



**BUREAU
VERITAS**

TEST REPORT No.: (5216)112-1294

TEST REPORT

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Attn:	Eric Kwok	Attn:	-
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Folder No.:	NBT-16AP213MTHS-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:	Toy Transmitter MODEL: G31HHRR

	Sample No:	HK160419/018
	Date of Receipt:	April 19, 2016
	Test Date(s):	April 29, 2016
	Test Requested:	FCC Part 15 – 2012
	Test Method:	ANSI C63.4 – 2009
	FCC ID:	G6DG31HHRR

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: Law Man Kit
Date: May 18, 2016	Date: May 18, 2016

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This report is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. Our report is limited to the test samples identified herein. The results set forth in this report are not necessarily indicative or representative of the statistical quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof. You shall have thirty days from receipt of this report to request additional testing of the samples or to notify us of any errors or omissions relating to our report, provided, however, such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



TEST REPORT No.: (5216)112-1294

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	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Frequency range of Fundamental Emission	ANSI C63.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
26dB Bandwidth of Fundamental Emission	ANSI C63.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Duty Cycle Correction During 100mesc	ANSI C63.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Report Revision & Sample Re-submit History:

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TEST REPORT No.: (5216)112-1294

Test Laboratory & Test Instruments List

Radiated and Conducted emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009. 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	22-FEB-2017
SIGNAL ANALYZER 40GHZ	R&S	FSV 40	100977	29-JUN-2016
LOOP ANTENNA	ETS-LINDGREN	6502	00102266	19-OCT-2016
BILOG ANTENNA	SCHAFFNER	CBL6112D	25229	05-NOV-2016
OPEN AREA TEST SITE	BVCPS	N/A	N/A	18-JUN-2016
ANECHOIC CHAMBER	ALBATROSS	M-CDC	80374004499B	11-FEB-2017
COAXIAL CABLE	SUHNER	RG214	N/A	04-OCT-2016

Remarks: -

N/A: Not Applicable or Not Available

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

TEST REPORT No.: (5216)112-1294

Equipment Under Test [EUT]

Description of Sample:

Model Name: Toy Transmitter
Model Number: G31HHRR
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 a 2 sticks transmitter 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.

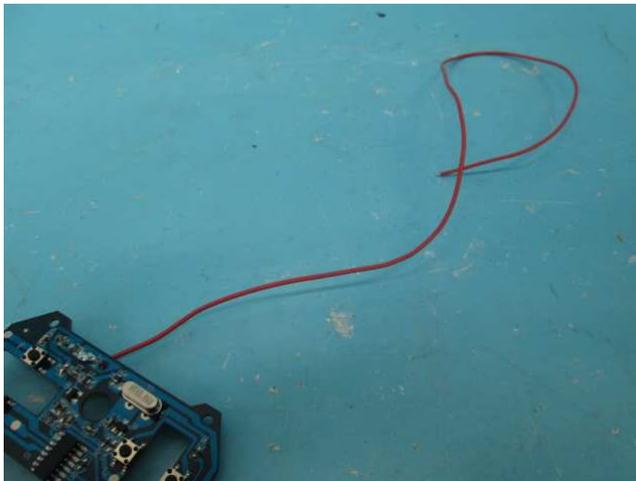
The transmitter has different control:

1. Left stick – control forward and backward
2. Right stick – control leftward and rightward

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



TEST REPORT No.: (5216)112-1294

Test Results

Radiated Emissions (Fundamental)

Test Requirement:	FCC Part 15 Section 15.235
Test Method:	ANSI C63.4
Test Date(s):	2016-04-29
Temperature:	26.0 °C
Humidity:	75.0 %
Atmospheric Pressure:	100.2 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	3Vd.c. ("AA" size battery x 2)

Test Method:

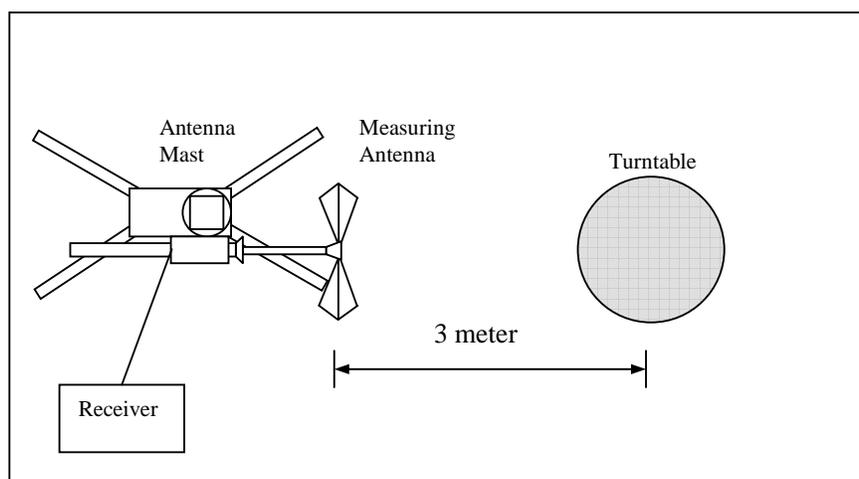
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009.

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





TEST REPORT No.: (5216)112-1294

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

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Peak] [$\mu\text{V/m}$]	Field Strength of Fundamental Emission [Average] [$\mu\text{V/m}$]
49.82 – 49.90	100,000 (100 dB $\mu\text{V/m}$)	10,000 (80 dB $\mu\text{V/m}$)

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 (dB $\mu\text{V/m}$)	Limit at 3m (dB $\mu\text{V/m}$)	Margin (dB)
49.86	H	10.0	60.9	100.0	-39.1
49.86	V	10.0	49.8	100.0	-50.2

Detection mode: #Average

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dB $\mu\text{V/m}$)	Limit at 3m (dB $\mu\text{V/m}$)	Margin (dB)
49.86	H	10.0	**57.1	80.0	-22.9
49.86	V	10.0	**46.0	80.0	-34.0

For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

**Duty Cycle Correction = $20\text{Log}(0.644) = -3.8\text{dB}$

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHz
VBW = 300KHz



TEST REPORT No.: (5216)112-1294

Radiated Emissions (9kHz – 1GHz)

Test Requirement: FCC Part 15 Section 15.209
 Test Method: ANSI C63.4
 Test Date(s): 2016-04-29
 Temperature: 26.0 °C
 Humidity: 75.0 %
 Atmospheric Pressure: 100.2 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 [$\mu\text{V}/\text{m}$]	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 (Transmission 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				

TEST REPORT No.: (5216)112-1294

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 (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
99.72	H	12.0	34.6	43.5	-8.9
149.58	H	10.5	26.2	43.5	-17.3
199.44	H	9.8	31.7	43.5	-11.8
249.30	H	13.1	29.6	46.0	-16.4
299.16	H	13.8	32.5	46.0	-13.5
349.02	H	15.8	31.9	46.0	-14.1
398.88	H	17.5	30.5	46.0	-15.5
448.74	H	17.9	31.8	46.0	-14.2
498.60	H	19.1	32.8	46.0	-13.2
548.46	H	20.3	33.7	46.0	-12.3

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
99.72	V	12.0	35.5	43.5	-8.0
149.58	V	10.5	27.3	43.5	-16.2
199.44	V	9.8	32.5	43.5	-11.0
249.30	V	13.1	29.4	46.0	-16.6
299.16	V	13.8	30.6	46.0	-15.4
349.02	V	15.8	32.4	46.0	-13.6
398.88	V	17.5	31.3	46.0	-14.7
448.74	V	17.9	32.5	46.0	-13.5
498.60	V	19.1	33.5	46.0	-12.5
548.46	V	20.3	34.2	46.0	-11.8

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz
VBW = 120KHz



TEST REPORT No.: (5216)112-1294

26dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.235
 Test Method: ANSI C63.4
 Test Date(s): 2016-04-29
 Temperature: 26.0 °C
 Humidity: 75.0 %
 Atmospheric Pressure: 100.2 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]
49.8608	30.4	within 49.82-49.90



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TEST REPORT No.: (5216)112-1294

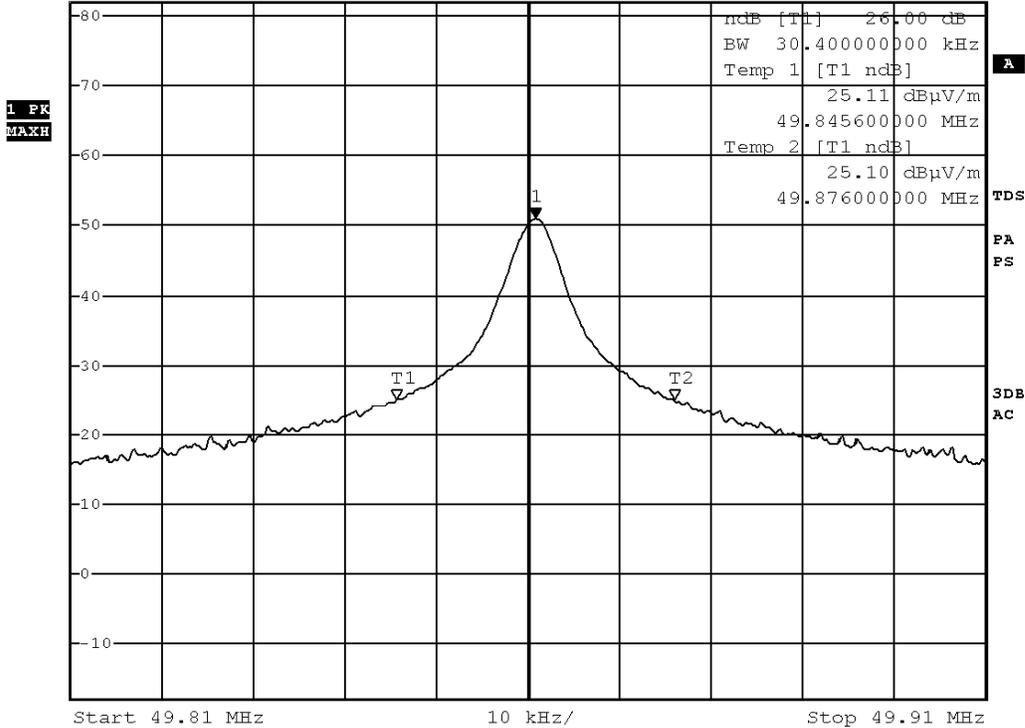
Measurement Data

Test Result of 26dB Bandwidth of Fundamental Emission: PASS



RBW 3 kHz Marker 1 [T1]
 VBW 10 kHz 51.03 dBµV/m
 SWT 15 ms 49.860800000 MHz

Ref 82 dBµV/m *Att 10 dB



Date: 29.APR.2016 09:19:14

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TEST REPORT No.: (5216)112-1294

Duty Cycle Correction During 100msec:

Each function key sends a different series of characters, but each packet period (100msec) never exceeds a series of 14 long (2.2msec) and 42 short (0.8msec) pulses. Assuming any combination of short and long pulses maybe obtained due to encoding the worst case transmit duty cycle would be considered $(14 \times 2.2\text{msec}) + (42 \times 0.8\text{msec})$ per 100msec = 64.4% duty cycle.

Remarks: -

Duty Cycle Correction = $20\text{Log}(0.644) = -3.8\text{dB}$

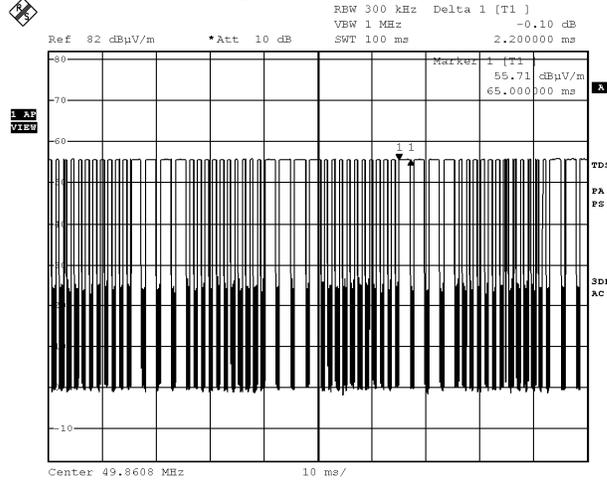
The following figures [Figure A to Figure B] show the characteristics of the pulse train for one of these functions.



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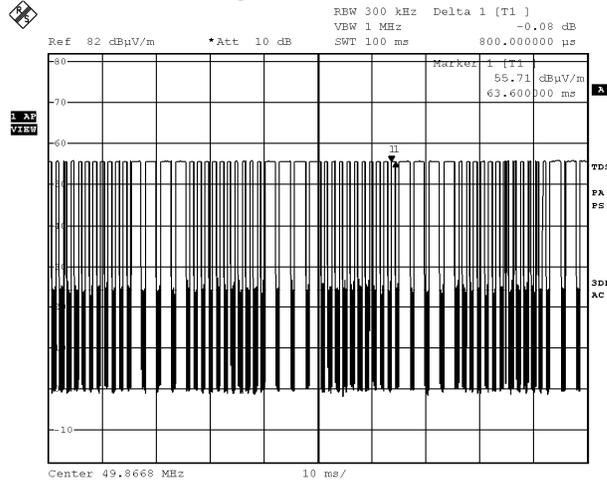
TEST REPORT No.: (5216)112-1294

Figure A [Long Pulse]



Date: 29.APR.2016 09:20:16

Figure B [Short Pulse]



Date: 29.APR.2016 09:20:37

TEST REPORT No.: (5216)112-1294

Photographs of EUT

Front View of the product



Rear View of the product



Top View of the product



Bottom View of the product



Side View of the product



Side View of the product



Battery compartment



Battery Cover





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TEST REPORT No.: (5216)112-1294

Photographs of EUT

Internal View of the product



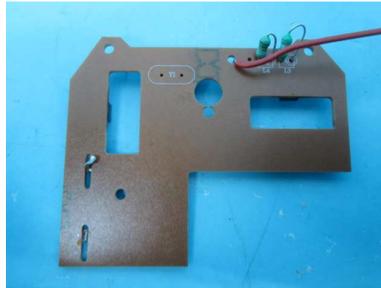
Internal View of the product



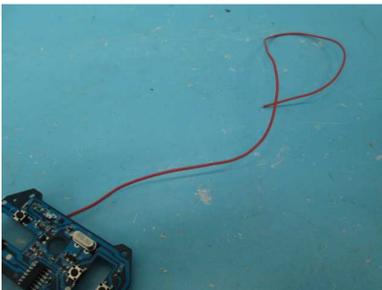
Inner Circuit Top View



Inner Circuit Bottom View



Antenna



TEST REPORT No.: (5216)112-1294

Measurement of Radiated Emission Test Set Up



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