# N9048B PXE EMI Receiver

N9048BU-WF1
Wideband Digital IF Hardware and
Software Options N9048TDSB, N9048WT1B,
and N9048WT2B

KEYSIGHT

INSTALLATION NOTE

# Notices



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# N9048BU-WF1 - Wideband Digital IF Hardware

| | |
|---|---|
| Products Affected: | N9048B PXE EMI Receiver |
| Requirements: | – Instrument Software Version A.32.03 or newer<br>– Access to the Instrument Administrator Login<br>– Keysight N7818A MXE and PXE Calibration and Adjustment Software (revision E.10.00 or later) |
| To Be Performed By: | (X) Service Center<br>( ) Advanced User<br>( ) User |
| Estimated Installation Time:<br>Estimated Adjustment Time:<br>Estimated Verification Time: | 3.0 Hours<br>none<br>8.0 Hours (Full Performance Verification Required) |

This document provides detailed instructions for the installation of Option N9048BU-WF1 - Wideband Digital IF Hardware in a N9048B PXE EMI Receiver. Please be sure to read this entire document before attempting to perform this upgrade.

## Tools Required

– Torx Driver T-20

– Torx Driver T-10

– Diagonal Cutters

## Contents

| Quantity | Description | Part Number |
|---|---|---|
| 1 | Installation note, Wideband Digital IF | N9048-90021 |
| 1 | Wideband Digital IF assembly, tested | N9030-60048 |
| 1 | Label, Wideband Digital IF | N9048-80014 |
| 1 | Cable Assembly-Coaxial A32/A32 50-Ohm MMCX-Male-Right angle MMCX-Male-Right angle 570mm-LG | 8121-2292 |
| 1 | Cable-Assembly Coaxial A32/A32 530-MM-LG | 8121-1401 |
| 2 | Cable Assembly-Coaxial A32/A32 MMCX-Male-Right angle MMCX-Male-Right angle 120mm-LG | 8121-0152 |
| 1 | Cable Assembly-LPF.J4-Preselector | N9048-21336 |
| 1 | Cable Assembly-Coaxial A12/A32 50-Ohm MMCX-Male-Right angle SMA-Male-Right angle, with toroids | N9048-21000 |
| 1 | Cable Assembly-Coaxial A32/A32 50-Ohm MMCX-Male-Right angle MMCX-Male-Right angle 710mm-LG | 8121-2291 |
| 1 | Cable Assembly-Coaxial A32/A32 50-Ohm MMCX-Male-Right angle MMCX-Male-Right angle 380mm-LG | 8121-2288 |
| 1 | Cable Assembly-Coaxial A32/A32 50-Ohm MMCX-Male-Right angle MMCX-Male-Right angle 760mm-LG | 8121-1919 |
| 1 | Bracket, Cable mounting | N9048-00017 |
| 16 | Screw-Machine 90-DEG-flat-HD Torx-T10 M3X0.5, 6 mm-LG SST 300 passivated | 0515-1946 |
| 2 | Screw-Machine W/Patch-Lock 90-DEG-Flat-HD Torx-T10 M3X0.5, 8 mm-LG SST-300 passivated | 0515-2032 |
| 1 | Screw-Machine W/Crest-Cup-Con-Washer Pan-HD Torx-T10 M3X0.5, 8 mm-LG SST-300 passivated | 0515-0372 |
| 2 | Spiral-Wrap 30.5m-LG 9.5mm-Wrap-Wide Polyethylene natural | 0890-0025 |
| 4 | Cable tie | 1400-0249 |

## What you will find in this document

## ESD Information

### Protection from Electrostatic Discharge

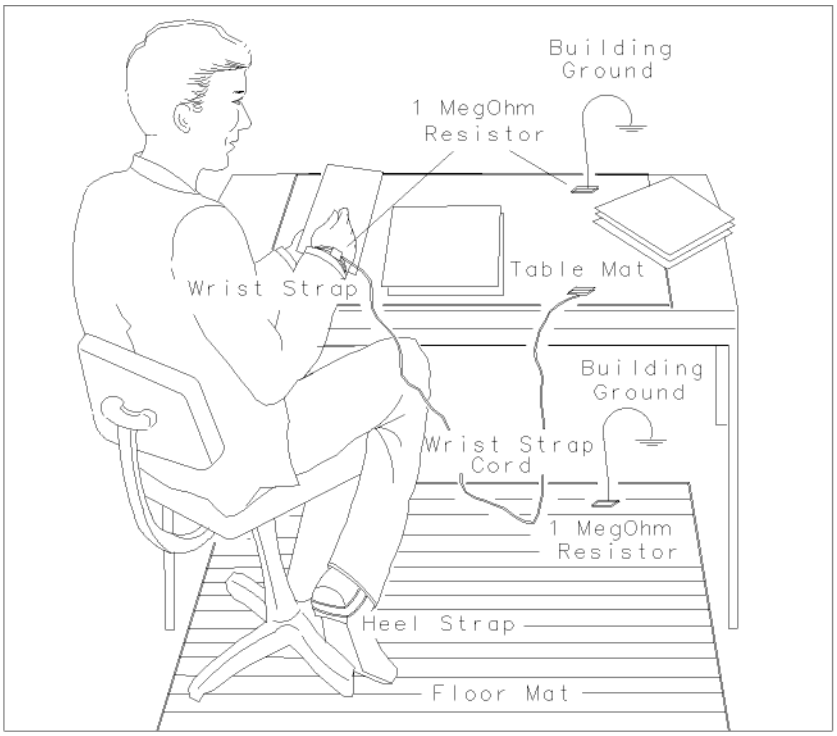
Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe workstation. Figure 1 shows an example of a static-safe workstation using two types of ESD protection:

- 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 megohm of isolation from ground.

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

Figure 1 Example of a Static-Safe Workstation



## Handling of Electronic Components and ESD

The possibility of unseen damage caused by ESD is present whenever components are transported, stored, or used. The risk of ESD damage can be greatly reduced by paying close attention to how all components are handled.

- Perform work on all components at a static-safe workstation.
- Keep static-generating materials at least one meter away from all components.
- Store or transport components in static-shielding containers.

**CAUTION** Always handle printed circuit board assemblies by the edges. This will reduce the possibility of ESD damage to components and prevent contamination of exposed plating.

## Test Equipment Usage and ESD

- Before connecting any coaxial cable to an analyzer connector, momentarily short the center and outer conductors of the cable together.
- Personnel should be grounded with a 1 megohm resistor-isolated wrist-strap before touching the center pin of any connector and before removing any assembly from the analyzer.
- Be sure that all analyzers are properly earth-grounded to prevent build-up of static charge.

## For Additional Information about ESD

For more information about preventing ESD damage, contact the Electrical Over Stress/Electrostatic Discharge (EOS/ESD) Association, Inc. The ESD standards developed by this agency are sanctioned by the American National Standards Institute (ANSI).

## Installation Instructions

### Instrument Software Version Verification

1. Determine what version of instrument software is currently installed in the PXE being upgraded by pressing the following front panel keys:

   **System**, **Show**, **System**

   The software revision can be found on this screen as the:

   **Instrument S/W Revision**

**NOTE** If the instrument software version is not **A.32.03** or higher it will need to be updated before proceeding with this upgrade.

If a software update is required, the latest version of PXE instrument software and installation instructions can be downloaded from:

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

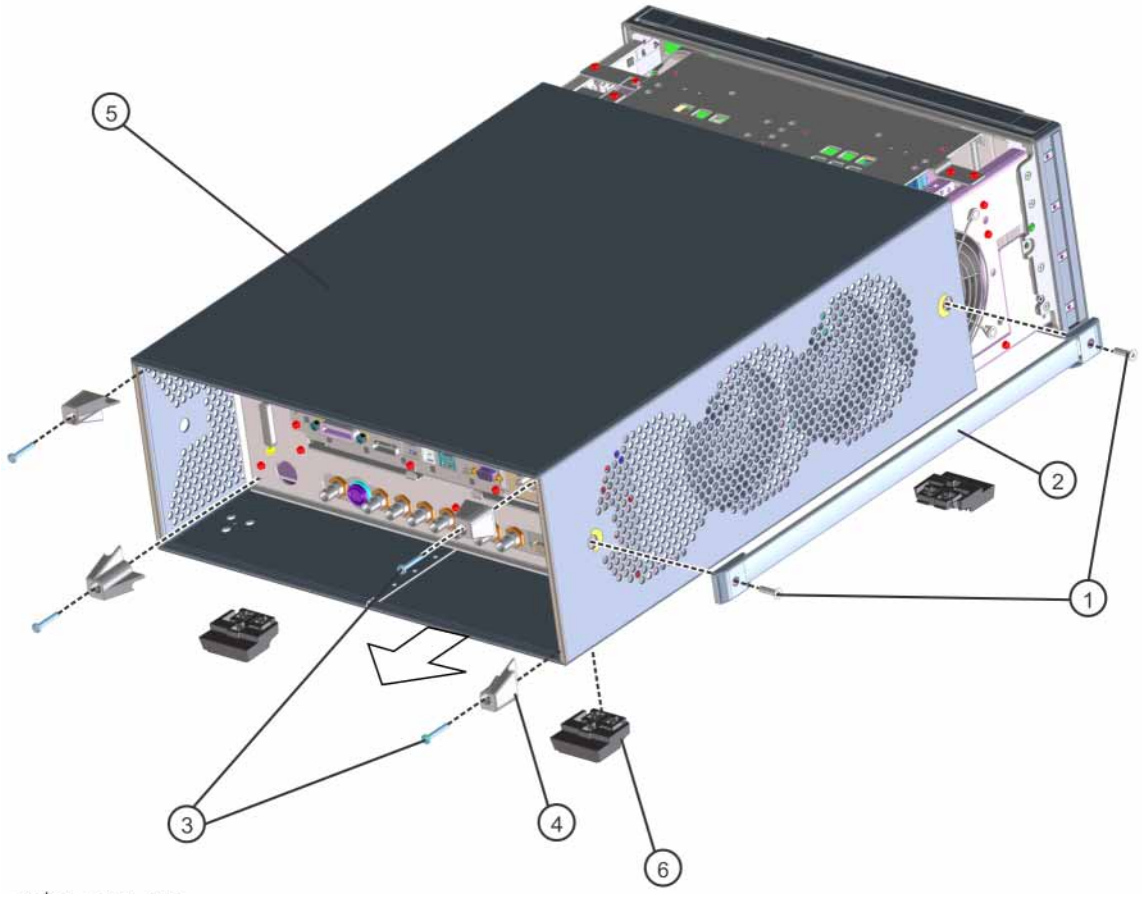
Once the instrument software requirement has been met proceed to step 2.

## Instrument Dress Cover Removal

**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.

2. Turn the instrument off and remove the ac power cord.
3. Refer to Figure 2. Using the T-20 driver, remove the four screws (1) that attach the strap handles (2) to each side of the instrument.
4. Remove the four bottom feet and locks (6) by lifting the tabs on the feet and sliding them to disengage from the outer case.
5. Using the T-20 driver, remove the four screws and washers (3) that hold the four rear feet (4) in place.
6. The instrument dress cover (5) can now be removed by pulling it off to the rear of the instrument.

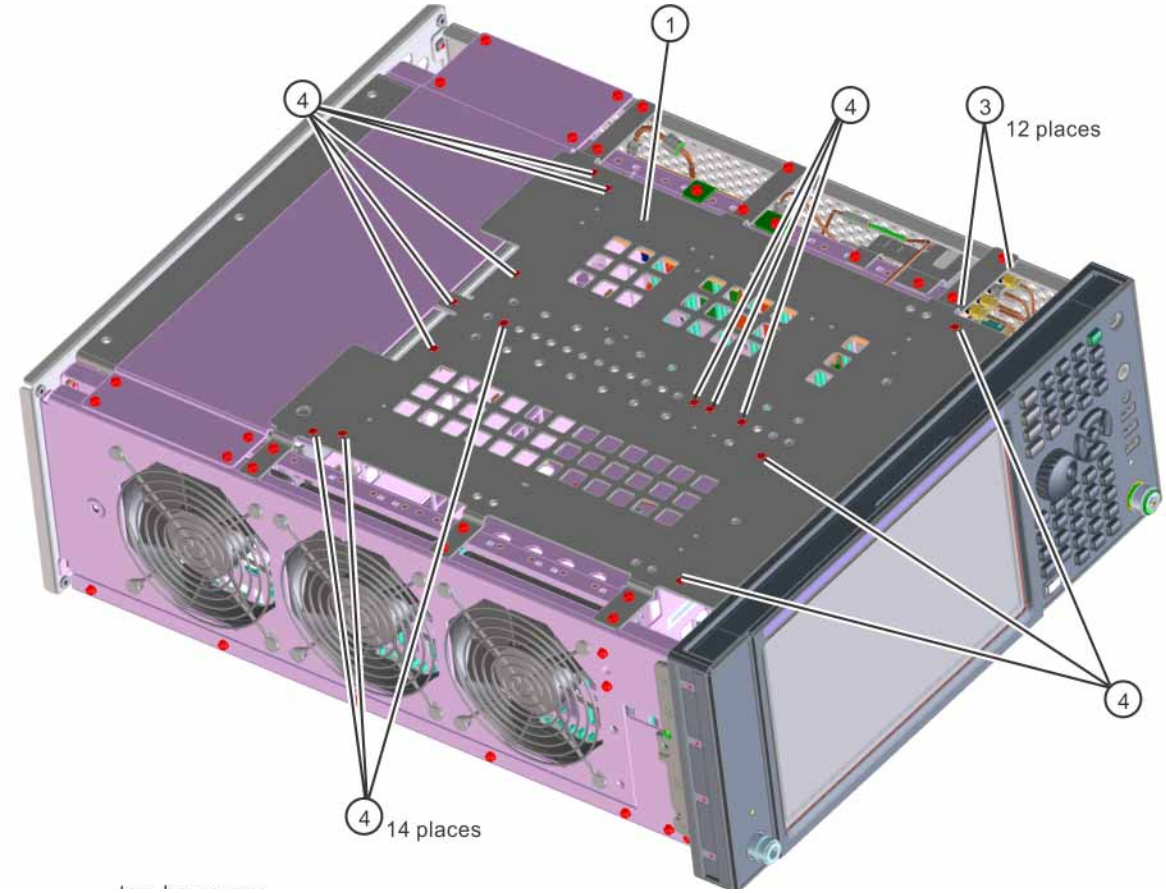
Figure 2 Instrument Dress Cover Removal



## Top Brace Removal

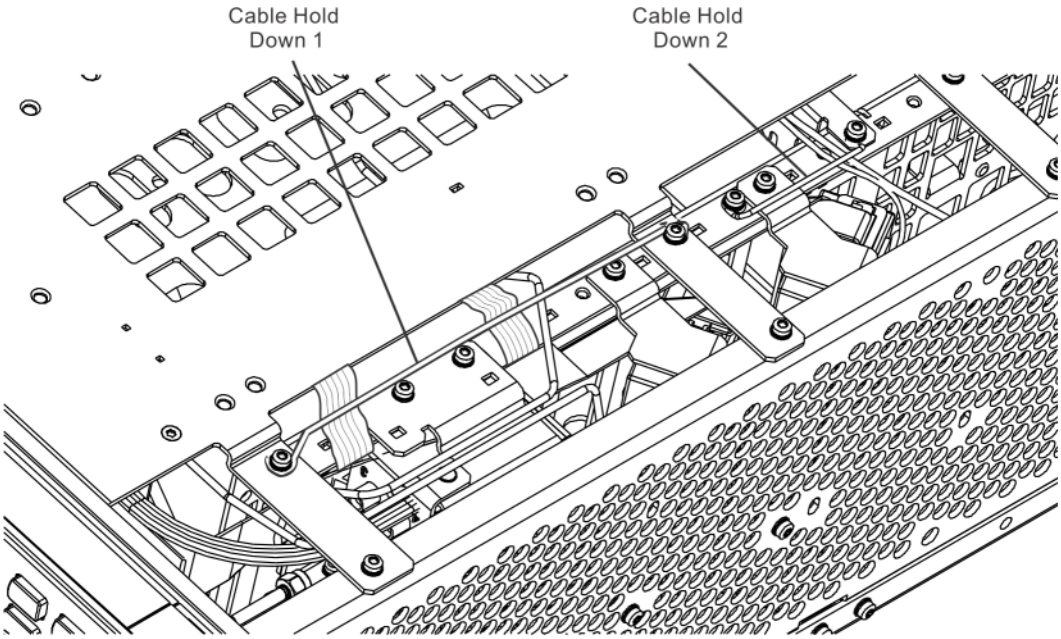
7. Refer to Figure 3. Using the T-10 driver remove the twelve pan head screws (3) (0515-0372) attaching the top brace (1) to the chassis, along the Cable Hold Down 1 as shown in Figure 4.
8. Remove the fourteen flat head screws (4) (0515-1946) attaching the top brace to the board assemblies. The top brace can now be removed.

**Figure 3** Top Brace Removal



**9.** Refer to Figure 4. Cable Hold Down 1 is to be removed to allow access under the top brace. Cable Hold Down 2 is to be removed to allow the cables routing to be consolidated and tidied after installation of the new board.

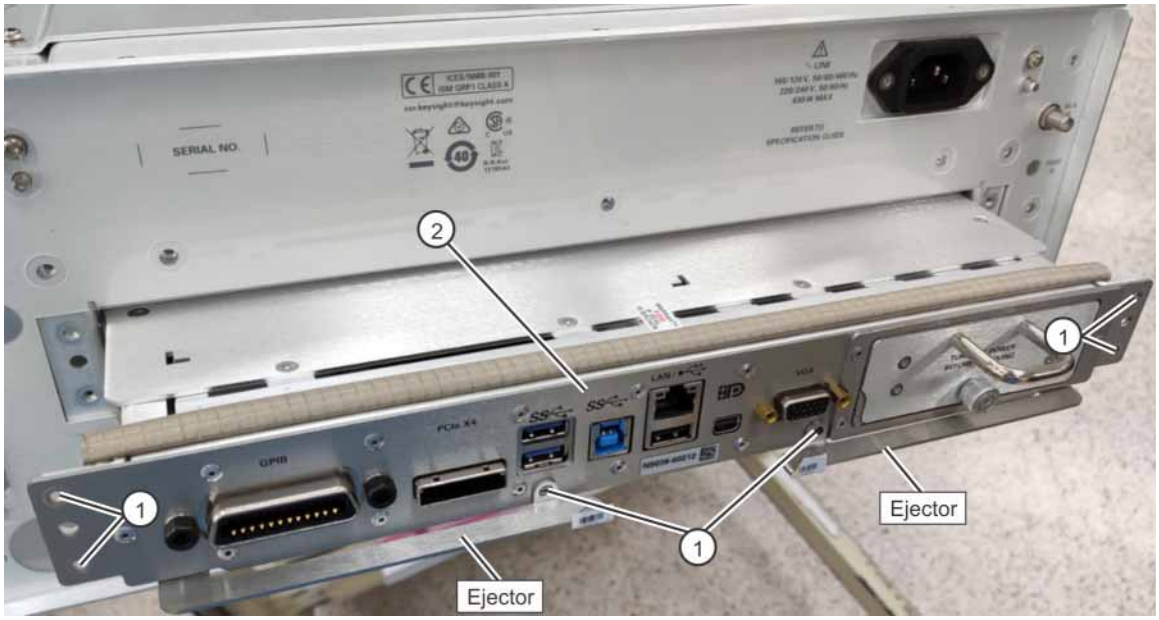
**Figure 4** Cable Hold Downs



## CPU Removal

**10.** Refer to Figure 5. Using the T-10 driver, remove the six pan head screws (1) (0515-0372) attaching the CPU (2) to the instrument. The CPU assembly can be removed by pulling straight out the back. Use the two ejectors to pull the CPU assembly out from the chassis.

Figure 5 CPU Removal

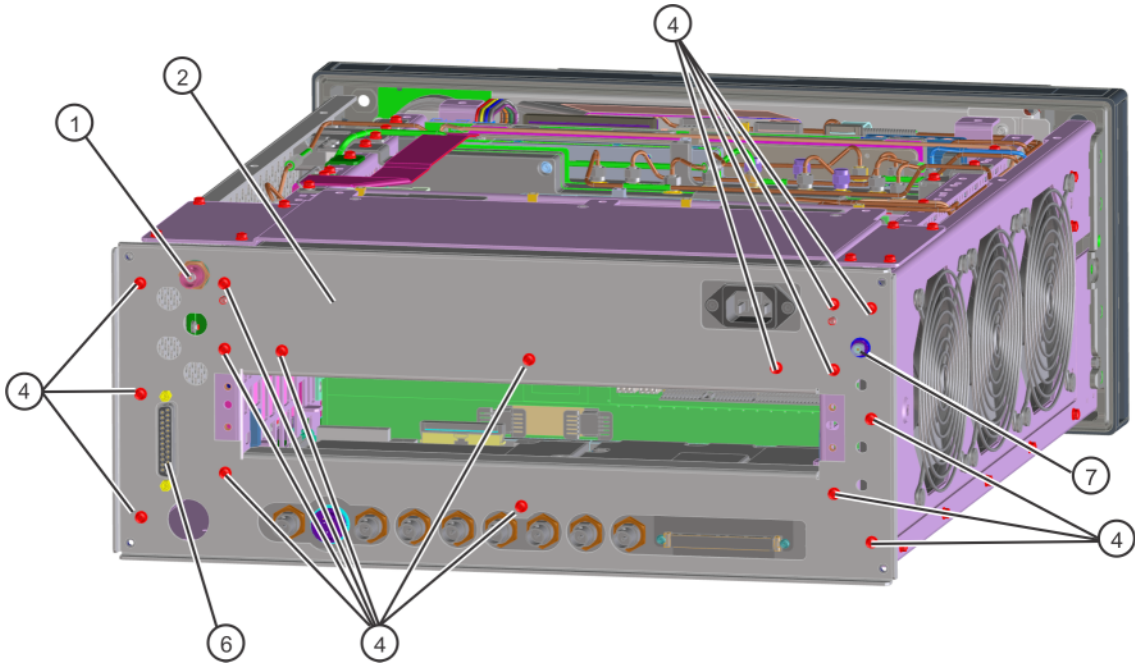


## Rear Panel Screw Removal

**NOTE** It is not necessary to completely remove the rear panel. After the screws are removed, leave the rear panel in place until the side panel has been removed in step 12.

11. Refer to Figure 6. Using the T-10 driver, remove the sixteen pan head screws (4) (0515-0372) attaching the rear panel (2) to the instrument. For convenience, it is not necessary to remove any of the rear panel cables (1), (6), and (7). Refer to Figure 8, where the rear panel has been repositioned to sit on top of the power supply brace after the side panel has been removed.

**Figure 6** Rear Panel Removal



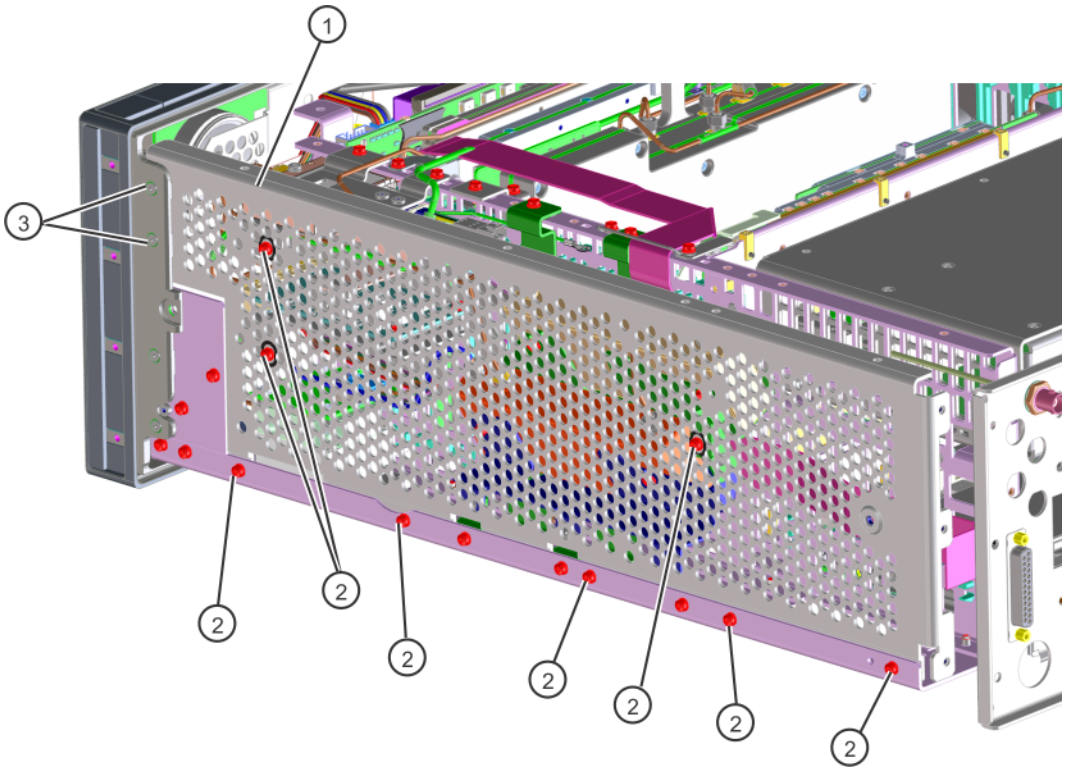
## Right Outer Chassis Side Removal and Reposition of Rear Panel

**12.** Refer to Figure 7. Using the T-10 driver remove the two flat head screws (3) (0515-1035) attaching the right outer chassis side (1) to the front frame assembly.

**NOTE** The two flat head screws (0515-1035) used to attach the right outer chassis side to the front frame assembly are longer than the rest of the flat head screws removed during this upgrade. Be sure to note this fact once they are reused so that they will be sure to go back to the correct location during reassembly

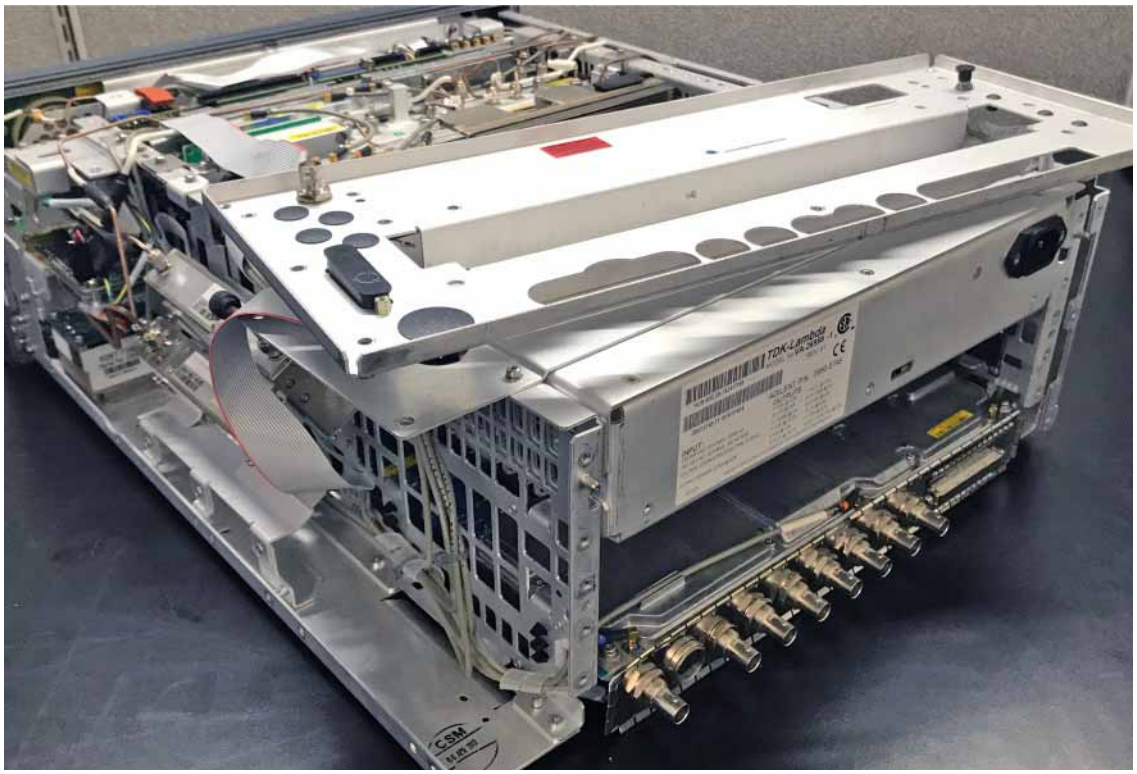
**13.** Using the T-10 driver, remove the eight pan head screws (2) (0515-0372) attaching the right outer chassis side to the instrument. The right side outer chassis can now be removed.

**Figure 7** Right Outer Chassis Side Removal



**14.** Refer to Figure 8. Carefully pull the rear panel away from the chassis enough to allow the rear panel to be repositioned to sit on top of the power supply brace.

**Figure 8** Rear Panel Reposition

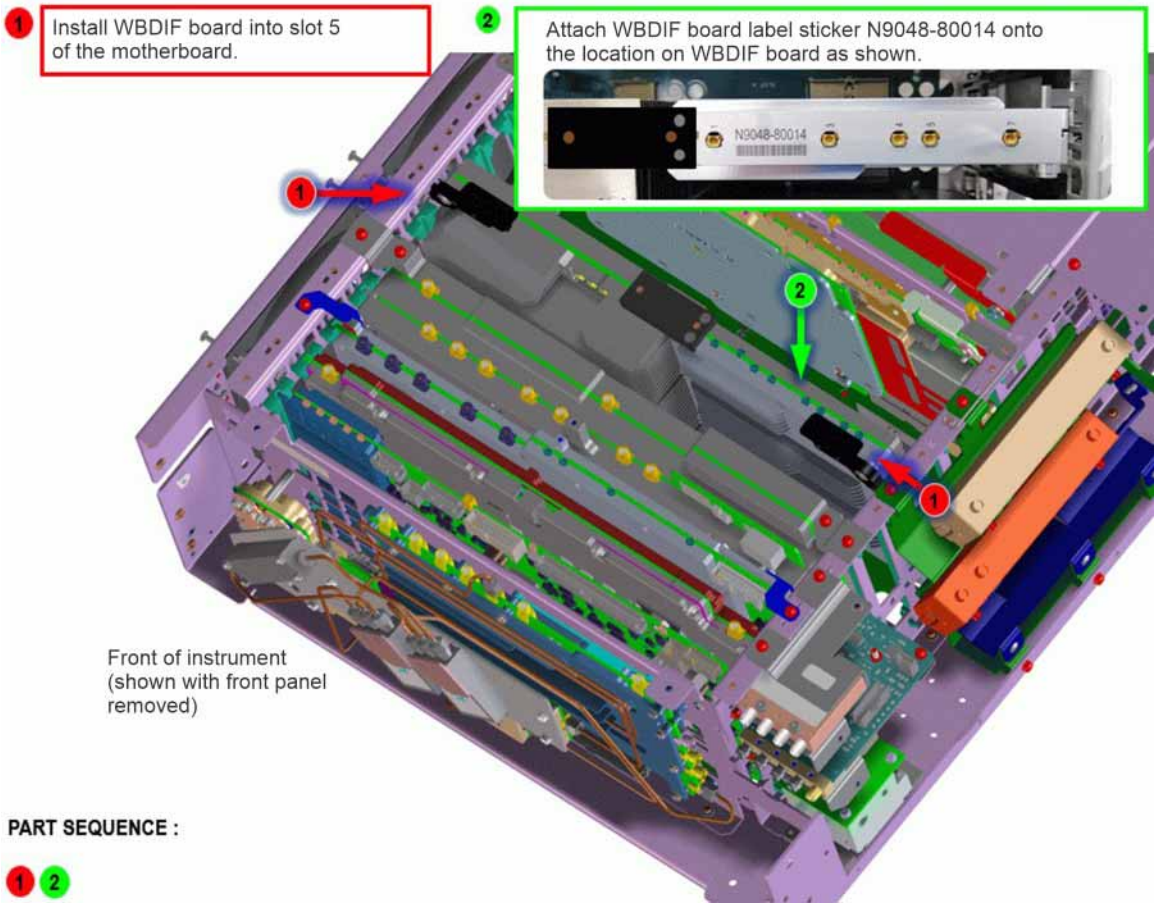


## Install Wideband DIF Board

**15.**Refer to Figure 9. Insert the Wideband DIF board N9030-60048 into Slot 5 of the PXE chassis.

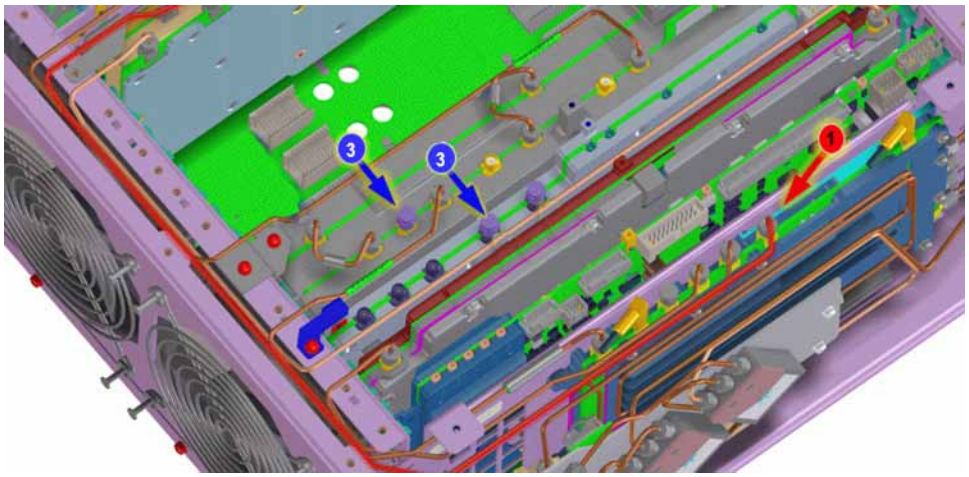
**16.**If it's not on there already, install the label N9048-80014 as shown below.

**Figure 9** Install WBDIF Board



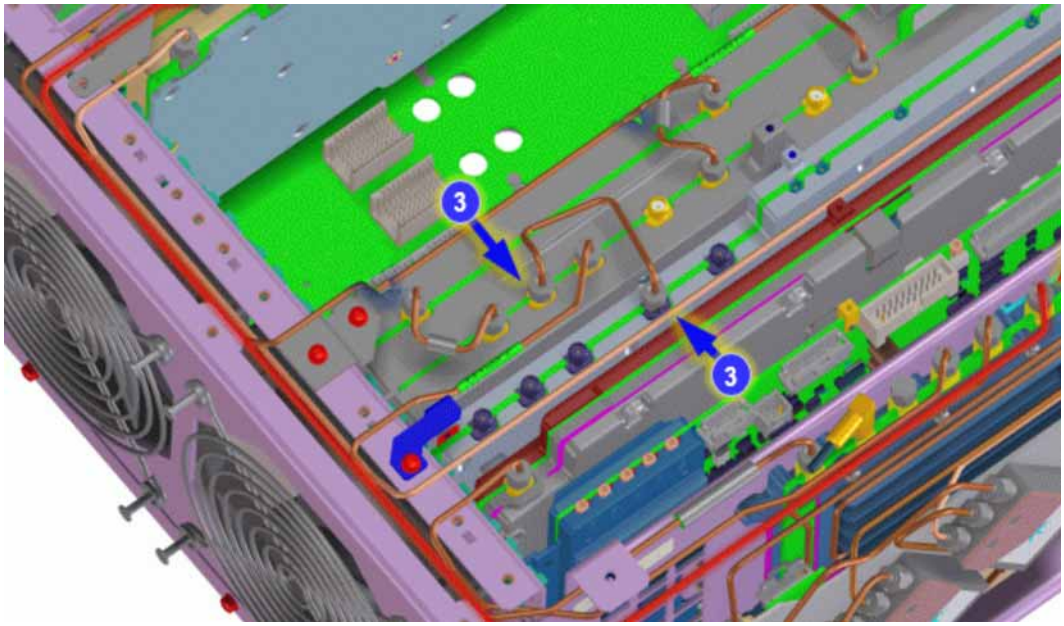
**17.** Refer to Figure 10. Remove the 50 ohm terminations (3) (if present) from LPF J4 and the Preselector. They will not be reused.

**Figure 10** Remove termination from LPF J4




**18.** Refer to Figure 11. Install cable N9048-21336 (3) from LPF J4 to Preselector.

**Figure 11** Install cable N9048-21336 from LPF J4 to Preselector

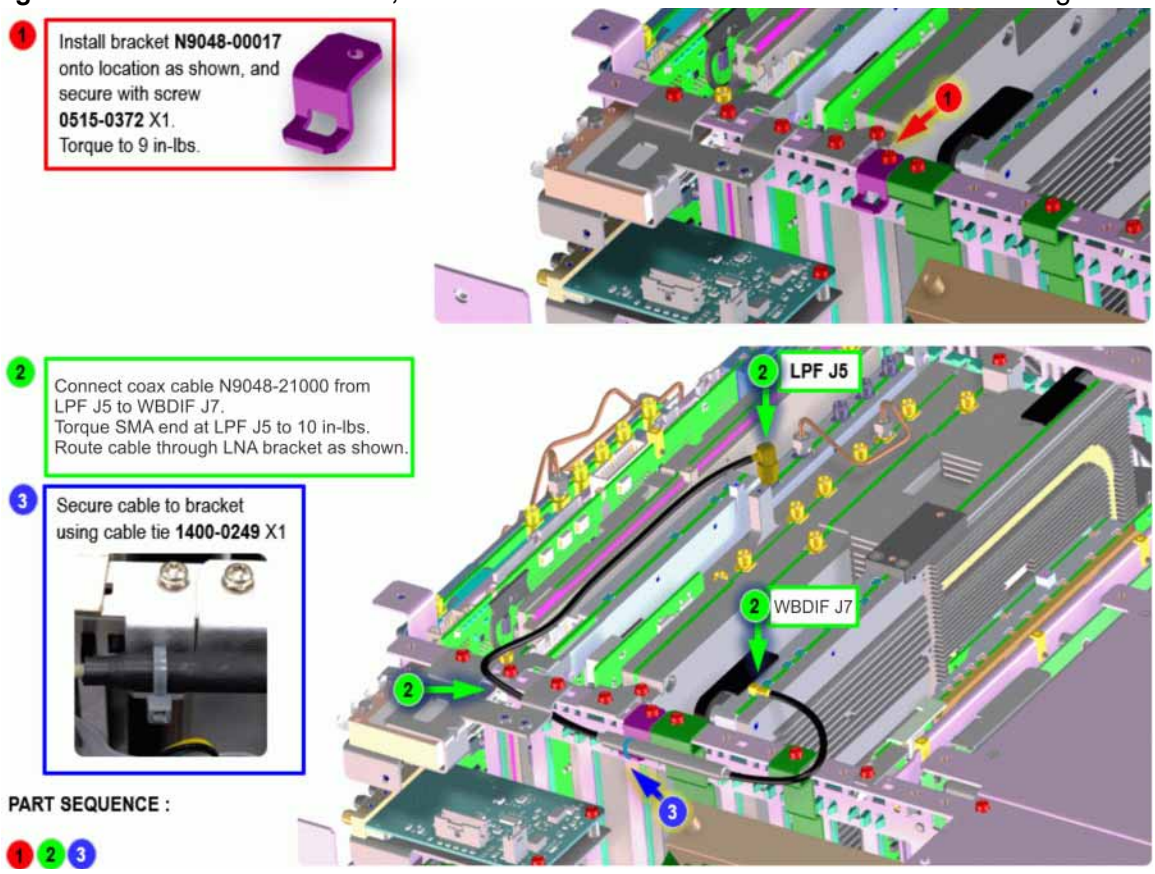


**19.** Refer to Figure 12. Install the N9048-00017 bracket in the location shown (1). Secure with a screw. Torque to 9 inch-lbs.

**20.** Connect the N9048-21000 coax cable (2) from LPF J5 to WBDIF J7. Route the cable through the LNA bracket as shown. Torque the SMA end at LPF J5 to 10 inch-lbs.

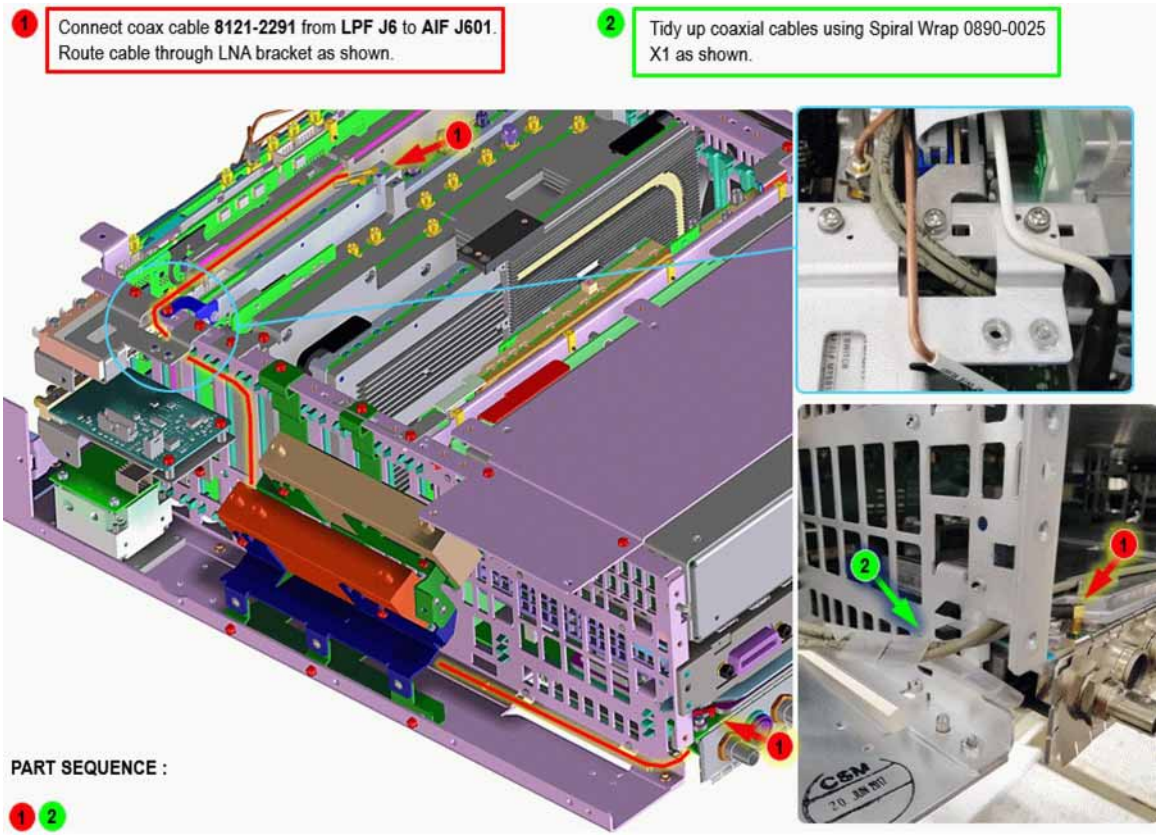
**21.** Secure the cable to the bracket using a cable tie (3) 1400-0249, then snip the cable tie end as shown in Figure 12 (window number 3) using the diagonal cutters.

**Figure 12** Install bracket, connect coax cable N9048-21000 and cable routing



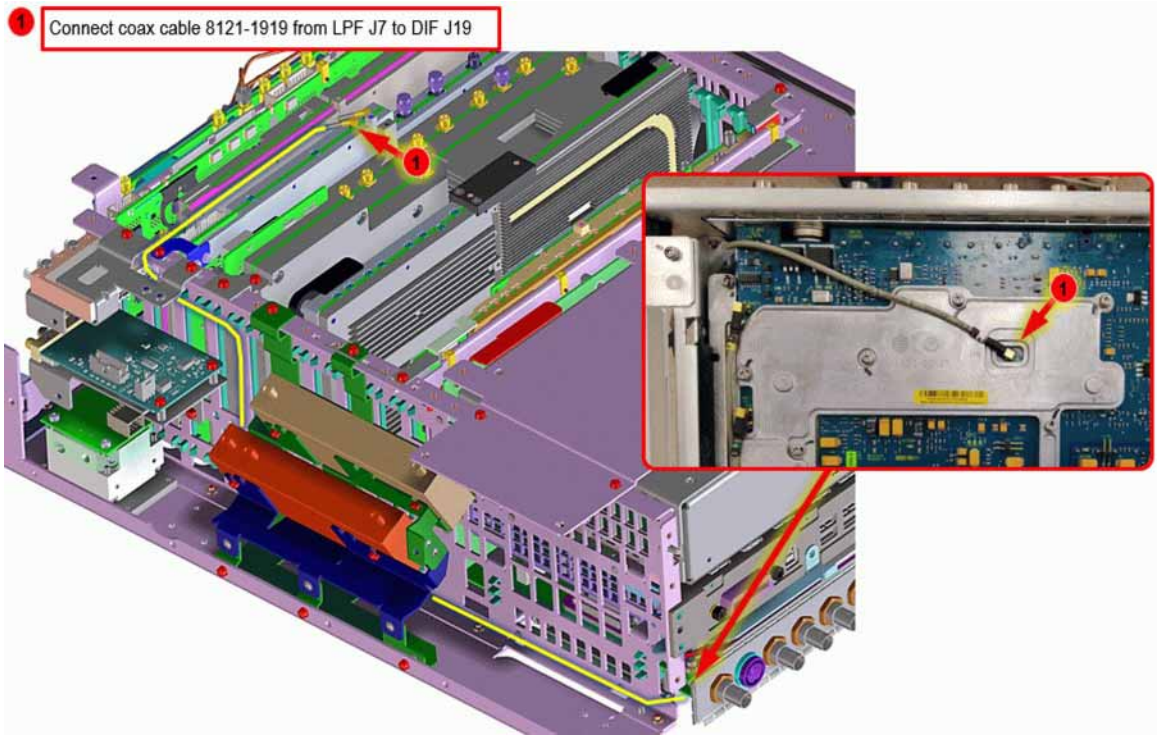
**22.** Refer to Figure 13. Connect the 8121-2291 coax cable from LPF J6 to Analog IF (AIF) J601. Route the cables as shown. Snip the cable tie ends with the diagonal cutters.

**Figure 13** Connect coax cable 8121-2291 and cable routing



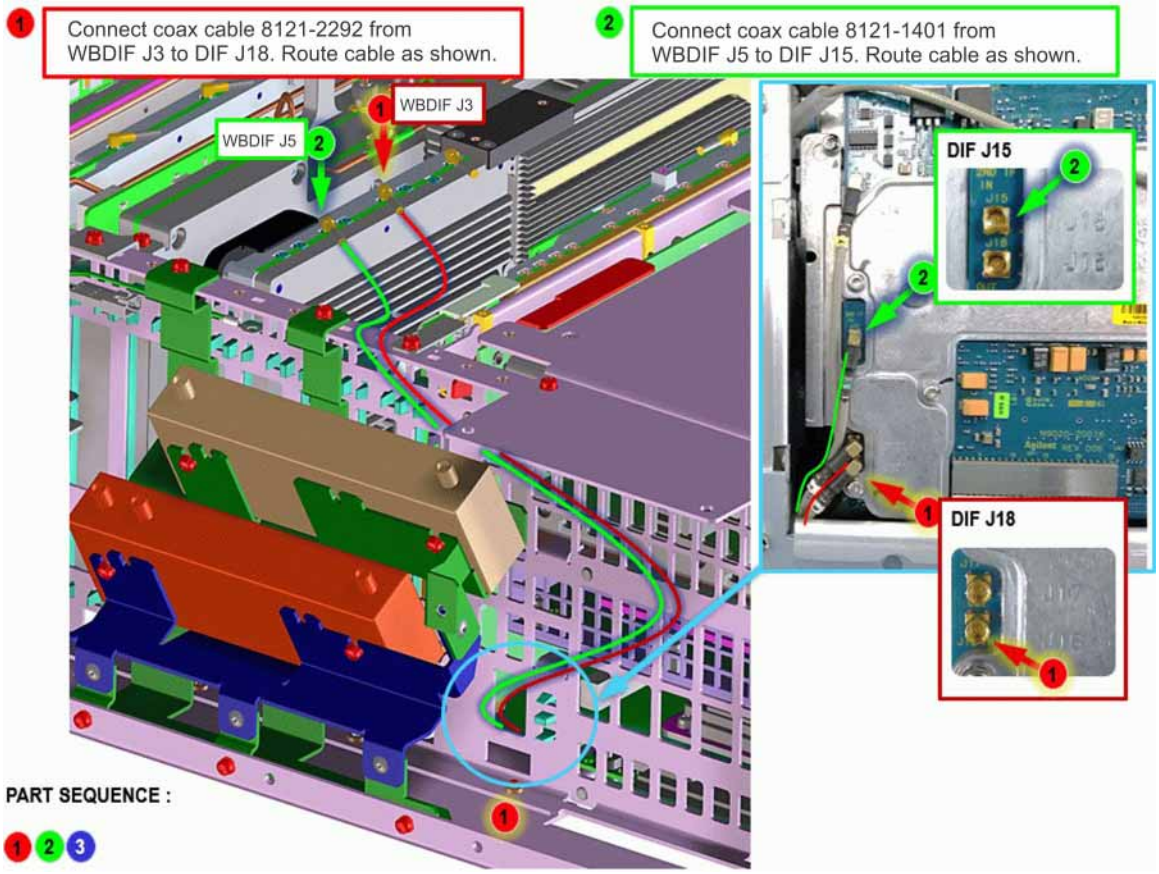
**23.** Refer to Figure 14. Connect the 8121-1919 coax cable to the LPF J7 port and then onto Digital IF board J19. Route the cables as shown.

**Figure 14** Connect coax cable 8121-1919 and cable routing



**24.** Refer to Figure 15. Connect the 8121-2292 coax cable from WBDIF J3 to DIF J18. Connect the 8121-1401 coax cable from WBDIF J5 to DIF J15. Route the cables as shown.

**Figure 15** Connect coax cables 8121-2292 and 8121-1401 and cable routing



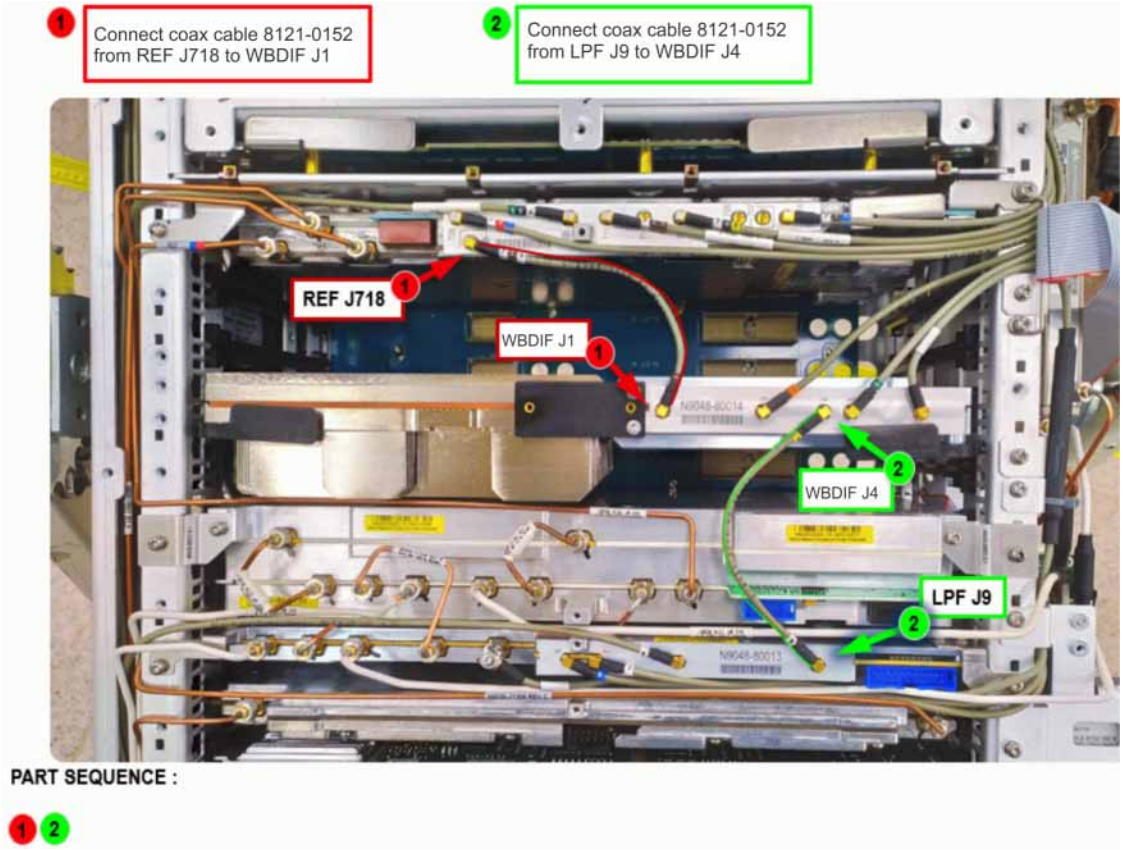
**25.**Refer to Figure 16. Install the following cables:

Connect 8121-0152 from Ref Board J718 to WBDIF J1.

Connect 8121-0152 from LPF J9 to the WBDIF J4.

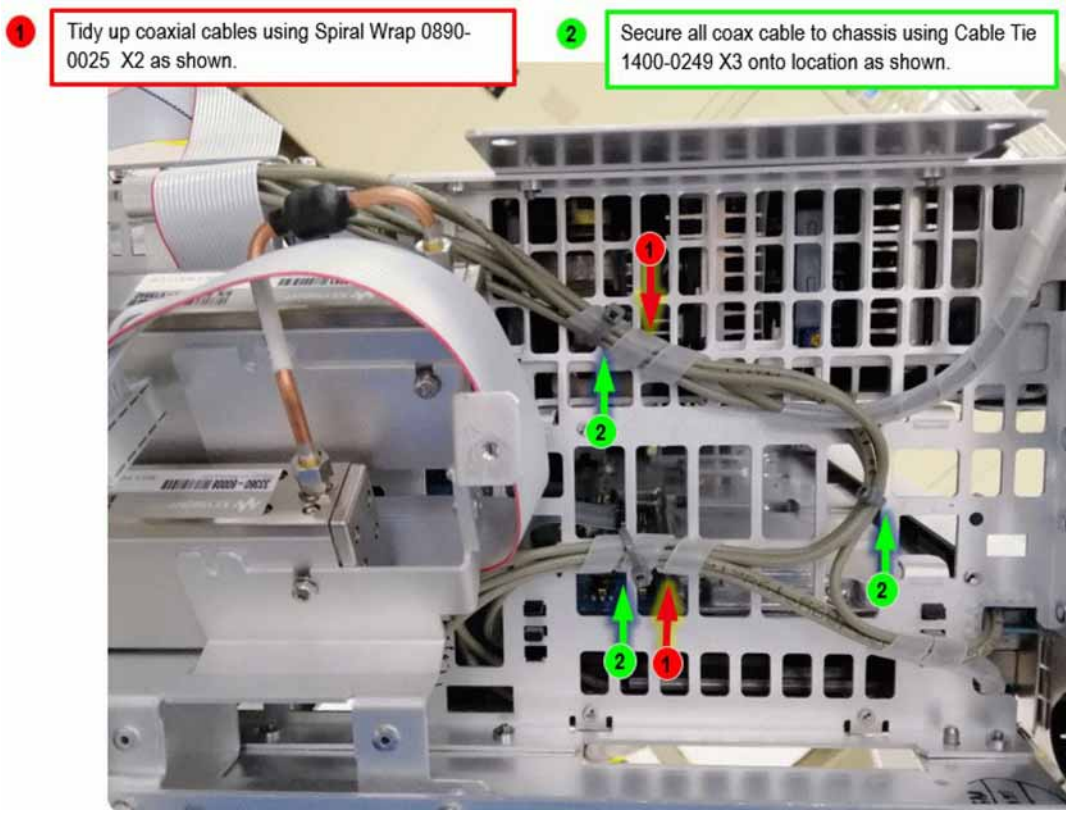
Route the cables as shown.

**Figure 16** Connect two coax cables 8121-0152 and cable routing



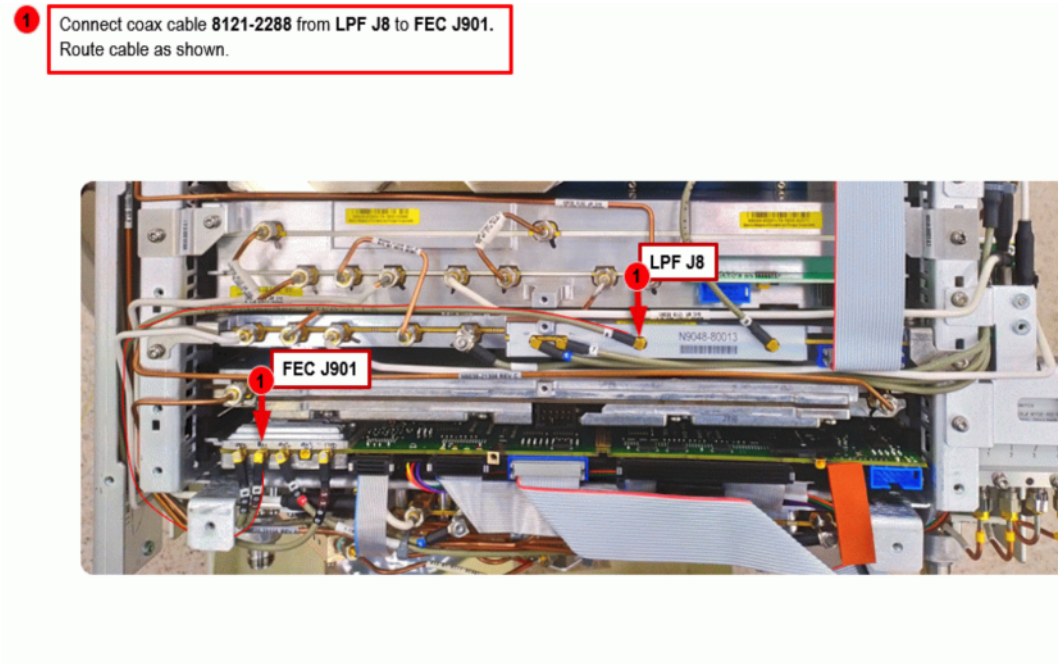
**26.** Refer to Figure 17. Gather the cables using the spiral wrap. Secure to the chassis using cable ties where shown.

**Figure 17** Secure Cables to Chassis



**27.** Refer to Figure 18. Connect the 8121-2288 coax cable from LPF J8 to Front End Controller board (FEC) J901.

**Figure 18** Connect Coax Cable 8121-2288 and Cable Routing



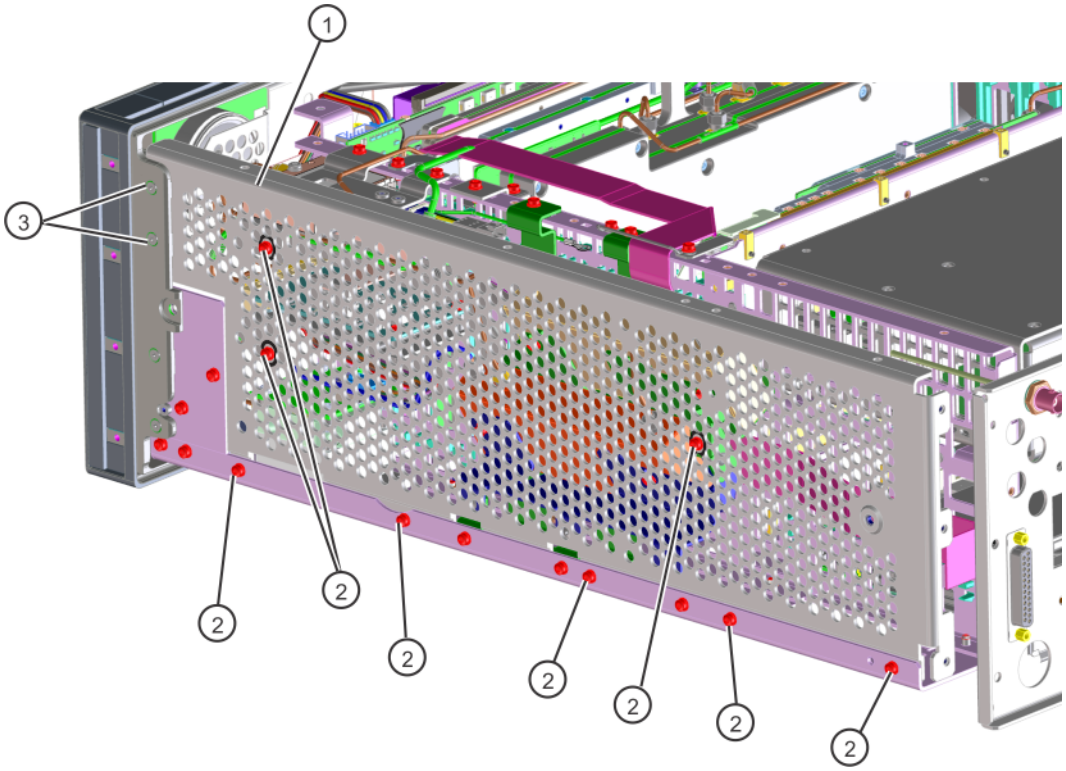
## Right Outer Chassis Side Replacement

**28.** Refer to Figure 19. Using the T-10 driver attach the right outer chassis side (1) to the instrument with the eight pan head screws (2) (0515-0372) and the two flat head screws (3) (0515-2032). Torque to 9 inch-lbs.

**NOTE**

The two flat head screws (0515-2032) used to attach the MP5 Right Outer Chassis Side to the front frame assembly are longer than the rest of the flat head screws removed during this upgrade. Be sure to note this fact once they are reused so that they will be sure to go back to the correct location during reassembly

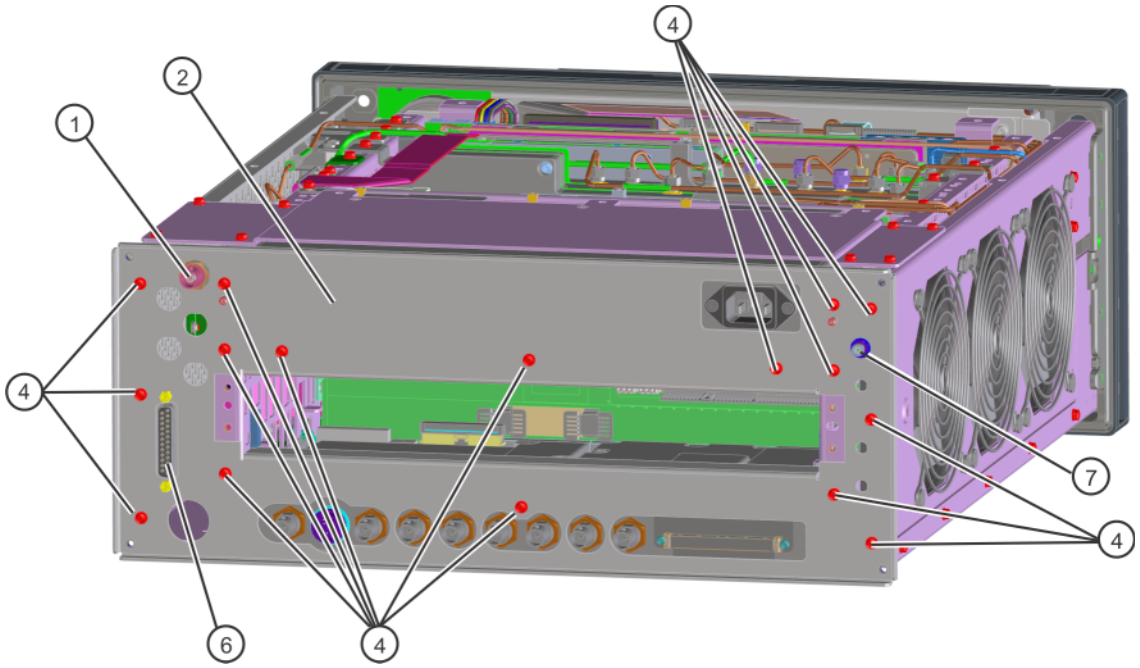
**Figure 19** Right Outer Chassis Side Installation



## Rear Panel Replacement

**29.** Refer to Figure 20. Place the rear panel into position on the chassis. Take care to route the rear panel cables correctly to avoid pinching between the rear panel and chassis. Using the T-10 driver, replace the sixteen pan head screws (4) (0515-0372) attaching the rear panel (1) to the instrument.

Figure 20 Rear Panel Replacement



## CPU Replacement

**30.** Refer to Figure 5. Slide the CPU assembly into the slot at the rear of the instrument and push on the assembly to mate the connectors to the midplane assembly. Secure the board with the ejectors.

**31.** Replace the six screws (1) (0515-0372) that attach the CPU assembly to the chassis. Torque to 9 inch-pounds.

Figure 21 CPU Replacement

## Top Brace Replacement

**32.** Refer to Figure 23 and Figure 22. 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 Cable Hold Downs to the chassis. Attach the top brace to the boards using the sixteen screws (4) (0515-1946) included in the kit.

**33.** Torque all screws to 9 inch-lbs.

**Figure 22** Top Brace Replacement

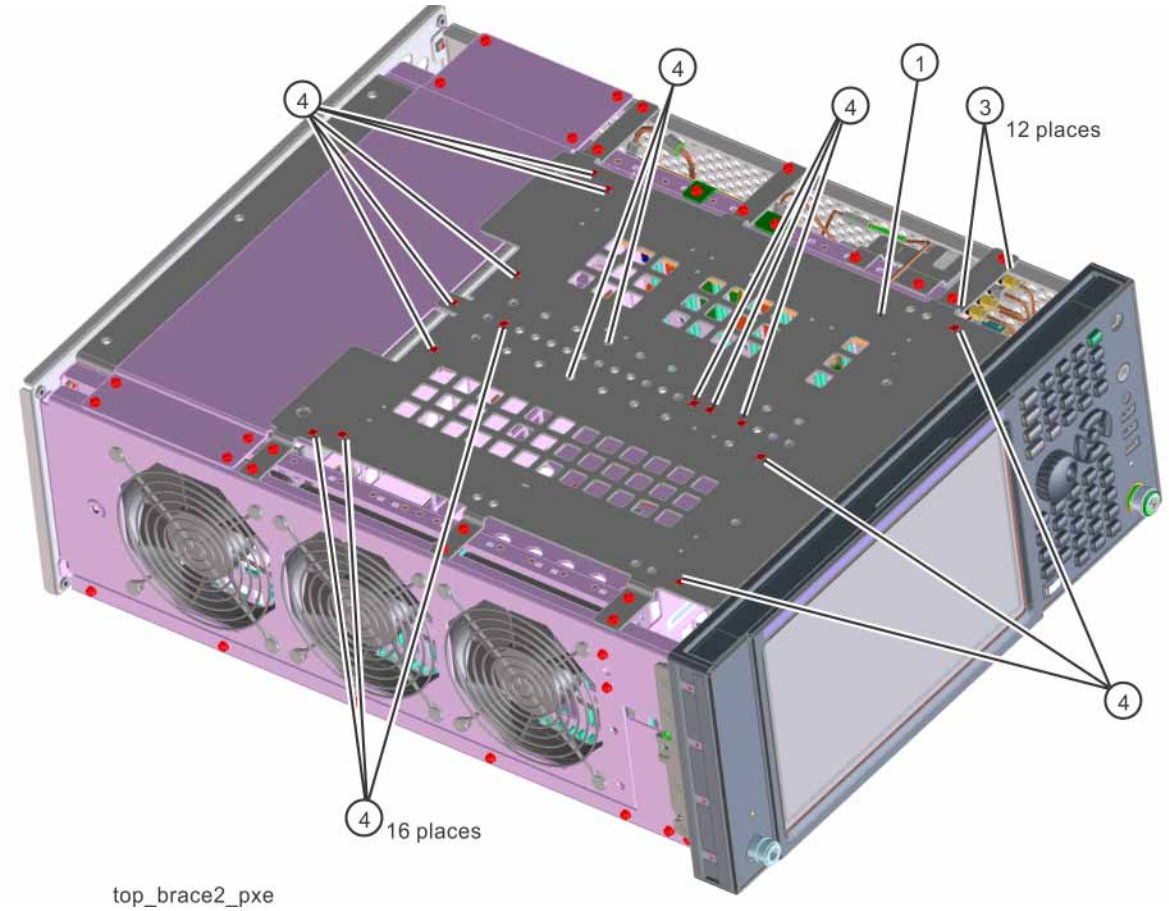
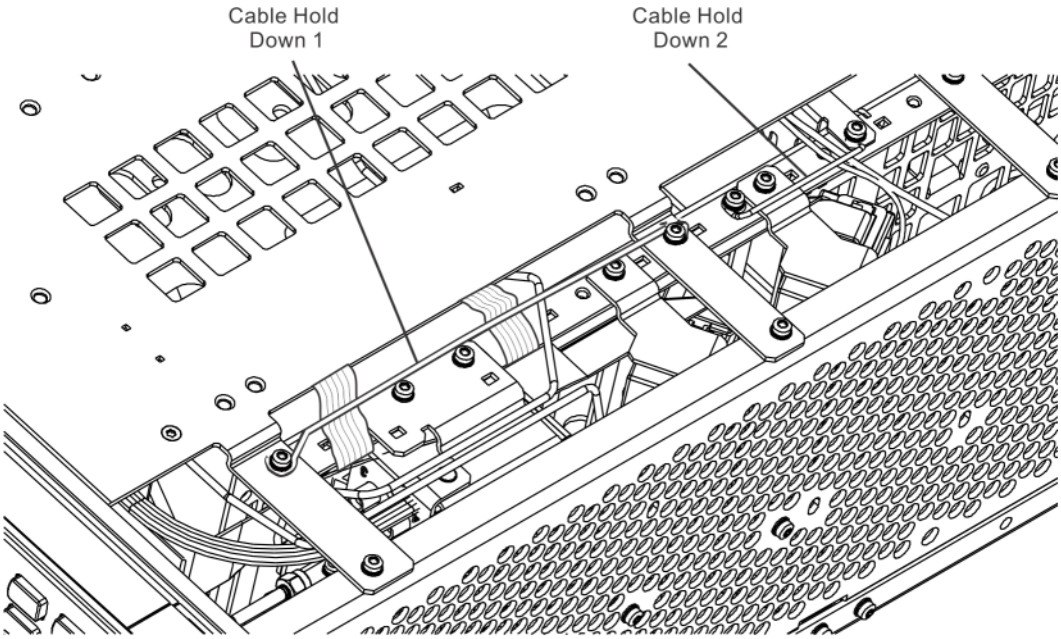


**Figure 23** Cable Hold Downs



## Instrument Dress Cover Replacement

**34.** Before reinstalling the dress cover inspect the instrument to be sure that there are no loose screws or cables, and that no cables are being pinched.

**35.** Refer to Figure 2. Install the instrument dress cover by carefully sliding it onto the instrument from the rear.

**36.** While making sure that the front edge of the dress cover fits evenly into the gasket at the rear of the front frame, use the T-20 driver to attach the four screws and washers (3) that hold the four rear feet (4) to the instrument. Torque to 21 inch-lbs.

**37.** Using the T-20 driver, attach the two strap handles (2) to the instrument with the four screws (1). Torque to 21 inch-lbs.

**38.** Install the four bottom feet (6) by inserting them into the holes in the bottom of the instrument and slide them to engage them with the dress cover. Insert the locks so that the feet cannot accidentally disengage.

## Licensing the New Option

### Installation Procedure over USB

**39.** Following the instructions on the Option N9048BU-WF1 License Entitlement Certificate redeem the Option WF1 license key for the instrument being upgraded.

**40.** Once the Option WF1 license key has been redeemed follow the installation instructions that come with the license to install it into the instrument.

**41.** Locate a USB storage device. Perform a virus scan on this device before use.

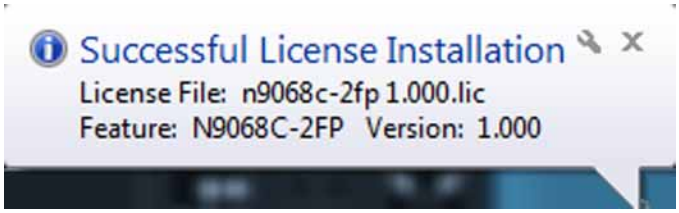
**42.** Save the License File to the root directory of the USB Storage Device.

**43.** 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 24. This menu may be configured according to your preferences.

**Figure 24** USB Storage Device Configuration Menu

**44.** 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 25.

**Figure 25** 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.

## Installation Verification

**45.** On the instrument front panel press **System**, **Show**, **System** and verify that there are entries for the following:

| | |
|---|---|
| N9048B-WF1 | Wideband Digital IF |
| N9048BTDSB | Time Domain Scan (requires WF1) |

Potentially, depending on what you have purchased, you may also have entries for one of the following:

| | |
|---|---|
| N9048BWT1B | Wideband Time Domain Scan, Basic Detection (requires WF1 and TDSB) |
| N9048BWT2B | Wideband Time Domain Scan, Basic Detection (requires WF1 and TDSB) |

**46.** Press **System**, **Show**, **Hardware** and verify that there are entries that match the following:

| | |
|---|---|
| Gen 4 DIF Controller | N9030-60048 |

## Verify default N9048TDSB SW option is correctly installed

**47.** To verify if the N9048TDSB license is installed, press **MODE/MEAS** and select **EMI Receiver**.

**48.** Press **Measurement**, **Real time Scan**, **View**. If you can view and select either **Spectrogram** or **Time Domain**, then the measurement is licensed as needed.

## Verify N9048WT1B or N9048WT2B functionality is installed (if purchased, you should only have one of these WTxB options)

**49.** Press **MODE/MEAS**, select **EMI Receiver**, **OK**.

**50.** Press **MEAS SETUP**, **SCAN**, **Scan Type**, and verify there is a selection labeled **Time Domain**. Select **Time Domain Scan**. If you have N9048WT1B or N9048WT2B license functionality, you should also be able to select **Accelerated TDS (30 MHz to 3.2GHz)** to **On**

**51.** The installation of Option WF1 is now complete. Proceed to the Adjustments and Performance Verification section of this document.

## Adjustments and Performance Verification

Adjustments and performance verification testing requires the use of the N7818A Calibration and Adjustment Software. The latest software information and downloads are available at:

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

### Adjustments Required

Perform All Automated Adjustments

### Performance Testing Recommended

Perform All Performance Verification Tests

### Manual Processes Required

Characterize Preselector (**System**, **Alignments**, **Advanced**, **Characterize Preselector**)

Perform Characterize EMI Receiver Noise Floor. Press (**System**, **Alignments**, **Advanced**, **Characterize EMI Receiver Noise Floor**)

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

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

Edition 1, April 2023

N9048-90021

www.keysight.com