

December 15, 2000

To : Toys World Electronic Limited - Attn. : Mr. Simon Wong

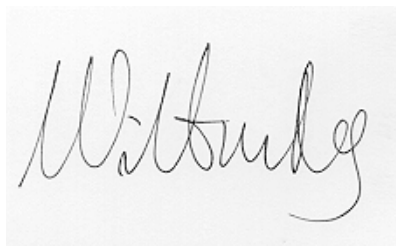
Dear Mr. Simon Wong,

Enclosed you will find your file copy of a Part 15 Certification (FCC ID: PEXTW2081-82-1200). We have forwarded the original to ITS-NA Inc. for review.

For your reference, review normally take 4 weeks. Approval will then be granted when no query is sorted.

Please contact me if you have any questions regarding the enclosed material.

Sincerely,

A handwritten signature in black ink, appearing to read 'Wilbur Ng', is shown on a light-colored background.

Wilbur Ng
Assistant Manager

Enclosure

FCC ID : PEXTW2081-82-1200

Toys World Electronic Limited

Application For Certification (FCC ID: PEXTW2081-82-1200)

Superregenerative Receiver

WO# 0012639
WN/at
December 15, 2000

- 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

FCC ID : PEXTW2081-82-1200

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December 15, 2000

FCC ID: PEXTW2081-82-1200

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List of attached file

Exhibit type	File Description	filename
Cover Letter	Letter of Agency	letter.pdf
Test Report	Test Report	report.doc
Test Setup Photo	Radiated Emission	radiated1.jpg to radiated2.jpg
External Photo	External Photo	ophoto1.jpg, ophoto2.jpg
Internal Photo	Internal Photo	iphoto1.jpg to iphoto2.jpg
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

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EXHIBIT 1

GENERAL DESCRIPTION

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1.0 **General Description**

1.1 Product Description

The equipment under test (EUT) is a Superregenerative Receiver for a Remote Controlled Toy operating at 49.860 MHz. The EUT is powered by three N batteries. The EUT can be controlled in for moving directions (forward/backward and left/right turn).

The brief circuit description is listed as follows :

- Q1 and associated circuit act as a RF amplifier.
- Q12 to Q17 and associated act as a motor driver.
- Q6 to Q11 and associated act as a motor driver.
- U1 and associated circuit act as decode IC.

1.2 Related Submittal(s) Grants

This is a single application for certification of a Receiver.

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1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). 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. 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.

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EXHIBIT 2

SYSTEM TEST CONFIGURATION

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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 (1992.)

The EUT was powered by three N batteries.

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 mounted to a cardboard box, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

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.

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2.4 Equipment Modification

Any modifications installed previous to testing by Toys World Electronic Limited will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services.

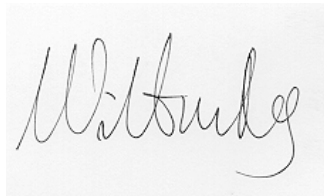
2.5 Support Equipment List and Description

This product was tested in a standalone configuration.

All the items listed under section 2.0 of this report are

Confirmed by:

*Wilbur Ng
Assistant Manager
Intertek Testing Services
Agent for Toys World Electronic Limited*



Signature

December 15, 2000 Date

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EXHIBIT 3

EMISSION RESULTS

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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.

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3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

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

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

$$FS = RR + LF$$

where FS = Field Strength in dB μ V/m

RR = RA - AG in dB μ V

LF = CF + AF in dB

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 52.0 \text{ dB}\mu\text{V/m}$$

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

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

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

$$FS = RR + LF$$

$$FS = 23 + 9 = 32 \text{ dB}\mu\text{V/m}$$

$$RR = 23.0 \text{ dB}\mu\text{V}$$

$$LF = 9.0 \text{ dB}$$

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

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3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission

49.096 MHz

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated1.jpg to radiated2.jpg

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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 11.4 dB

TEST PERSONNEL:



Signature

Anthony K. M. Chan, Compliance Engineer
Typed/Printed Name

December 15, 2000
Date

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Company: Toys World Electronic Limited
Model: TW2081

Date of Test: November 21, 2000

Table 1

Radiated Emissions

Polarity	Frequency (M H z)	Reading (dB μ V)	Antenna Factor (dB)	Pre- Am p G ain (dB)	Net at 3m (dB μ V /m)	L i m i t at 3m (dB μ V /m)	M arg in (dB)
H	46.096	33.6	11	16	28.6	40	-11.4
H	46.872	32.2	11	16	27.2	40	-12.8
H	47.356	32.0	11	16	27.0	40	-13.0
H	47.876	31.4	11	16	26.4	40	-13.6
H	48.692	31.5	11	16	26.5	40	-13.5
H	49.292	31.3	11	16	26.3	40	-13.7
H	50.096	32.1	11	16	27.1	40	-12.9
H	51.214	32.0	11	16	27.0	40	-13.0
H	52.554	30.9	11	16	25.9	40	-14.1

- Notes:
1. Negative sign in the column shows value below limit.
 2. Peak Detector Data unless otherwise stated.
 3. 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.

Test Engineer: Anthony K. M. Chan

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EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

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4.0 **Equipment Photographs**

For electronic filing, the photographs are saved with filename: ophoto1.jpg to ophoto2.jpg and iphoto1.jpg to iphoto2.jpg

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EXHIBIT 5

PRODUCT LABELLING

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5.0 **Product Labelling**

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

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EXHIBIT 6

TECHNICAL SPECIFICATIONS

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6.0 **Technical Specifications**

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

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EXHIBIT 7

INSTRUCTION MANUAL

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7.0 **Instruction Manual**

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

This manual will be provided to the end-user with each unit sold/leased in the United States.

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EXHIBIT 8

MISCELLANEOUS INFORMATION

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8.0 **Miscellaneous Information**

This miscellaneous information includes details of the stabilizing process (including a plot of the stabilized waveform), the test procedure and calculation of factors such as pulse desensitization and averaging factor.