

COMPLIANCE WORLDWIDE INC. TEST REPORT 261-06

In Accordance with the Requirements of
Industry Canada RSS 210, Issue 6, Annex 1
Federal Communications Commission CFR Title 47 Part 15.231, Subpart C
Low Power License-Exempt Radio Communication Devices
Intentional Radiators

Issued to

**Lasershield Systems, Inc.
277 East Amador Road, Suite 304
Las Cruces, NM 88001**

for

Wireless Detection Unit

**FCC ID: RIHW0013300
IC: 4740A-W0013300**

Report Issued on September 15, 2006

Prepared by


Suzanne M. Hayden

Reviewed By


Larry K. Stillings

This test report shall not be reproduced, except in full, without written permission from Compliance Worldwide, Inc.

Table of Contents

1 Scope	3
2 Product Details	3
3 Product Configuration	3
4 Measurements Parameters	4
5 Measurement Summary	5
6 Measurement Data	6
7. Conducted Emissions Test Setup	12
8. Conducted Emissions Test Results	13
9. Test Site Description	15

1. Scope

This test report certifies that the Lasershield Systems, Inc. Keychain Remote, as tested, meets the RSS 210 Annex 1 Rules and FCC Part 15.231, Subpart C requirements. The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required

2. Product Details

- 2.1. Manufacturer:** Lasershield Systems, Inc.
- 2.2. Model Number:** WDU-0013301
- 2.3. Serial Number:** 102703
- 2.4. Description:** The Wireless Detection Units communicate with the Master Alarm Unit via wireless radio signals
- 2.5. Power Source:** 10 volts DC, 500 mA from wall transformer
- 2.6. EMC Modifications:** None

3. Product Configuration

3.1. Cables

Cable Type	Length	Shield	From	To
Power				

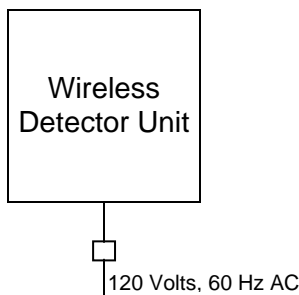
3.2. Support Equipment

Device	Manufacturer	Model	Serial No.	Comment
N/A				

3.3. Operational Characteristics

For the sake of performing the measurements, the manufacturer has configured the DU to remain in transmit mode by pressing the red alarm button on top of the unit.

3.4. Block Diagram



4 Measurements Parameters

4.1 Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Last Cal	Cal Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	1/5/2005	1/5/2007
Spectrum Analyzer	Hewlett Packard	8593E	3829A03887	3/13/2006	3/13/2007
Microwave Preamp	Hewlett Packard	8449B	3008A01323	09/22/2006	09/22/2008
Biconilog Antenna	Com-Power	AC220	25509	1/31/2006	1/31/2007
Horn Antenna	Electro-Metrics	EM-6961	6337	8/25/2006	8/25/2008

4.2 Measurement & Equipment Setup

Test Date:	9/13/2006
Test Engineer:	Robert J. McCall
Normal Site Temperature (15 - 35°C):	21.7
Extreme Test Temperatures (°C):	0 and +35
Relative Humidity (20 -75%RH):	29
Frequency Range:	418 MHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	Depends on measurement
EMI Receiver Avg Bandwidth:	Depends on measurement
Detector Function:	Depends on measurement

4.3 Test Procedure

Test measurements were made in accordance FCC Part 15.231: Operation within the bands 40.66 – 40.70 MHz and above 70 MHz.

The test methods used to generate the data in this test report is in accordance with ANSI C63.4: 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

5 Measurement Summary

Test Requirement	FCC Rule Requirement	Test Report Section	Result	Comment
Antenna Requirement	15.203	N.A	Compliant	Unit has an internal antenna.
Radiated Field Strength of Fundamental	15.231 (b)	6.1	Compliant	
Radiated Field Strength of Harmonics	15.231 (a)	6.2	Compliant	
Occupied Bandwidth		6.3	Compliant	
Band Width Measurements		6.4	Compliant	
Spurious Radiated Emissions	15.231 (b), 15.209	6.5	Compliant	
Determination of Average Factor		6.7	Compliant	
Conducted Emissions	15.207	N.A	Compliant	Unit is battery operated

6 Measurement Data

6.1 Radiated Field Strength of Fundamental (15.231, Section (b))

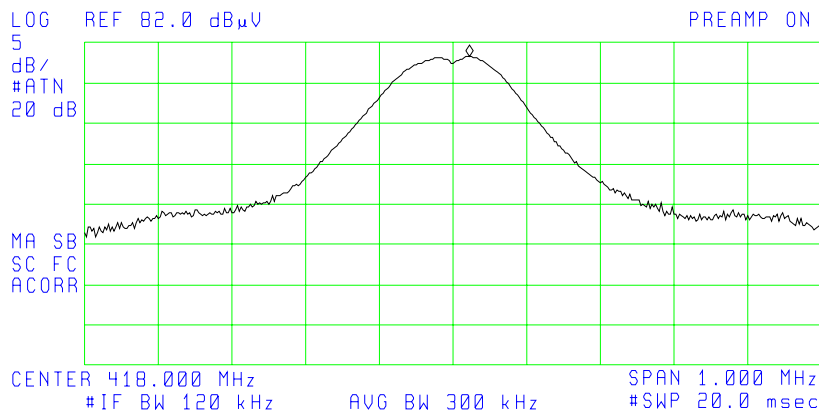
Requirement: The 3 meter field strength of the fundamental emissions from intentional radiators operated within the 418.0 MHz frequency bands shall comply with the following requirement: 4,133 microvolts/meter (72.33 dB μ V/m), average or quasi-peak mode measurement.

6.1.1 Radiated Field Strength of Fundamental

Frequency (MHz)	Amplitude (dB μ V/m)		Q-Peak Limit	Margin (dB)	Ant Pol	Ant Ht	TT Pos	Result
	Peak	Q-Peak						
418.0	89.53	69.53	72.33	-2.80	V	100	180	Passed

16:48:55 DEC 15, 2006
LaserShield Wireless Detection Unit Field Strength

FREQ 418.0 MHz
PEAK 80.5 dB μ V
QP NOT SELECTED
AVG 76.3 dB μ V



6 Measurement Data (continued)

6.2 Radiated Field Strength of Harmonics (15.231, Section (a))

Requirement: The 3 meter field strength of the harmonic emissions from intentional radiators operated within the 418.0 MHz frequency bands shall comply with the following: 500 microvolts/meter (54 dB μ V/m), average mode measurement. Peak field strength may not be greater than 20 dB above the average limit (74 dB μ V/m).

At frequencies equal to or less than 1000 MHz, emissions measurements were made using a receiver that employs a CISPR quasi-peak detector. Above 1000 MHz, measurements were made using a receiver that employs an average detector.

6.2.1 Channel (418.0 MHz)

Frequency (MHz)	Amplitude (dB μ V)		Corr. Fact. (dB)	Amplitude (dB μ V/m)		Quasi-Pk Limit	Margin (dB)	Ant Pol	Ant Ht	TT Pos	Result
	Peak	QP		Peak	QP			H/V	cm	Deg	
836.0	24.7	16.0	25.9	50.6	41.9	72.33	-28.73	V	103	60	Passed

Frequency (MHz)	Amplitude (dB μ V)		Corr. Fact. (dB)	Amplitude (dB μ V/m)		Average Limit	Margin (dB)	Ant Pol	Ant Ht	TT Pos	Result
	Peak	Avg		Peak	Avg			H/V	cm	Deg	
1254.0	16.23	-7.93	25.9	42.1	22.1	54.00	-31.9	V	147	84	Passed
1672.0	12.07	-6.53	29.2	41.3	21.3	54.00	-32.7	Noise Floor			Passed
2090.0	13.47	-1.89	31.3	44.8	24.8	54.00	-29.2	Noise Floor			Passed
2508.0	18.11	-7.93	29.9	48.0	28.0	54.00	-26.0	Noise Floor			Passed

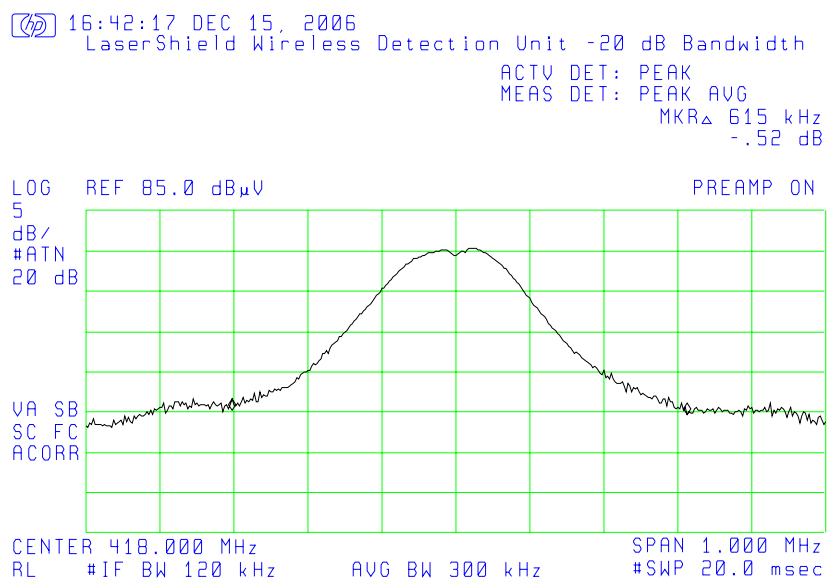
¹ Frequency falls within the Restricted Bands of Operation. See FCC Part 15, Section 15.205 for additional information.

6 Measurement Data (continued)

6.3 Occupied Bandwidth

6.3.1 Occupied Bandwidth

-20 dB Bandwidth = 635 kHz



6.5 Spurious Radiated Emissions, 30 MHz to 1 GHz (15.231, Section (b))

Requirement: 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.

6.5.1. Spurious Radiated Emissions, 30 MHz to 1 GHz Test Setup

6.5.1.1 Regulatory Limit: FCC Part 209, Quasi-Peak

Frequency Range (MHz)	Distance (Meters)	Limit (dB μ V/m)
30 to 88	3	40.0
88 to 216	3	43.5
216 to 960	3	46.0
960 to 1000	3	54.0

6.5.1.2 Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	1/5/2007
Biconilog Antenna	Com-Power	AC220	25509	1/31/2007

6.5.1.3. Measurement & Equipment Setup

Test Date:	09/13/2006
Test Engineer:	Robert J. McCall
Site Temperature (°C):	21.7
Relative Humidity (%RH):	29
Frequency Range:	30 MHz to 1 GHz
Measurement Distance:	10 Meters
EMI Receiver IF Bandwidth:	120 kHz
EMI Receiver Avg Bandwidth:	300 kHz
Detector Functions:	Peak and Quasi-Peak.
Antenna Height:	1 to 4 meters

6.5 Spurious Radiated Emissions, 30 MHz to 1 GHz (15.231, Section (b))

6.5.1. Spurious Radiated Emissions, 30 MHz to 1 GHz Test Setup (continued)

6.5.1.4. Test Procedure

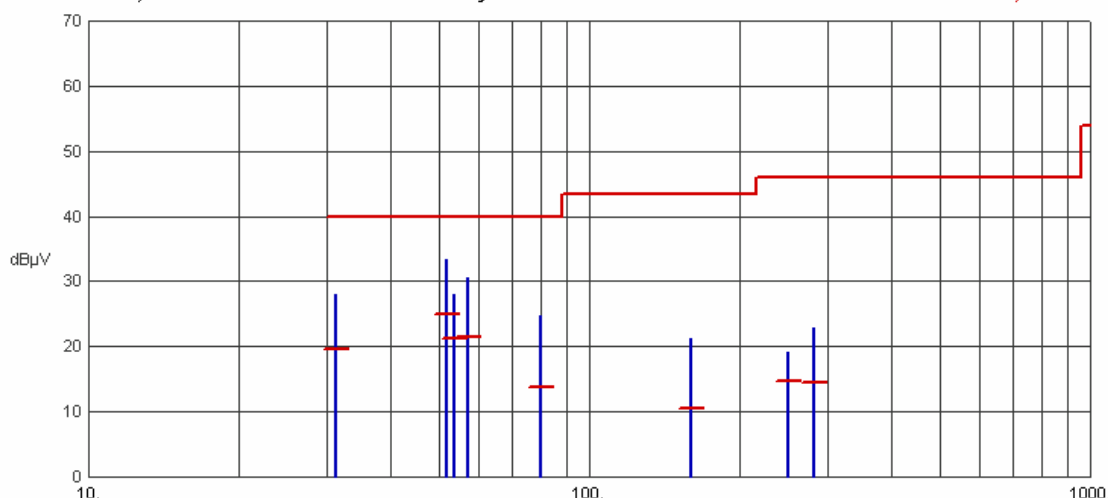
Test measurements were made in accordance with ANSI C63.4-2003, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

6.5 Spurious Radiated Emissions (30 MHz to 1 GHz) Test Results

6.5.2 Horizontal Polarity

Test No.: 261-06, Radiated Emissions - Horizontal Polarity

FCC, Class B



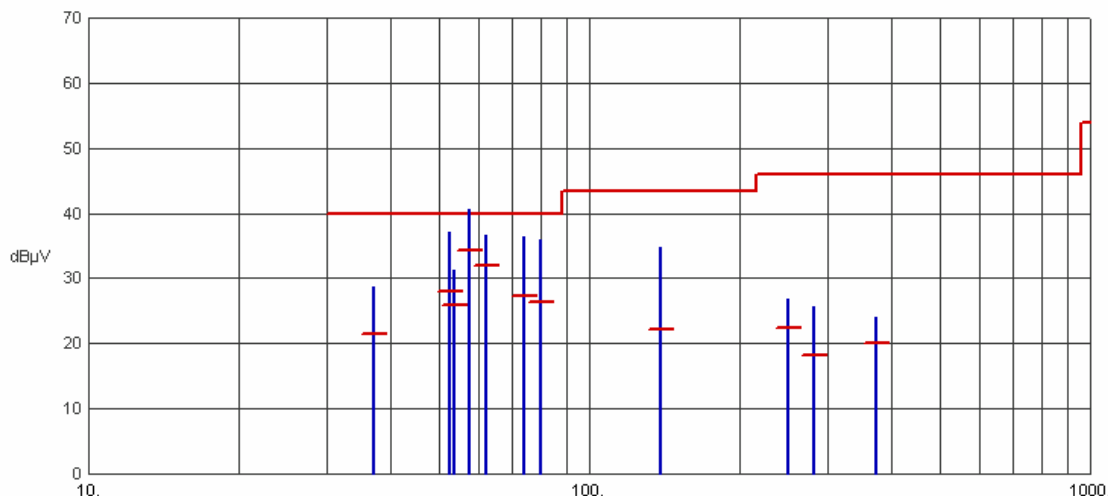
Frequency (MHz)	Pk Amp (dBμV/m)	QP Amp (dBμV/m)	QP Limit (dBμV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
31.0867	27.93	19.59	40.00	-20.41	N/A	N/A	
52.0643	33.36	24.98	40.00	-15.02	N/A	N/A	
53.8607	28.04	21.18	40.00	-18.82	N/A	N/A	
57.2472	30.65	21.52	40.00	-18.48	N/A	N/A	
80.0412	24.64	13.85	40.00	-26.15	N/A	N/A	
159.9392	21.25	10.47	43.50	-33.03	N/A	N/A	
250.0074	19.22	14.70	46.00	-31.30	N/A	N/A	
280.0050	22.88	14.50	46.00	-31.50	N/A	N/A	

6.5 Spurious Radiated Emissions (30 MHz to 1 GHz) Test Results (continued)

6.5.3 Vertical Polarity

Test No.: 261-06, Radiated Emissions - Vertical Polarity

FCC, Class B



Frequency (MHz)	Pk Amp (dBμV/m)	QP Amp (dBμV/m)	QP Limit (dBμV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
37.1576	28.76	21.43	40.00	-18.57	N/A	N/A	
52.7995	37.09	27.94	40.00	-12.06	N/A	N/A	
53.8585	31.17	25.97	40.00	-14.03	N/A	N/A	
57.7363	40.50	34.23	40.00	-5.77	N/A	N/A	
62.2377	36.67	31.93	40.00	-8.07	N/A	N/A	
74.0326	36.35	27.26	40.00	-12.74	N/A	N/A	
80.0147	35.95	26.29	40.00	-13.71	N/A	N/A	
139.2884	34.69	22.15	43.50	-21.35	N/A	N/A	
249.9973	26.81	22.49	46.00	-23.51	N/A	N/A	
280.0159	25.72	18.11	46.00	-27.89	N/A	N/A	
375.0031	24.06	19.97	46.00	-26.03	N/A	N/A	

6.6 Spurious Radiated Emissions (> 1 GHz) Test Results

There were no spurious emissions above 1 GHz other than the harmonics previously reported.

7. Conducted Emissions Test Setup

7.1. Regulatory Limit: 15.207

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-Peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5.0	56	46
5.0 to 30.0	60	50

* Decreases with the logarithm of the frequency.

7.2. Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Last Cal	Cal Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	1/5/2005	1/5/2007
LISN	EMCO	3825/2	9109-1860	12/15/2004	12/15/2006

7.3. Measurement & Equipment Setup

Test Date: 09/13/2006
 Test Engineer: Robert J. McCall
 Site Temperature (°C): 21.7
 Relative Humidity (%RH): 29
 Frequency Range: 0.15 MHz to 30 MHz
 EMI Receiver IF Bandwidth: 9 kHz
 EMI Receiver Avg Bandwidth: 30 kHz
 Detector Functions: Peak, Quasi-Peak. & Average

7.4. Test Procedure

Test measurements were made in accordance with ANSI C63.4-2003, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

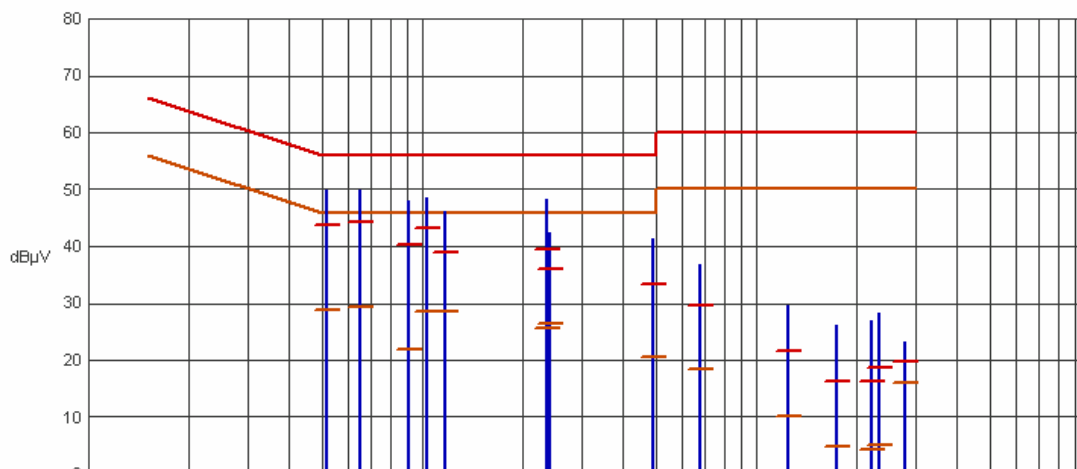
8. Conducted Emissions Test Results

8.1. 120 Volts, 60 Hz Phase

8.1. 120 Volts, 60 Hz Phase

Test No.: 261-06, 120 Volts, 60 Hz Phase

FCC, Class B >1 GHz



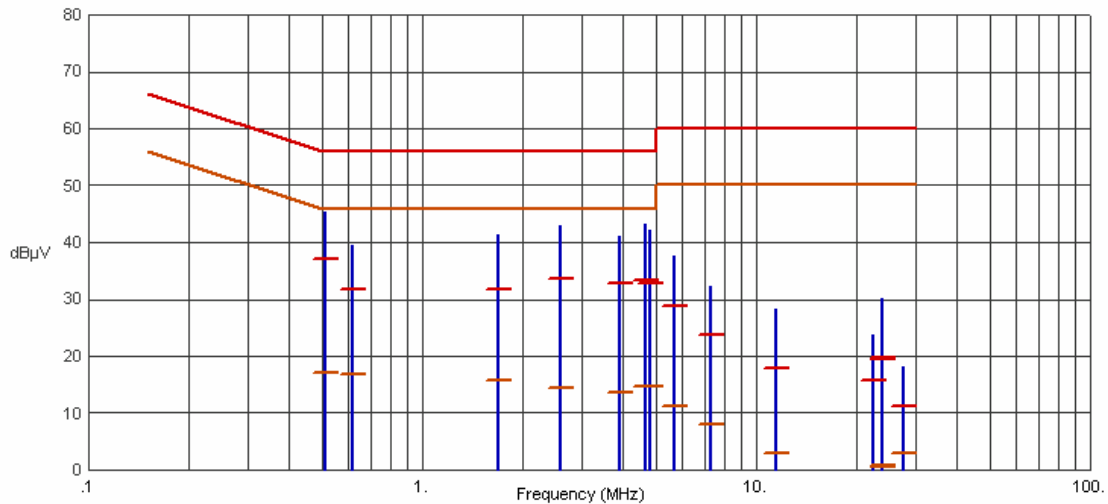
Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
.5178	49.94	43.78	56.00	-12.22	28.72	46.00	-17.28	
.6507	49.89	44.37	56.00	-11.63	29.39	46.00	-16.61	
.9061	47.99	40.36	56.00	-15.64	21.95	46.00	-24.05	
1.0360	48.50	43.26	56.00	-12.74	28.48	46.00	-17.52	
1.1677	46.18	38.91	56.00	-17.09	28.41	46.00	-17.59	
2.3475	48.15	39.58	56.00	-16.42	25.51	46.00	-20.49	
2.4214	42.49	36.07	56.00	-19.93	26.53	46.00	-19.47	
4.9262	41.22	33.23	56.00	-22.77	20.63	46.00	-25.37	
6.7580	36.90	29.56	60.00	-30.44	18.44	50.00	-31.56	
12.4694	29.49	21.67	60.00	-38.33	10.10	50.00	-39.90	
17.4566	26.24	16.14	60.00	-43.86	4.84	50.00	-45.16	
22.1286	26.81	16.22	60.00	-43.78	4.21	50.00	-45.79	
23.4500	28.29	18.65	60.00	-41.35	5.01	50.00	-44.99	
28.0013	23.16	19.81	60.00	-40.19	16.00	50.00	-34.00	

8. Conducted Emissions Test Results (continued)

8.2. 120 Volts, 60 Hz Neutral

Test No.: 261-06, 120 Volts, 60 Hz Neutral

FCC, Class B >1 GHz



Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
.5127	45.20	37.11	56.00	-18.89	17.12	46.00	-28.88	
.6195	39.54	31.82	56.00	-24.18	16.79	46.00	-29.21	
1.6903	41.42	31.66	56.00	-24.34	15.73	46.00	-30.27	
2.6045	43.06	33.60	56.00	-22.40	14.29	46.00	-31.71	
3.9012	41.03	32.83	56.00	-23.17	13.48	46.00	-32.52	
4.6697	43.16	33.35	56.00	-22.65	14.61	46.00	-31.39	
4.7991	42.06	32.77	56.00	-23.23	14.54	46.00	-31.46	
5.6953	37.71	28.88	60.00	-31.12	11.16	50.00	-38.84	
7.2806	32.33	23.69	60.00	-36.31	8.01	50.00	-41.99	
11.3991	28.26	17.77	60.00	-42.23	2.90	50.00	-47.10	
22.2771	23.82	15.65	60.00	-44.35	-2.20	50.00	-52.20	
23.8472	30.04	19.76	60.00	-40.24	0.73	50.00	-49.27	
23.9479	29.84	19.45	60.00	-40.55	0.57	50.00	-49.43	
27.6874	18.21	11.25	60.00	-48.75	2.88	50.00	-47.12	

9. Test Site Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with Federal Communications Commission (FCC) and Industry Canada standards. A description of the test sites is on file with the FCC (registration number **96392**) and Industry Canada (file number **IC 3023A-1**).

The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane required by EN 55022.

Both sites are designed to test products or systems 1.5 meters W x 1.5 meters L x 2.0 meters H, floor standing or table top.