

Agilent Technologies E444xAU Option H37

Installation Guide

Agilent Technologies E444xAU Option H37

Installation Guide Retrofit Kit for the PSA Instruments

**Use this manual with the following documents:
E4440A, E4443A, E4445A, E4446A and E4448A**



Agilent Technologies

Manufacturing Part Number: E4440-90587

**Printed in USA
April 2005**

© Copyright 2005 Agilent Technologies, Inc. All rights reserved.

Warranty Statement

THE MATERIAL CONTAINED IN THIS DOCUMENT IS PROVIDED “AS IS,” AND IS SUBJECT TO BEING CHANGED, WITHOUT NOTICE, IN FUTURE EDITIONS. FURTHER, TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, AGILENT DISCLAIMS ALL WARRANTIES, EITHER EXPRESS OR IMPLIED WITH REGARD TO THIS MANUAL AND ANY INFORMATION CONTAINED HEREIN, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. AGILENT SHALL NOT BE LIABLE FOR ERRORS OR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE FURNISHING, USE, OR PERFORMANCE OF THIS DOCUMENT OR ANY INFORMATION CONTAINED HEREIN. SHOULD AGILENT AND THE USER HAVE A SEPARATE WRITTEN AGREEMENT WITH WARRANTY TERMS COVERING THE MATERIAL IN THIS DOCUMENT THAT CONFLICT WITH THESE TERMS, THE WARRANTY TERMS IN THE SEPARATE AGREEMENT WILL CONTROL.

DFARS/Restricted Rights Notice

If software is for use in the performance of a U.S. Government prime contract or subcontract, Software is delivered and licensed as “Commercial computer software” as defined in DFAR 252.227-7014 (June 1995), or as a “commercial item” as defined in FAR 2.101(a) or as “Restricted computer software” as defined in FAR 52.227-19 (June 1987) or any equivalent agency regulation or contract clause. Use, duplication or disclosure of Software is subject to Agilent Technologies’ standard commercial license terms, and non-DOD Departments and Agencies of the U.S. Government will receive no greater than Restricted Rights as defined in FAR 52.227-19(c)(1-2) (June 1987). U.S. Government users will receive no greater than Limited Rights as defined in FAR 52.227-14 (June 1987) or DFAR 252.227-7015 (b)(2) (November 1995), as applicable in any technical data.

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.

WARNING	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.
----------------	---

CAUTION	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.
----------------	---

Definitions

- Specifications describe the performance of parameters covered by the product warranty (temperature – 0 to 55 °C, unless otherwise noted.)
- *Typical* describes additional product performance information that is not covered by the product warranty. It is performance beyond specification that 80% of the units exhibit with a 95% confidence level over the temperature range 20 to 30 °C. Typical performance does not include measurement uncertainty.
- *Nominal* values indicate expected performance, or describe product performance that is useful in the application of the product, but is not covered by the product warranty.

General Information

Description	2
Verifying the Shipment	2
Installation Information	3
Installation Procedure	4
Removing the Feet, Handles and Covers	4
Front Panel	7
For Older Instruments Only (E4440A, E4443A and E4445A)	11
All Units	11
Characteristics	12
Performance Tests and Adjustments	12
37 kHz Spur Test	12
Safety and Regulatory Information	14
Introduction	14
Connector Care and Cleaning	14
Before Applying Power	14
Shipping Instructions	14
Warnings	15
Cautions	16
Instrument Markings	17
Contacting Agilent	18

General Information

Description

The E444xAU Option H37 provides a kit to reduce the level of residuals in the 37 kHz range by 10 dB and can be installed into any PSA instrument. Before installing the Option H37 kit, measure the residual amplitude in the 37 kHz range.

This manual incorporates the installation of the following similar instrument models E4440A, E4443A, E4445A, E4446A, E4448A with Option H37. They are referred to as E444xAU throughout this document.

Verifying the Shipment

Inspect the shipping container. If the container or packing material is damaged, it should be kept until the contents of the shipment have been checked mechanically and electrically. If there is physical damage please notify the nearest Agilent Technologies office. Refer to [“Contacting Agilent” on page 18](#). Keep the damaged shipping materials (if any) for inspection by the carrier and an Agilent Technologies representative.

Table 1 E444xAU Option H37 Kit Content List (E4440-60440)

Description	Agilent Part Number	Qty
Shield (H37 front panel)	E4440-00067	1
Inverter shield	E4440-00068	1
Cable (RF Input)	E4440-20067	1
Cable (ATT A ATT B)	E4440-20068	1
Cable (ATN B RYTHM B)	E4440-20069	1
Installation Guide (H37)	E4440-90587	1
Label (Option H37)	7120-8080	1

Installation Information

Products Affected:	PSA E4440A,E4443A, E4445A, E4446A, E4448A
To Be Performed By:	(X) Agilent Service Center (X) Personnel Qualified by Agilent
Estimated Installation Time:	1 Hour
Estimated Adjustment and Verification Time:	2 Hour
Performance Test and Adjustments	Page 12

Installation Procedure

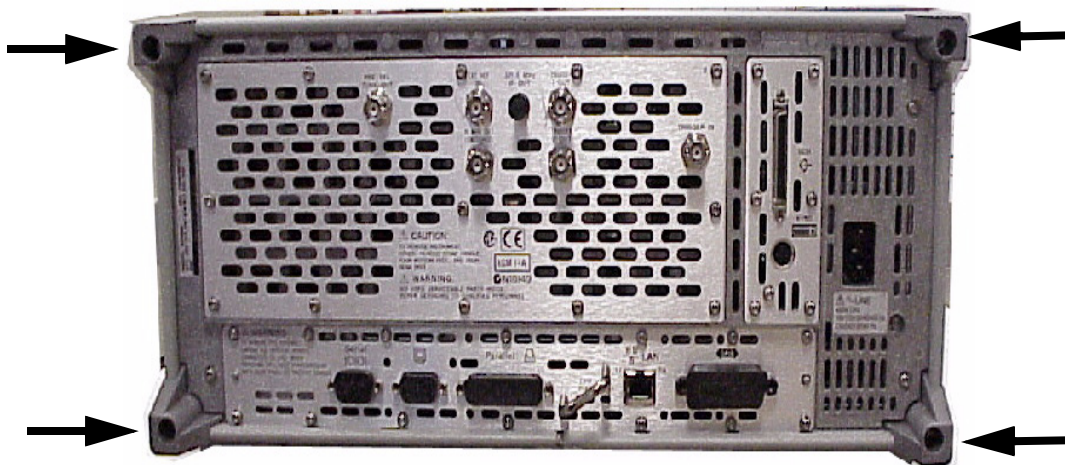
Removing the Feet, Handles and Covers

NOTE Keep all of the hardware (screws, nuts, etc.) for re-use when installing the assemblies.

Follow the steps outlined below to install the Option H37 retrofit kit.

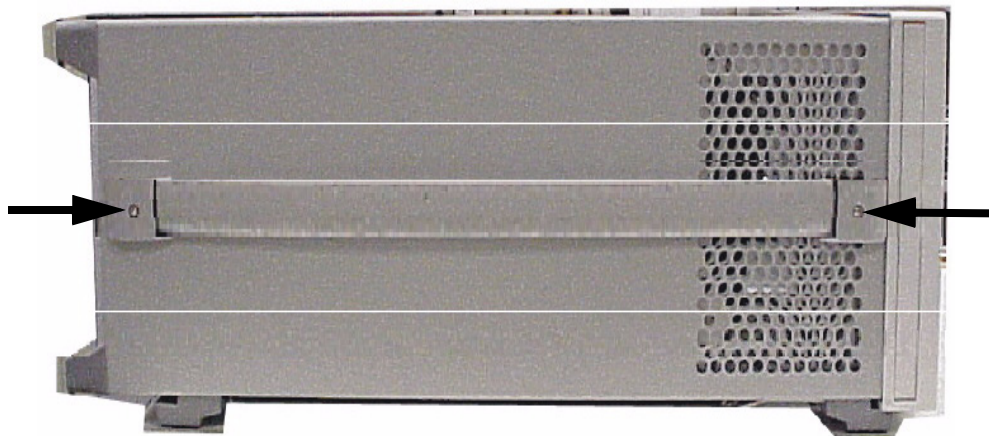
1. Remove the four rear panel feet on the PSA using a #20 Torx driver. Refer to [Figure 1](#). Torque rear panel feet to 21 in-lb when re-installing.

Figure 1 Rear Panel Feet



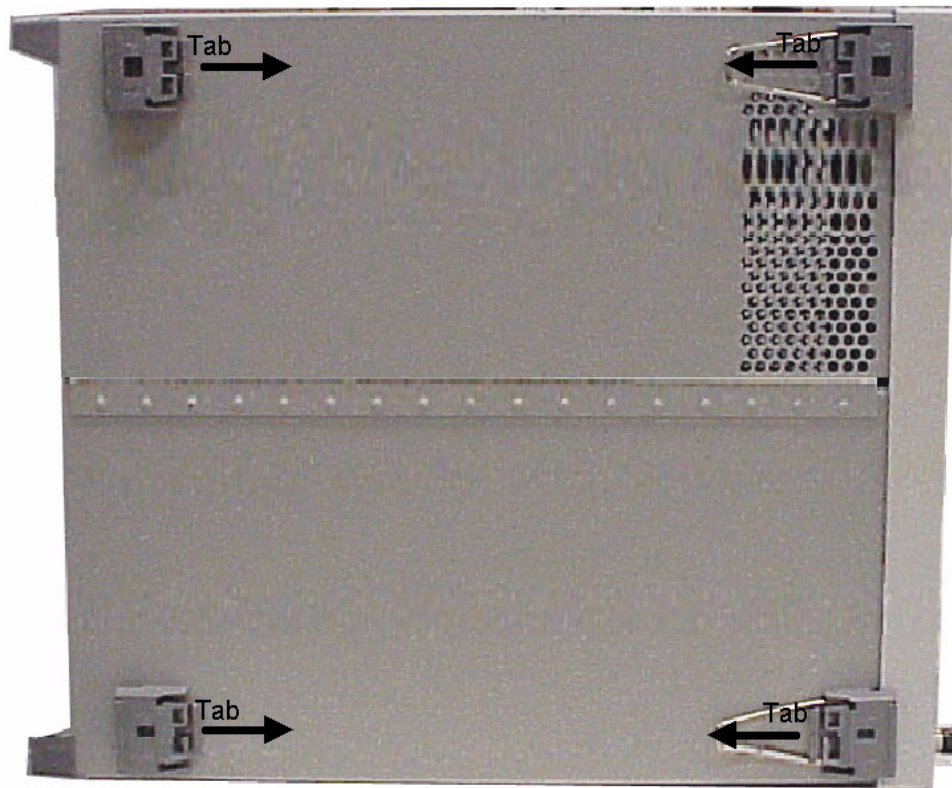
2. Remove the two side handles on the PSA by using a #20 Torx driver. Refer to [Figure 2](#). Torque side handles to 21 in-lb when re-installing.

Figure 2 Side Handles



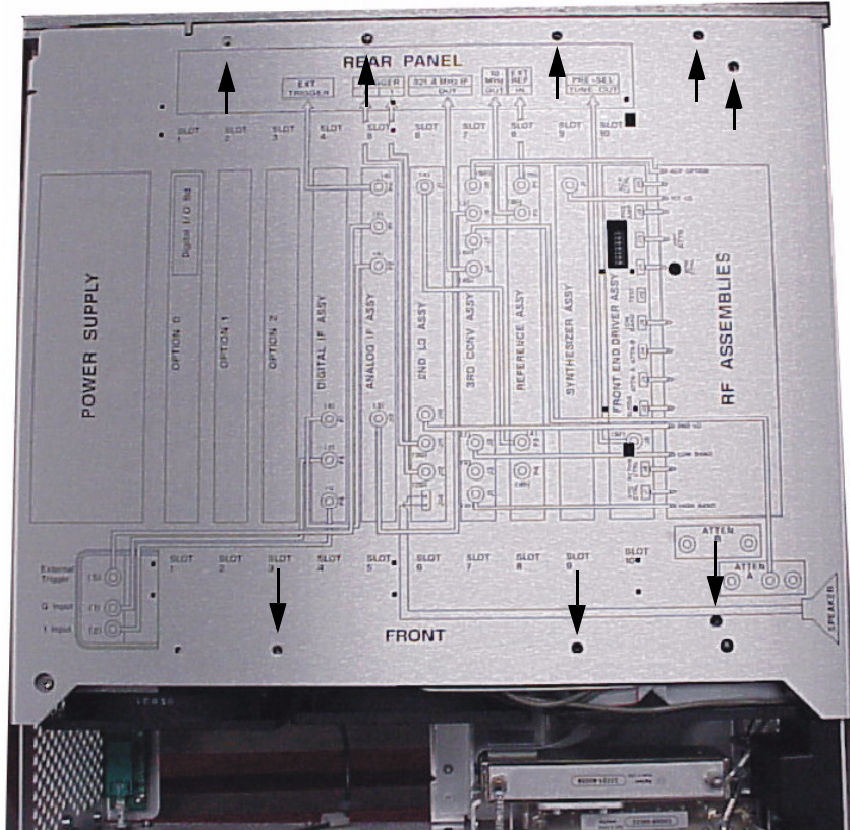
3. Remove the four feet from the bottom of the PSA instrument by pulling the tabs away from the instrument and sliding the feet toward the center of the instrument. Refer to [Figure 3](#).
4. Remove the outside cover by sliding it toward the rear of the instrument.

Figure 3 Bottom Feet Orientation



5. Remove the chassis cover using a #10 Torx driver. There are ten screws to remove from the “speaker” side of the chassis cover and two screws from the “power supply” side of the chassis cover. Place all hardware in a safe location for re-installation. Refer to [Figure 4](#) for location of top screws.

Figure 4 Chassis Cover

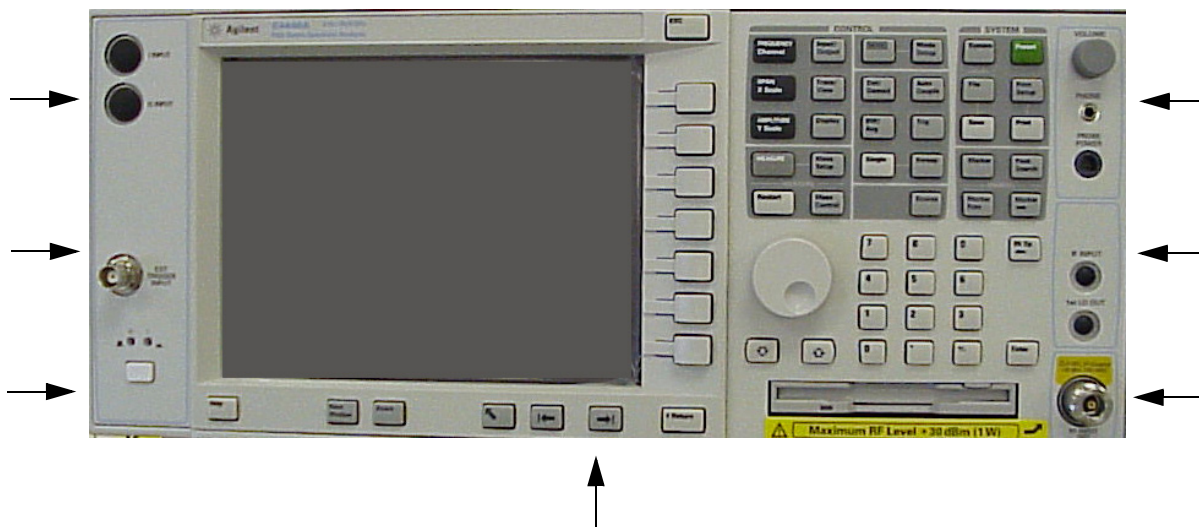


Front Panel

NOTE Keep all of the hardware (screws, nuts, etc.) for re-use when installing the assemblies.

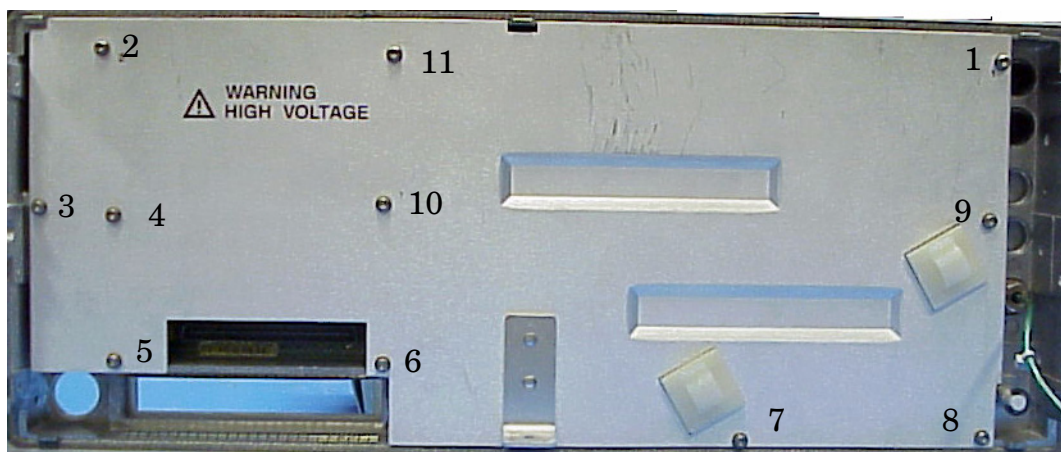
1. Remove the front panel (7 screws).
2. Disconnect the green Ext Trigger Input cable on the Analog IF Assembly (P1) and the front panel ribbon cable.

Figure 5 Front Panel



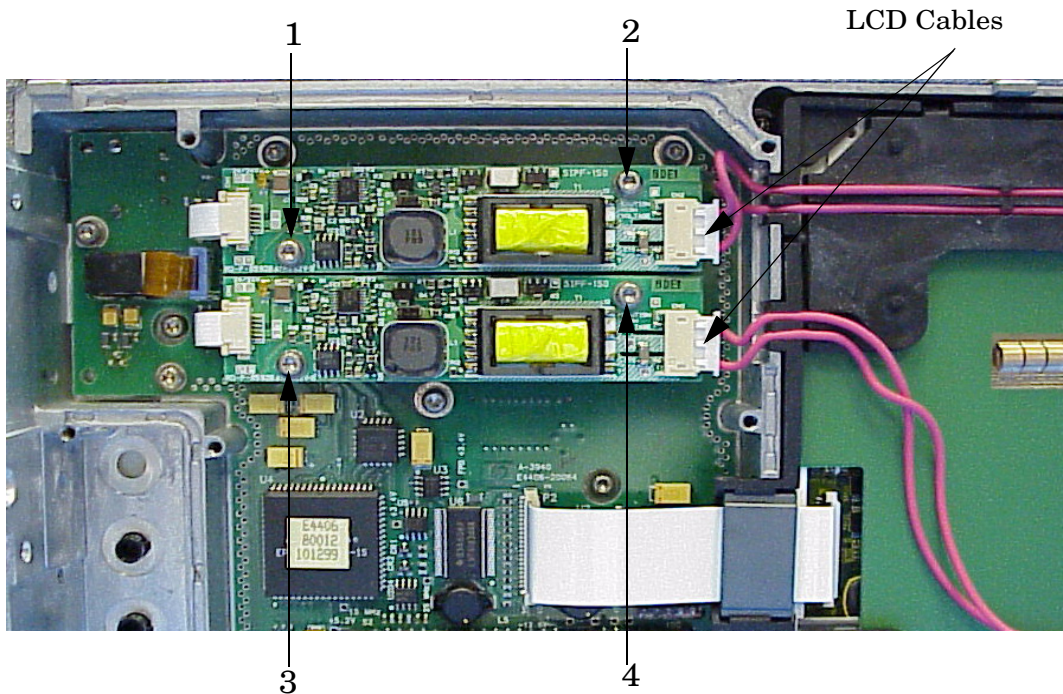
3. Remove the front panel shield (11 screws).

Figure 6 Front Panel Shield Removal



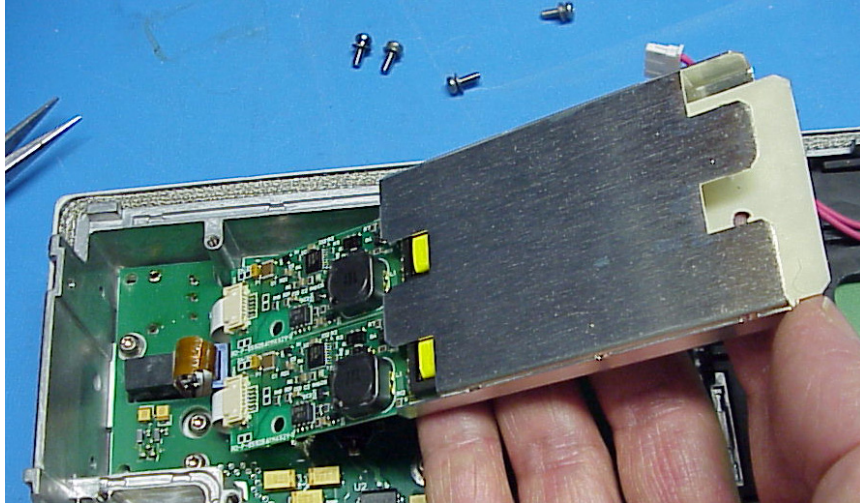
4. Disconnect the two LCD back light cables.
5. Remove the four screws on the two inverter board assemblies.

Figure 7 LCD Cables



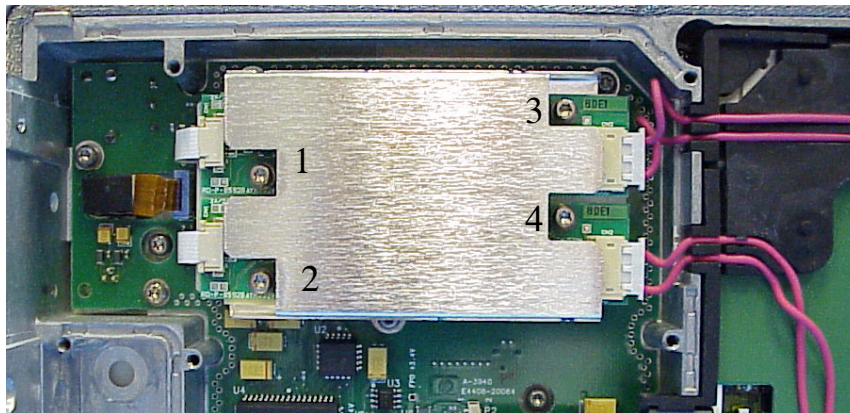
- Pivot the two inverter board assemblies up and slip the inverter shield (E4440-00068) over both of the boards.

Figure 8 Inverter Shield



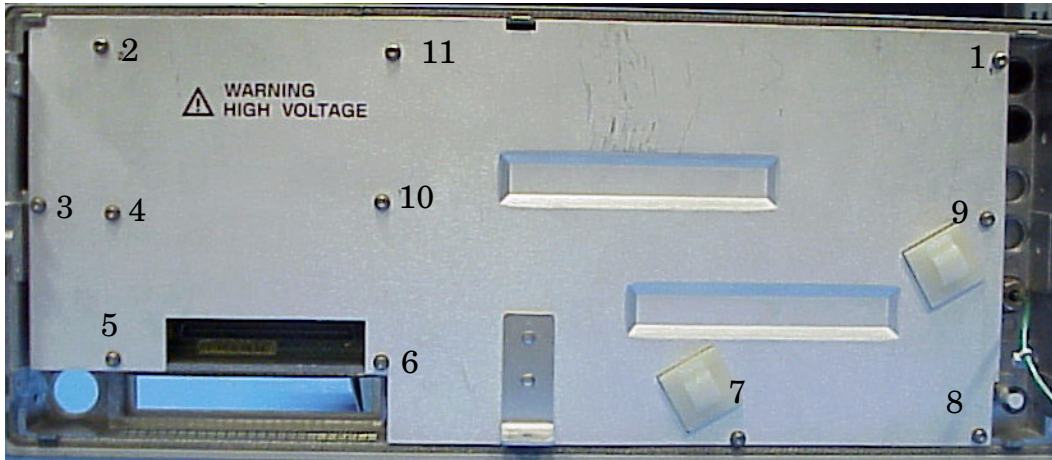
- Position the boards with the shield in place and install the four screws (previously removed) into the boards.
- Connect and dress the two LCD back light cables.

Figure 9 LCD Shield



9. Install the new Option H37 front panel shield (E4440-00067) using the 11 screws that were removed in step 2. Start with the screw in the upper right corner (#1) and then the upper left corner (#2) and continue inserting the remaining screws. Torque to 9 in-lb.

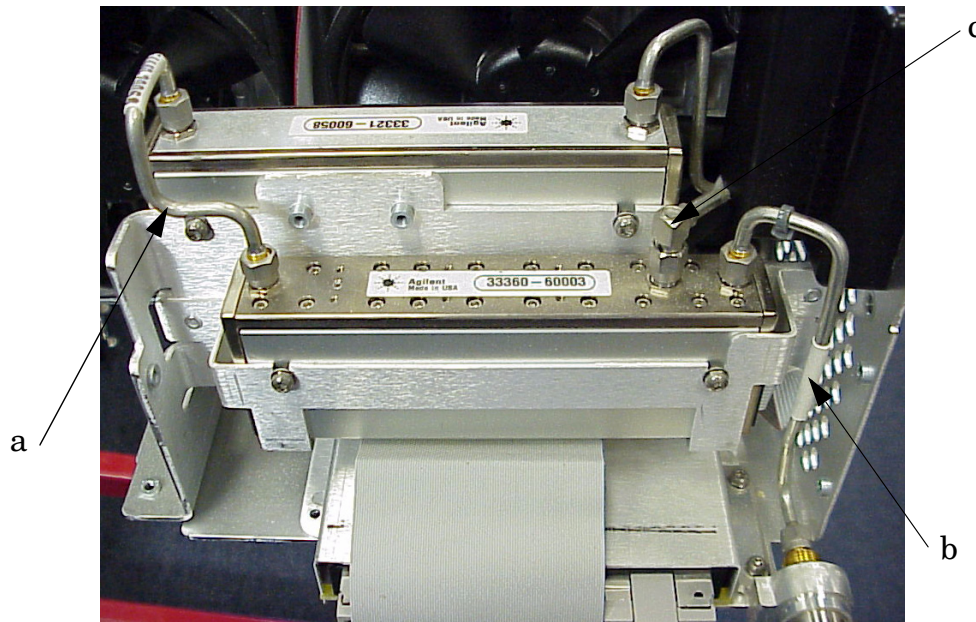
Figure 10 Front Panel Shield Insertion



For Older Instruments Only (E4440A, E4443A and E4445A)

Instruments that have been built recently will have the cables listed below.

10. Remove the three semi-rigid cables on the RF step attenuators (33360-60003 and (33321-60058) and add the following new cables.
 - a. Attenuator 1 to attenuator 2 cable (E4440-20068)
 - b. Input cable (E4440-20067)
 - c. Attenuator 2 cable to rhythm (E4440-20069). Torque to 9 in-lb.

Figure 11 Semi-rigid Cables**All Units**

11. Reconnect the front panel ribbon cable and carefully route the green Ext Trigger Input cable between the two fans and connect it to J5 on the Analog IF board. Refer to [Figure 4, “Chassis Cover.”](#) Install the front panel using the 7 screws that were removed in step 1. Torque to 9 in-lb. Refer to [Figure 4 on page 6.](#)
12. Apply option label “H37” to the rear panel serial tag option field.

Characteristics

The E444xxAU Option H37 reduces the level of residuals in the 37 KHz range. Option H37 provides a kit to reduce the level of residuals in the 37 kHz range by 10 dB. Refer to [Figure 12](#) and [Figure 13 on page 13](#).

Performance Tests and Adjustments

The tests outlined in this section are to verify the operation of the Option H37 and should be used in conjunction with the standard PSA manuals. This section also includes the equipment required.

37 kHz Spur Test

1. Connect a 50Ω load to the PSA RF Input connector.
2. Set the PSA to the following:

CF	37 kHz
Span	10 kHz
Res BW	3 Hz
Video BW	3 Hz

3. Place the Marker on the signal and verify 37 kHz residual has been reduced by 10 dB or greater. See [Figure 12](#) and [Figure 13 on page 13](#) for examples of the improved residuals.

Figure 12 Residuals (before)

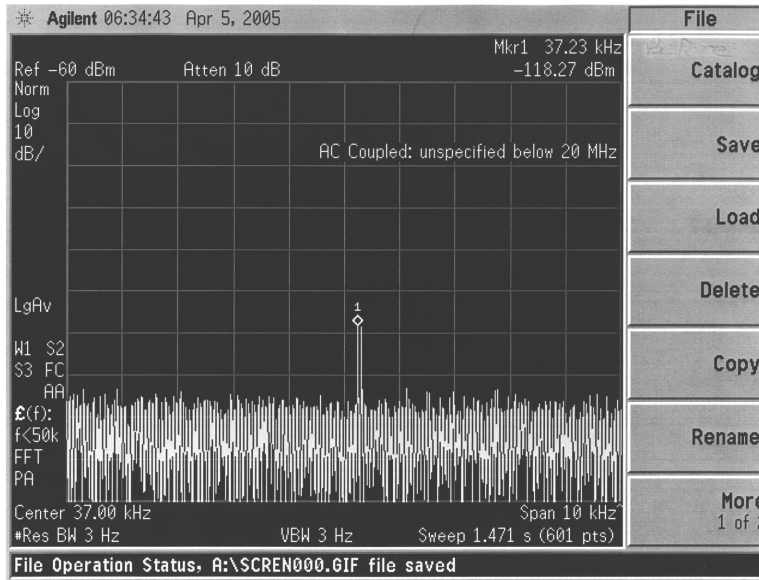
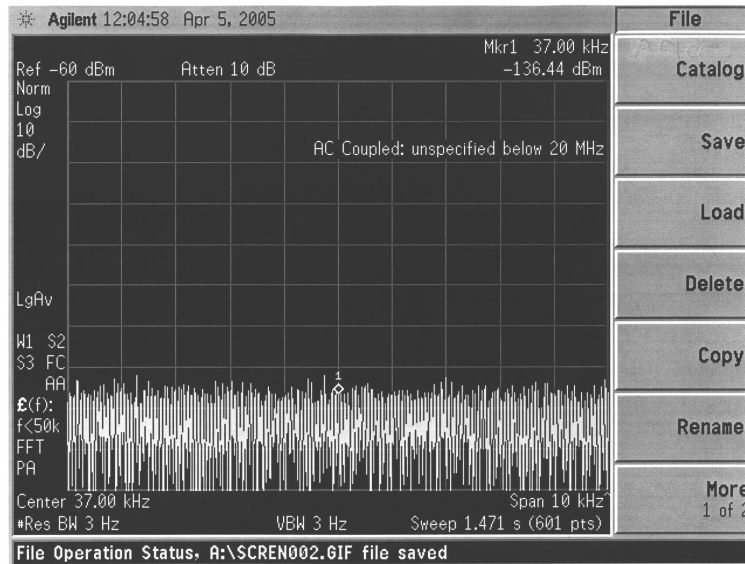


Figure 13 Residuals (after)



Safety and Regulatory Information

Introduction

Review this product and related documentation to familiarize yourself with safety markings and instructions before you operate the instrument. The documentation contains information and warnings that must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

Connector Care and Cleaning

If alcohol is used to clean the connectors, the power cord to the instrument must be removed. All cleaning should take place in a well ventilated area. Allow adequate time for the fumes to disperse and moist alcohol to evaporate prior to energizing the instrument.

Before Applying Power

Verify that the product is configured to match the available main power source. If this product is to be powered by autotransformer, make sure the common terminal is connected to the neutral (grounded) side of the ac power supply.

Shipping Instructions

You must always call the Agilent Technologies Instrument Support Center to initiate service before retuning your instrument to a service office. See [“Contacting Agilent” on page 18](#). Always transport or ship the instrument using the original packaging if possible. If not, comparable packaging must be used. Attach a complete description of the failure symptoms.

Warnings

WARNING **The WARNING notice denotes a hazard. It calls attention to a procedure which if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.**

Warnings applicable to this instrument are:

WARNING **To prevent electrical shock, disconnect the Agilent Technologies model 70429A K16 from mains before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.**

WARNING **If this instrument is not used as specified, the protection provided by the equipment could be impaired. This instrument must be used in a normal condition (in which all means for protection are intact) only.**

WARNING **For continued protection against fire hazard replace line fuse only with same type and rating:**

- **United States—F 0.5A/250V, Part Number 2110-0202**
- **Europe—F 3.15A/250V, Part Number 2110-0655**

The use of other fuses or material is prohibited.

WARNING **This is a Safety Class I product (provided with a protective earthing ground incorporated in the power cord). The mains plug shall be inserted only into a socket outlet provided with a protective earth contact. Any interruption of the protective conductor, inside or outside the product is likely to make the product dangerous. Intentional interruption is prohibited.**

WARNING **These servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing unless you are qualified to do so.**

WARNING **The opening of covers or removal of parts is likely to expose dangerous voltages. Disconnect the instrument from all voltage sources while it is being opened.**

WARNING **This product is designed for use in Installation Category II and Pollution Degree 2 per IEC 61010-1: 2001.**

WARNING **No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers.**

WARNING **If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.**

Cautions

CAUTION The CAUTION notice denotes a hazard. It calls attention to an procedure that, if not correctly performed or adhered to, could result in damage to or destruction of the product. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met

Cautions applicable to this instrument are:







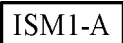




CAUTION Always use the three-prong ac power cord supplied with this instrument. Failure to ensure adequate earth grounding (by not using this cord) can cause instrument damage.

CAUTION This product is designed for use in Installation Category II and Pollution Degree 2 per IEC 61010-1:2001.

CAUTION This instrument has autoranging line voltage input; be sure the supply voltage is within the specified range.

CAUTION Ventilation Requirements: When installing the instrument in a cabinet, the convection into and out of the instrument must not be restricted. The ambient temperature (outside the cabinet) must be less than the maximum operating temperature of the instrument by 4 °C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, forced convection must be used.

Instrument Markings

	When you see this symbol on your instrument, you should refer to the instrument's instruction manual for important information.
	This symbol indicates hazardous voltages.
	The laser radiation symbol is marked on products that have a laser output.
	This symbol indicates that the instrument requires alternating current (ac) input.
	The CE mark is a registered trademark of the European Community. If it is accompanied by a year, it indicates the year the design was proven.
	The CSA mark is a registered trademark of the Canadian Standards Association.
	This text indicates that the instrument is an Industrial Scientific and Medical Group 1 Class A product (CISPR 11, Clause 4).
	This symbol indicates that the power line switch is ON.
	This symbol indicates that the power line switch is OFF or in STANDBY position.
	This symbol indicates the product meets the Australian Standards.
	Safety Earth Ground. This is a Safety Class I product (provided with a protective earthing terminal). An uninterruptible safety earth ground must be provided from the main power source to the product input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, the product must be made inoperative and secured against any unintended operation.

Contacting Agilent

By internet, phone, or fax, get assistance with all your test and measurement needs.

This information supersedes all prior HP contact information.			
Online assistance: www.agilent.com/find/assist			
Americas			
Brazil (tel) (+55) 11 3351 7012 (fax) (+55) 11 3351 7024	Canada (tel) +1 877 894 4414 (fax) +1 303 662 3369	Mexico (tel) 1 800 254 2440 (fax) 1 800 254 4222	United States (tel) 800 829 4444 (alt) (+1) 303 662 3998 (fax) 800 829 4433
Asia Pacific and Japan			
Australia (tel) 1 800 225 574 (fax) 1 800 681 776 (fax) 1 800 225 539	China (tel) 800 810 0508 (alt) 800 810 0510 (fax) 800 810 0507 (fax) 800 810 0362	Hong Kong (tel) 800 933 229 (fax) 800 900 701	India (tel) 1600 112 626 (fax) 1600 112 727 (fax) 1600 113 040
Japan (Bench) (tel) 0120 32 0119 (alt) (+81) 426 56 7799 (fax) 0120 01 2144	Japan (On-Site) (tel) 0120 802 363 (alt) (+81) 426 56 7498 (fax) (+81) 426 60 8953	Singapore (tel) 1 800 275 0880 (fax) (+65) 6755 1235 (fax) (+65) 6755 1214	South Korea (tel) 080 778 0011 (fax) 080 778 0013
Taiwan (tel) 0800 047 669 (fax) 0800 047 667 (fax) 886 3492 0779	Thailand (tel) 1 800 2758 5822 (alt) (+66) 2267 5913 (fax) 1 800 656 336	Malaysia (tel) 1800 880 399 (fax) 1800 801 054	
Europe			
Austria (tel) 0820 87 44 11* (fax) 0820 87 44 22	Belgium (tel) (+32) (0)2 404 9340 (alt) (+32) (0)2 404 9000 (fax) (+32) (0)2 404 9395	Denmark (tel) (+45) 7013 1515 (alt) (+45) 7013 7313 (fax) (+45) 7013 1555	Finland (tel) (+358) 10 855 2100 (fax) (+358) (0) 10 855 2923
France (tel) 0825 010 700* (alt) (+33) (0)1 6453 5623 (fax) 0825 010 701*	Germany (tel) 01805 24 6333* (alt) 01805 24 6330* (fax) 01805 24 6336*	Ireland (tel) (+353) (0)1 890 924 204 (alt) (+353) (0)1 890 924 206 (fax) (+353) (0)1 890 924 024	Israel (tel) (+972) 3 9288 500 (fax) (+972) 3 9288 501
Italy (tel) (+39) (0)2 9260 8484 (fax) (+39) (0)2 9544 1175	Luxemburg (tel) (+32) (0)2 404 9340 (alt) (+32) (0)2 404 9000 (fax) (+32) (0)2 404 9395	Netherlands (tel) (+31) (0)20 547 2111 (alt) (+31) (0)20 547 2000 (fax) (+31) (0)20 547 2190	Russia (tel) (+7) 095 797 3963 (alt) (+7) 095 797 3900 (fax) (+7) 095 797 3901
Spain (tel) (+34) 91 631 3300 (alt) (+34) 91 631 3000 (fax) (+34) 91 631 3301	Sweden (tel) 0200 88 22 55* (alt) (+46) (0)8 5064 8686 (fax) 020 120 2266*	Switzerland (French) (tel) 0800 80 5353 opt. 2* (alt) (+33) (0)1 6453 5623 (fax) (+41) (0)22 567 5313	Switzerland (German) (tel) 0800 80 5353 opt. 1* (alt) (+49) (0)7031 464 6333 (fax) (+41) (0)1 272 7373
Switzerland (Italian) (tel) 0800 80 5353 opt. 3* (alt) (+39) (0)2 9260 8484 (fax) (+41) (0)22 567 5314	United Kingdom (tel) (+44) (0)7004 666666 (alt) (+44) (0)7004 123123 (fax) (+44) (0)7004 444555		
(tel) = primary telephone number; (alt) = alternate telephone number; (fax) = FAX number; * = in country number 11/16/04			