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TEST EQUIPMENT LIST

1. X 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. X 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. X 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 TTTC, 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. X 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. X 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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#### TEST PROCEDURE

GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a preselector. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz and the video bandwidth was 300KHz. The ambient temperature of the UUT was 81°C with a humidity of 49%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz)	METER READING + ACF = FS
33	20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

ANSI STANDARD C63.4-1992 10.1.7 MEASUREMENT PROCEDURES: The unit under test was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The table used for radiated measurements is capable of continuous rotation.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

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NAME OF TEST: RADIATION INTERFERENCE

RULES PART NO.: 15.235

REQUIREMENTS: CARRIER FREQUENCY WILL NOT EXCEED 80 dBuV/m AT 3M.  
OUT-OF-BAND EMISSIONS SHALL NOT EXCEED:

30 - 88 MHz	40.0 dBuV/M MEASURED AT 3 METERS
88 - 216 MHz	43.5 dBuV/M
216 - 960 MHz	46.0 dBuV/M
ABOVE 960 MHz	54.0 dBuV/M

TEST DATA:

Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBuV/m	Margin dB
49.86	28.5	V	0.80	11.83	41.13	38.87
49.86	44.7	V	0.80	11.83	57.33	22.67
149.50	6.9	V	1.40	16.45	24.75	18.75
199.40	6.3	H	1.80	17.21	25.31	18.19
199.40	7.2	V	1.80	17.21	26.21	17.29
249.20	18.0	H	2.00	12.06	32.06	13.94
249.20	21.8	V	2.00	12.06	35.86	10.14
299.10	4.2	H	2.20	13.68	20.08	25.92
299.10	10.4	V	2.20	13.68	26.28	19.72
348.90	4.7	H	2.49	14.42	21.61	24.39
348.90	9.6	V	2.49	14.42	26.51	19.49
448.60	9.7	V	2.95	16.99	29.64	16.36
498.60	7.7	V	3.10	17.45	28.25	17.75

SAMPLE CALCULATION:  $FSdBuV/m = MR(dBuV) + ACFdB$ .

TEST PROCEDURE: The procedure used was ANSI STANDARD C63.4-1992. The spectrum was scanned from 30 MHz to 1000 MHz. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The UUT was tested in 3 orthogonal planes.

TEST RESULTS: THE UNIT DOES MEET THE FCC REQUIREMENTS.

PERFORMED BY: JOSEPH SCOGLIO

DATE: DECEMBER 17, 2001

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NAME OF TEST: Occupied Bandwidth

RULES PART NO.: 15.235

REQUIREMENTS: The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits of 15.209, whichever permits the higher emission levels.

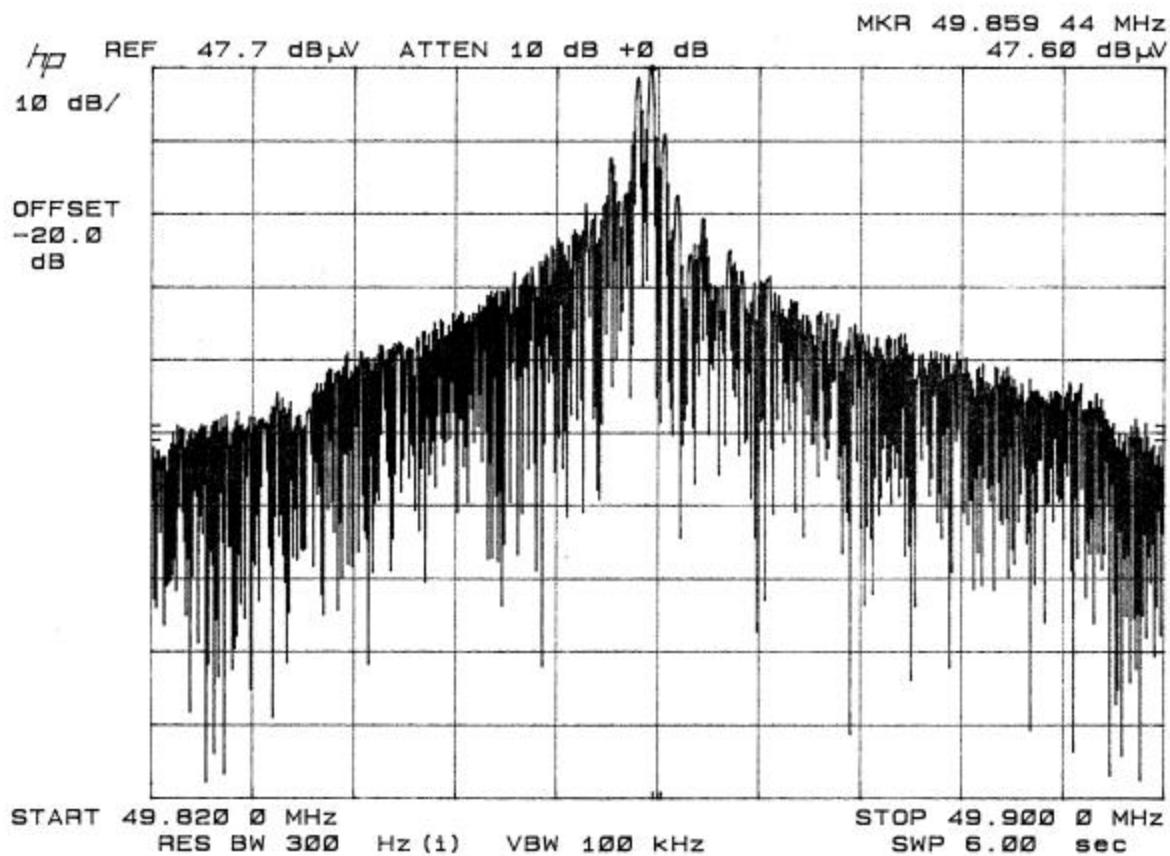
THE GRAPH ON THE NEXT PAGE REPRESENTS THE EMISSIONS TAKEN FOR THIS DEVICE.

METHOD OF MEASUREMENT: A small sample of the transmitter output was fed into the spectrum analyzer and the attached plot was taken. The vertical scale is set to -10 dBm per division. The horizontal scale is set to 5 kHz per division.

TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY: JOSEPH SC oglIO DATE: DECEMBER 17, 2001

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