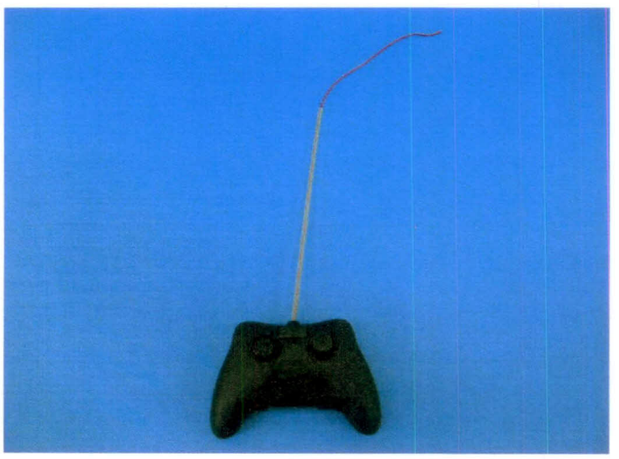
TEST REPORT No.: (5213)337-1424

TEST REPORT

To:	**NEW BRIGHT INDUSTRIAL CO., LTD**	To:	-
Attn:	Eric Kwok	Attn:	-
Address:	9/F., NEW BRIGHT BUILDING, 11 SHEUNG YUET ROAD, KOWLOON BAY, KOWLOON, HONG KONG	Address:	-
Fax:	852 27953665	Fax:	-
E-mail:	chkwok01@newbright.com	E-mail:	-
Folder No.:	NBT-13NO245MTHS-B-A		

Factory Name:	**NEW BRIGHT INDUSTRIAL CO., LTD**
Location:	9/F., NEW BRIGHT BUILDING, 11 SHEUNG YUET ROAD, KOWLOON BAY, KOWLOON, HONG KONG
Product:	Radio Control Toy Transmitter MODEL: G6DG31HH



Sample No:	HK131120/019
Test Date(s):	November 27, 2013
Test Requested:	FCC Part 15 – 2012
Test Method:	ANSI C63.4 – 2009
FCC ID:	G6DG31HH

The results given in this report are related to the tested specimen of the described electrical apparatus.

CONCLUSION: The submitted sample was found to COMPLY with requirement of FCC Part 15 Subpart C.

Authorized Signature:

Reviewed by: Keith Yeung	Approved by: Steven Tsang
Date: December 6, 2013	Date: December 6, 2013

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Test Result Summary

EMISSION TEST			
Test requirement: FCC Part 15 – 2012			
Test Condition	Test Method	Test Result	
		Pass	Failed
Radiated Emission Test, 9kHz to 1GHz	ANSI C63.4	☒	☐
Frequency range of Fundamental Emission	ANSI C63.4	☒	☐
26dB Bandwidth of Fundamental Emission	ANSI C63.4	☒	☐
Duty Cycle Correction During 100mesc	ANSI C63.4	☒	☐

Report Revision & Sample Re-submit History:

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Test Laboratory & Test Instruments List

Radiated and Conducted emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003. An Open Area Test Site and Full Anechoic Chamber (FCC Listed Site, Registration No. 642151) are set up for investigation and located at:

BUREAU VERITAS HONG KONG LIMITED, EMC CENTRE

No. 2106-2107, 21/F., Westin Centre,
26 Hung To Road,
Kwun Tong, Kowloon,
Hong Kong

Test Instrument List

Radiated Emission

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATION DUE
EMI TEST RECEIVER	R&S	ESCI	100379	28-JAN-2014
LOOP ANTENNA	ETS-LINDGREN	6502	00102266	20-OCT-2014
BILOG ANTENNA	SCHAFFNER	CBL6112D	25229	20-OCT-2014
OPEN AREA TEST SITE	BVCPS	N/A	N/A	11-SEP-2014
ANECHOIC CHAMBER	ALBATROSS	M-CDC	80374004499B	08-JUL-2014
COAXIAL CABLE	SUHNER	RG214	N/A	05-FEB-2014

Remarks: -
N/A: Not Applicable or Not Available

The measurement instrumentation uncertainty would be taking into consideration on each of the test result

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Equipment Under Test [EUT]

Description of Sample:

Model Name:	Radio Control Toy Transmitter
Model Number:	G6DG31HH
Additional Model Name:	--
Additional Model Number:	--
Additional Model information:	--
Rating:	3Vd.c. (“AA” size battery x 2)

Description of EUT Operation:

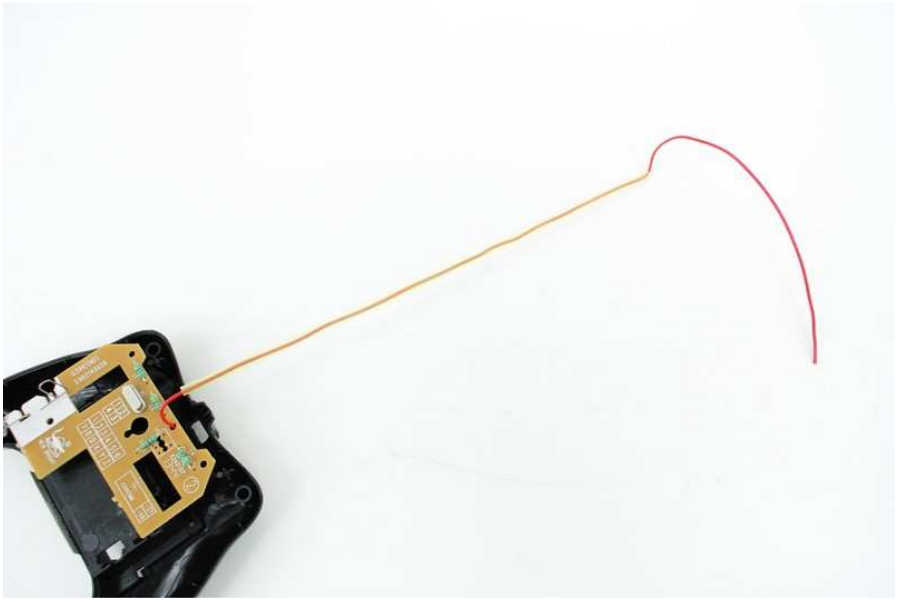
The Equipment Under Test (EUT) is a NEW BRIGHT INDUSTRIAL CO., LTD of Radio Control toy. The transmitter is 2 switches and operating at 49.86MHz. The EUT continues to transmit while sticks are being pushed or pulled, Modulation by IC, and type is pulse modulation.
The transmitter has different control:

1. Left stick – control forward and backward
2. Right stick – control left and right

Antenna Requirement

The EUT is use of a permanently antenna. The antenna consists of 35cm long wire. It is soldered on the PCB. The antenna is not replaceable or user serviceable. There are no deviations or exceptions to the specifications.

Photo of Antenna



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Test Results

Radiated Emissions (Fundamental)

Test Requirement:	FCC Part 15 Section 15.235
Test Method:	ANSI C63.4
Test Date(s):	2013-11-27
Temperature:	22.0 °C
Humidity:	68.0 %
Atmospheric Pressure:	100.8 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	3Vd.c. (“AA” size battery x 2)

Test Method:

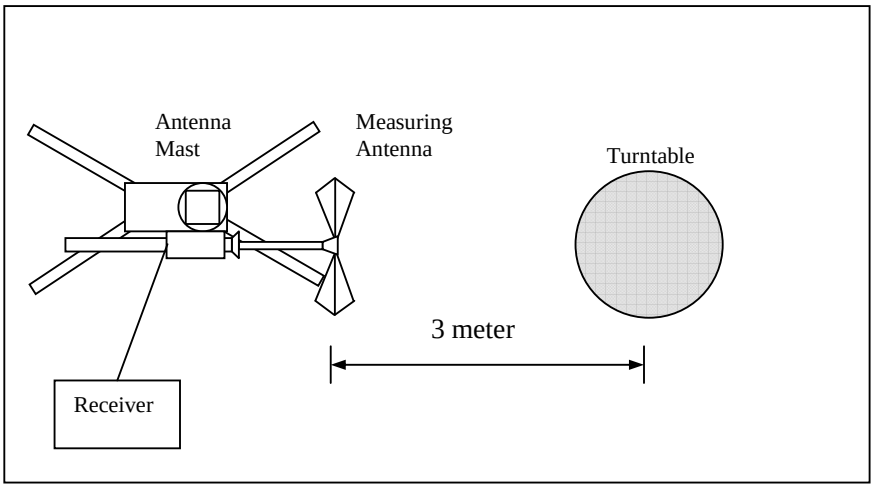
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using new battery. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.

Location: The Roof, Westin Centre, 26 Hung To Road, Kwun Tong, Kowloon, Hong Kong

Test Setup: Open Area Test Site



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Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.235]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Peak] [μV/m]	Field Strength of Fundamental Emission [Average] [μV/m]
49.82 – 49.90	100,000 (100 dBμV/m)	10,000 (80 dBμV/m)

Measurement Data

Test Result of (Transmission mode): PASS

Detection mode: Peak

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
49.86	H	13.9	64.8	100.0	-35.2
49.86	V	13.9	55.9	100.0	-44.1

Detection mode: #Average

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
49.86	H	13.9	**60.9	80.0	-19.1
49.86	V	13.9	**52.0	80.0	-28.0

For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.
**Duty Cycle Correction = 20Log(0.641) = -3.9dB

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHz
VBW = 300KHz

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Radiated Emissions (9kHz – 1GHz)

Test Requirement:	FCC Part 15 Section 15.209
Test Method:	ANSI C63.4
Test Date(s):	2013-11-27
Temperature:	22.0 °C
Humidity:	68.0 %
Atmospheric Pressure:	100.8 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	3Vd.c. (“AA” size battery x 2)

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [µV/m]	Measurement Distance m
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above960	500	3

Measurement Data

Test Result of (On mode): PASS

Detection mode: Quasi-Peak

Frequency	Polarity (H/V)	Field Strength	Limit	Margin (dB)
Emissions detected are more than 20 dB below the limit line(s) in 9kHz to 30MHz				

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TEST REPORT No.: (5213)337-1424

Measurement Data

Test Result of (Transmission mode): PASS

Detection mode: Quasi-Peak

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
99.72	H	11.1	36.3	43.5	-7.2
149.58	H	12.3	27.6	43.5	-15.9
199.44	H	12.2	26.3	43.5	-17.2
249.30	H	13.7	27.0	46.0	-19.0
299.16	H	14.6	30.2	46.0	-15.8
349.02	H	15.3	32.6	46.0	-13.4
398.88	H	17.3	29.7	46.0	-16.3
448.74	H	17.9	29.4	46.0	-16.6
498.60	H	18.7	30.2	46.0	-15.8
548.46	H	20.4	31.6	46.0	-14.4

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
99.72	V	11.1	35.9	43.5	-7.6
149.58	V	12.3	27.9	43.5	-15.6
199.44	V	12.2	26.0	43.5	-17.5
249.30	V	13.7	26.5	46.0	-19.5
299.16	V	14.6	28.3	46.0	-17.7
349.02	V	15.3	32.8	46.0	-13.2
398.88	V	17.3	30.3	46.0	-15.7
448.74	V	17.9	29.6	46.0	-16.4
498.60	V	18.7	30.5	46.0	-15.5
548.46	V	20.4	31.8	46.0	-14.2

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz
VBW = 120KHz

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26dB Bandwidth of Fundamental Emission

Test Requirement:	FCC 47 CFR 15.235
Test Method:	ANSI C63.4
Test Date(s):	2013-11-27
Temperature:	22.0 °C
Humidity:	68.0 %
Atmospheric Pressure:	100.8 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	3Vd.c. (“AA” size battery x 2)

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Limits for 26dB Bandwidth of Fundamental Emission:

Frequency [MHz]	26dB Bandwidth [KHz]	Limits [MHz]
49.8602	29.8	within 49.82-49.90

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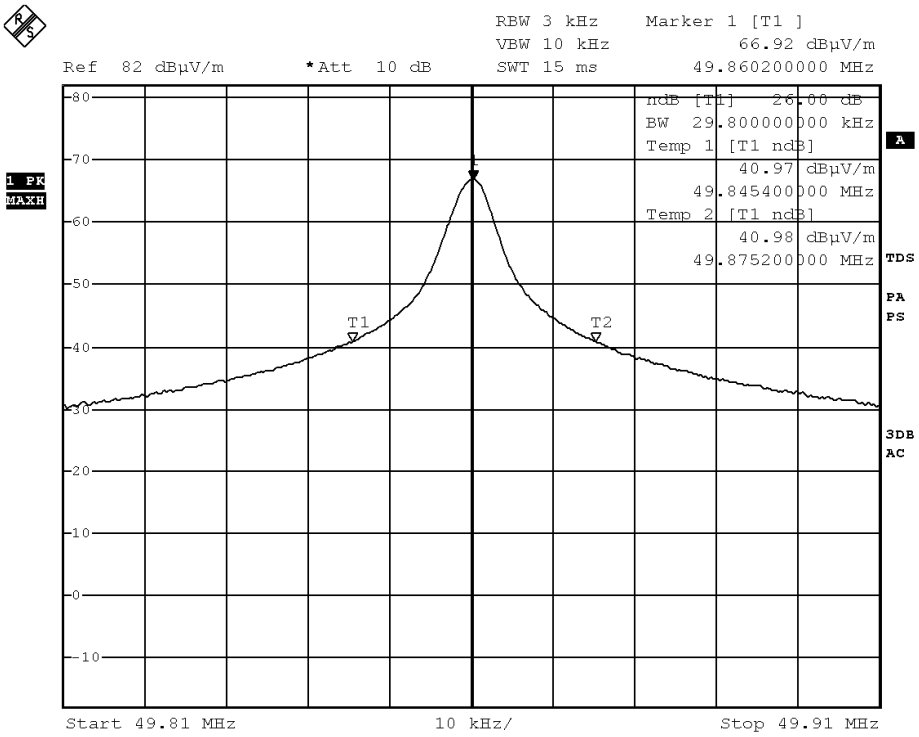
Measurement Data

Test Result of 26dB Bandwidth of Fundamental Emission: PASS



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Duty Cycle Correction During 100msec:

Each function key sends a different series of characters, but each packet period (57.4msec) never exceeds a series of 4 long (1.4msec) and 52 short (0.6msec) pulses. Assuming any combination of short and long pulses maybe obtained due to encoding the worst case transmit duty cycle would be considered (4 x 1.4msec)+(52 x 0.6msec) per 57.4msec = 64.1% duty cycle.

Remarks: -

Duty Cycle Correction = 20Log(0.641) = -3.9dB

The following figures [Figure A to Figure C] show the characteristics of the pulse train for one of these functions.

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Figure A [Pulse Train]

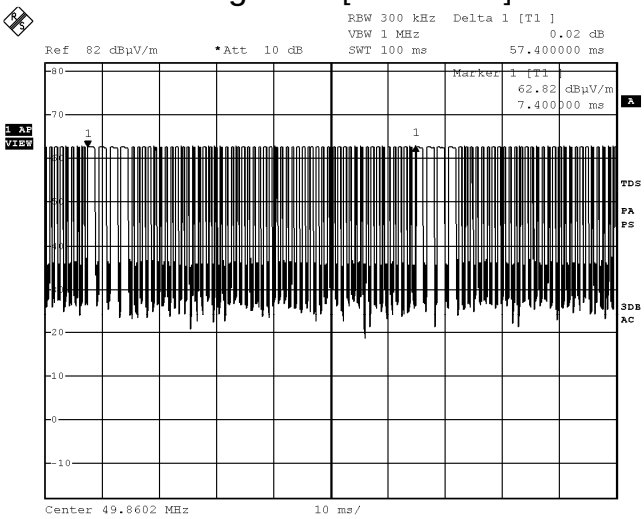

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Figure B [Long Pulse]

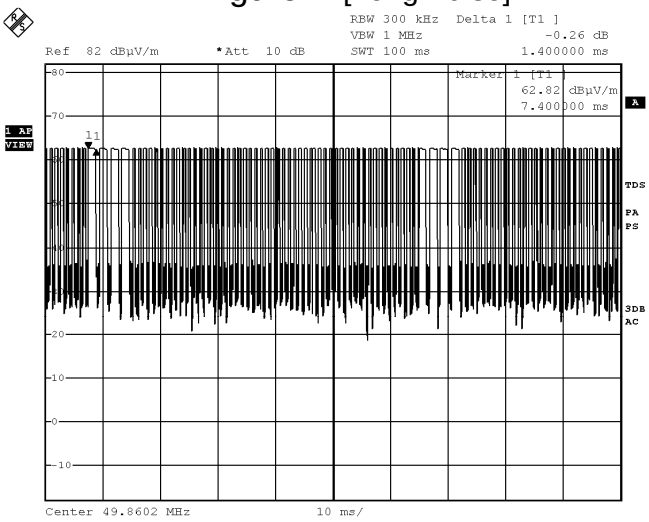

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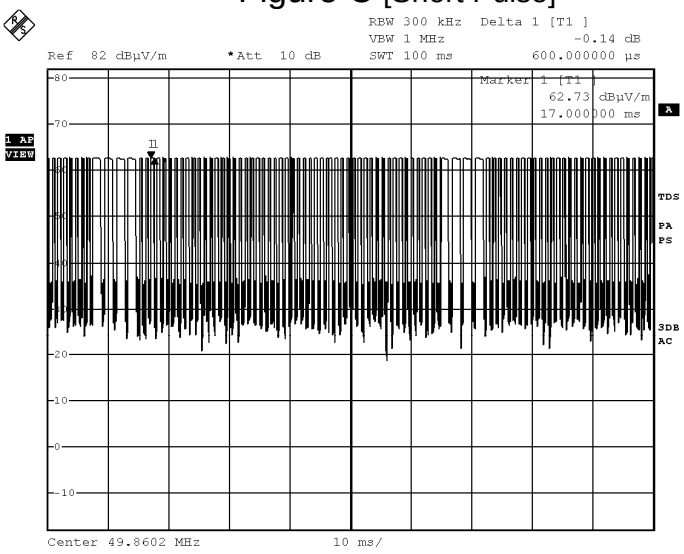
Figure C [Short Pulse]



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Photographs of EUT

Front View of the product

Rear View of the product

Battery compartment

Battery Cover

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Photographs of EUT

Internal View of the product

Internal View of the product

Inner Circuit Top View

Inner Circuit Bottom View

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Measurement of Radiated Emission Test Set Up

******* End of Report *******

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