COMMUNICATION CERTIFICATION LABORATORY

1940 West Alexander Street
Salt Lake City, UT 84119
801-972-6146

Test Report

Certification

Test Of: CCRF01

FCC ID: TOC-0003

Test Specification:

FCC PART 15, Subpart C

Test Report Serial No: 1975

Applicant:

Grayling Wireless Inc.
Suite 201, 4321-23B Street NE
Calgary, Alberta
Canada T2E 7V9

Date of Test: December 9, 2008

Issue Date: December 16, 2008

Accredited Testing Laboratory By:

NVLAP

NVLAP Lab Code 100272-0

CERTIFICATION OF ENGINEERING REPORT

This report has been prepared by Communication Certification Laboratory to document compliance of the device described below with the requirements of Federal Communications Commission (FCC) Part 15, Subpart C. This report may be reproduced in full. Partial reproduction may only be made with the written consent of the laboratory. The results in this report apply only to the sample tested.

- Applicant: Grayling Wireless Inc.
- Manufacturer: Grayling Wireless Inc.
- Brand Name: Grayling Wireless
- Model Number: CCRF01
- FCC ID Number: TOC-0003

On this 16th day of December 2008, I, individually, and for Communication Certification Laboratory, certify that the statements made in this engineering report are true, complete, and correct to the best of my knowledge, and are made in good faith.

Although NVLAP has accredited the Communication Certification Laboratory EMC testing facilities, this report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

COMMUNICATION CERTIFICATION LABORATORY

Tested by: Norman P. Hansen
EMC Technician

Reviewed by: Thomas C. Jackson
President

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SECTION 1.0 CLIENT INFORMATION

1.1 Applicant:

Company Name: Grayling Wireless Inc.
Suite 201, 4321-23B Street NE
Calgary, Alberta
Canada T2E 7V9

Contact Name: Keys Low
Title: Project Manager

1.2 Manufacturer:

Company Name: Grayling Wireless Inc.
Suite 201, 4321-23B Street NE
Calgary, Alberta
Canada T2E 7V9

Contact Name: Keys Low
Title: Project Manager

1.3 Party Responsible for Declaration of Conformity:

Company Name: Grayling Wireless Inc.
Suite 201, 4321-23B Street NE
Calgary, Alberta
Canada T2E 7V9

Contact Name: Keys Low
Title: Project Manager

Signature: _____

SECTION 2.0 EQUIPMENT UNDER TEST (EUT)

2.1 Identification of EUT:

Brand Name: Grayling Wireless
Model Number: CCRF01
Serial Number: None
Country of Manufacture: Canada

2.2 Description of EUT:

The CCRF01 is an RF programmer for Grayling Wireless equipment. The CCRF01 has a transceiver operating on 60 channels in the 902 – 928 MHz band. The CCRF01 interfaces a computer via a USB cable and is powered by the USB port of the computer. The CCRF01 is used to program features of the other equipment but does not allow access to transmitter power levels or channel frequencies.

2.3 EUT and Support Equipment:

The FCC ID numbers for all the EUT and support equipment used during the test are listed below:

Brand Name Model Number	FCC ID Number	Description	Name of Interface Ports / Interface Cables
BN: Grayling Wireless MN: CCRF01 (Note 1)	TOC-0003	RF Programmer	See Section 2.4
BN: IBM MN: Thinkpad R51	DoC	Laptop Computer	USB/USB cable (Note 2 & 3)

Note: (1) EUT.
(2) Interface port connected to EUT (See Section 2.4)
(3) Cable includes manufacturer-supplied ferrites.

The support equipment listed above was not modified in order to achieve compliance with this standard.

2.4 Interface Ports on EUT:

Name of Port	No. of Ports Fitted to EUT	Cable Descriptions/Length
USB	1	USB cable with Steward 28A0434-0A2 ferrite at each end/15 feet

2.5 Modification Incorporated/Special Accessories on EUT:

The following modifications were made to the CCRF01 by or the Client during testing to comply with the specification. These modifications will be implemented during manufacturing.

1. The transmitter power level was set to the 3 dB setting.
2. Two channels were removed from the firmware – 902.14 and 927.7 MHz.

Signature: _____

Typed Name: Keys Low

Title: Project Manager

SECTION 3.0 TEST SPECIFICATION, METHODS & PROCEDURES

3.1 Test Specification:

Title: FCC PART 15, Subpart C (47 CFR 15)
15.203, 15.207, 15.249

Limits and methods of measurement of radio interference characteristics of radio frequency devices.

Purpose of Test: The tests were performed to demonstrate initial compliance.

3.2 Methods & Procedures:

3.2.1 §15.203 Antenna Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

3.2.2 §15.207 Conducted Limits

(a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHZ to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization

network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 – 0.5*	66 to 56*	56 to 46*
0.5 – 5	56	46
5 - 30	60	50

*Decreases with the logarithm of the frequency.

3.2.1 §15.249

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 – 928 MHz	50	500
2400 – 2483.5 MHz	50	500
5725 – 5875 MHz	50	500
24.0 – 24.25 GHz	250	2500

(b) Fixed, point-to-point operation as referred to in this paragraph shall be limited to systems employing a fixed transmitter transmitting to a fixed remote location. Point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information are not allowed. Fixed, point-to-point operation is permitted in the 24.05-24.25 GHz band subject to the following conditions:

(1) The field strength of emissions in this band shall not exceed 2500 millivolts/meter.

(2) The frequency tolerance of the carrier signal shall be maintained within + 0.001% of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

(3) Antenna gain must be at least 33 dBi. Alternatively, the main lobe beamwidth must not exceed 3.5 degrees. The beamwidth limit shall apply to both the azimuth and elevation planes. At antenna gains over 33 dBi or beamwidths narrower than 3.5 degrees, power must be reduced to ensure that the field strength does not exceed 2500 millivolts/meter.

(c) Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

(e) As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

(f) Parties considering the manufacture, importation, marketing or operation of equipment under this section should also note the requirement in Section 15.37(d).

3.2.3 Test Procedure

The line conducted and radiated emissions testing was performed according to the procedures in ANSI C63.4 (2003). Testing was performed at CCL's Wanship open area test site #2, located at 29145 Old Lincoln Highway, Wanship, UT. This site has been fully described in a report submitted to the FCC, and was accepted in a letter dated June 6, 2006 (90504).

CCL participates in the National Voluntary Laboratory Accreditation Program (NVLAP) and has been accredited under NVLAP Lab Code: 100272-0, which is effective until September 30, 2009.

For radiated emissions testing at 30 MHz or above that is performed at distances closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

SECTION 4.0 OPERATION OF EUT DURING TESTING

4.1 Operating Environment:

Power Supply: 5 VDC from USB port of computer
120 VAC/60 Hz to computer

4.2 Operating Modes:

The EUT was tested on 3 orthogonal axes. The EUT was tested at the upper, middle, and lower frequency while constantly transmitting.

4.3 EUT Exercise Software:

Grayling Wireless software was used to exercise the EUT.

4.4 Configuration & Peripherals:

The CCRF01 was placed on the table and connected to the support equipment listed in Section 2.3 via each port listed in Section 2.4.

SECTION 5.0 SUMMARY OF TEST RESULTS

5.1 Class B of FCC Part 15, Subpart B

5.1.1 Summary of Tests:

Section	Requirement	Frequency Range (MHz)	Result
15.203	Antenna Requirements	N/A	Complied
15.207	Conducted Disturbance at Mains Ports (Neutral Lead to Ground)	0.15 to 30	Complied
15.249(a)	Field Strength of Fundamental	902 -928	Complied
15.249(a)	Field Strength of Harmonics	1804 -9280	Complied
15.249(b)	Fixed Point-to-Point Operation	N/A	Not Applicable
15.249(d)	Radiated Spurious Emissions	30 - 9280	Complied

5.2 Result

In the configuration tested, the EUT complied with the requirements of the specification.

SECTION 6.0 MEASUREMENTS, EXAMINATIONS AND DERIVED RESULTS

6.1 General Comments:

This section contains the test results only. Details of the test methods used and a list of the test equipment used during the measurements can be found in Appendix 1 of this report.

6.2 Test Results:

6.2.1 §15.203 Antenna Requirements

The antenna is a patch antenna soldered on the PCB and is not replaceable so the requirements of this section are met.

6.2.2 §15.207 Conducted Disturbance at the AC Mains Ports

Frequency (MHz)	AC Mains Lead	Detector	Measured Level (dBμV)	Limit (dBμV)	Margin (dB)
0.22	Hot Lead	Quasi-Peak (Note 2)	50.0	62.9	-12.9
0.22	Hot Lead	Average (Note 2)	37.9	52.9	-15.0
0.33	Hot Lead	Peak (Note 1)	40.3	49.5	-9.2
0.44	Hot Lead	Peak (Note 1)	34.0	47.1	-13.1
0.89	Hot Lead	Peak (Note 1)	28.8	46.0	-17.2
23.75	Hot Lead	Peak (Note 1)	33.0	50.0	-17.0
24.40	Hot Lead	Peak (Note 1)	33.4	50.0	-16.6
0.22	Neutral Lead	Peak (Note 1)	48.9	52.9	-4.0
0.33	Neutral Lead	Peak (Note 1)	40.3	49.5	-9.2
0.55	Neutral Lead	Peak (Note 1)	27.4	46.0	-18.6
0.88	Neutral Lead	Peak (Note 1)	27.7	46.0	-18.3
1.74	Neutral Lead	Peak (Note 1)	24.5	46.0	-21.5
2.28	Neutral Lead	Peak (Note 1)	25.6	46.0	-20.4
19.05	Neutral Lead	Peak (Note 1)	29.0	50.0	-21.0

Note 1: The reference detector used for the measurements was Quasi-Peak or Peak and the data was compared to the average limit; therefore, the EUT was deemed to meet both the average and quasi-peak limits.

Note 2: The reference detector used for the measurements was quasi-peak and average and the data was compared to the respective limits.

6.2.3 §15.249 Radiated Emissions

The radiated emissions from the fundamental frequency must not exceed 94.0 dBμV/m. Emissions from harmonics and spurious emissions must not exceed 54.0 dBμV/m. The measurement distance specified using these limits is 3 meters and the testing was performed at a 3 meter distance. The tables below show the worst-case emissions from testing. Testing was performed on the lowest, middle, and highest channels. The plots following the data tables show the fundamental frequency of the lowest channel and the highest channel residing totally within the specified operating band.

6.2.3.1 Radiated Emission Data Transmitting at 902.5 MHz

Frequency (MHz)	Detector	Antenna Polarity	Receiver Reading (dBμV)	Correction Factor (dB/m)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
902.5	Peak	Vertical	59.9	28.6	88.5	94.0	-5.5
902.5	Peak	Horizontal	58.1	28.6	86.7	94.0	-7.3
1805.0	Peak	Vertical	15.1	28.7	43.8	54.0	-10.2
1805.0	Peak	Vertical	14.8	28.7	43.5	54.0	-10.5
2707.5	Peak	Horizontal	14.6	31.6	46.2	54.0	-7.8
2707.5	Peak	Horizontal	14.0	31.6	45.6	54.0	-8.4
3610.0	Peak	Vertical	11.2	34.5	45.7	54.0	-8.3
3610.0	Peak	Vertical	11.2	34.5	45.7	54.0	-8.3
4512.5	Peak	Horizontal	11.9	35.5	47.4	54.0	-6.6
4512.5	Peak	Horizontal	11.5	35.5	47.0	54.0	-7.0
5415.0	Peak	Vertical	2.1	37.6	39.7	54.0	-14.3
5415.0	Peak	Vertical	1.8	37.6	39.4	54.0	-14.6
6317.5	Peak	Horizontal	7.8	38.5	46.3	54.0	-7.7
6317.5	Peak	Horizontal	7.8	38.5	46.3	54.0	-7.7
7220.0	Peak	Vertical	8.2	41.5	49.7	74.0	-24.3
7220.0	Average	Vertical	-3.6	41.5	37.9	54.0	-16.1
7220.0	Peak	Horizontal	9.2	41.5	50.7	74.0	-23.3
7220.0	Average	Horizontal	-2.5	41.5	39.0	54.0	-15.0
8122.5	Peak	Vertical	10.4	42.5	52.9	74.0	-21.1
8122.5	Average	Vertical	-2.7	42.5	39.8	54.0	-14.2
8122.5	Peak	Horizontal	9.7	42.5	52.2	74.0	-21.8
8122.5	Average	Horizontal	-2.6	42.5	39.9	54.0	-14.1
9025.0	Peak	Vertical	9.6	43.6	53.2	74.0	-20.8

Frequency (MHz)	Detector	Antenna Polarity	Receiver Reading (dBμV)	Correction Factor (dB/m)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
9025.0	Average	Vertical	-2.4	43.6	41.2	54.0	-12.8
9025.0	Peak	Horizontal	9.9	43.6	53.5	74.0	-20.5
9025.0	Average	Horizontal	-2.3	43.6	41.3	54.0	-12.7
Note: When only a peak measurement is shown, the peak measurement was compared to the average limit. Measurements shown for frequencies of 3000 MHz and above are noise floor measurements. Measurements above 5000 MHz are corrected to 3 meters as the measurements were taken at a 1 meter distance.							

6.2.3.2 Radiated Emission Data Transmitting at 913.275 MHz

Frequency (MHz)	Detector	Antenna Polarity	Receiver Reading (dBμV)	Correction Factor (dB/m)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
913.275	Peak	Vertical	60.2	28.6	88.8	94.0	-5.2
913.275	Peak	Horizontal	58.5	28.6	87.1	94.0	-6.9
1826.550	Peak	Vertical	15.2	28.8	44.0	54.0	-10.0
1826.550	Peak	Vertical	13.7	28.8	42.5	54.0	-11.5
2739.825	Peak	Horizontal	14.0	31.7	45.7	54.0	-8.3
2739.825	Peak	Horizontal	14.0	31.7	45.7	54.0	-8.3
3653.100	Peak	Vertical	11.2	34.5	45.7	54.0	-8.3
3653.100	Peak	Vertical	11.2	34.5	45.7	54.0	-8.3
4566.375	Peak	Horizontal	11.9	35.5	47.4	54.0	-6.6
4566.375	Peak	Horizontal	11.5	35.5	47.0	54.0	-7.0
5479.650	Peak	Vertical	2.1	37.6	39.7	54.0	-14.3
5479.650	Peak	Vertical	1.8	37.6	39.4	54.0	-14.6
6392.925	Peak	Horizontal	7.8	38.5	46.3	54.0	-7.7
6392.925	Peak	Horizontal	7.8	38.5	46.3	54.0	-7.7
7306.200	Peak	Vertical	8.2	41.5	49.7	74.0	-24.3
7306.200	Average	Vertical	-3.6	41.5	37.9	54.0	-16.1
7306.200	Peak	Horizontal	9.2	41.5	50.7	74.0	-23.3
7306.200	Average	Horizontal	-2.5	41.5	39.0	54.0	-15.0
8219.475	Peak	Vertical	10.4	42.5	52.9	74.0	-21.1
8219.475	Average	Vertical	-2.7	42.5	39.8	54.0	-14.2
8219.475	Peak	Horizontal	9.7	42.5	52.2	74.0	-21.8
8219.475	Average	Horizontal	-2.6	42.5	39.9	54.0	-14.1
9132.750	Peak	Vertical	9.6	43.6	53.2	74.0	-20.8
9132.750	Average	Vertical	-2.4	43.6	41.2	54.0	-12.8
9132.750	Peak	Horizontal	9.9	43.6	53.5	74.0	-20.5

Frequency (MHz)	Detector	Antenna Polarity	Receiver Reading (dBμV)	Correction Factor (dB/m)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
9132.750	Average	Horizontal	-2.3	43.6	41.3	54.0	-12.7
Note: When only a peak measurement is shown, the peak measurement was compared to the average limit. Measurements shown for frequencies of 3000 MHz and above are noise floor measurements. Measurements above 5000 MHz are corrected to 3 meters as the measurements were taken at a 1 meter distance.							

6.2.3.3 Radiated Emission Data Transmitting at 927.0 MHz

Frequency (MHz)	Detector	Antenna Polarity	Receiver Reading (dBμV)	Correction Factor (dB/m)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
927.0	Peak	Vertical	60.1	28.6	88.7	94.0	-5.3
927.0	Peak	Horizontal	59.7	28.6	88.3	94.0	-5.7
1854.0	Peak	Vertical	14.8	29.0	43.8	54.0	-10.2
1854.0	Peak	Vertical	14.6	29.0	43.6	54.0	-10.4
2781.0	Peak	Horizontal	14.0	31.9	45.9	54.0	-8.1
2781.0	Peak	Horizontal	14.1	31.9	46.0	54.0	-8.0
3708.0	Peak	Vertical	11.2	34.5	45.7	54.0	-8.3
3708.0	Peak	Vertical	11.2	34.5	45.7	54.0	-8.3
4635.0	Peak	Horizontal	11.9	35.5	47.4	54.0	-6.6
4635.0	Peak	Horizontal	11.5	35.5	47.0	54.0	-7.0
5562.0	Peak	Vertical	2.1	37.6	39.7	54.0	-14.3
5562.0	Peak	Vertical	1.8	37.6	39.4	54.0	-14.6
6489.0	Peak	Horizontal	7.8	38.5	46.3	54.0	-7.7
6489.0	Peak	Horizontal	7.8	38.5	46.3	54.0	-7.7
7416.0	Peak	Vertical	8.2	41.5	49.7	74.0	-24.3
7416.0	Average	Vertical	-3.6	41.5	37.9	54.0	-16.1
7416.0	Peak	Horizontal	9.2	41.5	50.7	74.0	-23.3
7416.0	Average	Horizontal	-2.5	41.5	39.0	54.0	-15.0
8343.0	Peak	Vertical	10.4	42.5	52.9	74.0	-21.1
8343.0	Average	Vertical	-2.7	42.5	39.8	54.0	-14.2
8343.0	Peak	Horizontal	9.7	42.5	52.2	74.0	-21.8
8343.0	Average	Horizontal	-2.6	42.5	39.9	54.0	-14.1
9270.0	Peak	Vertical	9.6	43.6	53.2	74.0	-20.8
9270.0	Average	Vertical	-2.4	43.6	41.2	54.0	-12.8
9270.0	Peak	Horizontal	9.9	43.6	53.5	74.0	-20.5
9270.0	Average	Horizontal	-2.3	43.6	41.3	54.0	-12.7

Frequency (MHz)	Detector	Antenna Polarity	Receiver Reading (dBμV)	Correction Factor (dB/m)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Note: When only a peak measurement is shown, the peak measurement was compared to the average limit. Measurements shown for frequencies of 3000 MHz and above are noise floor measurements. Measurements above 5000 MHz are corrected to 3 meters as the measurements were taken at a 1 meter distance.							

6.2.3.4 Sample Field Strength Calculation:

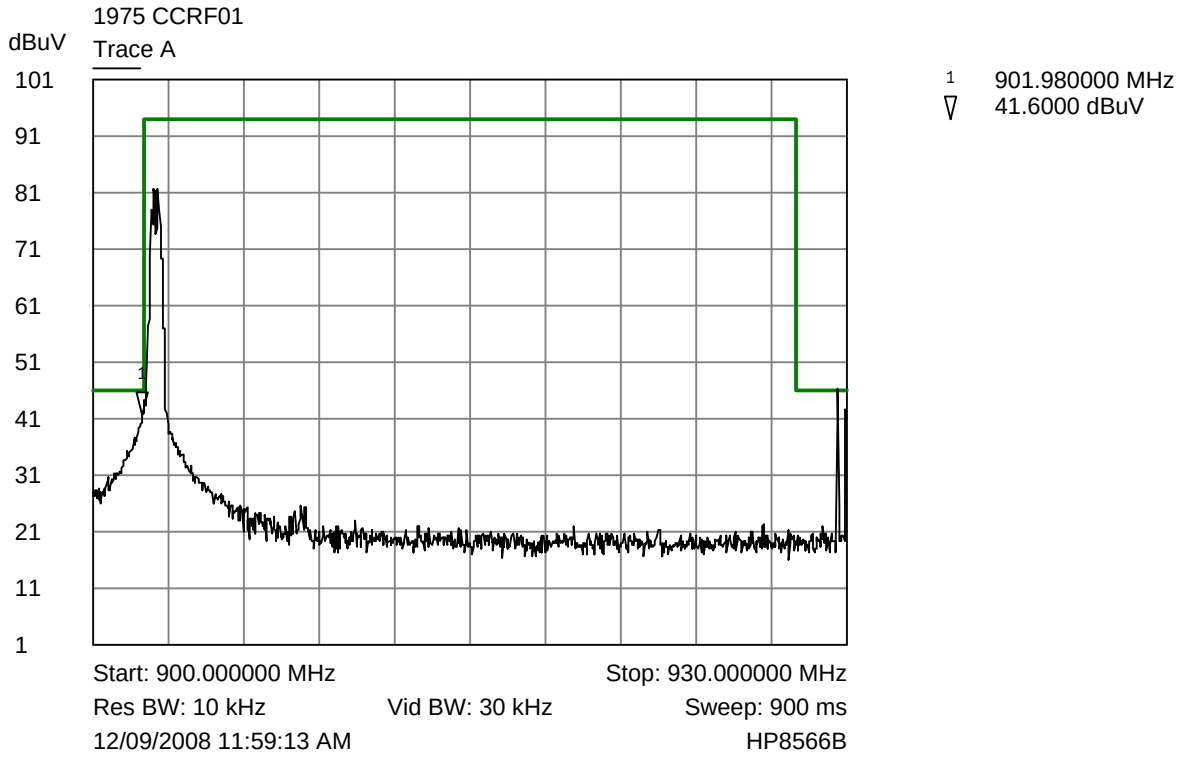
The field strength is calculated by adding the Correction Factor (Antenna Factor + Cable Factor), to the measured level from the receiver. The receiver amplitude reading is compensated for any amplifier gain. The basic equation with a sample calculation is shown below:

FS = RA + CF Where

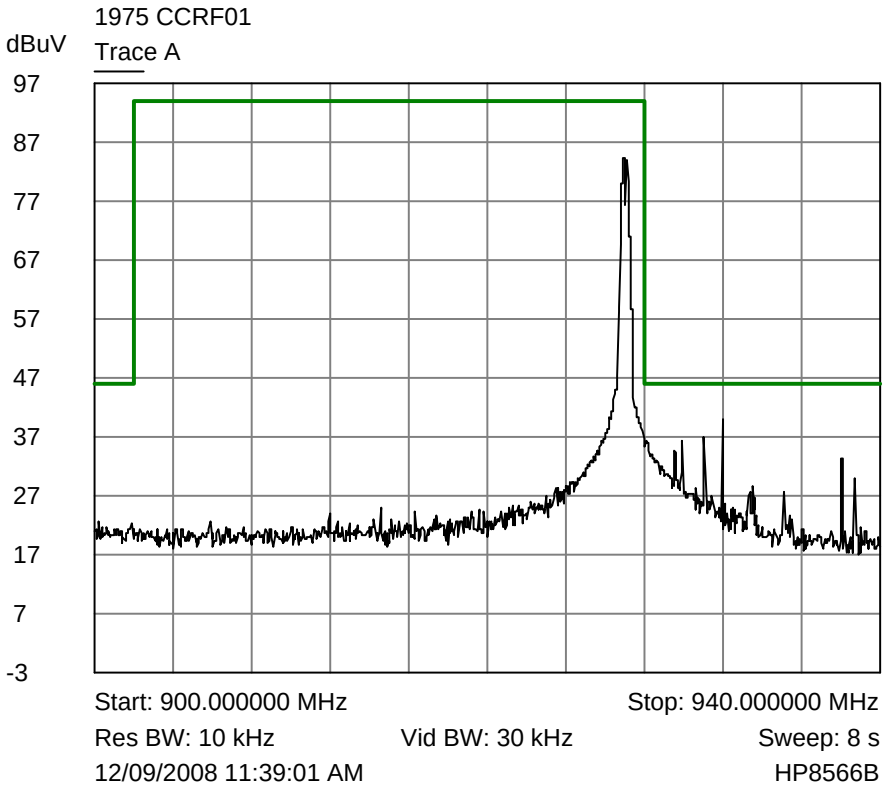
FS = Field Strength
RA = Receiver Amplitude Reading (Receiver Reading - Amplifier Gain)
CF = Correction Factor (Antenna Factor + Cable Factor)

Assume a receiver reading of 42.5 dBμV is obtained from the receiver, an amplifier gain of 26.5 dB and a correction factor of 8.5 dB/m. The field strength is calculated by subtracting the amplifier gain and adding the correction factor, giving a field strength of 24.5 dBμV/m, FS = (42.5 - 26.5) + 8.5 = 24.5 dBμV/m.

6.2.3.5 Operating Band Plots



Trace A Band usage - lower channel



Trace A Band usage - upper channel

APPENDIX 1 TEST PROCEDURES AND TEST EQUIPMENT

A1.1 Conducted Disturbance at Mains Ports:

The conducted disturbance at mains ports from the EUT was measured using a spectrum analyzer with a quasi-peak adapter for peak, quasi-peak and average readings. The quasi-peak adapter uses a bandwidth of 9 kHz, with the spectrum analyzer's resolution bandwidth set at 100 kHz, for readings in the 150 kHz to 30 MHz frequency ranges.

The conducted disturbance at mains ports measurements are performed in a screen room using a (50 Ω/50 μH) Line Impedance Stabilization Network (LISN).

Where mains flexible power cords are longer than 1 m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.

Where the EUT is a collection of devices with each device having its own power cord, the point of connection for the LISN is determined from the following rules:

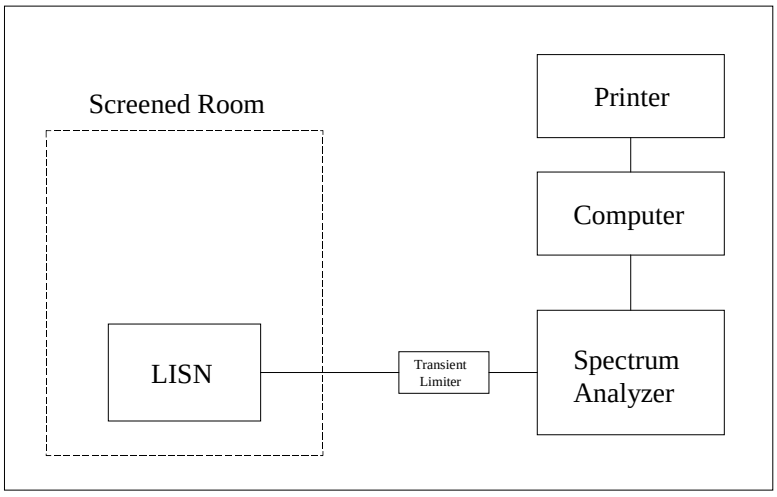
a) Each power cord, which is terminated in a mains supply plug, shall be tested separately.
b) Power cords, which are not specified by the manufacturer to be connected via a host unit, shall be tested separately.
c) Power cords which are specified by the manufacturer to be connected via a host unit or other power supplying equipment shall be connected to that host unit and the power cords of that host unit connected to the LISN and tested.
d) Where a special connection is specified, the necessary hardware to effect the connection is supplied by the manufacturer for the testing purpose.
e) When testing equipment with multiple mains cords, those cords not under test are connected to an artificial mains network (AMN) different than the AMN used for the mains cord under test.

For AC mains port testing, desktop EUT are placed on a non-conducting table at least 0.8 meters from the metallic floor and placed 40 cm from the vertical coupling plane (copper plating in the wall behind EUT table). Floor standing equipment is placed directly on the earth grounded floor.

Type of Equipment	Manufacturer	Model Number	Serial Number	Date of Last Calibration
Wanship Open Area Test Site #2	CCL	N/A	N/A	10/08/2008
Test Software	CCL	Conducted Emissions	Revision 1.2	N/A
Spectrum Analyzer	Hewlett Packard	8566B	2332A02726	04/29/2008
Quasi-Peak Detector	Hewlett Packard	85650A	2043A00287	04/02/2008
LISN	EMCO	3825/2	9508-2435	03/13/2008
Conductance Cable Wanship Site #2	CCL	Cable J	N/A	12/31/2007
Transient Limiter	Hewlett Packard	11947A	3107A02266	12/31/2007

An independent calibration laboratory or CCL personnel calibrates all the equipment listed above at intervals defined in ANSI C63.4:2003 Section 4.4 following outlined calibration procedures. All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to tractability is on file and is available for examination upon request.

Conducted Emissions Test Setup



A1.2 Radiated Disturbance:

The radiated disturbance from the EUT was measured using a spectrum analyzer with a quasi-peak adapter for peak and quasi-peak readings. A preamplifier with a fixed gain of 26 dB and a power amplifier with a fixed gain of 22 dB were used to increase the sensitivity of the measuring instrumentation. The quasi-peak adapter uses a bandwidth of 120 kHz, with the spectrum analyzer's resolution bandwidth set at 1 MHz, for readings in the 30 to 1000 MHz frequency ranges.

A biconilog antenna was used to measure the frequency range of 30 to 1000 MHz, at a distance of 3 or 10 meters from the EUT. The readings obtained by these antennas are correlated to the levels obtained with a tuned dipole antenna by adding antenna factors. A double-ridged guide antenna was used to measure the emissions at frequencies above 1000 MHz at a distance of 3 and/or 1 meter from the EUT.

The configuration of the EUT was varied to find the maximum radiated emission. The EUT was connected to the peripherals listed in Section 2.3 via the interconnecting cables listed in Section 2.4. A technician manually manipulated these interconnecting cables to obtain worst-case radiated disturbance. The EUT was rotated 360 degrees, and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission. Where there was multiple interface ports all of the same type, cables are either placed on all of the ports or cables added to these ports until the emissions do not increase by more than 2 dB.

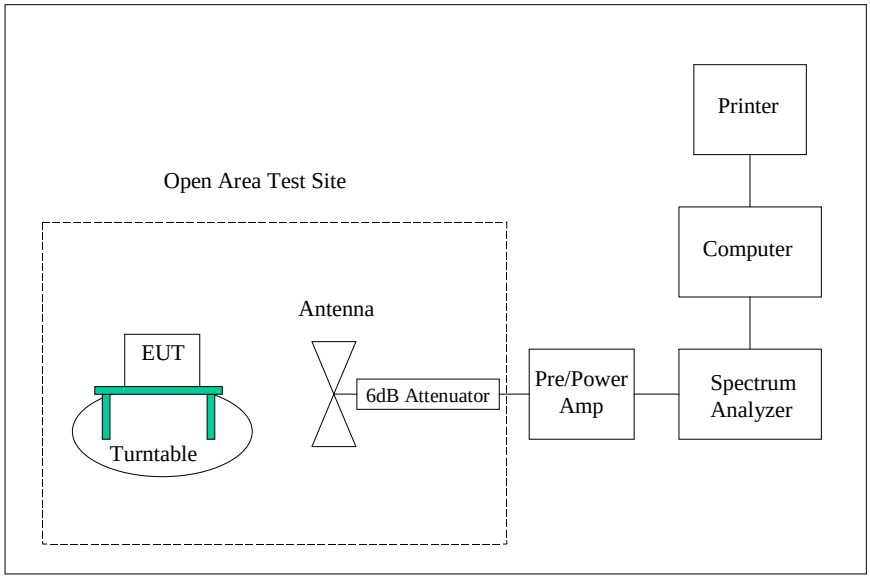
Desktop EUT are measured on a non-conducting table 0.8 meters above the ground plane. The table is placed on a turntable, which is level with the ground plane. For equipment normally placed on floors, the equipment shall be placed directly on the turntable.

Type of Equipment	Manufacturer	Model Number	Serial Number	Date of Last Calibration
Wanship Open Area Test Site #2	CCL	N/A	N/A	10/08/2008
Test Software	CCL	Radiated Emissions	Revision 1.3	N/A
Spectrum Analyzer	Hewlett Packard	8566B	2332A02726	04/29/2008
Quasi-Peak Detector	Hewlett Packard	85650A	2043A00287	04/02/2008

Type of Equipment	Manufacturer	Model Number	Serial Number	Date of Last Calibration
Biconilog Antenna	EMCO	3142	9601-1008	9/26/2008
Double Ridged Guide Antenna	EMCO	3115	9604-4779	03/17/2008
High Frequency Amplifier	Miteq	AFS4-01001800-43-10P-4	1096455	05/29/2007
20’ High Frequency Cable	Utiflex	UFA210A-1-2400-30050U	1175	04/01/2008
3 Meter Radiated Emissions Cable Wanship Site #2	CCL	Cable K	N/A	12/31/2007
Pre/Power-Amplifier	Hewlett Packard	8447F	3113A05161	08/28/2008
6 dB Attenuator	Hewlett Packard	8491A	32835	12/31/2007

An independent calibration laboratory or CCL personnel calibrates all the equipment listed above at intervals defined in ANSI C63.4:2003 Section 4.4 following outlined calibration procedures. All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to tractability is on file and is available for examination upon request.

Radiated Emissions Test Setup



APPENDIX 2 PHOTOGRAPHS

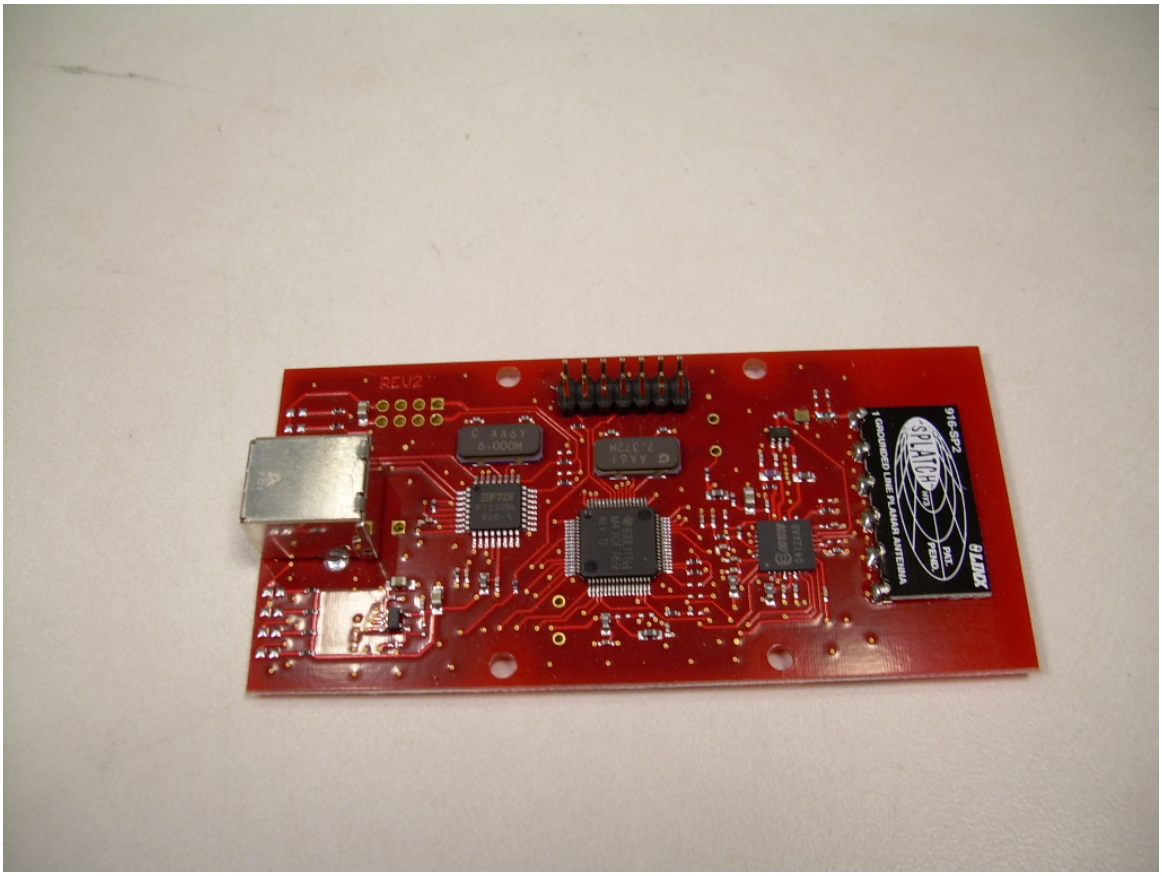
Photograph 1 – Front View Test Setup

Photograph 2 – Back View Test Setup

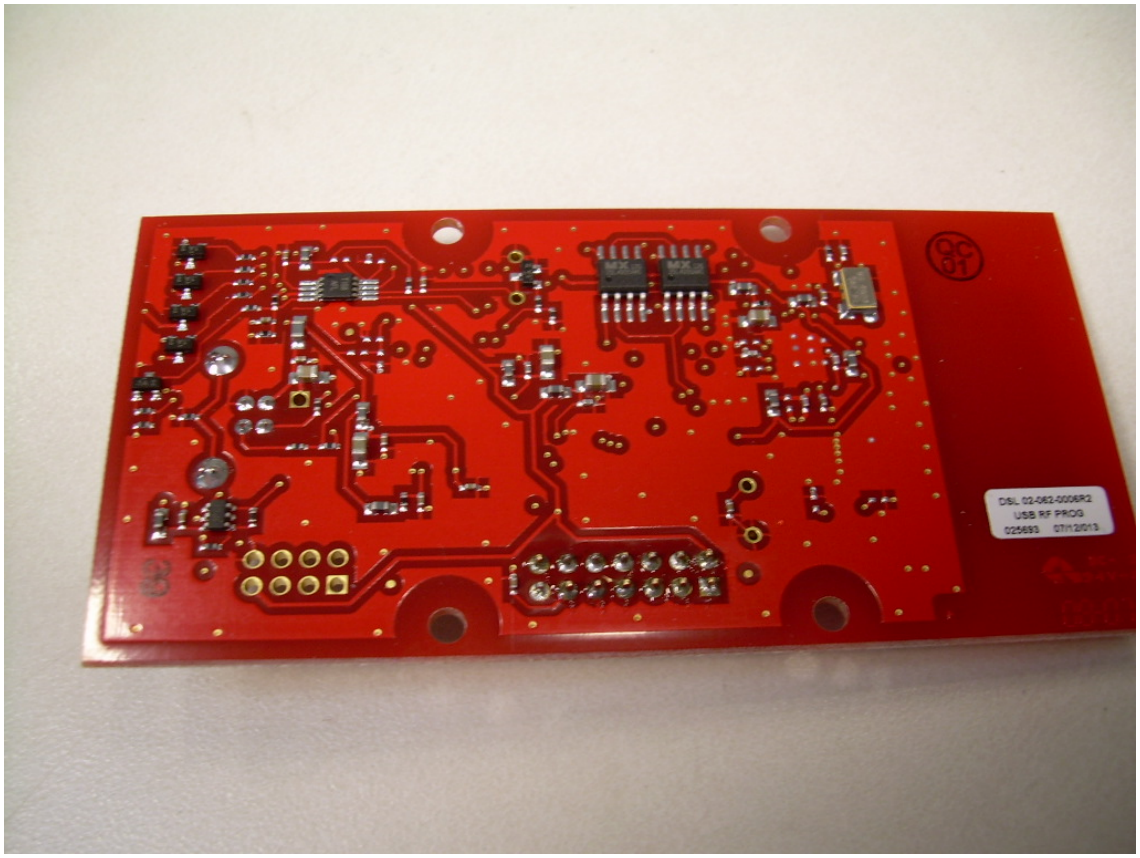
Photograph 3 – Top View of the EUT

Photograph 4 – Bottom View of the EUT

Photograph 5 – View of the Front Side of the PCB



Photograph 6 – View of the Trace Side of the PCB



APPENDIX 3 FCC Part 15/ICES-003 COMPLIANCE INFORMATION

A3.1 LABEL AND COMPLIANCE STATEMENT

The label of the Grayling Wireless Inc. CCRF01 was not available at the time of this report.

A3.2 BLOCK DIAGRAM

A block diagram showing the clock frequencies and signal paths of the Grayling Wireless Inc. CCRF01 was not available at the time of this report.

A3.3 USER'S MANUAL

A copy of the User's manual containing the FCC warning statement was not available at the time of this report.