Installation Note

Receiver Attenuators Upgrade Kit

For E8361A PNA Series Microwave Network Analyzers

Network Analyzer Model Number	Upgrade Kit Part Number
E8361A	E8361-60102

Agilent Technologies

Agilent Part Number: E8361-90003
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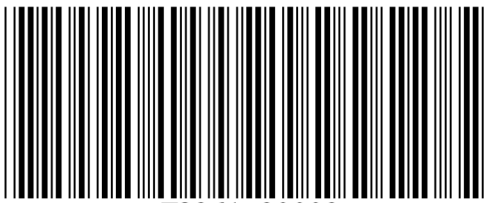

E8361- 90003

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About Installing the Upgrade Kit

IMPORTANT Option 016 can only be installed on analyzers with the option combinations listed below as “Products affected”. If your analyzer does not have the proper options (as listed below), it will be necessary to install those options BEFORE installing this option (Option 016).

Products affected	E8361A with Options 014 and UNL (with or without Options 080 and 081)
Installation to be performed by	Agilent service center or personnel qualified by Agilent
Estimated installation time	1 hour
Estimated verification time	5 minutes

Description of Option 016 Receiver Attenuators

This option adds a 50-dB step attenuator in the channel A and channel B signal paths.

Items Included in the Upgrade Kit

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 2.

Table 1 Contents of Option 016 Upgrade Kit (E8361-60102)

Ref. Desig.	Description	Qty	Part Number
	Installation note (this document)	1	E8361-90003
	Machine screw, M3.0 x 8 (for attaching attenuators)	4	0515-0372
A43, A44	50-dB step attenuator	2	84905-60001
	Ribbon cable (for A43 and A44 step attenuators)	2	8121-0819
W20	RF cable, A8 fractional-N synthesizer board J106 to A17 LOMA 12 J2	1	E8361-20045
W21	RF cable, A8 fractional-N synthesizer board J101 to A17 LOMA 12 J3	1	E8361-20046
W47	RF cable, A43 channel A step attenuator to A27 channel A mixer	1	E8361-20031
W48	RF cable, A44 channel B step attenuator to A30 channel B mixer	1	E8361-20025
W49	RF cable, PORT 1 RCVR A IN to A43 channel A step attenuator	1	E8361-20032
W50	RF cable, PORT 2 RCVR B IN to A44 channel B step attenuator	1	E8361-20029

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.

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.**

Electrostatic Discharge Protection

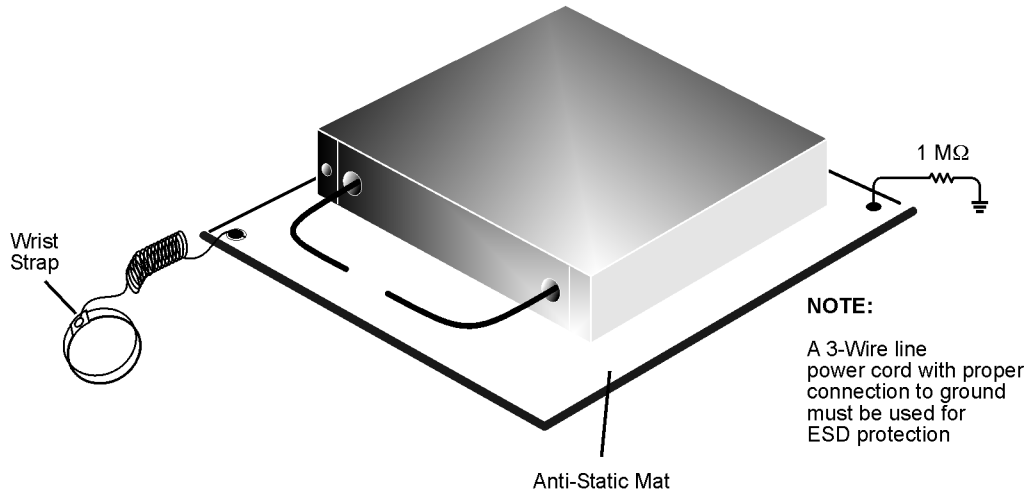
Protection against electrostatic discharge (ESD) is essential while removing or connecting cables or assemblies within the network analyzer.

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 MΩ 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 6 for part numbers.

Figure 1 ESD Protection Setup



esd_setup

Overview of the Installation Procedure

Step 1. Remove the Outer Cover.

Step 2. Replace Cables W20 and W21 (if necessary).

Step 3. Remove the Front Panel Assembly.

Step 4. Raise the Receiver Deck.

Step 5. Remove the Existing Cables.

Step 6. Install the Attenuators and Cables.

Step 7. Lower and Fasten the Receiver Deck.

Step 8. Reinstall the Front Panel Assembly and Front Panel Jumpers.

Step 9. Reinstall the Outer Cover.

Step 10. Enable Option 016.

Step 11. Verify that Option 016 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-inch torque wrench (set to 10 in-lbs)	1	N/A
5/16-inch torque wrench (set to 21 in-lbs) (Option 014 only)	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

CAUTION Use a 5/16-inch torque wrench set to 10 in-lbs on all cable connections except the front-panel connectors to which the front-panel jumpers attach (Option 014). Use a 5/16-inch torque wrench set to 21 in-lbs for these connections.

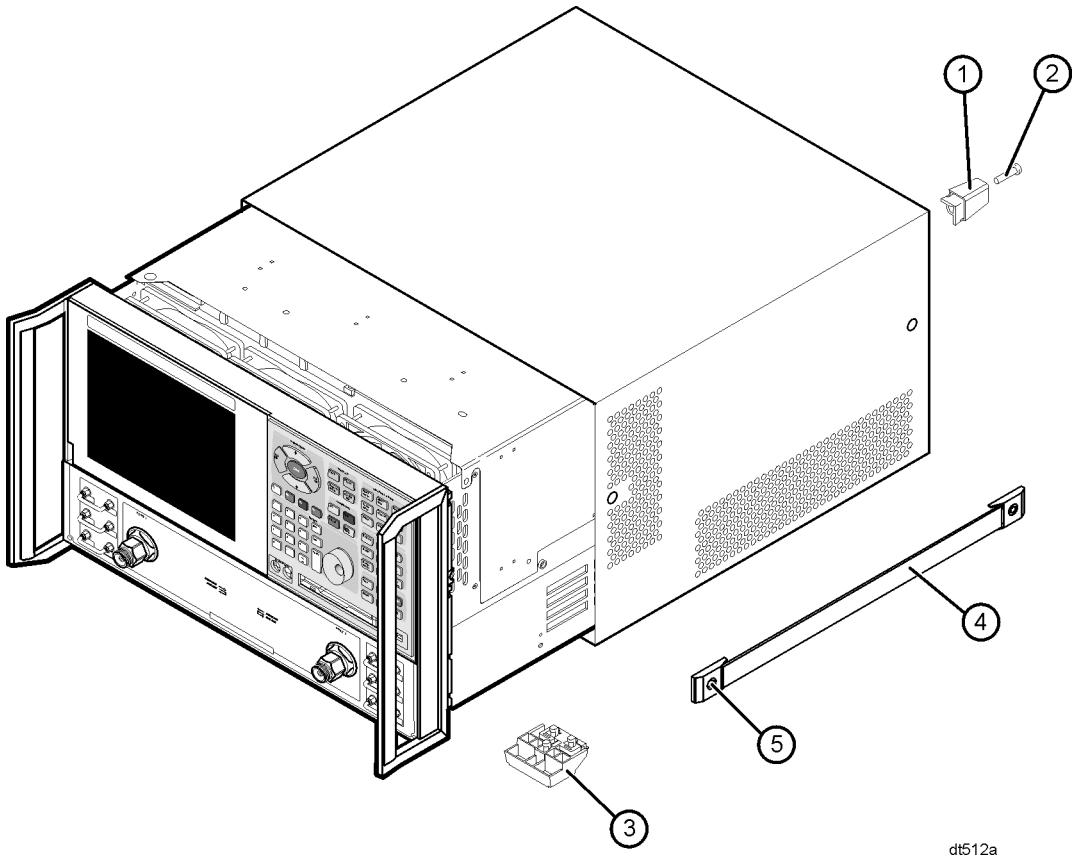
Step 1. Remove the Outer Cover

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 2.

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

Figure 2 Outer Cover Removal

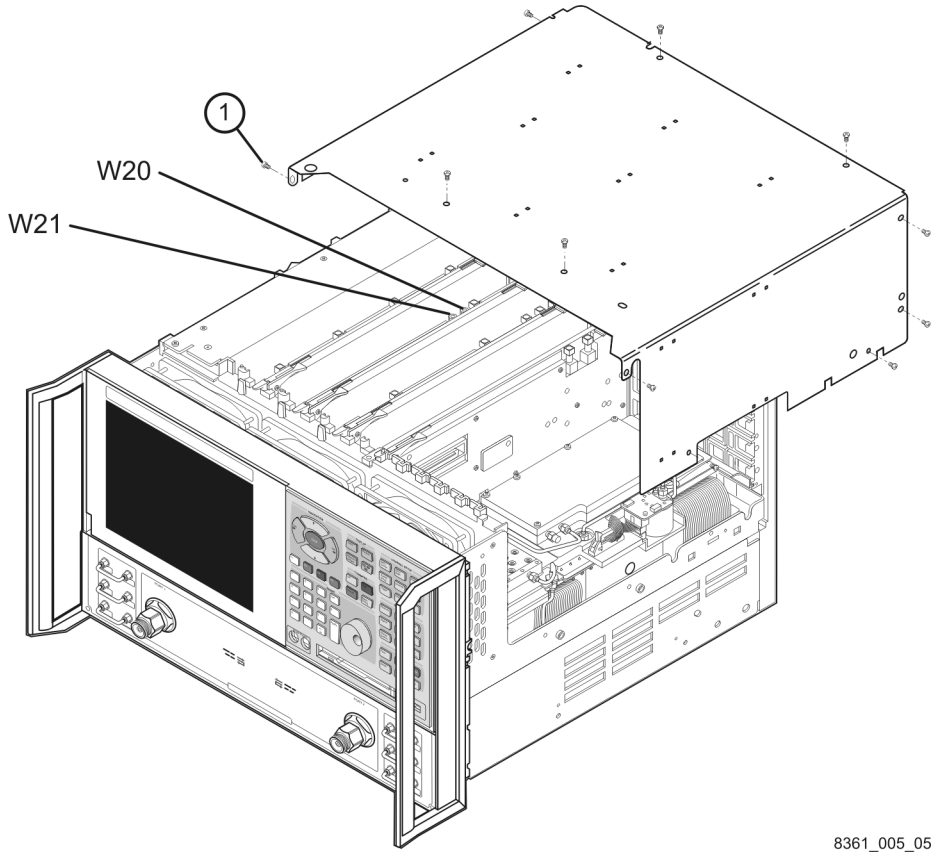


Step 2. Replace Cables W20 and W21 (if necessary)

Refer to Figure 3.

1. Place the analyzer top-side up.
2. With a T-10 TORX driver, remove the 11 screws (item ①) used to attach the inner cover and lift off the inner cover.
3. Examine the part number labels on cables W20 (connected to A8J106) and W21 (connected to A8J101).
   - If the part numbers are E8364-20045 and E8364-20046 respectively, then they do not need to be replaced. Proceed to step 4 on this page.
   - If the part numbers ARE NOT E8364-20045 and E8364-20046 respectively, replace them with the cables provided, that are labeled with these part numbers.
4. Replace the inner cover by reinstalling the 11 attachment screws (item ①).

Figure 3 Inner Cover Removal to Verify W20 and W21 Part Numbers



Step 3. Remove the Front Panel Assembly

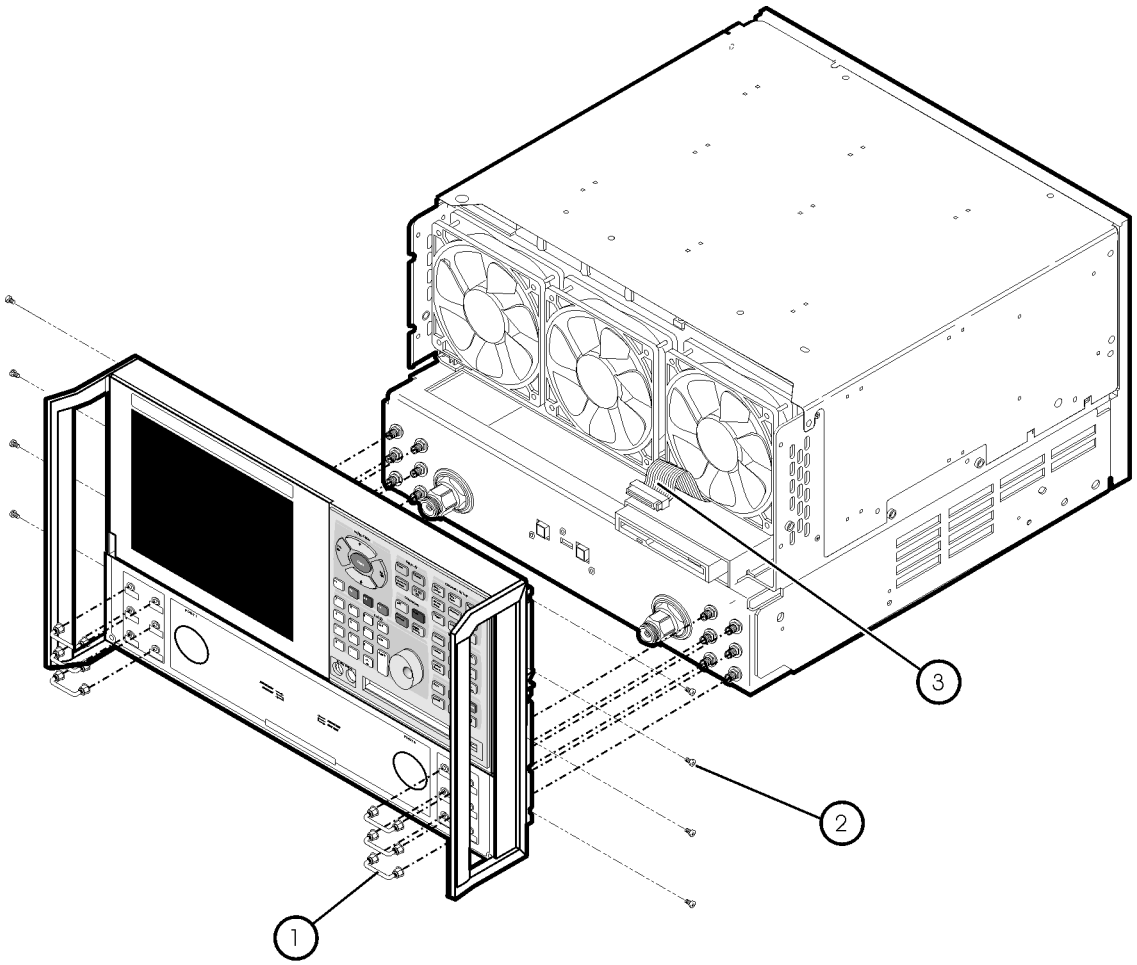
Refer to Figure 4.

1. With a 5/16-inch wrench, remove the six front panel semirigid jumper cables (item ①).
2. With a T-10 TORX driver, remove the eight screws (item ②) from the sides of the frame.

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

3. Slide the front panel over the test port connectors.
4. Disconnect the front panel interface ribbon cable (item ③) from the A3 front panel interface board. The front panel is now free from the analyzer.

Figure 4 Front Panel Assembly Removal

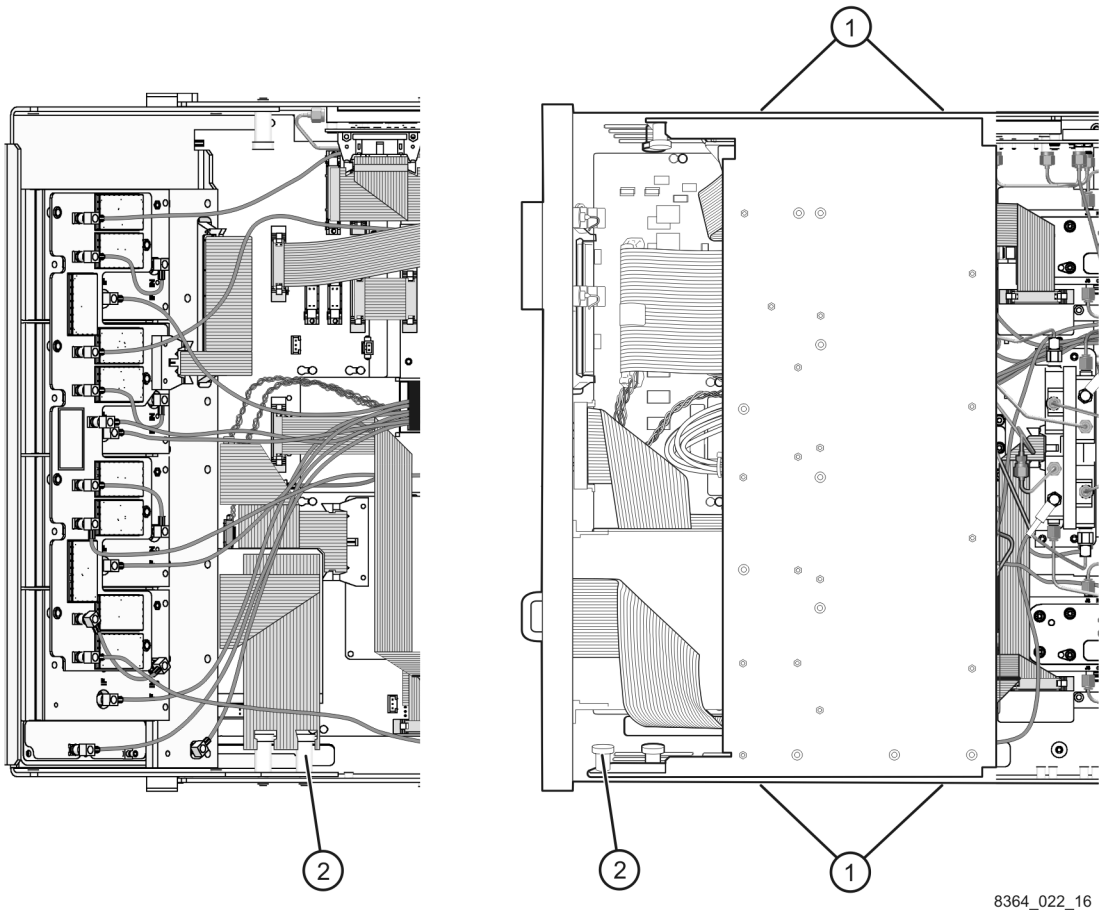


Step 4. Raise the Receiver Deck

Refer to Figure 5.

1. Place the analyzer bottom-side up on a flat surface.
2. With a T-10 TORX driver, remove the four screws (item ①) that secure the receiver deck.
3. Pull the latch pin (item ②) towards the opposite side of the analyzer to release the receiver deck.
4. Lift the receiver deck to partially raise it, then release the latch pin (item ②). Lift the receiver deck to its fully raised position and ensure that the latch pin latches in the raised position.

Figure 5 Receiver Deck Raising



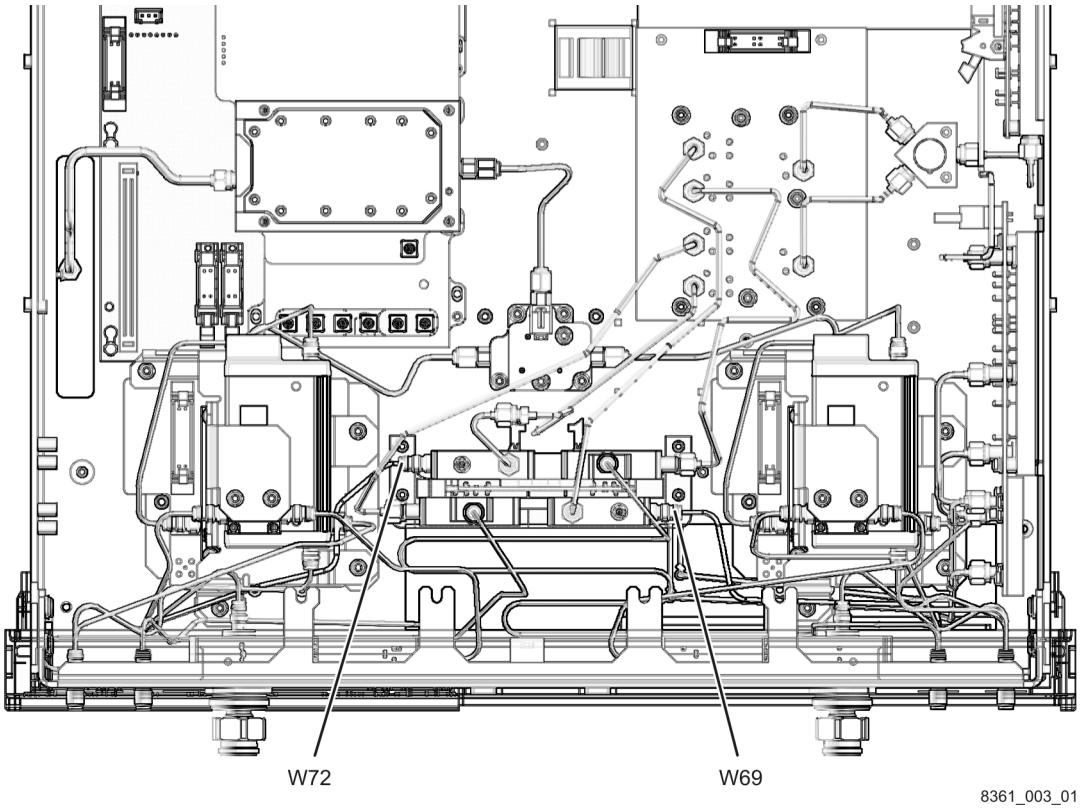
Step 5. Remove the Existing Cables

Refer to Figure 6.

Remove the following cables:

- W69 E8361-20047 PORT 1 RCVR A IN to A27 channel A mixer
- W72 E8361-20048 PORT 2 RCVR B IN to A30 channel B mixer

Figure 6 Existing Cables Removal



Step 6. Install the Attenuators and Cables

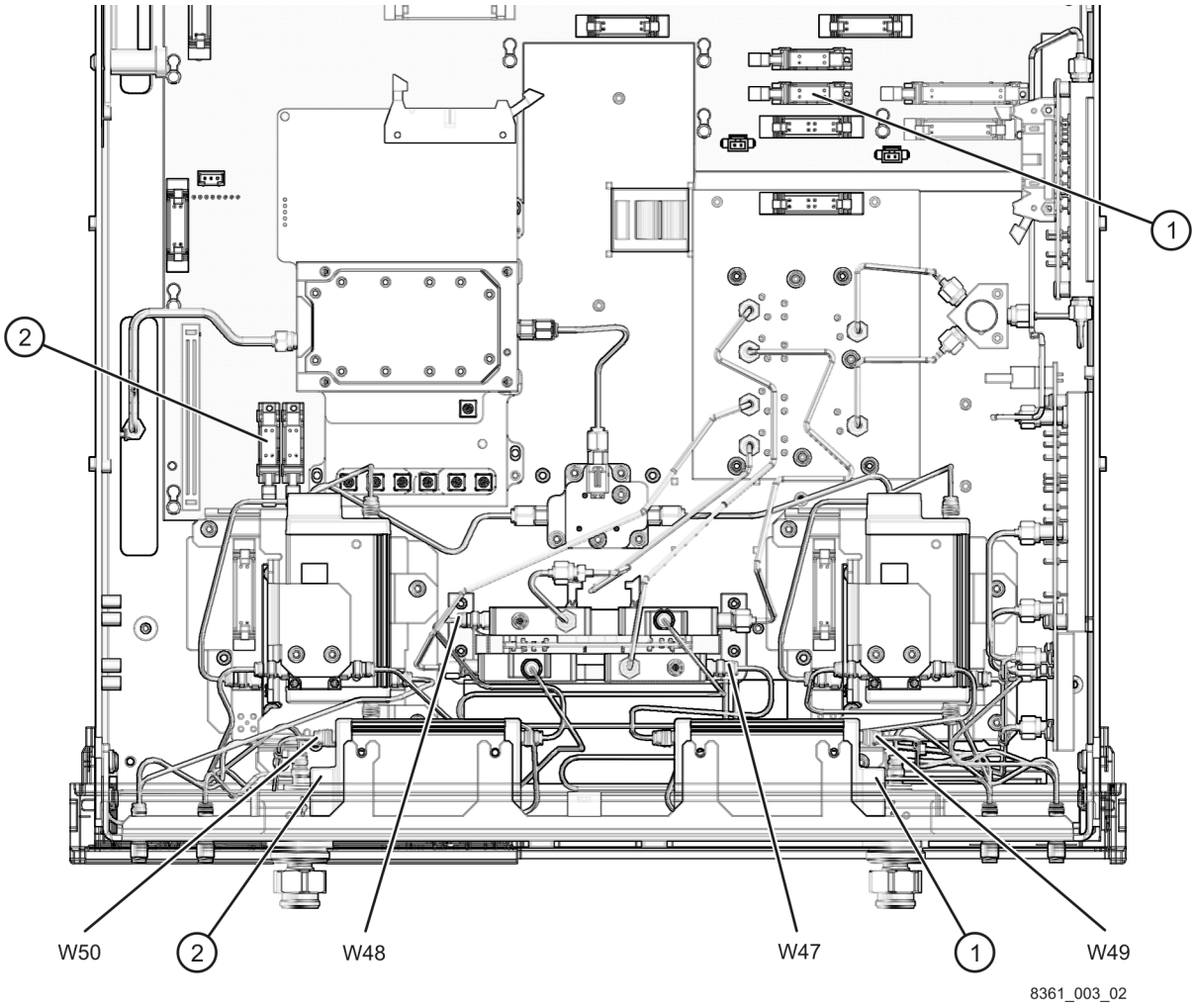
Refer to Figure 7. The new parts referenced in this step are listed in Table 1 on page 4.

1. Attach one step attenuator to each bracket, using two M3.0 x 8 screws (provided) for each.

   Be careful to position the step attenuators so that the necessary cables can be attached. The end of the step attenuator with the ribbon cable connector must face toward the outside of the analyzer.

2. Install the following cables in the order listed:
   - Ribbon cable ① 8121-0819 A43 ch A attenuator to A16 motherboard (P1 RCVR ATT)
   - Ribbon cable ② 8121-0819 A44 ch B attenuator to A16 motherboard (P2 RCVR ATT)
   - W47 E8361-20031 A43 channel A step attenuator to A27 channel A mixer
   - W48 E8361-20025 A44 channel B step attenuator to A30 channel B mixer
   - W49 E8361-20032 PORT 1 RCVR A IN to A43 channel A step attenuator
   - W50 E8361-20029 PORT 2 RCVR B IN to A44 channel B step attenuator

Figure 7 Attenuators and Cables Installation

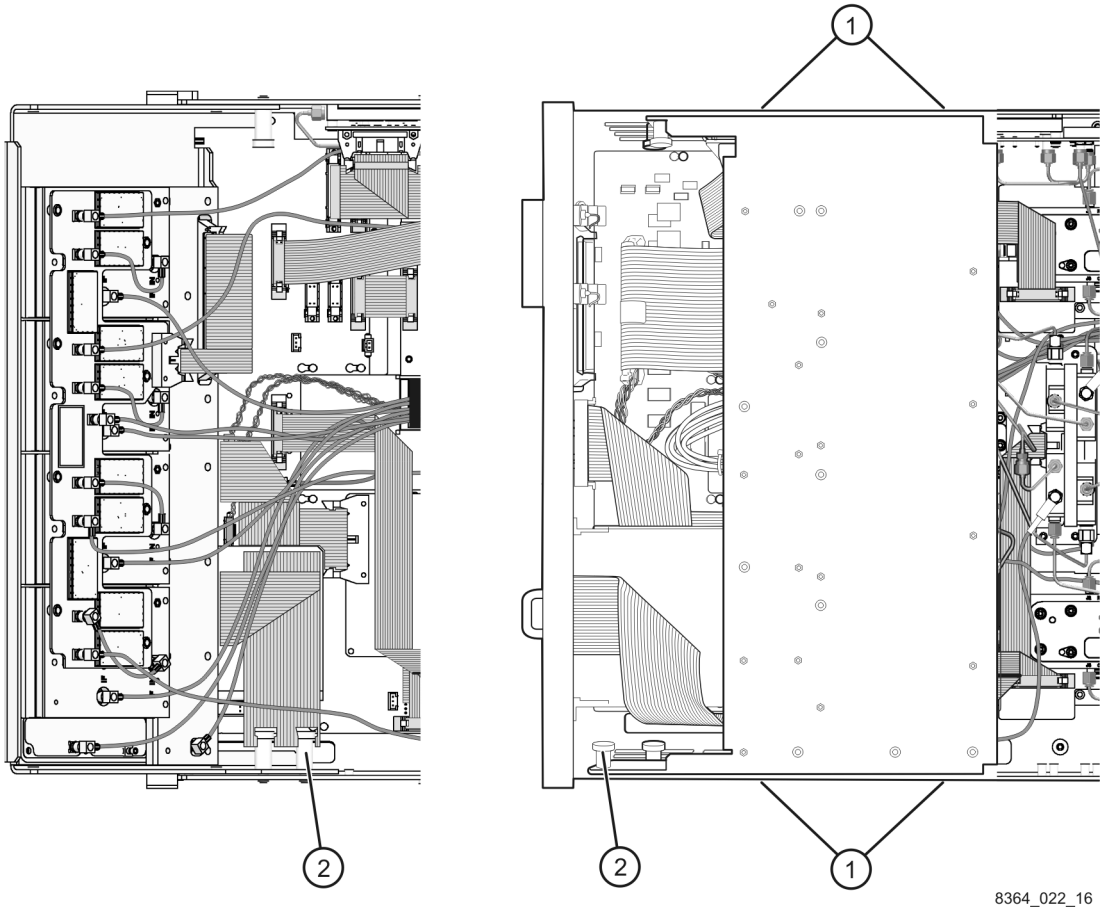


Step 7. Lower and Fasten the Receiver Deck

Refer to Figure 8.

1. Pull the latch pin (item ②) toward the center of the analyzer to release the receiver deck.
2. Lift the receiver deck to partially lower it, then release the latch pin (item ②). Lower the receiver deck to its fully lowered position and ensure that the latch pin latches in the lowered position.
3. With a T-10 TORX driver, install the four screws (item ①) to secure the receiver deck.

Figure 8 Receiver Deck, Lowering



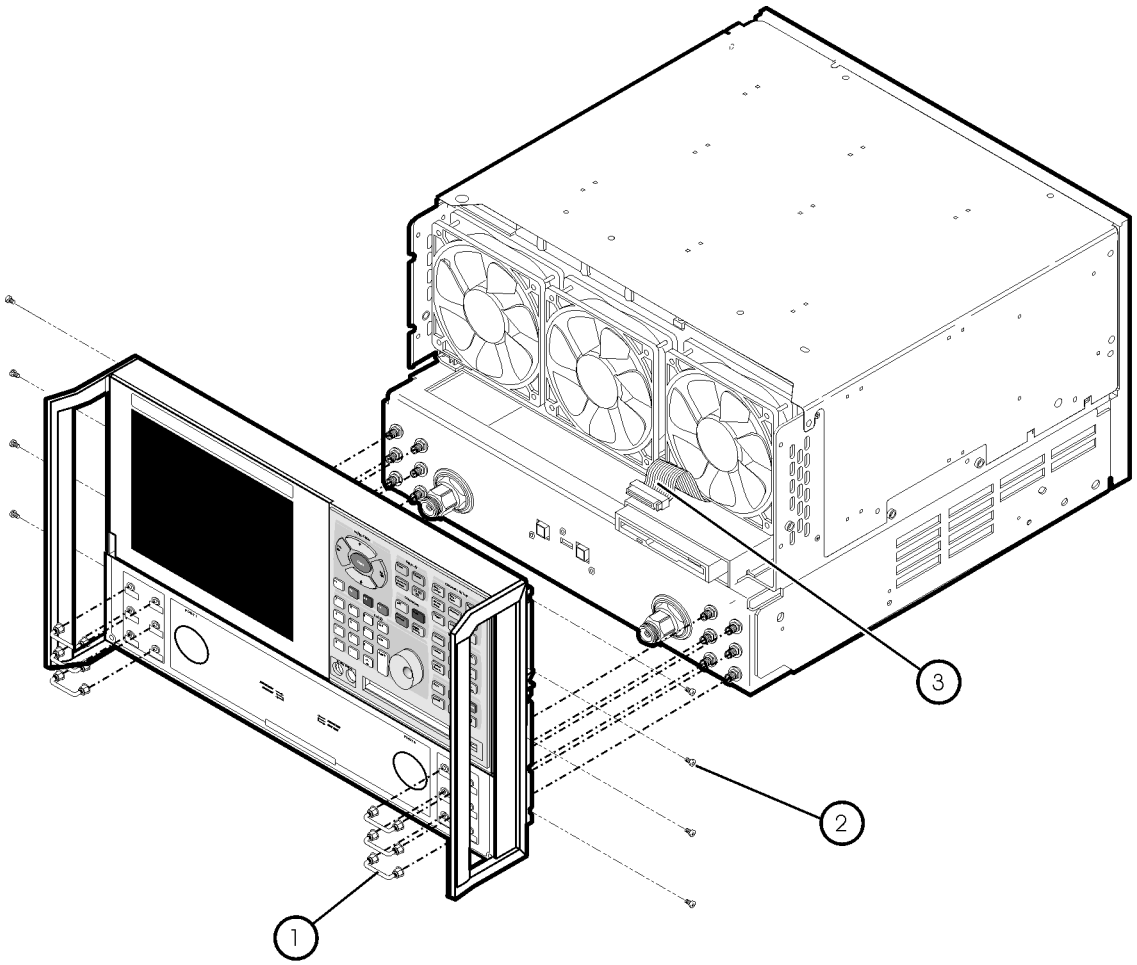
Step 8. Reinstall the Front Panel Assembly and Front Panel Jumpers

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

Refer to Figure 9.

1. Tighten all 12 of the front-panel feed-through connectors using a 5/16-inch torque wrench set to 21-in lbs.
2. Reconnect the ribbon cable (item ③) to the A3 front panel interface board.
3. 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.
4. With a T-10 TORX driver, install the eight screws (item ②) in the sides of the frame.
5. Install the six semirigid jumpers (item ①) on the front panel and tighten to 10-in lbs.

Figure 9 Front Panel Assembly Reinstallation



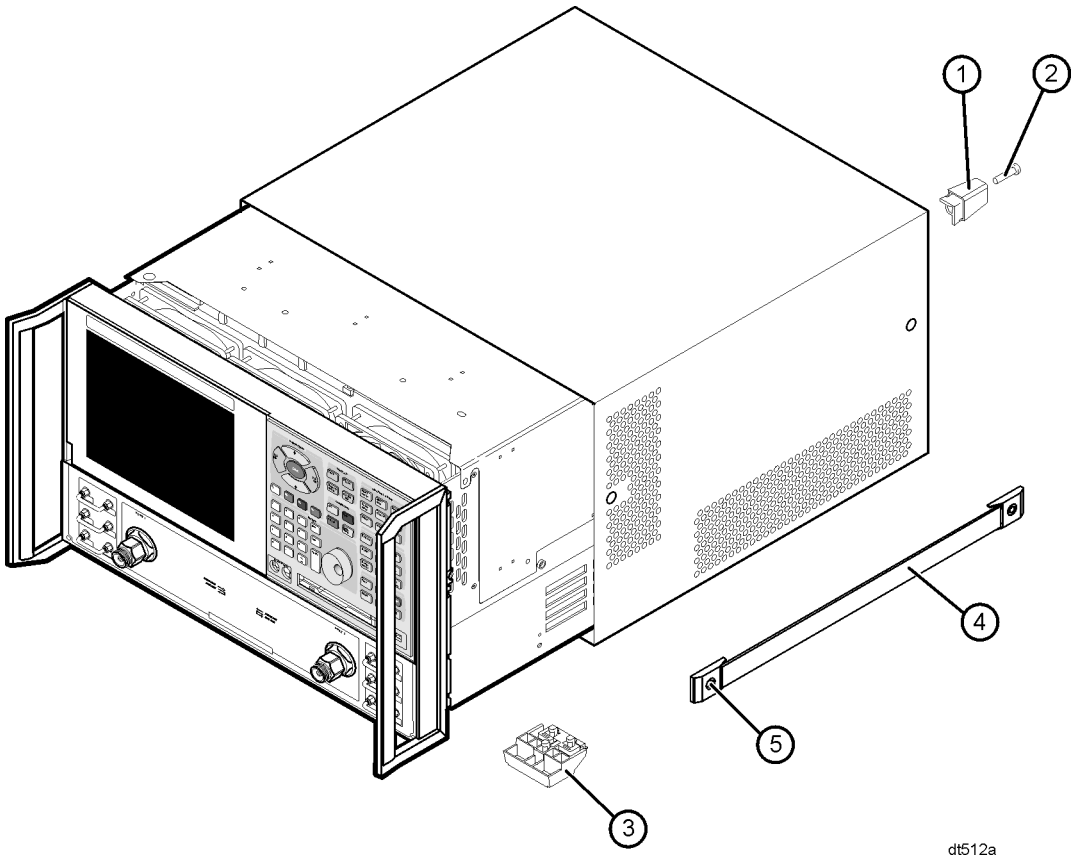
Step 9. Reinstall the Outer Cover

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 10.

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 10 Outer Cover Reinstallation



Step 10. Enable Option 016

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 **016 - Receiver Attenuators**.
3. Click **Enable**.
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 **016 - Receiver Attenuators**.
4. Tab to **Enable**, 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 11. Verify that Option 016 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 "016" is listed after "Options:" in the display. Click **OK**.

NOTE If Option 016 has not been enabled, perform step 9 again. If the option is still not enabled, contact Agilent Technologies. Refer to "Getting Assistance from Agilent" on page 2.

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 "016" is listed after "Options:" in the display. In the **COMMAND** block, press **OK** (or tab to **OK**, and then press **Click**).

NOTE If Option 016 has not been enabled, perform step 9 again. If the option is still not enabled, contact Agilent Technologies. Refer to "Getting Assistance from Agilent" on page 2.
