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APPLICANT: COBRA ELECTRONICS CORPORATION

FCC ID: BBOHH100

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GENERAL INFORMATION REQUIRED
FOR TYPE ACCEPTANCE

2.1033(c) COBRA ELECTRONICS CORPORATION will sell the
FCC ID: BBOHH100 VHF Marine transmitter in
quantity, for use under FCC RULES PART 80.

2.1033(c) TECHNICAL DESCRIPTION

(4) Type of Emission: 14K0G3E/14K0F3E For 20KHz
For 25KHz

$$B_n = 2M + 2DK$$

$$M = 3000$$

$$D = 4.0\text{KHz (Peak Deviation)}$$

$$K = 1$$

$$B_n = 2(3.0K) + 2(4.0K)(1) = 6.0K + 8.0 = 14.0K$$

80.205(A) ALLOWED AUTHORIZED BANDWIDTH = 20.00KHz.

2.1033(c)(5) Frequency Range: 156.025-157.425 MHz

2.1033(c)(6) Power Range and Controls: There is a user Power
switch for High/Low Power.

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

POWER INPUT

FINAL AMPLIFIER ONLY

High

$$V_{ce} = 6 \text{ VDC}$$

$$I_{ce} = .960 \text{ A.}$$

Low

$$V_{ce} = 6 \text{ VDC}$$

$$I_{ce} = .302$$

$$P_{in} = 5.76 \text{ Watts}$$

$$P_{in} = 1.82 \text{ Watts}$$

Function of each electron tube or semiconductor
device or other active circuit device: - SEE EXHIBIT# 7

2.1033(c)(10) Complete Circuit Diagrams: The circuit diagram is
included as EXHIBIT 2. The block diagram is
included as EXHIBIT 1.

2.1033(c)(3) Instruction book. The instruction manual is included
as EXHIBIT #3.

2.1033(c) (9) Tune-up procedure. The tune-up procedure is given in EXHIBIT #8.

Description of all circuitry and devices provided for determining and stabilizing frequency is included in the circuit description in the instruction manual.

2.1033(c) (13) Digital modulation. This unit does NOT use digital modulation.

The data required by 2.1046 through 2.1055 is submitted below.

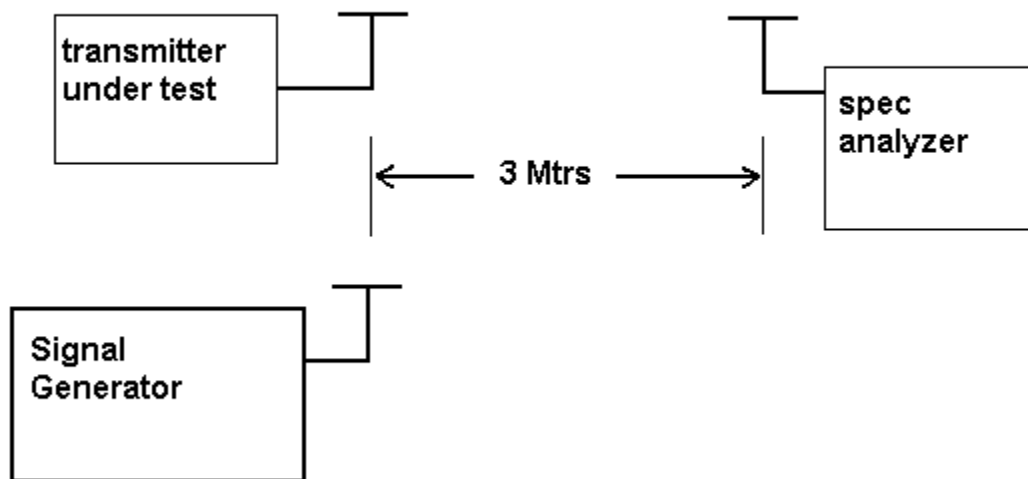
2.1046(a) RF_power_output.
80.215(e)(1)

RF power is measured by connecting the ERP METHOD. With A nominal battery voltage of 9.0V, and the transmitter Properly adjusted the RF output measures:

POWER OUTPUT

OUTPUT POWER: HIGH: .78 Watts ERP
LOW: .42 Watts ERP

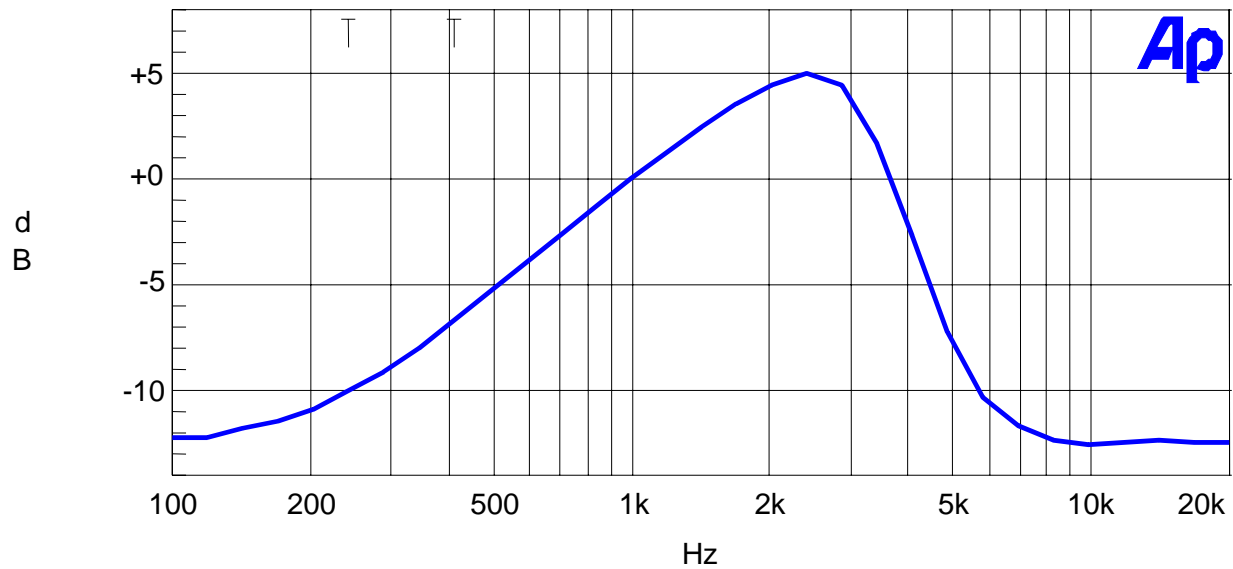
METHOD OF MEASURING RF POWER OUTPUT



2.1047(a) Voice Modulation_characteristics:

(b) AUDIO_FREQUENCY_RESPONSE

Audio Frequency Response



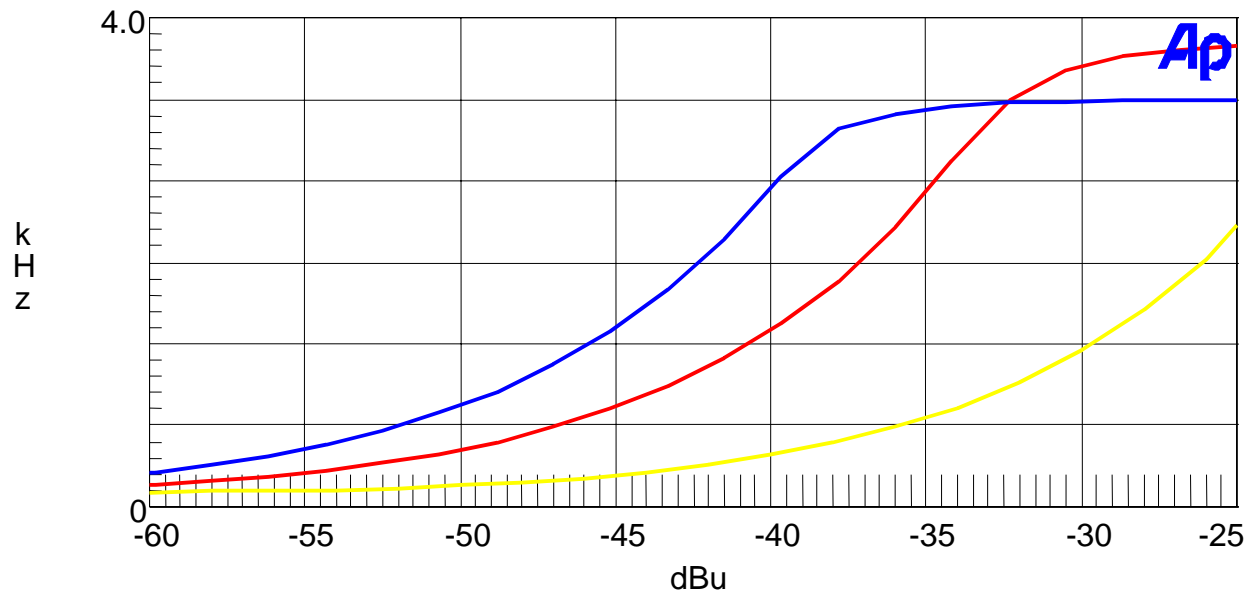
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Modulation Limiting: 2.5 KHz, 1.0 KHz, 300 Hz



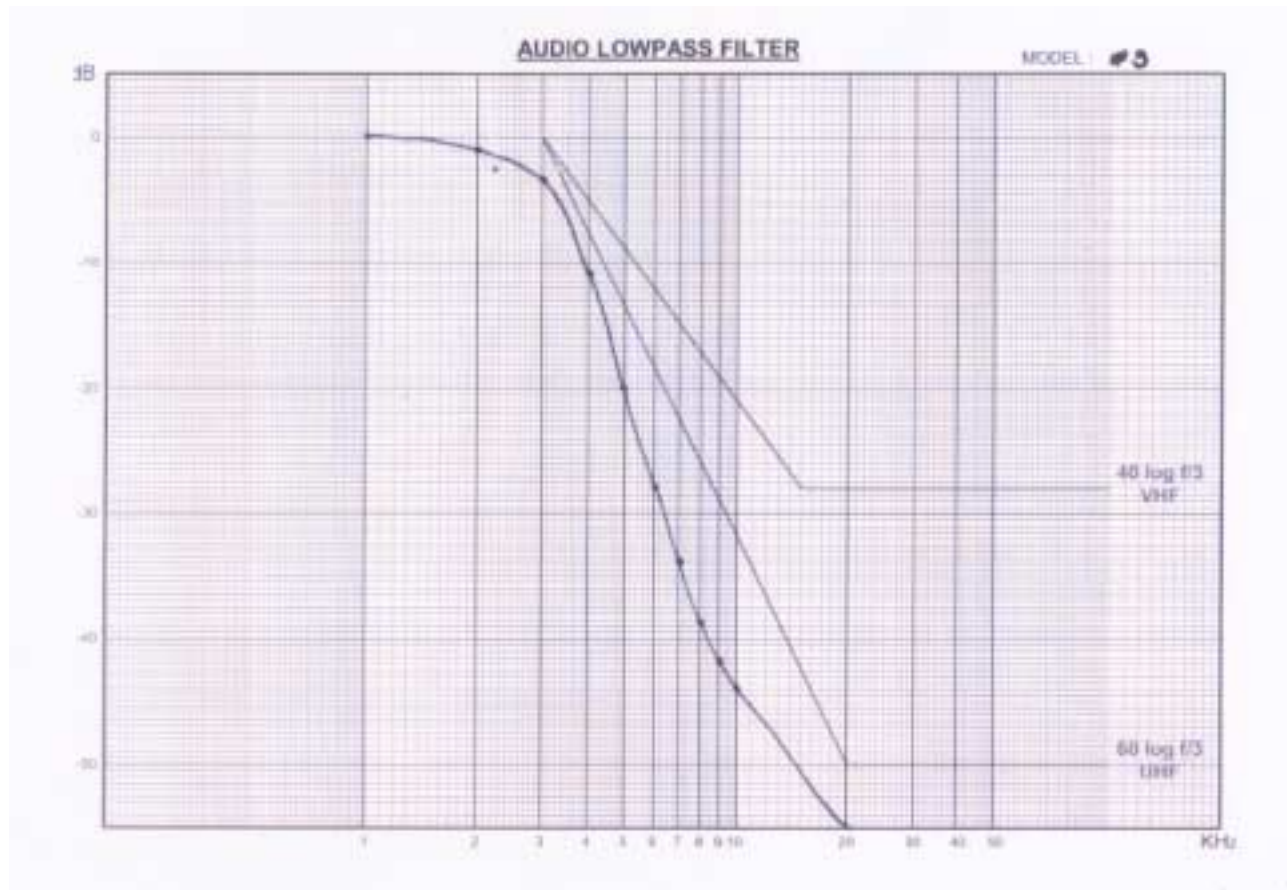
Blue Modulation 2.5KHz
Red Modulation 1.0KHz
Yellow Modulation 300Hz

2.1047(a)

AUDIO LOW PASS FILTER

The audio low pass filter is included and the plot is shown below. Rules 80.213(e) for ship stations with a low pass filter.

AUDIO LOW PASS FILTER GRAPH



2.1049(c) Occupied bandwidth:

80.213(b)

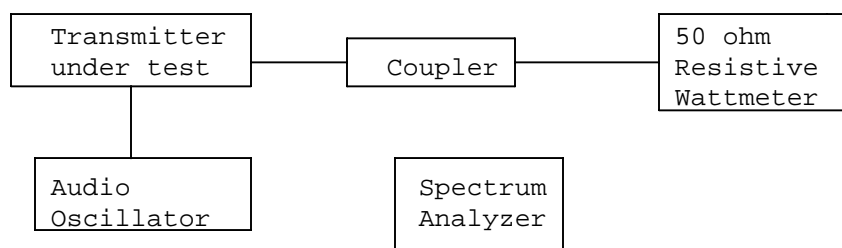
Data in the plots shows that on any frequency removed from the assigned frequency by more than 50%, but not more than 100%: At least 25dB. On any frequency removed from the assigned frequency by more than 100%, but not more than 250%: At least 35dB. On any frequency removed from the assigned frequency by more than 250%, of the authorized bandwidth: At least $43 + \log(P)$ dB.

Radiotelephone transmitter with modulation limiter.

Test procedure: TIA/EIA-603 para 2.2.11 , with the exception that various tones were used.

Test procedure diagram

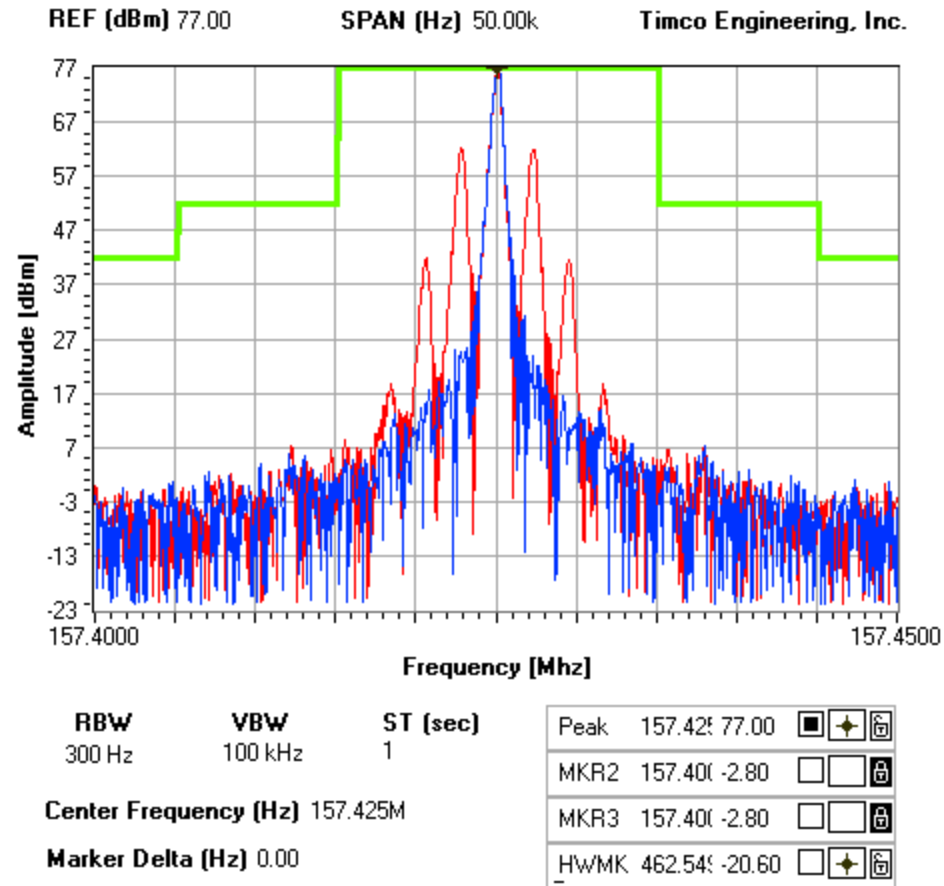
OCCUPIED BANDWIDTH MEASUREMENT



OCCUPIED BANDWIDTH PLOT

NOTES:
1046AUT3

FCC 80.211 (f)



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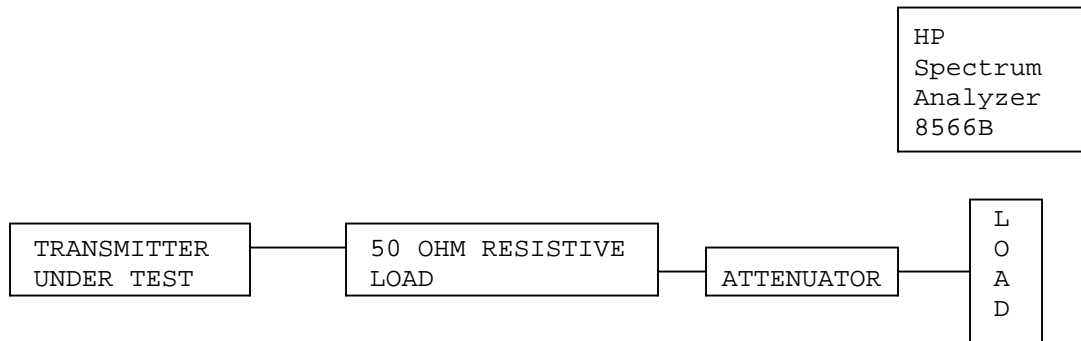
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2.1051 Spurious_emissions_at_antenna_terminals(conducted):
80.211 The data on the following page shows the level of
conducted spurious responses. The carrier was modu-
lated 100% using a 2500Hz tone. The spectrum was
scanned from 0.4 to at least the 10th harmonic of
the fundamental. The measurements were made in
accordance with standard TIA/EIA-603.

Method of Measuring Conducted Spurious Emissions



2.1051 Continued Spurious_Emissions_at_the_Antenna_Terminals:

Not Applicable - device has a fixed antenna.

2.1053(a) Field strength of spurious emissions:

NAME OF TEST: RADIATED SPURIOUS EMISSIONS

REQUIREMENTS: Emissions must be 43 +10log(Po) dB below the
mean power output of the transmitter.

TEST DATA:

HIGH POWER 43 + 10log(0.776) = 41.90dB
LOW POWER 43 + 10log(0.417) = 39.20dB

Emission Frequency (MHz)	Polarity Antenna	Corrected EUT Signal Reading (dBm)	Coax Loss	Sub. Ant.	dB Below Carrier (dBc)
156	V	28.9	0	0	0
312	H	-29	0	-1.22	59.12
468	V	-44	0	-1.46	74.36
624	H	-62	0	-1.54	92.44
780	V	-57.9	0	-1.31	88.11
936	V	-56.6	0	-1.33	86.83
1,092.00	V	-54	1	-3.54	85.44
1,240.00	V	-54.8	1	-4.08	86.78
1,404.00	V	-59.5	1	-4.63	92.03
1,560.00	H	-59.7	1.1	-5.03	92.53

Emission Frequency (MHz)	Polarity Antenna	Corrected EUT Signal Reading (dBm)	Coax Loss	Sub. Ant.	dB Below Carrier (dBc)
156	V	26.2	0	0	0
312	H	-37.6	0	-1.22	65.02
468	H	-51.3	0	-1.46	78.96
624	H	-60.1	0	-1.54	87.84
780	V	-52.3	0	-1.31	79.81
936	V	-56.3	0	-1.33	83.83
1,092.00	H	-58.2	1	-3.54	86.94
1,240.00	V	-52	1	-4.08	81.28
1,404.00	H	-51.3	1	-4.63	81.13
1,560.00	H	-59	1.1	-5.03	89.13

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HIGH POWER $43 + 10\log(0.776) = 41.90\text{dB}$
LOW POWER $43 + 10\log(0.417) = 39.20\text{dB}$

Emission Frequency (MHz)	Polarity Antenna	Corrected EUT Signal Reading (dBm)	Coax Loss	Sub. Ant.	dB Below Carrier (dBc)
157.4	V	28.9	0	0	0
314.8	H	-36.3	0	-1.22	66.42
472.2	V	-48.5	0	-1.46	78.86
629.6	H	-60.2	0	-1.54	90.64
787	H	-57.4	0	-1.31	87.61
944.5	V	-54.3	0	-1.33	84.53
1,101.80	V	-54.1	1	-3.54	85.54
1,259.30	V	-52.7	1	-4.08	84.68
1,416.00	V	-53	1	-4.63	85.53
1,574.00	H	-58.5	1.1	-5.03	91.33

Emission Frequency (MHz)	Polarity Antenna	Corrected EUT Signal Reading (dBm)	Coax Loss	Sub. Ant.	dB Below Carrier (dBc)
157.4	V	25.9	0	0	0
314.8	H	-42.2	0	-1.22	69.32
472.2	H	-57	0	-1.46	84.36
629.6	H	-61.9	0	-1.54	89.34
787	V	-49.3	0	-1.31	76.51
944.5	V	-53.4	0	-1.33	80.63
1,101.80	H	-50.2	1	-3.54	78.64
1,259.30	V	-52.2	1	-4.08	81.18
1,416.00	H	-56.1	1	-4.63	85.63
1,574.00	H	-58.7	1.1	-5.03	88.53

METHOD OF MEASUREMENT: The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 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 N.W. State Road 45, Newberry, FL 32669.

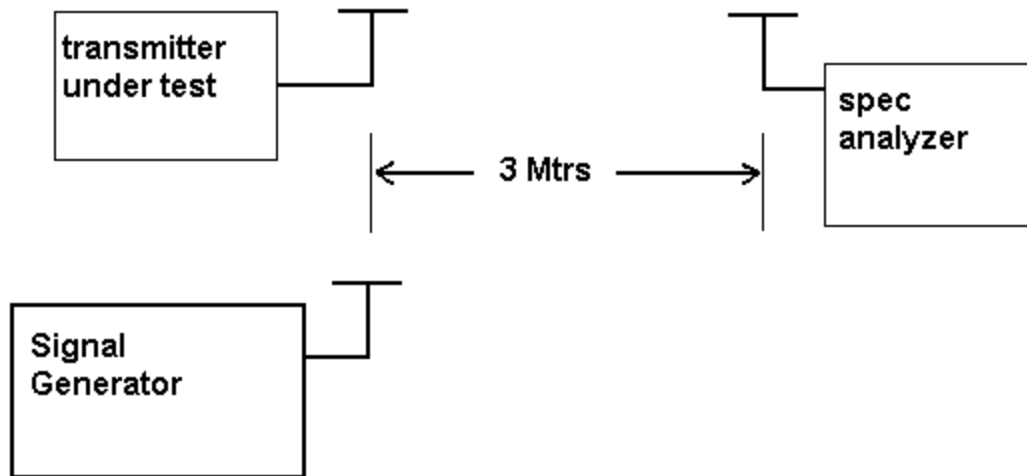
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Method of Measuring Radiated Spurious Emissions



Equipment placed 80 cm above ground
on a rotatable platform.

Frequency stability:

2.1055(a)(2)

80.209(a)

Temperature and voltage tests were performed to verify that the frequency remains within the .0010%,10.0 ppm specification limit, for 20kHz spacing. The test was conducted as follows: The transmitter was placed in the temperature chamber at 25 degrees 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 -30 degrees 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 + 50 degrees C.

Readings were also taken at the endpoint of the battery voltage of 6 V, which we estimate to be the battery endpoint.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 156.050 000MHz

TEMPERATURE_C	FREQUENCY_MHz	PPM
REFERENCE_____	156.050 000	0.00
-30_____	156.050 59	3.78
-20_____	156.050 382	2.45
-10_____	156.050 262	1.68
0_____	156.050 170	1.09
+10_____	156.050 060	0.38
+20_____	156.050 128	0.82
+30_____	156.050 065	0.42
+40_____	156.050 146	0.94
+50_____	156.050 454	2.91
Batt. Volts.	Batt. Data	PPM
Endpoint 5.1	156.050 079	0.51

RESULTS OF MEASUREMENTS: The test results indicates that the EUT meets the requirements.

EMC Equipment List

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/26/01	3/26/04
3-Meter OATS	TEI	N/A	N/A	Listed 1/13/03	1/13/06
Audio Generator	B&K Precision	3010	8739686	CHAR 12/1/02	12/1/04
Audio Oscillator	HP	653A	832-00260	CHAR 12/1/02	12/1/04
Biconnical Antenna	Eaton	94455-1	1057	CAL 3/18/03	3/18/05
Biconnical Antenna	Eaton	94455-1	1096	CAL 10/1/01	10/1/03
Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/26/01	4/26/03
Blue Tower Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 4/15/03	4/15/05
Blue Tower RF Preselector	HP	85685A	2926A00983	CAL 4/15/03	4/15/05
Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 4/15/03	4/15/05
Frequency Counter	HP	5352B	2632A00165	CAL 11/28/01	11/28/03
Frequency Counter	HP	5382A	1620A03535	CHAR 3/2/01	3/2/03
Frequency Counter	HP	5385A	2730A03025	CAL 3/7/03	3/7/05
Frequency Counter	HP	5385A	3242A07460	CAL 3/7/03	3/7/05
LISN	Electro-Metrics	ANS-25/2	2604	CAL 10/9/01	10/9/03
LISN	Electro-Metrics	EM-7820	2682	CAL 3/12/03	3/12/05
Log-Periodic Antenna	Eaton	96005	1243	CAL 5/8/03	5/8/05
Log-Periodic Antenna	Electro-Metrics	EM-6950	632	CHAR 10/15/01	10/15/03
Log-Periodic Antenna	Electro-Metrics	LPA-25	1122	CAL 10/2/01	10/2/03
Log-Periodic Antenna	Electro-Metrics	LPA-30	409	CAL 3/4/03	3/4/05
Modulation Analyzer	HP	8901A	3435A06868	CAL 9/5/01	9/5/03
Modulation Meter	Boonton	8220	10901AB	CAL 4/15/03	4/15/05
Peak Power Meter	HP	8900C	2131A00545	CAL 7/2/03	7/2/05

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Power Meter And Sensor	Bird	4421-107 & 4022	0166 & 0218	CAL 4/16/03	4/16/05
Signal Generator	HP	8640B	2308A21464	CAL 2/15/02	2/15/04
Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CHAR 3/4/01	3/4/03
Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 8/31/01	8/31/03
Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 8/31/01	8/31/03
Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 8/31/01	8/31/03
Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 1/22/02	1/22/04