Keysight Technologies
N9048B PXE EMI Receiver
N9038B MXE EMI Receiver, Multi-Touch

Option EXM, External Mixing Upgrade Kit

KEYSIGHT TECHNOLOGIES

Installation Note

Notices

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Option EXM, External Mixing Upgrade Kit

Products Affected:	N9048B PXE EMI Receiver N9038B MXE EMI Receiver, Multi-Touch
Serial Numbers:	All
To Be Performed By:	(X) Keysight Service Center (X) Personnel Qualified by Keysight ( ) Customer
Estimated Installation Time: Estimated Adjustment Time: Estimated Verification Time:	1.5 Hours 1.0 Hours[a] 4.0 Hours[a]

a.To ensure that these newly installed options are functioning properly, the procedure that follows includes the requirement of performing certain adjustments and performance verification tests. However, the completion of these tests does not guarantee that the instrument meets all advertised specifications.

Software and test equipment is required for making adjustments and for performance verification testing.

Information on how to obtain this software can be found at:
www.keysight.com/find/calibrationsoftware

While Keysight does recommend that a full calibration be performed after the installation of this upgrade, the end user must ultimately determine whether they want this service or not. If a full calibration is required, arrangements regarding the level of calibration must be made between the end user and the calibration provider.

Introduction

This kit includes parts to upgrade a N9048B PXE EMI Receiver or N9038B MXE EMI Receiver, Multi-Touch to add Option EXM, External Mixing. This kit includes parts to upgrade a PXE or MXE regardless of frequency range option installed. As a result, some parts included in this kit will not be needed for upgrading some analyzers.

In addition to installing the hardware to support Option EXM, a license for the following option will also be installed:

– N9048B-EXM, External Mixing

or

– N9038B-EXM, External Mixing

Installation Kit Parts List

Quantity	Description	Keysight Part Number
1	Adapter-Coaxial straight Female-SMA Female-SMA 50 Ohm	1250-1666
1	Washer-Lock Internal-Tooth 1/4-in 0.256-in-ID	2190-0067
1	Nut-HEX-DBL-CHAM 1/4-36-THD .125-in-THK Stainless Steel	2950-0223
1	Cable Assembly, External Mixing, Front Panel	N9020-20166
1	Label, Warning	N9030-80018
1	Cable Assembly, uW	N9020-20132
1	Cable Assembly, mmW	N9020-20167
1	Cable Assembly-Coaxial A12/A32 50-Ohm 350 mm-LG	8121-2027
2	EMI O-ring	8160-1637
16	Screw-Machine W/Patch-Lock 90-DEG-flat-HD Torx-T10 M3X0.5 6mm-LG SST 300 passivated	0515-1946
8	Screws, Machine W/Patch-Lock 90-DEG-Flat-HD Torx-T10 M3X0.5 8mm-LG SST-300 passivated finish	0515-2032
3	Cable Ties	1400-0249
1	Entitlement Certificate	-----
1	Installation Note	N9048-90017

Tools Required

- T-10 TORX Driver
- T-20 TORX Driver
- 5/16-inch torque wrench
- ¼-inch open-end wrench
- Diagonal cutters
- Keysight Calibration and Adjustment Software, N7818A (revision A.10.00 or later)
- Test equipment and computer supported by the X- Series Performance Tests and Adjustment Software
- PXE or MXE Service Guide.
- Microsoft Windows based personal computer with internet access and USB port
- USB storage device with > 2 GB free memory

Initial Instrument Functionality Check

Power on the instrument and allow the instrument to boot up. Run an alignment and display the measurement screen. (The instrument will probably display a spectrum analyzer screen and you will see the instrument sweeping.)

There should be no alignment failures. If there are failures, investigate and fix the problem before continuing.

WARNING Before you disassemble the instrument, turn the power switch to Standby. After the instrument has completely shut down, 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 the documentation that pertains to your instrument for information about static-safe workstations and ordering static-safe accessories.

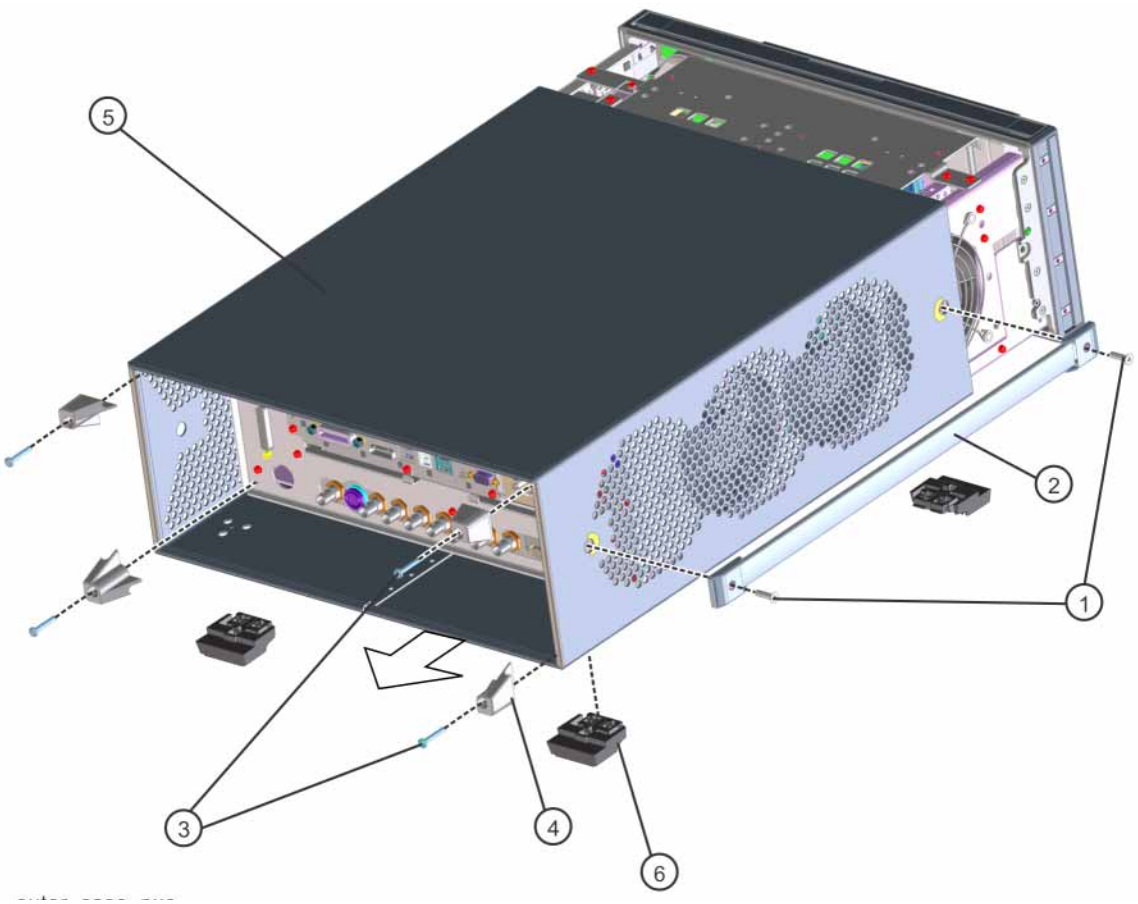
Analyzer Disassembly

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.

NOTE Make sure any adapters on the front panel are removed.

1. Disconnect the instrument from ac power.
2. Refer to Figure 1. Using the T-20 driver, remove the 4 screws (1) (two on each side) that attach the handle strap (2) on each side of the instrument.
3. Remove the four key locks from the instrument four bottom feet.
4. Remove the four instrument bottom feet (6).
5. Using the T-20 driver, remove the four screws (including washers) (3) that hold the rear feet (4) in place.
6. Pull the instrument cover (5) off towards the rear of the instrument.

Figure 1 Instrument Outer Case Removal



Top Brace Removal

Refer to Figure 2. To remove the top brace **(1)**, use the T-10 driver to remove the twelve screws **(3)** (0515-0372) attaching the top brace to the chassis. Remove the wire holddown (as shown in Figure 3). Remove and discard the fourteen screws (or sixteen with Option WF1) **(4)** (0515-1946) attaching the top brace to the boards.

Figure 2 Top Brace Removal

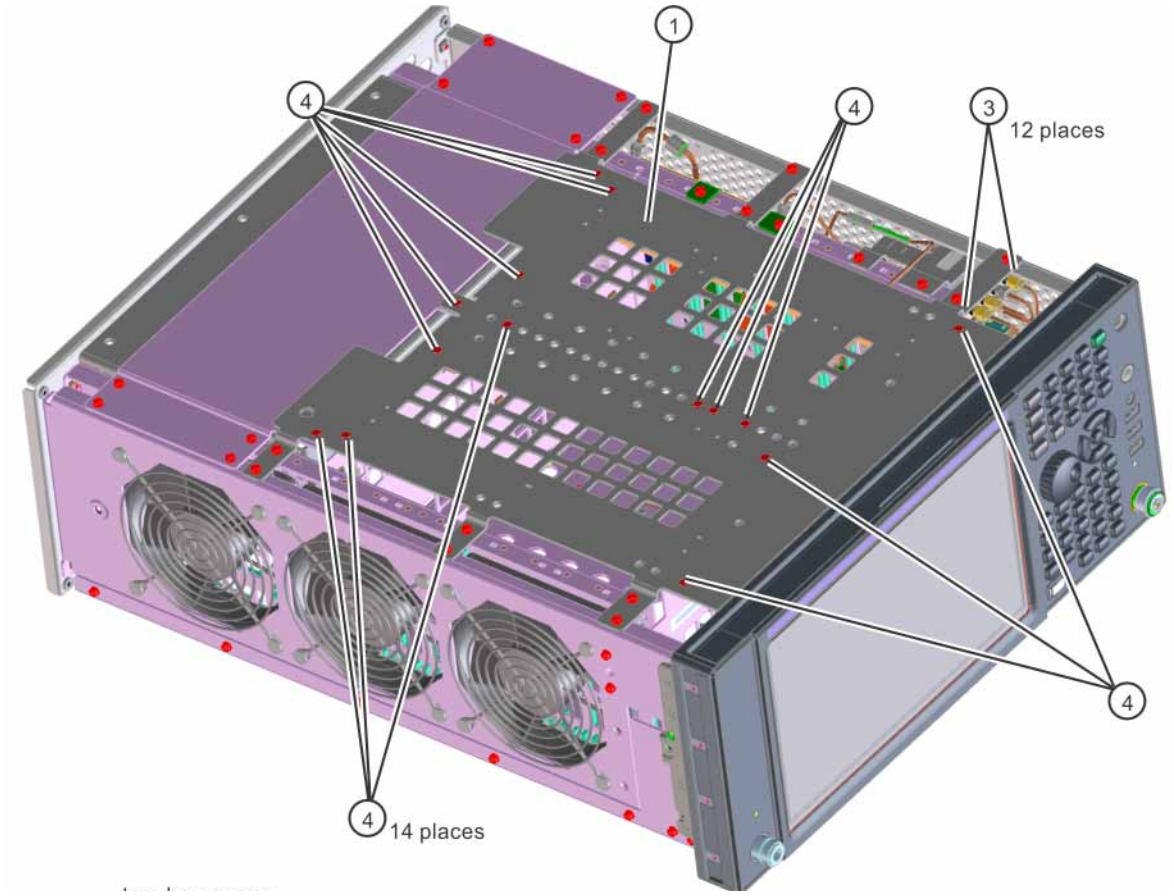


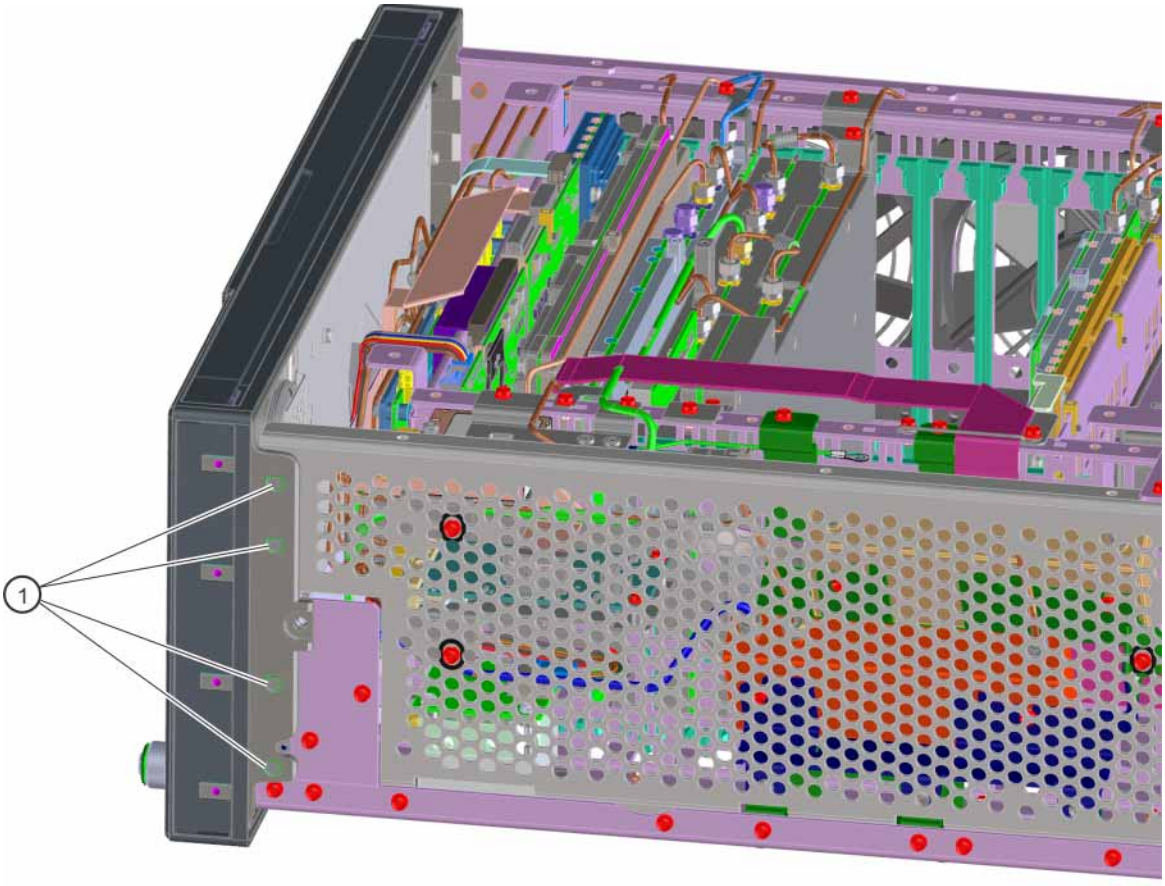
Figure 3 Wire Holddown

Front Frame Assembly Removal

NOTE Make sure any connectors on the front panel are removed.

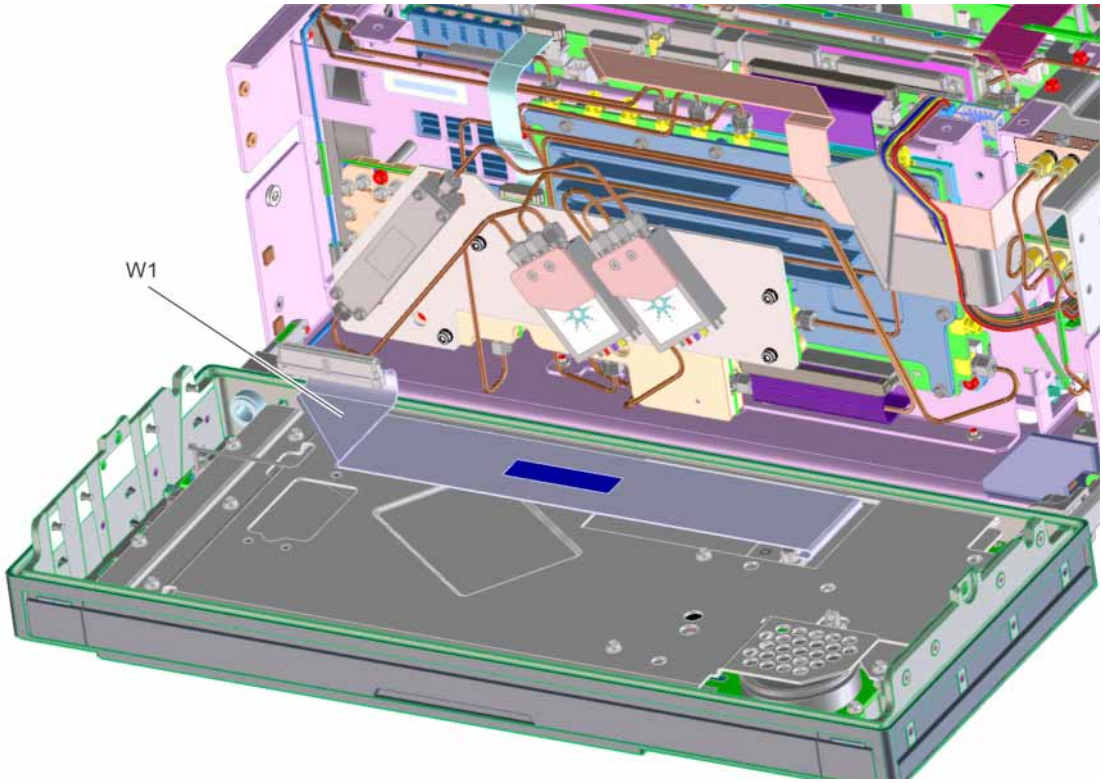
1. Refer to Figure 4. Using the T-10 driver, remove the eight screws (1), four on each side, to detach the Front Frame Assembly from the chassis. Discard these screws.

Figure 4 Front Frame Removal (PXE shown as example)



2. Refer to Figure 5. Pull the Front Frame Assembly carefully away from the chassis. Remove the ribbon cable W1 from the motherboard. The cable has locking tabs on each side, pinch and pull to release.

Figure 5 Front Panel Cable

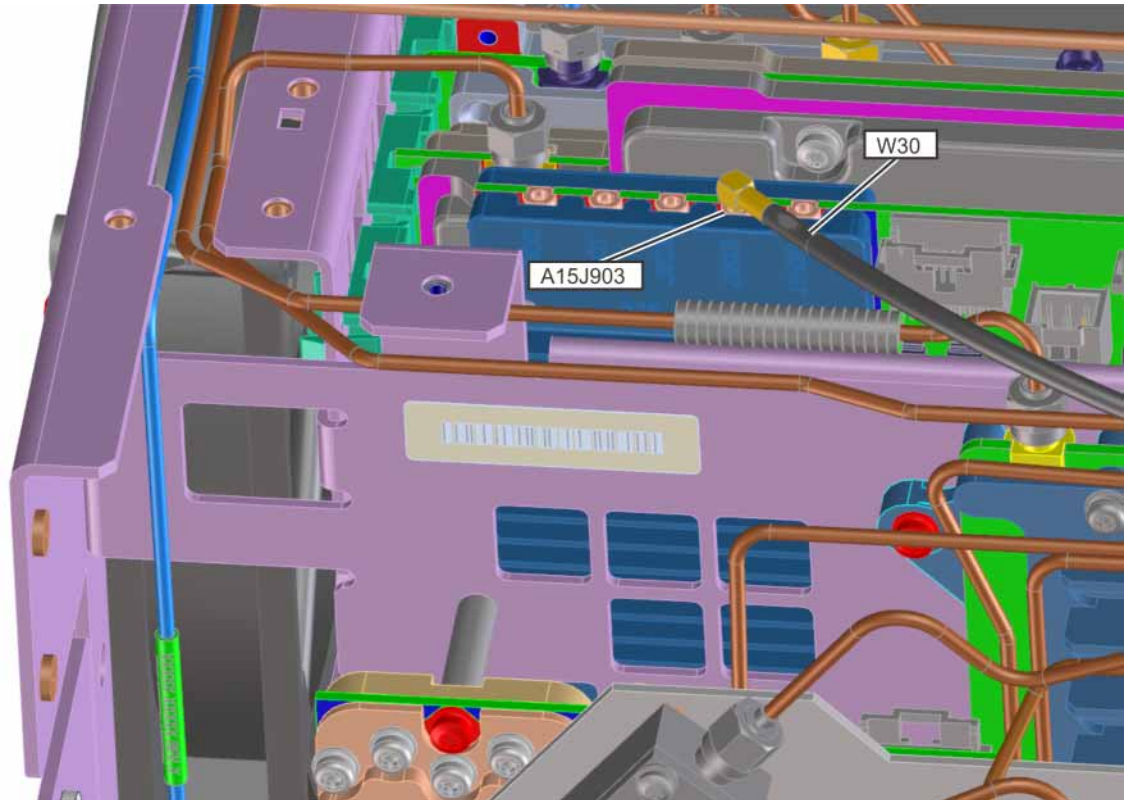


Add Cables to A13 Front End and A15 Front End Controller, RF/Microwave Instruments

NOTE This procedure only applies to RF and microwave instruments (frequency range options 503, 508, and 526). If your instrument has frequency range option 544 or 550, refer to "Add Cables to A13 Front End and A15 Front End Controller, Millimeter Wave Instruments" which follows.

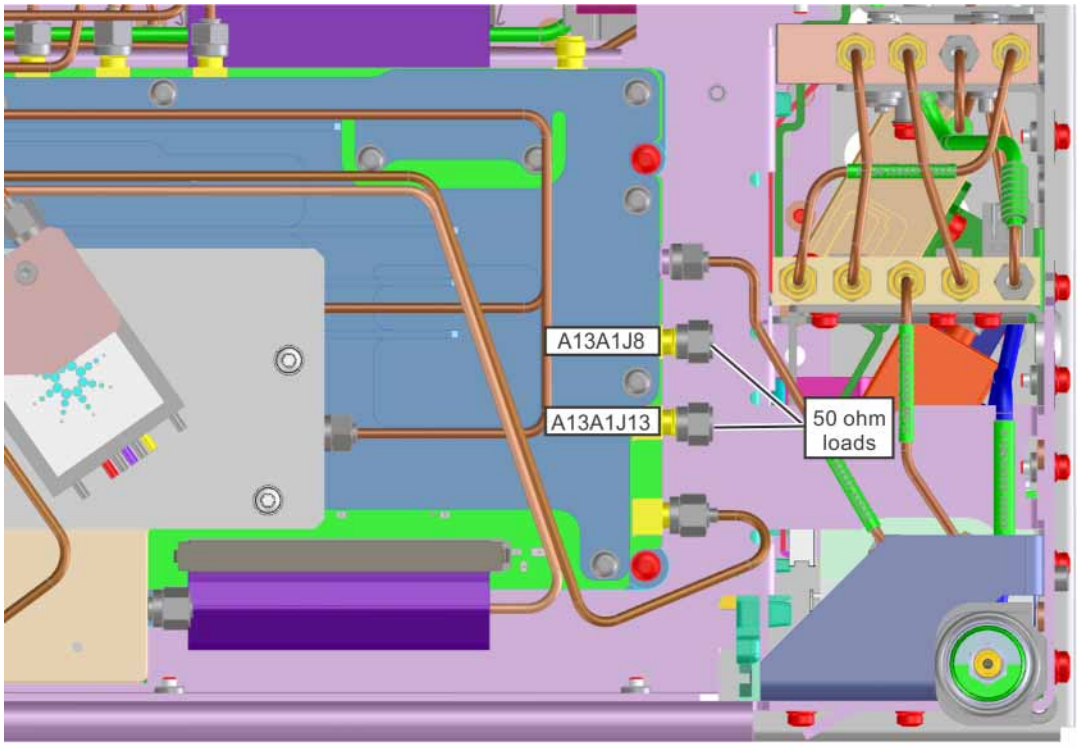
1. Locate the flexible coax cable in the Opt EXM Cable Kit. This is cable W30 and should be labeled "8121-2027".
2. Refer to Figure 6. Connect the end of W30 labeled "903" to A15J903.

Figure 6 A15J903



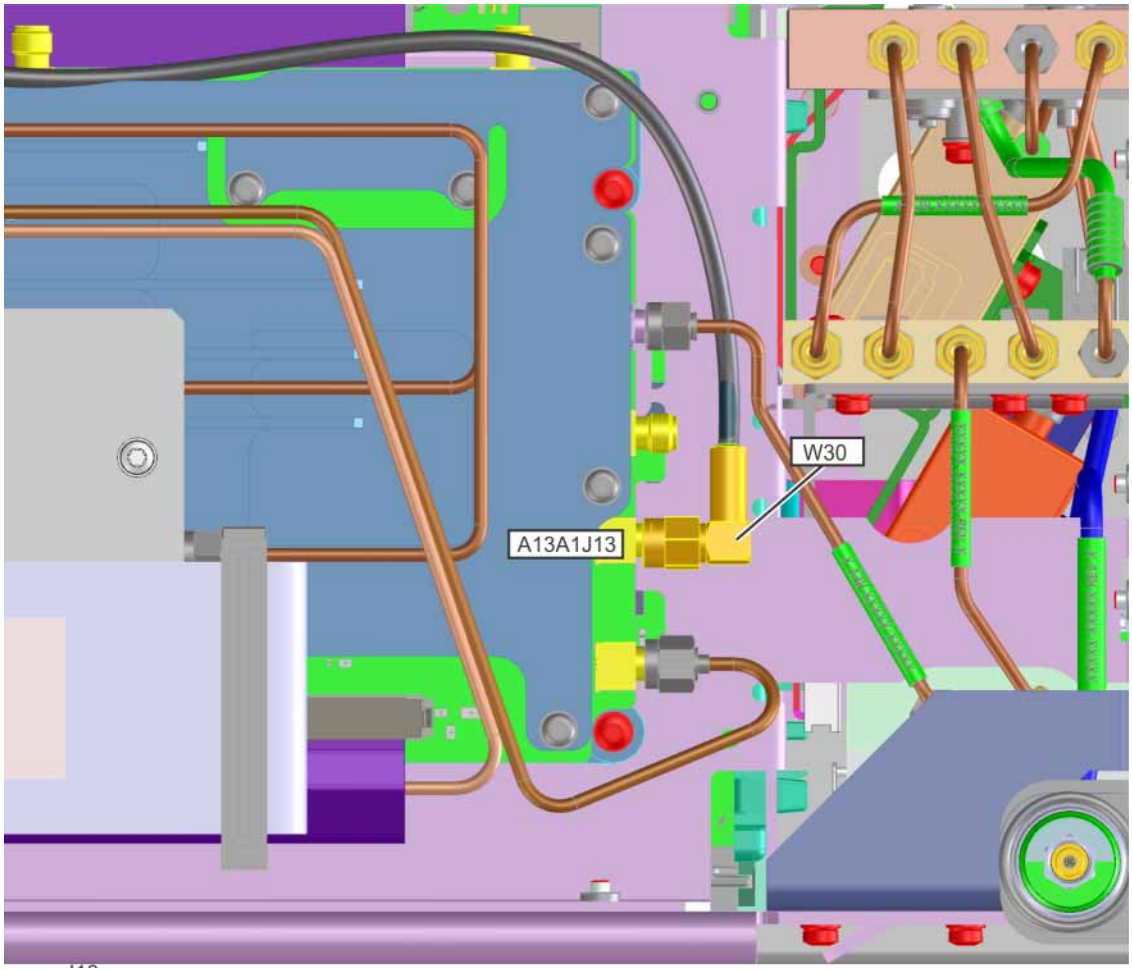
3. Refer to Figure 6. Remove the SMA 50 Ω loads on A13A1J8 and A13A1J13. Do not discard.

Figure 7 50 ohm Loads



4. Refer to Figure 8. Connect the end of W30 labeled “13” to A13A1J13. Torque the cable nut to 10 inch-pounds.

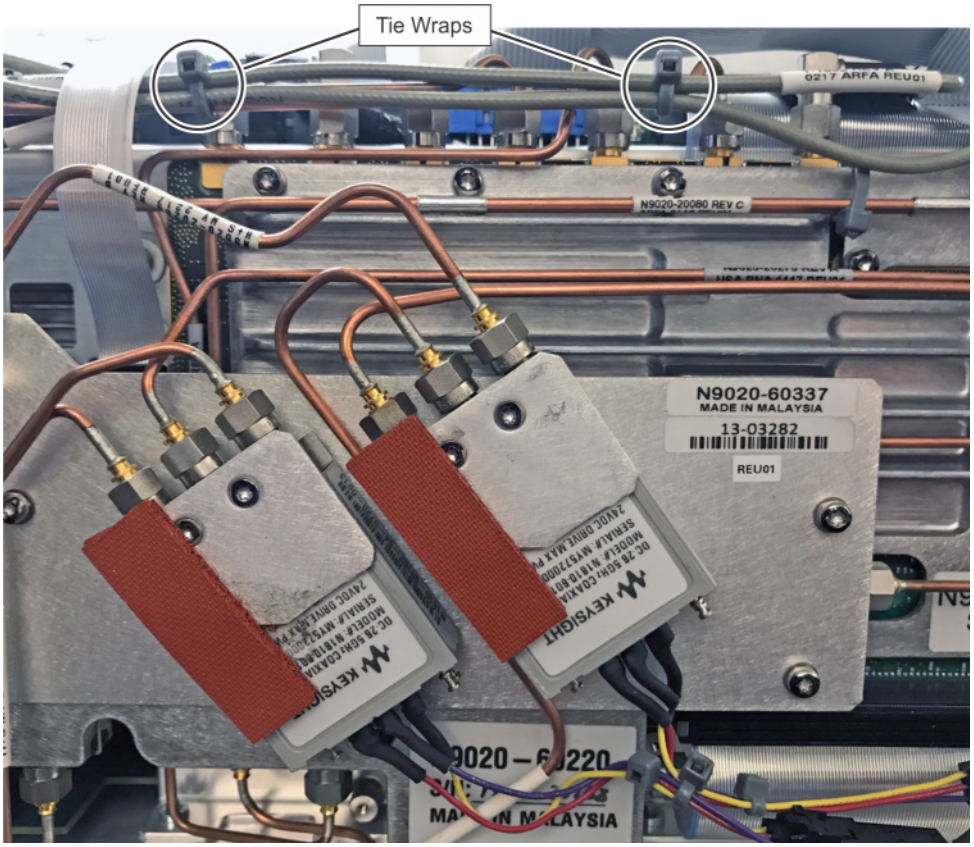
Figure 8 A13A1J13



5. Refer to Figure 9 and Figure 10. Use tie wraps at the locations indicated to secure W30 to the semi-rigid cables and to the wire harness.

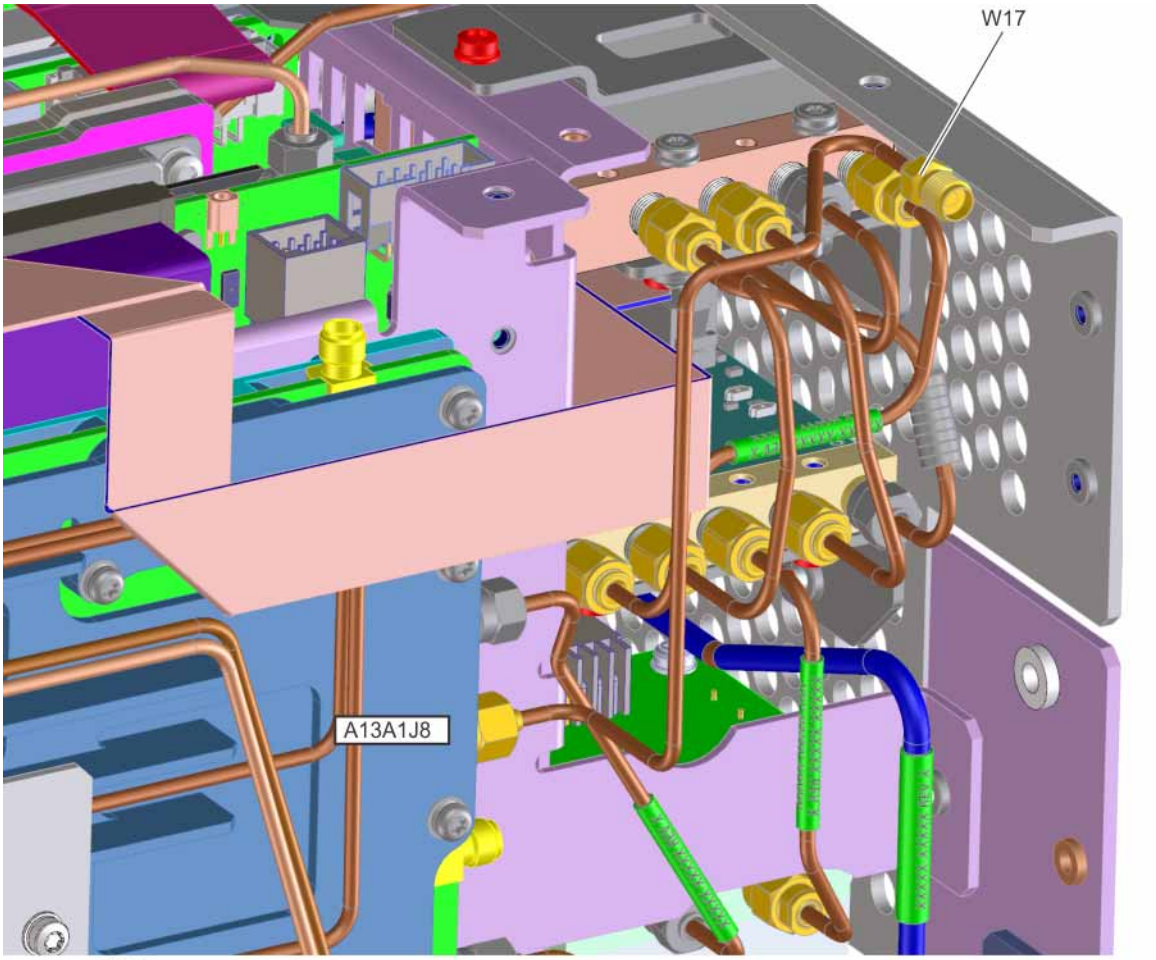
Figure 9 W30 Tie Wraps

Figure 10 W30 Tie Wraps



6. Locate semi-rigid coax cable, part number N9020-20132 in the upgrade kit. This is W17. Connect the end with the SMA male connector A13A1J8, with the SMA female connector pointing towards where the front panel would be. The long, straight section of W17 should be parallel to the casting of the A13 Front End and parallel to the side chassis. Refer to Figure 11. Torque the cable nut to 10 inch-pounds.

Figure 11 Orientation of W17 in an RF/Microwave PXEA

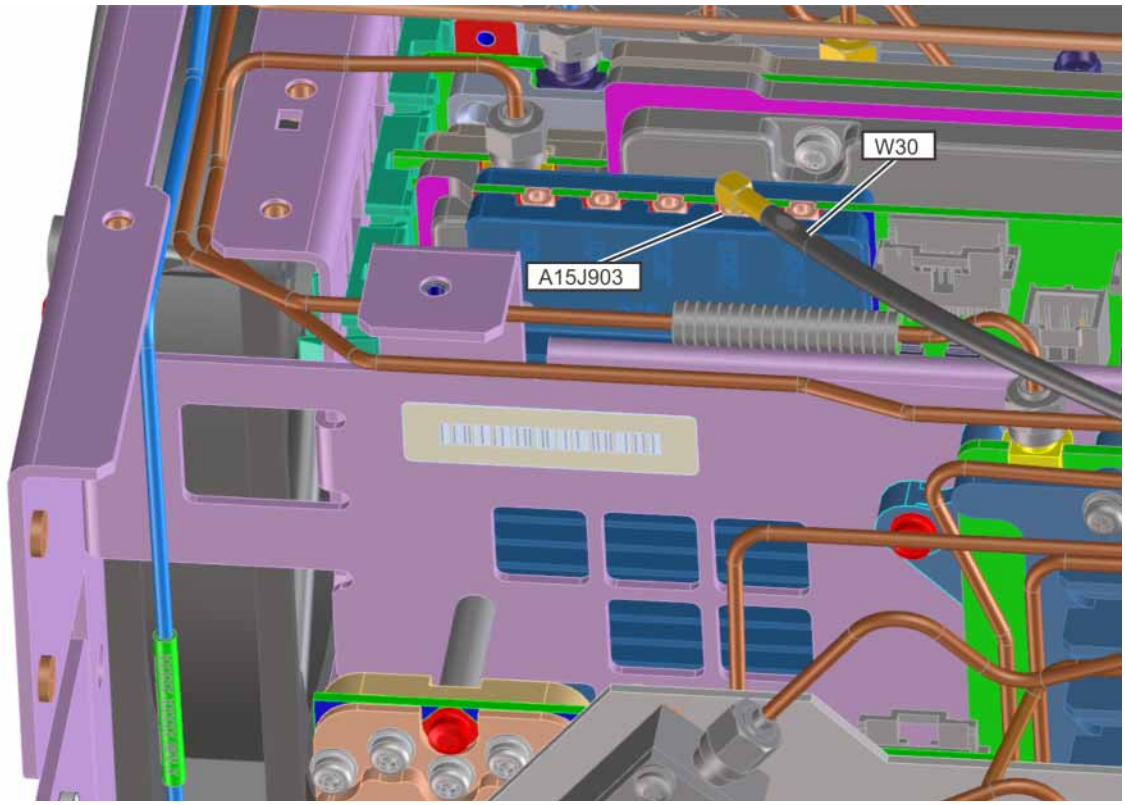


Add Cables to A13 Front End and A15 Front End Controller, Millimeter Wave Instruments

NOTE This procedure only applies to Millimeter Wave instruments (frequency range options 544 and 550). If your instrument has frequency range option 503, 508, or 526, refer to "Add Cables to A13 Front End and A15 Front End Controller, RF/Microwave Instruments" above.

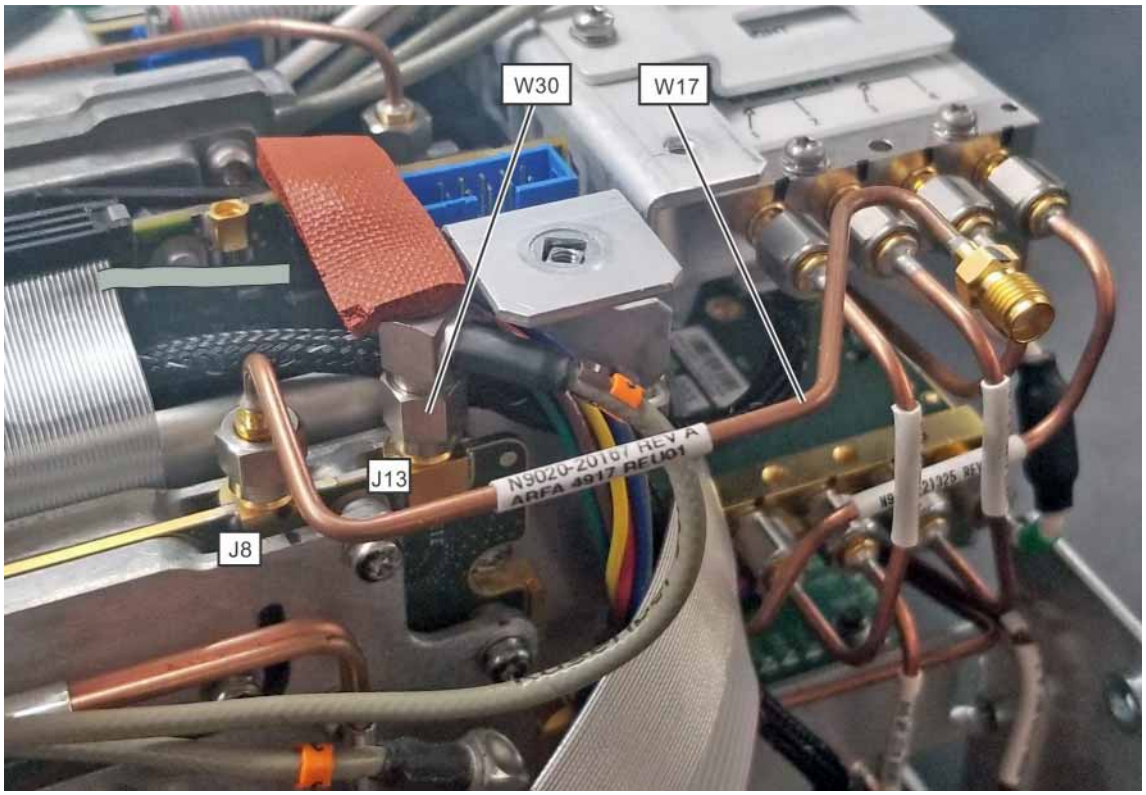
1. Locate the flexible coax cable in the Opt EXM Cable Kit. This is cable W30 and should be labeled "8121-2027".
2. Refer to Figure 12. Connect the end of W30 labeled "903" to A15J903.

Figure 12 A15J903



3. Refer to Figure 13. Remove the 50 Ω loads on J8 and J13 if present. Connect the end of W30 labeled “13” to A13A1J13. Torque the cable nut to 10 inch-pounds. Route the cable as shown.

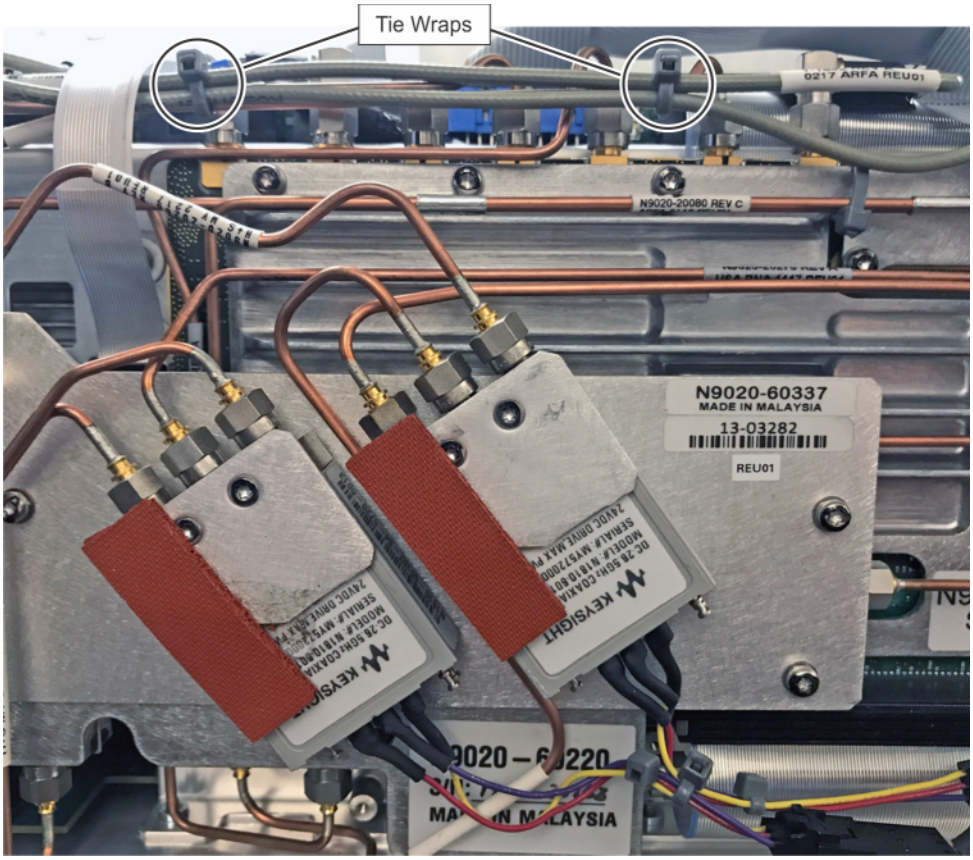
Figure 13 W17 and W30



4. Refer to Figure 13. Locate semi-rigid coax cable, part number N9020-20167 in the upgrade kit. This is W17. Connect the end with the SMA male connector A13A1J8, with the SMA female connector pointing towards where the front panel would be. The long, straight section of W17 should be parallel to the casting of the A13 Front End and level. Torque the cable nut to 10 inch-pounds.

5. Refer to Figure 14. Use tie wraps at the locations indicated to secure W30 to the semi-rigid cables and to the wire harness.

Figure 14 W30 Tie Wraps



Add EXT MIXER Connector and Cable to Front Frame Assembly

1. Locate the SMA female to SMA female connector (1250-1666), ¼" lockwasher (2190-0067), and ¼" hex nut (2950-0223) in the kit. If the SMA connector includes hardware, discard that hardware and use the 2190-0067 lockwasher and 2950-0223 hex nut included in this kit.
2. Remove the hole-plug in the top-most hole in the upper right corner of the front frame assembly. This hole will be labeled "EXT MIXER".
3. Insert the SMA female to SMA female connector in the hole in the front frame assembly from the front of the assembly. The hex feature on the connector should engage with the recess in the front frame assembly. Refer to Figure 15. Secure the connector using the ¼" lockwasher and ¼" hex nut from the rear. Torque to 21 inch-pounds.

Figure 15 Attaching SMA Female Connector

4. Locate the External Mixing, Front Panel semi-rigid coax assembly in the kit, part number N9020-20166. This is W29. Note that this cable is symmetrical; either end can be connected to the front-panel connector.

5. Connect one end of W29 to the SMA female connector as shown in Figure 16.
6. Orient W29 so that the cable slopes upward from the Ext Mixer connector at a 15 degree angle. The top of the connector should be approximately level with the top of the shield over the Front Panel Interface board. Refer to Figure 17. Torque the cable nut on the Ext Mixer connector to 10 inch-pounds.

Figure 16 Connecting W29 to Ext Mixer Connector

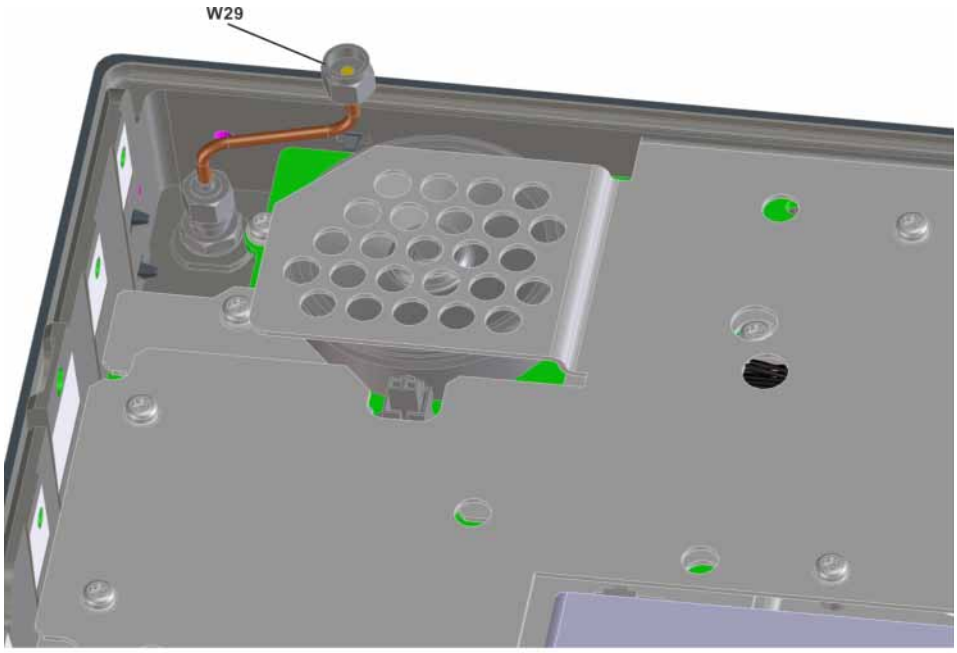
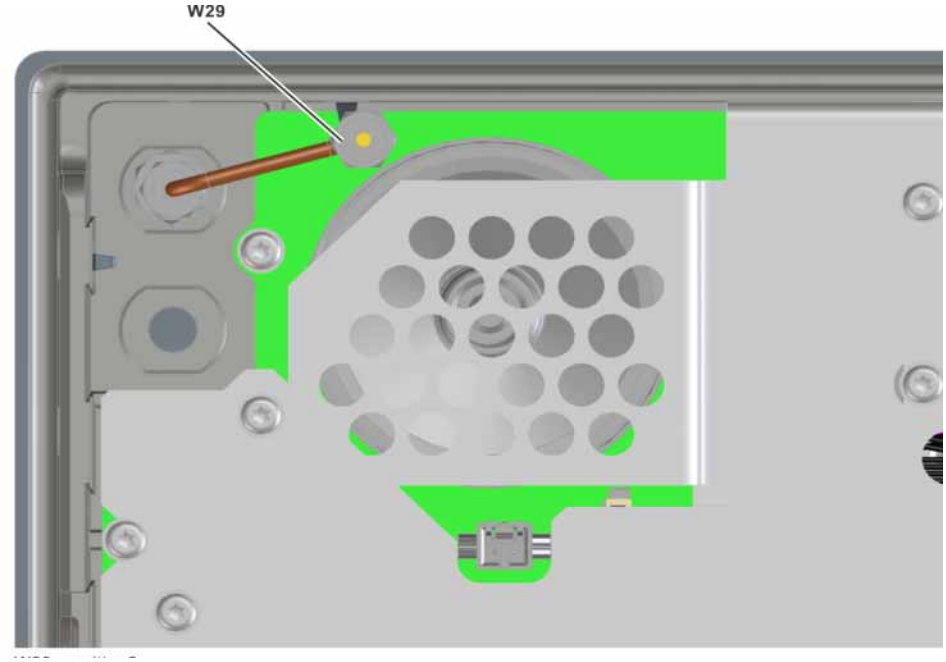


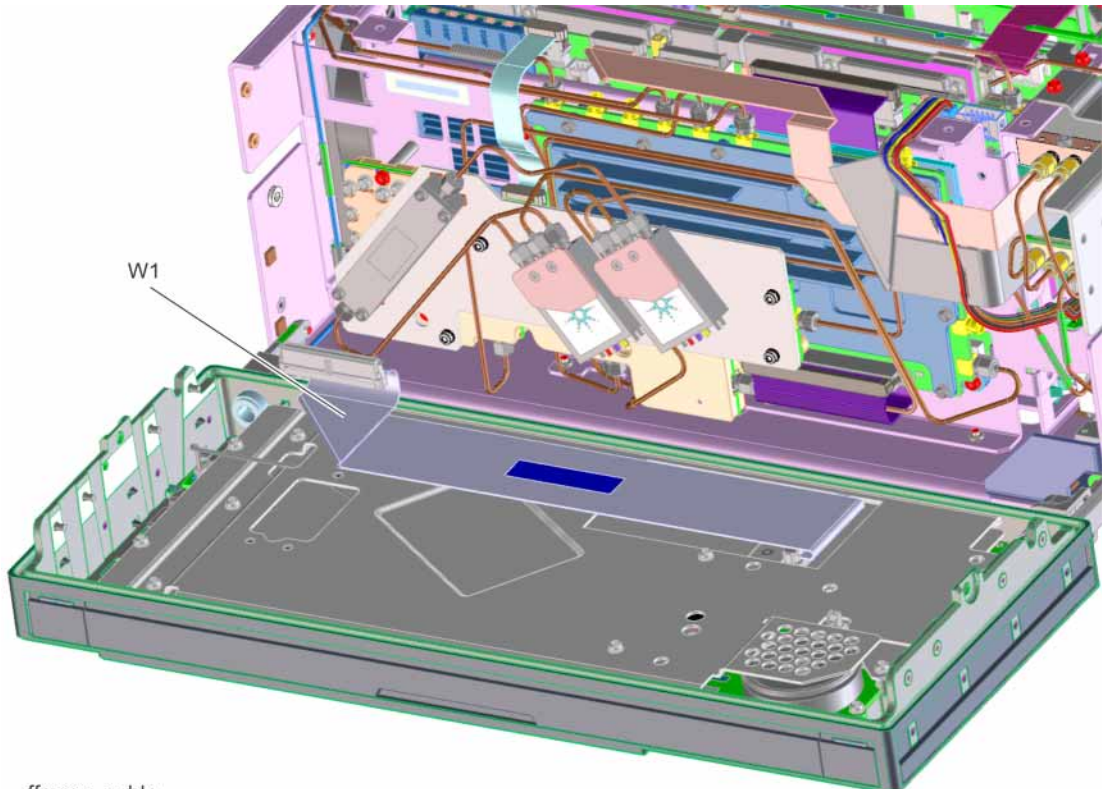
Figure 17 Proper Orientation of W29



Front Frame Replacement

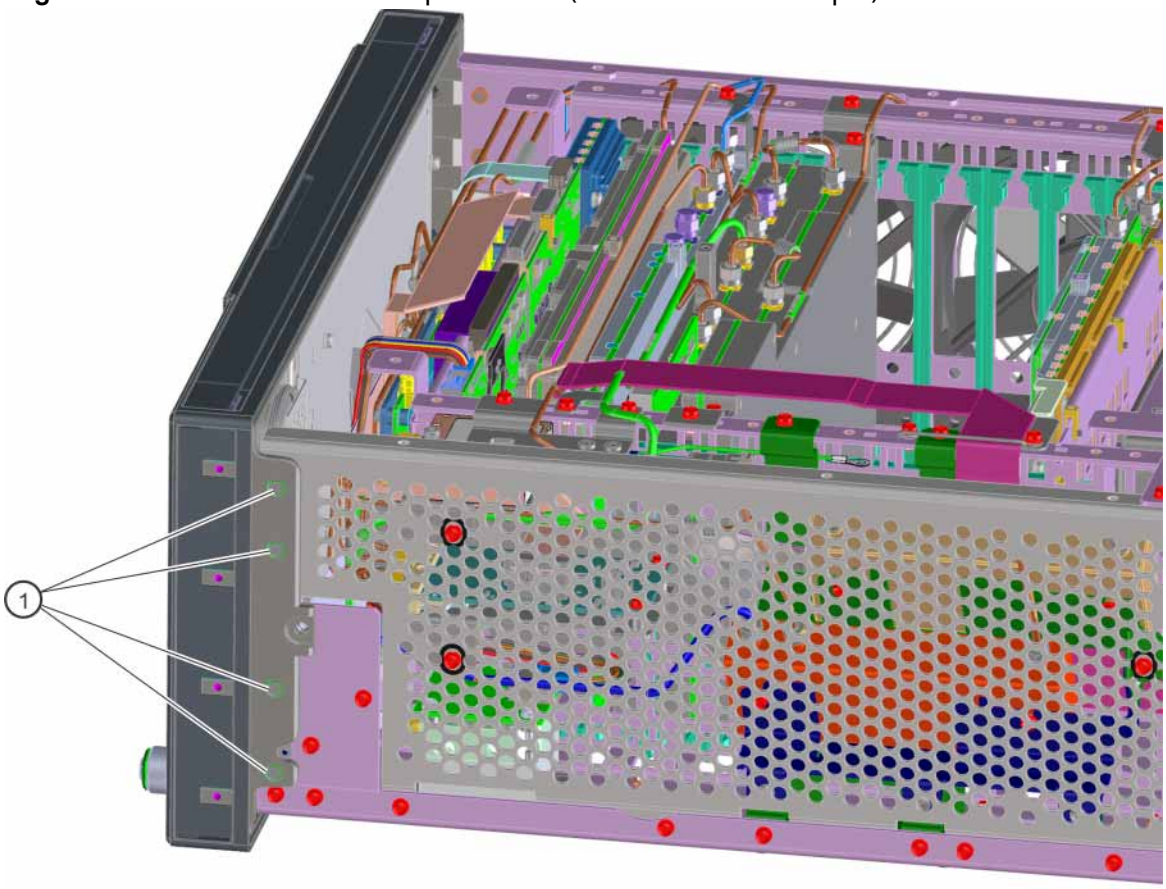
1. Refer to Figure 18. Reattach the ribbon cable W1. Ensure the locking tabs are engaged.

Figure 18 Front Panel Cable



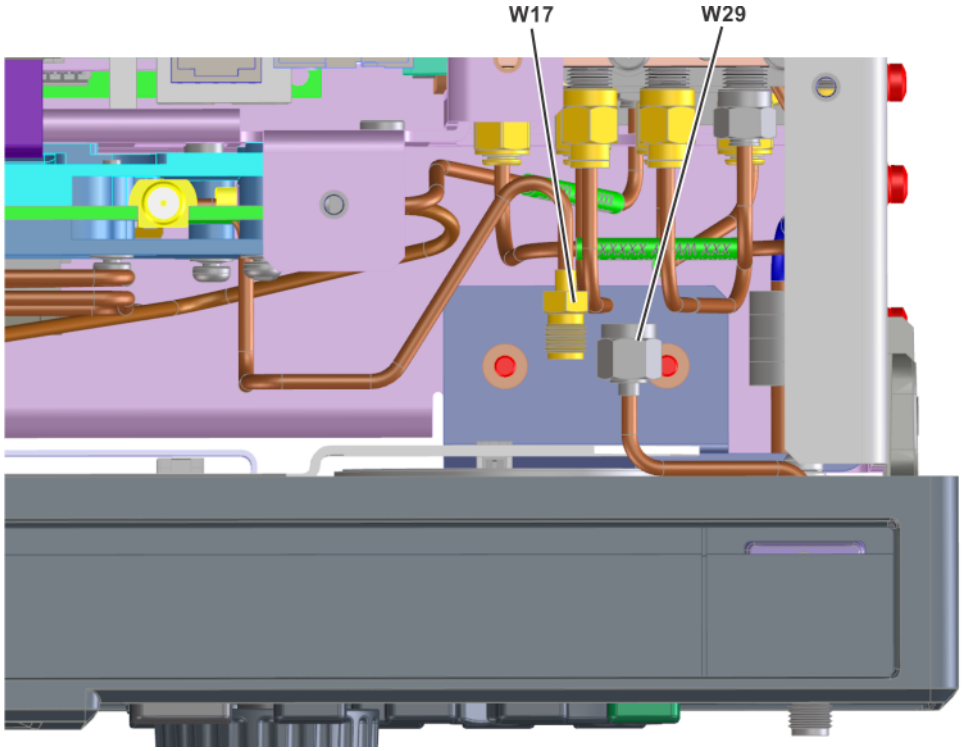
2. Refer to Figure 19. Take care to check the EMI O-ring around the RF Input connector before placing the Front Frame onto the chassis. If it is damaged or missing, replace with the EMI O-ring included in the kit. Carefully position the Front Frame Assembly onto the chassis. Ensure no cables are crushed.
3. Attach the Front Frame using the eight screws (1) (0515-2032) included in the kit, four on each side of the chassis. Torque to 9 inch-pounds.

Figure 19 Front Frame Replacement (PXE shown as example)



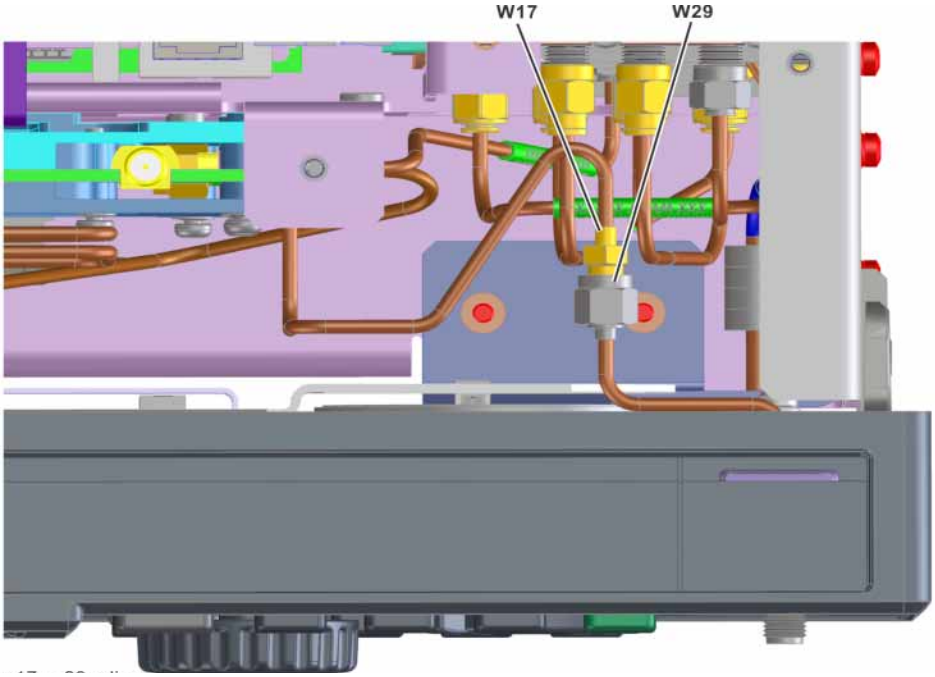
4. Refer to Figure 20. When the front panel is installed, cables W17 and W29 typically do not align. This is OK since the cables are flexible.

Figure 20 W17 and W29 Before Alignment



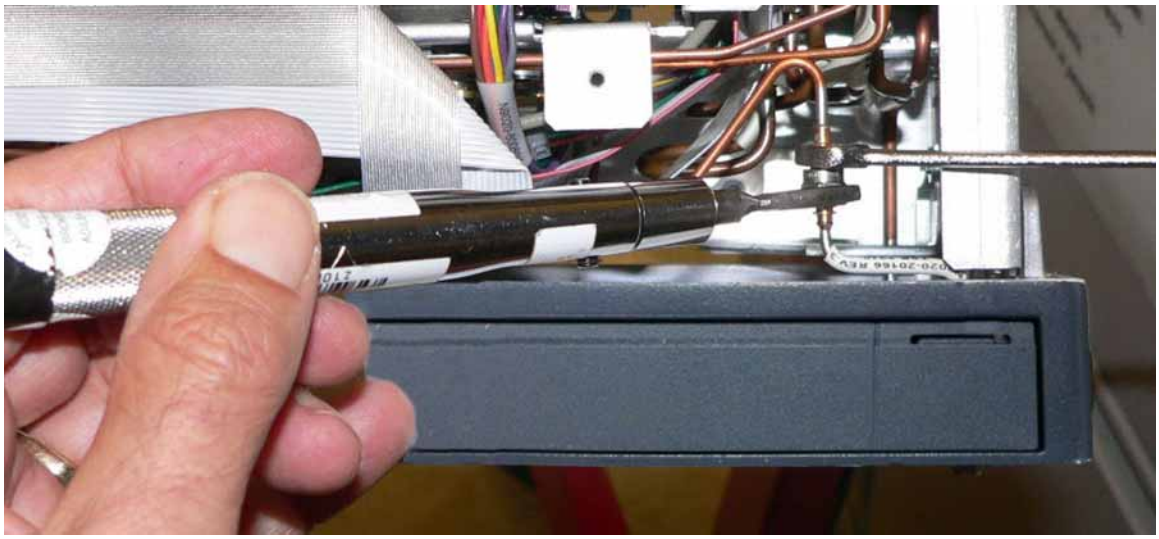
5. Refer to Figure 21. Align and connect cables W17 and W29. Hand-tighten the nut.

Figure 21 W17 and W29 Properly Aligned



6. Refer to Figure 22. Use a ¼" open-end wrench to prevent the SMA female connector on W17 from twisting. Use a 5/16" torque wrench to torque the nut on W29 to 10 inch-pounds.

Figure 22 Torque Cable W29 onto W17

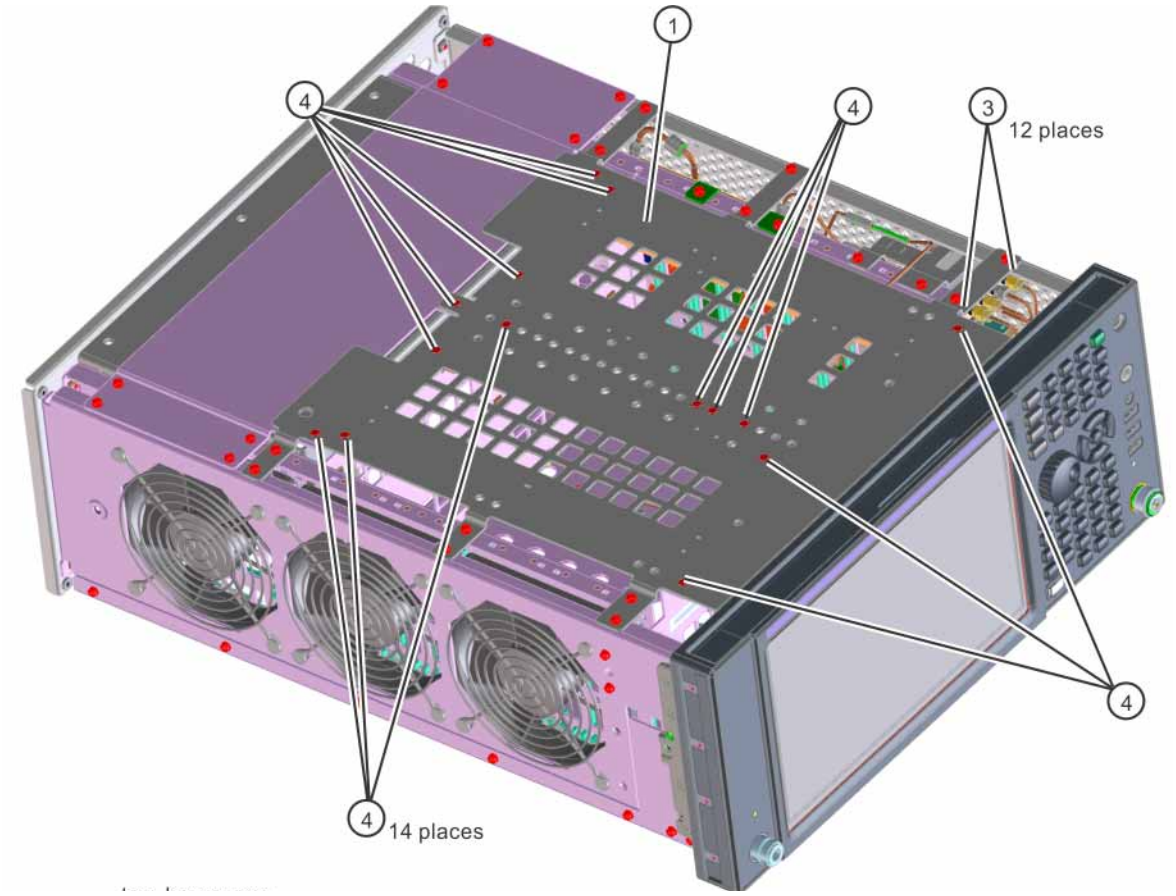


Top Brace Replacement

1. Refer to Figure 24 and Figure 23. To replace the top brace, place the brace and the wire holddown in the correct position. Using the twelve screws (3) (0515-0372), attach the top brace and wire holddown to the chassis. Attach the top brace to the boards using the fourteen screws (or sixteen with Option WF1) (4) (0515-1946) included in the kit.
2. Torque all screws to 9 inch-pounds.

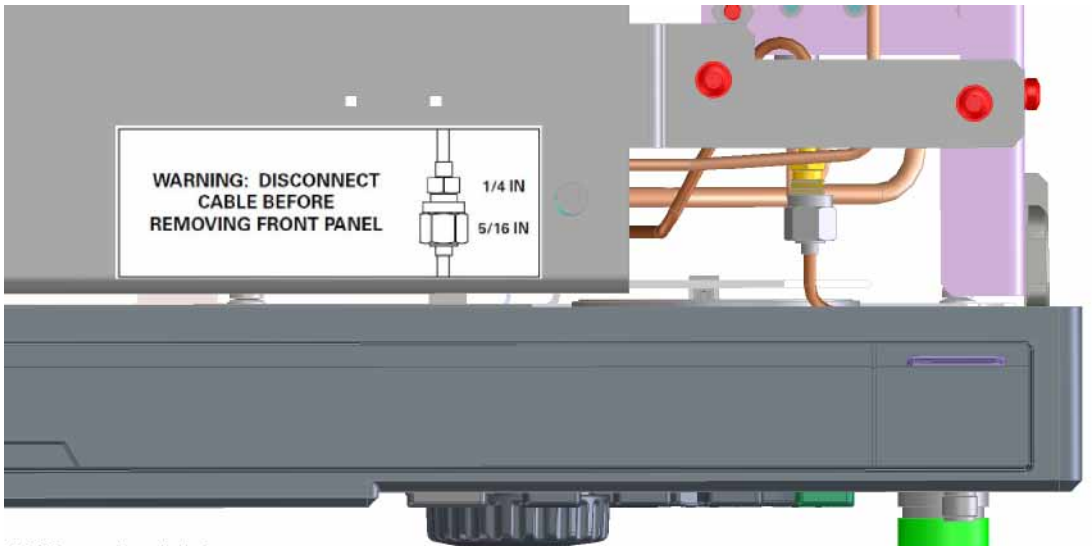
Figure 23 Wire Holddown

Figure 24 Top Brace Replacement



3. In the upgrade kit, locate the Warning Label, N9030-80018.
4. Refer to Figure 25. Attach the Warning Label to the top brace as shown.

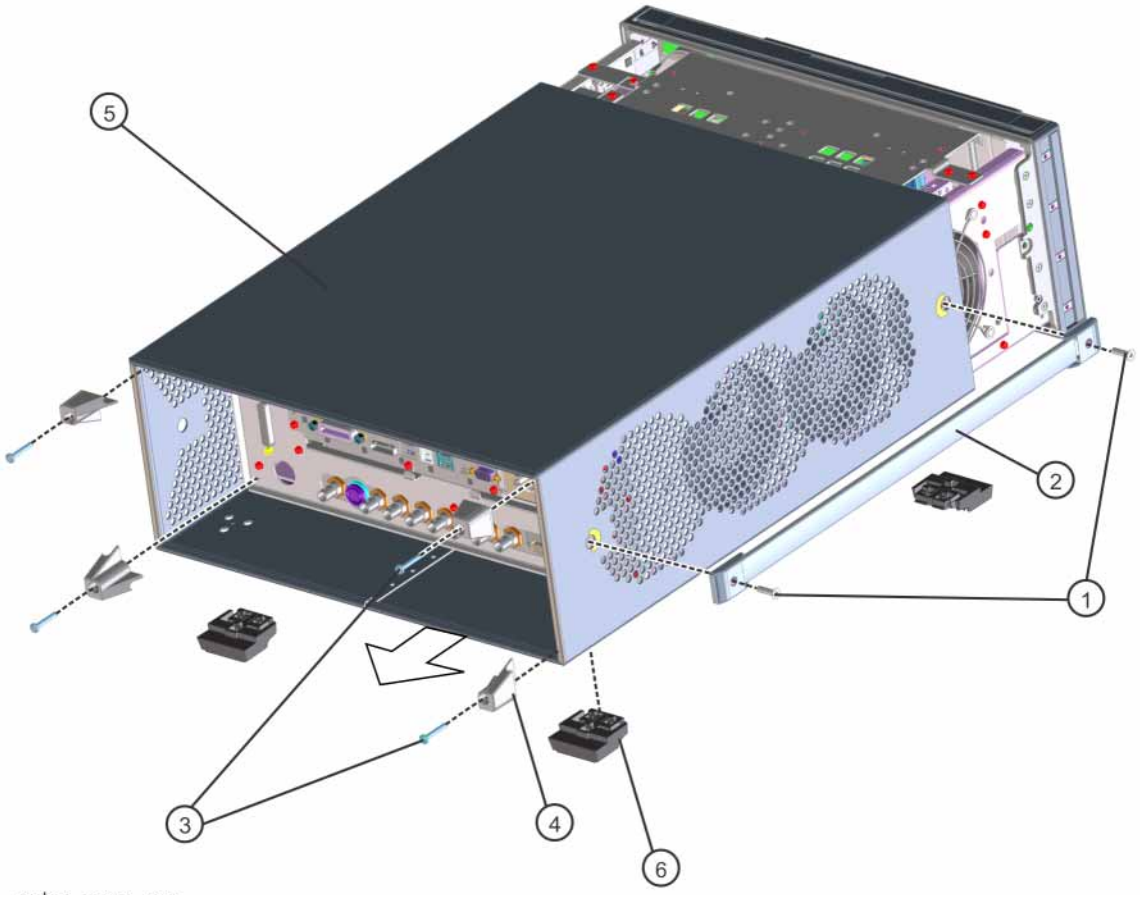
Figure 25 Add Warning Label to Top Brace



Final Assembly

1. Refer to Figure 26. 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 Assembly.
2. Replace the four rear feet to the rear of the instrument. Torque the rear feet screws (0515-1619 and 3050-0893 washers) to 21 inch-pounds.
3. Replace the bottom feet by sliding into place until they snap in. Install the locks by pressing in flat.
4. Replace the handle straps on both sides of the instrument. Torque the handle strap screws to 21 inch-pounds.
5. Attach the SMA load (removed earlier) to the front panel EXT MIXER connector.

Figure 26 Instrument Outer Cover Replacement



Licensing the New Option

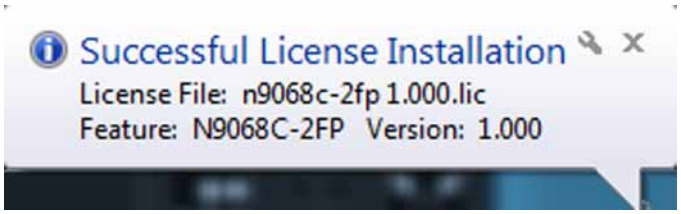
Installation Procedure over USB

1. Locate the Option Upgrade Entitlement Certificate from the kit.
2. Redeem the Option Upgrade Entitlement Certificate by following the instructions on the Certificate.
3. After redeeming your Option Upgrade Entitlement Certificate you will receive an email with an attached License File.
4. Locate a USB storage device. Perform a virus scan on this device before use.
5. Save the License File to the root directory of the USB Storage Device.
6. Connect the USB Storage Device to one of the analyzer's USB ports. Connect a mouse to another USB port. Windows will detect the new hardware and may display the configuration menu shown in Figure 27. This menu may be configured according to your preferences.

Figure 27 USB Storage Device Configuration Menu

7. The analyzer will automatically consume the License File (this may take a few minutes). When the License File is consumed the Keysight License Manager will display a "Successful License Installation" message similar to the one shown in Figure 28.

Figure 28 Successful License Installation



Alternate Installation Procedure

The License File can be manually installed over USB or LAN by placing the license file in the following analyzer folder: C:\Program Files\Agilent\licensing.

Verify the License Installation

1. Before the licenses will be recognized, the XSA application must be restarted. Press **File**, **Exit**. An Exit Analyzer dialog box will appear; press **Enter** to confirm the exit.
2. Double-click on the LaunchXSA icon on the Windows desktop. Wait for the XSA application to finish starting (the analyzer should be sweeping).
3. Press **System**, **Show System** on the analyzer to display a list of all displayed options. You should see the following option listed:
   - N9048B-EXM External Mixing

     or
   - N9038B-EXM External Mixing

Verify Optional Functionality

1. Press **MODE/MEAS, Spectrum Analyzer**, **Swept SA**, **OK**.
2. Press **Input/Output** and tap **Select Input**.
3. Verify that there is a selection for "**External Mixer**" below the "**RF Input**" selection.

Utilities, Adjustments, and Performance Verification Tests

Calibration Software and specified test equipment is required to perform the adjustments, and can be used to automate the performance verification testing. Information on how to obtain this software can be found at:

http://www.keysight.com/find/calibrationsoftware

Utilities Required

None

Adjustments Required

The following adjustments are the minimum set required to ensure that the newly installed hardware is functioning properly

- IF Input Gain Adjustment
- LO Output Power Adjustment

Performance Testing Required

The following performance verification tests are the minimum set required to ensure that this newly installed option is functioning properly.

- IF Input Gain Accuracy
- LO Output Power Accuracy

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

The end user must ultimately determine whether they want a full calibration to be performed after the installation of this upgrade or not. If a full calibration is required, arrangements regarding the level of calibration must be made between the end user and the calibration provider.

For assistance, contact your nearest Keysight Technologies Sales and Service Office. To find your local Keysight office access the following URL, or if in the United States, call the following telephone number:

http://www.keysight.com/find/assist

1-800-829-4444 (8 am - 8 pm ET, Monday - Friday)

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