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FCC ID: 02X2021

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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. 10/15/01 Due 10/15/02
- 5.___ Log-Periodic Antenna: Electro-Metrics Model LPA-30, S/N 409
Char. 10/16/01 Due 10/16/02
- 6.___ Log-Periodic Antenna: Electro-Metrics Model LPA-25, S/N 1122
Char. 2/10/01 Due 3/10/02
- 7.___ Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180,
1-18 GHz, S/N 2319 Cal. 12/19/01 Due 12/19/02
- 8.___ 18-26.3GHz Systron Donner Standard Gain Horn #DBE-520-20
No Cal Required
- 9.___ Horn 40-60GHz: ATM Part #19-443-6R No Cal Required
- 10.___ Line Impedance Stabilization Network: Electro-Metrics Model
EM-7820, w/NEMA Adapter S/N 2682 Cal. 3/16/01 Due 3/16/02
- 11.___ Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
Char. 1/22/02 Due 1/22/03
- 12.___ Frequency Counter: HP Model 5385A, S/N 3242A07460
Char. 12/11/01 Due 12/11/02
- 13.___ Peak Power Meter: HP Model 8900C, S/N 2131A00545
Char. 1/26/01 Due 1/26/02
- 14._X_Open Area Test Site #1-3meters Cal. 12/22/99
- 15.___ Signal Generator: HP 8640B, S/N 2308A21464
Cal. 11/15/01 Due 11/15/02
- 16._X_Passive Loop Antenna: EMC0 Model 6512, 9KHz to 30MHz, S/N
9706-1211 Char. 7/10/01 Due 7/10/02
- 17.___ Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 152
Cal. 3/21/01 Due 3/21/02
- 18.___ AC Voltmeter: HP Model 400FL, S/N 2213A14499
Cal. 10/9/01 Due 10/09/02
- 19._X_Digital Multimeter: Fluke Model 77, S/N 35053830
Char. 1/8/02 Due 1/8/03
- 20.___ 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 72° with a humidity of 75%.

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

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NAME OF TEST: RADIATION INTERFERENCE

RULES PART NO.: 15.227

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
27.10	36.4	H	0.31	13.96	50.67	29.34
27.10	64.2	V	0.31	13.96	78.47	1.54
54.20	18.9	V	0.84	10.37	30.11	9.89
108.50	19.0	H	1.23	11.12	31.35	12.15
108.50	16.7	V	1.23	9.30	27.23	16.27
135.70	13.6	H	1.34	14.44	29.38	14.12
135.70	17.5	V	1.34	14.44	33.28	10.22
162.80	4.5	V	1.50	16.68	22.68	20.82
190.00	5.3	V	1.72	14.20	21.22	22.28
217.10	5.6	V	1.87	11.39	18.86	27.14
244.30	12.5	V	1.98	11.82	26.30	19.70
271.40	9.8	H	2.09	13.75	25.64	20.36
271.40	7.4	V	2.09	13.75	23.24	22.76

SAMPLE CALCULATION: $FSD_{BuV/m} = MR(dBuV) + ACF_{dB}$.

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: JANUARY 29, 2001

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NAME OF TEST: Occupied Bandwidth
RULES PART NO.: 15.227
REQUIREMENTS: The field strength of any emissions appearing outside the 26.96-27.28 MHz band shall not exceed the general radiated emission limits in (15.209).

THE GRAPH ON THE NEXT PAGE REPRESENTS THE WORSE CASE OCCUPIED BANDWIDTH EMISSIONS 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 dB per division. The horizontal scale is set to 10 kHz per division.

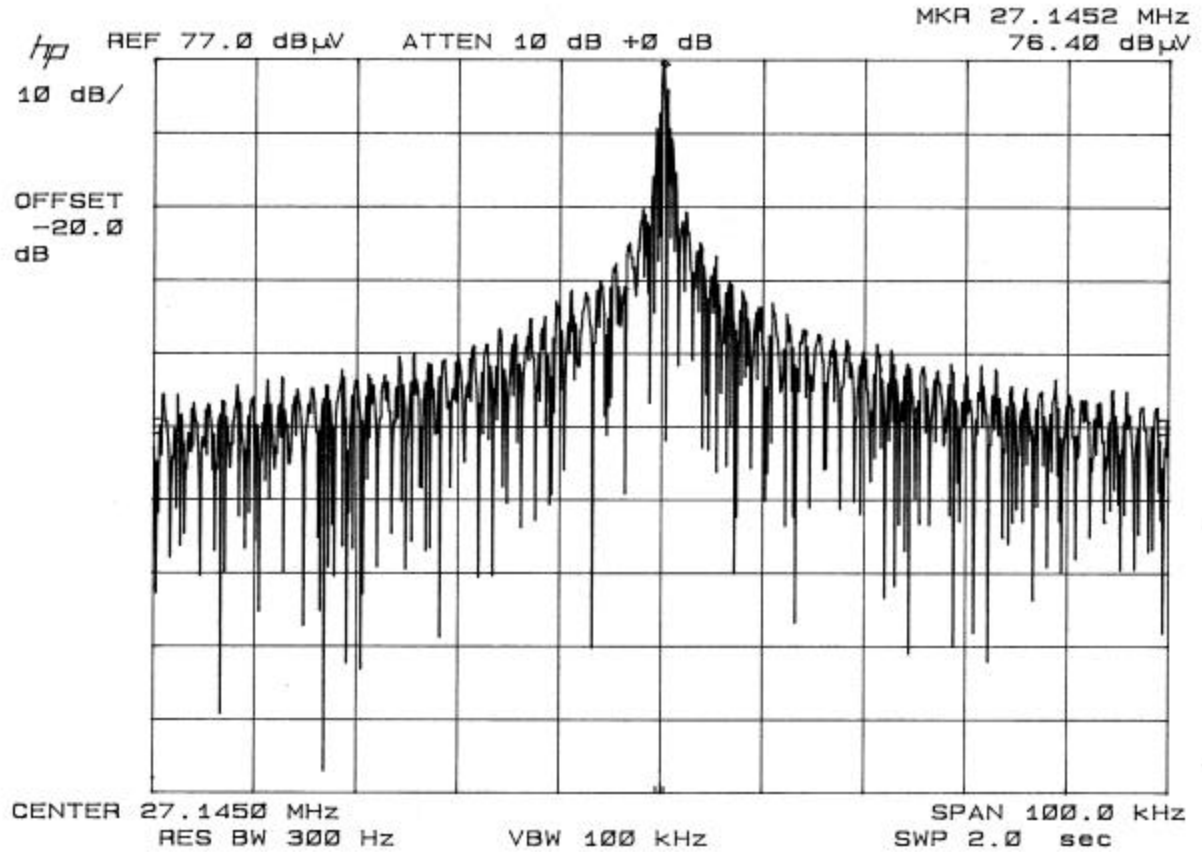
TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY: JOSEPH SCOGLIO

DATE: JANUARY 29, 2002

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