CERT NO: 2055.01

TEST REPORT #270808

STANDARD: FCC PART 15

SUBPART C--INTENTIONAL RADIATORS

SECTION 15. 231 PERIODIC OPERATION IN THE BAND 40.66 – 40.70 MHZ AND ABOVE 70 MHZ

EQUIPMENT TESTED:

RAVEN INDUSTRIES, INC.

WIRELESS SECTION CONTROL HANDHELD REMOTE CONTROL

MODEL: 063-0173-016

TEST DATE: 27 AUGUST, 2008

INTERNATIONAL

1100 Falcon Avenue
Glencoe, MN 55336

Tele: 320-864-4444
Fax: 320-864-6611

CERTIFICATION SERVICES, INC.

Prepared for:

Raven Industries, Inc.
205 East 6th Street
Sioux Falls, SD 57102

Test agent:

International Certification Services, Inc.
1100 Falcon Avenue
Glencoe, MN 55336
Tele: 320-864-4444
Fax: 320-864-6611

Test location:

International Certification Services, Inc.
1100 Falcon Avenue
Glencoe, MN 55336
Tele: 320-864-4444
Fax: 320-864-6611

Prepared by:

International Certification Services, Inc.
1100 Falcon Avenue
Glencoe, MN 55336

International Certification Services represents to the client that testing is done in accordance with standard procedures applicable and that reported test results are accurate within generally accepted commercial ranges of accuracy.

- **This report only applies to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. International Certification Services shall have no liability for any deductions, inferences or generalizations drawn by the client or others from this report.**

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval.

International
Certification Services, Inc.

1.0 TEST SUMMARY

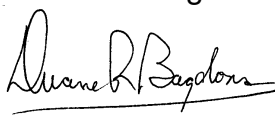
TEST REPORT: #270808	
COMPANY:	Raven Industries, Inc.
AGENT:	International Certification Services, Inc.
PHONE:	320-864-4444
TEST DATE:	27 August, 2008
EQUIPMENT UNDER TEST:	Wireless Section Control Handheld Remote Control Model: 063-0173-016
GENERAL TEST SUMMARY:	The testing was performed at International Certification Services, Inc. at 1100 Falcon Ave, Glencoe, MN 55336
VERIFICATION / CERTIFICATION STATUS:	The Raven Industries, Inc. Wireless Section Control Handheld Remote Control Model: 063-0173-016 was found to be in compliance with the FCC Part 15 Subpart C, Section 15.231 requirements.
MODIFICATIONS NECESSARY:	None

TESTED BY

Duane R. Bagdons

WRITTEN BY

Duane R. Bagdons



Applicable Standards

47 CFR Ch.1 (10-1-98 Edition)

FCC Part 15 Radio Frequency Devices

Subpart C Intentional Radiators

Section 15.231 Periodic Operation in the band 40.66 – 40.70 Mhz, and above 70 Mhz.

2.1 Referenced Standards

ANSI C63.4-2003 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 Khz to 40 Ghz.

2.2 TEST FACILITY

The open area test site (OATS) and conducted measurement facility used to collect the data was International Certification Services, Inc. at 1100 Falcon Ave. in Glencoe, MN 55336. This site has been certified to be in compliance with the normalized site attenuation section of CISPR 16-1. (See FCC Registration number: 91103 and Industry Canada File number: IC 3710.) International Certification Services, Inc. is also a registered appointed EMC test laboratory for TUV Rheinland Product Safety GmbH, a competent body.

2.3 LABORATORY ACCREDITATION

International Certification Services, Inc. maintains A2LA accreditation to ISO/IEC 17025 for this specific tests listed in A2LA Certificate Number 2055.01 and meets the relevant quality systems requirements of ISO 9001:1994.

2.4 Equipment Units Tested

The equipment tested was a battery powered 417.892 Mhz transmitter model: 063-0173-016 Wireless Section Control Handheld Remote Control. The antenna is a off the shelf grounded line planar antenna by LINX. This device uses a Linx Technologies TXE-418-KH2 Transmitter chip and a Linx Technologies RXE-418-KH2 Receiver with a Linx Technologies ANT-418-SP1 antenna. Firmware in the product controls the transmitter burst to a length of approximately 425 mS. The transmission is controlled by the operator pressing a button switch on the remote control.

2.5 Equipment and Cable Configuration

See photo of the EUT test configuration setup in Attachment A

2.6 List of Test Equipment

Test Equipment	Model	S/N	Calibration Date
Spectrum Analyzer	Hewlett-Packard 8566B	2421A00458	01/25/08
Preamp	MiniCircuits ZKL-2R7	N/A	07/23/08
Biconical Antenna	EMCO Model 93110B	105799	07/22/08
Log Periodic Antenna (200-1000 MHz)	EMCO 3146	9111-3280	07/22/08
Horn Antenna (1-18 Ghz)	EMCO 3115	2334	07/22/08

Measurement cable losses, and antenna correction factors are included in the data sheets. The Resolution BW was set at 1 Mhz and the Video BW was set at 1 Hz with a Span of 0 Hz to perform the correct average detected measurements over 1000 Mhz.

2.7 Units of Measurement.

All measurements were taken in dBuV/m with the antenna located at 3 meters distance from the EUT. Frequency measurements are recorded in Mhz

2.7 Location of Test Site

The open area test site (OATS) measurement facility used to collect the data was International Certification Services, Inc. at 1100 Falcon Ave in Glencoe, MN 55336. This site has been certified to be in spec of the normalized site attenuation per ANSI C63.4-2003**.**

2.9 Measurement Procedures

The antenna was placed at a distance of 3 meters from the EUT. The EUT was set on an insulating table in the OATS site and rotated through 360 degrees to determine the worst case EUT orientation. The antenna was then positioned vertical and horizontal to determine which antenna polarity orientation was worst case. Then certification data was recorded at all the transmitter frequencies from the fundamental to the 10^{th} harmonic at an antenna height variation of from 1-4 meters.

2.10 Reporting Measurement Data

See data sheets and plots in Attachment B.

2.11 Radiated Emissions Data

The frequency and amplitude of the tuned frequency of the EUT along with the frequencies and amplitudes of the harmonics up to the 10^{th} harmonic are reported in the data sheets in Attachment B. This information is plotted against the limit of section 15.231 of FCC Part 15 subpart C. Both Horizontal and Vertical antenna polarities as well as antenna heights of 1 to 4 meters were observed but all maximum signal strengths occurred in the Horizontal antenna polarity and at 1 meter antenna height.

The Final Level, expressed in dBuV/m, is arrived at by taking the reading from the spectrum analyzer (Level dBuV) and adding the antenna correction factor and cable loss factor (Factor dB) and subtracting the preamp gain. This result then has the FCC limit subtracted from it to provide the margin which gives the tabular data as shown in the data sheets in Attachment B.

Example:

Frequency (MHz)	Level (dBuV)	+	Factor (dB)	=	Corr Data (dBuV/m)	-	FCC Limit (dBuV/m)	=	Margin (dB)
100.0	20.6	+	11.0	=	31.6	-	43.5	=	-11.9

2.12 Operating Frequency Data for Intentional Radiators

All operating frequencies and harmonic frequencies and ambient temperature at which all data was taken at is recorded in the data sheets in Attachment B.

2.13 Occupied Bandwidth Data for Intentional Radiators

The occupied BW data for the EUT is listed in the data sheets in Attachment B.

2.14 Summary of Results

The EUT passed the requirements of FCC Part 15 Subpart C, Section 15.231 with a maximum field strength of 60.074 dBuV/m (average detected signal) at the fundamental frequency of 417.892 Mhz against a limit of 80.28 dBuV/m. No modifications were necessary to accomplish this compliance.

ATTACHMENT A

RADIATED MEASUREMENT

TEST SET UP

Raven Industries, Inc.
Wireless Section Control Handheld Remote Control
Model: 063-0173-016
Radiated Emissions
Test Configuration

International
Certification Services, Inc.

ATTACHMENT B

DETAILED TEST DATA SHEETS

Each radiated emissions plot indicates the receiving antenna measurement distance in meters and the emission amplitudes with respect to their applicable limits. The associated tabulation for each radiated plot lists the emission frequency, the final emission level, and the margin from the limit.

Raven Industries, Inc.
Wireless Section Control Handheld Remote Control
Model: 063-0173-016
Temperature: 50 Deg F.
Humidity: 69 % R.H.

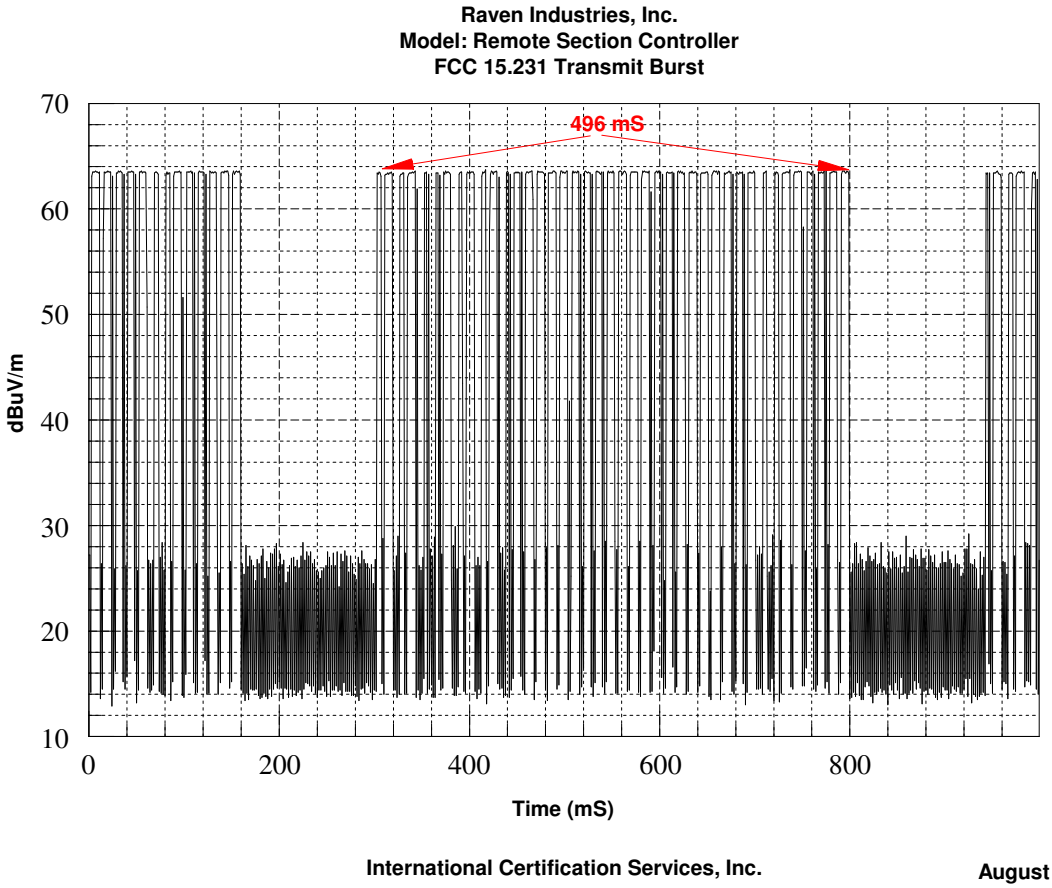
Test Technician: Duane R. Bagdons

Center Frequency: 417.892 Mhz

Preliminary testing was done to determine what antenna polarity and antenna height generated the highest signal levels. Tests were performed at this test configuration and then each frequency was maximized to 0-360 degrees orientation and antenna height of 1-4 meters.

15.231 (a) (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

15.231 (a) (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.



International Certification Services, Inc.

15.231 (a) (3) Periodic transmissions at regular predetermined intervals are not permitted….There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

This device is activated by a button press by the operator. The deactivation is controlled by the microprocessor.

15.231 (a) (4) Intentional Radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

Not Applicable

15.231 (a) (5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(4) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

Not Applicable

15.231 (b) In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental Freq (Mhz)	Field Strength of Fundamental (uV/m)	Field Strength of Spurious Emissions (uV/m)
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750	125 to 375
174-260	3750	375
260-470	**3750 to 12,500****	**375 to 1250****
Above 470	12,500	1250

**Linear interpolations

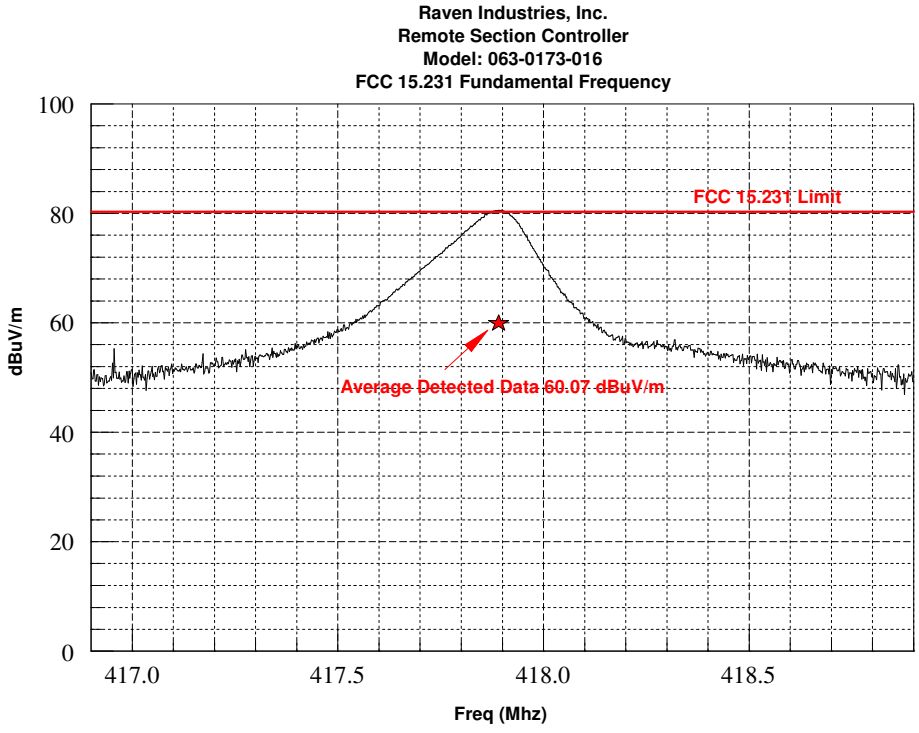
The maximum permitted fundamental field strengths are as follows:…for the band 260-470 Mhz, uV/m at 3 meters = 41.6667 (F) – 7083.3333. The maximum permitted unwanted emissions level is 20 dB below the maximum permitted fundamental level.

LIMIT:

Fundamental Freq (Mhz)	Field Strength of Fundamental (uV/m)	Field Strength of Fundamental (dBuV/m)	Field Strength of Spurious Emissions (uV/m)	Field Strength of Spurious Emissions (dBuV/m)
418	10,333.35	80.28	1033.335	60.28

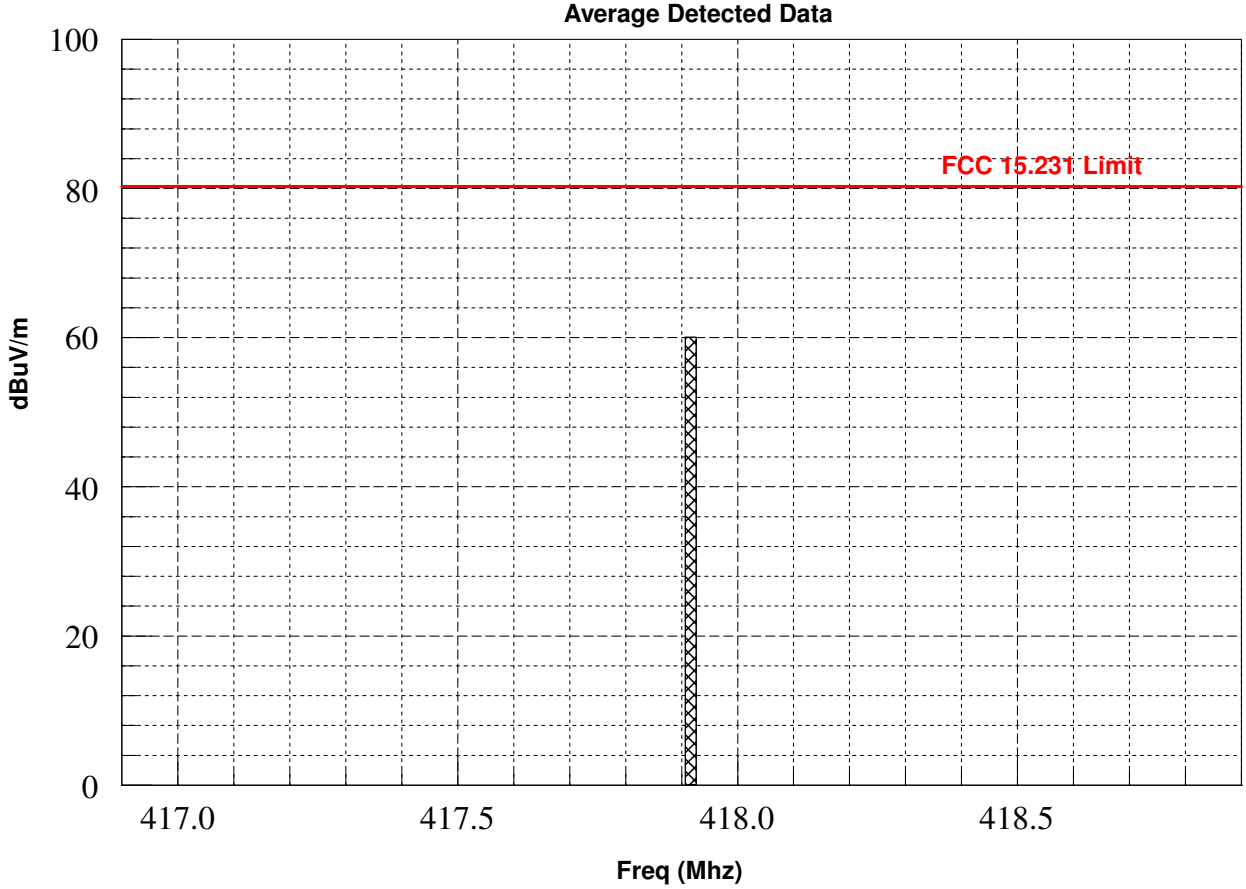
15.231 (b)(1) The field strength limits are specified at a distance of 3 meters.

15.231 (b)(2) Intentional Radiators operating under the provisions of this Section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emissions measurements are employed, the provisions in Section 15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of Section 15.205 shall be demonstrated using the measurement instrumentation specified in that section.



International Certification Services, Inc.

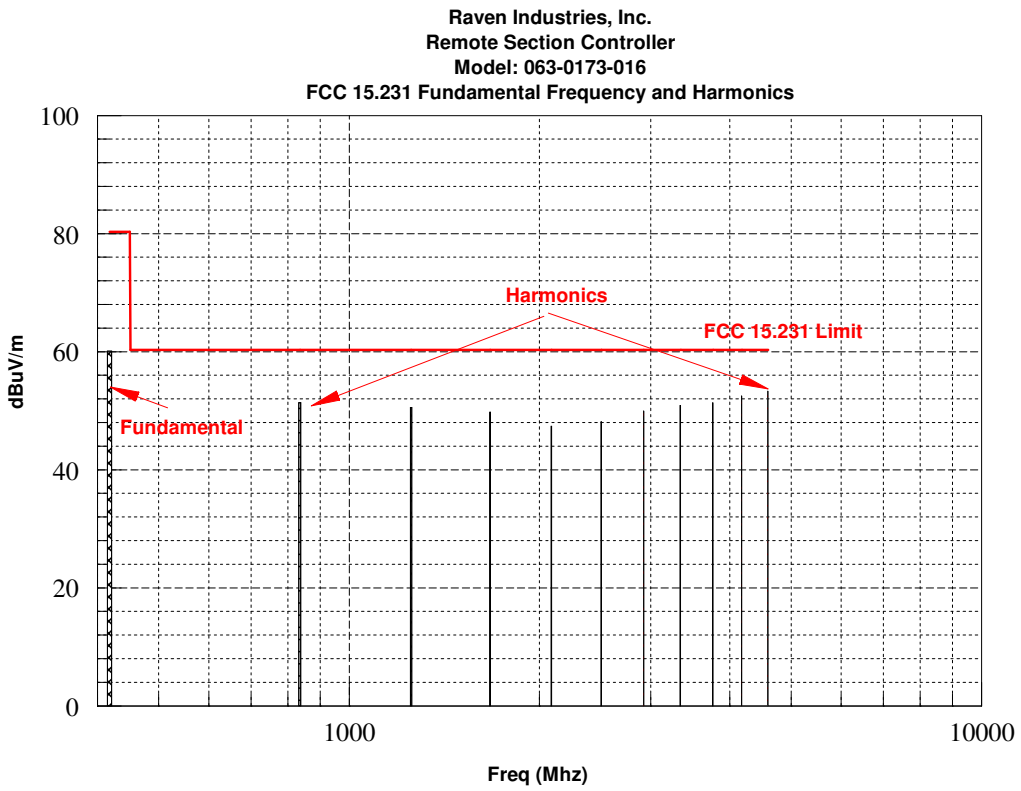
Raven Industries, Inc.
Remote Section Controller
Model: 063-0173-016
FCC 15.231 Fundamental Frequency
Average Detected Data



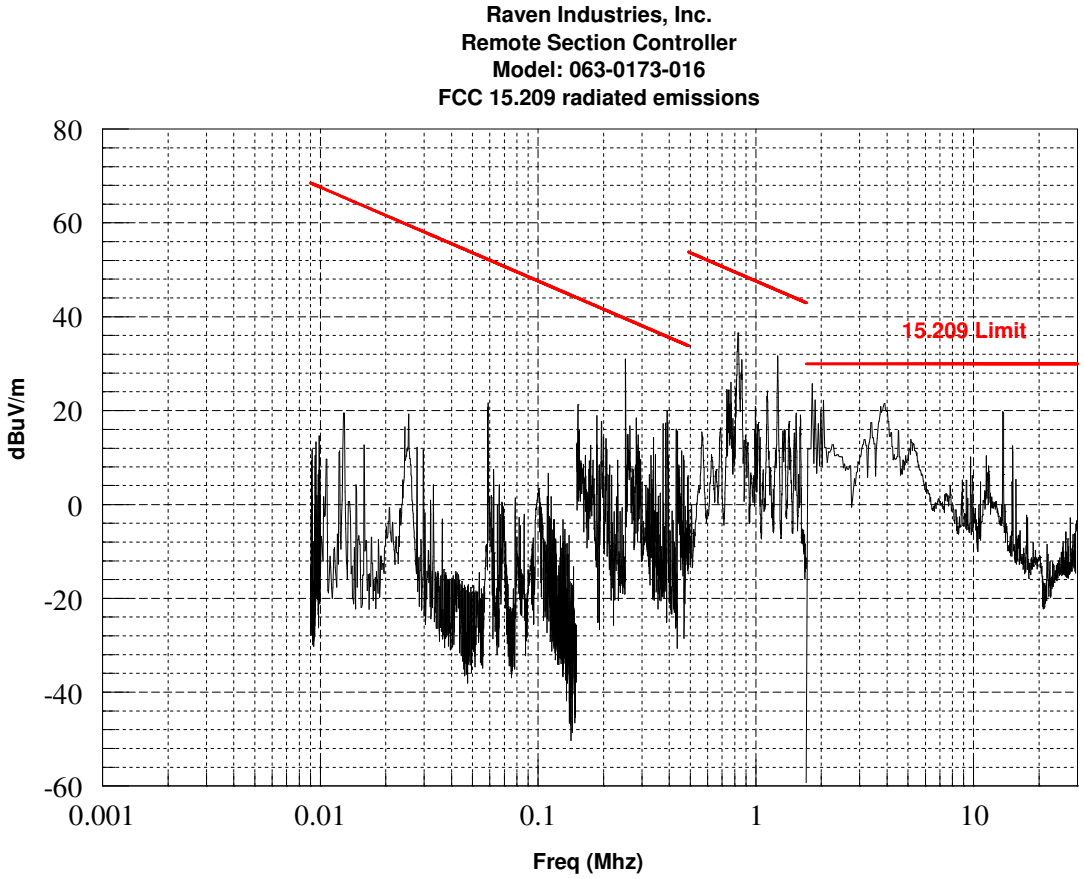
International Certification Services, Inc.

August 26, 2008

International Certification Services, Inc.

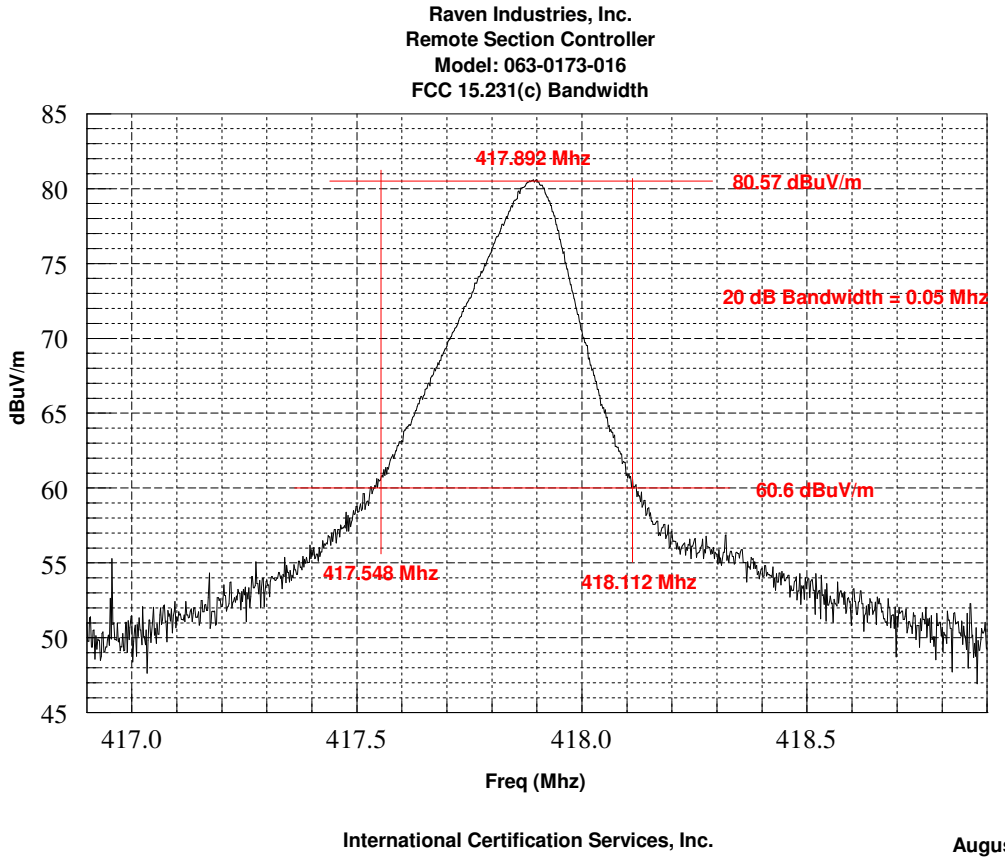


15.231 (b)(3) The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in Section 15.209, whichever limit permits a higher field strength.



NOTE: No signals from the EUT were observed above 30 Mhz

15.231 © The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 Mhz and below 900 Mhz. For devices operating above 900 Mhz, the emissions shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.



15.231 (d) For devices operating within the frequency band 40.66 to 40.70 Mhz, the bandwidth of the emission shall be confined within the band edges and the frequency tolerance of the carrier shall be +/- 0.01%. This frequency tolerance shall be maintained for 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.

Not Applicable

15.231 (e) Intentional Radiators may operate at a periodic rate exceeding that specified in paragraph (a) and may be employed for any type of operation, including operation prohibited in paragraph (a), provided the intentional radiator complies with the provision of paragraphs (b) through (d) of this Section, except the field strength table in paragraph (b) is replaced by the following:

Not Applicable

ATTACHMENT C

PRODUCT DATA SHEET OR PRODUCT INFORMATION FORM AS SUPPLIED BY THE CUSTOMER

COMPANY NAME: Raven Industries, Inc.

CUSTOMER REPRESENTATIVE: International Certification Services, Inc.

EQUIPMENT DESCRIPTION: Wireless Section Control Handheld Remote Control

MODEL NUMBER: 063-0173-016

SERIAL NUMBER: 105/103

TYPE OF TEST:
_____Development
_____Initial Design Verification
_____Design Change (Please describe exact changes below)
____**X**____Production Sample (Audit Test)
Changes made: NONE

OSCILLATOR FREQUENCIES:

7.37 Mhz

PRODUCT SHIELDING PROVISION:

Plastic enclosure

SOFTWARE AND / OR OPERATING MODES:

Software # 077-0171-254 Version 1.00.00

I/O CABLES: **NONE**