

ROGERS LABS, INC.

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ENGINEERING TEST REPORT FOR APPLICATION of GRANT of CERTIFICATION

**FOR
CFR 47, PART 15C - INTENTIONAL RADIATORS
Paragraph 15.249
Low Power License Exempt Intentional Radiator**

For

APPLIED DIGITAL, INC.

2131 N. State Highway 265
Branson, MO 65616-9842
David Boone,

**DATA TRANSMITTER
Model: AP-900
Frequency Range 902-928 MHz
FCC ID#: SOW AP-900**

Test Date: October 25, 2004

Certifying Engineer:

Scot D. Rogers
ROGERS LABS, INC.
4405 West 259th Terrace
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FORWARD:

The following is submitted for consideration in obtaining a Grant of Certification for a Low Power License Exempt Intentional Radiator operating under CFR Paragraph 15.249.

Name of Applicant:

APPLIED DIGITAL, INC.
2131 N. State Highway 265
Branson, MO 65616-9842

Model: AP-900 transceiver.

FCC I.D.: SOW AP-900.

Frequency Range: 902-928 MHz.

Operating Power: 94 dBmV/m at 3 meters distance.

1) Applicable Standards & Test Procedures

a) In accordance with the Federal Communications Code of Federal Regulations, dated October 1, 2003, Part 2, Subpart J, Paragraphs 2.907, 2.911, 2.913, 2.925, 2.926, 2.1031 through 2.1057, and applicable parts of paragraph 15, Part 15C Paragraph 15.249 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 Document FCC, documents DA00-1407 and DA00-705 and/or TIA/EIA 603-1.

2.1033(b) Application for Certification

- (1) Manufacturer: APPLIED DIGITAL, INC.
2131 N. State Highway 265
Branson, MO 65616-9842
- (2) Identification: Model: AP-900
FCC I.D.: SOW AP-900
- (3) Instruction Book:

Refer to Exhibit for Instruction Manual.
- (4) Description of Circuit Functions:

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

Refer to Exhibit of Operational Description.
- (6) Report of Measurements:

Report of measurements follows in this Report.
- (7) Photographs: Construction, Component Placement, etc.:

Refer to Exhibit for photographs of equipment.
- (8) No Peripheral Equipment was Necessary.
- (9) Transition Provisions of 15.37 are not being requested.
- (10) Not Applicable. The unit is not a scanning receiver.
- (11) Not Applicable. The EUT does not operate in the 59 – 64 GHz frequency band.

2) Equipment Tested

<u>Equipment</u>	<u>Model</u>	<u>FCC I.D.#</u>
EUT	AP-900	SOW AP-900

3) Equipment Function and Testing Procedures

The EUT is a 902-928 MHz radio transmitter used to transmit data to and from remote locations to a central control panel. The unit is marketed for use to incorporate a wireless link to exchange data information from one point to another. For testing purposes the transceiver was powered from the supplied AC power supply and set to transmit a maximum data packet. The unit operates from external supplied 5 volt direct current supplied from the AC/DC adapter. The device utilizes a permanently connected antenna system with no provision for user replacement.

4) Equipment and Cable Configurations

Conducted Emission Test Procedure

The unit typically operates from a user supplied 5 volt supply. For testing purposes, the manufacturer supplied five-volt wall transformer was used to power the unit. The test setup including the EUT was arranged in a typical equipment configuration and placed on a 1 x 1.5-meter wooden bench, 0.8 meters high located in a screen room. The power lines of the system were isolated from the power source using a standard LISN with a 50 - mHy choke. EMI was coupled to the spectrum analyzer through a 0.1 mF capacitor internal to the LISN. The LISN was positioned on the floor beneath the wooden bench supporting the EUT. The power lines and cables were draped over the back edge of the table.

Radiated Emission Test Procedure:

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.

5) List of Test Equipment

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

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

<u>EQUIPMENT MFG.</u>	<u>MODEL</u>	<u>CAL. DATES</u>	<u>DUE.</u>
LISN Comp. Design	FCC-LISN-2-MOD.CD	10/04	10/05
Antenna ARA	BCD-235-B	10/04	10/05
Antenna EMCO	3147	10/04	10/05
Antenna EMCO	3143	5/04	5/05
AnalyzerHP	8591EM	5/04	5/05
AnalyzerHP	8562A	2/04	2/05

6) Units of Measurements

Conducted EMI: Data is in dB μ V; dB referenced to one microvolt.

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

7) Test Site Locations

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

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

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

8) SUBPART B – UNINTENTIONAL RADIATORS

Conducted EMI

The EUT was arranged in a typical equipment configuration and placed on a 1 x 1.5 - meter wooden bench 80 cm above the conducting ground plane, floor of a screen room. The bench was positioned 40 cm away from the wall of the screen room. The LISN was positioned on the floor of the screen room 80-cm from the rear of the EUT. The manufacturer supplied AC power adapter for the EUT was connected to the LISN. A second LISN was positioned on the floor of the screen room 80-cm from the rear of the supporting equipment of the EUT. All power cords except the EUT were then powered from the second LISN. EMI was coupled to the spectrum analyzer through a 0.1 mF capacitor, internal to the LISN. Power line conducted emissions testing were carried out individually for each current carrying conductor of the EUT. The excess length of lead between the system and the LISN receptacle was folded back and forth to form a bundle not exceeding 40 cm in length. The screen room, conducting ground plane, analyzer, and LISN were bonded together to the protective earth ground. Preliminary testing was performed to identify the frequency of each radio frequency emission displaying the highest amplitude. The cables were repositioned to obtain maximum amplitude of measured EMI level. Once the worst-case configuration was identified, plots were made of the EMI from 0.15 MHz to 30 MHz then the data was recorded with maximum conducted emissions levels. Refer to figures one and two for plots of the conducted emissions.

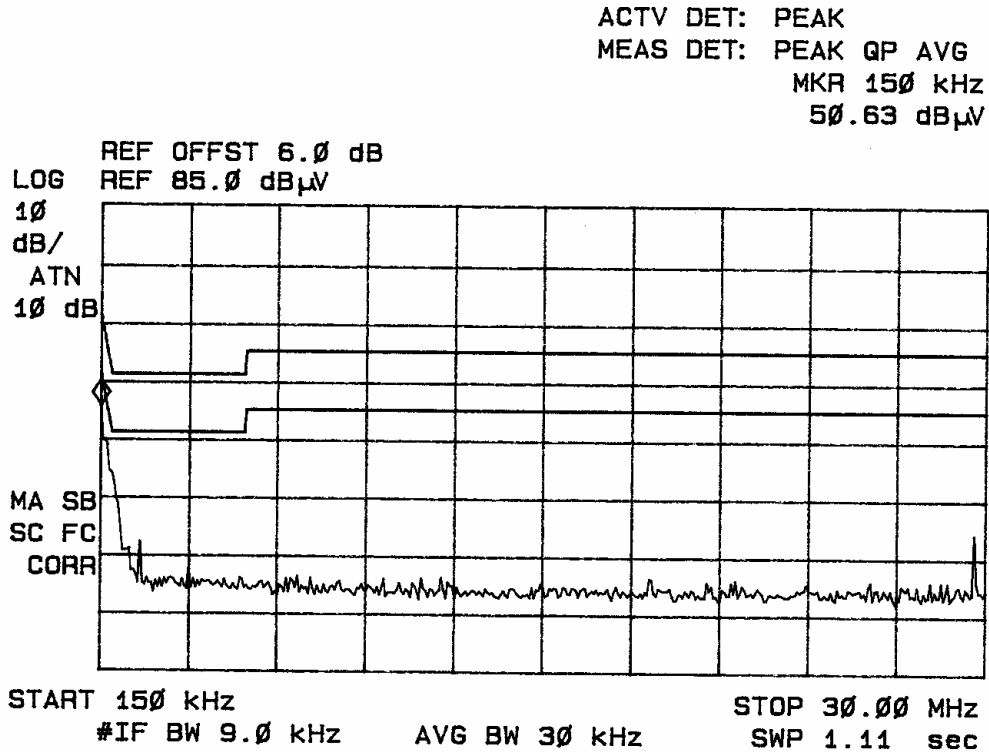


Figure 1 Conducted Emissions Line 1.

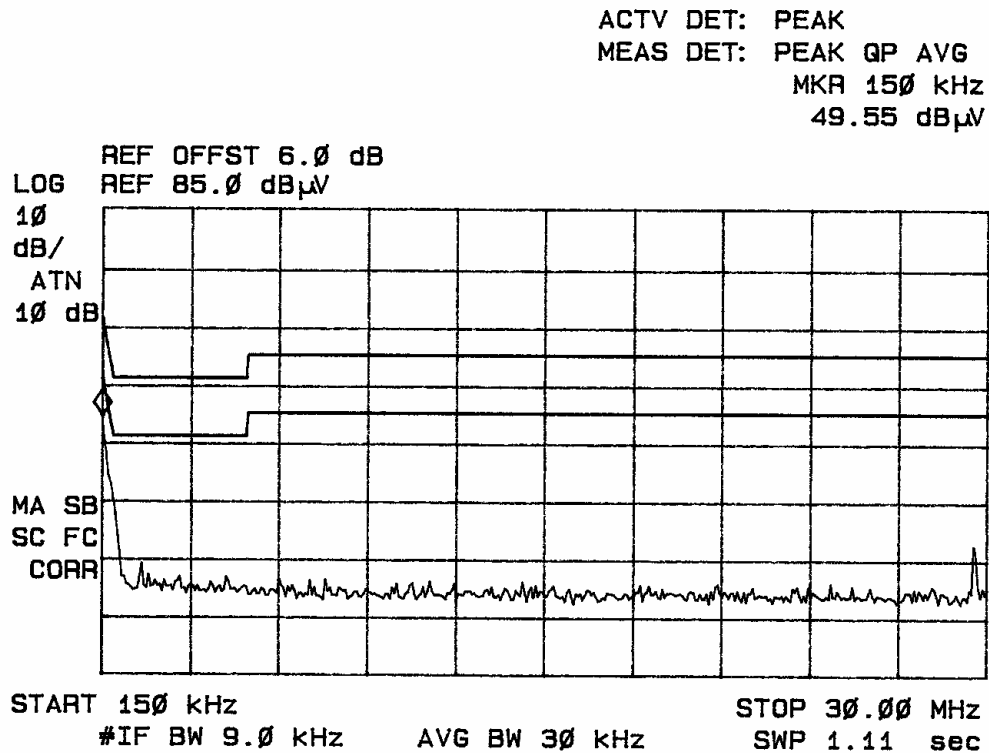


Figure 2 Conducted Emissions Line 2.

Radiated EMI

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

Sample Calculations:

$$\begin{aligned}\text{RFS} &= \text{Radiated Field Strength} \\ \text{dB}\mu\text{V/m @ 3m} &= \text{dB}\mu\text{V} + \text{A.F.} - \text{Amplifier Gain} \\ \text{dB}\mu\text{V/m @ 3m} &= 42.8 + 5.2 - 30 \\ &= 18.0\end{aligned}$$

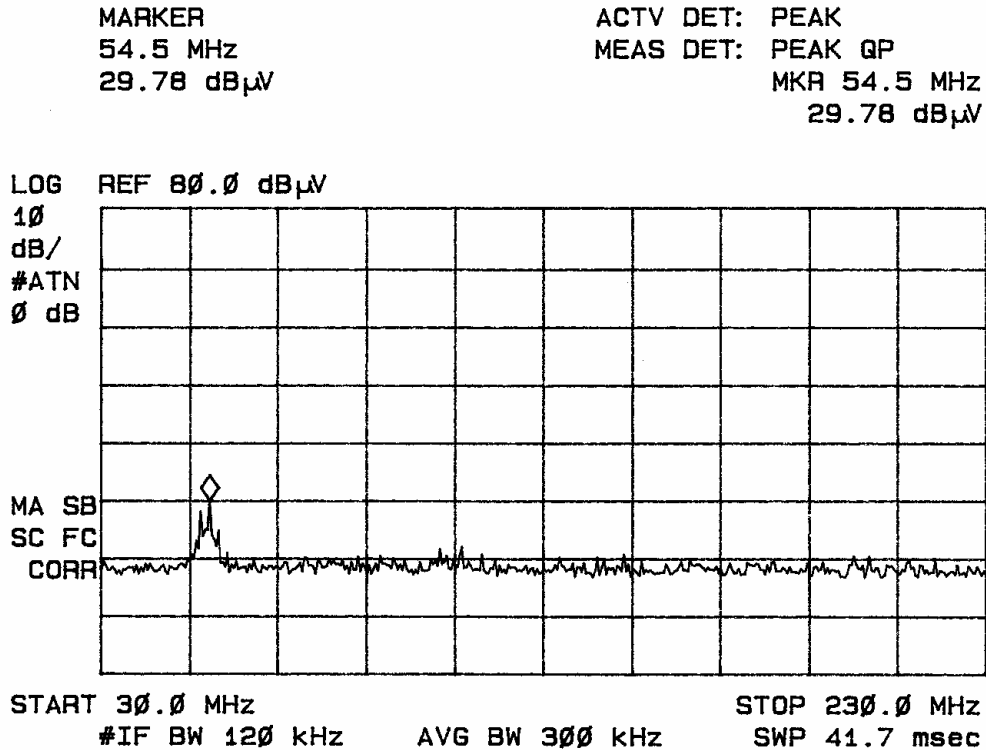


Figure three Radiated Emissions taken at 1 meter in screen room.

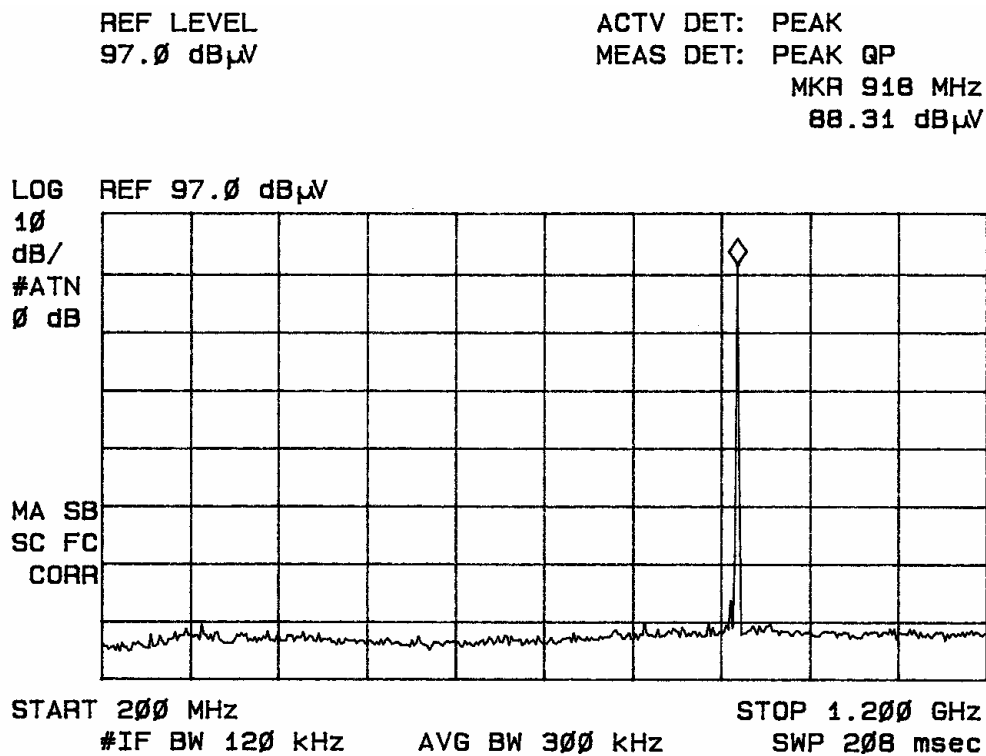


Figure four Radiated Emissions taken at 1 meter in screen room.

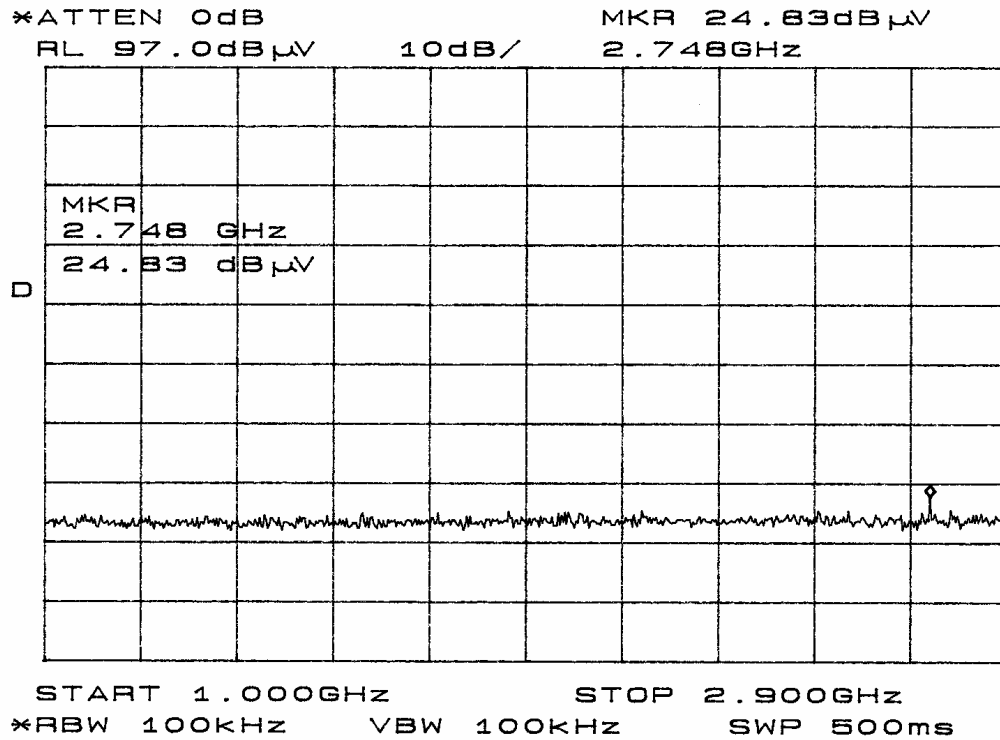


Figure five Radiated Emissions taken at 1 meter in screen room.

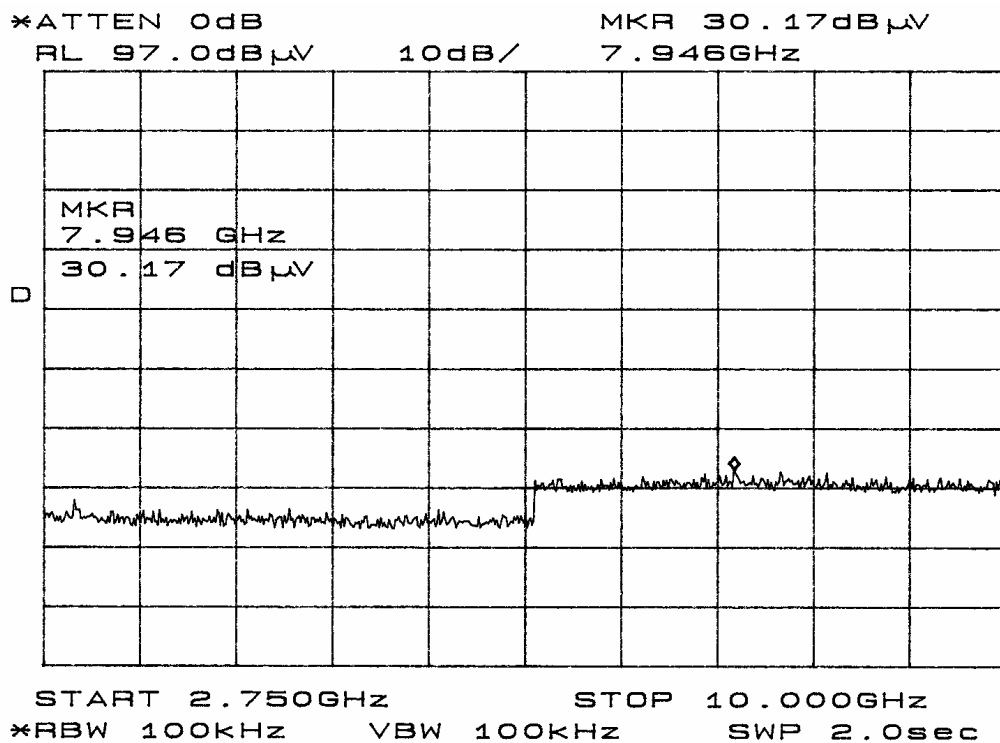


Figure six Radiated Emissions taken at 1 meter in screen room.

Data: Conducted Emissions (7 Highest Emissions)

Frequency band (MHz)	L1 Level (dB μ V)			L2 Level (dB μ V)			CISPR 22 Limit Q.P. Ave(dB μ V)
	Peak	Q.P.	AVE	Peak	Q.P.	AVE	
0.15 – 0.5	50.6	42.6	16.0	49.6	43.5	17.1	66 – 56 / 56 - 46
0.5 – 5	41.8	34.5	11.3	39.7	32.0	10.8	56 / 46
5 – 10	20.5	15.5	9.2	19.2	15.0	8.9	60 / 50
10 – 15	20.7	15.0	8.8	20.1	15.1	8.6	60 / 50
15 – 20	20.6	14.8	8.5	19.6	14.8	8.5	60 / 50
20 – 25	20.4	14.8	8.6	19.2	14.7	8.5	60 / 50
25 – 30	30.5	29.7	28.9	25.2	22.8	20.4	60 / 50

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

Data: General Radiated Emissions from EUT (6 Highest Emissions)

Frequency in MHz	FSM Horz. (dB μ V)	FSM Vert. (dB μ V)	A.F. (dB/m)	Amp. Gain (dB)	RFS Horz. @ 3m (dB μ V/m)	RFS Vert. @ 3m (dB μ V/m)	FCC Class B Limit @ 3m (dB μ V/m)
54.0	42.8	42.0	5.2	30	18.0	17.2	40
51.9	42.9	46.2	6.5	30	19.4	22.7	40
56.0	43.0	43.2	5.2	30	18.2	18.4	40
110.6	55.1	50.5	7.1	30	32.2	27.6	43.5
124.3	33.8	35.4	7.5	30	11.3	12.9	43.5
184.4	38.3	36.2	9.6	30	17.9	15.8	43.5

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

Summary of Results for Conducted Emissions

The conducted emissions for the EUT meet the requirements for CISPR 22 and FCC Part 15B CLASS B Digital Devices. The EUT had a 21.5 dB (Quasi-Peak) minimum margin below the limit, and a 21.1 dB minimum margin below the CISPR average limit.

Measurements were taken using the peak, quasi peak, and average, measurement function for each emissions amplitude and were below the limits stated in the specification. Other emissions were present with recorded data representing worst-case amplitudes.

Summary of Results for Radiated Emissions

The general radiated emissions for the EUT meet the requirements for CISPR 22 and FCC Part 15B CLASS B Digital Devices. The EUT had an 11.3 dB minimum margin below the quasi-peak limit. Other emissions were present with amplitudes at least 20 dB below the limit.

Statement of Modifications and Deviations

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

9) Subpart C - Intentional Radiators

As per CFR Part 15, Subpart C, paragraph 15.249 the following information is submitted.

15.203 Antenna Requirements

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

15.205 Restricted Bands of Operation

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

Sample Calculations:

$$\begin{aligned}\text{RFS (dB}\mu\text{V/m @ 3m)} &= \text{FSM(dB}\mu\text{V)} + \text{A.F.(dB)} - \text{Gain(dB)} \\ &= 55.1 + 7.1 - 30 \\ &= 32.2\end{aligned}$$

Data: Emissions in Restricted Bands

Frequency in MHz	FSM Horz. (dB μ V)	FSM Vert. (dB μ V)	A.F. (dB/m)	Amp. Gain (dB)	RFS Horz. @ 3m (dB μ V/m)	RFS Vert. @ 3m (dB μ V/m)	FCC Class B Limit @ 3m (dB μ V/m)
110.6	55.1	50.5	7.1	30	32.2	27.6	43.5
124.3	33.8	35.4	7.5	30	11.3	12.9	43.5
2709.0	22.8	22.8	34.9	22.5	36.2	35.2	54.0
2745.0	23.3	23.3	35.4	22.5	36.2	36.2	54.0
2781.0	23.3	23.5	35.5	22.5	36.3	36.5	54.0
3612.0	24.5	23.5	39.8	22.5	41.8	40.8	54.0
3660.0	23.5	22.8	39.8	22.5	40.8	40.1	54.0
3708.0	24.0	23.5	39.8	22.5	41.3	40.8	54.0
4515.0	24.1	23.3	44.3	22.5	45.9	45.1	54.0
4575.0	23.3	23.0	44.2	22.5	45.0	44.7	54.0
4635.0	24.0	23.3	44.0	22.5	45.5	44.8	54.0

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

Summary of Results for Radiated Emissions in Restricted Bands:

The radiated emissions for the EUT meet the requirements for FCC Part 15C Intentional Radiators. The EUT had an 8.1 dB minimum margin below the limits. Both average and peak amplitudes were checked for compliance with the regulations. No other emissions were found in the restricted frequency bands. Other emissions were present with amplitudes at least 20 dB below the FCC Limits.

15.209 Radiated Emissions Limits; General Requirements**Radiated EMI**

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

Sample Calculations:

RFS = Radiated Field Strength

$\text{dB}\mu\text{V/m @ 3m} = \text{dB}\mu\text{V} + \text{A.F.} - \text{Amplifier Gain}$

$\text{dB}\mu\text{V/m @ 3m} = 42.0 + 5.2 - 30$
 $= 18.0$

Data: General Radiated Emissions from EUT (Highest Emissions)

Frequency in MHz	FSM Horz. (dB μ V)	FSM Vert. (dB μ V)	A.F. (dB/m)	Amp. Gain (dB)	RFS Horz. @ 3m (dB μ V/m)	RFS Vert. @ 3m (dB μ V/m)	FCC Class B Limit @ 3m (dB μ V/m)
54.0	42.8	42.0	5.2	30	18.0	17.2	40
51.9	42.9	46.2	6.5	30	19.4	22.7	40
56.0	43.0	43.2	5.2	30	18.2	18.4	40
110.6	55.1	50.5	7.1	30	32.2	27.6	43.5
124.3	33.8	35.4	7.5	30	11.3	12.9	43.5
184.4	38.3	36.2	9.6	30	17.9	15.8	43.5

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

Summary of Results for Radiated Emissions:

The radiated emissions for the EUT meet the requirements for FCC Part 15C Intentional Radiators. The EUT had an 11.3 dB minimum margin below the limits. Other emissions were present with amplitudes at least 20 dB below the FCC Limits.

15.249 Operation in the Band 902-928 MHz

The power output was measured at the open area test site at a three-meter distance. Data was taken per Paragraph 2.1046(a) and 15.249. Figures 7 and 8 demonstrate compliance with band edge operation.

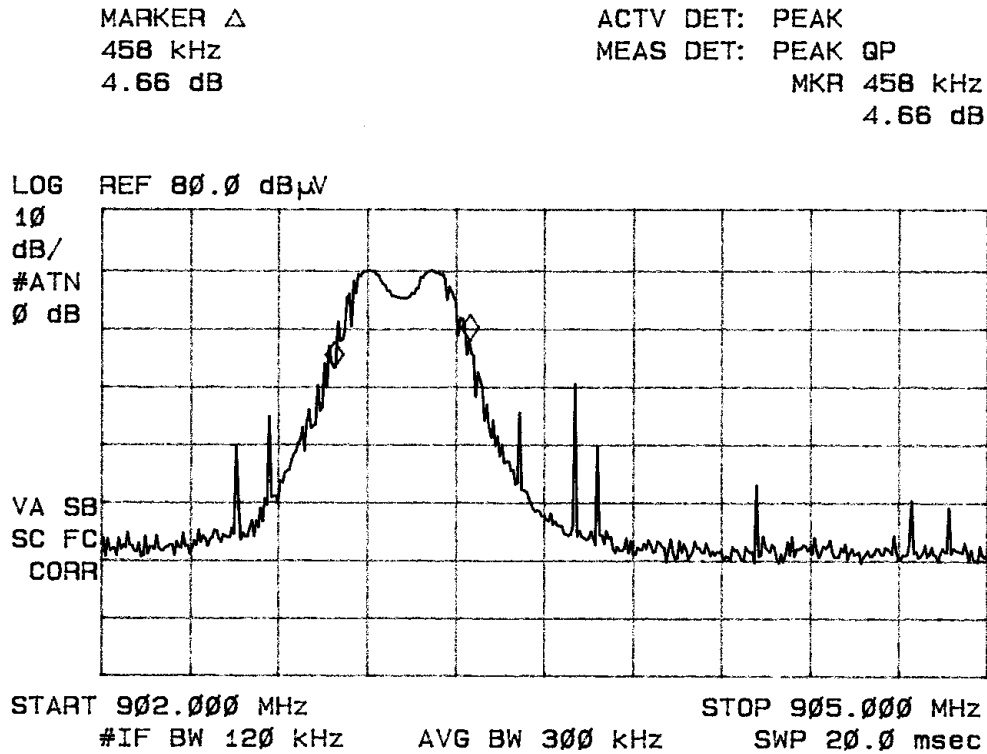


Figure 7 band edge plot taken in screen room.

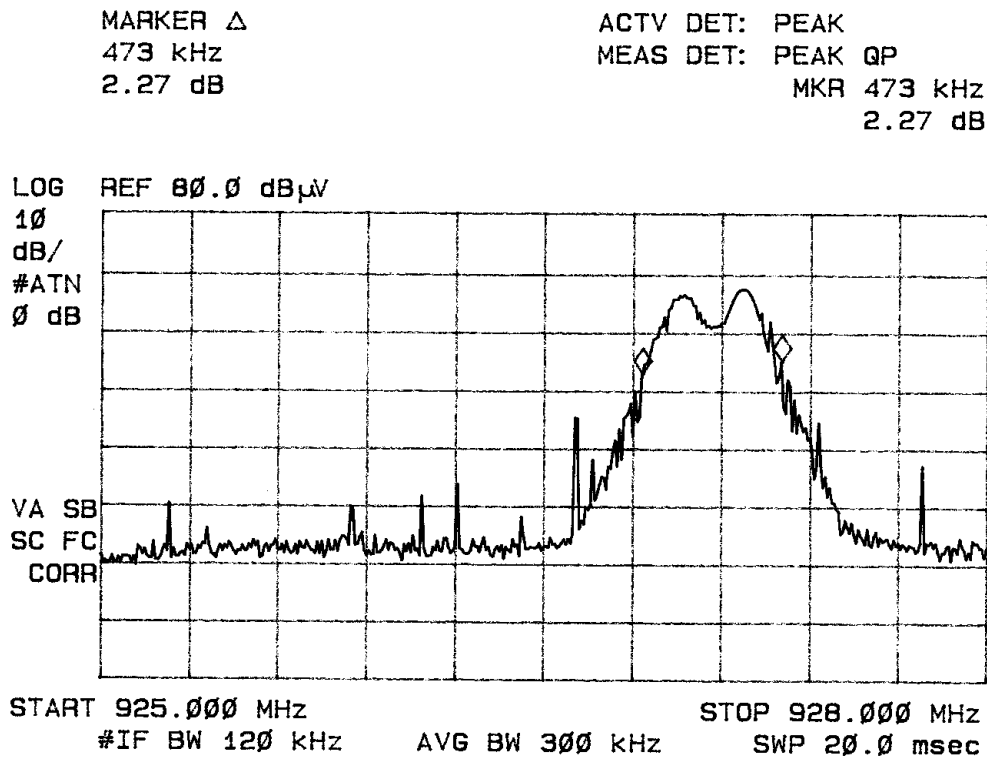


Figure 8 band edge plot taken in screen room.

Data: Radiated Emissions from Intentional Radiator

Emission Frequency (MHz)	FSM Horz. (dBμV)	FSM Vert. (dBμV)	Ant. Factor (dB)	Amp Gain (dB)	RFS Horz. @ 3m (dBμV/m)	RFS Vert. @ 3m (dBμV/m)	Limit @ 3m (dBμV/m)
903.0	67.8	51.3	23.2	-2	93.0	76.5	94.0
1806.0	29.3	23.1	29.9	22.5	36.7	30.5	54.0
2709.0	23.8	22.8	34.9	22.5	36.2	35.2	54.0
3612.0	24.5	23.5	39.8	22.5	41.8	40.8	54.0
4515.0	24.1	23.3	44.3	22.5	45.9	45.1	54.0
915.0	68.0	50.5	23.7	-2	93.7	76.2	94.0
1830.0	27.0	22.8	29.7	22.5	34.2	30.0	54.0
2745.0	23.3	23.3	35.4	22.5	36.2	36.2	54.0
3660.0	23.5	22.8	39.8	22.5	40.8	40.1	54.0
4575.0	23.3	23.0	44.2	22.5	45.0	44.7	54.0
927.0	67.0	50.2	24.1	-2	93.1	76.3	94.0
1854.0	28.3	24.3	29.6	22.5	35.4	31.4	54.0
2781.0	23.3	23.5	35.5	22.5	36.3	36.5	54.0
3708.0	24.0	23.5	39.8	22.5	41.3	40.8	54.0
4635.0	24.0	23.3	44.0	22.5	45.5	44.8	54.0

Summary of Results for Radiated Emissions of Intentional Radiator

The EUT had the highest emission of 93.7 dBmV/m at 3 meters at the fundamental frequency of operation. The EUT had a worst-case of 8.1 dB margin below the limit for the harmonic emissions. The radiated emissions for the EUT meet the requirements for FCC Part 15.249 Intentional Radiators. There are no measurable emissions in the restricted bands other than those recorded in this report. Other emissions were present with amplitudes at least 20 dB below the FCC Limits. The specifications of 15.249 were met; there are no deviations or exceptions to the requirements.

Statement of Modifications and Deviations

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

APPENDIX

Model: AP-900 DATA TRANSMITTER

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

TEST EQUIPMENT LIST FOR ROGERS LABS, INC.

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

<u>List of Test Equipment:</u>	<u>Calibration Date:</u>
Scope: Tektronix 2230	2/04
Wattmeter: Bird 43 with Load Bird 8085	2/04
Power Supplies: Sorensen SRL 20-25, SRL 40-25, DCR 150, DCR 140	2/04
H/V Power Supply: Fluke Model: 408B (SN: 573)	2/04
R.F. Generator: HP 606A	2/04
R.F. Generator: HP 8614A	2/04
R.F. Generator: HP 8640B	2/04
Spectrum Analyzer: HP 8562A,	2/04
Mixers: 11517A, 11970A, 11970K, 11970U, 11970V, 11970W	
HP Adapters: 11518, 11519, 11520	
Spectrum Analyzer: HP 8591 EM	5/04
Frequency Counter: Leader LDC 825	2/04
Antenna: EMC0 Biconilog Model: 3143	5/04
Antenna: EMC0 Log Periodic Model: 3147	10/04
Antenna: Antenna Research Biconical Model: BCD 235	10/04
Antenna: EMC0 Dipole Set 3121C	2/04
Antenna: C.D. B-101	2/04
Antenna: Solar 9229-1 & 9230-1	2/04
Antenna: EMC0 6509	2/04
Audio Oscillator: H.P. 201CD	2/04
R.F. Power Amp 65W Model: 470A-1010	2/04
R.F. Power Amp 50W M185 10-501	2/04
R.F. PreAmp CPPA-102	2/04
LISN 50 μ Hy/50 ohm/0.1 μ f	10/04
LISN Compliance Eng. 240/20	2/04
Peavey Power Amp Model: IPS 801	2/04
Power Amp A.R. Model: 10W 1010M7	2/04
Power Amp EIN Model: A301	2/04
ELGAR Model: 1751	2/04
ELGAR Model: TG 704A-3D	2/04
ESD Test Set 2010i	2/04
Fast Transient Burst Generator Model: EFT/B101	2/04
Current Probe: Singer CP105	2/04
Current Probe: Solar 91081N	2/04
Field Intensity Meter: EFM018	2/04
KEYTEK Ecat Surge Generator	2/04
Shielded Room 5 M x 3 M x 3.0 M (101 dB Integrity)	

10/1/2004

QUALIFICATIONS
Of
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:

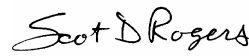
Systems Engineer: A/C Controls Mfg. Co., Inc.
6 Years

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

October 25, 2004
Date

1/11/03

FEDERAL COMMUNICATIONS COMMISSION

**Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046**

August 15, 2003

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: August 15, 2003

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,



Ms. Phyllis Parrish
Information Technician