EMC TEST REPORT

No. JSH05110518-001

Applicant	:Shanghai P&C Telesystems Inc. No. 1991-1 Cao An Road, Shanghai, P.R.China
Manufacturer	:Shanghai P&C Telesystems Inc. No. 1991-1 Cao An Road, Shanghai, P.R.China
Equipment	:Pistol Radio（75MHz）2CH&3CH
Type/Model	:FM-34T

Summary

The test report is to certify that the tested equipment properly complies with the requirements of:

FCC Rules and Regulations Part 95: Radio Control (R/C) Radio Service

Description

The appliances were tested by Quitek Corp. and found compliance with relevant requirements described in FCC Part 95: Radio Control (R/C) Radio Service.

Test results are contained in this test report and Intertek Testing Services ETL SEMKO Shanghai Limited is assumed full responsibility for the accuracy and completeness of these measurements.

Date of issue: January 5, 2006

Prepared by: Approved by:

Daniel Zhao(*Project engineer*) Steve Li (*Reviewer*)

Description of Test Facility

Name: Intertek Testing Service Shanghai Limited

Address: Building No.86, 1198 Qinzhou Road(North), Shanghai 200233, P.R. China

FCC Registration Number: 236597

Name of contact : Steve Li

Content

1.Applicant Information

Applicant	:Shanghai P&C Telesystems Inc. No. 1991-1 Cao An Road, Shanghai, P.R.China
Manufacture	: Shanghai P&C Telesystems Inc. No. 1991-1 Cao An Road, Shanghai, P.R.China
Country of origin	: P.R. China
Name of contact	: Ms. Lucy Dong
Telephone	: 86 21 59148358
Telefax	: 86 21 59144872

2.Information of Equipment Under Test (EUT)

2.1 Identification of the EUT

Equipment	: Pistol Radio（75MHz）2CH&3CH
Type of equipment	: Radio Control (R/C) Transmitter
Type/model	: FM-34T
FCC ID	: SEQFM-34T
Date of sample receipt	: December 20, 2005
Date of test	: December 22 – 29, 2005

2.2 Technical specification

TX Frequency	: 75.41 ~ 75.99 MHz (EUT in 75.79MHz)
Type of emission	: 4K40F1D
Rating	: DC 9.6 - 12V
Description of EUT	: Model FM-34T is the transmitter for radio control model (surface craft). There are two technical states for this model; one has 2 channels, and the other has 3 channels. They are same in RF circuit and PCB layout. Only the 3 channels unit adds a key to produce a channel control signal based on 2 channels one. All test were performed on the 3 channels unit.

2.3 Mode of operation during the test / Test peripherals used

The compliance tests were performed under the following operation mode.

(1) Measurement of Field Strength of Spurious Radiation;
Transmitting continuously,
With new battery supply nominal DC 12.0V
Antenna extended to the longest.
Operating with F = 75.79MHz

(2) Frequency Stability Measurement;
The EUT was continuously transmitted in modulation mode.

(3) Except above two test items:

See the page of each test items.

The EUT is configured as stand-alone device.

2.4 Standards

The Code of Federal Regulation 47, Part 95: PERSONAL RADIO SERVICES - Subpart C & E Radio Control (R/C) Radio Service.

The Code of Federal Regulation 47, Part 2: FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS - Subpart J Equipment Authorization Procedures

2.5 Instrument list

Equipment	Type	Manu.	Serials number	Cal. Date	Cal. Interval
Test receiver	ESCS 30	R&S	835418/003	2005-3-14	1 Year
Passive voltage probe	ESH2-Z3	R&S	100009	2005-3-14	2 Years
Artificial mains network	ESH3-Z5	R&S	835239/008	2005-3-14	1 Year
Absorbing Clamp	MDS 21	R&S	831676/016	2005-3-15	1 Year
Oscilloscope	TDS430A	TEK	B061847	2005-11-20	1 Year
Harmonic & Flicker test system	500lix-CTS-400	California Instruments	HK53885	2005-3-15	1 Year
Signal generator	SML03	R & S	838503/018	2005-3-14	1 Year
Log-periodic Antenna	HL046	R & S	100001	2005-10-10	1 Year

Horn Antenna	AT4002A	AR	302196	2005-10-10	1 Year
Power Amplifier	500W1000A	AR	302108	2005-8-16	1 Year
Power Amplifier	30S1G3	AR	302240	2005-9-6	1 Year
Field Monitor Mainframe 4 slors	FM5004	AR	300546	2005-8-2	1 Year
Isotropic “E” field probe	FP6001	AR	300540	2005-9-4	1 Year
RF generator with amplifier	NSG-2070	SCHAFFNER	1013	2005-8-2	2 Years
CDN	CDN M216	SCHAFFNER	15609	2005-8-2	2 Years
CDN	CDN M316	SCHAFFNER	15128	2005-8-2	2 Years
Attenuator	INA2070-1	SCHAFFNER	2013	2005-8-2	2 Years
EMC immunity system	BEST EMC	SCHAFFNER	200024-001SC	2005-8-2	1 Year
EMI test receiver	ESI 26	R&S	838687/011	2005-8-13	1 Year
Broadband antenna	HL562	R&S	100019	2005-10-10	1 Year
Horn antenna	HF906	R&S	100023	2005-6-24	1 Year
10m anechoic chamber	-	Franconia	-	2005-9-6	Half year

3. Test Summary

This report applies to tested sample only. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.

TEST ITEM	RESULT	NOTE
RF Power Output (Substitution Method)	Pass	
Emission Bandwidth	Pass	
Field Strength of Spurious Radiation	Pass	
Frequency Stability Measurement	Pass	

Notes: 1: NA =Not Applicable

4. RF OUTPUT POWER AND RADIATED SPURIOUS EMISSIONS

4.1 Reference File and Specification

FCC Rule Part 95(Section 95.635) and Part 2 Subpart J (Section 2.1053)

4.2 Test Procedure

(1) The measurement was applied in an anechoic chamber. Place the transmitter to be tested (EUT) on the turntable.

(2) Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier.

(3) For each spurious frequency, raise and lower the test antenna from 1m to 4m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Then the turntable should be rotated 360o to determine the maximum reading. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.

(4) Repeat step (3) for each spurious frequency with the test antenna polarized vertically.

(5) Remove the transmitter and replace it with a substitution antenna (the antenna should be approximately at the same location as the center of the transmitter.). At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.

(6) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-reading cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the generator output.

(7) Repeat step (6) with both antennas vertically polarized for each spurious frequency.

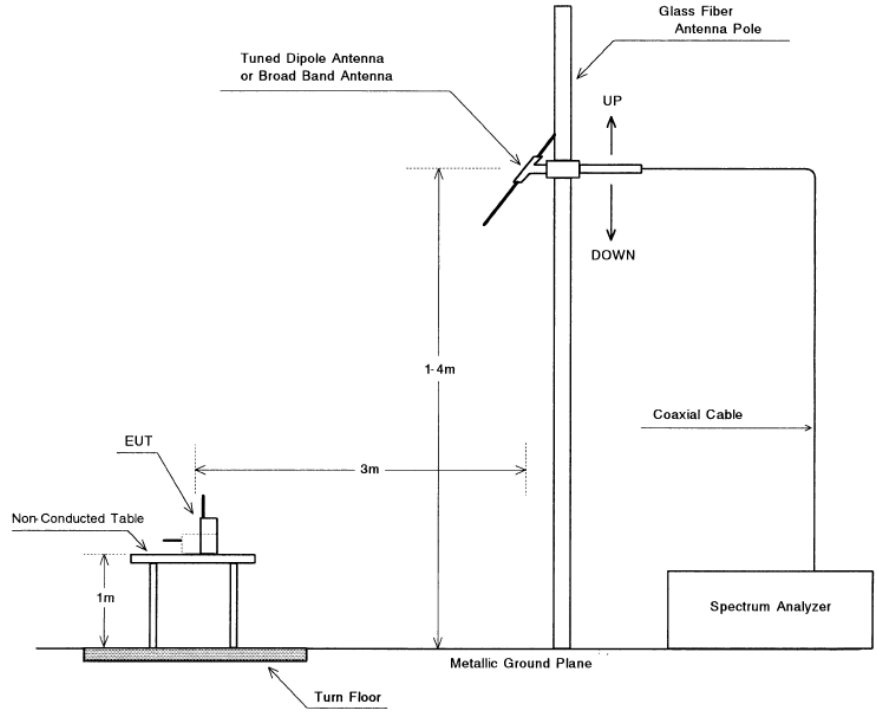
(8) Calculate power in dBm into a reference ideal half –wave dipole antenna by reducing the readings obtained in steps (6) and (7) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.

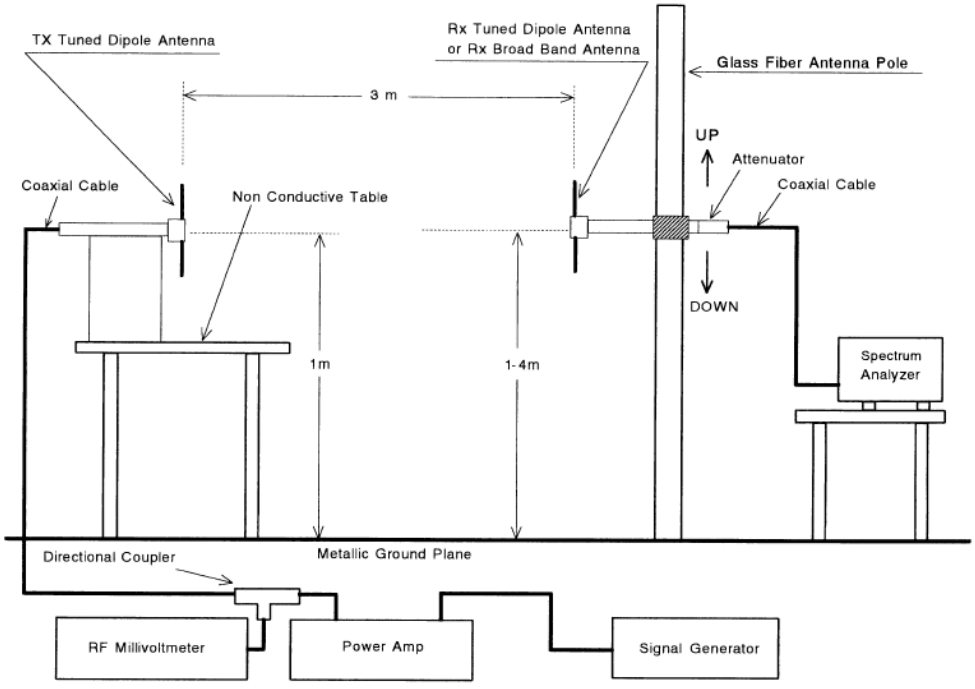
(9) The level records in step (8) are the absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

$$\text{Radiated spurious emissions (dB)} = 10\log_{10}\left[\frac{\text{TX power in watts}}{0.001}\right] - \text{the levels in step (8)}$$

Note: it is permissible to use other antennas provided they can be referenced to a dipole.

4.3 Test Configuration





4.4 Test Results

Temperature: 25 °C
Humidity: 43%

Carrier Frequency (MHz)	Power meter Reading (dBm)	Antenna Polarization (H/V)	Correction Factor (dB)	ERP (dBm)	RF Output Power (mW)	Limit (mW)
75.79	23.60	V	-9.84	13.76	23.77	750.0

Spurious Emission Frequency (MHz)	Power meter Reading (dBm)	Antenna Polarization (H/V)	Correction Factor (dB)	ERP (dBm)	Separation From Carrier (dBc)	Limit of ERP (dBc)	Margin For Limits (dB)
45.47	-23.30	V	-9.78	-33.08	-46.84	-39.76	7.08
60.63	-21.10	V	-9.83	-30.93	-44.69	-39.76	4.93
90.95	-23.00	V	-9.98	-32.98	-46.74	-39.76	6.98
242.53	-36.10	H	-10.20	-46.30	-60.06	-39.76	20.30
272.84	-36.70	H	-10.30	-47.00	-60.76	-39.76	21.00
348.63	-38.60	H	-10.07	-48.67	-62.43	-39.76	22.67
378.95	-32.80	H	-10.09	-42.89	-56.65	-39.76	16.89
394.11	-35.60	H	-10.10	-45.70	-59.46	-39.76	19.70
409.27	-35.70	V	-10.11	-45.81	-59.57	-39.76	19.81
424.42	-30.30	V	-10.15	-40.45	-54.21	-39.76	14.45
485.06	-37.00	V	-10.18	-47.18	-60.94	-39.76	21.18
530.53	-37.80	H	-10.23	-48.03	-61.79	-39.76	22.03
727.58	-41.00	H	-10.47	-51.47	-65.23	-39.76	25.47
742.74	-42.00	H	-10.49	-52.49	-66.25	-39.76	26.49

Note:
(1) Limit of ERP in dB
-56 – 10Log(0.02377) = -39.76 dB.
(2) Correction factor is included cable loss, coupling factor and attenuator loss.
(3) Three axes were tested, and the maximum values were recorded.
(4) ERP(dBm) = Power meter Reading(dBm) + Correction Factor(dB)
Margin (dB) = Limit of ERP(dBm) – Separation From Carrier(dBm)

Example: 90.95MHz
Power meter Reading = -23.00 dBm;
Correction Factor = -9.98 dB;
ERP = -23.00 + (-9.98) = -32.98 dBm;
Margin = -39.76 – (-46.74) = 6.98 dB.

Test Engineer: Daniel Zhao **Daniel Zhao** **Date of test:** **December 22, 2005**

5. Emission Bandwidth

5.1 Reference Rule and Specification

FCC Rule Part 95 (Section 95.633), (Section 95.635) and Part 2 Subpart J (Section 2.1049)

5.2 Test Procedure

The Occupied bandwidth is measured with a spectrum analyzer connected to the transmitter output while EUT is operating in transmit mode with modulation at the appropriate frequency. The spectrum analyzer was set to: RBW = 100 Hz, VBW = 100 Hz, span = 100 kHz, sweep = 10s

5.3 Test Configuration

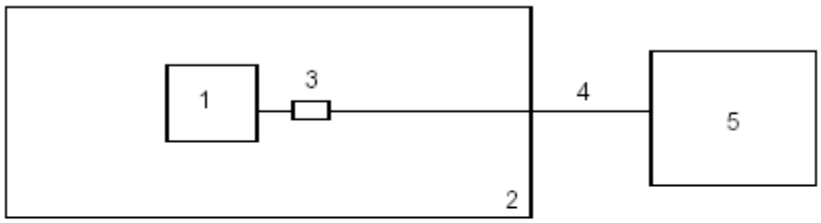


Figure 3: Measurement setup for operating bandwidth test

1 Transmitter (EUT)
2 Wooden table
3 DC-block
4 Test cable
5 Spectrum analyzer

5.4 Test Results

Ref Level (dBm)	Center Frequency (MHz)
13.76	75.79

Level (dBm)	M1/M2 Frequency (MHz)	Occupied Bandwidth (kHz)	Authorized Bandwidth (kHz)
-11.58	75.78720	4.40	8.00
-6.45	75.79160		

Test Engineer: Daniel Zhao **Daniel Zhao** **Date of test:** **December 22, 2005**

6. FREQUENCY STABILITY MEASUREMENT

6.1Reference Rule and Specification

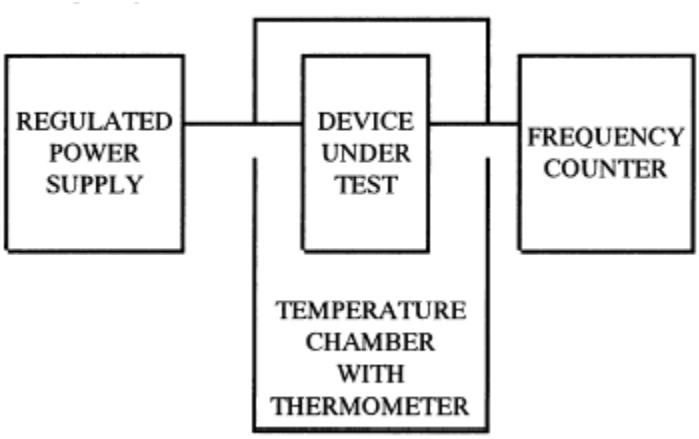
FCC Rule Part 95 (Section 95.623) and Part 2 Subpart J(Section 2.1055)

6.2 Frequency VS Temperature Test

The carrier power was measured with a spectrum analyzer connected to the output of the transmitter power amplifier while EUT was operating in transmit mode at the frequency (75.79MHz).

The spectrum analyzer was set to max hold with
RBW = 100 Hz, VBW = 100 Hz, span = 100 kHz, sweep = 10s

6.3Test Configuration



6.4Test Result

6.4.1Frequency vs Temperature Test

Temperature (°C)	Frequency Measured (MHz)	Frequency Deviation (MHz)	Frequency Deviation %	Limits %
-30	75. 791102	0. 001102	0. 00145	+/- 0.002%
-20	75. 790979	0. 000979	0. 00129	
-10	75. 791025	0. 001025	0. 00135	
0	75. 791113	0. 001113	0. 00147	
10	75. 791137	0. 001137	0. 00150	
20	75. 791182	0. 001182	0. 00156	
30	75. 791213	0. 001213	0. 00160	
40	75. 791100	0. 001100	0. 00145	
50	75. 790840	0. 000840	0. 00111	

6.4.2 Frequency vs Voltage Test

Input Voltage (v)	Frequency Measured (MHz)	Frequency Deviation (kHz)	Frequency Deviation %	Limits %
8.6	75. 791160	0. 001160	0.00153%	+/- 0.002%

Test Engineer: Daniel Zhao **Daniel Zhao** **Date of test:** **December 29, 2005**