

Installation Note

Agilent PSA Spectrum Analyzer E4440AU Option 071 Digital Demod Hardware Retrofit Kit for Serial Prefix US4042 or MY4024 and Earlier



Agilent Technologies

Part Number E4440-90124
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Digital Demodulation Hardware Retrofit Kit

Product Affected:	PSA E4440A
Serial Numbers:	US00000000/US4042xxxx MY00000000/MY4042xxxx
To Be Performed By:	(X) Agilent Service Center (X) Personnel Qualified by Agilent () Customer
Estimated Installation Time:	1 Hour
Estimated Adjustment and Verification Time:	8 Hours

Introduction

This kit is required to retrofit the digital demodulation hardware on early Agilent E4440A spectrum analyzers with serial prefixes less than or equal to those shown above. The kit contains the latest third converter and reference assembly in addition to the Option B7J electronic attenuator and cables. The option is licensed to one instrument model number/serial number combination. The kit will function only in the instrument for which it was ordered.

NOTE Instruments with serial prefix greater than 4042 do not require the third converter and reference assembly, so these instruments can be upgraded with the Option B7J kit.

NOTE The instrument must be re-adjusted and the performance tested to ensure that the instrument meets specifications following the hardware installation. All adjustments are automated, and are included in the PSA Series Performance Verification and Adjustment Software.

This software is not included in this kit. If you do not have this software, order Option 0BW, PSA Service Documentation and Performance Tests and Adjustment Software through your local Agilent Technologies Sales and Service Office.

Contents

Item	Quantity	Description	Agilent Part Number
1	1	License keyword certificate for Option B7J	
2	1	Basic Mode Guide	E4440-90094
3	1	Firmware Upgrade Kit	E4440-60087
4	1	A27 Electronic Attenuator	E4440-60022
5	1	W51, Cable, semi-rigid, E-Attenuator to RHYTHM	E4440-20110
6	1	W52, Cable, semi-rigid, E-Attenuator to 3 GHz LPF	E4440-20109
7	2	W53, Cable, ribbon, E-Attenuator to Front End Driver	E4440-60078
8	1	Screws, 3.0-8 metric 6 each	0515-0372
9	1	Bracket, electronic attenuator	E4440-00024
10	1	A11 Reference assembly	E4440-60201
11	2	A10 Third Converter assembly	E4440-60213
12	1	Installation Note	This note

Tools Required

- #20 Torx driver
- #10 Torx driver
- 5/16-inch open end wrench
- 7/16-inch open end wrench

Installation Procedure

1. Perform the following procedures in order:
 - a. Remove the instrument outer case.
 - b. Remove the instrument top brace.
 - c. Install the Option 071 retrofit kit.
 - d. Install the instrument top brace and outer case.
 - e. Install the option designator key.
 - f. Load firmware if existing firmware is A.02.07 or earlier.
 - g. Initialize calibration constants for the new hardware.
 - h. Perform the adjustments and performance tests.

For assistance at any time during this procedure, get in touch with your nearest Agilent Technologies Sales and Service Office. To find your local Agilent office access the following URL or call the following telephone number:

<http://www.agilent.com/find/assist>

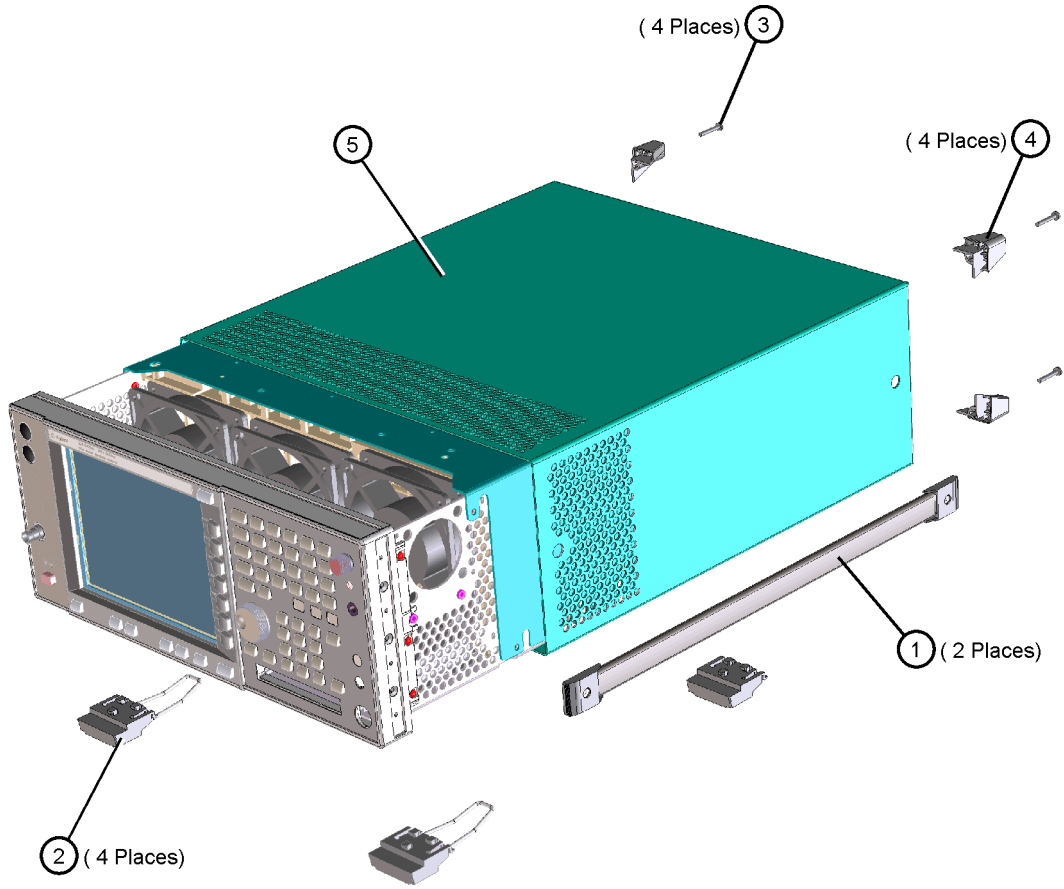
1-800-452-4844 (8am-8pm EST)

Remove the Outer Case

CAUTION	If the instrument is placed on its face during any of the following procedures, be sure to use a soft surface or soft cloth to avoid damage to the front panel, keys, or input connector.
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1. Disconnect the instrument from ac power.
2. Refer to [Figure 1](#). Remove the two handles on the sides of the instrument as shown. Use the T-20 driver to loosen the screws that attach each handle (1). Remove the handles.
3. Remove the four bottom feet (2). Lift up on the tabs on the feet, and slide the feet in the direction indicated by the arrows.
4. Remove the four screws (3) that hold the rear feet (4) in place.
5. Pull the instrument cover (5) off toward the rear of the instrument.

Figure 1 Instrument Outer Case Removal

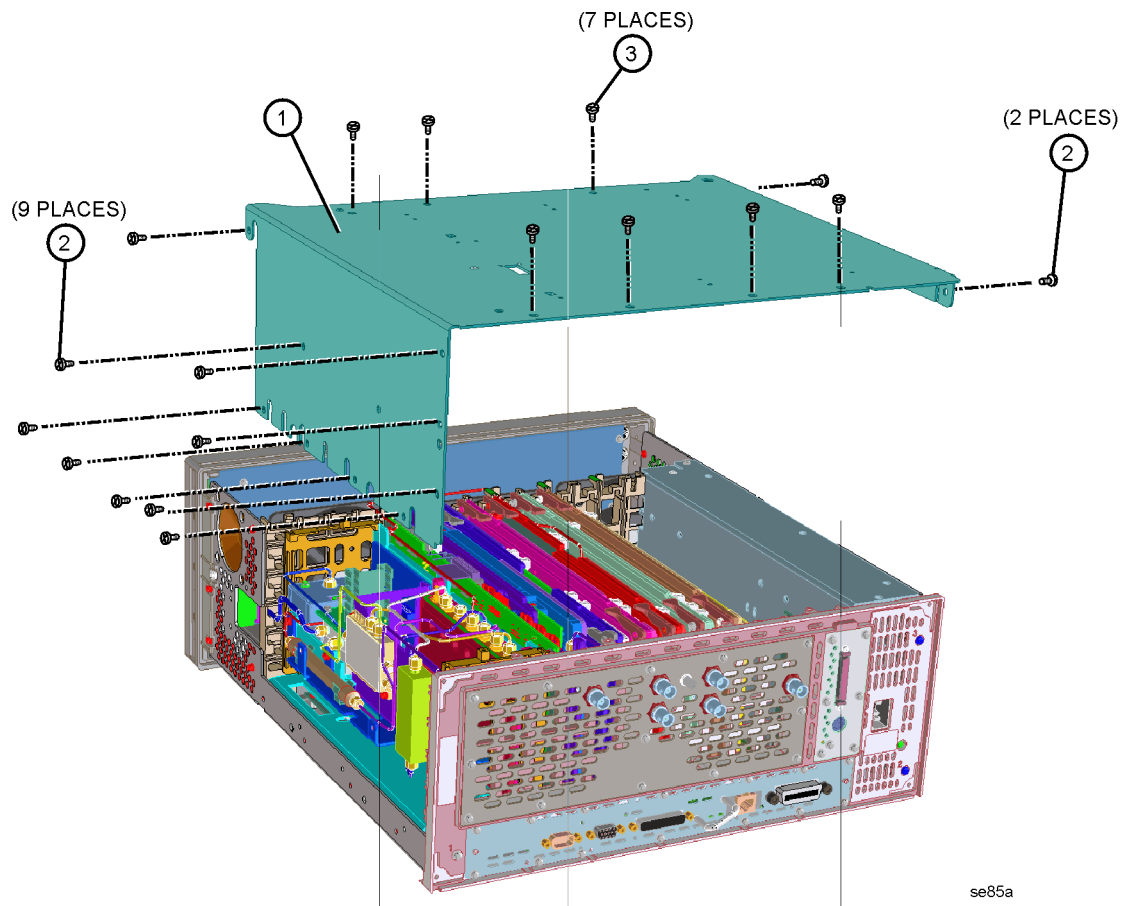


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Remove the Top Brace

1. Refer to [Figure 2](#). Use the T-10 driver to remove the top screws (3) (one screw is under the security label), and the side screws (2) attaching the top brace (1) to the deck.
2. Remove the top brace from the deck.

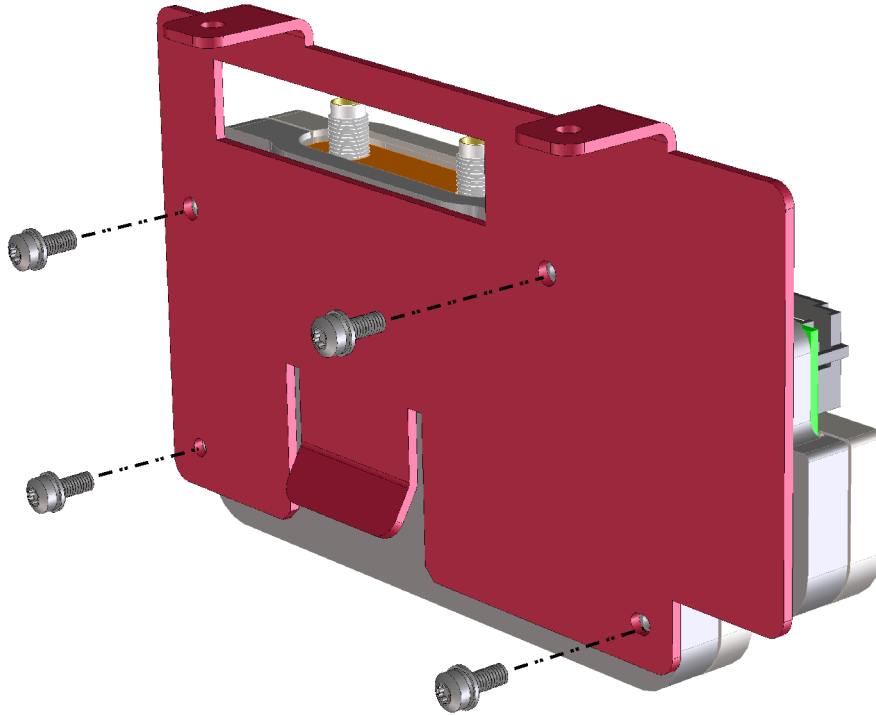
Figure 2 **Top Brace Removal**



Attach the Attenuator to the Bracket

1. Refer to [Figure 3](#). Install the electronic attenuator onto the attenuator bracket using four of the screws contained in the kit; torque to 101 Ncm (9 inch pounds).

Figure 3 **Attach the Attenuator to the Bracket**

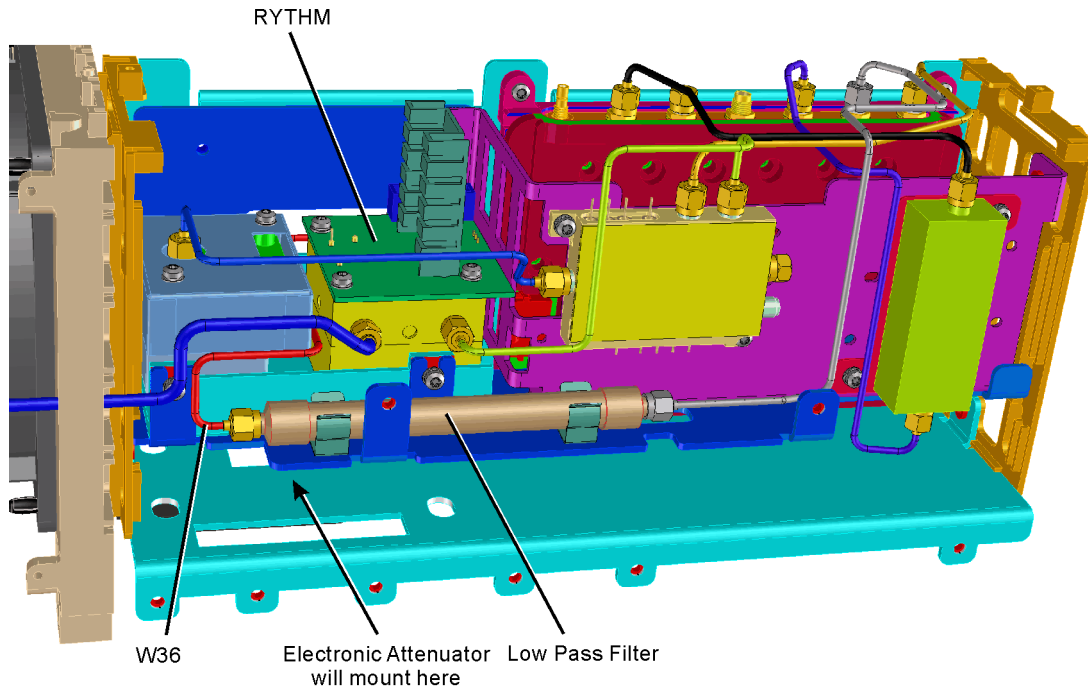


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Install the Attenuator

1. [Figure 4](#) shows the RF section and parts locations. Locate the RF section on the right side of the instrument.

Figure 4 **Remove Cables**



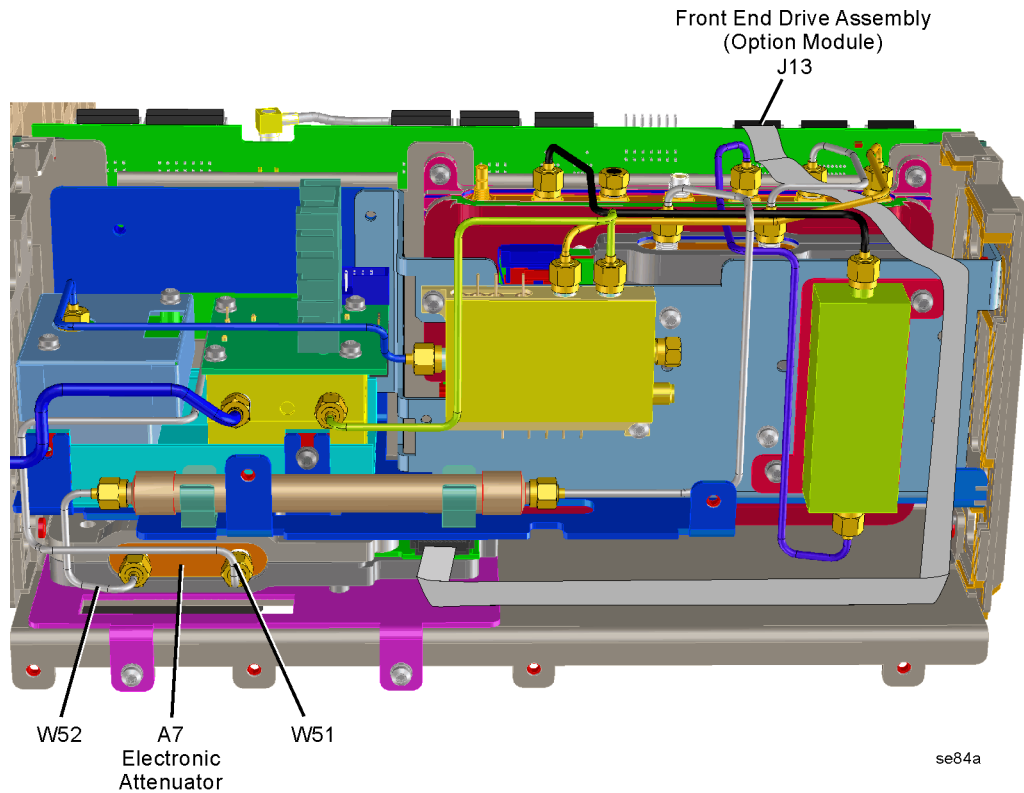
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CAUTION

In the following [step 2](#), use a 7/16-inch wrench on one of the wrench flats at the ends of the filter to prevent the filter body from rotating when removing the cable. Cables can be damaged if the low pass filter is allowed to rotate when loosening or tightening the cable connector.

2. Locate and remove cable W36 (RYTHM to low pass filter), using the 5/16-inch wrench. Discard this cable, since it will be replaced by another cable.
3. Connect one end of ribbon cable W53, contained in the kit, to the ribbon cable header on the electronic attenuator assembly. Make sure the alignment ribs on the cable connector line up with the keying feature on the cable header.
4. [Figure 5](#) shows installed attenuator and cable routing. Slide the electronic attenuator assembly into the instrument and secure with two screws included in the kit.

Figure 5 **Install the Attenuator**



5. Select the E4440-20110 semi-rigid cable from the kit. This cable is reference designator W51, shown in [Figure 5](#). Connect the cable between the RHYTHM and the electronic attenuator. Torque to 112 Ncm (10 in-lb).
6. The remaining semi-rigid cable in the kit is the E4440-20109 having cable reference designator W52. Connect this cable between the low pass filter and the electronic attenuator. Use the 7/16-inch wrench to hold the filter in place when tightening the cable connector to 112 Ncm (10 in-lb).
7. Carefully route the electronic attenuator ribbon cable (W53) to the front end driver J13 as shown in [Figure 5](#). Plug the ribbon cable into front end driver connector J13 (option module).
8. Locate the A11 Reference assembly and the A10 Third Converter assembly by looking at the silk-screen diagram on the top brace. Notice that the color codes of the cables that attach to these assemblies are shown on the top brace and are silk screened on the circuit boards near the connectors. Also notice how the cables are routed, so you can reproduce the routing after you replace these two assemblies.
9. Remove and replace the reference assembly. The reference assembly in the kit is part number E4440-60201.
10. Remove and replace the third converter. The third converter in the kit is part number E4440-60208.

Replace the Top Brace and Outer Case

1. Refer to [Figure 2](#). Carefully position the top brace on the deck. The alignment pin at the center of the web/fan assembly must mate with the alignment hole on the top brace. Make sure that no coaxial cables will get pinched underneath the brace.
2. Use the T-10 driver to replace and tighten the top screws first; then replace the side screws. Torque to 101 Ncm (9 in-lb).
3. Refer to [Figure 1](#). Slide the instrument cover back onto the deck from the rear. The seam on the cover should be on the bottom. Be sure the cover seats into the gasket groove in the front frame.
4. Replace the four rear feet onto the rear of the instrument. Torque to 236 Ncm (21 in-lb).
5. Use the T-20 driver to replace the handles. Torque to 236 Ncm (21 in-lb).
6. Replace the four bottom feet by pressing them into the holes in the case and sliding them in the opposite direction of the arrows until they click into place. Note that the feet at the front have the tilt stands.

Turn the Instrument On

Plug in the instrument and apply power. The auto align will run, and will fail because the instrument cannot recognize Option B7J since it is not yet licensed, and the instrument has new assemblies installed that require adjustment.

Instruments with firmware A.02.07 and earlier cannot support the new 3rd converter and errors will appear on-screen. One likely error is EEPROM SELF TEST FAILURE FOR BOARD: 3RD CONVERTER. The firmware will be updated later in this procedure. Continue with the next procedure to install the option designator and license keyword for this option.

Install the Option Designator and License Keyword

NOTE Option designator B7J and the license keyword must be entered into instrument memory before the electronic attenuator will function in the instrument.

1. On the instrument front panel press: **System, More**, until the **Licensing** softkey is visible. Press **Licensing** and **Option**. This will activate the alpha editor menu. Use the alpha editor and the front panel numerical keypad to enter the upper-case option designator B7J. Enter the letters using the alpha editor and the numeric keypad to enter the numbers. Press the **Enter** key. Note that **B7J** now appears on the **Option** key.
2. Press **License Key**. The license key number is a hexadecimal number that will require the entry of both letters and numbers. The license keyword appears on the license keyword certificate included in the kit. Use the alpha editor and the front panel numerical keypad to enter the license key number. Your entry will appear in the active function area of the display. If you make a typing error, use the backspace key to correct the error. Check the license key number you entered. Press **Enter, Activate License**.
3. Cycle instrument power and allow the instrument to perform the auto align routine. Press **System, More, Show System** and verify that B7J appears in the option field.

Install the Option Firmware

1. The firmware upgrade kit, included in this digital demodulation hardware kit, contains a CD of the instrument firmware including all options. See the installation instructions included in the firmware upgrade kit for CD installation instructions. Once the CD is installed on your PC, on-line, step-by-step instructions guide you through the installation. The installation program will sense the presence of option B7J and determine what firmware needs to be loaded. Instruments containing early firmware revisions will be updated to the latest firmware.

For the latest updated information go to:

<http://www.agilent.com/find/psa>

2. After completing the firmware update process, press **System, More, Show System** and verify that B7J appears in the option field.

Initialize Instrument Memory

NOTE This procedure requires the use of software included in Option 0BW, PSA Service Guide and Performance Tests and Adjustment Software. This option is available through your local Agilent Technologies Sales and Service Office.

1. Run the “PSA Series Performance Tests and Adjustments Software” on your PC.
2. Configure the unit under test by selecting PSA model number E4440A, and press the **Configure UUT** button.
3. Choose the **Utilities** test plan.
4. Select the **Manual Test Selection** tab.
5. Run **Calibration Constant Reset**.
6. Select Install Option 071 from the list and press **OK** to reset the calibration constants.

Perform Adjustments and Performance Tests

1. Choose **Adjustments** test plan in the “PSA Series Performance Tests and Adjustment Software.”
2. Perform the 50 MHz Calibrator Amplitude adjustment to set the internal 50 MHz calibrator to the correct amplitude. This will take about five minutes to perform.
3. Perform the Internal 10 MHz Reference adjustment that sets the 10 MHz time base on the reference assembly to the proper frequency. This will take about five minutes to perform.
4. Perform the Frequency Response adjustment. This adjustment will take about two hours to perform and accounts for the new cables and electronic attenuator through path.
5. Perform the Frequency Response (B7J) adjustment. This adjustment will take about one hour to perform.
6. Agilent recommends that all performance tests be performed since the calibration label was broken and the electronic attenuator added to the signal path.
7. The Option B7J installation is now complete.

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