

# Keysight Technologies N9030B PXA Signal Analyzer

Option HL2 Microwave Preselector Bypass  
(MPB) and Low Noise Path (LNP)  
for mm-Wave Instruments

# Notices

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## **Manual Part Number**

N9030-90084

## **Edition**

Edition 1, February 2016

Printed in USA/Malaysia

Published by:

Keysight Technologies, Inc.  
1400 Fountaingrove Parkway  
Santa Rosa, CA 95403

## Option HL2 Microwave Preselector Bypass (MPB) and Low Noise Path (LNP) Retrofit Kit

Products Affected:	N9030B PXA, Option 544 and 550
Serial Numbers:	All
To Be Performed By:	(X) Keysight Service Center (X) Personnel Qualified by Keysight ( ) Customer
Estimated Installation Time:	2.5 Hours
Estimated Adjustment Time:	8.0 Hours
Estimated Verification Time:	5.0 Hours

### Introduction

This installation note explains how to install the hardware, and provides guidelines for adjustment and verification for Option MPB, Microwave Preselector Bypass, and Option LNP, Low Noise Path. Please note that the Option HL2 kit designator is only an ordering number.

Option MPB provides a mechanical switch and associated hardware that bypass the A12 YTF (YIG Tuned Filter). The YTF limits the bandwidth of the input signal and also this filter can drift causing slight amplitude errors.

Option LNP provides a mechanical switch and associated hardware to bypass the A11 Low Band Assembly when the instrument is tuned to frequencies above 3.6 GHz (High Band path). The A11 Low Band assembly contributes loss to the input signal path and reducing this loss improves the Display Average Noise Level of the instrument. SHI performance increases also.

#### NOTE

The instrument must be readjusted and the performance tested to assure the instrument meets specifications following the hardware installation. The X- Series Performance Verification and Adjustment Software must be used. All adjustments are automated. This software is included in the N7814A performance test & adjustment software package, revision E.16.00 or greater.

The option is licensed for one instrument model number/serial number combination. The license file that is downloaded from the web will only install on the designated instrument.

## Option HL2 Microwave Preselector Bypass (MPB) and Low Noise Path (LNP) Retrofit Kit

### Installation Kit Parts List

Quantity	Description	Keysight Part Number
1	Installation Note	This note
1	Option Upgrade Entitlement Certificate	5964-5178
1	Transfer Switch (SW4)	87222-60031
1	Transfer Switch, (top switch) (SW3)	87222-60029
1	Bracket, Switch	N9020-00021
1	Cable, Wire Harness, Preselector Bypass Control	E4410-60159
1	Cable, Coax, YTF - Bottom Switch port 3	N9020-20129
1	Cable, Coax, Bottom Switch Port 2 to Front End Assembly J 9	N9020-20130
1	Cable, Coax, Bottom Switch port 4 to YTF	N9020-20128
1	Cable, Coax, Bottom Switch Port 1 to Top Switch Port 2	N9020-20151
1	Cable, Coax, Attenuator B - Top Switch Port 1	N9020-20171
1	Cable, Coax, Top Switch Port 4 to Low Band Switch Assembly J1	N9020-20125
1	Cable, Coax, Low Band Switch Assembly J3 to Top Switch Port 3	N9020-20127
1	Cable, Ribbon, Top Switch Control to Front End Controller Assembly J802 connector	N9020-60177
6	Screw M2.5 x 0.45 (6 mm long) Pan Head	0515-1934
14	Screw M3 x 0.5 (6 mm long) Flathead	0515-1946
2	Screw M3 x 0.5 (8 mm long) Flathead	0515-2032
2	Screw M3 x 0.5 (8 mm long) Pan Head	0515-0372
1	Connector Body (used on wire harness)	1252-1873

## Tools Required

- T-8 TORX Driver
- T-10 TORX Driver
- T-20 TORX Driver
- 5/16-inch torque wrench
- Keysight Calibration and Adjustment Software, N7814A, revision E.16.00 or greater
- Test equipment and computer supported by the X- Series Performance Tests and Adjustment Software
- PXA Signal Analyzer Service Guide. This manual is available online at the following URL:  
[www.keysight.com/find/N9030B\\_service\\_guide](http://www.keysight.com/find/N9030B_service_guide)
- Microsoft Windows based personnel computer with internet access and USB port
- USB storage device with > 2 GB free memory

## Initial Instrument Functionality Check

Power on the instrument and allow the instrument to boot up. Run an alignment and display the measurement screen. (The instrument will probably display a spectrum analyzer screen and you will see the instrument sweeping.)

There should be no alignment failures. If there are failures, investigate and fix the problem before continuing.

### **WARNING**

Before you disassemble the instrument, turn the power switch to Standby and unplug the instrument. Failure to unplug the instrument can result in personal injury.

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### **CAUTION**

Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe workstation. Refer to the documentation that pertains to your instrument for information about static-safe workstations and ordering static-safe accessories.

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## Installation Procedure

### CAUTION

If the instrument is placed on its face during any of the following procedures, be sure to use a soft surface or soft cloth to avoid damage to the front panel, keys, or input connector.

### NOTE

Make sure any adapters on the front panel are removed.

### Remove the instrument outer case, top brace, front panel, and right side chassis (RF side bracket)

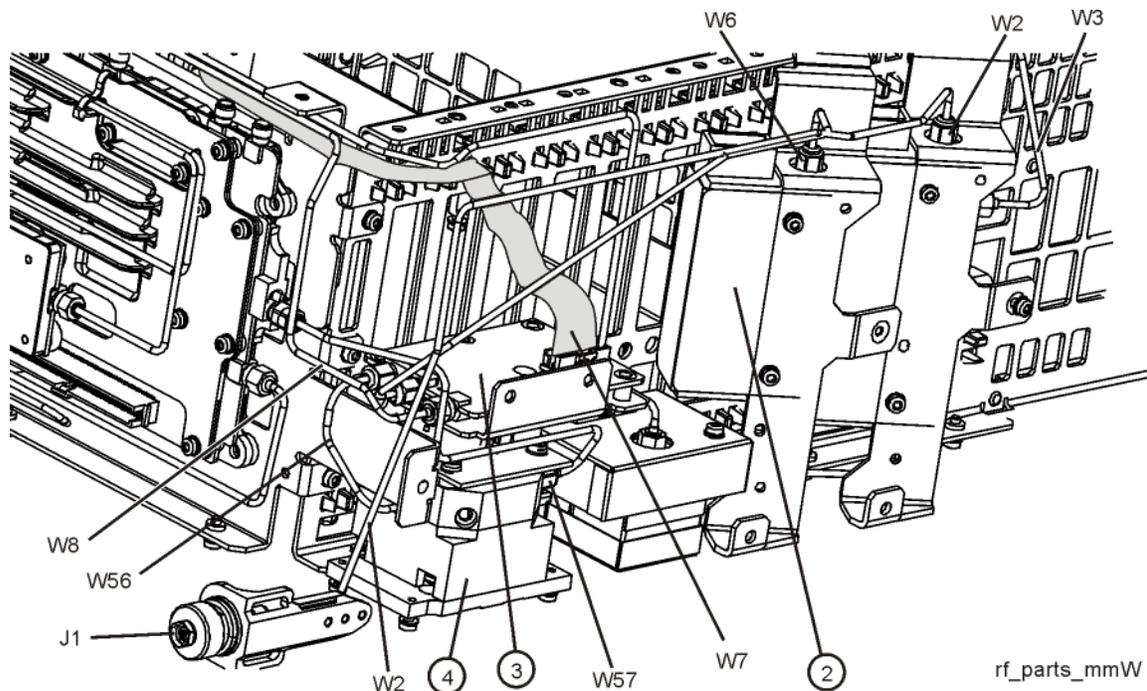
See the Instrument Outer Case, Top Brace, front frame, and RF area removal procedures in the Service Guide's "Assembly Replacement Procedures" chapter. If Option EXM External Mixing is present, disconnect the semi-rigid cable connections behind the LO/IF input before removing the front frame.

### Installing the retrofit kit

#### Removing Cables

1. Refer to **Figure 1**. Locate Attenuator B (2) on the right side of the instrument, and remove cable W6 from between Attenuator B and the Low Band Switch Assembly (3). This cable will not be reused.

**Figure 1** RF Section

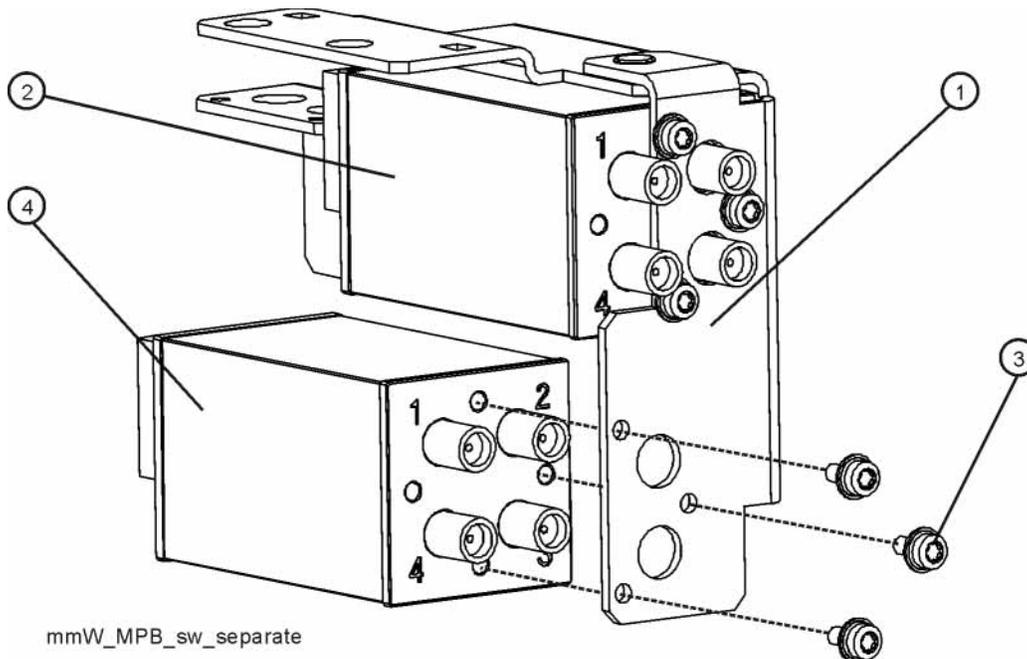


2. Locate the YTF (4) and remove W56 from between the YTF and the Low Band Switch Assembly (3), and remove W57 between the YTF and the Front End Assembly at J9. These cables will not be reused.
3. Disconnect the W7 ribbon cable from the Low Band Switch Assembly.

### Installing Switches and Control Cables

1. Refer to **Figure 2**. Locate the two switches and the switch bracket in the kit.

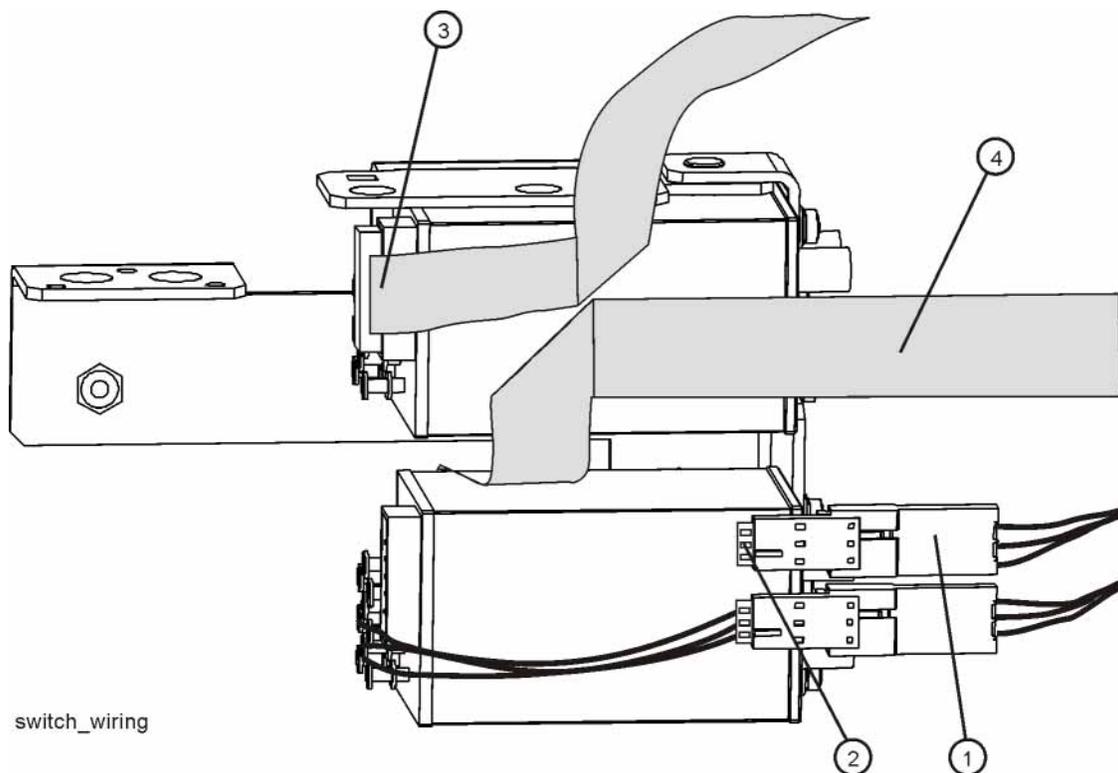
**Figure 2** Bracket Mount to Switches



2. Attach the switches (2) and (4) to the bracket with the 0515-1934 screws. Note that the switch with the wire pigtail (4) mounts below the switch without the pigtail (2). Torque to 6 inch-lbs.

3. Refer to **Figure 3**. Locate the switch wire harness (1) and the empty connector body **1252-1873** (2). Plug the empty connector body into the switch wire harness connector that has the orange, black, green wires. Plug the wire harness that has the yellow, black, green wires into the bottom switch harness as shown

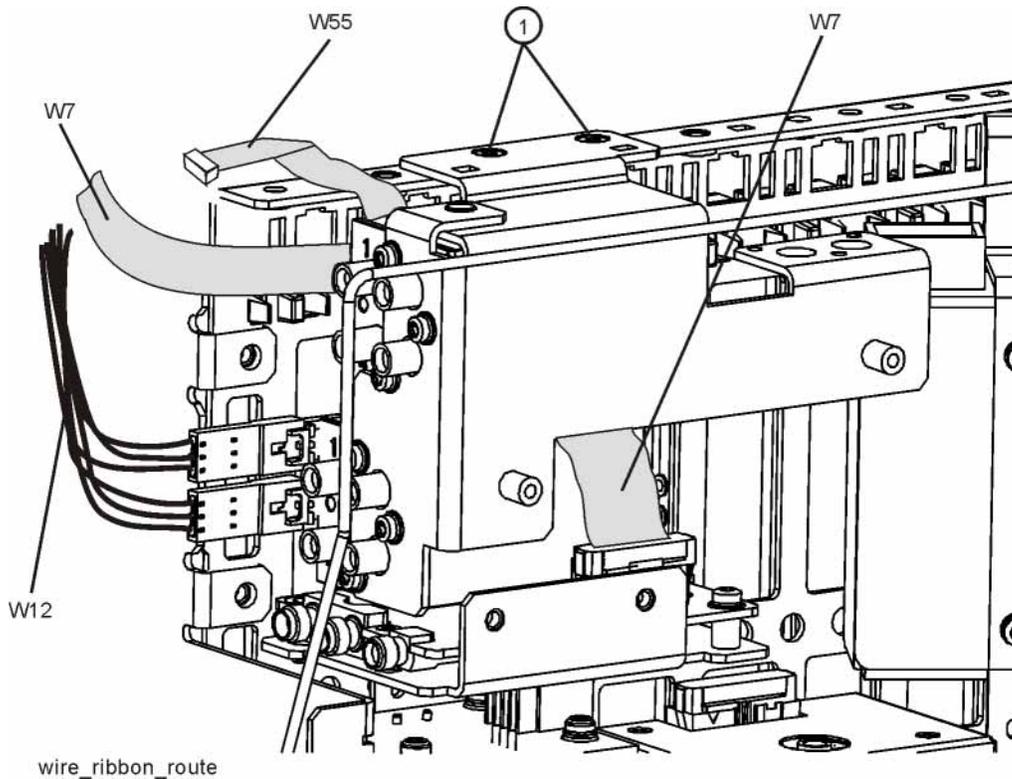
**Figure 3** Switch Wiring



4. Locate the ribbon cable (3) in the kit and install it onto the top switch. Note the cable must have a fold in it as shown. Ribbon cable (4) is the existing W7 cable removed from the Low Band Switch Assembly earlier. Notice how this cable will be routed between the switches. The other end of this cable should still be attached to the Front End Control Assembly. Notice the fold in the ribbon cable.

5. Refer to **Figure 4**. Position the switch/bracket assembly into the frame. Route W7 ribbon cable between the switches. Notice the position of the other ribbon cable W55 and wire harness W12. Secure the switch assembly with two 0515-2032 screws (1). Torque to 9 inch-lbs. Insert W7 ribbon cable into Low Band Switch header. Ensure the locking tabs are engaged.

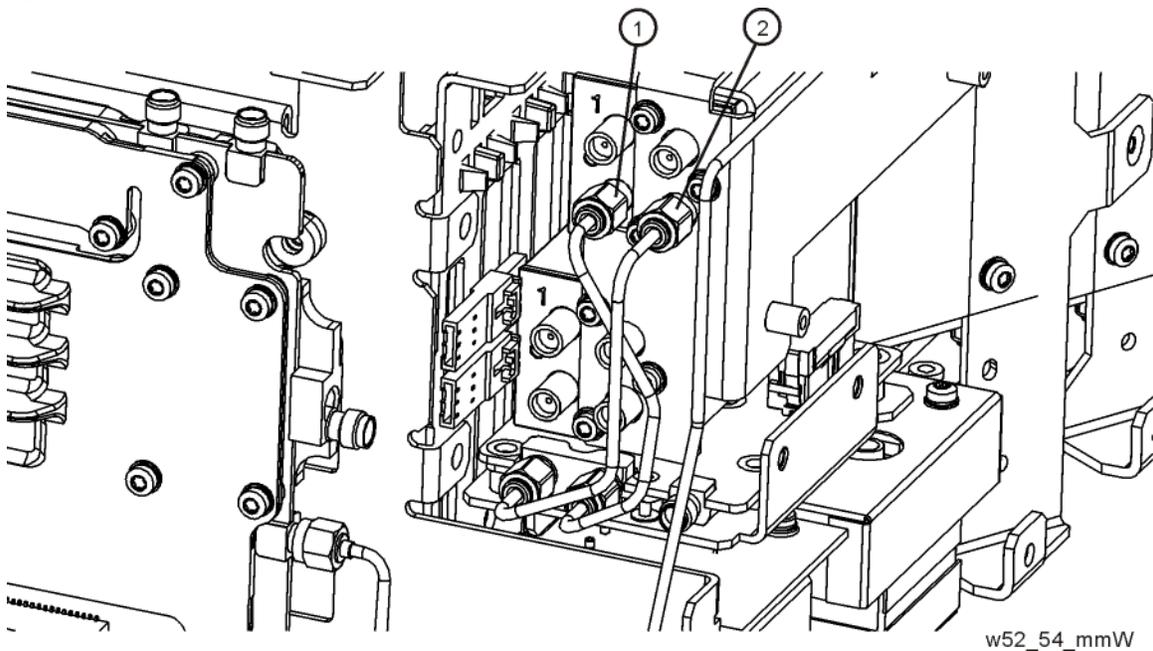
**Figure 4** Cable Routing



## Installing Semi-Rigid Cables

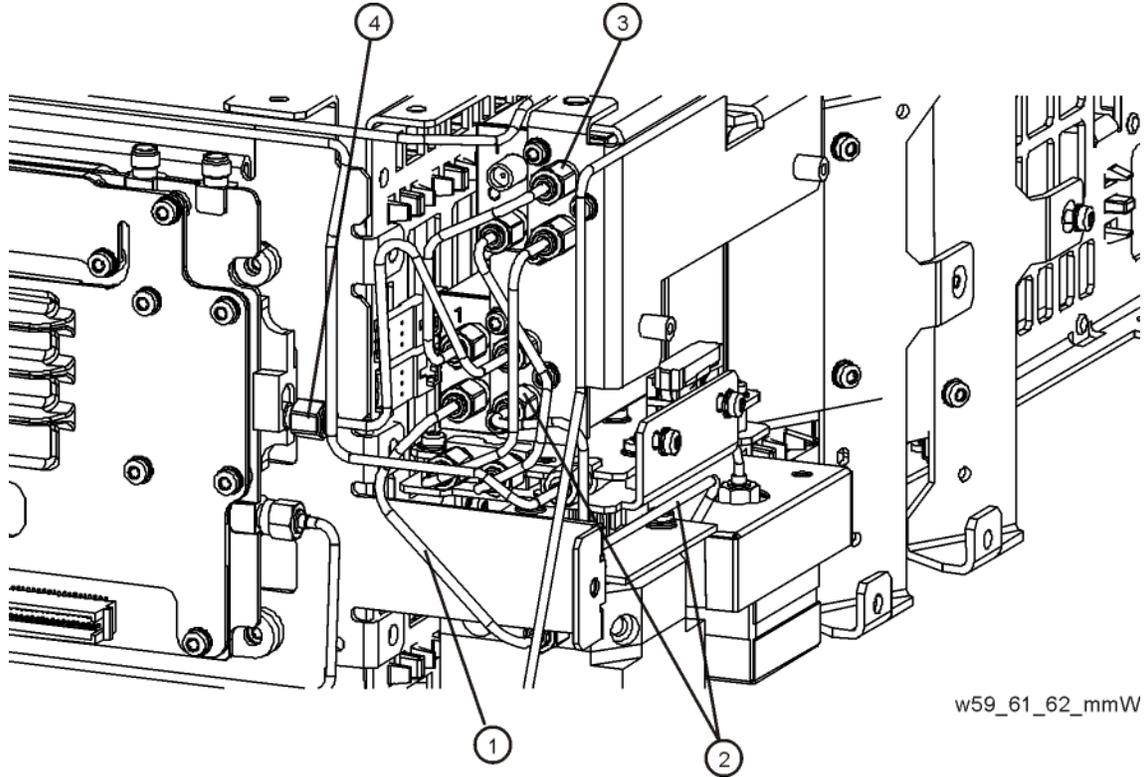
1. Refer to **Figure 5**. Locate W52 **N9020-20125** (1), and W54 **N9020-20127** (2), in the kit and install them as shown. Torque cables to 10 inch-lbs.

**Figure 5** W52 and W54 Cable Installation



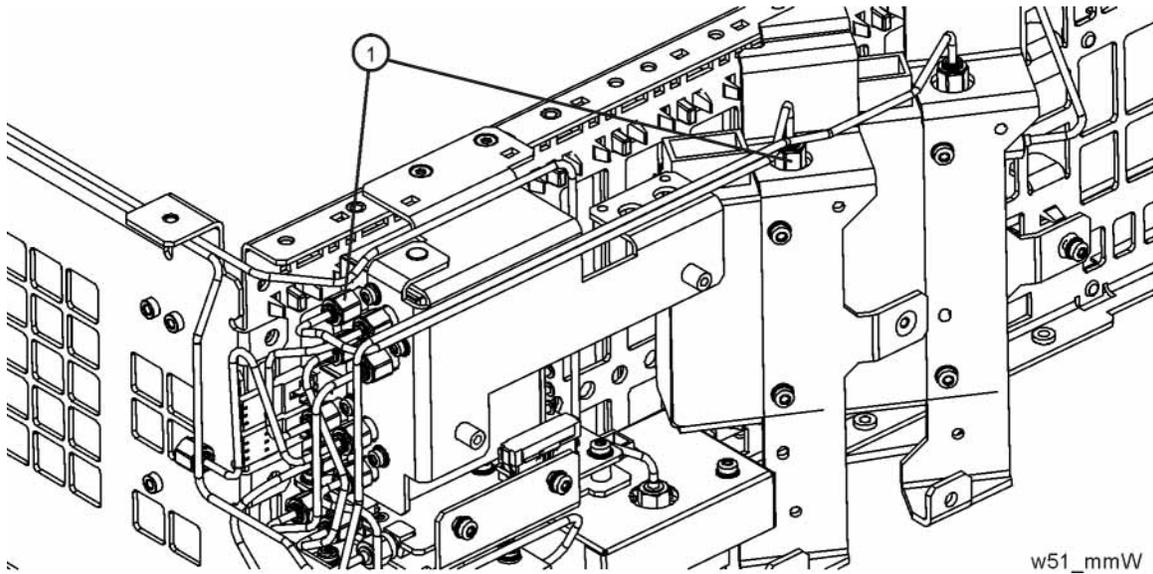
2. Refer to **Figure 6**. Locate W60 **N9020-20128** (1) in the kit and install it as shown. Locate W61 **N9020-20129** (2), and install it as shown. Locate W59 **N9020-20151** (3) and install it. Locate W62 **N9020-20130** (4) and install it. Torque cables to 10 inch-lbs.

**Figure 6** W60, W61, W62, and W59 Cable Installation



3. Refer to **Figure 7**. Locate W51 **N9020-20171** (1) in the kit and install one end to top switch port 1 and the other end to Attenuator B output. Torque cables to 10 inch-lbs.

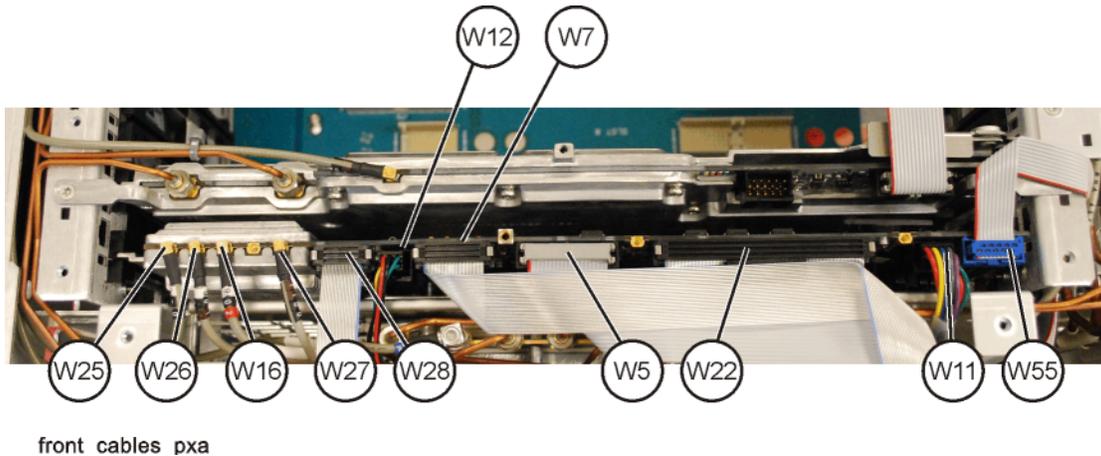
**Figure 7** W51 Cable Installation



## Connect the Ribbon and Wire Harness Cables to the Front End Control Assembly

1. Refer to **Figure 8**. Determine where ribbon cables W55 and W7 attach, and also where wire harness W12 attaches.

**Figure 8** Front End Control Cables Installation



2. Press down on the W7 ribbon cable header on the Front End Control assembly to assure it did not become loose during the installation. Also assure the ribbon cable is routed where it will not get damaged when the covers are replaced.
3. Attach the wire harness, W12, as shown in **Figure 8**. Assure the wire harness is routed so it will not get damaged when the covers are replaced.
4. Attach ribbon cable W55. Notice the cable is folded in order for it to fit flat against the instrument frame, and to avoid any of the screw holes where the instrument top brace attaches to.
5. Replace the right side chassis, front panel, top brace, and instrument cover. When replacing the top brace, use the 0515-1946 screws included in the kit. If Option EXM External Mixing is present, reconnect the LO/IF semi-rigid cable behind the front frame. Torque to 10 inch-lbs.
6. Power on the instrument and allow it to boot. There may be alignment failures since the newly installed hardware is not licensed. The analyzer should display a measurement screen.

## License Installation Procedure over USB

**NOTE**

In any correspondence or telephone conversation, refer to the product by its model number and full serial number. With this information, the Keysight representative can determine the warranty status of your unit.

**NOTE**

Even though the retrofit kit was ordered as Option HL2, the kit installs instrument options MPB and LNP. The license file mentioned below will install both option MPB and LNP.

1. Locate the Option Upgrade Entitlement Certificate (5964-5178) from the kit.
2. Redeem the Option Upgrade Entitlement Certificate by following the instructions on the Certificate.
3. After redeeming your Option Upgrade Entitlement Certificate you will receive an email with an attached License File.
4. Locate a USB storage device. Perform a virus scan on this device before use.
5. Save the License File to the root directory of the USB Storage Device.
6. Connect the USB Storage Device to the signal analyzer USB port. Windows will detect the new hardware and may display the configuration menu shown in **Figure 9**. This menu may be configured according to your preferences.

**Figure 9** USB Storage Device Configuration Menu



7. The signal analyzer will automatically consume the License File. (This may take a few minutes) When the License File is consumed the Keysight License Manager will display a “Successful License Installation” message similar to the one shown in **Figure 10**.

**Figure 10** Successful License Installation



### Verify the Installation

1. Cycle the power on the signal analyzer.
2. Press **System, Show System** to display a list of installed options.
3. Verify that the LNP and MPB options appear on the list.

## Option HL2 Microwave Preselector Bypass (MPB) and Low Noise Path (LNP) Retrofit Kit

### Utilities, Adjustments, and Performance Verification Tests

Calibration software and specified test equipment is required to perform the adjustments and performance verification testing. Information on how to obtain this software can be found at

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

#### Utilities Required

None

#### Adjustments Required

Perform all adjustments

#### Performance Tests Required

Perform all performance tests

A full calibration is required to assure the instrument meets all specifications

The end user must ultimately determine whether they want a full calibration to be performed after the installation of this upgrade or not. If a full calibration is required, arrangements regarding the level of the calibration must be made between the end user and the calibration provider.

For assistance, get in touch with your nearest Keysight Technologies Sales and Service Office. To find your local Keysight office access the following URL, or if in the United States, call the following telephone number:

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

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



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Edition 1, February 2016

N9030-90084

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