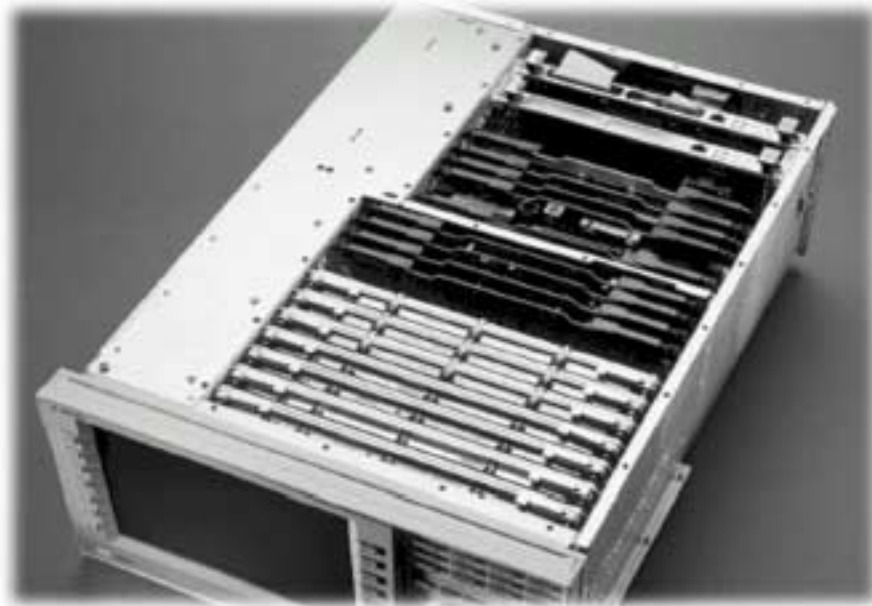# Installation Note

Agilent Technologies 8960 Wireless Communication Test Set
Add Option 004 (004 Digital Bus for Fading capability)
Kit Part Number: E5515CU-504 and E5515CU-514

Notice:
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E5515-90243

⁘ Agilent Technologies

WARNING:

The E5515C with option E5515CU – 504 or 514 installed for Fading is not compatible with the R-50H-501 and E5515C H16 gpsOne calibration.

If the E5515C has been calibrated for gpsOne with either
- Local service center R-50H-501 (R1431A)
- Or purchased new with the E5515C H16

The calibration data uncertainty becomes degraded from +/-17 nsec to +/- 30 nsec

The operation of performing gpsOne testing is not effected; it is only the uncertainty of the data that is affected. If the uncertainties are determined to be usable by the customer, they may proceed to use the functionality at their own discretion. Agilent will not specify or support the gpsOne operation on instruments that have installed the E5515CU option 504 or 514.

R-50H-501 Re-calibration of the E5515C with E5515CU option 504 or 514 is not supported.

Agilent Technologies 8960 Wireless Communication Test Set
Add Option 004 (004 Digital Bus for Fading capability)
Kit Part Number: E5515CU 504 or E5515CU 514

Product Affected:	E5515C
Serial Numbers:	All
Options Required:	003
Applications Supported:	E6702B and E6703C
To Be Performed By:	(X) Agilent Technologies Service Center
	(X) Personnel Qualified by Agilent Technologies
	(X) Customer
Estimated Installation Time:	1.5 hours for opt 504; 1 hour for opt 514
Estimated Verification Time:	0.5 hours

Introduction

This upgrade kit adds the 004 Digital Bus (Option 004) to the E5515C. Also with option 504 this adds the rear panel for the output of the Digital Baseband.

NOTE   E5515C with option 003 is required for this hardware option.

Installation includes the following major steps:
1. Check Functionality.
2. Disassembly
   a. Remove the instrument covers.
   b. Remove Rear Panel (Option 504 only)
3. Assembly
   a. Replace Rear Panel Board.
   b. Install new BBIO control Board.
   c. Install Option Label
4. Install new firmware.
5. Verification of the Communication Test Set.
6. Open Loop Calibration.

Installation Kit Parts List

Item	Qty	Description
1	1	Upgrade Rear Panel Assembly (option 504 only)
2	1	Baseband IO Board
4	1	Cable Assembly Mini 60
5	1	Shielded Coaxial Ribbon Cable
6	2	Zip Ties
7	1	Label

[**] Label has **003 004** printed on it.

Tools Required

- TORX T-10 driver
- TORX T-15 driver (some rear panels have the TORX T-20 screws)
- 9/16" socket
- Torque Wrench Ratchet (9-21 in-lbs.)
- Loop-back Dongle E4400-63583 (comes with the software or can be ordered separately)

Safety Considerations

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

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

Check Communication Test Set Functionality:

Use the following procedure to confirm that the test set powers up and that it can generate a CDMA signal.

1. Turn on the test set in the E6702B or E6703C applications and let it warm up for at least ten minutes.
   a. Make sure there are no warning messages and the box boots up OK.

2. Check to see if the test set can generate a CDMA signal.
   (One suggested approach)
   a. Connect to a VSA
   b. Setup the VSA for CDMA reception
   c. Setup the 8960 to generate a CDMA signal and verify it with the VSA.
   (Another approach)
   a. See Verification steps 1-6

Disassembly:

Remove outer cover and top cover for the 8960

1. Remove handles and rear bumpers.
2. Remove the screws on the real panel holding outer cover.
3. Slide outer cover off.
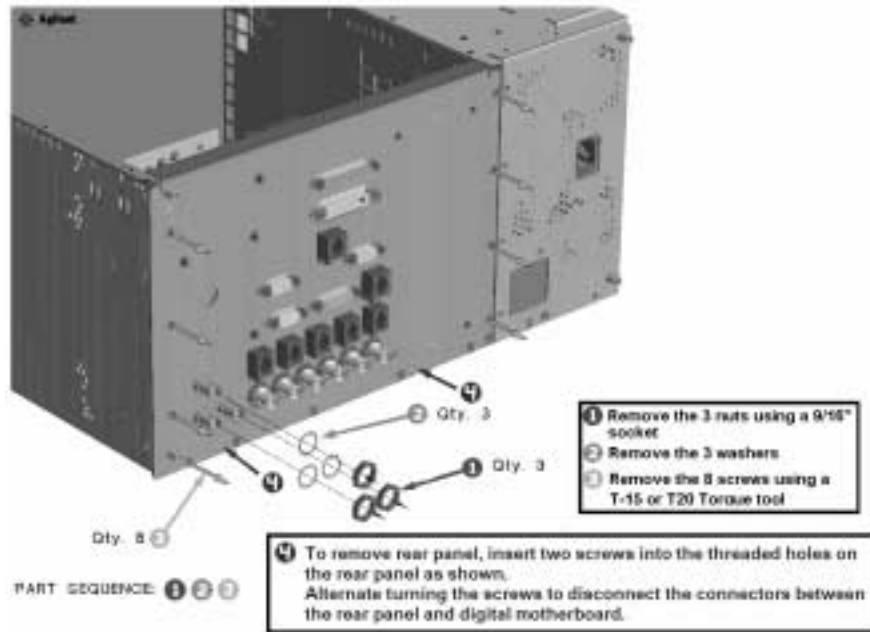4. Remove the 26 screws holding the top cover on and remove the cover.

Figure 1

NOTE: Rear Panel Removal and Replacement is only for option 504 kit

Remove Rear Panel

1. Disconnect the Hard drive's ribbon cable from the Host Processor.
2. Disconnect the two RJ-45 cables from the rear panel (**If applicable**).
3. Remove the nuts from the following BNC connectors: COUNTER IN MAX, 10 MHZ REF IN and OUT. (see Figure 1 steps 1-2)
4. Remove the 8 screws holding the rear panel sheet metal to the unit. (see Figure 1 step 3)
5. Remove the rear panel from the instrument and disconnect the green cable from the time base. (see Figure1 step 4)
6. Remove the hard drive and time base from the old rear panel. (see Figure 2)
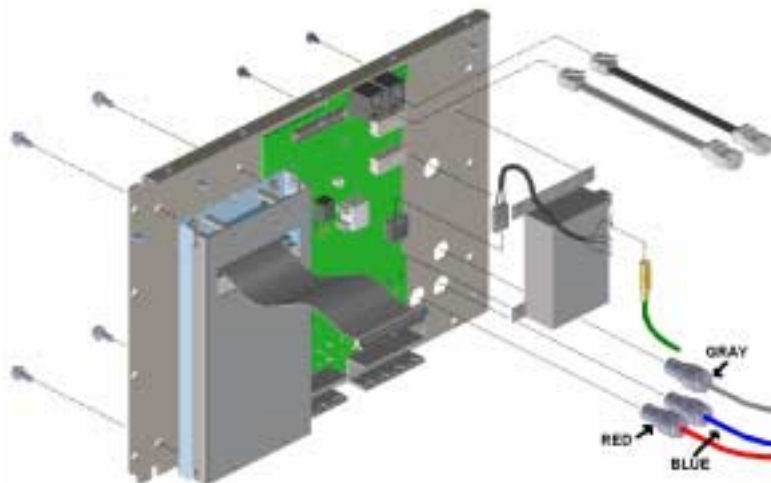

Figure 2

Assembly:

Replace Rear Panel

1. Connect the hard drive and time base to the new rear panel.
2. Install the three BNC connectors to the rear panel. (see Figure 2)
3. Connect the green time base cable to the time base.
4. Attach the new rear panel to the instrument.
5. Reconnect the hard drive ribbon cable to the Host Processor.
6. Reconnect the two RJ-45 cables to the rear panel (**If Applicable**).

Install the BBIO (see Figure 3)

1. Disconnect the ribbon cable (Old Cable) from the Digital Link board.
2. Connect the Old Cable (E5515-61209) from the Digital Link to the BBIO board. (see figure 3)
3. Connect the New Cable (E5515-61209) from the Analog Link to the BBIO board. (see figure 3)
4. Connect the Shielded Coaxial Ribbon Cable (8121-1335), Digital Bus Cable as seen in Figure 3, from the BBIO to the Rear panel board. Tie both ends with the zip ties.
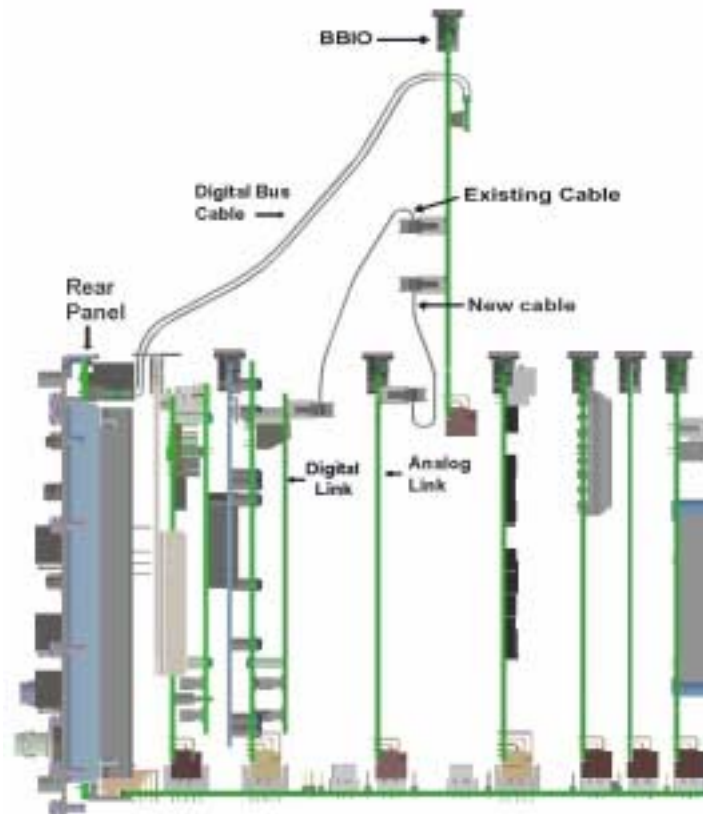5. Slide the BBIO board into the Spare #2 slot on the Digital Motherboard jumpers J4 and J46.

Figure 3

Install Option Label

1. Install the option label, 7121-7884, on the back of the instrument.
   a. Don't cover up the old option label if the options on the old label are not also on the new label.

Install New Firmware:

NOTE: This functionality only works with CDMA Lab Applications. If you do not have a license to run this application please obtain one before install the application.

1. Follow the Firmware installation instruction that come with the CDMA and WCDMA LAB Applications.

Verification of the Communication Test Set

1. Boot-up the E6702B cdma2000 Lab Application or the E6703C WCDMA Lab Application.
2. Select the US Cellular frequency band
3. Set the Cell Power to -20 dBm/1.23 MHz
4. Select the Spectrum Monitor from the Instrument List
5. Set the Reference Level to -20 dBm (F2)
6. On the Right-hand 3 of 3 menu, set the Measurement Frequency to 881.52 MHz (default is AUTO).
7. Set the Trigger Arm to CONTINUOUS.
8. At this point you should see the "Bart Head" of the 8960's signal generator centered on the spectrum monitor display.
9. Attached the "Loop-back Dongle" E4400-63583 to the rear panel Digital Bus connector
10. Go to the 3 of 4 screens on the CALL PROCESSING panel (left side)
    a) Select the Digital Bus Info and than DIGITAL BUS PATH in the option select TXOUT + TXIN. To return back to internal mode select Internal.
11. The Bart Head should still be visible if the data is being looped out and back through the digital bus
12. Disconnect the Loop-back Dongle from the rear panel digital bus.
13. The Bart Head should disappear from the spectrum monitor display since no data is being sent to the I/Q modulator. If the Bart Head disappears, then the Digital Bus functionality has been verified.

Open Loop ALC Calibration:

The Open Loop ALC calibration factors are temperature sensitive by ± 5℃. The calibration must be performed at lease once before using the fading hardware.

1. Go to the 3 of 4 screens on the CALL PROCESSING panel (left side)
2. Select the Digital Bus Info.
3. Select Calibrate Open Loop ALC
4. Select Yes.