# Agilent Technologies
# E444xA Option HN9

User's and Service Guide Supplement

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## User's and Service Guide Supplement

**Use this manual with the following documents:**

E444xA PSA Series Spectrum Analyzer's User's
and Programmer's Guide

Agilent Technologies

**Manufacturing Part Number: Part Number E4440-90557**

**Printed in USA**
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## Notice

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## Certification

Agilent Technologies, Inc. certifies that this product met its published specifications at the time of shipment from the factory. Agilent Technologies, Inc. further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by the Institute's calibration facility, and to the calibration facilities of other International Standards Organization members.

## Safety and Regulatory Information

The safety and regulatory information pertaining to this product is located in “Safety and Regulatory Information” on page 7.

## Assistance

Product maintenance agreements and other customer assistance agreements are available for Agilent Technologies, Inc. products. For information about these agreements and for other assistance, contact Agilent. Refer to “Contacting Agilent” on page 11.

# Safety Notes

The following safety notes are used throughout this manual. Familiarize yourself with each of the notes and its meaning before operating this instrument. All pertinent safety notes for using this product are located in "Safety and Regulatory Information" on page 7.

| | |
|---|---|
| **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. |

# Contents

# Contents

# Overview

# Introduction

The Agilent Technologies Performance Spectrum Analyzer E444xA Option HN9 provides a wide bandwidth IF output to the rear panel for RF input signals below 3.050 GHz. The center frequency is 321.4 MHz with a bandwidth of at least 80 MHz.

# Verifying the Shipment

After the instrument has been unpacked, keep the original packaging materials so they can be used if you need to transport the instrument.

Inspect the instrument and all accessories for any signs of damage that may have occurred during shipment. If your instrument or any accessories appear to be damaged or missing refer to “Contacting Agilent” on page 11.

# System Verification

Execute the following procedures to verify that the E444xA Spectrum Analyzer Option HN9 performs to listed specifications.

## Equipment Needed

- Signal Source - must be able to sweep a CW signal.
- Spectrum Analyzer #2- will be connected to 321.4 MHz IF Out.

## Connections

1. Connect the Signal Source to the RF Input of the PSA with Option HN9 (DUT).

2. On rear panel of the (DUT) connect the 321.4 MHz IF Out to the RF Input of the Spectrum Analyzer #2.

## Settings

1. Set the Signal Source Start Frequency to 925 MHz and the Stop Frequency to 1075 MHz and an Amplitude of –10 dBm.

2. Set E444xA HN9 Center Frequency to 1 GHz, 0 Hz Span.

3. Set Spectrum Analyzer #2 Center Frequency to 321.4 MHz, span 200 MHz. Set the Resolution Bandwidth to 3 MHz at 5 dB/div.

4. Set Max Hold on Spectrum Analyzer #2. Allow several sweeps to capture the bandwidth of signal.

5. Press Peak Search to place marker at peak of signal trace. Press Marker Δ and position movable marker 3 dB down from the stationary marker on the positive-going edge of the signal trace (the Marker Δ amplitude readout should be –3 dB.

6. Press Marker Δ and position movable marker 3 dB down from the signal peak on the negative-going edge of trace (the Marker Δ amplitude readout should be 0.00 dB. The 3 dB bandwidth is given by the Marker Δ frequency readout.

## Results

The 3 dB bandwidth at the 321.4 MHz IF Port should be greater than 80 MHz. Nominal values are in the 90 MHz range.

# Command Interface

Use the following command[1] to improve the Bandpass Flatness response out the rear panel of the PSA.

## Command Interface Example with FW Rev. A.04.07

To turn on the command for improving Bandpass Flatness, type:

**INPut: MIXer: TYPE UNPReselect,0**[1]

To turn off the command, type:

**INPut: MIXer: TYPE PRESelected,0**

## Command Interface Example with FW Rev. greater than A.04.07

To turn on the command for improving Bandpass Flatness, type:

**[:SENSe]:POWer[:RF]:PRESelector UNPReselect,0**[1]

To turn off the command, type:

**[:SENSe]:POWer[:RF]:PRESelector PRESelected,0**

## Error Message on Screen

When the above command for the Option HN9 is entered over the GPIB, the front panel display will show the following message in the lower portion of the LCD window. This is not an error.


**NOTE** **If your instrument is equipped with other IF Output options (e.g., H70 or HB2) the HN9 IF Output Bandwidth characteristics will supersede.**

**NOTE** **Since the output is not preselected, mixing products and spurs will be present in the output IF signal.**

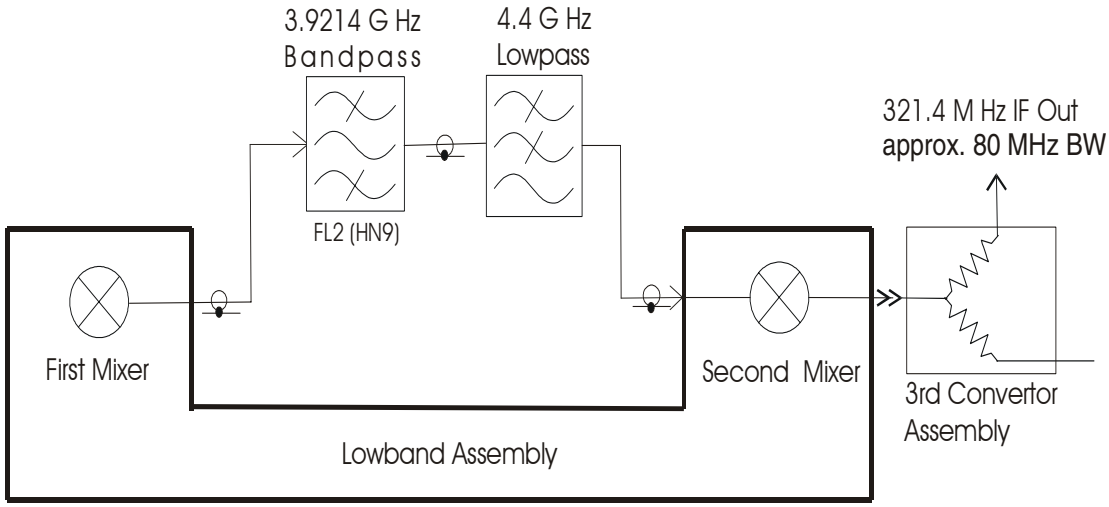
1. When the command is turned on, the IF signal is only routed to the rear panel; the signal cannot be measured by the digital IF of the PSA.

# Replaceable Parts

Use the table below for a list of replaceable parts for the E444xA Spectrum Analyzer Option HN9.

| Description | Agilent Part Number | Qty |
|---|---|---|
| 3.9214 GHz Bandpass Filter | 0955-1529 | 1 |
| 4.4 GHz Low pass Filter | 0955-0519 | 1 |
| Cable | E4446-20047 | 1 |
| Cable | E4446-20048 | 1 |
| E444xA HN9 User's and Service Guide | E4440-90557 | 1 |

**Figure 1 RF Block Diagram**



# Safety and Regulatory Information

## Introduction

Review this product and related documentation to familiarize yourself with safety markings and instructions before you operate the instrument. This product has been designed and tested in accordance with international standards.

## 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 11. 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.

## 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.

## Warnings

**WARNING** **The WARNING notice denotes a hazard. It calls attention to a procedure, practice, or the like, 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** **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 3A/250V, Part Number 2110-0780**
**• 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 instrument, is likely to make the instrument dangerous. Intentional interruption is prohibited.**

**WARNING** **The power cord is connected to internal capacitors that may retain dangerous electrical charges for 5 seconds after disconnecting the plug from its power supply.**

**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 1010 and 664 respectively.**

## Cautions

**CAUTION** The CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like, which if not correctly performed or adhered to, could result in damage to the product or loss of important data. 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 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. |
| ISM1-A | This text indicates that the instrument is an Industrial Scientific and Medical Group 1 Class A product (CISPER 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.

| **Online assistance:** www.agilent.com/find/assist | | | |
|---|---|---|---|
| **Americas** | | | |
| **Brazil**<br>*(tel)* (+55) 11 4197 3600<br>*(fax)* (+55) 11 4197 3800 | **Canada**<br>*(tel)* 877 894 4414<br>*(fax)* (+1) 905 282-6495 | **Mexico**<br>*(tel)* (+52) 55 5081 9469<br>*(alt)* 01800 5064 800<br>*(fax)* (+52) 55 5081 9467 | **United States**<br>*(tel)* 800 829 4444<br>*(alt)* (+1) 303 662 3998<br>*(fax)* 800 829 4433 |
| **Asia Pacific and Japan** | | | |
| **Australia**<br>(*tel*) 1800 629 485<br>(*alt*) 1800 143 243<br>(*fax*) 1800 142 134 | **China**<br>(*tel*) 800 810 0189<br>(*alt*) (+86) 10800 650 0021<br>(*fax*) 800 820 2816 | **Hong Kong**<br>(*tel*) 800 930 871<br>(*alt*) (+852) 3197 7889<br>(*fax*) (+852) 2 506 9233 | **India**<br>(*tel*) 1600 112 929<br>(*fax*) 000800 650 1101 |
| **Japan**<br>(*tel*) 0120 421 345<br>(*alt*) (+81) 426 56 7832<br>(*fax*) 0120 421 678 | **Malaysia**<br>(*tel*) 1800 888 848<br>(*alt*) 1800 828 848<br>(*fax*) 1800 801 664 | **Singapore**<br>(*tel*) 1800 375 8100<br>(*alt*) (+65) 6 375 8100<br>(*fax*) (+65) 6836 0252 | **South Korea**<br>(*tel*) 080 769 0800<br>(*alt*) (+82) 2 2004 5004<br>(*fax*) (+82) 2 2004 5115 |
| **Taiwan**<br>(*tel*) 0800 047 866<br>(*alt*) 00801 651 317<br>(*fax*) 0800 286 331 | **Thailand**<br>(*tel*) 1800 226 008<br>(*alt*) (+66) 2 268 1345<br>(*fax*) (+66) 2 661 3714 | | |
| **Europe** | | | |
| **Austria**<br>(*tel*) 0820 87 44 11*<br>(*fax*) 0820 87 44 22 | **Belgium**<br>(*tel*) (+32) (0)2 404 9340<br>(*alt*) (+32) (0)2 404 9000<br>(*fax*) (+32) (0)2 404 9395 | **Denmark**<br>(*tel*) (+45) 7013 1515<br>(*alt*) (+45) 7013 7313<br>(*fax*) (+45) 7013 1555 | **Finland**<br>(*tel*) (+358) 10 855 2100<br>(*fax*) (+358) 10 855 2923 |
| **France**<br>(*tel*) 0825 010 700*<br>(*alt*) (+33) (0)1 6453 5623<br>(*fax*) 0825 010 701* | **Germany**<br>(*tel*) 01805 24 6333*<br>(*alt*) 01805 24 6330*<br>(*fax*) 01805 24 6336* | **Ireland**<br>(*tel*) (+353) (0)1 890 924 204<br>(*alt*) (+353) (0)1 890 924 206<br>(*fax*)(+353) (0)1 890 924 024 | **Israel**<br>(*tel*) (+972) 3 9288 500<br>(*fax*) (+972) 3 9288 501 |
| **Italy**<br>(*tel*) (+39) (0)2 9260 8484<br>(*fax*) (+39) (0)2 9544 1175 | **Luxemburg**<br>(*tel*) (+32) (0)2 404 9340<br>(*alt*) (+32) (0)2 404 9000<br>(*fax*) (+32) (0)2 404 9395 | **Netherlands**<br>(*tel*) (+31) (0)20 547 2111<br>(*alt*) (+31) (0)20 547 2000<br>(*fax*) (+31) (0)20 547 2190 | **Russia**<br>(*tel*) (+7) 095 797 3963<br>(*alt*) (+7) 095 797 3900<br>(*fax*) (+7) 095 797 3901 |
| **Spain**<br>(*tel*) (+34) 91 631 3300<br>(*alt*) (+34) 91 631 3000<br>(*fax*) (+34) 91 631 3301 | **Sweden**<br>(*tel*) 0200 88 22 55*<br>(*alt*) (+46) (0)8 5064 8686<br>(*fax*) 020 120 2266* | **Switzerland (French)**<br>(*tel*) 0800 80 5353 opt. 2*<br>(*alt*) (+33) (0)1 6453 5623<br>(*fax*) (+41) (0)22 567 5313 | **Switzerland (German)**<br>(*tel*) 0800 80 5353 opt. 1*<br>(*alt*) (+49) (0)7031 464 6333<br>(*fax*) (+41) (0)1 272 7373 |
| **Switzerland (Italian)**<br>(*tel*) 0800 80 5353 opt. 3*<br>(*alt*) (+39) (0)2 9260 8484<br>(*fax*) (+41) (0)22 567 5314 | **United Kingdom**<br>(*tel*) (+44) (0)7004 666666<br>(*alt*) (+44) (0)7004 123123<br>(*fax*) (+44) (0)7004 444555 | | |
| *(tel)* = primary telephone number; *(alt)* = alternate telephone number; *(fax)* = FAX number; * = in country number | | | |