NVLAP Lab Code: 200087-0

Application Submittal Test Report For FCC and Industry Canada Grant of Certification

Model: HME

FCC ID: DBZHME

IC: 8024A-HME

Frequency Range: 470.1-537.5 MHz

Wireless Microphone Transmitter

Operating under rule of CFR47 Part 74, Subpart H and RSS-123

FOR

Lectrosonics, Inc.

581 Laser Road
Rio Rancho, NM 87124
Test Report Number: 090318E

Authorized Signatory Scot D Rogers
Scot D. Rogers

NVLAP Lab Code: 200087-0

ROGERS LABS, INC.

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

Engineering Test Report For Application for Grant of Certification For

Lectrosonics, Inc.

581 Laser Road
Rio Rancho, NM 87124

Larry Fisher
President

Model: HME Transmitter
Wireless Microphone Transmitter

Frequency: 470.1 - 537.5 MHz
FCC ID: DBZHME
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Test Date: March 18, 2009

Certifying Engineer Scot D Rogers

Scot D. Rogers
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The following information is submitted for consideration in obtaining a Grant of Certification for a transmitter operating under rule of CFR47 paragraph 74H and Industry Canada RSS-123.

Name of Applicant:

Lectrosonics Inc.
581 Laser Road
Rio Rancho, NM 87124

Model: HME Wireless Microphone Transmitter.

FCC I.D.: DBZHME IC: 8024A-HME

Operating Power: 100 mW

Opinion / Interpretation of Results

Tests Performed	Results
Emissions Tests	
Radiated Emissions as per CFR47 paragraphs 2 and 74H	Complies
Radiated Emissions as per RSS-123, Issue 1 Rev.2, 1999	Complies

Applicable Standards & Test Procedures

In accordance with the Code of Federal Regulations, CFR47 dated October 1, 2008, Part 2 Subpart J, Paragraphs 2.907, 2.911, 2.925, 2.926, 2.1031 through 2.1057 and; Part 74 Subpart H; Paragraphs 74.801 through 74.861 and RSS-123 the following report is submitted. Test procedures used are the established Methods of Measurement of Radio-Noise Emissions as described in the ANSI 63.4-2003 and/or TIA/EIA 603-1.

Environmental Conditions

Ambient Temperature	23.5° C
Relative Humidity	34%
Atmospheric Pressure	1004.5 mb

2.1033(C) Application for Certification

(1) The full name and mailing address of the manufacturer of the device and the applicant for certification.

Lectrosonics, Inc.
581 Laser Road
Rio Rancho, NM 87124

(2) FCC identifier. DBZHME IC: 8024A-HME

(3) A copy of the installation and operating instructions to be furnished the user. Refer to the instruction manual furnished with this application for details.

(4) Type or types of emission. 180KF3E

(5) Frequency range of operation. 470.1-537.5 MHz.

(6) Range of operating power values or specific operating power levels, and description of any means provided for variation of operating power. The output power is factory set to 100 mW (nominal). The EUT has no provision for operator variation of the output power.

(7) Maximum power rating as defined in the applicable part(s) of the rules. As stated in CFR47, 74.861(e)(ii), the maximum permissible output power allowed is 250 mW.

(8) The dc voltages applied to and dc currents into the several elements of the final radio frequency amplifying device for normal operation over the power range. The HME final amplification stage runs at 3.3 volts with 60 mA current producing 198 mW power.

(9) Tune-up procedure over the power range, or at specific operating power levels. Refer to the tune-up procedure furnished with this application for details.

(10) A schematic diagram and a description of all circuitry and devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation, and for limiting power. Refer to the schematics furnished with this application for details.

(11) A photograph or drawing of the equipment identification plate or label showing the information to be placed thereon. Refer to the FCC identification label information furnished with this application for details.

(12) Photographs (8" x 10") of the equipment of sufficient clarity to reveal equipment construction and layout, including meters, if any, and labels for controls and meters and sufficient views of the internal construction to define component placement and chassis assembly. Insofar as these requirements are met by photographs or drawings contained in instruction manuals supplied with the certification request, additional photographs are necessary only to complete the required showing. Refer to the exhibits of this report and or additional information furnished with the application for details.

(13) For equipment employing digital modulation techniques, a detailed description of the modulation system to be used, including the response characteristics (frequency, phase, and amplitude) of any filters provided, and a description of the modulating wave train, shall be submitted for the maximum rated conditions under which the equipment will be operated. The unit does not use digital modulation. It uses digital processing preparing the audio for transmission and then converts it back to audio before transmission.

(14) The data required by Sections 2.1046 through 2.1057, inclusive, measured in accordance with the procedures set out in Section 2.1041.

(15) The application for certification of an external radio frequency power amplifier under Part 97 of this chapter need not be accompanied by the data required by Paragraph (b)(14) of this section. In lieu thereof, measurements shall be submitted to show compliance with the technical specifications in Subpart C of Part 97 of this chapter and such information as required by Section 2.1060 of this part. This paragraph does not apply to this equipment.

(16) An application for certification of an AM broadcast stereophonic exciter-generator intended for interfacing with existing certified, or formerly type accepted or notified transmitters must include measurements made on a complete stereophonic transmitter. The instruction book must include complete specifications and circuit requirements for interconnecting with existing transmitters. The instruction book must also provide a full description of the equipment and measurement procedures to monitor modulation and to verify that the combination of stereo exciter-generator and transmitter meets the emission limitations of section 73.44. This paragraph does not apply to this equipment.

(17) A single application may be filed for a composite system that incorporates devices subject to certification under multiple rule parts; however, the appropriate fee must be included for each device. Separate applications must be filed if different FCC Identifiers will be used for each device.

Equipment Tested

Equipment	Model	FCC I.D.	IC: ID
EUT	HME	DBZHME	8024A-HME

Equipment Function and Testing Procedures

Equipment testing was performed on the Wireless Microphone model HME operating in the frequency band of 470.1-537.5 MHz. The frequency band of operation is covered using equipment typically capable of tuning through 25 MHz blocks. The frequency band of operation is broken into blocks, which cover the frequency band of operation as requested and as previously agreed upon between the commission and manufacturer. The unit operates from internal 1.5-volt DC battery power and offers no connection to utility power. For testing purposes, new batteries were used to power the EUT during testing.

Equipment and Cable Configurations

Radiated Emission Test Procedure

Testing for the radiated emissions were performed as defined in sections 8.3 and 13.1 of ANSI C63.4 and/or TIA/EIA 603. The EUT was placed on a rotating 1 x 1.5-meter wooden platform, 0.8 meters above the ground plane at a distance of 3 meters from the FSM antenna. 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. Refer to photographs in the exhibits for EUT placement.

List of Test Equipment

A Hewlett Packard 8591EM and or 8562A Spectrum Analyzer was used as the measuring device for the emissions testing. The analyzer settings used are described in the following table. Refer to the Appendix for a complete list of Test Equipment.

HP 8591EM Spectrum Analyzer Settings		
Conducted Emissions		
RBW	AVG. BW	Detector Function
9 kHz	30 kHz	Peak/Quasi Peak
Radiated Emissions (30 – 1000 MHz)		
RBW	AVG. BW	Detector Function
120 kHz	300 kHz	Peak/Quasi Peak
HP 8562A Spectrum Analyzer Settings		
Radiated Emissions (1 – 40 GHz)		
RBW	AVG. BW	Detector Function
1 MHz	1 MHz	Peak/Average
Antenna Conducted Emissions:		
RBW	AVG. BW	Detector Function
100 kHz	300 kHz	Peak

Equipment	Manufacturer	Model	Calibration Date	Due
LISN	Comp. Design	FCC-LISN-2-MOD.CD	10/08	10/09
LISN	Comp. Design	1762	2/09	2/10
Antenna	ARA	BCD-235-B	10/08	10/09
Antenna	EMCO	3147	10/08	10/09
Antenna	EMCO	3143	5/08	5/09
Analyzer	HP	8591EM	5/08	5/09

2.1046 Radio Frequency Power Output

Measurements Required

Measurements shall be made to establish the radio frequency power delivered by the transmitter into the standard output termination. The power output shall be monitored and recorded and no adjustment shall be made to the transmitter after the test has begun. If the power output is adjustable, measurements shall be made for the highest and lowest power levels.

Test Arrangement

The unit utilizes a permanently attached one-quarter wave antenna system. The radio frequency power output was measured at a three-meter distance on an approved Open Area Test Site (OATS) using the substitution method. A HP 8591EM Spectrum Analyzer was used to measure the radio frequency power produced by the EUT at a distance of three-meters. The level was recorded and the EUT was removed from the table and replaced by a substitution antenna driven by a frequency generator. The generator output level was then increased until the amplitude level produced by the substitution system measured the same as previously recorded from the EUT. The antenna was removed and replaced by a spectrum analyzer to accurately record the generators power output. This power output level was then recorded. This procedure was repeated for all frequencies of interest with the data taken reported below. Data was taken per Paragraph 2.1046(a) and applicable paragraphs of Part 74 and RSS-123.

Power in dBm was converted to power in Watts using the following formula.

Power (dBm) = power in dB above 1 milliwatt
Milliwatts = $10^{(\text{Power dBm}/10)}$
Watts = Power in milliwatts times 0.001
Example 18.97Bm = $10^{(18.97/10)}$
= 78.89 mW
= 0.079 Watts

Results

Frequency (MHz)	Amplitude of EUT at 3 m P(dBµV/m)	Power required from generator to reproduce level P(dBm)	Calculated power in Watts P(w)
470.1	114.2	18.97	0.1
500.0	114.8	19.57	0.1
537.5	115.0	19.77	0.1

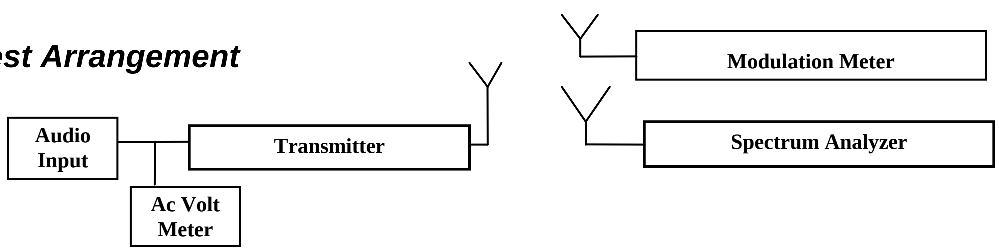
The specifications of Paragraph 2.1046(a) and applicable paragraphs of Part 74 and RSS-123 are met. There are no deviations to the specifications.

2.1047 Modulation Characteristics

Measurements Required

A curve or equivalent data, which shows that the equipment will meet the modulation requirements of the rules, under which the equipment is to be licensed, shall be submitted.

Test Arrangement



The radio frequency output was passively coupled to a HP Spectrum Analyzer and a modulation meter. The spectrum analyzer was used to observe the radio frequency spectrum with the transmitter operating in its standard mode(s). The modulation meter was used to measure the percent modulation or frequency deviation.

Modulation Characteristic Results

Figure one displays the graph made showing the audio frequency response of the modulator. The frequency generator was set to 1 kHz and injected into the audio input port of the EUT. The input voltage amplitude was adjusted to obtain 50% modulation at 1000 Hz. This level was then taken as the 0-dB reference. The frequency of the generator was then varied and the voltage input level recorded while holding the output modulation level constant. The specifications of Paragraph 2.1047 and applicable parts of 74 are met.

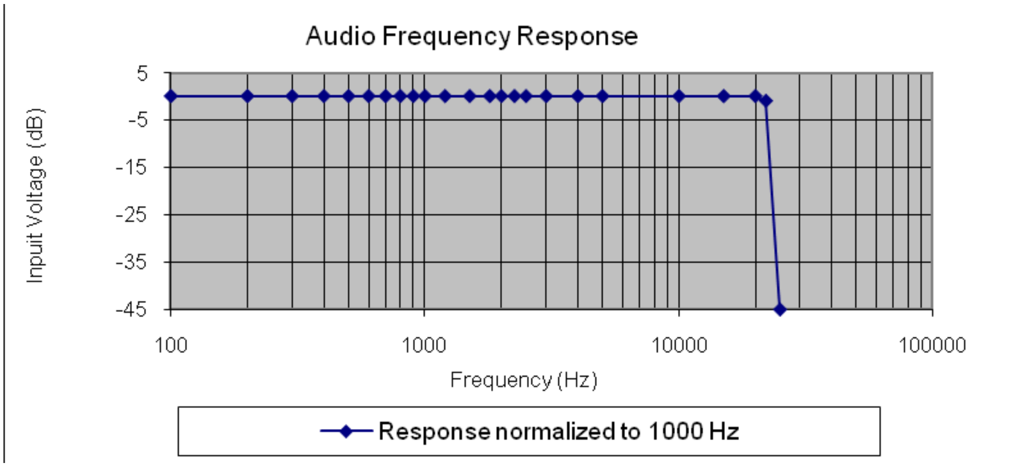


Figure one Audio Frequency Response Characteristics

Figure two shows the frequency deviation response for each of eight frequencies while the input voltage was varied. The frequency was held constant and the frequency deviation was read from the deviation meter.

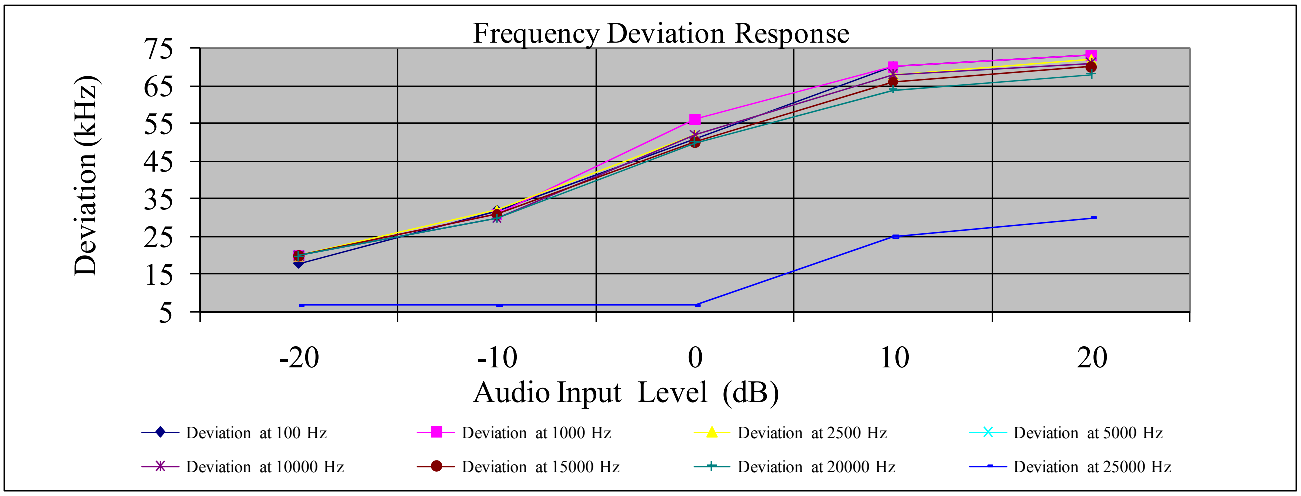


Figure two Deviation Characteristics

Figure three shows the frequency response of the audio low pass filter.

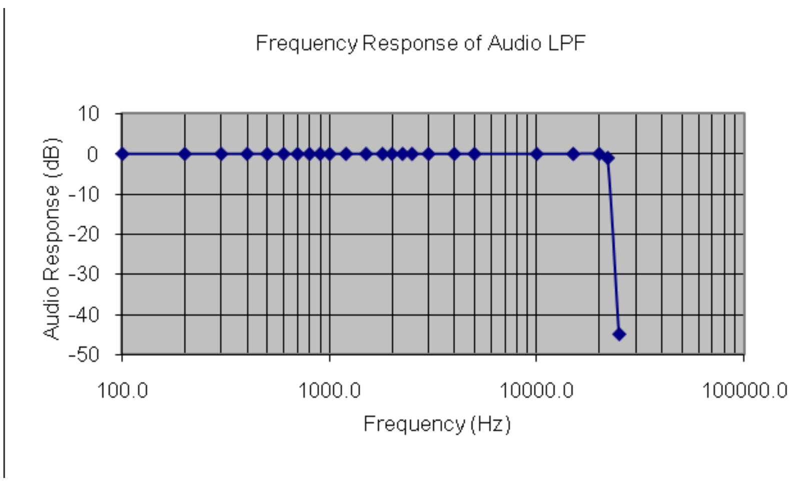


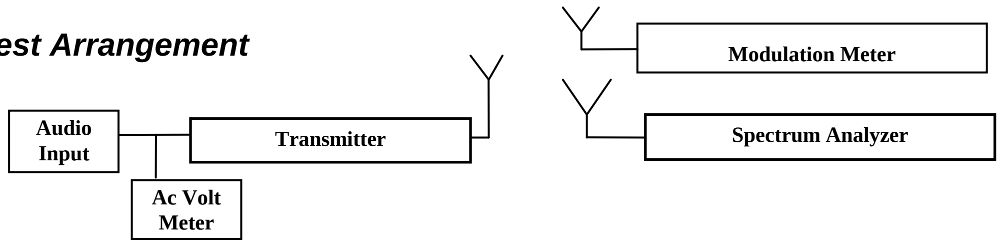
Figure three Frequency Response of Audio low Pass Filter

2.1049 Occupied Bandwidth

Measurements Required

The occupied bandwidth, that is the frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are equal to 0.5 percent of the total mean power radiated by a given emission.

Test Arrangement



A spectrum analyzer was used to observe the radio frequency spectrum with the transmitter operating in a normal mode, modulated by a frequency of 2,500 Hz and again at 21,000 Hz. The power ratio in dB representing 99.5% of the total mean power was recorded from the spectrum analyzer. Refer to figures four and five showing plots of the 99.5% power and spectral emissions mask.

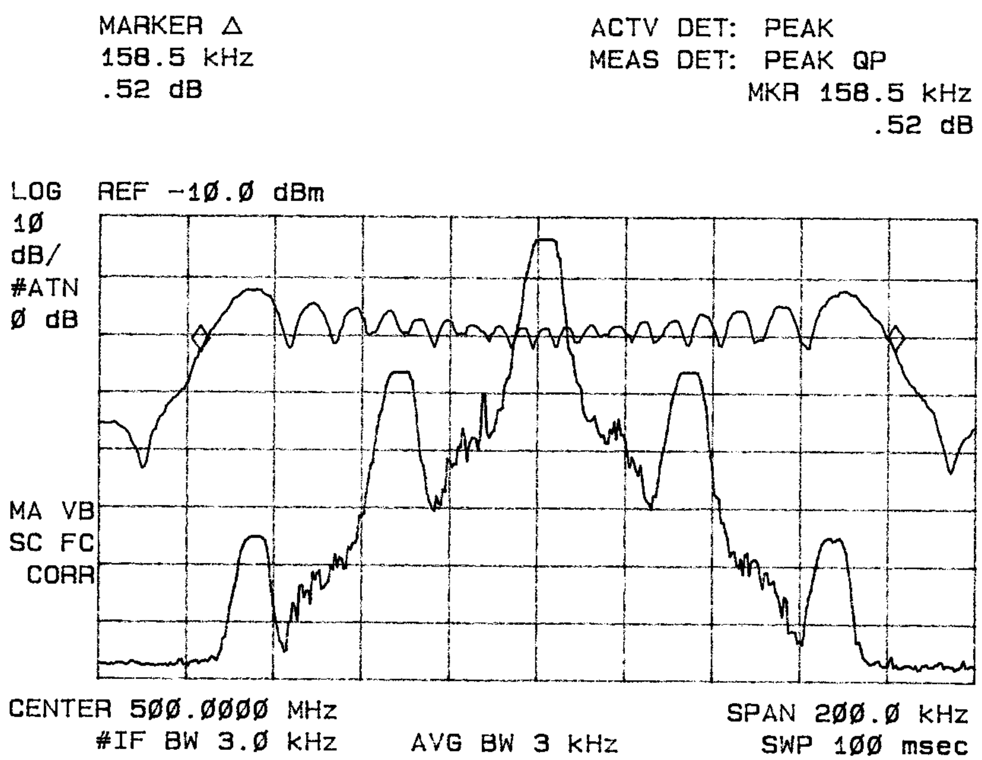


Figure four Occupied Bandwidth Measurement with 2500 Hz input

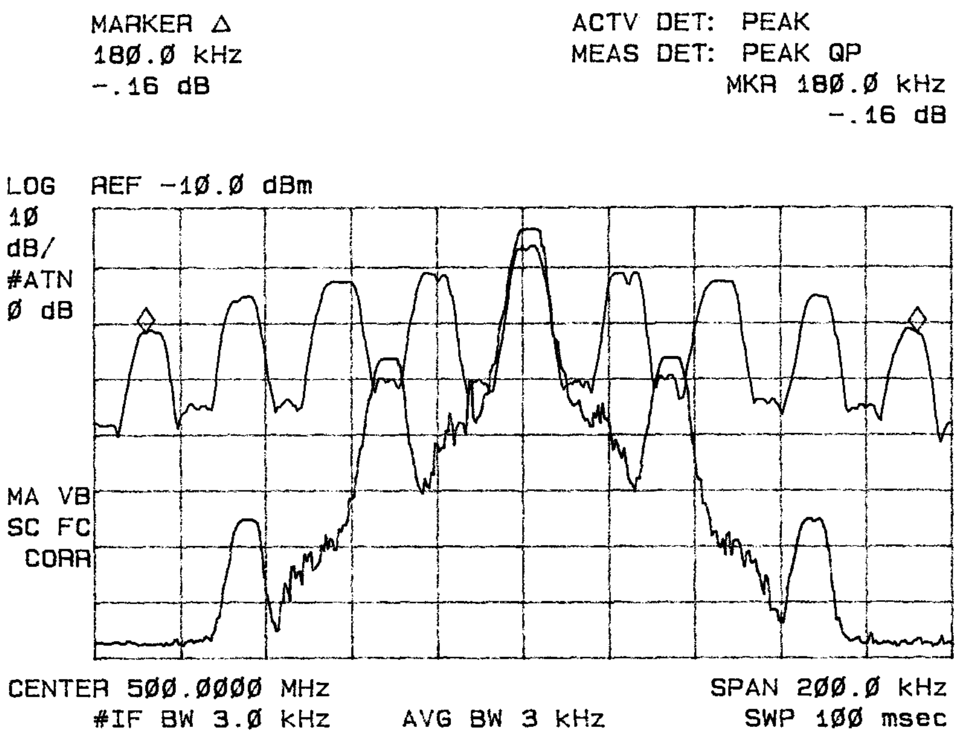


Figure five Occupied Bandwidth Measurement with 21,000 Hz input

Occupied Bandwidth Results

The necessary bandwidth for this sound broadcasting class of equipment is calculated from the equation Bn=2M+2KD (k=1, M=21,000 and D=75,000). This equates to a necessary bandwidth of 192 kHz. The limiting circuitry of the device reduces the measured bandwidth due to the constant frequency signal wave used at the input.

fc (MHz)	Occupied Bandwidth(kHz)
470.1	178.5 (measured)
500.0	180.0 (measured)
537.5	178.5 (measured)

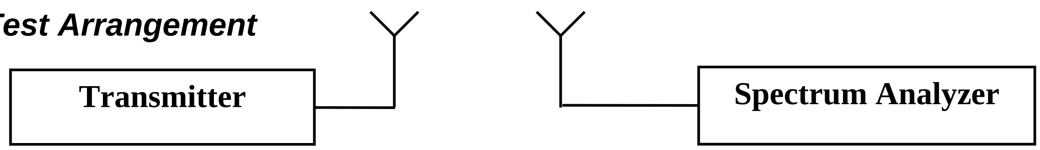
Requirements of 2.1049(c)(1) and applicable paragraphs of Parts 2, 74 and RSS-123 are met. There are no deviations to the specifications.

2.1051 Spurious Emissions at Antenna Terminals

Measurements Required

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. The EUT utilizes a permanently attached antenna system, therefore the requirements are met and compliance demonstrated from the radiated field strength measurements.

Test Arrangement



Results of Antenna Conducted Emissions

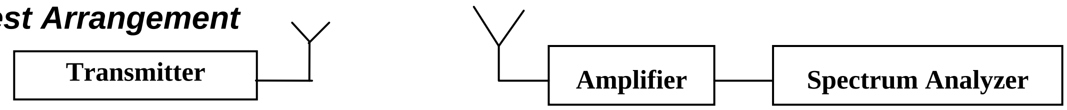
Specifications of Paragraphs 2.1051, 2.1057 and applicable paragraphs of part 74 and RSS-123 are met. There are no deviations to the specifications.

2.1053 Field Strength of Spurious Radiation

Measurements Required

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation.

Test Arrangement



The transmitter, with the permanent antenna attached, 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 turntable was rotated though 360 degrees to locate the position registering the highest amplitude emission. The frequency spectrum was then searched for spurious emissions generated from the transmitter. Raising and lowering the FSM antenna and rotating the turntable before final data was recorded maximized the measured amplitude of each spurious emission. A log periodic antenna was used for frequencies of 200 MHz to 5 GHz and pyramidal horn antennas were used for frequencies of 5 GHz to 40 GHz. The substitution method was used to measure the spurious emissions. Emission levels from the EUT were measured and amplitude levels were recorded. The EUT transmitter was then removed and replaced with a substitution antenna and signal generator. The signal from the generator was then adjusted such that the amplitude received was the same as that previously recorded for each frequency. This step was repeated for both horizontal and vertical polarizations. The power in dBm required to produce the desired signal level was then recorded from the signal generator. The power in dBm was then calculated by reducing the previous readings by the gain in the substitution antenna. The testing procedures used conform to the procedures stated in the TIA/EIA-603 document. The limits for the spurious radiated emissions are defined by the following equation. Refer to figures six through nine showing plots of the radiated emissions and spectral emissions mask of the EUT.

Limit = Amplitude of the spurious emission must be attenuated by this amount below the level of the fundamental. On any frequency removed from the assigned frequency by more than 250% of the authorized bandwidth: at least 55 + 10 Log (Po) dB = 55+10 Log (0.100), (=45.0 dBc).

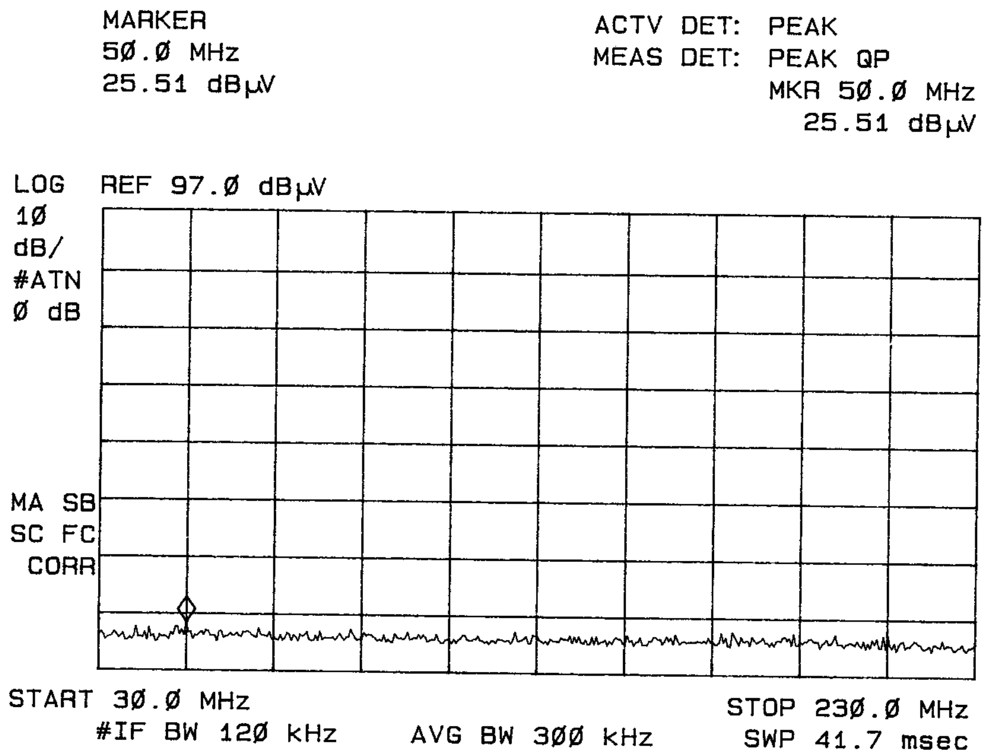


Figure six radiated emissions

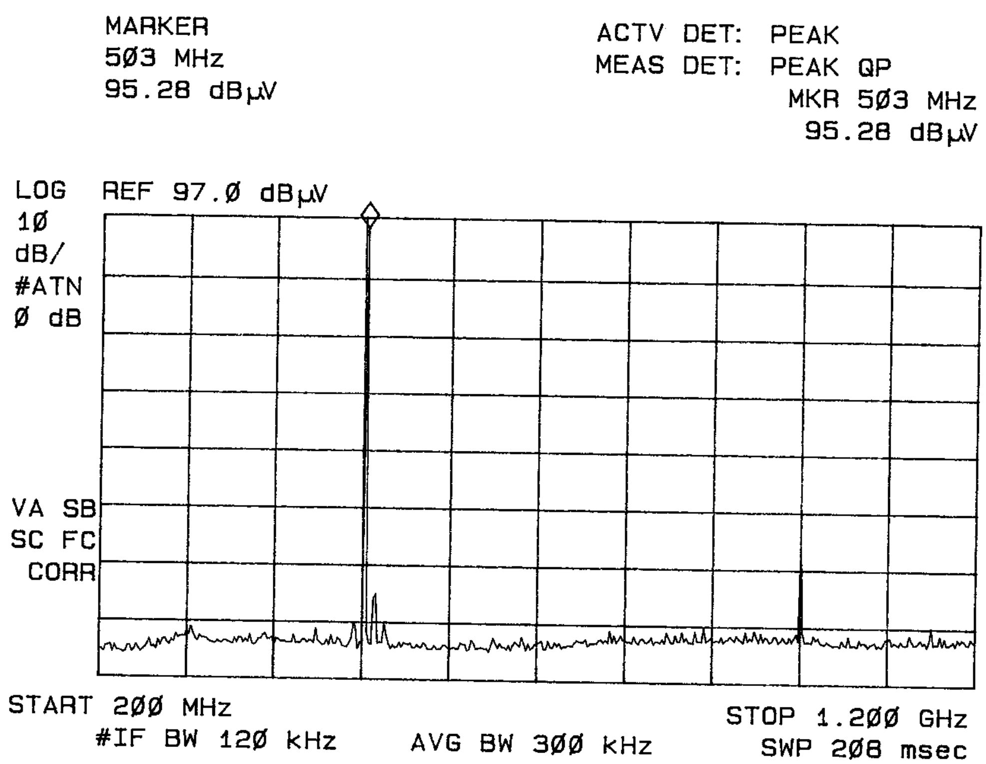


Figure seven radiated emissions

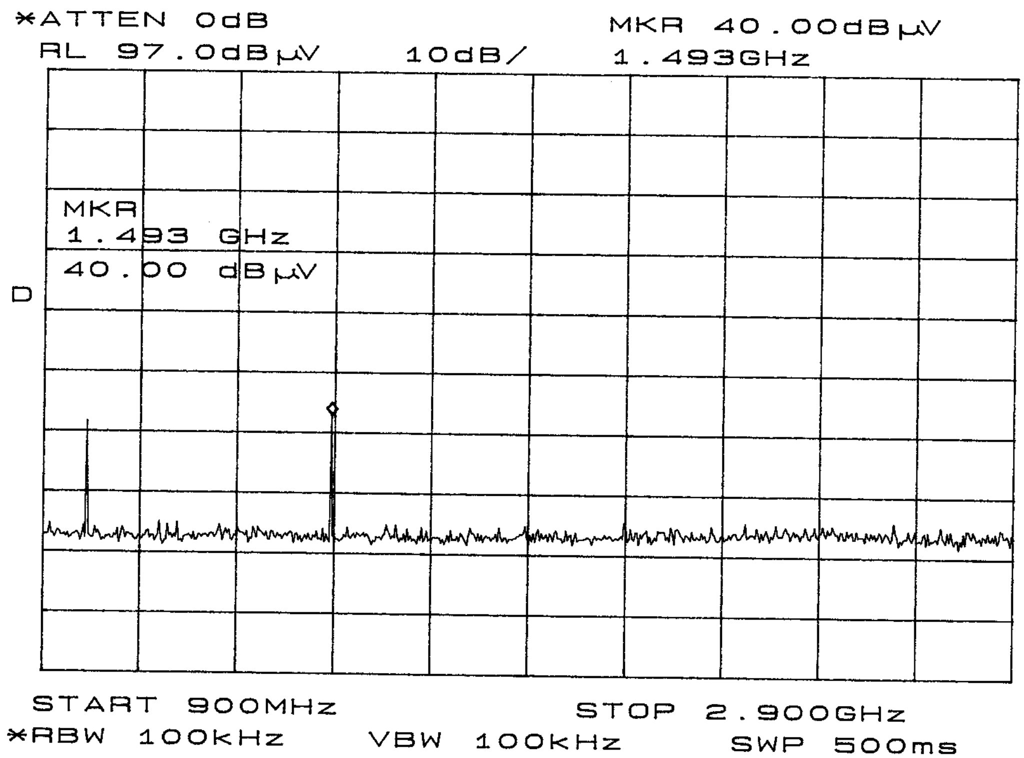


Figure eight radiated emissions

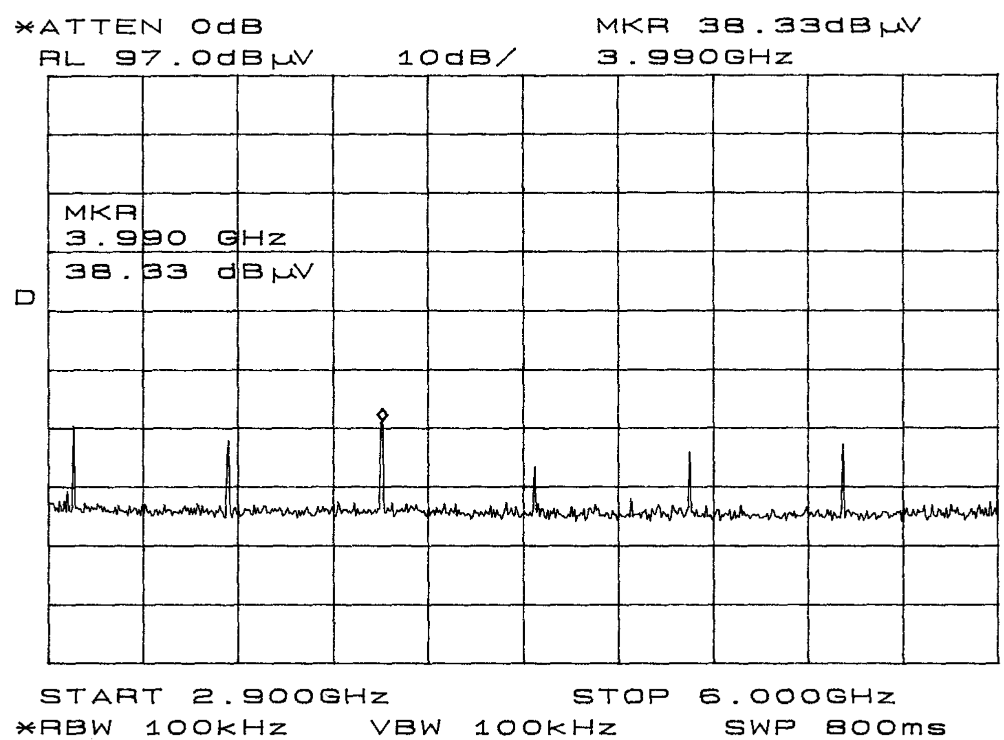


Figure nine radiated emissions

Results of Spurious Radiated Emissions

Frequency of Emission	Amplitude of EUT Spurious emission		Signal level to substitution antenna required to reproduce		Emission level below carrier		Limit At Least
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	
(MHz)	dBµV/m	dBµV/m	dBm	dBm	dBc	dBc	dBc
470.1	90.4	114.2	-4.83	18.97	0	0	0
940.2	32.0	44.2	-63.23	-51.03	58.4	70.0	45.0
1410.3	30.4	27.1	-64.83	-68.13	60.0	87.1	45.0
1880.4	23.1	33.2	-72.13	-62.03	67.3	81.0	45.0
2350.5	24.4	26.1	-70.83	-69.13	66.0	88.1	45.0
2820.6	36.9	36.2	-58.33	-59.03	53.5	78.0	45.0
3290.7	44.8	41.9	-50.43	-53.33	45.6	72.3	45.0
500.0	93.0	114.8	-2.23	19.57	0	0	0
1000.0	29.6	46.2	-65.63	-49.03	63.4	68.6	45.0
1500.0	29.8	37.3	-65.43	-57.93	63.2	77.5	45.0
2000.0	24.2	26.7	-71.03	-68.53	68.8	88.1	45.0
2500.0	28.0	35.0	-67.23	-60.23	65.0	79.8	45.0
3000.0	43.9	53.8	-51.33	-41.43	49.1	61.0	45.0
3500.0	46.9	53.9	-48.33	-41.33	46.1	60.9	45.0
537.5	93.2	115.0	-2.03	19.77	0	0	0
1075.0	31.9	45.2	-63.33	-50.03	61.3	66.0	45.0
1612.5	15.5	27.9	-79.73	-67.33	77.7	83.3	45.0
2150.0	19.3	23.3	-75.93	-71.93	73.9	87.9	45.0
2687.5	33.8	43.0	-61.43	-52.23	59.4	68.2	45.0
3225.0	43.8	42.1	-51.43	-53.13	49.4	69.1	45.0
3762.5	37.0	41.6	-58.23	-53.63	56.2	69.6	45.0

Specifications of Paragraph 2.1053, 2.1057, applicable paragraphs of part 74 and RSS-123 are met.

There are no deviations to the specifications.

2.1055 Frequency Stability

Measurements Required

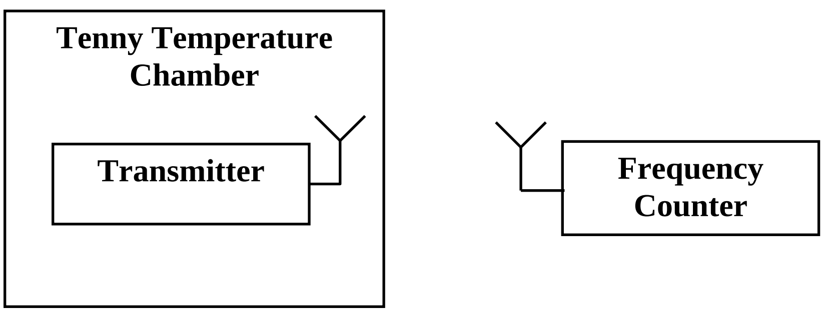
The frequency stability shall be measured with variations of ambient temperature from -30° to +50° centigrade. Measurements shall be made at the extremes of the temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. In addition to temperature stability, the frequency stability shall be measured with variation of primary supply voltage as follows.

Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

For hand carried, batteries powered equipment, reduce primary supply voltage to the battery-operating end point, which shall be specified by the manufacturer.

The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

Test Arrangement



The measurement procedure outlined below shall be followed.

Step 1 The transmitter shall be installed in an environmental test chamber whose temperature is controllable. Provision shall be made to measure the frequency of the transmitter.

Step 2 With the transmitter inoperative (power switched “OFF”), the temperature of the test chamber shall be adjusted to +25°C. After a temperature stabilization period of one hour at +25°C, the transmitter shall be switched “ON” with standard test voltage applied.

Step 3 The carrier shall be keyed “ON”, and the transmitter shall be operated unmodulated at full radio frequency power output at the duty cycle, for which it is rated, for duration of at least 5 minutes. The radio frequency carrier frequency shall be monitored and measurements shall be recorded.

Step 4 The test procedures outlined in Steps 2 and 3, shall be repeated after stabilizing the transmitter at the environmental temperatures specified, -30°C to 50°C in 10-degree increments.

The frequency stability was measured with variations in the power supply voltage from 85 to 115 percent of the nominal value. A BK Precision 1670A DC Power Supply was used to vary the DC voltage for the power input from 2.55 Vdc to 3.45 Vdc. The frequency was measured and the variation in parts per million was calculated. Data was taken per Paragraphs 2.1055 and applicable paragraphs of parts 2, 74.861, and RSS-123.

Frequency Stability Data and Results

Nominal frequency 500.0008 MHz	Frequency Stability Vs Temperature In Parts Per Million (PPM) and percent (limit=0.005%)								
Temperature	-30	-20	-10	0	10	20	30	40	50
Change (Hz)	4610.0	3430.0	2750.0	-210.0	-470.0	-440.0	180.0	440.0	780.0
PPM	9.220	6.860	5.500	-0.420	-0.940	-0.880	0.360	0.880	1.560
%	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000

Frequency 500.0008 MHz	Frequency Stability Vs Voltage Variation 3.0 volts nominal		
Voltage	2.55	3.000	3.45
Change (Hz)	0.0	0.0	0.0

Frequency 500.0008 MHz	Frequency Stability Vs Voltage Variation, 3.0 volts nominal Battery Endpoint Voltage 2.1 Vdc
Change(Hz)	0.0

The frequency tolerance of the transmitter shall be 0.005 percent per CFR47, 74.861 and RSS-123.

Specifications of Paragraphs 2.1055 and applicable paragraphs of part 74 and RSS-123 are met. There are no deviations to the specifications.

Annex

- Annex A Measurement Uncertainty Calculations
- Annex B Test Equipment List
- Annex C Rogers Qualifications
- Annex D FCC Site Registration Letter
- Annex E Industry Canada Site Registration Letter

Annex A Measurement Uncertainty Calculations

Radiated Emissions Measurement Uncertainty Calculation

Measurement of vertically polarized radiated field strength over the frequency range 30 MHz to 1 GHz on an open area test site at 3m and 10m includes following uncertainty:

Contribution	Probability Distribution	Uncertainty (dB)
Antenna factor calibration	normal (k = 2)	±0.58
Cable loss calibration	normal (k = 2)	±0.2
Receiver specification	rectangular	±1.0
Antenna directivity	rectangular	±0.1
Antenna factor variation with height	rectangular	±2.0
Antenna factor frequency interpolation	rectangular	±0.1
Measurement distance variation	rectangular	±0.2
Site Imperfections	rectangular	±1.5

Combined standard uncertainty $u_c(y)$ is

$$U_c(y) = \pm \sqrt{\left[\frac{1.0}{2}\right]^2 + \left[\frac{0.2}{2}\right]^2 + \left[\frac{1.0^2 + 0.1^2 + 2.0^2 + 0.1^2 + 0.2^2 + 1.5^2}{3}\right]}$$

$U_c(y) = \pm$ 1.6 dB

It is probable that $u_c(y) / s(q_k) > 3$, where $s(q_k)$ is estimated standard deviation from a sample of n readings unless the repeatability of the EUT is particularly poor, and a coverage factor of k = 2 will ensure that the level of confidence will be approximately 95%, therefore:

$$s(q_k) = \sqrt{\frac{1}{(n-1)} \sum_{k-1}^{n} (q_k - \bar{q})^2}$$

$U = 2\ U_c(y) = 2 \times \pm 1.6$ dB $= \pm$ 3.2 dB

Notes:

1.1 Uncertainties for the antenna and cable were estimated, based on a normal probability distribution with k = 2.

1.2 The receiver uncertainty was obtained from the manufacturer's specification for which a rectangular distribution was assumed.

1.3 The antenna factor uncertainty does not take account of antenna directivity.

1.4 The antenna factor varies with height and since the height was not always the same in use as when the antenna was calibrated an additional uncertainty is added.

1.5 The uncertainty in the measurement distance is relatively small but has some effect on the received signal strength. The increase in measurement distance as the antenna height is increased is an inevitable consequence of the test method and is therefore not considered a contribution to uncertainty.

1.6 Site imperfections are difficult to quantify but may include the following contributions:
-Unwanted reflections from adjacent objects.
-Ground plane imperfections: reflection coefficient, flatness, and edge effects.
-Losses or reflections from "transparent" cabins for the EUT or site coverings.
-Earth currents in antenna cable (mainly effect biconical antennas).

The specified limits for the difference between measured site attenuation and the theoretical value (± 4 dB) were not included in total since the measurement of site attenuation includes uncertainty contributions already allowed for in this budget, such as antenna factor.

Conducted Measurements Uncertainty Calculation

Measurement of conducted emissions over the frequency range 9 kHz to 30 MHz includes following uncertainty:

Contribution	Probability Distribution	Uncertainty (dB)
Receiver specification	rectangular	±1.5
LISN coupling specification	rectangular	±1.5
Cable and input attenuator calibration	normal (k=2)	±0.5

Combined standard uncertainty $u_c(y)$ is

$$U_c(y) = \pm \sqrt{\left[\frac{0.5}{2}\right]^2 + \frac{1.5^2 + 1.5^2}{3}}$$

$U_c(y) = \pm 1.2$ dB

As with radiated field strength uncertainty, it is probable that $u_c(y) / s(q_k) > 3$ and a coverage factor of k = 2 will suffice, therefore:

$U = 2\, U_c(y) = 2 \times \pm 1.2$ dB $= \pm 2.4$ dB

Annex B 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.

List of Test Equipment	Calibration Date
Oscilloscope Scope: Tektronix 2230	2/09
Wattmeter: Bird 43 with Load Bird 8085	2/09
Power Supplies: Sorensen SRL 20-25, SRL 40-25, DCR 150, DCR 140	2/09
H/V Power Supply: Fluke Model: 408B (SN: 573)	2/09
R.F. Generator: HP 606A	2/09
R.F. Generator: HP 8614A	2/09
R.F. Generator: HP 8640B	2/09
Spectrum Analyzer: HP 8562A,	2/09
Mixers: 11517A, 11970A, 11970K, 11970U, 11970V, 11970W	
HP Adapters: 11518, 11519, 11520	
Spectrum Analyzer: HP 8591EM	5/08
Frequency Counter: Leader LDC825	2/09
Antenna: EMCO Biconilog Model: 3143	5/08
Antenna: EMCO Log Periodic Model: 3147	10/08
Antenna: Antenna Research Biconical Model: BCD 235	10/08
Antenna: EMCO Dipole Set 3121C	2/09
Antenna: C.D. B-101	2/09
Antenna: Solar 9229-1 & 9230-1	2/09
Antenna: EMCO 6509	2/09
Audio Oscillator: H.P. 201CD	2/09
R.F. Power Amp 65W Model: 470-A-1010	2/09
R.F. Power Amp 50W M185- 10-501	2/09
R.F. PreAmp CPPA-102	2/09
LISN 50 µHy/50 ohm/0.1 µf	10/08
LISN Compliance Eng. 240/20	2/09
LISN Fischer Custom Communications FCC-LISN-50-16-2-08	2/09
Peavey Power Amp Model: IPS 801	2/09
Power Amp A.R. Model: 10W 1010M7	2/09
Power Amp EIN Model: A301	2/09
ELGAR Model: 1751	2/09
ELGAR Model: TG 704A-3D	2/09
ESD Test Set 2010i	2/09
Fast Transient Burst Generator Model: EFT/B-101	2/09
Current Probe: Singer CP-105	2/09
Current Probe: Solar 9108-1N	2/09
Field Intensity Meter: EFM-018	2/09
KEYTEK Ecat Surge Generator	2/09
Shielded Room 5 M x 3 M x 3.0 M	

Annex C Rogers Qualifications

Scot D. Rogers, Engineer

Rogers Labs, Inc.

Mr. Rogers has approximately 17 years experience in the field of electronics. Six years working in the automated controls industry and 6 years working 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

March 18, 2009

Annex D FCC Site Registration Letter

FEDERAL COMMUNICATIONS COMMISSION
Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

June 18, 2008

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: June 18, 2008

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
Industry Analyst

Annex E Industry Canada Site Registration Letter

Industry Canada Industrie Canada

July 29th, 2008

OUR FILE: 46405-3041
Submission No: 127059

Rogers Labs Inc.
4405 West 259th Terrace
Louisburg KY 66053
USA

Attention: Scot D. Rogers

Dear Sir/Madame:

The Bureau has received your application for the registration / renewal of a 3/10m OATS. Be advised that the information received was satisfactory to Industry Canada. The following number(s) is now associated to the site(s) for which registration / renewal was sought **(3040A-1).** Please reference the appropriate site number in the body of test reports containing measurements performed on the site. In addition, please be informed that the Bureau is now utilizing a **new site numbering scheme** in order to simplify the electronic filing process. Our goal is to reduce the number of secondary codes associated to one particular company. The following changes have been made to your records.

Your primary code is: **3041**
The company number associated to the site(s) located at the above address is: **3041A**
The table below is a summary of the changes made to the unique site registration number(s):

New Site Number	Obsolete Site Number	Description of Site	Expiry Date (YYYY-MM-DD)
3041A-1	3041-1	3 / 10m OATS	2010-07-29

Furthermore, to obtain or renew a unique site number, the applicant shall demonstrate that the site has been accredited to ANSI C63.4-2003 or later. A scope of accreditation indicating the accreditation by a recognized accreditation body to ANSI C63.4-2003 shall be accepted. Please indicate in a letter the previous assigned site number if applicable and the type of site (example: 3 meter OATS or 3 meter chamber). If the test facility is not accredited to ANSI C63.4-2003 or later, the test facility shall submit test data demonstrating full compliance with the ANSI standard. The Bureau will evaluate the filing to determine if recognition shall be granted.

The frequency for re-validation of the test site and the information that is required to be filed or retained by the testing party shall comply with the requirements established by the accrediting organization. However, in all cases, test site re-validation shall occur on an interval not to exceed two years. There is no fee or form associated with an OATS filing. OATS submissions are encouraged to be submitted electronically to the Bureau using the following URL;

If you have any questions, you may contact the Bureau by e-mail at certification.bureau@ic.gc.ca
Please reference our file and submission number above for all correspondence.

Yours sincerely,

S. Proulx Wireless Laboratory
Manager Certification and
Engineering Bureau Industry Canada
3701 Carling Ave., Building 94
Ottawa, Ontario K2H 8S2
Canada

Canada