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: MM400 and MM200E

NAME: Wireless Microphone Transmitter

FREQUENCY: 536 – 806 MHz
FCC ID: DBZ MM400

Test Date: April 16, 2002

Certifying Engineer:

Scot D. Rogers
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FORWARD:

In accordance with the Federal Communications Code of Federal Regulations, dated October 1, 2001, 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 the following is submitted:

Applicable Standards & Test Procedures

a) In accordance with the Federal Communications Code of Federal Regulations, dated October 1, 2001, Part 2, Subpart J, Paragraphs 2.907, 2.911, 2.913, 2.925, 2.926, 2.1031 through 2.1057, and applicable paragraphs of Part 74 the following is submitted.

b) Test procedures used are the established Methods of Measurement of Radio-Noise Emissions as described in the ANSI 63.4-1992 and ANSI/TIA/EIA 603.

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(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. DBZ MM400

(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. 536 to 806 MHz with lockout provisions on restricted frequency bands between 608 and 614 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 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 3.3 volts with 53 mA current for a power requirement of 175 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 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. 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. 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 meet 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.

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, 1-

dB attenuation, and cable. The spectrum analyzer had an impedance of 50 W 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 one through three 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)

20.0dBm = $10^{(20.0/10)}$
= 100.0 mW
= 0.1 Watts

Results:

FREQUENCY	P_{dBm}	P_{mw}	P_w
537.600	20.0	100.0	0.100
550.400	20.0	100.0	0.100
563.100	20.0	100.0	0.100
665.600	20.0	100.0	0.100
678.500	20.0	100.0	0.100
691.100	20.0	100.0	0.100
794.300	20.2	104.7	0.100
799.100	20.2	104.7	0.100
805.500	20.2	104.7	0.100

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

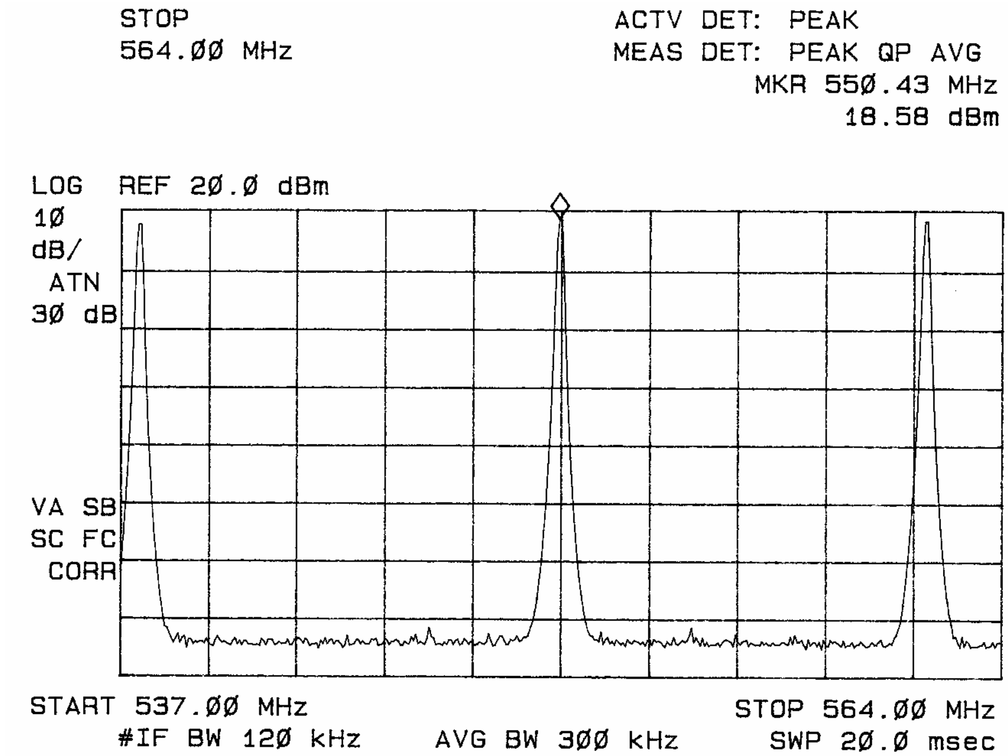


Figure one Power Output Block 21.

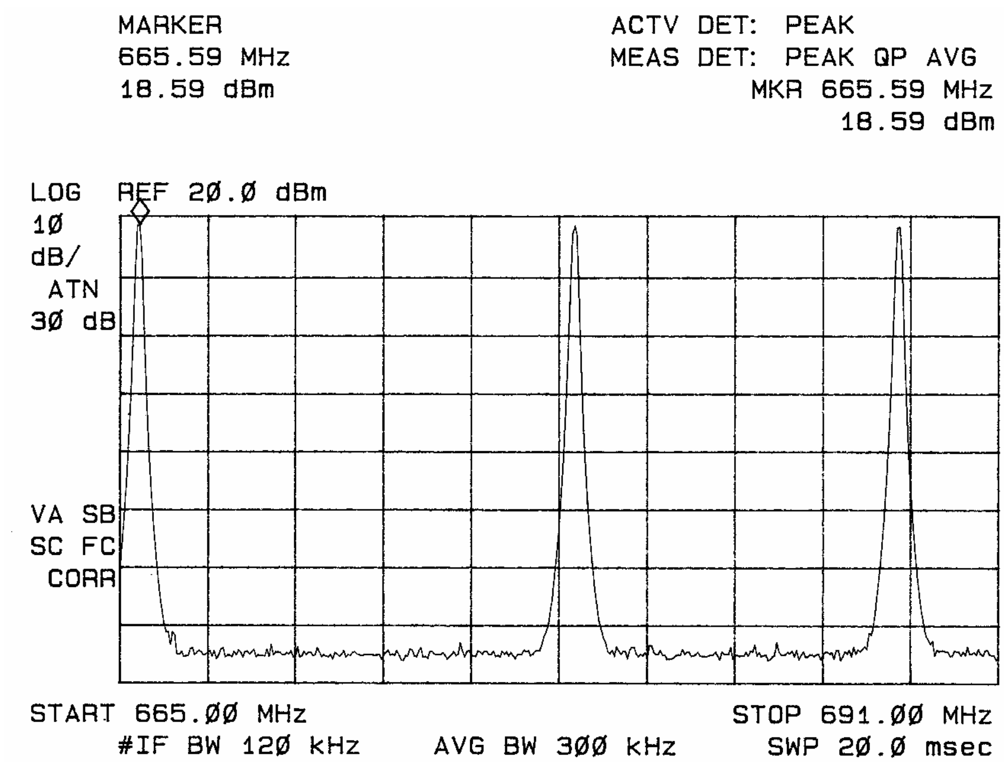


Figure two Power Output Block 26.

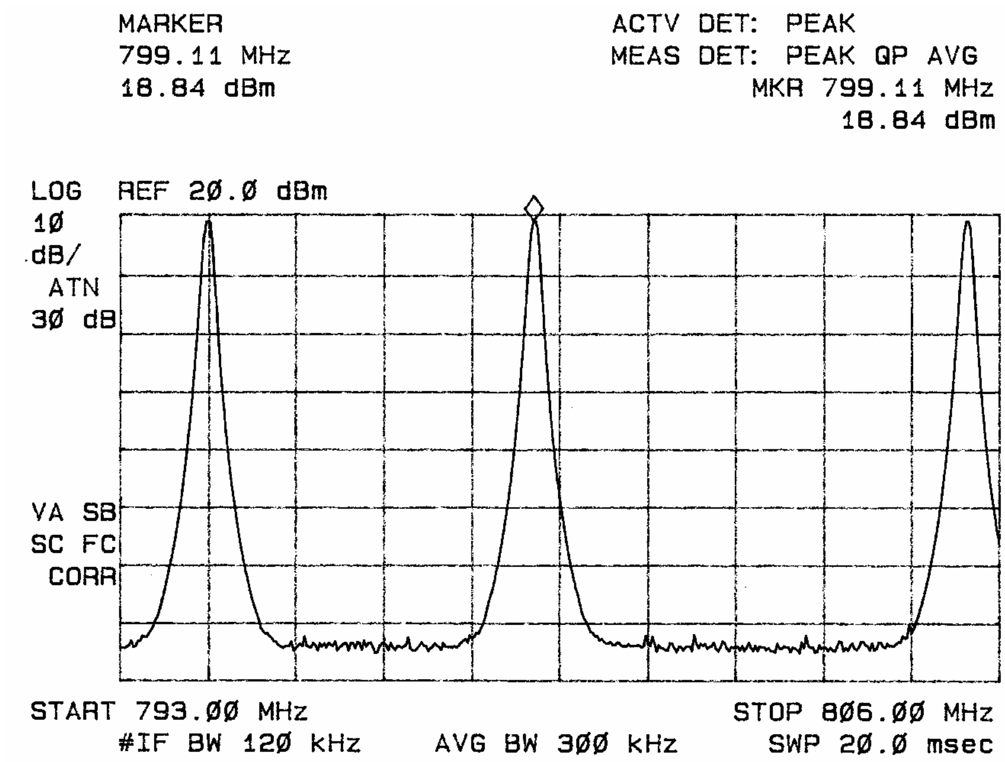


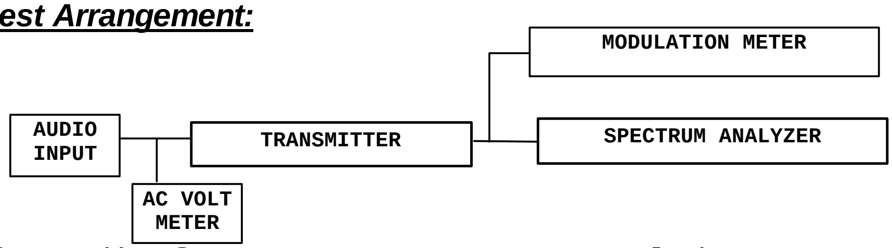
Figure three Power Output Block 31.

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 and a modulation meter. The spectrum analyzer was used to observe the radio frequency spectrum with the transmitter operating in its various modes. The modulation meter was used to measure the percent modulation or frequency deviation.

Results:

Figure 4 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.

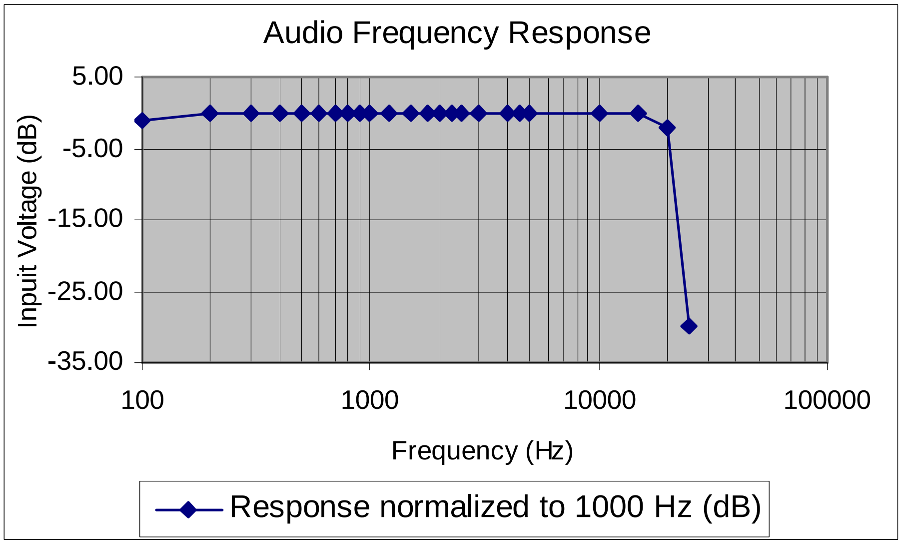


Figure four Audio Frequency Response Characteristics.

Figure 5 shows the deviation response for each of four frequencies while the input voltage was varied. The frequency is held constant and the frequency deviation is read from the deviation meter.

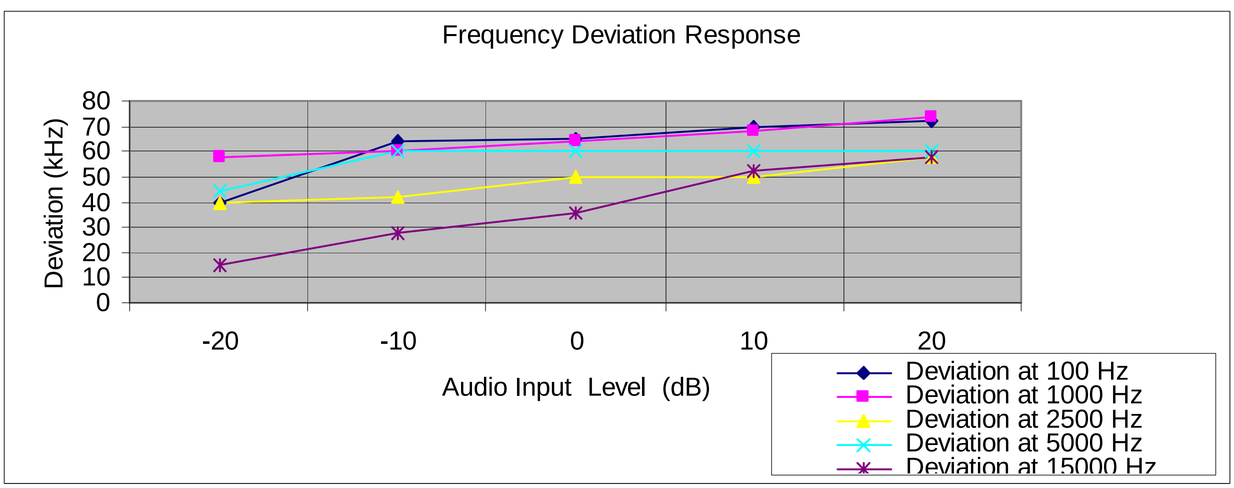


Figure five Deviation Characteristics.

Figure 6 shows the frequency response of the audio low pass filter.

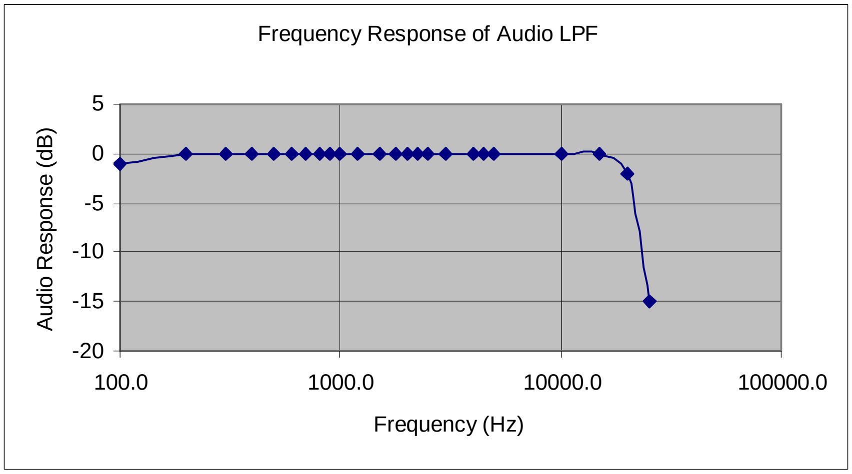


Figure six Frequency Response of Audio low Pass Filter.

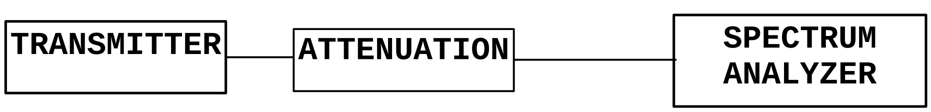
The specifications of Paragraph 2.1047 and applicable parts of 74 are met.

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 seven for a plot of the 99.5% power and spectral mask.

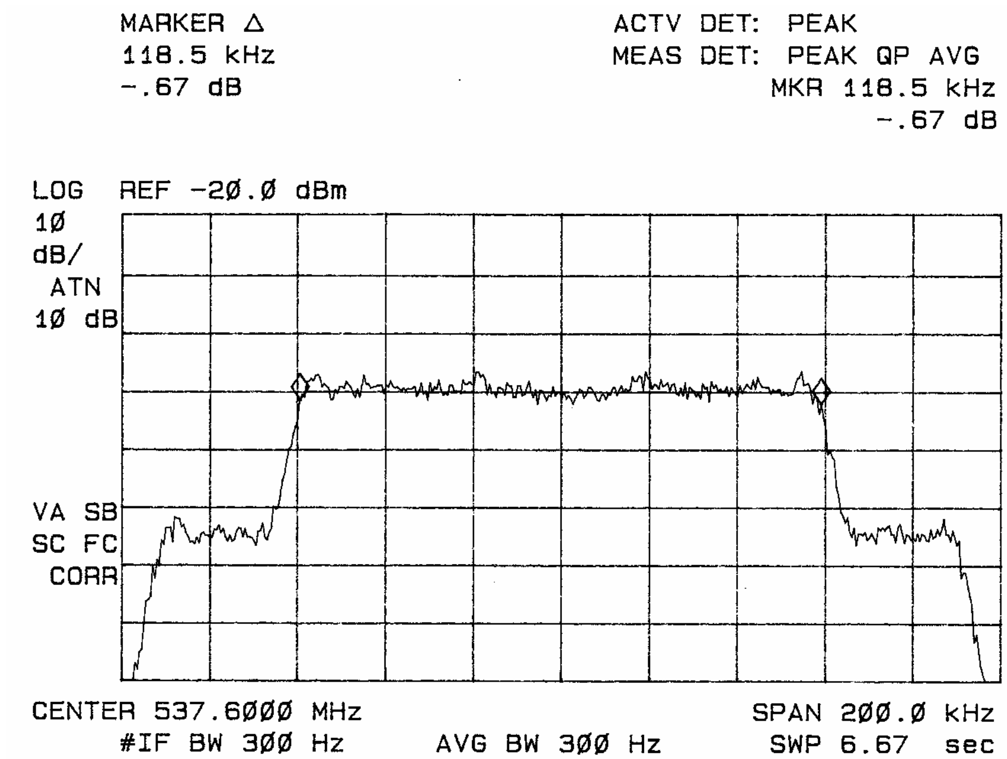


Figure seven Occupied Bandwidth Measurement and Spectral Mask

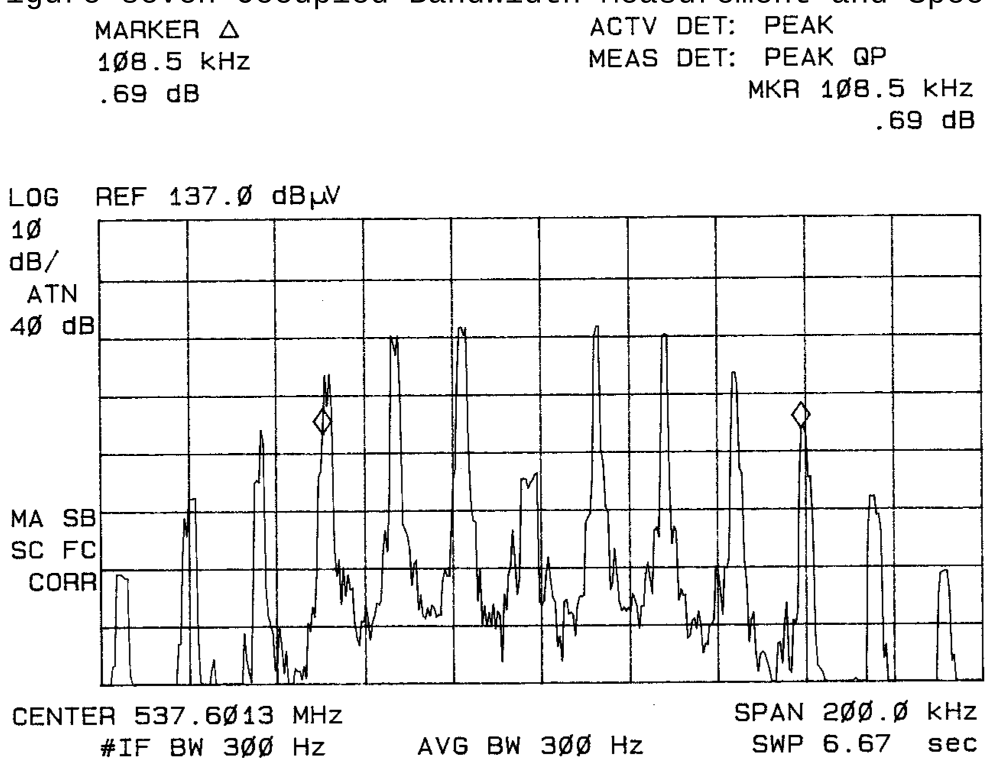


Figure seven(a) Occupied Bandwidth Measurement @ 15,000 Hz

Results:

The necessary bandwidth for this sound broadcasting class of equipment is calculated from the equation B_n=2M+2DK (k=1, M=15,000 and D=75,000). This equates to a necessary bandwidth of 180k Hz. The limiting circuitry of the device reduces the measured bandwidth due to the constant wave frequency signal used as input.

f_c (MHz)	Occupied Bandwidth(kHz)
537.600	118.5

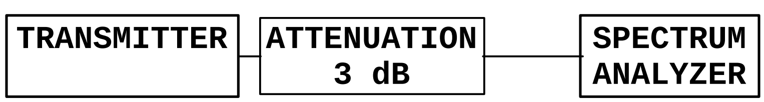
Requirements of 2.1049(c)(1) and applicable paragraphs of Parts 2, 22, and 74 are met. There are no deviations to the specifications.

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. Data was taken as specified in ANSI/TIA/EIA 603.

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 8 and 9 represent data for the EUT. Data was taken per 2.1051, 2.1057, and applicable paragraphs of Part 74.

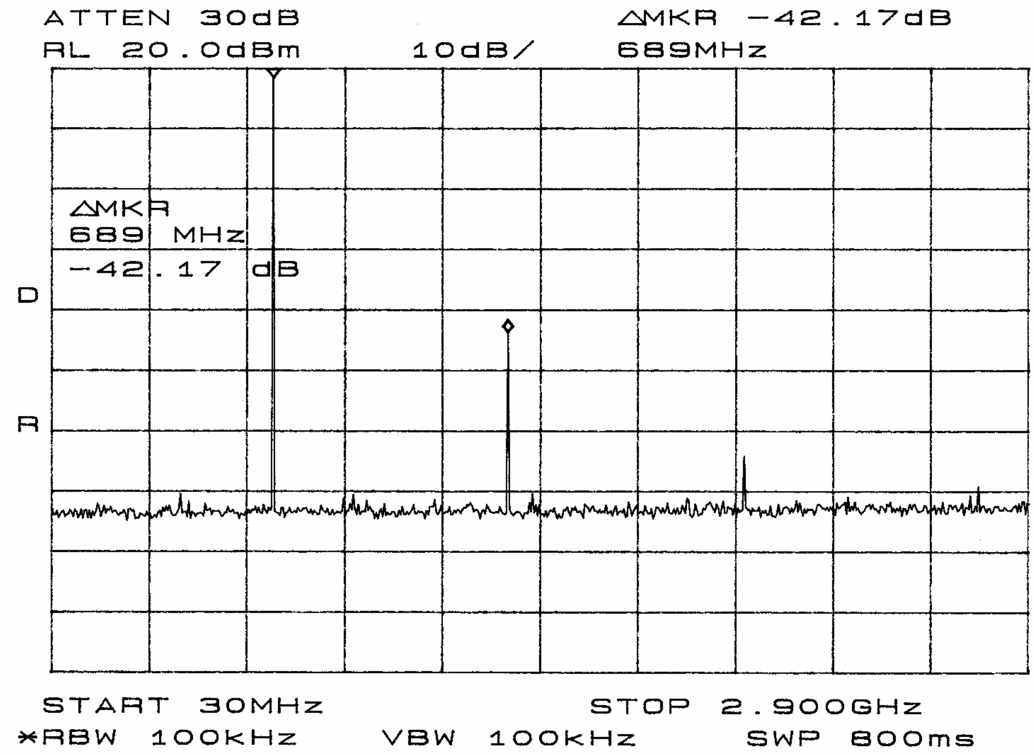


Figure eight Emissions at Antenna Terminal.

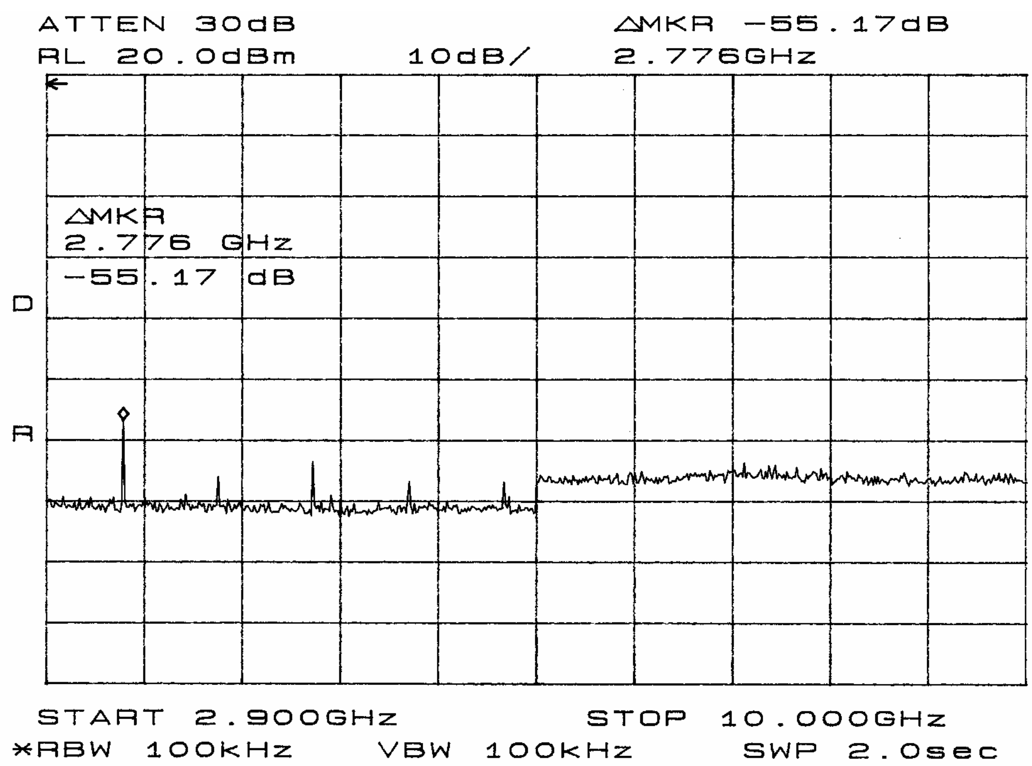


Figure nine Emissions at Antenna Terminal.

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 $43+10\log(P_o)$ below the level of the carrier frequency.

$= 43 + 10\ \mathrm{LOG}(P_o)$

$= 43 + 10\ \mathrm{LOG}(0.100)$

$= 33.0$

Spurious Emissions at antenna terminal

CHANNEL MHz	SPURIOUS FREQ. (MHz)	LEVEL BELOW CARRIER (dB)
688.100	1376.2	42.1
	2064.3	62.5
	2752.4	67.5
	3440.5	55.2
	4128.6	64.3
	4816.7	61.8
	5504.8	65.1
	6192.9	65.1

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 a standard 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. 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.

The limits 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 0.100-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.

$$E = \frac{5.5\sqrt{0.1(1.64)}}{3} = 0.742 \text{ V/m} = 0.742\text{E}6\,\mu\text{V/m at 3 meters.}$$

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

20*Log(0.742E6) = 117.4 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.

$$\begin{aligned}\text{Attenuation} &= 43 + 10\,\text{Log}_{10}(P_w)\\ &= 43 + 10\,\text{Log}_{10}(0.10)\\ &= 33\text{ dB}\end{aligned}$$

$$\begin{aligned}\text{Limit} &= 117.4 - 33.0\\ &= 84.4\text{ dB}\mu\text{V/m @ 3 meters}\end{aligned}$$

In addition, the substitution method was used to measure the spurious emissions. Emission levels were measured and recorded from the spectrum analyzer in dBµV. The 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 power loss in the cable and further corrected for 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.
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 43 + 10 Log (P_o) dB.
0.100-watt transmitter.
Attenuation = 43 + 10 $Log_{10}(P_w)$
= 43 + 10 $Log_{10}(0.1)$
= 33.0 dB

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)
537.60	78.6	95.3	18.3	0	96.9	113.6	117.4
1075.2	53.0	62.5	23.9	25	51.9	61.4	84.4
1612.8	26.8	37.8	27.7	25	29.5	40.5	84.4
2150.4	24.3	26.0	29.7	25	29.0	30.7	84.4
550.40	81.0	95.0	18.6	0	99.6	113.6	117.4
1100.8	56.0	65.8	24.9	25	55.9	65.7	84.4
1651.2	30.3	39.3	28.6	25	33.9	42.9	84.4
2201.6	24.5	25.8	29.7	25	29.2	30.5	84.4
563.10	78.5	94.8	19.0	0	97.5	113.8	117.4
1126.2	59.5	67.8	24.9	25	59.4	67.7	84.4
1689.3	28.3	40.5	28.6	25	31.9	44.1	84.4
2252.4	27.3	25.7	29.7	25	32.0	30.4	84.4

Block 26

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)
665.6	79.8	91.0	20.1	0	99.9	111.1	117.4
1331.2	48.6	66.0	26.0	25	49.6	67.0	84.4
1996.8	25.1	35.3	29.7	25	29.8	40.0	84.4
2662.4	22.6	28.6	32.5	25	30.1	36.1	84.4
678.5	81.8	95.7	20.1	0	101.9	115.8	117.4
1337.0	51.1	67.1	26.2	25	52.3	68.3	84.4
2035.5	23.5	37.0	29.7	25	28.2	41.7	84.4
2714.0	24.5	34.6	32.5	25	32.0	42.1	84.4
691.1	78.8	88.0	20.5	0	99.3	108.5	117.4
1382.2	51.5	61.5	26.2	25	52.7	62.7	84.4
2073.3	24.5	37.3	29.7	25	29.2	42.0	84.4
2764.4	25.1	36.3	32.5	25	32.6	43.8	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)
793.6	83.8	89.0	22.5	0	106.3	111.5	117.4
1587.2	42.3	61.1	27.6	25	44.9	63.7	84.4
2380.8	36.3	29.5	29.7	25	41.0	34.2	84.4
3174.4	32.6	39.0	36.1	25	43.7	50.1	84.4
800.0	81.5	91.5	22.5	0	104.0	114.0	117.4
1600.0	27.0	56.1	27.7	25	29.7	58.8	84.4
2400.0	30.0	31.1	29.7	25	34.7	35.8	84.4
3200.0	27.3	36.1	36.1	25	38.4	47.2	84.4
806.0	78.8	94.2	22.5	0	101.3	116.7	117.4
1612.0	40.3	32.3	27.7	25	43.0	35.0	84.4
2418.0	25.3	54.0	29.7	25	30.0	58.7	84.4
3224.0	28.8	32.5	36.1	25	39.9	43.6	84.4

Channel frequency 800.0 MHz

Frequency of Emission	Amplitude of Spurious emission		Signal level to dipole required to reproduce		Emission level below carrier		Limit
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	
(MHz)	dBµV	dBµV	dBm	dBm	dBc	dBc	dBc
1600.0	29.7	58.8					33

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

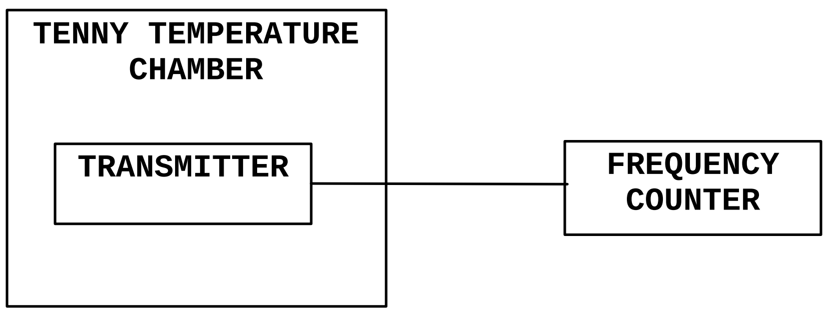
2.1055 Frequency Stability

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 1.27 Vdc to 1.725 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, 22, and 74.

Results:

Nominal frequency 799.1000 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
Change (Hz)	-340	2.1k	-1.7k	2.1k	2.5k	1.5k	-780	-1.1k	-1.9k
PPM	-0.4	2.7	-2.1	2.7	3.1	1.8	-0.9	-1.4	-2.4
%	0.00004	0.0002	-0.0002	0.0002	0.0003	-0.0002	-0.00009	-0.0001	-0.0002

FREQUENCY IN MHz	**FREQUENCY STABILITY VS VOLTAGE VARIATION 1.50 volts nominal; RESULTS IN PPM INPUT VOLTAGE**		
	1.275 V_{dc}	**1.50 V_{dc}**	**1.725 V_{dc}**
799.100	0.0	0.0	0.0

FREQUENCY IN MHz	**FREQUENCY STABILITY VS VOLTAGE VARIATION 1.5 volts nominal; RESULTS IN PPM BATTERY ENDPOINT VOLTAGE 1.00 V_{dc}**
799.100	0.0

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

APPENDIX

Model: MM400 and MM200E

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	2/02
Wattmeter: Bird 43 with Load Bird 8085	2/02
Power Supplies: Sorensen SRL 20-25, SRL 40-25, DCR 150, DCR 140	2/02
H/V Power Supply: Fluke Model: 408B (SN: 573)	2/02
R.F. Generator: HP 606A	2/02
R.F. Generator: HP 8614A	2/02
R.F. Generator: HP 8640B	2/02
Spectrum Analyzer: HP 8562A,	4/01
Mixers: 11517A, 11970A, 11970K, 11970U, 11970V, 11970W	
HP Adapters: 11518, 11519, 11520	
Spectrum Analyzer: HP 8591 EM	7/01
Frequency Counter: Leader LDC 825	2/02
Antenna: EMCO Biconilog Model: 3143	4/01
Antenna: EMCO Log Periodic Model: 3147	10/01
Antenna: Antenna Research Biconical Model: BCD 235	7/01
Antenna: EMCO Dipole Set 3121C	2/02
Antenna: C.D. B-101	2/02
Antenna: Solar 9229-1 & 9230-1	2/02
Antenna: EMCO 6509	2/02
Audio Oscillator: H.P. 201CD	2/02
R.F. Power Amp 65W Model: 470-A-1010	2/02
R.F. Power Amp 50W M185- 10-501	2/02
R.F. PreAmp CPPA-102	2/02
Shielded Room 5 M x 3 M x 3.0 M (101 dB Integrity)	
LISN 50 μHy/50 ohm/0.1 μf	10/01
LISN Compliance Eng. 240/20	2/02
Peavey Power Amp Model: IPS 801	2/02
Power Amp A.R. Model: 10W 1010M7	2/02
Power Amp EIN Model: A301	2/02
ELGAR Model: 1751	2/02
ELGAR Model: TG 704A-3D	2/02
ESD Test Set 2010i	2/02
Fast Transient Burst Generator Model: EFT/B-101	2/02
Current Probe: Singer CP-105	2/02
Current Probe: Solar 9108-1N	2/02
Field Intensity Meter: EFM-018	2/02
KEYTEK Ecat Surge Generator	2/02

02/01/2002

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

April 16, 2002
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
Electronics Engineer