# THRU Lab & Engineering.

**RM1105,11FL, ACE TECHNO TOWER**
**197-22,GURO-DONG GURO-GU, SEOUL KOREA**
**81221095059F81221095056 email thrukang@kornet.net**

Test Report

Product Name: 49.82-49.90 MHz Wireless R/C Toy - RX

FCC ID: QG33289R49

**Applicant:**
**PLANET TOYS WORLDWIDE LTD.**

**1107 CHINACHEM GOLDEN PLAZA**
**77 MODY ROAD, TSIMSHATSUI EAST**
**KOWLOON HONG KONG**

**Date Receipt: 06/14/2004**

**Date Tested: 06/22/2004**

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**TEST REPORT CONTAINING:**



**EXHIBITS CONTAINING:**

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## TEST EQUIPMENT LIST

| DEVICE | MODEL | MFGR | SERNO | DUE.CAL |
|---|---|---|---|---|
| EMI Test Receiver | ESVS 10 | Rohde & Schwarz | 830489/001 | 2005.04.07. |
| Spectrum Analyzer | 8566B | Hewlett Packard | 2311A02394 | 2005.04.07. |
| Spectrum Display | 85662A | Hewlett Packard | 2542A12429 | 2005.04.07. |
| Quasi-Peak Adapter | 85650A | Hewlett Packard | 2521A00887 | 2005.04.07. |
| RF Preselector | 85685A | Hewlett Packard | 2648A00504 | 2005.04.07. |
| Pre-Amplifier | 8449B | Hewlett Packard | 3008A00375 | 2005.04.07. |
| Pre-Amplifier | 8447F | Hewlett Packard | 3113A05367 | 2005.04.07. |
| Spectrum Monitor | EZM | Rohde & Schwarz | 862304/007 | 2005.04.07. |
| Bico-Antenna | 94455-1 | Eaton | 977 | 2005.03.17. |
| Log-Periodic Antenna | 3146 | EMCO | 2051 | 2005.03.17. |
| Dipole Antenna | TDA25/1/2 | Electro Metrics | 176/200/200 | 2005.03.17. |
| Horn Antenna | SAS-571 | A.H Systems | 414 | 2005.03.17. |
| Spectrum Analyzer | R3261C | Advantest | 71720189 | 2005.04.07. |
| LISN | KNW-242 | Kyoritsu | 8-923-2 | 2004.07.17. |
| LISN | 8012-50-R-24 | Solar | 8379121 | 2004.07.17. |
| Loop Ant | 6507 | EMCO | 1435 | 2004.10.06. |
| Signal Generator | SMS | Rohde & Schwarz | 872165/100 | 2005.04.07. |
| Modulation Analyzer | 8901B | Hewlett Packard | 3438A05094 | 2005.04.07. |
| Frequency Counter | CMC251 | Tektronic | CMC-251TW52489 | 2005.04.07. |

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## TEST PROCEDURE

**GENERAL**: This report shall NOT be reproduced except in full without the written approval of ThruLab & Engineering.

**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 27ºC with a humidity of 63%.

**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.

The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSIC63.4-1992 with the EUT 40 cm from the vertical ground wall.

**Not Applicable, battery operated.**

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**APPLICANT**: PLANET TOYS WORLDWIDE LTD.

**FCC ID**: QG33289R49

**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 | Emission Frequency (MHz) | Meter Reading dBuV | Ant. Polaritry | Correction Factor dB | Cable Loss dB | Field Strength (dBuv/m) | Margin (dBuv) | Limit (dBuv/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | 31.40 | 3.2 | H | 13.1 | 1.0 | 17.3 | -22.7 | 40.0 |
| 2 | 43.56 | 3.3 | H | 12.1 | 1.4 | 16.8 | -23.2 | 40.0 |
| 3 | 60.10 | 2.6 | H | 7.4 | 1.7 | 11.7 | -28.3 | 40.0 |
| 4 | 78.65 | 2.4 | H | 7.7 | 2.1 | 12.2 | -27.8 | 40.0 |
| 5 | 117.35 | 3.6 | H | 10.9 | 2.7 | 17.2 | -26.3 | 43.5 |
| 6 | 155.30 | 4.5 | V | 16.9 | 3.1 | 24.6 | -18.9 | 43.5 |
| 7 | 161.75 | 4.0 | H | 17.0 | 3.2 | 24.2 | -19.3 | 43.5 |
| 8 | 166.05 | 4.1 | H | 16.5 | 3.3 | 23.9 | -19.6 | 43.5 |
| 9 | 178.15 | 5.3 | V | 14.9 | 3.4 | 23.6 | -19.9 | 43.5 |
| 10 | 183.40 | 5.6 | H | 14.2 | 3.5 | 23.3 | -20.2 | 43.5 |
| 11 | 185.95 | 5.5 | H | 14.0 | 3.5 | 22.9 | -20.6 | 43.5 |
| 12 | 195.05 | 7.5 | H | 14.9 | 3.6 | 25.9 | -17.6 | 43.5 |
| 13 | 208.95 | 6.9 | H | 10.8 | 3.7 | 21.4 | -22.1 | 43.5 |
| 14 | 218.65 | 7.3 | H | 10.7 | 3.8 | 21.8 | -24.2 | 46.0 |
| 15 | 229.75 | 8.6 | H | 10.9 | 3.9 | 23.4 | -22.6 | 46.0 |
| 16 | 231.90 | 8.9 | H | 11.0 | 3.9 | 23.8 | -22.2 | 46.0 |
| 17 | 432.86 | 2.0 | H | 16.0 | 5.9 | 23.9 | -22.1 | 46.0 |

**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**: K.M Choi **DATE**:**06/22/04**