

Installation Note

Keysight Add Source and Receiver Attenuators Upgrade Kit For Version 6, Single-Source Synthesizers

To Upgrade PNA N5224A/B or N5225A/B, PNA-X N5244B, or N5245B
Option 417 to Option 419

Upgrade Kit Order Numbers: N5224AU-419, N5225AU-419,
N5224BU-419, N5225BU-419, N5244BU-419, N5245BU-419

Keysight Kit Number: N5225-90108

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**.



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CAUTION

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Keysight Add Bias Tees Upgrade Kit
Upgrade Kit Number: N5225-60108
Installation Note

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.

NOTE

If you had an A model PNA-X with Option 219/419 with Option H85 that was upgraded to a B model, please refer to Options 217/417. If you had an A model PNA-X with Option 224/423 with Option H85 that was upgraded to a B model then refer to Option 222/422.

This upgrade adds the following items to your N5224A/B or N5225A/B Option 417 or N5244B or N5245B Option 417 or N5244B or N5245B Option 417 analyzer:

- a bias tee in each source port channel
- front panel overlay replacement
- eight new RF cables

After installation of this upgrade, your analyzer will be an N5224A/B or N5225A/B or N5244B or N5245B Option 419 or N5244B or N5245B Option 419.

Refer to **“Overview of the Installation Procedure” on page 11**.

CAUTION

This repair must be done at a service center or a self-maintainer service center! Refer to **“Getting Assistance from Keysight” on page 4**.

Getting Assistance from Keysight

By internet, phone, or fax, get assistance with all your test and measurement needs.

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.

NOTE

IMPORTANT!

- This document contains references to legacy and new A25 HMA26.5 Multiplier/Amplifier and A27/A28 mixer brick assemblies. Your model instrument may have either legacy assemblies or the new parts installed.
 - To verify your instrument's A25 HMA26.5 Multiplier/Amplifier, refer to [“Verify the Model/Version of HMA26.5 Installed” on page 7](#).
 - The A27/A28 mixer bricks might be a legacy part number 5087-7323 (with (x2) discrete 3dB attenuators, 08490-60039) or new part number 5087-7417 (with integrated 3 dB attenuators).
 - See also your instrument's PDF Service Guide ^a.
-

a. See [“Downloading the Online PNA Service Guide” on page 8](#).

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 9](#).
- Enough time - refer to [“About Installing the Upgrade” on page 9](#).
- 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 8](#).

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.

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

If you are unfamiliar with the licensing process:

NOTE

- 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, you must request license key(s) (A models) or license key files(s) (B models) 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 find your new HostID, go to <http://mktwww.srs.is.keysight.com/field/service/network/pna/> and, using the HostID utility, enter the PNA serial number and your new, upgraded PNA-X model number - N5224A, N5225A, N5244A, or N5245A.

Description of the Upgrade Getting Prepared

– Host ID

Using the information just gathered, you must request license key(s) for your A model or for your B models, a license key file(s) 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). Refer to “**License Key Redemption**” on page 6.

Verify the Model/Version of HMA26.5 Installed

This upgrade kit contains components for use with PNA models using the legacy HMA26.5 part number 5086-7765. If your PNA has the newer HMA26.5 part number N5240-60101 installed you may discard these parts:

- A26 splitter 5067-4086
- W52 N5245-20013
- W53 N5245-20023
- W54 N5245-20022

(If you have the legacy 5086-7765 HMA26.5, please discard the N5245-20195 semi-rigid cables. Refer to **Figure 1 on page 7**.)

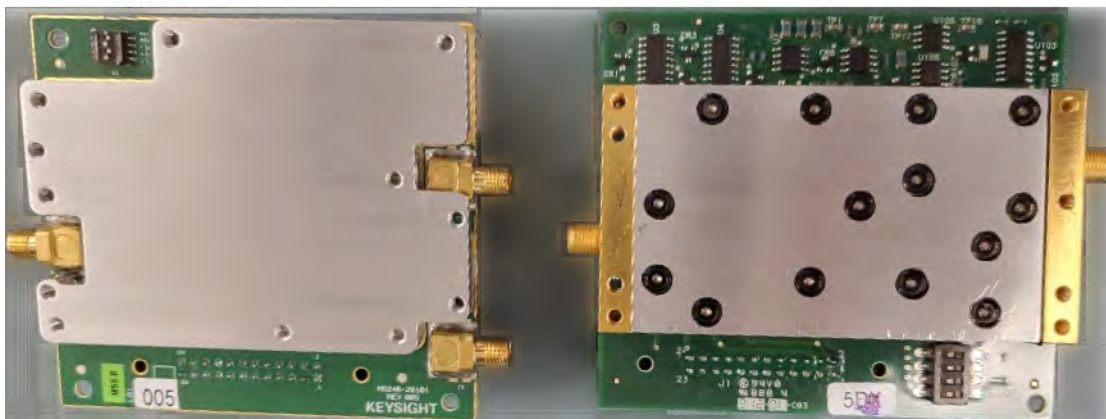
The new N5240-60101 HMA26.5 has the splitter integrated into the assembly. Refer to **Figure 1 on page 7**.

Figure 1

Comparison of Legacy HMA26.5 (5087-7765) and New HMA26.5 (N5240-60101)

New HMA26.5 -- N5240-60101
Requires (x1) Cable.

Legacy HMA26.5 -- 5087-7765
Requires A26 Splitter and (x3) Cables.



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 4.**

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

CAUTION

Use a 5/16-in torque wrench set to 10 in-lbs on all cable connections.

About Installing the Upgrade

Products affected	N5224A/B, N5225A/B, N5244B, N5245B Option 417 and N5244B and N5245B Option 417
Installation to be performed by	Keysight service center or personnel qualified by Keysight
Estimated installation time	2 hours
Estimated adjustment time	0.5 hour
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 4.**

Table 2 Contents of Upgrade Kit N5225-60108

Ref Desig.	Description	Qty	Part Number
--	Installation note (this document)	1	N5225-90108
--	Software Entitlement Certificate	1	5964-5145
--	China RoHS Addendum	1	9320-6722
A42– A45	Bias tee	4	5087-7789
--	Bias tee bracket	4	N5245-00011
--	Front panel overlay – PNA N5224/5A models	1	N5227-80005
--	Front panel overlay – PNA N5224/5B models	1	N5227-80020
--	Front panel overlay – PNA-X N5244/5B models	1	N5242-80025
--	Machine screw, M3 x 8, pan head (to attach bias tee brackets to deck)	10	0515-0372
--	Machine screw, M3 x 14, pan head (to attach bias tees to brackets)	10	0515-0665
--	Machine screw, M3.0 x 6, flat head (to attach front frame to coupler plate)	2	0515-1946
--	Machine screw, M3 x 14, pan head (to secure bias tees to brackets)	10	0515-2994
W83	RF cable, Front-panel Port 1 CPLR THRU to A42 port 1 bias tee	1	N5245-20076
W84	RF cable, A33 port 1 coupler to A42 port 1 bias tee	1	N5245-20085
W87	RF cable, Port 3 CPLR THRU to A43 port 3 bias tee	1	N5245-20089
W88	RF cable, A43 port 3 bias tee to A34 port 3 coupler	1	N5245-20086
W91	RF cable, Port 4 CPLR THRU to A44 port 4 bias tee	1	N5245-20090
W92	RF cable, A44 port 4 bias tee to A35 port 4 coupler	1	N5245-20088
W95	RF cable, Port 2 CPLR THRU to A45 port 2 bias tee	1	N5245-20030
W96	RF cable, A45 port 2 bias tee to A36 port 2 coupler	1	N5245-20087

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.

NOTE

Some of the following figures provided in this procedure contain bias tees. Bias tees are included in the Option 219/419 upgrade kits and can be ignored for Options 217/417 and 222/422.

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. Install the Bias Tee Brackets.”
- “Step 6. Install the Bias Tee Assemblies.”
- “Step 7. Install Some Bottom-Side (Test Set) Cables.”
- “Step 8. Remove the Old Lower Front Panel Overlay.”
- “Step 9. Reinstall Front Panel Assembly.”
- “Step 10. Install the New Lower Front Panel Overlay.”
- “Step 11. Reinstall Front Panel Jumpers.”
- “Step 12. Position the Cables and Wires to Prevent Pinching.”
- “Step 13. Reinstall the Outer Cover.”
- “Step 14. Remove Option 417 License.”
- “Step 15. Enable Option 419.”
- “Step 16. Perform Post-Upgrade Adjustments and Calibration.”
- “Step 17. 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 6**.

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 12**.

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 4**.

Step 2. Remove the Outer Cover

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

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 semirigid 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 cables in the following list in the order shown. To see an image showing the location of these cables, click the Chapter 6 bookmark “Bottom RF Cables, Standard 4-Port Configuration, Option 417 (S/N Prefixes <6021)” or “Bottom RF Cables, Standard 4-Port Configuration, Option 417 (S/N Prefixes ≥6021)” in the PDF Service Guide¹. These cables may be discarded - they will not be reinstalled.

1. See **“Downloading the Online PNA Service Guide” on page 8**.

Description of the Upgrade
Installation Procedure for the Upgrade

- W20 (N5245-20099) Front panel port 1 CPLR THRU to A33 port 1 coupler
- W24 (N5245-20098) Front panel port 3 CPLR THRU to A34 port 3 coupler
- W32 (N5245-20097) Front panel port 2 CPLR THRU to A36 port 2 coupler
- W28 (N5245-20096) Front panel port 4 CPLR THRU to A35 port 4 coupler
- W36 (N5245-20155) Front panel jumpers (quantity = 12)

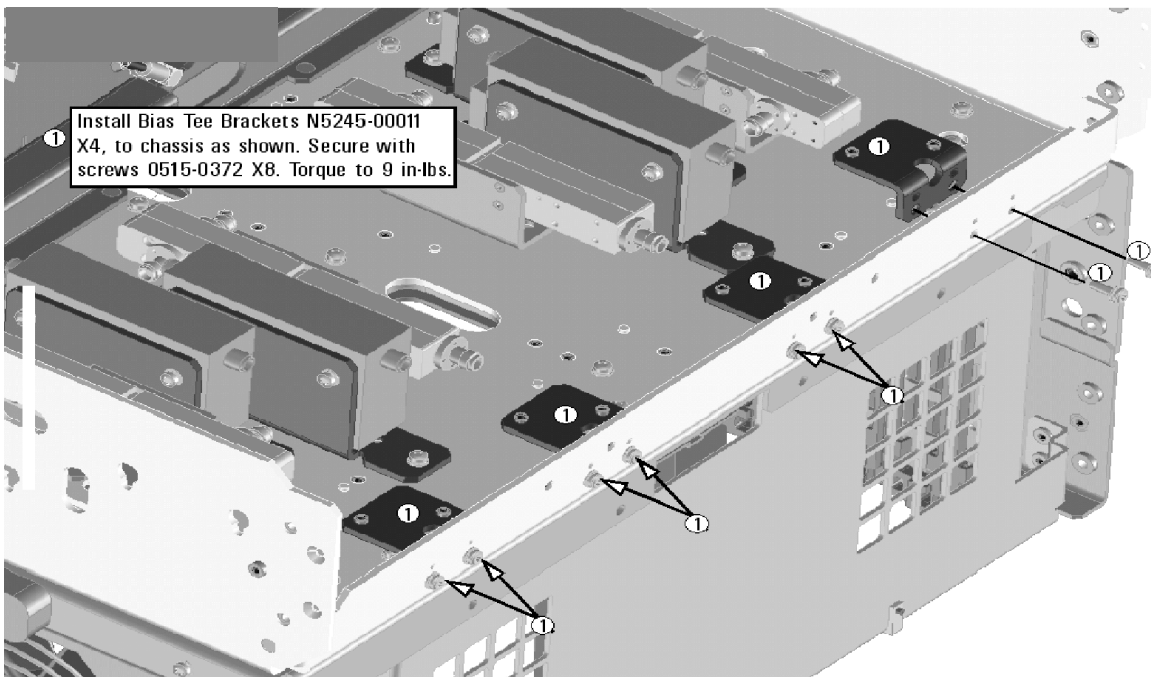
NOTE: Remove and save the cable guards for the front panel jumpers.

3. 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. Install the Bias Tee Brackets

Refer to **Figure 1** for this step of the procedure. New parts are listed in **Table 2** on page 10.

Figure 1 Bias Tee Brackets Installation (0515-0372, N5245-00011)

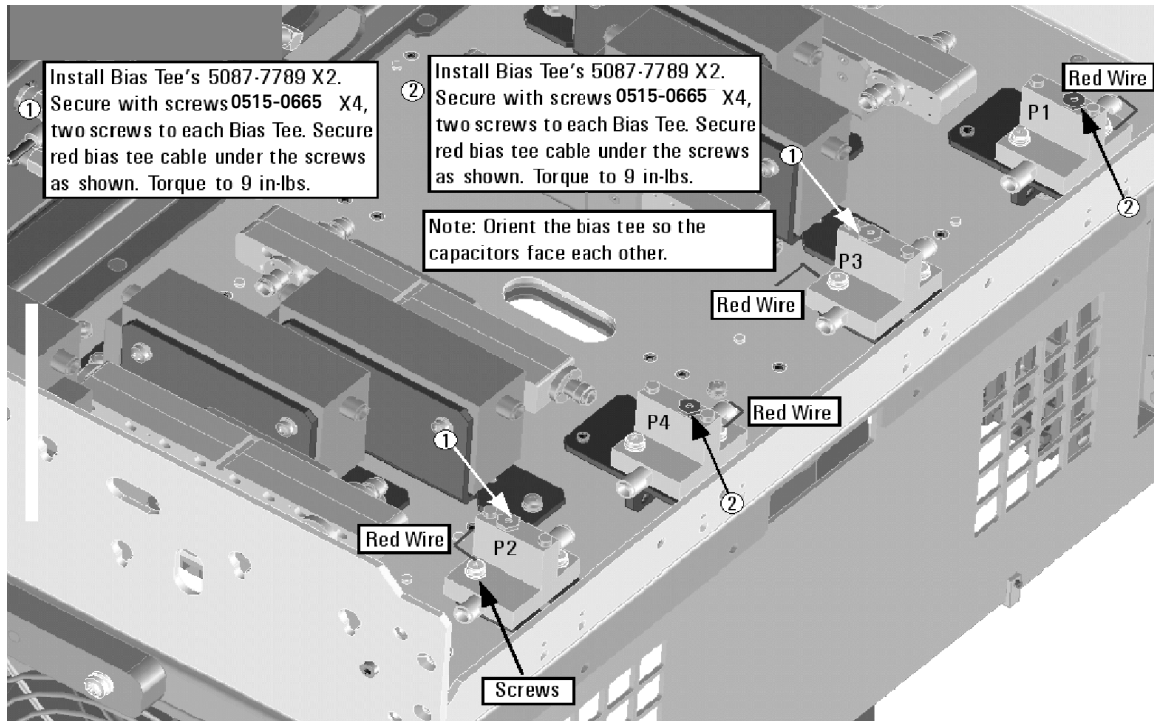


N5225_108_01

Step 6. Install the Bias Tee Assemblies

Refer to **Figure 2** for this step of the procedure. New parts are listed in **Table 2 on page 10**.

Figure 2 Bias Tee Installation (0515-0665, 5087-7789)



N5225_108_02

Step 7. Install Some Bottom-Side (Test Set) Cables

Remove the A23 mixer brick assembly from the PNA. For instructions, click the Chapter 7 bookmark, "Removing and Replacing the A23 and A24 Mixer Bricks" in the PDF Service Guide¹.

CAUTION

Follow instructions carefully when making cable connections, especially wire harness connections. Incorrect connections can destroy components, resulting in additional customer costs.

CAUTION

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

1. See ["Downloading the Online PNA Service Guide" on page 8](#).

Install the Semirigid Cables

To see an image showing the location of these cables, click the Chapter 6 bookmarks “Bottom RF Cables, 4-Port Configuration, Option 419” in the PDF Service Guide. New parts are listed in **Table 2 on page 10**.

Install the following new cables in the order listed.

- W96 (N5245-20087) A45 port 2 bias tee to A36 port 2 coupler
- W92 (N5245-20088) A44 port 4 bias tee to A35 port 4 coupler
- W84 (N5245-20085) A33 port 1 coupler to A42 port 1 bias tee
- W88 (N5245-20086) A43 port 3 bias tee to A34 port 3 coupler
- W95 (N5245-20030) Port 2 CPLR THRU to A45 port 2 bias tee
- W91 (N5245-20090) Port 4 CPLR THRU to A44 port 4 bias tee
- W87 (N5245-20089) Port 3 CPLR THRU to A43 port 3 bias tee
- W83 (N5245-20076) Front-panel Port 1 CPLR THRU to A42 port 1 bias tee

Install the Ribbon Cables and Wire Harnesses

To see an image showing the location of these cables, click the Chapter 6 bookmarks “Bottom Ribbon Cables and Wire Harnesses, 4-Port, Option 419” in the PDF Service Guide¹. New parts are listed in **Table 2 on page 10**.

If not already done, connect bias tee cable harnesses as follows:

- A42 port 1 bias tee to A23 test set motherboard J541
- A43 port 3 bias tee to A23 test set motherboard J543
- A44 port 4 bias tee to A23 test set motherboard J544
- A45 port 2 bias tee to A23 test set motherboard J542

Step 8. Remove the Old Lower Front Panel Overlay

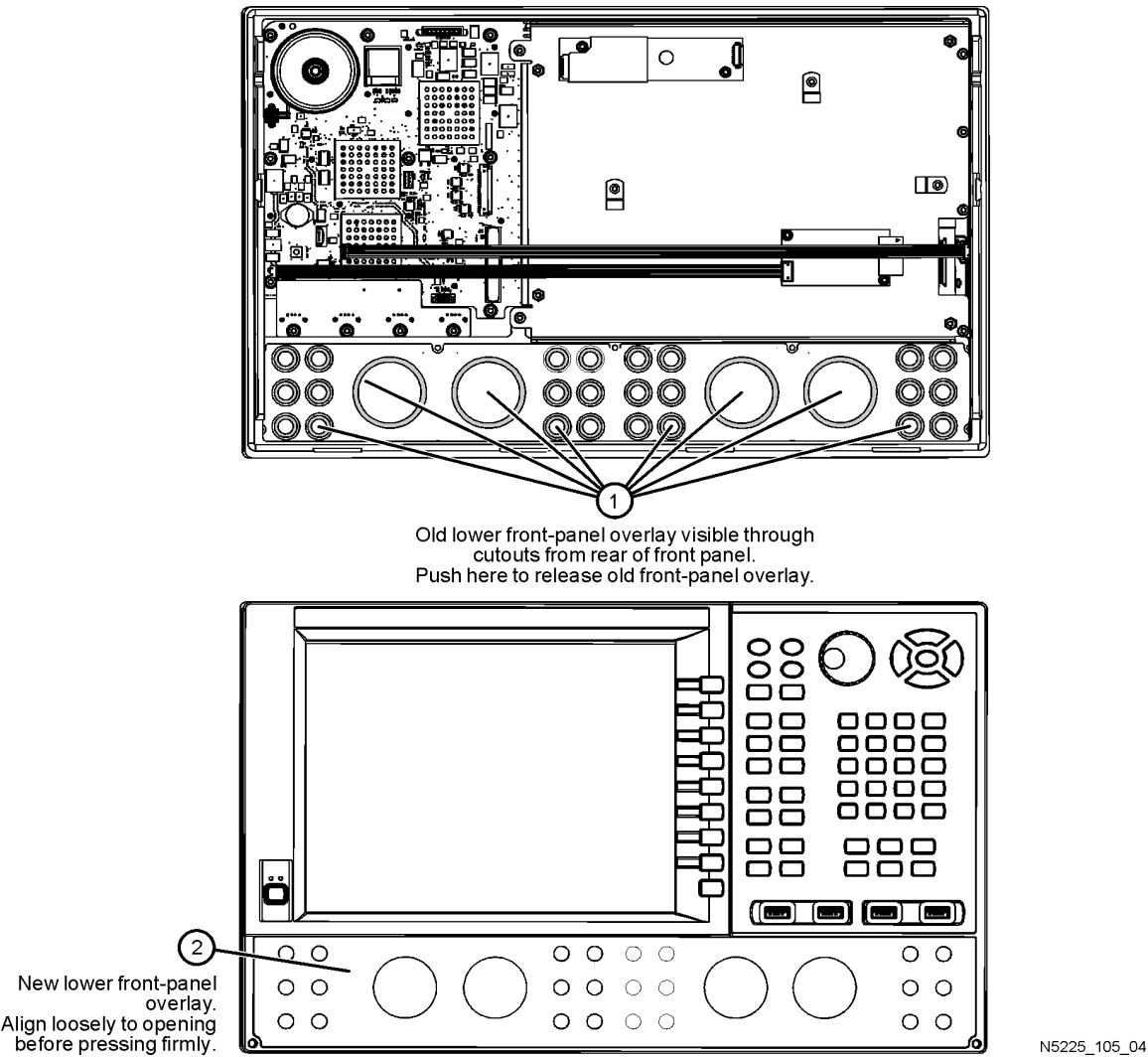
Refer to **Figure 3 on page 16** for this step of the procedure. New parts are listed in **Table 2 on page 10**.

1. From the back side of the front panel, use a blunt object in the cutouts in the lower front dress panel to push on the old overlay (item ①) and separate it from the front dress panel.
2. From the front side of the front panel, pull off the overlay completely and discard it.
3. Remove any adhesive remaining on the front panel.

CAUTION

To avoid possible damage to the lower front panel overlay (label), do not attempt to attach the lower front panel label until **“Step 10. Install the New Lower Front Panel Overlay” on page 17**.

Figure 3 Lower Front Panel Overlay Replacement



Step 9. 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.

1. Remove the protective backing from the new front panel overlay, N5227-80005 for N5224/5A models or N5227-80020 for PNA N5224/5B models or N5242-80025 for PNA-X N5244/5B (item ①).
2. Starting from either side, loosely place the overlay in the recess on the lower front panel, ensuring that it fits tightly against the edges of the recess.
3. Once the overlay is in place, press it firmly onto the frame to secure it.
4. Be sure to install the two new screws (0515-1946) in the front panel, next to test ports 3 and 4. Torque these screws to 9 in-lbs.

Step 10. Install the New Lower Front Panel Overlay

Follow the two instructions shown in **Figure 3** in this document. New parts are listed in **Table 2 on page 10** of this document.

Step 11. Reinstall Front Panel Jumpers

Reinstall all twelve of the front panel jumper cables (W36), part number N5245-20155. Torque to 10 in-lbs.

Step 12. 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.

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 13. Reinstall the Outer Cover

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

Step 14. Remove Option 417 License

Procedure Requirements

- The analyzer must be powered up and operating to perform this procedure.

1. See **“Downloading the Online PNA Service Guide” on page 8**.

- The Network Analyzer program must **not** be running.
- A keyboard and mouse must be connected to the network analyzer.

A Model Option 417 License Removal Procedure

For B models, refer to “**B Model Option 417 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 **417**.
4. Click Remove.

B Model Option 417 License Removal Procedure

For A models, refer to “**A Model Option 417 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 15. Enable Option 419

Procedure Requirements

- The analyzer must be powered up and operating to perform this procedure.
- The Network Analyzer program must **not** be running.
- Refer to the license message you received from Keysight: Verify that the analyzer’s model and serial numbers match those on the license message you received from Keysight.
- A keyboard must be connected to the network analyzer.

For “A” models, refer to “**Option Enable Procedure for “A” Model Instruments**” on page 19.

For “B” models refer to “**Option Enable Procedure for “B” Model Instruments**” on page 19.

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 **419 - Configurable Test Set**.
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 “419” is listed after “Options:” in the display. Click OK.

NOTE

If if the option(s) have not been enabled or an older option has not been removed, contact Keysight Technologies. Refer to [“Getting Assistance from Keysight” on page 4](#).

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 6](#).
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(s) have not been enabled or if your older options have not been removed, contact Keysight Technologies. Refer to **"Getting Assistance from Keysight" on page 4**.

1. Start the Network Analyzer program.
2. Once the Network Analyzer program is running:
 - Press **Help > About NA** and verify that Option 419 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 following Web site:
<http://mktwww.srs.is.keysight.com/field/service/network/pna/>.

Step 16. Perform Post-Upgrade Adjustments and Calibration

Adjustments

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.

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

- 10 MHz frequency reference adjustment
- EE default adjustment: Synth LO only (Version 6 synthesizers)
- 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.)
- Noise adjustment (For N5244/5B models: Option 029 with S93029A/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.

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.

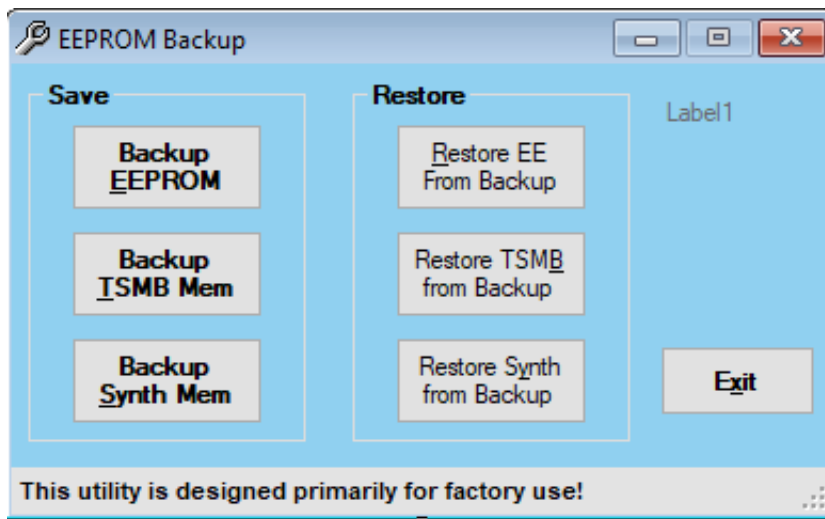
1. See [“Downloading the Online PNA Service Guide” on page 8](#).

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 4 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 4**.

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 Guide.

Step 17. 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.

Description of the Upgrade
Installation Procedure for the Upgrade

