

Installation Note

Agilent Technologies PSA Series Spectrum Analyzers Option AYZ External Mixing Retrofit Kit



Agilent Technologies

**Part Number E4440-90304 Supersedes: E4440-90142
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E4440-90304

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Option AYZ Hardware Retrofit Kit

Products Affected:	PSA E4440A PSA E4446A PSA E4447A PSA E4448A
Serial Numbers:	US00000000/US99999999 MY00000000/MY99999999
To Be Performed By:	(X) Agilent Service Center (X) Personnel Qualified by Agilent () Customer
Estimated Installation Time:	2 Hours
Estimated Adjustment and Verification Time:	1.5 Hours (see note below)

Introduction

The Option AYZ retrofit kit contains the parts and instructions necessary to install external mixing capability into the Agilent E4440A, E4446A, E4447A, or E4448A spectrum analyzer. The Option AYZ kit is licensed by redeeming the license redemption certificate, and will only function on one instrument model number/serial number combination.

The firmware must be Revision A.05.00 or greater. It is recommended that the latest firmware be loaded. See ["Tools Required"](#) below.

NOTE	The installation of this kit requires that some re-adjustment and performance testing be performed in order to assure the new option is functioning properly. This installation note includes a list of required adjustments and performance tests. Completing the list of required performance tests does not guarantee the instrument meets all specifications.
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Contents

Quantity	Description	Agilent Part Number
1	Option Upgrade Entitlement Certificate	---
1	Installation Note	this note
1	Documentation CD	---
1	W44, Cable flex coax, IF IN to 3 rd Converter	E4440-60384
1	W45, Cable semi-rigid, LO OUT from front panel to W46	E4440-20095
1	W46, Cable semi-rigid, LO OUT extension cable from A21 SLODA LO OUT to W45 (For use only on E4440A)	E4440-20087
1	W46, Cable semi-rigid, LO OUT extension cable from A21 FELOMA LO OUT to W45 (For use only on E4446A or E4448A)	E4446-20035
2	SMA adapters	1250-1666

Tools Required

- ☐ T-20 Torx driver
- ☐ T-10 Torx driver
- ☐ Flat blade screwdriver
- ☐ 5/16-inch open-end wrench
- ☐ 1/4-inch open-end wrench
- ☐ Firmware later than A.05.00 required. Download from http://www.agilent.com/find/psa_firmware or order the Firmware Update Kit, E444xAU Option UE2.
- ☐ Calibration software. Latest software information and downloads available at <http://www.agilent.com/find/calibrationsoftware>
- ☐ Test equipment supported by the calibration software.

Installation Procedure

Perform the following procedures in order:

1. Remove the instrument outer case.
2. Remove the instrument top brace.
3. Remove the front frame.
4. Install the Option AYZ retrofit kit.
5. Install the front frame, instrument top brace, and outer case.
6. Install the option designator key.
7. Perform the performance tests.

For assistance at any time during this procedure, get in touch with your nearest Agilent Technologies Sales and Service Office. To find your local Agilent office access the following URL:

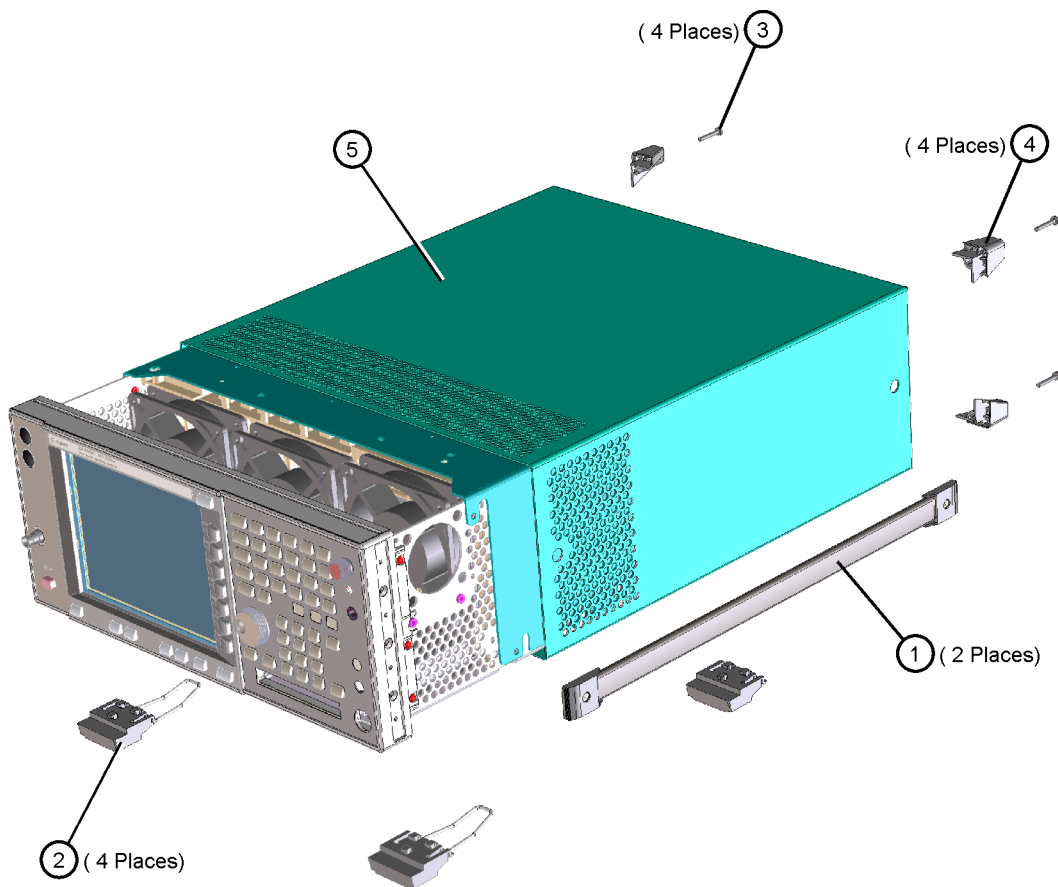
<http://www.agilent.com/find/assist>

Remove the Outer Case

CAUTION	If the instrument is placed on its face during any of the following procedures, be sure to use a soft surface or soft cloth to avoid damage to the front panel, keys, or input connector.
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1. Disconnect the instrument from ac power.
2. Refer to [Figure 1](#). Remove the two handles on the sides of the instrument as shown. Use the T-20 driver to loosen the screws that attach each handle (1). Remove the handles.
3. Remove the four bottom feet (2). Lift up on the tabs on the feet, and slide the feet in the direction indicated by the arrows.
4. Remove the four screws (3) that hold the rear feet (4) in place.
5. Pull the instrument cover (5) off toward the rear of the instrument.

Figure 1 Instrument Outer Case Removal

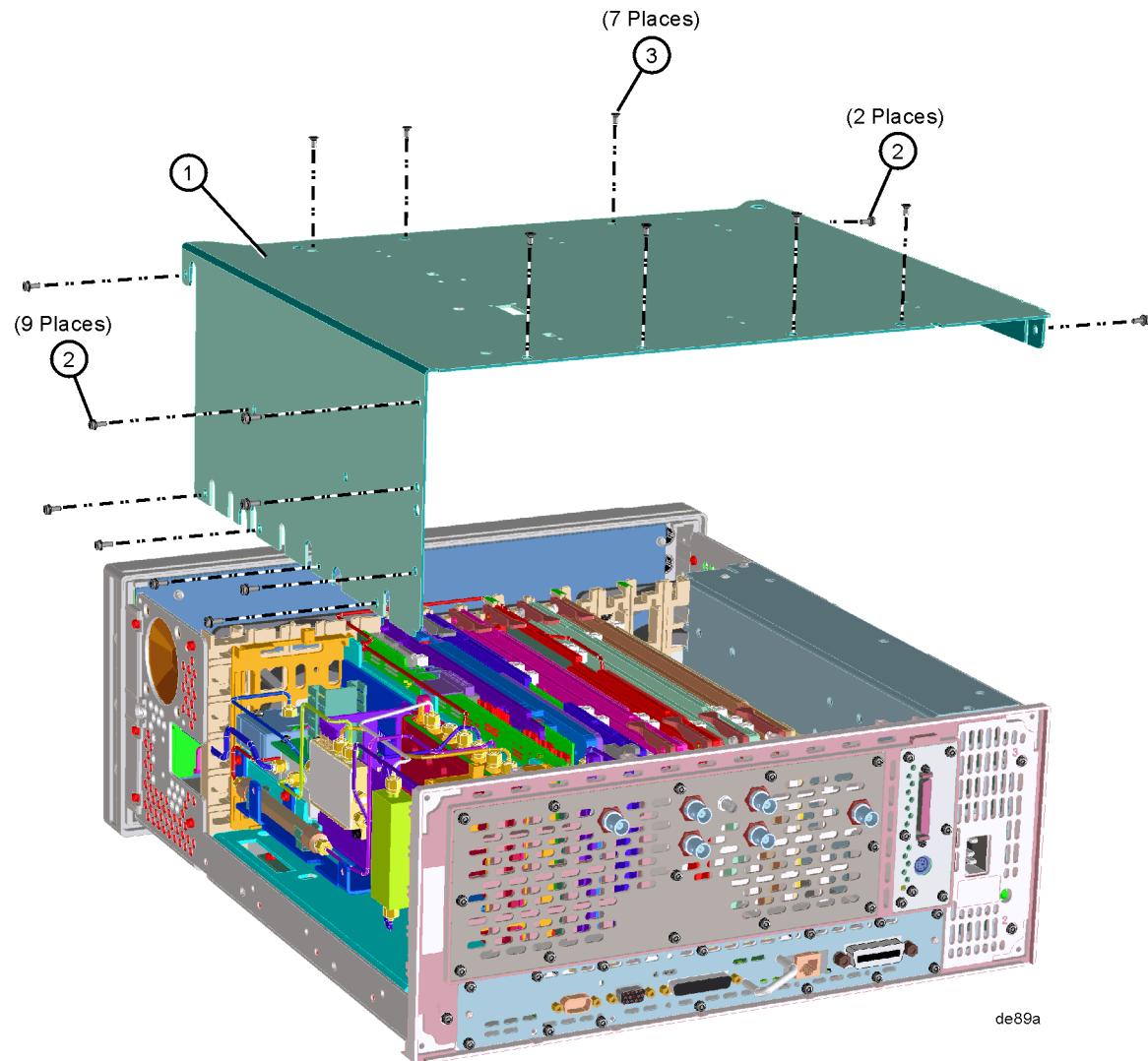


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Remove the Top Brace

6. Refer to [Figure 2](#). Use the T-10 driver to remove the top screws (3) (one screw is under the security label), and the side screws (2) attaching the top brace (1) to the deck.
7. Remove the top brace from the deck.

Figure 2 **Top Brace Removal**



Determine if the Front Dress Panel Requires Removal

NOTE

Only early instruments require removing the dress panel because the holes for the IF INPUT and 1st LO OUT connectors are too small to allow the SMA connectors to be installed from the front. However, later instruments have larger holes and do not require removal of the dress panel. Remove one of the hole plugs covering either the 1st LO OUT and IF INPUT holes and hold one of the SMA connectors from the kit up to the hole to determine if the adapter will easily slide in from the front without hitting the silk-screened dress panel label.

If the connector slides in easily, skip to the section [“Remove the Front Frame” on page 10](#). If the connector does not slide in easily, continue with the following steps.

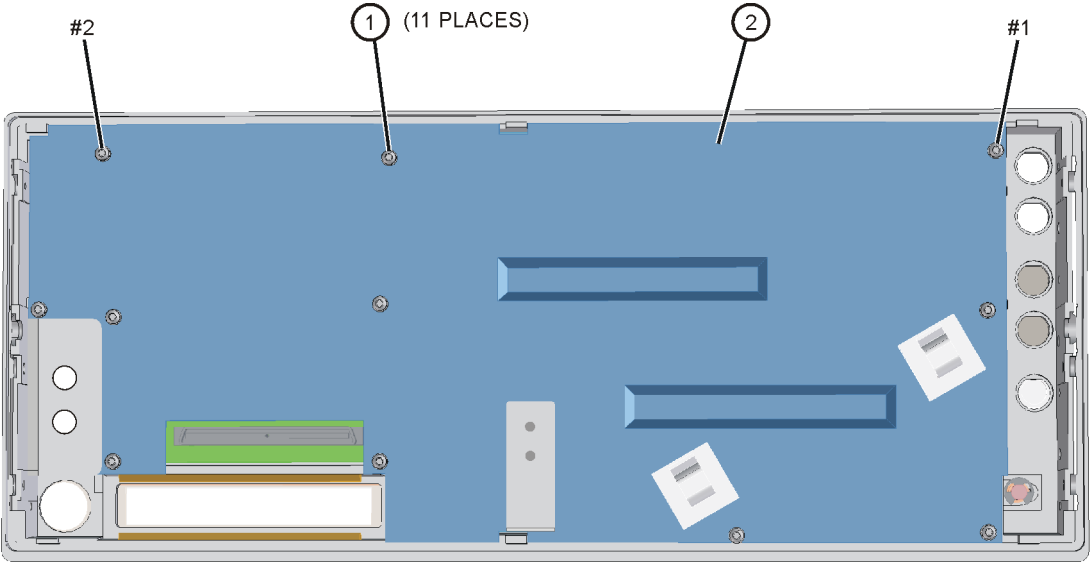
8. Remove the RPG knob and volume knob by placing one or two flat blade screwdrivers under the knob and pulling straight off of the control shafts. Avoid scratching the dress panel.
9. Remove the two hole plugs covering the 1st LO OUT and IF INPUT holes.
10. Refer to [Figure 5](#). Using the T-10 driver, remove the 7 screws (1) that attach the front frame assembly (2) to the deck (5).
11. Pull the front frame off of the deck until it is disengaged from the disc drive.
12. Unclip the coaxial cable (4) (Ext Trigger Input cable) from the two front frame cable clips.
13. Disconnect the ribbon cable (3) from the A2 front panel interface board.
14. At this point, the front frame can be placed flat on the bench.
15. Refer to [Figure 3](#). Using the T-10 driver, remove the 11 screws (1) securing the front shield (2) to the front frame. Lift the shield from the front frame.

WARNING

With the shield removed, the flat panel display can fall out of the front frame. Be careful when turning the front frame assembly over to avoid damage.

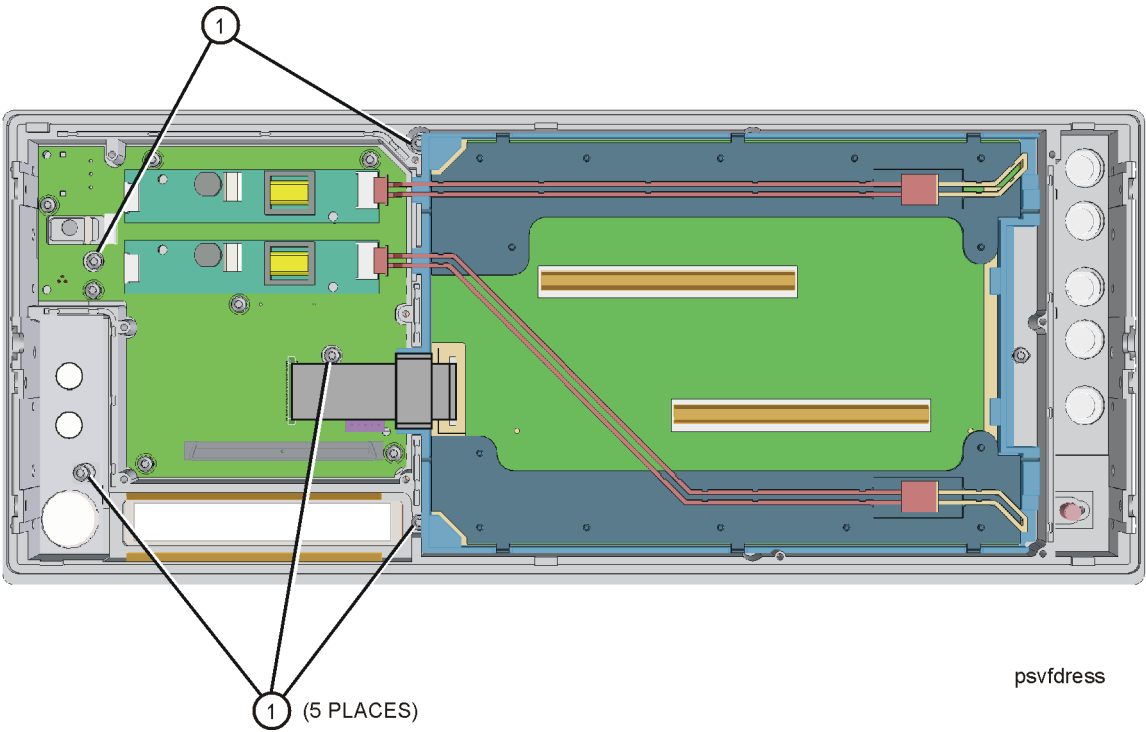
16. Refer to [Figure 4](#). To remove the dress panel, the front panel interface board does not need to be removed. Locate and remove the 5 screws (1). Carefully remove the dress panel being careful to avoid damaging the keyboard.
17. Skip to the section [“Install the Option AYZ Retrofit Kit” on page 11](#).

Figure 3 Front Frame Shield



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Figure 4 Dress Panel Removal

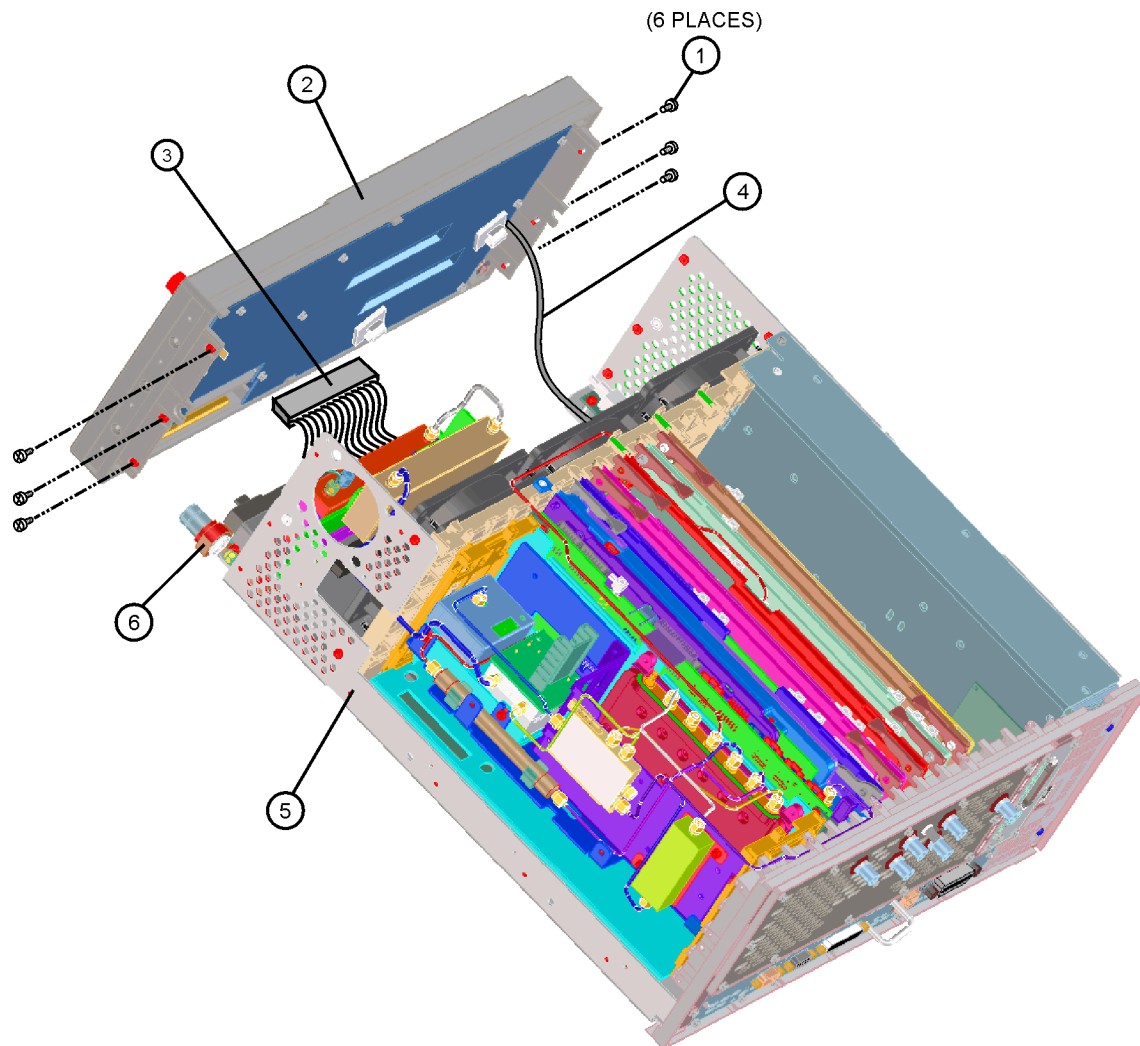


psvfdress

Remove the Front Frame

18. Remove the two hole plugs covering the 1st LO OUT and IF INPUT holes.
19. Refer to [Figure 5](#). Using the T-10 driver, remove the 7 screws (1) that attach the front frame assembly (2) to the deck (5).
20. Pull the front frame off of the deck until it is disengaged from the disc drive.
21. Unclip the coaxial cable (4) (Ext Trigger Input cable) from the two front frame cable clips.
22. Disconnect the ribbon cable (3) from the A2 front panel interface board.
23. At this point, the front frame can be placed flat on the bench.

Figure 5 **Front Frame Removal**



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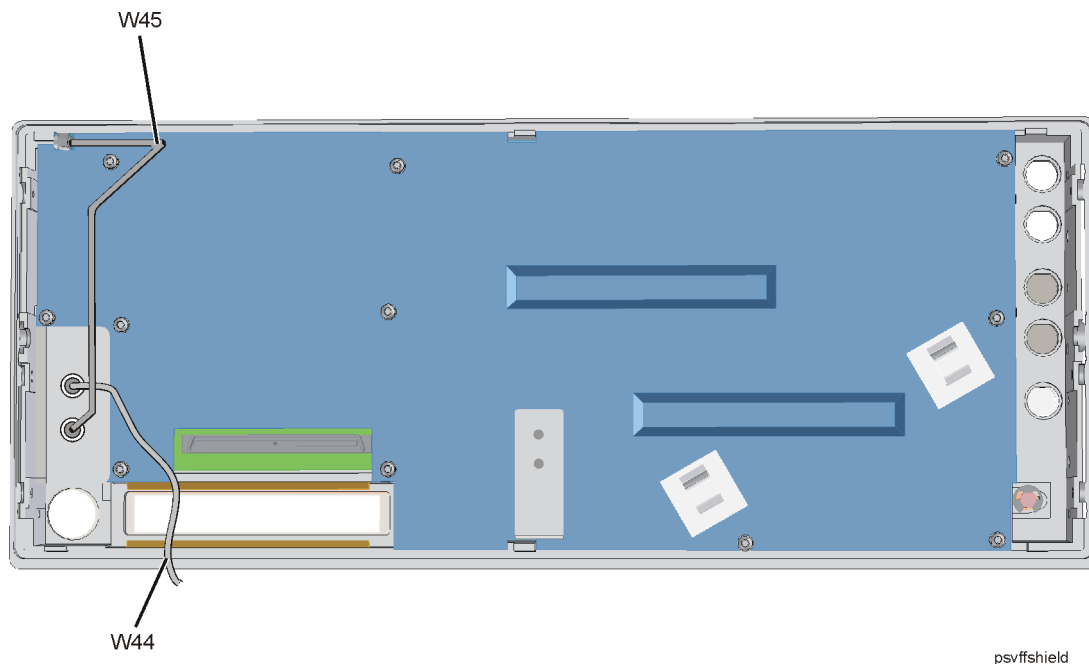
Install the Option AYZ Retrofit Kit

24. Install the SMA connectors included in this kit. The connectors are inserted through the front frame with the longer portion of the SMA connector pointing inside the instrument. The built-in nut on the connector must engage the flat sections on the front frame so the connector can be secured from the inside of the frame without spinning. Secure the connector with the washer and nut provided in the package. A 1/4 inch deep socket is required. Torque to 21 inch-pounds.
25. If you did not have to remove the dress panel, skip to [step 26](#). Otherwise, reinstall the dress panel now, and secure with the 5 screws removed earlier. Torque the screws to 9 inch-pounds.

Reinstall the front frame shield. Refer to [Figure 3](#). Tighten the first two screws in the holes marked 1 and 2. Torque screws to 9 inch-pounds.

Reinstall the RPG and volume knobs.
26. Install the semi-rigid cable W45, (1st LO OUT, E4440-20095) onto the SMA connector next to the RF input connector hole. See [Figure 6](#) for proper orientation of the cable. Torque to 10 inch-pounds.

Figure 6 W45 Cable Orientation



27. Install the flexible SMA cable W44 (included in the kit) onto the other SMA connector. Torque to 10 inch-pounds.
28. Plug in the front panel ribbon cable and assure the green flexible coax cable (**Ext Trigger Input** cable) is inserted into the cable clips.
29. Position the front frame on the deck using the alignment bosses on the deck. Avoid pinching the flexible coax cables. The green coax cable must be placed between the

Installation Procedure

fan housings to prevent the cable from catching on the fan blades. Remember to tuck the ribbon cable up under the attenuator when pushing the frame onto the deck. This will insure proper airflow to cool the instrument. The W45, 1st LO OUT cable should be resting on top of the fan when the front frame is installed.

30. Using the T-10 driver, replace the 7 screws that secure the front frame to the deck. Torque to 9 inch pounds.

31. Locate the A21 LO distribution amplifier in the RF section of the instrument.

[Figure 7](#) shows the A21 SLODA in the E4440A. [Figure 8](#) shows the A21 FELOMA in the E4446A and E4448A. You will need to remove the SMA load from the LO Out port. Place this load on the LO OUT connector that you just installed on the front panel.

Figure 7 **A21 SLODA Location (E4440A)**

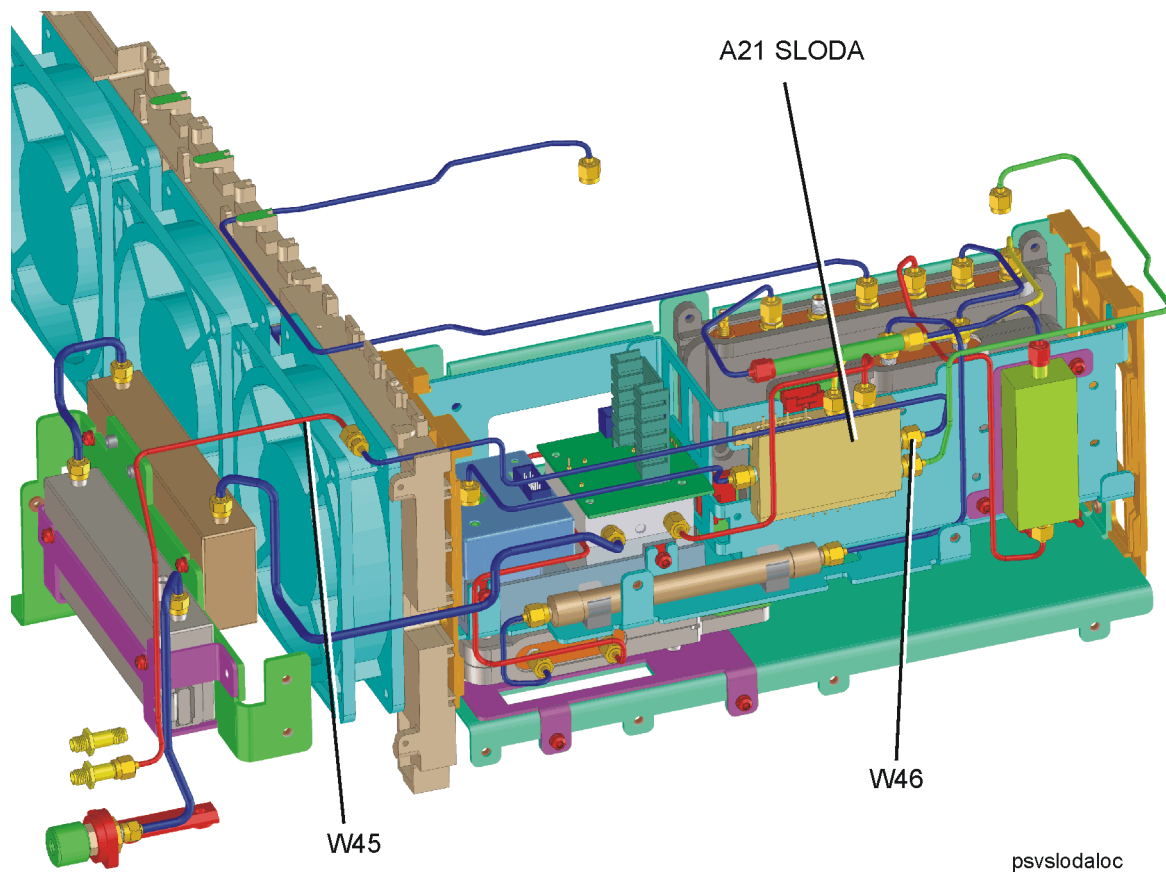
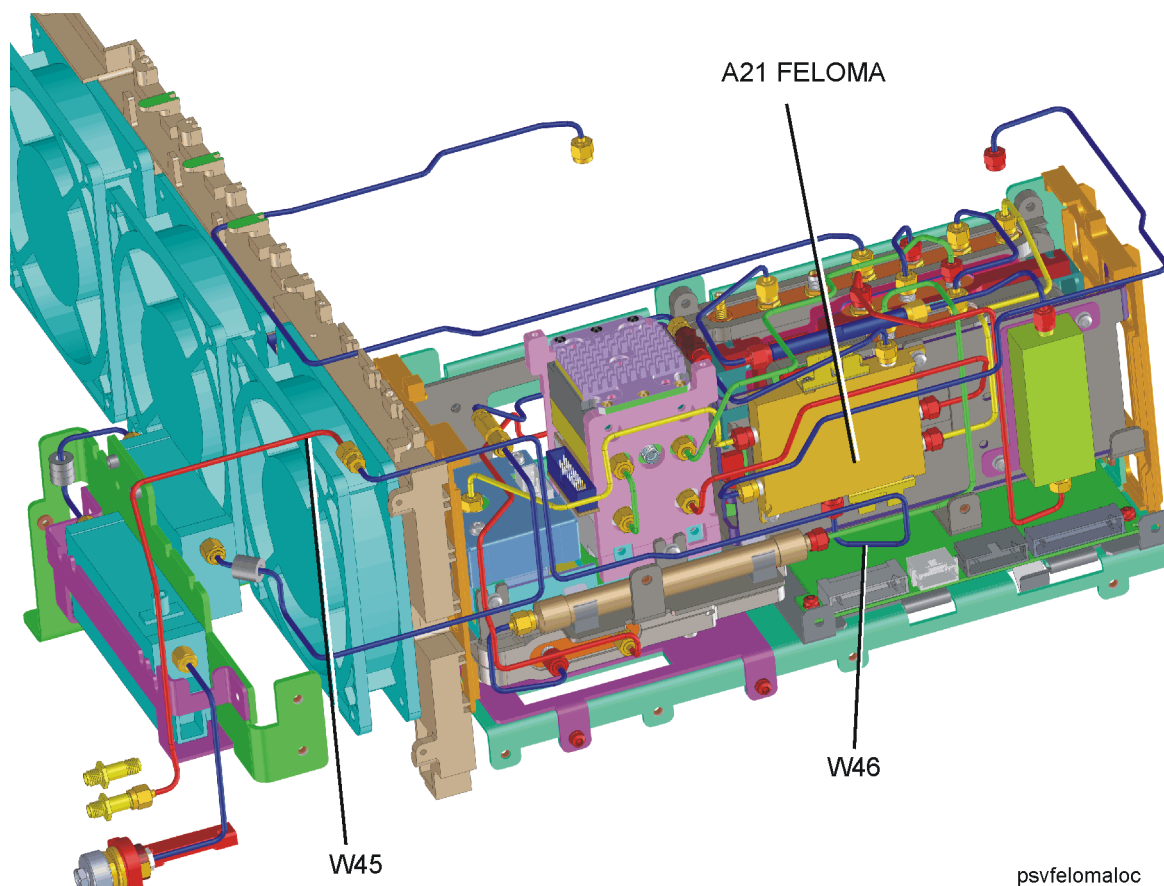


Figure 8 A21 FELOMA Location (E4446A and E4448A)



32. Locate the correct W46 semi-rigid cable from the kit. The kit contains two cables; the E4440-20087 is required for the E4440A. The E4446-20036 is required for the E4446A and E4448A analyzers. Dispose of the unused cable.
33. Connect W46 from the LO Out port of the LO distribution amplifier to W45. W45 is the semi-rigid cable you just installed on the front panel. Route all ribbon cables under W46. The W45 to W46 connection requires a 1/4 inch open-end wrench to hold W46 while W45 is tightened with a 5/16 inch wrench.
34. A cable tie, not included in this kit, should be used to lightly secure the W46 cable to the fan mounting hole near the cable connection. This will also provide proper routing for the IF Input cable that will be attached in the next step.
35. Route the IF Input flexible coax cable behind the W45/W46 connection, along the top of the fans, under the coax cable, and connect to J3 (9) on the A10 3rd Converter assembly.

Replace the Top Brace and Outer Case

36. Refer to [Figure 2](#). Carefully position the top brace on the deck. The alignment pin at the center of the web/fan assembly must mate with the alignment hole on the top brace. Make sure that no coaxial cables will get pinched underneath the brace.
37. Use the T-10 driver to replace and tighten the top screws first; then replace the side screws. Torque to 101 Ncm (9 in-lb).
38. Refer to [Figure 1](#). Slide the instrument cover back onto the deck from the rear. The seam on the cover should be on the bottom. Be sure the cover seats into the gasket groove in the front frame.
39. Replace the four rear feet onto the rear of the instrument. Torque to 236 Ncm (21 in-lb).
40. Use the T-20 driver to replace the handles. Torque to 236 Ncm (21 in-lb).
41. Replace the four bottom feet by pressing them into the holes in the case and sliding them in the opposite direction of the arrows until they click into place. Note that the feet at the front have the tilt stands.

Turn the Instrument On

Plug in the instrument and apply power. Continue with the next procedure to install the option designator and license keyword for this option.

Obtaining a License Key and Activating the Option

The entitlement certificate supplied in this kit allows you to obtain a license key from our Agilent website so you can enable this upgrade option. Once you have retrieved the license key, you can begin the process of activating the option.

NOTE	Option designator AYZ and the license keyword must be entered into instrument memory before the instrument will recognize the option.
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1. On the instrument front panel press: **System, More**, until the **Licensing** softkey is visible. Press **Licensing** and **Option**. This will activate the alpha editor menu. Use the front panel alpha editor to enter the upper-case option designator AYZ. Press the **Enter** key.
Note that **AYZ** now appears on the **Option** key.
2. Press **License Key**. The license key number is a hexadecimal number that will require the entry of both letters and numbers. Use the alpha editor to enter the letters and the front panel numeric keypad to enter the numbers. Your entry will appear in the active function area of the display. If you make a typing error, use the backspace key to correct the error. Check the license key number you entered. Press **Enter, Activate License**.
3. Cycle instrument power and allow the instrument to perform the auto align routine.

Install the Option Firmware

Firmware revision A.05.00 or greater must be loaded before the option will function. It is recommended that the latest instrument firmware be loaded. For the latest update information and to download firmware, go to:

http://www.agilent.com/find/psa_firmware

The firmware update program available from the web includes step by step instructions to guide you through the installation. The installation program will sense the presence of the Option AYZ license and enable external mixing. Unlike some of the other instrument options, there is no check box for Option AYZ in the firmware update program.

Once the firmware update process is complete, press **System, More, Show System** and verify AYZ appears in the option field.

Adjustments and Performance Tests Required

Adjustments Required

The adjustments listed below are required following the kit installation.

Perform the adjustments in the order listed.

Performance Testing Required

The performance tests listed below are the minimum set that will verify the hardware retrofit just installed is functioning correctly. Performing only these tests does not guarantee the instrument meets all specifications.

A full calibration is required to assure the instrument meets all specifications.

Adjustments and performance testing requires the use of the calibration software. The latest software information and downloads are available at:

<http://www.agilent.com/find/calibrationsoftware>

Load the calibration software on your PC

Perform the following adjustments and performance tests:

Adjustments
LO Output Amplitude Adjustment
IF Input Adjustment
Preselector Tune Out Accuracy Adjustment
Performance Tests
LO Output Amplitude Test
IF Input Accuracy Test
Preselector Tune Out Accuracy Test

For assistance, contact your nearest Agilent Technologies Sales and Service Office. To find your local Agilent office access the following URL:

<http://www.agilent.com/find/assist>