



## TEST REPORT

Report No. : AF004603-001

Date : 2005 March 18

Application No.: LF202625(6)

Applicant : Early Light Industrial Co., Ltd.  
Early Light International Centre,  
No. 9, Ka Fu Close, Sheung Shui,  
N. T., Hong Kong.

Sample Description : One(1) submitted sample stated to be 1/24 Bobble Head RC Car of Model No. WC164  
Rating : 2 x 1.5 "AA" size battery  
No. of sample(s) : Three (3) set (s)

Date Received : 2005 February 17

Test Period : 2005 February 17 – 2005 February 28

Test Requested : FCC Part 15 Certification

Test Method : FCC Rules and Regulations Part 15 – July 2004  
ANSI C63.4 – 2003

Test Result : See attached sheet(s) from page 2 to 11.

Conclusion : The submitted sample was found to comply with requirement of FCC Part 15 Subpart C.

*For and on behalf of*  
CMA Testing and Certification Laboratories

Authorized Signature :

May Chen

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### **1 General Information**

#### **1.1 General Description**

The equipment under test (EUT) is a transmitter for 1/24 Bobble Head R/C car. Operating at 27.145 MHz which is controlled by a crystal. The EUT is powered by 2 x 1.5V "AA" size battery. There are four control switch in front of EUT. When the forward, backward, turn left and turn right switch pressed once, it will transmit difference radio signal to receiver moving difference direction.

The brief circuit description is listed as follows :

- IC101 and associated circuit act as encoder
- X1 and associated circuit act as oscillator
- Q101, Q102 and associated circuit act as key board control
- T2 and associated circuit act as transmitter amplify

#### **1.2 Related Submittal Grants**

This is a single application for certification of a transmitter.

The receiver for this transmitter is exempted from the Part 15 technical rules per 15.101(b).



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### **1.3 Location of the test site**

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2001. A Semi-Anechoic Chamber Testing Site is set up for investigation and located at :

Ground Floor, Yan Hing Centre,  
9 – 13 Wong Chuk Yeung Street,  
Fo Tan, Shatin,  
New Territories,  
Hong Kong.

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2001. A shielded room is located at :

Ground Floor, Yan Hing Centre,  
9 – 13 Wong Chuk Yeung Street,  
Fo Tan, Shatin,  
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### **1.4 List of measuring equipment**

Equipment	Manufacturer	Model No.	Serial No.	Calibration Certification No.
EMI Test Receiver	R&S	ESCS30	100001	S21141
Broadband Antenna	Schaffner	CBL6113B	2718	AC1753
Signal Generator	IFR	2023B	202302/938	Nil
LISN	R&S	ESH3-Z5	100038	S21142
Pulse Limiter	R&S	ESH3-Z2	100001	20-73194
Biconical Antenna	R&S	HK116	837414/004	4000.7752.02

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### **2 Description of the radiated emission test**

#### **2.1 Test Procedure**

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2001.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

The device was rotated through three orthogonal axes to determine which attitude and configuration produce the highest emission during measurement.

#### **2.2 Test Result**

Peak Detector data was measured unless otherwise stated.

\* Emissions appearing within the restricted bands shall follow the requirement of section 15.205.

It was found that the EUT meet the FCC requirement.

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### **2.3 Radiated Emission Measurement Data**

**Radiated emission  
pursuant to  
the requirement of FCC Part 15 subpart C**

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB $\mu$ V/m)	Antenna and Cable factor (dB)	Average Factor (dB)	Field Strength (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
27.145	V	55.6	20.2	-6.9	68.9	80.0	-11.1
54.291	V	17.7	8.1	-	25.8	40.0	-14.2
81.435	H	14.3	7.2	-	21.5	40.0	-18.5
*108.580	H	11.0	11.0	-	22.0	43.5	-21.5
*135.725	H	10.2	12.4	-	22.6	43.5	-20.9
*162.870	H	13.0	10.4	-	23.4	43.5	-20.1
190.015	H	14.0	9.2	-	23.2	43.5	-20.3
217.161	H	14.0	9.7	-	23.7	46.0	-22.3
*244.305	H	14.3	9.7	-	24.0	46.0	-22.0
*271.450	H	10.3	13.9	-	24.2	46.0	-21.8

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### **3 Description of the Line-conducted Test**

#### **3.1 Test Procedure**

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2001. The EUT was setup as described in the procedures, and both lines were measured.

#### **3.2 Test Result**

No measurement is required as the EUT is a battery-operated product.

#### **3.3 Graph and Table of Conducted Emission Measurement Data**

Not Applicable



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### **4 Photograph**

#### **4.1 Photographs of the Test Setup for Radiated Emission and Conduction Emission**

For electronic filing, the photos are saved with filename TSup1.jpg to TSup2.jpg

#### **4.2 Photographs of the External and Internal Configurations of the EUT**

For electronic filing, the photos are saved with filename ExPho1.jpg to ExPho2.jpg and InPho1.jpg to InPho2.jpg.



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### **5 Supplementary document**

The following document were submitted by applicant, and for electronic filing, the document are saved with the following filenames:

<b>Document</b>	<b>Filename</b>
ID Label/Location	LabelSmp.jpg
Block Diagram	BlkDia.pdf
Schematic Diagram	Schem.pdf
Users Manual	UserMan.pdf
Operational Description	OpDes.pdf

### **5.1 Bandwidth**

The plot on saved in TestRpt 2.pdf shows the fundamental emission is confined in the specified band. It also shows that the band edge met the 15.209 requirement at 26.9599 and 27.2801 MHz.

### **5.2 The duty cycle is simply the on-time divided by the period :**

$$\text{The duration of one cycle} = 31.8 \text{ ms}$$

$$\begin{aligned}\text{Effective period of the cycle} &= (0.94\text{ms} \times 6) + (0.44\text{ms} \times 20) \\ &= 14.44\text{ms}\end{aligned}$$

$$\begin{aligned}\text{Duty Cycle} &= (14.44 / 31.8)\text{ms} \\ &= 0.454\text{ms}\end{aligned}$$

Therefore, the average factor is found by  $20 \log_{10} 0.454 = -6.9 \text{ dB}$



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### **6 Appendices**

A1.	Photos of the set-up of Radiated Emissions	1 page
A2.	Photos of External Configurations	1 page
A3.	Photos of Internal Configurations	1 page
A4.	ID Label/Location	1 page
A5.	Bandwidth Plot	1 page
A6.	Average Factor	2 pages
A7.	Block Diagram	1 page
A8.	Schematics	1 page
A9.	User Manual	4 pages
A10.	Operation Description	1 page

\*\*\*\*\* End of Report \*\*\*\*\*

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