



## **TEST REPORT**

Report No. : AF026659-001 Date : 2005 November 22

Application No. : LF220929(2)

Applicant : Greyland Trading Ltd.  
Rm. 705A, TST CTR. West Wing,  
66 Mody Road, TST,  
Kowloon, Hong Kong

Sample Description : One(1) submitted sample(s) stated to be Splash R/C Electronic Friendly Fish/  
Splash R/C Electronic Shark Attack of Model No. PG-3093 and PG-3095  
Rating : 3 x 1.5V button cell  
No. of submitted sample : Two (2) piece(s)

Date Received : 2005 November 15

Test Period : 2005 November 15 – 2005 November 21

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.

Remark : All two models are the same in circuitry and components; and therefore model  
PG-3093 was chosen to be the representative of the test sample.

*For and on behalf of*  
CMA Industrial Development Foundation Limited

Authorized Signature : \_\_\_\_\_  
Danny Chui  
EMC Engineer - EL. Division

FCC ID: TCEGREYLAND-05

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### **1 General Information**

#### **1.1 General Description**

The equipment under test (EUT) is a transmitter for Splash R/C Electronic Friendly Fish. Operating at 27.145MHz which is controlled by a crystal. The EUT is powered by 3 x 1.5V button cell. It has three button keys in the centre of EUT. When the button key is pressed once, it will transmit a radio signal to receiver going forward, left or right.

The brief circuit description is listed as follows :

- Y1, Q2 and associated circuit act as oscillator.
- U1 and associated circuit act as encoder.
- Q4, L3 and associated circuit act as RF amplify and filter.



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### **1.2 Location of the test site**

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003. 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 – 2003. A shielded room is located at :

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

Equipment	Manufacturer	Model No.	Serial No.	Calibration Certification No.
EMI Test Receiver	R&S	ESCS30	100001	S43284
Broadband Antenna	Schaffner	CBL6112B	2692	CA3025
Signal Generator	IFR	2023B	202302/938	S43098
LISN	R&S	ESH3-Z5	100038	S43377
LISN	R&S	ESH3-Z5	100010	S43101
Pulse Limiter	R&S	ESH3-Z2	100001	S43325
Biconical Antenna	R&S	HK116	837414/004	2GB05000535-0001
Loop Antenna	EMCO	6502	00056620	49906



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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 – 2003.

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.

For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1 m above the ground.

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	38.7	16.4	-4.9	50.2	80.0	-29.8
54.298	V	12.7	8.1	-	20.8	40.0	-19.2
81.447	H	10.0	7.2	-	17.2	40.0	-22.8
* 108.596	H	11.4	11.0	-	22.4	43.5	-21.1
* 135.733	H	11.2	12.4	-	23.6	43.5	-19.9
* 162.886	H	8.7	10.4	-	19.1	43.5	-24.4
190.027	H	15.7	9.2	-	24.9	43.5	-18.6
217.184	H	15.0	9.7	-	24.7	46.0	-21.3
* 244.325	H	14.8	9.7	-	24.5	46.0	-21.5
* 271.445	H	9.7	13.9	-	23.6	46.0	-22.4



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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 – 2003. 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 TestRpt2.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 Duty cycle**

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

$$\begin{aligned}\text{The duration of one cycle} &= 19.1\text{ms} \\ \text{Effective period of the cycle} &= (1.5 \times 4)\text{ms} + (0.48 \times 10)\text{ms} \\ &= 10.8\text{ms} \\ \text{Duty Cycle} &= 10.8 / 19.1 \\ &= 0.565\end{aligned}$$

Therefore, the average factor is found by  $20 \log_{10} 0.565 = -4.9\text{dB}$

#### **5.3 Transmission time**

NA



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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	2	pages
A10	Operation Description	1	page

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