# COMMUNICATION CERTIFICATION LABORATORY

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

## Test Report

Certification

TEST OF: CCR01A

FCC ID: TOC-0002

To FCC PART 15, Subpart C
Section 15.249

Test Report Serial No: 73-8199

Applicant:

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

Date of Test: March 21 & 22, 2006

Issue Date: March 28, 2006

Accredited Testing Laboratory By:

NVLAP

NVLAP Lab Code 100272-0

**CERTIFICATION OF ENGINEERING REPORT**

This report has been prepared by Communication Certification Laboratory to determine compliance of the device described below with the certification requirements of 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.
- Trade Name: Grayling Wireless
- Model Number: CCR01A
- FCC ID: TOC-0002

On this 28th day of March 2006, 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 recognized that the Communication Certification Laboratory EMC testing facilities are in good standing, NVLAP does not endorse the product described in this report.

COMMUNICATION CERTIFICATION LABORATORY

Tested by: Norman P. Hansen
EMC Technician

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## SECTION 1.0 CLIENT INFORMATION

### 1.1 Client Information:

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

Contact Name: Keyes Lowe
Title: Project Manager

### 1.2 Manufacturer:

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

Contact Name: Keyes Lowe
Title: Project Manager

## SECTION 2.0 EQUIPMENT UNDER TEST (EUT)

### 2.1 Identification of EUT:

Trade Name: Grayling Wireless
Model Number: CCR01A
Serial Number: MB303
Options Fitted: N/A
Country of Manufacture: Canada

### 2.2 Description of EUT:

The CCR01A is a transceiver for use with the CCT01A of the ClearCalm system that attaches to the lapel or belt of the user. The CCR01A has a speaker for local communication or will interface a long range communication system. A Motorola HT1000 was used to terminate the long range interface cable of the CCR01A. The CCR01A is powered from 3 - AAA batteries.

The CCR01A uses 5 channels in the 902 to 928 MHz frequency range. Testing was performed with the CCR01A operating on the lower, middle, and upper channels as specified in FCC §15.31(m).

| Channel 1 | Channel 2 | Channel 3 | Channel 4 | Channel 5 |
|---|---|---|---|---|
| 906.0 MHz | 910.0 MHz | 915.0 MHz | 919.0 MHz | 923.0 MHz |

This report covers the transmitter portion of the CCR01A that is subject to the requirements of FCC Part 15, Subpart C. The receiver and digital circuitry of the CCR01A that is subject to FCC Part 15, Subpart B is covered in separate testing and report.

## SECTION 3.0 TEST SPECIFICATION, METHODS & PROCEDURES

### 3.1 Test Specification:

Title: FCC PART 15, Subpart C (47 CFR 15). Section 15.249

Operation within the bands 902 – 928 MHz, 2400 – 2483.5 MHz, 5725 – 5875 MHz, and 24.0 – 24.25 GHz

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

### 3.2 Methods & Procedures:

### 3.2.1 §15.224

(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).

**3.3 Test Procedure**

The 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 550 West Wanship Road, Wanship, UT. This site has been fully described in a report submitted to the FCC, and was accepted in a letter dated August 11, 2003 (90504).

CCL participates in the National Voluntary Laboratory Accreditation Program (NVLAP) and has been accepted under NVLAP Lab Code:100272-0, which is effective until September 30, 2006.

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: 4.5 VDC from 3 – AAA batteries

### 4.2 Operating Modes:

The CCR01A was tested when placed vertical on the table, flat horizontally on the table, and on edge. The transmitter was in a constant transmit state during testing at either the upper, middle, or lower channel.

### 4.3 EUT Exercise Software:

No software was required.

## SECTION 5.0 SUMMARY OF TEST RESULTS

### 5.1 FCC PART 15, Subpart C, Section 15.249

#### 5.1.1 Summary of Tests:

| Section | Test Performed | Frequency Range (MHz) | Result |
|---|---|---|---|
| 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 §15.249 (a) & (d)

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.

### Channel 1 - Radiated Emission Data

| Frequency (MHz) | Detector | Antenna Polarity | Receiver Reading (dBμV) | Correction Factor (dB/m) | Field Strength (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 906.0 | Peak | Vertical | 57.8 | 28.6 | 86.4 | 94.0 | -7.6 |
| 906.0 | Peak | Horizontal | 57.2 | 28.6 | 85.8 | 94.0 | -8.2 |
| 1812.0 | Peak | Vertical | 22.9 | 27.7 | 50.6 | 74.0 | -23.4 |
| 1812.0 | Average | Vertical | 20.5 | 27.7 | 48.2 | 54.0 | -5.8 |
| 1812.0 | Peak | Horizontal | 22.5 | 27.7 | 50.2 | 74.0 | -23.8 |
| 1812.0 | Average | Horizontal | 20.5 | 27.7 | 48.2 | 54.0 | -5.8 |
| 2718.0 | Peak | Vertical | 10.8 | 30.7 | 41.5 | 74.0 | -32.5 |
| 2718.0 | Average | Vertical | 4.0 | 30.7 | 34.7 | 54.0 | -19.3 |
| 2718.0 | Peak | Horizontal | 11.1 | 30.7 | 41.8 | 74.0 | -32.2 |
| 2718.0 | Average | Horizontal | 1.4 | 30.7 | 32.1 | 54.0 | -21.9 |
| 3624.0 | Peak | Vertical | 6.4 | 33.6 | 40.0 | 74.0 | -34.0 |

| Frequency (MHz) | Detector | Antenna Polarity | Receiver Reading ($dB\mu V$) | Correction Factor (dB/m) | Field Strength ($dB\mu V/m$) | Limit ($dB\mu V/m$) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 3624.0 | Average | Vertical | -5.0 | 33.6 | 28.6 | 54.0 | -25.4 |
| 3624.0 | Peak | Horizontal | 6.8 | 33.6 | 40.4 | 74.0 | -33.6 |
| 3624.0 | Average | Horizontal | -5.2 | 33.6 | 28.4 | 54.0 | -25.6 |
| 4530.0 | Peak | Vertical | 5.3 | 34.7 | 40.0 | 74.0 | -34.0 |
| 4530.0 | Average | Vertical | -6.0 | 34.7 | 28.7 | 54.0 | -25.3 |
| 4530.0 | Peak | Horizontal | 5.1 | 34.7 | 39.8 | 74.0 | -34.2 |
| 4530.0 | Average | Horizontal | -6.0 | 34.7 | 28.7 | 54.0 | -25.3 |
| 5436.0 | Peak | Vertical | 5.7 | 36.4 | 42.1 | 74.0 | -31.9 |
| 5436.0 | Average | Vertical | -6.4 | 36.4 | 30.0 | 54.0 | -24.0 |
| 5436.0 | Peak | Horizontal | 5.3 | 36.4 | 41.7 | 74.0 | -32.3 |
| 5436.0 | Average | Horizontal | -6.1 | 36.4 | 30.3 | 54.0 | -23.7 |
| 6342.0 | Peak | Vertical | 9.1 | 37.0 | 46.1 | 74.0 | -27.9 |
| 6342.0 | Average | Vertical | -2.7 | 37.0 | 34.3 | 54.0 | -19.7 |
| 6342.0 | Peak | Horizontal | 9.0 | 37.0 | 46.0 | 74.0 | -28.0 |
| 6342.0 | Average | Horizontal | -2.6 | 37.0 | 34.4 | 54.0 | -19.6 |
| 7248.0 | Peak | Vertical | 9.3 | 39.5 | 48.8 | 74.0 | -25.2 |
| 7248.0 | Average | Vertical | -2.8 | 39.5 | 36.7 | 54.0 | -17.3 |
| 7248.0 | Peak | Horizontal | 8.6 | 39.5 | 48.1 | 74.0 | -25.9 |
| 7248.0 | Average | Horizontal | -2.9 | 39.5 | 36.6 | 54.0 | -17.4 |
| 8154.0 | Peak | Vertical | 8.3 | 40.6 | 48.9 | 74.0 | -25.1 |
| 8154.0 | Average | Vertical | -3.5 | 40.6 | 37.1 | 54.0 | -16.9 |
| 8154.0 | Peak | Horizontal | 8.1 | 40.6 | 48.7 | 74.0 | -25.3 |
| 8154.0 | Average | Horizontal | -3.6 | 40.6 | 37.0 | 54.0 | -17.0 |
| 9060.0 | Peak | Vertical | 8.4 | 41.7 | 50.1 | 74.0 | -23.9 |
| 9060.0 | Average | Vertical | -3.6 | 41.7 | 38.1 | 54.0 | -15.9 |
| 9060.0 | Peak | Horizontal | 8.3 | 41.7 | 50.0 | 74.0 | -24.0 |
| 9060.0 | Average | Horizontal | -3.7 | 41.7 | 38.0 | 54.0 | -16.0 |

Note: Measurements shown for frequencies of 3624 MHz and above are noise floor measurements. No emissions were seen at a distance of 1 meter from the EUT.

**Channel 3 Radiated Emission Data**

| Frequency (MHz) | Detector | Antenna Polarity | Receiver Reading (dBμV) | Correction Factor (dB/m) | Field Strength (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 915.0 | Peak | Vertical | 57.8 | 28.8 | 86.6 | 94.0 | -7.4 |
| 915.0 | Peak | Horizontal | 57.8 | 28.8 | 86.6 | 94.0 | -7.4 |
| 1830.0 | Peak | Vertical | 21.6 | 27.8 | 49.4 | 74.0 | -24.6 |
| 1830.0 | Average | Vertical | 19.4 | 27.8 | 47.2 | 54.0 | -6.8 |
| 1830.0 | Peak | Horizontal | 19.8 | 27.8 | 47.6 | 74.0 | -26.4 |
| 1830.0 | Average | Horizontal | 17.3 | 27.8 | 45.1 | 54.0 | -8.9 |
| 2745.0 | Peak | Vertical | 10.2 | 30.7 | 40.9 | 74.0 | -33.1 |
| 2745.0 | Average | Vertical | 0.4 | 30.7 | 31.1 | 54.0 | -22.9 |
| 2745.0 | Peak | Horizontal | 10.3 | 30.7 | 41.0 | 74.0 | -33.0 |
| 2745.0 | Average | Horizontal | 1.4 | 30.7 | 32.1 | 54.0 | -21.9 |
| 3660.0 | Peak | Vertical | 6.4 | 33.6 | 40.0 | 74.0 | -34.0 |
| 3660.0 | Average | Vertical | -5.0 | 33.6 | 28.6 | 54.0 | -25.4 |
| 3660.0 | Peak | Horizontal | 6.8 | 33.6 | 40.4 | 74.0 | -33.6 |
| 3660.0 | Average | Horizontal | -5.2 | 33.6 | 28.4 | 54.0 | -25.6 |
| 4575.0 | Peak | Vertical | 5.3 | 34.7 | 40.0 | 74.0 | -34.0 |
| 4575.0 | Average | Vertical | -6.0 | 34.7 | 28.7 | 54.0 | -25.3 |
| 4575.0 | Peak | Horizontal | 5.1 | 34.7 | 39.8 | 74.0 | -34.2 |
| 4575.0 | Average | Horizontal | -6.0 | 34.7 | 28.7 | 54.0 | -25.3 |
| 5490.0 | Peak | Vertical | 5.7 | 36.4 | 42.1 | 74.0 | -31.9 |
| 5490.0 | Average | Vertical | -6.4 | 36.4 | 30.0 | 54.0 | -24.0 |
| 5490.0 | Peak | Horizontal | 5.3 | 36.4 | 41.7 | 74.0 | -32.3 |
| 5490.0 | Average | Horizontal | -6.1 | 36.4 | 30.3 | 54.0 | -23.7 |
| 6405.0 | Peak | Vertical | 9.1 | 37.0 | 46.1 | 74.0 | -27.9 |
| 6405.0 | Average | Vertical | -2.7 | 37.0 | 34.3 | 54.0 | -19.7 |
| 6405.0 | Peak | Horizontal | 9.0 | 37.0 | 46.0 | 74.0 | -28.0 |
| 6405.0 | Average | Horizontal | -2.6 | 37.0 | 34.4 | 54.0 | -19.6 |
| 7320.0 | Peak | Vertical | 9.3 | 39.5 | 48.8 | 74.0 | -25.2 |
| 7320.0 | Average | Vertical | -2.8 | 39.5 | 36.7 | 54.0 | -17.3 |

| Frequency (MHz) | Detector | Antenna Polarity | Receiver Reading (dBμV) | Correction Factor (dB/m) | Field Strength (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 7320.0 | Peak | Horizontal | 8.6 | 39.5 | 48.1 | 74.0 | -25.9 |
| 7320.0 | Average | Horizontal | -2.9 | 39.5 | 36.6 | 54.0 | -17.4 |
| 8235.0 | Peak | Vertical | 8.3 | 40.6 | 48.9 | 74.0 | -25.1 |
| 8235.0 | Average | Vertical | -3.5 | 40.6 | 37.1 | 54.0 | -16.9 |
| 8235.0 | Peak | Horizontal | 8.1 | 40.6 | 48.7 | 74.0 | -25.3 |
| 8235.0 | Average | Horizontal | -3.6 | 40.6 | 37.0 | 54.0 | -17.0 |
| 9150.0 | Peak | Vertical | 8.4 | 41.7 | 50.1 | 74.0 | -23.9 |
| 9150.0 | Average | Vertical | -3.6 | 41.7 | 38.1 | 54.0 | -15.9 |
| 9150.0 | Peak | Horizontal | 8.3 | 41.7 | 50.0 | 74.0 | -24.0 |
| 9150.0 | Average | Horizontal | -3.7 | 41.7 | 38.0 | 54.0 | -16.0 |
| Note: Measurements shown for frequencies of 3660 MHz and above are noise floor measurements. No emissions were seen at a distance of 1 meter from the EUT. | | | | | | | |

**Channel 5 Radiated Emission Data**

| Frequency (MHz) | Detector | Antenna Polarity | Receiver Reading (dBμV) | Correction Factor (dB/m) | Field Strength (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 923.0 | Peak | Vertical | 58.5 | 28.9 | 87.4 | 94.0 | -6.6 |
| 923.0 | Peak | Horizontal | 60.1 | 28.9 | 89.0 | 94.0 | -5.0 |
| 1846.0 | Peak | Vertical | 23.5 | 27.9 | 51.4 | 74.0 | -22.6 |
| 1846.0 | Average | Vertical | 21.9 | 27.9 | 49.8 | 54.0 | -4.2 |
| 1846.0 | Peak | Horizontal | 22.3 | 27.9 | 50.2 | 74.0 | -23.8 |
| 1846.0 | Average | Horizontal | 19.0 | 27.9 | 46.9 | 54.0 | -7.1 |
| 2769.0 | Peak | Vertical | 12.9 | 30.7 | 43.6 | 74.0 | -30.4 |
| 2769.0 | Average | Vertical | 0.0 | 30.7 | 30.7 | 54.0 | -23.3 |
| 2769.0 | Peak | Horizontal | 10.0 | 30.7 | 40.7 | 74.0 | -33.3 |
| 2769.0 | Average | Horizontal | -0.6 | 30.7 | 30.1 | 54.0 | -23.9 |
| 3692.0 | Peak | Vertical | 6.4 | 33.6 | 40.0 | 74.0 | -34.0 |
| 3692.0 | Average | Vertical | -5.0 | 33.6 | 28.6 | 54.0 | -25.4 |

| Frequency (MHz) | Detector | Antenna Polarity | Receiver Reading ($dB\mu V$) | Correction Factor (dB/m) | Field Strength ($dB\mu V/m$) | Limit ($dB\mu V/m$) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 3692.0 | Peak | Horizontal | 6.8 | 33.6 | 40.4 | 74.0 | -33.6 |
| 3692.0 | Average | Horizontal | -5.2 | 33.6 | 28.4 | 54.0 | -25.6 |
| 4615.0 | Peak | Vertical | 5.3 | 34.7 | 40.0 | 74.0 | -34.0 |
| 4615.0 | Average | Vertical | -6.0 | 34.7 | 28.7 | 54.0 | -25.3 |
| 4615.0 | Peak | Horizontal | 5.1 | 34.7 | 39.8 | 74.0 | -34.2 |
| 4615.0 | Average | Horizontal | -6.0 | 34.7 | 28.7 | 54.0 | -25.3 |
| 5538.0 | Peak | Vertical | 5.7 | 36.4 | 42.1 | 74.0 | -31.9 |
| 5538.0 | Average | Vertical | -6.4 | 36.4 | 30.0 | 54.0 | -24.0 |
| 5538.0 | Peak | Horizontal | 5.3 | 36.4 | 41.7 | 74.0 | -32.3 |
| 5538.0 | Average | Horizontal | -6.1 | 36.4 | 30.3 | 54.0 | -23.7 |
| 6461.0 | Peak | Vertical | 9.1 | 37.0 | 46.1 | 74.0 | -27.9 |
| 6461.0 | Average | Vertical | -2.7 | 37.0 | 34.3 | 54.0 | -19.7 |
| 6461.0 | Peak | Horizontal | 9.0 | 37.0 | 46.0 | 74.0 | -28.0 |
| 6461.0 | Average | Horizontal | -2.6 | 37.0 | 34.4 | 54.0 | -19.6 |
| 7384.0 | Peak | Vertical | 9.3 | 39.5 | 48.8 | 74.0 | -25.2 |
| 7384.0 | Average | Vertical | -2.8 | 39.5 | 36.7 | 54.0 | -17.3 |
| 7384.0 | Peak | Horizontal | 8.6 | 39.5 | 48.1 | 74.0 | -25.9 |
| 7384.0 | Average | Horizontal | -2.9 | 39.5 | 36.6 | 54.0 | -17.4 |
| 8307.0 | Peak | Vertical | 8.3 | 40.6 | 48.9 | 74.0 | -25.1 |
| 8307.0 | Average | Vertical | -3.5 | 40.6 | 37.1 | 54.0 | -16.9 |
| 8307.0 | Peak | Horizontal | 8.1 | 40.6 | 48.7 | 74.0 | -25.3 |
| 8307.0 | Average | Horizontal | -3.6 | 40.6 | 37.0 | 54.0 | -17.0 |
| 9230.0 | Peak | Vertical | 8.4 | 41.7 | 50.1 | 74.0 | -23.9 |
| 9230.0 | Average | Vertical | -3.6 | 41.7 | 38.1 | 54.0 | -15.9 |
| 9230.0 | Peak | Horizontal | 8.3 | 41.7 | 50.0 | 74.0 | -24.0 |
| 9230.0 | Average | Horizontal | -3.7 | 41.7 | 38.0 | 54.0 | -16.0 |

Note: Measurements shown for frequencies of 3692 MHz and above are noise floor measurements. No emissions were seen at a distance of 1 meter from the EUT.

**Sample Field Strength Calculation:**

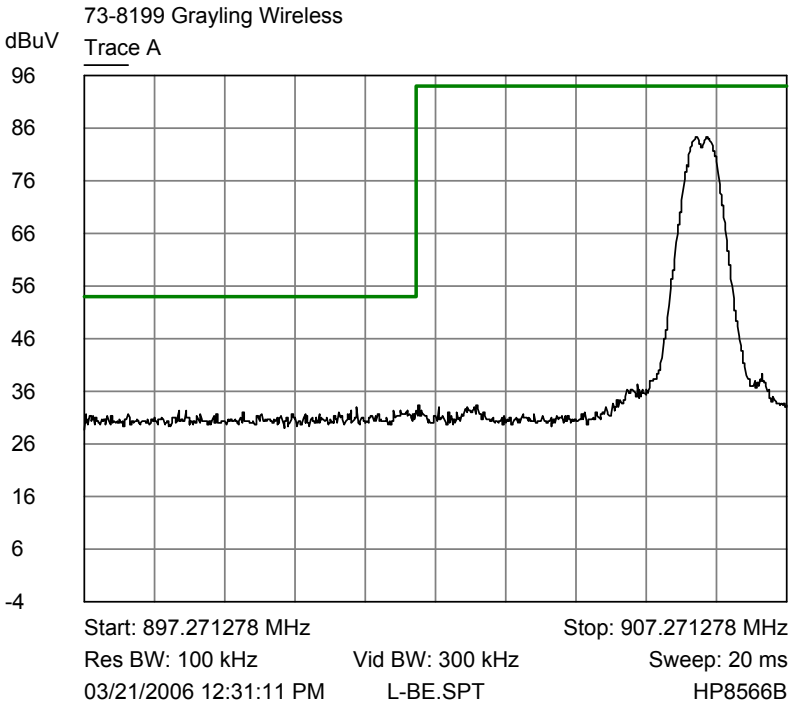
The field strength is calculated by adding the Correction Factor (Antenna Factor + Cable Factor) to the measured level of the receiver. The receiver amplitude reading is compensated for any amplifier gain.

The basic equation with a sample calculation is shown below:

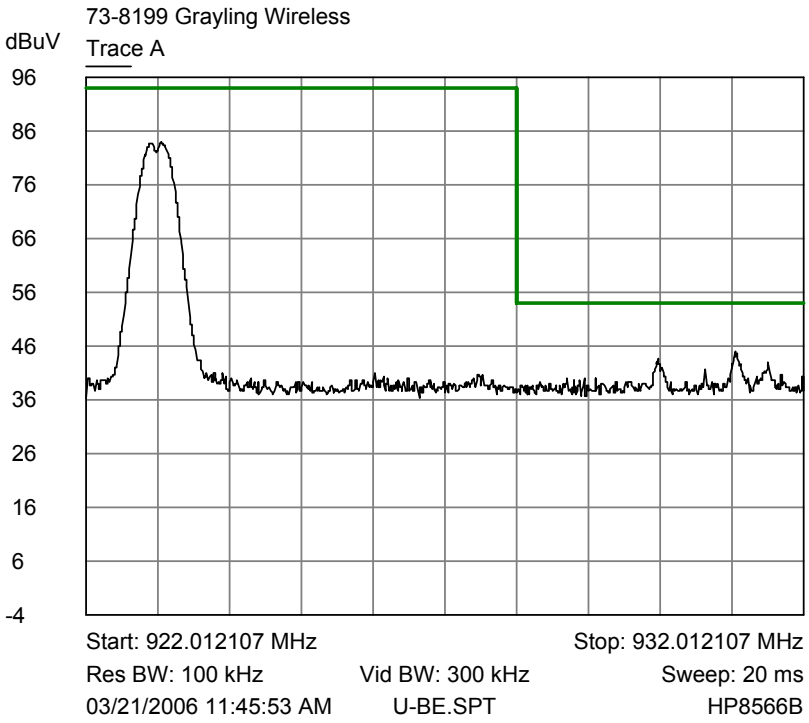
FS = RA + CF Where

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

Assume a receiver reading of 44.2 dBμV is obtained from the receiver and a correction factor of 17.5 dB. The field strength is calculated by adding the correction factor to the receiver reading, giving a field strength of 61.7 dBμV/m, FS = 44.2 + 17.5 = 61.7 dBμV/m.




Trace A Channel 1 Band edge plot




Trace A Channel 5 band edge plot

**RESULT**

In the configuration tested, the EUT complied with the requirements of §15.249 (a) & (d) with a nearest margin to the limit of 4.2 dB and the fundamental frequencies of all channels are within the specified band of operation.

## APPENDIX 1 TEST PROCEDURES AND TEST EQUIPMENT

### A.1.1 Radiated Interference Emissions

The radiated emission from the intentional radiator was measured using a spectrum analyzer. For frequencies above 30 MHz and below 1000 MHz, the resolution bandwidth was set at 100 kHz and the video bandwidth was set at 300 kHz, bypassing the Quasi-Peak Adapter. For measurements at frequencies above 1000 MHz, a 1 MHz RBW was used with the VBW set to 3 MHz for peak detection and set to 10 Hz for average detection measurements.

A biconilog antenna was used to measure the frequency range of 30 to 1000 MHz at a distance of 3 meters from the EUT. The readings obtained by the antenna are correlated to the levels obtained with a tuned dipole antenna by adding antenna factors. A double-ridged guide antenna was used for frequencies above 1000 MHz at a distance of 3 MHz. If no emission was seen at a distance of 3 meters from the EUT, a distance of 1 meter was used and the measurement adjusted for distance and compared to the 3 meter limit.

The configuration of the intentional radiator was varied to find the maximum radiated emission. The intentional radiator was rotated 360 degrees, and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

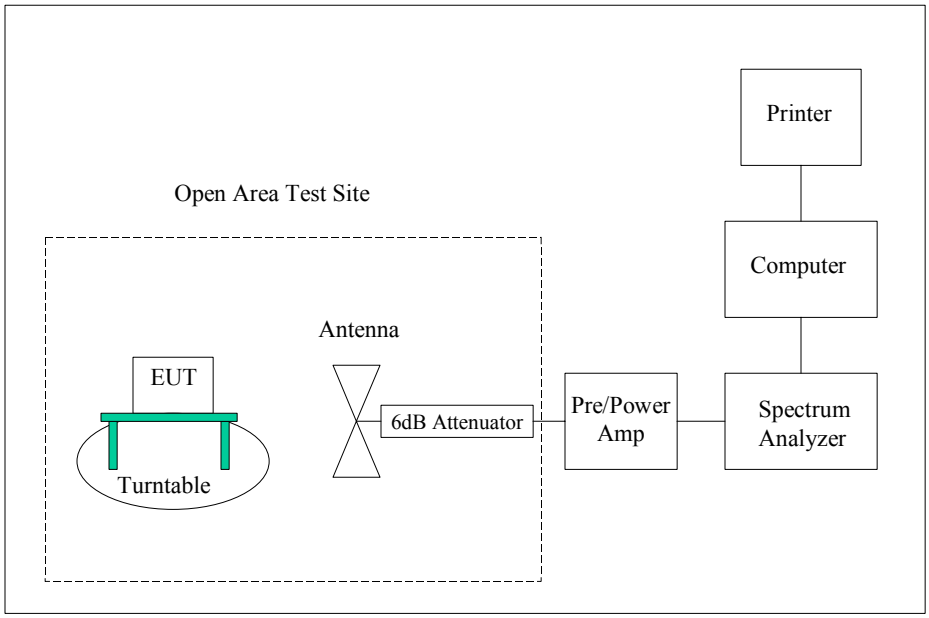
Desktop intentional radiators are measured on a non-conducting table 0.8 meter above the ground plane. The table is placed on a turntable which is level with the ground plane.

| Type of Equipment | Manufacturer | Model Number | Serial Number | Date of Last Calibration |
|---|---|---|---|---|
| Wanship Open Area Test Site #2 | CCL | N/A | N/A | 10/28/2005 |
| Test Software | CCL | Radiated Emissions | Revision 1.3 | N/A |
| Spectrum Analyzer | Hewlett Packard | 8566B | 2230A01711 | 10/10/2005 |
| Biconilog Antenna | EMCO | 3142 | 9601-1009 | 12/28/2005 |
| Active Loop Antenna | EMCO | 6502 | 2011 | 04/21/2005 |
| 3 Meter Radiated Emissions Cable Wanship Site #2 | CCL | Cable K | N/A | 12/12/2005 |

| Type of Equipment | Manufacturer | Model Number | Serial Number | Date of Last Calibration |
|---|---|---|---|---|
| Double Ridged Guide Antenna | EMCO | 3115 | 9604-4779 | 05/26/2005 |
| High Frequency Amplifier | Hewlett Packard | 8449B | 3008A00990 | 05/25/2005 |
| Pre/Power-Amplifier | Hewlett Packard | 8447F | 3113A05161 | 09/19/2005 |
| 6 dB Attenuator | Hewlett Packard | 8491A | 32835 | 12/12/2005 |

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 of the Test Setup
(Horizontal, Flat Alignment)

Photograph 2 – Back View of the Test Setup
(Horizontal, Flat Alignment)

Photograph 3 – Front View of the Radiated Test Setup
(Horizontal on Edge Alignment)

Photograph 4 – Back View of the Test Setup
(Horizontal on Edge Alignment)

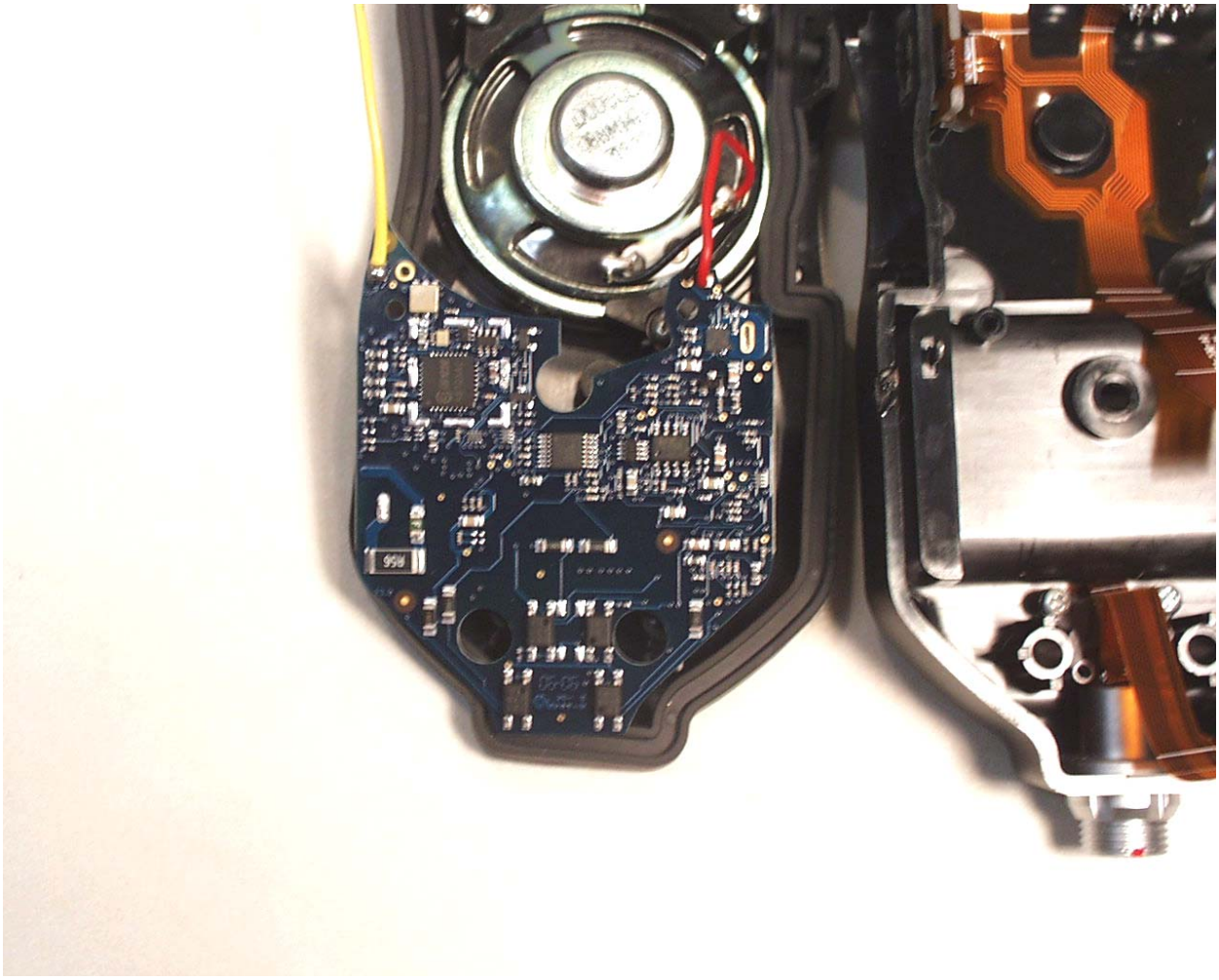
Photograph 5 – Front View of the Test Setup
(Vertical Alignment)

Photograph 6 – Back View of the Test Setup
(Vertical Alignment)

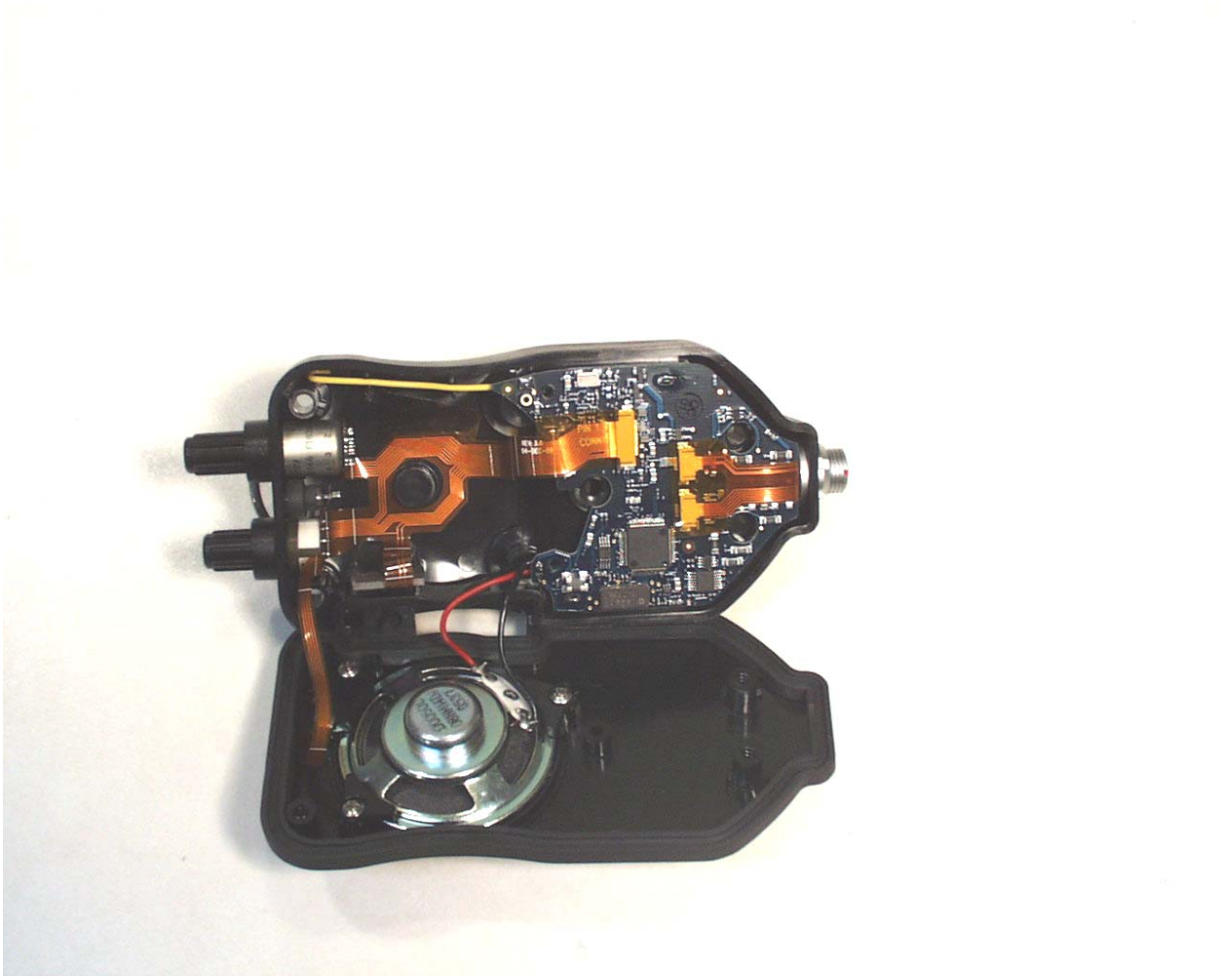
Photograph 7 – Front View of the EUT

Photograph 8 – Back View of the EUT

Photograph 9 – View of the Back Side of the PCB



Photograph 10 – View of the Front Side of the PCB



Photograph 11 – View of the Interface Cable