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APPLICANT: COLUMBIA TELECOMMUNICATIONS GROUP, INC.

FCC ID: GAFMURS2

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GENERAL_INFORMATION_REQUIRED FOR_TYPE_ACCEPTANCE

2.1033(c)(1)(2) COLUMBIA TELECOMMUNICATIONS GROUP, INC.will manufacture the FCC ID: GAFMURS2 MULTI USER RADIO SERVICE TRANSCEIVER in quantity, for use under FCC RULES PART 95. The UUT is a PTT Radio with a maximum duty cycle of 50%.

COLUMBIA TELECOMMUNICATIONS GROUP, INC.
174 MILBAR BLVD.
FARMINGDALE NY 11735 USA

2.1033 (c) TECHNICAL_DESCRIPTION

2.1033(c)(3) Instruction book. A draft copy of the instruction manual is included as EXHIBIT 6.

2.1033(c) (4) Type of Emission: 9K6F3E
95.632 Bn = 2M + 2DK
M = 3000
D = 2.0K
Bn = 2(3.0)+2(1.8) = 9.6K

Authorized Bandwidth – 11.25 kHz for frequencies:
151.820, 151.880, 151.940 MHz

Authorized Bandwidth - 12.5 kHz for frequencies:
154.570, 154.600 MHz

2.1033(c)(5) Frequency Range: 1. 151.820
95.632 2. 151.880
3. 151.940
4. 154.570
5. 154.600

2.1033(c)(6)(7) Power Output shall not exceed 2.0 Watts effective
95.639 radiated power. There can be no provisions for
95.649 increasing the power or varing the power.

The antenna is an intergral part to the unit, it cannot be removed without rendering the unit inoperative. In order to remove the antenna the case must unscrewed, then the PCB assemblies must be removed then the antenna can be removed.

2.1033(c)(9) Tune-up procedure. The tune-up procedure is included in the IN USER'S MANUAL.

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

High - Vce = 6.0 Volts DC Ice = 0.5A
Pin = 3 Watts

Low - Vce = 6.0 Volts DC Ice = 0.13A
Pin = 0.78 Watts

2.1033(c)(10) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 5A & 5B of this report. The block diagram is included as EXHIBIT 4 of this report.

2.1033(c)(11) A photograph or a drawing of the equipment identification label is included as exhibit No. 1.

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 - See EXHIBIT 3A-3H.

2.1033(c)(13) Digital modulation is not not used in this device.

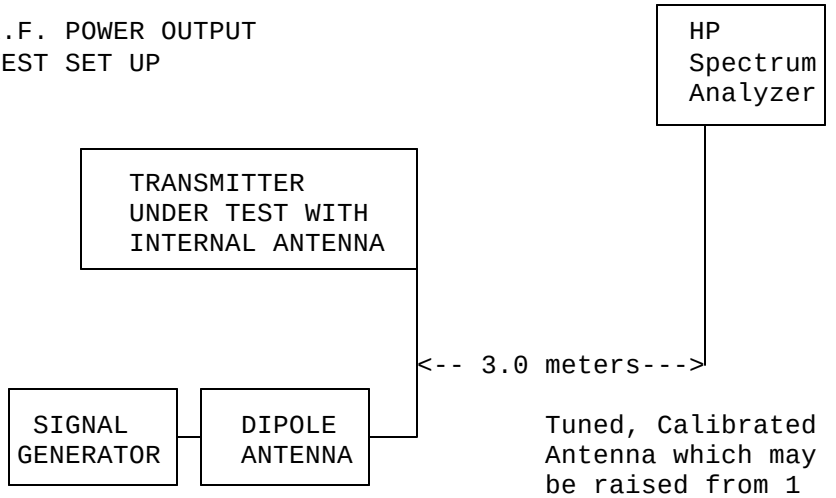
2.1033(c)(14) The data required by 2.1046 through 2.1057 is submitted below.

2.1046(a) RF_power_output.

95.639(g) RF power is measured by measuring the radiated power at 3 meters and then replacing the transmitter with a signal generator to determine the effective radiated power. The ERP shall not exceed 2.0 Watts.

MEASURED POWER OUTPUT = 0.5 Watts ERP HIGH POWER
.033 Watts ERP LOW POWER

R.F. POWER OUTPUT
TEST SET UP



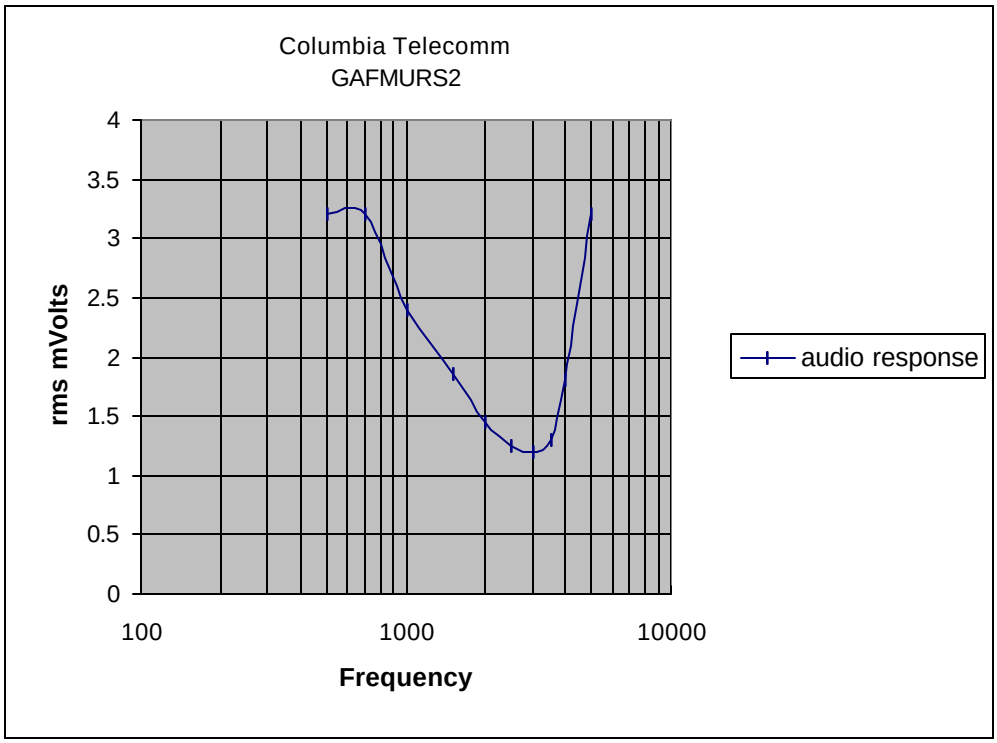
Equipment placed 80cm above ground
on a rotatable platform.

2.1047(a)(b) Modulation_characteristics:

AUDIO_FREQUENCY_RESPONSE

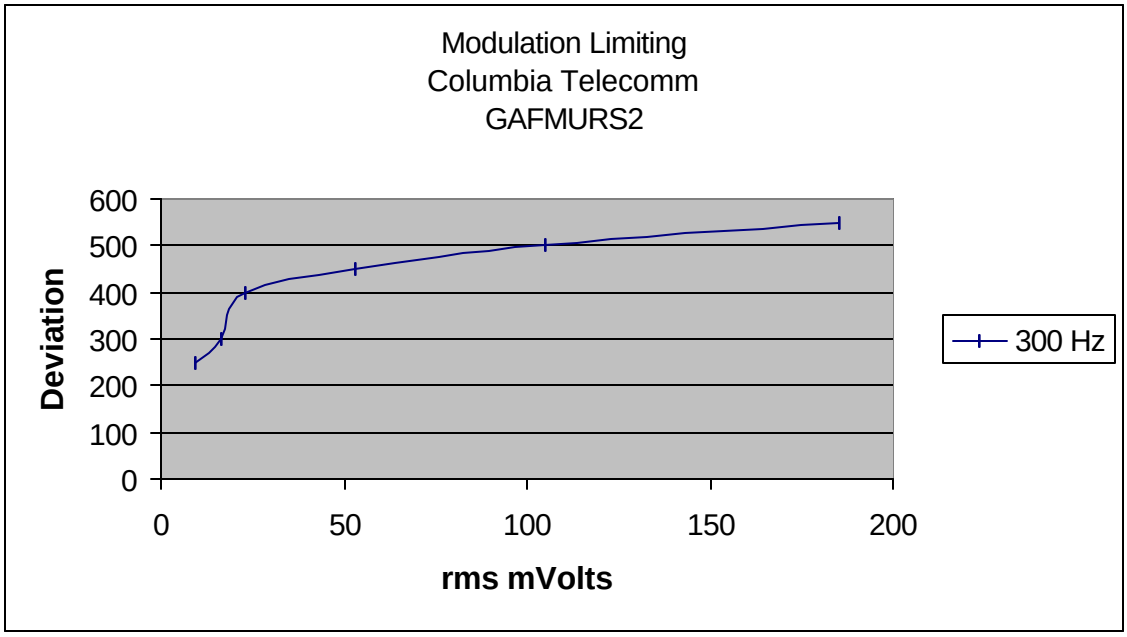
The audio frequency response was measured in accordance with TIA/EIA Specification 603. The audio frequency response curve is shown below.

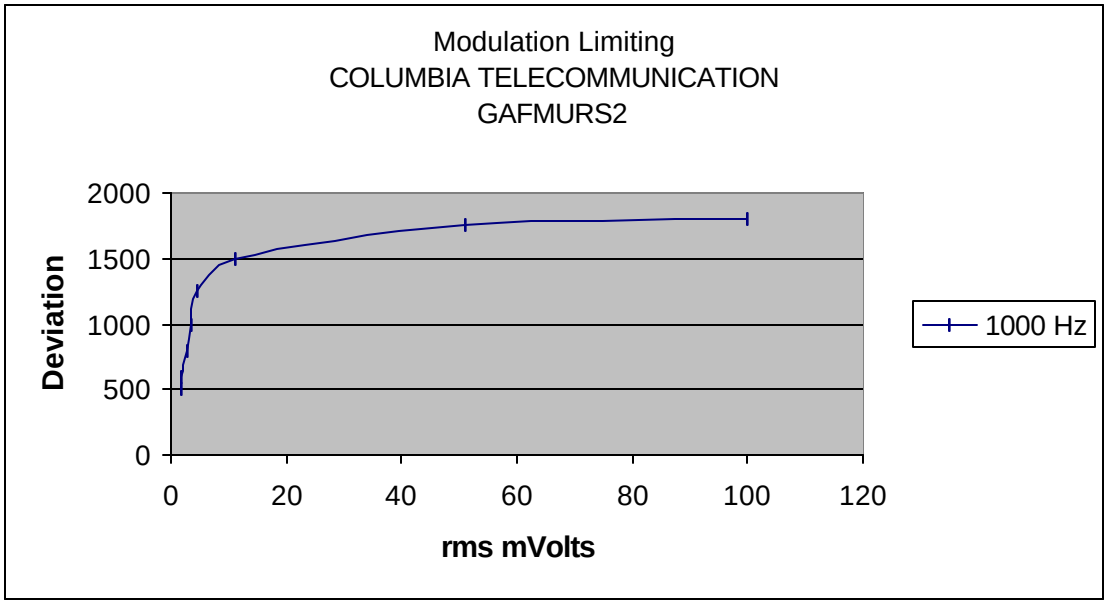
The audio signal was fed into a dummy microphone circuit and into the microphone connector. The input required to produce 30 percent modulation level was measured.

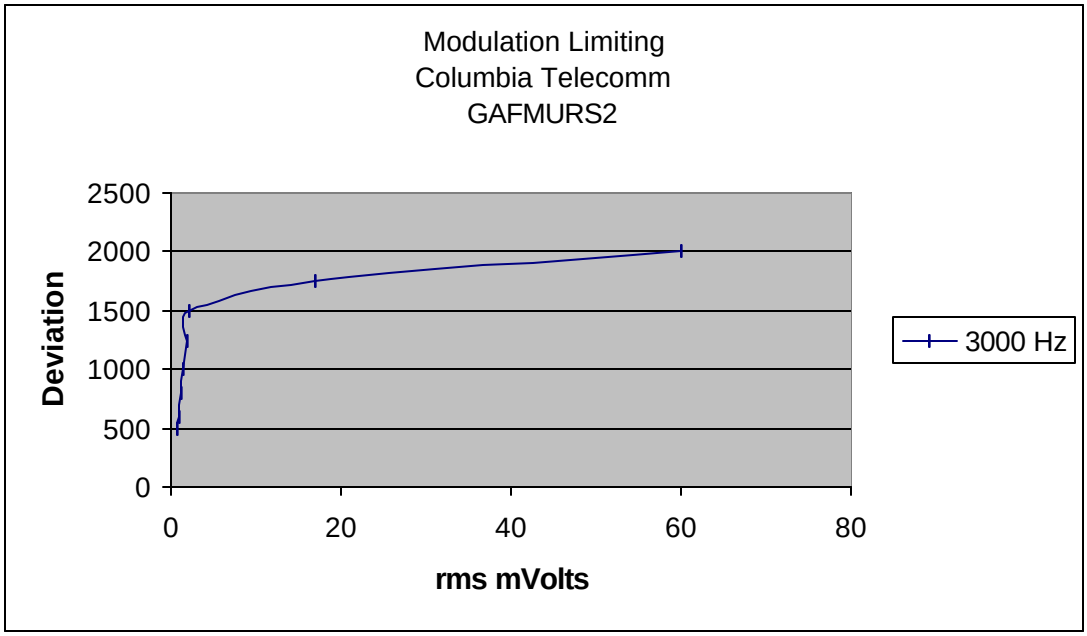


2.1047(b) Audio input versus modulation

The audio input level needed for a particular per-percentage of modulation was measured in accordance with TIA/EIA Specification 603. The audio input curves versus modulation are shown below. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz.




Modulation Limiting
COLUMBIA TELECOMMUNICATION
GAFMURS2
Deviation
2000
1500
1000
500
0
0
20
40
60
80
100
120
rms mVolts
1000 Hz


Modulation Limiting
Columbia Telecomm
GAFMURS2
Deviation
2500
2000
1500
1000
500
0
0
20
40
60
80
rms mVolts
3000 Hz

EMISSION BANDWIDTH:

95.633(c)

90.210(b) Emission Mask B. For transmitters that are equipped with an audio low pass filter pursuant to § 90.211(a), the power of any emission must be below the unmodulated carrier power (P) as follows :

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth : At least 25dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth : At least 35dB.

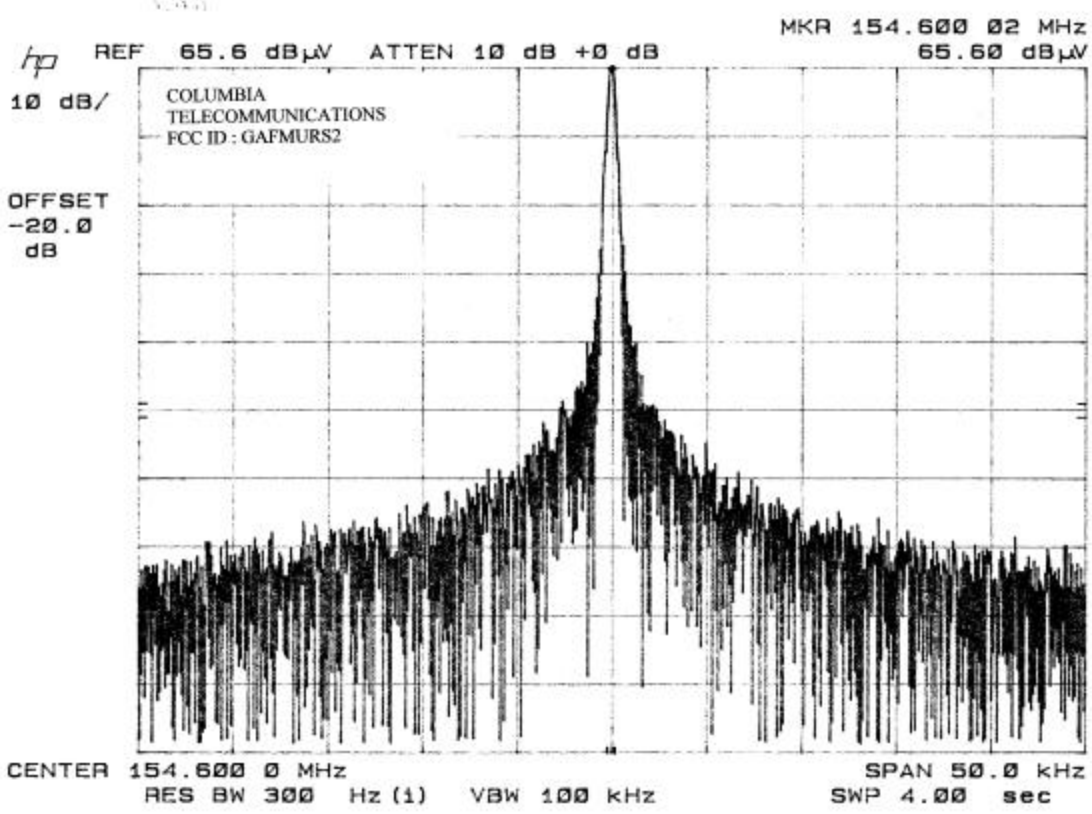
(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43+10 log (P) dB.

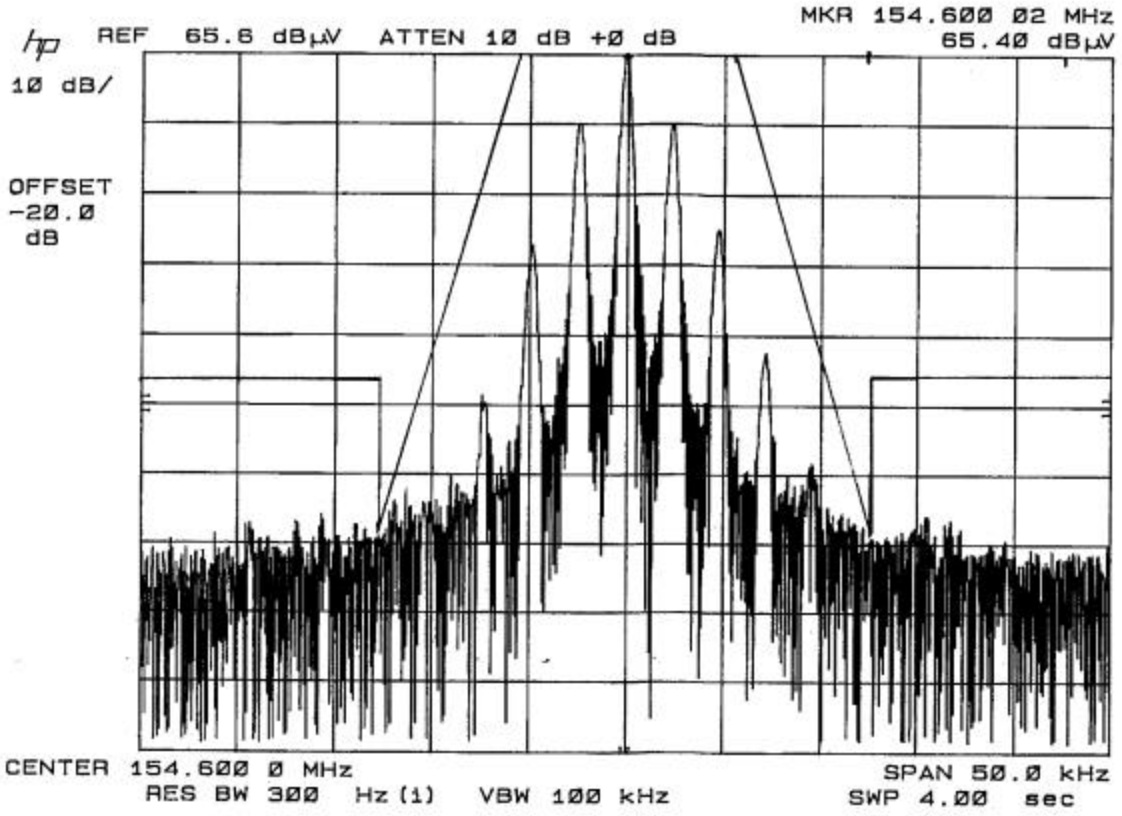
90.210(d) Emission Mask D. 12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency for the center of the authorized bandwidth f to 5.625 kHz removed from f : Zero dB.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least 7.27 (f - 2.88kHz) dB.

(4) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f in kHz) of more than 12.5kHz:
Atleast 50+10 log (P) dB or 70dB, whichever is the lesser attenuation.

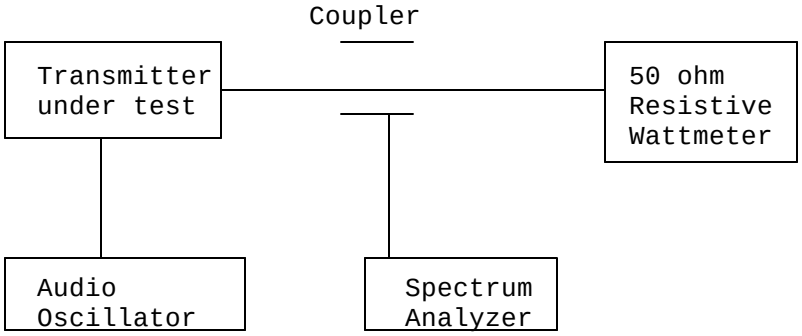

MKR 154.600 02 MHz
REF 65.6 dBµV ATTEN 10 dB +0 dB
65.60 dBµV
10 dB/
COLUMBIA
TELECOMMUNICATIONS
FCC ID : GAFMURS2
OFFSET
-20.0
dB
CENTER 154.600 0 MHz
SPAN 50.0 kHz
RES BW 300 Hz (i) VBW 100 kHz
SWP 4.00 sec


MKR 154.600 02 MHz
65.40 dBµV
REF 65.6 dBµV
ATTEN 10 dB +0 dB
10 dB/
OFFSET
-20.0
dB
CENTER 154.600 0 MHz
RES BW 300 Hz (i)
VBW 100 kHz
SPAN 50.0 kHz
SWP 4.00 sec

Radiotelephone transmitter with modulation limiter.

Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT



2.1051 Not Applicable, no external antenna terminal.

2.1053 SPURIOUS EMISSIONS:
95.635(c)

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

HIGH POWER	43 + 10log(.5) = 39.99 dB
LOW POWER	43 + 10log(.033) = 28.19 dB

TEST DATA:

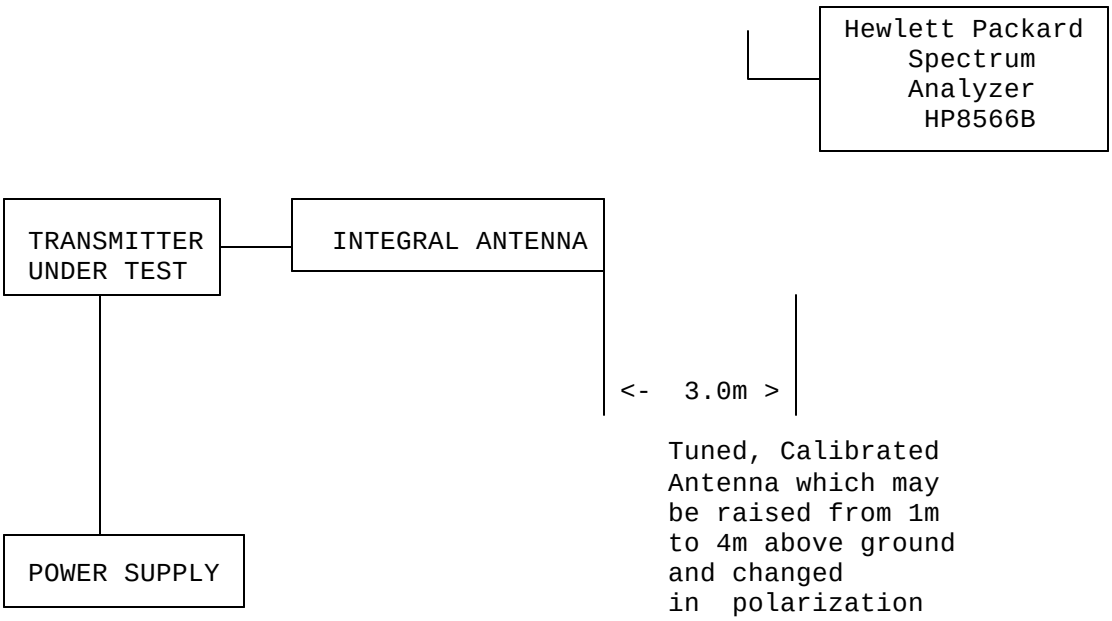
Emission Frequency MHz	Ant. Polarity	dBc	Margin dB
LOW POWER			
151.90	**V**	**0.00**	**0.00**
303.90	**H**	**38.18**	**9.99**
455.90	**V**	**44.80**	**16.61**
607.50	**H**	**54.85**	**26.66**
759.80	**V**	**57.31**	**29.12**
911.80	**H**	**65.24**	**37.05**
1063.70	**H**	**49.73**	**21.54**
1215.70	**V**	**42.73**	**14.44**
1367.70	**V**	**45.73**	**17.54**
1519.00	**V**	**57.78**	**27.59**
HIGH POWER			
154.60	**V**	**0.00**	**0.00**
309.20	**H**	**41.05**	**1.06**
463.80	**H**	**59.27**	**19.28**
618.40	**H**	**51.72**	**11.73**
773.00	**V**	**58.88**	**18.89**
927.60	**V**	**57.11**	**17.12**
1082.20	**V**	**70.30**	**30.31**
1236.80	**V**	**77.50**	**37.51**
1391.40	**V**	**71.10**	**31.11**
1546.00	**V**	**70.75**	**30.76**

MARGIN = (Field strength of Fund – 39.99 dB) - FS OF EMISSION (HIGH)
MARGIN = (Field strength of Fund – 28.19 dB) - FS OF EMISSION (LOW)

METHOD OF MEASUREMENT: The procedure used was TIT/EIA STANDARD 603 USING THE SUBSTITUTION method. The spectrum was scanned from 30 to at least the tenth harmonic of the fundamental using a HP model 8566B spectrum analyzer, and an appropriate antenna - see test equipment list. Measurements were made at the open field test site of TIMCO ENGINEERING INC. located at 849 N.W. State Road 45, Newberry, FL 32669.

2.1053 SPURIOUS EMISSIONS:
95.635

Method of Measuring Radiated Spurious Emissions



Equipment placed 80cm above ground
on a rotatable platform.

95.632(c)
2.1055

Frequency_stability:

Temperature and voltage tests were performed to verify that the frequency remains within the 0.00050%, 5.0 ppm specification limit if the device is designed to operate with 11.25 kHz or 12.5 kHz authorized bandwidth and .00020%, 2.0 ppm if the device is designed to operate with 6.25 kHz authorized bandwidth. 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 plus and minus 15% of the battery voltage of 6 VDC.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 154.600 000

TEMPERATURE°C	FREQUENCY_MHz	PPM
REFERENCE	154.600 000	00.00
-30	154.599 344	-4.26
-20	154.600 093	0.60
-10	154.600 019	0.12
0	154.600 212	1.38
+10	154.600 216	1.40
+20	154.600 012	0.78
+30	154.599 991	-0.06
+40	154.599 884	-0.75
+50	154.599 904	-0.62
BATT. End-Point 5.1V/dc	154.599 946	-0.35
BATT. End-Point 6.9V/dc	154.599 947	-0.34

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was –4.26 to +1.40 ppm. The maximum frequency variation with voltage was –0.35ppm.

TEST EQUIPMENT LIST

1. Spectrum Analyzer: HP 8566B-Opt 462, S/N 3138A07786, w/ preselector HP 85685A, S/N 3221A01400, Quasi-Peak Adapter HP 8565OA, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02, S/N 3008A00372
2. Biconnical Antenna: Eaton Model 94455-1, S/N 1057,
3. Biconnical Antenna: Electro-Metrics Model BIA-25, S/N 1171
4. Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
5. Log-Periodic Antenna: Electro-Metrics Model LPA-30, S/N 409
6. Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180, 1-18 GHz, S/N 2319
7. 18-26.3GHz Systron Donner Standard Gain Horn #DBE-520-20
8. Horn 40-60GHz: ATM Part #19-443-6R
9. Line Impedance Stabilization Network: Electro-Metrics Model ANS-25/2, S/N 2604
10. Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
11. Frequency Counter: HP Model 5385A, S/N 3242A07460
12. Peak Power Meter: HP Model 8900C, S/N 2131A00545,
13. Open Area Test Site #1-3meters
14. Signal Generator: HP 8640B, S/N 2308A21464
15. Signal Generator: HP 8614A, S/N 2015A07428
16. Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N 9706-1211
17. Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153
18. AC Voltmeter: HP Model 400FL, S/N 2213A14499
19. Digital Multimeter: Fluke Model 8012A, S/N 4810047
20. Digital Multimeter: Fluke Model 77, S/N 43850817
21. Oscilloscope: Tektronix Model 2230, S/N 300572