

# TIMCO ENGINEERING INC.

849 NW State Road 45  
Newberry, Florida 32669  
<http://www.timcoengr.com>  
888.472.2424 F 352.472.2030 email: [sid@timcoengr.com](mailto:sid@timcoengr.com)



## Test Report

Product Name: 49MHz REMOTE CONTROL TX

FCC ID: F5J21749

Applicant:

KA WAH MANUFACTORY LTD.  
WAH HING IND. MANSIONS, 10/F FLAT F  
36, TAI YAU STREET, SAN PO KONG KOWLOON  
HONG KONG

Date Receipt: 4/20/2005

Date Tested: 4/20/2005

APPLICANT: KA WAH MANUFACTORY LTD.  
FCC ID: F5J21749  
REPORT #: K\KAWAHF5J\836HT5\836HT5TestReport.doc

COVER SHEET

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## TABLE OF CONTENTS LIST

**APPLICANT:** KA WAH MANUFACTORY LTD.

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### TEST REPORT CONTAINING:

PAGE 1.....TEST EQUIPMENT LIST  
PAGE 2.....TEST PROCEDURE  
PAGE 3-4.....RADIATION INTERFERENCE TEST DATA  
PAGE 5.....OCCUPIED BANDWIDTH  
PAGE 6.....OCCUPIED BANDWIDTH PLOT

### EXHIBITS INCLUDING:

BLOCK DIAGRAM  
SCHEMATIC  
INSTRUCTION MANUAL  
LABEL SAMPLE  
LABEL LOCATION  
EXTERNAL PHOTOGRAPHS  
INTERNAL PHOTOGRAPHS  
CIRCUIT DESCRIPTION  
TEST SET UP PHOTOGRAPH

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TABLE OF CONTENTS

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## Equipment List

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/27/04	3/26/07
3-Meter OATS	TEI	N/A	N/A	Listed 1/13/03	1/12/06
Biconnical Antenna	Eaton	94455-1	1057	CAL 3/18/03	3/18/05
Biconnical Antenna	Eaton	94455-1	1096	CAL 10/1/01	10/1/03
Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/26/01	4/26/03
Blue Tower Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 4/15/03	4/15/05
Blue Tower RF Preselector	HP	85685A	2620A00294	CAL 4/27/04	4/27/06
Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 4/15/03	4/15/05
LISN	Electro-Metrics	ANS-25/2	2604	CAL 10/9/01	10/9/03
LISN	Electro-Metrics	EM-7820	2682	CAL 3/12/03	3/12/05
Log-Periodic Antenna	Eaton	96005	1243	CAL 5/8/03	5/8/05

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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 C63.4-2003 using a HEWLETT PACKARD spectrum analyzer with a pre-selector. 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 100 kHz and the video bandwidth was 300 kHz. The ambient temperature of the UUT was 80°C 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 Pre-selector 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

**ANSI STANDARD C63.4-2003 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.

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**APPLICANT:** KA WAH MANUFACTORY LTD.

**FCC ID:** F5J21749

**NAME OF TEST:** RADIATION INTERFERENCE

**RULES PART NO.:** 15.235

**REQUIREMENTS:** CARRIER FREQUENCY WILL NOT EXCEEDS 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:**

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correcti on Factor dB	Field Strength dBuV/m	Margin dB
49.8	49.80	34.0	H	1.10	11.65	46.75	33.26
49.8	49.80	54.0	V	1.10	10.83	65.93	14.08
49.8	99.70	10.6	H	1.35	10.50	22.45	21.05
49.8	99.70	23.8	V	1.35	11.32	36.47	7.03
49.8	149.50	8.0	H	1.85	15.77	25.62	17.89
49.8	149.50	21.0	V	1.85	16.95	39.80	3.71
49.8	199.40	5.0	H	2.44	16.61	24.05	19.45
49.8	199.40	8.7	V	2.44	17.41	28.55	14.95
49.8	249.30	16.6	H	2.60	12.55	31.75	14.25
49.8	249.30	20.0	V	2.60	12.35	34.95	11.05
49.8	299.10	15.8	H	2.80	14.75	33.35	12.65
49.8	299.10	24.0	V	2.80	14.59	41.39	4.61
49.8	349.00	16.0	H	3.05	14.78	33.83	12.18
49.8	349.00	27.8	V	3.05	14.50	45.35	0.65
49.8	398.80	16.2	H	3.29	15.79	35.28	10.72
49.8	398.80	26.6	V	3.29	15.79	45.68	0.32
49.8	448.70	14.2	H	3.49	17.13	34.82	11.18
49.8	448.70	23.5	V	3.49	16.69	43.68	2.32
49.8	498.60	12.7	H	3.69	17.87	34.26	11.74
49.8	498.60	17.8	V	3.69	17.86	39.35	6.65

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

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**APPLICANT:** KA WAH MANUFACTORY LTD.

**FCC ID:** F5J21749

**NAME OF TEST:** RADIATION INTERFERENCE

**TEST PROCEDURE:** The procedure used was ANSI STANDARD C63.4-2003. 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:** MARIO R. de ARANZETA

**DATE:** 4/20/2005

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**APPLICANT:** KA WAH MANUFACTORY LTD.

**FCC ID:** F5J21749

**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 un-modulated carrier or to the general limits of 15.209, whichever permits the higher emission levels.

THE GRAPH ON THE NEXT PAGE 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 dB per division.

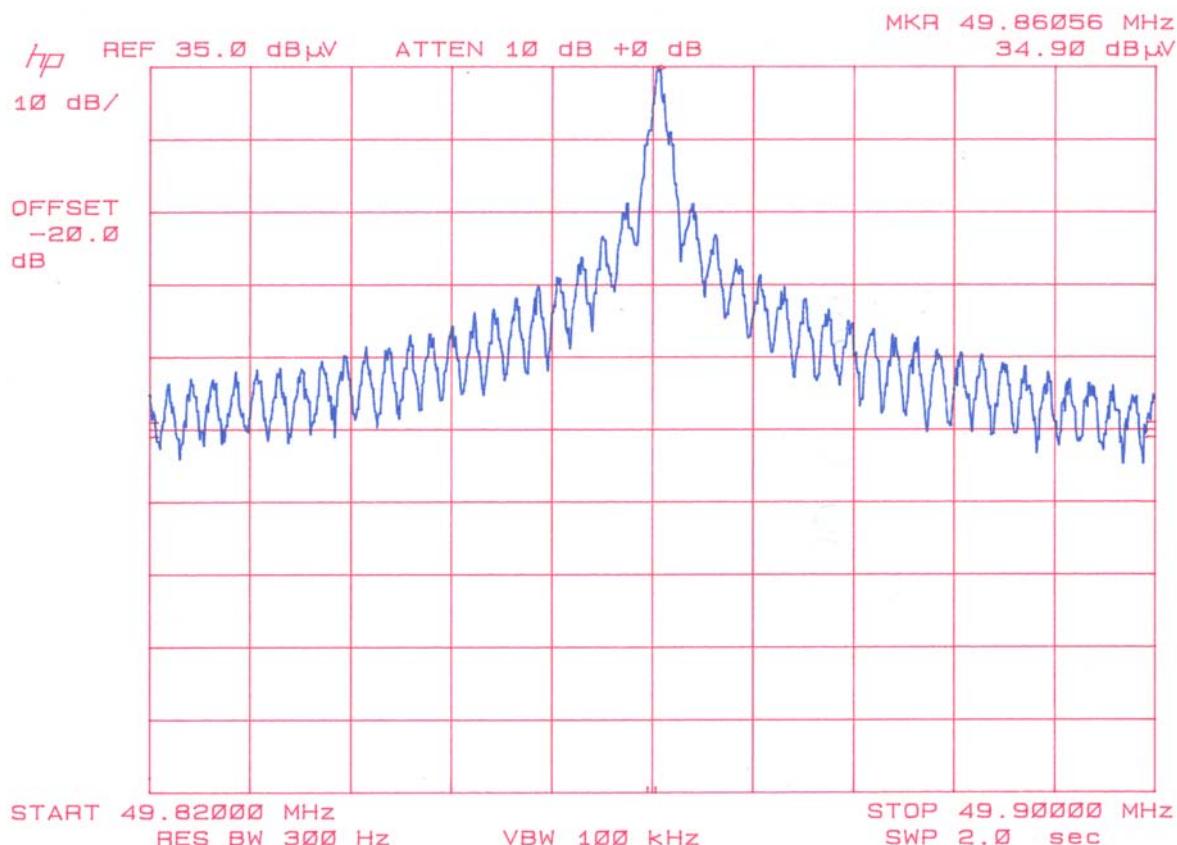
**TEST RESULTS:** The unit DOES meet the FCC requirements.

**PERFORMED BY:** JOSEPH SGOGLIO                    **DATE:** April 20, 2003

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