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**FCC PART 95 SUBPART C  
AND IC RSS-210 TEST REPORT  
FOR REMOTE CONTROL TRANSMITTERS**

<b>APPLICANT</b>	HITEC RCD INC.
	12115 PAINE STREET POWAY CALIFORNIA 92064 USA
<b>FCC ID</b>	IFHSPECPRO-72
<b>IC</b>	3420A-SPECPRO72
<b>MODEL NUMBER</b>	SPECTRA PRO
<b>PRODUCT DESCRIPTION</b>	RADIO CONTROL HOBBY TRANSMITTER
<b>DATE SAMPLE RECEIVED</b>	January/13/2011
<b>DATE TESTED</b>	February/1/2011
<b>TESTED BY</b>	JOSEPH SCOGGIO
<b>APPROVED BY</b>	MARIO R. DE ARANZETA
<b>TIMCO REPORT NO.</b>	94AT11TestReport.doc
<b>TEST RESULTS</b>	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**



Testing Certificate # 0955-01



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APPLICANT: HITEC RCD INC.  
FCC ID: IFHSPECPRO-72  
IC: 3420A-SPECPRO72  
REPORT #: H\HITEC\_IFH\94AT11\94AT11TestReport.doc

## GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

The test results relate only to the items tested.

## Summary

The device under test does:

- ☒ fulfill the general approval requirements as identified in this test report  
☐ not fulfill the general approval requirements as identified in this test report

## Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.



Testing Certificate # 0955-01

I attest that the necessary measurements were made, under my supervision, at:

Timco Engineering Inc.  
849 NW State Road 45  
Newberry, Fl 32669



## Authorized Signatory Name:

Mario de Aranzeta C.E.T.  
Compliance Engineer/ Lab. Supervisor

**Date: February/1/2011**

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## GENERAL INFORMATION

### DUT Specification

<b>DUT Description</b>	RADIO CONTROL HOBBY TRANSMITTER
<b>FCC ID</b>	IFHSPECPRO-72
<b>Model Number</b>	SPECTRA PRO
<b>Serial Number</b>	N/A
<b>Operating Frequency</b>	72.01 - 72.99 MHz
<b>Type of Emission</b>	8K0F1D
<b>DUT Power Source</b>	<input type="checkbox"/> 110-120Vac/50- 60Hz
	<input type="checkbox"/> DC Power
	<input checked="" type="checkbox"/> Battery Operated Exclusively
<b>Test Item</b>	<input type="checkbox"/> Prototype
	<input checked="" type="checkbox"/> Pre-Production
	<input type="checkbox"/> Production
<b>Type of Equipment</b>	<input type="checkbox"/> Fixed
	<input type="checkbox"/> Mobile
	<input checked="" type="checkbox"/> Portable



## TEST ENVIRONMENT

Test Facility	Timco Engineering, Inc. 849 NW State Road 45 Newberry, FL 32669 USA.
Test Condition in the laboratory	Temperature: 26°C Relative humidity: 50%

## TEST SETUP SUMMARY

Test Setup Diagram/Description	The DUT was placed on the turntable per setup per ANSI C63.4: 2003. A test set up photo is provided for clarification.
Deviation from the standard/procedure	No deviation
Modification of DUT	No modification
Applicable Standards	EIA/TIA-382-A, FCC CFR 47 PART 95, IC RSS-210

## EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 3/10/10	3/10/12
AC Voltmeter	HP	400FL	2213A14499	CAL 3/23/09	3/23/11
Antenna: Dipole Kit	Electro-Metrics	TDA-30/1-4	153	CHAR 6/10/09	6/10/11
Frequency Counter	HP	5385A	3242A07460	CAL 5/26/09	5/26/11
Hygro-Thermometer	Extech	445703	0602	CAL 1/30/09	1/30/11
Modulation Analyzer	HP	8901A	3435A06868	CAL 5/26/09	5/26/11
Digital Multimeter	Fluke	FLUKE-77-3	79510405	CAL 5/18/09	5/18/11
Analyzer Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CAL 11/21/09	11/21/11
Analyzer Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 11/22/09	11/22/11
Analyzer Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 11/21/09	11/21/11
Analyzer Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 11/24/09	11/24/11
Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 4/25/10	4/25/12



## TEST PROCEDURE

**Power Line Conducted Interference:** The procedure used was EIA/TIA-382-A using a 50uH LISN. Both lines were observed with the UUT transmitting. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

**Bandwidth 20 dB:** The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 1 MHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

**Power Output:** The RF power output was measured at the antenna feed point using a peak power meter.

**Antenna Conducted Emissions:** The RBW = 100 kHz, VBW = 300 kHz and the span set to 10.0 MHz and the spectrum was scanned from 30 MHz to the 10<sup>th</sup> Harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = 3 MHz and the span to 50 MHz.

**Radiation Interference:** The test procedure used was EIA/TIA-382-A using an Agilent spectrum receiver with pre-selector. The bandwidth (RBW) of the spectrum EIA/TIA-382-A receiver was 100 kHz up to 1 GHz and 1 MHz above 1 GHz with an appropriate sweep speed. The VBW above 1 GHz was 3 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

## RF POWER OUTPUT

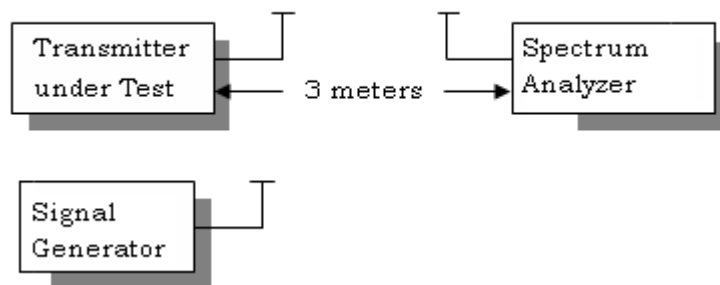
**Rule Part No.:** Part 2.1046(c), Part 95.210 , RSS-210 A1.2.3.2(1)

**Requirements:** For 72-76 MHz, transmitter output power shall not exceed 0.75 W

**Method of Measurement:** RF power is measured radiated in a method similar to that of radiated spurious emissions using the substitution method. With a nominal battery voltage and the transmitter properly adjusted the RF output measures:

**Test Data:** OUTPUT POWER: 0.026W ERP

### Test Setup Diagram:



## Part 2.1033 (C)(8) DC Input into the final amplifier

INPUT POWER:  $(7.2V)(0.37A) = 2.6 \text{ Watts}$





## **MODULATION CHARACTERISTICS**

Not applicable. No voice information permitted in this band.

## OCCUPIED BANDWIDTH

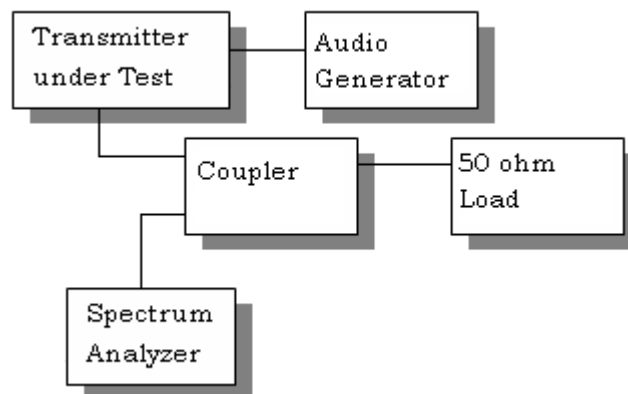
2.1049

95.635 (b). RSS-210 A1.2.3.2(5)

- (1) At least 25dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.
- (2) 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.
- (3) 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.
- (4) At least  $56 + 10 \log_{10} (T)$  dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

### Radiotelephone Transmitter with Modulation Limiter

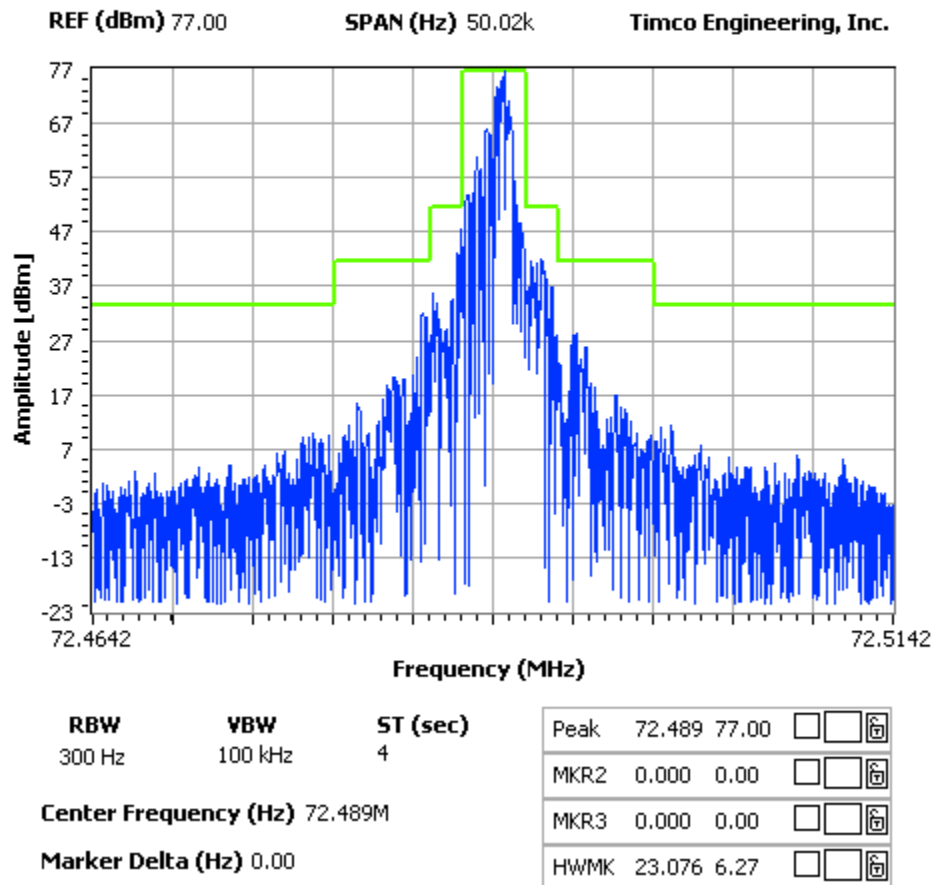
Test procedure diagram



## OCCUPIED BANDWIDTH PLOT

### NOTES:

occupied bandwidth



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**SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)**

**Rule Part No.:** Part 2.1051(a)

Not applicable. No antenna port. This device has a permanently attached antenna.

## FIELD STRENGTH OF SPURIOUS EMISSIONS

**Rule Parts. No.:** 2.1053, 95.635(1)(3)(7)(10)(11)(12), RSS-210

**REQUIREMENTS:** At least  $56 + 10\log(T)$  on any frequency removed from the center of the authorized bandwidth by more than 250%.

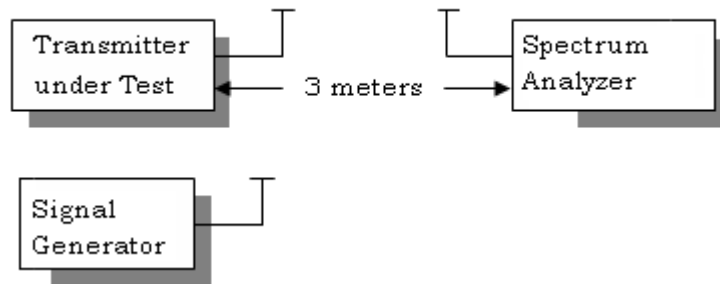
$$56 + 10\log(0.026) = 40.15 \text{ dB}$$

### Test Data:

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
72.50	V	0
145.00	V	63.48
217.50	V	68.54
290.00	V	70.96
362.50	V	61.41
435.00	V	66.16
507.50	V	66.12
580.00	V	65.88
652.50	V	72.96
725.00	V	71.77

**METHOD OF MEASUREMENT:** The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 MHz to at least the tenth harmonic of the fundamental. This test was conducted per EIA/TIA-382-A using the substitution method. Measurements were made at a test site of TIMCO ENGINEERING, INC. located at 849 NW State Road 45, Newberry, FL 32669.

**Test Setup Diagram:**



## FREQUENCY STABILITY

2.1055(a)(1))  
95.623(b), RSS-210 A1.2.3.2(4)

Temperature and voltage tests were performed to verify that the frequency remains within the .002%, 20 ppm specification limit. The test was conducted as follows: The transmitter was placed in the temperature chamber at 25 °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 °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 °C.

Readings were also taken at ±15% of the battery voltage of 12.0 VDC.

### Test Data:

Assigned Frequency (Ref. Frequency) (MHz)		
Temperature (°C)	Frequency (MHz)	Frequency Stability (PPM)
-30	72.490297	10.42
-20	72.490405	11.91
-10	72.490322	10.76
0	72.490120	7.97
+10	72.489872	4.55
+20	72.489695	2.11
+30	72.489441	-1.39
+40	72.489337	-2.83
+50	72.48933	-2.92

Assigned Frequency (Ref. Frequency) (MHz)		
% Battery	Frequency (MHz)	Frequency Stability (PPM)
-15%	72.489543	0.01
0	72.489542	0
+15%	72.489543	0.01