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FCC PART 95 SUBPART D
AND IC RSS-236 (issue 1) TEST REPORT
FOR CB TRANSCEIVERS

APPLICANT	BIKEMP3
	308A BARTOW MUNICIPAL AIRPORT P.O. BOX 2243 BARTOW, FL 33830-2243 USA
FCC ID	2ABR2EV01A
IC	11815A-EV01A
MODEL NUMBER	EV01A
PRODUCT DESCRIPTION	CB RADIO
DATE SAMPLE RECEIVED	2/24/2014
DATE TESTED	2/27/2014
TESTED BY	Joe Scoglio
APPROVED BY	Joe Scoglio
TIMCO REPORT NO.	263AUT14TestReport.docx
TEST RESULTS	☒ PASS ☐ FAIL

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GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

The test results relate only to the items tested.

Summary

The device under test does:
☒ fulfill the general approval requirements as identified in this test report
☐ not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made, under my supervision, at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, Fl 32669

Authorized Signatory Name: _____

Joe Scoglio
Test Technician/Project Manager

Date: 2/27/2014

GENERAL INFORMATION

DUT Specification

DUT Description	EV01A
FCC ID	2ABR2EV01A
IC	11815A-EV01A
Model Number	EV01A
Serial Number	N/A
Operating Frequency	26.965-27.405 MHz
No. of Channels	40
Type of Emission	6KOOA3E Bn = 2M M = 3000 Bn = 6000
Modulation	A3E
DUT Power Source	☐ 110–120Vac/50– 60Hz
	☒ DC Power
	☐ Battery Operated Exclusively
Test Item	☐ Prototype
	☒ Pre-Production
	☐ Production
Type of Equipment	☐ Fixed
	☒ Mobile
	☐ Portable

TEST ENVIRONMENT

Test Facility	Timco Engineering, Inc. 849 NW State Road 45 Newberry, FL 32669 USA.
Test Condition in the laboratory	Temperature: 26°C Relative humidity: 50%

TEST SETUP SUMMARY

Test Setup Diagram/ Description	The DUT was placed on the turntable per setup per ANSI C63.4: 2003. A test set up photo is provided for clarification.
Deviation from the standard/procedure	No deviation
Modification of DUT	No modification
Applicable Standards	EIA/TIA-382-A, FCC CFR 47 PART 95, RSS-GEN ISSUE 8, RSS-236 ISSUE 1

EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Analyzer Silver Tower Spectrum Analyzer	HP	8566B Opt 462	3552A22064 3638A08608	06/05/13	06/05/15
Antenna: Biconnical	Electro-Metrics	BIA-25	1171	06/13/12	06/13/14
Antenna: Biconnical	Eaton	94455-1	1096	05/10/13	05/10/15
Antenna: Log-Periodic	Electro-Metrics	LPA-25	1122	05/09/13	05/09/15
Frequency Counter	HP	5385A	2730A03025	08/22/13	08/22/15
Hygro-Thermometer	Extech	445703	0602	06/20/13	06/20/15
Digital Multimeter	Fluke	77	35053830	08/22/13	08/22/15
Temperature Chamber	Thermotron Corp.	S1.2 Mini Max	25-1420-09	07/03/12	07/03/14
Antenna: Double-Ridged Horn/ETS Horn 2	ETS-Lindgren	3117	0041534	10/05/12	10/05/14
Antenna: Double-Ridged Horn	Electro-Metrics	RGA-180	2319	06/19/12	06/19/14
Audio Analyzer	HP	8903B	3011A13084	08/22/13	08/22/15
Software: Field Strength Program	Timco	N/A	Version 4.0		
Analyzer Silver Tower RF Preselector	HP	85685A	2926A00983	06/05/13	06/05/15
Antenna: Double-Ridged Horn/ETS Horn 2	ETS-Lindgren	3117	00041534	10/05/12	10/05/14
EMI Test Receiver	Rhode & Schwarz	ESU 40	100320	03/21/13	03/21/15
Analyzer Silver Tower Quasi-Peak Adapter	HP	85650A	2811A01175	06/05/13	06/05/15
Temperature Chamber	Tenney Engineering	TTRC	11717-7	07/03/12	07/03/14
Frequency Counter	HP	5385A	3242A07460	06/16/13	06/16/15
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	12/31/11	03/31/14
Signal Gen	HP	8648C	3847A04696	09/18/13	09/18/15

RF power meter	**Booton**	**4531**	**11793**	**1/9/13**	**1/9/15**
Modulation Analyzer	**HP**	**8901A**	**05856**	**9/26/12**	**9/26/14**
AF Generator	**SRS**	**FS345**	**38435**	**6/19/13**	**6/19/15**

TEST PROCEDURE

Power Line Conducted Interference: The procedure used was EIA/TIA-382-A using a 50uH LISN. Both lines were observed with the DUT transmitting. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

Bandwidth 20 dB: The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 1 MHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

Power Output: The RF power output was measured at the antenna feed point using a peak power meter.

Antenna Conducted Emissions: The RBW = 100 kHz, VBW = 300 kHz and the span set to 10.0 MHz and the spectrum was scanned from 30 MHz to the 10th Harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = 3 MHz and the span to 50 MHz.

Radiation Interference: The test procedure used was EIA/TIA-382-A using an Agilent spectrum receiver with pre-selector. The bandwidth (RBW) of the spectrum EIA/TIA-382-A receiver was 100 kHz up to 1 GHz and 1 MHz above 1 GHz with an appropriate sweep speed. The VBW above 1 GHz was 3 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

RF POWER OUTPUT

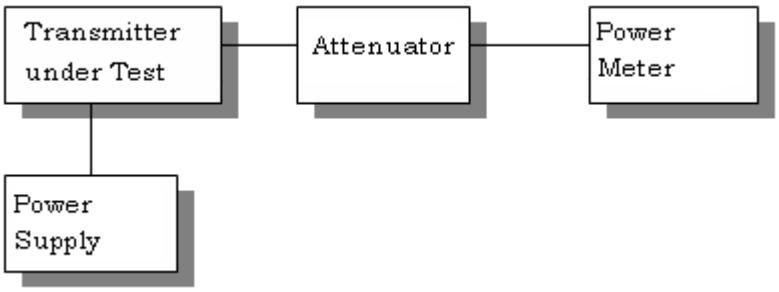
Rule Part No.: Part 2.1033(c), Part 95, RSS-236 issue 1

Test Requirements:

Method of Measurement: RF power is measured by connecting a 50-ohm, resistive wattmeter to the RF output connector. With a nominal battery voltage, and the transmitter properly adjusted the RF output measures:

Test Data: OUTPUT POWER: 4 Watts

Test Setup Diagram:



Part 2.1033 (C)(8) DC Input into the final amplifier

INPUT POWER: (13.8V)(1.2A) = 16.5 Watts

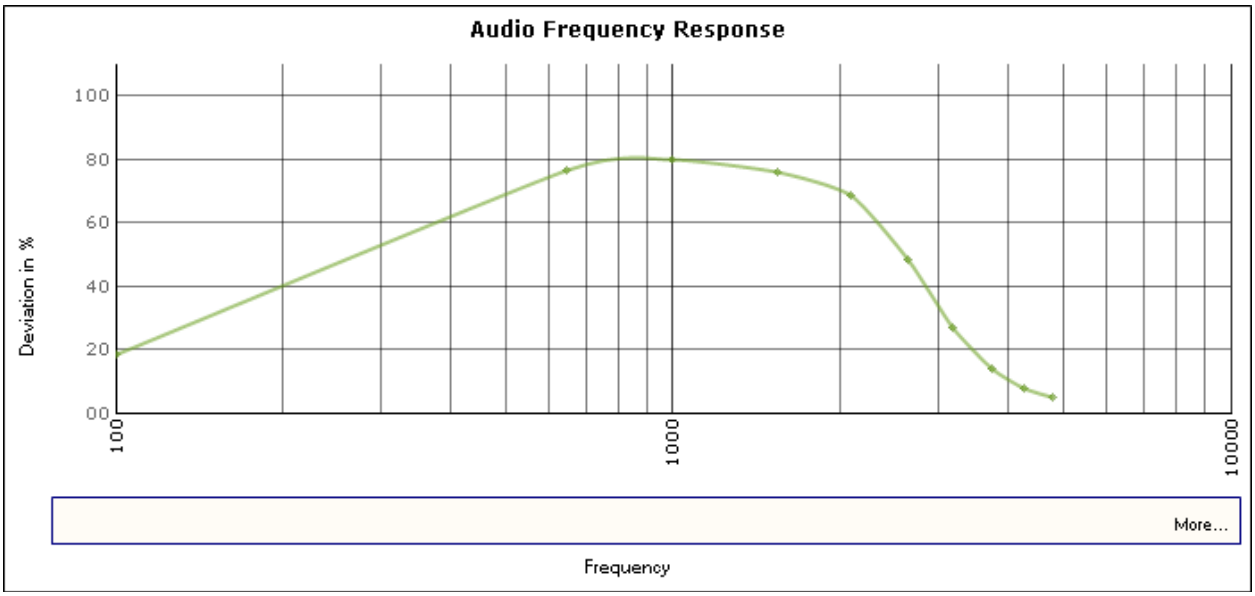
MODULATION CHARACTERISTICS

AUDIO FREQUENCY RESPONSE

Rule Part No.: Part 2.1047(a)(b), RSS-236 issue 1

Method of Measurement:

The audio frequency response was measured in accordance with EIA/TIA-382-A with no exception. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 – 5000 Hz shall be submitted. The audio frequency response curve is shown below.

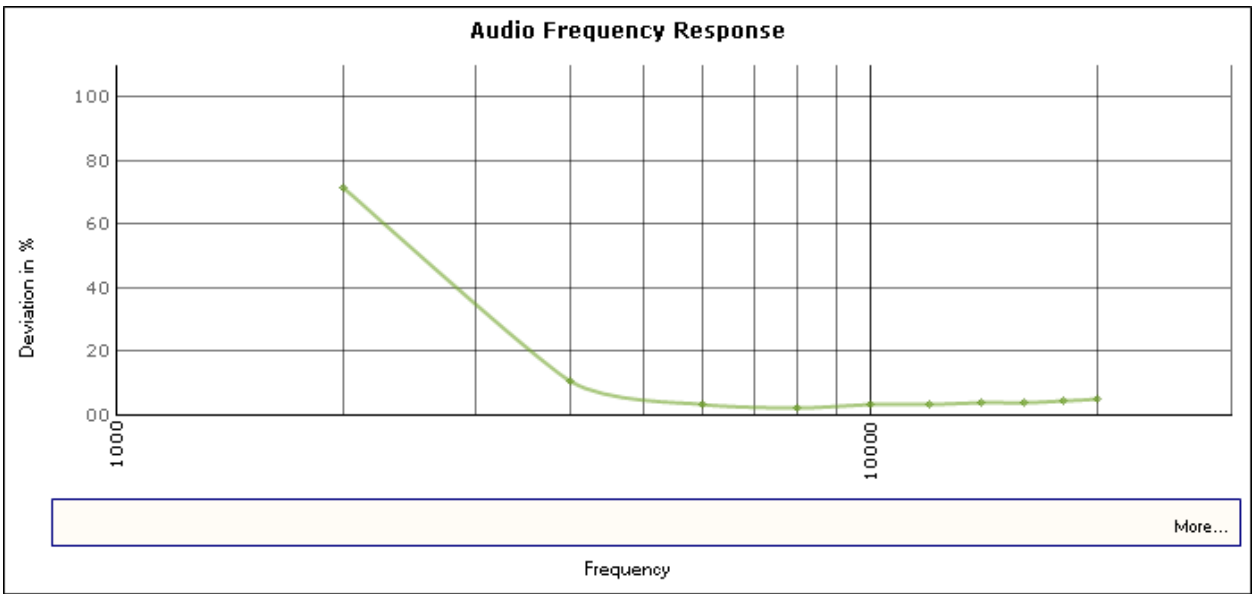


AUDIO LOW PASS FILTER RESPONSE

Rule Part No.: Part 2.1047(a)(b), RSS-236 issue 1

Required for voice modulated communication equipment

For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all the circuitry installed between the modulation limiter and the modulated stage shall be submitted.



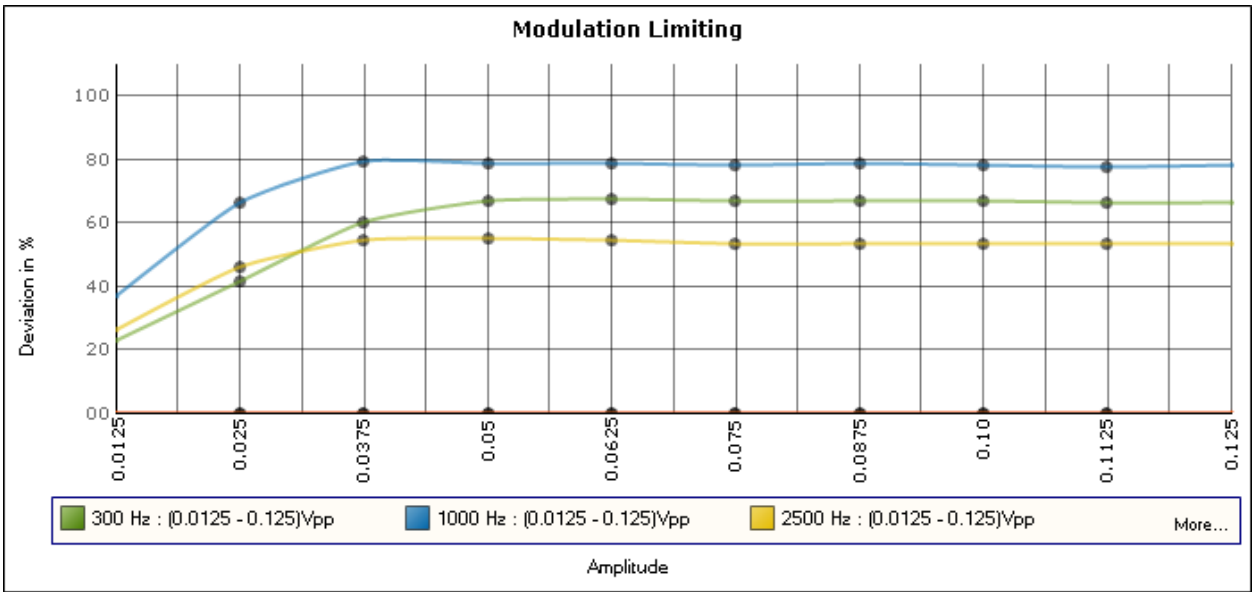
AUDIO INPUT VS MODULATION

Rule Part No.: Part 2.1047(a)(b), RSS-236 issue 1

Test Requirements: Modulation cannot exceed 100%

Method of Measurement: The audio input level needed for a particular percentage of modulation was measured in accordance with EIA/TIA-382-A. The audio input curves versus modulation are shown below. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz.

Test data:



AM modulation

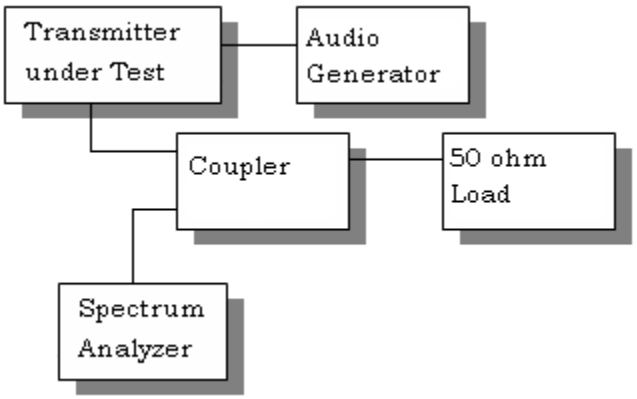
OCCUPIED BANDWIDTH

2.1049, RSS-236 issue 1

95.631(c) Data in the plots shows that the sidebands from greater than 50% to 100% of the authorized bandwidth must be attenuated by at least 25 dB and from 100 to 250% the sidebands must be attenuated by at least 35 dB. Beyond 250% the sidebands must be attenuated by at least 53+ 10log (TP). The transmitter was modulated with 2500 Hz, adjusted for 50% modulation plus 16 dB. The spectrum analyzer was set with the un-modulated carrier at the top of the screen. The test procedure diagram and occupied bandwidth photographs follow.

Radiotelephone transmitter with modulation limiter.

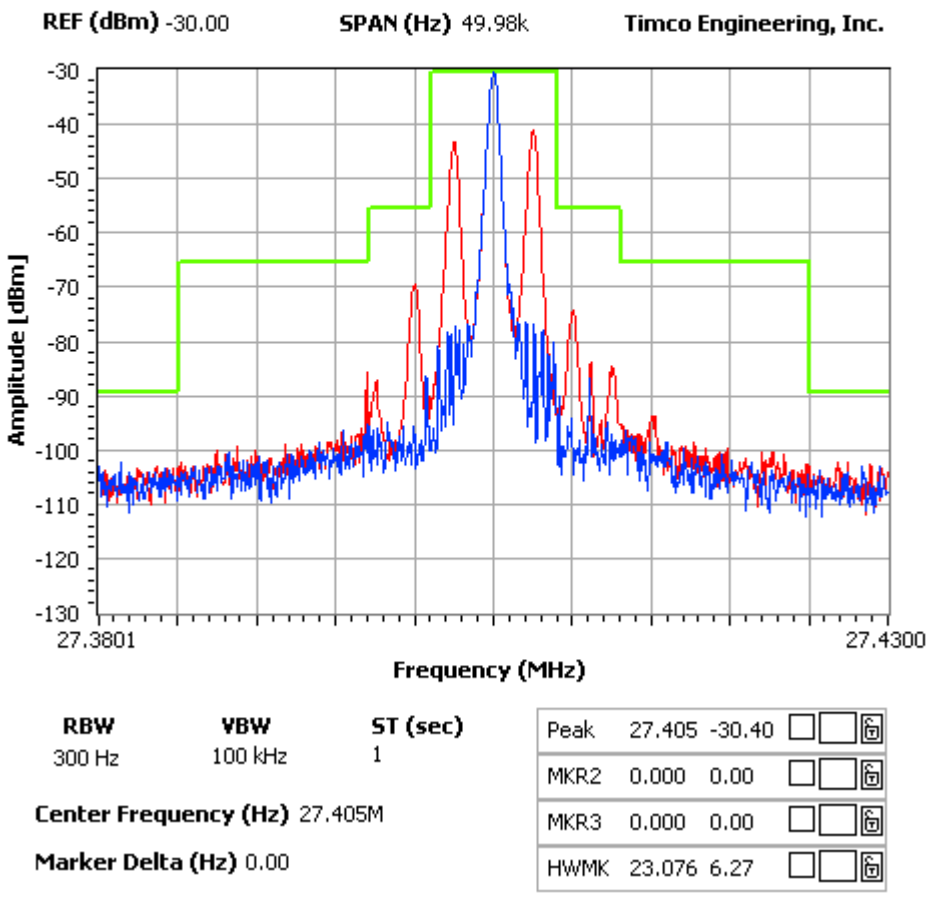
Test procedure diagram



OCCUPIED BANDWIDTH PLOT

NOTES:

FCC 95.635 Mask (1) (3) (8) (9)



AM mode: modulation frequency 2.5 kHz

SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

Rule Part No.: Part 2.1051(a), RSS-236 issue 1

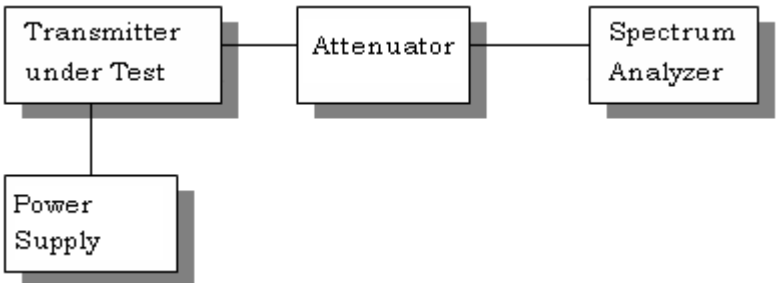
Requirements: 53+ 10log (4.00) = 59.0dB. Any emissions above 54 MHz must be 60 dBc.

Method of Measurement: The carrier was modulated 100% using a 2500 Hz tone. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental. The measurements were made in accordance with standard EIA/TIA-382-A.

Test Data:

channel 1				channel 40		
Frequency				Frequency		
MHz	dBm	dBc		MHz	dBm	dBc
26.9	35.9	0		27.4	36	0
53.9	-60.9	96.8		54.8	-60.2	96.2
80.8	-62.8	98.7		82.2	-62.5	98.5
107.8	-64.3	100.2		109.6	-63.9	99.9
134.8	-64.9	100.8		137	-65.5	101.5
161.7	-63.8	99.7		164.4	-63.6	99.6
188.7	-62.5	98.4		191.8	-62.2	98.2
215.7	-65.7	101.6		219.2	-64.8	100.8
242.6	-62.9	98.8		246.6	-62.8	98.8
269.6	-63.9	99.8		274	-65.3	101.3

Method of Measuring Conducted Spurious Emissions



METHOD OF MEASUREMENT: The procedure used was EIA/TIA-382-A.

FIELD STRENGTH OF SPURIOUS EMISSIONS

Rule Parts. No.: Part 2.1053, 95.635(b)(8)(9), RSS-236 issue 1

Requirements: Emissions must be attenuated by at least the following below the output of the transmitter.

53 + 10log(4.00) = 59.0 dB or
FCC Limit for**:** 8kHz Authorized BW

At least 53+10Log(T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%. At least 60dB on any frequency twice or greater than twice the fundamental.

Test Data:

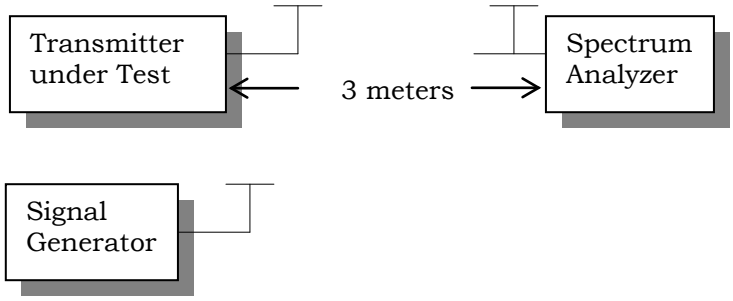
Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
26.90	V	0
53.90	V	108.9
80.80	H	109.0
107.80	V	92.8
134.80	H	103.2
161.70	V	99.2
188.70	V	98.0
215.70	H	113.4
242.60	H	108.3
269.60	V	107.8

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
27.40	V	0
54.80	V	109.0
82.20	V	107.2
109.60	V	94.4
137.00	V	96.8
164.40	H	104.2
191.80	V	98.0
219.20	V	107.3
246.60	H	109.7
274.00	V	107.9

METHOD OF MEASUREMENT

The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 MHz to at least the tenth harmonic of the fundamental. This test was conducted per EIA/TIA-382-A using the substitution method.

Test Setup Diagram:



FREQUENCY STABILITY

2.1055(a)(b)(d), RSS-236 issue 1

Temperature and voltage tests were performed to verify that the frequency remains within the .005%, 50 ppm specification limit. The test was conducted as follows: The transmitter was placed in the temperature chamber at 25 ºC and allowed to stabilize for one hour. The transmitter was keyed ON for one minute during which four frequency readings were recorded at 15-second intervals. The worse case number was taken for temperature plotting. The assigned channel frequency was considered to be the reference frequency. The temperature was then reduced to -30 ºC after which the transmitter was again allowed to stabilize for one hour. The transmitter was keyed ON for one minute, and again frequency readings were noted at 15-second intervals. The worst case number was recorded for temperature plotting. This procedure was repeated in 10 degree increments up to + 50 ºC.

Readings were also taken at ±15% of the battery voltage of 13.8 VDC.

Test Data:

Assigned Frequency (Ref. Frequency) (MHz)		
Temperature (ºC)	**Frequency (MHz)**	**Frequency Stability (PPM)**
-30	27.4047564	-9.13
-20	27.404898	-3.95
-10	27.404981	-0.94
0	27.405028	0.78
+10	27.405024	0.65
+20	27.4050016	-0.19
+30	27.4049836	-0.84
+40	27.4049671	-1.44
+50	27.4049715	-1.28

Assigned Frequency (Ref. Frequency) (MHz)		
Battery %	**Frequency (MHz)**	**Frequency Stability (PPM)**
-15%	27.4050065	-0.01
0	27.4050067	0
+15%	27.4050061	-0.02