S E R V I C E N O T E

SUPERSEDES: E4422B-03A

ESG "B" Series RF Signal Generator

Defective 1 GHz VCO on the reference board (A11) displays Error 513 "Het band VCO Unlock" and causes frequency inaccuracy below 250 MHz.

Serial Numbers:

E4400B-03B	US38440487-US39340708 & GB38450200-GB39340269
E4420B-02B	US38440519-US39340719 & GB38450272-GB39340313
E4421B-02B	US38440535-US39340832 & GB38450457-GB39340827
E4422B-02B	US38440334-US39340523 & GB38450127-GB39340228
E4430B-02B	US38440217-US39340294 & GB38450163-GB39340178
E4431B-02B	US38440257-US39340403 & GB38450249-GB39340275
E4432B-02B	US38441439-US39342082 & GB38450432-GB39340694
E4433B-01B	US38440755-US39341087 & GB38450413-GB39340593

To Be Performed By: Agilent Technologies-Qualified Personnel and customers capable of running the Agilent ESG Service Software.

Parts Required:

P/N	Description	Quantity
E4400-60244	Pre-tested 1 GHz VCO	1

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DATE: August 2000

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION:

MODIFICATION RECOMMENDED

ACTION CATEGORY:	☐ IMMEDIATELY ■ ON SPECIFIED FAILURE ☐ AGREEABLE TIME	STANDARDS: LABOR 40 min assy, 30 min test Hours			
LOCATION CATEGORY:	■ CUSTOMER INSTALLABLE ■ ON-SITE ■ SERVICE CENTER	SERVICE INVENTORY:	☐ RETURN ☐ SCRAP ■ SEE TEXT	USED PARTS:	☐ RETURN ☐ SCRAP ■ SEE TEXT
AVAILABILITY:	PRODUCT'S SUPPORT LIFE	AGILENT RESPONSIBLE UNTIL: Support Life			
AUTHOR: SN	ENTITY: 5923	ADDITIONAL INFORMATION:			

Agilent Technologies

Tools, Equipment and Manuals Required:

-ESG Family Signal Generators Service Guide
-ESG Family Signal Generators Calibration Guide
-ESG Family Service Software
-T-8 TORX screwdriver
-T-15 TORX screwdriver
-T-20 TORX screwdriver
-soldering tools
-Agilent 8563E Spectrum Analyzer
-Agilent 8491B Option 010 Attenuator (10 dB)

Situation

The ESG-B Family of Signal Generators has been experiencing failures in the reference board modules with part numbers E4400-60139 and E4400-60140. This is due to the failure of the 1 GHz VCO which causes the ESG to display Error 513 "Het band VCO Unlock". Due to the existance of this problem, a corrective action was taken on February 7, 2000. However, the initial corrective action needs to be modified. All ESG's, with reference boards E4400-60139 and E4400-60140, and serial numbers mentioned above, may experience Error 513. If this error occurs, the 1 GHz VCO needs to be replaced. As a consequence, the ESG-B population with affected VCOs will decrease significantly if we provide the service centers and customers with the means to replace the 1 GHz VCO and not the entire reference module. The Pre-tested 1 GHz VCO pn E4400-60244 is available on CPL and should be treated as a warranty repair. To order, provide the model and serial number of the ESG, and the part number of the reference board. Also reference this service note as "Error 513". These information will ensure the ESG fits into the suspected range of defective 1 GHz VCOs.

Solution:

The resolution plan consists of the following:

1. Repair on failure.
2. Prevent future occurances of Error 513 by repairing the ESG in advance. When the ESG is returned for service or calibration,check for the following criteria:

    -ESG's serial number falls within range mentioned above.

    -ESG's reference board number is E4400-60139 or E4400-60140.

    -ESG has not been treated for defect "Error 513".

If all three criteria are true, replace 1 GHz VCO. Otherwise, no prevention is necessary.

Replace the defective 1 GHz VCO with p/n E4400-60244 and do the "Nonharmonics" performance test in accordance to the Calibration Guide (Refer to "Nonharmonics" "Performance tests" procedure on Calibration Guide). If the customer is capable of running the ESG Service Software, repair may be performed by following the instructions below, otherwise ship failed units to Agilent Technologies customer service center as described in the routing guide.

Instructions for removing and replacing the 1 GHz VCO pn E4400-60244, and for calibrating the ESG:

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Removal:

1. Remove Reference Board Assembly A11. (Refer to "Daughterboard Card Cage Boards" replacement procedure on Service Guide.)
2. Remove 1 GHz VCO from Reference Board.

   - Remove the RF shield by removing the 15 screws. Use a T-15 TORX screwdriver.
   - Locate the 1 GHz VCO on the Reference Board. It is referenced as "FL100".
   - Remove the VCO by unsoldering the leads of the VCO from the Reference board.

NOTE:

Remove any excess solder from the Reference board

Replacement:

1. Insert the new 1 GHz VCO (part number E4400-60244) into the Reference board. Make sure it is oriented with the correct pin configuration.

NOTE:

The black dot, on the bottom left hand side of the VCO, denotes pin 1.

2. Solder the VCO's leads to the Reference board.
3. Reassemble the RF shield and torque all 15 T-15 TORX screws to 9 in-lbs

NOTE:

Make sure EMI gasket is properly fitted between RF shields.

NOTE:

Carefully reassemble RF shield to prevent damage on circuit board.

4. Reverse the removal procedure and torque all T-8 TORX screws to 9 in-lbs.

Calibration & Verification:

1. Run the "Nonharmonics" performance test using the ESG Family Service Software. (Refer to "Nonharmonics" "Performance tests" procedure on Calibration Guide).
2. Turn on power to the ESG and let it warm up for at least 5 minutes. Clear the error messages in the queue by pressing Utility Error Info Clear Error Queue.
3. Cycle the power to the ESG.

   -The UNLOCK annunciator should not be displayed.

   -There should be no error messages associated with Error 513.

4. On the ESG, generate a CW below 250 MHz. Use a Spectrum Analyzer to view the signal. There should be no residual FM.