ROGERS LABS, INC.

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TEST REPORT

For

APPLICATION of CERTIFICATION

for

LECTROSONICS, INC.
581 Laser Road
Rio Rancho, NM 878124

Larry Fisher
Vice President of Engineering

MODEL: UM700

NAME: Wireless Microphone Transmitter

FREQUENCY: 470 - 802 MHz
FCC ID: DBZUM700

Test Date: March 6, 2001

Certifying Engineer: Scot D Rogers

Scot D. Rogers
ROGERS LABS, INC.
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E X H I B I T I:

FORWARD:

In accordance with the Federal Communications Code of Federal Regulations, dated October 1, 1999, Part 2 Subpart J, Paragraphs 2.907, 2.911 to 2.913, 2.925, 2.926, 2.1031 through 2.1057 and; Part 74 Subpart H; Paragraphs 74.801 through 74.861 the following is submitted:

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

2.1033 Application for Certification:

(c) Applications for equipment other than that operating under Parts 15 and 18 of the rules shall be accompanied by a technical report containing the following information:

(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. DBZUM700

(3) A copy of the installation and operating instructions to be furnished the user. A draft copy of the instructions may be submitted if the actual document is not available. The actual document shall be furnished to the FCC when it becomes available. Refer to the instruction manual furnished with this application for details.

(4) Type or types of emission. 180K Q2E

(5) Frequency range. 470 to 806 MHz with lockout provisions on restricted frequency bands.

(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 50 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 CFR 47, 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 EUT final amplification stage runs at 4 volts with 42 mA current for a power requirement of 168 mW.

(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 shows the information to be placed thereon. Refer to the FCC identification label 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 appendix 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 wavetrain, shall be submitted for the maximum rated conditions under which the equipment will be operated. Refer to page 9 of this report or the modulation description furnished with this application for details.

(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.

(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 meet the emission limitations of section 73.44.

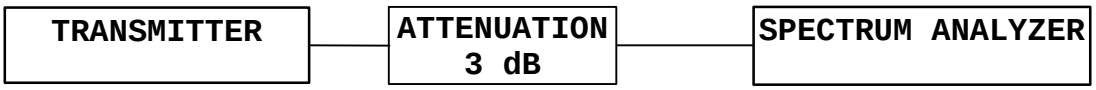
(17) A single application may be filed for a composite system that incorporates devices subject to certification under multiple rule parts; however, the appropriate fee must be included for each device. Separate applications must be filed if different FCC Identifiers will be used for each device.

2.1046 RF 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, except as noted below:
If the power output is adjustable, measurements shall be made for the highest and lowest power levels.

Test Arrangement:



The radio frequency power output was measured at the antenna terminal by replacing the antenna with a spectrum analyzer, 3-dB attenuation and cable. The spectrum analyzer had an impedance of 50Ω to match the impedance of the standard antenna. A HP 8591EM Spectrum Analyzer was used to measure the radio frequency power at the antenna port. The data was taken in dBm and converted to watts as shown in the following Table. Refer to Figures 1 through 3 showing the output power of the transmitter. Data was taken per Paragraph 2.1046(a) and applicable paragraphs of Part 74.

P_{dBm} = power in dB above 1 milliwatt.
Milliwatts = $10^{(PdBm/10)}$
Watts = (Milliwatts)(0.001)(W/mW)

17.00dBm = $10^{(17/10)}$
= 50.11 mW
= 0.050 Watts

Results:

REQUENCY	P_{dBm}	P_{mw}	P_{w}
537.800	16.7	46.8	0.050
549.000	16.9	49.0	0.050
561.800	16.5	44.7	0.050
691.800	16.7	46.8	0.050
703.000	16.8	47.9	0.050
715.800	16.7	46.8	0.050
793.800	17.0	50.1	0.050
800.200	17.1	51.2	0.051
805.000	16.9	49.0	0.050

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

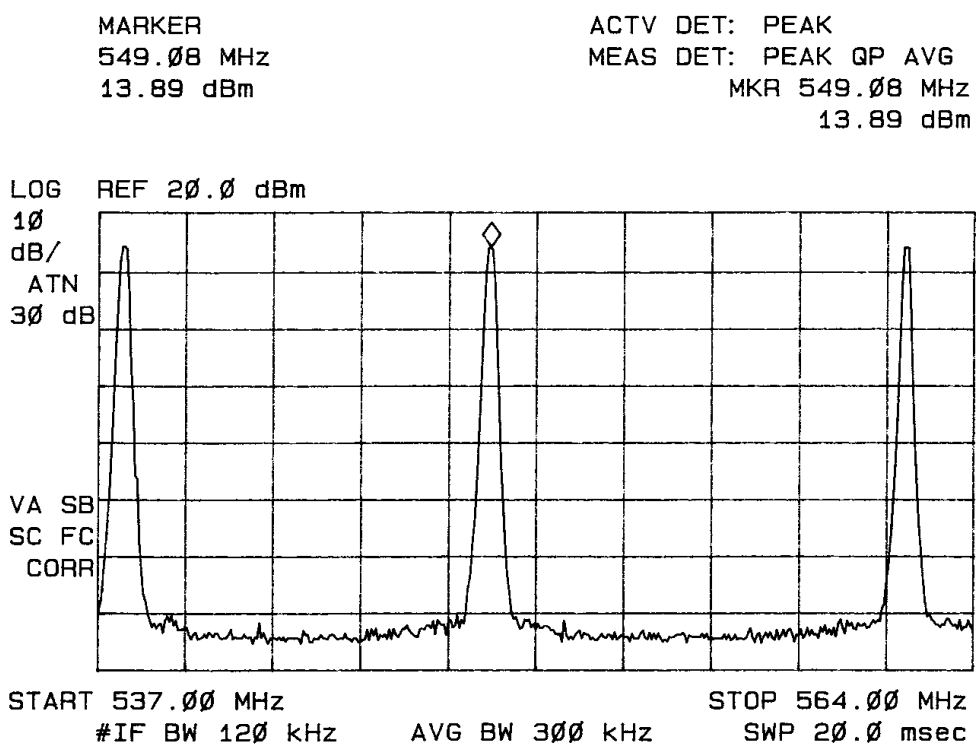


Figure 1: Power Output Block 21

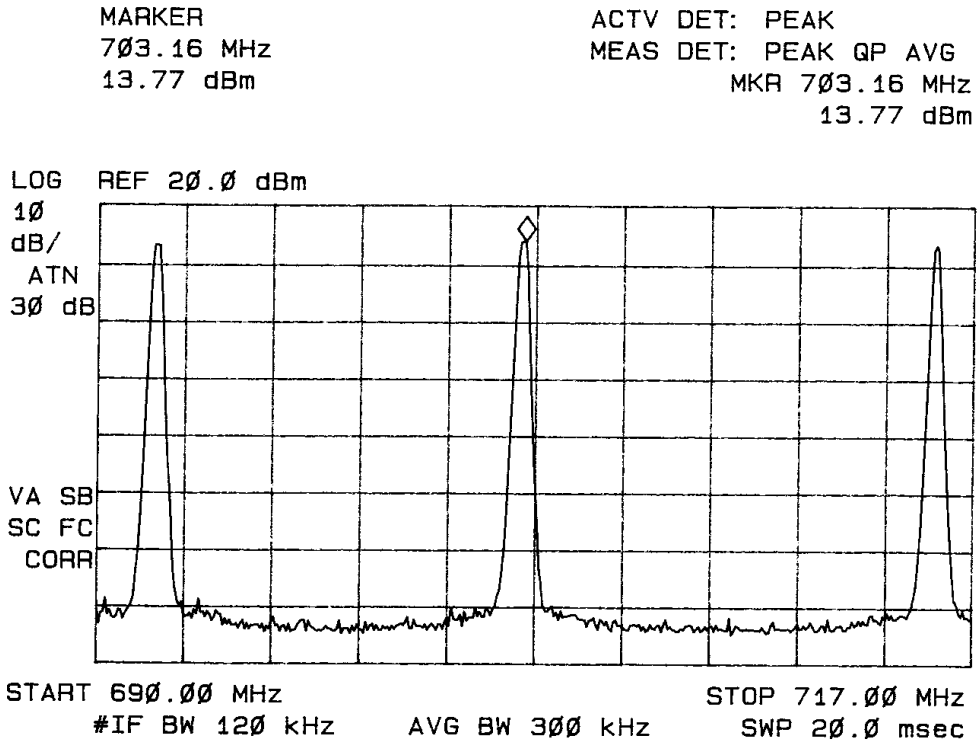


Figure 2: Power Output Block 27

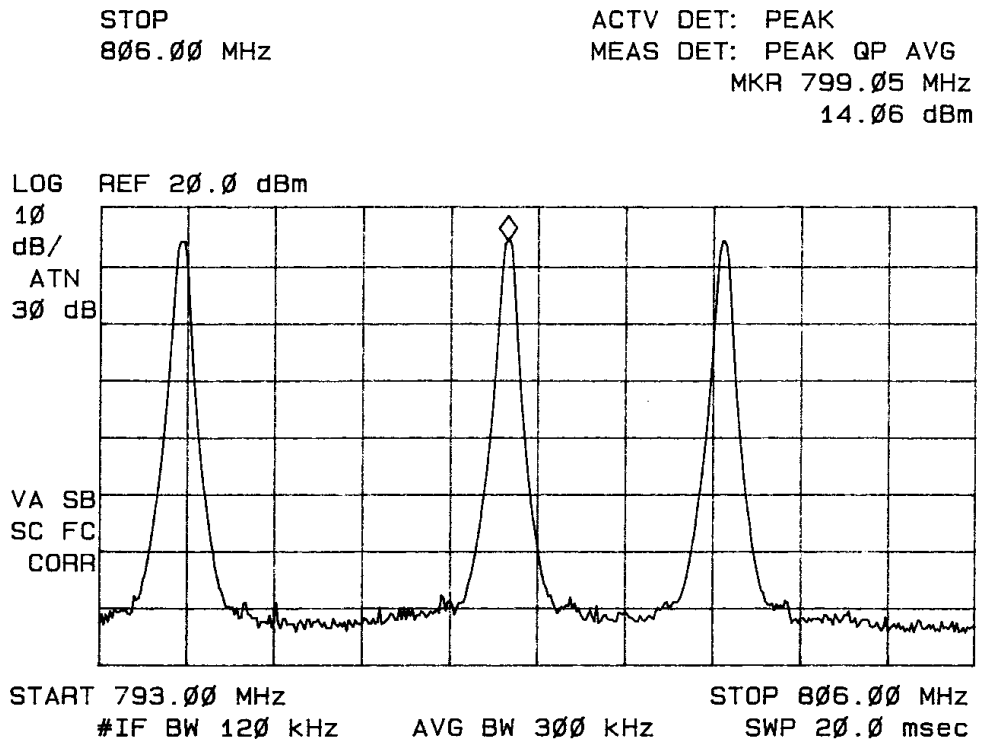


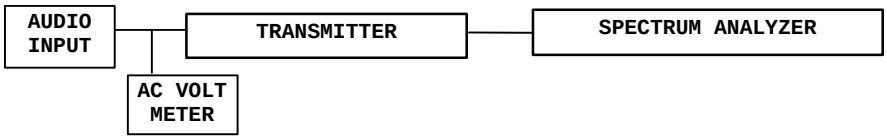
Figure 3: Power Output Block 31

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 coupled to a HP Spectrum Analyzer for analysis. The spectrum analyzer was used to observe the radio frequency spectrum with the transmitter operating in its various modes.

The UM700 transmitter encodes the audio tone to digital format using an analog to digital converter. Once encoded, the digital audio is then serialized into a nominal 240 Kbps data stream. This serial data stream remains a fixed rate, regardless of the nature, content, amplitude, or frequency of the audio tone applied to the audio input of the transmitter.

The data stream is split into two serial streams, I and Q, at a rate of 1/2 the original data stream, or 120 Kbps nominal. The I and Q data streams are then encoded for digital transmission, using pi/4 Differential Quadrature Phase Shift Keying, via a dual baseband digital to analog converter. The I and Q signals, now in an analog format, are filtered using the 5 pole lowpass Bessel filters to restrict the occupied bandwidth. The Bessel filters have -3dB response of 55 kHz. Once filtered, the I and Q signals are then applied to a quadrature modulator for direct conversion onto the RF carrier.

The nature of the encoding process gives the transmitted data a pseudo random appearance. As opposed to conventional FM, the nature of the applied audio has no effect of the spectrum of the RF carrier due to the fact that a fixed bit rate is being transmitted.

Results:

The output radio frequency spectrum was observed while the audio input was adjusted from 300 Hz to 15,000 Hz. There was no apparent effect of the output frequency spectrum observed while varying the input signal frequency or amplitude. Since the modulation technique is digital there was no audio frequency response characterization made of the unit.

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 15,000 Hz. The power ratio in dB representing 99.5% of the total mean power was recorded from the spectrum analyzer. Refer to figure 4 for a plot of the 99.5% power and spectral mask.

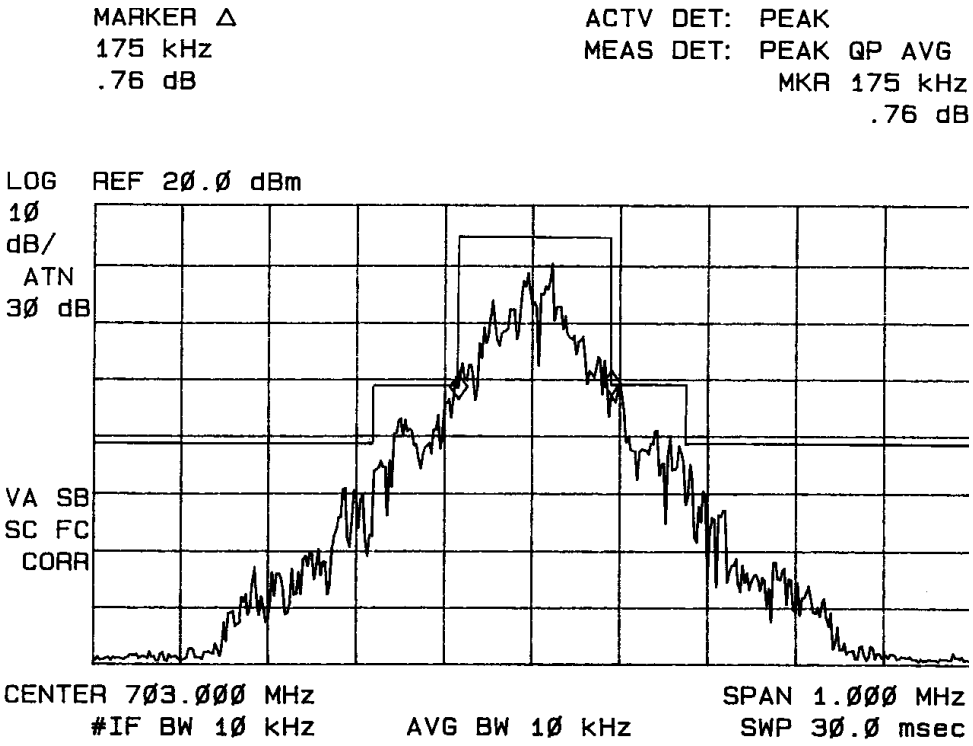


Figure 4: Occupied BandWidth Measurement and Spectral Mask

Results:

f_c (MHz)	O.B.(kHz)
549.000	175
703.000	175
800.000	178

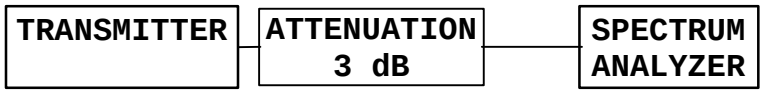
Requirements of 2.1049(c)(1) and applicable paragraphs of Parts 22, 74, 90 and 97 are met. There are no deviations to the specifications.

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.

Test Arrangement:



The radio frequency output was coupled to a HP 8562A Spectrum Analyzer. The spectrum analyzer was used to observe the radio frequency spectrum with the transmitter operated in a normal mode. The frequency spectrum from 30 MHz to 10.0 GHz was observed and plots produced of the frequency spectrum. Figures 5 and 6 represent data for the EUT. Data was taken per 2.1051, 2.1057, and applicable paragraphs of Part 74.

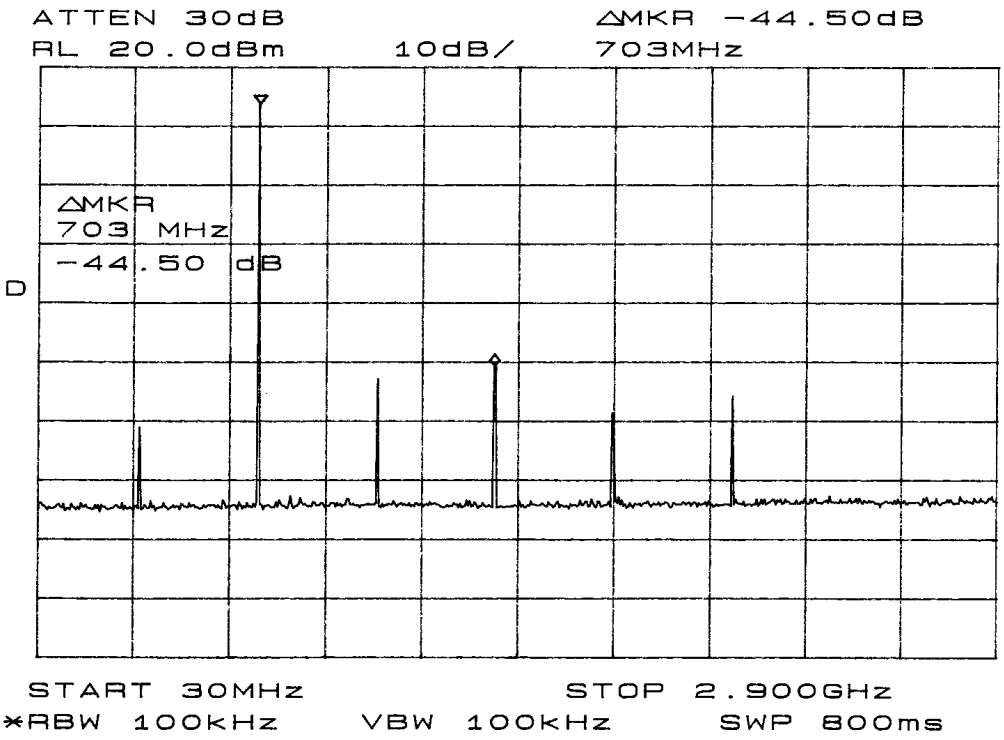


Figure 5: Emissions at Antenna Terminal

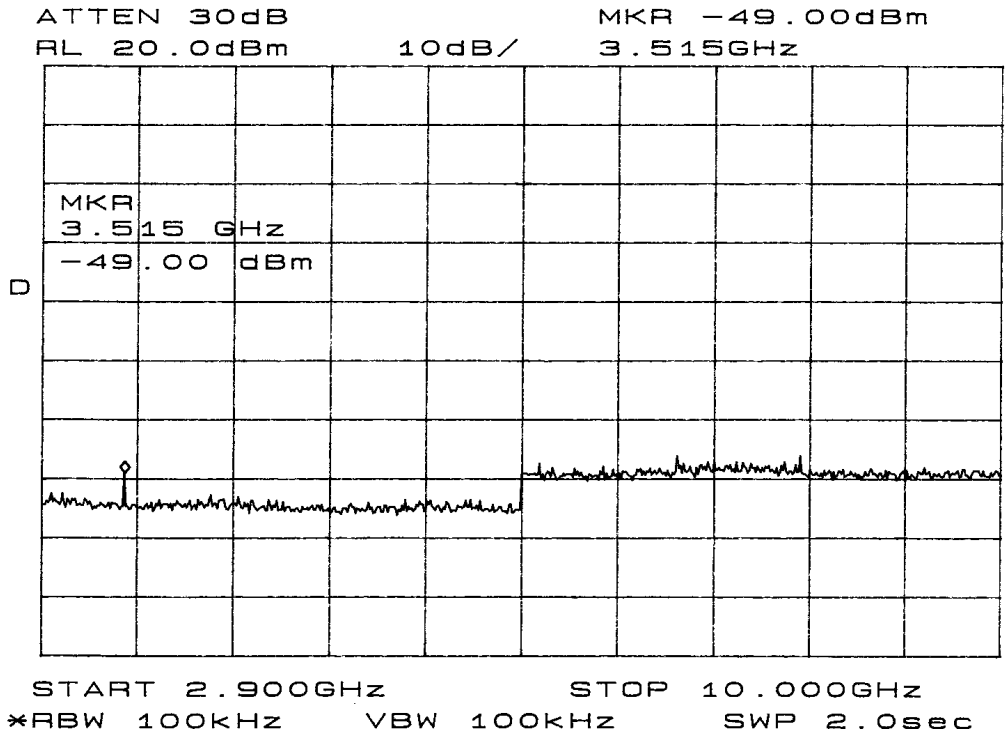


Figure 6: Emissions at Antenna Terminal

Results:

The output of the unit was coupled to a HP Spectrum Analyzer and the frequency emissions were measured. Data was taken as per 2.1051 and applicable paragraphs of Part 74. Specifications of Paragraphs 2.1051, 2.1057 and applicable paragraphs of part 74 are met. There are no deviations to the specifications.

FCC Limit: The spurious emissions must be attenuated at least 43+10log(P_o) below the level of the carrier frequency.

= 43 + 10 LOG(P_o)
= 43 + 10 LOG(0.05)
= 30.0

Spurious Emissions at antenna terminal

CHANNEL MHz	SPURIOUS FREQ. (MHz)	LEVEL BELOW CARRIER (dB)
700.000	350.00	54.8
	1050.00	46.6
	1400.00	44.5
	1750.00	52.3
	2100.00	49.5
	3150.00	49.0

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 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. Emission levels were measured and recorded from the spectrum analyzer in dBµV. This level was then added to the antenna factor less amplification stages, to calculate the field strength at 3 meters. Data was taken at the ROGERS LABS, INC. 3 meters open area test site (OATS). A description of the test facility is on file with the FCC, Reference 90910. The testing procedures used conform to the procedures stated in the ANSI 63.4-1992 document.

Calculations made are as follows:

CFS = Calculated Field Strength
FSM = Field Strength Measurement
CFS = FSM + Antenna Factor – Amplifier Gain
CFS = 89.0 + 18.7 – (-2.5)
CFS = 110.2

The limit for emissions are defined by the following equations:

Limit = Amplitude of spurious emission must be attenuated by this amount below the level of the fundamental.

Calculating the field strength at 3 meters for the 0.05-watt transmitter was done as follows:

$E = \frac{5.5\sqrt{PG}}{d}$ where E is V/m, P is Watts, G = 1.64 and d is meters.

$E = \frac{5.5\sqrt{0.05(1.64)}}{3} = 0.525$ V/m = 0.525E6µV/m at 3 meters.

This was converted to dBµV/m using (20*log µV/m) for convenience.

20*Log(0.525E6) = 114.4 dBµV/m @ 3 meters

On any frequency removed from the assigned frequency by more than 250% of the authorized bandwidth: at least 43 + 10 Log (P_o) dB.

Attenuation = 43 + 10 $Log_{10}(P_w)$
= 43 + 10 $Log_{10}(0.05)$
= 30.0 dB

Limit = 114.4 – 30.0
= 84.4 dBµV/m @ 3 meters

Results:

Block 21

Frequency (MHz)	FSM Horz. (dBµV)	FSM Vert. (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	CFS Horz. @ 3m (dBµV/m)	CFS Vert. @ 3m (dBµV/m)	Limit (dBµV/m)
537.800	89.0	93.6	18.7	-2.5	110.2	114.8	
268.900	44.8	46.3	13.5	25	33.3	34.8	84.4
806.700	57.0	72.0	22.2	25	54.2	69.2	84.4
1075.600	29.0	38.8	24.1	25	28.1	37.9	84.4
1344.500	41.5	51.5	26.4	25	42.9	52.9	84.4
1613.400	52.0	48.0	28.2	25	55.2	51.2	84.4
1882.300	25.0	35.0	29.5	25	29.5	39.5	84.4

Block 21

Frequency (MHz)	FSM Horz. (dBµV)	FSM Vert. (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	CFS Horz. @ 3m (dBµV/m)	CFS Vert. @ 3m (dBµV/m)	Limit (dBµV/m)
549.000	89.5	93.3	18.6	-2.5	110.6	114.4	
274.500	56.1	54.3	13.5	25	44.6	42.8	84.4
823.500	51.0	64.8	22.5	25	48.5	62.3	84.4
1098.000	30.5	40.5	24.5	25	30.0	40.0	84.4
1372.500	36.8	52.0	26.4	25	38.2	53.4	84.4
1647.000	50.3	47.8	28.2	25	53.5	51.0	84.4
1921.500	25.0	28.8	29.9	25	29.9	33.7	84.4

Block 21

Frequency (MHz)	FSM Horz. (dBµV)	FSM Vert. (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	CFS Horz. @ 3m (dBµV/m)	CFS Vert. @ 3m (dBµV/m)	Limit (dBµV/m)
561.800	89.3	92.3	18.6	-2.5	110.4	113.4	
280.900	62.0	62.8	13.5	25	50.5	51.3	84.4
842.700	50.5	66.0	22.5	25	48.0	63.5	84.4
1123.600	26.5	40.5	24.5	25	26.0	40.0	84.4
1404.500	38.3	53.5	27.0	25	40.3	55.5	84.4
1685.400	43.8	42.0	28.2	25	47.0	45.2	84.4
1966.300	26.5	30.3	29.9	25	31.4	35.2	84.4

Block 27

Frequency (MHz)	FSM Horz. (dBµV)	FSM Vert. (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	CFS Horz. @ 3m (dBµV/m)	CFS Vert. @ 3m (dBµV/m)	Limit (dBµV/m)
691.800	89.3	92.0	20.9	-2.5	112.7	115.4	
345.900	43.2	51.6	15.3	25	33.5	41.9	84.4
1037.700	43.0	45.3	24.1	25	42.1	44.4	84.4
1383.600	30.3	34.3	26.4	25	31.7	35.7	84.4
1729.500	26.8	32.8	28.2	25	30.0	36.0	84.4
2075.400	28.6	32.5	30.0	25	33.6	37.5	84.4
2413.000	24.0	26.8	32.0	25	31.0	33.8	84.4

Block 27

Frequency (MHz)	FSM Horz. (dBµV)	FSM Vert. (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	CFS Horz. @ 3m (dBµV/m)	CFS Vert. @ 3m (dBµV/m)	Limit (dBµV/m)
703.000	89.7	91.9	20.9	-2.5	113.1	115.3	
351.500	41.3	57.8	15.3	25	31.6	48.1	84.4
1054.500	44.0	44.1	24.1	25	43.1	43.2	84.4
1406.000	26.8	30.3	27.0	25	28.8	32.3	84.4
1757.500	30.5	39.3	28.2	25	33.7	42.5	84.4
2109.000	28.5	35.3	30.0	25	33.5	40.3	84.4

Block 27

Frequency (MHz)	FSM Horz. (dBµV)	FSM Vert. (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	CFS Horz. @ 3m (dBµV/m)	CFS Vert. @ 3m (dBµV/m)	Limit (dBµV/m)
715.800	89.1	91.3	20.9	-2.5	112.5	114.7	
357.900	46.8	64.8	15.3	25	37.1	55.1	84.4
1073.700	29.5	56.1	24.1	25	28.6	55.2	84.4
1431.600	28.1	28.6	27.0	25	30.1	30.6	84.4
1789.500	39.3	42.0	28.2	25	42.5	45.2	84.4
2147.400	30.0	32.8	30.0	25	35.0	37.8	84.4
2505.300	24.0	24.0	33.0	25	32.0	32.0	84.4

Block 31

Frequency (MHz)	FSM Horz. (dBµV)	FSM Vert. (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	CFS Horz. @ 3m (dBµV/m)	CFS Vert. @ 3m (dBµV/m)	Limit (dBµV/m)
793.800	88.5	90.5	22.0	-2.5	113.0	115.0	
396.900	51.5	64.5	16.5	25	43.0	56.0	84.4
1190.700	55.5	59.2	25.1	25	55.6	59.3	84.4
1587.600	30.8	32.6	27.6	25	33.4	35.2	84.4
1984.500	36.0	42.8	29.9	25	40.9	47.7	84.4
2381.400	35.2	34.0	31.0	25	41.2	40.0	84.4

Block 31

Frequency (MHz)	FSM Horz. (dBµV)	FSM Vert. (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	CFS Horz. @ 3m (dBµV/m)	CFS Vert. @ 3m (dBµV/m)	Limit (dBµV/m)
800.200	88.8	91.2	22.2	-2.5	113.5	115.9	
400.100	54.5	65.0	16.5	25	46.0	56.5	84.4
1200.300	52.3	52.5	25.5	25	52.8	53.0	84.4
1600.400	31.8	36.0	28.6	25	35.4	39.6	84.4
2000.500	30.6	40.3	29.9	25	35.5	45.2	84.4
2400.600	34.3	34.3	31.0	25	40.3	40.3	84.4

Block 31

Frequency (MHz)	FSM Horz. (dBµV)	FSM Vert. (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	CFS Horz. @ 3m (dBµV/m)	CFS Vert. @ 3m (dBµV/m)	Limit (dBµV/m)
805.000	89.7	91.2	22.2	-2.5	114.4	115.9	
402.500	57.8	64.1	16.5	25	49.3	55.6	84.4
1207.500	49.5	56.0	25.5	25	50.0	56.5	84.4
1610.000	29.5	39.5	28.6	25	33.1	43.1	84.4
2012.500	26.8	39.5	29.9	25	31.7	44.4	84.4
2415.000	37.5	37.1	31.0	25	43.5	43.1	84.4

Specifications of Paragraph 2.1053, 2.1057, applicable paragraphs of part 74 are met. There are no deviations to the specifications.

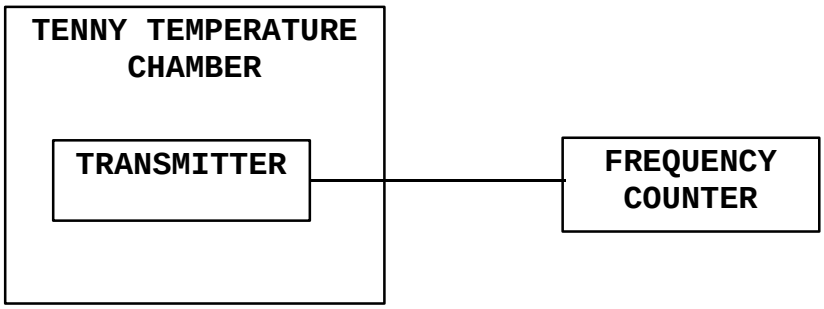
2.1055 Frequency Stability

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:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
(2) For hand carried, batteries powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.
(3) 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:

Steps 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 a 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 Topward 6303A DC Power Supply was used to vary the dc voltage for the power input from 6.375 Vdc to 8.625 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 22, 74, 90 and 97.

Results:

FREQ. (MHz)		FREQUENCY STABILITY VS TEMPERATURE IN PARTS PER MILLION (PPM) and percent (limit=0.005%)								
		Temperature in °C								
		-30	-20	-10	0	+10	+20	+30	+40	+50
703.000	PPM	-9.68	-4.05	0.59	1.38	1.80	0.0	-1.24	-2.43	-4.26
	%	-0.0009	-0.0004	0.0006	0.0001	0.0002	0.0	-0.0001	-0.0002	-0.0004

FREQUENCY IN MHz	**FREQUENCY STABILITY VS VOLTAGE VARIATION 9.60 volts nominal; RESULTS IN PPM INPUT VOLTAGE**		
	8.16 V_{dc}	**9.60 V_{dc}**	**11.04 V_{dc}**
703.000	0.0	0.0	0.0

FREQUENCY IN MHz	**FREQUENCY STABILITY VS VOLTAGE VARIATION 9.60 volts nominal; RESULTS IN PPM BATTERY ENDPOINT VOLTAGE 6.00 V_{dc}**
703.000	0.0

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

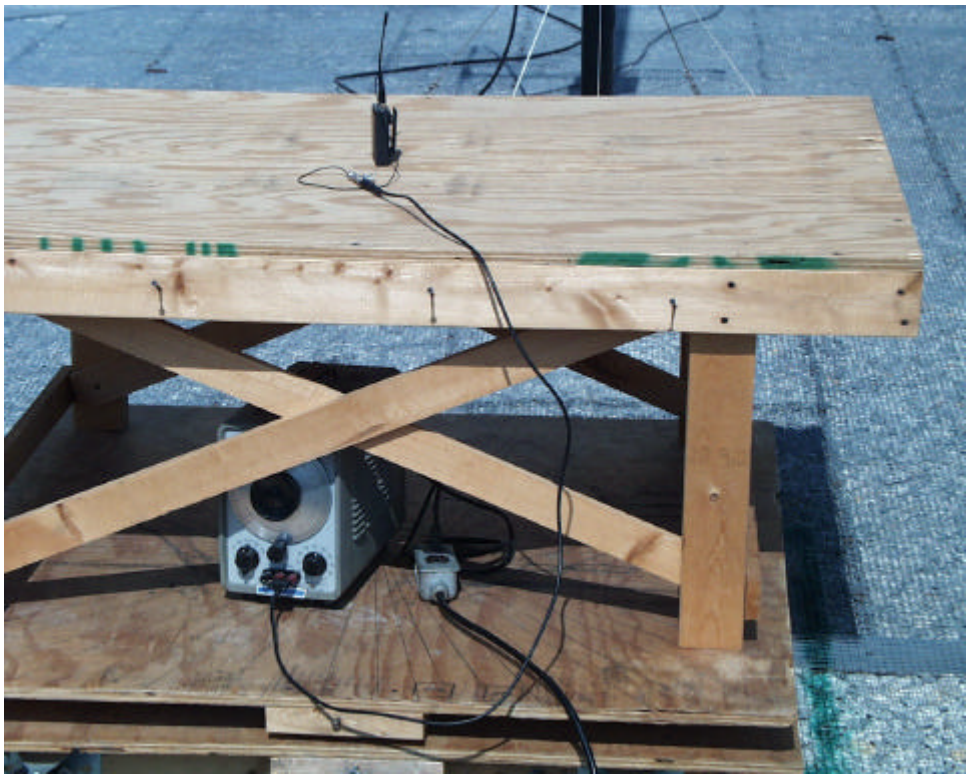
EXHIBIT II:

APPENDIX

Model: UM700

1. Photos of Radiated Emissions Setup
2. Test Equipment List
3. Rogers Qualifications
4. FCC Site Approval Letter

LECTROSONICS, INC.
MODEL: UM700
PHOTOGRAPHS FOR RADIATED EMISSIONS TESTS



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:
Scope: Tektronix 2230	2/01
Wattmeter: Bird 43 with Load Bird 8085	2/01
Power Supplies: Sorensen SRL 20-25, SRL 40-25, DCR 150, DCR 140	2/01
H/V Power Supply: Fluke Model: 408B (SN: 573)	2/01
R.F. Generator: HP 606A	2/01
R.F. Generator: HP 8614A	2/01
R.F. Generator: HP 8640B	2/01
Spectrum Analyzer: HP 8562A,	2/01
Mixers: 11517A, 11970A, 11970K, 11970U, 11970V, 11970W	
HP Adapters: 11518, 11519, 11520	
Spectrum Analyzer: HP 8591 EM	7/00
Frequency Counter: Leader LDC 825	2/01
Antenna: EMCO Biconilog Model: 3143	4/00
Antenna: EMCO Log Periodic Model: 3147	10/00
Antenna: Antenna Research Biconical Model: BCD 235	10/00
Antenna: EMCO Dipole Set 3121C	2/01
Antenna: C.D. B-101	2/01
Antenna: Solar 9229-1 & 9230-1	2/01
Antenna: EMCO 6509	2/01
Audio Oscillator: H.P. 201CD	2/01
R.F. Power Amp 65W Model: 470-A-1010	2/01
R.F. Power Amp 50W M185- 10-501	2/01
R.F. PreAmp CPPA-102	2/01
Shielded Room 5 M x 3 M x 3.0 M (101 dB Integrity)	
LISN 50 µHy/50 ohm/0.1 µf	10/00
LISN Compliance Eng. 240/20	2/01
Peavey Power Amp Model: IPS 801	2/01
Power Amp A.R. Model: 10W 1010M7	2/01
Power Amp EIN Model: A301	2/01
ELGAR Model: 1751	2/01
ELGAR Model: TG 704A-3D	2/01
ESD Test Set 2010i	2/01
Fast Transient Burst Generator Model: EFT/B-101	2/01
Current Probe: Singer CP-105	2/01
Current Probe: Solar 9108-1N	2/01
Field Intensity Meter: EFM-018	2/01
KETEK Ecat Surge Generator	2/01

02/28/2001

QUALIFICATIONS

of

SCOT D. ROGERS, ENGINEER

ROGERS LABS, INC.

Mr. Rogers has approximately 13 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 9, 2001
Date

1/08/2001

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

December 08, 2000

Registration Number: 90910

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

Attention: Scot D. Rogers

Re: Measurement facility located at Louisburg
3 & 10 meter site
Date of Listing: December 08, 2000

Gentlemen:

Your submission of the description of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC Rules. The description has, therefore, been placed on file and the name of your organization added to the Commission's 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 this filing must be updated for any changes made to the facility, and at least every three years from the date of listing the data on file must be certified as current.

If requested, the above mentioned facility has been added to our list of those who perform these measurement services for the public on a fee basis. An up-to-date list of such public test facilities is available on the Internet on the FCC Website at WWW.FCC.GOV, E-Filing, OET Equipment Authorization Electronic Filing.

Sincerely,

Thomas W. Phillips

Thomas W Phillips
Electronics Engineer