

Date: 2013-08-19 Page 1 of 23 No.: HM168677

Applicant (NEB001): NEW BRIGHT INDUSTRIAL CO., LTD.

9/F., NEW BRIGHT BUILDING, 11 SHEUNG YUET

ROAD, KOWLOON BAY, KOWLOON, H.K.

Manufacturer: NEW BRIGHT INDUSTRIAL CO., LTD.

9/F., NEW BRIGHT BUILDING, 11 SHEUNG YUET

ROAD, KOWLOON BAY, KOWLOON, H.K.

**Description of Sample(s):** Product: Radio Control Toy Transmitter

Brand Name: New Bright
Model Number: G6DTH2
FCC ID: G6DTH2

**Date Sample(s) Received:** 2013-08-09

**Date Tested:** 2013-08-16 to 2013-08-19

**Investigation Requested:** Perform ElectroMagnetic Interference measurement in

accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2012 and ANSI C63.4:2009 for FCC Certification.

**Conclusion(s):** The submitted product <u>COMPLIED</u> with the requirements of

Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this

Test Report.

Remark(s):

Dr. LEE Kam Chuen
Authorized Signatory
ElectroMagnetic Compatibility Department
For and on behalf of

The Hong Kong Standards and Testing Centre Ltd.



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# 1.0 General Details

### 1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd. EMC Laboratory 10 Dai Wang Street, Taipo Industrial Estate New Territories, Hong Kong

# 1.2 Applicant Details Applicant

NEW BRIGHT INDUSTRIAL CO., LTD. 9/F., NEW BRIGHT BUILDING, 11 SHEUNG YUET ROAD, KOWLOON BAY, KOWLOON, H.K.

#### Manufacturer

NEW BRIGHT INDUSTRIAL CO., LTD. 9/F., NEW BRIGHT BUILDING, 11 SHEUNG YUET ROAD, KOWLOON BAY, KOWLOON, H.K.



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# 1.3 Equipment Under Test [EUT] Description of Sample(s)

Product: Radio Control Toy Transmitter

Manufacturer: NEW BRIGHT INDUSTRIAL CO., LTD.

9/F., NEW BRIGHT BUILDING, 11 SHEUNG YUET ROAD,

KOWLOON BAY, KOWLOON, H.K.

Brand Name: New Bright Model Number: G6DTH2

Input Voltage: 3.7Vd.c. ("AA" size battery x 2)

#### 1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a New Bright Industrial Co., Ltd. Radio Control Toy Transmitter. The EUT is a transmitter of radio control toy. The transmitter was operating with a trigger, the EUT continues to transmit while trigger is being on, It is pulse transmitter, Modulation by IC, and type is FSK modulation.

### 1.4 Date of Order

2013-08-09

#### 1.5 Submitted Sample(s):

1 Sample

#### 1.6 Test Duration

2013-08-16 to 2013-08-19

# 1.7 Country of Origin

China



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# 2.0 Technical Details

### 2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2012 Regulations and ANSI C63.4:2009 for FCC Certification.

#### 2.2 Test Standards and Results Summary Tables

	EMISSION Results Summary								
Test Condition	Test Condition Test Requirement Test Method Class / Test Result								
			Severity	Pass	Fail	N/A			
Field Strength of Fundamental & Harmonics Emissions	FCC 47CFR 15.249	ANSI C63.4:2009	N/A						
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2009	N/A	$\boxtimes$					

Note: N/A - Not Applicable



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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions

Test Requirement: FCC 47CFR 15.249
Test Method: ANSI C63.4:2009
Test Date: 2013-08-16
Mode of Operation: Tx mode

#### **Test Method:**

The sample was placed 0.8m above the ground plane on a standard radiated emission test site. Measurements in both horizontal and vertical polarities were performed. 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, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. In the frequency range of 9kHz to 30MHz, The center of the loop antenna shall be 1 meter above the ground and rotated loop axis for maximum reading. The emissions worst-case are shown in Test Results of the following pages.

Remark: 3 orthogonal axis apply to hand-held device only.

\*: Semi-anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.



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#### **Spectrum Analyzer Setting:**

9KHz – 30MHz (Pk & Av) RBW: 10kHz

VBW: 30kHz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

30MHz – 1GHz (QP) RBW: 120kHz

VBW: 120kHz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

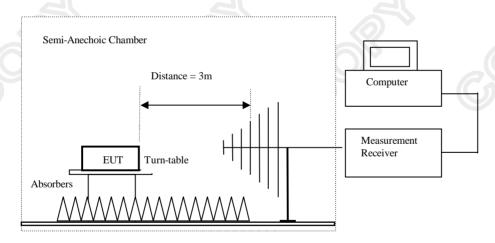
Above 1GHz (Pk & Av) RBW: 3MHz

VBW: 3MHz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

# **Test Setup:**



Ground Plane

Absorbers placed on top of the ground plane are for measurements above 1000MHz only.



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# Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental	Field Strength of Fundamental Emission	Field Strength of Harmonics Emission		
[MHz]	[microvolts/meter]	[microvolts/meter]		
902-928	50,000 [Average]	500 [Average]		
2400-2483.5	50,000 [Average]	500 [Average]		

#### Results of Ty mode (Channel 1). Pass

	Field Strength of Fundamental Emissions							
	Quasi-Peak Value							
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field		
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	$dB\mu V/m$	$dB\mu V/m$	$dB\mu V/m$	$\mu V/m$	$\mu V/m$			
909.1	39.7	26.9	66.6	2,138.0	50,000	Vertical		

	Field Strength of Harmonics Emission Peak Value							
Frequency								
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	dBµV/m	dBμV/m	dBμV/m	μV/m	μV/m			
1818.1	14.7	27.6	42.3	130.3	5,000	Vertical		
* 2727.2	6.9	27.8	34.7	54.3	5,000	Vertical		
3636.2					5,000	Vertical		
* 4545.3					5,000	Vertical		
* 5454.4		Emissions det	ected are more	e	5,000	Vertical		
6363.4		than 20 dB below the Limits				Vertical		
* 7272.5						Vertical		
* 8181.5					5,000	Vertical		
* 9090.6					5,000	Vertical		



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## Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental	Field Strength of Fundamental Emission	Field Strength of Harmonics Emission		
[MHz]	[microvolts/meter]	[microvolts/meter]		
902-928	50,000 [Average]	500 [Average]		
2400-2483.5	50,000 [Average]	500 [Average]		

# Results of Tx mode (Channel 1): Pass

	Field Strength of Harmonics Emission Average Value							
Frequency								
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	dBμV/m	$dB\mu V/m$	$dB\mu V/m$	$\mu V/m$	$\mu V/m$			
1818.1	1.7	27.6	29.3	29.2	500	Vertical		
* 2727.2	1.9	27.8	29.7	30.5	500	Vertical		
3636.2					500	Vertical		
* 4545.3					500	Vertical		
* 5454.4		Emissions det	ected are more	e	500	Vertical		
6363.4		than 20 dB be	low the Limits	3	500	Vertical		
* 7272.5			500	Vertical				
* 8181.5			500	Vertical				
* 9090.6				(())	500	Vertical		



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# Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental	Field Strength of Fundamental Emission	Field Strength of Harmonics Emission		
[MHz]	[microvolts/meter]	[microvolts/meter]		
902-928	50,000 [Average]	500 [Average]		
2400-2483.5	50,000 [Average]	500 [Average]		

Results of Tx mode (Channel 2): Pass

results of	Results of 1x mode (Channel 2). I ass								
	Field Strength of Fundamental Emissions								
	Quasi-Peak Value								
Freque	ncy	Measured	Correction	Field	Field	Limit @3m	E-Field		
		Level @3m	Factor	Strength	Strength		Polarity		
MHz	Z	dBμV/m	$dB\mu V/m$	$dB\mu V/m$	$\mu V/m$	$\mu V/m$			
913	3.1	39.9	27.0	66.9	2,213.1	50,000	Vertical		

	Field Strength of Harmonics Emission							
	Peak Value							
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field		
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	dBμV/m	dBμV/m	$dB\mu V/m$	$\mu V/m$	$\mu V/m$			
1826.1	14.7	27.6	42.3	130.3	5,000	Vertical		
* 2739.2	7.3	27.8	35.1	56.9	5,000	Vertical		
* 3652.2					5,000	Vertical		
* 4565.3					5,000	Vertical		
5478.4		Emissions det	ected are more	e	5,000	Vertical		
6391.4		than 20 dB be	low the Limit	S	5,000	Vertical		
* 7304.5					5,000	Vertical		
* 8217.5					5,000	Vertical		
* 9130.6					5,000	Vertical		



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#### Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental	Field Strength of Fundamental Emission	Field Strength of Harmonics Emission		
[MHz]	[microvolts/meter]	[microvolts/meter]		
902-928	50,000 [Average]	500 [Average]		
2400-2483.5	50,000 [Average]	500 [Average]		

#### Results of Tx mode (Channel 2): Pass

Field Strength of Harmonics Emission							
		A	Average Valu	e			
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field	
	Level @3m	Factor	Strength	Strength		Polarity	
MHz	$dB\mu V/m$	$dB\mu V/m$	$dB\mu V/m$	$\mu V/m$	$\mu V/m$		
1826.1	1.8	27.6	29.4	29.5	500	Vertical	
* 2739.2	1.8	27.8	29.6	30.2	500	Vertical	
* 3652.2					500	Vertical	
* 4565.3					500	Vertical	
5478.4		Emissions det	ected are more	e	500	Vertical	
6391.4		than 20 dB be	low the Limits		500	Vertical	
* 7304.5						Vertical	
* 8217.5		500					
* 9130.6					500	Vertical	

#### Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Calculated measurement uncertainty : 9kHz to 30MHz 2.0dB

30MHz to 1GHz 4.6dB 1GHz to 26GHz 4.5dB

<sup>\*:</sup> Denotes restricted band of operation.



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# Limits for 20dB Bandwidth of Fundamental Emission:

19.AUG.2013 13:24:41

Date:

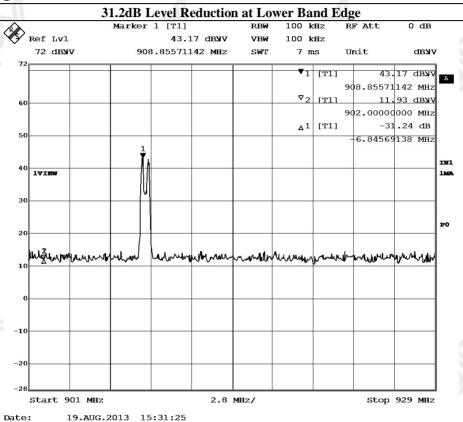
Frequency Range	20dB Bandwidth
[MHz]	[MHz]
909.06	0.641

#### **Channel 1** 20dB Bandwidth of Fundamental Emission Marker 1 [T1 ndB] 30 kHz RF Att 0 dB 20.00 dB Ref Lvl ndB VBW 100 kHz 87 dB**y**V BW 641.28256513 kHz SWT 6 ms Unit db**y**v 48.25 dByV ▼1 [T1] 908.83354709 MHz ndB 20.00 dB 641.28256513 kHz BW 28.70 dB**y**V $\nabla_{T1}$ [T1] 908.70128257 MHz 27.62 dBWV 60 909.34256513 MHz 1VIEW 50 10 www.twww.ust Center 909.06 MHz 200 kHz/ Span 2 MHz



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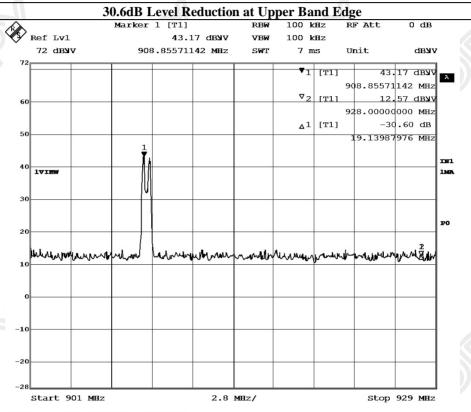




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# **Channel 1**



Date: 19.AUG.2013 15:32:18

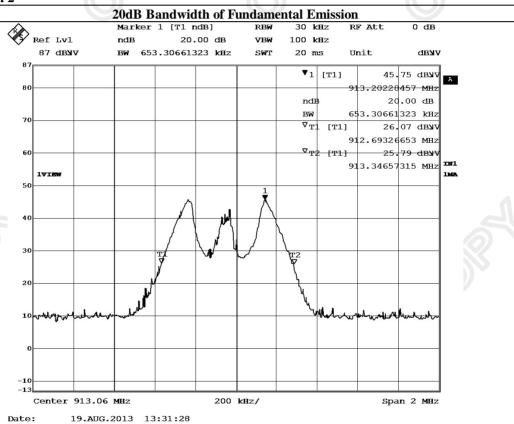


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# Limits for 20dB Bandwidth of Fundamental Emission:

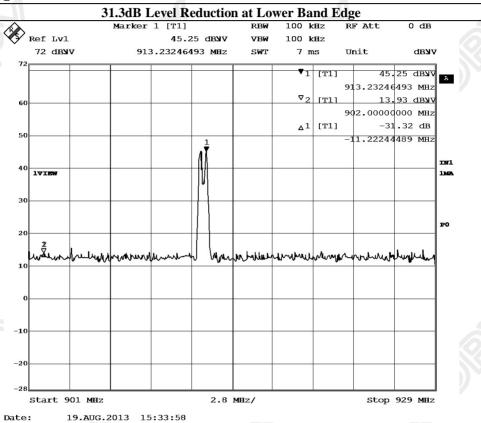
Frequency Range	20dB Bandwidth
[MHz]	[MHz]
913.06	0.653





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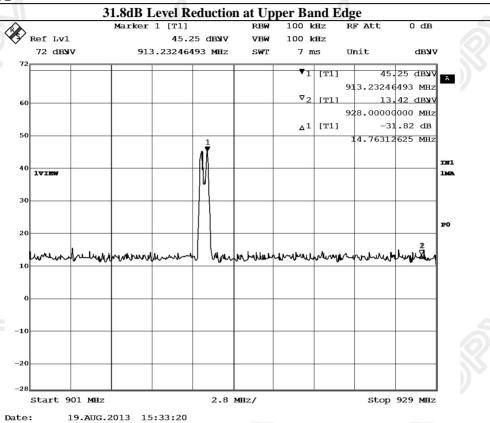
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#### Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Field strength [microvolts/meter]	Measurement distance [meters]
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

The emission limits shown in the above table are based on measurement employing a CISPR quasipeak detector and above 1000MHz are based on measurements employing an average detector.

# Results of Tx on mode (9k - 30MHz): PASS

Field Strength of Spurious Emissions								
			Peak Value					
Frequency	Frequency Measured Correction Field Field Limit E-Field							
	Level Factor Strength Strength Polari							
MHz	dBμV/m	dB/m	$dB\mu V/m$	$\mu V/m$	$\mu V/m$			
Emissions detected are more than 20 dB below the FCC Limits								
				7				

Field Strength of Spurious Emissions Average Value							
Frequency	Measured	Correction	Field	Field	Limit	E-Field	
	Level Factor Strength Strength Polarity						
MHz $dB\mu V/m$ $dB/m$ $dB\mu V/m$ $\mu V/m$ $\mu V/m$							
	Emissions detected are more than 20 dB below the FCC Limits						



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Results of Tx on mode (30MHz - 1000MHz): PASS

(Band-edge measurement) Channel 1

Ī			Field Streng	th of Spurio	us Emissions		
	Quasi-Peak Value						
Ī	Frequency	Measured	Correction	Field	Field	Limit	E-Field
		Level Factor Strength Strength					Polarity
1	MHz	dBμV/m	dB/m	$dB\mu V/m$	$\mu V/m$	μV/m	
4	901.50	3.9	26.2	30.1	32.0	200.0	Vertical
ſ	928.50	4.8	26.4	31.2	36.3	200.0	Vertical

Results of Tx on mode (30MHz - 1000MHz): PASS

(Band-edge measurement) Channel 2

Field Strength of Spurious Emissions							
		Qu	ıasi-Peak Va	lue			
Frequency	Frequency Measured Correction Field Field Limit E-Field						
Level Factor Strength Strength Polari							
MHz	MHz $dB\mu V/m$ $dB/m$ $dB\mu V/m$ $\mu V/m$ $\mu V/m$						
901.50	3.5	26.2	29.7	30.5	200.0	Vertical	
928.50	3.5	26.4	29.9	31.3	200.0	Vertical	

Results of Tx on mode (Above 1000MHz): PASS

	Field Strength of Spurious Emissions							
	Peak Value							
Frequency	Frequency Measured Correction Field Field Limit E-Field							
	Level Factor Strength Strength Polarity							
MHz $dB\mu V$ $dB/m$ $dB\mu V/m$ $\mu V/m$ $\mu V/m$								
	Emissions detected are more than 20 dB below the FCC Limits							

Results of Tx on mode (Above 1000MHz): PASS

Field Strength of Spurious Emissions									
Average Value									
Frequency	Frequency Measured Correction Field Field Limit E-Field								
	Level Factor Strength Strength Polarity								
MHz	MHz $dB\mu V$ $dB/m$ $dB\mu V/m$ $\mu V/m$ $\mu V/m$								
Emissions detected are more than 20 dB below the FCC Limits									

#### Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 9kHz to 30MHz 2.0dB

30MHz to 1GHz 4.6dB 1GHz to 26GHz 4.5dB

# The Hong Kong Standards and Testing Centre Ltd.

10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong Tel: (852) 2666 1888 Fax: (852) 2664 4353 Homepage:www.hkstc.org E-mail: hkstc@hkstc.org



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# Appendix A

# List of Measurement Equipment

#### **Radiated Emission**

	THUMBUT DIMEDION									
EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL				
EM299	DOUBLE-RIDGED WAVEGUIDE HORN ANTENNA	ETS-LINDGREN	3115	00114120	2012/01/25	2014/01/25				
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A				
EM216	MINI MAST SYSTEM	EMCO	2075	00026842	N/A	N/A				
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A				
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3		2012/10/25	2013/10/25				
EM174	BICONILOG ANTENNA	EMCO	3142B	1671	2012/05/31	2014/05/31				
EM229	EMI TEST RECEIVER	R&S	ESIB40	100248	2013/05/07	2014/05/07				
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	2011/09/14	2013/09/14				
EM200	DUAL CHANNEL POWER METER	R & S	NRVD	100592	2011/10/10	2013/10/10				
EM201	10V INSERTION UNIT	R & S	URV5-Z2	100089	2011/0/10	2013/10/10				

#### Remarks:-

CM Corrective Maintenance

N/A Not Applicable **TBD** To Be Determined



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Appendix B

Photographs of EUT

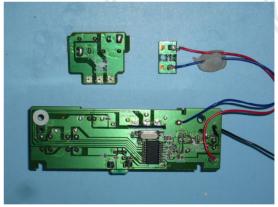




**Inner Circuit Top View** 



**Inner Circuit Bottom View** 





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#### **Photographs of EUT**





\*\*\*\*\* End of Test Report \*\*\*\*\*

The Hong Kong Standards and Testing Centre Ltd.

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