

**Agilent Technologies
E444xAU Options H20, H25
and H70**

Installation Guide

Agilent Technologies
E444xAU Options H20, H25 and H70

Installation Guide
Retrofit Kit for the PSA Instruments

Use this manual with the following products:
E4440A/E4443A/E4445A/E4446A/E4448A



Agilent Technologies

Manufacturing Part Number: E4440-90214

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| | |
|----------------|---|
| WARNING | Warning denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met. |
|----------------|---|

| | |
|----------------|---|
| CAUTION | Caution denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met. |
|----------------|---|

Definitions

- *Specifications* describe the performance of parameters covered by the product warranty (temperature –0 to 55 °C, unless otherwise noted.)
- *Typical* describes additional product performance information that is not covered by the product warranty. It is performance beyond specification that 80% of the units exhibit with a 95% confidence level over the temperature range 20 to 30 °C. Typical performance does not include measurement uncertainty.
- *Nominal* values indicate expected performance or describe product performance that is useful in the application of the product, but is not covered by the product warranty.
- *Characteristic Performance* describes performance parameter that the product is expected to meet before it leaves the factory, but is not verified in the field and is not covered by the product warranty. A characteristic includes the same guard bands as a specification.

E444xAU Options H20, H25 and H70

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E444xAU Options H20, H25 and H70

Introduction

This manual incorporates the installation of the following similar instrument models E4440A, E4443A, E4445A, E4446A, E4448A with Option H20, H25 or H70.

Only one of the options can be installed per instrument due to the 321.4 MHz IF being required as the input. When the Option IF Output is installed with Option H7L or HNQ, the 321.4 MHz IF Output must be jumpered (8120-5066) to the H7L IN, HNQ IN, or Option IF IN (H20 IN, H25 IN or H70 IN) for any one of the options to function properly.

Description

The Agilent model numbers E4440AU, E4443AU, E4445AU, E4446AU and E4448AU are referred to as the E444xAU through out this document. Options H20, H25, and H70 are referred to as the Option IF Output.

The E444xAU Option IF Output is a retrofit kit that provides the components necessary to install a down converted IF Output connector to the rear panel of the PSA Performance Spectrum Analyzer. The Option IF Output can be installed with Options H7L and HNQ.

Verifying the Shipment

Check the items received in the following option specific Tables on the following pages to ensure that you have received all the items in your shipment. If there are any signs of damage that may have occurred during shipment, or any accessories appear to be damaged or missing, call your nearest Agilent Technologies sales or service office. See [“Contacting Agilent” on page 32](#) for more information.

Table 1 E4440xAU Option H20 Content List

| Description | Agilent Part Number | Quantity |
|--------------------------|----------------------------|-----------------|
| Plug Hole .25D NYL | 6960-0076 | 3 |
| Plug Hole .5D NY | 6960-0149 | 2 |
| Option Label (H20) | E4440-80560 | 1 |
| Panel Rear Dress | E4440-00059 | 1 |
| Cable AY (W40) | E4440-60411 | 1 |
| Cable AY (W51) | E4440-60412 | 1 |
| Cable AY (W41) | E4440-60413 | 1 |
| IF Output Board | E4440-60414 | 1 |
| Label (20 MHz) | E4440-80541 | 1 |
| Label (H20 IN) | E4440-80552 | 1 |
| Installation Guide | E4440-90214 | 1 |
| Product Note | E4440-90545 | 1 |
| Wire Marker Clip 2 (red) | 7121-5602 | 2 |

Table 2 E4440xAU Option H25 Content List

| Description | Agilent Part Number | Quantity |
|--------------------------|----------------------------|-----------------|
| Plug Hole .25D NYL | 6960-0076 | 3 |
| Plug Hole .5D NY | 6960-0149 | 2 |
| Option Label (H25) | E4440-80561 | 1 |
| Panel Rear Dress | E4440-00059 | 1 |
| Cable AY (W40) | E4440-60411 | 1 |
| Cable AY (W51) | E4440-60412 | 1 |
| Cable AY (W41) | E4440-60413 | 1 |
| IF Output Board | E4440-60429 | 1 |
| Label (H25 IN) | E4440-80553 | 1 |
| Label (25 MHz) | E4440-80554 | 1 |
| Product Note | E4440-90575 | 1 |
| Installation Guide | E4440-90214 | 1 |
| Wire Marker Clip 2 (red) | 7121-5602 | 2 |

Table 3 E4440xAU Option H70 Content List

| Description | Agilent Part Number | Quantity |
|--------------------------|--------------------------------|-----------------|
| Plug Hole .25D NYL | 6960-0076 | 3 |
| Plug Hole .5D NY | 6960-0149 | 2 |
| Option Label | E4440-80563 | 1 |
| Panel Rear Dress | E4440-00059 | 1 |
| IF Output Board | E4440-60424 ¹ | 1 |
| Cable AY (W40) | E4440-60411 | 1 |
| Cable AY (W51) | E4440-60412 | 1 |
| Cable AY (W41) | E4440-60413 | 1 |
| Product Note | E4440-90213 | 1 |
| Installation Guide | E4440-90214 | 1 |
| Wire Marker Clip 2 (red) | 7121-5602 | 2 |

1. Earlier versions of this upgrade kit may include the IF Output Board (E4440-60410).

Installation Procedure

Removing the Feet, Handles and Covers

NOTE Keep all of the hardware (screws, nuts, etc.) for re-use when installing the assemblies.

Follow the steps outlined below to install the Option IF Output retrofit kit.

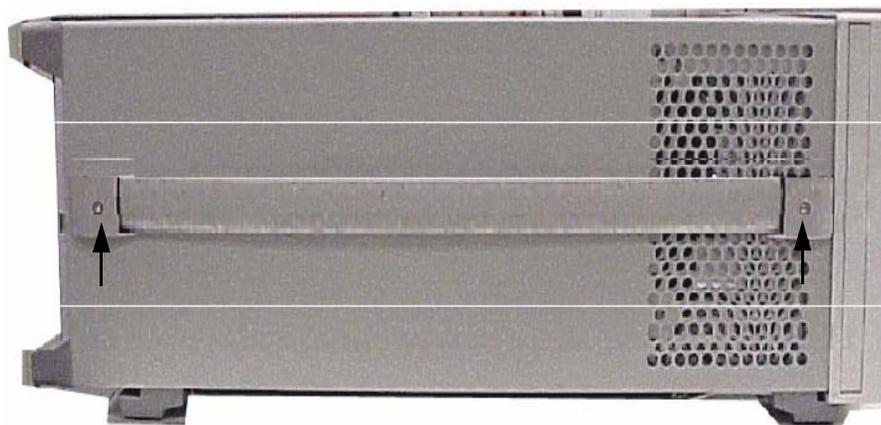
1. Remove the four rear panel feet on the PSA, using a #20 Torx driver. Refer to [Figure 1](#). Upon re-installation torque to 21 in-lb.

Figure 1 Rear Panel Feet



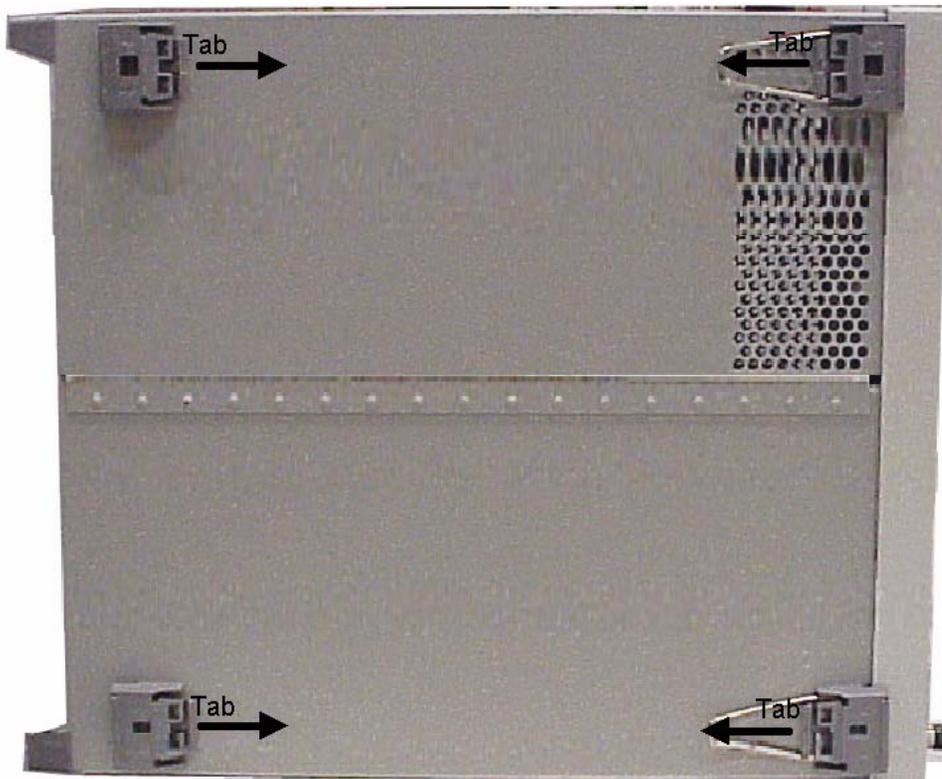
2. Remove the two side handles on the PSA, using a #20 Torx driver. Refer to [Figure 2](#). Upon re-installation torque to 21 in-lb.

Figure 2 Side Handles



3. Remove the four feet from the bottom of the PSA instrument by pulling the tabs away from the instrument and sliding the feet toward the center of the instrument. Refer to [Figure 3](#).
4. Remove the outside cover by sliding it toward the rear of the instrument.

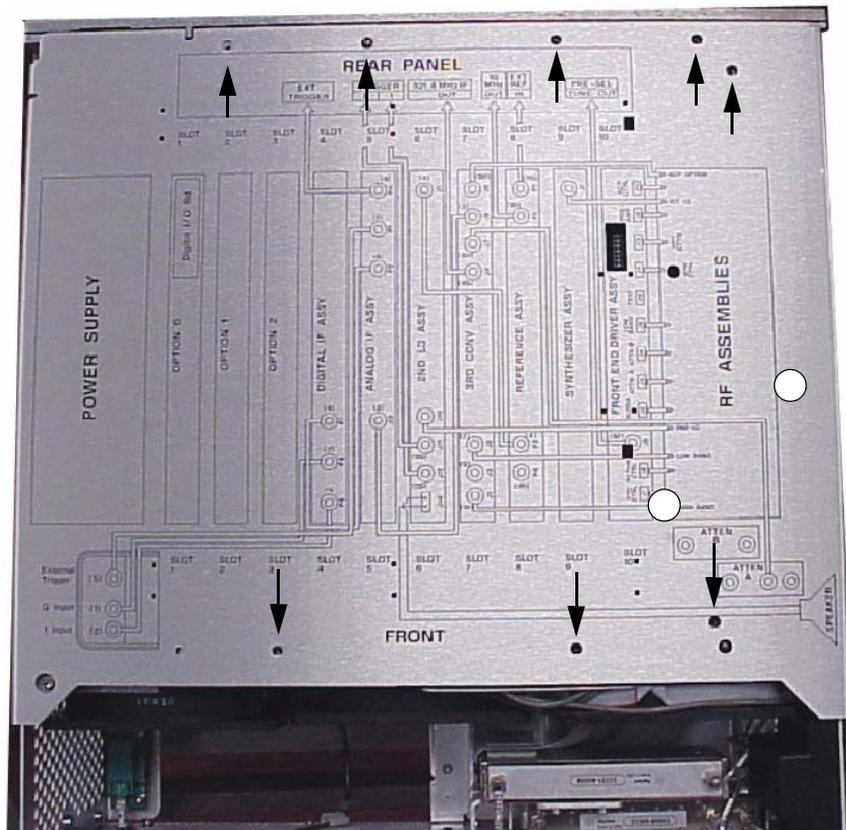
Figure 3 Bottom Feet Orientation



5. Remove the chassis cover, using a #10 Torx driver. Refer to [Figure 4](#) for location of top screws. There are ten screws to remove from the “speaker” side of the chassis cover and two screws from the “power supply” side of the chassis cover. Place all hardware in a safe location for re-installation.

NOTE The E4446A and E4468A have two additional screws in the chassis cover. The white circles indicate the approximate position.

Figure 4 Chassis Cover Screw Location



6. Remove the rear panel plate by removing the following components. Refer to [Figure 5](#).
 - BNC (f) connectors nuts
 - SMA connector nut
 - thirteen rear plate screws
7. Carefully pull the rear panel plate away from the BNC and SMA connectors. Insure that the cables are labeled so that the BNC and SMA connectors are inserted into the correct holes when re-installing them on the new rear panel plate. Discard the old rear panel plate.

Figure 5 Rear Panel Plate Connectors and Hardware



Instruments with H7L or HNQ

1. Remove the brown (1) wire marker clip from the E4440-60412 cable and add a red marker clip (2) to each end of the cable. The wire marker will now read 52 (reference designator W52).
2. Install cables (E4440-60412 and E4440-60413) and hole plug(s), as per the specific option configuration, on the rear panel plate (E4440-00059). See [Figure 6](#), [Figure 7](#) and [Figure 8](#).
3. Apply the option specific label to cover the 70 MHz silk screen with the frequency for the specific option being installed (20 MHz or 25 MHz). The Option H70 does not require a label.
4. Apply the label to cover the “H70 IN” silk screen with the specific option being installed (H20 IN or H25 IN). The Option H70 does not require a label.

Figure 6 Rear Panel Plate with Option H7L

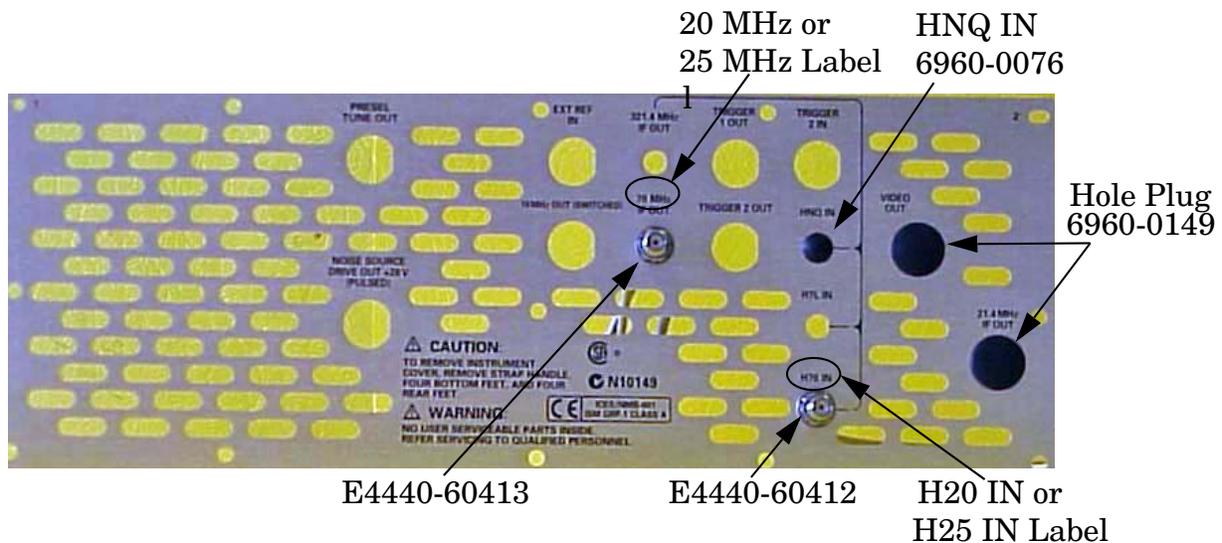


Figure 7 Rear Panel Plate with Option HNQ

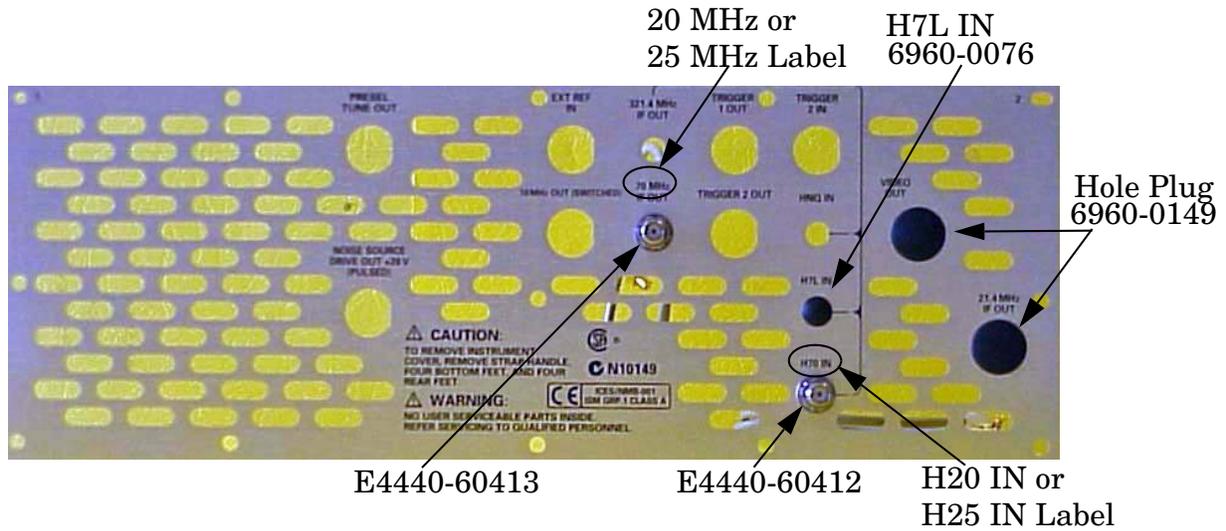
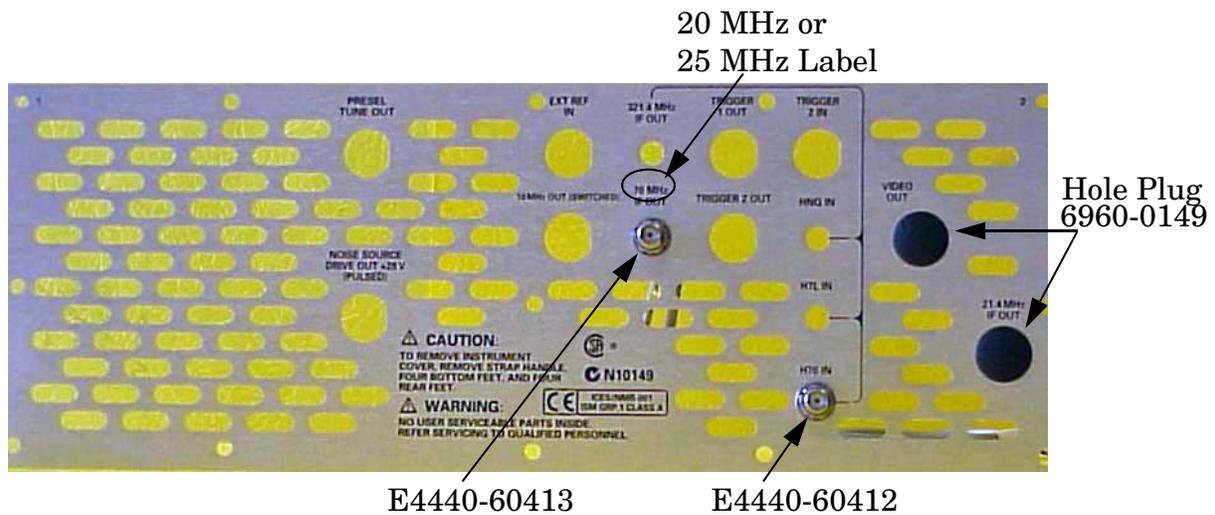


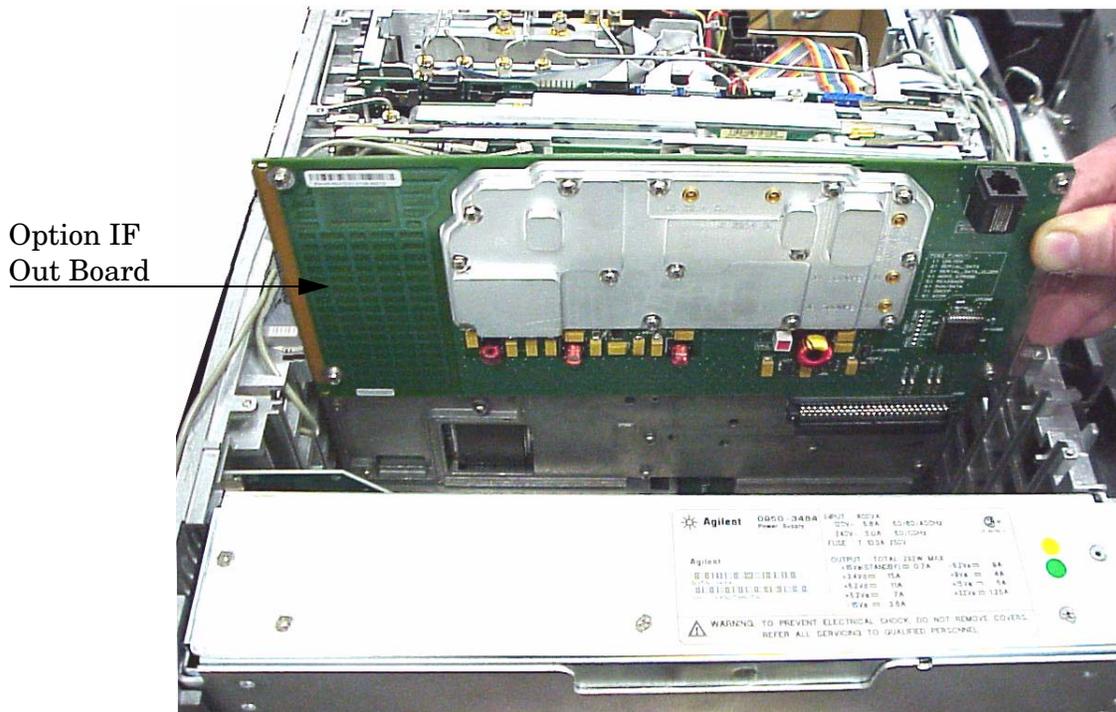
Figure 8 Rear Panel Plate with Option H7L and HNQ



Installing the Rear Panel with H7L or HNQ

1. Connect the BNC and SMA connectors as labeled in step 7 on [Page 8](#), using the previously removed hardware. Carefully route the new cables (W41 and W52) through the rear frame, near Slot 2. (To be connected to the Option IF board later in this procedure). Refer to [Figure 12 on page 13](#).
2. Connect the new rear panel plate to the rear panel, using the previously removed screws. Torque to 9 in-lb.
3. Partially insert the Option IF board into Option Slot 2. See [Figure 9](#).

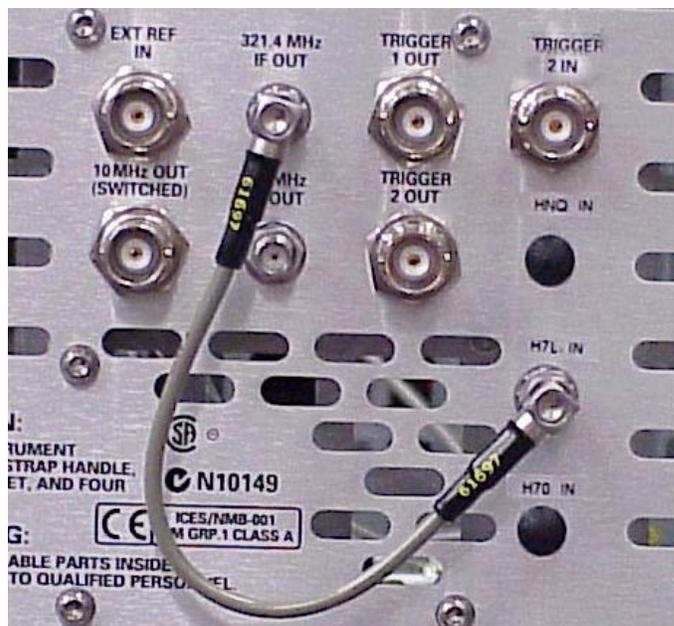
Figure 9 Option IF Board Insertion



4. Carefully route the cables along the top of the rear frame and between the board extractors to insure that they will not be damaged when installing the chassis cover. Refer to [Figure 12](#) and [Figure 13](#) on page 14. Connect the cables as follows:
 - Connect the 321.4 MHz IF Input cable (E4440-60412) (W52) on the rear panel to the 321.4 MHz IF Input connector (J1) on the Option IF board. Refer to [Figure 11](#) on page 13.
 - Connect the Option IF Output cable (E4440-60413, W41) on the rear panel to the Option IF Output connector (J2) on the Option IF board.
 - Connect the jumper cable (8120-5066). See [Figure 10](#).

NOTE Jumper cable (8120-5066) is included on instruments with Option H7L or HNQ. Move the cable from the Option H7L IN or HNQ IN to the Option IF IN connector (H20 IN, H25 IN or H70 IN) for the option to function properly.

Figure 10 Jumper Cable (Option H7L)



5. Completely insert the Option IF Output board into Slot 2.
6. Attach the appropriate option label (H20, H25 or H70) to the rear panel next to the existing list of options on the serial number label.
7. Install the chassis cover, instrument cover, side handles, bottom and rear feet in reverse order of the removal process described in the beginning of the procedure.
8. Install licence key to enable Option H20, H25 or H70. Refer to Option Upgrade Entitlement Certificate for option license procedure.

Figure 11 Option IF Board Connector Layout

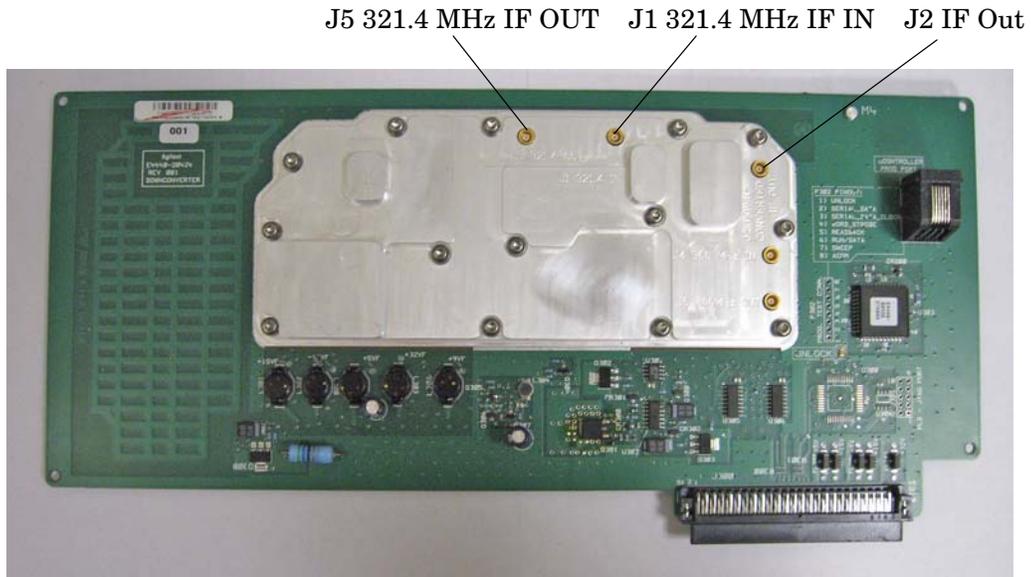


Figure 12 Top View of the PSA Instrument

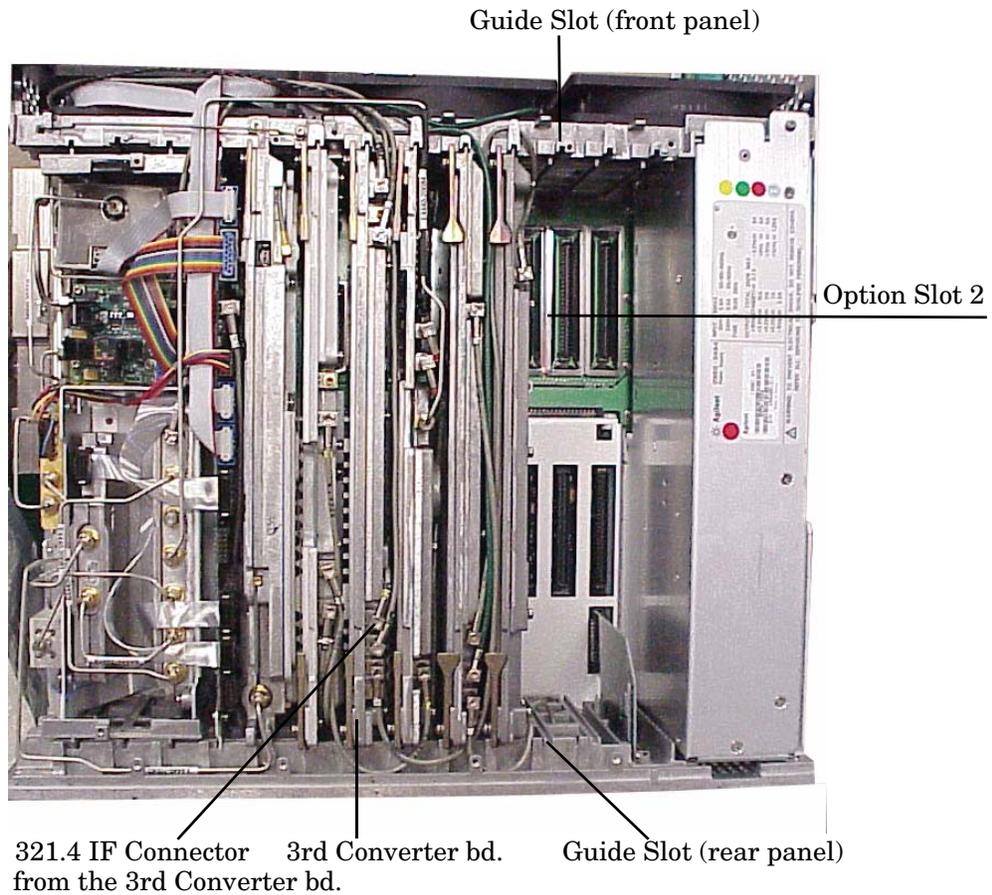
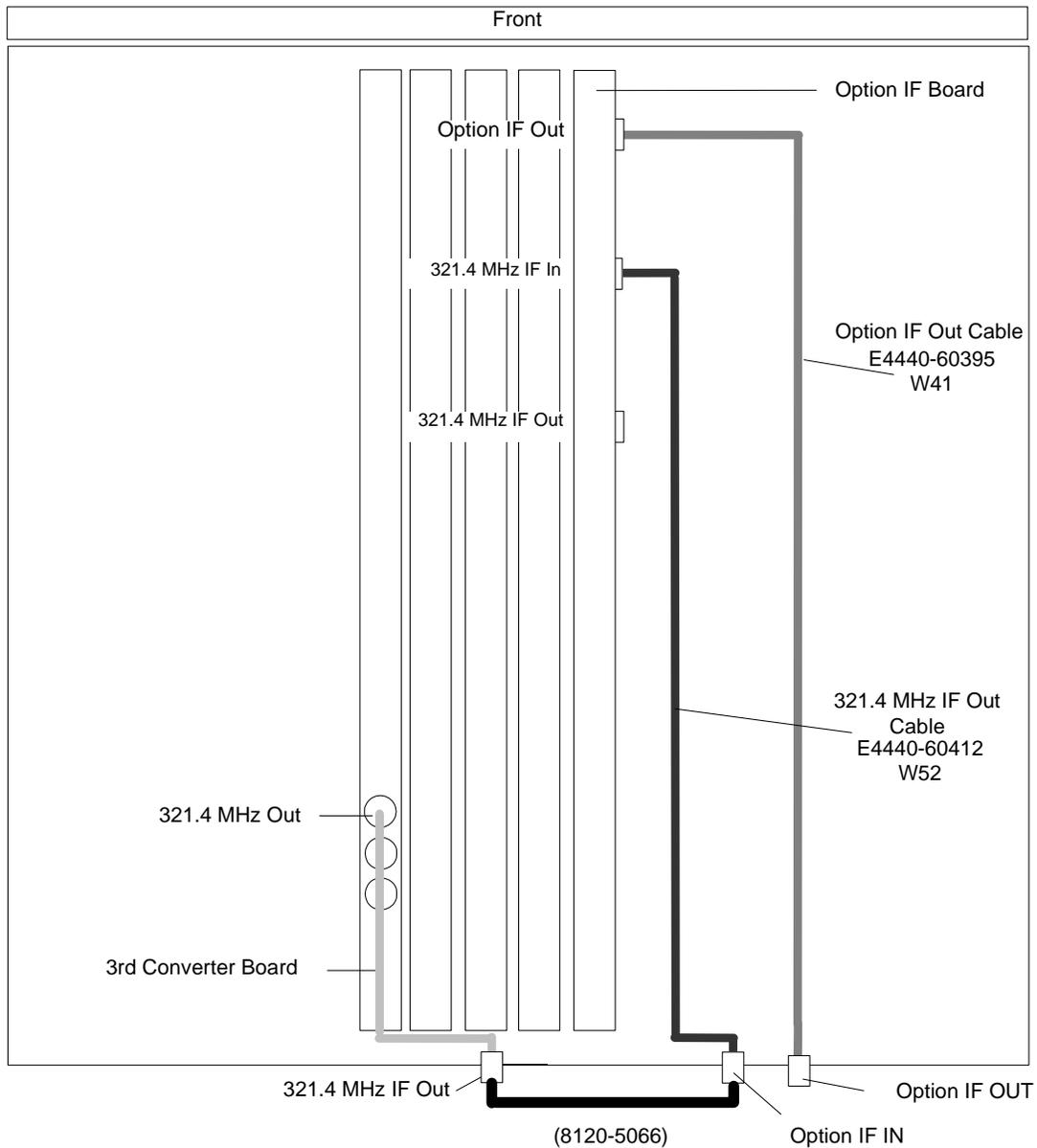


Figure 13 Top View Cable Orientation with Option H7L or HNQ

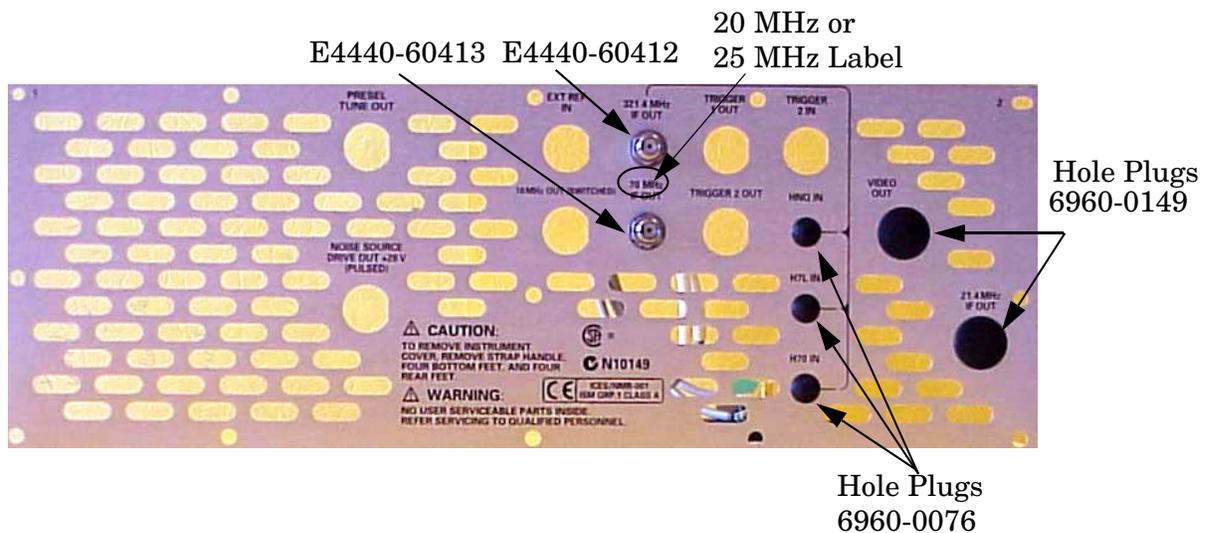


This concludes the installation of the E444xAU Option H7L or HNQ into the PSA instrument.

Instruments without H7L or HNQ

1. Install cables (E4440-60412 and E4440-60413) and hole plug(s), as per the specific option configuration, on the rear panel plate (E4440-00059). See [Figure 14](#).
2. Apply the option specific label to cover the 70 MHz silk screen with the frequency for the specific option being installed (20 MHz or 25 MHz). The Option H70 does not require a label.

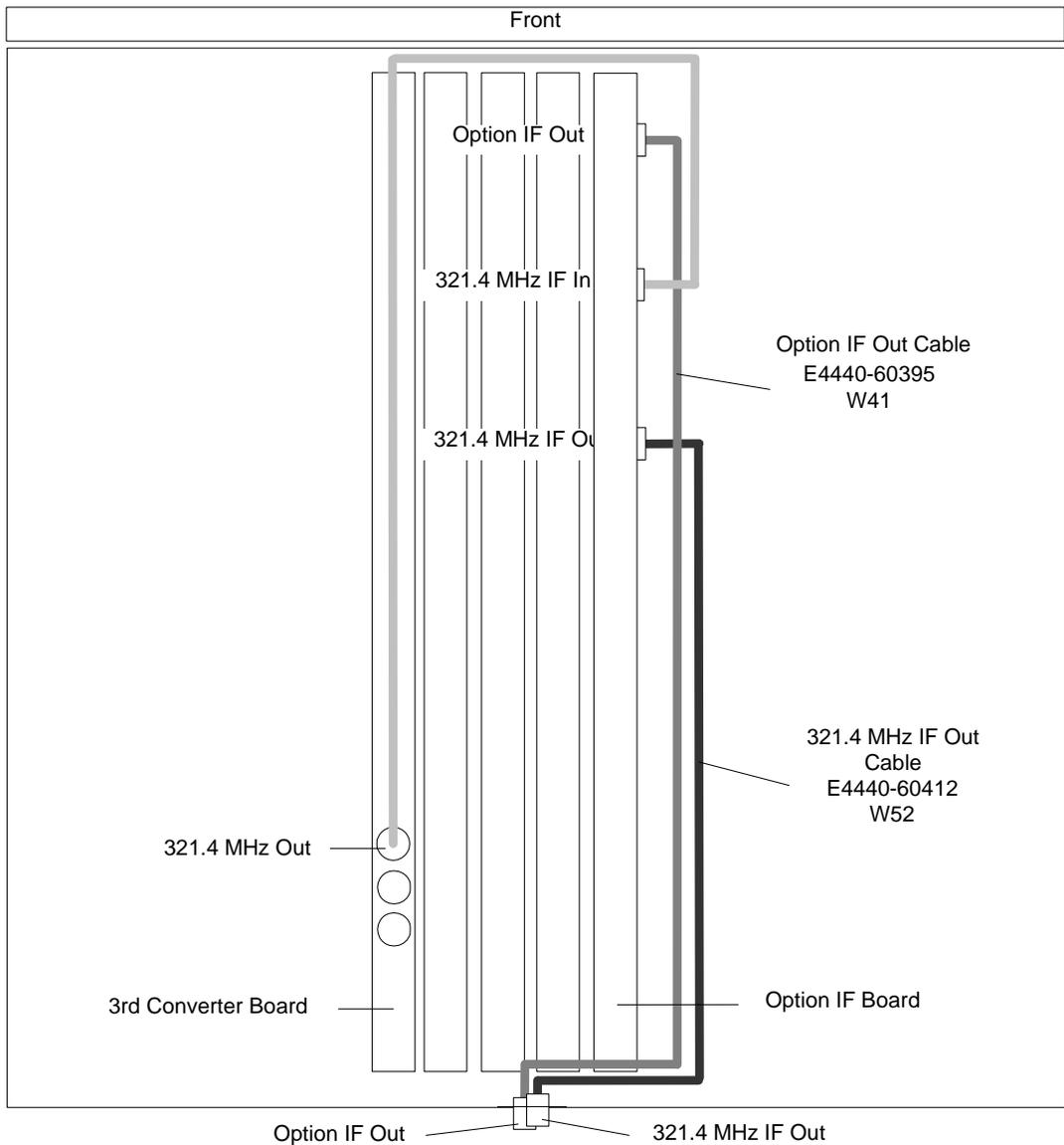
Figure 14 Rear Panel Plate (without Option H7L or HNQ)



3. Connect the BNC and SMA connectors as labeled in step 7 on [Page 8](#), using the previously removed hardware. Carefully route the new cables (W41 and W51) through the rear frame. (To be connected to the Option IF board later in this procedure). Refer to [Figure 12 on page 13](#).
4. Connect the new rear panel plate to the rear panel, using the previously removed screws. Torque to 9 in-lb.
5. Carefully disconnect and remove the 321.4 MHz IF Out cable from the 3rd Converter board by gently pulling up, using needle nose pliers. Refer to [Figure 12 on page 13](#) and [Figure 15 on page 17](#).
6. Partially insert the Option IF board (E4440-60414) into Option Slot 2. See [Figure 9 on page 11](#) and [Figure 12 on page 13](#). Ensure the Option IF board is installed with the edges in the grooves of the chassis.

7. Carefully route the cables along the top of the rear frame and between the board extractors to insure that they will not be damaged when installing the chassis cover. Refer to [Figure 12 on page 13](#). Connect the cables as follows:
 - Connect the new 321.4 MHz IF Output cable (E4440-60411) (W40) in the instrument from the 321.4 MHz Output connector on the 3rd Converter board to the 321.4 MHz IF Input (J1) on the Option IF board. Refer to [Figure 11 on page 13](#) and [Figure 15 on page 17](#).
 - Connect the 321.4 MHz IF Output cable (E4440-60412) (W51) on the rear panel to the 321.4 MHz IF Output connector (J5) on the Option IF board.
 - Connect the Option IF Output cable (E4440-60413, W41) on the rear panel to the Option IF Output connector (J2) on the Option IF board.
8. Attach the appropriate option label (H20, H25 or H70) to the rear panel next to the existing list of options on the serial number label.
9. Install the chassis cover, instrument cover, side handles, bottom and rear feet in reverse order of the removal process described in the beginning of this procedure.
10. Install licence key to enable Option H20, H25 or H70. Refer to Option Upgrade Entitlement Certificate for option license procedure.

Figure 15 Top View Cable Orientation without Option H7L or HNQ



This concludes the installation of the E444xAU that do not include Options H7L or HNQ.

Nominal Characteristics

Review the following table for the nominal characteristics of the 321.4 MHz and Option IF Output of the E444xAU with the new Option IF Output installed.

Table 4 Nominal Characteristics for the 321.4 and Option IF Output

| Parameter | 321.4 MHz IF Output | Option IF Output |
|-------------------------------------|---------------------|---------------------|
| Frequency | 321.4 MHz | 20, 25, or 70 MHz |
| Conversion Loss ¹ | -2 dB (\pm 2 dB) | -6 dB (\pm 2 dB) |
| IF Bandwidth | | |
| Low Band < 3 GHz | 40 MHz | 40 MHz |
| High Band \geq 3 GHz ² | 30 to 60 MHz | 30 to 60 MHz |

1. Attenuator setting: 0 dB. In high band, the Preselector Center routine must be performed to achieve the conversion loss listed in [Table 4](#). If applicable, when Option 1DS (100 kHz to 3 GHz Preamp) is on there will be a 28 to 30 dB of gain in the Option IF Output at the rear panel of the PSA. With the Preamp ON the conversion loss outlined in [Table 4](#) will be +22 dB.
2. Dependent on internal RF path. Typically, 40 MHz bandwidth increases as a function of center frequency up to approximately 60 MHz with a center frequency of 26 GHz.

While performing the “Align All” routine on the PSA, the Option IF Output will be corrupted due to the systems variable gain circuit stepping through the alignment routine.

The ripple correction in the flatness routine will be non-existent in the Option IF Output since the Option IF Output is ported to the rear panel before the IF signal is digitized and used for the flatness correction routine.

NOTE The 321.4 MHz IF Output is only effected if the Option IF Out is installed without Option H7L or HNQ.

Performance Tests and Adjustments

The tests outlined in this section are to verify the operation of the IF Output options and should be used in conjunction with the standard PSA manuals. This section also includes the equipment required.

Tests:

- “Equipment Required” on page 20.
- “Option IF Output Amplitude Test Procedure” on page 22.
- “321.4 MHz IF Out Amplitude Test Procedure” on page 24.
- “Measuring the Bandwidth of the IF Outputs” on page 25.
- “Repeat Steps 3 through 6 to measure the bandwidth of the Option IF Output.” on page 26.

Equipment Required

Gather the equipment listed in the Tables below to verify the performance of the PSA amplitude at the Option IF Output on the rear panel.

Table 5 Signal Source Equipment

| Description | Characteristics | Model |
|---------------------|---|--------|
| Synthesized Sweeper | Frequency: Must sweep 100 MHz around 1 GHz Amplitude: >0 dBm | 83620B |

Table 6 Analyzer Equipment (test spectrum analyzer)

| Description | Characteristics | Model |
|-------------------|------------------------------|----------------|
| Spectrum Analyzer | Upper Frequency Range: 2 GHz | 8562E 8563E |

Table 7 Power Meter Equipment

| Description | Characteristics | Model |
|--------------|---|------------------|
| Power Meter | Absolute Accuracy: $\pm 0.5\%$ Resolution: 0.01 dB Reference Accuracy: 1.2% Power Reference Accuracy: $\pm 0.9\%$ Compatible with Agilent 8480 series power sensors dB relative mode | E4419B E4418A |
| Power Sensor | Frequency Range: 1 MHz to 4.0 GHz SWR at 50 MHz: ≤ 1.05 1 MHz to 4 GHz SWR: $\leq 1.22:1$ Type-N (m) 50 Ω | 8482A 8481A |

Table 8 Cables

| Description | Characteristics | Agilent Part Numbers |
|------------------------------|---|----------------------|
| APC 3.5 (m)(m) 2 required | DC to 26.5 GHz Length: ≤ 92 cm (36 in) Insertion Loss: ~ 2 dB | 8120-4921 |
| SMA | Low-loss, 1 m | 5064-5458 |

Table 9 **50 Ω Adapters**

| Description | Characteristics | Agilent Part Number |
|--|---|----------------------------|
| Adapter 3.5 (f) to 3.5 (f) (two required) | VSWR: $\leq 1.05:1$ | 83059B |
| BNC to dual banana | | 1251-0781 |
| BNC Tee (f,m,f) | | 1250-0781 |
| BNC (m) to SMA (f) | VSWR: $\leq 1.13:1$ | 1250-1700 |
| BNC (f) to SMA (m) | | 1250-1200 |
| Type-N (m) to 3.5 mm (m) | VSWR: $\leq 1.08:1$ | 1250-1743 |
| Type-N (m) to APC 3.5 (f) two required | VSWR: $\leq 1.08:1$ | 1250-1744 |
| Type-N (f) to APC 3.5 (f) | For the 83620B VSWR: $1.08:1$ | 1250-1745 |
| APC 3.5 (m) to APC 3.5 (m) two required | VSWR: $\leq 1.12:1$ | 1250-1748 |
| APC 3.5 (f) to APC 3.5 (f) | Connector saver for 83630B VSWR: $1.15:1$ | 1250-1749 |
| Type-N (f) to APC 3.5 (m) two required | VSWR: $1.08:1$ | 1250-1750 |
| Type-N (f) to N (f) | VSWR: $1.03:1 \leq 1.3 \text{ GHz}$ $\sim 1.15 \leq 18 \text{ GHz}$ | 1250-1472 |
| Type-N (m) to BNC (m) | | 1250-1473 |
| Type-N (m) to N (m) | VSWR: $1.03:1 \leq 1.3 \text{ GHz}$ $\sim 1.15 \leq 18 \text{ GHz}$ | 1250-1475 |
| Type-N (m) to BNC (f) | VSWR: $\leq 1.03:1 \leq 1.3 \text{ GHz}$ $\sim 1.15 \leq 18 \text{ GHz}$ | 1250-1476 |
| Type-N (f) to BNC (m) | VSWR: $1.03:1 \leq 1.3 \text{ GHz}$ $\sim 1.15 \leq 18 \text{ GHz}$ | 1250-1477 |

Option IF Output Amplitude Test Procedure

This test verifies that the Option IF Output meets its amplitude accuracy specification. In this test, the source is connected to the RF Input and a spectrum analyzer is connected to the Option H70 Output.

Follow the steps below to prepare for the amplitude verification of the Option IF Output on the rear of the PSA.

1. Preset the PSA DUT and all the test equipment.
2. Run **Align All Now** on the PSA. Press: **[System] > Alignments < Align All Now**.
3. Initialize the test equipment parameters as follows:

Table 10 E444xA PSA Spectrum Analyzer Setup

| Parameter | Setting |
|------------------------------|--|
| Frequency: Center Span | 1 GHz 0 Hz |
| Resolution Bandwidth | 1 MHz |
| Attenuation | Choose 0 dB since this setting will determine what the IF output level is, with respect to the input signal. |
| Frequency Reference | Internal |

Table 11 Synthesized Sweeper Setup

| Parameter | Settings |
|-----------|------------|
| Frequency | 1 GHz |
| Function | CW or Sine |
| Level | -10 dBm |

4. Zero and calibrate the power sensor.
5. Connect the power sensor/power meter to the end of the Type-N cable that is connected to the source. Use an N (f) to N (f) adapter between the power sensor and the cable.
6. Adjust the source amplitude for a power meter reading of -10 dBm.
7. Disconnect the power sensor from the cable and connect the cable to the PSA RF Input.

NOTE If the PSA has Option BAB (APC 3.5 mm input connector) an APC 3.5 mm (f) to N (f) adapter is required between the PSA and the Type-N cable.

8. Connect the PSA rear panel Option IF Output to the RF Input of the test spectrum analyzer. Use an SMA or APC 3.5 mm cable and appropriate adapters.
9. Initialize the test spectrum analyzer parameters as follows. Refer to [Table 12](#).

Table 12 Option IF Output Measurement Settings

| Parameter | Option H20 | Option H25 | Option H70 |
|------------------|------------|------------|------------|
| Center Frequency | 20 MHz | 25 MHz | 70 MHz |
| Span | 5 MHz | 5 MHz | 5 MHz |
| Res BW | 1 MHz | 1 MHz | 1 MHz |
| Reference Level | 0 dBm | 0 dBm | 0 dBm |
| Log Scale | 5 dB/div. | 5 dB/div. | 5 dB/div. |

10. Record the amplitude of the Option IF Output in [Table 13](#). The signal level should be -16 dBm (± 2 dB). This equates to a 6 dB loss between the RF Input and the Option IF Output port.

Table 13 Data Sheet Record

| Frequency | Expected Amplitude | Measured Amplitude |
|----------------------------------|-------------------------|--------------------|
| 20/25/70 MHz | -15 dBm (± 2 dB) | |
| 321.4 MHz (with H7L & HNQ) | -2 dBm (± 2 dB) | |
| 321.4 MHz (without H7L & HNQ) | -12 dBm (± 2 dB) | |

321.4 MHz IF Out Amplitude Test Procedure

1. Refer to the previous steps for the Option IF Output measurements, connect the PSA rear panel 321.4 MHz IF Out to the RF Input of the test spectrum analyzer. Use an SMA or APC 3.5 mm cable and appropriate adapters. Initialize the test spectrum analyzer parameters as follows to measure the 321.4 MHz IF Out on the rear panel of the PSA.

Table 14 321.4 MHz Measurement Spectrum Analyzer Settings

| Parameter | Settings |
|------------------|-----------|
| Center Frequency | 321.4 MHz |
| Span | 5 MHz |
| Res BW | 1 MHz |
| Reference Level | 0 dBm |
| Log Scale | 5 dB/div. |

2. Record the amplitude of the 321.4 MHz Output. The signal level should be -12 dBm (± 2 dB). This equates to a 2 dB loss between the RF Input and the 321.4 MHz Output port.

NOTE For units with Option H7L or HNQ the signal level should be 2 dB lower.

Measuring the Bandwidth of the IF Outputs

This test measures the PSA's IF Outputs (standard 321.4 MHz and IF Output options) amplitude response as a function of frequency (bandwidth). A signal is applied to the PSA at 950 MHz to 1050 MHz. The 321.4 MHz If Output and 21.4 MHz IF Output bandwidth are measured using a test spectrum analyzer.

1. While the spectrum analyzer is still connected to the 321.4 MHz IF Output connector on the rear panel of the PSA, configure the PSA and test equipment as follows:

Table 15 E444xA PSA Spectrum Analyzer Setup

| Parameter | Setting |
|------------------------------|--|
| Frequency: Center Span | 1 GHz 0 Hz |
| Resolution Bandwidth | 1 MHz |
| Attenuation | Choose 0 dB since this setting will determine what the IF output level is, with respect to the input signal. |
| Frequency Reference | Internal |

Table 16 Bandwidth Measurement Spectrum Analyzer Setup

| Parameter | Settings |
|------------------|-----------|
| Center Frequency | 321.4 MHz |
| Span | 100 MHz |
| Res BW | 3 MHz |
| Reference Level | 0 dBm |
| Log Scale | 5 dB/div. |
| Trace | MAX Hold |

Table 17 Synthesized Sweeper Setup

| Parameter | Settings |
|---------------------------------------|---------------------|
| Frequency: Start Freq Stop Freq | 950 MHz 1050 MHz |
| Function | CW or Sine |
| Level | -10 dBm |

2. Press **[Trace Max Hold]** and wait until the response of the 321.4 MHz Output is displayed on the test spectrum analyzer.
3. Press **[Peak Search]** on the spectrum analyzer to place a marker on the peak of the response.
4. Press **[Marker Delta]** on the test spectrum analyzer and adjust the delta marker down the skirt of the response to the 3 dB point.
5. Press **[Marker Delta]** again and adjust the marker to the other side of the peak response and down the other skirt until the marker amplitude reads 0 dB. (The marker delta frequency is the 3 dB bandwidth of the 321.4 MHz Output).
6. Refer to the [“Nominal Characteristics” on page 18](#) to verify the results of your tests.
7. Connect the test spectrum analyzer to the Option IF Output port on the rear panel of the PSA.
8. Repeat Steps 3 through 6 to measure the bandwidth of the Option IF Output.

NOTE If the flatness slopes on the IF Output, connect a 50 Ohm load to the 321.4 MHz IF Output port.

This concludes the Performance Verification of the E444xAU Option in the PSA instrument.

Safety and Regulatory Information

Introduction

Review this product and related documentation to familiarize yourself with safety markings and instructions before you operate the instrument. The documentation contains information and warnings that must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

Before Applying Power

Verify that the product is configured to match the available main power source. If this product is to be powered by autotransformer, make sure the common terminal is connected to the neutral (grounded) side of the ac power supply.

Connector Care and Cleaning

Cleaning connectors with alcohol shall only be done with the instrument power cord removed, and in a well ventilated area. Allow all residue alcohol moisture to evaporate and the fumes to dissipate prior to energizing the instrument.

WARNING **Keep isopropyl alcohol away from heat, sparks, and flame. Store in a tightly closed container. It is extremely flammable. In case of fire, use alcohol foam, dry chemical, or carbon dioxide; water may be ineffective.**

Use isopropyl alcohol with adequate ventilation and avoid contact with eyes, skin, and clothing. It causes skin irritation, may cause eye damage, and is harmful if swallowed or inhaled. It may be harmful if absorbed through the skin. Wash thoroughly after handling.

In case of spill, soak up the sand or earth. Flush spill area with water. Dispose of isopropyl alcohol in accordance with all applicable federal, state, and local environmental regulations.

Declaration of Conformity

For a copy of the manufacturer's Declaration of Conformity for this apparatus, contact your local Agilent Technologies office or sales representative on [Page 32](#).

Statement of Compliance

This instrument has been designed and tested in accordance with IEC Publication 1010, Safety Requirements for Electronic Measuring Apparatus, and has been supplied in a safe condition. The instruction documentation contains information and warnings which must be followed by the user to ensure safe operation and to maintain the instrument in a safe condition.

Compliance with Canadian EMC Requirements

This ISM device complies with Canadian ICES-001.
Cet appareil ISM est conforme a la norme NMB du Canada.

Compliance with German Noise Requirements

This is to declare that this instrument is in conformance with the German Regulation on Noise Declaration for Machines (Laermangabe nach der Maschinenlaermrerordnung-3. GSGV Deutschland).

| Acoustic Noise Emission/Geraeuschemission | |
|---|----------------------|
| LpA<70 dB | Lpa<70 dB |
| Operator Position | am Arbeitsplatz |
| Normal Operation | normaler Betrieb |
| per ISO 7779 | nach DIN 45635 t. 19 |

Warnings

WARNING **The WARNING notice denotes a hazard. It calls attention to a procedure which if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.**

Warnings applicable to this instrument are:

WARNING **To prevent electrical shock, disconnect the Agilent Technologies instrument from mains before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.**

WARNING **If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.**

WARNING **For continued protection against fire hazard replace line fuse only with same type and rating: Fuse 0.5A/250V, Part Number 2110-0202**
The use of other fuses or material is prohibited.

WARNING **This is a Safety Class I product (provided with a protective earthing ground incorporated in the power cord). The mains plug shall be inserted only into a socket outlet provided with a protective earth contact. Any interruption of the protective conductor, inside or outside the product is likely to make the product dangerous. Intentional interruption is prohibited.**

WARNING **These servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing unless you are qualified to do so.**

WARNING **The opening of covers or removal of parts is likely to expose dangerous voltages. Disconnect the instrument from all voltage sources while it is being opened.**

WARNING **This product is designed for use in Installation Category II and Pollution Degree 2 per IEC 61010-1: 2001.**

WARNING **No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers.**

WARNING **If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.**

Cautions

CAUTION The CAUTION notice denotes a hazard. It calls attention to an procedure that, if not correctly performed or adhered to, could result in damage to or destruction of the product. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met

Cautions applicable to this instrument are:

CAUTION Always use the three-prong ac power cord supplied with this instrument. Failure to ensure adequate earth grounding (by not using this cord) can cause instrument damage.

CAUTION This product is designed for use in Installation Category II and Pollution Degree 2 per IEC 61010-1:2001.

CAUTION This instrument has autoranging line voltage input; be sure the supply voltage is within the specified range.

CAUTION Ventilation Requirements: When installing the instrument in a cabinet, the convection into and out of the instrument must not be restricted. The ambient temperature (outside the cabinet) must be less than the maximum operating temperature of the instrument by 4 °C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, forced convection must be used.

Instrument Markings



The instruction documentation symbol. The product is marked with this symbol when it is necessary for the user to refer to the instructions in the documentation.



This symbol indicates that the instrument requires alternating current (ac) input.



This symbol indicates separate collection for electrical and electronic equipment, mandated under EU law as of August 13, 2005. All electric and electronic equipment are required to be separated from normal waste for disposal (Reference WEEE Directive, 2002/96/EC).



This symbol indicates that the power line switch is ON.



This symbol indicates that the power line switch is in the STANDBY position.



This symbol indicates that the power line switch is in the OFF position.



This symbol is used to identify a terminal which is internally connected to the product frame or chassis.



The CE mark is a registered trademark of the European Community. (If accompanied by a year, it is when the design was proven.)



The CSA mark is a registered trademark of the Canadian Standards Association. This instrument complies with Canada: CSA 22.2 No. 000000061010-1, Second Edition.



This is a symbol of an Industrial Scientific and Medical Group 1 Class A product.



This is a marking to indicate product compliance with the Canadian Interference-Causing Equipment Standard (ICES-001).



Direct Current.



This is a required mark signifying compliance with an EMC requirement. The C-Tick mark is a registered trademark of the Australian Spectrum Management Agency.



China RoHS regulations include requirements related to packaging, and require compliance to China standard GB18455-2001.



This symbol indicates compliance with the China RoHS regulations for paper/fiberboard packaging.

Agilent Support, Services, and Assistance

Service and Support Options

The analyzer's standard warranty is a one-year return to Agilent Technologies service warranty.

NOTE There are many other repair and calibration options available from the Agilent Technologies support organization. These options cover a range of service agreements with varying response times. Contact Agilent for additional information on available service agreements for this product. Refer to “[Contacting Agilent](#)” on page 32.

Contacting Agilent

Assistance with test and measurements needs and information or finding a local Agilent office are available on the Web at:
<http://www.agilent.com/find/assist>

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

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

Shipping Your Analyzer to Agilent for Service or Repair

IMPORTANT Agilent Technologies reserves the right to reformat or replace the internal hard disk drive in your analyzer as part of its repair. This will erase all user information stored on the hard disk. It is imperative, therefore, that you make a backup copy of your critical test data located on the analyzer's hard disk before shipping it to Agilent for repair.

If you wish to send your network analyzer to Agilent Technologies for service or repair:

- Include a complete description of the service requested or of the failure and a description of any failed test and any error message.
- Ship the analyzer using the original or comparable antistatic packaging materials.
- Contact Agilent for instructions on where to ship your analyzer.