
Keysight Power Range and Bias Tees Upgrade Kit For Version 6 Synthesizers

To Upgrade PNA N5227A/B
Option 200/201 to Option 219

Upgrade Kit Order Number:
N5227AU-219 and N5227BU-219

Kit Number: N5227-60103

This is Installation Note is for upgrading the N5227A/B Microwave Network Analyzers from Option 200/201 to Option 219.

Notices

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NOTICE: This document contains references to Agilent Technologies. Agilent's former Test and Measurement business has become Keysight Technologies. For more information, go to **www.keysight.com**.



Description of the Upgrade

NOTE

Some of the assembly drawings in this document may be different from your instrument, but the process is similar for both an “A” model and “B” model instruments.

This upgrade converts your standard 2-port configurable test set analyzer (N5227A/B) with Option 201 to an extended power range analyzer with bias tees by adding:

- a 50-dB source attenuator and a bias tee in each source port channel
- a 50-dB receiver attenuator in each receiver channel
- new RF cables

After installation of this upgrade, your analyzer will be an N5227A/B with Option 219.

Refer to **“Overview of the Installation Procedure” on page 13.**

CAUTION

This repair must be done at a service center or a self-maintainer service center! Refer to **“Getting Assistance from Keysight” on page 6.**

Getting Assistance from Keysight

Installing this upgrade kit requires special skills and experience. If you think you may not be qualified to do the work, or need advice, contact Keysight.

Contacting Keysight

Assistance with test and measurements needs and information on finding a local Keysight office are available on the Web at:

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

If you do not have access to the Internet, please contact your Keysight field engineer.

NOTE

In any correspondence or telephone conversation, refer to the Keysight product by its model number and full serial number. With this information, the Keysight representative can determine whether your product is still within its warranty period.

If You Have Problems With the Upgrade Kit Contents

Keysight stands behind the quality of the upgrade kit contents. If you have problems with any item in the kit, refer to www.keysight.com and the **Contact**

Keysight () link.

Getting Prepared

CAUTION

The PNA contains extremely sensitive components that can be ruined if mishandled. Follow instructions carefully when making cable connections, especially wire harness connections.

The person performing the work accepts responsibility for the full cost of the repair or replacement of damaged components.

To successfully install this upgrade kit, you will need the following:

- A license key - refer to [“License Key Redemption”](#) below.
- A PDF copy or a paper copy of the PNA Service Guide - refer to [“Downloading the Online PNA Service Guide”](#) below.
- An ESD-safe work area - refer to [“Protecting Your Workspace from Electrostatic Discharge”](#) below.
- Correct tools - refer to [“Tools Required for the Installation”](#) on page 10.
- Enough time - refer to [“About Installing the Upgrade”](#) on page 10.
- Test equipment for the post-upgrade adjustments and full instrument calibration. To view the equipment list, click the Chapter 3 bookmark “Tests and Adjustments” in the PDF Service Guide¹.

1. See [“Downloading the Online PNA Service Guide”](#) on page 9.

License Key Redemption

NOTE

The only difference between an A model license key redemption and a B model is that the A model uses a 12-character license key and the B model uses a license key file.

NOTE

Ensure that you are connected to an external server, before attempting to download your email and license key file.

– For A models: Refer to

<https://www.keysight.com/us/en/assets/9018-03565/installation-guides/9018-03565.pdf> (N5225-90110).

– For B models: Refer to the

<https://www.keysight.com/us/en/assets/9018-04534/installation-guides/9018-04534.pdf> (N5242-90024).

NOTE

The enclosed Software Entitlement Certificate is a receipt, verifying that you have purchased a licensed option for the PNA of your choice. You must now use a Keysight Web page to request a license key for the instrument that will receive the option.

To enable the option product(s), you must request license key(s) file from the Keysight Software Manager:

<http://www.keysight.com/find/softwaremanager>.

To complete the request, you will need to gather the following information:

– From the certificate

– Order number

– Certificate number

– From your instrument

(Instrument information is available in the network analyzer - on the toolbar, click Help, then click About Network Analyzer.)

– Model number

– Serial number

A models ONLY: From the online Keysight HostID utility

– Part of the OEC procedure to obtain the 12-digit license key online requires you to provide the HostID number of the PNA. This HostID number is NOT the one currently shown on the PNA. To determine your new HostID, Keysight personnel should use the new model number with the utility at go to

<http://mktwww.srs.is.keysight.com/field/service/network/pna/upgrades.html>. Non-Keysight personnel should contact Keysight at

<http://www.keysight.com/key/contactus>.

Getting Prepared

– Host ID

Using the information just gathered, you must request license key(s) file from the Keysight Software Manager:

<http://www.keysight.com/find/softwaremanager>.

You will need to provide an email address, Keysight will promptly email your A model license key(s) or a for a B model, license key file(s) attachment message.

Verify the License Contents

Refer to the license message you received from Keysight:

If the model number, serial number, or option number do not match those on the license message you received from Keysight, you will not be able to install the license key file. If this is the case, contact Keysight for assistance. Refer to **“Getting Assistance from Keysight” on page 6**.

Downloading the Online PNA Service Guide

To view the online Service Guide for your PNA model number, use the following steps:

1. Go to www.keysight.com.
2. In the **Search** box, enter the model number of the analyzer (e.g., N5225B) and click **Search**.
3. Click **Support > Keysight Product Support**.
4. In the **Search Support** area type your instrument’s model number (e.g., N2225B).
5. Press **Enter**.
6. Scroll down to the **PRINT DOCUMENTATION** section and click to select **Service Manual**.

The **Service Manual** for your instrument will be displayed near the top of the right column.

7. Click the hyperlink of the Service Guide title to download the PDF file.
8. When the PDF of the Service Guide is displayed, scroll through the Contents section bookmarks to locate the information needed.

Protecting Your Workspace from Electrostatic Discharge

For information, click on the Chapter 1 bookmark, “Electrostatic Discharge Protection” in the PDF Service Guide¹.

ESD Equipment Required for the Installation

Description	Keysight Part Number
ESD grounding wrist strap	9300-1367
5-ft grounding cord for wrist strap	9300-0980
2 x 4 ft conductive table mat and 15-ft grounding wire	9300-0797
ESD heel strap (for use with conductive floors)	9300-1308

Tools Required for the Installation

Description	Qty	Part Number
T-10 TORX driver - set to 9 in-lbs (1.02 N.m)	1	N/A
T-20 TORX driver - set to 21 in-lbs (2.38 N.m)	1	N/A
5/16-in (8 mm) nutsetter or open end torque wrench- set to 10 in-lbs (1.13 N.m)	1	N/A
5/16-in (8 mm) nutsetter or open end torque wrench - set to 21 in-lbs (2.38 N.m)	1	N/A
9 mm nutsetter or open end torque wrench - set to 21 in-lbs (2.38 N.m)	1	N/A

CAUTION

Use a 5/16-in torque wrench set to 10 in-lbs on all cable connections except the front and rear panel bulkhead connectors and the bias tees. The bias tees should be torqued to 9 in-lbs. And, on the front and rear bulkhead connectors, use a 5/16 inch nutsetter or open end torque wrench set to 21 in-lb.

About Installing the Upgrade

Products affected	N5227A/B
Installation to be performed by	Keysight service center or personnel qualified by Keysight
Estimated installation time	3 hours
Estimated adjustment time	0.5 hours
Estimated full instrument calibration time	4.5 hours

Items Included in the Upgrade Kit

Check the contents of your kit against the following list. If any part is missing or damaged, contact Keysight Technologies. Refer to **“Getting Assistance from Keysight” on page 6**.

Table 1 **Contents of Upgrade Kit N5227-60103**

Ref Desig.	Description	Qty	Part Number
-	Installation note (this document)	1	N5227-90103
-	Software Entitlement Certificate (provided separately)	1	5964-5145
-	China RoHS Addendum	1	9320-6722
A42	Test port 1 bias tee	2	5087-7732
A45	Test port 2 bias tee		
A38	Test port 1 source attenuator	4	84905-60004
A41	Test port 2 source attenuator		
A46	Port 1 receiver attenuator		
A49	Port 2 receiver attenuator		
-	Machine screw, M2.5 x 20, pan head (to attach side braces to bottom-side of PNA)	6	0515-0374
-	Machine screw, M4.0 x 10, pan head (to attach center brace on bottom-side of PNA)	4	0515-0380
-	Machine screw, M3.0 x 8, pan head (to attach attenuator assemblies to brackets (x8); to attach attenuator assembly brackets to test set deck (x8); to attach bias tee assemblies to test set deck (x4); to attach center brace on bottom-side of PNA (x2))	25	0515-0372
-	Machine screw, M3.0 x 6, flat head (to attach bias tees to brackets)	6	0515-1227
-	Cable tie wrap, to secure W33 (N5247-20079)	5	1400-0249
-	Cable clamp, to secure W45 (N5247-20058)	5	1400-1334
-	Cap, protective (black)	2	1401-0214
-	Bracket for source and receiver attenuators	2	N5247-00005
-	Brackets for bias tees	2	N5247-20129
-	Brace (center), bottom side of PNA	1	N5247-20131
-	Brace (side), bottom side of PNA	2	N5247-20132
W27	RF cable, A60 port 1 70 GHz doubler to A29 port 1 reference coupler	1	N5247-20044
W30	RF cable, A63 port 2 70 GHz doubler to A32 port 2 reference coupler	1	N5247-20043
W33	RF cable, A29 port 1 receiver coupler to A37 reference mixer switch	1	N5247-20079
W45	RF cable, A32 port 2 receiver coupler to front-panel REF 2 SOURCE OUT	1	N5247-20058

Table 1 Contents of Upgrade Kit N5227-60103

Ref Desig.	Description	Qty	Part Number
W56	RF cable, A27 mixer brick (R2) to front-panel REF 2 RCVR R2 IN	1	N5247-20045
W101	RF cable, A29 port 1 reference coupler to A38 port 1 source attenuator	1	N5247-20083
W102	RF cable, A38 port 1 source attenuator to front-panel port 1 SOURCE OUT	1	N5247-20014
W103	RF cable, front-panel port 1 CPLR THRU to A42 port 1 bias tee	1	N5247-20081
W104	RF cable, A33 port 1 coupler to A42 port 1 bias tee	1	N5247-20040
W113	RF cable, A32 port 2 reference coupler to A41 port 2 source attenuator	1	N5247-20083
W114	RF cable, A41 port 2 source attenuator to front-panel port 2 SOURCE OUT	1	N5247-20034
W115	RF cable, front-panel port 2 CPLR THRU to A45 port 2 bias tee	1	N5247-20027
W116	RF cable, A36 port 2 coupler to A45 port 2 bias tee	1	N5247-20042
W117	RF cable, front-panel port 1 RCVR A IN to A46 port 1 receiver attenuator	1	N5247-20013
W118	RF cable, A46 port 1 receiver attenuator to A27 mixer brick (A)	1	N5247-20047
W123	RF cable, port 2 RCVR B IN to A49 port 2 receiver attenuator	1	N5247-20020
W124	RF cable, A49 port 2 receiver attenuator to A27 mixer brick (B)	1	N5247-20046
-	Ribbon cable, A23 test set motherboard J549 to A38 port 1 source attenuator	2	N5245-60006
-	Ribbon cable, A23 test set motherboard J546 to A41 port 2 source attenuator		
-	Ribbon cable, A23 test set motherboard J205 to A46 port 1 receiver attenuator	2	N5247-60020
-	Ribbon cable, A23 test set motherboard J208 to A49 port 2 receiver attenuator		
-	Ribbon cable, A23 test set motherboard J541 to A42 port 1 bias tee	2	N5247-60021
-	Ribbon cable, A23 test set motherboard J542 to A45 port 2 bias tee		

NOTE

Extra quantities of items such as protective plastic caps, screws, cable ties, and cable clamps may be included in this upgrade kit. It is normal for some of these items to remain unused after the upgrade is completed.

Installation Procedure for the Upgrade

The network analyzer must be in proper working condition prior to installing this option. Any necessary repairs must be made before proceeding with this installation.

WARNING

This installation requires the removal of the analyzer's protective outer covers. The analyzer must be powered down and disconnected from the mains supply before performing this procedure.

Overview of the Installation Procedure

- "Step 1. Obtain a Keyword and Verify the Information."
- "Step 2. Remove the Outer Cover."
- "Step 3. Remove the Front Panel Assembly."
- "Step 4. Remove Some Bottom-Side (Test Set) Cables."
- "Step 5. Remove Port 1 and Port 2 Coupler Assemblies from the Test Set Deck."
- "Step 6. Swap Brackets on the Port 1 and Port 2 Coupler Assemblies."
- "Step 7. Assemble the Port 1 and Port 2 Step Attenuators."
- "Step 8. Install the Step Attenuators."
- "Step 9. Reinstall the Port 1 and Port 2 Coupler Assemblies."
- "Step 10. Assemble the Bias Tees and Brackets."
- "Step 11. Install the Bias Tees Assemblies."
- "Step 12. Install Some Bottom-Side (Test Set) Cables."
- "Step 13. Install Braces on Bottom-Side (Test Set) of PNA."
- "Step 14. Reinstall Front Panel Assembly."
- "Step 15. Position the Cables and Wires to Prevent Pinching."
- "Step 16. Reinstall the Outer Cover."
- "Step 17. Remove Option 201 License."
- "Step 18. Enable Options 219."
- "Step 19. Perform Post-Upgrade Adjustments and Calibration."
- "Step 20. Prepare the PNA for the User."

Step 1. Obtain a Keyword and Verify the Information

Follow the instructions on the Software Entitlement Certificate supplied to obtain a license key for installation of this upgrade. Refer to **“License Key Redemption” on page 8**.

Verify that the model number, serial number, and option number information on the license key match those of the instrument on which this upgrade will be installed.

Once the license key (A models) or license key file (B models) has been received and the information verified, you can proceed with the installation at **“Step 2. Remove the Outer Cover” on page 14**.

NOTE

If the model number, serial number, or option number do not match those on your license key (A models) or license key file (B models), you will not be able to install the option. If this is the case, contact Keysight for assistance before beginning the installation of this upgrade. Refer to **“Contacting Keysight” on page 6**.

Step 2. Remove the Outer Cover

For instructions, click the Chapter 7 bookmark “Removing the Covers” in the PDF Service Guide.

Step 3. Remove the Front Panel Assembly

For instructions, click the Chapter 7 bookmark “Removing and Replacing the Front Panel Assembly” in the PDF Service Guide¹.

Step 4. Remove Some Bottom-Side (Test Set) Cables

CAUTION

Be careful not to damage the center pins of the semi-rigid cables. Some flexing of the cables may be necessary but do not over-bend them.

NOTE

When removing a cable, also remove the plastic cable clamp, if present. It is normal for some of the cable clamp’s adhesive to remain.

1. Place the analyzer bottom-side up on a flat surface.
2. Remove the following semi-rigid cables, but keep them for re-installation later. To see an image showing the location of these cables, click the Chapter 6 bookmark “Bottom RF Cables, Standard 2-Port Configuration, Option 201 (S/N Prefixes <6021)” in the PDF Service Guide¹.

1. Refer to **“Downloading the Online PNA Service Guide” on page 9**.

- W12 (N5247-20059) A60 port 1 70 GHz doubler to W11
- W34 (N5247-20039) A33 port 1 coupler to front panel port 1 CPLR ARM
- W24 (N5247-20061) A63 port 2 70 GHz doubler to W23
- W46 (N5247-20041) A36 port 2 coupler to front panel port 2 CPLR ARM

3. Remove and discard the following semi-rigid cables:

- W27 (N5247-20074) A60 port 1 70 GHz doubler to A29 port 1 reference coupler
- W32 (N5247-20049) Port 1 CPLR THRU to A33 port 1 coupler
- W31 (N5247-20037) A29 port 1 ref coupler to front-panel port 1 SOURCE OUT
- W47 (N5247-20053) Port 1 RCVR A IN to A27 mixer brick (A)
- W33 (N5247-20056) A29 port 1 receiver coupler to A37 reference mixer switch
- W30 (N5247-20052) A63 port 2 70 GHz doubler to A32 port 2 reference coupler
- W56 (N5247-20055) REF 2 RCVR R2 IN to A27 mixer brick (R2)
- W43 (N5247-20036) A32 port 2 ref coupler to front-panel port 2 SOURCE OUT
- W50 (N5247-20054) Front-panel port 2 RCVR B IN to A27 mixer brick (B)
- W44 (N5247-20050) Port 2 CPLR THRU to A36 port 2 coupler
- W45 (N5247-20057) A32 port 2 receiver coupler to front-panel REF 2 SOURCE OUT

4. Leave the gray flexible cables, the wire harnesses, and the ribbon cables connected where possible. Any that are removed should be labeled for reconnection later.

Step 5. Remove Port 1 and Port 2 Coupler Assemblies from the Test Set Deck

For instructions on removing the coupler assemblies, click the Chapter 7 bookmark “Removing and Replacing the A29–A32 Reference Couplers and Reference Coupler Mounting Brackets” in the PDF Service Guide¹.

1. See [“Downloading the Online PNA Service Guide” on page 9](#).

Step 6. Swap Brackets on the Port 1 and Port 2 Coupler Assemblies

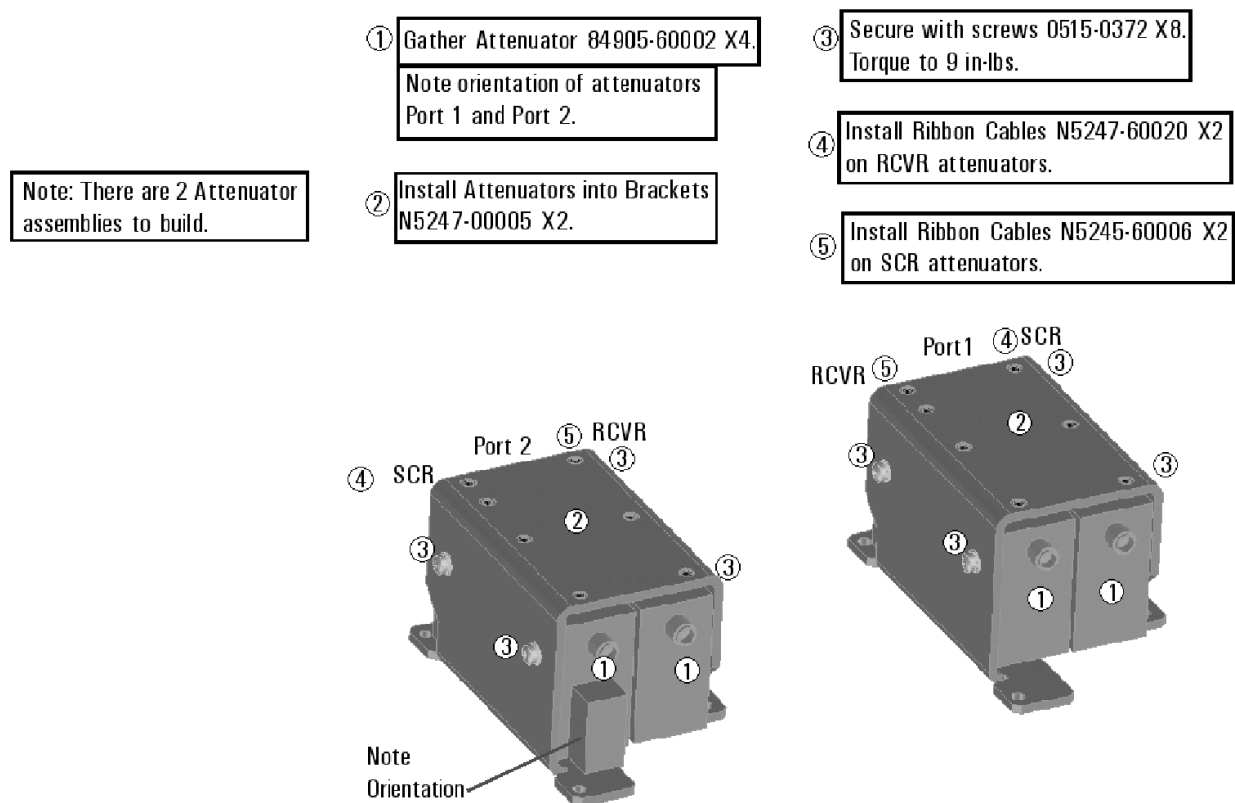
Remove the brackets from the coupler assemblies being careful to remember which bracket was removed from each coupler. Reinstall the bracket that had been installed on the Port 1 Coupler Assembly onto the Port 2 Coupler Assembly. Next, reinstall the bracket that had been installed on the Port 2 Coupler Assembly onto the Port 1 Coupler Assembly.

Step 7. Assemble the Port 1 and Port 2 Step Attenuators

Refer to **Figure 1** for this step of the procedure. New parts are listed in **Table 1 on page 11**. Use a T-10 TORX driver to tighten all screws.

Figure 1

Port 1 and Port 2 Step Attenuators Assembly (0515-0372, 84905-60002, N5245-60006, N5247-00005, N5247-60006)

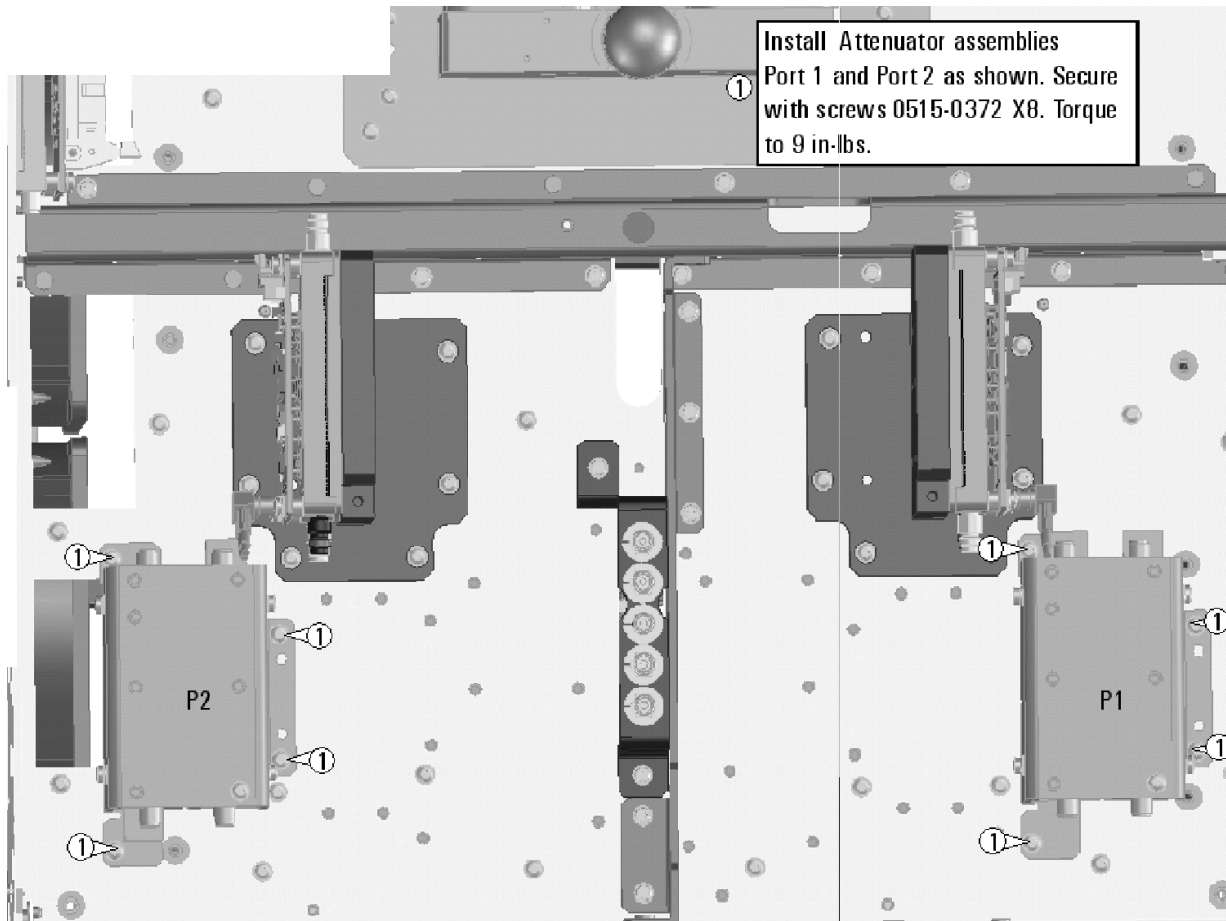


N5247 101 01

Step 8. Install the Step Attenuators

Refer to **Figure 2** for this step of the procedure. New parts are listed in **Table 1 on page 11**. Use a T-10 TORX driver to tighten all screws.

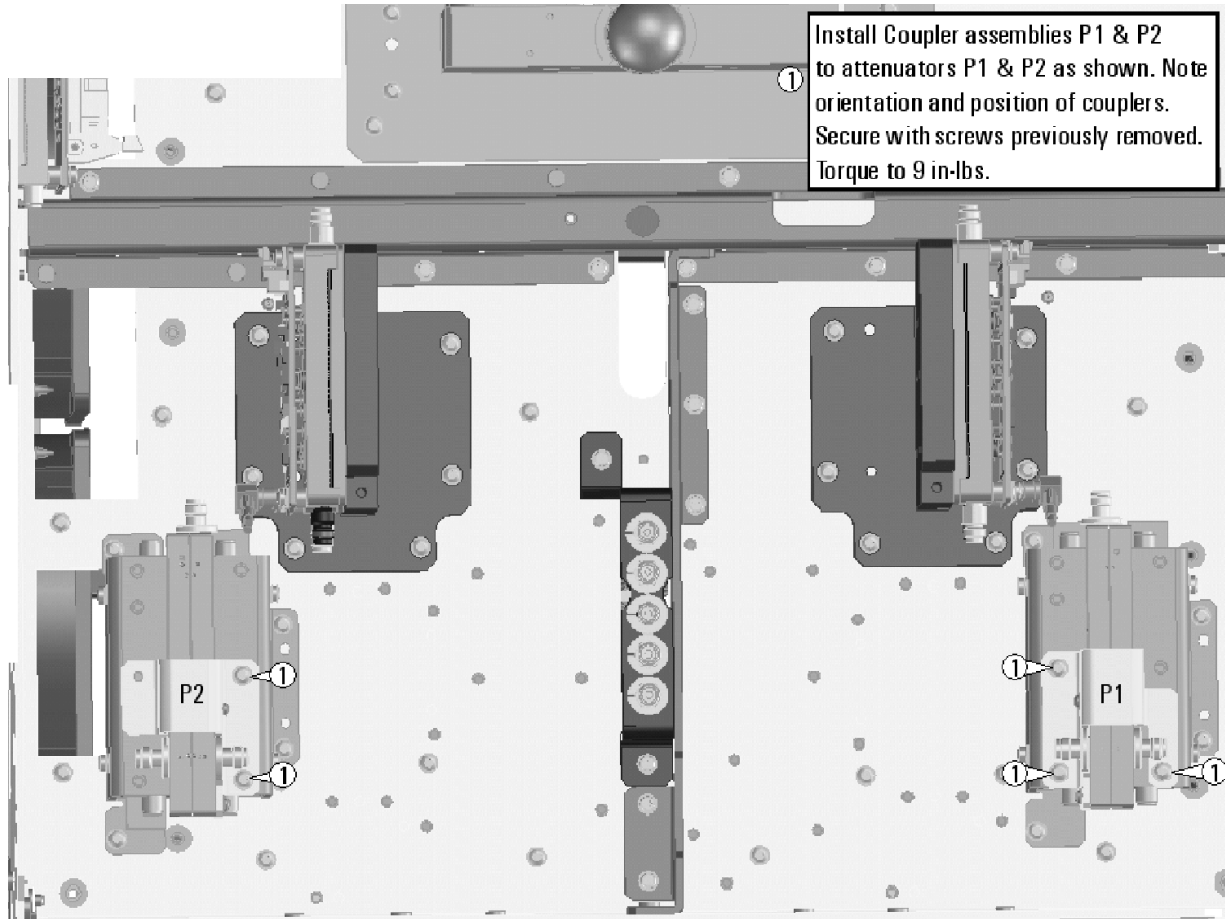
Figure 2 Port 1 and Port 2 Step Attenuators Installation (0515-0372)



Step 9. Reinstall the Port 1 and Port 2 Coupler Assemblies

Refer to **Figure 3** for this step of the procedure. Use a T-10 TORX driver to tighten all screws.

Figure 3 Port 1 and Port 2 Coupler Assemblies Re-installation

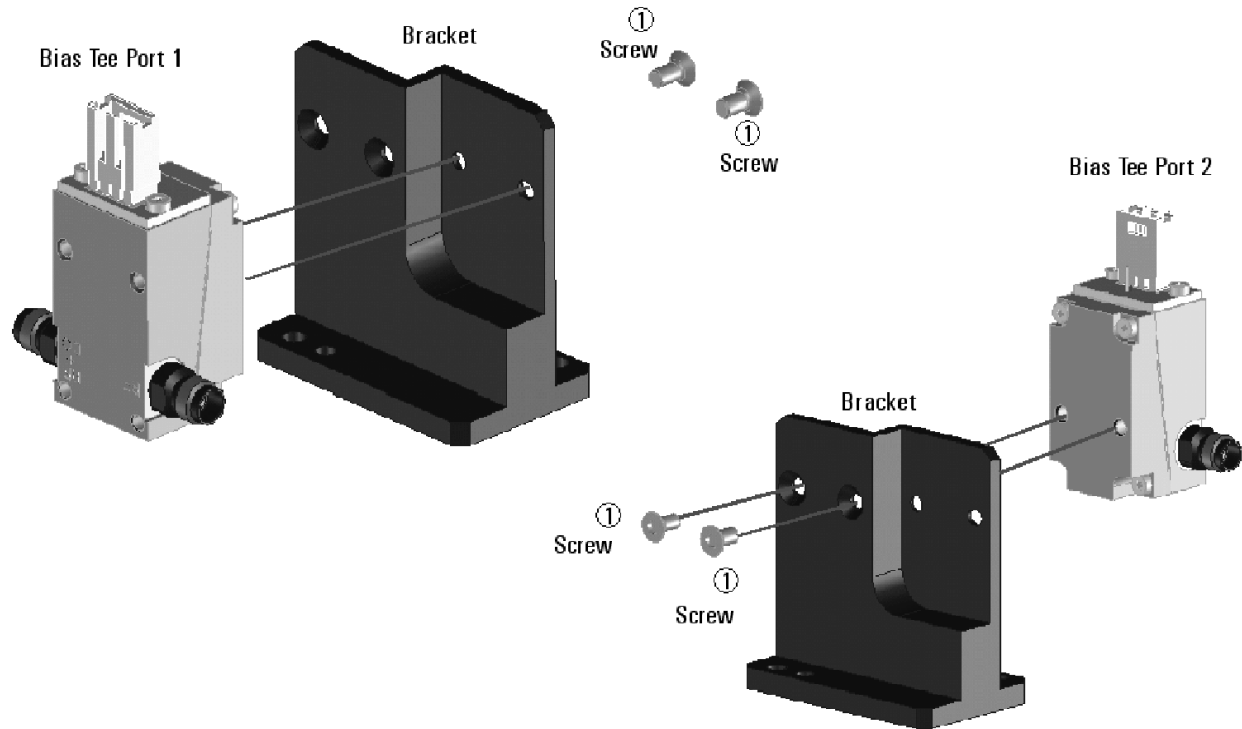


Step 10. Assemble the Bias Tees and Brackets

Refer to **Figure 4** for this step of the procedure. New parts are listed in **Table 1 on page 11**. Use a T-10 TORX driver to tighten all screws.

Figure 4

Bias Tees and Brackets (0515-1227, 5087-7732, N5247-20129)



①

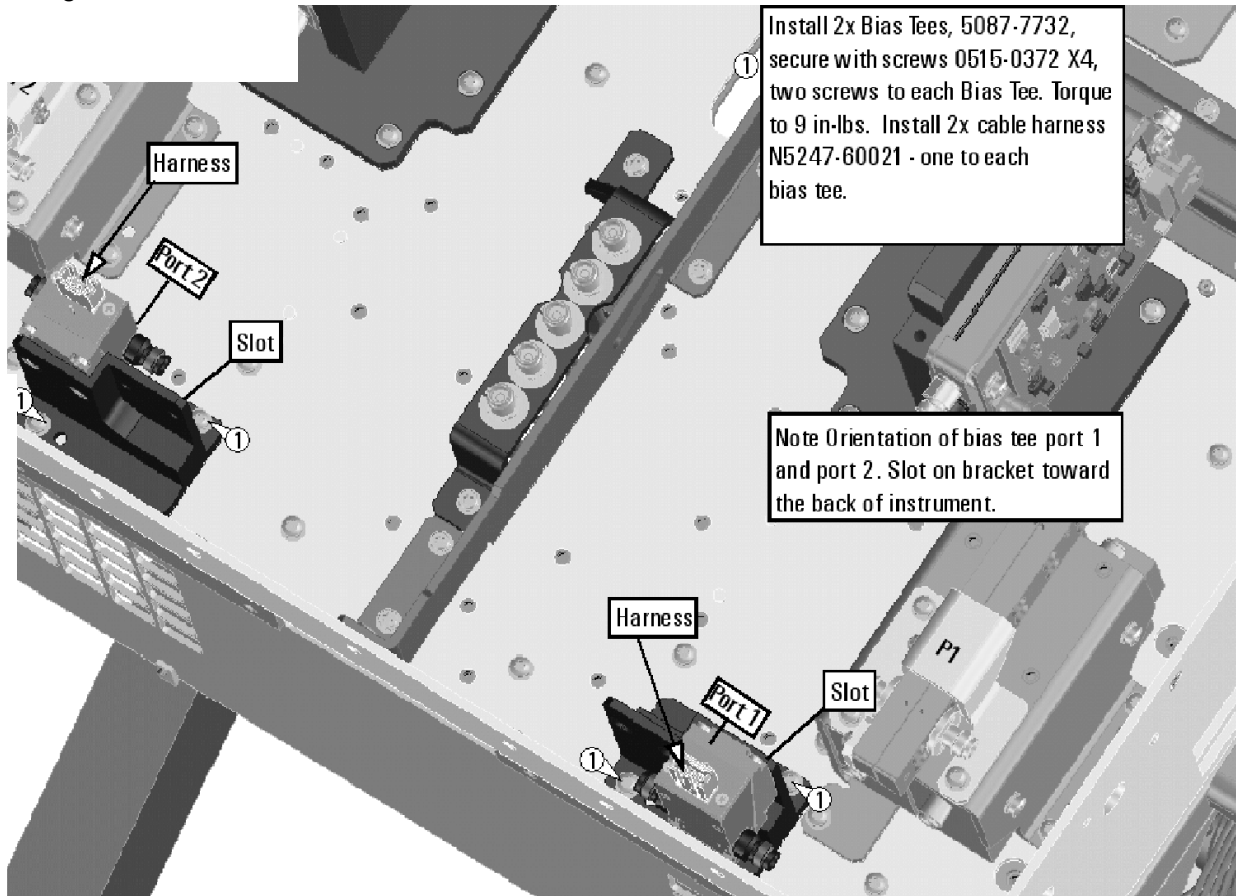
Gather 2x Bias Tee 5087-7732, and install 2x brackets N5247-20129. Secure with screws 0515-1227 X4. Torque to 9 in-lbs.

Note: Orientation of Bracket and Bias Tee. Slot on bracket should be on the back side.

Step 11. Install the Bias Tees Assemblies

Refer to **Figure 5** for this step of the procedure. New parts are listed in **Table 1 on page 11**. Use a T-10 TORX driver to tighten all screws.

Figure 5 Bias Tees Assemblies Installation (0515-0372, 5087-7732, N5247-60021)



Step 12. Install Some Bottom-Side (Test Set) Cables

CAUTION

Use a 5/16-in torque wrench set to 10 in-lbs on all cable connections except the front and rear panel bulkhead connectors. Torque these connections to 21 in-lb.

CAUTION

Be careful not to damage the center pins of the semi-rigid cables. Some flexing of the cables may be necessary but do not over-bend them.

Semi-rigid Cables Required for Upgrading to an Option 219 PNA

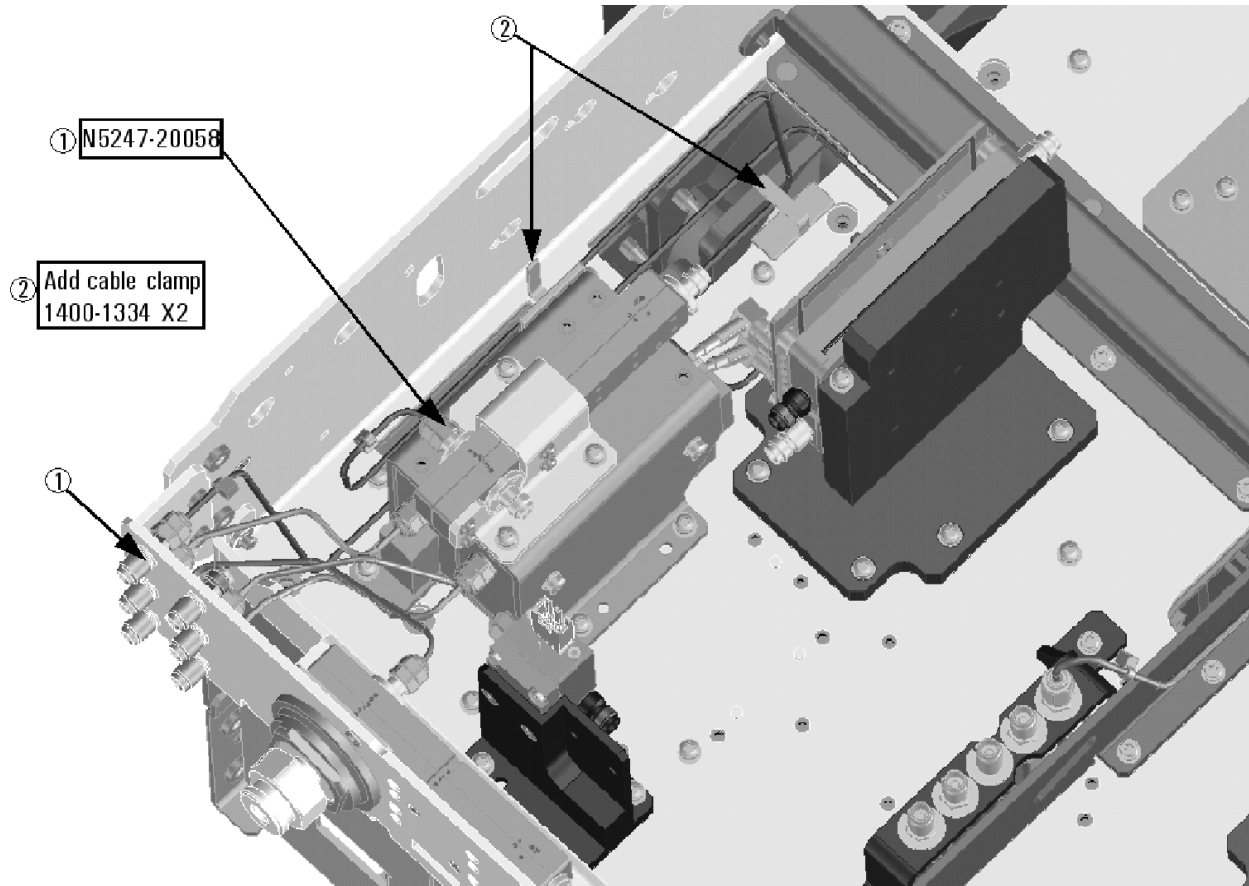
To see images showing the location of these cables, click the Chapter 6 bookmark “Bottom RF Cables, 2-Port, Option 219 (S/N Prefixes <6021)” in the PDF Service Guide¹. New parts are listed in **Table 1 on page 11**.

- W123 (N5247-20020) Port 2 RCVR B IN to A49 port 2 receiver attenuator
- W115 (N5247-20027) Front-panel port 2 CPLR THRU to A45 port 2 bias tee
- W46 (reuse) (N5247-20041) A36 port 2 coupler to front panel port 2 CPLR ARM
- W114 (N5247-20034) A41 port 2 source attenuator to front-panel port 2 SOURCE OUT
- W45 (N5247-20058) A32 port 2 ref coupler to front-panel REF 2 SOURCE OUT

* As shown in **Figure 6**, install two clamps (part number 1400-1334) to secure cable W146.

1. See “**Downloading the Online PNA Service Guide**” on page 9.

Figure 6 Location of Cable Clamps to Secure W45 (1400-1334, N5247-20058)

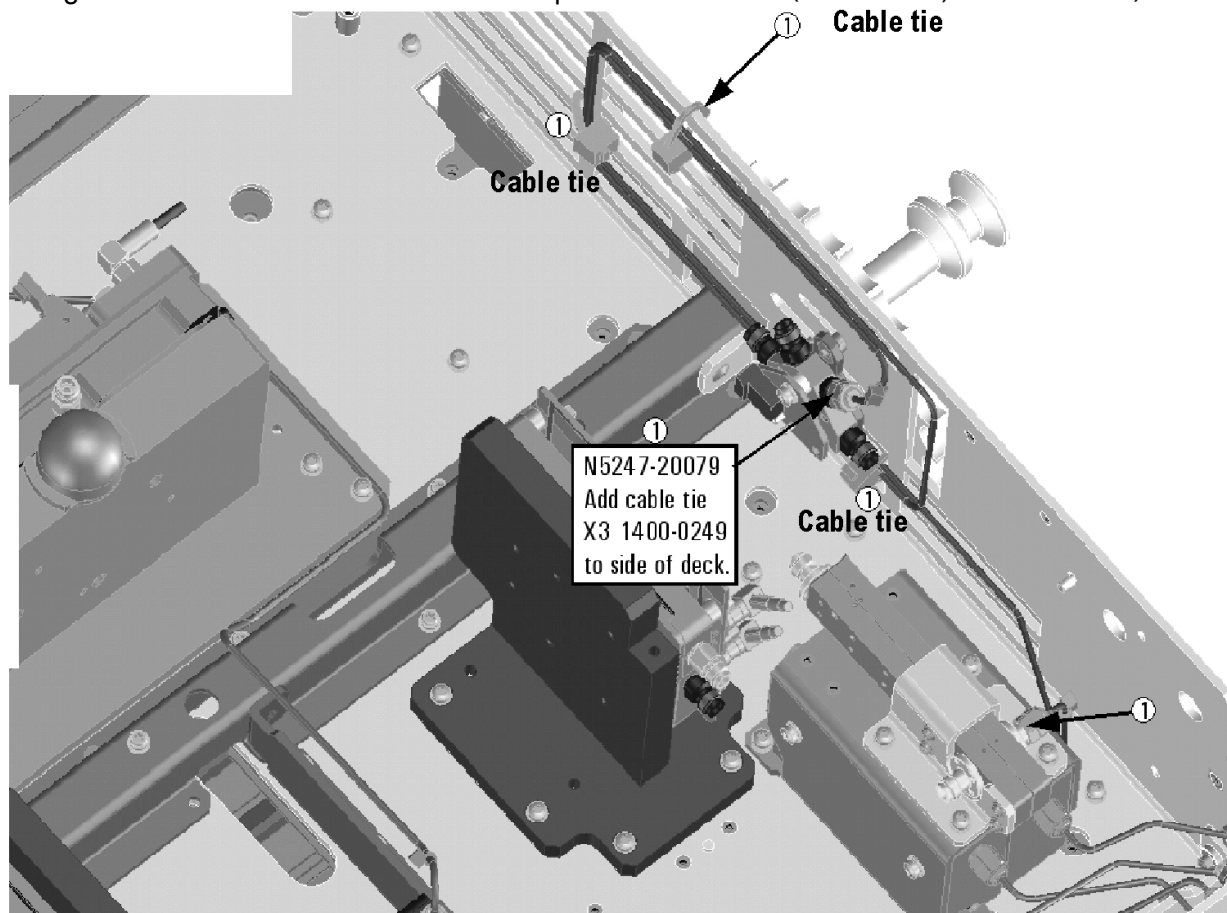


- W124 (N5247-20046) A49 port 2 receiver attenuator to A27 mixer brick (B)
- W56 (N5247-20045) A27 mixer brick (R2) to front-panel REF 2 RCVR R2 IN
- W116 (N5247-20042) A36 port 2 coupler to A45 port 2 bias tee
- W104 (N5247-20040) A33 port 1 coupler to A42 port 1 bias tee
- W117 (N5247-20013) Front-panel port 1 RCVR A IN to A46 port 1 receiver attenuator
- W103 (N5247-20081) Front-panel port 1 CPLR THRU to A42 port 1 bias tee
- W34 (reuse) (N5247-20039) A33 port 1 coupler to front panel port 1 CPLR ARM
- W102 (N5247-20014) A38 port 1 source attenuator to front-panel port 1 SOURCE OUT
- W33 (N5247-20079) A29 port 1 reference coupler to A37 reference mixer switch

* As shown in **Figure 7**, install three cable ties (part number 1400-0249) to secure W152.

Figure 7

Location of Cable Clamps to Secure W33 (1400-0249, N5247-20079)

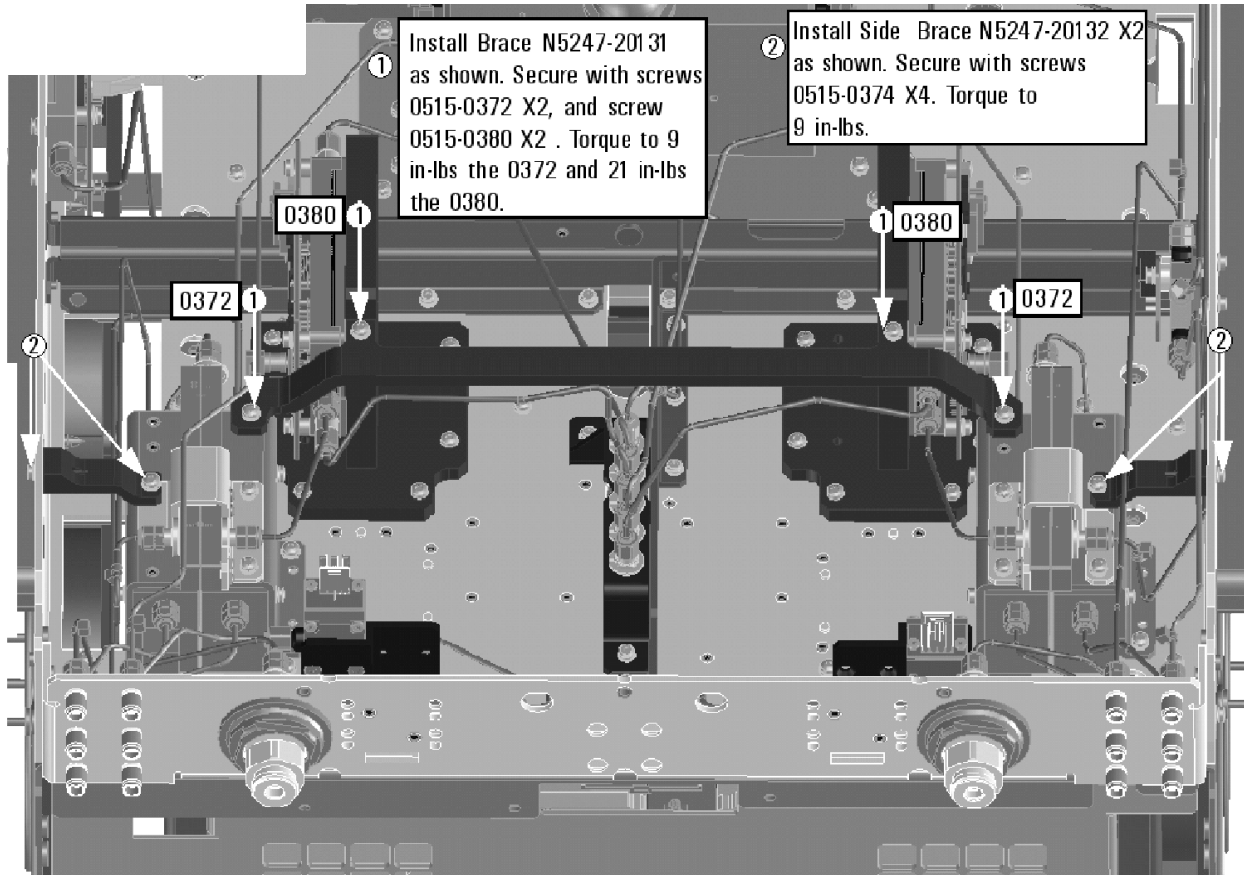


- W101 (N5247-20083) A29 port 1 reference coupler to A38 port 1 source attenuator
- W113 (N5247-20083) A32 port 2 reference coupler to A41 port 2 source attenuator
- W118 (N5247-20047) A46 port 1 receiver attenuator to A27 mixer brick (A)
- W27 (N5247-20044) A60 port 1 70 GHz doubler to A29 port 1 reference coupler
- W12 (reuse) (N5247-20059) A60 port 1 70 GHz doubler to W11
- W24 (reuse) (N5247-20061) A63 port 2 70 GHz doubler to W23
- W30 (N5247-20043) A63 port 2 70 GHz doubler to A32 port 2 reference coupler

Step 13. Install Braces on Bottom-Side (Test Set) of PNA

Refer to **Figure 8** for this step of the procedure. New parts are listed in **Table 1** on page 11.

Figure 8 Location of Braces on Bottom Side (Test Set) of PNA (0515-0372, 0515-0374, 0515-0380, N5247-20131, N5247-20132)



Step 14. Reinstall Front Panel Assembly

For instructions on reinstalling the front panel assembly, click the Chapter 7 bookmark “Removing and Replacing the Front Panel Assembly” in the PDF Service Guide¹.

Step 15. Position the Cables and Wires to Prevent Pinching

On the top side of the PNA, carefully position the gray flex cables so they can’t be pinched between the covers and the rails.

1. See [“Downloading the Online PNA Service Guide”](#) on page 9.

On the bottom side of the PNA, carefully fold or push down the ribbon cables and wires so they can't be pinched between the hardware and the outer cover. Ribbon cables and wires must never be positioned on top of hardware.

Step 16. Reinstall the Outer Cover

For instructions, click the Chapter 7 bookmark "Removing the Covers" in the PDF Service Guide¹.

Step 17. Remove Option 201 License

Procedure Requirements

- The analyzer must be powered up and operating to perform this procedure.
- The Network Analyzer program must **not** be running.
- A keyboard and mouse must be connected to the network analyzer.

A Model Option 201 License Removal Procedure

For B models, refer to "[B Model Option 201 License Removal Procedure.](#)"

1. To start the option enable utility, press UTILITY **System**, then **Service**, then **Option Enable**. An option enable dialog box will appear.
2. Click the arrow in the Select Desired Option box. A list of available options will appear.
3. In the **Select Desired Option** list, click **201**.
4. Click **Remove**.

B Model Option 201 License Removal Procedure

For A models, refer to "[A Model Option 201 License Removal Procedure.](#)"

1. To start the Keysight License Manager, press **Start > Keysight License Manager > Keysight License Manager**. A Keysight License Manager dialog box will appear.
2. Right click the on the desired option and click **Delete**.
3. In the Keysight License Manager dialog box that appears, press or click **Yes** to confirm delete.
4. A message displays stating that the option removal was successful.

Step 18. Enable Options 219

Procedure Requirements

- The analyzer must be powered up and operating to perform this procedure.
- The Network Analyzer program must **not** be running.
- A keyboard and mouse must be connected to the network analyzer.

For “A” models, refer to [“Option Enable Procedure for “A” Model Instruments” on page 26](#).

For “B” models refer to [“Option Enable Procedure for “B” Model Instruments” on page 27](#).

Option Enable Procedure for “A” Model Instruments

1. To start the option enable utility, press UTILITY **System**, then **Service**, then **Option Enable**. An option enable dialog box will appear.
2. Click the arrow in the **Select Desired Option** box. A list of available options will appear.
3. In the **Select Desired Option** list, click **219 - Src/Rcvr Atten & Bias Ts 2-Port**.
4. Using the keyboard, enter the license key in the box provided. The license key is printed on the license message you received from Keysight. Enter this key *exactly* as it is printed on the message.
5. Click **Enable**.
6. Click Yes in answer to the displayed question in the Restart Analyzer? box.
7. When the installation is complete, click Exit.

“A” Model Option Verification Procedure

Once the analyzer has restarted and the Network Analyzer program is again running:

1. On the analyzer’s **Help** menu, click **About Network Analyzer**.
2. Verify that “219” is listed after “Options:” in the display. Click **OK**.

Option Enable Procedure for “B” Model Instruments

NOTE

For this step, you will need a USB flash drive.

A single license file may contain more than one feature.

1. Locate the email(s) from Keysight which contain license file attachments. These emails are a result of Step 3 on [“License Key Redemption” on page 8](#).
2. Copy the license file(s) from the email(s) to the root directory of the USB flash drive.
More than one license file may be copied to the USB flash drive.

NOTE

A license file may contain more than one feature.

3. Insert the USB flash drive to the PNA’s USB drive slot. Within 5 seconds, the PNA should display a small “New licenses installed” message.

Else, load the license key file(s), manually move your license file(s) to C:\Program Files\Agilent\licensing. It may take Keysight License Manager an extra ~5 seconds to enable the licenses.

NOTE

Attempting to re-install a license file that is already installed may generate a “Corrupt Media” error message. Ignore this message.

4. Disconnect the USB flash drive from the PNA.
5. On the analyzer, click or press to open the KLM software from your PNA’s Windows taskbar by pressing **Start > More Programs > Keysight License Manager folder > Keysight License Manager** and verify the options are correct.

“B” Model Option Verification Procedure

NOTE

If the option has not been enabled or if Option 201 has not been removed, contact Keysight Technologies. Refer to [“Getting Assistance from Keysight” on page 6](#).

Once the Network Analyzer program is again running:

1. Start the Network Analyzer program.
2. Once the Network Analyzer program is running:

- Press **Help > About NA** and verify that Option 219 is listed in the PNA application.
- 3. After successful installation of all upgrades, some features require some adjustments to ensure the instrument meets its specified performance. Refer to the Adjustments (i.e., Diagnostic Tools, Utilities, and Adjustments) topic in the PNA Online Help:
<https://rfmw.em.keysight.com/wireless/helpfiles/N52xxB/help.htm>.

Step 19. Perform Post-Upgrade Adjustments and Calibration

Adjustments

The following adjustments must be made due to the hardware changes of the analyzer.

NOTE

IMPORTANT!

The 10 MHz reference crystal oscillator is the most accurate after running for three hours. The 10 MHz Frequency Reference Adjustment can be run after the PNA has warmed up for 90 minutes, and the other adjustments can be completed in the order presented, but then the 10 MHz Frequency Reference Adjustment should be repeated after the PNA has been able to warm up for three hours.

-
- 10 MHz frequency reference adjustment
 - EE default adjustment: Synth LO only (Version 6 synthesizers)
 - synthesizer bandwidth adjustment (only if EE default adjustment is insufficient)
 - source adjustment
 - IF gain adjustment
 - receiver characterization
 - receiver adjustment
 - IF Response adjustment (For A model: Options 090, 093, or 094 only. For B models: Options S93090xA/B, S93093A/B, or S93094A/B only.)

These adjustments are described in the PNA Service Guide and in the PNA on-line HELP. A list of equipment required to perform these adjustments is also found in the service guide.

To view this service guide information, click the Chapter 3 bookmark “Tests and Adjustments” in the PDF Service Guide¹.

After the specified adjustments have been performed, the analyzer should operate and phase lock over its entire frequency range.

1. See “[Downloading the Online PNA Service Guide](#)” on page 9.

EEPROM Backup

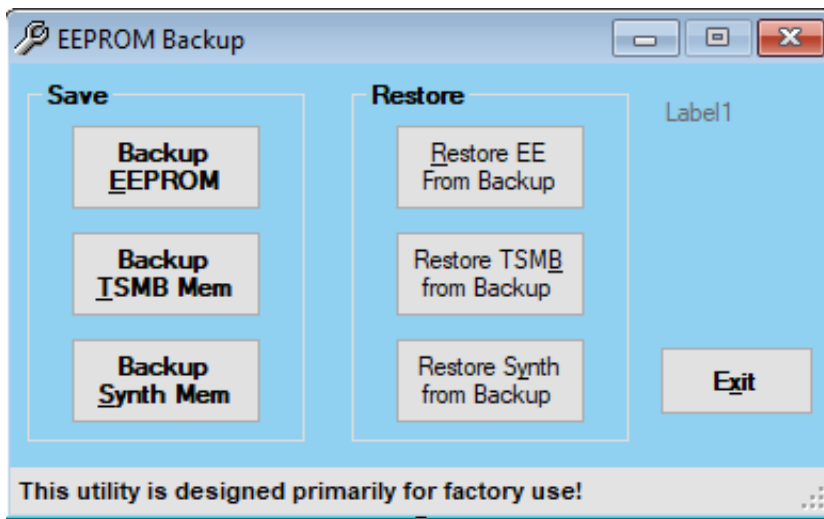
The analyzer uses arrays of correction constants to enable the analyzer to produce accurate, leveled source signals and receive clean test signals. These constants are stored in non-volatile EEPROM memory and in flash memory files.

The adjustments listed here generate new correction constants. The analyzer must have a backup of this new data in case any of the data becomes corrupted.

To store the backup data, perform these steps:

- Navigate to the EEPROM Backup Utility, located at:
 - Windows 7 -- C:\Program Files (x86)\Keysight\Network Analyzer\Service\eebackup.exe
 - Windows 10 -- C:\Program Files\Keysight\Network Analyzer\Service\eebackup.exe
- Run the program.
- Click Backup EEPROM.
- Click Backup TSMB Mem.
- Click Backup Synth Mem. (Applies to Version 7 Synthesizers Only)
- Click Exit when the program has finished.

Figure 9 EEPROM Backup Menu



Operator's Check

Perform the Operator's Check to check the basic functionality of the analyzer. For instructions, click the Chapter 3 bookmark "Tests and Adjustments" in the PDF Service Guide¹.

If you experience difficulty with the basic functioning of the analyzer, contact Keysight. Refer to **“Contacting Keysight” on page 6.**

Calibration

Although the analyzer functions, its performance relative to its specifications has not been verified. It is recommended that a full instrument calibration be performed using the analyzer’s internal performance test software. To view information on the performance test software, click the Chapter 3 bookmark “Tests and Adjustments” in the PDF Service Guide¹.

Step 20. Prepare the PNA for the User

1. If necessary, reinstall front jumper cables.
2. Install the cable guards, pushing them over the front jumper cables until the cushioning material touches the front panel of the PNA.
3. Install the dust caps on the test ports.
4. Clean the analyzer, as needed, using a damp cloth.

1. See **“Downloading the Online PNA Service Guide” on page 9.**

