Installation Note
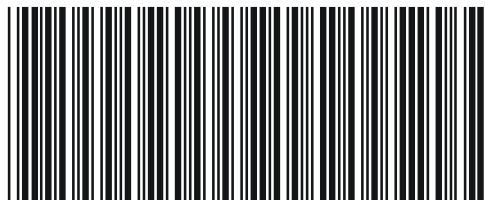
**Agilent Technologies PSG Series Signal Generators E8267C Upgrade Kit for Option 602 (Digital Bus Baseband Generator with 64 Msample Memory)
Kit Part Number E8267CK-602**

∴∵ **Agilent Technologies**

E8251-90275

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Digital Bus Baseband Generator Upgrade Kit

Product Affected:	E8267C
Serial Numbers:	All
Options:	
To Be Performed By:	(X) Agilent Technologies Service Center (X) Personnel Qualified by Agilent Technologies (X) Customer
Estimated Installation Time:	0.5 hours
Estimated Verification Time:	1.0 hours

Introduction

This upgrade kit adds the Digital Bus Baseband Generator with 64 Msample memory to the E8267C.

NOTE   This upgrade kit is not compatible with Option 1EM (Rear Panel Connector). This kit requires a PC or UNIX computer with LAN, GPIB, or RS232 access.

Installation includes the following major steps:

1. Check signal generator functionality.

2. Install new firmware.

3. Initialize the signal generator memory.

4. Remove the outer and inner signal generator covers.

5. Replace the A17 Digital Bus Baseband Generator Interface board.

6. Replace the A14 Digital Bus Baseband Generator board.

7. Install the Digital Bus cable.

8. Verify proper installation of Option 602.

9. Re-assemble the signal generator.

10. Run the I/Q Calibration.

11. Verify signal generator calibration.

Installation Kit Parts List

Item	Quantity	Description	Part Number
1	1	Installation Note	E8251-90275
2	1	PSG Firmware Upgrade Kit	E4400-60597
3	1	A17 Baseband Generator Interface	E4400-60655
4	1	W90 Digital Bus Cable	8121-0690
5	1	W64 AUX I/O Cable	8121-0920
6	1	W65 BNC Cable (Baseband Generator Reference IN)	8121-0901
7	5	Hex Nut 15/21-32 (AUX I/O)	2950-0035
8	5	Washer .4721D (BNC)	2190-0102
9	2	Washer LK .115ID (AUX I/O)	2190-0003
10	2	Screw .312HX4 (AUX I/O)	0380-2079
11	2	Screw LK 2.5X6MM (Digital Bus)	0515-4439
12	1	Digital Bus Label	E4400-80545
13	1	A14 Digital Bus Baseband Generator 64 Msample	E4400-60654
14	1	Option 602 Label	7120-1232

Tools Required

- TORX T-10 driver
- TORX T-15 driver
- TORX T-20 driver
- 9/16" nut driver
- 5mm nut driver
- 9/16" socket
- 5 mm socket
- Torque Wrench Ratchet (9-21 in-lb)
- Small Phillips screw driver
- Needle-nose pliers

Safety Considerations

WARNING	**Before you disassemble the signal generator, turn the power switch off and unplug the power cord. Failure to unplug the signal generator can result in personal injury.**

CAUTION	Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe workstation.

Check Signal Generator Functionality

Use the following procedure to confirm that the signal generator powers up and the internal check identifies no errors. The internal check evaluates the operation of the signal generator and returns an error message if it detects a problem.

NOTE	When the signal generator is first connected to ac line power, the error message `ERROR 514, Reference Oven Cold` occurs which causes both the `OVEN COLD` annunciator and the `ERR` annunciator to turn on. After approximately five minutes, the `OVEN COLD` annunciator automatically clears, but the `ERR` annunciator remains on until all errors are cleared from the error queue.

1. Turn on the signal generator and let it warm up for at least five minutes.

2. Run the signal generator self-test by pressing **Utility** > **Instrument Info/Help Mode** > **Self Test** > **Run Complete Self Test**. Upon completion a summary of the self-test will be displayed. Use the service guide to troubleshoot any failures detected by the test.

NOTE	Some circuits may require up to 50 minutes to warm up before passing the self-test. If self-tests continue to fail after 50 minutes of warm up, troubleshoot the instrument.

3. Check to see if the `ERR` annunciator is on.

   - If the `ERR` annunciator is on, review the error messages in the error queue by pressing **Utility** > **Error Info**. The first error message in the error queue appears in the display text area. (Refer to the signal generator error messages document for information about each error message.)

     After resolving all problems causing errors, press **Clear Error Queue(s)**.

   - If the `ERR` annunciator is off, the signal generator functionality check has passed.

Install New Firmware

1. Use the installation note, provided in the PSG firmware upgrade kit, E4400-60597, to install new firmware.

2. Perform the verification procedure described in the firmware upgrade installation note.

Initialize the Signal Generator Memory

If you have access to a LAN,

1. Connect the signal generator to the LAN, using the instructions in the ESG Vector Programming Guide.

2. Press: **Utility** > **GPIB** > **RS-232** > **LAN** > **LAN Setup**.

3. Write down the IP address shown.

4. Using the web browser on your PC, enter the following URL, replacing <ip-address> with the actual IP address received from completing step 3: http://<ip-address>/update.

5. Click "Initialize Option 601 and 602".

NOTE   To undo the previous steps, press "Restore Factory Setup"

If you do not have access to a LAN,

1. Locate a PC or UNIX computer that can send commands to a signal generator through a GPIB or RS-232 interface.

2. Using the PC or UNIX computer, send the following command to the signal generator:

   :diag:mfg "UPDATE_FIXED_SETUP_P7".

3. Verify no error messages appear on the signal generator.

4. If an error appears, press: **Utility** > **Error Info** > **Clear Error Queue** and repeat step 2.

NOTE   To undo the previous steps, send the command `idiag:mfg` "RESTORE_FIXED_SETUP".

Remove the Outer and Inner Signal Generator Covers

Remove the Outer Cover

Refer to Figure 1.

1. Disconnect the power cord.

2. Using a T-20 driver, loosen the two screws (1) and remove the strap handle (2).

3. Using a T-15 driver, remove the center screws (3) on the four rear-panel feet (4).

4. Remove the four bottom feet (5) from the cover by lifting the tab and sliding the foot toward the tab.

5. Place the signal generator on its side.

6. Tilt the signal generator forward and slide the outer cover (6) back to remove it from the frame.

Remove the Inner Top Cover

Refer to Figure 2.

1. Using a T-10 driver, remove the eleven screws (1) from the inner-top cover (2).

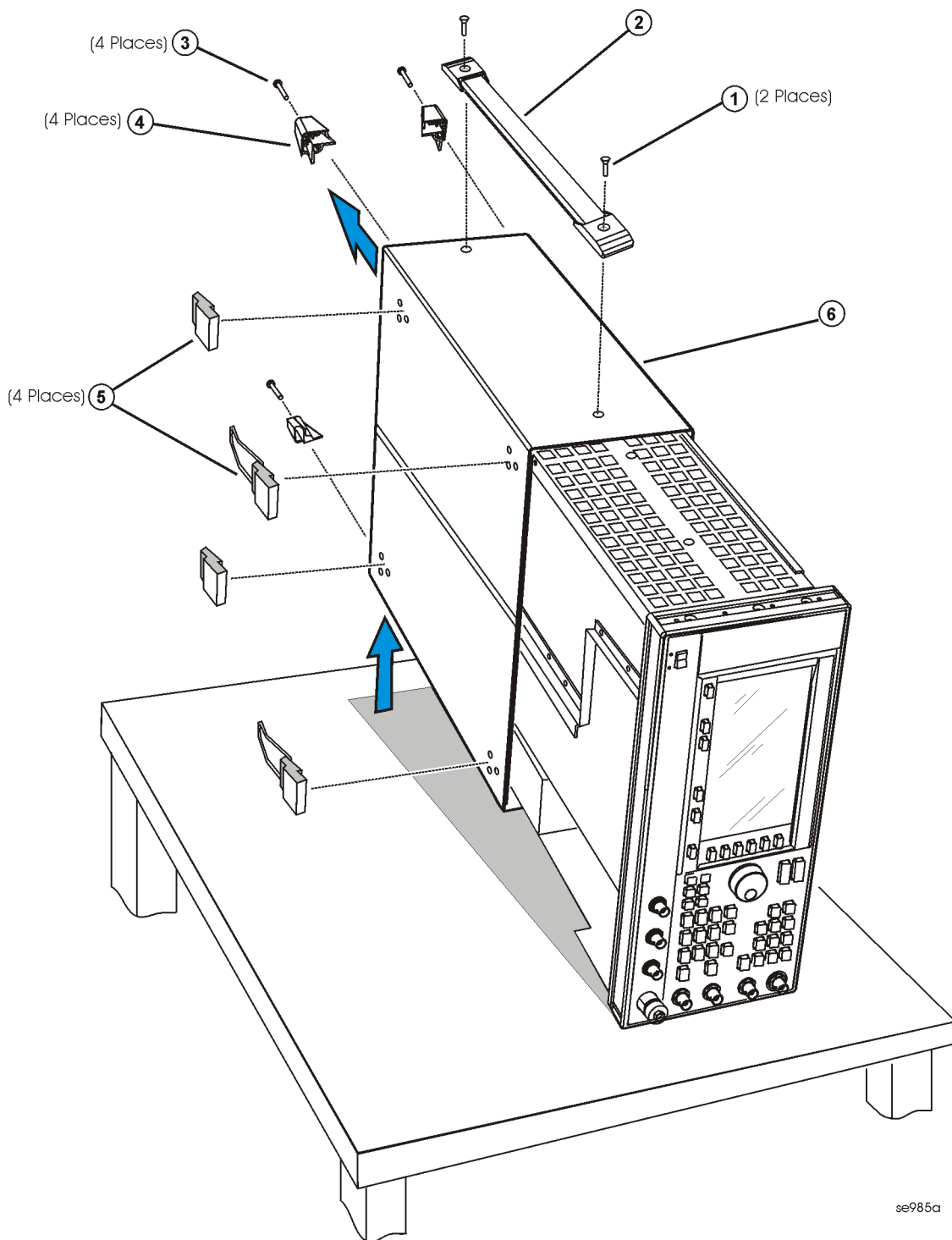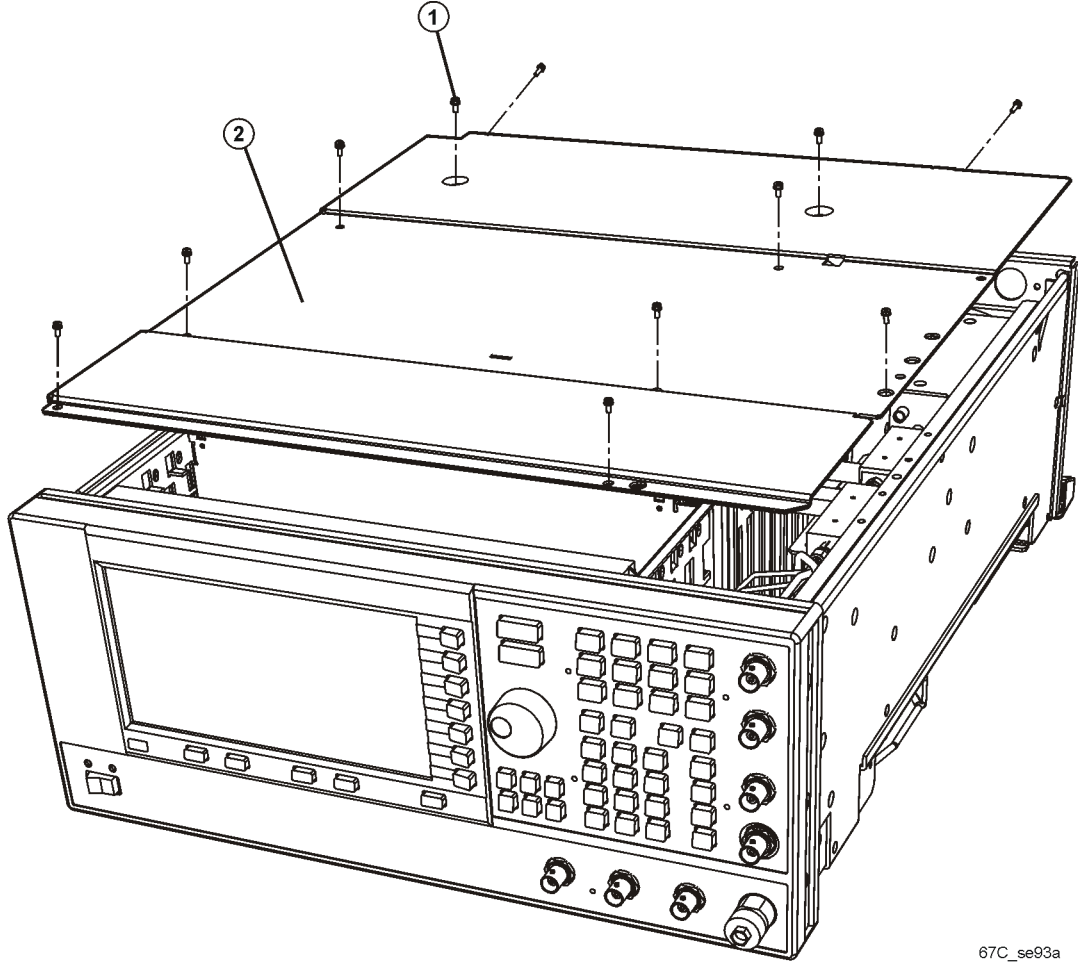2. Remove the inner-top cover.

Figure 1   Outer Cover Removal

(4 Places) ③

(4 Places) ④

(4 Places) ⑤

②

① (2 Places)

⑥

se985a

**Figure 2**   **Inner Top Cover Removal**

67C_se93a

Replace the A17 Digital Bus Baseband Generator Interface Board

Refer to Figure 3.

1. Disconnect the W64 ribbon cable from A17P2.

2. Using the needle-nose pliers, disconnect the W68 wire cable from A17P4.

3. Using the 9/16" nut driver, remove the hex-nuts and washers securing the four BNC connectors (1) on the rear panel.

4. Using the 5 mm nut driver, remove the hex-nuts (2) and washers that secure the A17 Baseband Generator Interface Board to the rear panel.

5. Using a small Philips screw driver, remove the two screws that secure the DIG I/Q I/O connector (3).

6. Remove the A17 Digital Bus Baseband Generator Interface Board.

7. Install the new A17 Digital Bus Baseband Generator Interface Board, provided in this upgrade kit, by reversing steps 1 thru 6.

8.   Torque all BNC nuts to 21 in-lbs.

Figure 3   **A17 Baseband Generator Interface Board**

A17

W64/A17P2

W68/A17P4
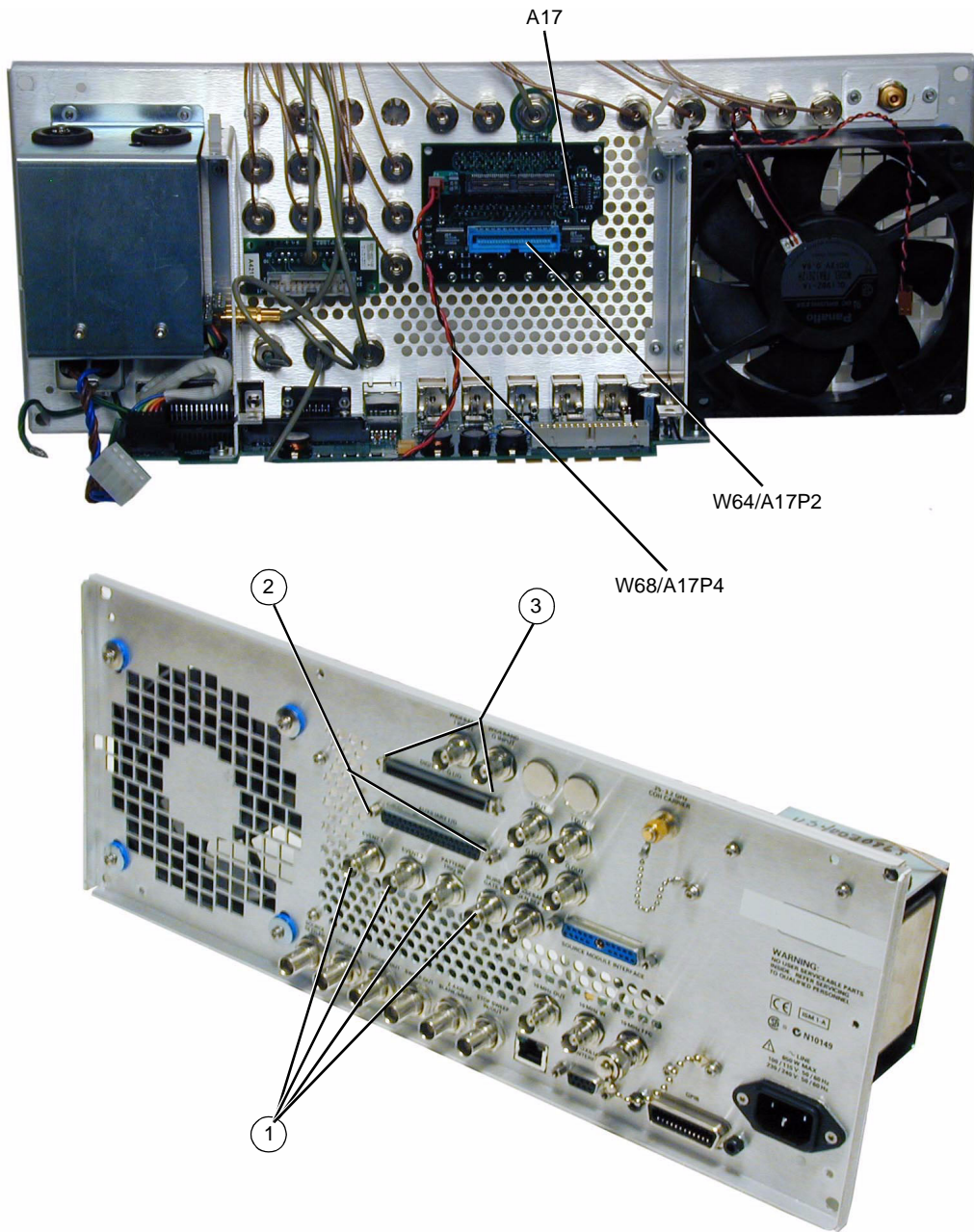
p2_a17

Replace the A14 Digital Bus Baseband Generator Board

| NOTE	If this upgrade kit is being used for the original installation of an A14 Digital Bus Baseband Generator board, skip steps 1 thru 4.

Refer to Figure 4.

1. Using the needle-nose pliers, disconnect the W65 flexible cable from A14J800.

2. Disconnect the W64 ribbon cable from A14J13

3. Lift the retention levers and disconnect the A14 Digital Bus Baseband Generator Board from the A31 Motherboard.

4. Lift the A14 Digital Bus Baseband Generator Board out of the card cage guides.

5. Insert the new A14 Digital Bus Baseband Generator board into the card cage guides.

6. Connect the W90 cable end with foam attached to it, to A14J21.

7. Install the A14 Digital Bus Baseband Generator board onto the A31 motherboard.

NOTE	Skip step 8 if W65 is already installed on the rear panel.

8. Install the W65 cable to the rear panel slot labeled "BASEBAND GEN REF IN." Use a lock washer and a hex-nut to secure one end of the cable to the rear panel. Torque the hex-nut to 21 in-lb.

9. Connect the loose end of the W65 cable to A14J800.

10. Connect the W64 ribbon cable to A14J13.

Figure 4   A14 Internal Baseband Generator Board
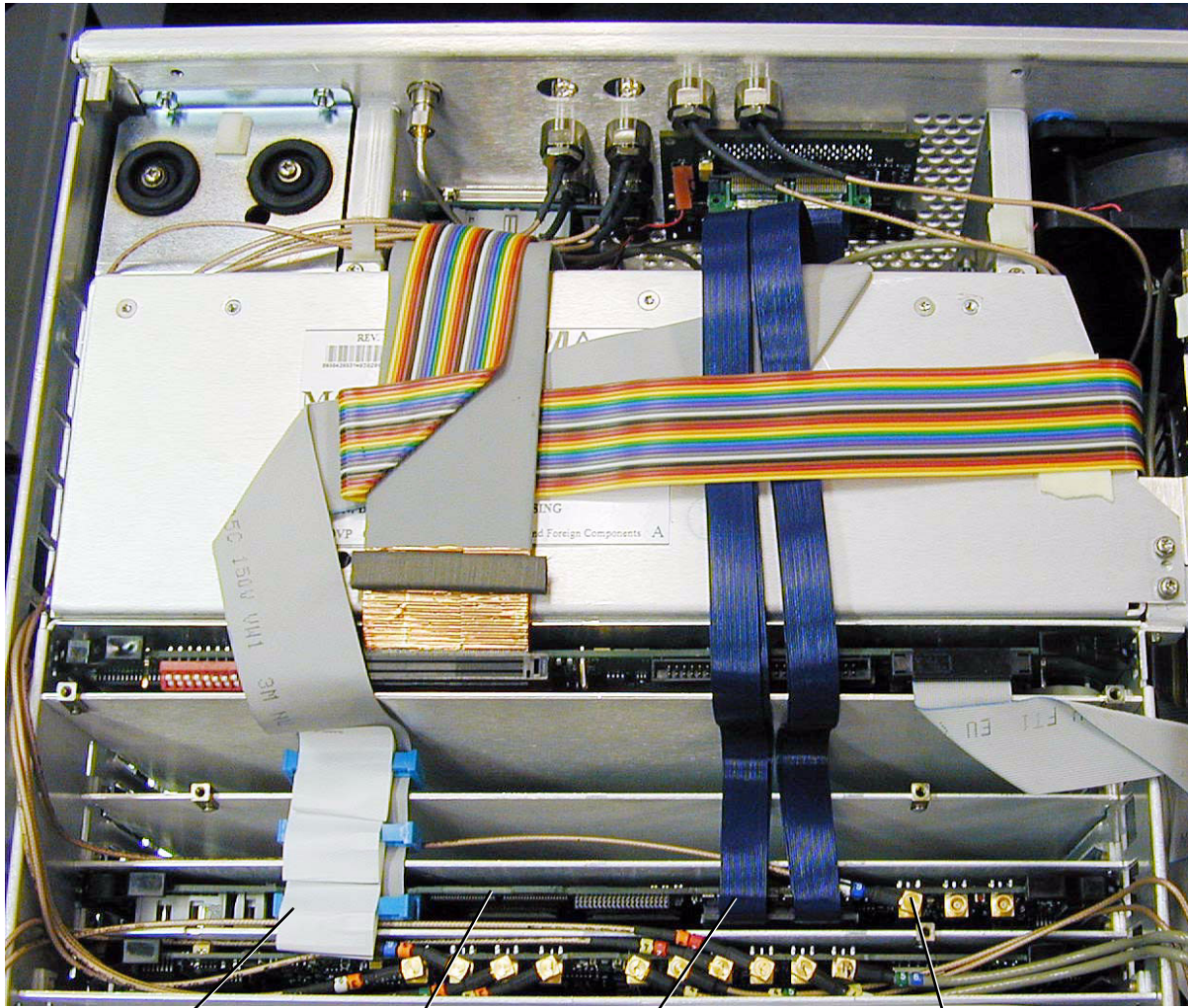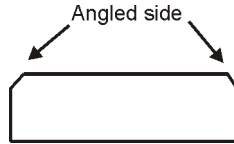

W64/A14J13   A14   W90/A14J21   W65/A14J800
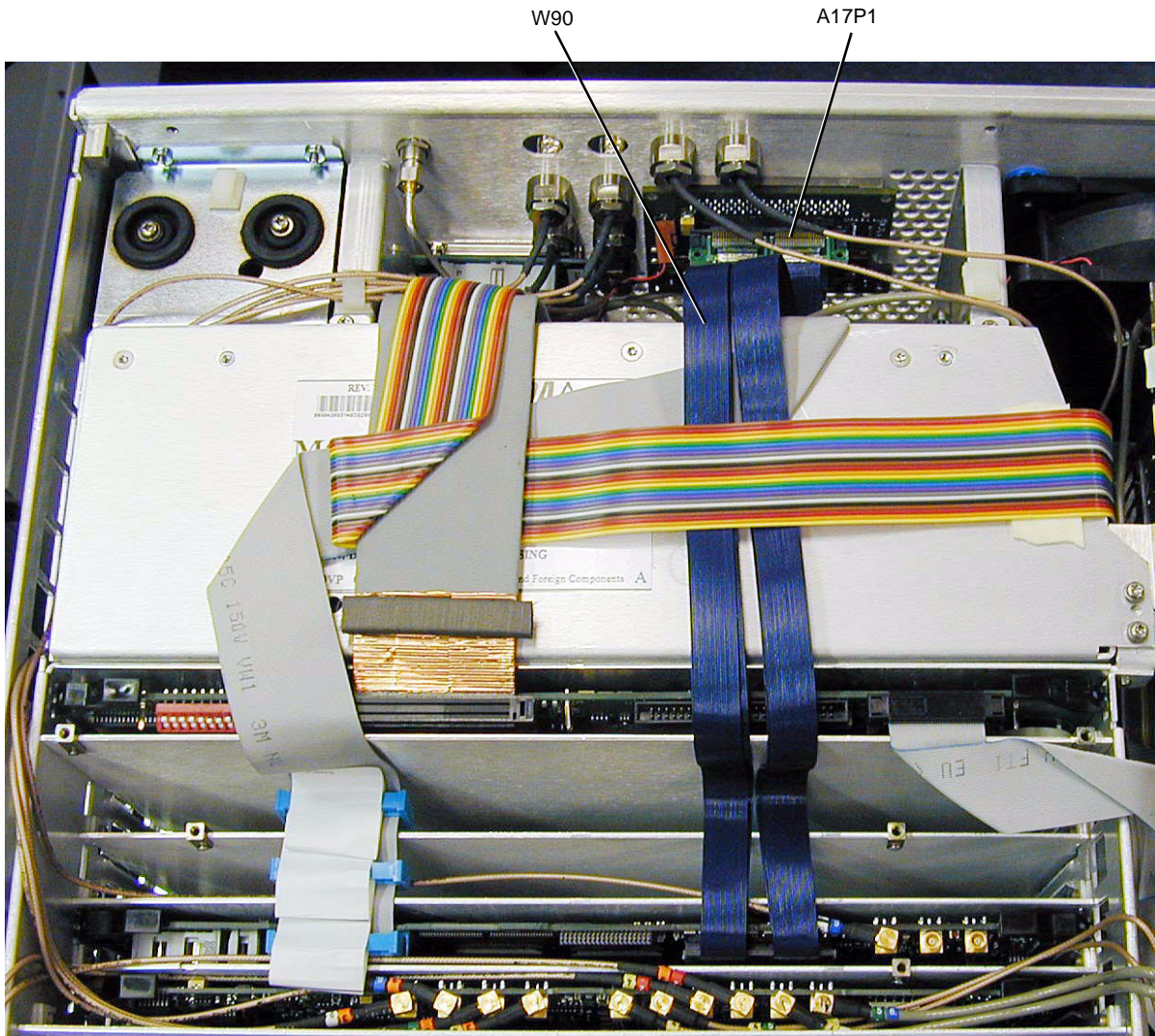
Install the Digital Bus Cable

1. Refer to Figure 5. Connect the loose end of W90 to A17P1 on the A17 Baseband Generator Interface Board.

CAUTION   Make sure the angled side of the cable connector on W90 is facing up.

Angled side

Failure to do so could result in damage to the A17 Rear Panel Interface Board connector.

Figure 5   **A14 Digital Bus Baseband Generator Board**

Verify Proper Installation of Option 602

1. Turn the signal generator on.

2. Check that Option 602 is installed by pressing **Utility** > **Instrument Info/Help Mode** > **Options Info**.

3. Using the installation note provided in the ESG firmware upgrade kit, E4400-60597, install the latest revision of the Digital Bus Baseband Generator DSP code. In the Upgrade Selection window select only the "Baseband Generator" component to upgrade the DSP code.

4. Perform the "Checking Signal Generator Functionality" procedure, as described on page 5.

5. Verify that the Baseband Generator self-tests all pass.

Re-Assemble the Signal Generator

Refer to Figure 1.

1. Reinstall the inner and outer instrument covers by reversing the order for removal.

2. Torque all T-10 screws to 9 in-lbs.

3. Torque all T-15 and T-20 screws to 21 in-lbs.

4. Attach the Option 602 label to the rear panel, near the original serial number label.

5. Attach the Digital Bus label over "DIG I/Q I/O" on the rear panel.

Run the I/Q Calibration

1. Turn the instrument on and let it warm up for 30 minutes.

2. Press: **I/Q** > **I/Q Calibration** > **Calibration Type Full** > **Execute Cal**

Verify Instrument Calibration

The new baseband generator will function properly in most applications, without re-calibrating the signal generator. If the application is critical, with respect to EVM, the following performance tests are recommended. Refer to the PSG Signal Generators Service Guide:

1. Self Test

2. I/Q 20 Prelevel Gain Mixer Bias, and Digital Gain Cal

3. I/Q Impairment Calibration

4. EVM and IQ Offset

5. External Digital Modulation Level Accuracy Relative to CW

6. Dual Arbitrary Waveform Generator Check