

FCC PART 95

MEASUREMENT AND TEST REPORT

For

Guangzhou Walkera Technology Co., Ltd

Taishi Industrial Park, Yuwotou Town, Panyu District, Guangzhou, Guangdong, China

FCC ID: S29WK-1001

February 21, 2006

| | |
|---|--|
| This Report Concerns: <input checked="" type="checkbox"/> Original Report | Equipment Type: Transmitter for Model Plane |
| Test Engineer: | Tony Wu |
| Report Number: | SE06B-042R |
| Test Date: | Jan 19~Feb11, 2006 |
| Reviewed By: | <i>Tony Wu</i> |
| Prepared By: | S&E Technologies Laboratory Ltd Room407,Block A Shennan Garden,Hi-Tech Industrial Park, Shenzhen 518057, P.R. China . Tel: 86-755-26636573, 26630631 Fax: 86-755-26630557 |

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of S&E Technologies Laboratory Ltd.

TABLE OF CONTENTS

| | |
|---|-----------|
| 1 - GENERAL INFORMATION..... | 3 |
| 1.1 Product Description for Equipment Under Test (EUT)..... | 3 |
| 1.2 Test Standards..... | 3 |
| 1.3 Test Summary..... | 4 |
| 1.4 Test Methodology | 4 |
| 1.5 Test Facility..... | 5 |
| 1.6 Test Equipment List and Details | 5 |
| 2 - SYSTEM TEST CONFIGURATION | 6 |
| 2.1 Justification | 6 |
| 2.2 EUT Exercise Software..... | 6 |
| 2.3 Special Accessories..... | 6 |
| 2.4 Equipment Modifications..... | 6 |
| 2.5 Basic Test Setup Block Diagram | 6 |
| 3 – CONDUCTED DISTURBANCES | 7 |
| 3.1 Measurement Uncertainty..... | 7 |
| 3.2 Limit of Conducted Disturbances (Class B) | 7 |
| 3.3 EUT Setup | 7 |
| 3.4 Instrument Setup..... | 7 |
| 3.5 Test Procedure | 8 |
| 3.6 Summary of Test Results..... | 8 |
| 3.7 Disturbance Voltage Test Data | 8 |
| 3.8 Test Result..... | 8 |
| 4- RF OUTPUT POWER | 11 |
| 4.1 Standard Applicable..... | 11 |
| 4.2 Test Procedure | 11 |
| 4.3 RF Output Power Test Result..... | 12 |
| 5- OCCUPIED BANDWIDTH | 13 |
| 5.1 Standard Applicable..... | 13 |
| 5.2 Test Procedure | 13 |
| 5.3 Occupied Bandwidth Test Result..... | 13 |
| 6- §95.635(B)(1), §95.635(B)(3), §95.635(B)(7), §95.635(B)(10), §95.635(B)(11), §95.635(B)(12) - UNWANTED EMISSION | 15 |
| 6.1 Standard Applicable..... | 15 |
| 6.2 Test Procedure | 15 |
| 6.3 Unwanted Emission Test Result | 16 |
| 7- FREQUENCY STABILITY MEASUREMENT | 17 |
| 7.1 Standard Applicable..... | 17 |
| 7.2 Test Procedure | 17 |
| 7.3 Frequency Stability Test Result | 17 |

1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: **Guangzhou Walkera Technology Co., Ltd**
 Address of applicant: Taishi Industrial Park, Yuwotou Town, Panyu District, Guangzhou, Guangdong, China
 Manufacturer: **Guangzhou Walkera Technology Co., Ltd**
 Address of manufacturer: Taishi Industrial Park, Yuwotou Town, Panyu District, Guangzhou, Guangdong, China

General Description of E.U.T

The **Guangzhou Walkera Technology Co., Ltd.**'s product, model number: **WK-1001** or the "EUT" as referred to in this report is a transmitter of **Transmitter for Model Plane**.

The technical data has been listed following:

| Items | Description |
|---------------------|--|
| EUT Description: | Transmitter for Model Plane |
| Trade Name: | Walkera |
| Model No.: | WK-1001 |
| Rated Voltage: | DC 12V (8 x AA Manganin-Zincic Battery) for Transmitter |
| Max. Output Power | 0.013W (11dBm) |
| Frequency range: | 72.81MHz |
| Number of channels: | 8 digital channel with different digital code for identification |
| Size | 185mmL x 100mmW x 180mmH |
| Channel Separation: | None |
| Type of Antenna: | Dedicate Antenna |

** The test data gathered are from the production sample provided by the manufacturer.*

1.2 Test Standards

The following Declaration of Conformity report of EUT is prepared in accordance with

FCC Rules and Regulations Part 2

FCC Rules and Regulations Part 95 Subpart C

The objective of the manufacturer is to demonstrate compliance with the described above standards.

1.3 Test Summary

For the EUT described above, test items carried out Under FCC Rules and Regulations Part 2 & FCC Rules and Regulations Part 95 Subpart C are listed as follow:

| FCC Rules | Test Item | Requirement | Result |
|---|---|--|----------|
| 2.1053 15.107 (a) | Conducted Emission | Reference to Conducted Limit Table in 15.107 (a) | Complied |
| 2.1046 95.639 (b)(3) | RF Output Power | 0.75W | Complied |
| 2.1049 95.633 (b) | Emission Bandwidth | 8 kHz | Complied |
| 95.635(b)(1) 95.635(b)(3) 95.635(b)(7) 95.635(b)(10) 95.635(b)(11) 95.635(b)(12) | Unwanted Emission | Reference to section 6.3 in this report | Complied |
| 2.1055 95.623 | Frequency Stability Vs. Temperature Vs. Voltage | Deviation < 0.002% | Complied |

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003.

The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

The maximum emission levels emanating from the device are compared to the FCC Rules and Regulations Part 95 Subpart C limits for radiation emissions and the measurement results contained in this test report show that EUT is to be technically compliant with FCC requirements.

All measurement required was performed at laboratory of Shenzhen Huatongwei International Inspection Co., Ltd at Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

1.5 Test Facility

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

FCC – Registration No.: 662850

Shenzhen Huatongwei International Inspection 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 662850, November 17, 2003.

1.6 Test Equipment List and Details

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal | Calibration Period |
|-------------------------------------|-----------------|-----------|-----------------|----------|--------------------|
| EMI Test Receiver | ROHDE & SCHWARZ | ESCS30 | 100038 | 2005/11 | 1 year |
| EMI Test Receiver | ROHDE & SCHWARZ | ESI 26 | 100009 | 2005/11 | 1 year |
| Test Receiver/ spectrum analyzer | ROHDE & SCHWARZ | ESPI | 100123 | 2005/03 | 1 year |
| Artificial Mains | ROHDE & SCHWARZ | ESH2-Z5 | 100028 | 2005/11 | 1 year |
| Pulse Limiter | ROHDE & SCHWARZ | ESHSZ2 | 100044 | 2005/11 | 1 year |
| Ultra-Broadband Antenna | ROHDE & SCHWARZ | HL562 | 100015 | 2005/11 | 1 year |
| Signal Generator | IFR | 2023A | 202304/060 | 2005/11 | 1 year |
| EMI Test Receiver | ROHDE & SCHWARZ | ESI 26 | 100009 | 2005/11 | 1 year |
| RF Test Panel | ROHDE & SCHWARZ | TS / RSP | 335015/ 0017 | N/A | N/A |
| Climate Chamber | QINGSHENG | THS-2001 | ZHS-C7C | 2004-11 | 1 year |
| Turntable | ETS | 2088 | 2149 | N/A | N/A |
| Antenna Mast | ETS | 2075 | 2346 | N/A | N/A |

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was tested according to TIA/EIA 603A to represent the worst-case results during the final qualification test.

2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software offered by manufacture, can let the EUT being normal operation.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product supplied by **Guangzhou Walkera Technology Co., Ltd** and its respective support equipment manufacturers.

2.4 Equipment Modifications

The EUT tested was not modified by S&E.

2.5 Basic Test Setup Block Diagram

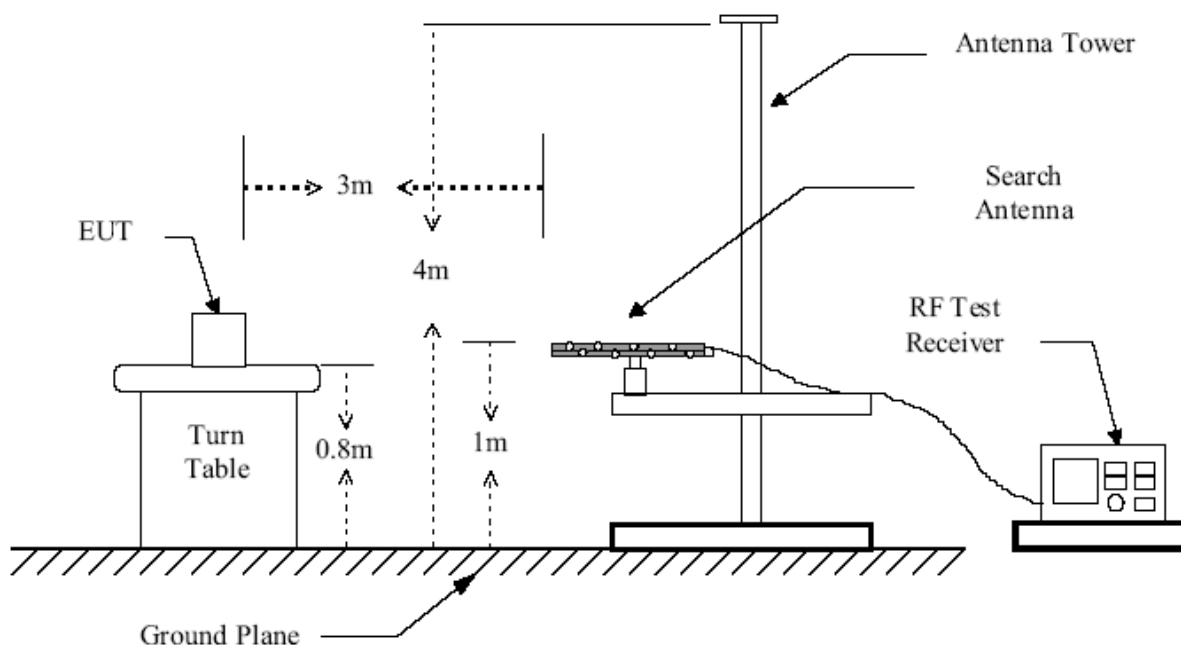


Figure 1 : Frequencies measured below 1 GHz configuration

3 – Conducted Disturbances

3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.4 dB.

3.2 Limit of Conducted Disturbances (Class B)

| Frequency Range (MHz) | Limits (dBuV) | |
|-----------------------|----------------|---------|
| | Quasi-Peak | Average |
| 0.150 ~ 0.500 | 66 ~ 56 | 56 ~ 46 |
| 0.500 ~ 5.000 | 56 | 46 |
| 5.000 ~ 30.00 | 60 | 50 |

Note: (1)The tighter limit shall apply at the edge between two frequency bands.

3.3 EUT Setup

The setup of EUT is according with ANSI C63.4-2003 measurement procedure. The specification used was the FCC Rules and Regulations Part 15 Section 15.107(a) limits.

The EUT was placed center and the back edge of the test table.

The AV cables were draped along the test table and bundled to 30-40cm in the middle.

The spacing between the peripherals was 10 cm.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

3.4 Instrument Setup

The test receiver was set with the following configurations:

Test Receiver Setting:

Frequency Range.....150 KHz to 30 MHz
 Detector.....Peak & Quasi-Peak & Average
 Sweep Speed.....Auto
 IF Band Width.....9 KHz

3.5 Test Procedure

During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within -10 dB μ V of specification limits). Quasi-peak readings are distinguished with a "QP". Average readings are distinguished with a "Av".

3.6 Summary of Test Results

According to the data in section 3.7, the EUT complied with the FCC Part 15 Section 15.107(a) Conducted margin, with the *worst* margin reading of:

3.7 Disturbance Voltage Test Data

| | |
|------------------------------|-----------------------------|
| Temperature () | 22~23 |
| Humidity (%RH) | 40~42 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Transmitter for Model Plane |
| M/N | WK-1001 |
| Operating Mode | Charging Mode |

Test data see following pages (Page 10~11)

Remark: (1) When PK reading is less than relevant limit 20dB, the QP reading and AV reading will not be recorded.
 (2) Where QP reading is less than relevant AV limit, the AV reading will not be measured

3.8 Test Result

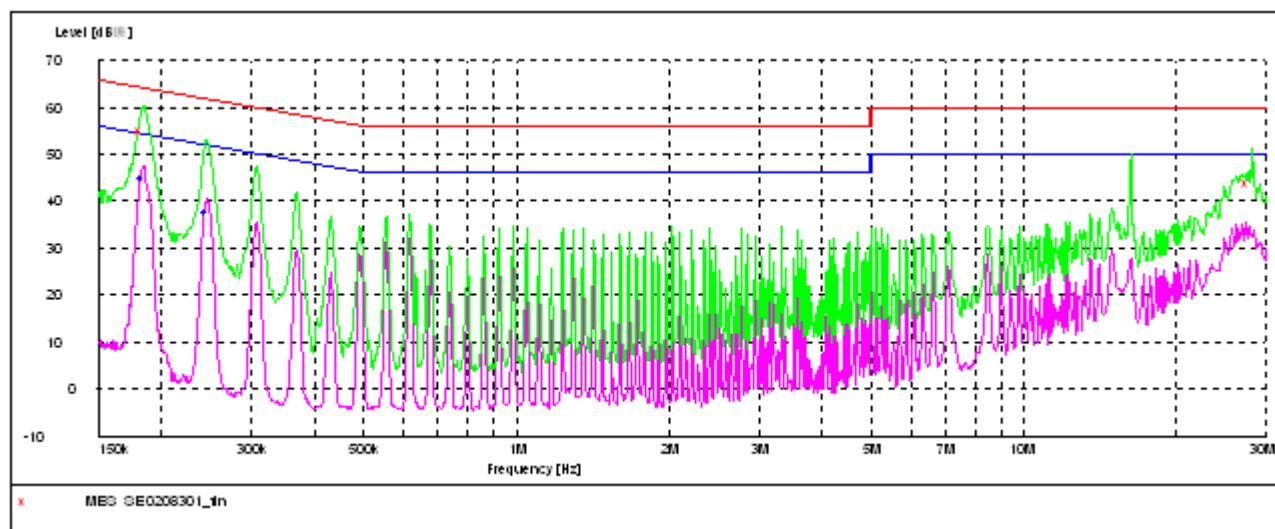
Pass

Conducted Emission Test Data

EUT: Transmitter for Model Plane
 Operating Condition: Charging Mode
 Operator: Jimmy
 Test Specification: AC 120V/60Hz
 Comment: Live Line
 Start of Test: 2/08/06 / 5:38:45PM

SCAN TABLE: "Voltage (9K-30M)QP"

Short Description: 150K-30M Voltage
 Start Frequency: 150.0 kHz Stop Frequency: 30.0 MHz Step Width: 5.0 kHz
 Detector: QuasiPeak Average Meas. Time: 1.0 s IF Bandw.: 9 kHz Transducer: ESH2-Z5_1000280



MEASUREMENT RESULT: "SE0208301_fin"

2/08/06 5:42PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.184520 | 54.80 | 11.0 | 64 | 9.2 | QP | L1 | GND |
| 27.938320 | 42.70 | 11.2 | 60 | 17.3 | QP | L1 | GND |

MEASUREMENT RESULT: "SE0208301_fin2"

2/08/06 5:42PM

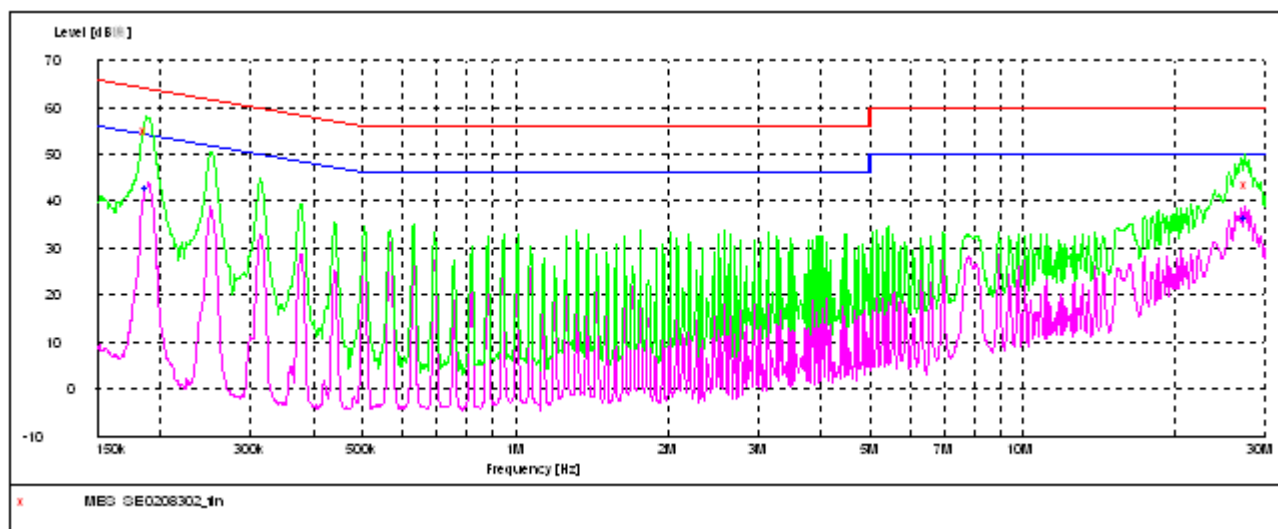
| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.186000 | 44.50 | 10.9 | 54 | 9.5 | AV | L1 | GND |
| 0.247800 | 38.10 | 10.6 | 52 | 13.9 | AV | L1 | GND |

Conducted Emission Test Data

EUT: Transmitter for Model Plane
 Operating Condition: Charging Mode
 Operator: Jimmy
 Test Specification: AC 120V/60Hz
 Comment: Neutral Line
 Start of Test: 2/08/06 / 5:43:02PM

SCAN TABLE: "Voltage (9K-30M)QP"

Short Description: 150K-30M Voltage
 Start Frequency: 150.0 kHz Stop Frequency: 30.0 MHz Step Width: 5.0 kHz
 Detector: QuasiPeak Average
 Meas. Time: 1.0 s IF Bandw.: 9 kHz Transducer: ESH2-Z5_1000280



MEASUREMENT RESULT: "SE0208302_fin"

2/08/06 5:47PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.188988 | 55.00 | 10.9 | 64 | 9.0 | QP | N | GND |
| 27.061890 | 42.40 | 11.2 | 60 | 17.6 | QP | N | GND |

MEASUREMENT RESULT: "SE0208302_fin2"

2/08/06 5:47PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.190500 | 43.20 | 10.9 | 54 | 10.8 | AV | N | GND |
| 27.061890 | 37.80 | 11.2 | 50 | 12.2 | AV | N | GND |

4- RF OUTPUT POWER

4.1 Standard Applicable

Per FCC §2.1046, and §95.639(b)(3), No R/C transmitter, under any condition of modulation, shall exceed a carrier power or peak envelope TP (single-sideband only) of: 0.75 W in the 72-76 MHz frequency band.

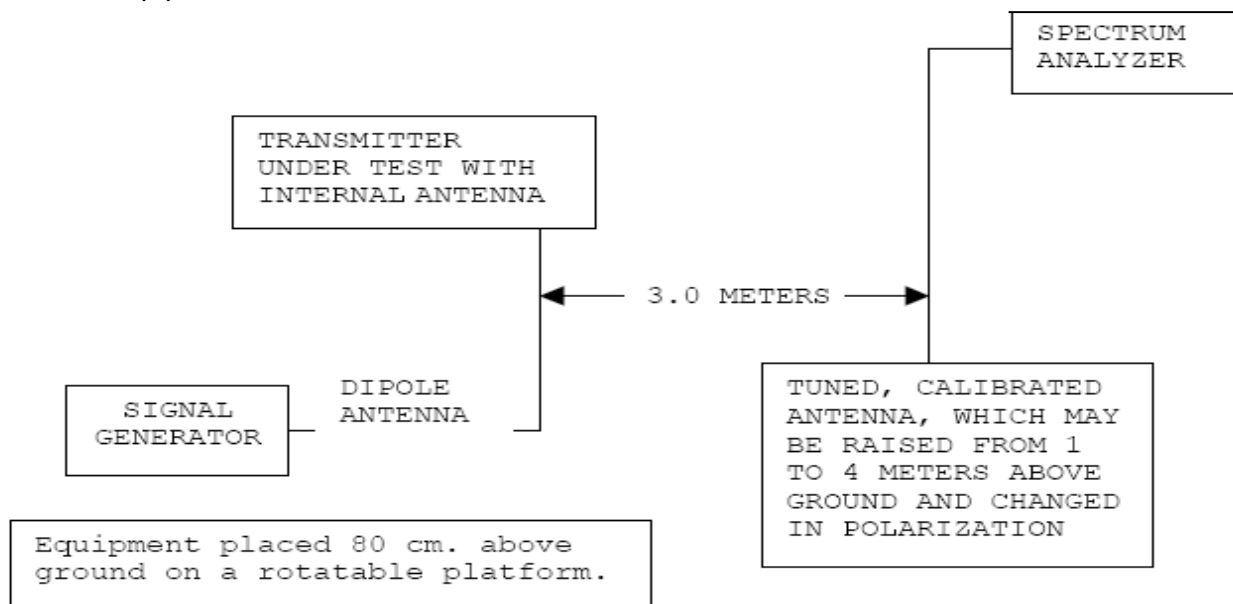
4.2 Test Procedure

The test procedure used was ANSI C63.4-2003.

The technique used to find the output power of the transmitter was the antenna substitution method. The test procedure was followed:

1. The EUT was powered ON and placed on a table in the chamber. The antenna of the transmitter was extended to its maximum length of 117cm.
2. The fundamental frequency (72.810MHz) of the transmitter was maximized on the test receiver display by raising and lowering the receive antenna and by rotating the turntable. After the fundamental emission was maximized, a field strength measurement was made.
3. Steps 1 and 2 were preformed with the EUT and the receive antenna in both vertical and horizontal polarization and performed a pre-test three orthogonal planes.
4. The transmitter was then removed and replaced with a substitution antenna.
5. A signal at the fundamental frequency (72.810MHz) was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally and vertically polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 2 is obtained for this set of conditions.
6. The output power into the substitution antenna was then measured.

The test setup plot was followed:



4.3 RF Output Power Test Result

| | |
|------------------------------|-----------------------------|
| Temperature () | 22~23 |
| Humidity (%RH) | 50~54 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Transmitter for Model Plane |
| M/N | WK-1001 |
| Operating Mode | Continuous Transmitting |

Test result:

The transmitter output power found using the antenna substitution method was 0.011W.

| Indicated | | Table | Test Antenna | | | Substituted | | Antenna Gain Correction | Cable Loss dB | Absolute Level dBm | Limit dBm | Margin dB |
|------------------|----------------------------|-------|-----------------|-----------------|--------------|------------------|--------------|-------------------------------|---------------------|--------------------------|--------------|--------------|
| Frequency MHz | Meter Reading dBuV/m | | Angle Degree | Height Meter | Polar H/V | Frequency MHz | Level dBm | | | | | |
| 72.81 | 95.54 | 255 | 1.8 | V | 72.81 | 12.45 | 2.4 | 0.1 | 10.50 | / | / | |

5- OCCUPIED BANDWIDTH

5.1 Standard Applicable

Per FCC §2.1049 and FCC §95.633 (b), The authorized bandwidth for any emission type transmitted by an R/C transmitter is 8 kHz.

5.2 Test Procedure

The antenna was disconnected from the transmitter and the short cable was connected to the transmitter RF output. The RF output was connected to the input of the spectrum analyzer through sufficient attenuation.

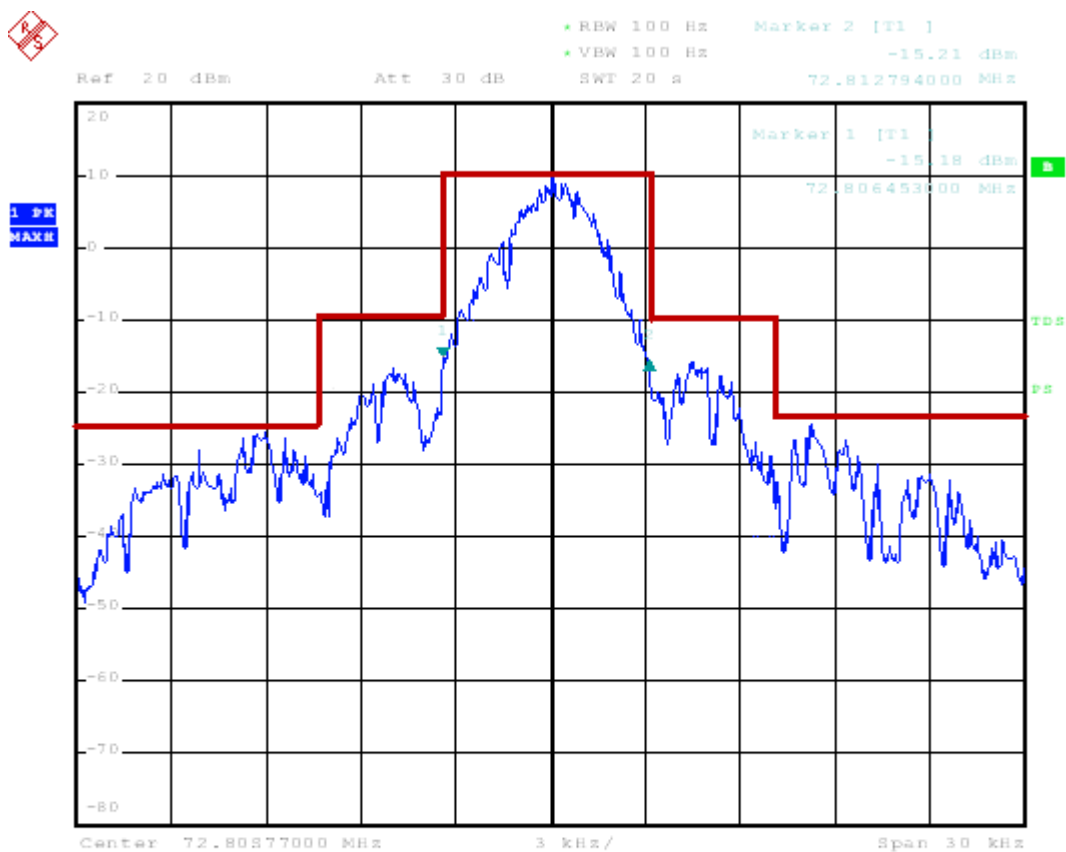
Turn on the transmitter, and set it to transmit the pulse train continuously.

The bandwidth of the carrier was measured and recorded.

5.3 Occupied Bandwidth Test Result

| | |
|------------------------------|-----------------------------|
| Temperature () | 22~23 |
| Humidity (%RH) | 50~54 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Transmitter for Model Plane |
| M/N | WK-1001 |
| Operating Mode | Continuous Transmitting |

Test plots see following page



Date: 8.FEB.2006 12:56:00

6- §95.635(b)(1), §95.635(b)(3), §95.635(b)(7), §95.635(b)(10), §95.635(b)(11), §95.635(b)(12) - UNWANTED EMISSION

6.1 Standard Applicable

Per FCC §95.635 (b)(1), at least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

Per FCC §95.635 (b)(3), at least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

Per FCC §95.635 (b)(7), at least $43 \pm 10 \log_{10} (T)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

Per FCC §95.635 (b)(10), At least 45 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 125% of the authorized bandwidth.

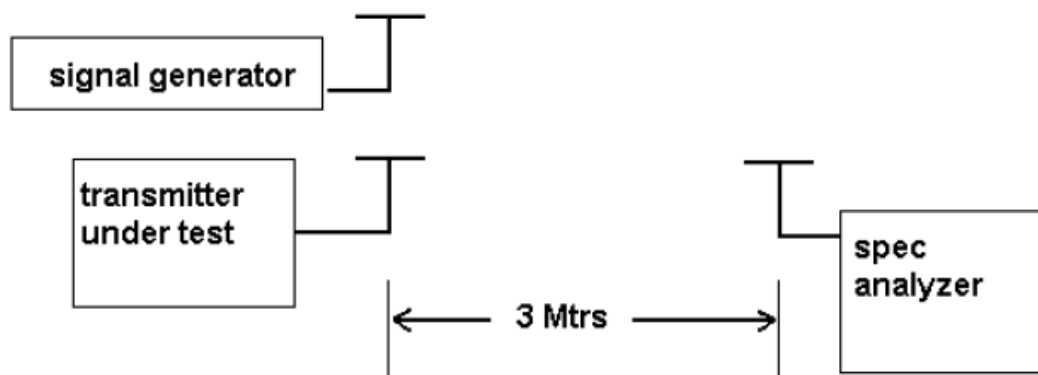
Per FCC §95.635 (b)(11), At least 55 dB on any frequency removed from the center of the authorized bandwidth by more than 125% up to and including 250% of the authorized bandwidth.

Per FCC §95.635 (b)(12), At least $56 + 10 \log_{10} (T)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

6.2 Test Procedure

The procedure used was ANSI C63.4-2003. The unit was operating into its permanently attached antenna at a height of 117 cm. The spectrum was scanned from 30 to at least the tenth harmonic of the fundamental using a spectrum analyzer and an appropriate antenna. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

The test setup plot was followed:



6.3 Unwanted Emission Test Result

| | |
|------------------------------|--------------------------------------|
| Temperature () | 22~23 |
| Humidity (%RH) | 50~54 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Transmitter for Model Plane |
| M/N | WK-1001 |
| Operating Mode | Charging and Continuous Transmitting |

Note: 1. During the test, the EUT was respectively set to continuous transmitting mode and charging mode, and only the worst test result was recorded and presented.

2. Calculation of FCC Limit was: $56+10 \log_{10}(0.011)=36.4\text{dB}$

Test Result used Substitution Method:

| Indicated | | Table | Test Antenna | | | Substituted | | Antenna Gain Correction | Cable Loss dB | Absolute Level dBm | Limit dBm | Margin dB |
|---------------|----------------------|-------|--------------|--------------|-----------|---------------|-----------|-------------------------|---------------|--------------------|-----------|-----------|
| Frequency MHz | Meter Reading dBuV/m | | Angle Degree | Height Meter | Polar H/V | Frequency MHz | Level dBm | | | | | |
| 72.81 | 95.54 | 255 | 1.8 | V | 72.81 | 12.45 | 2.4 | 0.1 | 10.15 | / | / | |
| 87.37 | 36.50 | 301 | 1.6 | V | 87.37 | -29.00 | 2.4 | 0.1 | -31.30 | -26.4 | 4.90 | |
| 145.62 | 38.63 | 301 | 1.7 | V | 145.62 | -29.22 | 3.3 | 0.2 | -32.42 | -26.4 | 6.02 | |
| 218.43 | 34.25 | 110 | 1.7 | V | 218.43 | -27.25 | 3.1 | 0.2 | -30.25 | -26.4 | 3.85 | |
| 291.24 | 32.75 | 255 | 1.7 | V | 291.24 | -33.01 | 3.2 | 0.1 | -36.01 | -26.4 | 9.61 | |
| 364.05 | 38.50 | 255 | 1.8 | V | 364.05 | -38.25 | 4.0 | 0.1 | -42.15 | -26.4 | 15.75 | |
| 436.86 | 37.95 | 301 | 1.6 | V | 436.86 | -36.80 | 3.9 | 0.1 | -40.60 | -26.4 | 14.20 | |
| 509.67 | 38.35 | 301 | 1.7 | V | 509.67 | -41.90 | 4.1 | 0.2 | -45.80 | -26.4 | 19.40 | |
| 582.48 | 34.20 | 110 | 1.7 | V | 582.48 | -43.40 | 4.1 | 0.2 | -47.30 | -26.4 | 20.90 | |
| 655.29 | 32.80 | 120 | 1.7 | V | 655.29 | -43.20 | 4.2 | 0.2 | -47.20 | -26.4 | 20.80 | |
| 720.81 | 32.75 | 250 | 1.7 | V | 720.81 | -43.20 | 4.2 | 0.2 | -47.20 | -26.4 | 20.80 | |
| 72.81 | 87.68 | 255 | 1.8 | H | 72.81 | 7.45 | 2.3 | 0.1 | 5.25 | / | / | |
| 87.37 | 34.70 | 301 | 1.7 | H | 87.37 | -32.45 | 2.3 | 0.1 | -34.65 | -26.4 | 8.25 | |
| 145.62 | 35.70 | 301 | 1.8 | H | 145.62 | -33.68 | 3.3 | 0.2 | -36.78 | -26.4 | 10.38 | |
| 218.43 | 33.10 | 110 | 1.6 | H | 218.43 | -32.10 | 3.2 | 0.2 | -35.10 | -26.4 | 8.70 | |
| 291.24 | 29.78 | 255 | 1.7 | H | 291.24 | -37.05 | 3.2 | 0.2 | -40.05 | -26.4 | 13.65 | |
| 364.05 | 33.60 | 255 | 1.8 | H | 364.05 | -38.45 | 3.9 | 0.2 | -42.15 | -26.4 | 15.75 | |
| 436.86 | 32.55 | 301 | 1.7 | H | 436.86 | -41.50 | 3.9 | 0.2 | -45.20 | -26.4 | 18.80 | |
| 509.67 | 33.35 | 301 | 1.8 | H | 509.67 | -43.70 | 4.0 | 0.2 | -47.50 | -26.4 | 21.10 | |
| 582.48 | 30.20 | 110 | 1.7 | H | 582.48 | -43.50 | 4.2 | 0.2 | -47.50 | -26.4 | 21.10 | |
| 655.29 | 29.75 | 255 | 1.7 | H | 655.29 | -43.50 | 4.2 | 0.2 | -47.50 | -26.4 | 21.10 | |
| 720.81 | 29.30 | 250 | 1.7 | H | 720.81 | -43.50 | 4.2 | 0.2 | -47.50 | -26.4 | 21.10 | |

7- FREQUENCY STABILITY MEASUREMENT

7.1 Standard Applicable

According to FCC §2.1055(a)(1), the frequency stability shall be measure with variation of ambient temperature from -30°C to $+50^{\circ}\text{C}$, and according to FCC 2.1055(d)(2), the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point which is specified by the manufacturer.

According to FCC §95.623(c), All R/C transmitters capable of operation in the 72-76 MHz band that are manufactured in or imported into the United States, on or after March 1, 1992, or are marketed on or after March 1, 1993, must be maintained within a frequency tolerance of 0.002%.

7.2 Test Procedure

Frequency stability versus environmental temperature

The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feedthrough attenuators. The EUT was placed inside the temperature chamber at 25 degrees C and allowed to stabilize for one hour. The transmitter was keyed ON for one minute during which four frequency readings were recorded at 15-second intervals. The worse case number was taken for temperature plotting. The assigned channel frequency was considered to be the reference frequency. The temperature was then reduced to -30 degrees C after which the transmitter was again allowed to stabilize for one Hour. The transmitter was keyed ON for one minute, and again frequency readings were noted at 15-second intervals. The worst-case Number was recorded for temperature plotting. This procedure was repeated in 10 degree increments up to $+50$ degrees C.

Frequency Stability versus Input Voltage

At room temperature ($25\pm 5^{\circ}\text{C}$), an external variable DC power supply was connected to the EUT. Readings were also taken at the end point of the battery voltage of 12.0VDC.

7.3 Frequency Stability Test Result

| | |
|------------------------------|-----------------------------|
| Temperature () | 22~23 |
| Humidity (%RH) | 50~54 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Transmitter for Model Plane |
| M/N | WK-1001 |
| Operating Mode | Continuous Transmitting |

| Reference Frequency: 72.81 MHz, Limit: +/-0.002% | | | |
|--|----------------------|-------------------------------------|---------|
| Environment Temperature (°C) | Power Supplied (VDC) | Frequency Measure with Time Elapsed | |
| | | MCF (MHz) | Error % |
| 50 | 12 | 72.80927 | -0.0010 |
| 40 | 12 | 72.80949 | -0.0007 |
| 30 | 12 | 72.80945 | -0.0008 |
| 20 | 12 | 72.80978 | -0.0003 |
| 10 | 12 | 72.80962 | -0.0005 |
| 0 | 12 | 72.80989 | -0.0002 |
| -10 | 12 | 72.81011 | +0.0002 |
| -20 | 12 | 72.81017 | +0.0002 |
| -30 | 12 | 72.81009 | +0.0001 |

So, Frequency Stability Versus Input Voltage is:

| Reference Frequency: 72.81 MHz, Limit: +/-0.002% | | |
|--|-------------------------------------|---------|
| Power Supplied (VDC) | Frequency Measure with Time Elapsed | |
| | Frequency (MHz) | Error % |
| 5 | 72.80955 | -0.0006 |