Keysight PXA Signal Analyzer
Option HL6
External Mixing Upgrade Kit
Serial Prefix < MY/SG/US5138

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Installation Note

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TECHNOLOGIES

Notice.

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Option HL6, External Mixing Upgrade, Serial Prefix < MY/SG/US5138 Kit

Products Affected:	PXA N9030A
Serial Numbers:	<US/MY/SG51380000 (Options 503, 508, 513, and 526)
Options:	EXM
To Be Performed By:	(X) Agilent Service Center
	(X) Personnel Qualified by Agilent
	( ) Customer
Estimated Installation Time: Estimated Adjustment Time: Estimated Verification Time:	2.0 Hours 6.0 Hours[a] 6.0 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.agilent.com/find/calibrationsoftware

While Agilent 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 PXA signal analyzer with serial numbers prior to US/MY/SG51380000 to add option EXM, External Mixing. This kit includes parts to upgrade a PXA with frequency range option 503, 508, 513, or 526.

For upgrading a PXA with frequency range option 503, 508, 513, or 526 and serial number US/MY/SG51380000 and above, or any PXA with frequency range option 543, 544, or 550, the N9030AK-EXM, External Mixing Upgrade Kit, should be used.

In addition to installing the hardware to support option EXM, licenses for the following options will also be installed:

• N9030A-EXM, External Mixing

• N9060A-5FP, ACP 18 Carrier Enhancement

Installation Kit Parts List

Quantity	Description	Agilent Part Number
1	Adapter- Coaxial Straight Female-SMA to Female-SMA, 50Ω	1250-1666
1	Washer, Lock, Internal Tooth, ¼ inch	2190-0067
1	Nut-Hex-Double-Chamfer 1/4-36-THD.125-IN-THK, Stainless Steel	2950-0223
1	50 Ohm Termination, SMA male	1810-0118
1	RF Front End Assembly w/shipping tray	N9020-60173
1	Opt HL6 Cable Kit with Wire Markers (includes cable W30, listed below)	N9030-60016
1	Cable Assembly, External Mixing, Front Panel (W29)	N9020-20166
1	Cable Assembly, uW Front End to W29 (W17)	N9020-20132
1	Cable Assembly, Coaxial 350 mm LG (W30)	8120-2027[a] with ends labeled '903' and '13'
1	Label, External Mixing	N9030-80014
1	Label, Warning	N9030-80018
5	Cable Ties	1400-0249
1	Entitlement Certificate	5964-5178
1	Entitlement Certificate Envelope	5967-7169
1	Installation Note	This note

a. This cable is included in the Opt HL6 Cable Kit with Wire Markers, p/n N9030-60016

Tools Required

❏ T-10 TORX Driver

❏ T-20 TORX Driver

❏ 5/16-inch torque wrench

❏ ¼-inch open-end wrench

❏ Diagonal cutters

❏ Agilent Calibration and Adjustment Software, N7814A (revision E.08.00 or later)

❏ Test equipment and computer supported by the X- Series Performance Tests and Adjustment Software

❏ PXA Signal Analyzer Service Guide. This manual is available as:

— N9030A Option 0BW or

— Agilent part number N9030-90030

❏ 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.

Installation Procedure

Analyzer Information

1. Connect a power cord to the analyzer and turn on the analyzer.

2. After the analyzer has completed turning on, press **System**, **Show**, **System**. Make note of the following information from the Show System screen:

   Product Number: _____
   Serial Number: _____
   Instrument S/W Revision: _____

3. Check for the presence of one of the following frequency range options listed below in the Show System. Put a check mark or "X" after the frequency range option listed below that appears in the Show System menu.

   N9030A-503_____
   N9030A-508_____
   N9030A-513_____
   N9030A-526_____
   N9030A-543_____
   N9030A-544_____
   N9030A-550_____

4. On the analyzer, press **System**, **Show**, **Hardware**. Note the Part #, Matl Rev, Rev, OF Rev, and Hw Id of the Front End in the table below.

Assembly Name	Part #	Matl Rev	Rev	OF Rev	Hw Id
Front End					

5. If the analyzer is equipped with any of the following frequency range options (refer to the data in step 3 above):

   N9030A-503
   N9030A-508
   N9030A-513
   N9030A-526

   And if the part number shown on the Show Hardware screen is N9020-60050, proceed with the kit installation.

   If the part number in the Show Hardware screen is not N9020-60050, this kit is not required since it includes a replacement Front End assembly which is not required for your instrument. Instead, the N9030AK-EXM, External Mixing Upgrade kit should be ordered.

6. If the analyzer is equipped with any of the following frequency range options (refer to the data in step 3 above):

   N9030A-543
   N9030A-544

N9030A-550

do not proceed with the installation of this upgrade kit. Instead, the N9030AK-EXM, External Mixer Upgrade Kit should be ordered.

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.
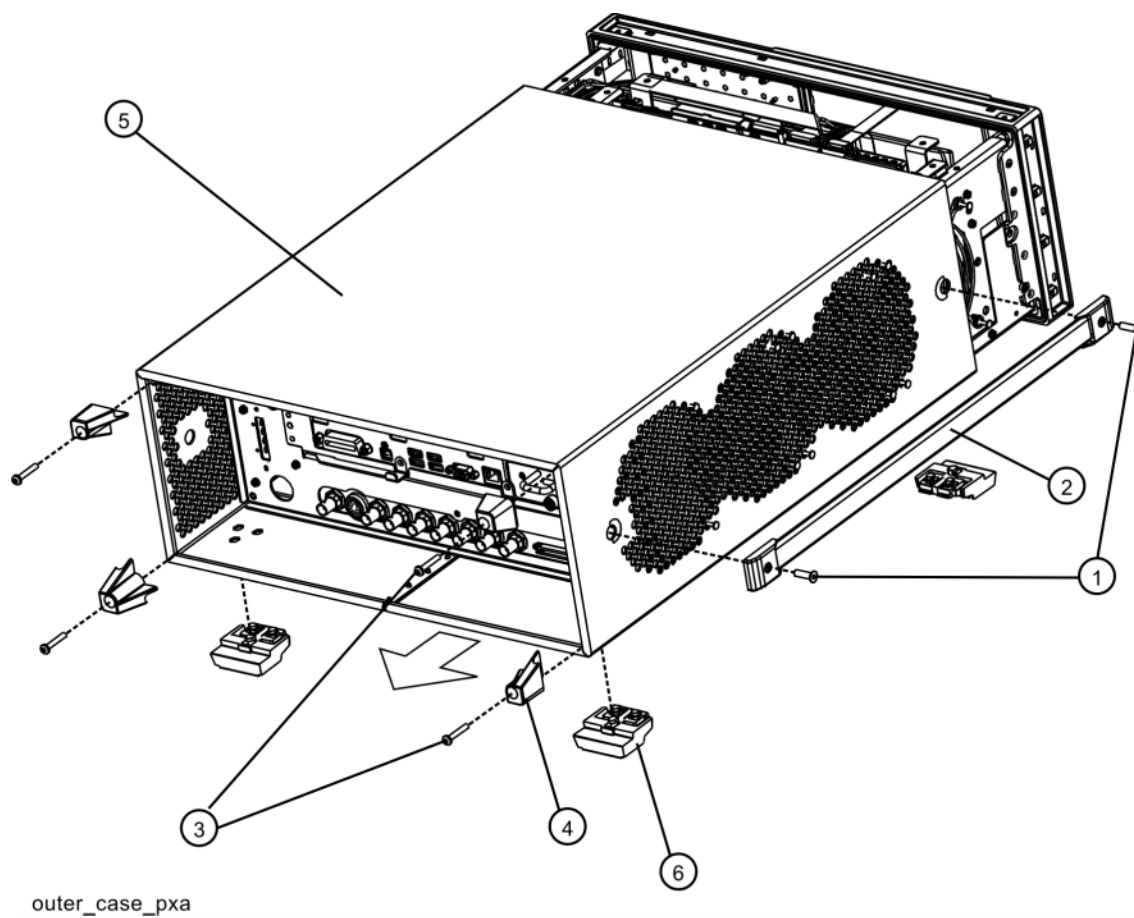

NOTE   Make sure any adapters on the front panel are removed.

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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.

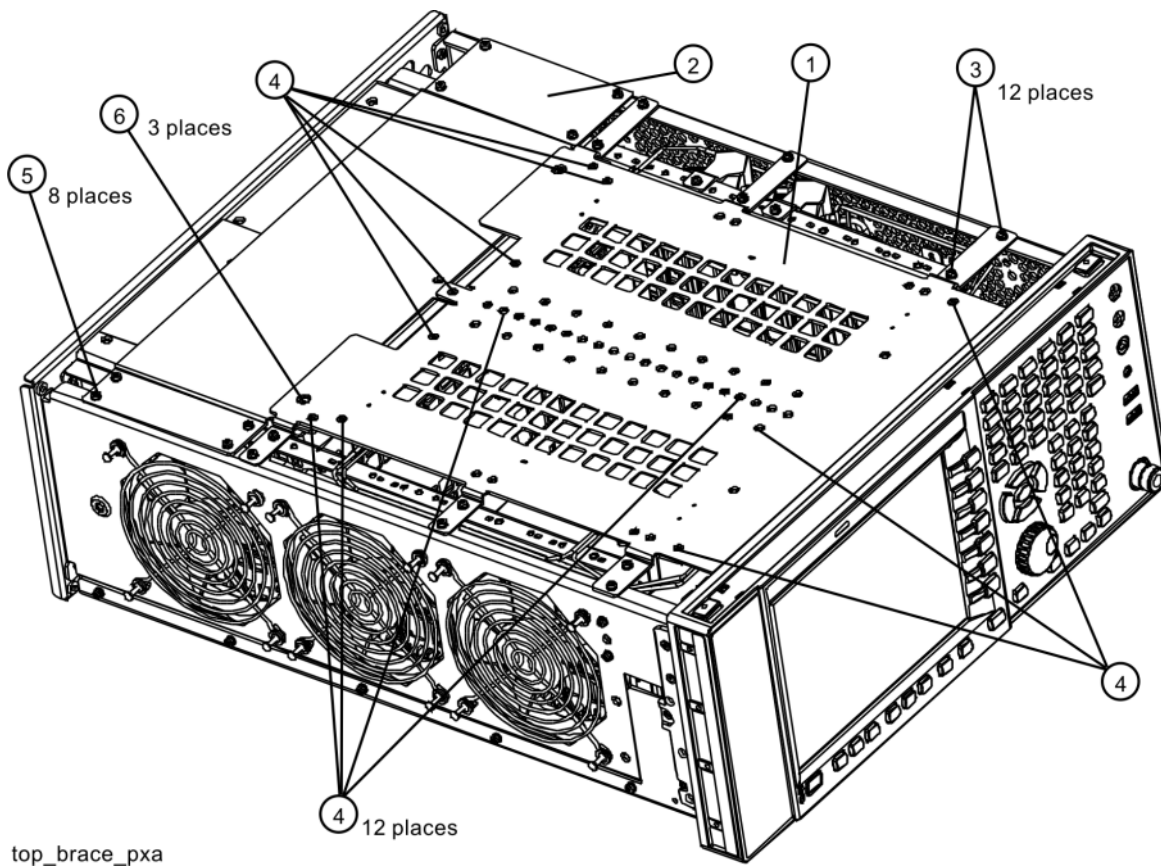6. Pull the instrument cover **(5)** off towards the rear of the instrument.

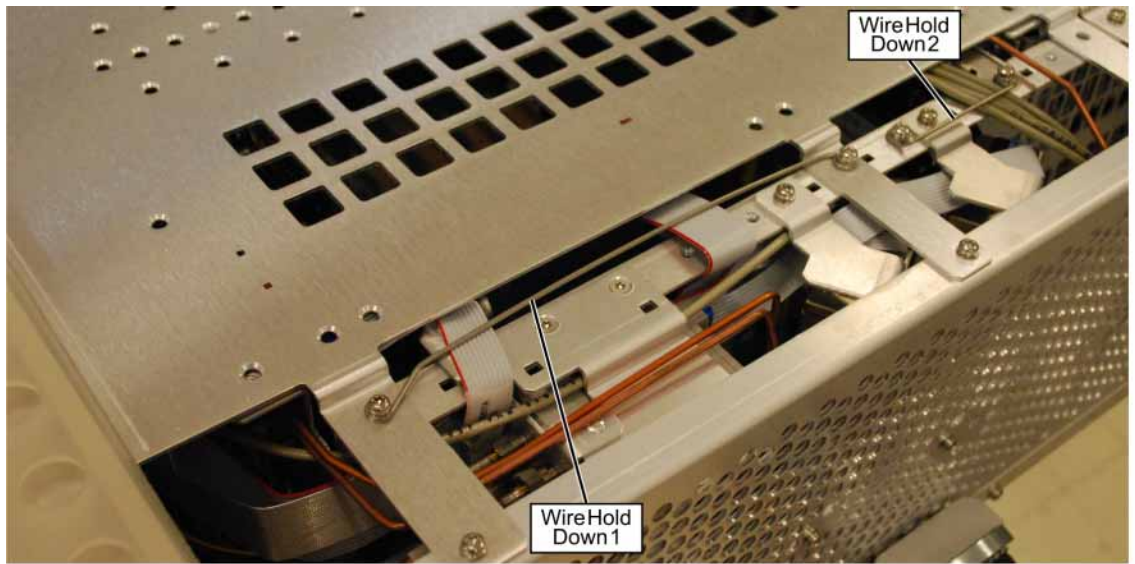**Figure 1**   **Instrument Outer Case Removal**

outer_case_pxa

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 hold down 1 (as shown in Figure 3). Remove the twelve screws (14 screws with Option B1X) **(4)** (0515-1227) attaching the top brace to the boards.

Figure 2　　　　　　　**Top Brace Removal**

top_brace_pxa

Figure 3 **Wire Hold Downs**

cable_hold_downs

Front Frame Assembly Removal

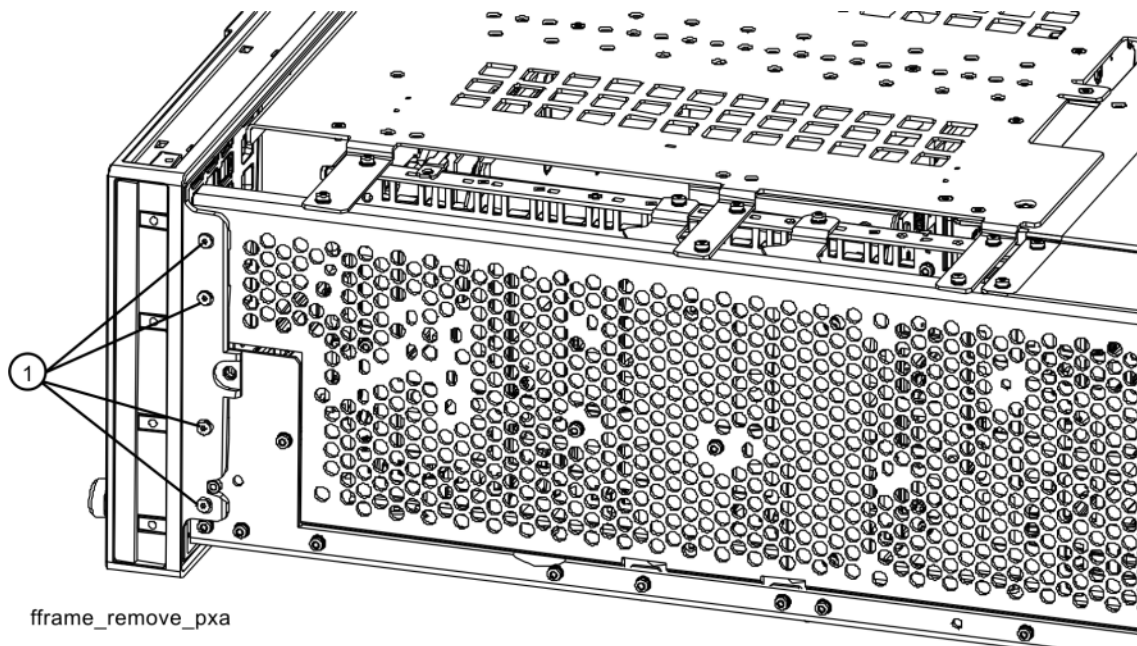| NOTE	Make sure any connectors on the front panel are removed.

1. Refer to Figure 4. Using the T-10 driver, remove the eight screws **(1)** (0515-1035), four on each side, to detach the Front Frame Assembly from the chassis.

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.
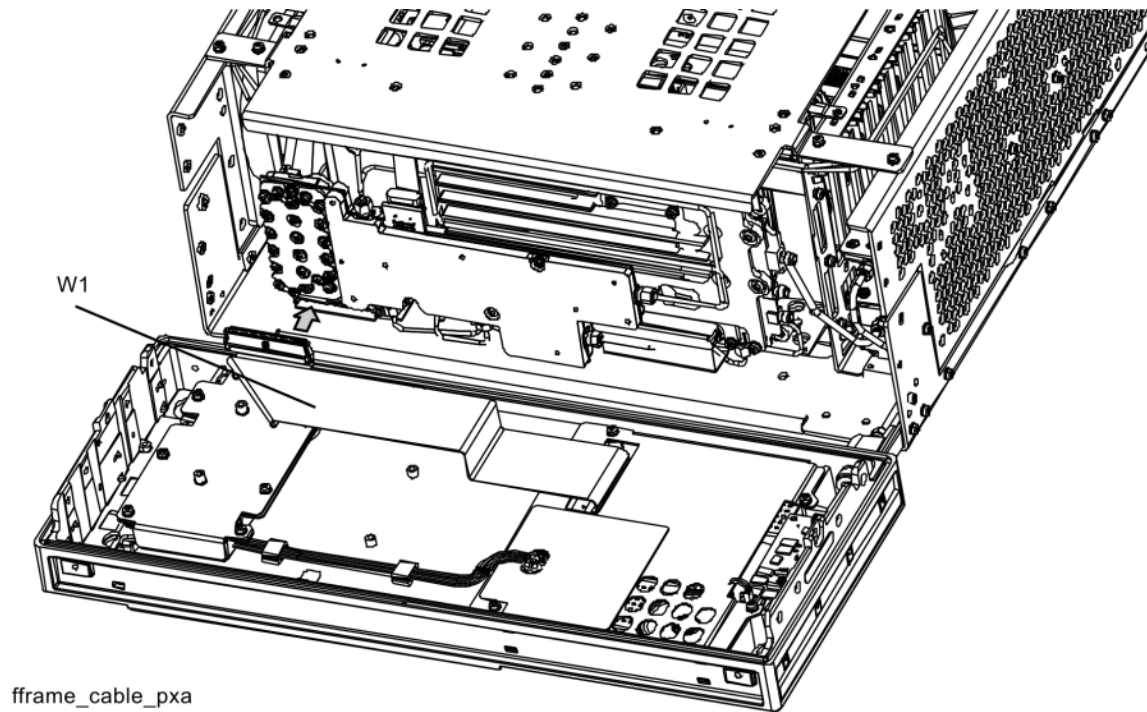
NOTE	W1 may have locking springs on each side. Depress the spring on each side of the connector to remove from the motherboard.

Figure 4   **Front Frame Removal**

fframe_remove_pxa
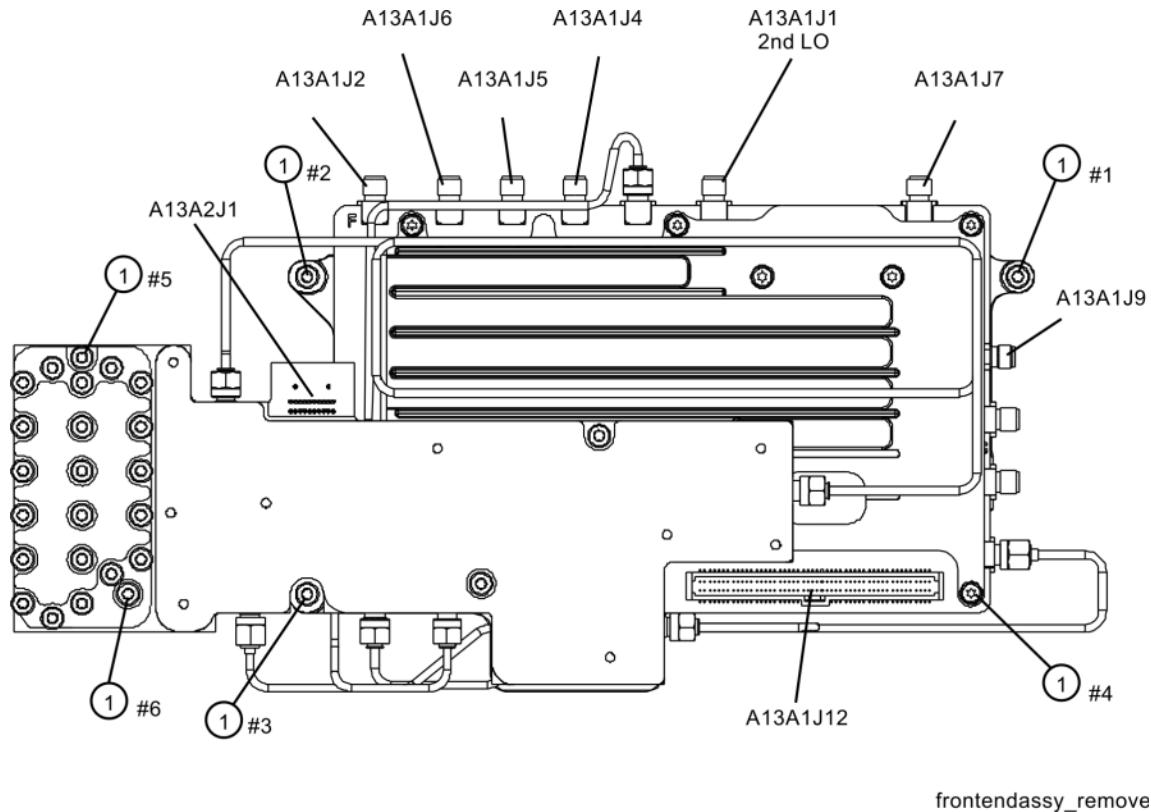
Figure 5   **Front Panel Cable**
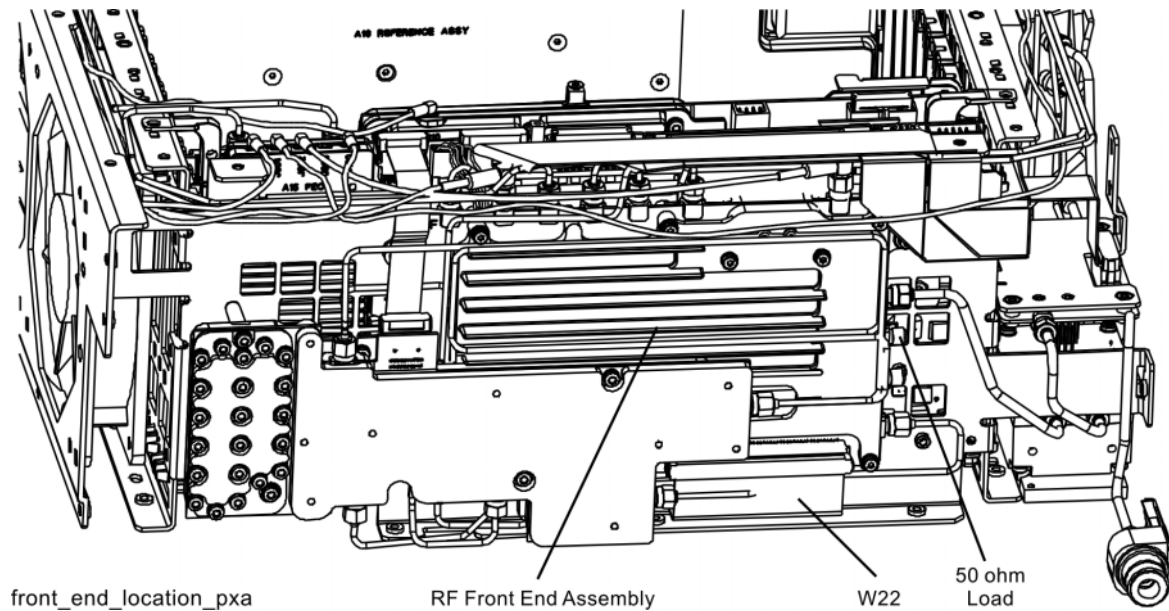

fframe_cable_pxa

RF Front End Assembly Replacement

1. Refer to Figure 6. Using the 5/16 inch wrench, remove the cables attached to A13A1J1, A13A1J2, A13A1J4, A13A1J5, A13A1J6, A13A1J7, A13A1J9 on the RF Front End Assembly.

2. Remove the W22 and W28 ribbon cables from Front End Controller board connectors J102 and J1300. The ribbon cables then can be removed from the Front End Assembly connectors A13A1J12 and A13A1J1 once it is out of the instrument.

3. Remove the six screws (1) (0515-0372) using the T-10 driver. The RF Front End Assembly can now be removed from the chassis.

Figure 6   **RF Front End Assembly Removal**

frontendassy_remove

4. Refer to Figure 7. Attach the W22 ribbon cable to the Front End Assembly first. Route behind the Front End Assembly and ensure the cable is engaged under the tabs, then place the RF Front End Assembly into the chassis.

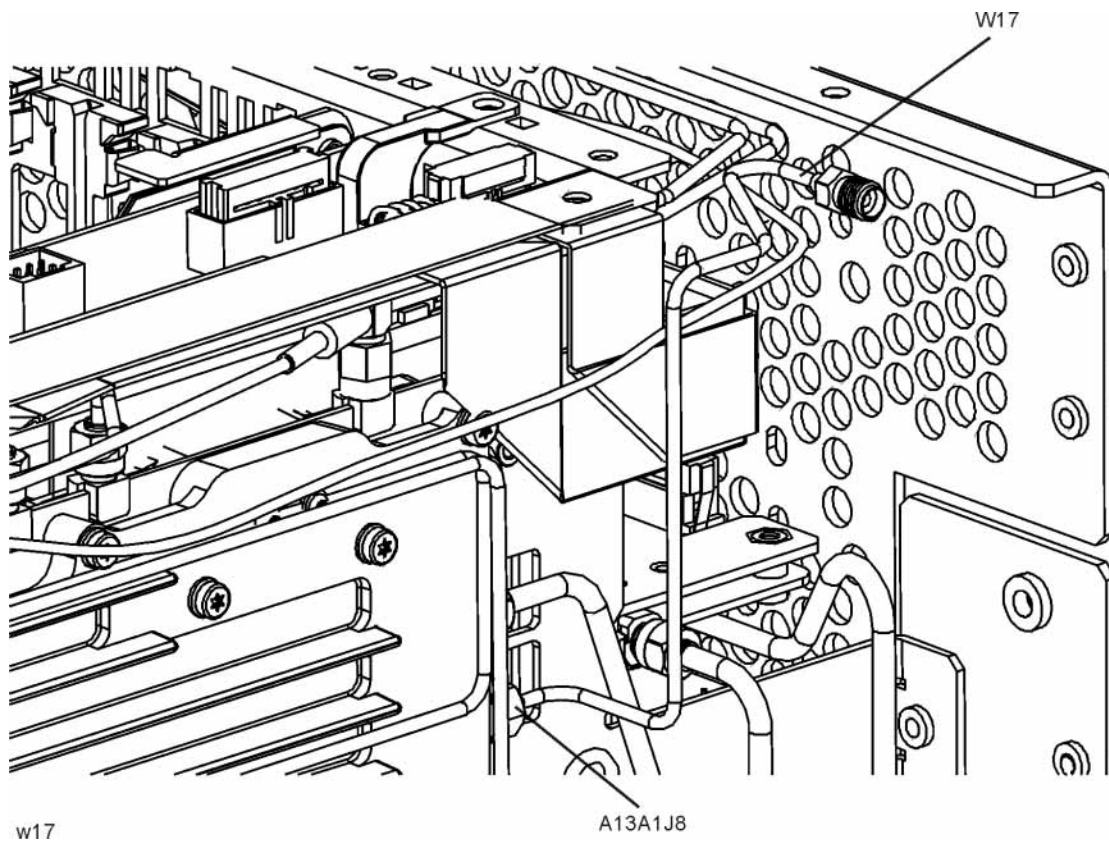**Figure 7**   **RF Front End Assembly Location**

front_end_location_pxa   RF Front End Assembly   W22   50 ohm Load

5. Refer to Figure 6. Replace the six screws **(1)** (0515-0372). Torque to 9 inch-pounds in the sequence shown, starting with #1.

6. Reattach W22 ribbon cable to Front End Controller J102 and W28 ribbon cable between Front End Controller J1300 and A13A1J1 on the RF Front End Assembly.

7. Reattach the cables to A13A1J1, A13A1J2, A13A1J4, A13A1J5, A13A1J6, A13A1J7, A13A1J9 on the RF Front End Assembly. Torque the semi-rigid cables to 10 inch-pounds.

Add Cables to A13 Front End and A15 Front End Controller

1. Locate the flexible coax assembly in the Opt HL6 Cable Kit with Markers. This is cable W30 and should be labeled "8120-2027" and have the ends labeled "903" and "13"

2. Connect the end of W30 that is labeled "903" to A15J903.

3. Connect the end of W30 that is labeled "13" to A13A1J13. J13 is one of the connectors along the right side of A13, near the A12 BYFA. Torque the cable nut to 10 inch-pounds.

4. 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 8. Torque the cable nut to 10 inch-pounds.

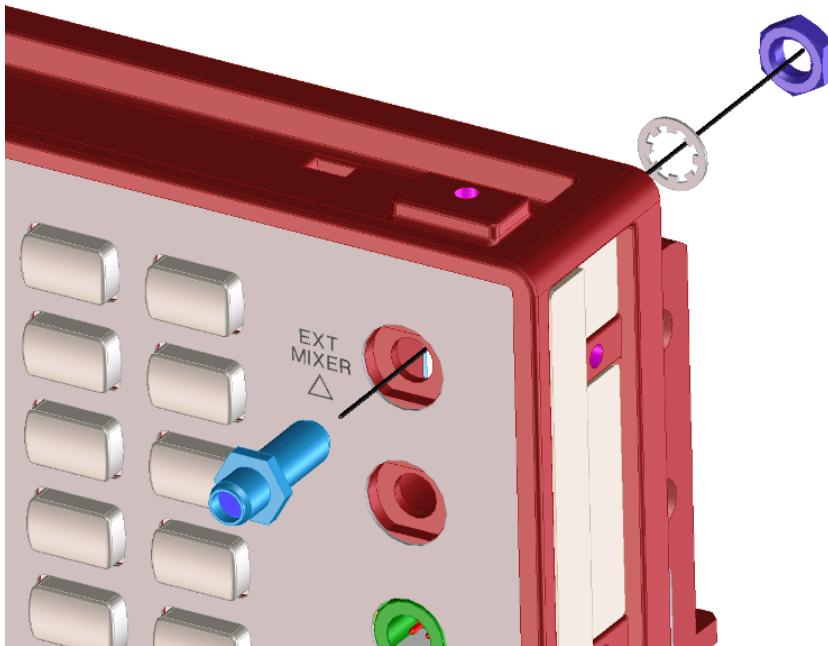**Figure 8**   **Orientation of W17 in an RF/Microwave PXA**

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. On newer PXAs, this hole will be labeled "EXT MIXER". On older PXAs, there will be no label; a label is included in this kit and will be added later.

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 9. Secure the connector using the ¼" lockwasher and ¼" hex nut from the rear. Torque to 21 inch-pounds.
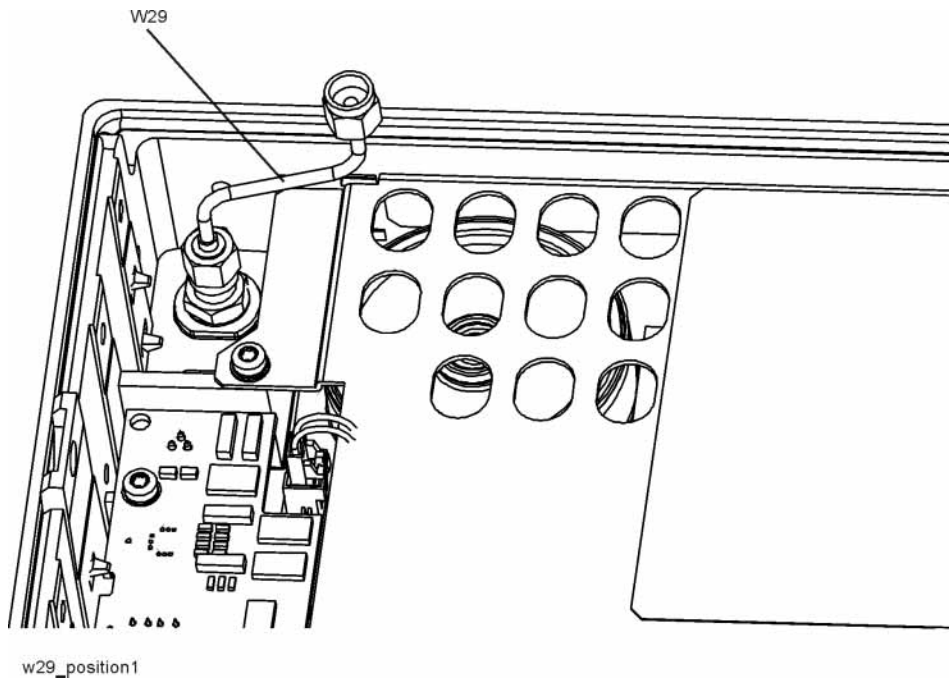
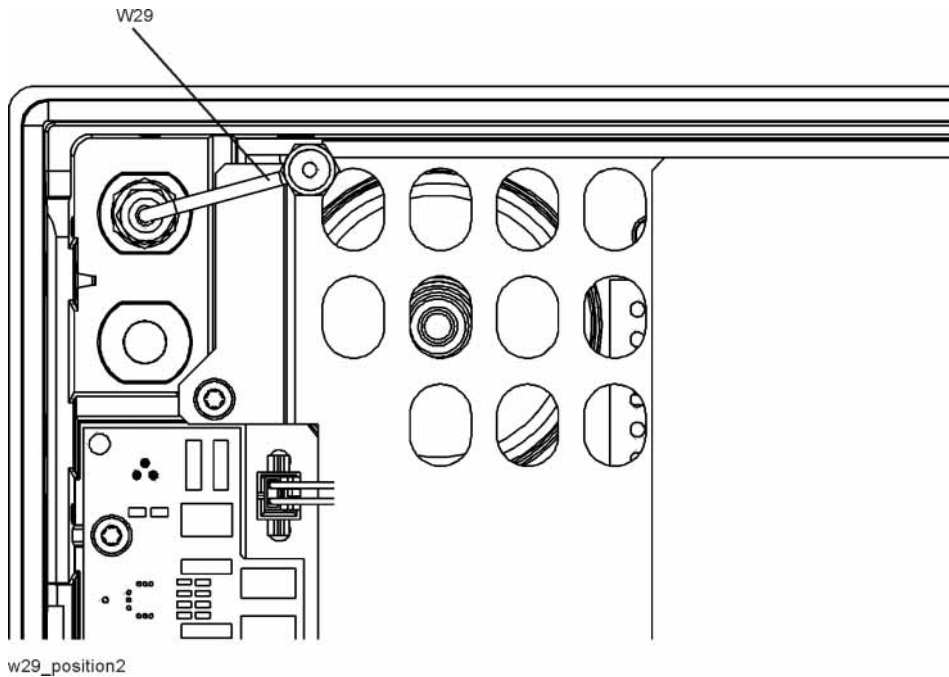**Figure 9   Attaching SMA Female Connector**

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 10.

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 11. Torque the cable nut on the Ext Mixer connector to 10 inch-pounds.

Figure 10   **Connecting W29 to Ext Mixer Connector**

w29_position1

Figure 11   **Proper Orientation of W29**
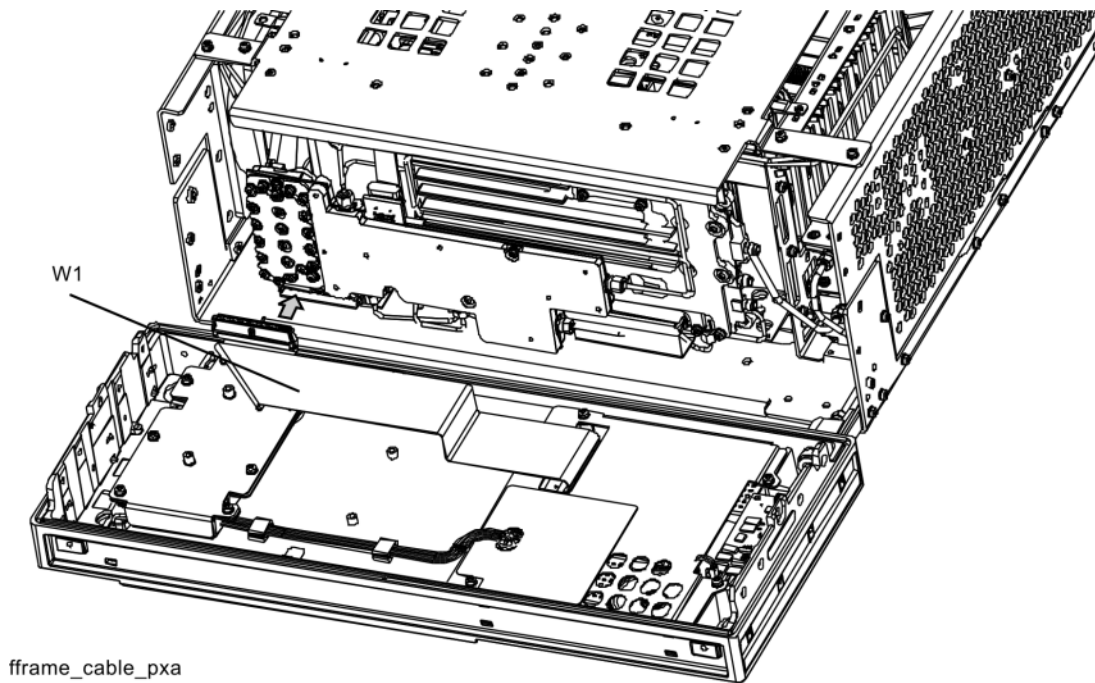

w29_position2

7. If the new front panel SMA connector is not already labeled "EXT MIXER", locate the External Mixing Label in the kit.

8. Clean the area around the SMA connector to ensure the new label will adhere well.

9. Peel off the backing from the label and carefully apply the label to the front panel, making sure that the straight edges of the label are parallel to the top and side edges of the front frame.
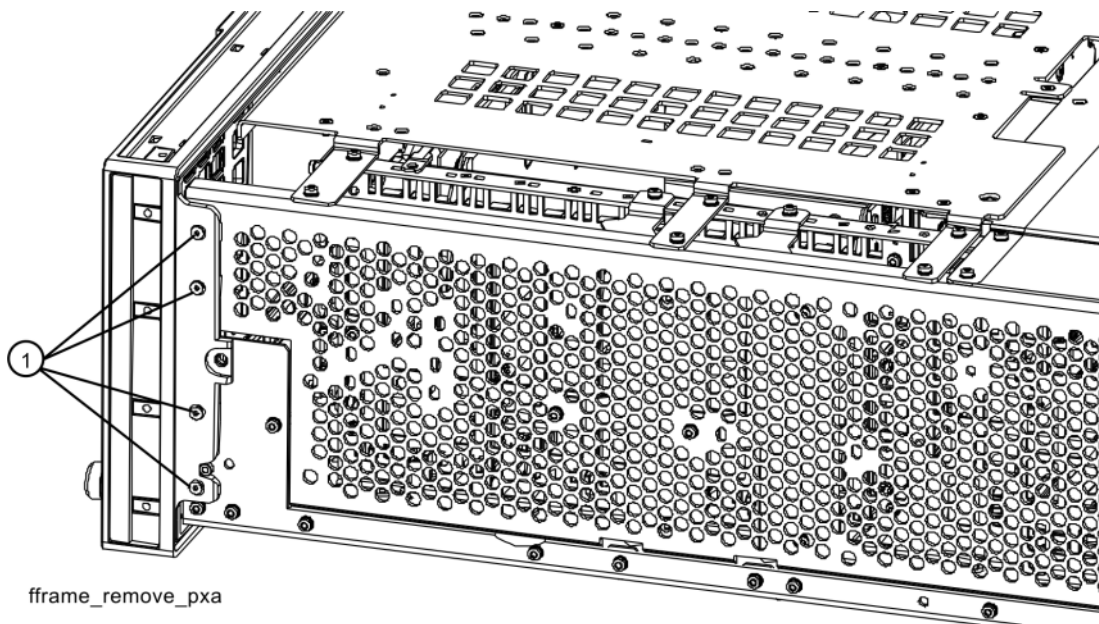
Front Frame Replacement

1. Refer to Figure 12. Reattach the ribbon cable W1. Ensure the locking tabs are engaged.

2. Refer to Figure 13. Carefully position the Front Frame Assembly onto the chassis. Ensure no cables are crushed. Replace the eight screws **(1)** (0515-1035), four on each side of the chassis. Torque to 9 inch pounds.

Figure 12   **Front Panel Cable**

W1

fframe_cable_pxa

Figure 13   **Front Frame Replacement**

1

fframe_remove_pxa
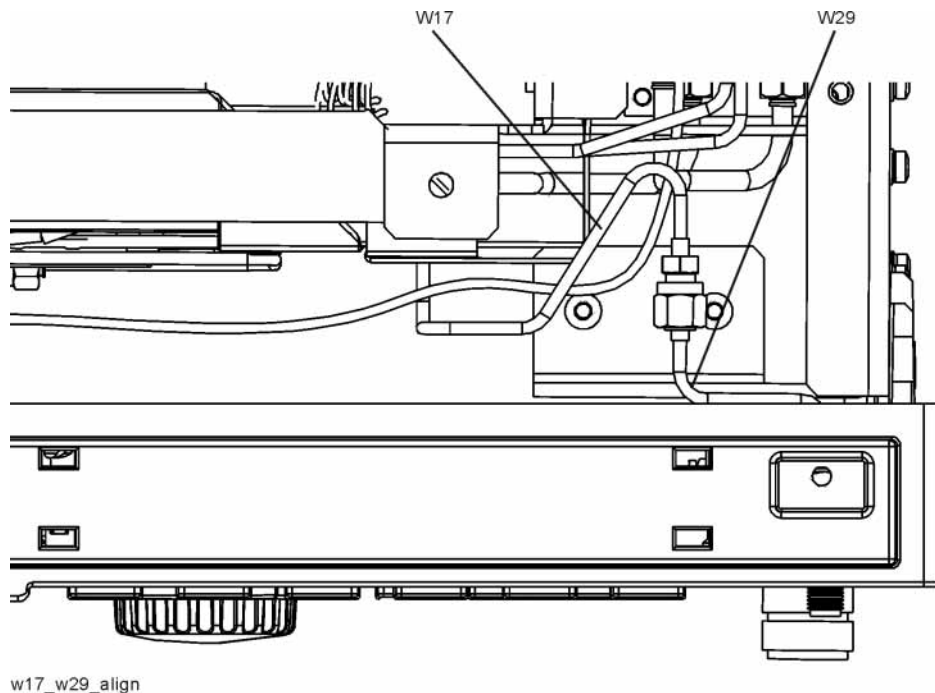
3. Refer to Figure 14. When the front panel is installed, cables W17 and W29 typically do not align. This is OK since the cables are flexible.

4. Refer to Figure 15. Align and connect cables W17 and W29. Hand-tighten the nut.
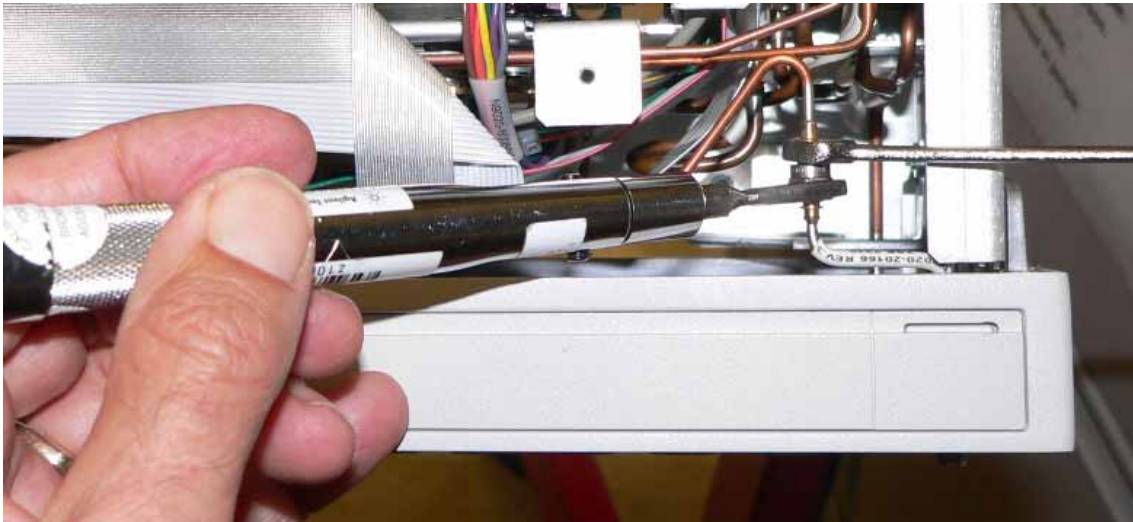
Figure 14   **W17 and W29 Before Alignment**

Figure 15   **W17 and W29 Properly Aligned**

w17_w29_align

5. Refer to Figure 16. 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.

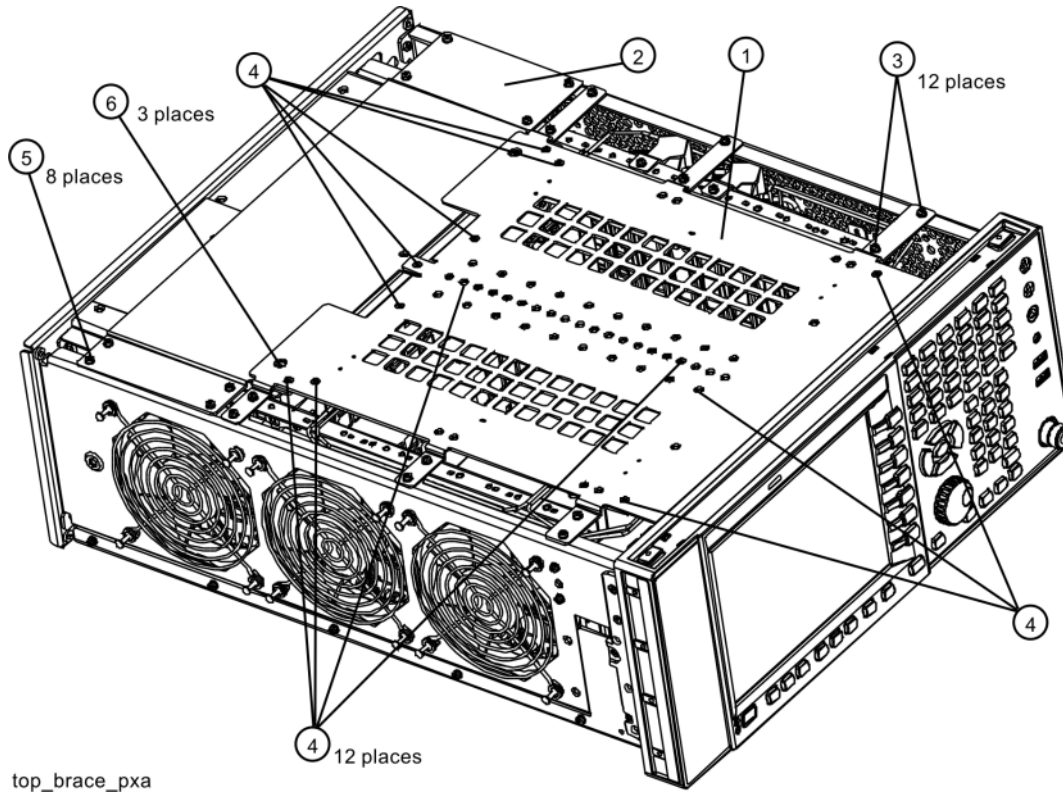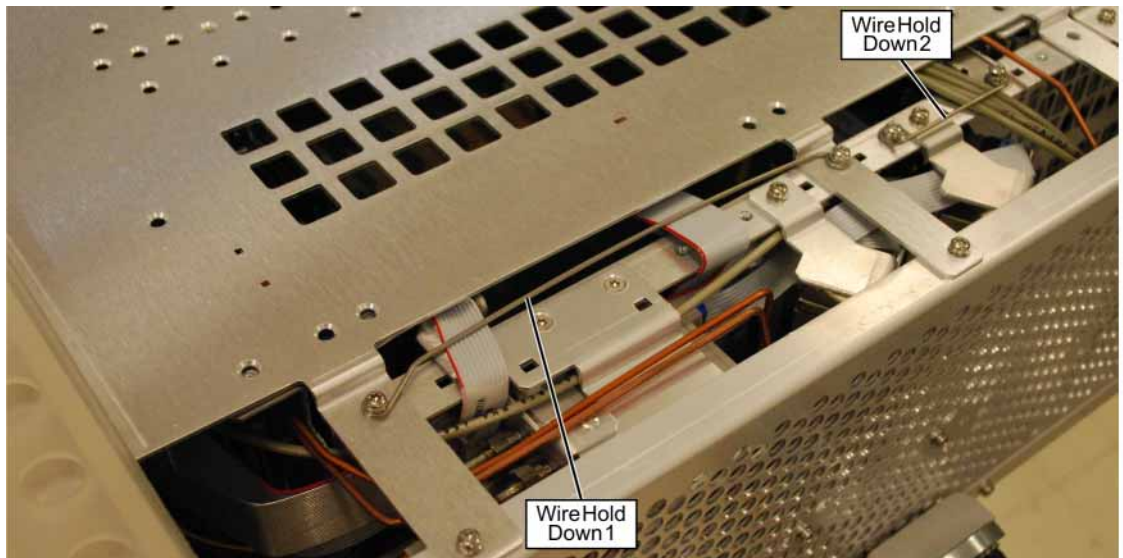**Figure 16**   **Torque Cable W29 onto W17**

Top Brace Replacement

1. Refer to Figure 17. To replace the top brace, place the brace in the correct position and attach to the chassis using the twelve screws **(3)** (0515-0372). Attach the top brace to the boards using the twelve screws (14 screws with Option B1X) **(4)** (0515-1227).

2. Refer to Figure 18. Reinstall wire hold down 1.

3. Torque all screws to 9 inch-pounds.
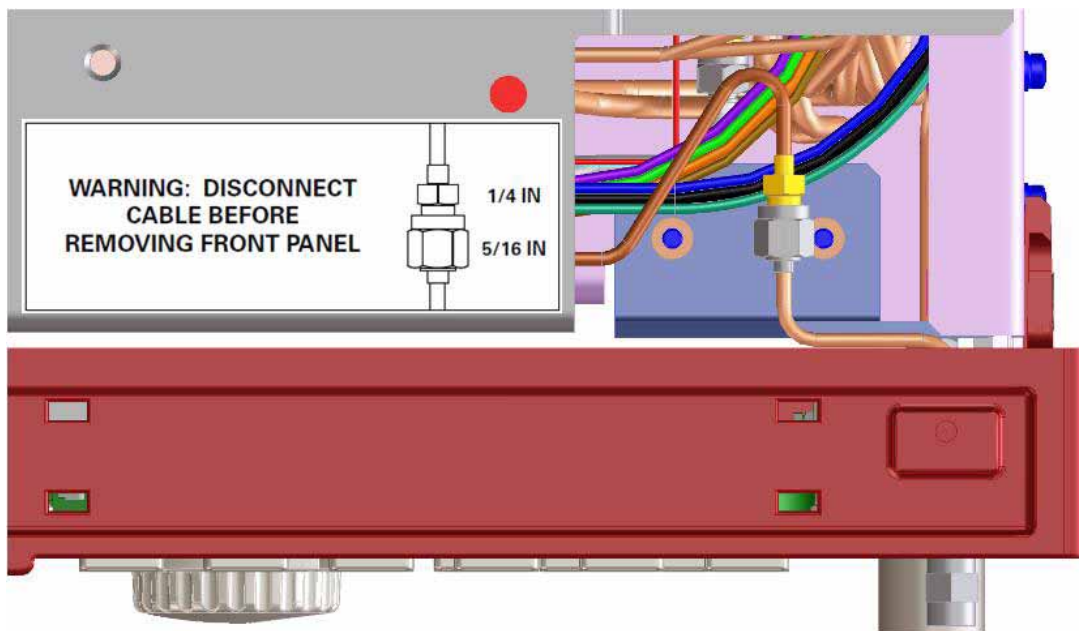
Figure 17   **Top Brace Replacement**

top_brace_pxa

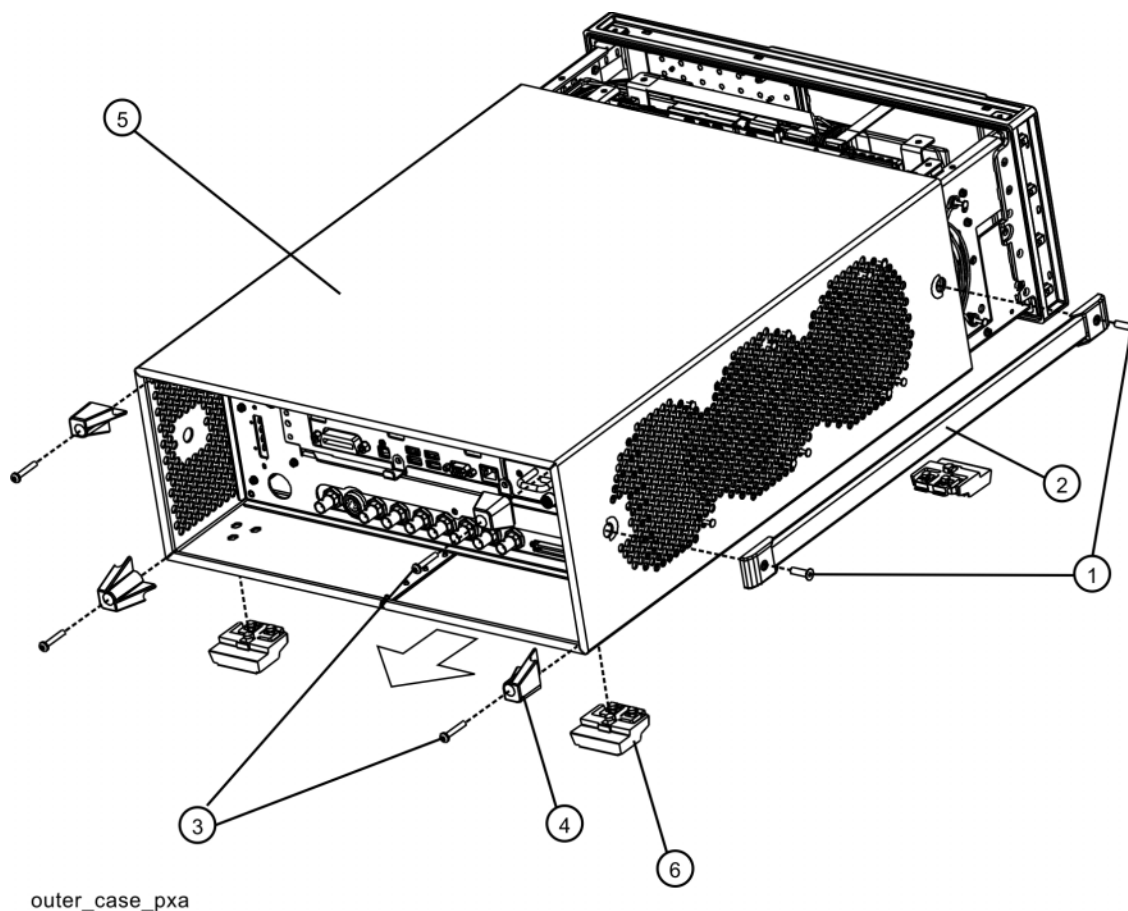**Figure 18**   **Wire Hold Downs**

cable_hold_downs

4. In the upgrade kit, locate the Warning Label, N9030-80018.

5. Refer to Figure 19. Attach the Warning Label to the top brace as shown.

Figure 19   **Add Warning Label to Top Brace**

Final Assembly

1. Refer to Figure 20. 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. Locate the 50 ohm SMA termination in the kit, part number 1810-0118. Attach the SMA termination to the front panel EXT MIXER connector.

Figure 20   **Instrument Outer Cover Replacement**

outer_case_pxa

Update Instrument Software

Go to the following website and determine whether or not the analyzer has the latest instrument software already installed (the currently-installed software was noted in the Analyzer Information procedure at the beginning of the installation procedure):

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

If the analyzer does not have the latest instrument software already installed, download and install the latest version.

NOTE	SW revision A.08.54 is the minimum revision to allow external mixing to function with supported mixers.

Licensing the New Option

Installation Procedure over USB

1. Locate the Option Upgrade Entitlement Certificate (5964-5178) 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 21. This menu may be configured according to your preferences.

Figure 21   **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 Agilent License Manager will display a "Successful License Installation" message as shown in Figure 22.

Figure 22   **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 options listed:

   • N9030A-EXM   External Mixing

   • N9060A-5FP   ACP 18 Carrier Enhancement

Verify Optional Functionality

1. Press **Mode, Spectrum Analyzer**

2. Press **Input/Output**

3. Verify that softkey "**External Mixer**" appears below the "**RF Input**" softkey

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.agilent.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

- Frequency Response (All Tests)

- Attenuator Slope

- TOI Adjustment

- Effective DANL

- LO Output Adjustment

- IF Input Adjustment

Performance Testing Required

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

- Residual Responses

- Displayed Average Noise Level

- Spurious Responses

- Third Order Intermodulation

- Second Harmonic Distortion

- Absolute Amplitude Accuracy

- Frequency Response (All Tests)

- Effective DANL

- LO Output Accuracy

- IF Input 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 Agilent Technologies Sales and Service Office. To find your local Agilent office access the following URL, or if in the United States, call the following telephone number:

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

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