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FCC ID: BSYWT-115

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#### TEST EQUIPMENT LIST

1. Spectrum Analyzer: Hewlett Packard 8566B, with preselector HP 85685A, & Quasi-Peak Adapter HP 85650A, & HP 8449B OPT H02 Cal. 9/30/97
2. Eaton Biconnical Antenna Model 94455-1 20-200 MHz Serial No. 0997 Cal. 9/17/97
3. Electro-Metric Dipole Kit, 20-1000 MHz, Model TDA 25 cal. 5/15/97
4. Electro-Metric Horn 1-18 GHz, Model RGA-180, Cal. 9/24/97
5. Electro-Metric Antennas Model TDS-25-1, TDS-25-2, 9/3/97
6. Electro-Metric Line Impedance Stabilization Network Model No. EM-7821, Serial No. 101; 100KHz-30MHz 50uH. 9/30/97
7. Electro-Metric Line Impedance Stabilization Network Model No. EM-7820, Serial No. 2682; 10KHz-30MHz 50uH. 9/30/97

#### TEST PROCEDURE

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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 80oC with a humidity of 76%.

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

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-1992 using a 50uH LISN. Both lines were observed. The bandwidth of the spectrum analyzer was 10kHz with an appropriate sweep speed. The ambient temperature of the UUT was 80oC with a humidity of 76%.

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TEST PROCEDURES CONTINUED

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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.

The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSIC63.4-1992 with the EUT 40 cm from the vertical ground wall.

**CIRCUIT DESCRIPTION:**

In the receive mode the signal comes in on the receive antenna to the double tuned circuit T4 to the super-regenerative detector Q7, where the audio is detected. From Q7 the audio goes to the volume resistor VR1 to the input to the three(3) stage audio amplification, Q8, Q9 & Q10. Q10 drives the audio output transformer T5 which is connected to the speaker.

**ANTENNA AND GROUND CIRCUITRY**

This unit makes use of a external 5 inch antenna. The antenna is inductively coupled. This unit is powered from a 9.0V battery.

No ground connection is provided. The unit relies on the ground tract of the printed circuit board.

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APPLICANT: GMT INDUSTRIAL LTD.  
 FCC ID: BSYWT-115  
 NAME OF TEST: RADIATION INTERFERENCE  
 RULES PART NUMBER: 15.109  
 REQUIREMENTS: 30 to 80 MHz: 40.0 dBuV/M @ 3 METERS  
 88 to 216 MHz: 43.5 dBuV/M  
 216 to 960 MHz: 46.0 dBuV/M  
 ABOVE 960 MHz: 54.0 dBuV/M

TEST RESULTS: A search was made of the spectrum from 30 to 1000 MHz and the measurements indicate that the unit DOES meet the FCC requirements.

TEST DATA:

TUNED FREQ. MHz	EMISSION FREQUENCY MHz	METER READING @ 3m dBuV	COAX LOSS dB	A.C.F. dB	FIELD STRENGTH dBuV/m@3m	MARGIN dB	ANT.
49.86	47.92	20.60	0.25	10.92	31.77	8.23	V
49.86	48.10	19.70	0.25	10.93	30.88	9.12	V
49.86	48.45	20.20	0.25	10.94	31.39	8.61	V
49.86	48.80	19.20	0.25	10.95	30.41	9.59	V
49.86	49.15	15.30	0.25	10.97	26.52	13.48	V
49.86	49.65	13.70	0.25	10.99	24.94	15.06	V
49.86	49.96	16.60	0.25	11.00	27.85	12.15	V
49.86	50.52	17.70	0.80	10.83	29.33	10.67	V
49.86	51.00	15.40	0.80	10.68	26.88	13.13	V
49.86	51.63	21.60	0.80	10.47	32.87	7.13	V
49.86	52.04	14.70	0.80	10.34	25.84	14.16	V
49.86	52.29	15.60	0.80	10.26	26.66	13.34	V
49.86	52.79	7.40	0.80	10.09	18.29	21.71	V
49.86	52.98	3.20	0.80	10.03	14.03	25.97	V
49.86	53.60	4.80	0.80	9.83	15.43	24.57	V
49.86	53.85	5.70	0.80	9.75	16.25	23.75	V
49.86	54.29	3.60	0.80	9.61	14.01	25.99	V

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

TEST PROCEDURE: ANSI STANDARD C63.4-1992 using a Hewlett Packard Model 8566B spectrum analyzer, a Hewlett Packard Model 85685A Preselector, a Hewlett Packard Model 85650A Quasi-Peak adapter, an Electro-Metric Dipole Kit, and an Eaton Model 94455-1 Biconical Antenna. The bandwidth of spectrum analyzer was 100 kHz with an appropriate sweep speed. 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 receiver was put into the coherent mode by placing an antenna driven by a signal generator off site. The UUT was tested in 3 orthogonal planes.

PERFORMED BY: S. S. SANDERS

DATE: JULY 9, 1998

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NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE  
RULES PART NUMBER: 15.107  
MINIMUM REQUIREMENTS:    FREQUENCY            LEVEL  
                                  MHz                    uV  
                                  0.450-30                250  
TEST PROCEDURE: ANSI STANDARD C63.4-1992

THE HIGHEST EMISSION READ FOR LINE 1 WAS 4.116 uV @ 23.56 MHz.  
THE HIGHEST EMISSION READ FOR LINE 2 WAS 13.016 uV @ 800 kHz.

THE GRAPHS IN EXHIBITS 11-12 REPRESENT THE EMISSIONS READ FOR  
POWERLINE CONDUCTED FOR THIS DEVICE.

TEST RESULTS: Both lines were observed. The measurements indicate  
that the unit DOES appear to meet the FCC requirements for this class  
of equipment.

PERFORMED BY: S. S. SANDERS

DATE: JULY 9, 1998

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