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FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: GLEMO080702147RFT
Page: 1 of 11
FCC ID: WJS139239006098

TEST REPORT

Application No. : GLEMO080702147RF
Applicant: ZHAO FENG TOYS FACTORY
FCC ID: WJS139239006098
Fundamental Frequency : 49.860MHz (inter modulation)
Equipment Under Test (EUT):
EUT Name: RC HELICOPTER
Model No.: 183#, 183-2#, 184#, 185#, 186#, 187#, 188#, 189#, 190#, 191#♣
♣ Please refer to section 2 of this report which indicates which Item was actually tested and which were electrically identical.
Standards: FCC PART15 SUBPART C: 2007
Date of Receipt: July 09, 2008
Date of Test: July 16, 2008 to July 22, 2008
Date of Issue: July 30, 2008

Test Result :	PASS *
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* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 2 of this report for further details..

Authorized Signature:

Stephen Guo
Lab Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Occupied Bandwidth	FCC PART 15 :2007	Section 15.235	PASS
Radiated Emission (30MHz to 1000MHz)	FCC PART 15 :2007	Section 15.235 & 15.209	PASS①

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radiated Frequency.

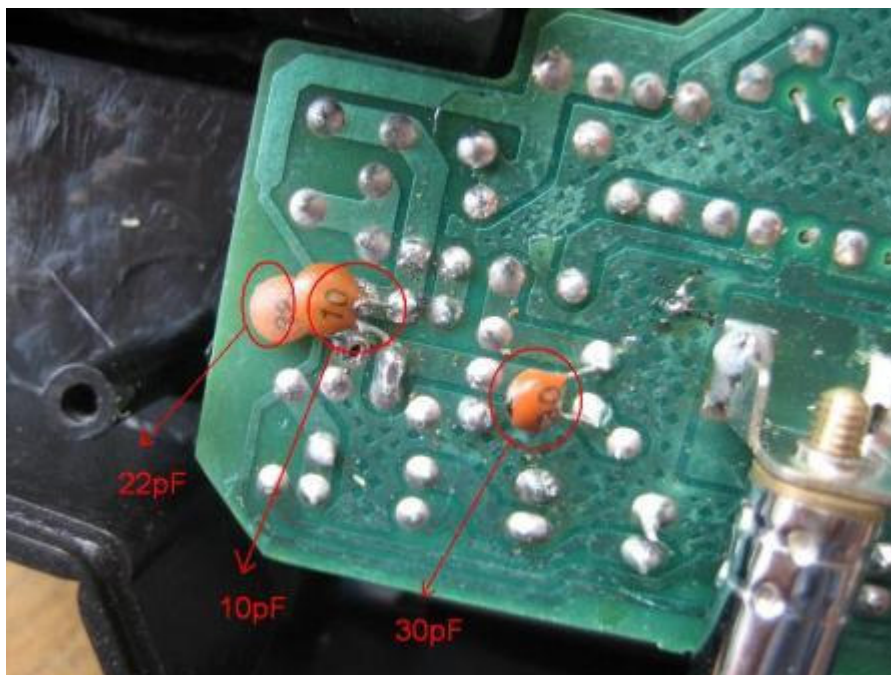
♣ Remark:

Item No.: 183#, 183-2#, 184#, 185#, 186#, 187#, 188#, 189#, 190#, 191#

Only the Item 183# was tested, since the electrical circuit design, PCB layout, components used and internal wiring were identical for the above items, only the outer decoration. color and item numbers were different according to the conformation from the applicant (manufacturer).

① : The Tx passed Radiated Emission test after modification. Please refer to the following information for further details.

1. Modification method: Replace the C5 with one new capacitor (30p F) as the following photo shown.
2. Replace the C3 with one new capacitor (10p F) as the following photo shown.
3. Replace the C2 with one new capacitor (22p F) as the following photo shown.





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4 General Information

4.1 Client Information

Applicant Name: ZHAO FENG TOYS FACTORY

Applicant Address: Lane 4 of Customhouse, Yuting Road, Chenghai District, Shantou City, Guangdong, China

4.2 Details of E.U.T.

EUT Name: RC HELICOPTER

Item No.: 183#, 183-2#, 184#, 185#, 186#, 187#, 188#, 189#, 190#, 191#

Power Supply: 12V DC (Size: "AA" x 8)

Power Cord: None

4.3 Description of Support Units

The EUT was tested as an independent unit: 49.860MHz radio transmitter.

4.4 Standards Applicable for Testing

The customer requested FCC tests for the EUT.

The standard used was FCC PART 15, SUBPART C: 2007 (Section 15.235);

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory, No.198 Kezhu Road, Science Town Economic & Technology Development District Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.6 Other Information Requested by the Customer

None.



4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP – Lab Code: 200611-0**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **FCC – Registration No.: 282399**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP's accreditation, SGS-CSTC is an authorized test laboratory for the DoC process.

5 Equipments Used during Test

	RE in Chamber					
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	N/A	N/A
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	28-01-2008	28-01-2009
N/A	EMI Test Software	Audix	E3	N/A	N/A	N/A
EMC0514	Coaxial cable	SGS	N/A	N/A	04-12-2007	04-12-2008
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	12-08-2007	12-08-2008
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	12-08-2007	12-08-2008
EMC0517	Horn Antenna	Rohde & Schwarz	HF906	100095	12-08-2007	12-08-2008
EMC0040	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2007	05-12-2008
EMC0520	0.1-1300 MHz Pre-Amplifier	HP	8447D OPT 010	2944A06252	11-03-2008	11-03-2009
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	11-03-2008	11-03-2009
EMC0075	310N Amplifier	Sonama	310N	272683	10-09-2007	10-09-2008
EMC0523	Active Loop Antenna	EMCO	6502	00042963	09-08-2006	09-08-2008
EMC0530	10m Semi- Anechoic Chamber	ETS	N/A	N/A	10-08-2007	10-08-2008



6 Test Results

6.1 E.U.T. test conditions

Power supply: 12V DC (Size: "AA" x 8) (New batteries)

Requirements: **15.31(e)** :For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

Type of antenna: Integral

Operating Environment:

Temperature: 22.0 -25.0°C

Humidity: 40-60% RH

Atmospheric Pressure: 1002-1010 mbar

Test frequencies: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Test nominal frequency: 49.860MHz

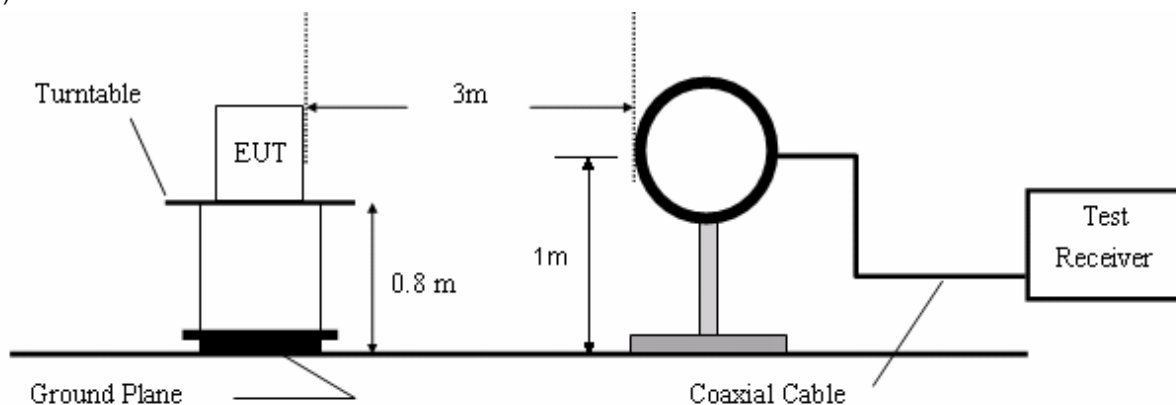


6.2 Radiated Emissions

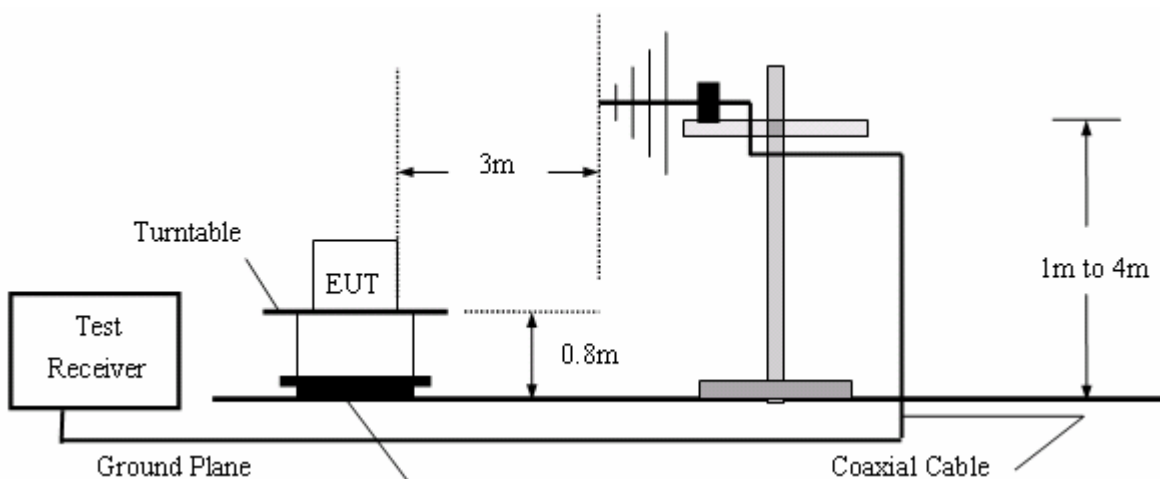
Test Requirement:	FCC Part15 C Section 15.235&15.209
Test Method:	ANSI C63.4
Test Date:	July 16, 2008(initially); July 22, 2008(modified)
Measurement Distance:	3m (Semi-Anechoic Chamber)
Requirements:	<p>15.235(a) :The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.</p> <p>15.235(b) : The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in Section 15.209, whichever permits the higher emission levels. The field strength of any emissions removed by more than 10 kHz from the band edges shall not exceed the general radiated emission limits in Section 15.209. All signals exceeding 20 microvolts/meter at 3 meters shall be reported in the application for certification.</p> <p>Out of band emissions shall not exceed:</p> <p>40.0 dBμV/m between 30MHz & 88MHz</p> <p>43.5 dBμV/m between 88MHz & 216MHz</p> <p>46.0 dBμV/m between 216MHz & 960MHz</p> <p>54.0 dBμV/m above 960MHz</p>
Detector:	Peak Scan (9kHz resolution bandwidth for 9kHz to 30MHz; 120kHz resolution bandwidth for 30MHz to 1000MHz)
Test Procedure:	<p>1)9K to 30MHz emissions:</p> <p>For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.4 section 8.2.1. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT.During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.</p> <p>2)30MHz to 1GHz emissions:</p> <p>For testing performed with the bi-log type antenna, testing was performed in accordance to ANSI 63.4. The measurement is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical polarizations.</p> <p>3)1GHz to 40GHz emissions:</p> <p>For testing performed with the horn antenna, testing was performed in accordance to ANSI 63.4. The measurement is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.</p>

Test Configuration:

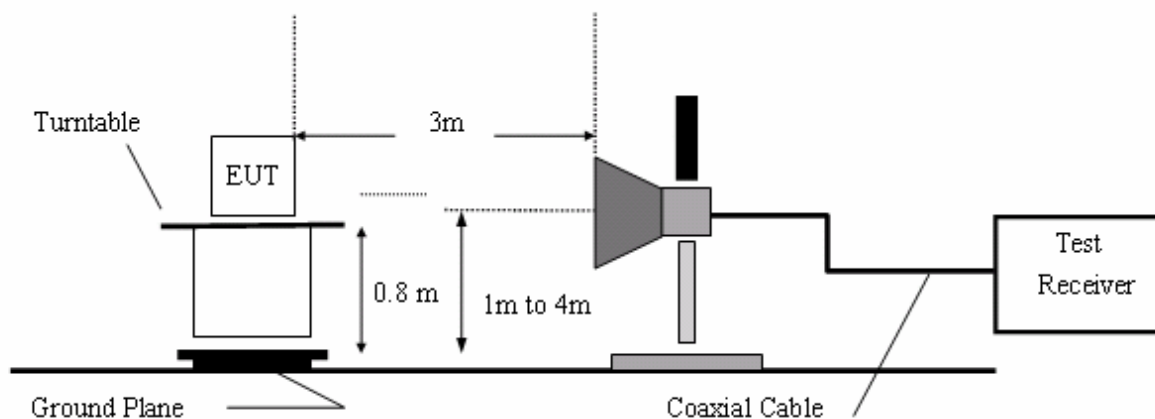
1) 9K to 30MHz emissions:



2) 30MHz to 1GHz emissions:



3) 1GHz to 40GHz emissions:





6.2.1 Carrier Emissions:

Pre-test the EUT in X, Y and Z axis,.

Y: EUT as Radiated Emission test setup photograph in section 6 of this report.

X: rotate EUT by 90° clockwise.

Z: rotate EUT by 90° vertically.

The maximum emissions was found in the Y axis.

Measurement record:

Vertical:

Frequency (MHz)	Reading Level (dBuV)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor (dB)	Emission Level (dBuV/m)	Limit (dBμV/m)	Antenna polarization
49.860	63.23	11.78	0.80	25.30	50.51	100.00	Peak
49.860	62.44	11.78	0.80	25.30	49.72	80.00	Average

Horizontal:

Frequency (MHz)	Reading Level (dBuV)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor (dB)	Emission Level (dBuV/m)	Limit (dBμV/m)	Antenna polarization
49.860	56.85	13.55	0.80	25.30	45.90	100.00	Peak
49.860	55.93	13.55	0.80	25.30	44.98	80.00	Average

6.2.2 Unwanted Radiated emissions

Test Procedure: The procedure used was ANSI Standard C63.4-2003. The receive was scanned from 30MHz to 1000MHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. The worst case emissions were reported.

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bilog antenna with 2 orthogonal polarities

The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Peramplifier Factor.

The following test results were performed on the EUT.



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Test the EUT in transmitting mode.

Horizontal.

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
99.720	49.77	11.64	1.20	25.10	37.51	43.50	-5.99
199.430	46.97	11.98	1.70	24.61	36.04	43.50	-7.46
249.220	41.51	15.25	1.89	24.40	34.24	46.00	-11.76
299.150	37.56	17.65	2.10	24.40	32.91	46.00	-13.09
349.020	37.50	17.12	2.30	24.71	32.20	46.00	-13.80
398.870	31.65	16.61	2.49	24.99	25.76	46.00	-20.24
448.710	32.26	16.39	2.60	25.46	25.80	46.00	-20.20
997.730	35.30	22.34	4.10	24.61	37.13	54.00	-16.82

Vertical.

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
99.710	50.20	10.06	1.20	25.10	36.36	43.50	-7.14
199.580	52.34	10.86	1.70	24.61	40.29	43.50	-3.21
249.580	47.20	12.47	1.89	24.40	37.16	46.00	-8.84
299.150	48.95	14.46	2.10	24.40	41.11	46.00	-4.89
349.020	48.03	15.76	2.30	24.71	41.37	46.00	-4.63
398.870	32.08	16.87	2.49	24.99	26.45	46.00	-19.55
448.750	33.23	16.23	2.60	25.46	26.60	46.00	-19.40
498.550	34.25	15.62	2.80	25.90	26.77	46.00	-19.23

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

Test Results: The unit does meet the FCC Part 15 C Section 15.235 requirements.

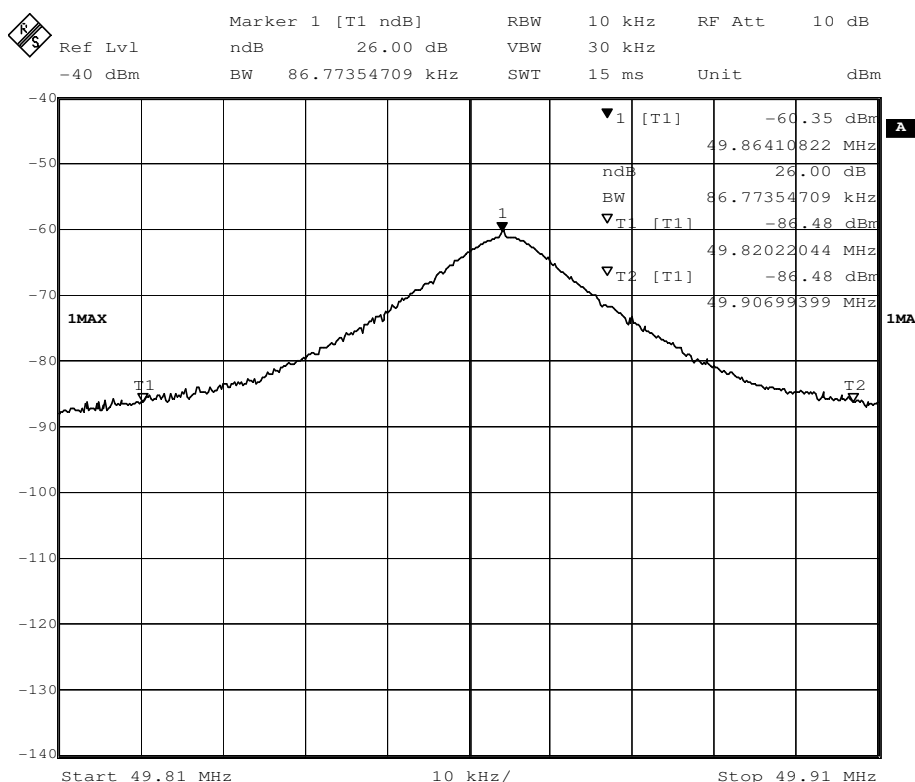


6.3 Occupied Bandwidth

Test Requirement: FCC Part 15 C Section 15.235
Test Method: ANSI C63.4
Test Date: July 17, 2008
Requirements: 15.235(b):The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier

Operation within the band 49.81 – 49.91 MHz

Method of measurement: The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector. The vertical Scale is set to 10dB per division. The horizontal scale is set to 10KHz per division. Read the down 26dB bandwidth of the carrier.



Down 26dB Bandwidth: 86.7735KHz

Operation within the band 49.81 – 49.91 MHz

The results: The unit does meet the FCC requirements

--End of the Report--