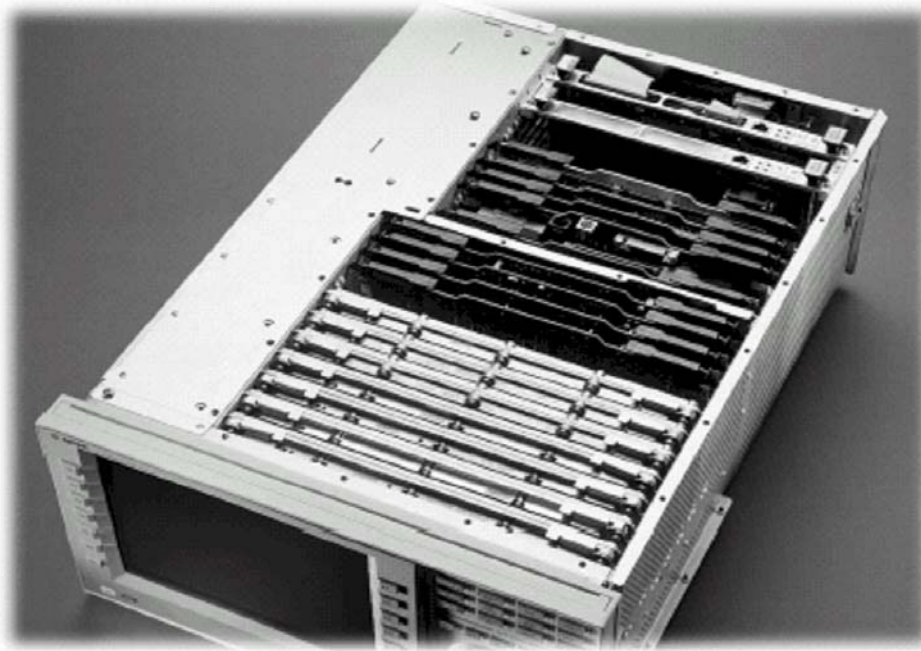


Installation Note

**Agilent Technologies 8960 Wireless Communication Test Set
Upgrade E5515B to CDMA
Kit Part Number: E5515CU-963**



Notice:

The information contained in this document is subject to change without notice.

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E5515-90368



Agilent Technologies

Agilent Technologies 8960 Wireless Communication Test Set Upgrade E5515B to CDMA Kit Part Number: E5515CU-963

Product Affected:	E5515B
Options Required:	N/A
Applications Supported:	All
To Be Performed By:	(X) Agilent Technologies Service Center (X) Personnel Qualified by Agilent Technologies
Estimated Installation Time:	3.0 hours
Estimated Verification Time:	0.5 hours

Introduction

This kit provides the instructions for installing Option 963 into the E5515B Wireless Test Set to enable CDMA capability.

NOTE: This upgrade kit requires the installation of the most current revisions of application software that is compatible with this HW. Failure to install compatible applications may result in boot-up failures.

NOTE: It is assumed that the E5515 is fully operational prior to a HW upgrade. Installing HW upgrades in a non-operational instrument may complicate a successful installation and verification process.

This kit includes multiple modules that should be installed in the recommended sequence:

- 1) Bottom section RF modules (RFIO, Attenuators)
- 2) Top section RF modules (Vector, Synth Doubler, BBG)
- 3) Digital modules (ADC, DSP, RTI, LSS, Protocol)
- 4) Rear section modules (HDD, Host Processor, Rear Panel)

Installation Kit Parts List

Item	Qty	Description
1	6	SMM 2.5_PN_TX
2	1	Locking Clip
3	1	LSS Analog
4	1	LSS Digital
5	1	RF Mother Board
6	1	Digital Mother Board
7	1	Timing Reference
8	1	Protocol Processor
9	1	ADC Board
10	1	Vector Output Module
11	1	Measurement Down Converter
12	1	Demod Down Converter
13	1	DSP Assembly

14	1	RFIO
15	1	CA_ASSY_MINI_60
16	1	Installation Note
17	1	Packing List
18	6	TORX-T8 Machine Screw

Tools Required

TORX T-15 and T-20 drivers
 ¾" Socket
 PC with LAN capabilities
 PLCC –Extractor

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 assemblies should be performed at a static-safe workstation.

Install Compatible Versions of Existing Applications:

Upgrade all existing compatible applications to the latest revision.

HW compatibility info is available at: www.agilent.com/find/e5515releasenotes

Test Application downloads are available at: www.agilent.com/find/8960TA

Lab Application downloads are available at: www.agilent.com/find/8960upgrades

1. Make active one of the new application versions. This will ensure the instrument will boot to a compatible application after the HW installation.
2. Follow the Firmware installation instructions that come with the Applications

Remove Non-compatible Applications:

1. Remove all non-compatible applications from the test set. Removing older application revisions prevents improper operation of the test set. The test set must be connected to a PC using a cross-over cable via the test set's LAN port.
 - a. Run the Agilent 8960 File Utility
 - b. Select the Direct Connection (Single test set) button.
 - c. Select the Test Application tab.
 - d. Highlight the old revision(s) of application(s) and select the Delete From test set button. All licenses should remain on the instrument. Removing an application does not remove the license for that application.

HW Disassembly: (see Appendix 1 on page 10 for detailed pictures)

Remove outer cover and top cover for the 8960

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

Note: The repair kit does not include an extra set of screws. It is important to keep them organized by size as they will be used to reassemble the instrument.

HW Remove Boards

Refer to the *Replaceable Parts List (E5515A/B/C/T)* in the *Troubleshooting and Repair* section of the 8960 Assembly Level Repair area at: www.agilent.com/find/8960toolbox for board location.

1. Disassembling sequence: handles, rear bumpers, external cover, top cover, remove all E5515B modules on the top side, bottom cover, RFIO cables, RFIO, RF Mother Board, rear panel, remove screws and cables on Digital Mother Board, Digital Mother Board.
2. To avoid confusion, separate the modules that will be replaced and the modules that are not going to be replaced. For example, for E5515BU OPT 963 upgrade the following modules will be replaced: Timing Reference, Protocol Processor, RF Mother Board, Digital Mother Board, ADC, Vector, DSP, MDC, DDC, and RFIO Module.
3. To remove some modules, you need to disconnect some cables as well. Record the position and cabling on a piece of paper.
4. Remove the nut on the RF IN/OUT connector with 3/4" socket before removing the RFIO module.

HW Assembly: (see Appendix 2 on page 15 for detailed pictures)

1. Reassembling sequence: Digital Mother Board, RF Mother Board and cables, RFIO module, bottom cover, attach Daughter boards to ADC, all E5515B modules on the top side, replace U19 and U30 on the RTI board, if needed, RTI board, digital modules, top cover, external cover, rear bumpers, handles, option label.
2. When installing new Digital Mother Board, fasten the 4 motherboard screws for power supply connection securely otherwise, it will cause unreliable power connection.
3. Install and tighten the nuts for the 10 MHz Reference IN, OUT and COUNTER IN BNC connectors on the rear panel before attaching the rear panel.
4. Verify the position of the Jumpers on the Digital Mother Board, compare to Table 1. (Next Page)
5. Install the new RF Mother Board from the kit.
6. HOST module should be installed before PROTOCOL module.
7. Install the Digital Link Board to the new Protocol Processor using T8 screws. Tighten to 6 in-lbs. See Figure 1.

8. Install the new Protocol Processor.

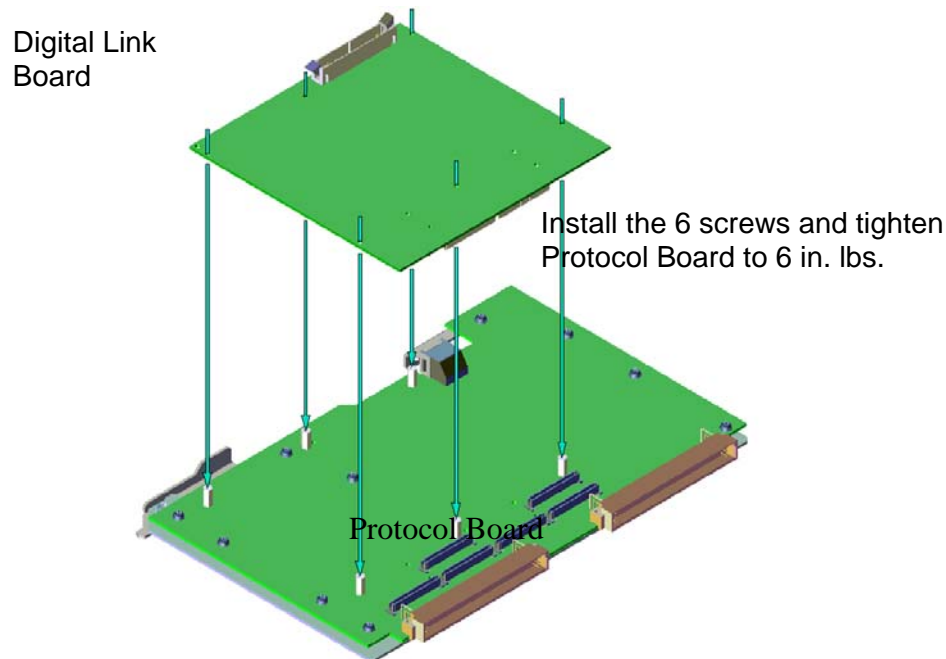


Figure 1: Attach Digital LSS board to Protocol Processor

9. Install the Analog Link board in the motherboard J44 and J12, labeled (LSS ANALOG).
10. Connect the ribbon cable between the Digital Link and Analog Link Boards.
11. Reuse the original ADC Daughter boards on the new ADC board included in the kit.
12. ~~Replace U19 and U30 on the RTI board with new parts in kit.~~
13. Install the new Vector Output Module from the kit. The new Vector Output Module must be used as Vector 1. The original Vector 1 could be used as Vector 2 if desired.
14. Install the Measurement and Demod Down Converters.
15. Carefully check that all of the modules are in the correct locations.

Install the Test Applications (E1962B or E1963A) in the unit. Refer to the TA installation instructions provided with the TA.

To ensure that both TA's work, Download and install the TA (E1962B or E1963A) not provided by the customer from the 8960 web page.

http://wireless.agilent.com/rfcomms/dloads/downloads_8960.php

Two temp licenses one for E1962B and another for E1963A was shipped with the upgrade kit. Install both applications and the licenses.

Replace covers:

1. Replace the top and bottom covers and secure it with the appropriate screws.
2. Slide the outer cover on.
3. Replace the screw on the rear
4. Attach the rear bumpers and handles.

Verification Test after all HW Upgrades are Installed

1. Turn on the E5515. The unit should boot to the new Application.
2. Check for boot up and/or error messages. If any error message are displayed, re-check installation process for errors.
3. After warming up the instrument for at least 30 minutes, perform the user calibrations.

Calibration Procedure for Instruments with Option 003

	Calibration Interval = 1 year				Calibration Interval = 1 month		
Application Or Format	IQ Calibrations (See Note 1)	Burst Mod Offset 1 Calibration	Thermal Power Null Adjust	Digital Average Power Calibration	Spectrum Monitor Calibration	Channel Power Calibration	Calibrate Measurements
Cdma2000/IS-95/AMPS	Step 1 Perform IQ1 and IQ2 once from one of these applications or formats	Step 2 Perform once from one of these applications or formats	Step 3 Perform once from one of these applications or formats	Step 4A Perform once from one of these applications or formats Step 4B Cycle Power	Step 5 Perform once from one of these applications or formats	Covered by Step 5 (See Note 2)	
1xEV-DO							
W-CDMA					Step 6 Perform once from this application		Covered by Step 6 (See Note 2)
GSM/GPRS/EGPRS					Step 7 Perform once from one of these applications or formats		
AMPS/136							

Note 1 – Calibrate Second IQ Modulator only applies to instruments with Option 002: RF Source 2.
Note 2 – You do not need to run this calibration if Spectrum Monitor calibration is run first.

Calibration Procedure for Instruments without Option 003

	Calibration Interval = 1 year	Calibration Interval = 1 month
Application or Format	IQ Calibrations (See Note 1)	Spectrum Monitor Calibration
GSM/GPRS/EGPRS	Step 1 Perform IQ1 and IQ2 once from one of these applications or formats	Step 2 Perform once from one of these applications or formats
AMPS/136		

Note 1 – Calibrate Second IQ Modulator only applies to instruments with Option 002: RF Source 2

4. If additional verification testing is desired, tools are available from Agilent to verify the functional and parametric performance of the instrument.
 - a. Self Test software – requires no external test equipment. Good for functional verification if traceable parametric measurements are not required. For more information, see <http://wireless.marketing.agilent.com/docloader.asp?did=12376>
 - b. Test Set Verify software and system – requires external test equipment. Best for traceable functional verification parametric measurements. For more information, see <http://www.spk.agilent.com/~yerxa/Upgrades/index.htm>

Questions contact Agilent Support:
 Phone: (800) 827-3848 (U.S. & Canada)
 Web: www.agilent.com/find/8960support

Appendix 1

NOTE: For the most up-to-date summary of compatible E5515 applications, access the E5515 Mainframe Revision website at: www.agilent.com/find/e5515releasenotes

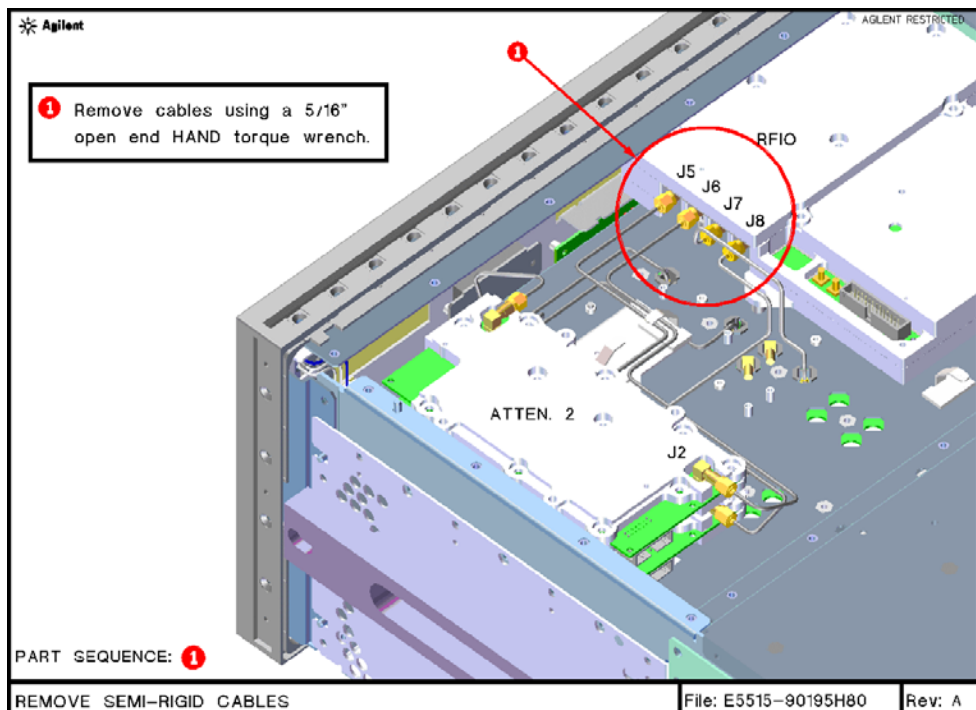
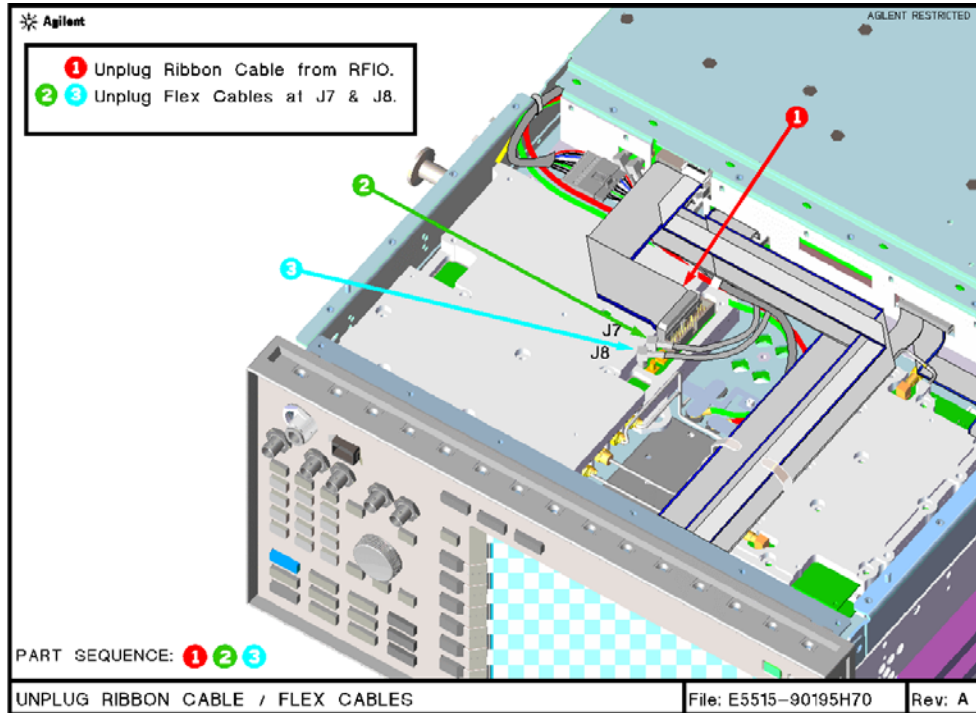
All existing Applications must be upgraded to the latest revision and switched to one of the new revisions. All non-compatible Applications must be upgraded to work with the new boards that are included in this upgrade kit. Follow the Firmware installation instruction that come with the Applications.

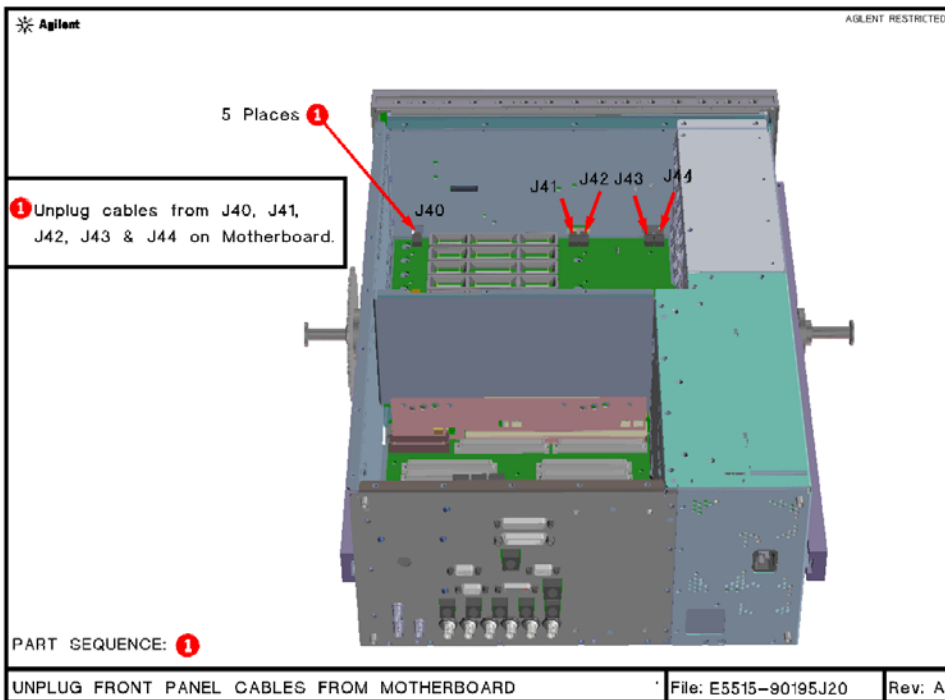
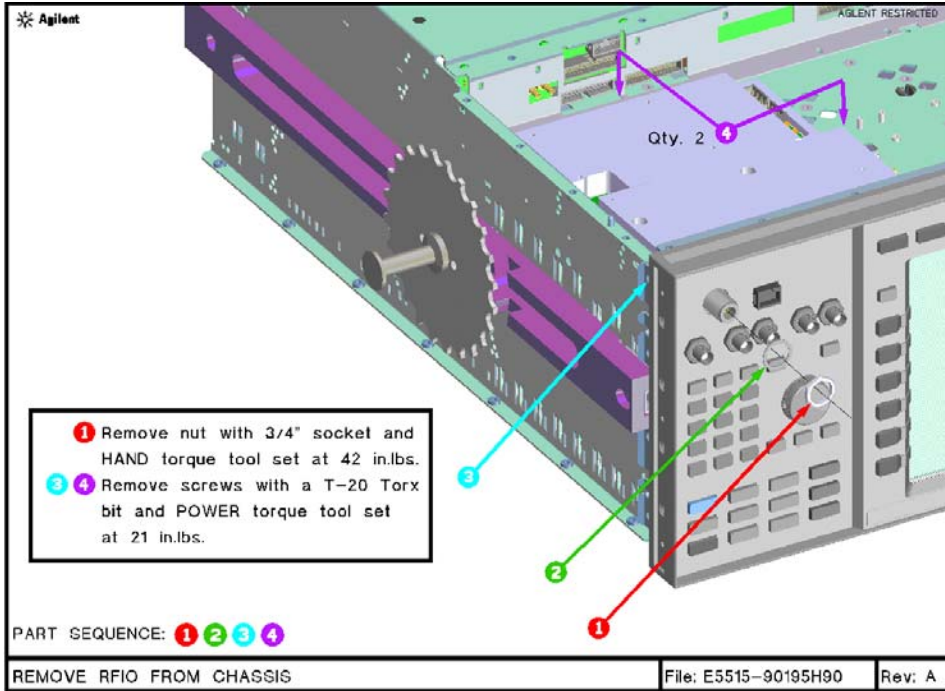
Summary of Supported Applications		
E1961A	AMPS/136	A.12.00 or greater
E1962B	CDMA 2000 TA	B.14.00 or greater
E1963A	W-CDMA TA	A.13.00 or greater
E1966A	1xEV-DO TA	A.09.00 or greater
E1968A	GSM/GPRS/EGPRS TA	A.09.00 or greater
E1976A	1xEV-DO FTM TA	A.03.00 or greater
E1987A	GSM/GPRS/W-CDMA Fast Switch TA	A.08.00 or greater
E6590A	GSM/GPRS RF Modem -- Anite	B.05.00 or greater
E6701F	GSM/GPRS Lab App F	F.01.00 or greater
E6702B	CDMA 2000 Lab App B	B.07.00 or greater
E6703E	WCDMA/HSPA Lab App E	E.01.00 or greater
E6706B	1xEV-DO Lab App	B.01.00 or greater
E6785E	GSM/GPRS_W-CDMA Lab App E	E.01.00 or greater
Applications Not Compatible		
E1960A	GSM	NOT SUPPORTED
E1962A	CDMA 2000 TA	NOT SUPPORTED
E1964A	GPRS	NOT SUPPORTED
E1985A/B/C	GSM/GPRS_AMPS/136_W-CDMA	NOT SUPPORTED
E1985E	CDMA2000_1xEV-DO	NOT SUPPORTED
E6701A/B/C/D/E	GSM/GPRS Lab App B/C/D/E	NOT SUPPORTED
E6701T/U	GSM/GPRS LA – High Data Rate	NOT SUPPORTED
E6702A	CDMA 2000 Lab App A	NOT SUPPORTED
E6703A/B/C/D	W-CDMA Lab App	NOT SUPPORTED
E6703T/U	WCDMA/HPPA LA – High Data Rate	NOT SUPPORTED
E6706A	1xEV-DO Lab App	NOT SUPPORTED
E6785A/B/C/D	GSM/GPRS_W-CDMA Lab App	NOT SUPPORTED
E6785T/U	Fast Switch LA – High Data Rate	NOT SUPPORTED

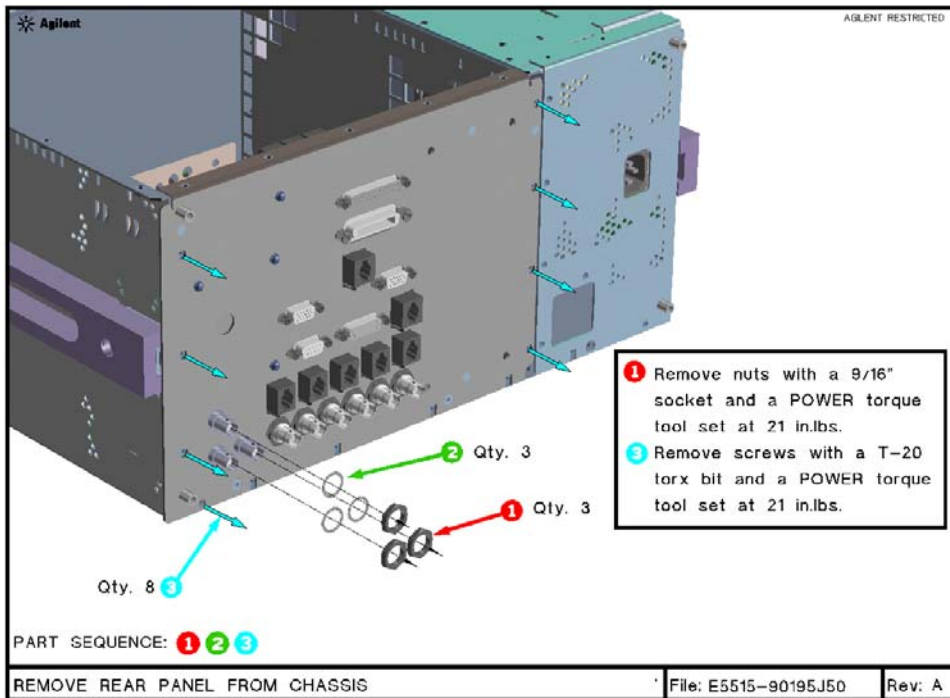
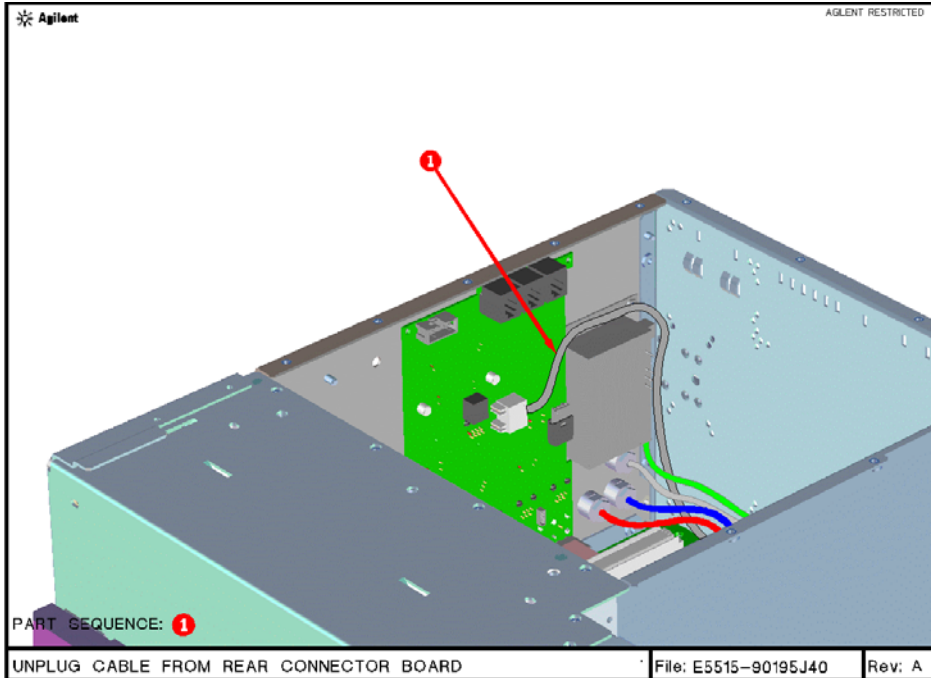
Table 1

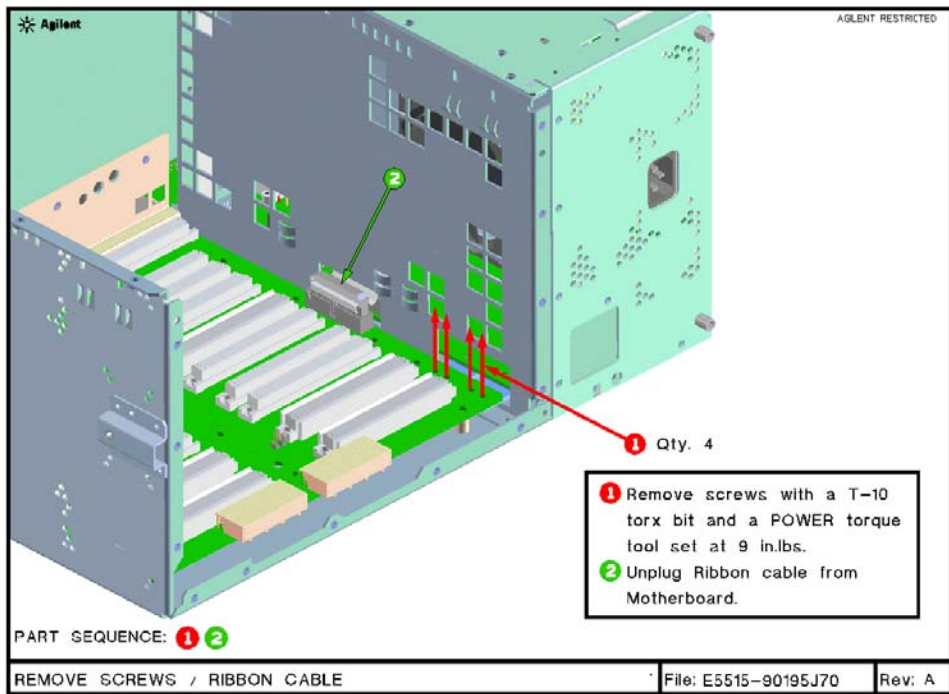
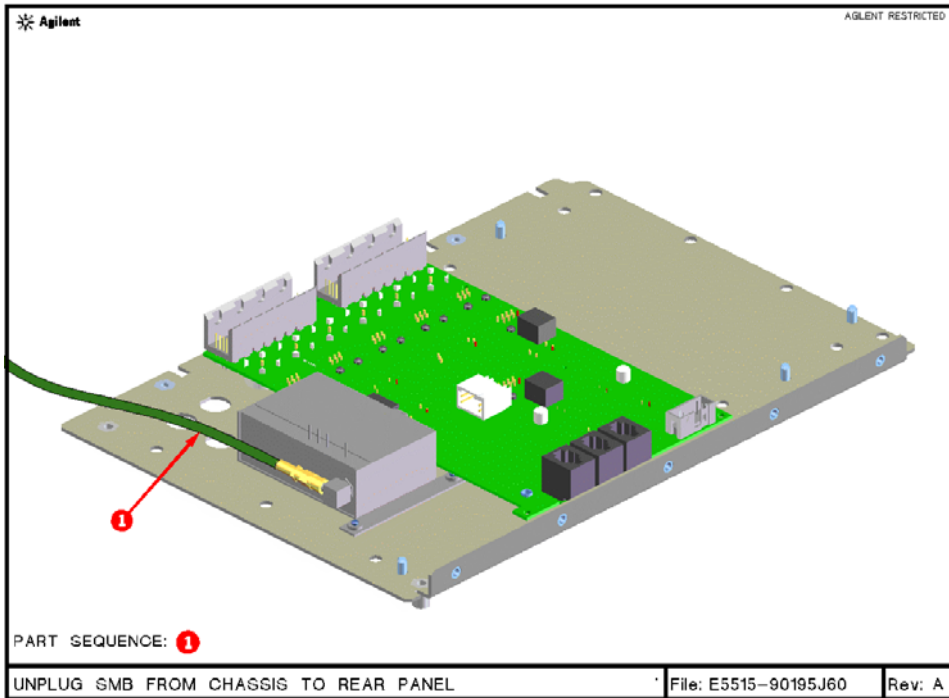
Appendix 2 E5515B Disassembly

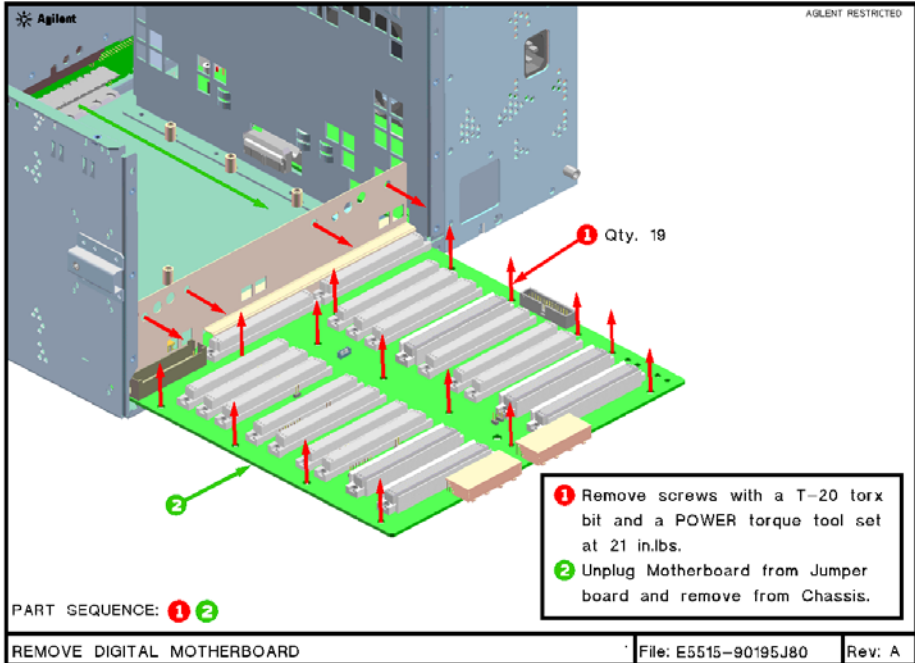
Remove all covers











Appendix 3

E5515B Re-assembly

The purpose of this document is to support the hardware upgrade requirements for new configuration. This document will instruct the service personal on how to reassemble the instrument.

Install the new RF Mother Board part number E5515-60408 as shown.

Agilent AGILENT RESTRICTED

- 1** Place Mother Board into chassis and fully engage J1 & J2 into Jumper Bd.
NOTE: Impaler pins for alignment (2 places).
- 2** Tighten screws in any order with a T-20 torx bit and a POWER torque tool set at 21 in.lbs.
- 3** Attach blue cable to J48 on RF Mother Bd.
NOTE: Use clearance holes in chassis to aid in assembly.
- 4** Attach gray cable to J45 on RF Mother Bd. Dress cables along side of board, pushing any excess cable length into the Digital side of the chassis.
- 5** Attach Power Supply cable to J38 on RF Mother Bd.

PART SEQUENCE: 1 2 3 4 5

SECURE RF MOTHERBOARD / ATTACH CABLES

Agilent AGILENT RESTRICTED

1 Plug in cables per matrix.

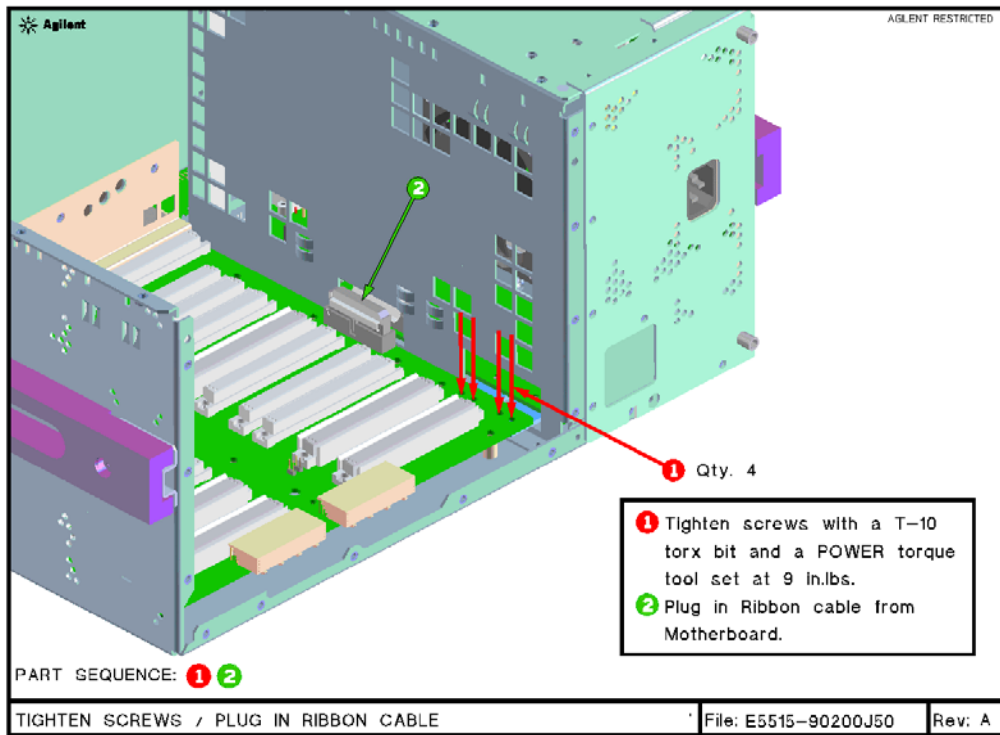
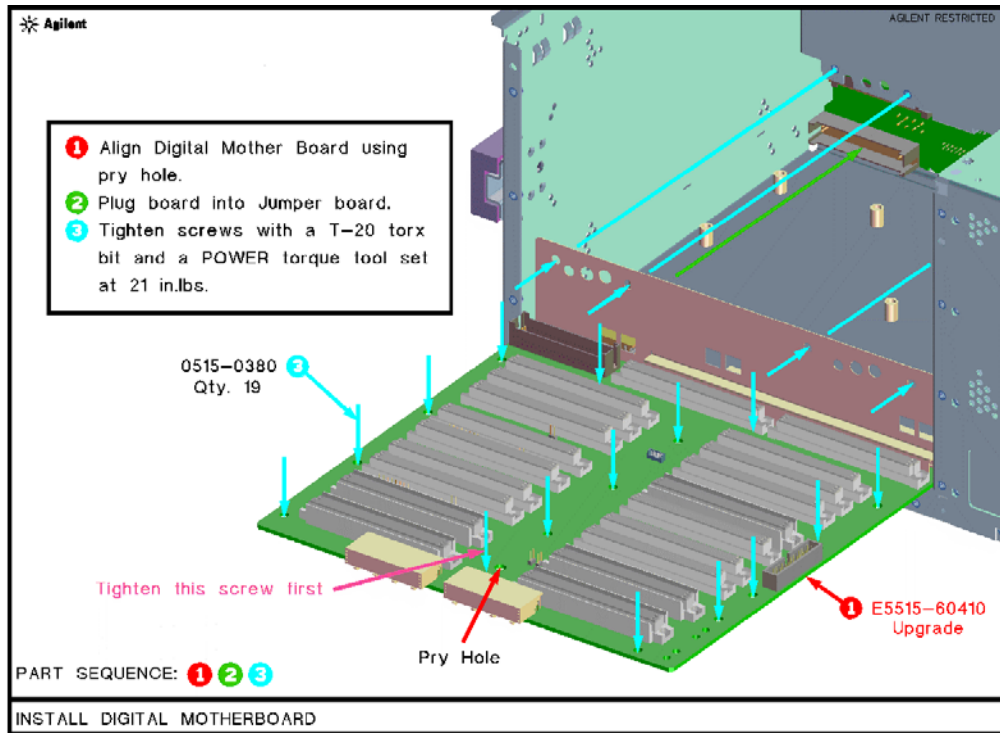
FROM F.P.	COLOR	TO MB
Audio Out	Violet	J40
Audio In Low	Red	J41
Audio In High	Green	J42
DVM Low	Gray	J43
DVM High	Blue	J44

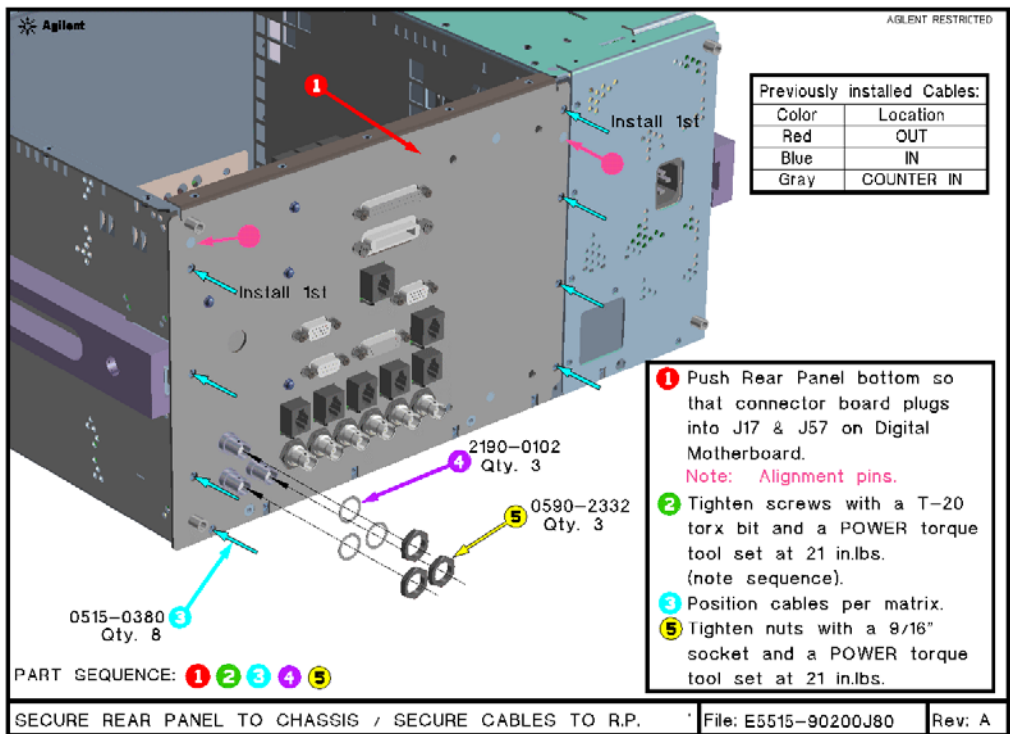
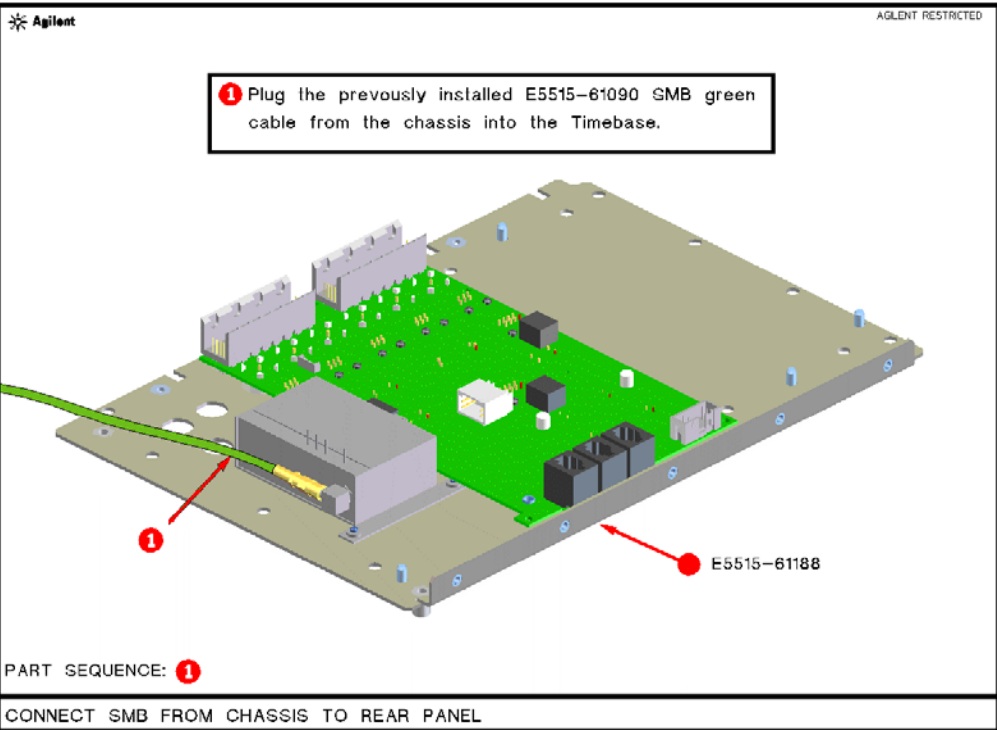
PART SEQUENCE: 1

PLUG FRONT PANEL CABLES INTO MOTHERBOARD

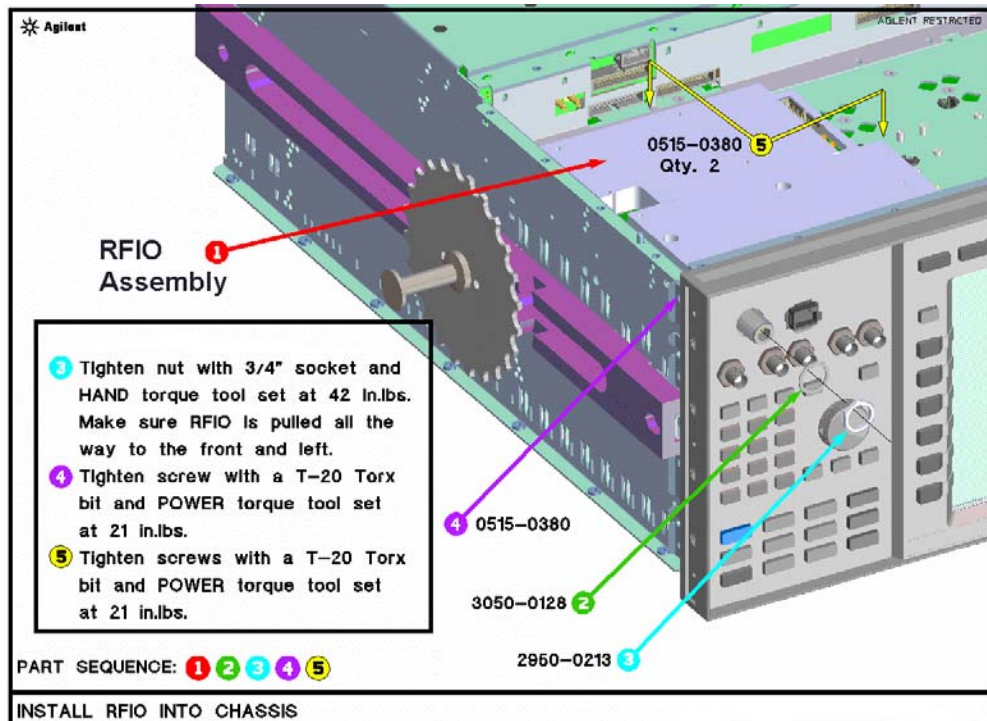
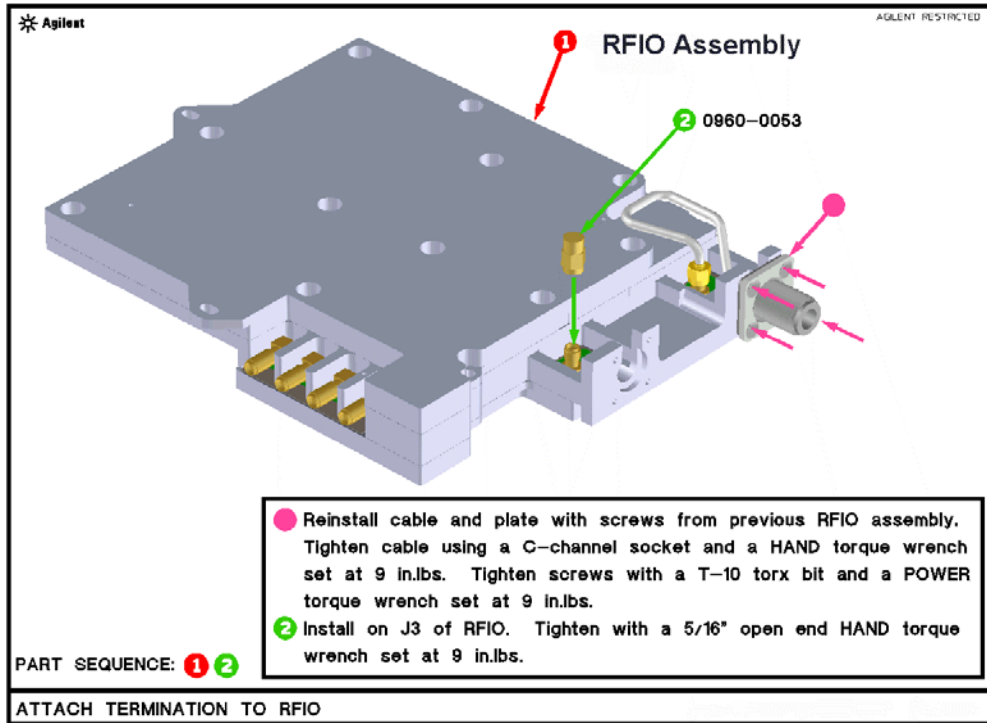
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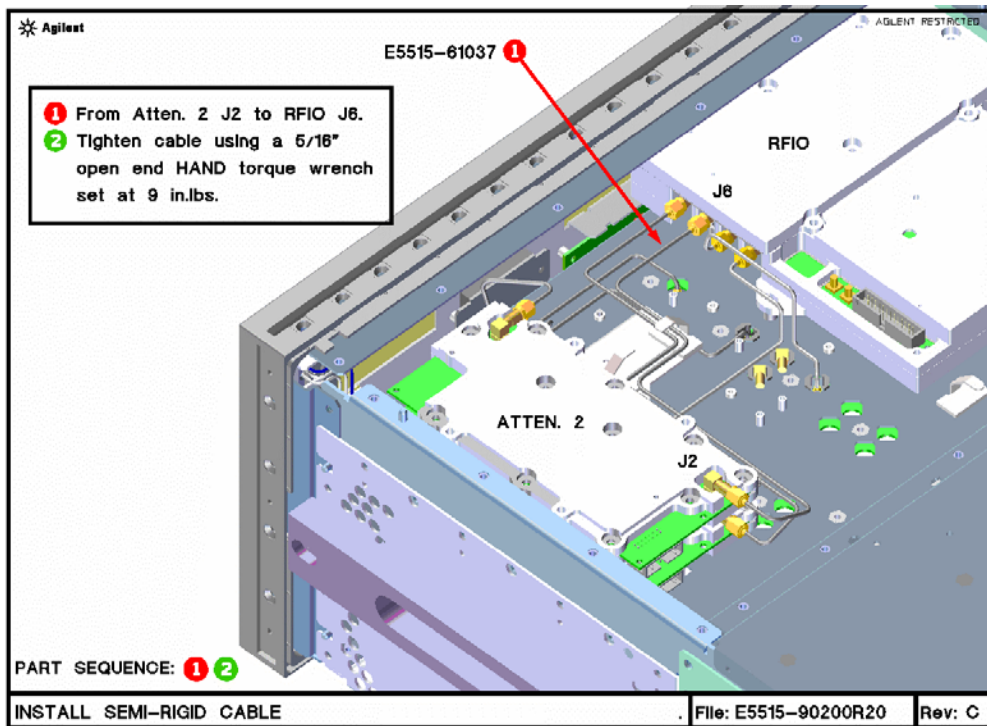
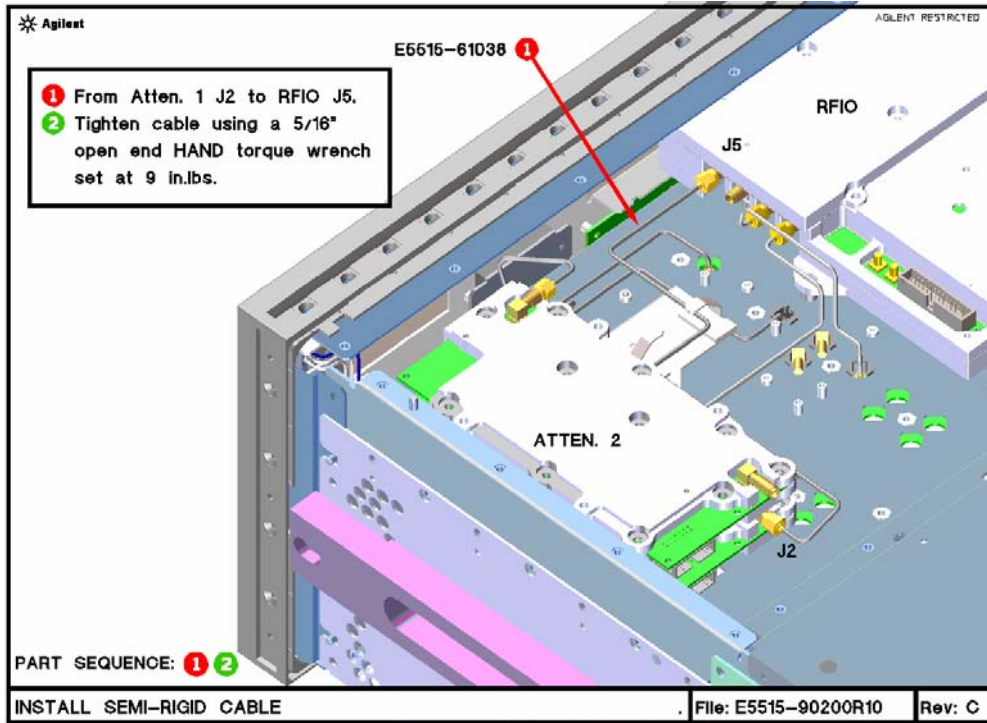
Install new Digital Mother Board part number E5515-60410.



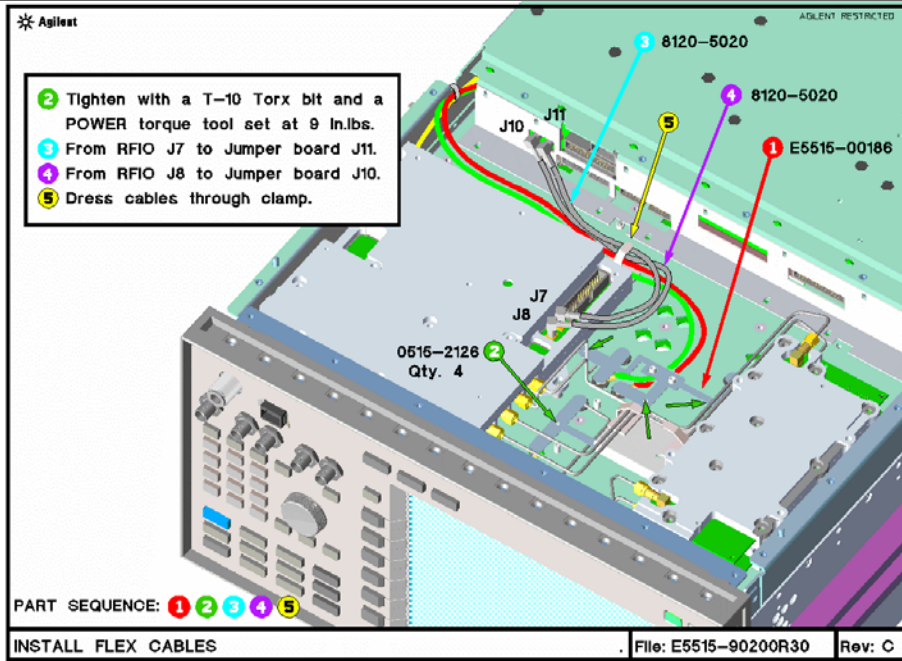


Install the new RFIO part number E5515-61300 as shown.

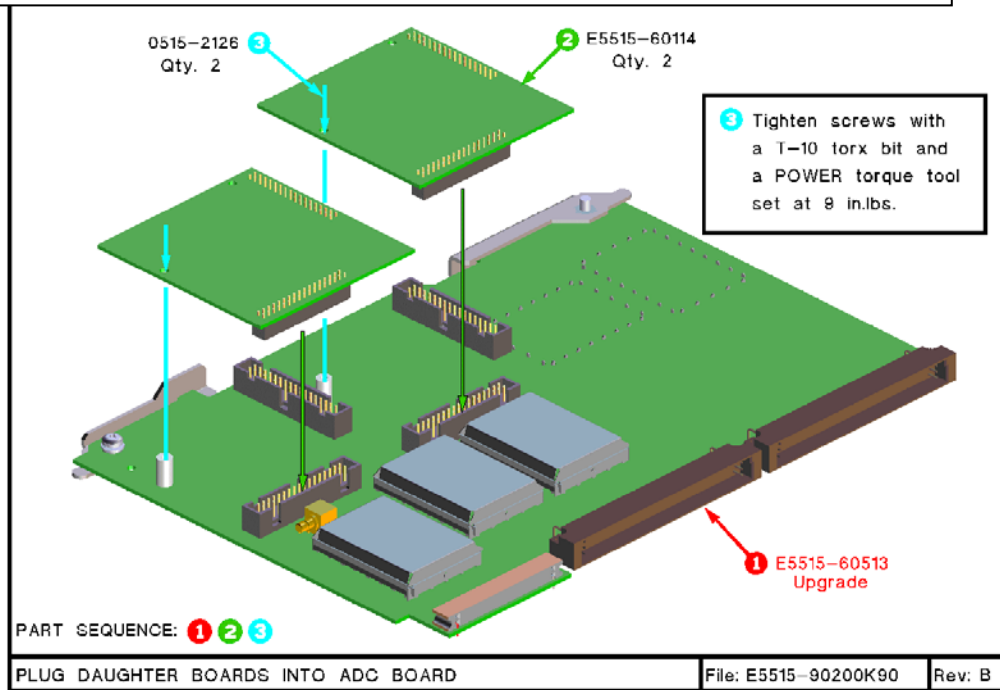


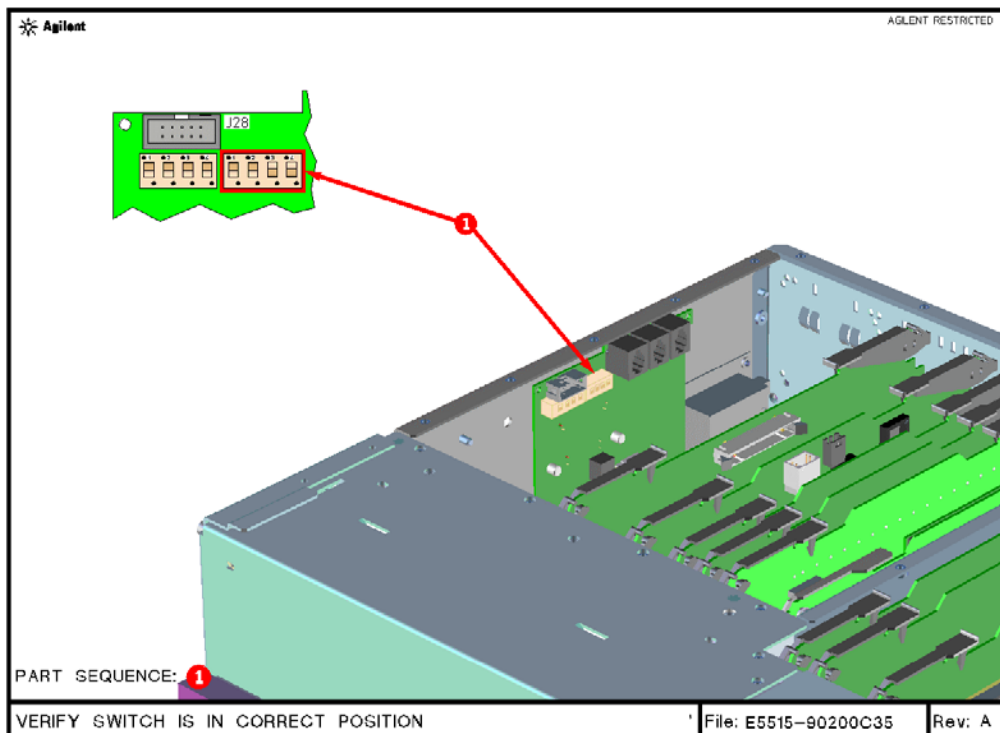
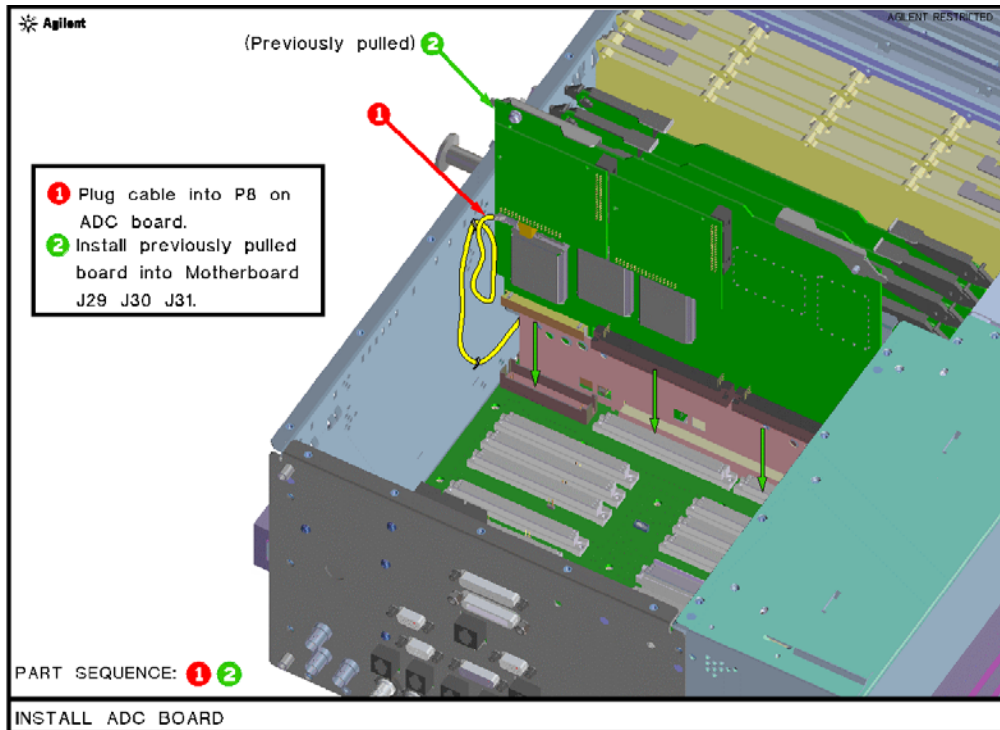


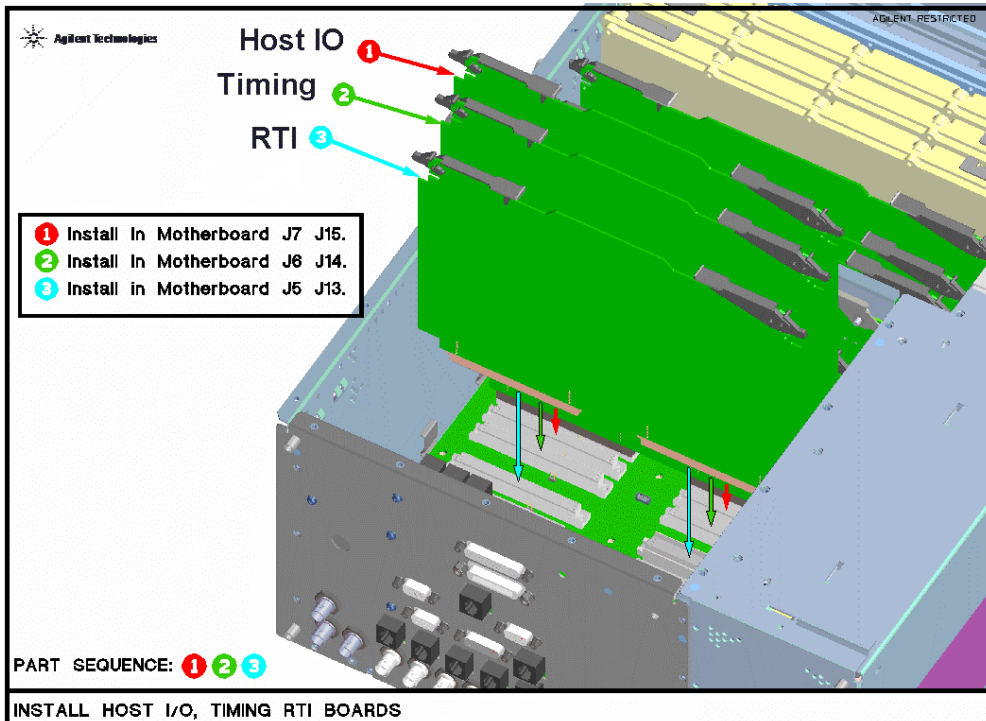
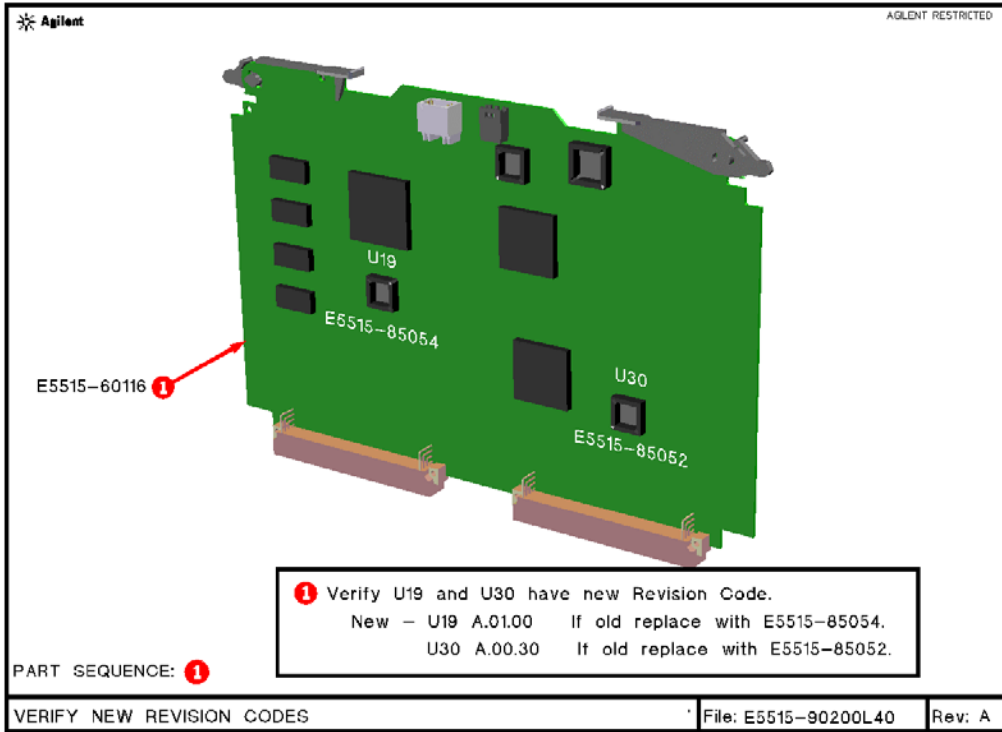
Install the 1252-2219 locking clip over the RFIO ribbon cable. Verify that the locking clip snaps into place to secure the ribbon cable.

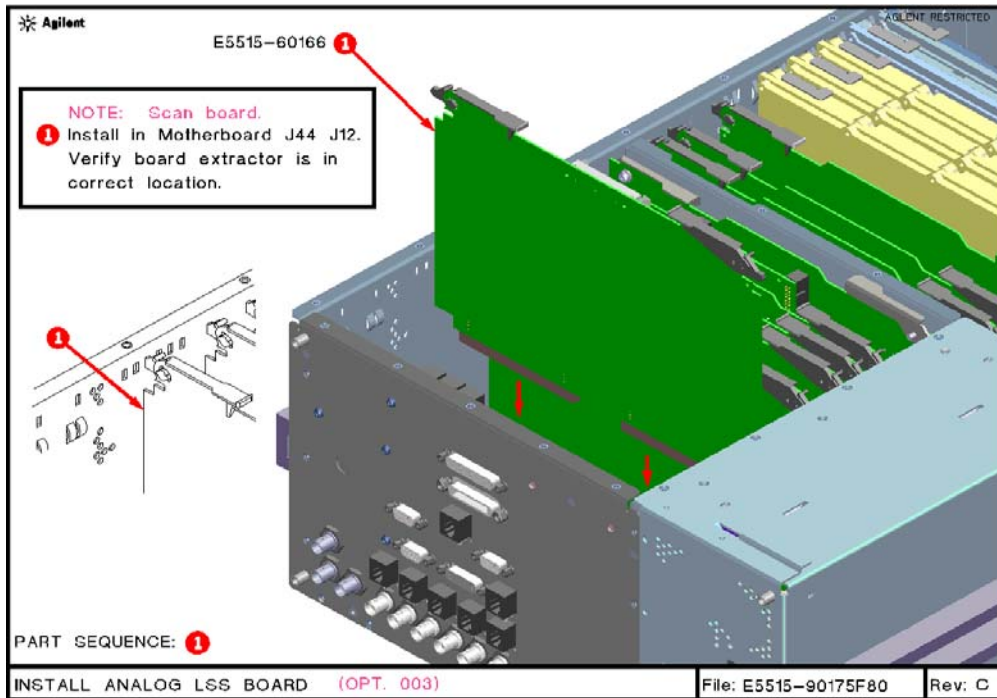


Reuse the original Daughter boards on the new ADC board part number E5515-60813. Install the new DSP Module part number

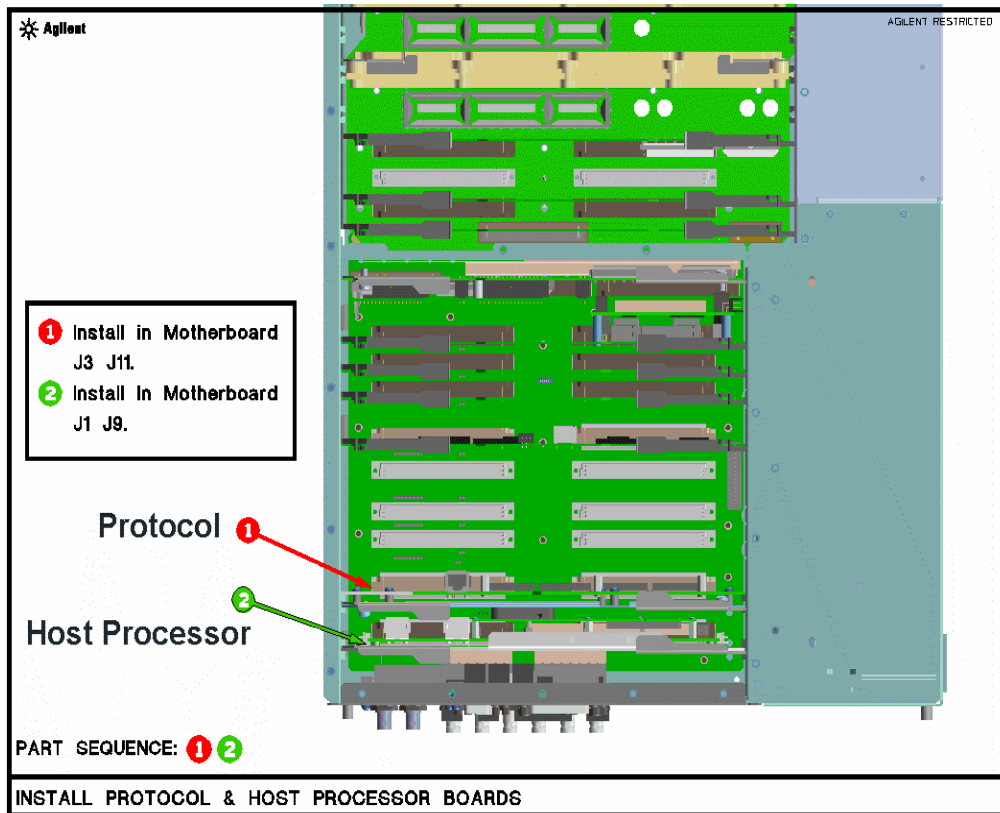


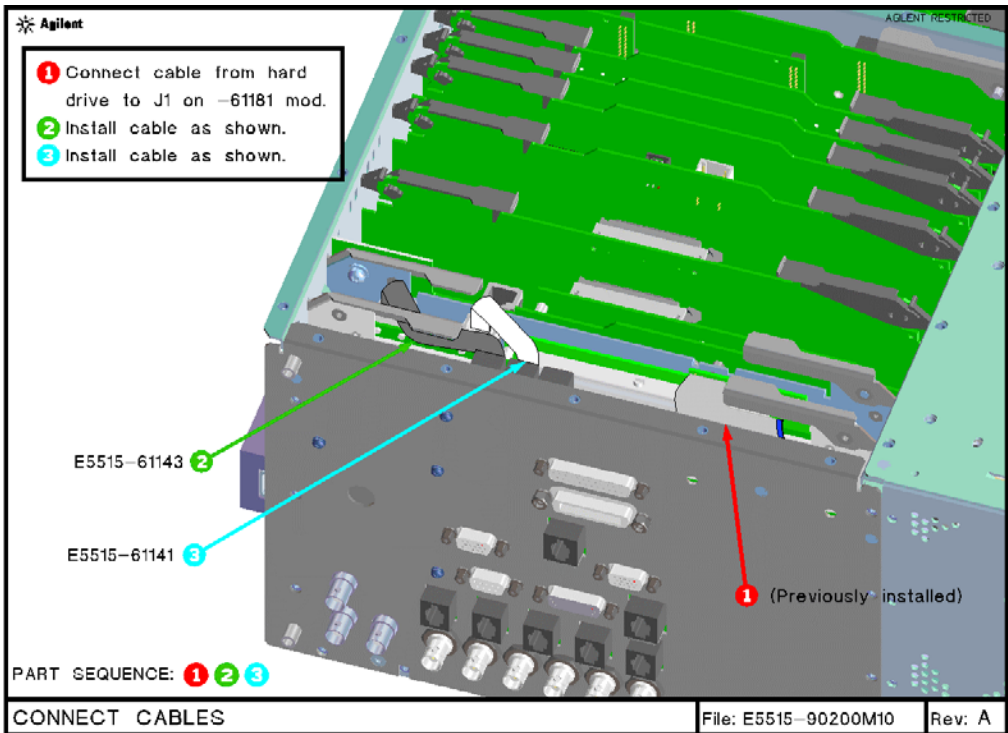
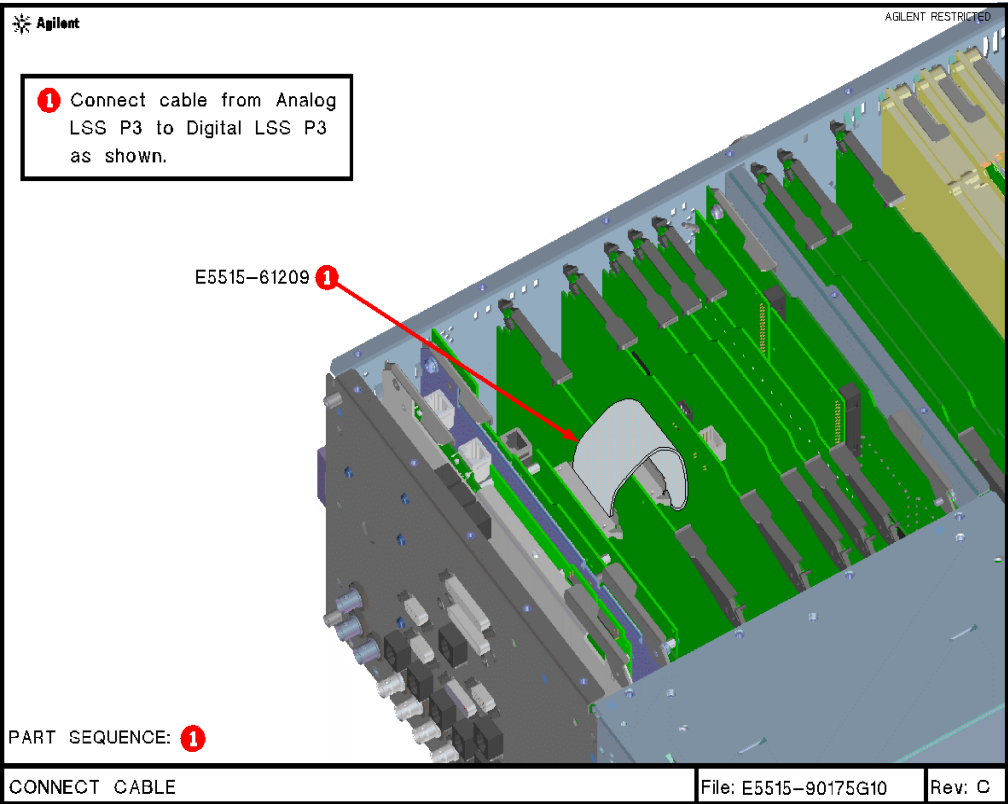




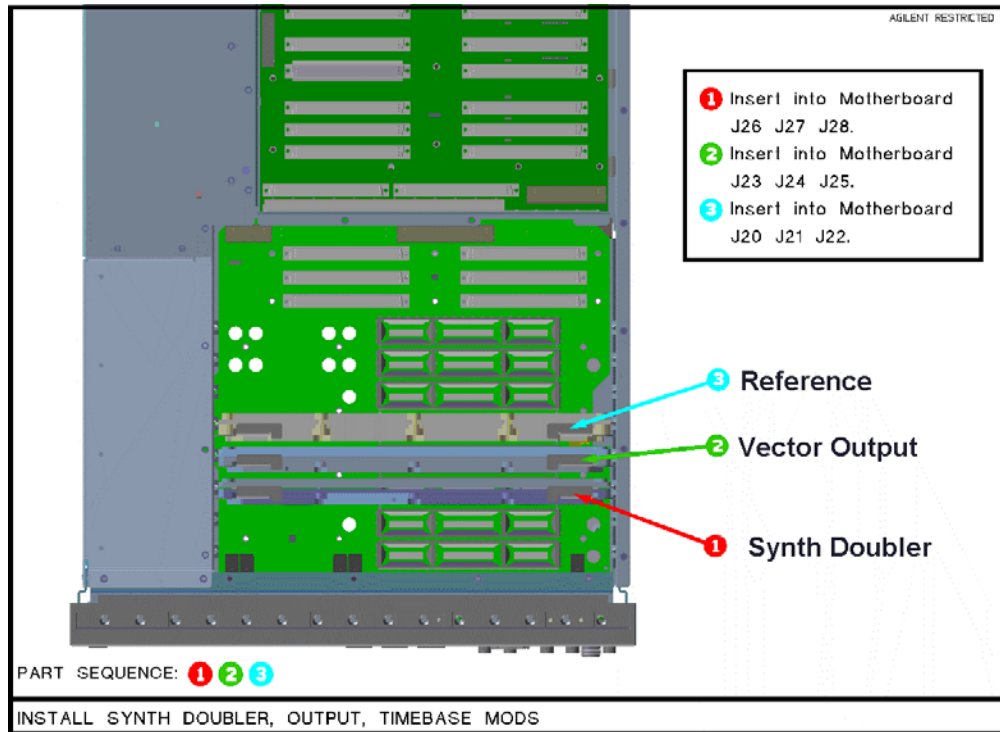


Install the Protocol Processor part number E5515-60759.

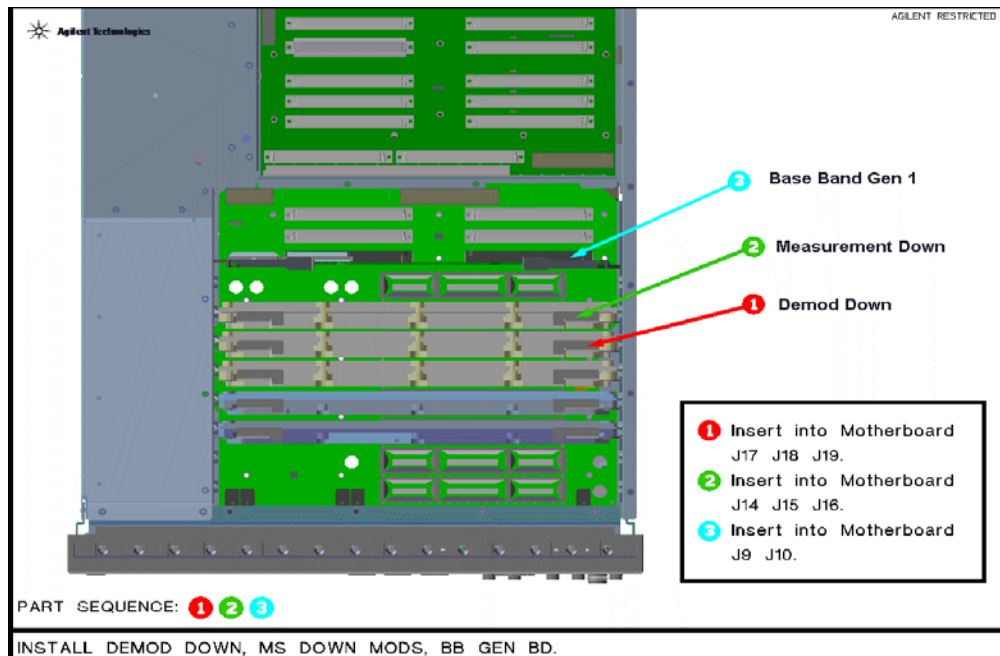


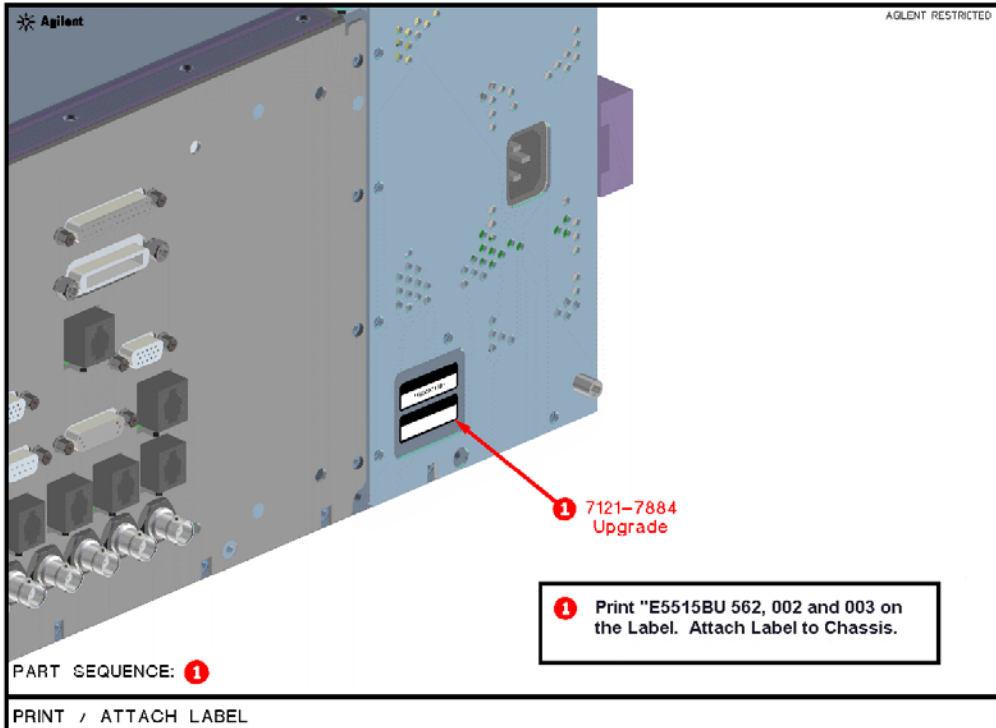


Install the Reference, Synth Doublor and new Vector Output Module part number E5515-61199 .



Install Measurement Down Converter part number E5515-61219 and Demod Down Converter part number E5515-61231.





Install all Covers, Rear Bumpers and Handles