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## FCC PART 15.235 TEST REPORT

Applicant	SCIENTIFIC TOYS, LTD.
Address	13/F., CHAI WAN INDUSTRIAL CENTRE 20 LEE CHUNG STREET CHAI WAN, HONG KONG
FCC ID	BY34318-49SP
Product Description	49.86 MHz WIRELESS R/C TOY
Date Sample Received	12/4/2006
Date Tested	12/6/2006
Tested By	Richard Block
Approved By	Mario de Aranzeta
Timco Report No.	3295UT6TestReport.PDF
Test Results	<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.**



## TABLE OF CONTENTS

STATEMENT OF COMPLIANCE.....	3
REPORT SUMMARY.....	4
TEST ENVIRONMENT AND SYSTEM .....	4
DUT SPECIFICATION.....	5
EMC EQUIPMENT LIST .....	6
TEST PROCEDURE .....	7
RADIATION INTERFERENCE .....	8
OCCUPIED BANDWIDTH .....	9

## STATEMENT OF COMPLIANCE

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

I attest that the necessary measurements were made by me or under my supervision, at Timco Engineering, Inc. located at 849 N.W. State Road 45, Newberry, Florida 32669 USA.



Certificate #0955-01

**Authorized by:** Mario de Aranzeta  
**Signature:** On file  
**Function:** Engineer  
**Date:** December 7, 2006  
**Tested by:** Richard Block  
**Signature:** on file  
**Date:** December 6, 2006

## REPORT SUMMARY

Disclaimer	The test result only relates to the item tested.
Purpose of Test Report	To demonstrate compliance with FCC Pt 15.235 requirements for a R/C toy transmitter.
Applicable Rule(s)	FCC Pt 15.235, ANSI C63.4 2003
Related Report	No related report

## TEST ENVIRONMENT AND SYSTEM

Test Facility	Timco Engineering Inc. 849 NW State Road 45 Newberry, FL 32669 USA.
Test Condition:	The DUT was tested in a laboratory with normal temperature and humidity. The temperature was 26°C with relative humidity of 50%.
Test Exercise (e.g software description, test signal, etc.):	The DUT was placed in continuous transmit mode of operation.
Supporting Peripheral Equipment	Not applicable. The device is a stand-alone radio.
Deviation to the standard(s)	No deviation from the standard(s)
Modification to the DUT:	No modification was made to the DUT.

## DUT SPECIFICATION

Manufacturer	Scientific Toys, Ltd.		
Description	R/C Toy Transmitter		
FCC ID	BY34318-49SP		
Tx Frequency	49.86 MHz		
DUT Power Source	<input type="checkbox"/> 110–120Vac/50– 60Hz		
	<input type="checkbox"/> DC Power		
	<input checked="" type="checkbox"/> Battery Operated Exclusively		
Test Item	<input type="checkbox"/> Prototype	<input checked="" type="checkbox"/> Pre-Production	<input type="checkbox"/> Production
Type of Equipment	<input type="checkbox"/> Fixed	<input type="checkbox"/> Mobile	<input checked="" type="checkbox"/> Portable
Antenna	Integrated		

## EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/27/04	3/26/07
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/06	1/10/09
Antenna: Biconnical	Eaton	94455-1	1057	CAL 12/12/05	12/12/07
Antenna: Biconnical	Eaton	94455-1	1096	CAL 10/11/06	10/11/08
Antenna: Biconnical	Electro-Metrics	BIA-25	1171	CAL 4/29/05	4/29/07
Analyzer Blue Tower Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 4/13/05	4/13/07
Analyzer Blue Tower RF Preselector	HP	85685A	2926A00983	CAL 9/5/05	9/5/07
Analyzer Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 4/13/05	4/13/07
LISN	Electro-Metrics	ANS-25/2	2604	CAL 10/5/06	10/5/08
LISN	Electro-Metrics	EM-7820	2682	CAL 4/28/05	4/28/07
Antenna: Log-Periodic	Eaton	96005	1243	CAL 12/14/05	12/14/07
Antenna: Active Loop	ETS-Lindgren	6502	00062529	CAL 3/30/06	3/30/08
Antenna: Passive Loop	EMC Test Systems	EMCO 6512	9706-1211	CAL 4/27/06	4/27/08

## TEST PROCEDURE

**Radiation Interference:** The test procedure used was ANSI standard C63.4-2003 using a Agilent 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 300 kHz.

**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 (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 +CL= FS

33        20 dBuV + 10.36 dB/m+1.2 = 31.56 dBuV/m @ 3m

**ANSI Standard C63.4-2003 10.1.7 Measurement Procedures:** The DUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The DUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes. The highest readings were reported.

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.

## RADIATION INTERFERENCE

**Rules Part No.:** 15.235, Pt 15.209

**Requirements:** Carrier frequency will not exceed 80 dBuV/m at 3m. Out-of-band emissions shall not exceed:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV)
30 – 88	40.0
88 – 216	43.5
216 – 960	46.0
Above 960	54.0

### Test Data:

Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
49.86	25.5	H	0.97	11.20	37.67	42.33
49.86	36.1	V	0.97	11.07	48.14	31.86
99.70	18.6	V	1.40	11.55	31.55	11.95
99.70	23.1	H	1.40	11.37	35.87	7.63
149.50	4.8	H	1.75	14.31	20.86	22.64
149.50	8.7	V	1.75	14.09	24.54	18.96
199.40	7.5	H	2.10	17.32	26.92	16.58
199.40	8.1	V	2.10	17.22	27.42	16.08
249.30	9.4	H	2.35	12.37	24.12	21.88
249.30	11.8	V	2.35	12.46	26.61	19.39
299.10	8.9	H	2.60	14.06	25.56	20.44
299.10	15.6	V	2.60	14.29	32.49	13.51
349.00	10.0	H	2.85	14.88	27.73	18.28
349.00	19.5	V	2.85	14.43	36.78	9.22
398.80	10.7	H	3.09	15.98	29.77	16.23
398.80	15.3	V	3.09	15.78	34.17	11.83
448.70	6.8	V	3.29	18.01	28.10	17.90
448.70	7.3	H	3.29	17.61	28.20	17.80
498.60	6.0	V	3.49	18.12	27.61	18.39
498.60	8.2	H	3.49	17.96	29.65	16.35

Note: Emissions attenuated more than 20 dB below the limit are not reported.



## OCCUPIED BANDWIDTH

**Rules Part No.:** 15.235

**Requirements:** 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 un-modulated carrier or to the general limits of 15.209, whichever permits the higher emission levels.

**Test Data:** The following plot represents the emissions for this device.

**NOTES:**

OCCUPIED BANDWIDTH  
SCIENTIFIC TOYS, LTD. -- FCC ID: BY3 4318-495P

