Installation Note

Frequency Offset Mode Upgrade Kit

For PNA Series Microwave Network Analyzers (E8361A, E8362B, E8363B, and E8364B)

Network Analyzer Model Number	Upgrade Kit Part Number
E8361A, E8362B, E8363B, E8364B	E8362-60111

Agilent Technologies

E8362-90010

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About Installing the Upgrade Kit

Products affected	E8361A, E8362B, E8363B, and E8364B; all option combinations that include Option 014
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 080 Frequency Offset Mode

Frequency offset mode allows the PNA source and receiver to be tuned to different frequencies. This is convenient, if not necessary, for testing frequency conversion devices, such as mixers and converters, where the input and output frequencies are different.

The PNA source, at one frequency, can be used as the input to the DUT, and the PNA receiver can be tuned to the output signal of the DUT at a different frequency.

Items Included in the Upgrade Kit

Check the contents of your kit against the following list. If any item is missing or damaged, contact Agilent Technologies. Refer to "Getting Assistance from Agilent" on page 2.

Table 1   Contents of the Option 080 Upgrade Kit (E8362-60111)

Ref. Desig.	Description	Qty	Part Number
	Installation note (this document)	1	E8362-90010
A9	Fractional-N synthesizer board	1	E8364-60099
A13	Frequency offset receiver assembly	1	E8364-60024
W91	RF cable, semi-rigid, A9 fractional-N synthesizer board J106 to A13 frequency offset receiver board J4	1	E8364-20140
W92	RF cable, semi-rigid, A9 fractional-N synthesizer board J101 to A13 frequency offset receiver board J2	1	E8364-20141
W93	RF cable, semi-rigid, A12 source 20 to A13 frequency offset receiver board RF IN	1	E8364-20143
W105	RF cable, flexible, A10 frequency reference board J11 to A9 fractional-N synthesizer board J105	1	E8364-60018
W106	RF cable, flexible, A13 frequency offset receiver board J6 to A35 receiver motherboard J502	1	E8364-60017

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 5 for part numbers.

Figure 1   ESD Protection Setup

esd_setup
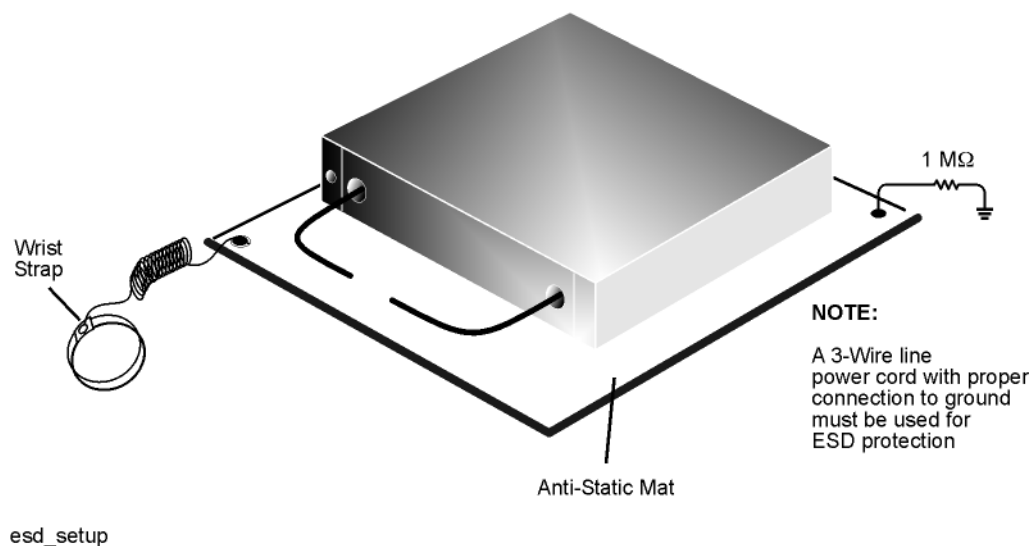
Overview of the Installation Procedure

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
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

Step 1. Remove the Outer and Inner Covers

Remove the Outer Cover

Refer to Figure 2 for this procedure.

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.

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 of the cover.

4. With a T-20 TORX driver, remove the strap handles (item ④) by loosening the screw (item ⑤) on each end until the handle is free of the analyzer.

5. Slide the cover off of the frame.
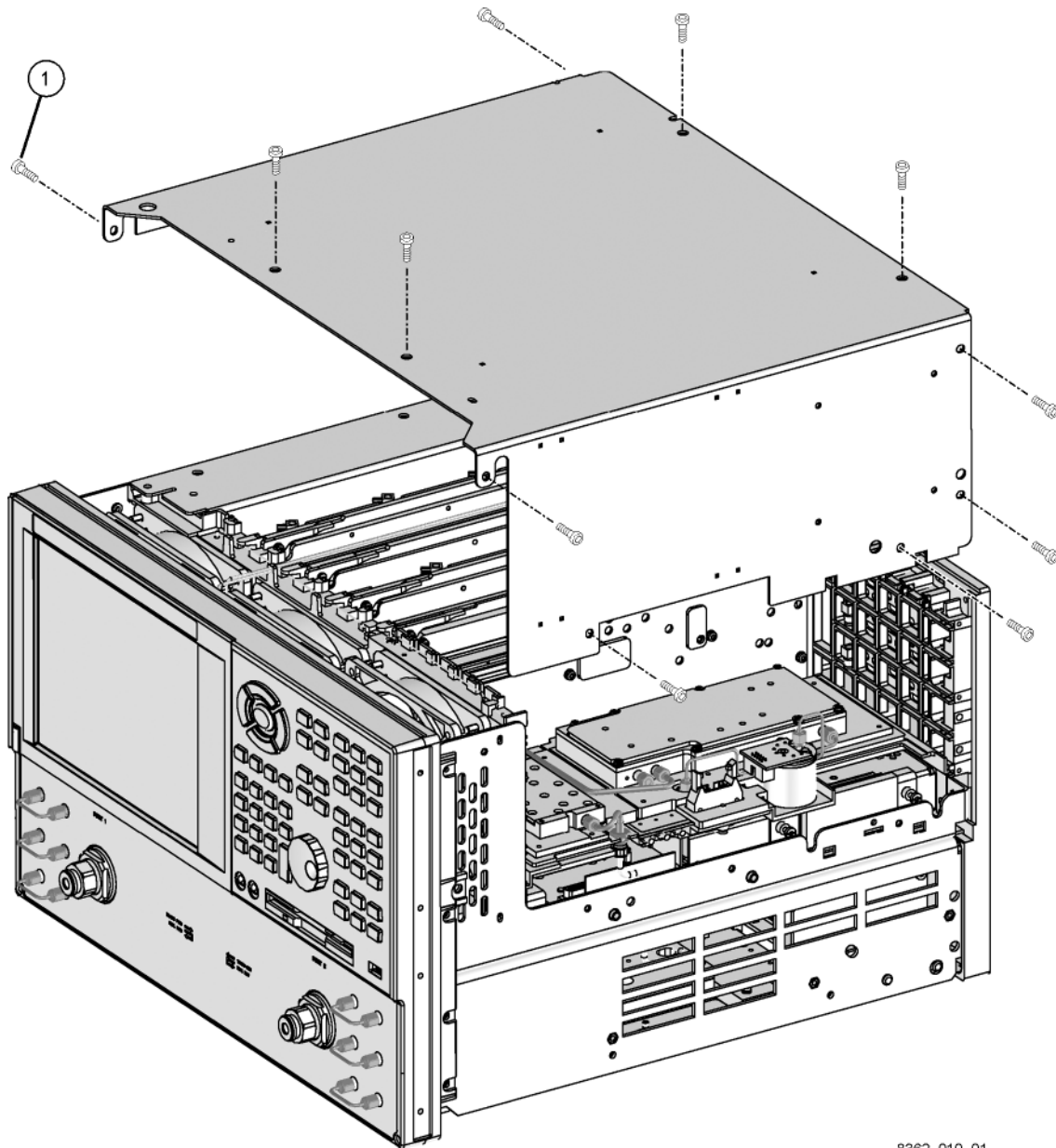
Figure 2   Outer Cover Removal
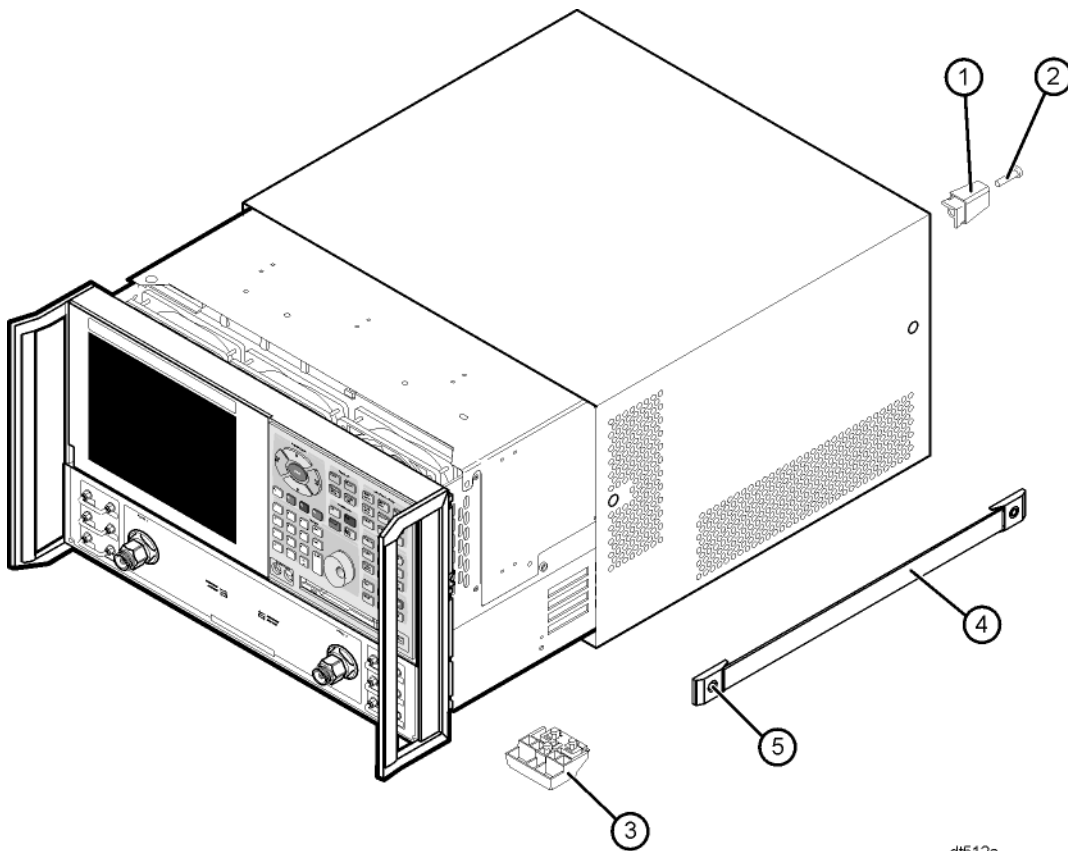
dt512a

Remove the Inner Cover

Refer to Figure 3 for this procedure.

1. Place the analyzer top-side up on a flat surface.

2. With a T-10 TORX driver, remove the 11 screws (item ①).

3. Lift off the cover.

Figure 3   Inner Cover Removal

8362_010_01

Step 2. Install the A13 Frequency Offset Receiver Assembly

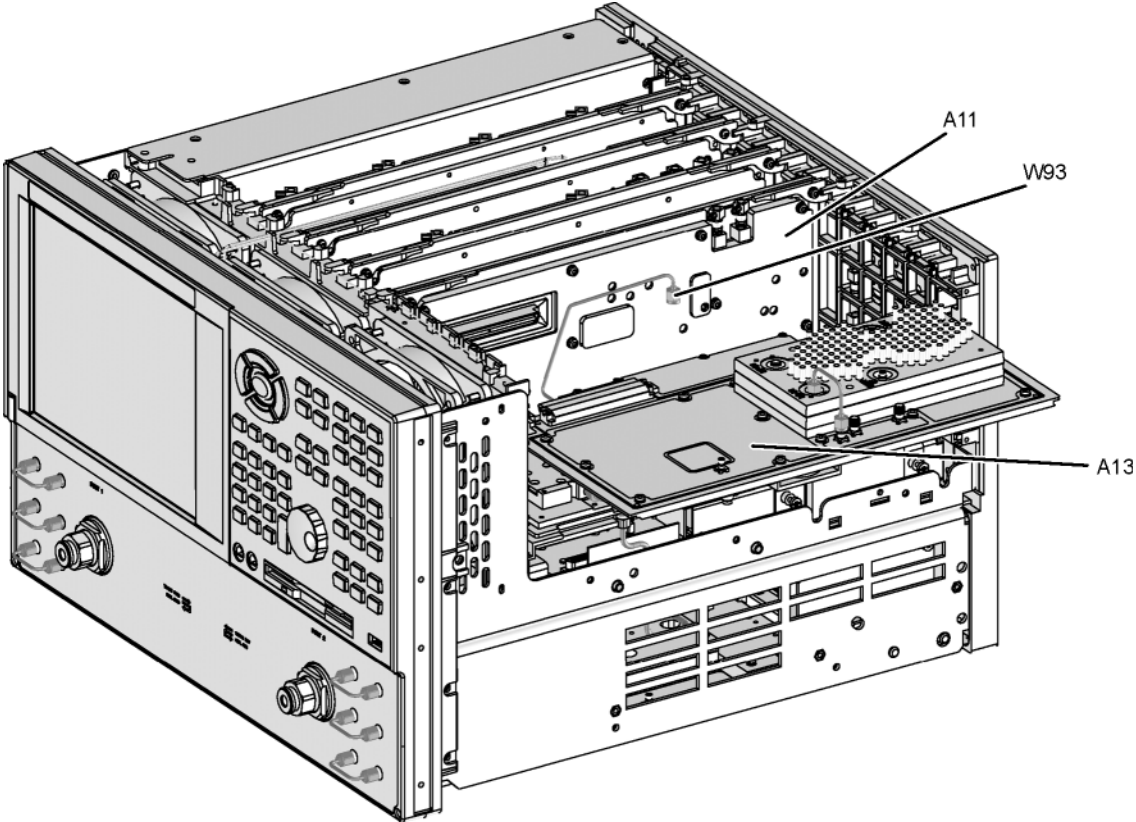Refer to Figure 4 and Figure 5 for this procedure.

1. Connect cable W93 (E8364-20143) to the A12 source 20 assembly. Position the cable as shown and, while holding the cable in position with one hand, use a 5/16-inch torque wrench set to 10-in-lbs to tighten the connector nut with the other hand.

2. Loosely insert the A13 frequency offset receiver assembly into the analyzer in the location shown. As you insert the A13 assembly, lift cable W93 slightly to prevent the center conductor pin from being damaged.

3. Make sure the connectors on the A13 assembly are properly aligned with the connectors on the A11 board. Make sure that cable W93 moves freely behind the A13 assembly.

4. Firmly push the A13 assembly toward the A11 board to fully engage the connectors.

5. Connect the loose end of cable W93 to the A13 receiver RF IN. Using a 5/16-inch torque wrench set to 10-in-lbs, tighten the connector nut.

Figure 4   A13 Frequency Offset Receiver Assembly, Cable Installation
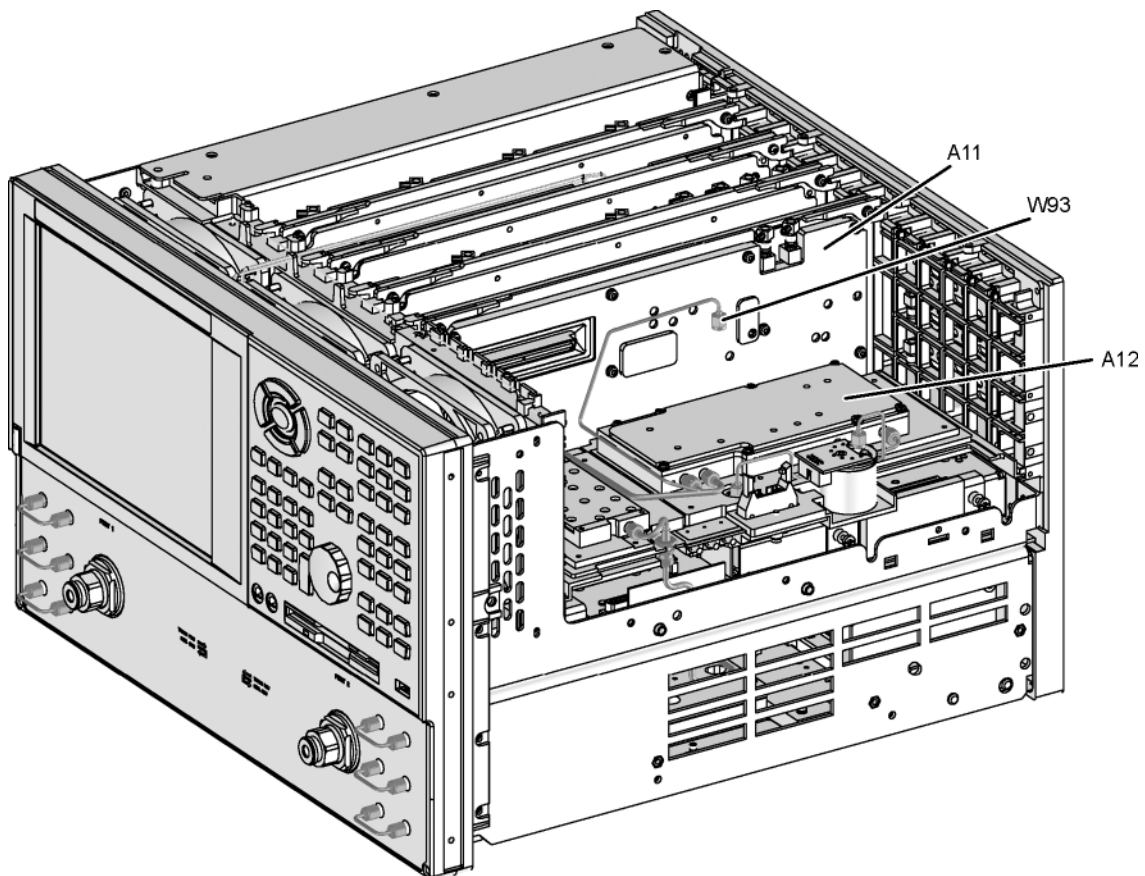
8362_010_02

**Figure 5   A13 Frequency Offset Receiver Assembly, Installation**

8362_010_03

Step 3. Install the A9 Fractional-N Synthesizer Board

Refer to Figure 6 for this procedure.

1. With a T-10 TORX driver, remove the two brackets that secure cables to the top of the midweb.

2. Connect one end of cable W105 (E8364-60018) to A9 J105 at the bottom of the A9 board. Route the cable beneath the A9 board so that the other end can be connected to the A10 board.

3. Loosely insert the A9 fractional-N synthesizer board into the analyzer in the location shown. Be careful not to drop cable W105 between the boards.

4. Connect the loose end of W105 to A10 J11. Make sure that the cable moves freely under the A9 board.

5. Make sure the connectors at the bottom of the A9 board are properly aligned with the motherboard connectors and that the board extractors (item ①) are in the down position.

6. Press firmly on the top of the A9 board to fully engage the connectors.

**Figure 6   A9 Fractional-N Synthesizer Board, Installation**
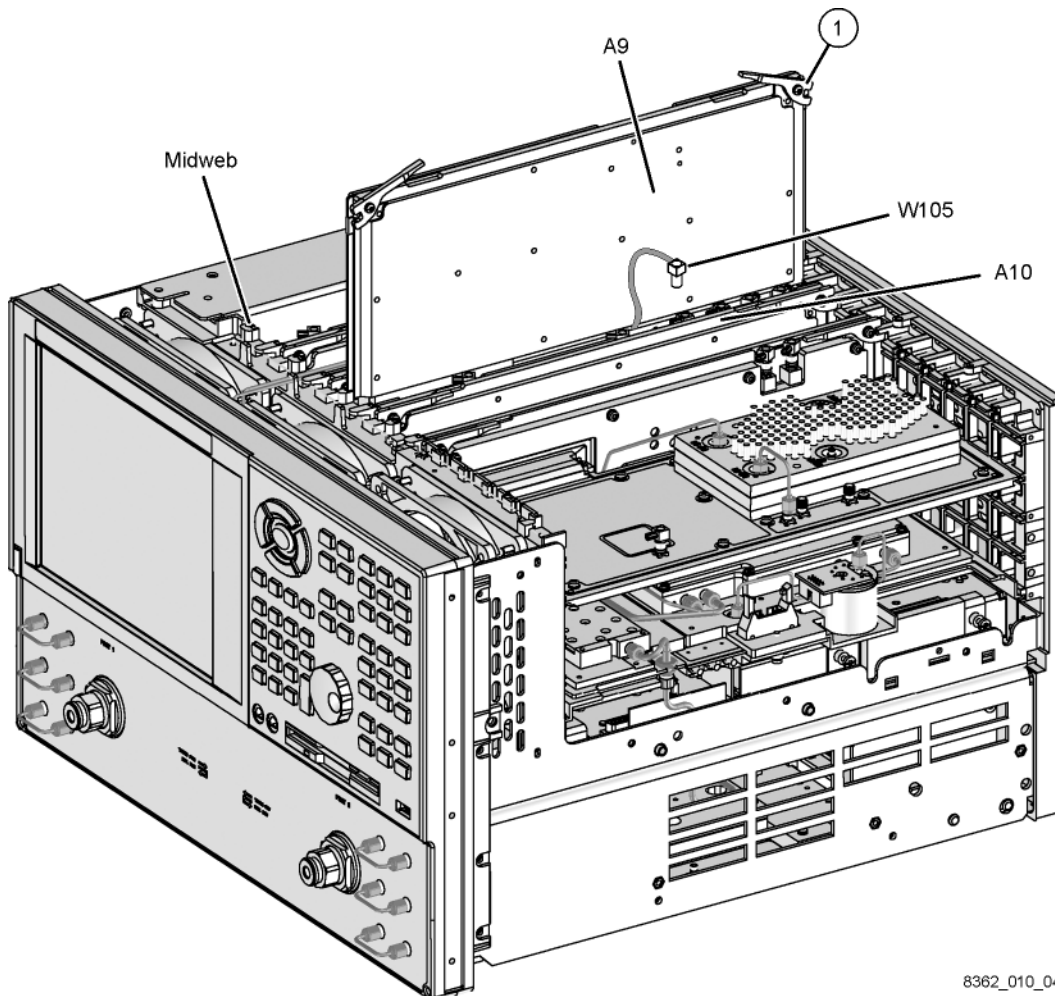
Step 4. Install the Remaining New Cables

Top Cable Connections

Refer to Figure 7 for this procedure.

1. Install the following cables as indicated:
    - W91   E8364-20140 A9 J106 to A13 J4.
    - W92   E8364-20141 A9 J101 to A13 J2.
    - W106 E8364-60017 A13 J6 to bottom side of analyzer. Route W106 through the hole in the chassis as shown.

2. With a T-10 TORX driver, reinstall the two brackets (item ①) to the top of the midweb.

Figure 7   Top Cable Connections

8362_010_05
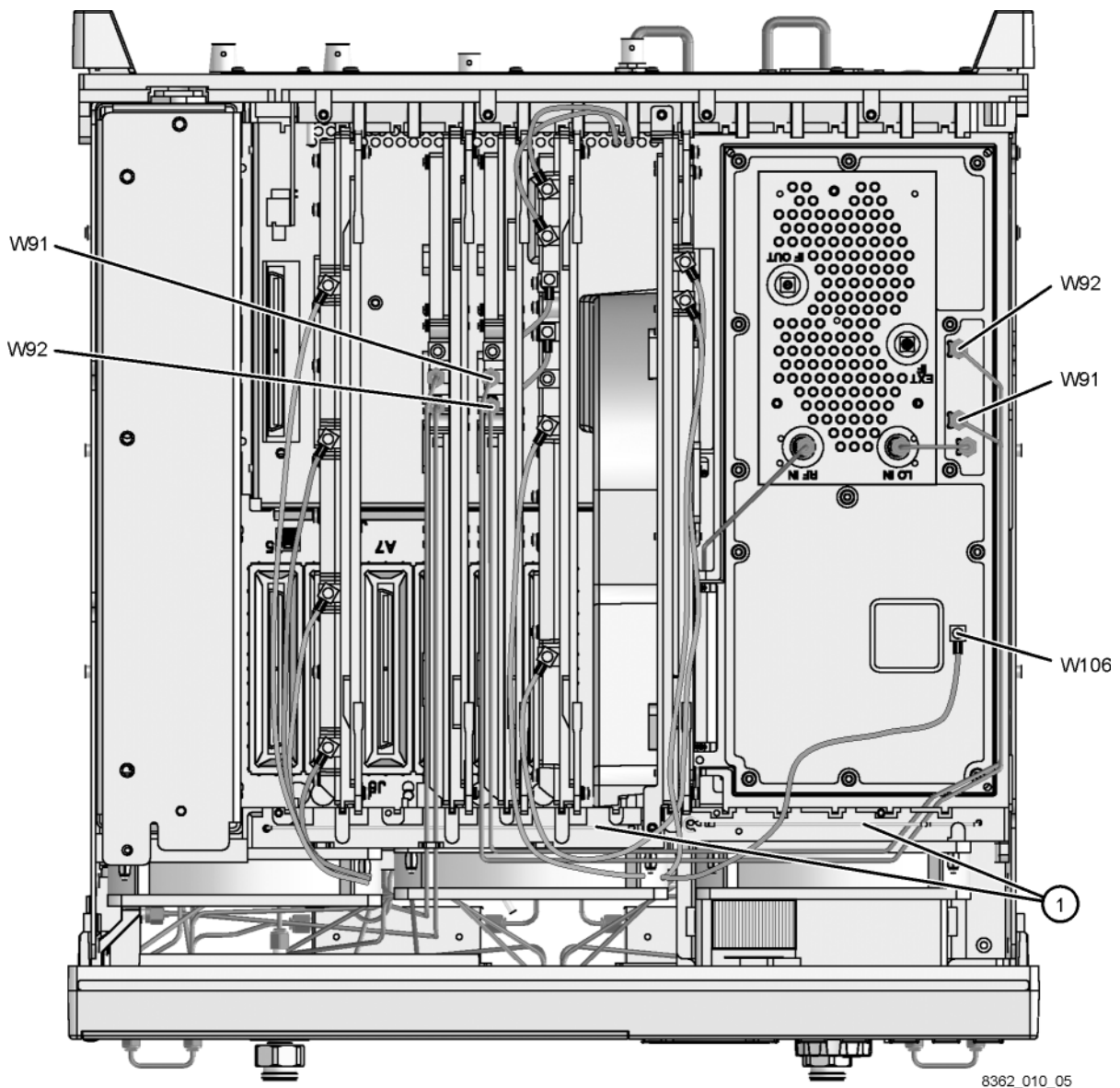
Bottom Cable Connection

Raise the Receiver Deck

Refer to Figure 8 for this procedure.

1. Place the analyzer bottom-side up on a flat surface.

2. With a T-10 TORX driver, remove the four screws (item (①), securing the receiver deck.

3. Pull the latch pin (item (②) toward the other 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.

Make the Cable Connection

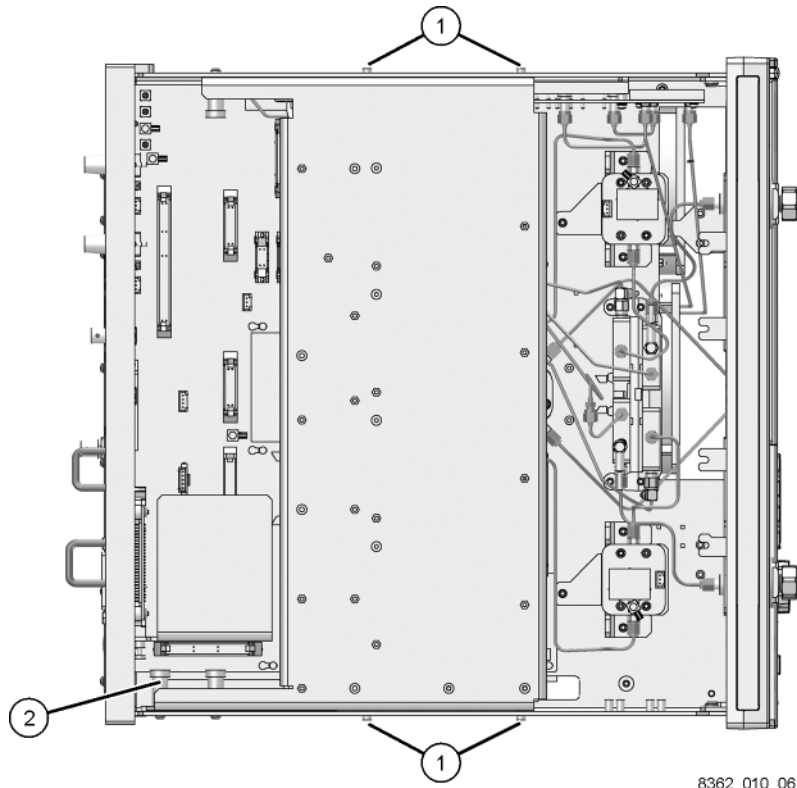Refer to Figure 9 for this procedure.

1. Route cable W106 beneath the semirigid cables and through the cable clamp as shown.

2. Connect the end of cable W106 to A35 J502 as shown.

Lower the Receiver Deck
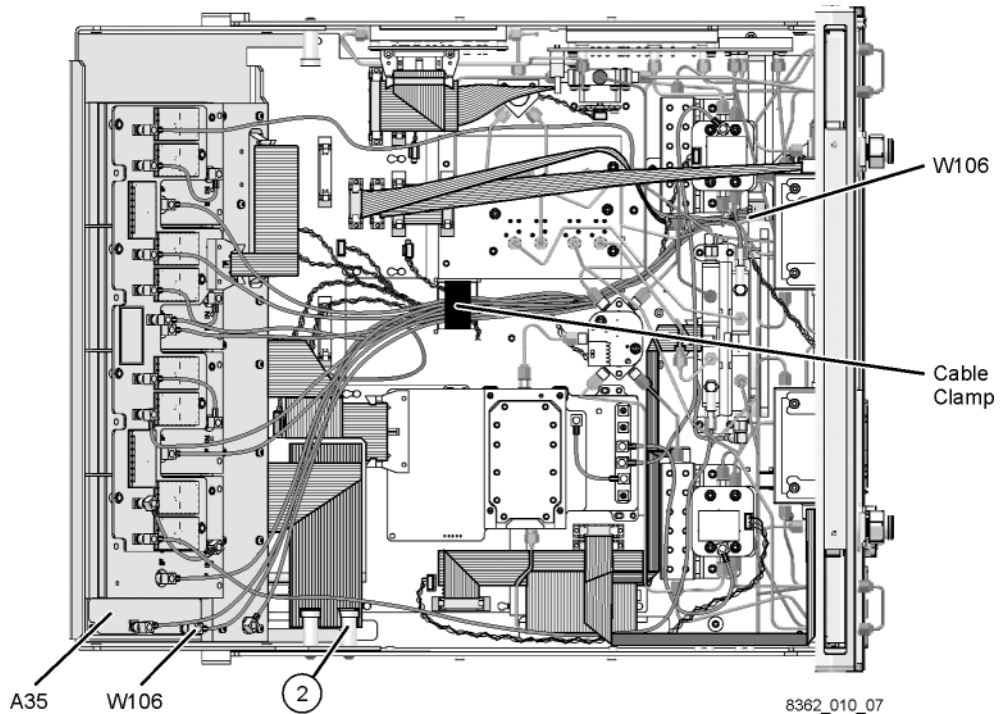
Refer to Figure 8 and Figure 9 for this procedure.

1. Pull the latch pin (item (②) toward the other side 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 Raising

8362_010_06

**Figure 9   Bottom Cable Connection**

8362_010_07

Step 5. Reinstall the Inner and Outer Covers

Refer to Figure 10 for this procedure.

Reinstall the Inner Cover

1. Place the inner cover in position on the analyzer. There are two alignment pins on the front frame that must be aligned with holes in the cover.

2. With a T-10 TORX driver, install the 11 screws (item ①).

**Figure 10 Inner Cover Reinstallation**
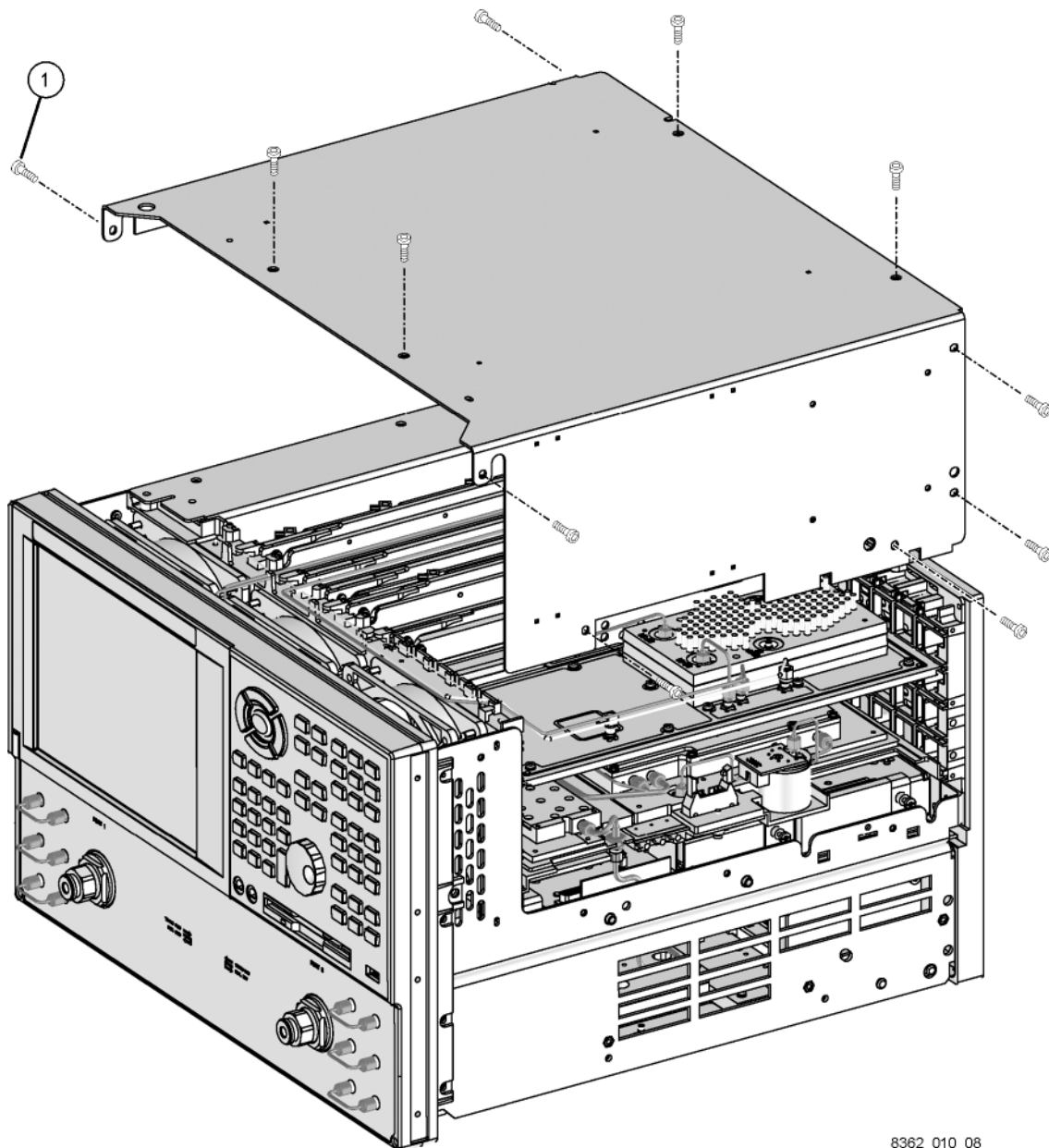
8362_010_08

Reinstall the Outer Cover

Refer to Figure 11 for this procedure.

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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1. Slide the cover onto the analyzer.

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) onto the cover.

4. With a T-20 TORX driver, install the strap handles (item ④) by tightening the screw (item ⑤) on each end.

Figure 11 Outer Cover Reinstallation
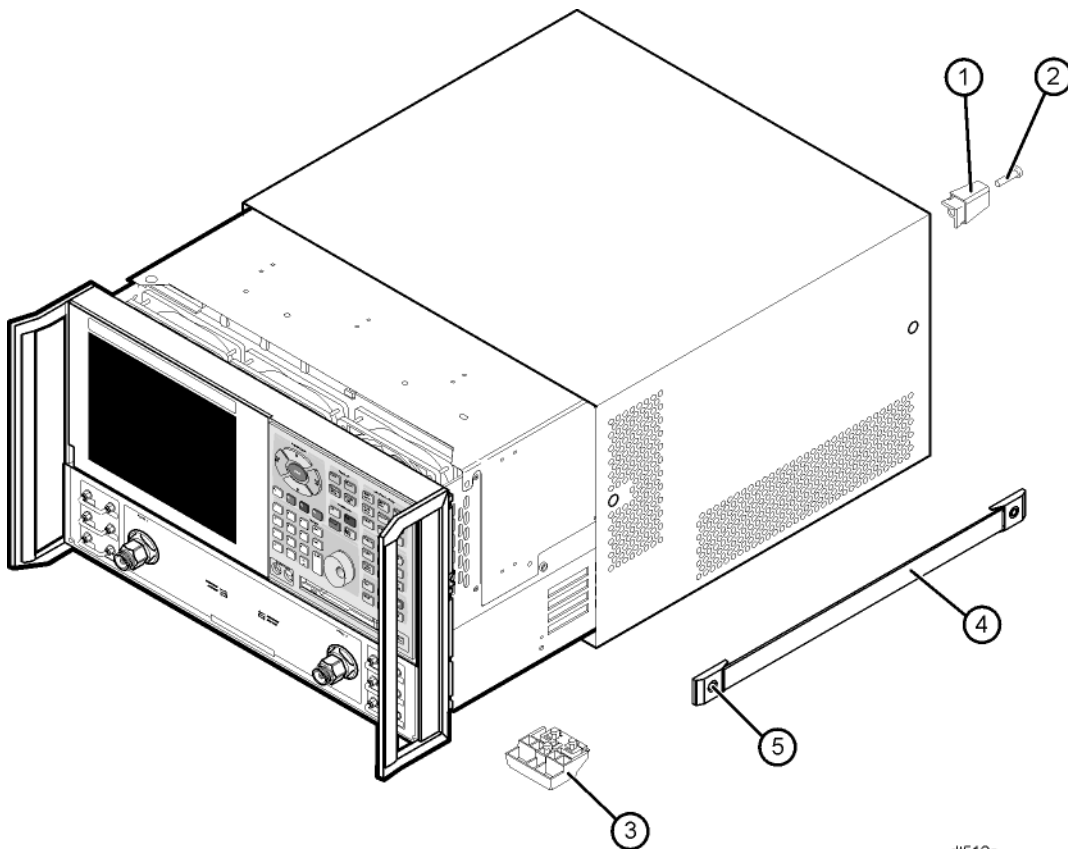
dt512a

Step 6.   Enable Option 080

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 **080 - Frequency Offset Mode**.
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 **080 - Frequency Offset Mode**.
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 7. Verify that Option 080 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 "080" is listed after "Options:" in the display. Click **OK**.

NOTE	If Option 080 has not been enabled, perform step 6 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 "080" is listed after "Options:" in the display. In the **COMMAND** block, press **OK** (or tab to **OK**, and then press **Click**).

NOTE	If Option 080 has not been enabled, perform step 6 again. If the option is still not enabled, contact Agilent Technologies. Refer to "Getting Assistance from Agilent" on page 2.