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Report No.: GLEMO09050115501

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FCC ID:XCZTC49MHZFB09

TEST REPORT

Application No. : GLEMO090501155RF
Applicant: TOY CENTURY COMPANY LTD. SUPERWAY INTERNATIONAL LIMITED
FCC ID: XCZTC49MHZFB09
Fundamental Frequency : 49.860MHz
Equipment Under Test (EUT):
EUT Name: R/C CAR SERIES
Model No.: #19547, #89967(#19580), #6811, #91262, #89741, #19652, # 84891, #80052, #6812, #80022, #80024B, #89230FF♣
• Please refer to section 3 of this report which indicates which item was actually tested and which were electrically identical.
Standards: FCC PART15 SUBPART C: 2008
Date of Receipt: 04 May 2009
Date of Test: 05 May to 11 May 2009
Date of Issue: 20 May 2009

Test Result :	PASS *
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* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 3 of this report for further details..

Authorized Signature:

Stephen Guo
Lab Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Version

Version No.	Date	Description
01	20 May 2009	New application

Prepared By: *Celia Xiang* **Date** *20 May 2009*

Project Engineer

Check By: *Gavin Wu* **Date** *25 May 2009*

Reviewer

3 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Occupied Bandwidth	FCC PART 15 :2008	Section 15.235	PASS
Carrier Emissions	FCC PART 15 :2008	Section 15.235	PASS
Radiated Emission (30MHz to 1000MHz)	FCC PART 15 :2008	Section 15.235 & 15.209	PASS

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radiated Frequency.

♣ Remark:

Item No.: #19547, #89967(#19580), #6811, #91262, #89741, #19652, # 84891, #80052, #6812, #80022, #80024B, #89230FF

Only the Item #19547 was tested, since the electrical circuit design, PCB layout, components used and internal wiring were identical for the above items, only the outer decoration, color and item numbers were different according to the conformation from the applicant (manufacturer).

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5 General Information

5.1 Client Information

Applicant Name: TOY CENTURY COMPANY LTD. SUPERWAY INTERNATIONAL LIMITED
Applicant Address: Unit 508, 5th Floor, Peninsula Centre, No.67 Mody Road, Tsim Sha Tsui East, Kowloon, Hong Kong.

5.2 Details of E.U.T.

EUT Name: R/C CAR SERIES
Item No.: #19547, #89967(#19580), #6811, #91262, #89741, #19652, # 84891, #80052, #6812, #80022, #80024B, #89230FF
Power Supply: DC 9V("6F22")
Power Cord: None

5.3 Description of Support Units

The EUT was tested as an independent unit: 49.860MHz radio transmitter.

5.4 Standards Applicable for Testing

The customer requested FCC tests for the EUT.

The standard used was FCC PART 15, SUBPART C: 2008(Section 15.235);

5.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,
198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

5.6 Other Information Requested by the Customer

None.

5.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP – Lab Code: 200611-0**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **FCC – Registration No.: 282399**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.

6 Equipments Used during Test

RE in Chamber						
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	N/A	N/A
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	28-01-2009	28-01-2010
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	10036	14-07-2008	14-07-2009
N/A	EMI Test Software	Audix	E3	N/A	N/A	N/A
EMC0514	Coaxial cable	SGS	N/A	N/A	04-12-2008	04-12-2009
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	12-08-2008	12-08-2009
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	12-08-2008	12-08-2009
EMC0517	Horn Antenna	Rohde & Schwarz	HF906	100095	12-08-2008	12-08-2009
EMC0040	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2008	05-12-2009
EMC0520	0.1-1300 MHz Pre-Amplifier	HP	8447D OPT 010	2944A0625 2	11-03-2009	11-03-2010
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A0164 9	11-03-2009	11-03-2010
EMC0075	310N Amplifier	Sonama	310N	272683	10-09-2008	10-09-2009
EMC0523	Active Loop Antenna	EMCO	6502	00042963	09-08-2008	09-08-2010
EMC0530	10m Semi- Anechoic Chamber	ETS	N/A	N/A	10-08-2008	10-08-2009

7 Test Results

7.1 E.U.T. test conditions

Power supply:	DC 9V("6F22") (New batteries)	
Requirements:	15.31(e) :For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.	
Type of antenna:	Integral	
Operating Environment:		
Temperature:	22.0 -25.0°C	
Humidity:	40-60% RH	
Atmospheric Pressure:	1002-1010 mbar	
Test frequencies:	According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:	
Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Test nominal frequency: 49.860MHz

7.2 Radiated Emissions

Test Requirement: FCC Part15 C Section 15.235&15.209

Test Method: ANSI C63.4

Test Date: 11 May 2009

Measurement Distance: 3m (Semi-Anechoic Chamber)

Requirements: **15.235(a)** :The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

15.235(b) : 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 in Section 15.209, whichever permits the higher emission levels. The field strength of any emissions removed by more than 10 kHz from the band edges shall not exceed the general radiated emission limits in Section 15.209. All signals exceeding 20 microvolts/meter at 3 meters shall be reported in the application for certification.

Out of band emissions shall not exceed:

40.0 dB μ V/m between 30MHz & 88MHz

43.5 dB μ V/m between 88MHz & 216MHz

46.0 dB μ V/m between 216MHz & 960MHz

54.0 dB μ V/m above 960MHz

Detector: Peak Scan (9kHz resolution bandwidth for 9kHz to 30MHz;
120kHz resolution bandwidth for 30MHz to 1000MHz)

Test Procedure:

1)9K to 30MHz emissions:

For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.4 section 8.2.1. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

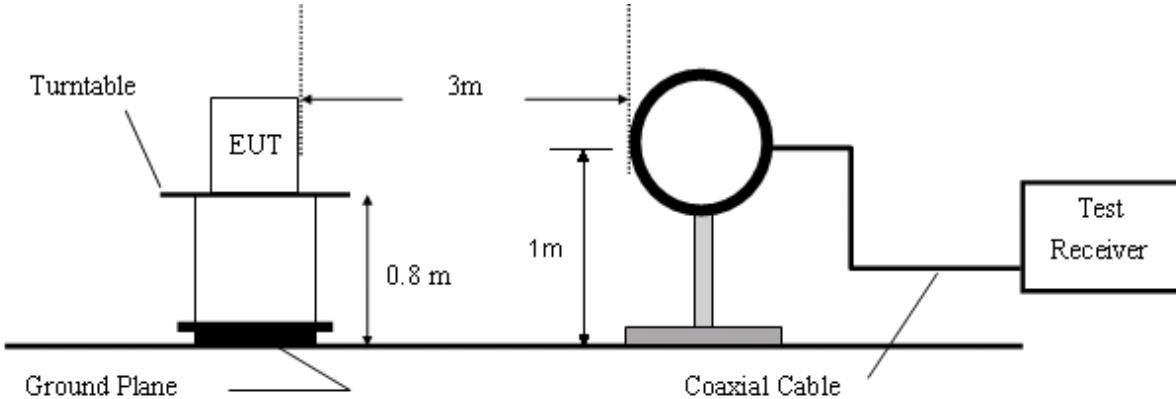
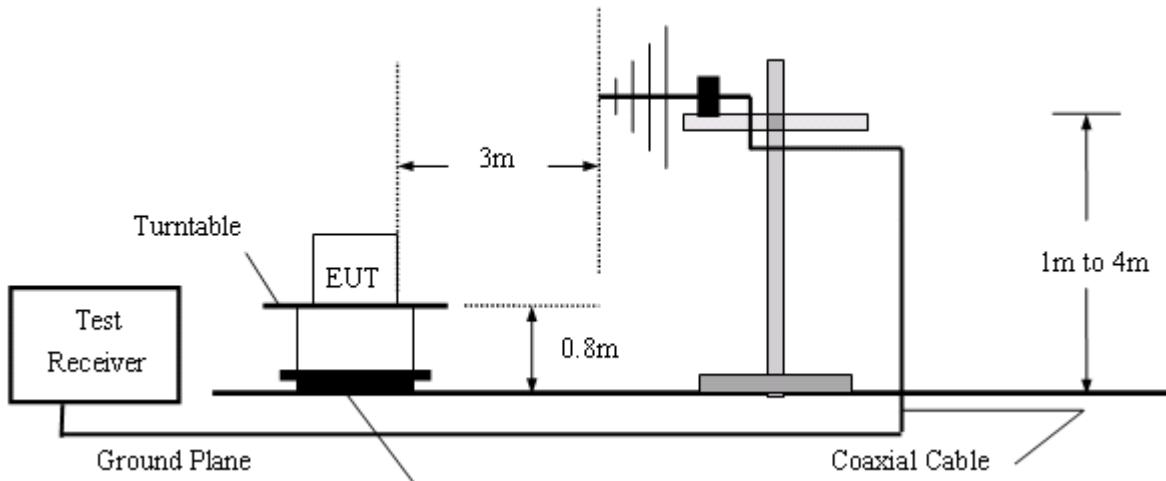
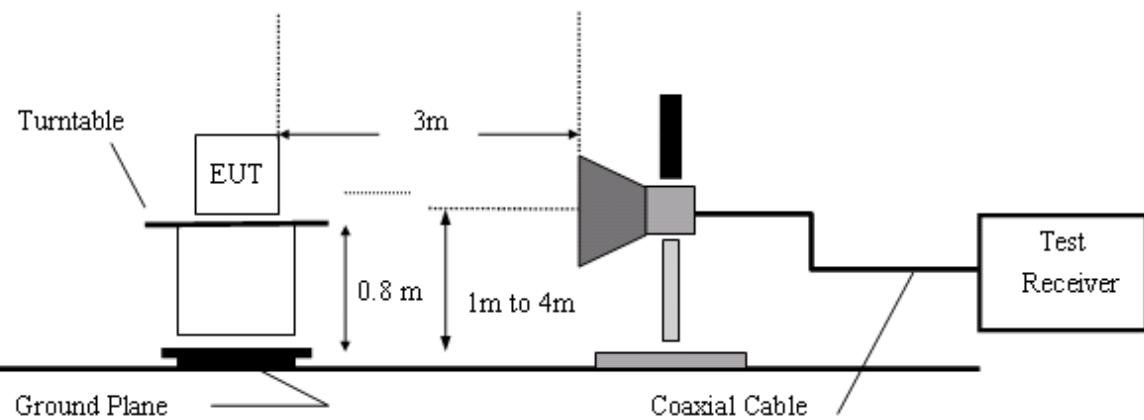
2)30MHz to 1GHz emissions:

For testing performed with the bi-log type antenna, testing was performed in accordance to ANSI 63.4. The measurement is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical polarizations.

3)1GHz to 40GHz emissions:

For testing performed with the horn antenna, testing was performed in accordance to ANSI 63.4. The measurement is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

Test Configuration:

1) 9K to 30MHz emissions:

2) 30MHz to 1GHz emissions:

3) 1GHz to 40GHz emissions:


7.2.1 Carrier Emissions:

Pre-test the EUT in X, Y and Z axis.,

Y: EUT as Radiated Emission test setup photograph in section 8 of this report.

X: rotate EUT by 90° clockwise.

Z: rotate EUT by 90° vertically.

The maximum emissions was found in the Y axis.

Measurement record:

Vertical:

Frequency (MHz)	Reading Level (dB μ V)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor (dB)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Antenna polarization
49.860	83.37	13.6	0.6	24.5	73.07	100.00	Peak
49.860	65.49	13.6	0.6	24.5	55.19	80.00	Average

Horizontal:

Frequency (MHz)	Reading Level (dB μ V)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor (dB)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Antenna polarization
49.860	76.73	13.6	0.6	24.5	66.43	100.00	Peak
49.860	56.91	13.6	0.6	24.5	46.61	80.00	Average

7.2.2 Unwanted Radiated emissions

Test Procedure: The procedure used was ANSI Standard C63.4-2003. The receive was scanned from 30MHz to 1000MHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. The worst case emissions were reported.

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bilog antenna with 2 orthogonal polarities

The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor -Peramplifier Factor.

The following test results were performed on the EUT.

Test the EUT in transmitting mode.

Horizontal.

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
97.900	39.70	10.15	0.90	31.20	19.56	43.50	-23.94
144.460	31.80	10.64	1.00	31.20	12.24	43.50	-31.26
249.220	41.51	15.25	1.89	24.40	34.24	46.00	-11.76
299.150	37.56	17.65	2.10	24.40	32.91	46.00	-13.09
349.020	37.50	17.12	2.30	24.71	32.20	46.00	-13.80
398.870	31.65	16.61	2.49	24.99	25.76	46.00	-20.24
448.710	32.26	16.39	2.60	25.46	25.80	46.00	-20.20
997.730	35.30	22.34	4.10	24.61	37.13	54.00	-16.82

Vertical.

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
97.900	46.00	10.15	0.90	31.20	25.85	43.50	-17.65
144.460	37.19	10.64	1.00	31.20	17.63	43.50	-25.87
249.580	37.20	12.47	1.89	24.40	27.16	46.00	-18.84
299.150	38.95	14.46	2.10	24.40	31.11	46.00	-14.89
349.020	38.03	15.76	2.30	24.71	31.37	46.00	-14.63
398.870	32.08	16.87	2.49	24.99	26.45	46.00	-19.55
448.750	33.23	16.23	2.60	25.46	26.60	46.00	-19.40
498.550	34.25	15.62	2.80	25.90	26.77	46.00	-19.23

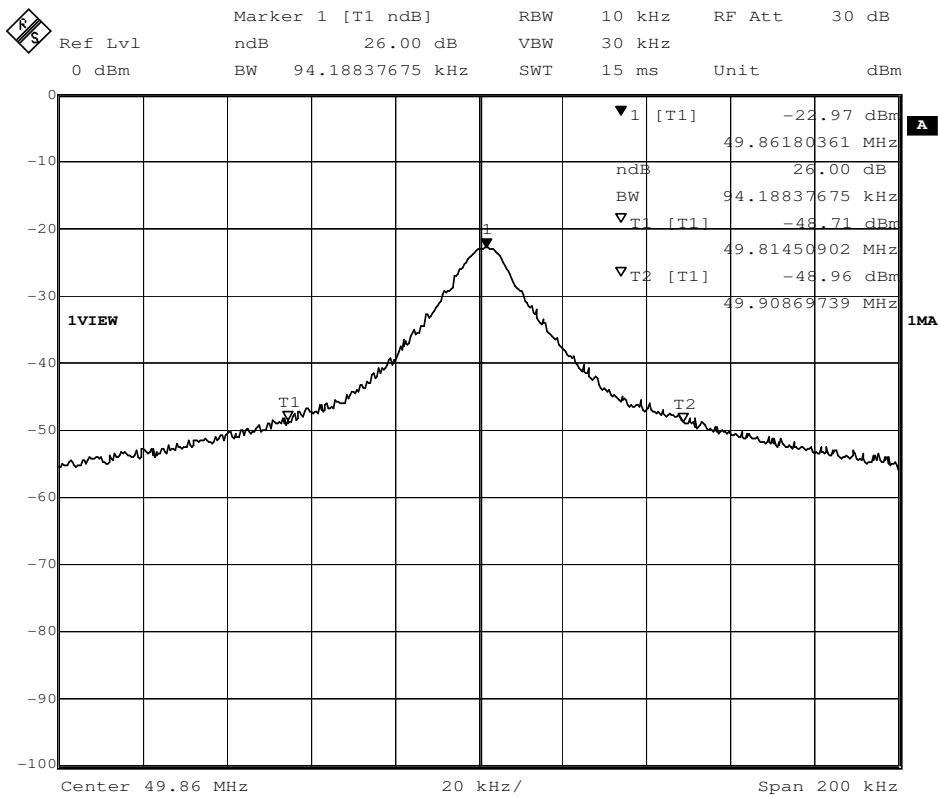
Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

Test Results: The unit does meet the FCC Part 15 C Section 15.235 requirements.

7.3 Occupied Bandwidth

Test Requirement: FCC Part 15 C Section 15.235
Test Method: ANSI C63.4
Test Date: 05 May 2009
Requirements: 15.235(b):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
Operation within the band 49.81 – 49.91 MHz
Method of measurement: The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector. The vertical Scale is set to 10dB per division. The horizontal scale is set to 20KHz per division. Read the down 26dB bandwidth of the carrier.



The 26dB down bandwidth lower edge is: 49.8145MHz

The 26dB down bandwidth upper edge is: 49.9087MHz

Operation within the band 49.81 – 49.91 MHz

The results: The unit does meet the FCC requirements

-End of the Report--