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APPLICANT: AEARO COMPANY

FCC ID: NUVMT7H7460A

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APPLICANT: AERO COMPANY

FCC ID: NUVMT7H7460A

REPORT #: T:\A\AEARO\712XAU1\712XAU1TestReport.doc

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GENERAL INFORMATION REQUIRED
FOR TYPE ACCEPTANCE

2.1033(c)(1)(2) AEARO COMPANY will manufacture the
FCCID: NUVMT7H7460A FAMILY RADIO SERVICES 14CHANNEL
TRANSCEIVER in quantity, for use under FCC RULES
PART 95. The UUT is a PTT Radio with a maximum duty
cycle of 50%.

AEARO COMPANY
5457 W. 79TH STREET
INDIANAPOLIS IN 46268

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: 10K6F3E
95.631

Bn = 2M + 2DK
M = 3000
D = 2.3K
Bn = 2(3.0)+2(2.3) = 10.6K

Authorized Bandwidth 12.5 kHz

2.1033(c)(5) Frequency Range: 1. 462.5625 8. 467.5625
95.627 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) Power Output shall not exceed 0.500 Watts effective
95.639 radiated power. There can be no provisions for
95.649 increasing the power or varying the power.

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

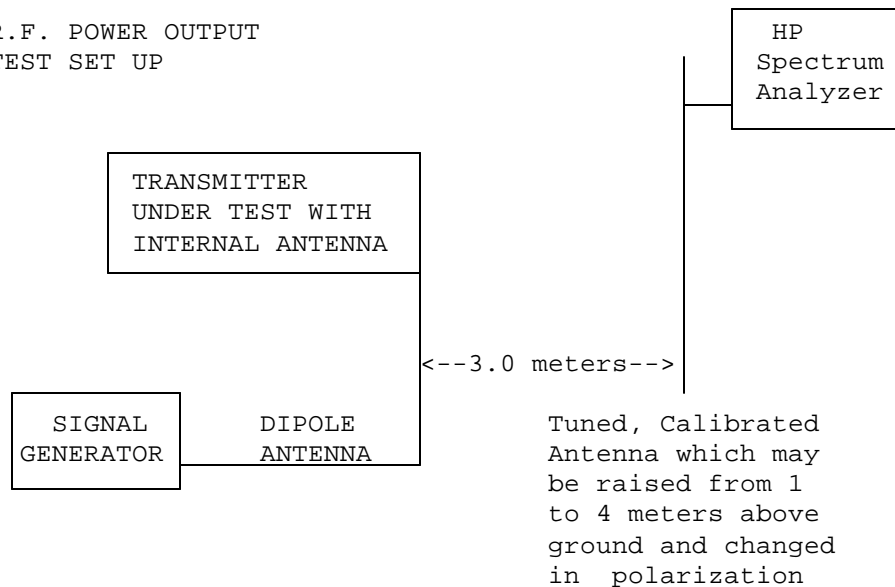
- 2.1033(c)(8) DC Voltages and Current into Final Amplifier:
FINAL AMPLIFIER ONLY
Vce 3.0 Volts DC Ice = 0.21A.
Pin = .63 Watts
- 2.1033(c)(9) Tune-up procedure. The tune-up procedure is included in the TECHNICAL DESCRIPTION MANUAL.
- 2.1033(c)(10) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 5A-5B of this report. The block diagram is included as EXHIBIT No. 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'S 3A-3F.
- 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.

2.1046(a) RF power output.

95.639 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 0.500 Watts.

MEASURED POWER OUTPUT = 0.084 Watts ERP

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 on page 5.

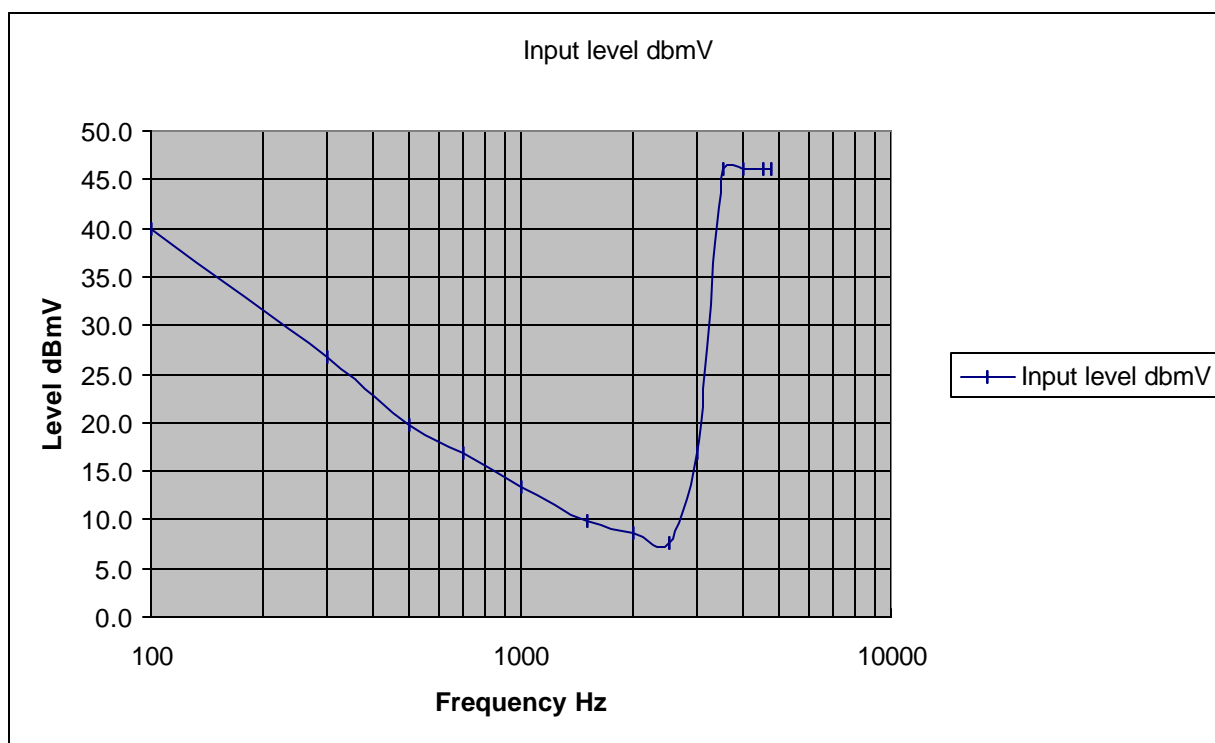
The audio signal was fed into a dummy microphone circuit and into the microphone connector. The input required to produce 30 percent modulation level was measured.

2.1047(b) Audio input versus modulation

The audio input level needed for a particular percentage of modulation was measured in accordance with TIA/EIA Specification 603. The audio input curves versus modulation are shown on page 6. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz.

95.637(b) Post Limiter Filter The filter must be between the modulation limiter and the modulated stage. At any frequency between 3 & 20KHz the filter must have an attenuation of $60\log(f/3)$ greater than the attenuation at 1KHz. See the plot on page 7.

AUDIO FREQUENCY RESPONSE GRAPH



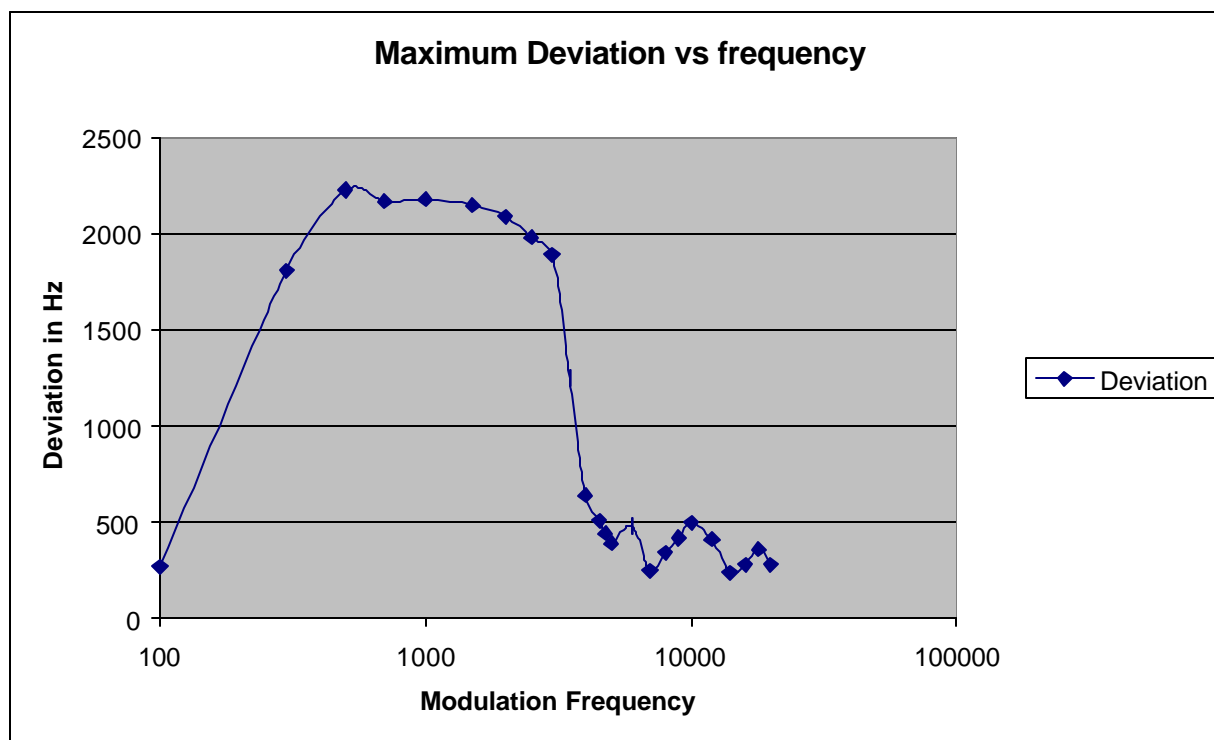
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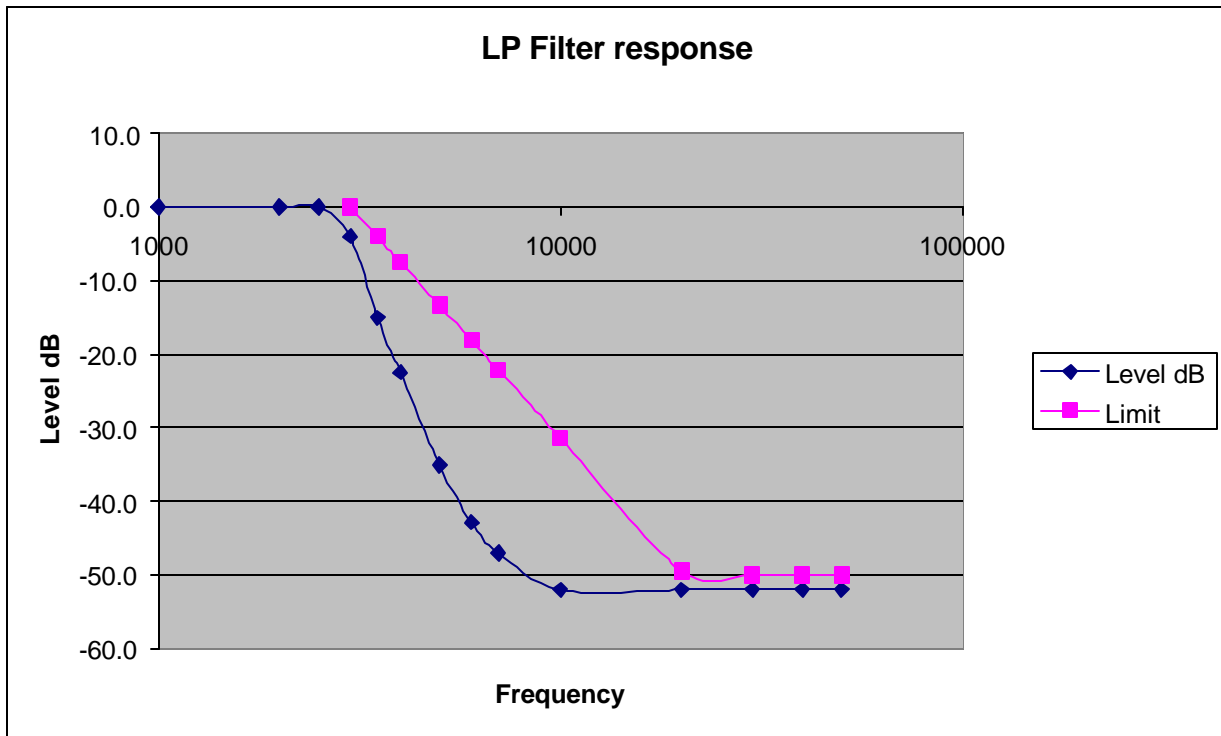
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MODULATION LIMITING GRAPH



The Mic level of 62mV was chosen as 20dB above the 6.2mV typical input at 800Hz.

AUDIO LOW PASS FILTER GRAPH



2.989(c)

EMISSION BANDWIDTH:

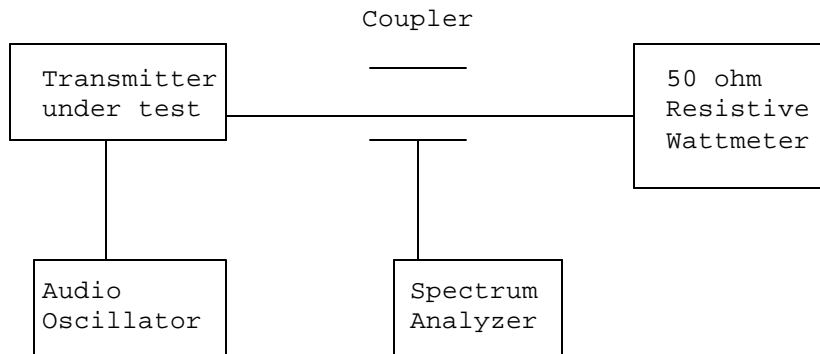
95.633(c)

Data in the plots shows that the sidebands from greater than 50% to 100% of the authorized bandwidth must be attenuated by at least 25dB and from 100 to 250% the sidebands must be attenuated by at least 35dB. Beyond 250% the sidebands must be attenuated by at least $43 + \log_{10}(TP)$. The transmitter was modulated with 2500 Hz, adjusted for 50% modulation plus 16 dB. The spectrum analyzer was set with the unmodulated carrier at the top of the screen. The test procedure diagram follows. See the occupied bandwidth plots in report as pages 9-10.

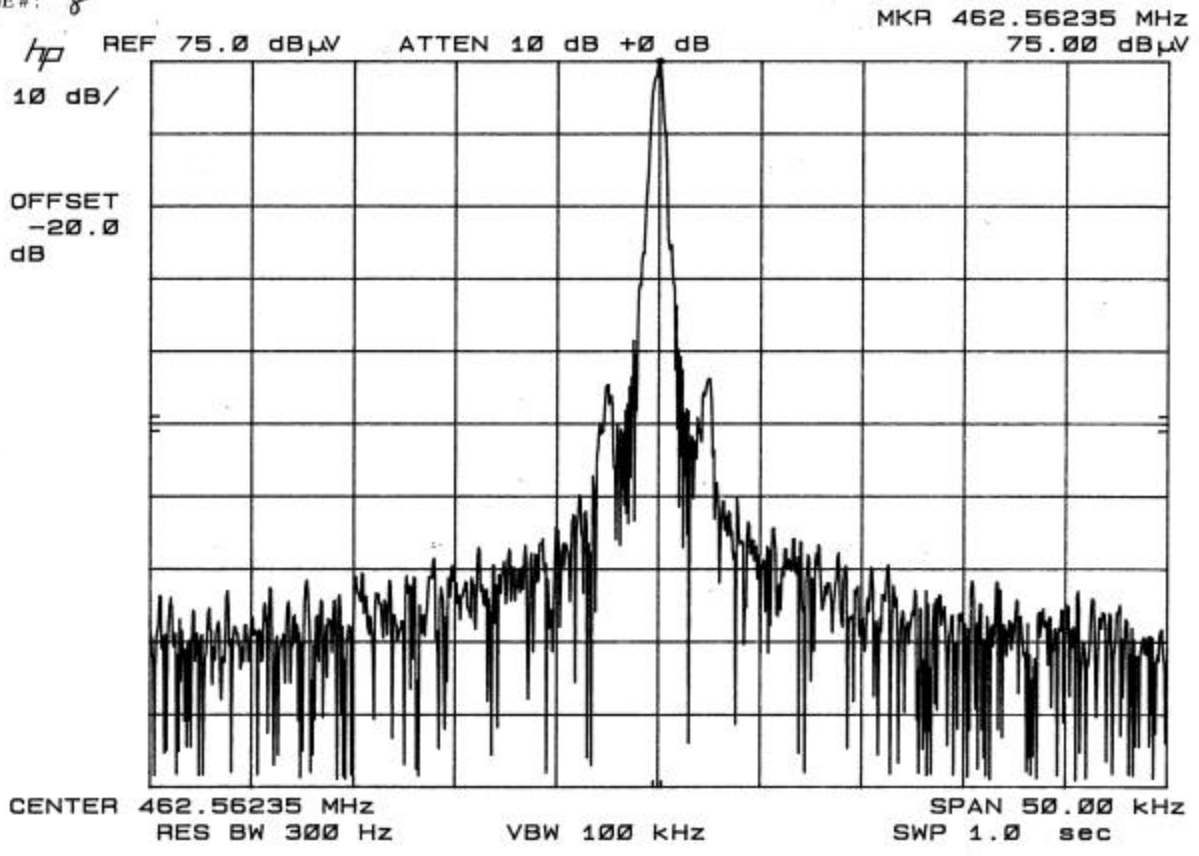
Radiotelephone transmitter with modulation limiter.

Test procedure diagram

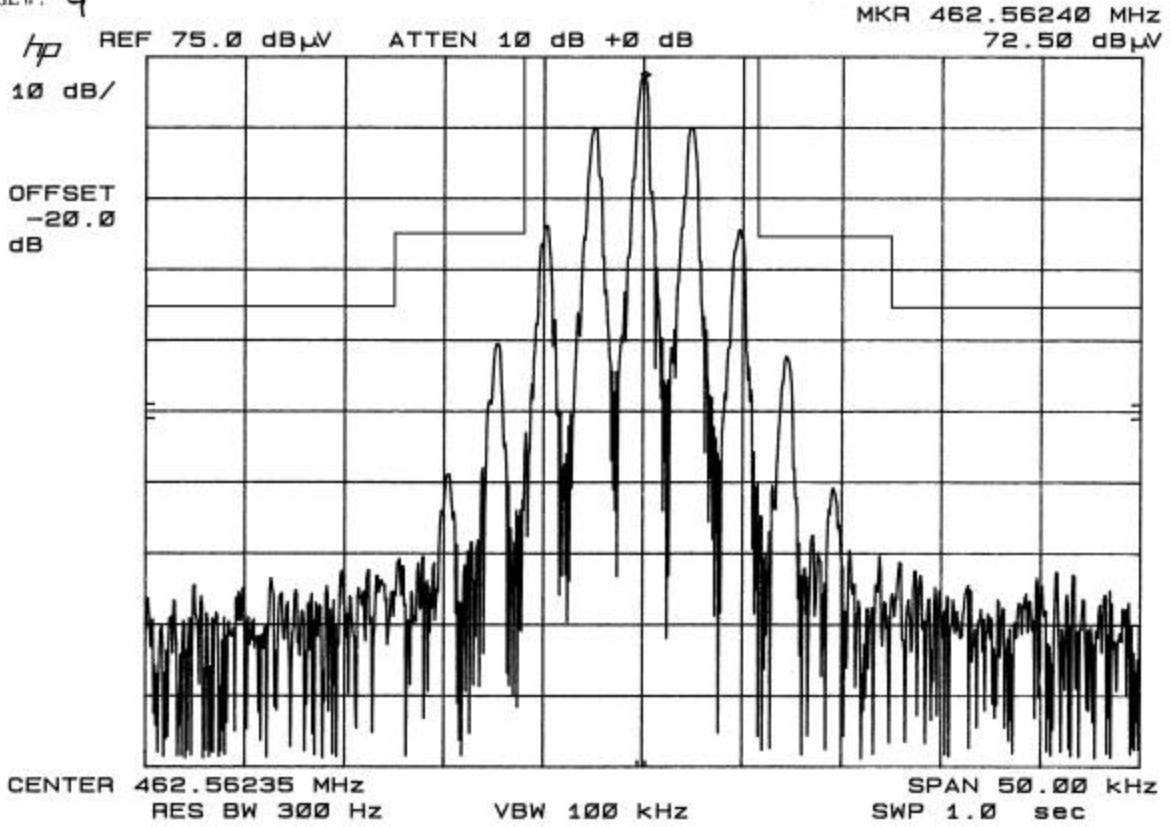
OCCUPIED BANDWIDTH MEASUREMENT



OCCUPIED BANDWIDTH PLOT CW



OCCUPIED BANDWIDTH PLOT



2.1051 Not Applicable, no antenna terminal allowed.

2.1053 UNWANTED RADIATION:
95.635(b)(4)

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

HIGH - $43 + 10\log(TP) = 43 + 10\log(0.084) = 32.24$ dB
LOW - $43 + 10\text{LOG}(TP) = 43 + 10\text{LOG}(.033) = 28.19$ dB

TEST DATA:

Emission Frequency MHz	Meter Reading dBuv	Ant. Polarity	Coax Loss dB	Correction Factor dB	Attn db	Field Strength dBuv/m	Margin dB
Low Power							
462.60	92.4	v	2.99	17.12	0.00	112.51	0.00
925.30	33.1	v	3.63	23.28	52.50	60.01	24.31
1,388.00	40.3	v	2.36	27.26	42.59	69.92	14.40
1,850.60	20.0	v	2.84	28.45	61.22	51.29	33.03
2,313.30	13.5	v	3.25	28.82	66.94	45.57	38.75
2,775.90	8.8	v	3.62	29.97	70.12	42.39	41.93
3,238.60	9.0	h	4.04	30.89	68.58	43.93	40.39
3,701.30	10.4	h	4.50	31.91	65.70	46.81	37.51
4,163.90	7.1	h	5.03	33.33	67.05	45.46	38.86
High Power							
462.60	96.5	v	2.99	17.12	0.00	116.61	0.00
925.30	34.7	v	3.63	23.28	55.00	61.61	22.76
1,388.00	35.3	v	2.36	27.26	51.69	64.92	19.45
1,850.60	19.1	v	2.84	28.45	66.22	50.39	33.98
2,313.30	11.9	v	3.25	28.82	72.64	43.97	40.40
3,238.60	8.8	h	4.04	30.89	72.88	43.73	40.64
3,701.30	9.4	v	4.50	31.91	70.80	45.81	38.56
4,163.90	6.1	h	5.03	33.33	72.15	44.46	39.81

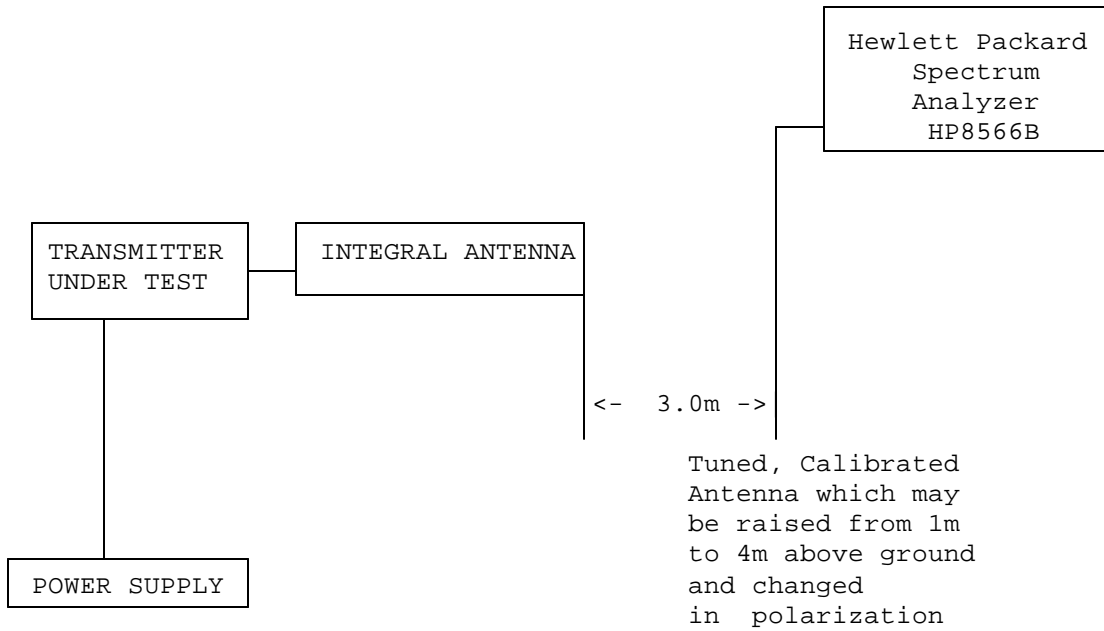
MARGIN = (Field strength of Fund - 28.19dB) - FS OF EMISSION

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
95.635

UNWANTED RADIATION:

Method of Measuring Radiated Spurious Emissions



Equipment placed 80cm above ground on a rotatable platform.

2.1055

Frequency stability:

Temperature and voltage tests were performed to verify that the frequency remains within the 0.00025%, 2.5 ppm specification limit. 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 -20 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 3 VDC.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 462.662 500

TEMPERATURE_C	FREQUENCY_MHz	PPM
REFERENCE_____	462.662 500	00.00
-20_____	462.663 463	2.08
-10_____	462.663 587	2.35
0_____	462.663 595	2.37
+10_____	462.663 416	1.98
+20_____	462.662 997	1.08
+30_____	462.662 510	0.02
+40_____	462.662 153	-0.75
+50_____	462.662 161	-0.73
BATT. End-Point 2.55V/dc	462.662 618	0.26
BATT. 3.45V/dc	462.662 585	0.18

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was -0.75 ppm to 2.37 ppm. The maximum frequency variation with voltage was 0.26ppm.

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TEST EQUIPMENT LIST

1. Spectrum Analyzer: HP 8566B-Opt 462, S/N 3138A07786, w/
preselector HP 85685A, S/N 3221A01400, Quasi-Peak Adapter
HP 85650A, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02,
S/N 3008A00372 Cal. 8/31/01 Due 8/31/02
2. Biconnical Antenna: Eaton Model 94455-1, S/N 1057,
Cal. 10/1/01 Due 10/1/02
3. Biconnical Antenna: Electro-Metrics Model BIA-25, S/N 1171
Cal. 4/26/01 Due 4/26/03
4. Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
Char. 3/15/00 Due 3/15/01
5. Log-Periodic Antenna: Electro-Metrics Model LPA-30, S/N 409
Char. 3/15/00 Due 3/15/01
6. Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180,
1-18 GHz, S/N 2319 Cal. 4/27/99 Due 4/27/00
7. 18-26.3GHz Systron Donner Standard Gain Horn #DBE-520-20
No Cal Required
8. Horn 40-60GHz: ATM Part #19-443-6R No Cal Required
9. Line Impedance Stabilization Network: Electro-Metrics Model
EM-7820, w/NEMA Adapter S/N 2682 Cal. 3/16/01 Due 3/16/02
10. Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
Char. 1/27/01 Due 1/27/02
11. Frequency Counter: HP Model 5385A, S/N 3242A07460
Char. 11/20/00 Due 11/20/01
12. Peak Power Meter: HP Model 8900C, S/N 2131A00545
Char. 1/26/01 Due 1/26/02
13. Open Area Test Site #1-3meters Cal. 12/22/99
14. Signal Generator: HP 8640B, S/N 2308A21464
Cal. 11/15/01 Due 11/15/02
15. Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N
9706-1211 Char. 6/10/00 Due 6/10/01
16. Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153
Char. 11/24/00 Due 11/24/01
17. AC Voltmeter: HP Model 400FL, S/N 2213A14499
Cal. 10/9/01 Due 10/09/02
18. Digital Multimeter: Fluke Model 77, S/N 43850817
Cal. 11/16/00 Due 11/16/01
19. Oscilloscope: Tektronix Model 2230, S/N 300572
Char. 2/1/01 Due 2/1/02

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