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## FCC PART 15.227 TEST REPORT

### LOW POWER UNLICENSED TRANSMITTER

|                             |   |
|-----------------------------|---|
| <b>Applicant</b>            | SCIENTIFIC TOYS, LTD.   |
| <b>Address</b>              | RM.1108, 11/F., BLOCK B, NEW MANDARIN<br>PLAZA 14 SCIENCE MUSEUM ROAD TST EAST<br>KOWLOON HONG KONG |
| <b>FCC ID</b>               | BY33548-274P  |
| <b>Product Description</b>  | 26.96-27.28 MHZ WIRELESS R/C TOYS - TX  |
| <b>Date Sample Received</b> | 7/7/2010  |
| <b>Date Tested</b>          | 7/7/2010  |
| <b>Tested By</b>            | Joe Scoglio   |
| <b>Approved By</b>          | Mario R. de Aranzeta  |
| <b>Timco Report No.</b>     | 1628HT10TestReport.doc  |
| <b>Test Results</b>         | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail                              |

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**



Certificate # 0955-01

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## GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

### Summary

The device under test does:

- fulfill the general approval requirements as identified in this test report  
 not fulfill the general approval requirements as identified in this test report

### Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.



Testing Certificate # 0955-01

I attest that the necessary measurements were made, under my supervision, at:

Timco Engineering Inc.  
849 NW State Road 45  
Newberry, Fl 32669



### Authorized Signatory Name:

Mario de Aranzeta C.E.T.  
Compliance Engineer/ Lab. Supervisor

**Date: 7/13/2010**

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## REPORT SUMMARY

|                    |  |
|--------------------|--|
| Disclaimer         | The test results only relate to the item tested. |
| Applicable Rule(s) | FCC Pt 15.227, ANSI C63.4: 2003                  |

## TEST ENVIRONMENT

|                 |  |
|-----------------|--|
| Test Facility   | The test sites are located at 849 NW State Road 45 Newberry, FL 32669 USA. |
| Test Condition: | Temperature: 26°C<br>Relative humidity: 50%                                |

## TEST SETUP

|  |   |
|--|---|
| Test Exercise (e.g software description, test signal, etc.): | The DUT was placed in continuous transmit mode of operation.      |
| Deviation from the standard(s)                               | No deviation from the standard(s)                                 |
| Modification to the DUT:                                     | No modification was made to the DUT.                              |
| Supporting Peripheral Equipment                              | Not applicable. The device is a stand-alone remote control radio. |

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## DUT SPECIFICATION

|                          |  |  |  |
|--------------------------|--|--|--|
| <b>Applicant</b>         | SCIENTIFIC TOYS, LTD.  |  |  |
| <b>Description</b>       | 26.96-27.28 MHZ WIRELESS R/C TOYS - TX                           |  |  |
| <b>FCC ID</b>            | BY33548-274P   |  |  |
| <b>Frequency Range</b>   | 27.145 MHz   |  |  |
| <b>DUT Power Source</b>  | <input type="checkbox"/> 110-120Vac/50- 60Hz                     |  |  |
|                          | <input type="checkbox"/> DC Power                                |  |  |
|                          | <input checked="" type="checkbox"/> Battery Operated Exclusively |  |  |
| <b>Test Item</b>         | <input type="checkbox"/> Prototype                               | <input checked="" type="checkbox"/> Pre-Production | <input type="checkbox"/> Production          |
| <b>Type of Equipment</b> | <input type="checkbox"/> Fixed                                   | <input type="checkbox"/> Mobile                    | <input checked="" type="checkbox"/> Portable |

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## TEST EQUIPMENT LIST

| Device                                | Manufacturer     | Model         | Serial Number            | Cal/Char Date      | Due Date |
|---------------------------------------|------------------|---------------|--------------------------|--------------------|----------|
| 3-Meter Semi-Anechoic Chamber         | Panashield       | N/A           | N/A                      | Listed<br>03/10/10 | 03/10/12 |
| Analyzer Tan Tower Quasi-Peak Adapter | HP               | 85650A        | 3303A01690               | CAL<br>11/22/09    | 11/22/11 |
| Analyzer Tan Tower RF Preselector     | HP               | 85685A        | 3221A01400               | CAL<br>11/21/09    | 11/21/11 |
| Analyzer Tan Tower Spectrum Analyzer  | HP               | 8566B Opt 462 | 3138A07786<br>3144A20661 | CAL<br>11/24/09    | 11/24/11 |
| Analyzer Tan Tower Preamplifier       | HP               | 8449B-H02     | 3008A00372               | CAL<br>11/21/09    | 11/21/11 |
| Coaxial Cable #64                     | Semflex Inc.     | 60637         | Timco #64                | CHAR<br>3/30/09    | 3/30/11  |
| Antenna: Dipole Kit                   | Electro-Metrics  | TDA-30/1-4    | 152                      | CAL 3/3/09         | 3/3/12   |
| Antenna: Dipole Kit                   | Electro-Metrics  | TDA-30/1-4    | 153                      | CHAR<br>4/5/09     | 4/5/12   |
| Hygro-Thermometer                     | Extech           | 445703        | 0602                     | CAL<br>1/30/09     | 1/30/11  |
| Modulation Analyzer                   | HP               | 8901A         | 3435A06868               | CAL 5/9/09         | 5/9/11   |
| Digital Multimeter                    | Fluke            | FLUKE-77-3    | 79510405                 | CAL<br>5/14/09     | 5/14/11  |
| Antenna: Passive Loop                 | EMC Test Systems | EMCO<br>6512  | 9706-1211                | CAL. 6/1/09        | 6/2/11   |

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## TEST PROCEDURES

**Radiated Spurious Emissions:** The test procedure used was ANSI C63.4-2003 using a 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 100 kHz and the video bandwidth was always greater than the RBW.

**Occupied Bandwidth:** A small sample of the transmitter output was fed into the spectrum analyzer and the following plot was generated. The vertical scale is set to 10 dB per division.

**Formula Of Conversion Factors:** The field strength at 3m was established by adding the meter reading of the spectrum analyzer to the antenna correction factor supplied by the antenna manufacturer plus the coax loss. The antenna correction factors are stated in terms of dB/m. The gain of the preselector was accounted for in the spectrum analyzer reading.

Example:

| Freq<br>MHz | Meter Reading<br>dB $\mu$ V | ACF<br>dB/m | Cable Loss<br>dB | Field Strength<br>dB $\mu$ V/m @ 3 m |
|-------------|-----------------------------|-------------|------------------|--------------------------------------|
| 33          | 20                          | +10.36      | +1.2             | = 31.56                              |

**ANSI C63.4-2003 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.

For measurements below 30 MHz, a loop antenna was used and rotated in horizontal and vertical positions to maximize emissions. Emissions attenuated more than 20 dB below the permissible value are not reported.

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## RADIATION INTERFERENCE

Rules Part No.: 15.227

### Requirements:

| Frequency MHz         | Limits                                |
|-----------------------|---------------------------------------|
| Fundamental Frequency | 80.0 dB $\mu$ V/m measured @ 3 meters |
| 30 – 88               | 40.0 dB $\mu$ V/m measured @ 3 meters |
| 80 – 216              | 43.5 dB $\mu$ V/m measured @ 3 meters |
| 216 – 960             | 46.0 dB $\mu$ V/m measured @ 3 meters |
| Above 960             | 54.0 dB $\mu$ V/m measured @ 3 meters |

### Test Data:

| Tuned Frequency MHz | Emission Frequency MHz | Meter Reading dB $\mu$ V | Ant. Pol | Coax Loss dB | Correction Factor dB | Field Strength dB $\mu$ V/m | Margin dB |
|---------------------|------------------------|--------------------------|----------|--------------|----------------------|-----------------------------|-----------|
| 27.1                | 27.10                  | 43.8                     | H        | 0.71         | 34.16                | 78.67                       | 1.33      |
| 27.1                | 27.10                  | 44.4                     | V        | 0.71         | 34.16                | 79.27                       | 0.73      |
| 27.1                | 54.30                  | 16.2                     | H        | 0.92         | 10.04                | 27.16                       | 12.84     |
| 27.1                | 54.30                  | 25.9                     | V        | 0.92         | 9.48                 | 36.30                       | 3.70      |
| 27.1                | 81.40                  | 15.1                     | H        | 1.18         | 8.64                 | 24.92                       | 15.08     |
| 27.1                | 81.40                  | 26.5                     | V        | 1.18         | 8.74                 | 36.42                       | 3.58      |
| 27.1                | 108.60                 | 17.4                     | V        | 1.42         | 10.81                | 29.63                       | 13.87     |
| 27.1                | 162.90                 | 14.6                     | V        | 1.79         | 17.23                | 33.62                       | 9.88      |
| 27.1                | 217.20                 | 11.8                     | H        | 2.10         | 11.64                | 25.54                       | 20.46     |
| 27.1                | 217.20                 | 20.0                     | V        | 2.10         | 11.44                | 33.54                       | 12.46     |
| 27.1                | 244.30                 | 13.1                     | H        | 2.18         | 12.32                | 27.60                       | 18.40     |
| 27.1                | 244.30                 | 19.1                     | V        | 2.18         | 12.36                | 33.64                       | 12.36     |
| 27.1                | 271.50                 | 13.2                     | V        | 2.27         | 13.53                | 29.00                       | 17.00     |

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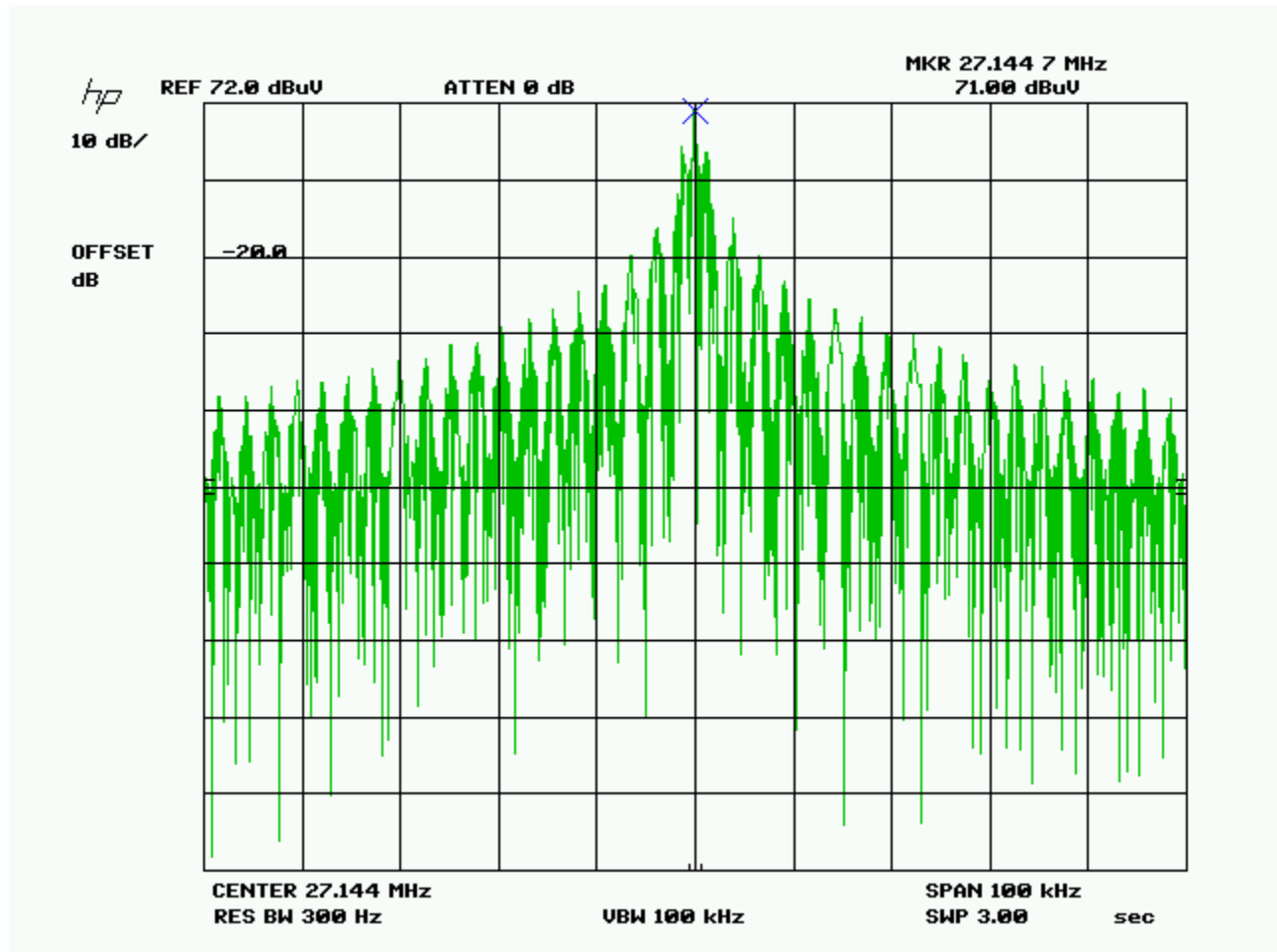


# OCCUPIED BANDWIDTH

Rules Part No.: 15.227

Requirements: The field strength of any emissions appearing outside of 26.96 and 27.28MHz shall be attenuated to the general limits of 15.209.

Test Data: Please refer to the following plots.



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