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

Test Report

Product Name: 49 MHz WIRELESS REMOTE CONTROL CAR - RECEIVER

FCC ID: F5J711549

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: NOVEMBER 25, 2003

Date Tested: NOVEMBER 25, 2003

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

TABLE OF CONTENTS LIST

APPLICANT: KA WAH MANUFACTORY LTD.

FCC ID: F5J711549

TEST REPORT CONTAINING:

EXHIBITS CONTAINING:

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

EMC Equipment List

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/26/01	3/26/04
3-Meter OATS	TEI	N/A	N/A	Listed 1/13/03	1/13/06
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	2926A00983	CAL 4/15/03	4/15/05
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
Log-Periodic Antenna	Electro-Metrics	EM-6950	632	CHAR 10/15/01	10/15/03
Log-Periodic Antenna	Electro-Metrics	LPA-25	1122	CAL 10/2/01	10/2/03
Log-Periodic Antenna	Electro-Metrics	LPA-30	409	CAL 3/4/03	3/4/05
Signal Generator	HP	8640B	2308A21464	CAL 2/15/02	2/15/04
Silver Tower Preamplifier	HP	8449B	3008A01075	CHAR 1/28/02	1/28/04
Silver Tower Quasi-Peak Adapter	HP	85650A	3303A01844	CAL 10/14/02	10/14/04
Silver Tower RF Preselector	HP	85685A	2620A00294	CAL 10/14/02	10/14/04
Silver Tower Spectrum Analyzer	HP	8566B Opt 462	3552A22064 3638A08608	CAL 10/14/02	10/14/04
Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CHAR 3/4/01	3/4/03
Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 8/31/01	8/31/03
Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 8/31/01	8/31/03
Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 8/31/01	8/31/03

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

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 80°F with a humidity of 70%.

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

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.

ANSI STANDARD C63.4-1992 12.1.1.1 SUPERREGENERATIVE RECEIVER: A signal Generator was set to the unit under test operating frequency. An un-modulated continuous wave (CW) signal was radiated at the super-regenerative receiver operating frequency to cohere the characteristic broadband emissions from the receiver.

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

APPLICANT: KA WAW MANUFACTORY LTD

FCC ID: F5J711549

NAME OF TEST: RADIATION INTERFERENCE

RULES PART NO.: 15.109

REQUIREMENTS:
30 to 88 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 1000MHz and the measurements indicate that the unit DOES meet the FCC requirements.

TEST DATA:

No	Frequency (MHz)	Result (dBuV)	Polar	Ant Height	Antenna Factor	Cable Loss	Limit Value (dBuV/m)	Value (dBuV/m)	Margin (dBuV/m)
1	31.72	22.7	H	3.6	13.1	1.0	40.0	8.6	-17.3
2	34.70	22.2	H	3.1	13.0	1.1	40.0	8.1	-17.8
3	42.98	24.0	V	2.0	12.2	1.4	40.0	10.4	-16.0
4	55.29	19.7	H	3.5	9.0	1.6	40.0	9.0	-20.3
5	59.66	15.5	H	3.4	7.5	1.7	40.0	6.3	-24.5
6	66.32	12.3	V	1.8	6.2	1.9	40.0	4.3	-27.7
7	100.10	19.8	V	1.5	11.2	2.4	43.0	6.2	-23.2
8	150.35	26.5	H	3.0	16.8	3.1	43.0	6.7	-16.5
9	161.45	26.3	H	3.1	17.0	3.2	43.0	6.1	-16.7
10	177.80	24.8	H	2.5	14.9	3.4	43.0	6.5	-18.2
11	195.20	23.8	V	1.6	14.9	3.6	43.0	5.3	-19.2
12	215.15	18.4	H	2.7	10.7	3.8	43.0	3.9	-24.6
13	300.75	29.0	V	1.6	16.1	4.6	46.0	8.2	-17.0
14	332.10	27.8	V	1.2	16.5	4.9	46.0	6.4	-18.2
15	342.05	27.1	H	2.8	15.5	5.0	46.0	6.5	-18.9
16	472.60	30.3	H	2.6	19.9	6.3	46.0	4.1	-15.7
17	501.05	32.1	H	2.0	18.1	6.6	46.0	7.4	-13.9

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, and an appropriate antenna – see the test equipment list. 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.

PERFORMED BY: JOSEPH SCOGLIO **DATE**: NOVEMBER 25, 2003