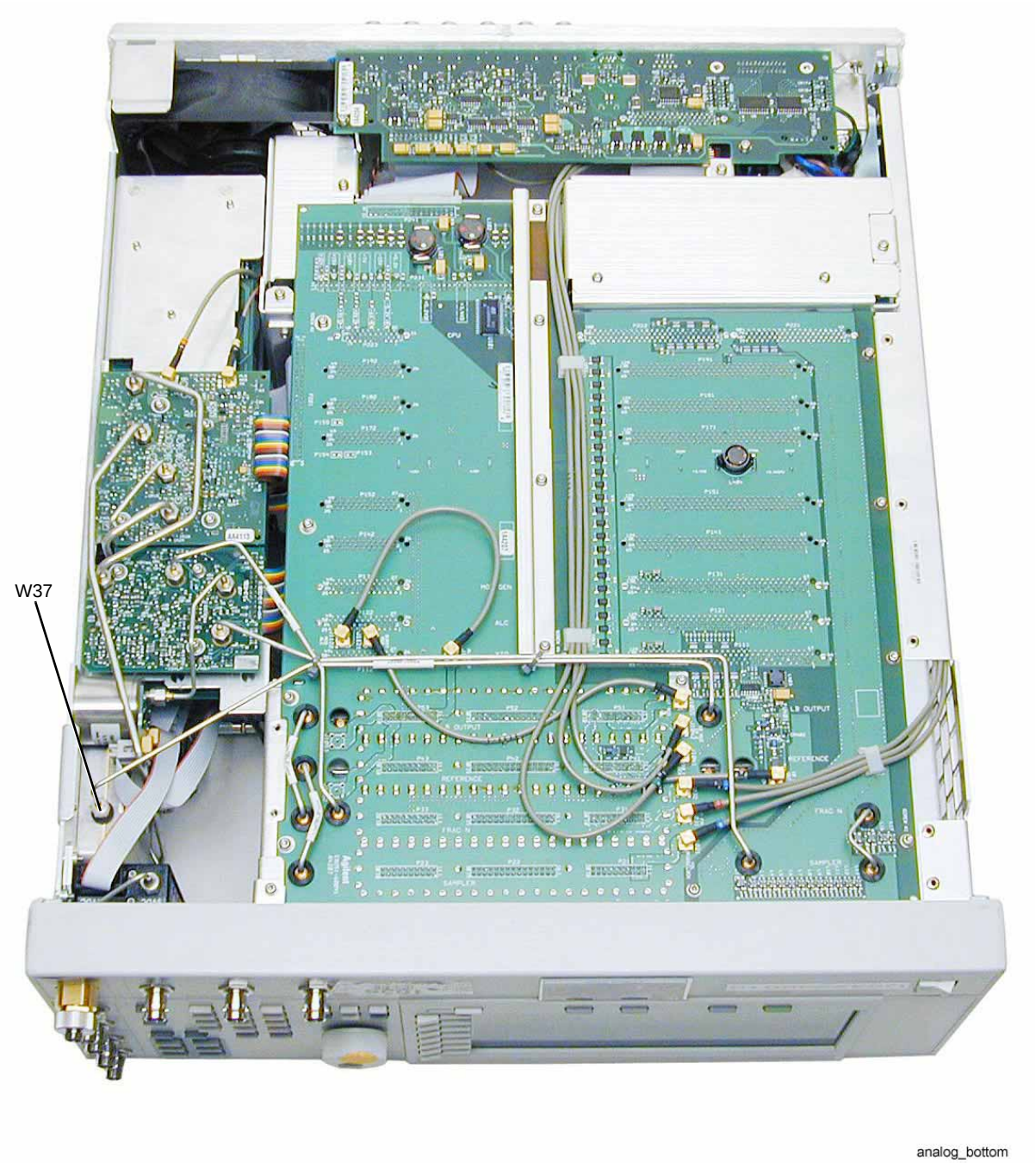
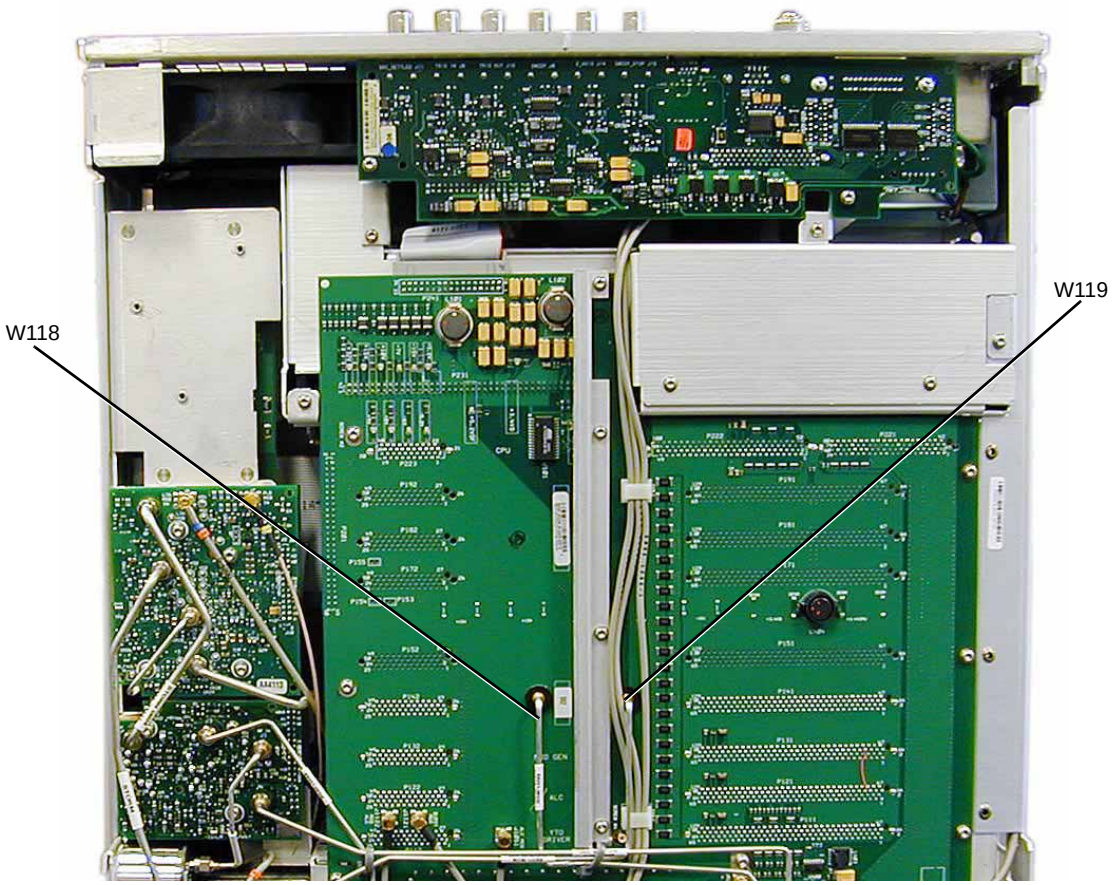


Figure 4 Placement of W118 and W119



Install Option 1EH (For Instruments with Option UNW)

Refer to Figure 5 for steps 1-3.

Refer to Figure 6 for steps 4-14.

Refer to for Figure 7 steps 15 and 16.

1. Remove A6 thru A8.
2. Using needle-nose pliers remove the cable retainer base for W120 (E8251-20342).
3. With the A31 Motherboard facing you, using the 5/16” open-ended wrench, remove the other end of semi-rigid cable W120.
4. Position the instrument on it’s side.
5. Place a cable retainer base on W118 (E8251-20332).
6. Insert W118 through the A31 Motherboard, at the A38 Lowband Switch Filter (IN) opening.
7. Using the needle-nose pliers, connect a cable retainer top to W118.
8. Place a cable retainer base on the other end of W118.
9. Insert W118 through the A31 Motherboard, at the A8 LB Output (OUT) opening.

Add Option 1EH (Improved Low Band Harmonics from 10 MHz to 3.2 GHz) Kit Part Number: E8251-60382

10. Using the needle-nose pliers, connect a cable retainer top to W118.

11. Place a cable retainer base on W76 (E8251-20334).

12. Insert W76 through the A31 Motherboard, at the A38 Lowband Switch Filter (OUT) opening.

13. Using the needle-nose pliers, connect a cable retainer top to W76.

14. Using the 5/16” open-ended wrench, connect the other end of W76 to the A12 Pulse Modulator.

15. Position the instrument with the RF deck on top and the front panel facing you.

16. Install the A38 Lowband Switch Filter (Option 1EH) assembly.

Figure 5 Placement of W120

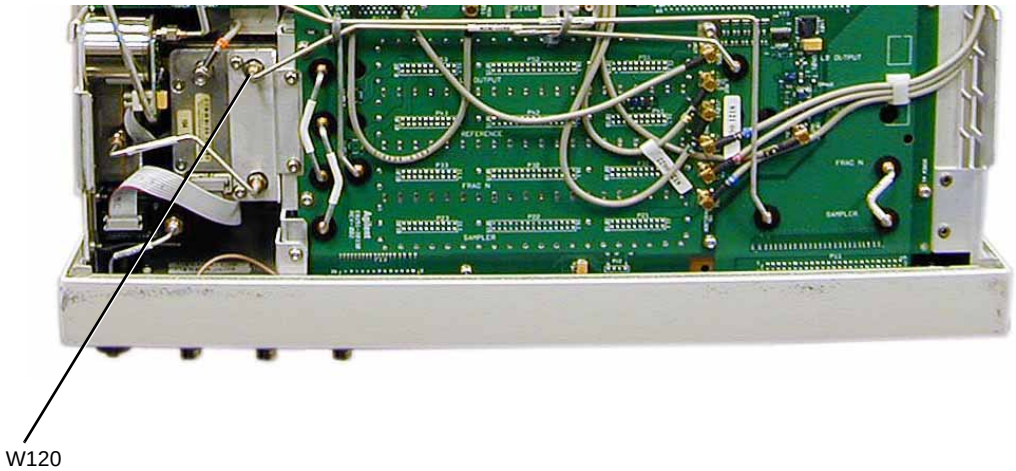
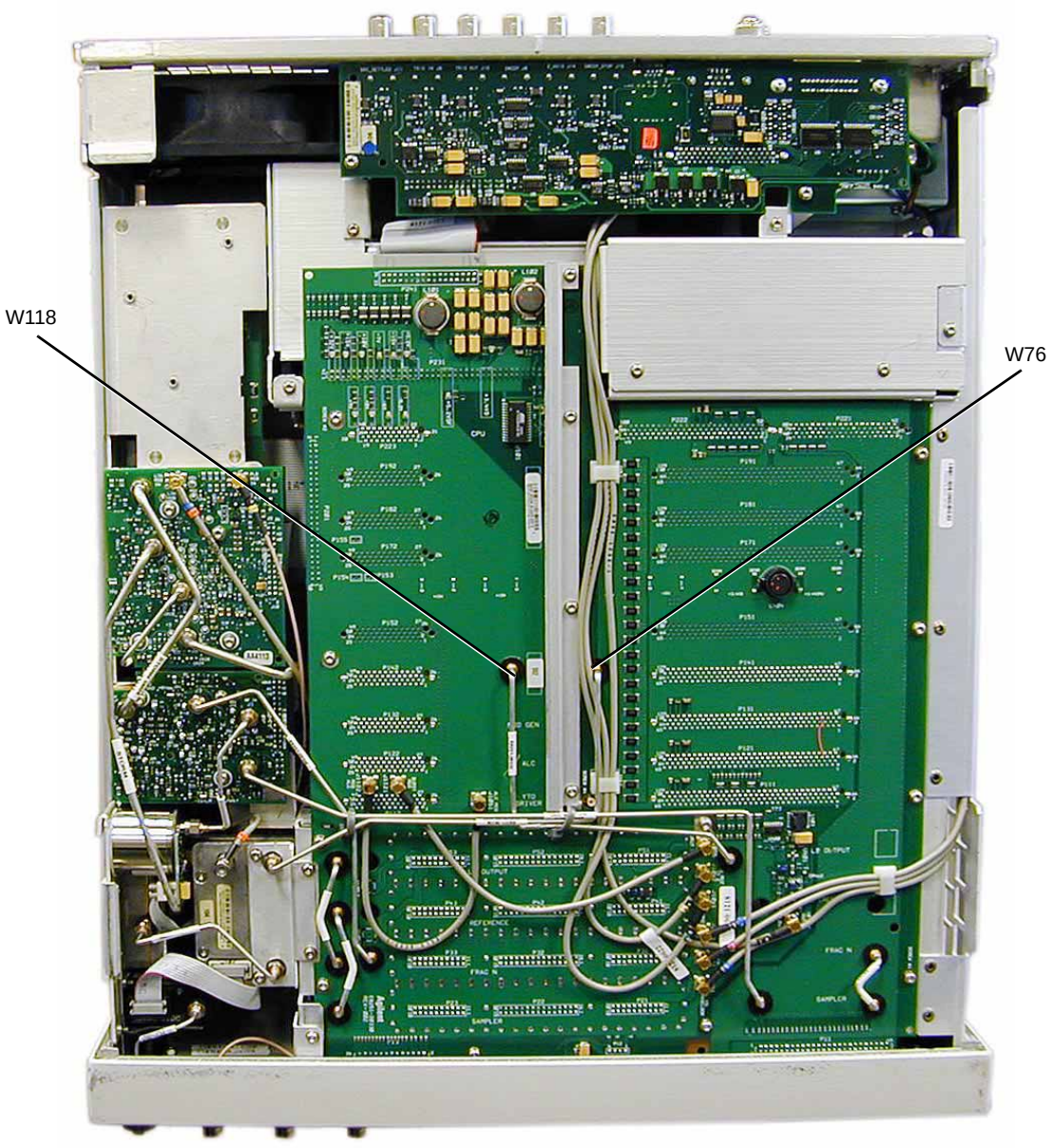
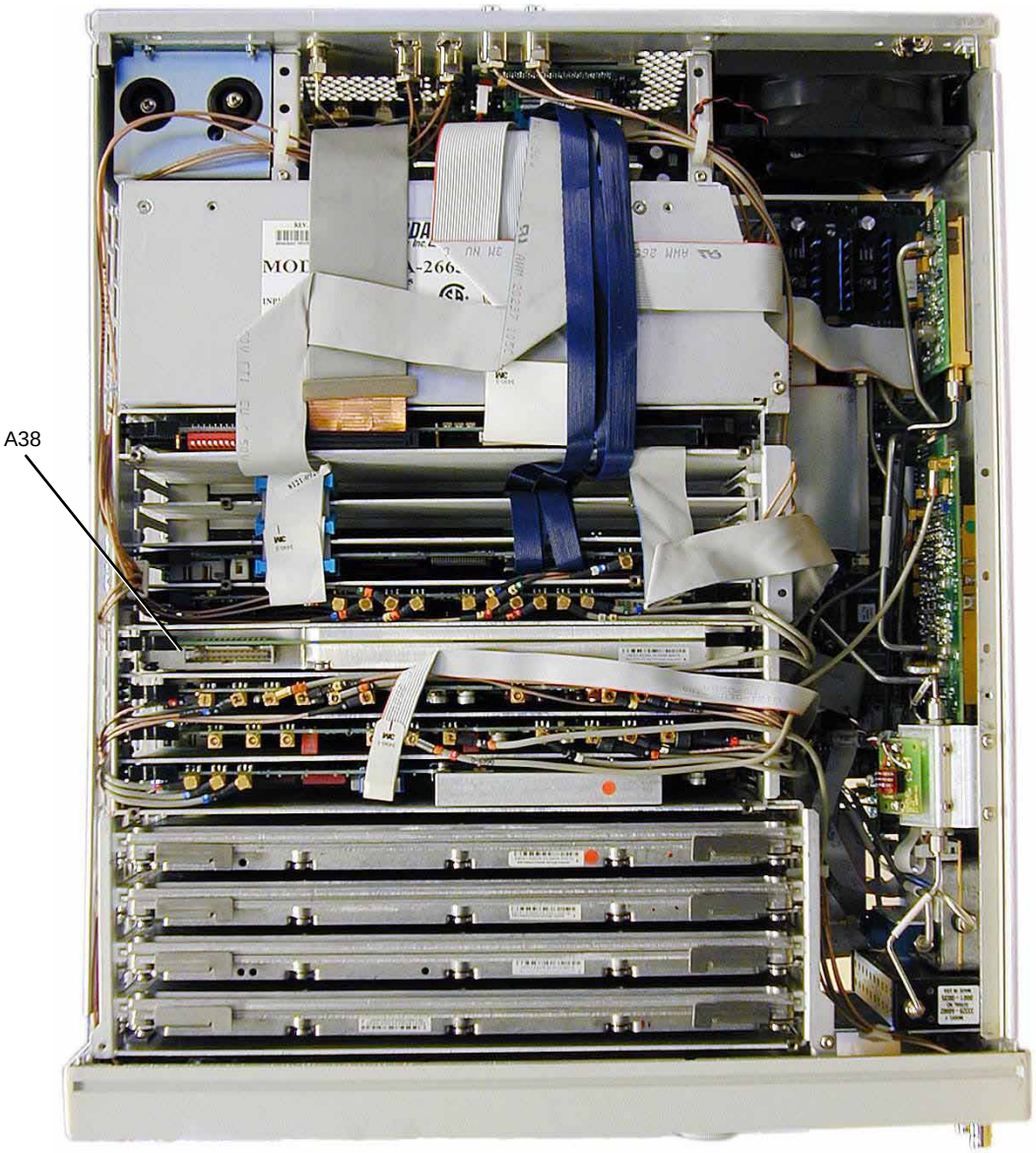


Figure 6 Placement of W76 and W118



Add Option 1EH (Improved Low Band Harmonics from 10 MHz to 3.2 GHz) Kit Part Number: E8251-60382

Figure 7 A38 Lowband Switch Filter (Option 1EH)



Activate Option 1EH

1. Follow the instructions on the Entitlement Certificate.

NOTE If Error 517 occurs, the instrument files need to be updated. See "Error: 517, Calibration Failure".

Error: 517, Calibration Failure

If error message 517, Calibration Failure appears on the instrument screen, the following two checks and possible updates need to be performed:

— Check the firmware version and update if <C.04.71.

— Update the arrays.

Check Firmware Version and Update if <C.04.71

1. Press **Utility** > **Instrument Info/Help Mode** > **Diagnostic Info.**
2. If the firmware is <C.04.71, upgrade the firmware.

Update the Arrays

1. Connect the instrument to the LAN and write down the IP address.
2. Load the IP address into the instrument, by pressing: **Utility** > **GPIB/RS-232/LAN** > **LAN Setup** > **IP Address**.
3. Open a web browser on your PC.
4. Enter the following URL, replacing <ip-address> with the actual IP address of your instrument, http://<ip-address>/update.
5. Type in or, if using the web to view this installation note, copy the script from below and paste it into the text area on the update page.

```
cs "FREQ LB SWITCHED FILTER FREQ", 18
cd "FREQ LB SWITCHED FILTER FREQ", 0, 9.999999999e06
cd "FREQ LB SWITCHED FILTER FREQ", 1, 1.40e07
cd "FREQ LB SWITCHED FILTER FREQ", 2, 1.90e07
cd "FREQ LB SWITCHED FILTER FREQ", 3, 2.70e07
cd "FREQ LB SWITCHED FILTER FREQ", 4, 3.80e07
cd "FREQ LB SWITCHED FILTER FREQ", 5, 5.30e07
cd "FREQ LB SWITCHED FILTER FREQ", 6, 7.50e07
cd "FREQ LB SWITCHED FILTER FREQ", 7, 1.050e08
cd "FREQ LB SWITCHED FILTER FREQ", 8, 1.460e08
cd "FREQ LB SWITCHED FILTER FREQ", 9, 2.050e08
cd "FREQ LB SWITCHED FILTER FREQ", 10, 2.50e08
cd "FREQ LB SWITCHED FILTER FREQ", 11, 3.960e08
cd "FREQ LB SWITCHED FILTER FREQ", 12, 5.0e08
cd "FREQ LB SWITCHED FILTER FREQ", 13, 6.280e08
cd "FREQ LB SWITCHED FILTER FREQ", 14, 1.0e09
cd "FREQ LB SWITCHED FILTER FREQ", 15, 1.50e09
cd "FREQ LB SWITCHED FILTER FREQ", 16, 2.0e09
cd "FREQ LB SWITCHED FILTER FREQ", 17, 1.0e11
cc "FREQ LB SWITCHED FILTER FREQ"
cs "FREQ LB SWITCHED FILTER PATH", 18
cd "FREQ LB SWITCHED FILTER PATH", 0, 0.00
cd "FREQ LB SWITCHED FILTER PATH", 1, 4.587520e05
cd "FREQ LB SWITCHED FILTER PATH", 2, 5.242880e05
```

```
cd "FREQ LB SWITCHED FILTER PATH", 3, 5.898240e05
cd "FREQ LB SWITCHED FILTER PATH", 4, 6.55360e5
cd "FREQ LB SWITCHED FILTER PATH", 5, 7.208960e05
cd "FREQ LB SWITCHED FILTER PATH", 6, 7.864320e05
cd "FREQ LB SWITCHED FILTER PATH", 7, 8.519680e05
cd "FREQ LB SWITCHED FILTER PATH", 8, 9.175040e05
cd "FREQ LB SWITCHED FILTER PATH", 9, 9.83040e05
cd "FREQ LB SWITCHED FILTER PATH", 10, 1.0485760e06
cd "FREQ LB SWITCHED FILTER PATH", 11, 6.55360e04
cd "FREQ LB SWITCHED FILTER PATH", 12, 1.310720e05
cd "FREQ LB SWITCHED FILTER PATH", 13, 1.966080e05
cd "FREQ LB SWITCHED FILTER PATH", 14, 2.621440e05
cd "FREQ LB SWITCHED FILTER PATH", 15, 3.27680e05
cd "FREQ LB SWITCHED FILTER PATH", 16, 3.932160e05
cd "FREQ LB SWITCHED FILTER PATH", 17, 0.00
cc "FREQ LB SWITCHED FILTER PATH"
cs "FREQ SWEEP LB SWITCHED FILTER FREQ", 9
cd "FREQ SWEEP LB SWITCHED FILTER FREQ", 0, 2.50e08
cd "FREQ SWEEP LB SWITCHED FILTER FREQ", 1, 3.960e08
cd "FREQ SWEEP LB SWITCHED FILTER FREQ", 2, 5.0e08
cd "FREQ SWEEP LB SWITCHED FILTER FREQ", 3, 6.280e08
cd "FREQ SWEEP LB SWITCHED FILTER FREQ", 4, 1.0e09
cd "FREQ SWEEP LB SWITCHED FILTER FREQ", 5, 1.50e09
cd "FREQ SWEEP LB SWITCHED FILTER FREQ", 6, 2.0e09
cd "FREQ SWEEP LB SWITCHED FILTER FREQ", 7, 1.0e11
cd "FREQ SWEEP LB SWITCHED FILTER FREQ", 8, 0.00
cc "FREQ SWEEP LB SWITCHED FILTER FREQ"
cs "FREQ SWEEP LB SWITCHED FILTER PATH", 9
cd "FREQ SWEEP LB SWITCHED FILTER PATH", 0, 0.00
cd "FREQ SWEEP LB SWITCHED FILTER PATH", 1, 6.55360e04
cd "FREQ SWEEP LB SWITCHED FILTER PATH", 2, 1.310720e05
cd "FREQ SWEEP LB SWITCHED FILTER PATH", 3, 1.996080e05
cd "FREQ SWEEP LB SWITCHED FILTER PATH", 4, 2.621440e05
cd "FREQ SWEEP LB SWITCHED FILTER PATH", 5, 3.27680e05
cd "FREQ SWEEP LB SWITCHED FILTER PATH", 6, 3.932160e05
cd "FREQ SWEEP LB SWITCHED FILTER PATH", 7, 0.00
cd "FREQ SWEEP LB SWITCHED FILTER PATH", 8, 0.00
cc "FREQ SWEEP LB SWITCHED FILTER PATH"
cs "LB SWITCHED FILTER OFFS", 800
cc "LB SWITCHED FILTER OFFS"
cs "LB SWITCHED FILTER OFFS SEGMENT", 50
cc "LB SWITCHED FILTER OFFS SEGMENT"
ky 43749
```

6. Press Execute, to update the arrays.

7. Cycle the instrument power.

Verify Proper Installation of Option 1EH

1. Press: **Utility** > **Instrument Info** > **Help Info** > **Options Info**.
2. Make sure Option 1EH is listed.

NOTE If you enable an option that does not have the required hardware installed, the menus for that option will be activated but the option **cannot** operate.

Re-Assemble the Signal Generator

Refer to Figure 1 and Figure 2.

1. Reinstall the inner and outer instrument covers by reversing the order for removal.
2. Torque all T-10 screws to 9 in-lbs.
3. Torque all T-15 and T-20 screws to 21 in-lbs.

Verify Signal Generator Calibration

1. Turn the signal generator on and allow it to warm up for 30 minutes.
2. Perform the following adjustment and performance tests to verify signal generator calibration. Refer to the PSG Family Signal Generators Service Software.
   - YIG-Driver Pre-Tune Calibration
   - ALC Dynamic Calibration
   - Upconverter Gain Adjustment Calibration (E8267D models only)
   - Lowband Filter Offset Calibration
   - Self Tests
   - Maximum Leveled Output Power
   - Harmonic Spurious
   - Sub-Harmonic Spurious
   - Non-Harmonic Spurious

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