SUBMITTAL APPLICATION REPORT

FOR GRANT OF CERTIFICATION

FOR

MODEL: IQ58
Control Signal Transmitter
FCC ID: ULPIQ58

FOR

Interactive Technologies, Inc.

418 South Kansas
Olathe, KS 66061

Test Report Number: 060820

ROGERS LABS, INC.

4405 West 259th Terrace
Louisburg, KS 66053
Phone / Fax (913) 837-3214

ENGINEERING TEST REPORT
FOR
APLLICATION of
GRANT of CERTIFICATION

FOR

CFR 47, PART 15C - INTENTIONAL RADIATORS

For

Interactive Technologies, Inc.

418 South Kansas
Olathe, KS 66061
Mr. Scott Finnell

Control Signal Transmitter
Model: IQ58
Frequency 315 MHz
FCC ID#: ULPIQ58

Test Date: August 20, 2006

Certifying Engineer: Scot D Rogers

Scot D. Rogers
ROGERS LABS, INC.
4405 West 259th Terrace
Louisburg, KS 66053
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FAX: (913) 837-3214

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FORWARD

The following information is submitted for consideration in obtaining a Grant of Certification for intentional radiators operating under CFR47 Paragraph 15.231.

Name of Applicant:

Interactive Technologies, Inc.
418 South Kansas
Olathe, KS 66061

Model: IQ58

FCC I.D.: ULPIQ58

Frequency Range: 315 MHz
Operating Power: 0.006 mw (3 meter antenna substitution measurement).

E(v/m) = 10^(FSM (dBµV)-120/20)	=10^(72.8-120/20)	= 4.37E-3 v/m
ERP (Watts) = $[(Ed)^2]/30$	= $[(4.37E\text{-}3*3)^{2]}/30$	= 5.72E-6 Watts

Applicable Standards & Test Procedures

In accordance with the Federal Communications Code of Federal Regulations 47, dated October 1, 2005, Part 2, Subpart J, Paragraphs 2.907, 2.911, 2.913, 2.925, 2.926, 2.1031 through 2.1057, and applicable parts of paragraph 15, Part 15C Paragraph 15.231 the following information is submitted.

Test procedures used are the established Methods of Measurement of Radio-Noise Emissions as described in the ANSI 63.4-2003 Document FCC, documents DA00-1407 and DA00-705 and/or TIA/EIA 603-1.

Application for Certification per CFR47 2.1033(b)

(1) Manufacturer: Interactive Technologies, Inc.
418 South Kansas
Olathe, KS 66061

(2) Identification: Model: IQ58
FCC I.D.: ULPIQ58

(3) Instruction Book:
Refer to Exhibit for Instruction Manual.

(4) Description of Circuit Functions:
Refer to Exhibit of Operational Description.

(5) Block Diagram with Frequencies:
Refer to Exhibit of Operational Description.

(6) Report of Measurements:
Report of measurements follows in this Report.

(7) Photographs: Construction, Component Placement, etc.:
Refer to Exhibit for photographs of equipment.

(8) No Peripheral Equipment was Necessary.

(9) Transition Provisions of 15.37 are not being requested.

(10) Frequency hopping Spread Spectrum transmitters:
Not applicable as this device does not function as a spread spectrum transmitter.

(11) Scanning receiver:
Not applicable as this device is not a scanning receiver.

(12) Not Applicable.
The EUT does not operate in the 59 – 64 GHz frequency band.

Equipment Tested

Equipment	Model	FCC I.D.#
EUT	IQ58	ULPIQ58

Equipment Function and Testing Procedures

The EUT is a 315 MHz radio transmitter used to control remotely located equipment. The unit enables an operator to send control signals to remote switches and controls. The unit operates at 315 MHz and sends wireless control signals to the receiver for control of the remote equipment. The unit only transmits when one of the switches are pressed and ends transmission when the switch is released. The device operates from a replaceable button cell battery only offering no other connection for power. The device utilizes a permanently connected antenna system on the printed circuit board of the transmitter with no provision for user replacement. The unit has no provision to connect to other external auxiliary equipment.

Equipment and Cable Configurations

Conducted Emission Test Procedure per CFR47 15.207

The unit operates from a replaceable internal button cell battery only. The unit has no provision to connect to utility power and is therefore exempt from conducted emissions testing.

Radiated Emission Test Procedure per CFR47 15.209

The EUT was placed on a rotating 1 x 1.5-meter wooden platform, 0.8 meters above the ground plane at a distance 3 meters from the Field Strength Measuring (FSM) antenna. Electro Magnetic Interference (EMI) energy was maximized by equipment placement, raising and lowering the FSM antenna, changing the antenna polarization, and by rotating the turntable. Each emission was maximized before data was taken using a spectrum analyzer. The antenna substitution method was used to measure the radiated power required to reproduce the measured emission of the intentional radiator. Refer to photographs in the exhibits for EUT placement.

List of Test Equipment

A Hewlett Packard 8591EM Spectrum Analyzer was used as the measuring device for the emissions testing of frequencies below 1 GHz. A Hewlett Packard 8562A Spectrum Analyzer was used as the measuring device for testing the emissions at frequencies above 1 GHz. The analyzer settings used are described in the following table. Refer to the appendix for a complete list of test equipment.

HP 8591 EM ANALYZER SETTINGS		
CONDUCTED EMISSIONS:		
RBW	AVG. BW	DETECTOR FUNCTION
9 kHz	30 kHz	Peak / Quasi Peak
RADIATED EMISSIONS: (Below 30 MHz)		
RBW	AVG. BW	DETECTOR FUNCTION
9 kHz	30 kHz	Peak / Average
RADIATED EMISSIONS: (Above 30 MHz)		
RBW	AVG. BW	DETECTOR FUNCTION
120 kHz	300 kHz	Peak / Quasi Peak
HP 8562A ANALYZER SETTINGS		
RBW	VIDEO BW	DETECTOR FUNCTION
100 kHz	100 kHz	PEAK
1 MHz	1 MHz	Peak / Average

Equipment	Manufacturer	Model	Cal. Date	Due
LISN	Comp. Design	FCC-LISN-2-MOD.CD	10/05	10/06
LISN	Comp. Design	1762	2/06	2/07
Antenna	ARA	BCD-235-B	10/05	10/06
Antenna	EMCO	3147	10/05	10/06
Antenna	EMCO	3143	5/06	5/07
Analyzer	HP	8591EM	5/06	5/07
Analyzer	HP	8562A	2/06	2/07

Units of Measurements

Conducted EMI Data is in dBµV; dB referenced to one microvolt.

Radiated EMI Data is in dBµV/m; dB/m referenced to one microvolt per meter.

Test Site Locations

Site Approval Refer to Appendix for FCC Site Approval Letter, Reference # 90910.

NVLAP Accredited Lab Code 200087-0.

Conducted EMI The AC power line conducted emissions tests were performed in a shielded screen room located at Rogers Labs, Inc., 4405 W. 259th Terrace, Louisburg, KS.

Radiated EMI The radiated emissions tests were performed at the 3 meters, Open Area Test Site (OATS) located at Rogers Labs, Inc., 4405 W. 259th Terrace, Louisburg, KS.

Unintentional Radiators per CFR47 Part 15 Subpart B

Conducted EMI per CFR47 15.107

The unit operates from 12 volt dc supplied from an internal battery. The unit has no provision to connect to utility power and is therefore exempt from conducted emissions testing.

Radiated EMI per CFR47 15.109

The EUT was arranged in a typical equipment configuration and operated through all of its various modes. Preliminary testing was performed in a screen room with the EUT positioned 1 meter from the FSM. Radiated emissions measurements were performed to identify the frequencies, which produced the highest emissions. Plots were made of the frequency spectrum from 30 MHz to 6,000 MHz for the preliminary testing. Refer to figures one through four for plots of the radiated emissions spectrum taken in a screen room at one meter distance. The highest radiated emission was then re-maximized at the OATS location before final radiated emissions measurements were performed. Final data was taken with the EUT located at the OATS at a distance of 3 meters between the EUT and the receiving antenna to demonstrate compliance with the general radiated emissions limits. The frequency spectrum from 30 MHz to 6,000 MHz was searched for radiated emissions. Measured emission levels were maximized by EUT placement on the table, rotating the turntable through 360 degrees, varying the antenna height between 1 and 4 meters above the ground plane and changing antenna position between horizontal and vertical polarization. Antennas used were Broadband Biconical from 30 to 200 MHz, Biconilog from 30 to 1000 MHz, Log Periodic from 200 MHz to 5 GHz and or, pyramidal horns and mixers from 4 GHz to 10 GHz, notch filters and appropriate amplifiers were utilized.

Sample Calculations:

RFS = Radiated Field Strength
dBµV/m @ 3m = dBµV + A.F. - Amplifier Gain
dBµV/m @ 3m = 54.1 + 19.7 - 30
= 43.8

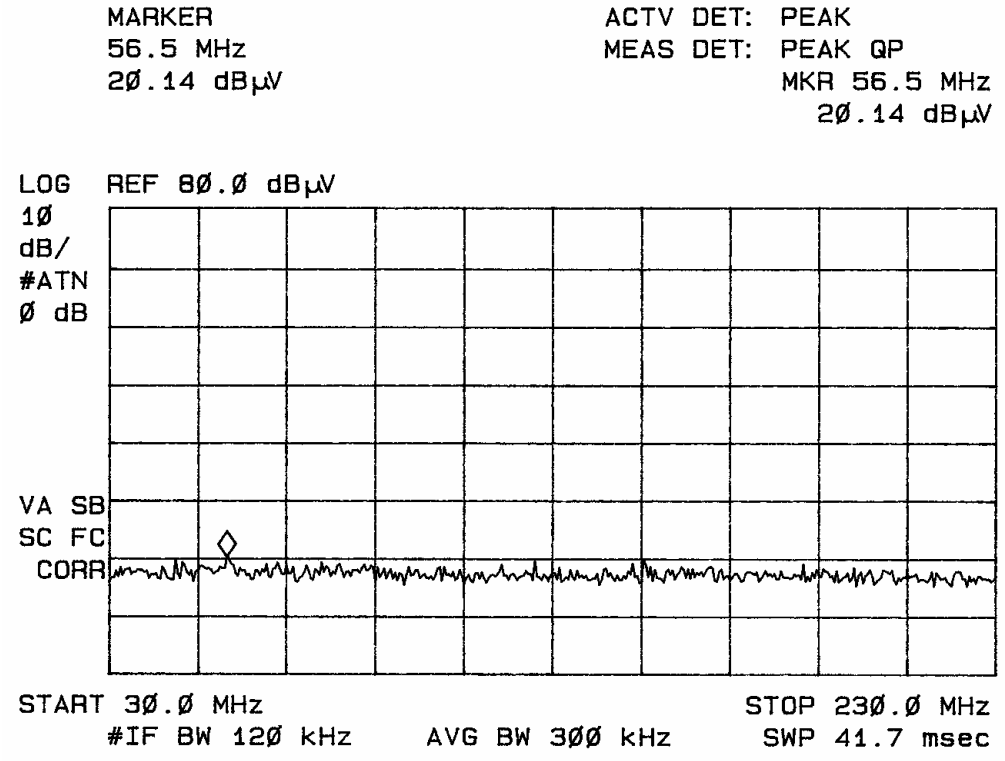

Figure one Radiated Emissions taken at 1 meter in screen room.

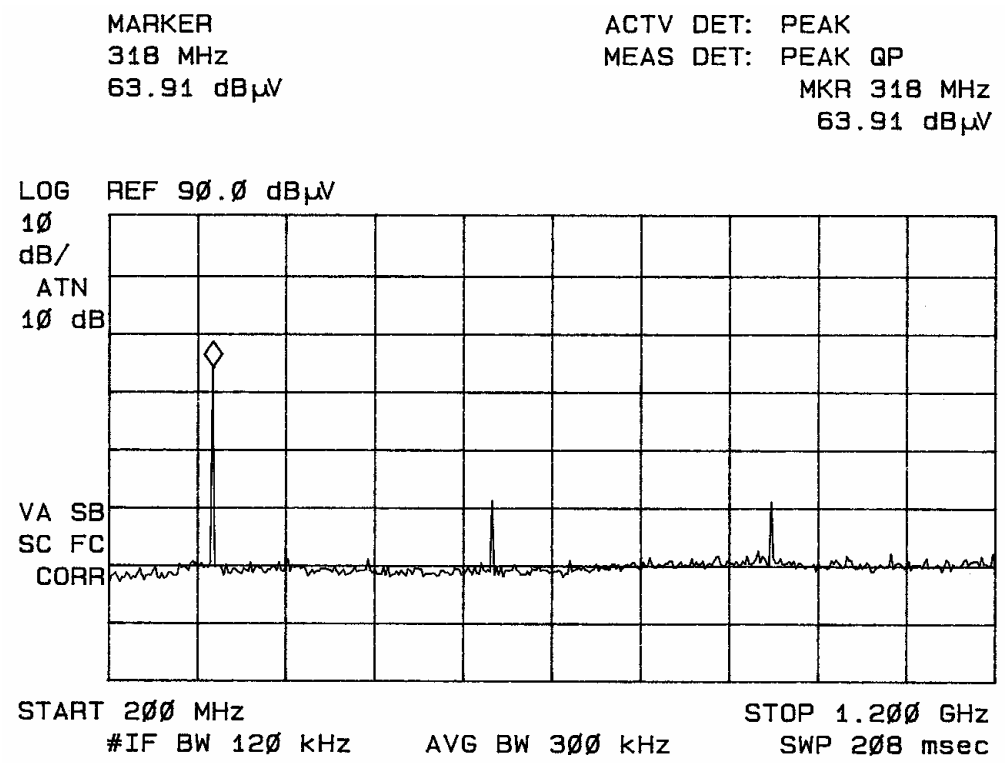

Figure two Radiated Emissions taken at 1 meter in screen room.

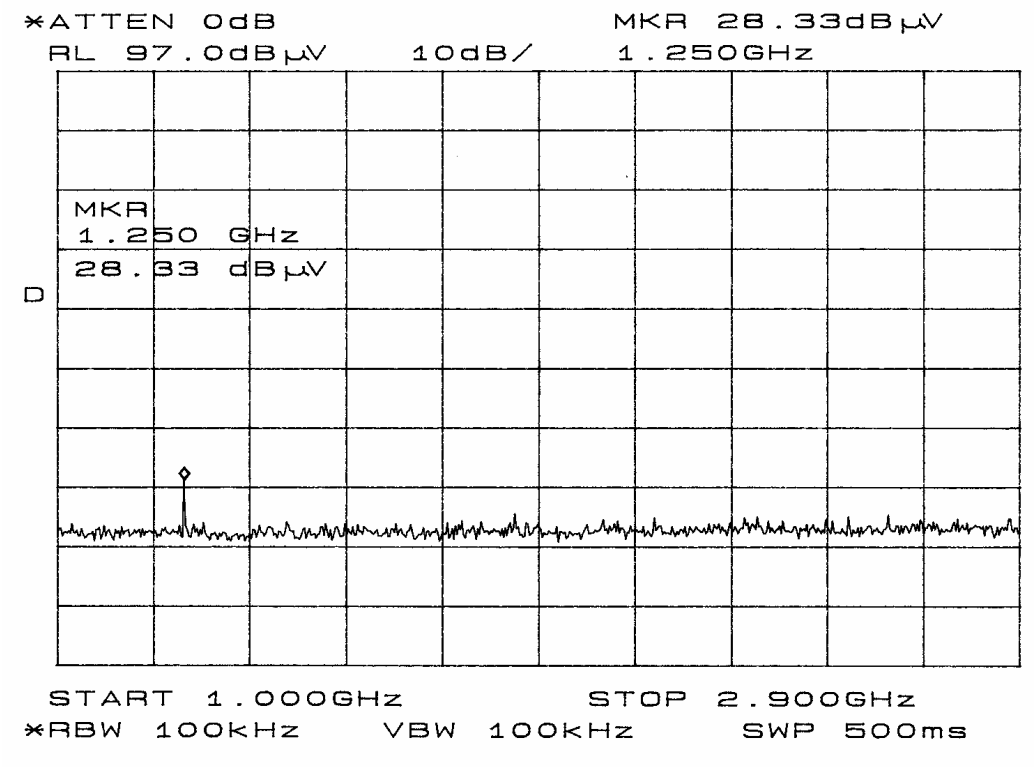

Figure three Radiated Emissions taken at 1 meter in screen room.

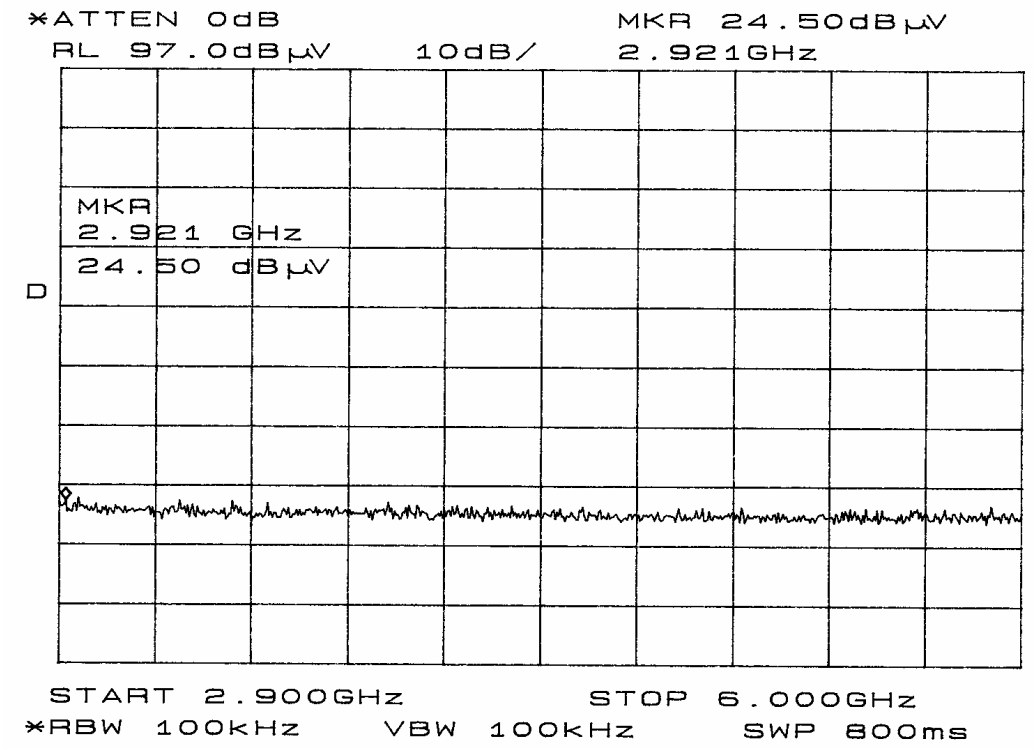

Figure four Radiated Emissions taken at 1 meter in screen room.

AC Line Conducted (CFR47 15.107)

Frequency band (MHz)	L1 Level (dBµV) Peak	Q.P.	AVE	L2 Level (dBµV) Peak	Q.P.	AVE	CISPR 22 Q.P./AVE Limit(dBµV)
0.15 – 0.5							66 / 56
0.5 – 5							56 / 46
5 – 10							60 / 50
10 – 15							60 / 50
15 – 20							60 / 50
20 – 25							60 / 50
25 – 30							60 / 50

Other emissions present had amplitudes at least 20 dB below the limit.

General Radiated Emissions (CFR47 15.109)

Frequency in MHz	FSM Horz. (dBµV)	FSM Vert. (dBµV)	A.F. (dB/m)	Amp. Gain (dB)	RFS Horz. @ 3m (dBµV/m)	RFS Vert. @ 3m (dBµV/m)	FCC Class B Limit @ 3m (dBµV/m)
630.0	54.1	51.3	19.7	30	43.8	41.0	54.0
945.0	58.9	48.9	23.6	30	52.5	42.5	54.0
1260.0	48.6	44.2	25.3	30	43.9	39.5	54.0
1575.0	36.3	28.1	27.1	30	33.4	25.2	54.0
1890.0	21.5	23.3	29.2	30	20.7	22.5	54.0
2205.0	13.2	11.8	31.2	30	14.4	13.0	54.0

Other emissions present had amplitudes at least 10 dB below the limit.

Summary of Results for Conducted Emissions per CFR47 15.107

The conducted emissions for the EUT meet the requirements for CISPR 22 and FCC Part 15B CLASS B Digital Devices. The EUT is powered solely from internal battery supply and has no provision to connect to utility power and is therefore exempt from conducted emissions testing.

Summary of Results for Radiated Emissions per CFR47 15.109

The radiated emissions for the EUT meet the requirements for CISPR 22 and FCC Part 15B CLASS B Digital Devices. The EUT had at least a 1.5 dB minimum margin below the average limit. Other emissions were present with amplitudes at least 20 dB below the limit.

Statement of Modifications and Deviations

No modifications to the EUT were required for the unit to meet the CISPR 22 or FCC Part 15B CLASS B emissions standards. There were no deviations or exceptions to the specifications.

Intentional Radiators per CFR47 Part15 Subpart C

As per CFR47 Part 15, Subpart C, paragraph 15.201 the following information is submitted.

Antenna Requirements per CFR47 15.203

The unit is produced with a permanently attached antenna and has no provision for user service, replacement, or antenna modification. The requirements of 15.203 are fulfilled and there are no deviations or exceptions to the specification.

Restricted Bands of Operation per CFR47 15.205

Spurious emissions falling in the restricted frequency bands of operation were measured at a distance of three meters at the OATS. The EUT utilizes frequency, determining circuitry, which generates harmonics falling in the restricted bands. Emissions were checked at the OATS, using appropriate antennas or pyramidal horns, amplification stages, and a spectrum analyzer. No other significant emission was observed which fell into the restricted bands of operation.

Sample Calculation:

RFS (dBµV/m @ 3m) = FSM(dBµV) + A.F.(dB) - Gain(dB)
= 36.3 + 27.1 - 30
= 33.4

Radiated Emissions in Restricted Bands Data per CFR47 15.205

Frequency in MHz	FSM Horz. (dBµV)	FSM Vert. (dBµV)	A.F. (dB/m)	Amp. Gain (dB)	RFS Horz. @ 3m (dBµV/m)	RFS Vert. @ 3m (dBµV/m)	FCC Class B Limit @ 3m (dBµV/m)
1575.0	36.3	28.1	27.1	30	33.4	25.2	54.0

Summary of Results for Radiated Emissions per CFR47 15.205

The radiated emissions for the EUT meet the requirements for FCC Part 15C Intentional Radiators. The EUT had a 19.4 dB minimum margin below the limits. Average, Quasi-peak, and peak amplitudes were checked for compliance with the regulations. No other emissions where found in the restricted frequency bands. Other emissions were present with amplitudes at least 20 dB below the FCC Limits.

Radiated Emissions Limits per CFR47 15.209

Radiated EMI

The EUT was arranged in a typical equipment configuration and operated through all of its various modes. Preliminary testing was performed in a screen room with the EUT positioned 1 meter from the FSM. Radiated emissions measurements were performed to identify the frequencies, which produced the highest emissions. Emissions were checked in the screen room from 30 to 6,000 MHz and plots were made of the frequency spectrum from 30 MHz to 6,000 MHz for the preliminary testing. Refer to figure five displaying the plot made of emissions taken in the screen room. The highest radiated emission was then re-maximized at the OATS location before final radiated emissions measurements were performed. Final data was taken with the EUT located at the open area test site at a distance of 3 meters between the EUT and the receiving antenna. The frequency spectrum from 30 MHz to 6,000 MHz was searched for radiated emissions. Measured emission levels were maximized by EUT placement on the table, rotating the turntable through 360 degrees, varying the antenna height between 1 and 4 meters above the ground plane and changing antenna polarization between horizontal and vertical. Antennas used were Broadband Biconical from 30 MHz to 200 MHz, Biconilog from 30 MHz to 1000 MHz, Log Periodic from 200 MHz to 5 GHz, and/or Pyramidal Horns from 4 GHz to 10 GHz.

Sample Calculations:

RFS = Radiated Field Strength
dBµV/m @ 3m = dBµV + A.F. - Amplifier Gain
dBµV/m @ 3m = 54.1 + 19.7 - 30
= 43.8

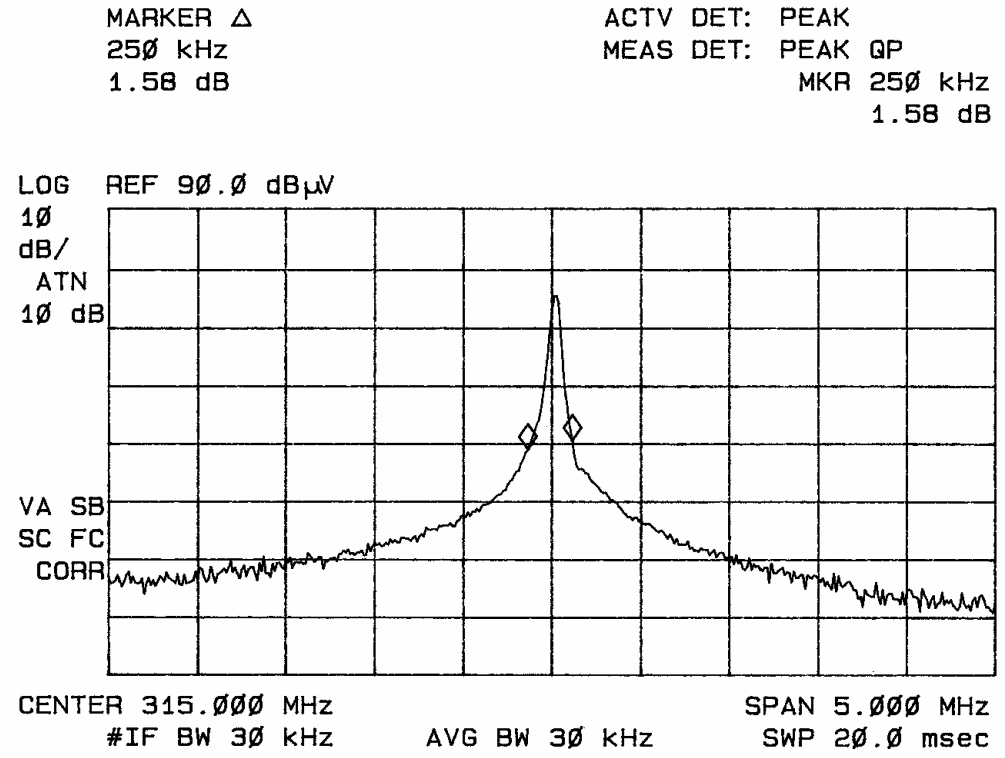

Figure five Radiated Emissions taken at 1 meter in screen room.

General Radiated Emissions Data per CFR47 15.209

Frequency in MHz	FSM Horz. (dBµV)	FSM Vert. (dBµV)	A.F. (dB/m)	Amp. Gain (dB)	RFS Horz. @ 3m (dBµV/m)	RFS Vert. @ 3m (dBµV/m)	FCC Class B Limit @ 3m (dBµV/m)
630.0	54.1	51.3	19.7	30	43.8	41.0	54.0
945.0	58.9	48.9	23.6	30	52.5	42.5	54.0
1260.0	48.6	44.2	25.3	30	43.9	39.5	54.0
1575.0	36.3	28.1	27.1	30	33.4	25.2	54.0
1890.0	21.5	23.3	29.2	30	20.7	22.5	54.0
2205.0	13.2	11.8	31.2	30	14.4	13.0	54.0

Other emissions present had amplitudes at least 20 dB below the limit.

Summary of Results for General Radiated Emissions per CFR47 15.209

The radiated emissions for the EUT meet the requirements for FCC Part 15C Intentional Radiators. The EUT had at a 1.5 dB minimum margin below the limits. Other emissions were present with amplitudes at least 20 dB below the FCC Limits.

Radiated Emissions in the Band 315 MHz per CFR47 15.231

The power output was measured on an open field test site @ 3 meters. Data was taken per Paragraph 2.1046(a) and 15.231. The EUT was placed on a wooden turntable 0.8 meters above the ground plane and at a distance of 3 meters from the FSM antenna. The amplitude of the carrier frequency was measured using a spectrum analyzer. The amplitude of the emission was then recorded from the analyzer display. The EUT was replaced by a dipole antenna driven by a frequency generator. The generator output was increased until the received emission level was equal to the level take from the EUT. The antenna was removed and the output amplitude of the generator was measured and recorded from the spectrum analyzer. The EUT was placed on a wooden turntable 0.8 meters above the ground plane and at a distance of 3 meters from the FSM antenna. The amplitude of the harmonic frequencies was measured using a spectrum analyzer. The amplitude of the emission was then recorded from the analyzer display. The EUT was replaced by a dipole antenna drive by a frequency generator. The generator output was increased until the received emission level was equal to the level take from the EUT. The antenna was removed and the output amplitude of the generator was measured and recorded from the spectrum analyzer. Refer to figure five showing compliance with occupied bandwidth requirements. The radiated emissions for the EUT were measured at a distance of 3 meters.

Intentional Radiated Emissions data per CFR47 15.231

Emission Frequency (kHz)	FSM (dBµV) Horizontal	FSM (dBµV) Vertical	Antenna Factor (dB)	Amplifier Gain (dB)	Calculated Horizontal Field Strength @ 3m (dBµV/m)	Calculated Vertical Field Strength @ 3m (dBµV/m)
315.0	88.1	69.6	14.7	30	72.8	54.3
630.0	54.1	51.3	19.7	30	43.8	41.0
945.0	58.9	48.9	23.6	30	52.5	42.5
1260.0	48.6	44.2	25.3	30	43.9	39.5
1575.0	36.3	28.1	27.1	30	33.4	25.2
1890.0	21.5	23.3	29.2	30	20.7	22.5

The calculated limit for the fundamental at a three meter distance was 75.6 dBµV/m, and harmonic limits were 55.6 dBµV/m.

Antenna Substitution Method Data

Frequency of Emission MHz	Amplitude of EUT Spurious emission		Signal level to substitution antenna required to reproduce		Emission level below carrier	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
	dBµV	dBµV	dBm	dBm	dBc	dBc
315.0	88.1	69.6	-22.43	-40.93	--	--
630.0	54.1	51.3	-51.43	-54.23	29.00	13.30
945.0	58.9	48.9	-42.73	-52.73	20.30	11.80
1260.0	48.6	44.2	-51.33	-55.73	28.90	14.80
1575.0	36.3	28.1	-61.83	-70.03	39.40	29.10
1890.0	21.5	23.3	-74.53	-72.73	52.10	31.80

Summary of Results for Intentional Radiator Emissions per CFR47 15.231

The EUT had the highest emission value of 72.8 dBµV/m at 3 meters at the fundamental frequency of operation. This amplitude is below the limit of 75.6 dBµV/m required by 15.231. The harmonic emissions were also measured and compared to the specifications of 15.209 and found to be below the limits. There are no measurable emissions in the restricted bands other than those recorded in this report. Other emissions were present with amplitudes at least 20 dB below the FCC Limits. The specifications of 15.231 were met; there are no deviations or exceptions to the requirements.

Statement of Modifications and Deviations

No modifications to the EUT were required for the unit to meet the FCC Part 15C emissions standards. There were no deviations to the specifications.

APPENDIX

Model: IQ58 Control Signal Transmitter

1. Test Equipment List
2. Rogers Qualifications
3. FCC Site Approval Letter

TEST EQUIPMENT LIST FOR ROGERS LABS, INC.

The test equipment used is maintained in calibration and good operating condition. Use of this calibrated equipment ensures measurements are traceable to national standards.

Equipment	Calibration Date
Scope: Tektronix 2230	2/06
Wattmeter: Bird 43 with Load Bird 8085	2/06
Power Supplies: Sorensen SRL 20-25, SRL 40-25, DCR 150, DCR 140	2/06
H/V Power Supply: Fluke Model: 408B (SN: 573)	2/06
R.F. Generator: HP 606A	2/06
R.F. Generator: HP 8614A	2/06
R.F. Generator: HP 8640B	2/06
Spectrum Analyzer: HP 8562A,	2/06
Mixers: 11517A, 11970A, 11970K, 11970U, 11970V, 11970W	
HP Adapters: 11518, 11519, 11520	
Spectrum Analyzer: HP 8591 EM	5/06
Frequency Counter: Leader LDC 825	2/06
Antenna: EMCO Biconilog Model: 3143	5/06
Antenna: EMCO Log Periodic Model: 3147	10/05
Antenna: Antenna Research Biconical Model: BCD 235	10/05
Antenna: EMCO Dipole Set 3121C	2/06
Antenna: C.D. B-101	2/06
Antenna: Solar 9229-1 & 9230-1	2/06
Antenna: EMCO 6509	2/06
Audio Oscillator: H.P. 201CD	2/06
R.F. Power Amp 65W Model: 470-A-1010	2/06
R.F. Power Amp 50W M185- 10-501	2/06
R.F. PreAmp CPPA-102	2/06
LISN 50 µHy/50 ohm/0.1 µf	10/05
LISN Compliance Eng. 240/20	2/06
LISN Fischer Custom Communications FCC-LISN-50-16-2-08	6/05
Peavey Power Amp Model: IPS 801	2/06
Power Amp A.R. Model: 10W 1010M7	2/06
Power Amp EIN Model: A301	2/06
ELGAR Model: 1751	2/06
ELGAR Model: TG 704A-3D	2/06
ESD Test Set 2010i	2/06
Fast Transient Burst Generator Model: EFT/B-101	2/06
Current Probe: Singer CP-105	2/06
Current Probe: Solar 9108-1N	2/06
Field Intensity Meter: EFM-018	2/06
KEYTEK Ecat Surge Generator	2/06
Shielded Room 5 M x 3 M x 3.0 M (101 dB Integrity)	

5/2/2006

QUALIFICATIONS

Of

SCOT D. ROGERS, ENGINEER

ROGERS LABS, INC.

Mr. Rogers has approximately 16 years experience in the field of electronics. Working for six years in the automated controls industry and the remaining time with the design, development and testing of radio communications and electronic equipment.

POSITIONS HELD:

Systems Engineer	A/C Controls Mfg. Co., Inc.
	6 Years
Electrical Engineer	Rogers Consulting Labs, Inc.
	5 Years
Electrical Engineer	Rogers Labs, Inc.
	Current

EDUCATIONAL BACKGROUND:

1) Bachelor of Science Degree in Electrical Engineering from Kansas State University.

2) Bachelor of Science Degree in Business Administration Kansas State University.

3) Several Specialized Training courses and seminars pertaining to Microprocessors and Software programming.

Scot D Rogers

Scot D. Rogers
August 20, 2006

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

May 16, 2006

Registration Number: 90910

Rogers Labs, Inc.
4405 West 259th Terrace
Louisburg, KS 66053

Attention: Scot Rogers

Re: Measurement facility located at Louisburg
3 & 10 meter site
Date of Renewal: May 16, 2006

Dear Sir or Madam:

Your request for renewal of the registration of the subject measurement facility has been received. The information submitted has been placed in your file and the registration has been renewed. The name of your organization will remain on the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Phyllis Parrish
Information Technician