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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: EMCO 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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FCC ID: O2X2021

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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FCC ID: O2X2021  
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.

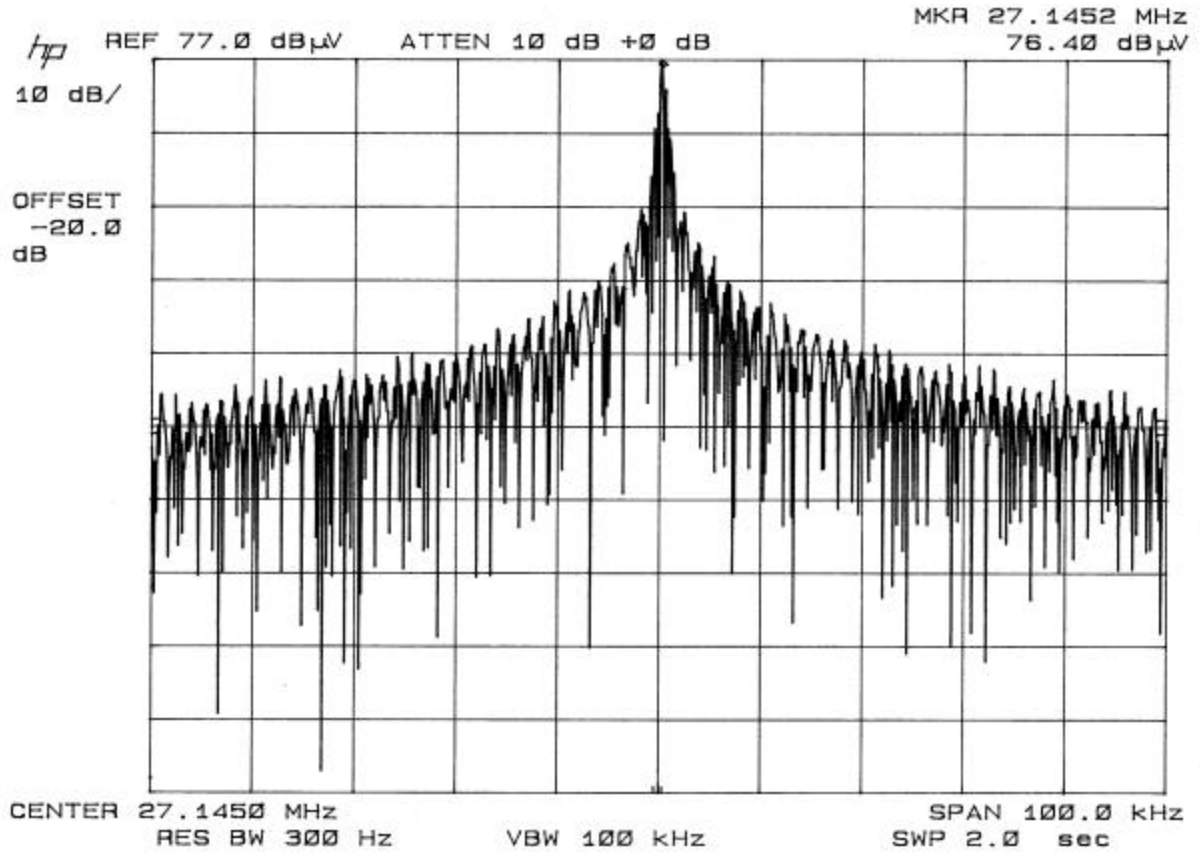
TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY: JOSEPH SCOGLIO

DATE: JANUARY 29, 2002

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