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FCC PART 15.235 TEST REPORT

LOW POWER UNLICENSED TRANSMITTER

Applicant	SCIENTIFIC TOYS, LTD.
Address	RM.1108, 11/F., BLOCK B, NEW MANDARIN PLAZA 14 SCIENCE MUSEUM ROAD TST EAST KOWLOON HONG KONG
FCC ID	BY32782-49TT
Product Description	49 MHZ REMOTE CONTROL TRANSMITTER
Date Sample Received	8/23/2010
Date Tested	8/25/2010
Tested By	Joe Scoglio
Approved By	Mario R. de Aranzeta
Timco Report No.	1991HT10TestReport.doc
Test Results	☒ Pass ☐ Fail

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

ACCREDITED
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: 2005 requirements.

ACCREDITED

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

TIMCO ENGINEERING INC

Authorized Signatory Name:

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

Date: 8/25/2010

REPORT SUMMARY

Disclaimer	The test results only relate to the item tested.
Applicable Rule(s)	FCC Pt 15.235, 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 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.

DUT SPECIFICATION

Applicant	SCIENTIFIC TOYS, LTD.		
Description	49 MHZ REMOTE CONTROL TRANSMITTER		
FCC ID	BY32782-49TT		
Frequency Range	49.86-49.86		
DUT Power Source	☐ 110–120Vac/50– 60Hz		
	☐ DC Power		
	☒ Battery Operated Exclusively		
Test Item	☐ Prototype	☒ Pre-Production	☐ Production
Type of Equipment	☐ Fixed	☐ Mobile	☒ Portable

TEST EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 3/10/10	3/10/12
AC Voltmeter	HP	400FL	2213A14499	CAL 3/23/09	3/23/11
Antenna: Dipole Kit	Electro-Metrics	TDA-30/1-4	153	CHAR 6/10/09	6/10/11
Frequency Counter	HP	5385A	3242A07460	CAL 5/26/09	5/26/11
Hygro-Thermometer	Extech	445703	0602	CAL 1/30/09	1/30/11
Modulation Analyzer	HP	8901A	3435A06868	CAL 5/26/09	5/26/11
Digital Multimeter	Fluke	FLUKE-77-3	79510405	CAL 5/18/09	5/18/11
Analyzer Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CAL 11/21/09	11/21/11
Analyzer Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 11/22/09	11/22/11
Analyzer Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 11/21/09	11/21/11
Analyzer Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 11/24/09	11/24/11
Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 4/25/10	4/25/12

TEST PROCEDURES

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. The spectrum was searched to at least the 10th harmonic.

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 MHz	Meter Reading dBuV	ACF dB/m	Cable Loss dB	Field Strength dBuV/m @ 3 m
33	20	+10.36	+1.2	= 31.56

ANSI C63.4-2003 Measurement: 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 the 10th harmonic of the fundamental.

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

Requirements:

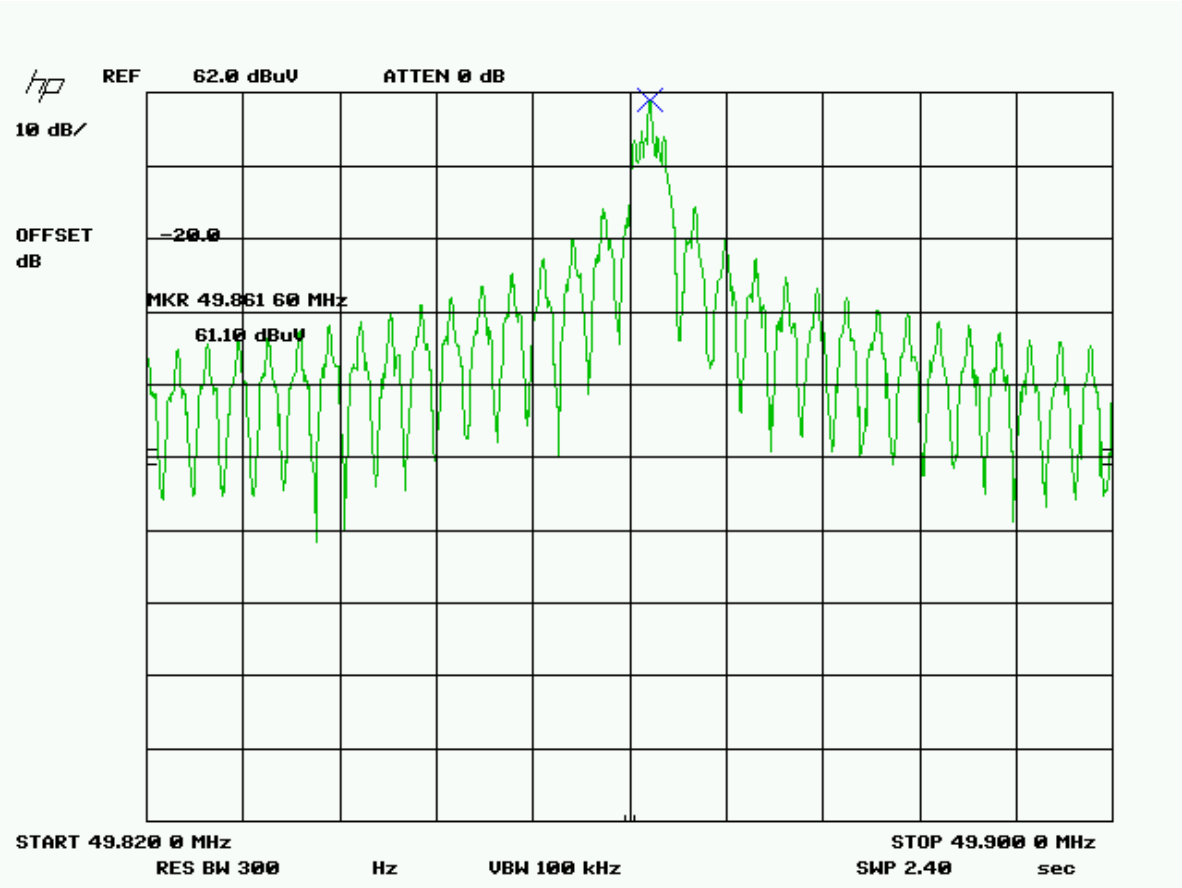
Frequency MHz	Limits
Fundamental Frequency	80.0 dBµV/m measured @ 3 meters
30 – 88	40.0 dBµV/m measured @ 3 meters
80 – 216	43.5 dBµV/m measured @ 3 meters
216 – 960	46.0 dBµV/m measured @ 3 meters
Above 960	54.0 dBµV/m measured @ 3 meters

Test Data:

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBµV	Ant. Pol	Coax Loss dB	Correction Factor dB	Field Strength dBµV/m	Margin dB
49.8	49.80	56.9	H	1.10	10.90	68.90	11.11
49.8	49.80	66.7	V	1.10	10.78	78.58	1.43
49.8	99.70	23.0	H	1.35	11.19	35.54	7.96
49.8	99.70	25.7	V	1.35	11.63	38.68	4.82
49.8	149.50	15.3	H	1.85	13.86	31.01	12.50
49.8	149.50	18.4	V	1.85	14.23	34.48	9.03
49.8	199.40	8.8	H	2.44	17.02	28.26	15.24
49.8	199.40	15.5	V	2.44	17.05	34.99	8.51
49.8	249.30	16.2	H	2.60	12.56	31.36	14.64
49.8	249.30	16.7	V	2.60	12.37	31.67	14.33
49.8	299.10	12.6	H	2.80	14.55	29.95	16.05
49.8	299.10	18.3	V	2.80	14.55	35.65	10.35
49.8	349.00	16.6	H	3.05	14.78	34.43	11.58
49.8	349.00	18.2	V	3.05	14.58	35.83	10.18
49.8	398.80	16.8	V	3.29	15.78	35.87	10.13
49.8	398.80	16.9	H	3.29	15.98	36.17	9.83
49.8	448.70	7.4	H	3.49	17.44	28.33	17.67
49.8	448.70	7.6	V	3.49	16.94	28.03	17.97
49.8	498.60	8.6	V	3.69	17.90	30.19	15.81
49.8	498.60	11.2	H	3.69	17.96	32.85	13.15

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: Please refer to the following plot.