Compliance Testing, LLC
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Test Report

Prepared for: Wulfsberg Electronics Division

Model: RT-5000

Description: 29.7 MHz to 960 MHz Tactical Airborne Transceiver

To

FCC Parts 80 & 87

Date of Issue: September 5, 2013

On the behalf of the applicant:	**Wulfsberg Electronics Division** **6400 Wilkinson Drive** **Prescott, AZ 86301**
Attention of:	**Jim Buehring, Certification Manager** **Ph: (928) 708-1550** **E-Mail: jim.buehring@cobham.com**

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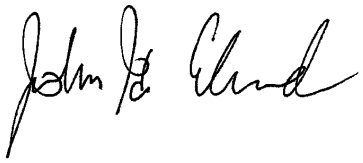
Project No: p12a0008



John Erhard
Project Test Engineer

Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	November 30, 2012	John Erhard	Original Document
2.0	August 5, 2013	Jennifer Sanchez	Class II Permissive Change to add Parts 80/87
3.0	August 14, 2013	Jennifer Sanchez	Update table 3 configuration
4.0	August 22, 2013	Jennifer Sanchez	Update table 3 configuration
5.0	September 5, 2013	Jennifer Sanchez	Remove 151.95MHz data

This Table serves to define the FCC ID numbers regarding the optional RF sub-assemblies included with the main transceiver. In the table below there are twelve combinations of these optional RF assemblies.
Part numbers can differentiate both hardware configuration and software features.
Part numbers that match the hardware combination in the following table with be identified with the FCC ID listed in the table.

This test report contains the full test suite for all optional combinations for the indicated FCC ID.

Table 1 – FCC ID Defining RF Sub-Assemblies Installed

	Installed Options, Part Numbers and Frequency Range				
FCC ID	Base Transceiver Module **(118.05MHz, 127.50MHz, 136.95MHz, 156.3000MHz, 157.4250MHz, 161.775MHz)**	246-049664-01, 02, 04, 24, & 25 **(136–174 MHz)**	246-049664-05, 08, 10, & 26 **(380–470 MHz)**	246-049664-11, 12, 14, 15, 16, 23, & 27 **(450-520 MHz)**	246-049664-21, 22, 28, & 29 **(764-870 MHz)**
FRWRT-5000P-01	1 each				
FRWRT-5000P-02	2 each				
FRWRT-5000P-03	1 each				1 each
FRWRT-5000P-04	1 each			1 each	
FRWRT-5000P-05	1 each		1 each		
FRWRT-5000P-06	1 each	1 each			
FRWRT-5000P-07	1 each			1 each	1 each
FRWRT-5000P-08	1 each		1 each		1 each
FRWRT-5000P-09	1 each	1 each			1 each
FRWRT-5000P-10	1 each		1 each	1 each	
FRWRT-5000P-11	1 each	1 each		1 each	
FRWRT-5000P-12	1 each	1 each	1 each		

*__Note:__ This table is meant to clearly list the RF module (Base Transceiver) which controls the Part 80/87 frequencies. The Base Transceiver module is also approved under Part 90. RF part numbers operating in frequencies 136-174MHz, 380-470MHz, 450-520MHz & 764-870MHz have been approved under Parts 90/22. Please refer to original Part 90/22 test report “p12a0008_FCC Part 22_80_90_Rev 3.0” for details.

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ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009)

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

Please refer to http://www.compliancetesting.com/labscope.html for current scope of accreditation.

Testing Certificate Number: **2152.01**

FCC OATS Reg, #933597

IC Reg. #2044A-1

Non-accredited tests contained in this report:

N/A

The Applicant has been cautioned as to the following:

15.21: **Information to the User**

The user's manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a): **Special Accessories**

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without an additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Test and Measurement Data
Sub-part
2.1033(c)(14):

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II, Part 2, Sub-part J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1079, 2.1051, 2.1053, 2.1055, 2.1057, and the following individual Parts: 80, and 87.

Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing.

In accordance with ANSI/C63.4-2009, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104°F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Environmental Conditions		
Temp (ºC)	**Humidity (%)**	**Pressure (mbar)**
20.4 - 23.3	23.4 - 24.5	974 - 980

Measurement results, unless otherwise noted, are worst-case measurements.

EUT Description

Model: RT-5000
Description: 29.7 to 960 MHz Tactical Airborne Transceiver
Firmware: N/A
Software: N/A

Additional Information:

None

EUT Operation during Tests

The EUT was in a normal operating condition.

Accessories: None

Cables: None

Modifications: None

Test Result Summary

Specification	Test Name	Pass, Fail, N/A	Comments
2.1046	Carrier Output Power (Conducted)	Pass	
2.1051	Unwanted Emissions (Transmitter Conducted)	Pass	
2.1053	Field Strength of Spurious Radiation	Pass	
80.205, 87.135	Emission Masks (Occupied Bandwidth)	Pass	
2.1047	Audio Low Pass Filter (Voice Input)	Pass	
2.1047	Audio Frequency Response	Pass	
2.1047(a)	Modulation Limiting	Pass	
87.133	Frequency Stability (Temperature Variation)	Pass	
87.133	Frequency Stability (Voltage Variation)	Pass	
RSS-Gen	Receiver Spurious Emissions	Pass	
2.202	Necessary Bandwidth Calculation	Pass	

Frequency Test List and Rule Section Summary Table

Frequency (MHz)	FCC Rule Section(s)	IC Rule Section(s)	Emissions Designator	FCC Extended Frequency
118.05	87	RSS-141	6K00A3E	
127.50	87	RSS-141	6K00A3E	
136.95	87	RSS-141	6K00A3E	
161.775	80	RSS-119	8K10F1E	
	80	RSS-119	8K10F1D	
	80	RSS-119	11K0F3E	
		RSS-119	16K0F3E (RSS-119 Only)	
156.3000	87		16K0F3E	
	87		11K0F3E	
157.4250	87		16K0F3E	
	87		11K0F3E	
Frequency (MHz)	**FCC Rule Section(s)**	**IC Rule Section(s)**	**Emissions Designator**	**FCC Extended Frequency**
MTM 161.775	80	RSS-119	8K10F1E	
	80	RSS-119	8K10F1D	
	80	RSS-119	11K0F3E	
		RSS-119	16K0F3E (RSS-119 Only)	

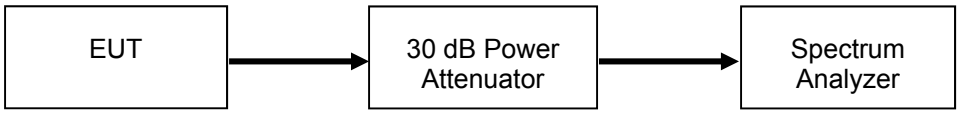
Carrier Output Power (Conducted)

Name of Test:	Carrier Output Power (Conducted)	**Engineer:** John Erhard
Test Equipment Utilized:	i00331	**Test Date:** 11/16/2012

Measurement Procedure

The Equipment Under Test (EUT) was connected to a spectrum analyzer through a 30 dB power attenuator. The cable and attenuator losses were input into the spectrum analyzer as a reference level offset to ensure accurate reading were obtained. The peak readings were taken and the result was then compared to the limit. Multiple frequencies per rule section and frequency band were tested ensuring compliance across all operational rule sections.

Test Setup



Transmitter Output Power

Tuned Frequency (MHz)	Recorded Measurement (dBm)	Recorded Measurement (Watts)	Result
118.05	42.15	16.41	Pass
127.50	42.61	18.24	Pass
136.95	42.79	19.01	Pass
161.775	40.56	11.38	Pass
156.3000	40.72	11.80	Pass
157.4250	40.70	11.75	Pass
MTM 161.775	41.65	14.62	Pass

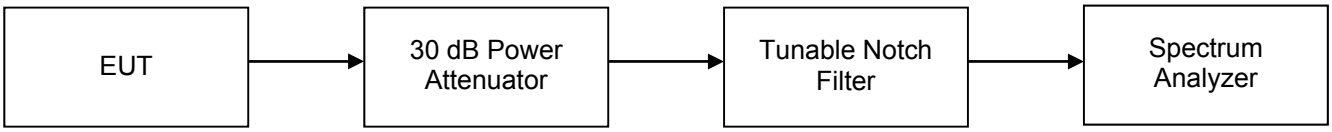
Conducted Spurious Emissions

Name of Test:	Conducted Spurious Emissions	**Engineer:** John Erhard
Test Equipment Utilized:	i00331, i00124, i00126, i00364	**Test Date:** 11/19/2012

Test Procedure

The EUT was connected to a spectrum analyzer through a 30 dB power attenuator to verify that the UUT met the requirements for spurious emissions. A tunable notch filter was utilized to ensure the fundamental did not put the spectrum analyzer into compression. The reference level was adjusted to ensure the system had sufficient dynamic range to measure spurious emissions. The frequency range from 25 MHz to the 10th harmonic of the fundamental transmitter was observed and plotted. Multiple frequencies per rule section and frequency band were tested ensuring compliance across all operational rule sections.

Test Setup



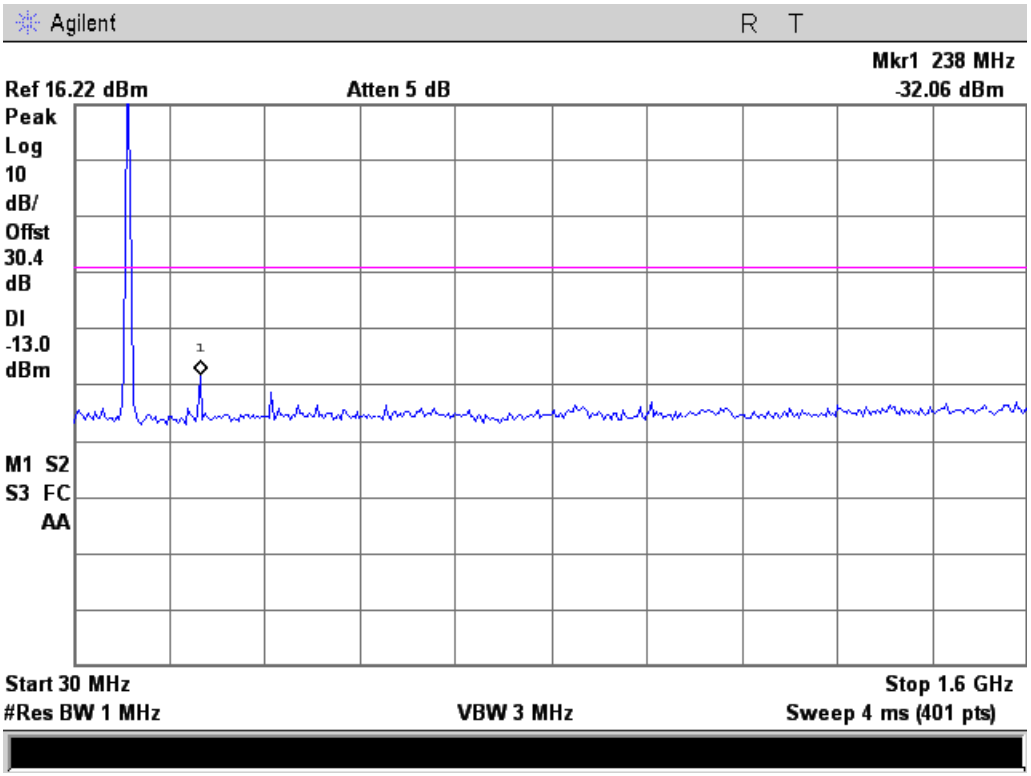
Conducted Spurious Emissions Summary Test Table

Tuned Frequency (MHz)	Spurious Frequency (MHz)	Measured Spurious Level (dBm)	Specification Limit (dBm)	Result
118.05	238.0	-32.06	-13	Pass
127.50	254.0	-29.56	-13	Pass
136.95	273.0	-29.12	-13	Pass
161.775	50.0	-35.91	-13	Pass
156.3000	607.0	-36.14	-13	Pass
157.4250	317.0	-36.26	-13	Pass

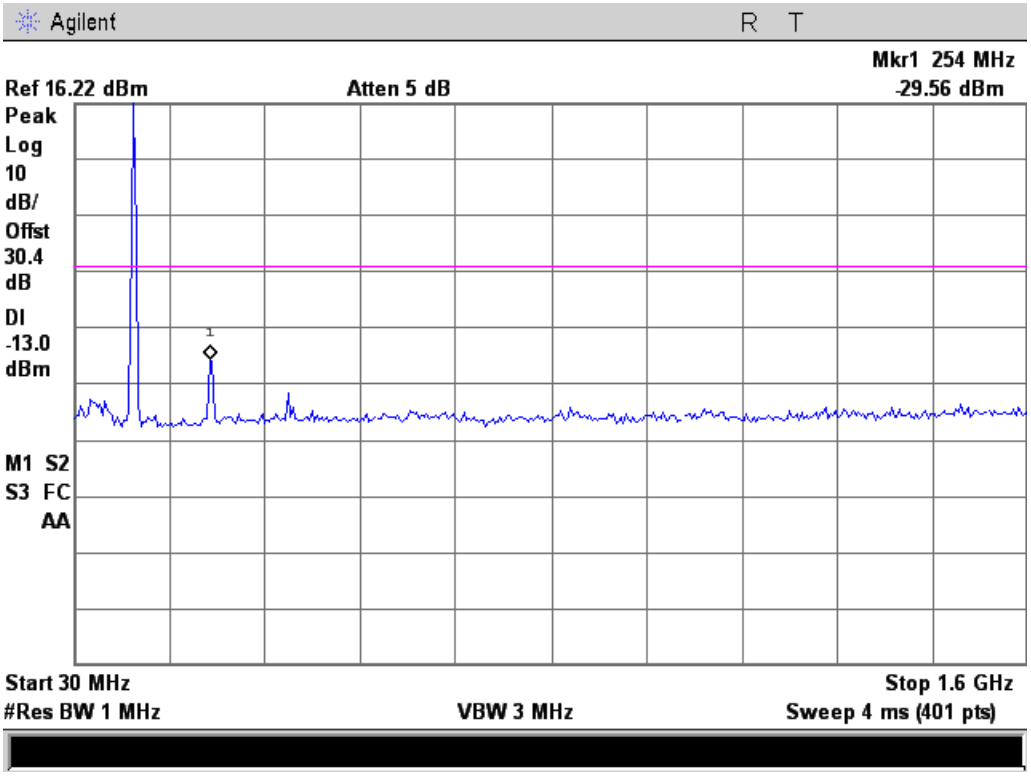
Tuned Frequency (MHz)	Spurious Frequency (MHz)	Measured Spurious Level (dBm)	Specification Limit (dBm)	Result
MTM 161.775	1457.0	-28.93	-13	Pass

Test Plots

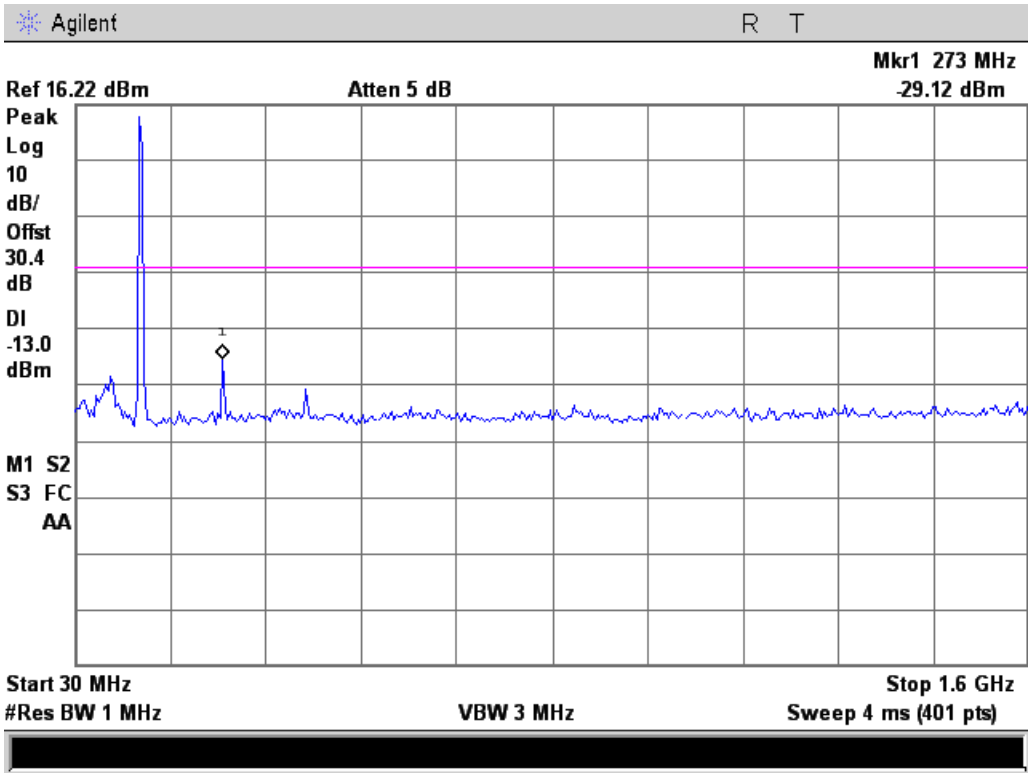
118.05 MHz



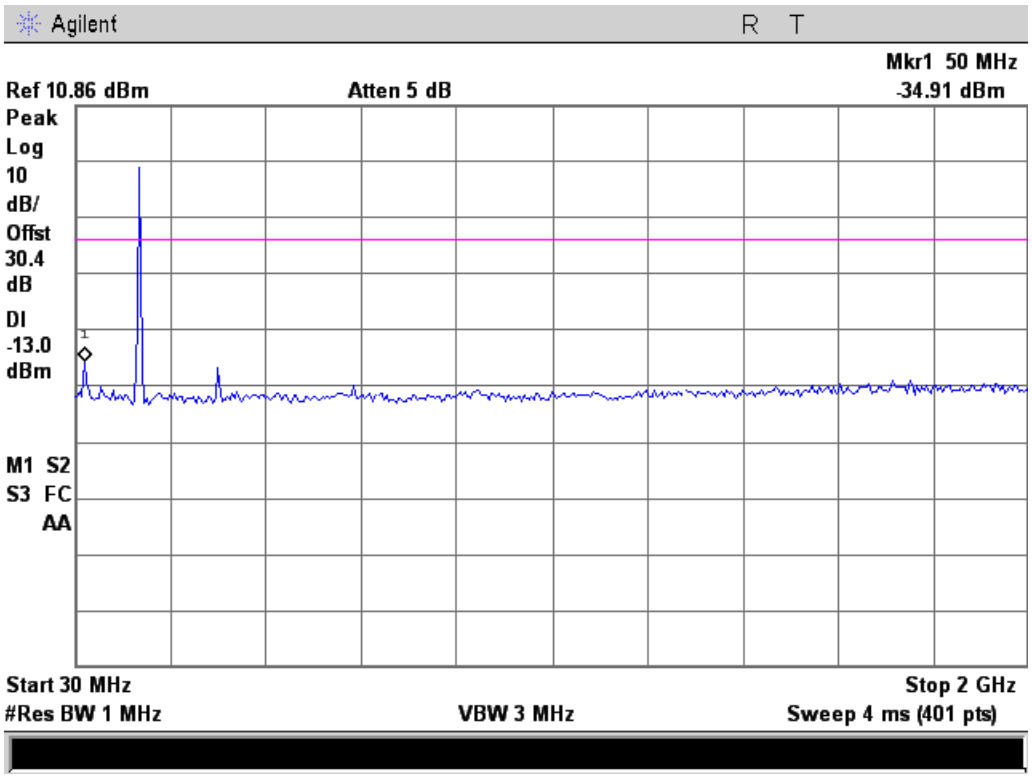
127.50 MHz



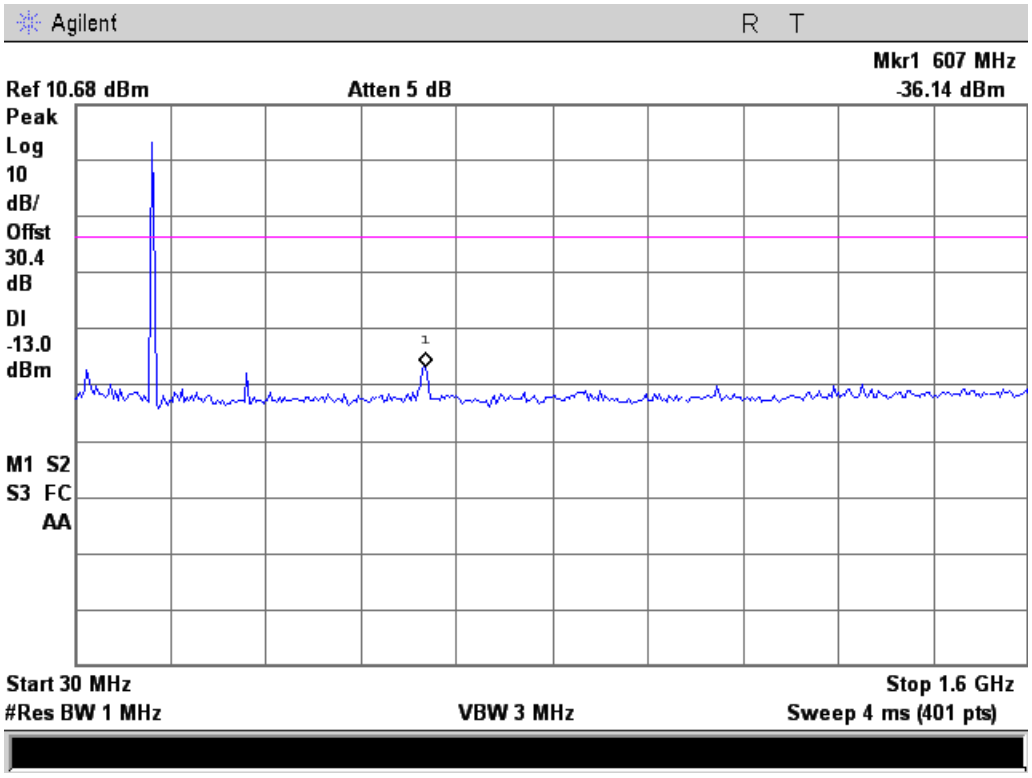
136.95 MHz



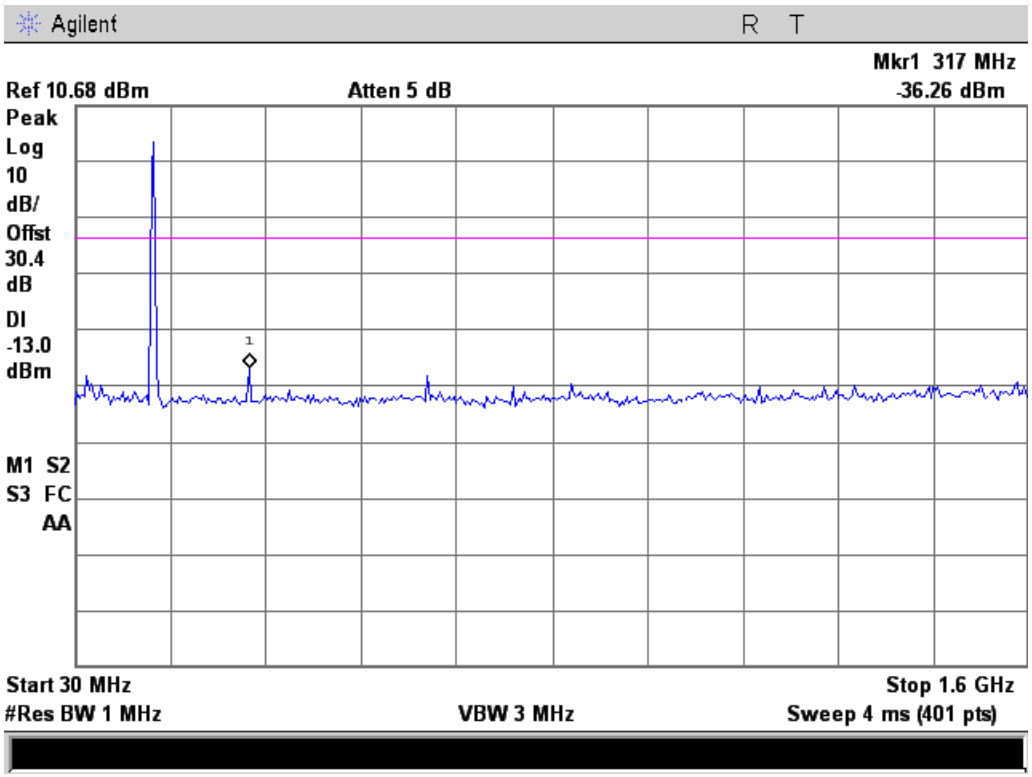
161.775 MHz



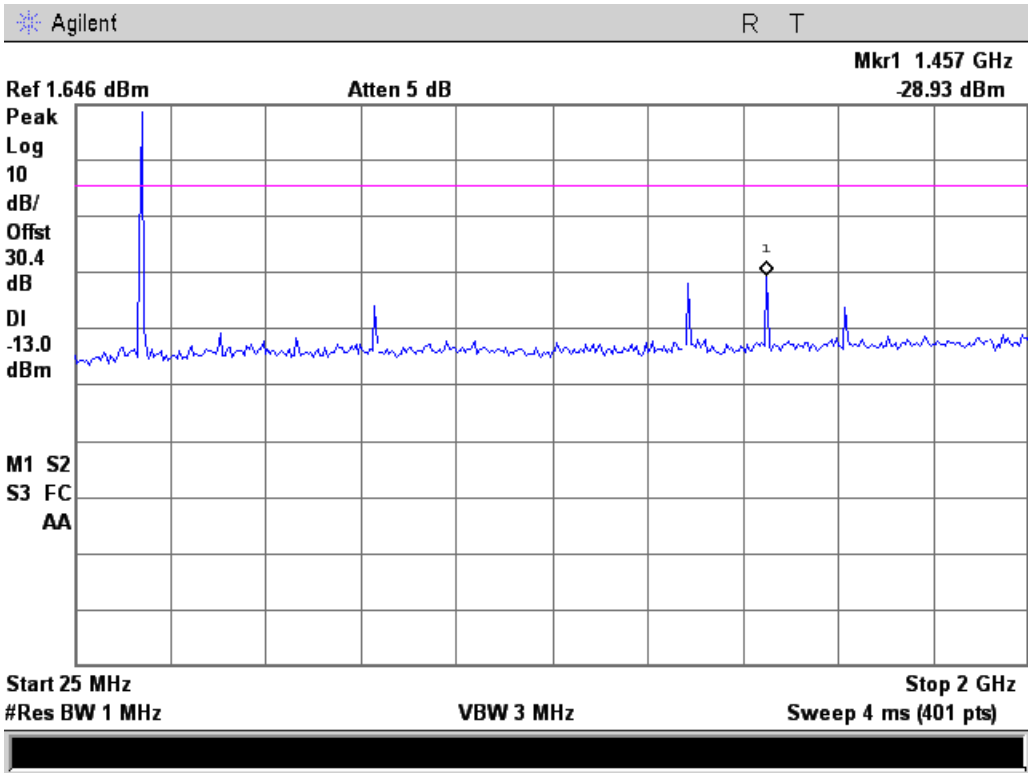
156.300 MHz



157.425 MHz



MTM 161.775 MHz



Field Strength of Spurious Radiation

Name of Test: Field Strength of Spurious Radiation **Engineer:** John Erhard

Test Equipment Utilized: i00103, i00142,i00147,i00148,i00266,i00267,i00331 **Test Date:** 11/29/2012

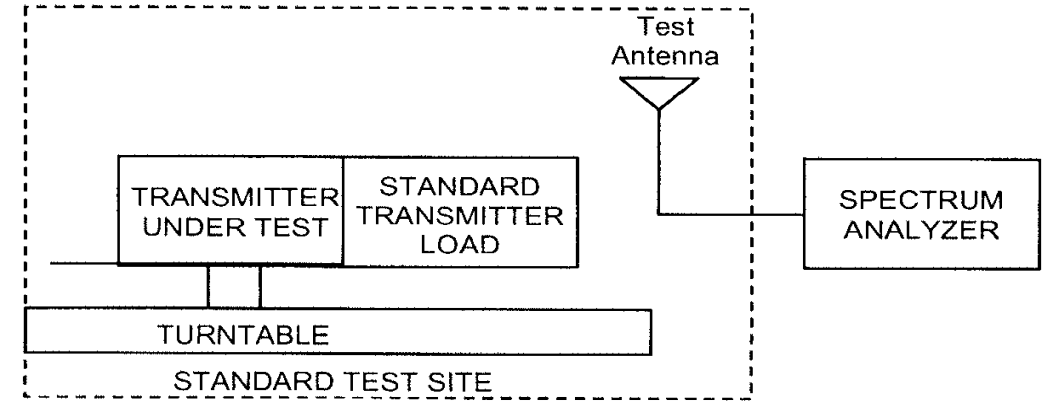
Test Procedure

A) Connect the equipment as illustrated below.
B) Adjust the spectrum analyzer to the following settings:
   1) Resolution Bandwidth 100 kHz (< 1 GHZ), 1 MHZ (> 1GHz)
   2) Video Bandwidth ≥ 3 times Resolution Bandwidth, or 30 kHz
   3) Sweep Speed ≤2000 Hz/second
   4) Detector Mode = Mean or Average Power
C) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into a non- radiating load that is placed on the turntable. The RF cable to this load should be of minimum length.
D) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to ± the test bandwidth (see Section 1.3.4.4).
E) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.
F) Repeat Step E) for each spurious frequency with the test antenna polarized vertically.
G) Reconnect the equipment as illustrated.
H) Keep the spectrum analyzer adjusted as in Step B).
I) Remove the transmitter and replace it with a substitution antenna (the antenna should be half wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.
J) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
K) Repeat Step J) with both antennas vertically polarized for each spurious frequency.
L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in Steps J) and K) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.
M) The levels recorded in Step L) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

$$\text{Radiated spurious emissions dB} = 10\log_{10}(\text{TX power in watts}/0.001) - \text{the levels in Step I)}$$

NOTE: It is permissible that the other antennas provided can be referenced to a dipole.

Test Setup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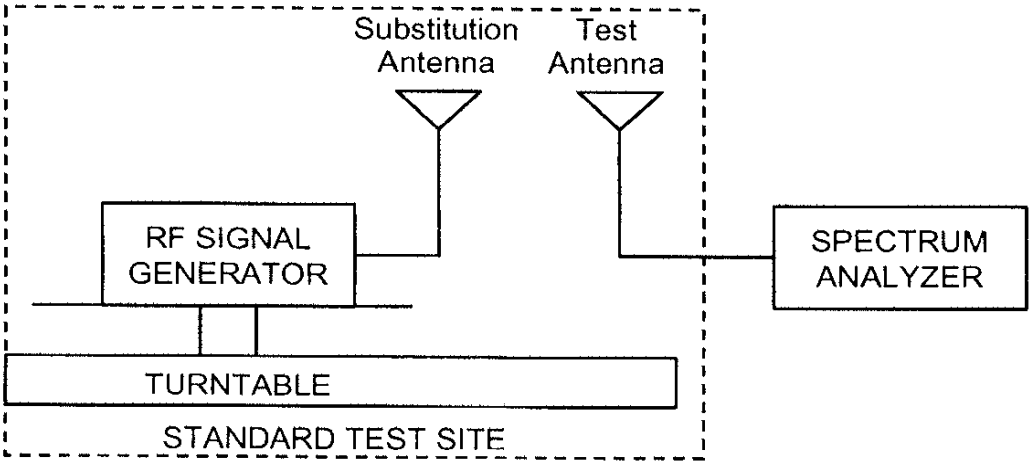
Antenna
TRANSMITTER
UNDER TEST
STANDARD
TRANSMITTER
LOAD
SPECTRUM
ANALYZER
TURNTABLE
STANDARD TEST SITE


Substitution
Antenna
Test
Antenna
RF SIGNAL
GENERATOR
SPECTRUM
ANALYZER
TURNTABLE
STANDARD TEST SITE

118.05 MHz Test Results

Emission Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
236.1	-74.72	-13	Pass
354.15	-69.78	-13	Pass
472.2	-72.99	-13	Pass

127.50 MHz Test Results

Emission Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
255.0	-78.87	-13	Pass
382.5	-68.3	-13	Pass
765.0	-68.33	-13	Pass

136.95 MHz Test Results

Emission Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
273.9	-66.76	-13	Pass
410.85	-66.69	-13	Pass
821.7	-68.42	-13	Pass

161.775 MHz Test Results

Emission Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
323.55	-76.97	-13	Pass
647.1	-67.58	-13	Pass
808.875	-67.68	-13	Pass

156.30 MHz Test Results

Emission Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
312.6	-75.37	-13	Pass
468.9	-69.79	-13	Pass
781.5	-66.72	-13	Pass

157.425 MHz Test Results

Emission Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
314.85	-76.23	-13	Pass
472.275	-72.5	-13	Pass
787.125	-66.97	-13	Pass

MTM 161.775 MHz Test Results

Emission Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
323.55	-73.26	-13	Pass
347.1	-69.9	-13	Pass
808.875	-67.9	-13	Pass

No other emissions were detected. All emissions were less than –13 dBm.

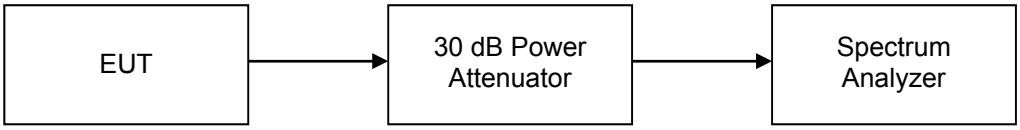
Emission Masks (Occupied Bandwidth)

Name of Test:	Emission Masks (Occupied Bandwidth)	**Engineer:** John Erhard
Test Equipment Utilized:	i00331, i00118	**Test Date:** 11/16/2012

Measurement Procedure

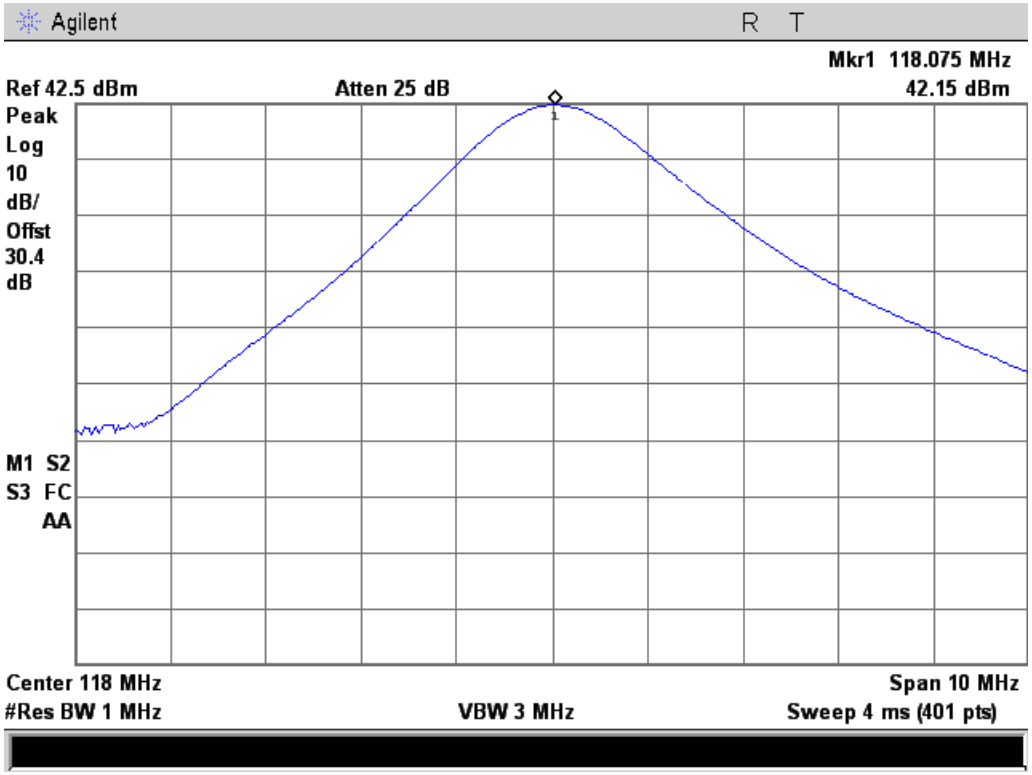
The EUT was connected to a spectrum analyzer through a 30 dB power attenuator to verify that the EUT meets the required emissions mask. A reference level plot is provided to verify that the peak power was established prior to testing the mask. A modulation frequency of 2.5 kHz at a level of 500 mVPP was input into the EUT for the analog tests and an internal test pattern was utilized for the digital input. Multiple frequencies per rule section and frequency band were tested ensuring compliance across all operational rule sections.

Test Setup

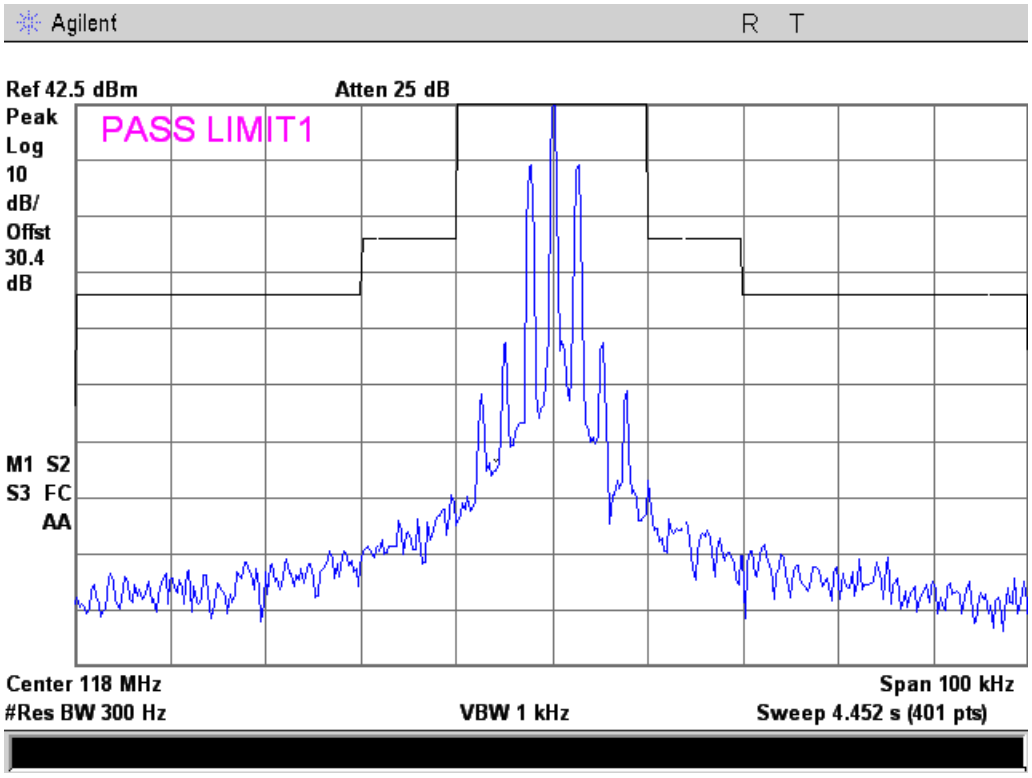


Occupied Bandwidth Plots

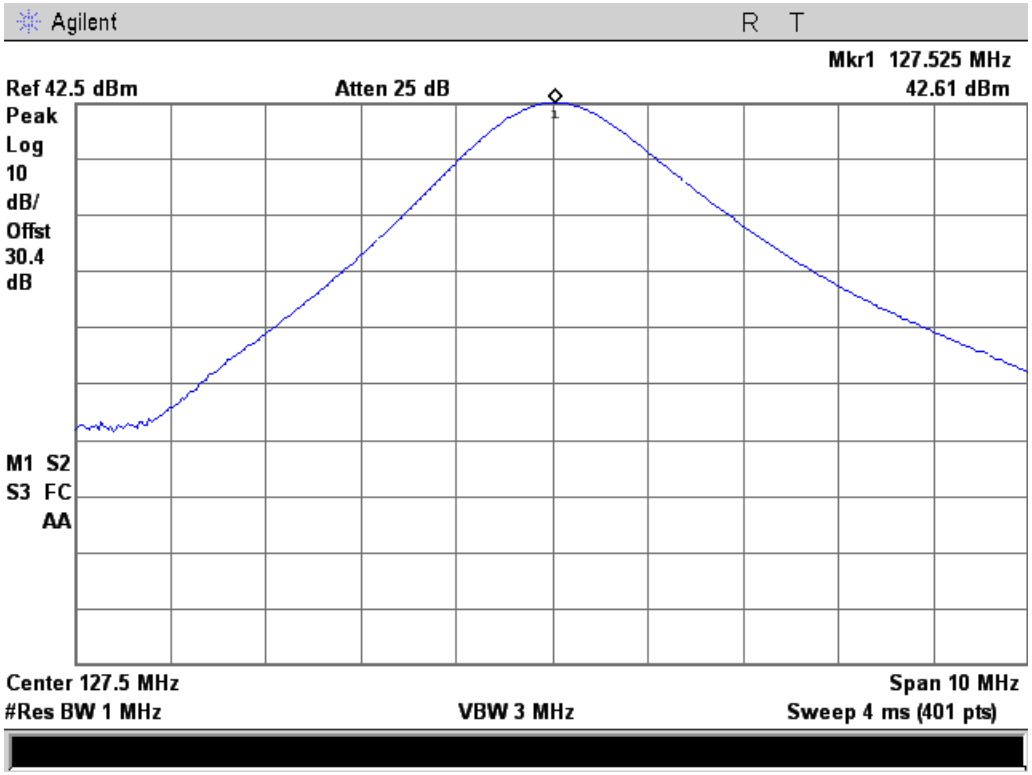
118.05 MHz
Reference



6K00A3E



127.50 MHz
Reference



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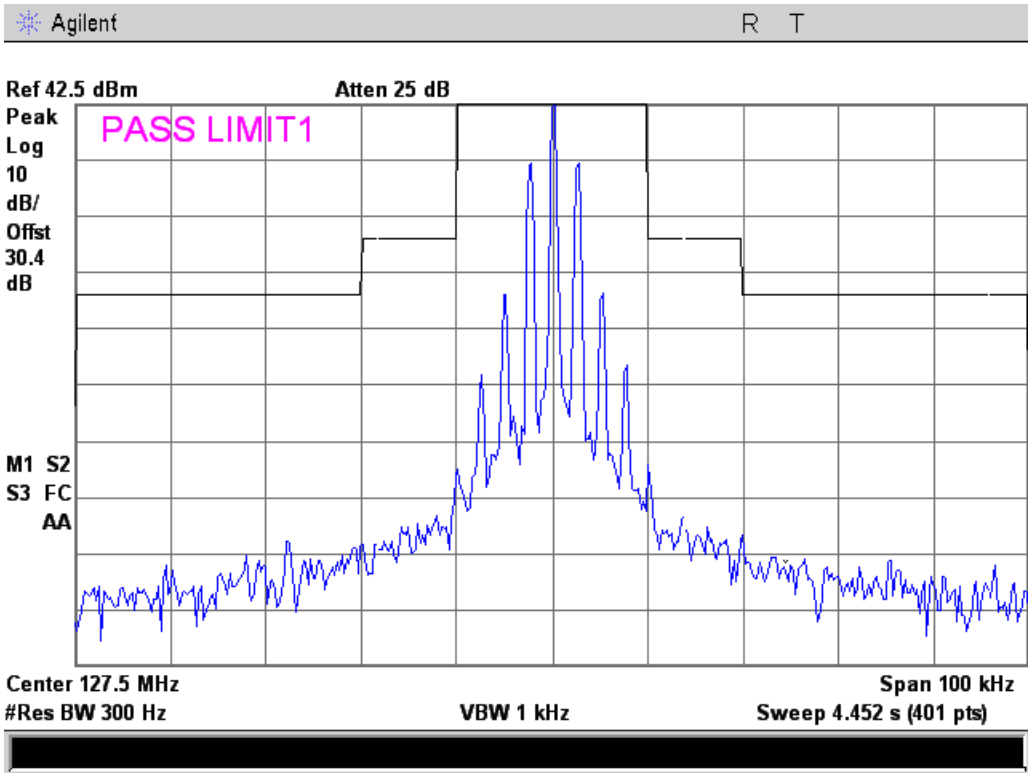
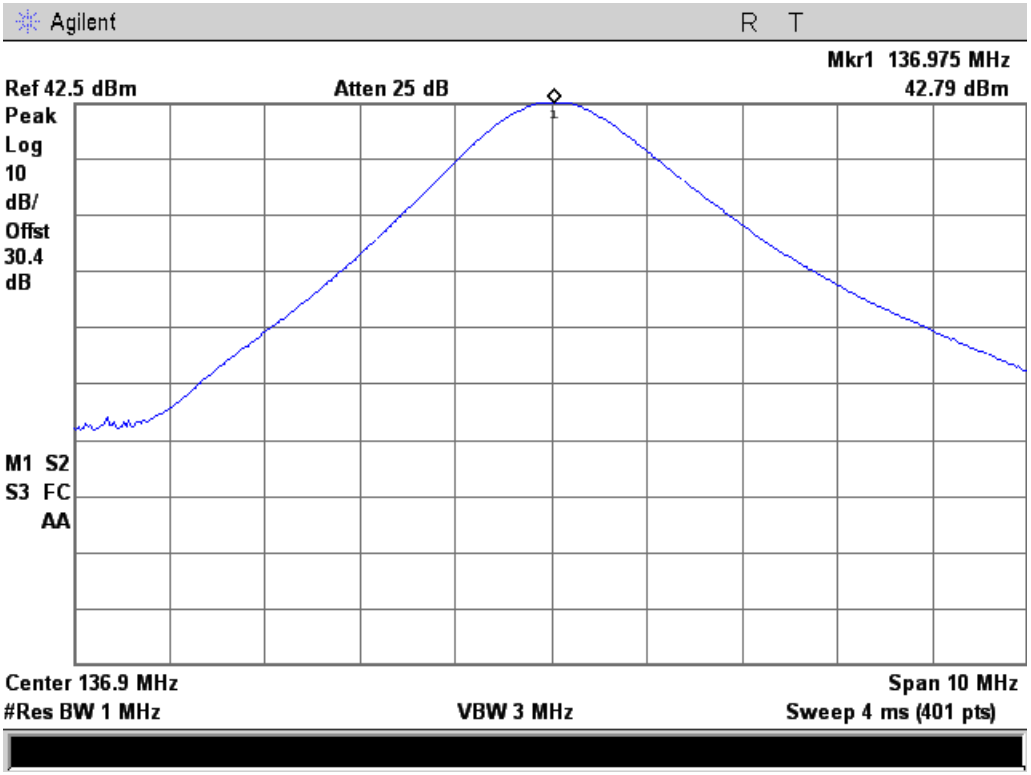


136.95 MHz
Reference



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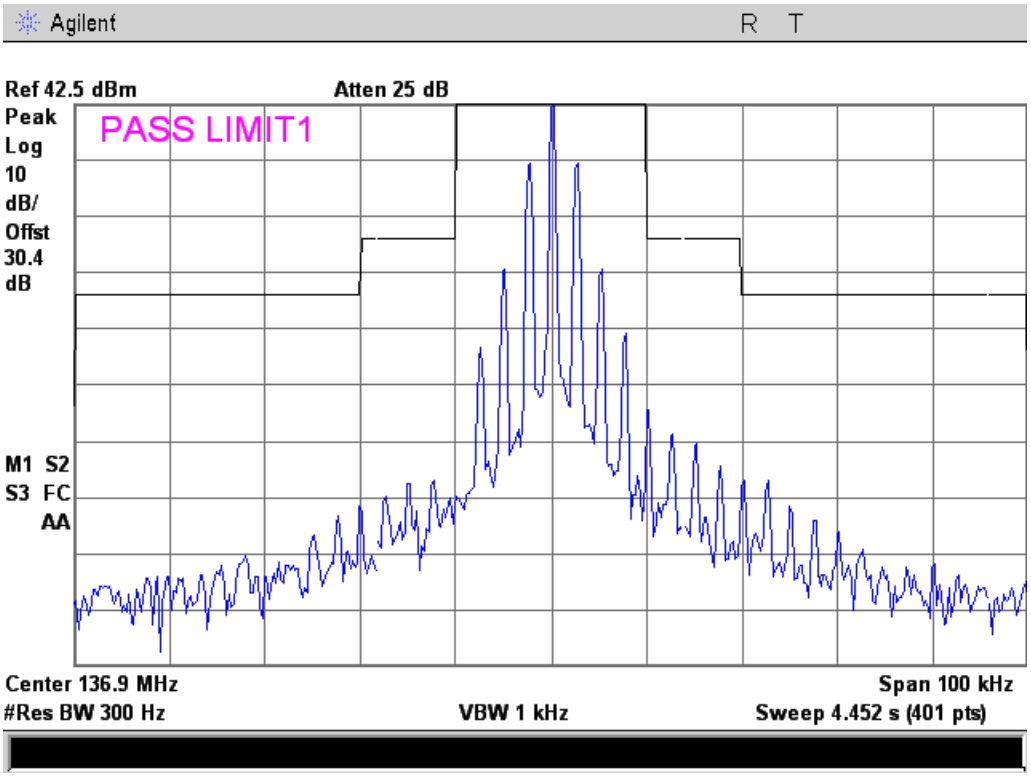
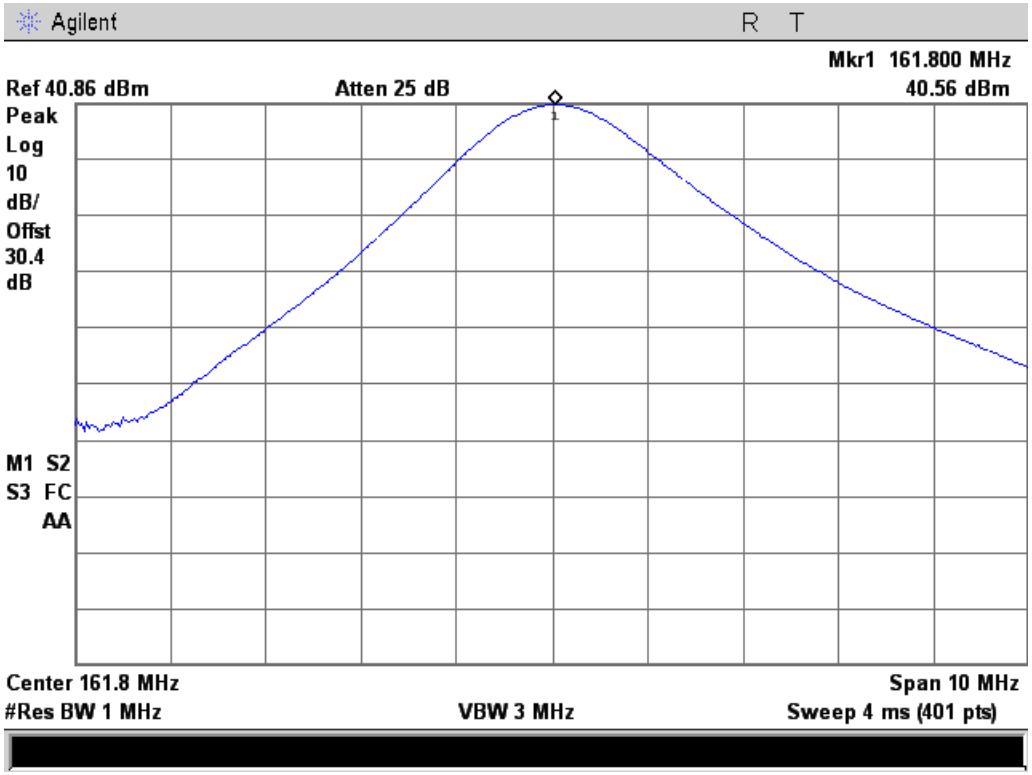
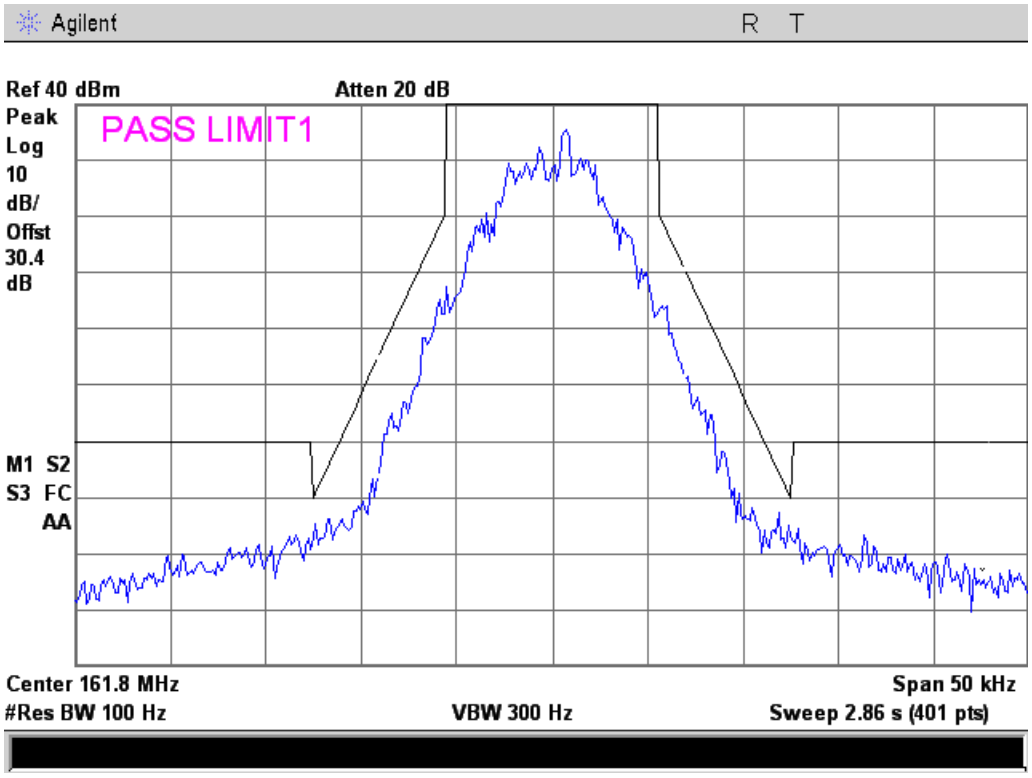


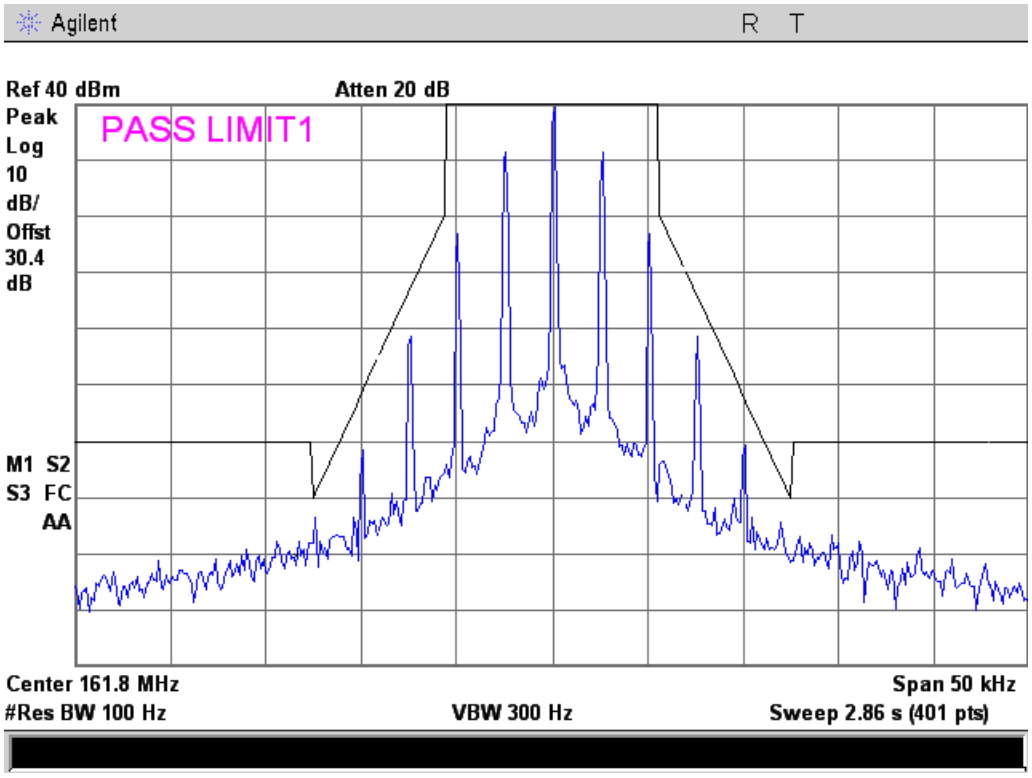
161.775 MHz
Reference



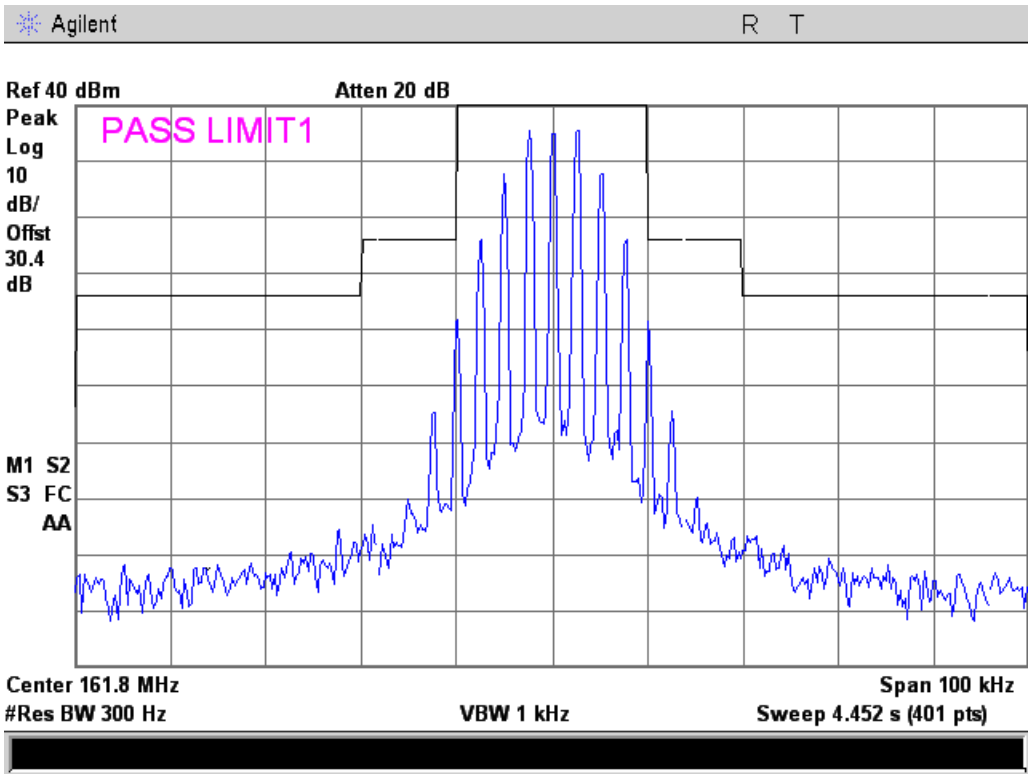
8K10F1D



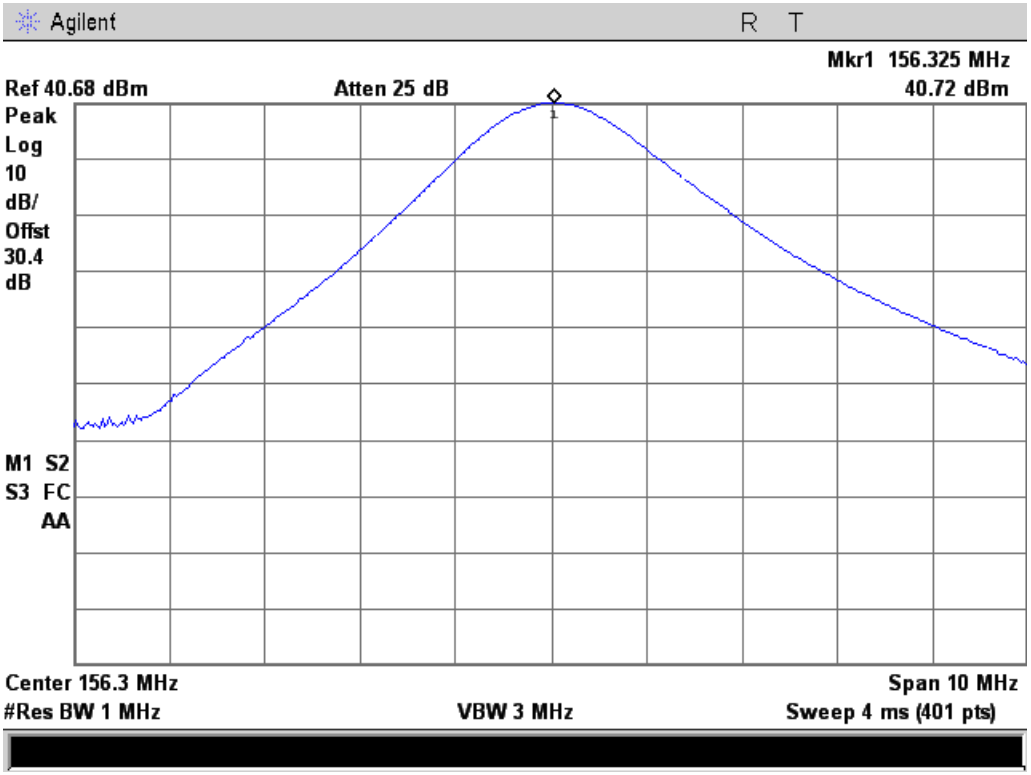
11K0F3E



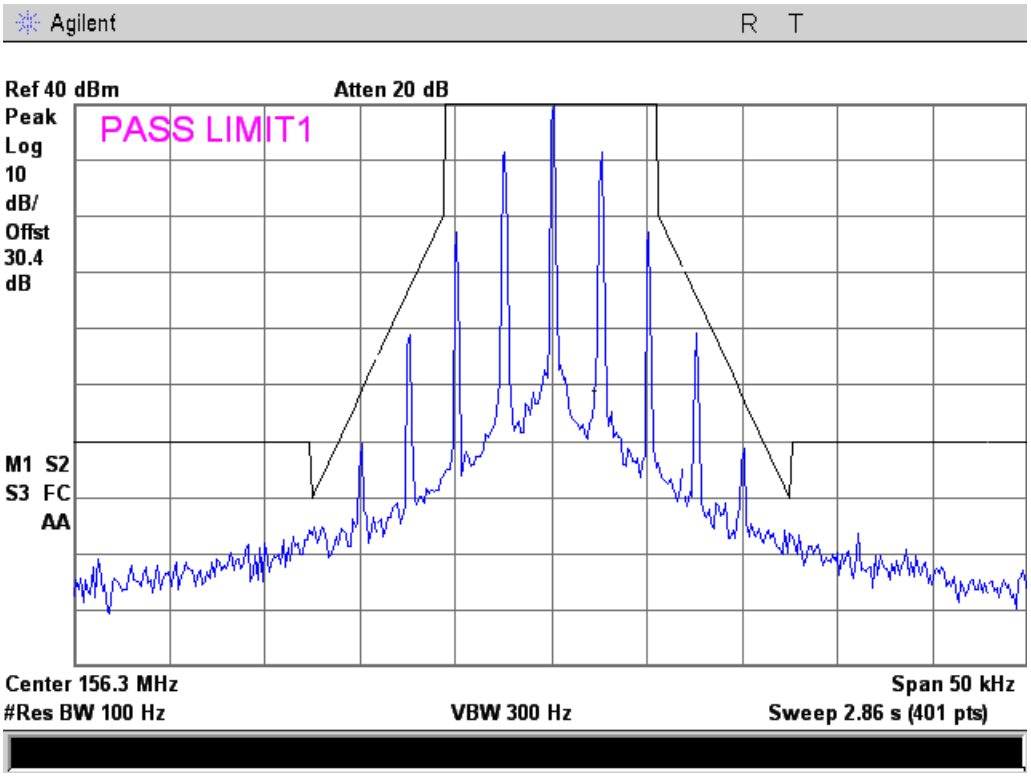
16K0F3E (RSS-119 Only)



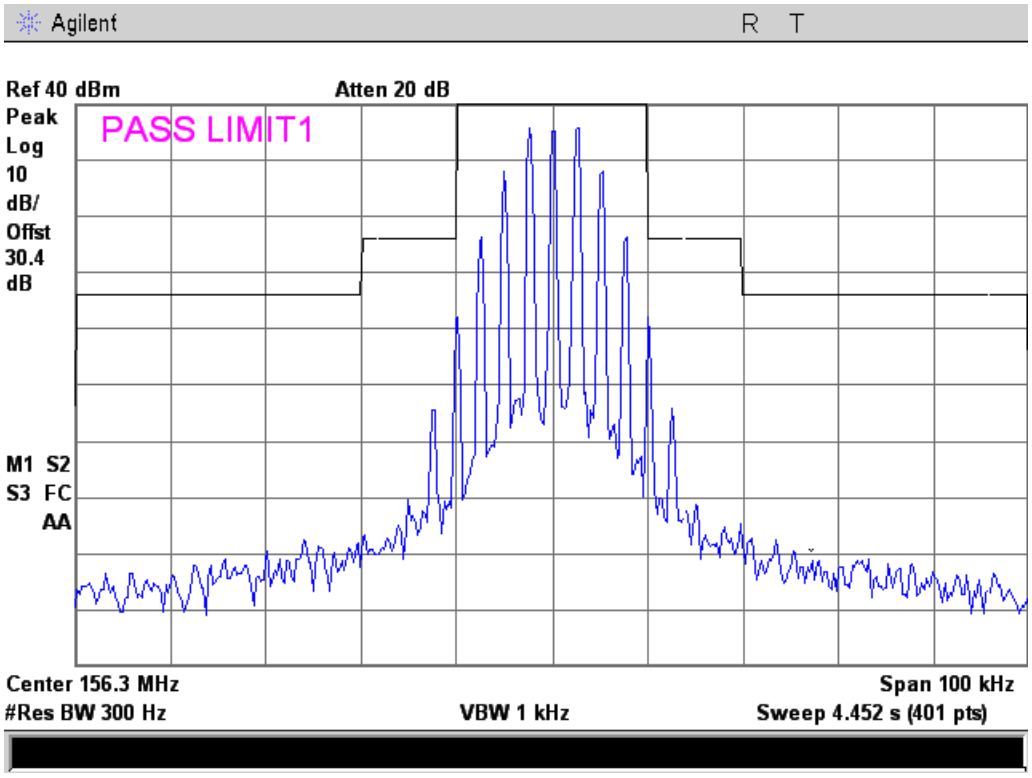
156.3000 MHz
Reference



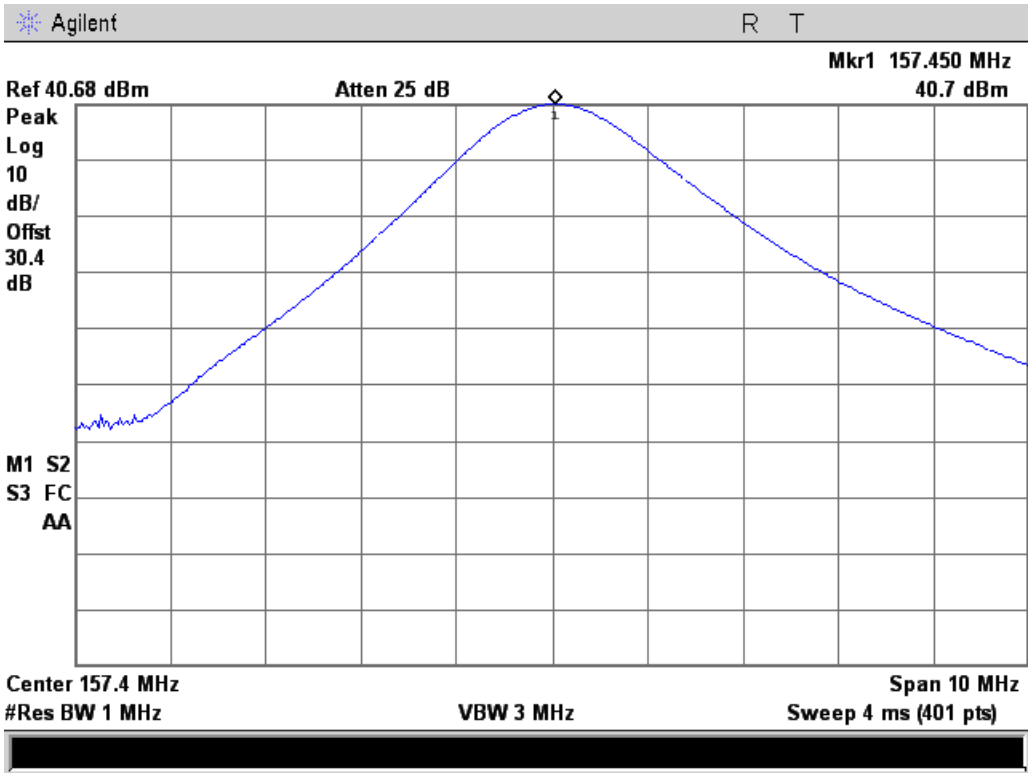
11K0F3E



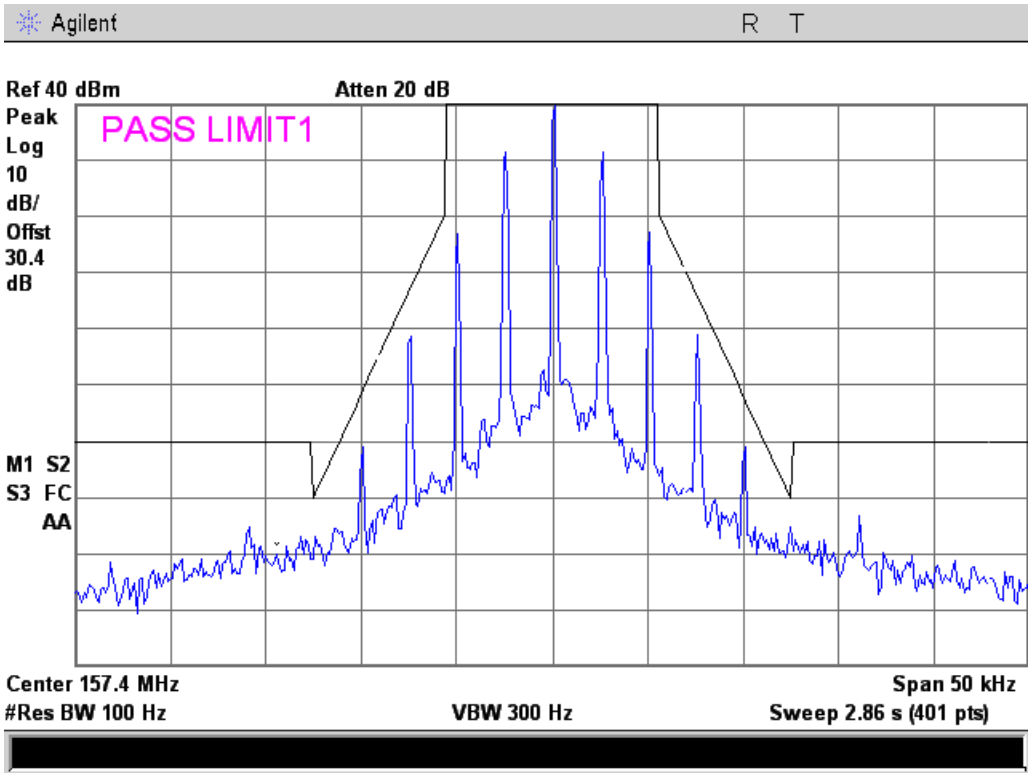
16K0F3E



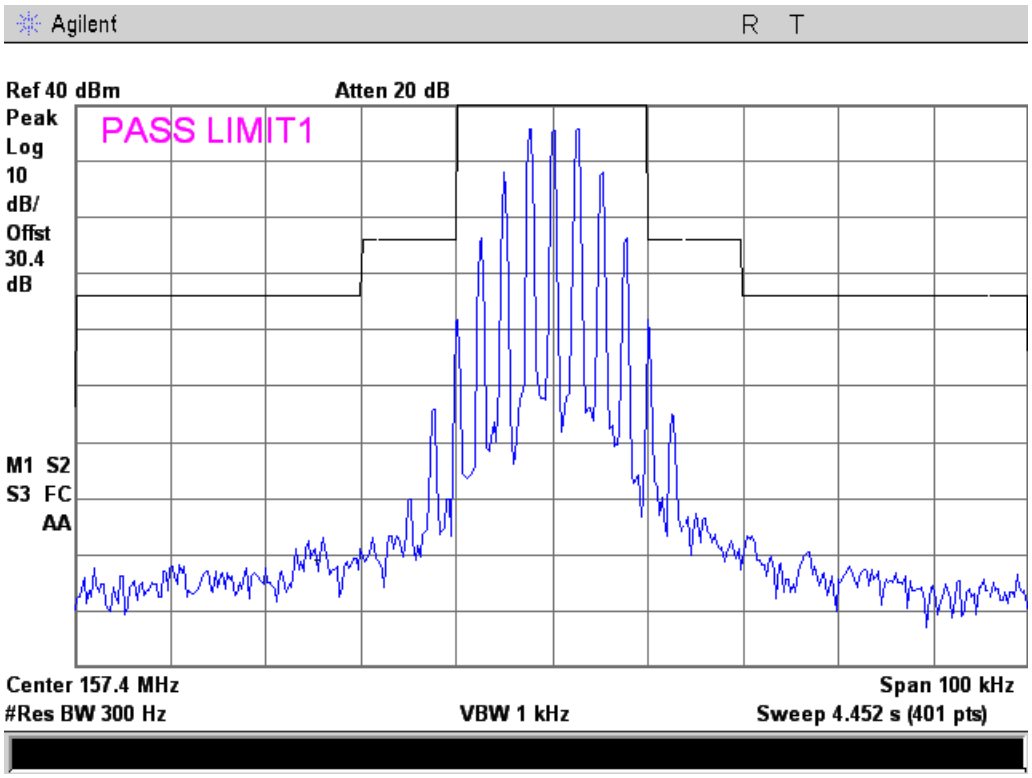
157.4250 MHz
Reference



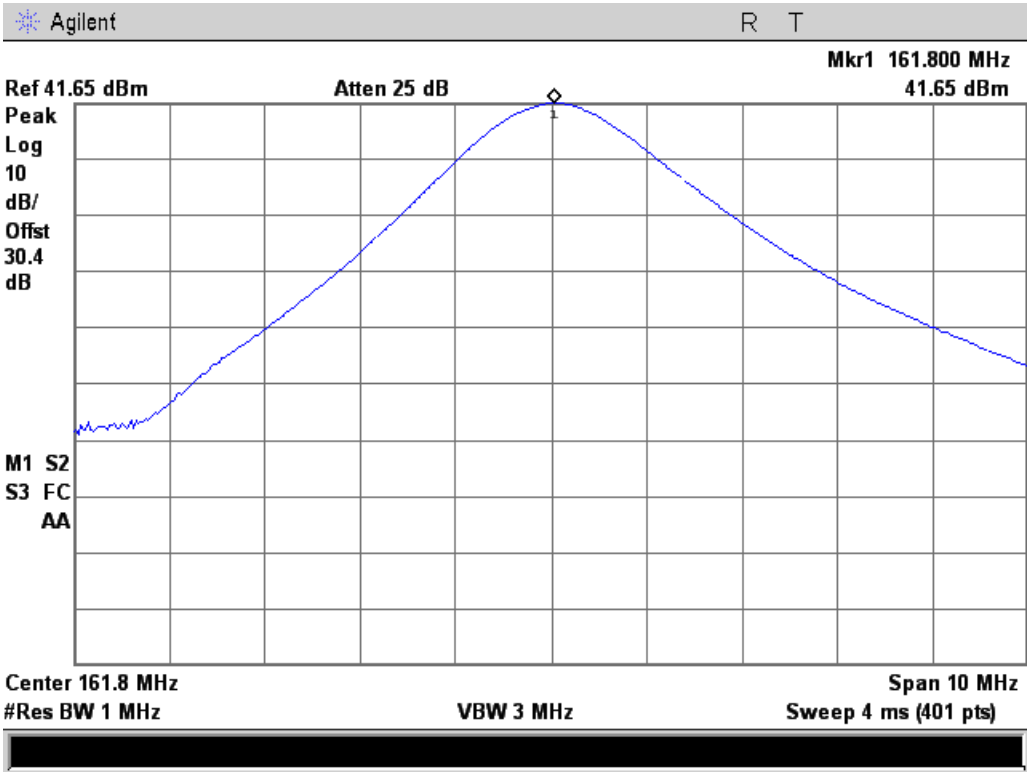
11K0F3E



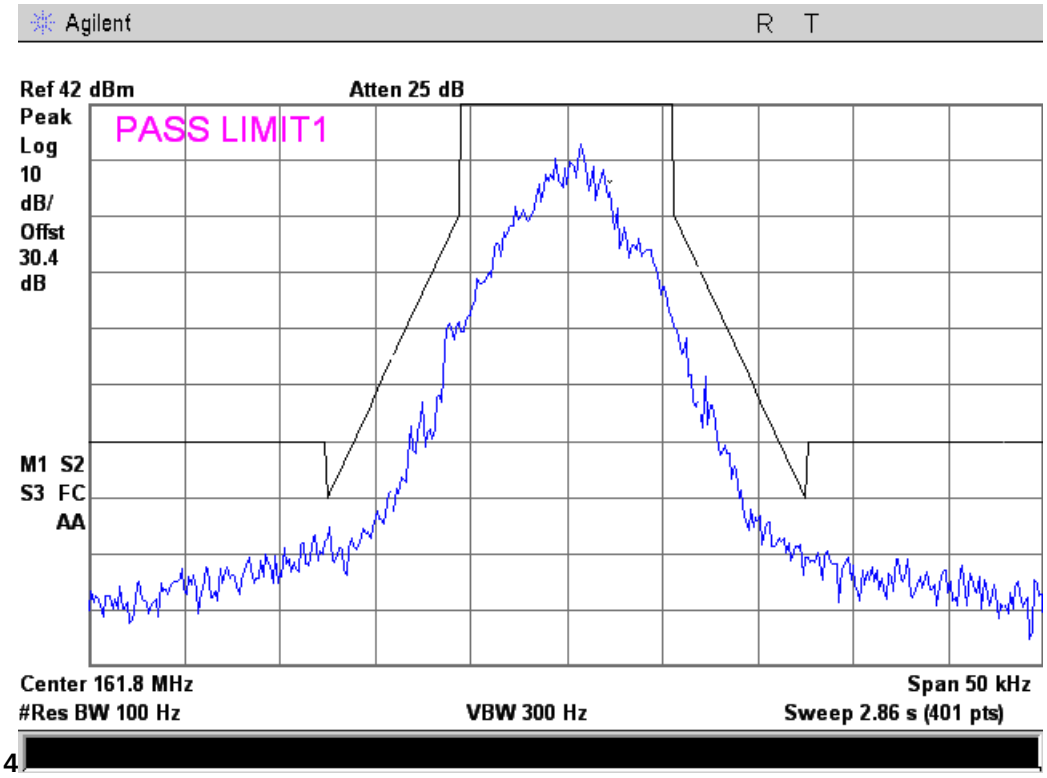
16K0F3E



MTM 161.775 MHz
Reference

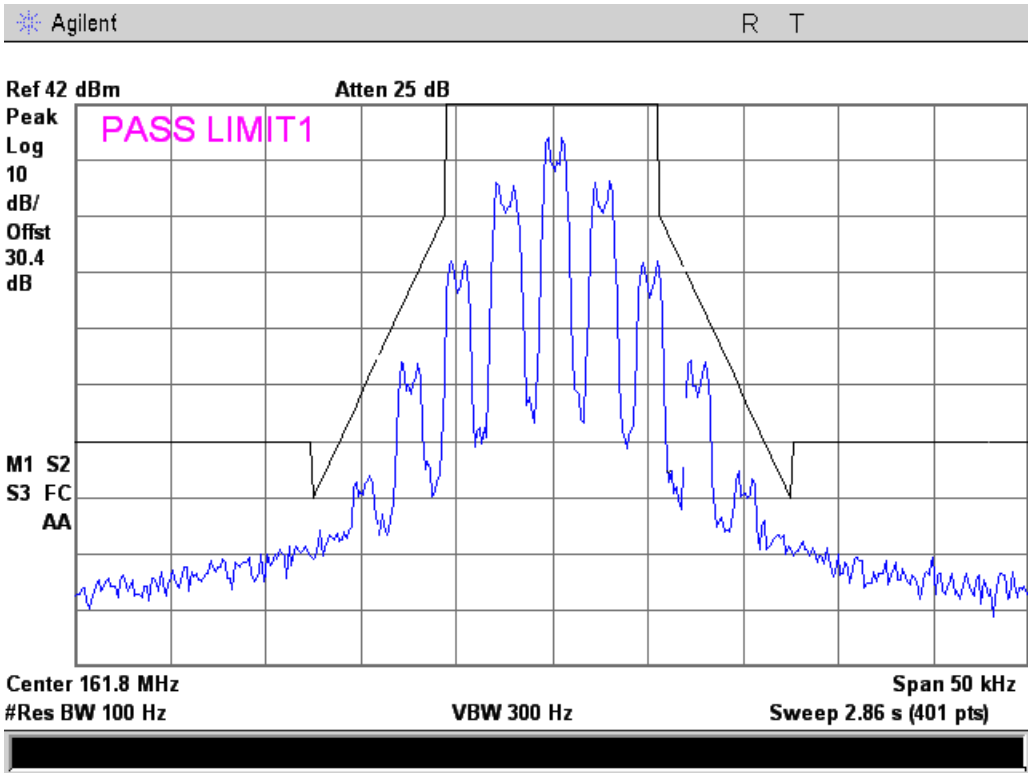


8K10F1D

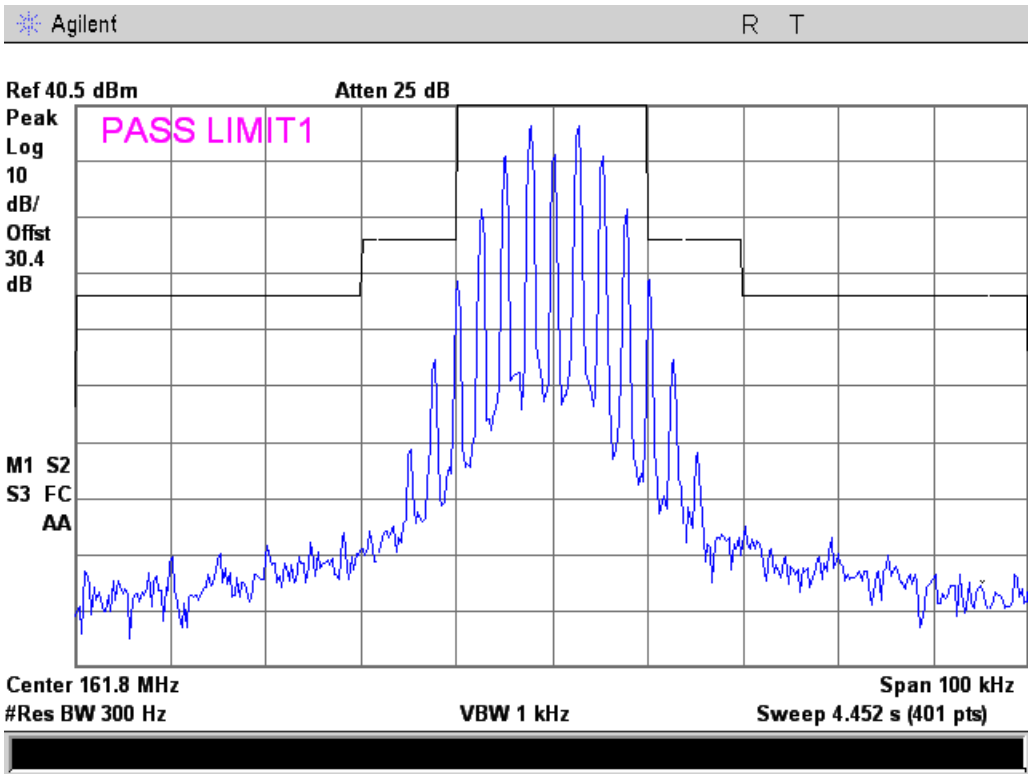


4

11K0F3E



16K0F3E (RSS-119 Only)



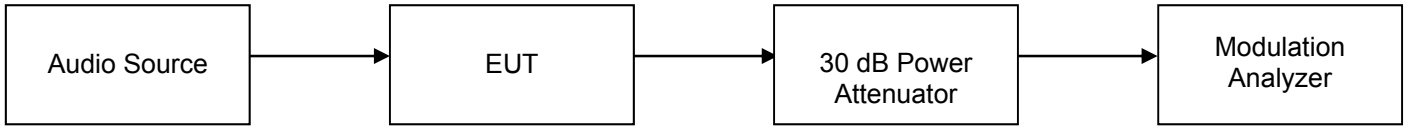
Audio Low Pass Filter (Voice Input)

Name of Test:	Audio Low Pass Filter (Voice Input)	**Engineer:** John Erhard
Test Equipment Utilized:	i00345, i00118	**Test Date:** 11/27/2012

Test Procedure

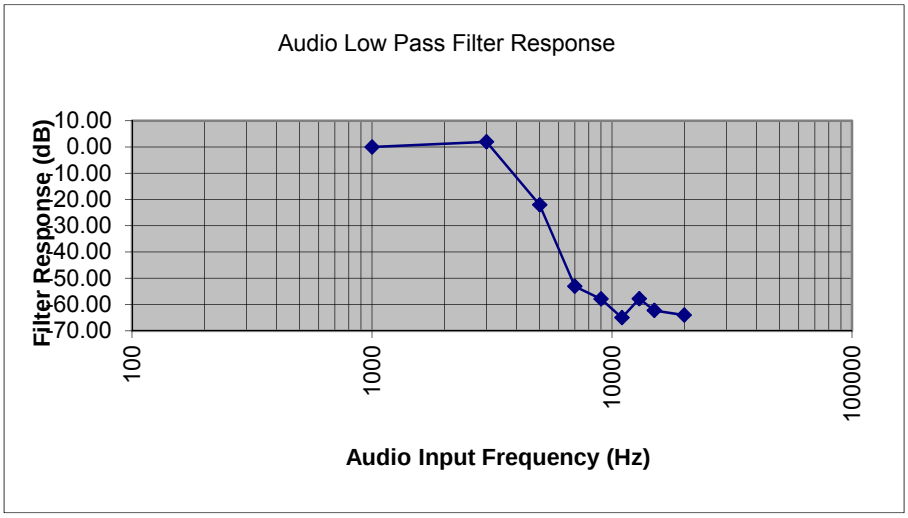
The EUT was connected to a modulation analyzer through a 30 dB power attenuator. The audio source was tuned across the required audio frequency range and the audio low pass filter response was measured and plotted. The modulation analyzer is a real time spectrum analyzer with integrated demodulation, audio measurement capabilities, and timing analysis. As this parameter is not frequency or band dependent the number of frequencies tested was reduced in comparison to previous tests

Test Setup

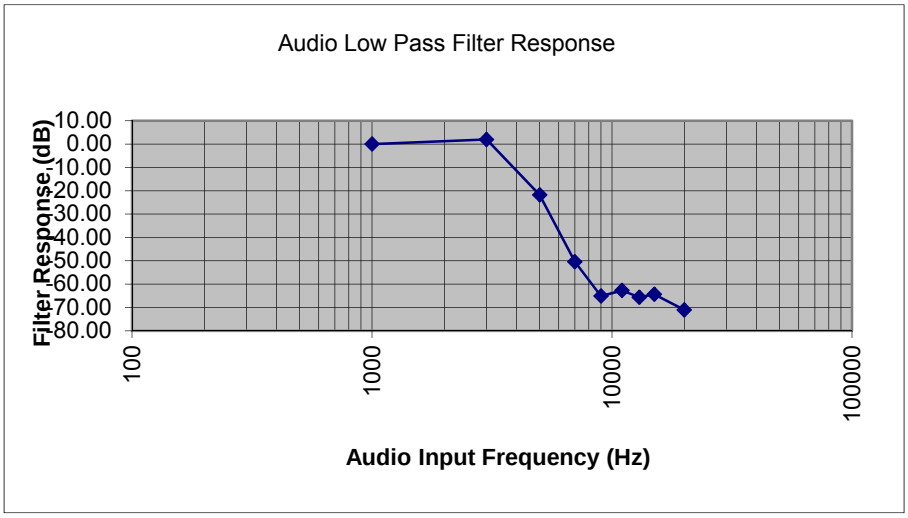


136-174 MHz Band

11K0F3E

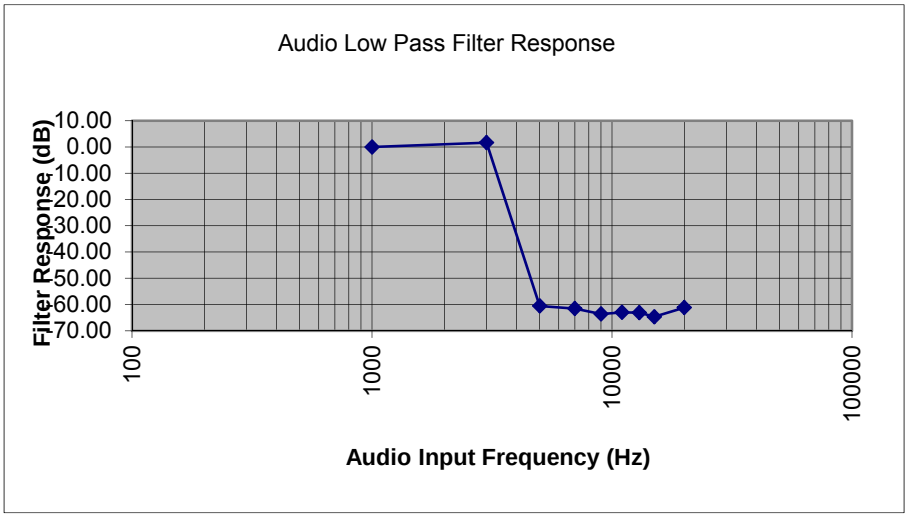


16K0F3E

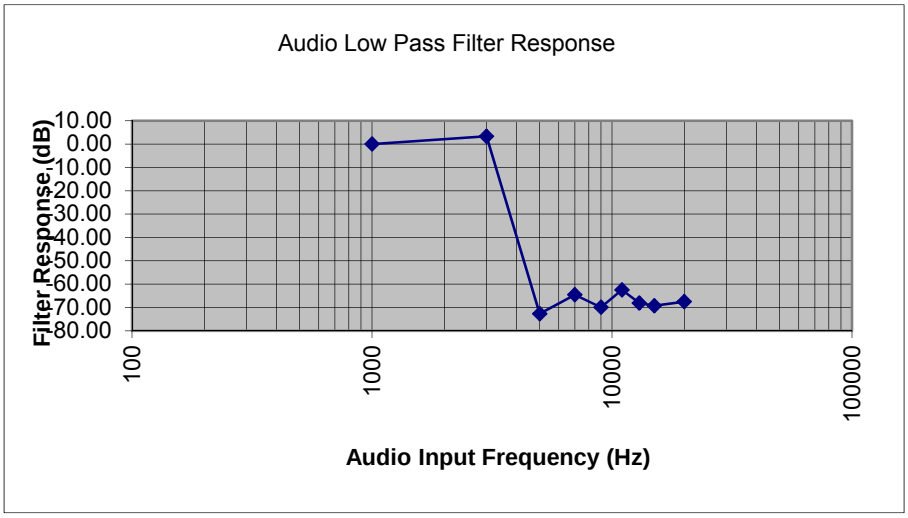


MTM 136-174 MHz Band

11K0F3E



16K0F3E



Audio Frequency Response

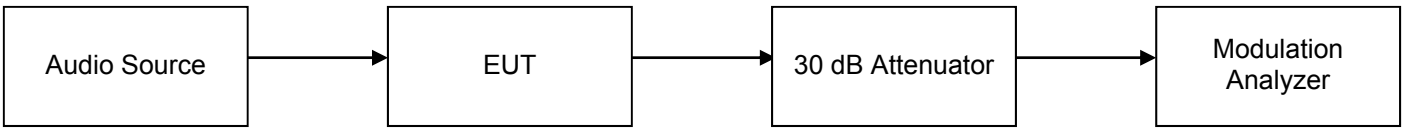
Name of Tests: Audio Frequency Response **Engineer:** John Erhard

Test Equipment Utilized: i00345, i00118 **Test Date:** 12/27/2012

Measurement Procedure

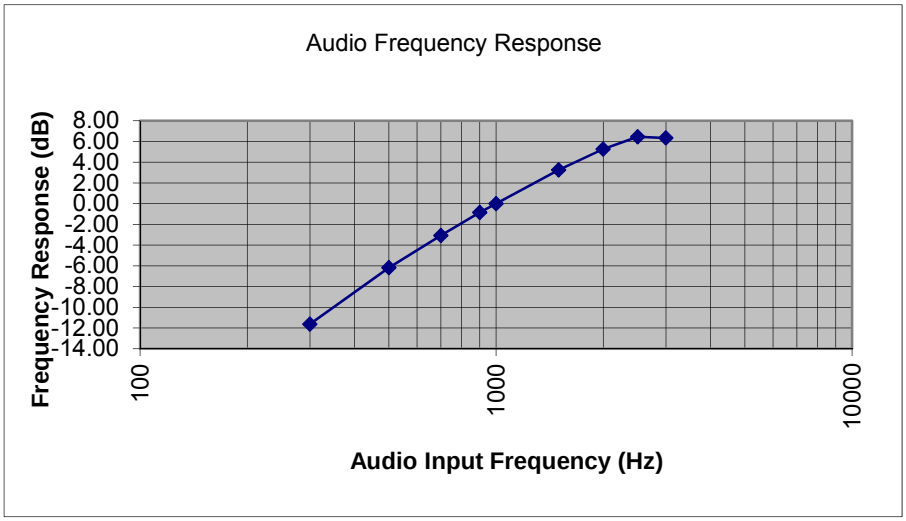
The EUT was connected directly to a modulation analyzer through an attenuator. The audio source was tuned across the required audio frequency range and the audio frequency response was measured and plotted. The modulation analyzer is a real time spectrum analyzer with integrated demodulation, audio measurement capabilities, and timing analysis. As this parameter is not frequency or band dependent the number of frequencies tested was reduces in comparison to previous tests

Test Setup

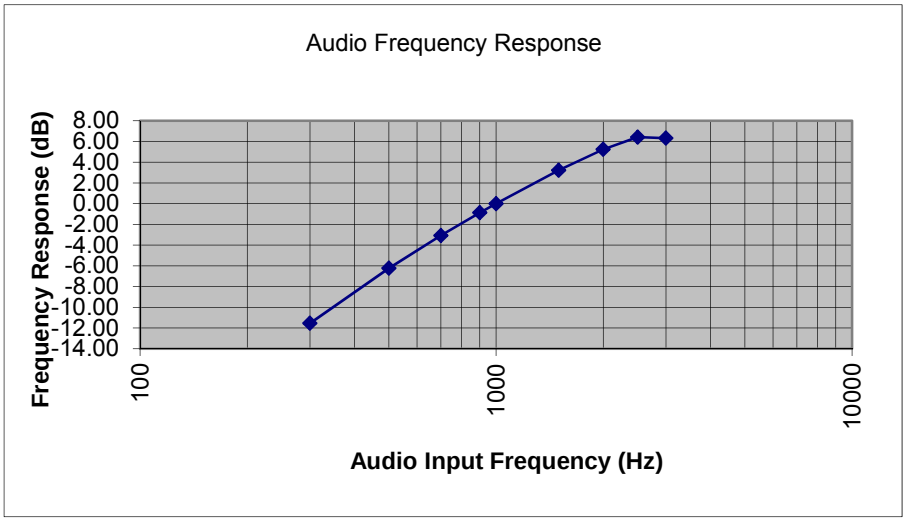


136-174 MHz Band

11K0F3E

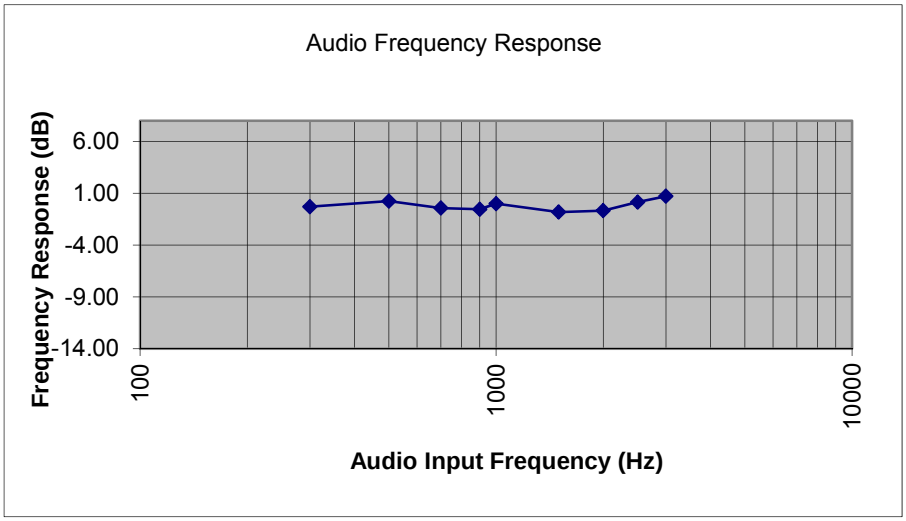


16K0F3E

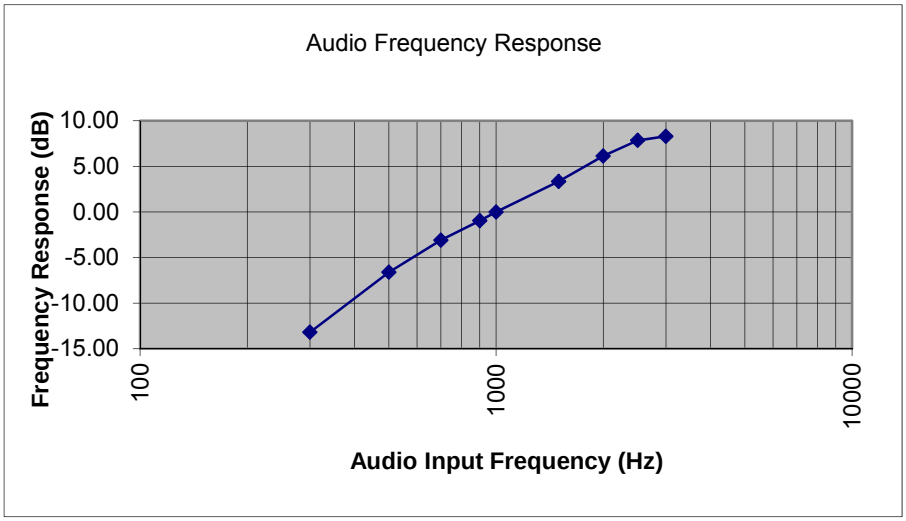


MTM 136-174 MHz Band

11K0F3E



16K0F3E



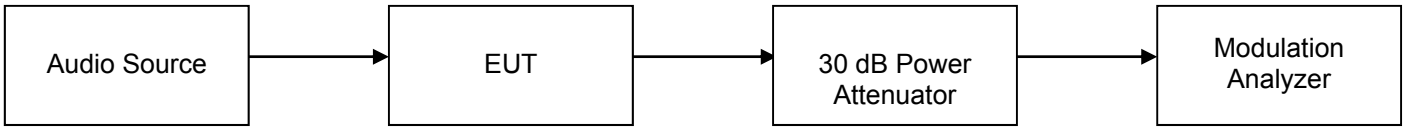
Modulation Limiting

Name of Test:	Modulation Limiting	**Engineer:** John Erhard
Test Equipment Utilized:	i00345, i00118	**Test Date:** 11/27/2012

Test Procedure

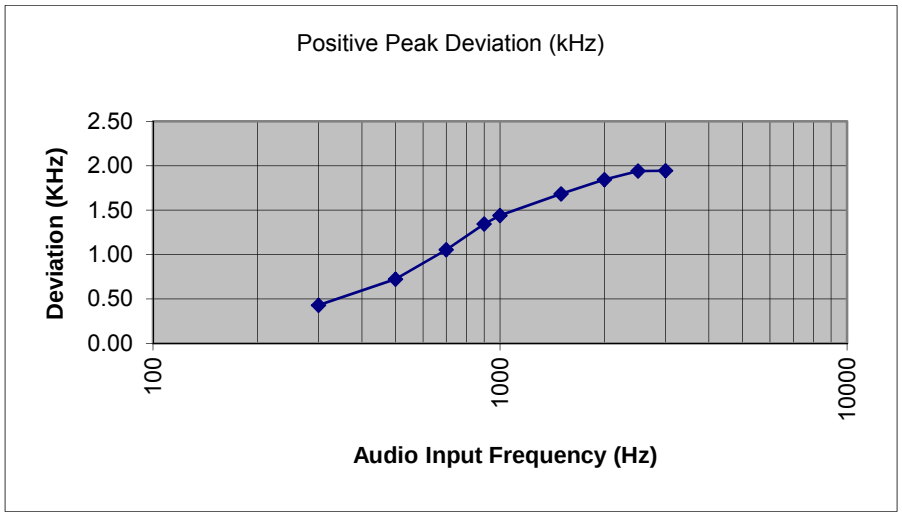
The EUT was connected directly to a modulation analyzer through an attenuator. The audio source was tuned across the required audio frequency range and the modulation limiting response was measured and plotted. The modulation analyzer is a real time spectrum analyzer with integrated demodulation, audio measurement capabilities, and timing analysis. As this parameter is not frequency or band dependent the number of frequencies tested was reduces in comparison to previous tests

Test Setup

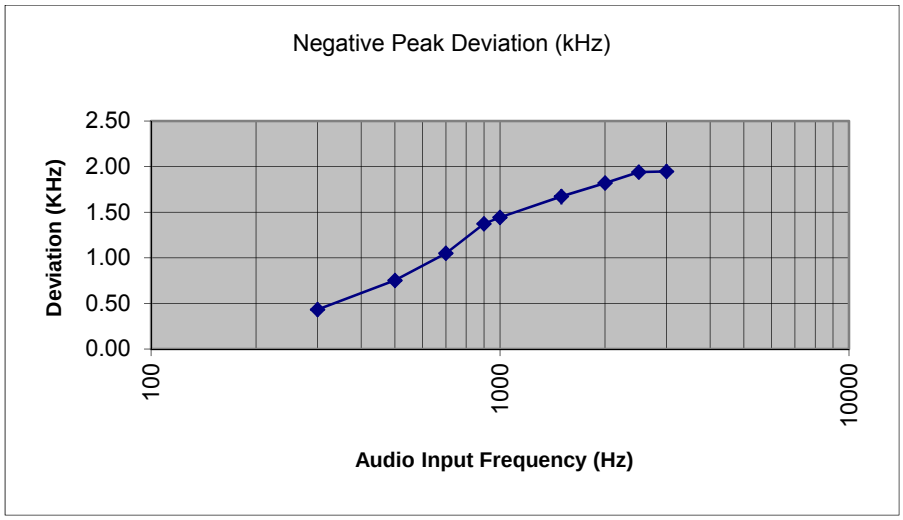


136-174 MHz Band

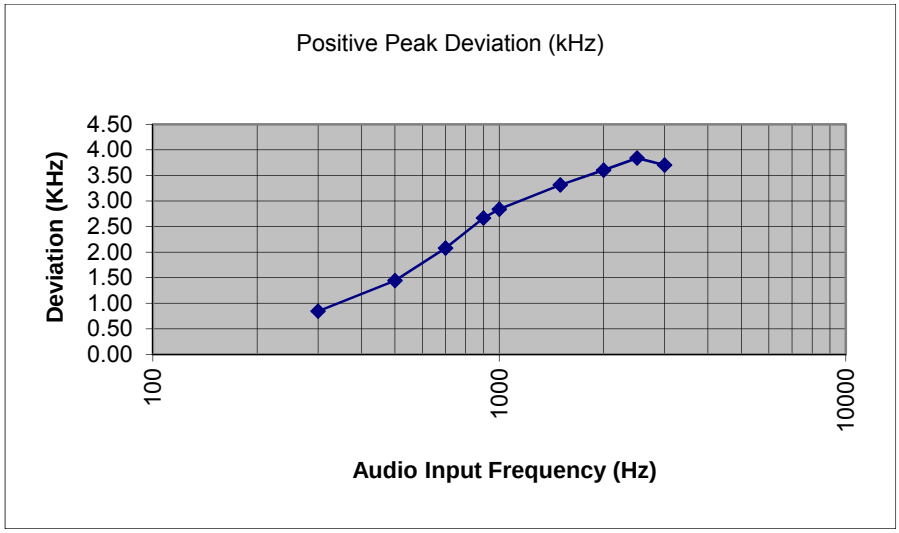
11K0F3E Positive Peaks



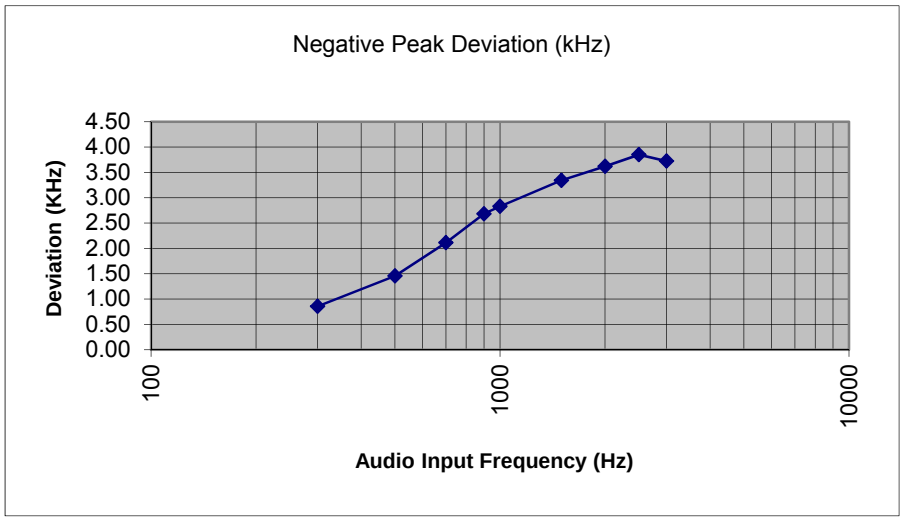
11K0F3E Negative Peaks



16K0F3E Positive Peaks

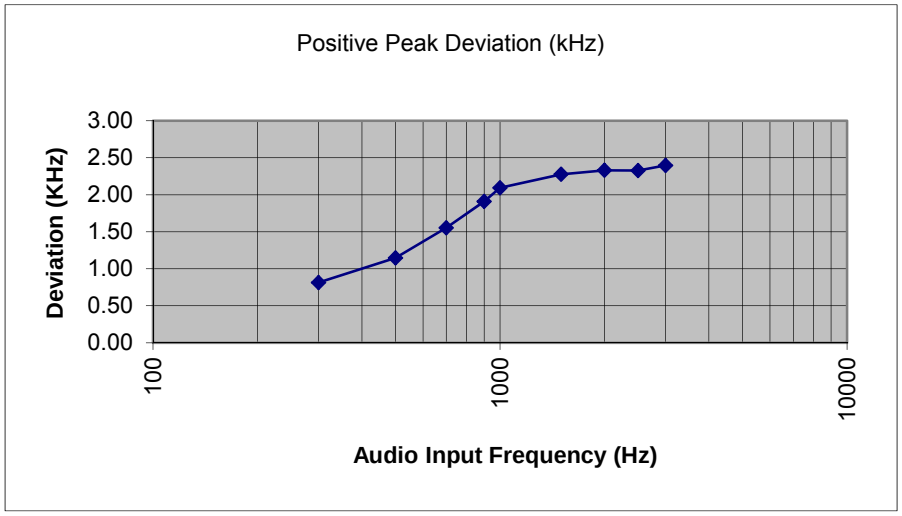


16K0F3E Negative Peaks

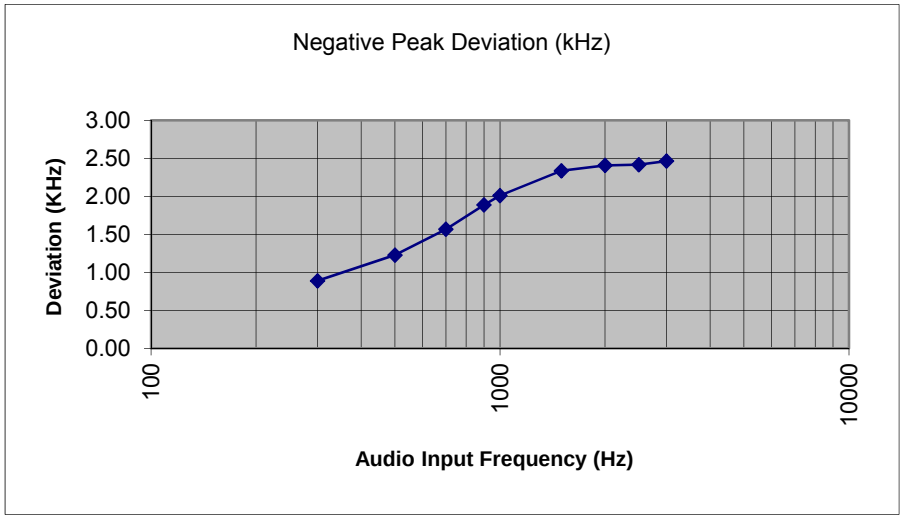


MTM 136-174 MHz Band

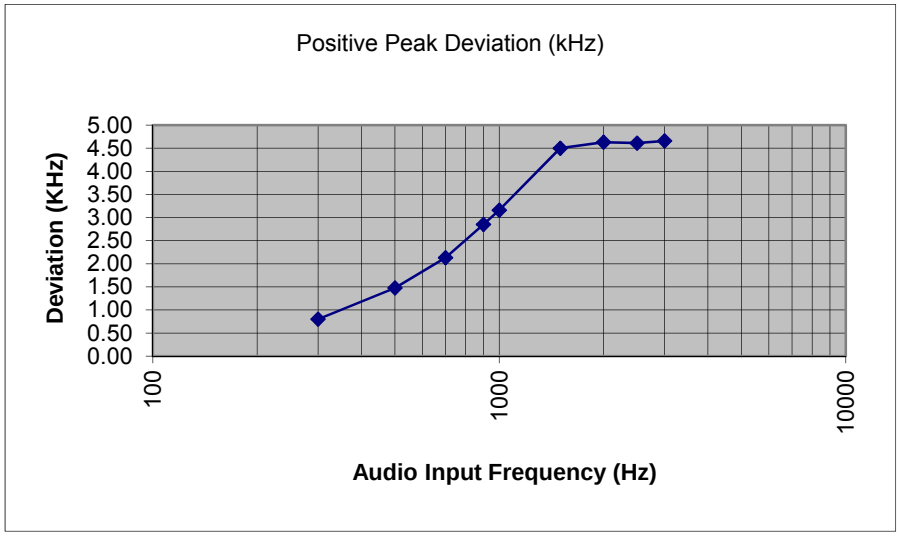
11K0F3E Positive Peaks



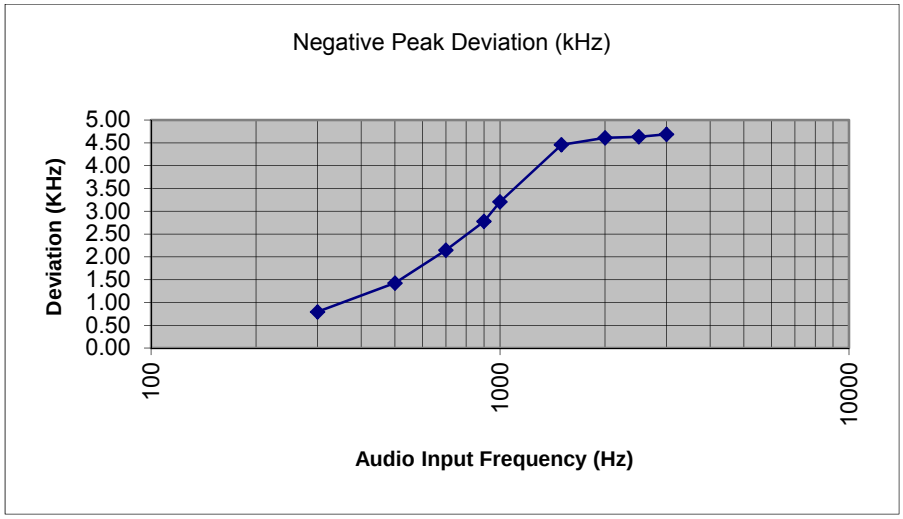
11K0F3E Negative Peaks



16K0F3E Positive Peaks



16K0F3E Negative Peaks



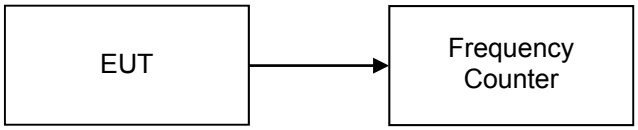
Frequency Stability

Name of Test:	Frequency Stability	**Engineer:**	John Erhard
Test Equipment Utilized:	i00019, i00287, i00343, i00191	**Test Date:**	11/21/2012

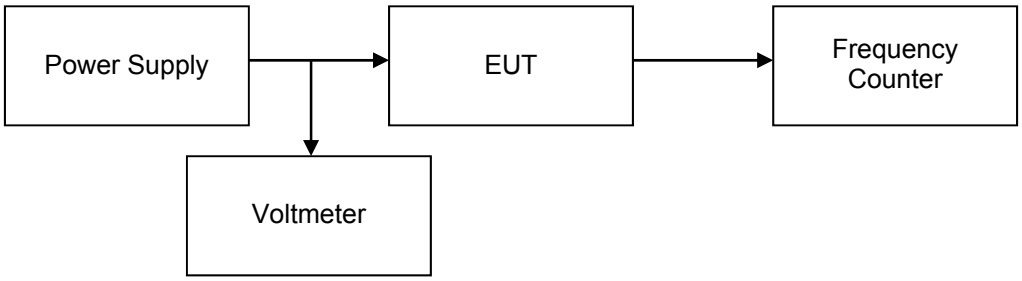
Test Procedure

The EUT was placed in an environmental test chamber and the RF output was connected to a frequency counter. The temperature was varied from -30°C to 50°C in 10°C increments. After a sufficient time for temperature stabilization the RF output frequency was measured. At 20°C the input voltage was varied to +/- 15% of the nominal input voltage. The number of frequencies tested was reduced to the amount required for variations in frequency tolerance by rule section.

Test Setup (Temperature Variation)



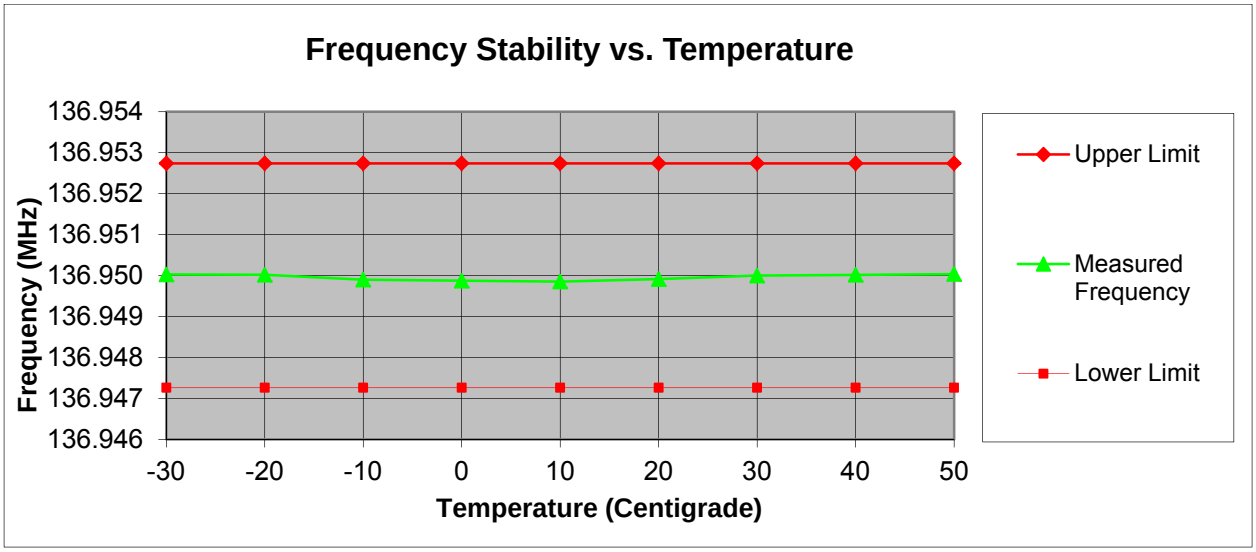
Test Setup (Voltage Variation)



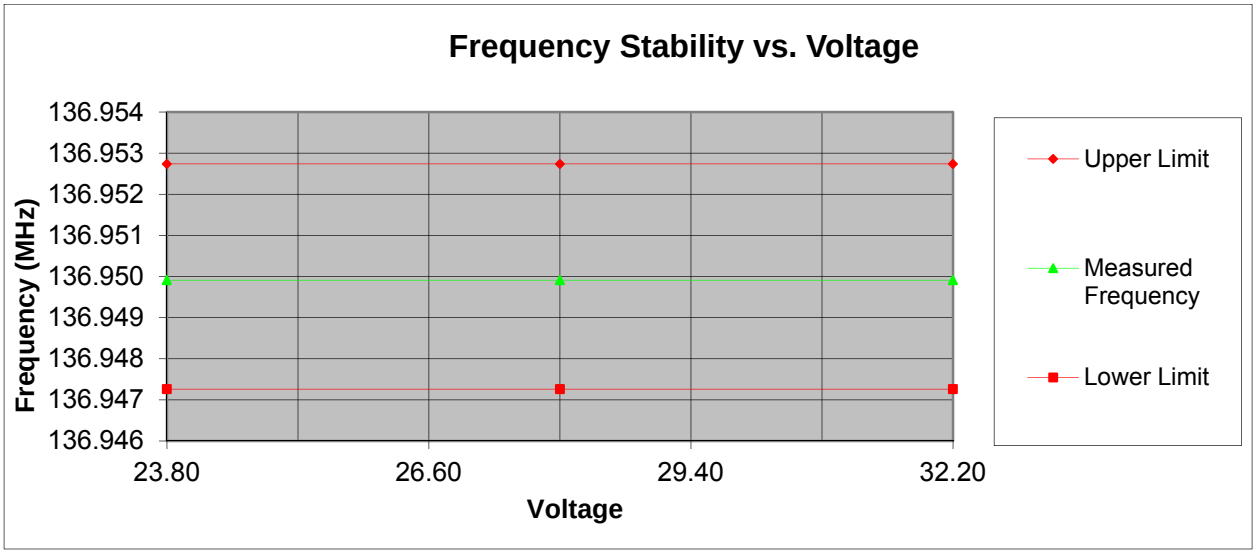
Test Results 118-135 MHz Band

Tuned Frequency 136.95 MHz
Limit = 20 PPM
Upper Limit = 136.952739
Lower Limit = 136.947261

Temperature Variation



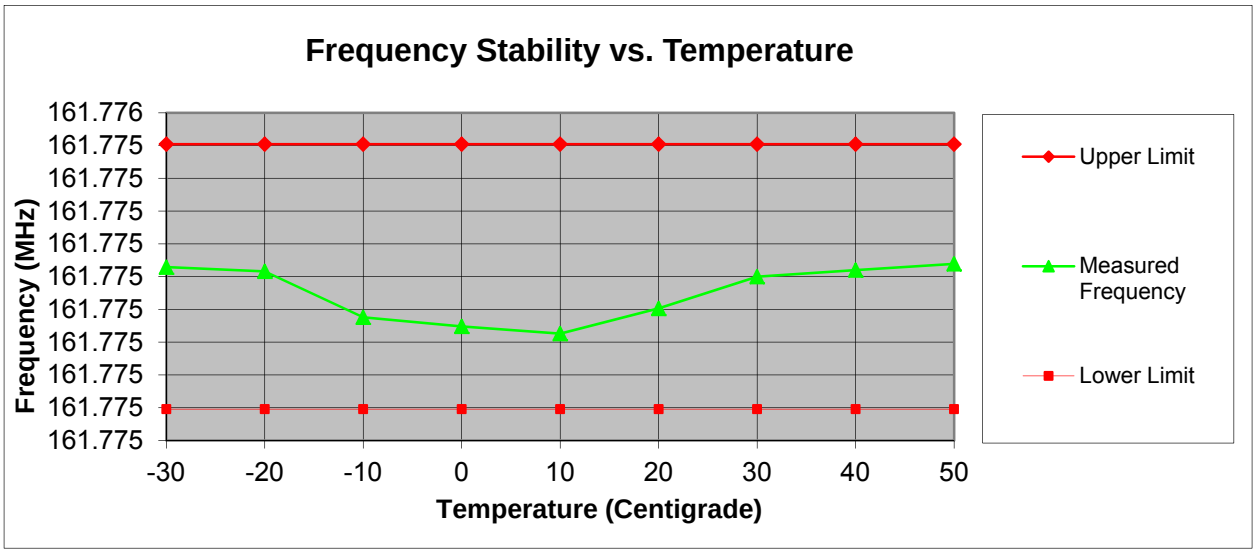
Voltage Variation



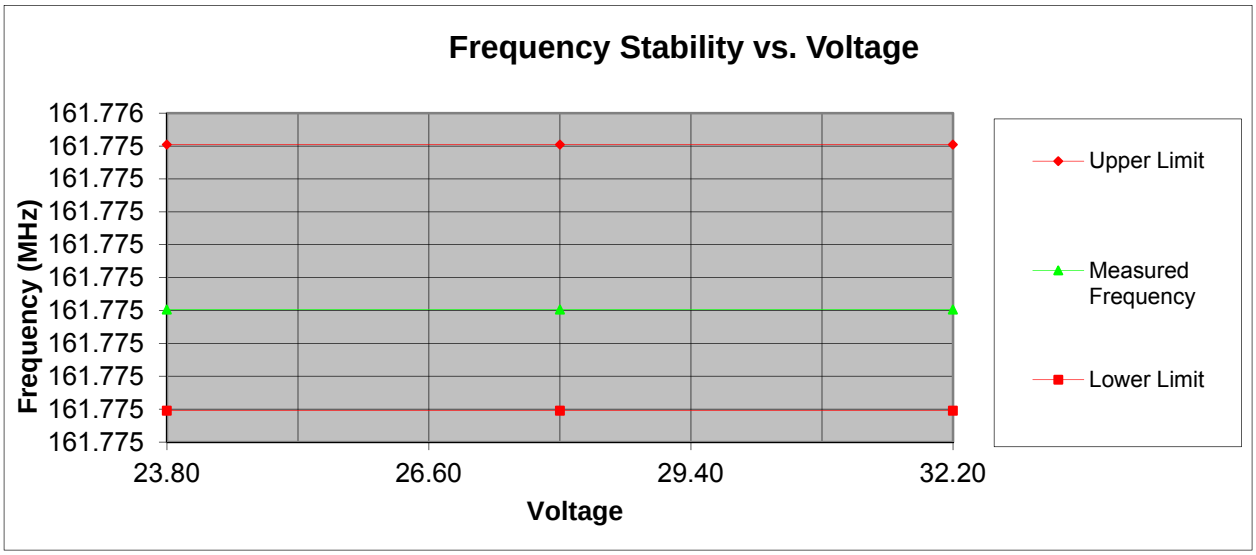
Test Results 136-174 MHz

Tuned Frequency 161.775 MHz
Limit = 2.5 PPM
Upper Limit = 161.775404
Lower Limit = 161.774596

Temperature Variation



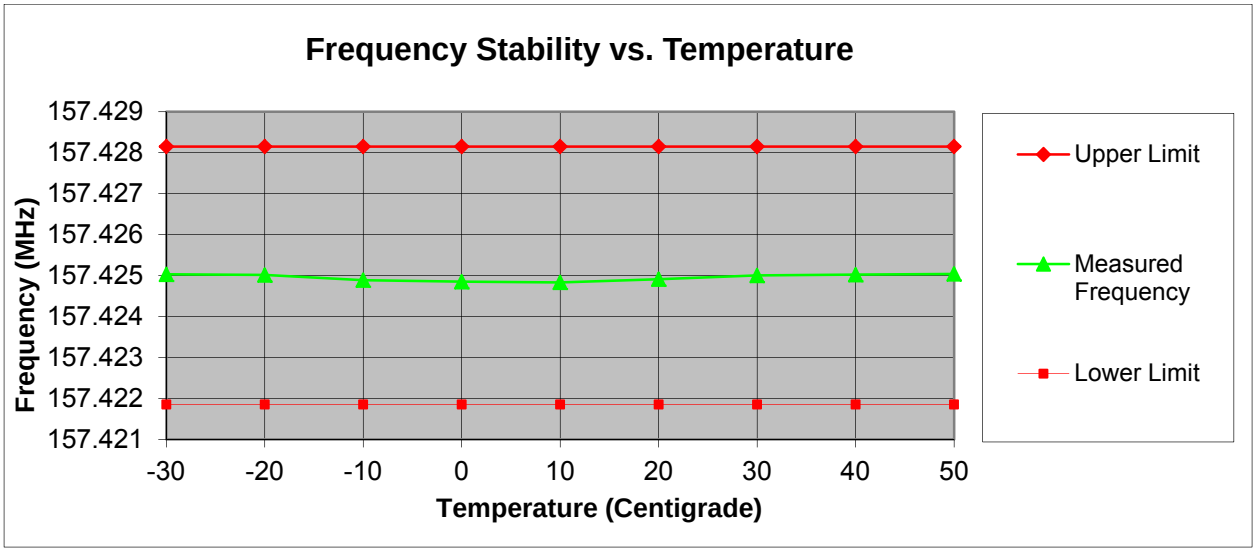
Voltage Variation



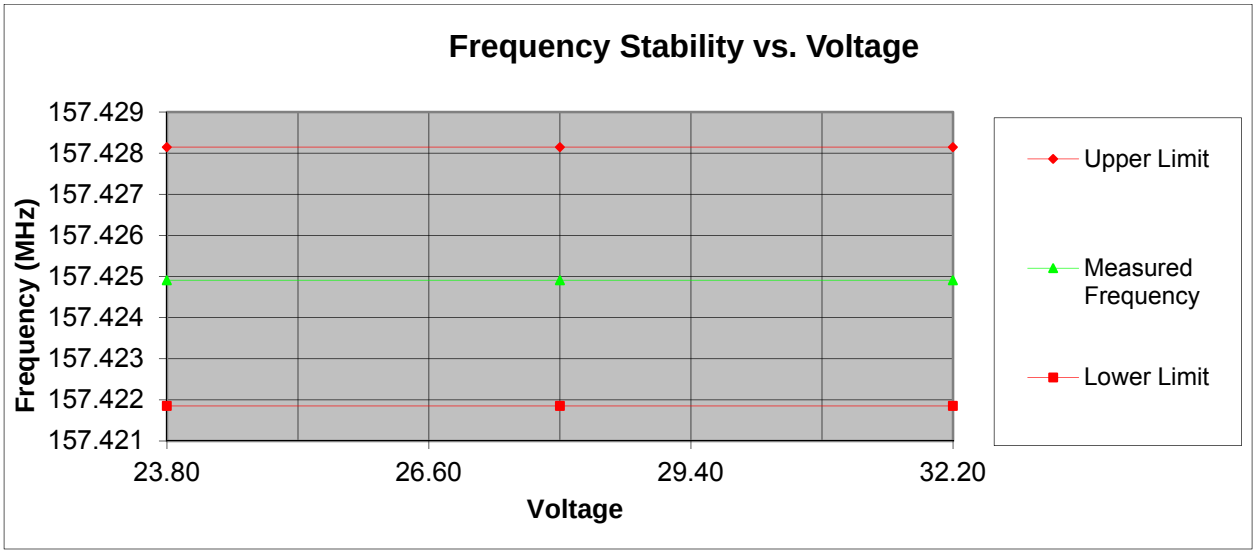
Test Results 156-158 MHz Band

Tuned Frequency 157.425 MHz
Limit = 20 PPM
Upper Limit = 157.428149
Lower Limit = 157.421852

Temperature Variation



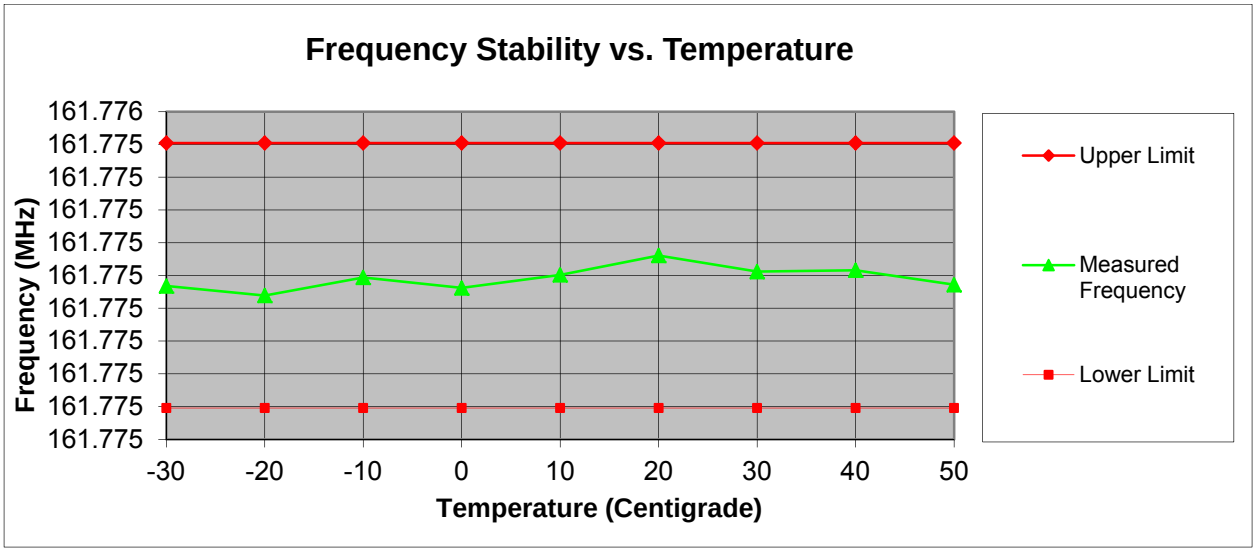
Voltage Variation



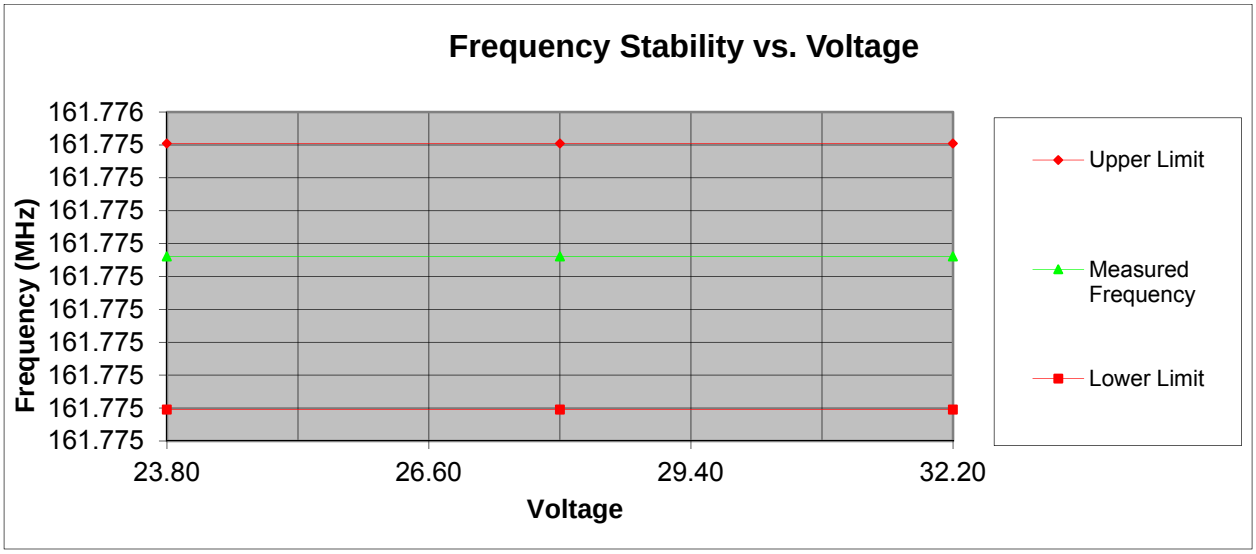
Test Results MTM 136-174 MHz Band

Tuned Frequency 161.775 MHz
Limit = 2.5 PPM
Upper Limit = 161.775404
Lower Limit = 161.774596

Temperature Variation



Voltage Variation



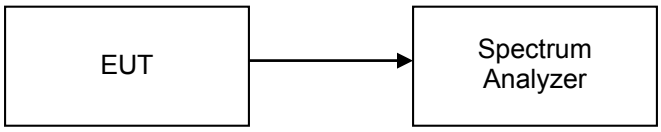
Receiver Spurious Emissions

Name of Test:	Receiver Spurious Emissions	**Engineer:**	John Erhard
Test Equipment Utilized:	i00331	**Test Date:**	11/28/2012

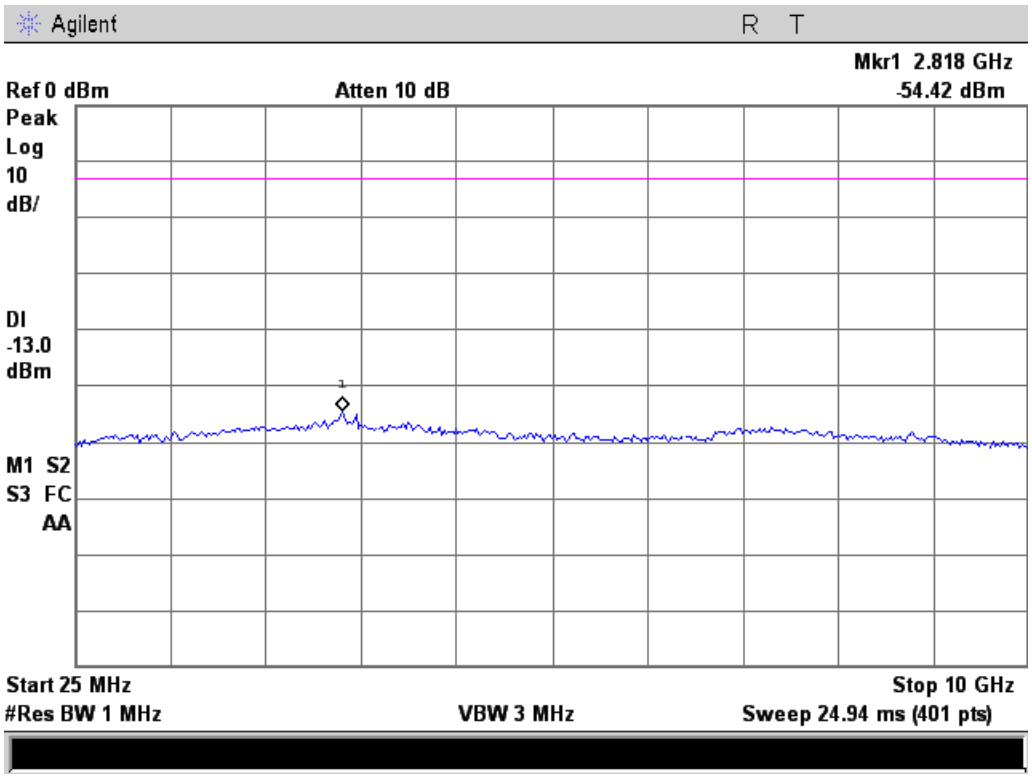
Test Procedure

The EUT was connected directly to a spectrum analyzer. The cable loss was input into the analyzer as a reference level offset to ensure accurate readings.

Test Setup



Test Results



Necessary Bandwidth Calculations

Name of Test: Necessary Bandwidth Calculations **Engineer:** John Erhard
Test Specification: 2.202 **Test Date:** 11/28/2012

Modulation = 6K00A3E		
Necessary Bandwidth Calculation:		
Modulation	=	3000
Necessary Bandwidth (B_N), kHz	=	2M
	=	6000 Hz

Modulation = 8K30F1E		
Necessary Bandwidth Calculation:		
Maximum Modulation (M), kHz	=	1.65
Maximum Deviation (D), kHz	=	2.5
Constant Factor (K)	=	1
Necessary Bandwidth (B_N), kHz	=	(2xM)+(2xDxK)
	=	8.3

Modulation = 8K30F1D		
Necessary Bandwidth Calculation:		
Data Rate (R) Kbps	=	2.3
Maximum Deviation (D), kHz	=	2.5
Necessary Bandwidth (B_N), kHz	=	2.4D+1.0R
	=	8.3

Modulation = 11K0F3E		
Necessary Bandwidth Calculation:		
Maximum Modulation (M), kHz	=	3
Maximum Deviation (D), kHz	=	2.5
Constant Factor (K)	=	1
Necessary Bandwidth (B_N), kHz	=	(2xM)+(2xDxK)
	=	11.0

Modulation = 16K0F3E (RSS-119 Only)		
Necessary Bandwidth Calculation:		
Maximum Modulation (M) kHz	=	3
Maximum Deviation (D), kHz	=	5
Constant Factor (K)	=	1
Necessary Bandwidth (B_N), kHz	=	(2xM)+(2xDxK)
	=	16.0

Test Equipment Utilized

Description	Manufacturer	Model Number	CT Asset #	Last Cal Date	Cal Due Date
Frequency Counter	HP	5334B	i00019	1/10/12	1/10/13
Temperature Chamber	Tenney	Tenney II Benchmaster	i00287	Verified on: 11/21/12	
Horn Antenna	EMCO	3115	i00103	11/5/10	11/5/12**
Function Generator	HP	33120A	i00118	Verified on: 11/16/12	
Tunable Notch Filter	Eagle	TNF-1-(250-850MHz)	i00124	Verified on: 11/16/12	
Tunable Notch Filter	Eagle	TNF-1-(100-500MHz)	i00126	Verified on: 11/16/12	
Monopole Antenna Set	Ailtech	DM-105A-T1,T2,T3	i00142, 147,148	Verified on: 11/29/12	
Power Supply	HP	6673A	i00191	Verified on: 11/16/12	
Signal Generator	Rohde & Schwarz	SMT-03	i00266	12/13/11	12/13/12
Bi-Log Antenna	Schaffner	CBL611C	i00267	12/19/11	12/19/13
Humidity / Temp Meter	Newport	IBTHX-W-5	i00282	11/5/11	11/5/12**
Voltmeter	Fluke	87III	i00319	7/3/12	7/3/13
Spectrum Analyzer	Agilent	E4407B	i00331	4/20/12	4/20/13
Data Logger	Fluke	Hydra Data Bucket	i00343	12/15/11	12/15/12
Spectrum Analyzer	Tektronix	RSA3308A	i00345	10/16/12	10/16/13
Tunable Notch Filter	Eagle	TNF-240MFMF	i00364	Verified on: 11/16/12	

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

**30 day extended calibration

END OF TEST REPORT