

# Installation Note

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## Frequency Offset Mode Upgrade Kit

For PNA Series Microwave Network Analyzers

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



**Agilent Part Number: E8362-90010**

**Printed in USA September 2007**

Supersedes print date: February 2004

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E8362-90010

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## Safety Notes

The following safety notes are used throughout this document. Familiarize yourself with each of these notes and its meaning before performing any of the procedures in this document.

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<b>WARNING</b>	<b>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.</b>
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<b>CAUTION</b>	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.
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## About Installing the Upgrade Kit

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**IMPORTANT** Option 080 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 080).

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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

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## 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.

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## 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 [“Contacting Agilent” on page 18](#).

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

Ref. Desig.	Description	Qty	Part Number
	Installation note (this document)	1	E8362-90010
	License key certificate	1	5964-5136
A9	Fractional-N synthesizer board	1	E8364-60099
A13	Frequency offset receiver board	1	E8364-60097
	Frequency offset receiver module	1	E8356-60018
	Gasket	1	N3381-20032
	RF cable, receiver module to receiver board	1	E8364-20142
	Machine screw	3	0515-1349
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

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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

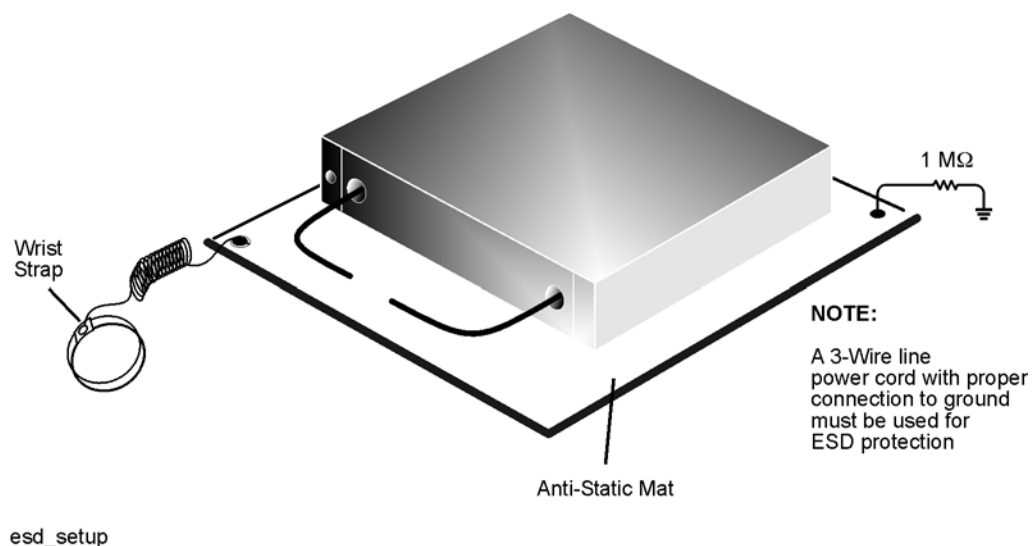
Protection against electrostatic discharge (ESD) is essential while removing or connecting cables or assemblies within the network analyzer.

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.
- *always* ground yourself before you clean, inspect, or make a connection to a static-sensitive device or test port. You can, for example, grasp the grounded outer shell of the test port or cable connector briefly.

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**



## Overview of the Installation Procedure

Step 1. Remove the Outer and Inner Covers.

Step 2. Install the A13 Frequency Offset Receiver Assembly.

Step 3. Install the A9 Fractional-N Synthesizer Board.

Step 4. Install the Remaining New Cables.

Step 5. Reinstall the Inner and Outer Covers.

Step 6. Enable Option 080.

## 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.

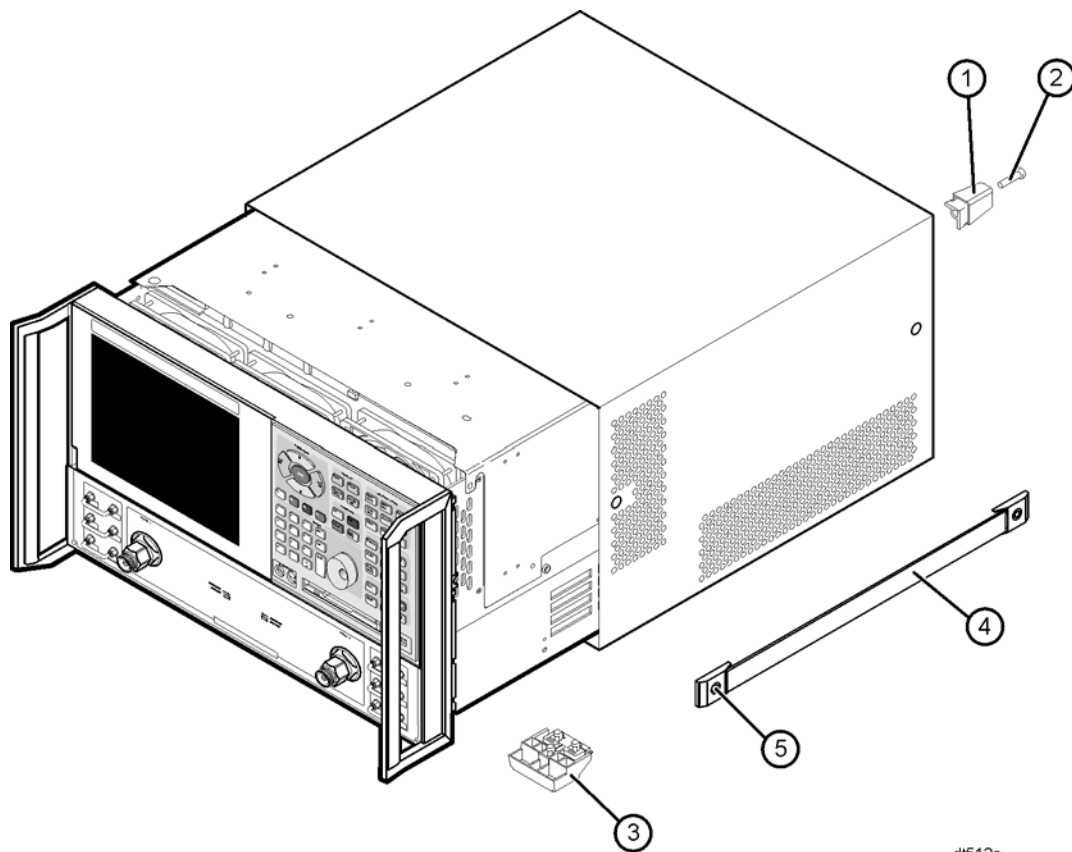
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**CAUTION** This procedure is best performed with the analyzer resting on its front handles in the vertical position. *Do not place the analyzer on its front panel without the handles.* This will damage the front panel assemblies.

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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**



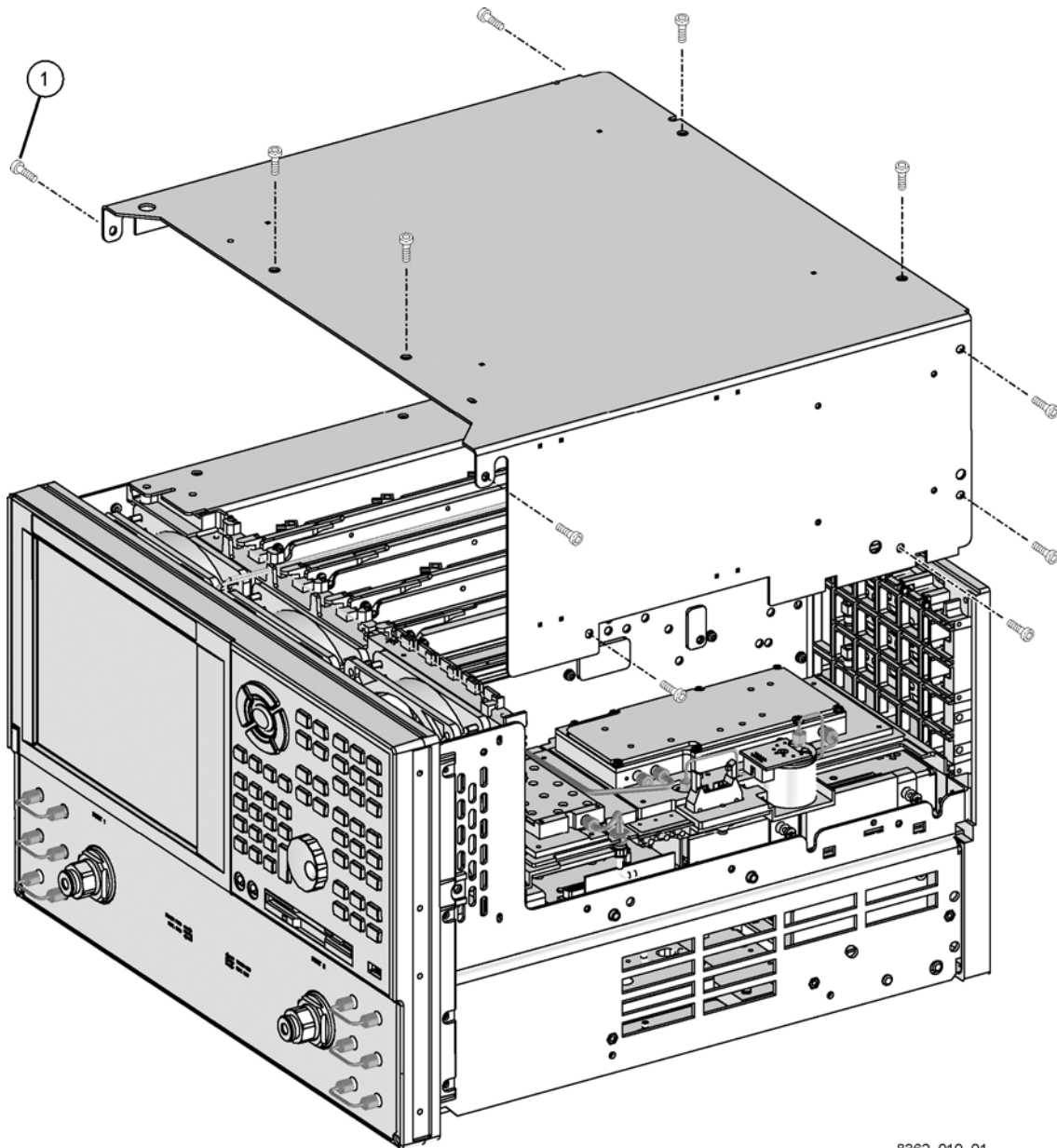
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## Remove the Inner Cover

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**



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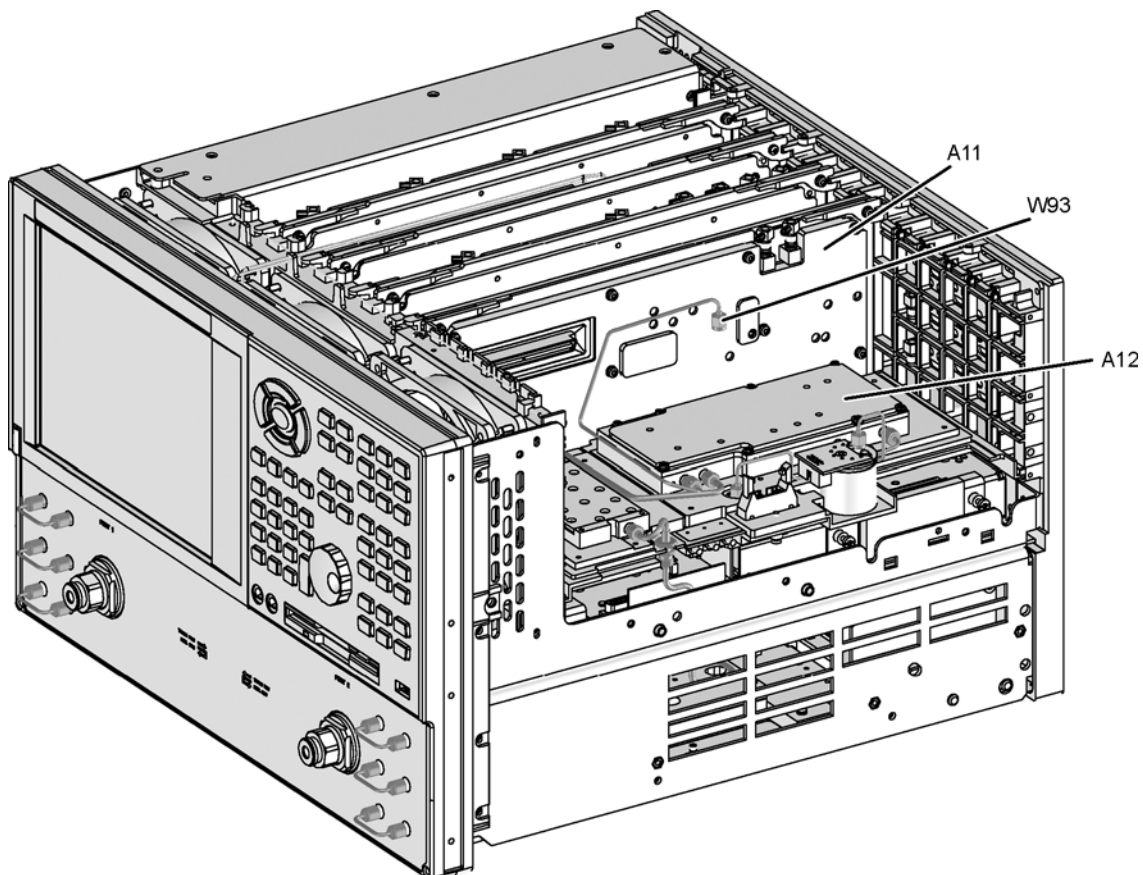


## Step 2. Install the A13 Frequency Offset Receiver Assembly

Refer to [Figure 4](#) and [Figure 5](#) for this procedure.

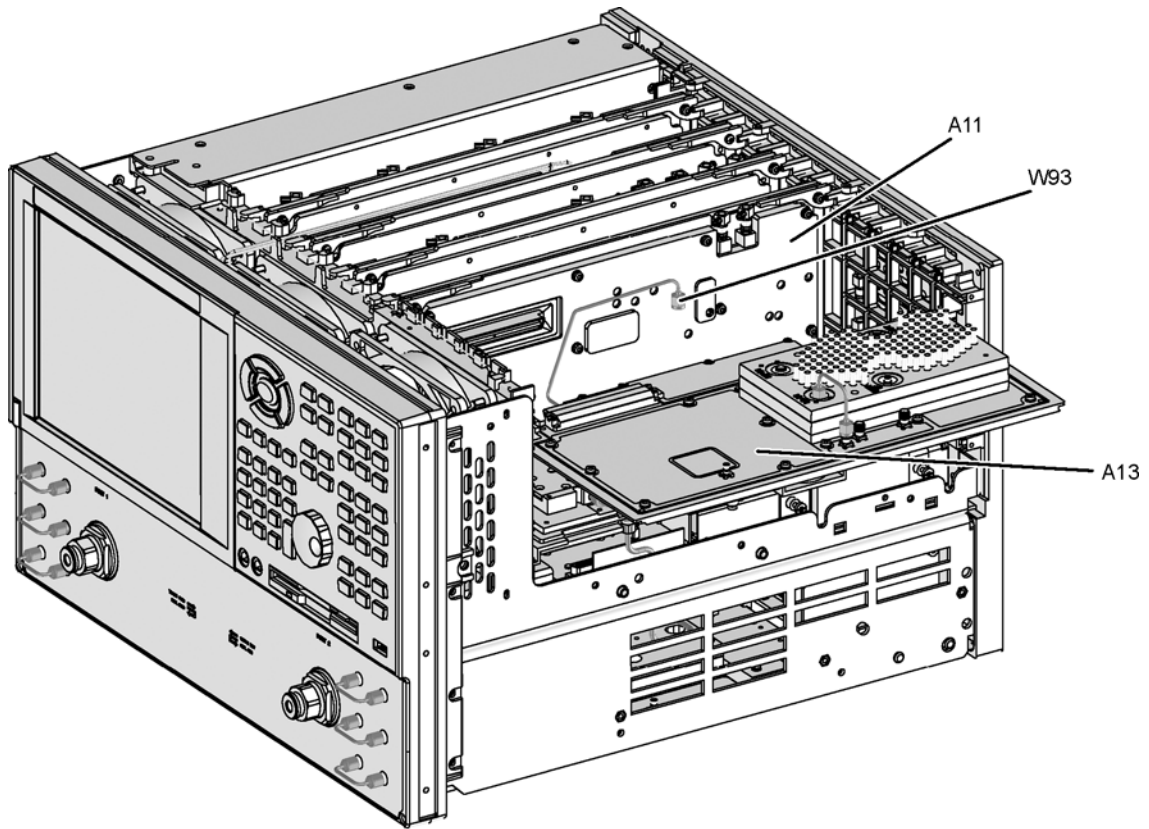
1. Assemble the A13 frequency offset receiver assembly (parts are listed in [Table 1](#)):
  - a. Position the frequency offset receiver module on the frequency offset receiver board, as shown in [Figure 5](#), with the gasket between the receiver module and the receiver board. Install the three screws to secure the receiver module to the receiver board.
  - b. Install the cable between the receiver module and the receiver board.
2. 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.
3. 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.
4. 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.
5. Firmly push the A13 assembly toward the A11 board to fully engage the connectors.
6. 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



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



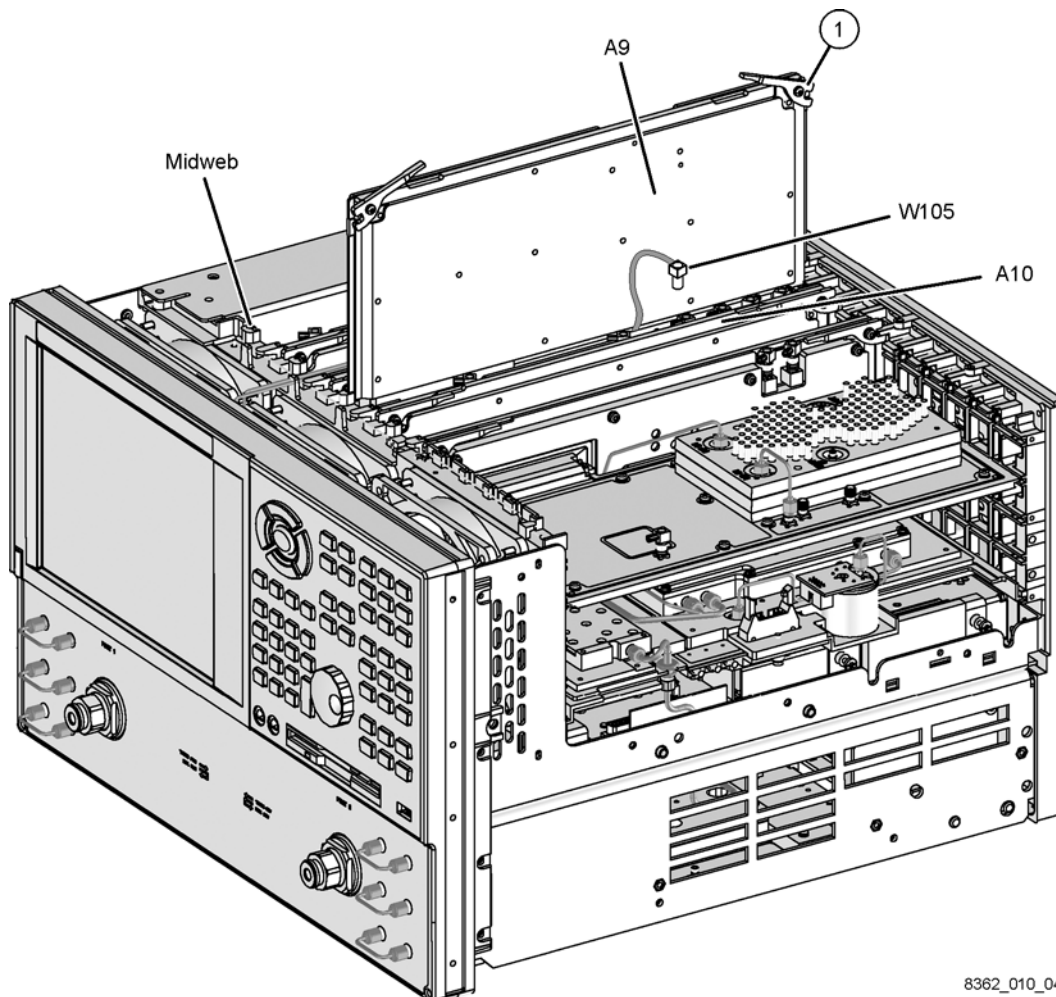
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### Step 3. Install the A9 Fractional-N Synthesizer Board

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**



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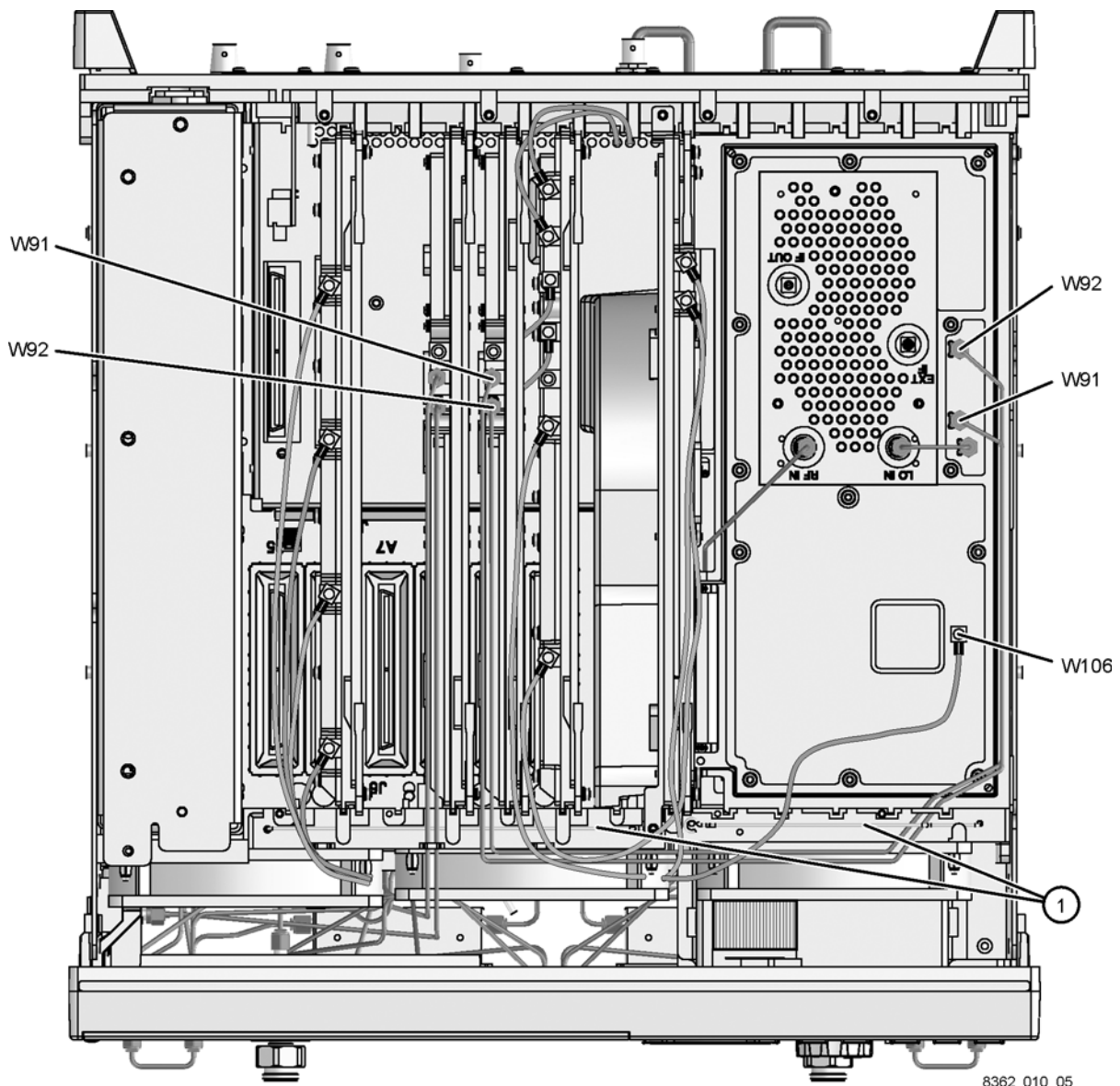
## Step 4. Install the Remaining New Cables

### 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**



## **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.

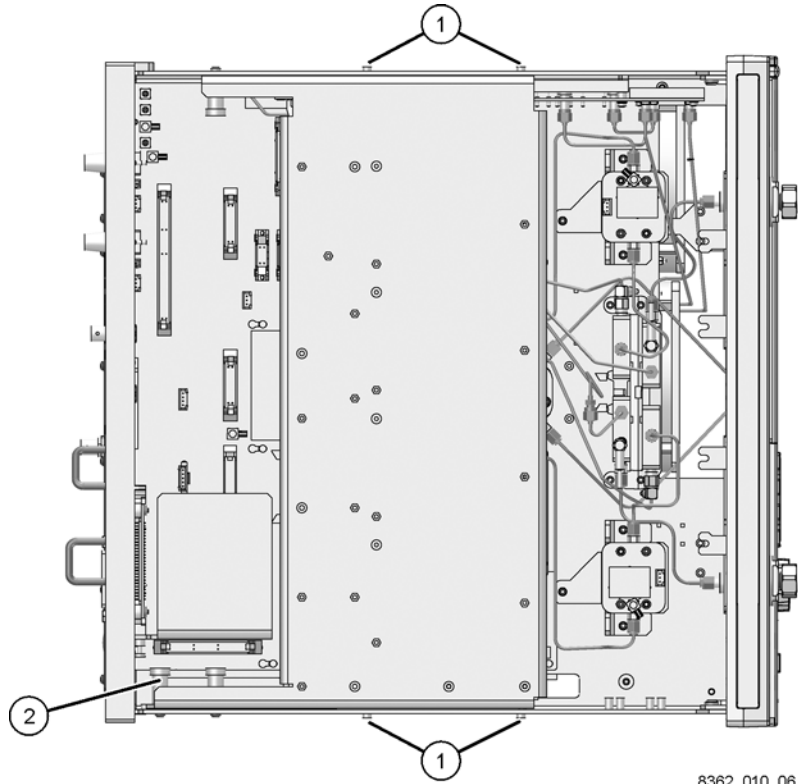
### **Lower the Receiver Deck**

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.

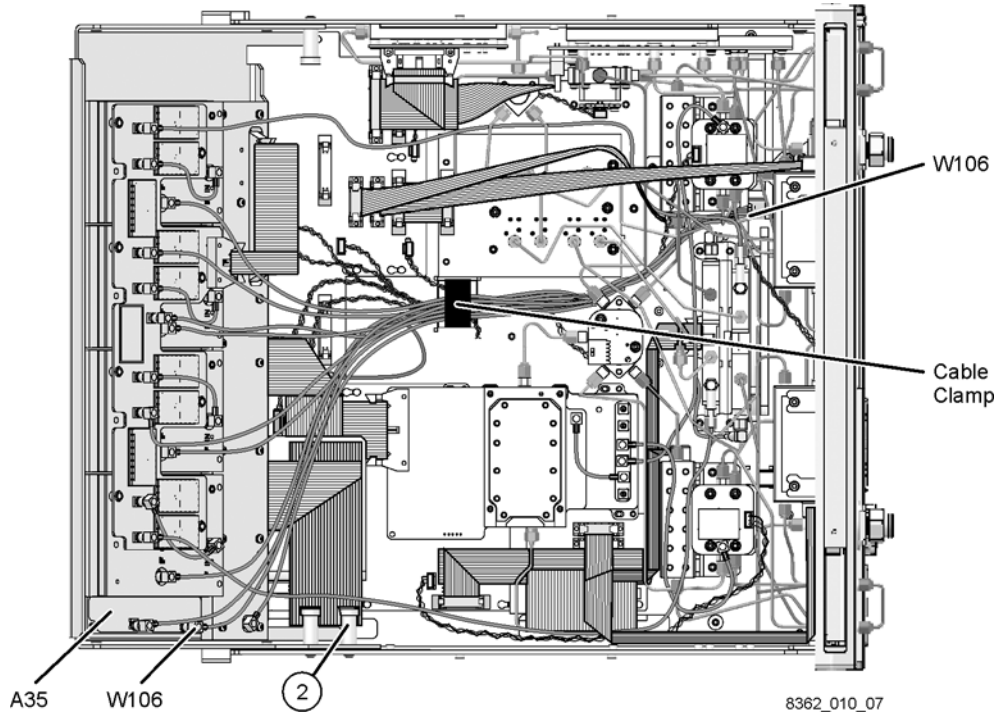


**Figure 8 Receiver Deck Raising**



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**Figure 9 Bottom Cable Connection**



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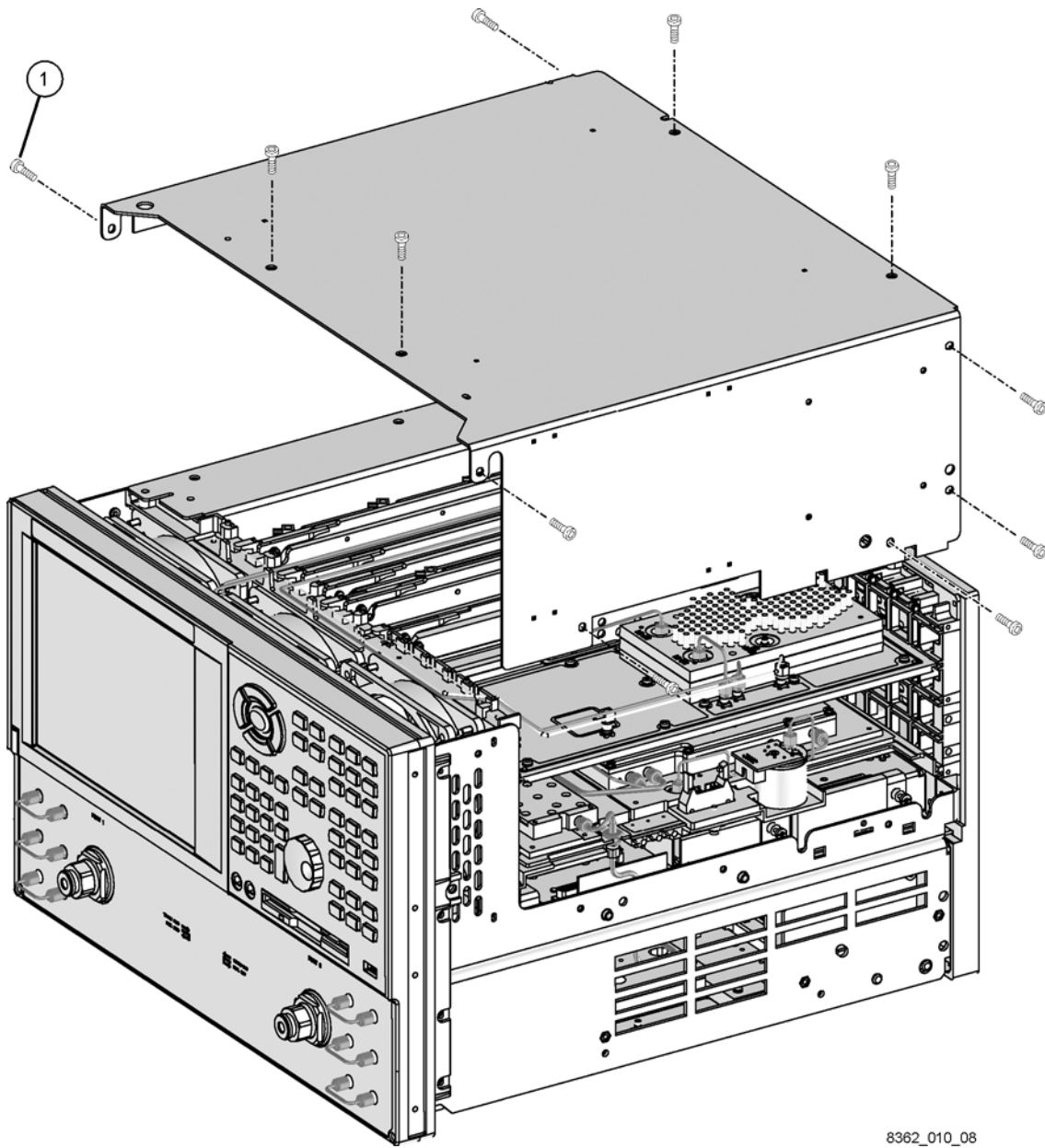
## Step 5. Reinstall the Inner and Outer Covers

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**



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## Reinstall the Outer Cover

Refer to [Figure 11](#) for this procedure.

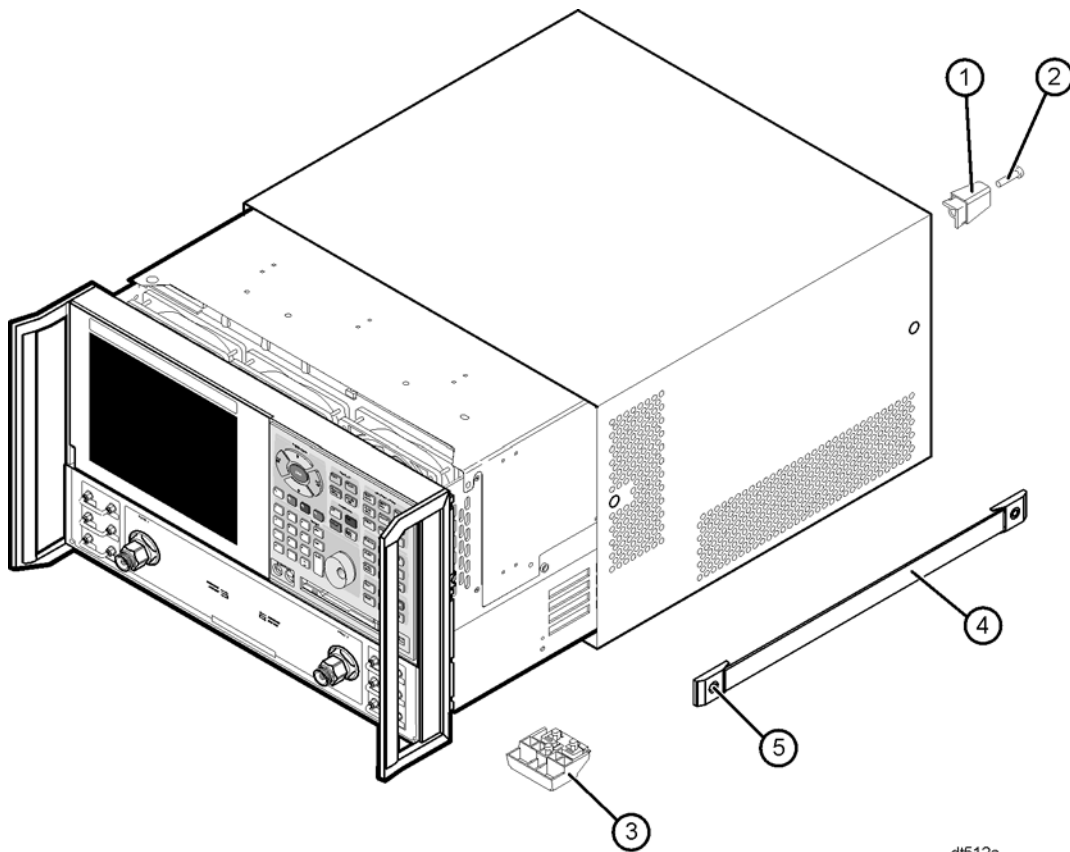
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**CAUTION** This procedure is best performed with the analyzer resting on its front handles in the vertical position. *Do not place the analyzer on its front panel without the handles.* This will damage the front panel assemblies.

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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**



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## Step 6. Enable Option 080

### Requirements

- The analyzer must be powered up and operating to perform this procedure.
- The Network Analyzer program must be running.
- This installation requires that a keyboard and a mouse be connected to the network analyzer.

### Verify the Model, Serial, and Option Numbers

Refer to the License Key Certificate supplied with the kit:

- Verify that the analyzer's model and serial numbers match those on the certificate.
- Verify that the option number on the certificate matches the option number described in this installation note.

If the model number, serial number, or option number do not match the expected results, you will not be able to enable the option. If this is the case, contact Agilent for assistance. Refer to [“Contacting Agilent” on page 18](#).

### 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. Using the keyboard, enter the keyword in the box provided. The keyword is printed on the License Key Certificate provided in the kit. Enter this keyword *exactly* as it is printed on the certificate.
4. Click **Enable**.
5. Click **Yes** in answer to the displayed question in the **Restart Analyzer?** box.
6. When the installation is complete, click **Exit**.
7. Once the analyzer has restarted and the Network Analyzer program is again running: On the analyzer's **Help** menu, click **About Network Analyzer**.
8. Verify that “080” is listed after “Options:” in the display. Click **OK**.

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**NOTE** If Option 080 has not been enabled, perform step 6 again. If the option is still not enabled, contact Agilent Technologies. Refer to [“Contacting Agilent” on page 18](#).

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## Contacting Agilent

Assistance with test and measurements needs and information on finding a local Agilent office are available on the Web at:

[www.agilent.com/find/assist](http://www.agilent.com/find/assist)

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

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**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.

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