TIMCO ENGINEERING INC.
849 NW State Road 45
Newberry, Florida 32669
http://www.timcoengr.com
888.472.2424 F 352.472.2030 email: sid@timcoengr.com

Test Report

Product Name: FRS/GMRS TRANSCEIVER

FCC ID: BBOPR5000

Applicant:

COBRA ELECTRONICS CORPORATION
6500 WEST CORTLAND STREET
CHICAGO IL 60707

Date Receipt: 9/15/2005

Date Tested: 9/16/2005

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TABLE OF CONTENTS LIST

TEST REPORT:

EXHIBITS INCLUDED:

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GENERAL INFORMATION REQUIRED
FOR CERTIFICATION

2.1033(c)(1)(2) COBRA ELECTRONICS CORPORATION will manufacture the FCCID: BBOPR5000 GMRS/FRS COMBINATION TRANSCEIVER in quantity, for use under FCC RULES PART 95.

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2.1033 (c) TECHNICAL DESCRIPTION

2.1033(c)(3) Instruction book. A draft copy of the instruction manual is included is included in the exhibits.

2.1033(c) (4) 95.631 Type of Emission: 10K5F3E

Bn = 2M + 2DK
M = 3000
D = 1.75K
Bn = 2(3000)+2(2250) = 10.5K

GMRS Authorized Bandwidth 20.0 kHz

2.1033(c)(5) 95.621 GMRS Frequency Range:

1.	462.5500	13.	462.7000
2.	462.5625	14.	462.7125
3.	462.5750	15.	462.7250
4.	462.5875	16.	467.5500
5.	462.6000	17.	467.5750
6.	462.6125	18.	467.6000
7.	462.6250	19.	467.6250
8.	462.6375	20.	467.6500
9.	462.6500	21.	467.6750
10.	462.6625	22.	467.7000
11.	462.6750	23.	467.7250
12.	462.6875		

FRS Authorized Bandwidth 12.5KHz

2.1033(c)(5) 95.627 FRS Frequency Range:

1.	462.5625	8.	467.5625
2.	462.5875	9.	467.5875
3.	462.6125	10.	467.6125
4.	462.6375	11.	467.6375
5.	462.6625	12.	467.6625
6.	462.6875	13.	467.6875
7.	462.7125	14.	467.7125 MHz

2.1033(c)(6)(7) 95.639 95.649 Power Output shall not exceed 0.50 Watts effective radiated power. There can be no provisions for increasing the power or varying the power.

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2.1033(c)(8) DC Voltages and Current into Final Amplifier:
FINAL AMPLIFIER ONLY

FOR LOW POWER SETTING INPUT POWER: (6.0V)(0.47A) = 2.82 Watts
FOR HIGH POWER SETTING INPUT POWER: (6.0V)(0.58A) =3.48 Watts

2.1033(c)(9) Tune-up procedure. The tune-up procedure is included in the exhibits.

2.1033(c)(10) Complete Circuit Diagrams: The circuit diagram and block diagram are included in the exhibits.

2.1033(c)(11) A photograph or a drawing of the equipment identification label is included in the exhibits.

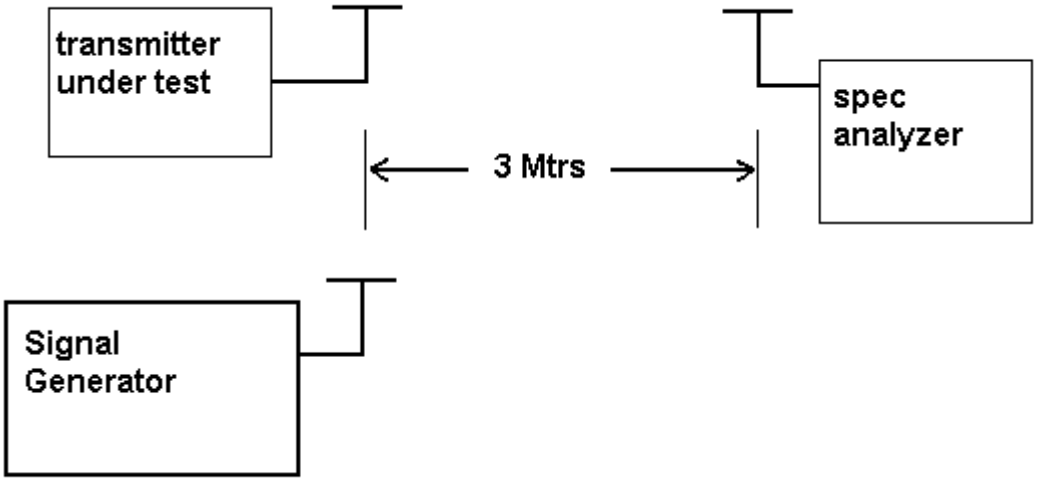
2.1033(c)(12) Photographs(8"X10") of the equipment of sufficient clarity to reveal equipment construction and layout, including meters, labels for controls, including any view under shields.

2.1033(c)(13) Digital modulation is not allowed.

2.1033(c)(14) The data required by 2.1046 through 2.1057 is submitted below.

2.10311c)(6)(7) RF power is measured by the substitution method as
2.1046(a) outlined in TIA/EIA - 603. With a nominal battery voltage of 6.0 V, and the transmitter properly adjusted the RF output measures:

GMRS - 1.4 Watts
FRS - .50 Watts



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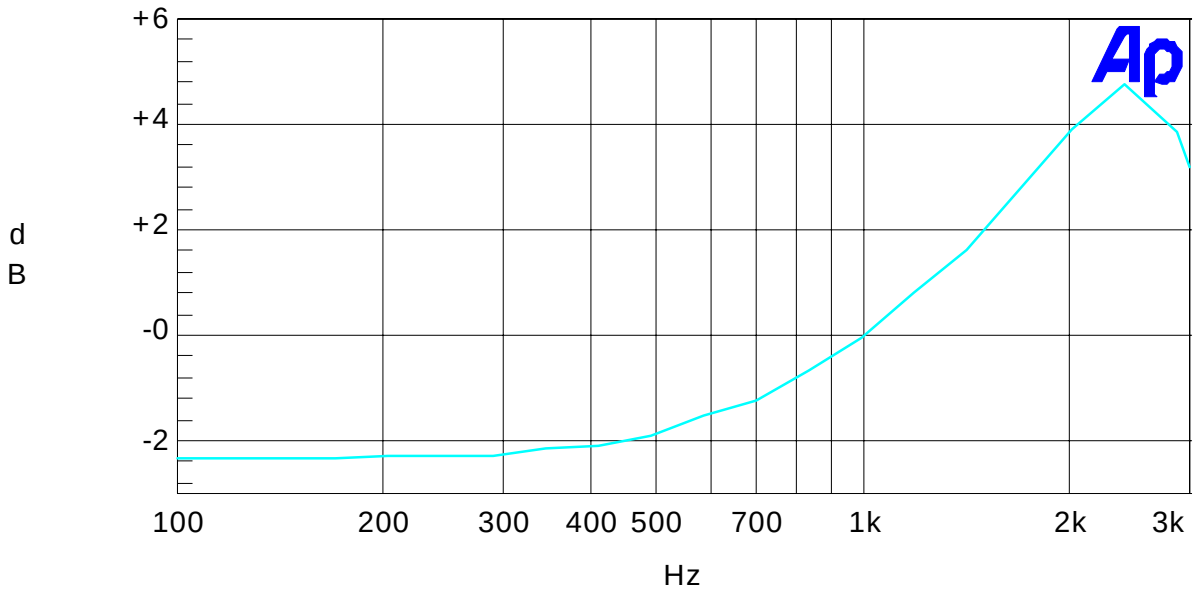
2.1047(a)(b) Modulation characteristics:

AUDIO FREQUENCY RESPONSE

The audio frequency response was measured in accordance with TIA/EIA Specification 603. The audio frequency response curve is shown on the next page. The audio signal was fed into a dummy microphone circuit and into the microphone connector. The input required to produce 30 percent modulation level was measured. See plot below.

Audio Frequency Response Plot



Color	Line Style	Thick	Data	Axis
Cyan	Solid	1	Anlr.Level A!Normalize	Left

MaxFreq.at1

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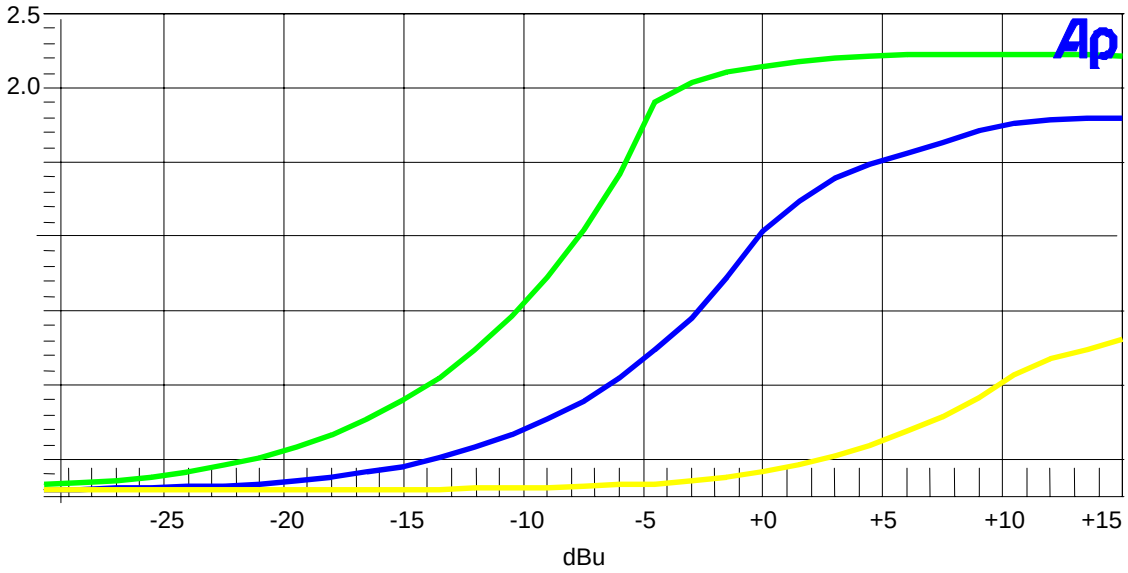
2.1047(b) Audio input versus modulation

The audio input level needed for a particular percentage of modulation was measured in accordance with TIA/EIA Specification 603. The audio input curves versus modulation are on the following pages. Curves are provided for audio input frequencies of 300, 1000, and 2500 Hz. See the plot below.

Modulation Limiting Plots:
2.5 KHz (Green), 1.0 KHz (Blue), and 300 Hz (Yellow)



Color	Line Style	Thick	Data	Axis
Blue	Solid	3	Anlr.Level A	Left
Green	Solid	3	Anlr.Level A	Left
Yellow	Solid	3	Anlr.Level A	Left

modulation limiting.at1

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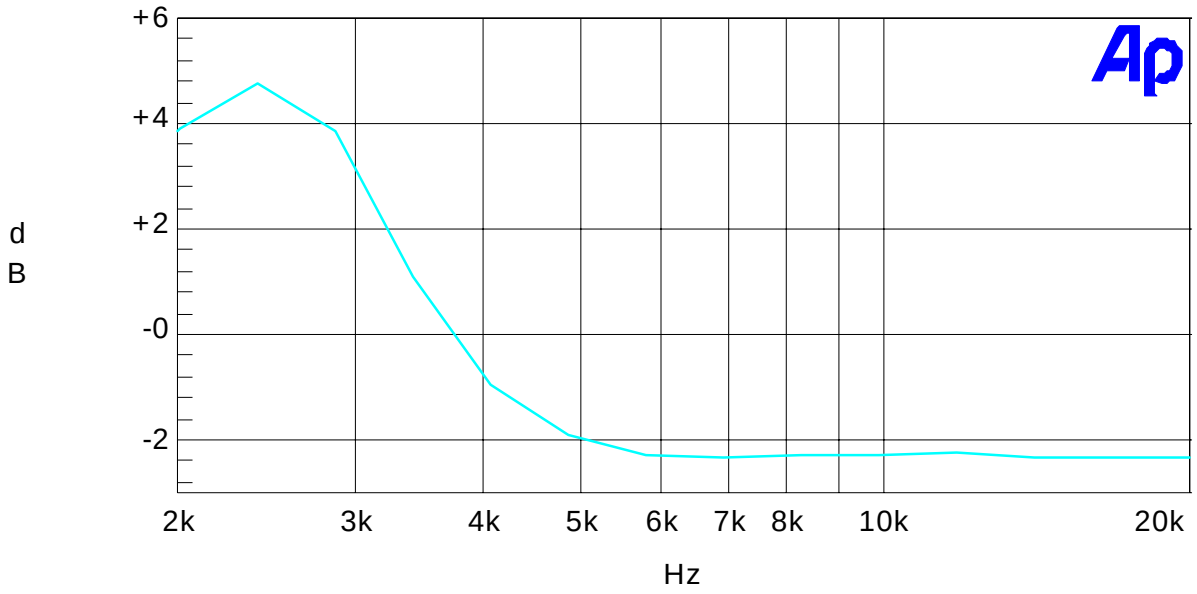
95.637 Post Limiter Filter Each GMRS transmitter, except a mobile station transmitter with a power of 2.5Watts or less, must be equipped with an audio low pass filter. At any frequency between 3 & 20 kHz the filter must have an attenuation of 60log (f/3) greater than the attenuation at 1KHz. See below.

Audio Low Pass Filter Plot



Color	Line Style	Thick	Data	Axis
Cyan	Solid	1	Anlr.Level A!Normalize	Left

MaxFreq.at1

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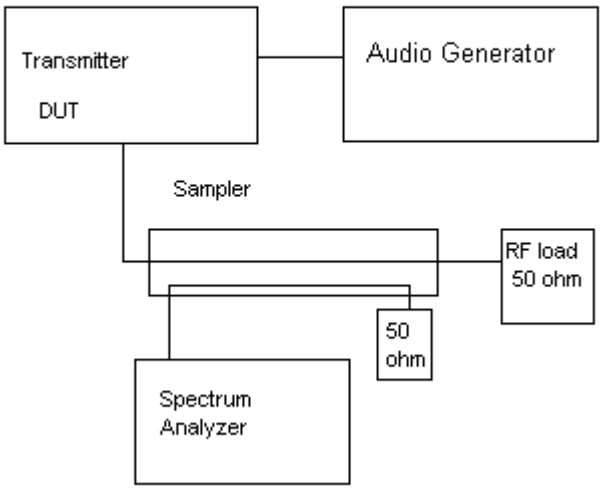
2.1049 Occupied bandwidth:
95.635(b)(1)(3)(7)

At least 25dB on any frequency removed from the center of the authorized bandwidth by more than 50%up to and including 100% of the authorized bandwidth. At least 35 dB on any frequency removed from the center of the authorized BW by more than 100% up to and including 250% of the authorized BW. At least 43+log10(TP) dB on any frequency removed from the center of the authorized bandwidth by more than 250%. See plots on the next 2 pages.

Occupied BW Test Equipment Setup



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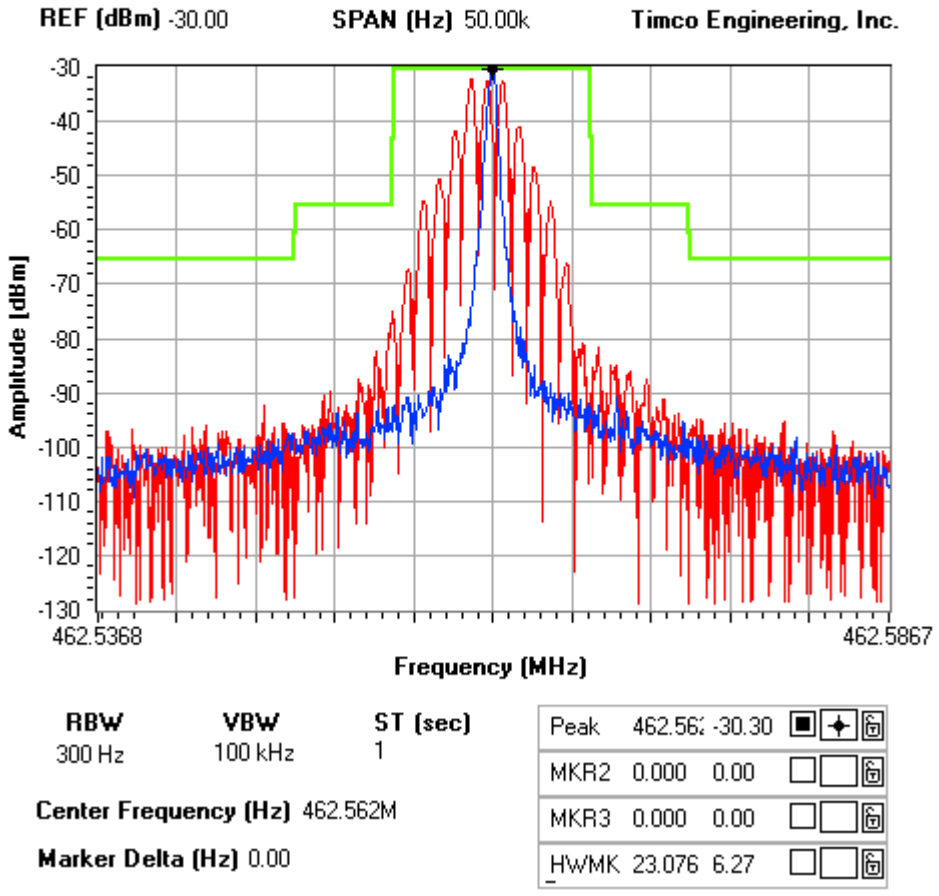
OCCUPIED BANDWIDTH PLOT

NOTES:
COBRA ELECTRONICS CORPORATION - FCC ID: BBOPR5050
OCCUPIED BANDWIDTH PLOT

FCC 95.635 Mask (1) (3) (7)



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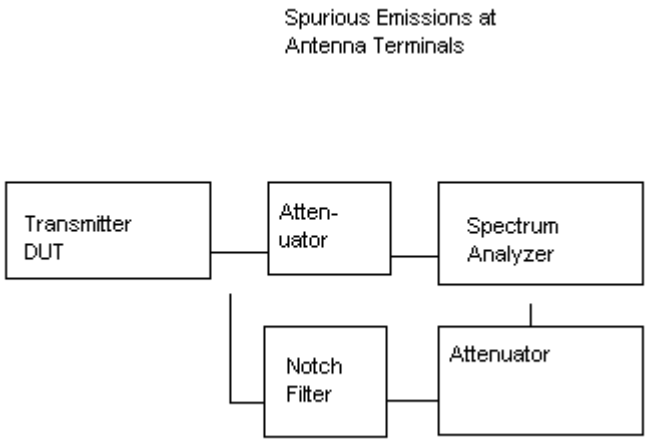
2.1051 Spurious emissions at antenna terminals(conducted): The following data shows the level of conducted spurious responses at the antenna terminal. The test procedure used was TIA/EIA 603 S2.2.13 with the exception that the emissions were recorded in dBc. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental.

NAME OF TEST: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

2.1051 Not Applicable, no antenna terminal allowed.

Method of Measuring Conducted Spurious Emissions



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2.1053 UNWANTED RADIATION:
95.635(b)(7)

The tabulated Data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the fundamental. This test was conducted per ANSI C63.4-2003.

GMRS REQUIREMENTS: HIGH - 43 + 10log(1.4) = 44.45 dB
LOW – 43 + 10log(0.5) = 39.99

TEST DATA HIGH:

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
462.56	0	0.00
925.12	V	60.20
1387.68	V	68.68
1850.24	H	53.62
2312.80	H	62.90
2775.36	H	65.94
3237.92	H	56.65
3700.48	H	62.78
4163.04	H	59.70
4625.60	H	56.02

TEST DATA LOW:

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
462.56	0	0.00
925.12	V	58.54
1387.68	V	65.02
1850.24	H	56.66
2312.80	H	56.84
2775.36	H	61.68
3237.92	H	45.99
3700.48	H	58.32
4163.04	H	59.44
4625.60	H	50.46

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2.1053
95.635(b)(7)

UNWANTED RADIATION:

The tabulated Data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the fundamental. This test was conducted per ANSI C63.4-2003.

FRS REQUIREMENTS: LOW – 43 + 10log(0.5) = 39.99

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
467.71	0	0
935.20	V	62.06
1402.80	V	63.36
1870.40	H	55.05
2338.00	H	51.18
2805.60	H	63.56
3273.20	H	48.97
3740.80	H	58.21
4208.40	H	54.89
4676.00	H	54.13

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 TIA/EIA STANDARD 603 using the substitution method. Measurements were made at the open field test site of TIMCO ENGINEERING, INC. located at 849 NW State Road 45, Newberry, FL 32669.

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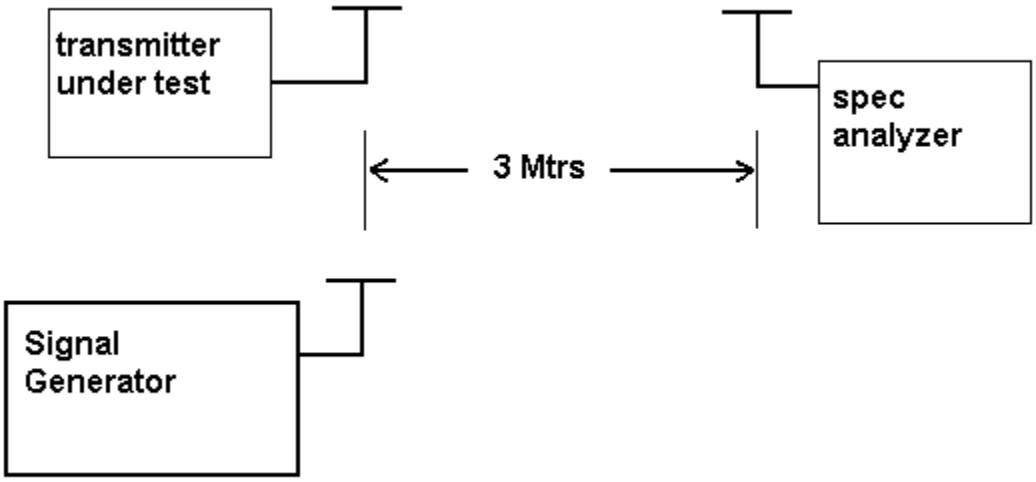
Method of Measuring Radiated Spurious Emissions



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2.1055 Frequency stability:
95.621(b)

Temperature and voltage tests were performed to verify that the frequency remains within the 0.0005%, 5 ppm specification limit. The test was conducted as follows: The transmitter was placed in the temperature chamber at 25º C 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 -30º C 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 + 50º C.

Readings were also taken at plus and minus 15% of the battery voltage of 6.0 VDC.

MEASUREMENT DATA:

Ref. Freq.
462.561876

TEMPERATURE °C	FREQUENCY MHz	PPM
-30C	462.559580	-4.96
-20C	462.561227	-1.40
-10C	462.562181	0.66
0C	462.562523	1.40
10C	462.562759	1.91
20C	462.561876	0.00
30C	462.561329	-1.18
40C	462.560890	-2.13
50C	462.560891	-2.13

Batt. Volts	Batt. Data	PPM
-15%	462.561962	0.19
+15%	462.561857	-0.04

Note: This EUT meets the frequency stability requirement for a FRS: +/- 2.5ppm over temp range of -20 degrees C to +50 degrees C. It also meets the GMRS frequency stability requirements: +/- 5ppm over the temp range –30 degrees C to +50 degrees C.

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EMC Equipment List

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/27/04	3/26/07
3-Meter OATS	TEI	N/A	N/A	Listed 1/13/03	1/12/06
Biconnical Antenna	Eaton	94455-1	1057	CAL 3/18/03	3/18/05
Biconnical Antenna	Eaton	94455-1	1096	CAL 8/17/04	8/17/06
Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/29/05	4/29/07
Blue Tower Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 4/13/05	4/13/07
Blue Tower RF Preselector	HP	85685A	2926A00983	CAL 8/3/05	8/3/07
Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 4/13/05	4/13/07
LISN	Electro-Metrics	ANS-25/2	2604	CAL 8/27/04	8/27/06
LISN	Electro-Metrics	EM-7820	2682	CAL 4/28/05	4/28/07
Log-Periodic Antenna	Eaton	96005	1243	CAL 5/8/03	5/8/05