

TABLE OF CONTENTS LIST

APPLICANT: GMT INDUSTRIAL LTD.

FCC ID: BSYWT-55414

TEST REPORT CONTAINING:

PAGE 1.....TEST PROCEDURE  
PAGE 2.....TEST PROCEDURE CONTD. AND CIRCUIT DESCRIPTION  
PAGE 3.....RADIATION INTERFERENCE TEST DATA  
PAGE 4.....OCCUPIED BANDWIDTH TEST DATA

EXHIBITS CONTAINING:

EXHIBIT 1.....POWER OF ATTORNEY LETTER  
EXHIBIT 2.....BLOCK DIAGRAM  
EXHIBIT 3.....SCHEMATIC  
EXHIBIT 4.....INSTRUCTION MANUAL  
EXHIBIT 5.....SAMPLE OF FCC ID LABEL  
EXHIBIT 6.....LOCATON OF FCC ID LABEL  
EXHIBIT 7.....EXTERNAL PHOTO - FRONT SIDE  
EXHIBIT 8.....EXTERNAL PHOTO - BACK SIDE  
EXHIBIT 9.....INTERNAL PHOTO - COMPONENT SIDE  
EXHIBIT 10.....INTERNAL PHOTO - COPPER SIDE  
EXHIBIT 11.....OCCUPIED BANDWIDTH PLOT - LOUD VOICE

APPLICANT: GMT INDUSTRIAL LTD.  
FCC ID: BSYWT-55414  
REPORT #: F:\CUS\G\GMT\GMT165H8.TX  
PAGE: TABLE OF CONTENTS LIST

**APPLICANT:** GMT INDUSTRIAL LTD.

**FCC ID:** BSYWT-55414

**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**

**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 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%.

APPLICANT: GMT INDUSTRIAL LTD.

FCC ID: BSYWT-55414

REPORT #: F:\CUS\G\GMT\GMT165H8.TX

PAGE #: 1

**TEST PROCEDURES CONTINUED**

**APPLICANT:** GMT INDUSTRIAL LTD.  
**FCC ID:** BSYWT-55414

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 transmit the audio from the microphone MIC1 is amplified in IC1 which amplifies the audio and also turns on the RF portion of the transmitter. When IC1 activates the transmitter it mutes the receiver. When the transmitter is turned on by Q1 & Q2 the crystal controlled oscillator Q3 is turned on. From Q3 the RF signal goes to the RF amplifier Q5 and then through the low pass filter, C26, L2 C3, & L1 to the antenna.

**ANTENNA AND GROUND CIRCUITRY**

This unit makes use of a external 5" 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.

APPLICANT: GMT INDUSTRIAL LTD.  
FCC ID: BSYWT-55414  
REPORT #: F:\CUS\G\GMT\GMT165H8.TX  
PAGE #: 2

**APPLICANT:** GMT INDUSTRIAL LTD.

**FCC ID:** BSYWT-55414

**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 AT 3 METERS dBuV	COAX LOSS dB	ANTENNA CORRECTION FACTOR dB	FIELD STRENGTH dBuV/m@3m	MARGIN dB	ANT. POL.
49.86	63.40	0.25	10.99	74.64	5.36	V
99.70	28.10	0.80	8.39	37.29	6.21	V
199.46	9.90	0.90	12.66	23.46	20.04	V
249.30	28.20	1.20	13.35	42.75	3.25	H
299.17	26.70	1.40	15.65	43.75	2.25	H
349.00	28.20	1.40	15.52	45.12	0.88	H
398.91	26.80	1.40	16.97	45.17	0.83	H
448.65	18.10	1.60	18.12	37.82	8.18	H
498.65	15.10	1.60	19.27	35.97	10.03	H
548.40	10.70	1.60	19.69	31.99	14.01	H
648.20	20.50	1.60	21.16	43.26	2.74	H

**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:** S. S. SANDERS

DATE: JULY 16, 1998

APPLICANT: GMT INDUSTRIAL LTD.  
FCC ID: BSYWT-55414  
REPORT #: F:\CUS\G\GMT\GMT165H8.TX  
PAGE #: 3

**APPLICANT:** GMT INDUSTRIAL LTD.

**FCC ID:** BSYWT-55414

**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 IN EXHIBIT 11 REPRESENTS THE EMISSIONS TAKEN FOR THE 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:** S. S. SANDERS

**DATE:** JULY 16, 1998

APPLICANT: GMT INDUSTRIAL LTD.  
FCC ID: BSYWT-55414  
REPORT #: F:\CUS\G\GMT\GMT165H8.TX  
PAGE #: 4