

**Silverlit Toys Manufactory Ltd.**

Application  
For  
Certification  
**(FCC ID: OYK-TX027145-0504)**

Transmitter

Sample Description : X-Flying Club : R/C Airlifter/Storm-Fighter  
Model : Not Applicable

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [12-8-2003]

0504955  
WL/at  
April 8, 2005

- The test results reported in this report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
- This report shall not be reproduced except in full without prior authorization from Intertek Testing Services Hong Kong Limited.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

FCC ID : OYK-TX027145-0504

# INTERTEK TESTING SERVICES

---

## LIST OF EXHIBITS

### *INTRODUCTION*

<i>EXHIBIT 1:</i>	General Description
<i>EXHIBIT 2:</i>	System Test Configuration
<i>EXHIBIT 3:</i>	Emission Results
<i>EXHIBIT 4:</i>	Equipment Photographs
<i>EXHIBIT 5:</i>	Product Labelling
<i>EXHIBIT 6:</i>	Technical Specifications
<i>EXHIBIT 7:</i>	Instruction Manual
<i>EXHIBIT 8:</i>	Miscellaneous Information

---

# INTERTEK TESTING SERVICES

---

## MEASUREMENT/TECHNICAL REPORT

**Silverlit Toys Manufactory Ltd. - MODEL: Not Applicable**  
**FCC ID: OYK-TX027145-0504**

**April 8, 2005**

This report concerns (check one:) Original Grant  Class II Change

Equipment Type: Low Power Transmitter (example: computer, printer, modem, etc.)  
\_\_\_\_\_

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes  No

If yes, defer until: \_\_\_\_\_  
date

Company Name agrees to notify the Commission by: \_\_\_\_\_  
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes  No

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [12-8-2003 Edition] provision.

Report prepared by: \_\_\_\_\_  
Wilbur Ng  
Intertek Testing Services  
2/F., Garment Center,  
576, Castle Peak Road,  
HONG KONG  
Phone: 852-2173-8502  
Fax: 852-2742-9149

---

# INTERTEK TESTING SERVICES

---

## Table of Contents

1.0	<b><u>General Description</u></b> .....	2
1.1	Product Description .....	2
1.2	Related Submittal(s) Grants.....	2
1.3	Test Methodology .....	3
1.4	Test Facility .....	3
2.0	<b><u>System Test Configuration</u></b> .....	5
2.1	Justification.....	5
2.2	EUT Exercising Software .....	5
2.3	Special Accessories .....	5
2.4	Equipment Modification .....	6
2.5	Support Equipment List and Description .....	6
3.0	<b><u>Emission Results</u></b> .....	8
3.1	Field Strength Calculation.....	9
3.1	Field Strength Calculation (cont'd) .....	10
3.2	Radiated Emission Configuration Photograph .....	11
3.3	Radiated Emission Data .....	12
4.0	<b><u>Equipment Photographs</u></b> .....	16
5.0	<b><u>Product Labelling</u></b> .....	18
6.0	<b><u>Technical Specifications</u></b> .....	20
7.0	<b><u>Instruction Manual</u></b> .....	22
8.0	<b><u>Miscellaneous Information</u></b> .....	24
8.1	Measured Bandwidth.....	25
8.2	Discussion of Pulse Desensitization.....	26
8.3	Calculation of Average Factor.....	27
8.4	Emission Test Procedures .....	28
8.4	Emission Test Procedures (Cont'd).....	29

## INTERTEK TESTING SERVICES

---

### List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	radiated photos.doc
Test Report	Bandwidth Plot	bw.pdf
External Photo	External Photo	external photos.doc
Internal Photo	Internal Photo	internal photos.doc
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Test Report	Average Factor	af.pdf

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 1**

**GENERAL DESCRIPTION**

## INTERTEK TESTING SERVICES

---

### 1.0 General Description

#### 1.1 Product Description

The equipment under test (EUT) is a transmitter for a RC Toy Aircraft operating at 27.145 MHz which is controlled by a crystal. The EUT is powered by 6 x 1.5V AA size batteries. The EUT has a ON/OFF switch, a left lever, a right lever, a steering trimmer and a charging plug. After switching ON the EUT, the left lever controls the Aircraft to fly straight forward and to control the speed. The right lever controls the Aircraft flying left and right directions. The steering trimmer is used to adjust the flight direction. When the charging plug connects to the corresponding Aircraft, the battery inside the Aircraft can be charged. The product designs that three users can play together as the same time. Each transmitter is set to transmit a certain control code only which can be recognized by the corresponding Aircraft. However, the user cannot select others control code by any keys on the transmitter.

The brief circuit description is saved with filename : descri.pdf

#### 1.2 Related Submittal(s) Grants

The receiver for this transmitter is exempted from the Part 15 technical rules per 15.101(b).

## INTERTEK TESTING SERVICES

---

### 1.3 Test Methodology

The radiated emission measurements were performed according to the procedures in ANSI C63.4 (2001). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

### 1.4 Test Facility

The open area test site and conducted measurement facility used to collect the emission data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.



**INTERTEK TESTING SERVICES**

---

**EXHIBIT 2**

**SYSTEM TEST CONFIGURATION**

## INTERTEK TESTING SERVICES

---

### 2.0 **System Test Configuration**

#### 2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2001).

The EUT was powered by six new 1.5V AA size batteries during test.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The unit was operated standalone and placed in the center of the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on a turn table, and the Antenna of EUT was fully extended, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

For simplicity of testing, the unit was wired to transmit continuously.

#### 2.2 EUT Exercising Software

There was no special software to exercise the device.

#### 2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

## INTERTEK TESTING SERVICES

---

### 2.4 Equipment Modification

Any modifications installed previous to testing by Silverlit Toys Manufactory Ltd. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services.

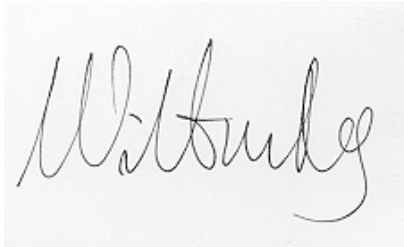
### 2.5 Support Equipment List and Description

This product was tested in a standalone configuration.

All the items listed under section 2.0 of this report are

*Confirmed by:*

*Wilbur Ng  
Manager  
Intertek Testing Services  
Agent for Silverlit Toys Manufactory Ltd.*



\_\_\_\_\_ Signature

April 8, 2005 \_\_\_\_\_ Date

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 3**  
**EMISSION RESULTS**

## INTERTEK TESTING SERVICES

---

### 3.0 **Emission Results**

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

---

## INTERTEK TESTING SERVICES

---

### 3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

where FS = Field Strength in dB $\mu$ V/m

RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

## INTERTEK TESTING SERVICES

---

### 3.1 Field Strength Calculation (cont'd)

#### Example

Assume a receiver reading of 62.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$AV = -10 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm} [(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

## INTERTEK TESTING SERVICES

---

### 3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission

54.290 MHz

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos.doc



## INTERTEK TESTING SERVICES

---

### 3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 4.9 dB

#### **TEST PERSONNEL:**



\_\_\_\_\_  
*Signature*

Ivan Y. M. Wong, Compliance Engineer  
\_\_\_\_\_  
*Typed/Printed Name*

April 8, 2005  
\_\_\_\_\_  
*Date*

## INTERTEK TESTING SERVICES

---

Applicant: Silverlit Toys Manufactory Ltd.  
Model: Not Applicable (TX)  
Mode: TX  
Sample: 4/4

Date of Test: March 30, 2005

Table 1

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Average Factor (-dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	27.145	76.2	14	16.0	18.4	55.8	80.0	-24.2
V	54.290	40.1	11	16.0	--	35.1	40.0	-4.9
H	81.435	40.7	7	16.0	--	31.7	40.0	-8.3
H	108.581	35.2	13	16.0	--	32.2	43.5	-11.3
H	135.725	36.0	13	16.0	--	33.0	43.5	-10.5
H	162.872	34.5	16	16.0	--	34.5	43.5	-9.0
H	190.015	32.4	16	16.0	--	32.4	43.5	-11.1
H	217.161	33.1	17	16.0	--	34.1	46.0	-11.9
H	244.305	30.2	20	16.0	--	34.2	46.0	-11.8
H	271.450	27.0	22	16.0	--	33.0	46.0	-13.0
H	298.596	24.4	22	16.0	--	30.4	46.0	-15.6

Notes: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3 meter distance were measured at 0.3 meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3 meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna are used for the emission over 1000MHz.

\*Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and peak detector data with average factor for frequencies over 1000 MHz.

Test Engineer: Ivan Y. M. Wong

---

FCC ID: OYK-TX027145-0504

---

## INTERTEK TESTING SERVICES

---

Applicant: Silverlit Toys Manufactory Ltd.  
Model: Not Applicable (TX)  
Mode: Charging Mode  
Sample: 4/4

Date of Test: March 30, 2005

Table 2

### Radiated Emissions

Polarization	Frequency (MHz)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	32.522	27.4	40.0	-12.6
V	35.907	28.1	40.0	-11.9
V	39.107	28.2	40.0	-11.8
V	44.524	27.1	40.0	-12.9
V	62.889	26.5	40.0	-13.5
V	72.521	25.5	40.0	-14.5

Notes: Negative signs (-) in the margin column signify levels below the limit.

Test Engineer: Ivan Y. M. Wong

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 4**

**EQUIPMENT PHOTOGRAPHS**

## INTERTEK TESTING SERVICES

---

### 4.0 Equipment Photographs

For electronic filing, the photographs are saved with filename:  
external photos.doc and internal photos.doc

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 5**

**PRODUCT LABELLING**

## INTERTEK TESTING SERVICES

---

### 5.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and the label location are saved with filename: label.pdf

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 6**

**TECHNICAL SPECIFICATIONS**



## INTERTEK TESTING SERVICES

---

### 6.0 Technical Specifications

For electronic filing, the block diagram and schematics are saved with filename:  
block.pdf and circuit.pdf

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 7**

**INSTRUCTION MANUAL**

## INTERTEK TESTING SERVICES

---

### 7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 8**

**MISCELLANEOUS INFORMATION**

## INTERTEK TESTING SERVICES

---

### 8.0 Miscellaneous Information

This miscellaneous information includes details of the measured bandwidth, the test procedure and calculation of factors such as pulse desensitization and averaging factor.

## INTERTEK TESTING SERVICES

---

### 8.1 Measured Bandwidth

The plot saved in bw.pdf which shows the fundamental emission is confined in the specified band. And it also shows that the emission is at least 60.9 dB below the carrier level at the band edge (26.96 and 27.28 MHz). It meets the requirement of Section 15.227(b).

Figure 8.1 Bandwidth

## INTERTEK TESTING SERVICES

---

### 8.2 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF*.

The effective period ( $T_{\text{eff}}$ ) was approximately 0.6 ms for a digital "1" bit, as shown in the plots of Exhibit 8.3. With a resolution bandwidth (3 dB) of 100 kHz, the pulse desensitivity factor was 0 dB.

---

## INTERTEK TESTING SERVICES

---

### 8.3 Calculation of Average Factor (Worst-case: CH3 and control the Aircraft to fly forward with maximum speed)

Averaging factor in dB =  $20 \log$  (duty cycle)

The specification for output field strengths in accordance with the FCC rules specify measurements with an average detector. During testing, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

The time period over which the duty cycle is measured is 100 milliseconds, or the repetition cycle, whichever is a shorter time frame. The worst case (highest percentage on) duty cycle is used for the calculation. The duty cycle is measured by placing the spectrum analyzer in zero scan (receiver mode) and linear mode at maximum bandwidth (3 MHz at 3 dB down) and viewing the resulting time domain signal output from the analyzer on a Tektronix oscilloscope. The oscilloscope is used because of its superior time base and triggering facilities.

A plot of the worst-case duty cycle as detected in this manner are saved with filename: af.pdf

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

$$\begin{aligned} \text{The duration of one cycle} &= 157.3 \text{ ms} \\ \text{Effective period of the cycle} &= 1.6 \text{ ms} + 1.2 \text{ ms} \times 12 + 0.6 \text{ ms} \times 5 \\ &= 19 \text{ ms} \end{aligned}$$

$$\text{DC} = 19 \text{ ms} / 157.3 \text{ ms} = 0.12079 \text{ or } 12.079\%$$

Therefore, the averaging factor is found by  $20 \log_{10} 0.12079 = -18.4 \text{ dB}$



## INTERTEK TESTING SERVICES

---

### 8.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2001.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The antenna height and polarization are varied during the testing to search for maximum signal levels.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

## INTERTEK TESTING SERVICES

---

### 8.4 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4 - 2001.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.2). Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

When determining the test result, the Measurement Uncertainty of the test has been considered.