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FCC ID: NCO8080TX

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TEST EQUIPMENT LIST

1. Spectrum Analyzer: Hewlett Packard 8566B - Opt 462, w/ preselector 85685A, & Quasi-Peak Adapter HP 85650A, & HP 8449B - OPT H02 Cal. 10/17/99
2. Signal Generator, Hewlett Packard 8640B, cal. 9/23/99
3. Signal Generator, HP 8614A Serial No.2015A07428 cal. 5/27/99
4. EMCO Model No. 6512 Passive Loop 9KHz to 30MHz
5. Eaton Biconnical Antenna Model 94455-1
20-200 MHz Serial No. 0997 Cal. 9/30/99
6. Electro-Metric Log-Periodic Model No. EM-6950 Ser#632 9/18/99
7. Electro-Metric Dipole Kit, 20-1000 MHz, Model TDA-30 10/31/98
8. Electro-Metric Horn 1-18 GHz, Model RGA-180, Cal. 4/27/99
9. Systron Donner Horn 18-26.3GHz Model DBE-520-20 7/14/99
10. Systron Donner Horn 26.5-40.2GHz Model DBD-520-20 7/14/99
11. ATM Horn 40-60GHz Part #19-443-6R 9/15/99
12. Electro-Metric Antennas Model TDA-30/1-4, Cal. 10/15/98
13. Electro-Metric Line Impedance Stabilization Network Model
No. EM-7821, Serial No. 101; 100KHz-30MHz 50uH. Cal.11/19/98
14. Electro-Metric Line Impedance Stabilization Network Model
No. EM-7820, Serial No. 2682; 10KHz-30MHz 50uH. Cal. 11/19/98
15. Special low loss cable was used above 1 GHz
16. Tenney Temperature Chamber
17. AC Voltmeter, HP 400FL, Serial No 2213A14499. Cal. 9/21/99
18. Digital Multimeter, Fluke 8010A/12A, Serial No. 4810047.
Cal 9/21/99
19. Digital Multimeter, Fluke 77, Serial No. 43850817. Cal 9/21/99
20. Oscilloscope, Tektronix 2230, Serial No. 300572. Cal 9/23/99
21. Frequency Counter, HP 5385A, Serial No. 3242A07460. Cal 10/6/99

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 77oF with a humidity of 40%.

Example:

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

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TEST PROCEDURES CONTD.

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.

ANSI STANDARD C63.4-1992 10.1.7 MEASUREMENT PROCEDURES: The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The UUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings were converted to average readings based on the duration of "ON" time.

Measurements were made by TIMCO ENGINEERING INC. at the registered open field test site located at 6051 N.W. 19th Lane, Gainesville, FL 32605.

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.: 15.231

REQUIREMENTS:

Fundamental Frequency MHz	Field Strength of Fundamental dBuV	Field Strength of Harmonics and Spurious Emissions (dBuV/m @ 3m)
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	61.94 to 71.48	41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	71.48 to 81.94	51.48 to 61.94
470 and above	81.94	61.94

THE LIMIT FOR AVERAGE FIELD STRENGTH dBuV/m FOR THE FUNDAMENTAL FREQUENCY= 81.26 dBuV/m dBuV/m. NO FUNDAMENTAL IS ALLOWED IN THE RESTRICTED BANDS.

THE LIMIT FOR AVERAGE FIELD STRENGTH dBuV/m FOR THE HARMONICS AND SPURIOUS FREQUENCIES = 61.26 dBuV/m dBuV/m. SPURIOUS IN THE RESTRICTED BANDS MUST BE LESS THAN 54dBuV/m OR 15.209.

TEST DATA:

EMISSION FREQ. MHz	METER READING @ 3m dBuV	COAX LOSS dB	ACF dB	PEAK FIELD STRNGTH dBuV/m	AVERAGE FIELD STRNGTH dBuV/m	MARGIN dB	ANT.
447.80	59.70	1.60	18.10	79.40	79.40	1.86	V
895.60	28.60	2.90	24.15	55.65	55.65	5.61	V
1343.40R	24.40	1.00	25.37	50.77	50.77	3.23	V

SAMPLE CALCULATION OF LIMIT @ 303 MHz:

(470 - 260)Mhz = 210 MHz

(12500 - 3750)uV/m = 8750 uV/m

8750uV/m/210MHz = 41.67 uV/m/MHz

(303-260)MHz = 43 MHz

43 MHz * 41.67 uV/m/MHz = 1791.81 uV/m

(1791.81 + 3750)uV/m = 5541.81 uV/m limit @ 303 MHz

The transmitter ceases transmitting when the button is released.

TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY: S. S. SANDERS

DATE TESTED: NOVEMBER 12, 1999

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CALCULATION OF DUTY CYCLE:

This device is pulse width modulated and operates
with a duty cycle of 100%.

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