

# Installation Note

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## Configurable Test Set Upgrade Kit

**For PNA Series RF Network Analyzers (E8801A, E8802A, and E8803A)**

| <b>Network Analyzer<br/>Model Number</b> | <b>Upgrade Kit<br/>Part Number</b> |
|--|------------------------------------|
| E8801A, E8802A, E8803A                   | E8801-60103                        |



**Agilent Technologies**

Agilent Part Number: E8801-90024

Printed in USA December 2001

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## About the Upgrade Kit

|   |   |
|---|---|
| Products affected. . . . .                | E8801A, E8802A, and E8803A; all options                             |
| Installation to be performed by . . . . . | Agilent service center, personnel qualified by Agilent, or customer |
| Estimated installation time . . . . .     | 2 hours   |
| Estimated verification time . . . . .     | 5 minutes   |

If you need assistance, refer to [“Getting Assistance from Agilent” on page 5](#).

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## Description of Option 014

An Option 014 analyzer can be configured to measure high-power devices and devices for high dynamic range.

For a high-power measurement, external amplifiers and high power attenuators or isolators can be added to complete the test setup. In this configuration, test-port output-power up to 1 Watt (+30 dBm) can be applied to the device under test (DUT). Additionally, there is an external reference input that allows the external amplifier’s frequency response and drift to be ratioed out. There are also internal step attenuators between the coupler and the receivers to prevent receiver overload.

For high dynamic range measurements, front panel jumpers are moved to reverse the signal path through one of the couplers. This allows for a 15 dB improvement in transmitted signal sensitivity in one direction only. These jumpers are installed on both ports allowing the user to choose a high dynamic range measurement in either the forward or reverse direction.

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## Items Included in the Upgrade Kit

Table 1 lists the parts included in this upgrade kit, Agilent part number E8801-60103. Check the contents of your kit against this list. If any item is missing or damaged, contact Agilent Technologies. Refer to [“Getting Assistance from Agilent” on page 5](#).

**Table 1 Contents of Option 014 Upgrade Kit (E8801-60103)**

| Ref Des | Description  | Qty | Part Number |
|---------|--|-----|-------------|
|         | Installation note (this document)                                  | 1   | E8801-90024 |
|         | SMA feed-through connectors, female SMA to female SMA              | 10  | 1250-1251   |
| W51     | RF cable, A12 source assembly to front panel R Out                 | 1   | E8801-20002 |
| W52     | RF cable, A22 RF switch to front panel port 1 Source Out           | 1   | E8801-20004 |
| W54     | RF cable, A22 RF switch to front panel port 2 Source Out           | 1   | E8801-20010 |
| W55     | RF cable, front panel port 1 Coupler In to A24 test port 1 coupler | 1   | E8801-20012 |
| W56     | RF cable, front panel port 2 Coupler In to A26 test port 2 coupler | 1   | E8801-20008 |
| W57     | RF cable, A24 test port 1 coupler to front panel A out             | 1   | E8801-20013 |
| W59     | RF cable, A26 test port 2 coupler to front panel B out             | 1   | N3381-20013 |
| W60     | RF cable, front panel jumper                                       | 5   | E8356-20072 |
| W61     | RF cable, front panel A In to A18 receiver A                       | 1   | E8801-20003 |
| W62     | RF cable, front panel R In to A19 receiver R                       | 1   | E8801-20001 |
| W64     | RF cable, front panel B In to A21 receiver B                       | 1   | E8801-20007 |
|         | Lower front panel overlay  | 1   | E8801-80003 |

## Getting Assistance from Agilent

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

**Table 2 Contacting Agilent**

|  |   |  |
|--|---|--|
| <b>Online assistance:</b> <a href="http://www.agilent.com/find/assist">www.agilent.com/find/assist</a>   |   |  |
| <b>United States</b><br><i>(tel)</i> 1 800 452 4844  | <b>Latin America</b><br><i>(tel)</i> (305) 269 7500<br><i>(fax)</i> (305) 269 7599  | <b>Canada</b><br><i>(tel)</i> 1 877 894 4414<br><i>(fax)</i> (905) 282-6495  |
| <b>Europe</b><br><i>(tel)</i> (+31) 20 547 2323<br><i>(fax)</i> (+31) 20 547 2390  | <b>Australia</b><br><i>(tel)</i> 1 800 629 485<br><i>(fax)</i> (+61) 3 9210 5947  | <b>New Zealand</b><br><i>(tel)</i> 0 800 738 378<br><i>(fax)</i> (+64) 4 495 8950  |
| <b>Japan</b><br><i>(tel)</i> (+81) 426 56 7832<br><i>(fax)</i> (+81) 426 56 7840   | <b>Singapore</b><br><i>(tel)</i> 1 800 375 8100<br><i>(fax)</i> (65) 836 0252   | <b>Malaysia</b><br><i>(tel)</i> 1 800 828 848<br><i>(fax)</i> 1 800 801 664  |
| <b>India</b><br><i>(tel)</i> 1 600 11 2929<br><i>(fax)</i> 000 800 650 1101  | <b>Hong Kong</b><br><i>(tel)</i> 800 930 871<br><i>(fax)</i> (852) 2506 9233  | <b>Taiwan</b><br><i>(tel)</i> 0800 047 866<br><i>(fax)</i> (886) 2 25456723  |
| <b>Philippines</b><br><i>(tel)</i> (632) 8426802<br><i>(tel)</i> (PLDT subscriber only)<br>1 800 16510170<br><i>(fax)</i> (632) 8426809<br><i>(fax)</i> (PLDT subscriber only)<br>1 800 16510288 | <b>Thailand</b><br><i>(tel)</i> (outside Bangkok)<br>(088) 226 008<br><i>(tel)</i> (within Bangkok)<br>(662) 661 3999<br><i>(fax)</i> (66) 1 661 3714 | <b>People's Republic of China</b><br><i>(tel)</i> (preferred)<br>800 810 0189<br><i>(tel)</i> (alternate)<br>10800 650 0021<br><i>(fax)</i> 10800 650 0121 |

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## Installation Procedure for the Upgrade Kit

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.

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**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.**

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### Electrostatic Discharge Protection

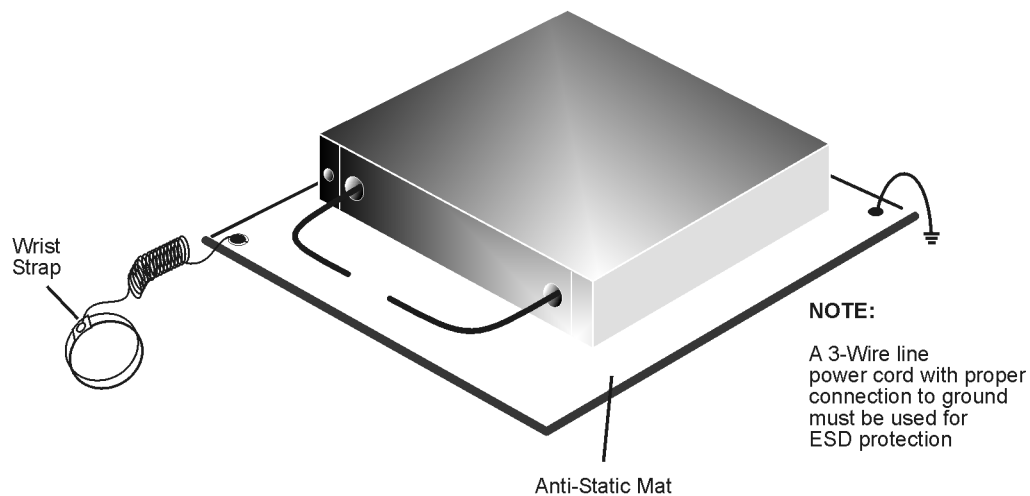
Protection against electrostatic discharge (ESD) is essential while removing or connecting cables or assemblies within the network analyzer.

Static electricity can build up on your body and can easily damage sensitive internal circuit elements when discharged. Static discharges too small to be felt can cause permanent damage. To prevent damage to the instrument:

- *always* wear a grounded wrist strap having a 1 M $\Omega$  resistor in series with it when handling components and assemblies.
- *always* use a grounded, conductive table mat while working on the instrument.
- *always* wear a heel strap when working in an area with a conductive floor. If you are uncertain about the conductivity of your floor, wear a heel strap.

Figure 1 shows a typical ESD protection setup using a grounded mat and wrist strap. Refer to “Tools and Equipment Required for the Installation” on page 7 for part numbers.

**Figure 1**    **ESD Protection Setup**



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## Overview of the Installation Procedure

The following steps comprise the installation of the Option 014 upgrade kit.

1. Remove the outer cover.
2. Remove the front panel assembly.
3. Remove the standard instrument cables.
4. Install the Option 014 cables and front panel connectors.
5. Replace the lower front panel overlay.
6. Reinstall the front panel assembly.
7. Reinstall the outer cover.
8. Enable Option 014.
9. Verify that Option 014 is enabled.

## Tools and Equipment Required for the Installation

| Description  | Qty | Part Number |
|--|-----|-------------|
| T-10 TORX driver (set to 9 in-lbs)                     | 1   | N/A         |
| T-20 TORX driver (set to 21 in-lbs)                    | 1   | N/A         |
| 5/16 in torque wrench (set to 10 in-lbs)               | 1   | N/A         |
| 5/16 in torque wrench (set to 21 in-lbs)               | 1   | N/A         |
| ESD grounding wrist strap                              | 1   | 9300-1367   |
| 5 ft grounding cord for wrist strap                    | 1   | 9300-0980   |
| 2 x 4 ft conductive table mat and 15 ft grounding wire | 1   | 9300-0797   |
| ESD heel strap (for use with conductive floors)        | 1   | 9300-1308   |

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**CAUTION** Use a 5/16-in torque wrench set to 10 in-lbs on all SMA cable connections except the front-panel SMA feed-through connectors to which the front-panel jumpers attach. Use a 5/16-in torque wrench set to 21 in-lbs for these connections.

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## Step 1. Remove the Outer Cover

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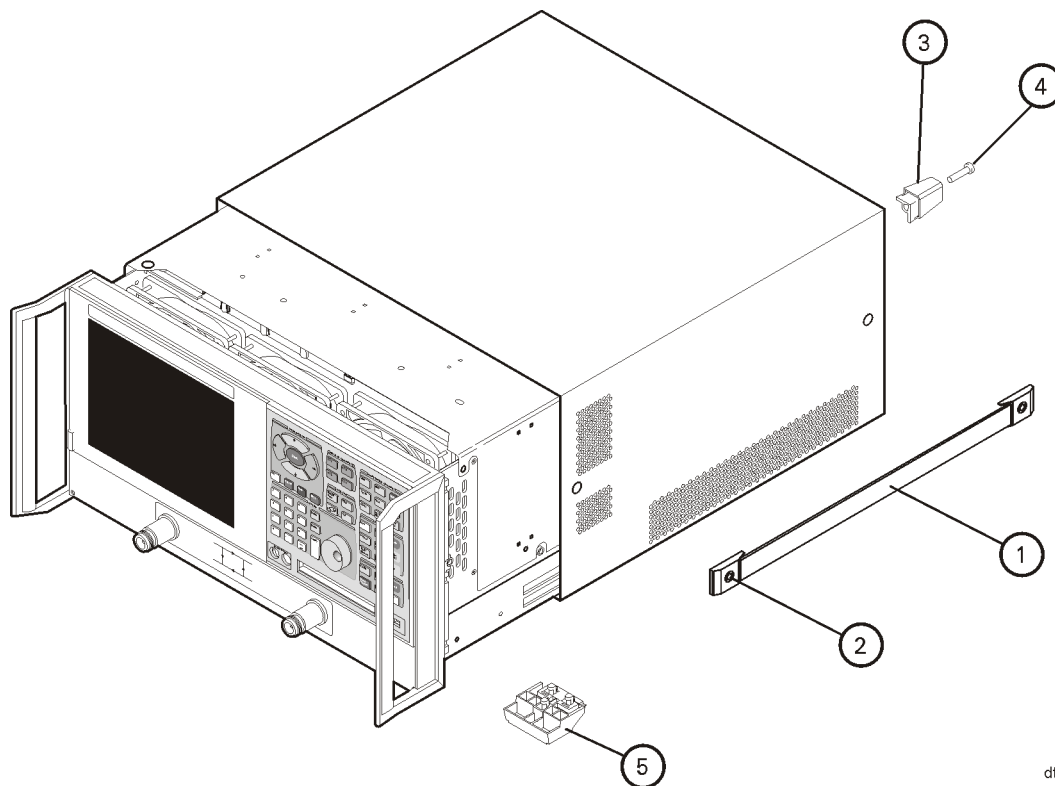
**CAUTION** This procedure is best performed with the analyzer resting on its front handles in the vertical position. *Do not place the analyzer on its front panel without the handles.* This will damage the front panel assemblies.

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Refer to [Figure 2](#) for this procedure.

1. Disconnect the power cord (if it has not already been disconnected).
2. With a T-20 TORX driver, remove the strap handles (item ①) by loosening the screws (item ②) on both ends until the handle is free of the analyzer.
3. With a T-20 TORX driver, remove the four rear panel feet (item ③) by removing the center screws (item ④).
4. Slide the four bottom feet (item ⑤) off the cover.
5. Slide the cover off of the frame.

**Figure 2 Outer Cover Removal**



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## Step 2. Remove the Front Panel Assembly

Refer to [Figure 3](#) for this procedure.

1. With a T-10 TORX driver, remove the six screws (item ①) from the sides of the frame.

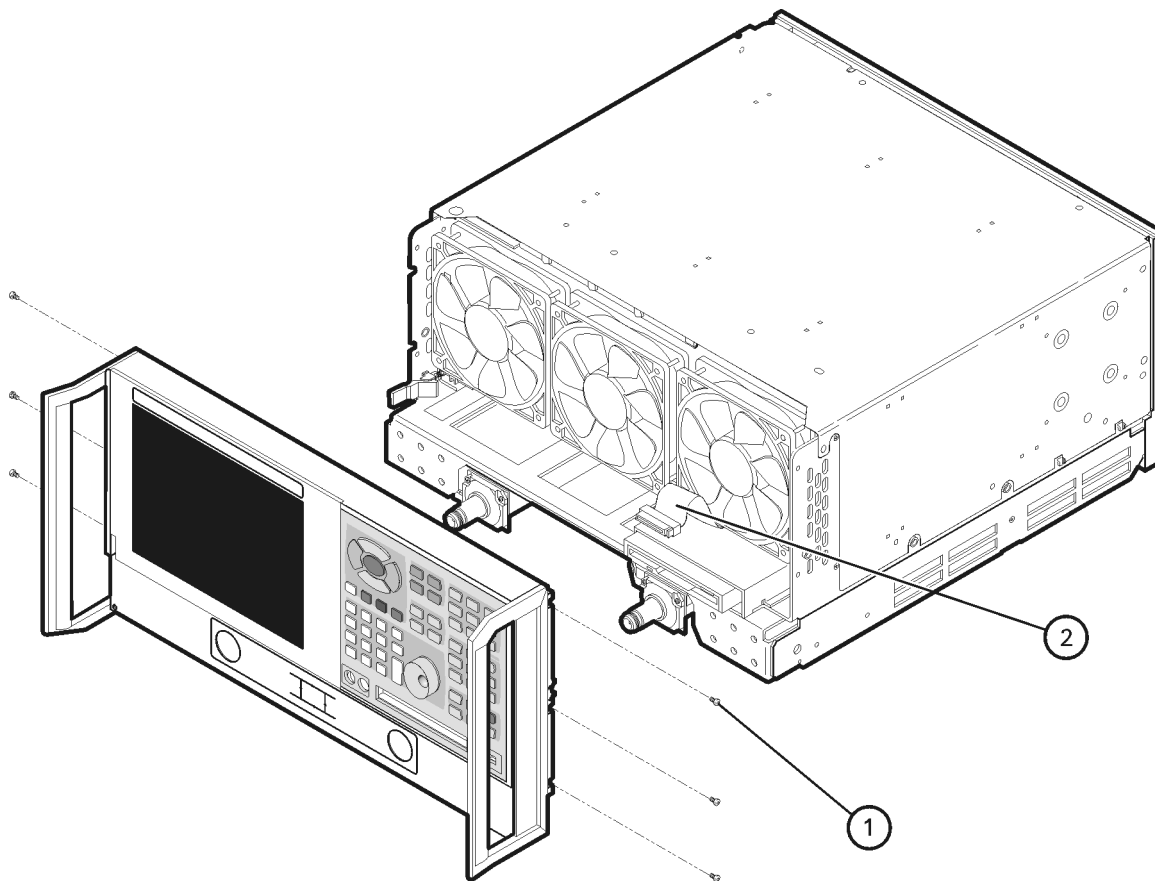
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**CAUTION** Before removing the front panel from the analyzer, lift and support the front of the analyzer chassis.

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2. Slide the front panel over the test port connectors.
3. Disconnect the front panel interface ribbon cable (item ②). The front panel is now free from the analyzer.

**Figure 3 Front Panel Assembly Removal**



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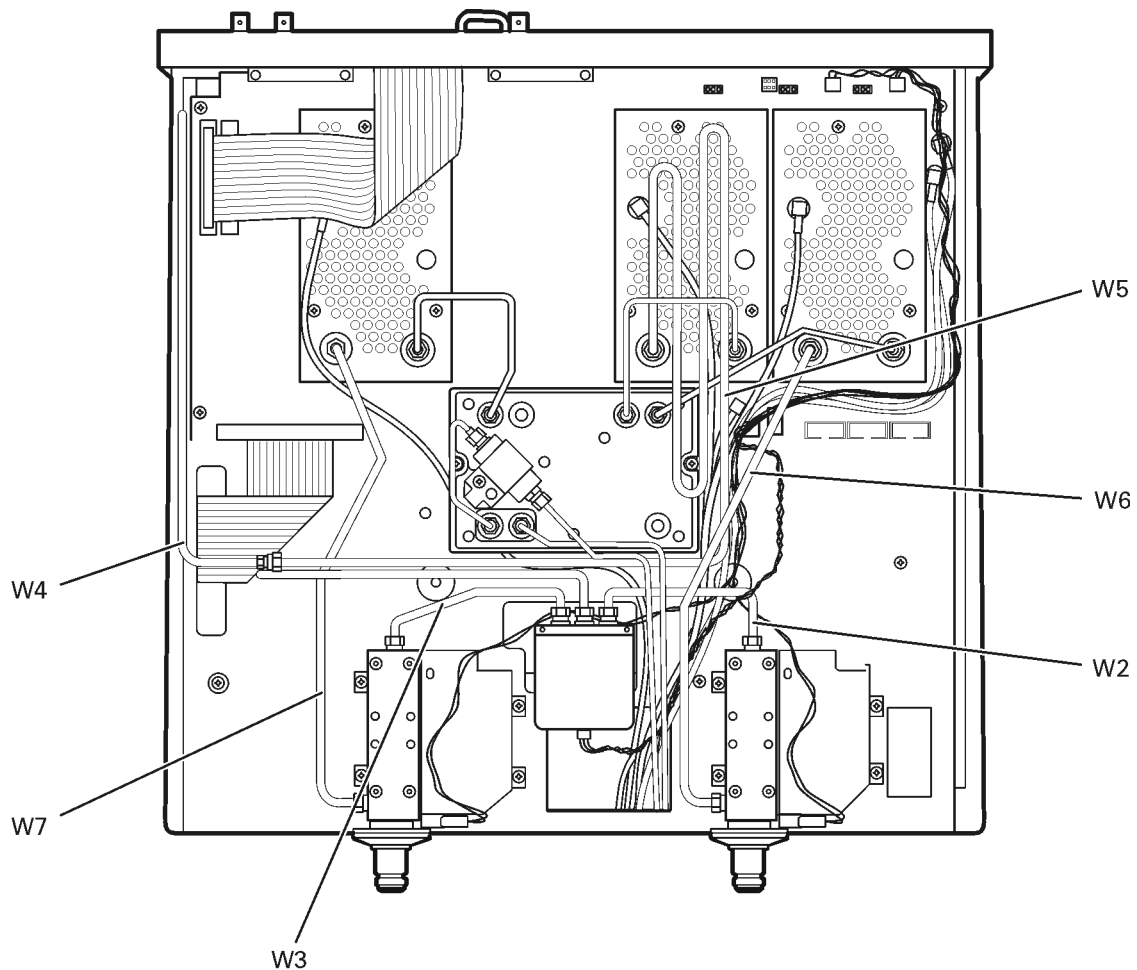
### Step 3. Remove the Standard Instrument Cables

**CAUTION** Use a 5/16 in torque wrench (set to 10 in-lbs) on all SMA cable connections in this step of the procedure.

Refer to [Figure 4](#) for this procedure.

1. Remove and discard the following cables: W2, W3, W4, W5, W6, and W7.

**Figure 4 Standard Cable Removal**



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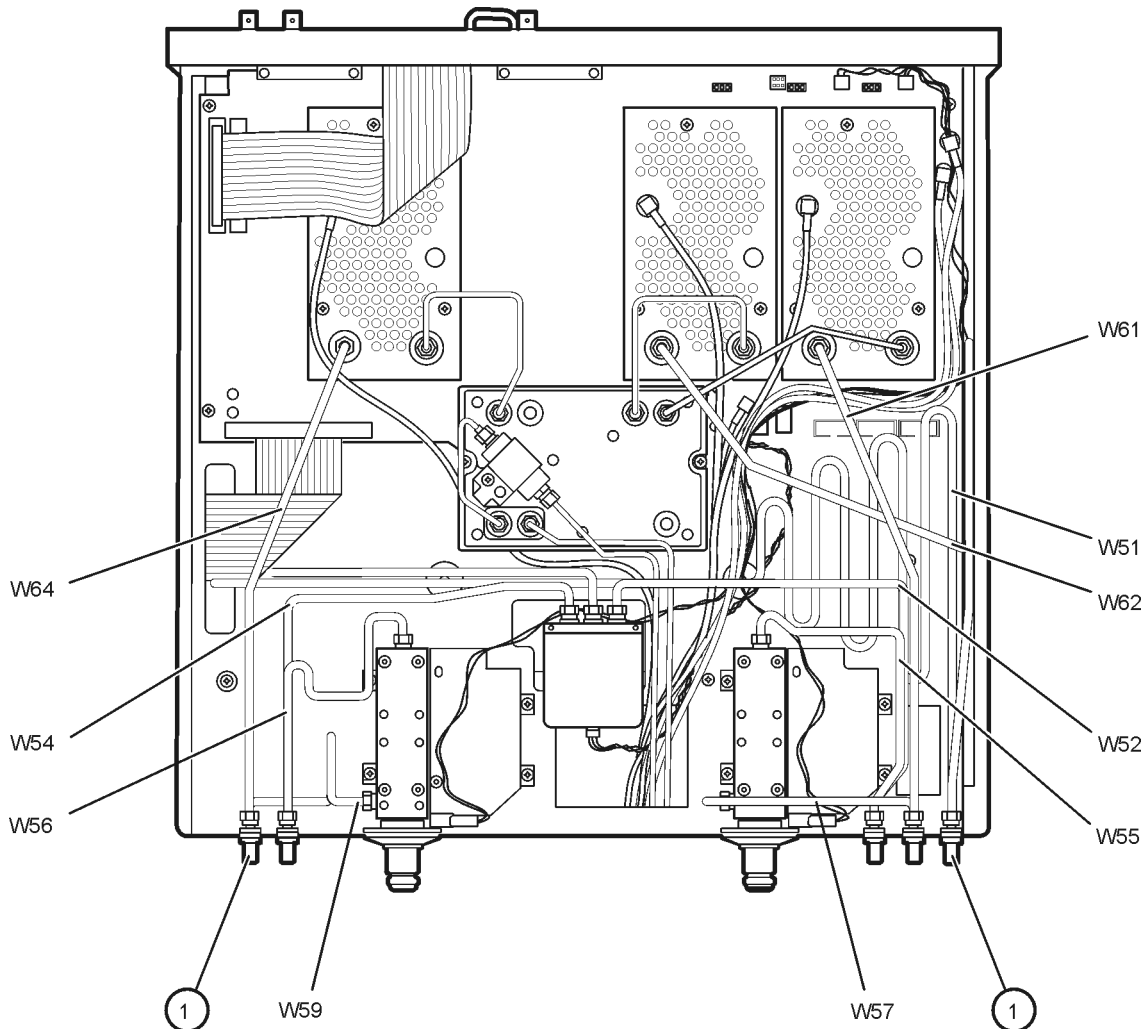
## Step 4. Install the Option 014 Cables and Front Panel Connectors

**CAUTION** Use a 5/16-in torque wrench set to 10 in-lbs on all SMA cable connections except the front-panel SMA feed-through connectors to which the front-panel jumpers attach. Use a 5/16-in torque wrench set to 21 in-lbs for these connections.

Refer to [Figure 5](#) for this procedure. The new parts referenced in this procedure are listed in [Table 1](#) on page 4.

1. Install ten SMA feed-through connectors (item ①) in the front chassis holes provided.
2. Install cables W51, W52, and W57.
3. Install cables W55, W61 and W62.
4. Install cables W54 and W59.
5. Install cables W56 and W64.

**Figure 5 Option 014 Cable Installation**



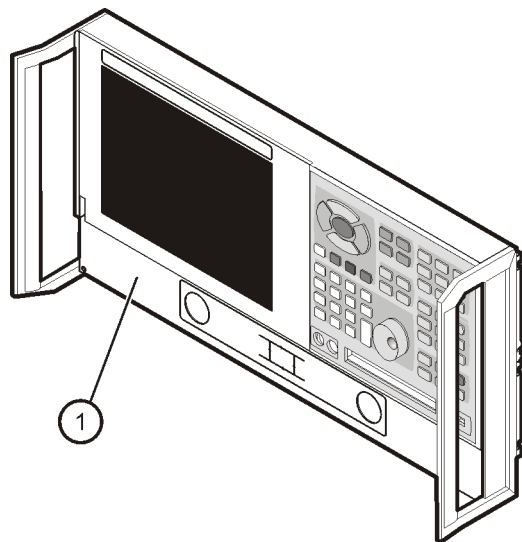
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## Step 5. Replace the Lower Front Panel Overlay

Refer to [Figure 6](#) for this procedure. The new parts referenced in this procedure are listed in [Table 1](#) on page 4.

1. Remove the standard lower front panel overlay (item ①) from the front panel assembly:
  - a. From the back side of the front panel, use a blunt object in one of the unused cutouts in the frame, to push the overlay and separate it from the front panel.
  - b. From the front side of the front panel, pull the overlay completely off and discard it.
  - c. Remove any adhesive remaining on the front panel.
2. Remove the protective backing from the new Option 014 front panel overlay.
3. Starting from either the left or right side, *loosely* place the overlay in the recess on the lower front panel, ensuring that it fits tightly against the recess edges.
4. Once the overlay is in place, press it firmly onto the frame to secure it.

**Figure 6 Lower Front Panel Overlay Replacement**



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## Step 6. Reinstall the Front Panel Assembly

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**CAUTION** Use a 5/16 in torque wrench (set to 10 in-lbs) on all SMA cable connections in this step of the procedure.

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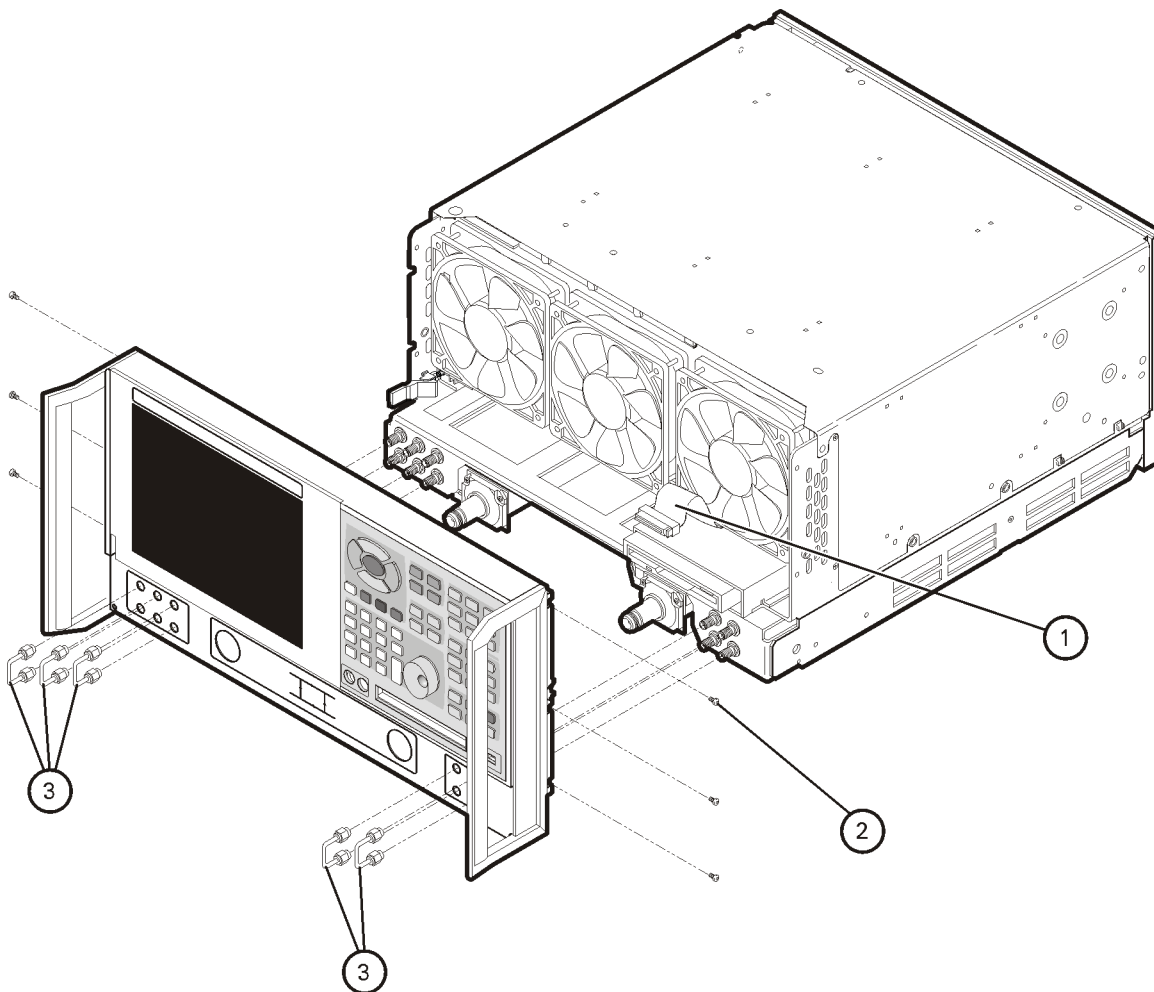
**CAUTION** Before installing the front panel assembly onto the analyzer, lift and support the front of the analyzer chassis.

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Refer to [Figure 7](#) for this procedure.

1. Connect the front panel interface ribbon cable (item ①).
2. Slide the front panel over the test port connectors being careful to align the power switch and floppy disk drive to their corresponding front panel cutouts. Ensure that the ribbon cable ① is located below the fan to prevent it from being damaged by the fan blades.
3. With a T-10 TORX driver, install the six screws (item ②) in the sides of the frame.
4. Install the semirigid jumpers (item ③) on the front panel.

**Figure 7 Front Panel Assembly Reinstallation**



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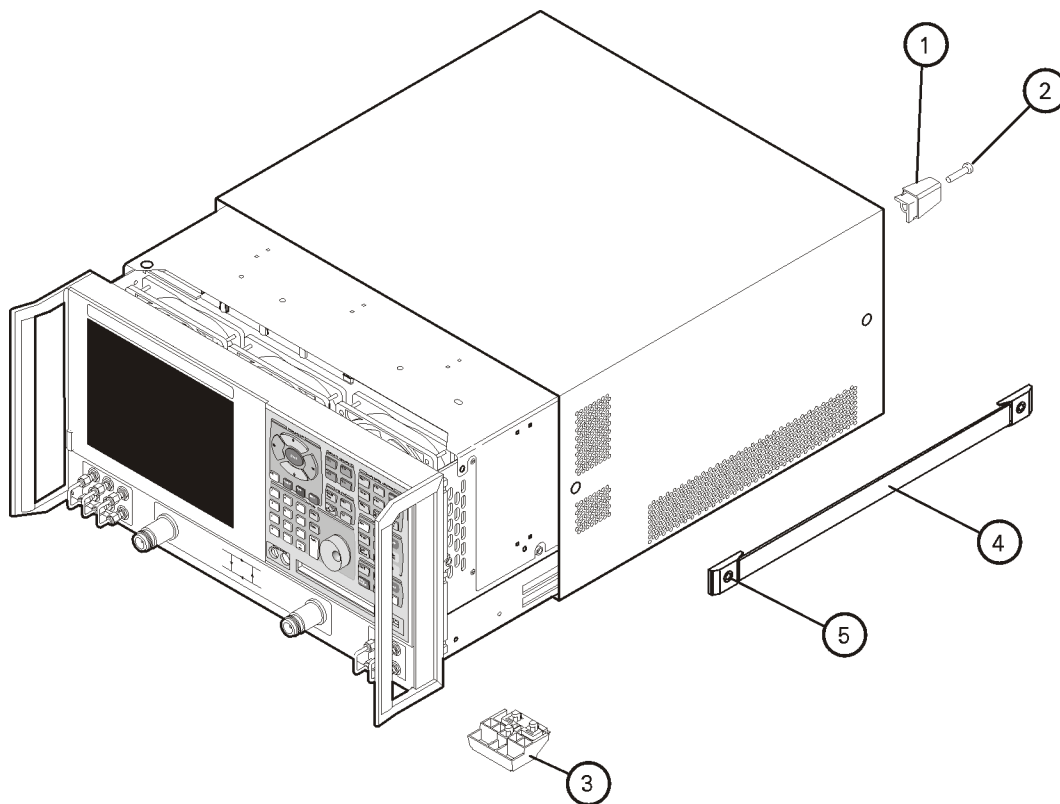
## Step 7. Reinstall the Outer Cover

**CAUTION** This procedure is best performed with the analyzer resting on its front handles in the vertical position. *Do not place the analyzer on its front panel without the handles.* This will damage the front panel assemblies.

Refer to [Figure 8](#) for this procedure.

1. Slide the cover over the analyzer frame.
2. With a T-20 TORX driver, install the four rear panel feet (item ①) by installing the center screws (item ②).
3. Slide the four bottom feet (item ③) into position on the cover.
4. With a T-20 TORX driver, install the strap handles (item ④) by installing the screws (item ⑤) on both ends of the handle.

**Figure 8 Outer Cover Reinstallation**



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## Step 8. Enable Option 014

### Procedure Requirements

- The analyzer must be powered up and operating to perform this procedure.
- The Network Analyzer program must be running.
- A mouse is recommended for this procedure but is not required.

### Mouse Procedure

1. On the analyzer's **System** menu, point to **Service**, and then click **Option Enable**.
2. In the **Select Desired Option** list, click **014 - Configurable Test Set**.
3. Click **Install**.
4. Click **Yes** in answer to the displayed question in the **Restart Analyzer?** box.
5. When the installation is complete, click **Exit**.

### Front Panel Keys Procedure

1. In the **COMMAND** block, press **Menu/Dialog**.
2. In the **NAVIGATION** block, press the Right Tab and Arrows to move over to the **System** menu and down to the **Service** selection. Press the Right Tab to display the extended menu and the Arrows to select **Option Enable**. Press **Click**.
3. Tab to the **Select Desired Option** list, and press Arrows to select **014 - Configurable Test Set**.
4. Tab to **Install**, and then press **Click**.
5. Click **Yes** in answer to the displayed question in the **Restart Analyzer?** box.
6. When the installation is complete, in the **COMMAND** block, press **OK** (or tab to **OK**, and then press **Click**).

## Step 9. Verify that Option 014 Is Enabled

### Procedure Requirements

- The analyzer must be powered up and operating to perform this procedure.
- The Network Analyzer program must be running.
- A mouse is recommended for this procedure but is not required.

### Mouse Procedure

1. On the analyzer's **Help** menu, click **About Network Analyzer**.
2. Verify that "014" is listed after "Options:" in the display. Click **OK**.

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**NOTE** If Option 014 has not been enabled, perform step 8 again. If the option is still not enabled, contact Agilent Technologies. Refer to ["Getting Assistance from Agilent" on page 5](#).

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### Front Panel Keys Procedure

1. In the **COMMAND** block, press **Menu/Dialog**.
2. In the **NAVIGATION** block, press the Right Tab and Arrows to move over to the **Help** menu, and down to the **About Network Analyzer** selection. Press **Click**.
3. Verify that "014" is listed after "Options:" in the display. In the **COMMAND** block, press **OK** (or tab to **OK**, and then press **Click**).

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**NOTE** If Option 014 has not been enabled, perform step 8 again. If the option is still not enabled, contact Agilent Technologies. Refer to ["Getting Assistance from Agilent" on page 5](#).

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