UNISYS

PCTC
Product Compliance Test Center
2476 Swedesford Road, Malvern, PA 19355

ELECTROMAGNETIC INTERFERENCE TEST REPORT

Doc. 20040415R / Project No. 1054

TEST STANDARD: USA 47 CFR PART 15

Generation4 Outdoor Radio Remote Control
FCC ID: RXR0362018010

SCHULMERICH CARILLONS, INC.
SELLERSVILLE, PA

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PREFACE

This report documents product testing conducted to verify compliance of the specified EUT with applicable standards and requirements as identified herein. EUT, test instrument configurations, test procedures and recorded data are generally described in this report. The reader is referred to the applicable test standards for detailed procedures. The following table summarizes the test results obtained during this evaluation.

SUMMARY

The Schulmerich Carillons Generation4 Outdoor Radio Remote Control (FCC ID: RXR0362018010) was tested to the standards listed below, and found to have the following characteristics:

TEST	STANDARD	REQUIREMENT	RESULT
Radiated Emissions - Intentional Radiation	FCC Part 15C, Section 15.249 (Operating Band: 902 –928 MHz)	900 MHz – 10 GHz	Below Max. Permissible limit
Radiated Emissions - Unintentional Radiation	FCC Part 15B, Class B	30 MHz – 5.00 GHz	Below Max. Permissible limit

EUT Modifications

The following modification was required for the Generation4 Outdoor Radio Remote Control hardware to meet the EMI requirements:

Installed a 20.5-ohm series resistor to the transmitting antenna input.

MEASUREMENT UNCERTAINTY				
Measurement Type	Measurement Dist	Frequency Range	Measurement Limit	Expanded Combined Uncertainty
Radio Disturbance	10 meters	30 MHz to 1 GHz	Class A	4.3 dB
Radio Disturbance	10 meters	30 MHz to 1 GHz	Class B	5.0 dB
Radio Disturbance	3 meters	30 MHz to 1 GHz	Class B	4.3 dB
Conducted Disturbance	N/A	150 kHz to 30 MHz	Class A or B	3.6 dB

As all values of uncertainty are less than the CISPR 16-4:2002 recommendations, no adjustments to measured data presented in this report are required.

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1.0 Description of The Equipment Under Test (EUT)

Equipment Identification	Generation4 Outdoor Radio Remote Control
Part Number	036-2018-010
ID Number	TP1
Manufacturer	Schulmerich Carillons, Inc. PO Box 903 1 Carillon Hill Sellersville, PA 18960-0903
Technical Contact	Chris Nadovich (JTA) Gregory L. Schwartz
Condition Received	Acceptable for Test
Date Received	4/15/04
Sample Type	Production Unit
Equipment Classification	Remote Control Transmitter
Unisys Test Personnel	Itamar Gonen Dipak Patel

Unless otherwise noted in the individual test results sections, testing was performed on the EUT configured as follows.

1.1 General Description

The Generation4 Outdoor Radio Remote Control is a battery operated, handheld remote control unit. It is used primarily to control operation of the Schulmerich electronic carillon from a remote location. This transmitter transmits control signals to a receiving unit which communicates with the carillon equipment via. fiber optic cable. The Generation4 has a permanently attached antenna.

The following is the list of Generation4 Outdoor Radio Remote Control transmitting frequencies:

903.37 MHz,
906.37 MHz
907.87 MHz
909.37 MHz
912.37 MHz
915.37 MHz
919.87 MHz
921.37 MHz

Photo 1 – Generation4 Outdoor Radio Remote Control – Front View

Photo 2 –Generation4 Outdoor Radio Remote Control – Rear View

1.2 Test Configurations

Testing was carried out on a single EUT configuration. The EUT was placed on a wooden table of 80 cm height. The testing was performed with mounting the EUT in the three different positions as identified below:

1. Vertical Straight Up
2. On Left Side
3. Flat on Back

Detailed EUT Hardware Listing

The Generation4 has a permanently attached antenna. It incorporates the following printed circuit board assembly:

Description	Manufacturer	Manufacturer's Model Number/Part Number
Transmitter PCB	Schulmerich Carillons	036-1717-000

Test Support Items

The following device was used to verify the EUT operation.

Description	Manufacturer	Part Number	Serial Number
Receiver	Schulmerich Carillons	036-2017-010	None

1.3 Rationale for The Chosen Configuration

The tested configuration represents deliverable hardware.

1.4 EUT Modifications

The following modifications were required for the Generation4 Outdoor Radio Remote Control hardware to meet the EMI requirements:

Installed a 20.5-ohm series resistor to the transmitting antenna input.

2.0 Operation of The EUT During Testing

Unless otherwise noted in the individual test results sections, testing was performed on the EUT as follows.

2.1 General

Climatic Environment

The following were the ambient conditions in the laboratory during testing:
Temperature: 22^{o} C ± 5^{o} C
Relative Humidity 50% ± 10% RH

DC Power

The Generation4 Outdoor Radio Remote Control is a battery-operated device. Testing was performed using a 9 VDC new battery.

2.2 Operating Mode

During intentional radiated emissions testing the Generation4 Outdoor Radio Remote Control was operated for continuous transmission at the following three selected transmitting frequencies:

903.37 MHz (Low)

909.37 MHz (Medium)

921.37 MHz (High)

Unintentional radiated emission testing on the Generation4 Outdoor Radio Remote Control was performed using two modes of operation: (i) Continuous transmission at 909.37 MHz, and (ii) Power ON - Standby mode.

2.3 Rationale for The Chosen Mode of Operation

The selected operating modes of the Generation4 Outdoor Radio Remote Control represent actual EUT operation of standby and RF transmission therefore constitute appropriate test modes. The selected test configuration duplicates the use of the Generation4 Outdoor Radio Remote Control by customers that may cause emissions.

3.0 Applicable Requirements, Methods and Procedures

3.1 Applicable Requirements

The results of the measurement of the radio disturbance characteristics of the EUT described herein may be applied and, where appropriate, provide a presumption of compliance to one or more of the following requirements or to other requirement at the discretion of the client, regulatory agencies, or other entities.

USA

47 CFR, Part 15, Radio Frequency Devices,
- Subpart B, "Unintentional Radiators".
- Subpart C, "Intentional Radiators".

3.2 Basic Test Methods and Procedures

The applicable regulatory product family or generic standards require that radio disturbance/interference tests be performed in accordance with the following:

- C63.4, 2001 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in The Range of 9 kHz to 40 GHz".

3.4 Deviations Or Exclusions From The Requirements And Standards

There were no deviations or exclusions from the requirements and standards.

4.0 Test Results

4.1 Radiated Emissions

4.1.1 Test Facility

The test site is an all weather, open field measurement facility defined by an elliptical area of 3258 square meters, which is free of reflective metallic objects and extraneous electromagnetic signals. A non-metallic A-Frame enclosure covers 172 square meters of the ellipse. This enclosure contains a ground level 5-meter diameter turntable, capable of rotating equipment through a complete 360 degrees, and a 3-meter and 10-meter test range with a remotely controlled antenna mast. The floor of the A-Frame and surface of the turntable are covered with a flat metal continuous ground plane. The ground plane extends outside the A-Frame to a distance of 35.6 meters from the center of the turntable. The width of the extension is 2.4 meters.

The ground plane, under the A-Frame enclosure, is covered with protective insulating material. A cellar located beneath the ground level of the A-Frame structure houses personnel and instrumentation for remote control of the antenna mast, the turntable, and other equipment above ground level. The test site complies with the Attenuation Measurements specified in ANSI C63.4 - 2001, and is registered with FCC, VCCI, BSMI, NEMKO and EZU.

For electric field radiated emissions, the EUT and support peripherals or devices required to facilitate EUT operation were positioned either directly on the turntable surface (floor standing equipment) or on a wooden table 80 cm. in height (tabletop equipment), depending on the size and status of the sample. Hardware not needed in the test field such as remote terminals or non-standard exercisers were placed in the basement below the turntable.

4.1.2 Radiated Emissions Test Procedure

Radiated Emissions 30 MHz – 1000 MHz

Initial measurements, for the purpose of identifying suspect emissions from the equipment under test, were performed by dividing the test frequency range into the following twenty bands:

Band	Frequency Range	Band	Frequency Range	Band	Frequency Range
1)	30 - 40 MHz	8)	108 - 148 MHz	15)	570 - 670 MHz
2)	40 - 50 MHz	9)	148 - 165 MHz	16)	670 - 770 MHz
3)	50 - 88 MHz	10)	165 - 200 MHz	17)	770 - 855 MHz
4)	88 - 93 MHz	11)	200 - 300 MHz	18)	855 - 875 MHz
5)	93 - 98 MHz	12)	300 - 450 MHz	19)	875 - 892 MHz
6)	98 - 103 MHz	13)	450 - 470 MHz	20)	892 - 1000 MHz
7)	103 - 108 MHz	14)	470 - 570 MHz		

Each of these bands was monitored on a spectrum analyzer display while the turntable was initially positioned at the reference 0 degree point. A mast mounted broadband antenna was located at a distance of 10 meters from the periphery of the EUT(s). The antenna was set to a height of 1 meter, for the vertical polarity and a height of 2.5 meters, for horizontal polarity for these suspect emission scans. All emissions with amplitudes 8 dB or less below the appropriate regulatory limit were identified and saved for later source identification and investigation. This initial suspect identification procedure was repeated for turntable positions of 90, 180 and 270 degrees.

The source of questionable emissions was verified by powering off the EUT(s). Those emissions remaining were removed from the suspect list. Valid suspect emissions were then maximized through cable manipulation. The highest six signals or all within 4 dB of the limit, identified during this initial investigation, were then maximized by rotating the turntable through a complete 360 degrees of azimuth and then raising the antenna from 1 to 4 meters of elevation with the turntable positioned at the angle of maximum signal level. When the EUT(s) azimuth, antenna height and polarization that produced the maximum indication were found, the emission amplitude and frequency were remeasured to obtain maximum peak and quasi-peak field strength. The frequencies and amplitudes of RFI emissions are recorded in this report in units derived as follows:

Field Strength (dBuV/m) = meter reading (dBuV) + antenna factor (dB/m)+ Cable Loss (dB)

Radiated Emissions above 1 GHz

The required test frequency range above 1 GHz, was scanned manually by placing a Double Ridged Guide antenna at a distance of 3 meters from the perimeter of the equipment under test. Emissions were monitored using EMI Test Receiver ESIB 40 set for a 1 MHz bandwidth with rotating the turntable through a complete 360 degrees of azimuth. Both horizontal and vertical antenna polarities were investigated for suspect emissions. The support equipment and test item(s) were powered off in turn to determine the source of the emissions. The test procedure described above for 30 –1000 MHz was observed to maximize the emissions. The measurements were made with both peak and average detectors. The field strengths were recorded as follows:

Field Strength (dBuV/m) = Meter reading (dBuV) + Correction Factor*

* Correction Factor includes Antenna Factor (dB/m) + Cable Loss (dB) – Amplifier Gain (dB)

4.1.3 Radiated Emissions Test Results (4/15/04-4/21/04)

4.1.3.1 Radiated Emissions - Intentional Radiator

Fundamental Frequency Emissions

Low Transmitting Frequency, EUT Position: Straight Up

Freq	Q-Pk	Pol	Angle	Ht	CF	Limit	Delta
[MHz]	[dBµV/m]		[deg]	[cm]	[dB]	[dBµV/m]	[dB]
903.32	78.25	H	289	1	26.98	94	-15.75
903.32	89.87	V	187	1	26.98	94	-4.13

Low Transmitting Frequency, EUT Position: On Left Side

Freq	Q-Pk	Pol	Angle	Ht	CF	Limit	Delta
[MHz]	[dBµV/m]		[deg]	[cm]	[dB]	[dBµV/m]	[dB]
903.32	88	H	230	1	26.98	94	-6
903.32	78.05	V	233	1.41	26.98	94	-15.95

Low Transmitting Frequency, EUT Position: Flat on Back

Freq	Q-Pk	Pol	Angle	Ht	CF	Limit	Delta
[MHz]	[dBµV/m]		[deg]	[cm]	[dB]	[dBµV/m]	[dB]
903.32	90.53	H	237	1	26.98	94	-3.47
903.32	85.47	V	215	1.28	26.98	94	-8.53

Medium Transmitting Frequency, EUT Position: Straight Up

Freq	Q-Pk	Pol	Angle	Ht	CF	Limit	Delta
[MHz]	[dBµV/m]		[deg]	[cm]	[dB]	[dBµV/m]	[dB]
909.32851	75.73	H	239	1	27.13	94	-18.27
909.32851	89.23	V	227	1	27.13	94	-4.77

Medium Transmitting Frequency, EUT Position: On Left Side

Freq	Q-Pk	Pol	Angle	Ht	CF	Limit	Delta
[MHz]	[dBµV/m]		[deg]	[cm]	[dB]	[dBµV/m]	[dB]
909.32851	88.86	H	227	1	27.13	94	-5.14
909.32851	79.76	V	235	1	27.13	94	-14.24

Medium Transmitting Frequency, EUT Position: Flat on Back

Freq	Q-Pk	Pol	Angle	Ht	CF	Limit	Delta
[MHz]	[dBµV/m]		[deg]	[cm]	[dB]	[dBµV/m]	[dB]
909.32851	90.73	H	235	1	27.13	94	-3.27
909.32851	83.85	V	215	124	27.13	94	-10.15

High Transmitting Frequency, EUT Position: Straight Up

Freq	Q-Pk	Pol	Angle	Ht	CF	Limit	Delta
[MHz]	[dBµV/m]		[deg]	[cm]	[dB]	[dBµV/m]	[dB]
921.319	76.87	Horiz	101	1.1	27.41	94	-17.13
921.319	90.54	Vert	224	1	27.41	94	-3.46

High Transmitting Frequency, EUT Position: On Left Side

Freq	Q-Pk	Pol	Angle	Ht	CF	Limit	Delta
[MHz]	[dBµV/m]		[deg]	[cm]	[dB]	[dBµV/m]	[dB]
921.319	89.05	Horiz	226	1	27.41	94	-4.95
921.319	80.58	Vert	235	2.42	27.41	94	-13.42

High Transmitting Frequency, EUT Position: Flat on Back

Freq	Q-Pk	Pol	Angle	Ht	CF	Limit	Delta
[MHz]	[dBµV/m]		[deg]	[cm]	[dB]	[dBµV/m]	[dB]
921.319	91.71	Horiz	237	1	27.41	94	-2.29
921.319	82.14	Vert	149	220	27.41	94	-11.86

Overall Results: All fundamental radiated emissions, as recorded for all the three selected transmitting frequencies, at a distance of 3 meters from the Generation4 Outdoor Radio Remote Control, are below the 3 meter limit specified by FCC Part 15, Section 15.249.

Harmonics of Fundamental Frequency Emissions (Upto 10 GHz)

Average Detector Measurements

Low Transmitting Frequency, EUT Position: Straight Up

Freq [MHz]	Avg [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1806.64	44.37	H	338	136	-2.12	54	-9.63
1806.64	53.14	V	197	114	-2.12	54	-0.86
2709.96	30.03	H	325	207	14.13	54	-23.97
2709.96	33.87	V	1	132	14.13	54	-20.13
3613.28	44.82	V	335	110	12.45	54	-9.18
4516.6	37.02	V	334	100	12.51	54	-16.98
4516.6	41.67	H	149	131	12.51	54	-12.33

Low Transmitting Frequency, EUT Position: On Left Side

Freq [MHz]	Avg [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1806.64	52.43	H	183	136	-2.12	54	-1.57
1806.64	47.44	V	180	100	-2.12	54	-6.56
2709.96	30.31	V	187	107	14.13	54	-23.69
2709.96	33.69	H	70	154	14.13	54	-20.31
3613.28	42.78	H	47	117	12.45	54	-11.22
4516.6	37.68	H	339	114	12.51	54	-16.32

Low Transmitting Frequency, EUT Position: Flat on Back

Freq [MHz]	Avg [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1806.64	46.08	V	118	100	-2.12	54	-7.92
1806.64	49.11	H	100	100	-2.12	54	-4.89
2709.96	36.95	V	353	146	14.13	54	-17.05
2709.96	29.76	H	139	101	14.13	54	-24.24
3613.28	44.98	V	30	100	12.45	54	-9.02
4516.6	34.64	H	350	214	12.51	54	-19.36

Medium Transmitting Frequency, EUT Position: Straight Up

Freq [MHz]	Avg [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1818.657	51.92	V	196	111	-2	54	-2.08
1818.657	46.27	H	314	132	-2	54	-7.73
2727.986	29.65	H	354	175	14.24	54	-24.35
2727.986	34.26	V	13	106	14.24	54	-19.74
3637.314	46	V	339	111	12.54	54	-8
4546.643	38.87	V	337	109	12.7	54	-15.13

Medium Transmitting Frequency, EUT Position: On Left Side

Freq [MHz]	Avg [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1818.657	51.33	H	180	132	-2	54	-2.67
1818.657	46.92	V	186	126	-2	54	-7.08
2727.986	36.48	H	79	180	14.24	54	-17.52
2727.986	34.26	V	13	106	14.24	54	-19.74
3637.314	43.27	H	118	160	12.54	54	-10.73
3637.314	42.89	V	349	100	12.54	54	-11.11
4546.643	41.04	H	339	127	12.7	54	-12.96

Medium Transmitting Frequency, EUT Position: Flat on Back

Freq [MHz]	Avg [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1818.657	47.76	H	99	127	-2	54	-6.24
1818.657	45.22	V	174	103	-2	54	-8.78
2727.986	30.42	H	65	121	14.24	54	-23.58
2727.986	37.37	V	342	100	14.24	54	-16.63
3637.314	36.69	H	31	219	12.54	54	-17.31
3637.314	44.08	V	29	100	12.54	54	-9.92
4546.643	34.17	H	255	100	12.7	54	-19.83

High Transmitting Frequency, EUT Position: Straight Up

Freq	Avg	Pol	Angle	Ht	CF	Limit	Delta
[MHz]	[dBuV/m]		[deg]	[cm]	[dB]	[dBuV/m]	[dB]
1842.638	47.54	H	315	100	-1.77	54	-6.46
1842.638	53.24	V	195	114	-1.77	54	-0.76
2763.957	37.26	V	199	105	14.44	54	-16.74
2763.957	35.48	H	36	126	14.44	54	-18.52
3685.276	46.58	V	329	107	12.7	54	-7.42
4606.595	37.67	V	207	104	13.07	54	-16.33

High Transmitting Frequency, EUT Position: On Left Side

Freq	Avg	Pol	Angle	Ht	CF	Limit	Delta
[MHz]	[dBuV/m]		[deg]	[cm]	[dB]	[dBuV/m]	[dB]
1842.638	49.07	V	191	125	-1.77	54	-4.93
1842.638	52.25	H	178	188	-1.77	54	-1.75
2763.957	39.09	H	58	123	14.44	54	-14.91
2763.957	35.78	V	177	102	14.44	54	-18.22
3685.276	41.31	H	35	260	12.7	54	-12.69
3685.276	43.96	V	352	100	12.7	54	-10.04
4606.595	39.48	H	332	125	13.07	54	-14.52

High Transmitting Frequency, EUT Position: Flat on Back

Freq	Avg	Pol	Angle	Ht	CF	Limit	Delta
[MHz]	[dBuV/m]		[deg]	[cm]	[dB]	[dBuV/m]	[dB]
1842.638	48.95	V	314	111	-1.77	54	-5.05
1842.638	48.47	H	99	125	-1.77	54	-5.53
2763.957	41.12	V	339	143	14.44	54	-12.88
2763.957	31.99	H	55	113	14.44	54	-22.01
3685.276	44.72	V	31	100	12.7	54	-9.28
4606.595	35.32	H	359	100	13.07	54	-18.68

Harmonics of Fundamental Frequency Emissions – Peak Detector

Low Transmitting Frequency, EUT Position: Straight Up

Freq [MHz]	Pk [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1806.64	47.84	H	338	136	-2.12	74	-26.16
1806.64	55.46	V	197	114	-2.12	74	-18.54
2709.96	42.27	H	325	207	14.13	74	-31.73
2709.96	44.26	V	1	132	14.13	74	-29.74
3613.28	51.75	V	335	110	12.45	74	-22.25
4516.6	47.99	V	334	100	12.51	74	-26.01
4516.6	50.37	H	149	131	12.51	74	-23.63

Low Transmitting Frequency, EUT Position: On Left Side

Freq [MHz]	Pk [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1806.64	54.4	H	183	136	-2.12	74	-19.6
1806.64	51.2	V	180	100	-2.12	74	-22.8
2709.96	41.89	V	187	107	14.13	74	-32.11
2709.96	43.38	H	70	154	14.13	74	-30.62
3613.28	50.22	H	47	117	12.45	74	-23.78
4516.6	48.24	H	339	114	12.51	74	-25.76

Low Transmitting Frequency, EUT Position: Flat on Back

Freq [MHz]	Pk [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1806.64	49.25	V	118	100	-2.12	74	-24.75
1806.64	51.74	H	100	100	-2.12	74	-22.26
2709.96	45.04	V	353	146	14.13	74	-28.96
2709.96	43.51	H	139	101	14.13	74	-30.49
3613.28	51.62	V	30	100	12.45	74	-22.38
4516.6	47.58	H	350	214	12.51	74	-26.42

Medium Transmitting Frequency, EUT Position: Straight Up

Freq [MHz]	Pk [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1818.657	54	V	196	111	-2	74	-20
1818.657	48.97	H	314	132	-2	74	-25.03
2727.986	42.12	H	354	175	14.24	74	-31.88
2727.986	43.36	V	13	106	14.24	74	-30.64
3637.314	52.1	V	339	111	12.54	74	-21.9
4546.643	48.68	V	337	109	12.7	74	-25.32

Medium Transmitting Frequency, EUT Position: On Left Side

Freq [MHz]	Pk [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1818.657	53.21	H	180	132	-2	74	-20.79
1818.657	49.76	V	186	126	-2	74	-24.24
2727.986	44.49	H	79	180	14.24	74	-29.51
2727.986	43.36	V	13	106	14.24	74	-30.64
3637.314	50.71	H	118	160	12.54	74	-23.29
3637.314	50.32	V	349	100	12.54	74	-23.68
4546.643	49.68	H	339	127	12.7	74	-24.32

Medium Transmitting Frequency, EUT Position: Flat on Back

Freq [MHz]	Pk [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1818.657	50.31	H	99	127	-2	74	-23.69
1818.657	48.33	V	174	103	-2	74	-25.67
2727.986	42.12	H	65	121	14.24	74	-31.88
2727.986	45.01	V	342	100	14.24	74	-28.99
3637.314	47.3	H	31	219	12.54	74	-26.7
3637.314	50.84	V	29	100	12.54	74	-23.16
4546.643	46.82	H	255	100	12.7	74	-27.18

High Transmitting Frequency, EUT Position: Straight Up

Freq [MHz]	Pk [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1842.638	50.12	H	315	100	-1.77	74	-23.88
1842.638	54.87	V	195	114	-1.77	74	-19.13
2763.957	45.47	V	199	105	14.44	74	-28.53
2763.957	44.43	H	36	126	14.44	74	-29.57
3685.276	52.55	V	329	107	12.7	74	-21.45
4606.595	48.55	V	207	104	13.07	74	-25.45

High Transmitting Frequency, EUT Position: On Left Side

Freq [MHz]	Pk [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1842.638	51.26	V	191	125	-1.77	74	-22.74
1842.638	54.09	H	178	188	-1.77	74	-19.91
2763.957	45.85	H	58	123	14.44	74	-28.15
2763.957	44.06	V	177	102	14.44	74	-29.94
3685.276	50.51	H	35	260	12.7	74	-23.49
3685.276	51.28	V	352	100	12.7	74	-22.72
4606.595	48.8	H	332	125	13.07	74	-25.2

High Transmitting Frequency, EUT Position: Flat on Back

Freq [MHz]	Pk [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1842.638	51.12	V	314	111	-1.77	74	-22.88
1842.638	50.83	H	99	125	-1.77	74	-23.17
2763.957	46.86	V	339	143	14.44	74	-27.14
2763.957	43.19	H	55	113	14.44	74	-30.81
3685.276	51.53	V	31	100	12.7	74	-22.47
4606.595	47.47	H	359	100	13.07	74	-26.53

Overall Results: All the harmonic radiated emissions (Average and Peak), as recorded for all the three selected transmitting frequencies, at a distance of 3 meters from the Generation4 Outdoor Radio Remote Control, are below the applicable 3 meter limits specified by FCC Part 15C, Section 15.249.

4.1.3.2 Radiated Emissions - Unintentional Radiator

Testing was performed for EUT operating in (i) Continuously Transmit mode (ii) Power ON – Standby mode. No EUT signals found, so noise floor measurements were made as below:

30 MHz - 1000 MHz (Quasi-Peak Detector)

Freq [MHz]	Q-Pk [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
34.433	18.94	H	1	100	17.54	40	-21.06
76.41	12.5	H	1	100	8.33	40	-27.5
161.454	16.62	H	1	100	11.8	43.5	-26.88
263.12	12.99	H	1	100	15.11	46	-33.01
397.584	16.92	H	1	100	18.48	46	-29.08
534.836	21.36	H	1	100	21.55	46	-24.64
742.909	24.86	H	1	100	24.8	46	-21.14
915.617	28.85	H	1	100	27.28	46	-17.15

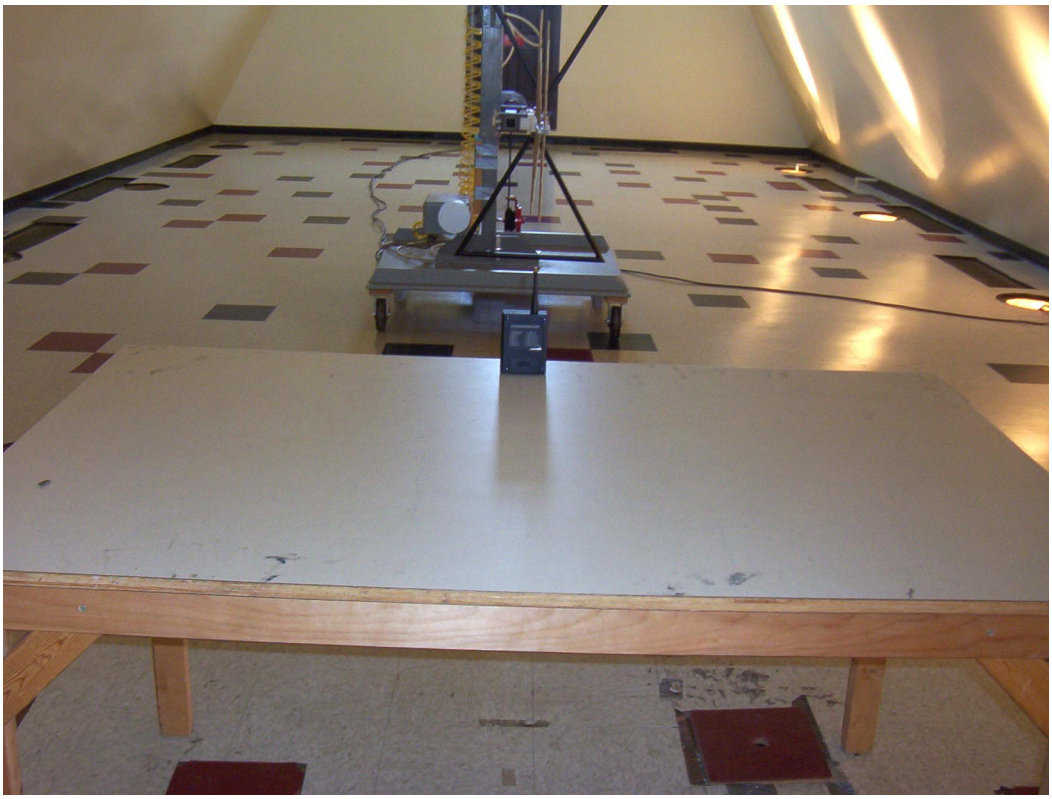
1GHz – 5GHz (Average Detector)

Freq [MHz]	Avg [dBuV/m]	Pol	Angle [deg]	Ht [cm]	CF [dB]	Limit [dBuV/m]	Delta [dB]
1300	20.2	H	1	100	-5.95	54	-33.8
1472.371	21.33	H	1	100	-5.34	54	-32.67
1700	22.62	H	1	100	-3.15	54	-31.38
2400	26.1	H	1	100	8.28	54	-27.9
2800	27.41	H	1	100	11.64	54	-26.59
3500	31.4	H	1	100	12.06	54	-22.6
4500	32.12	H	1	100	12.41	54	-21.88

Overall Results: No EUT signals found at a distance of 3 meters from the Generation4 Outdoor Radio Remote Control with respect to 3 meter limit specified by FCC Part 15B, Class B products.

Test Setup Photos

Radiated Emission Test Setup – Front View



Radiated Emission Test Setup – Rear View

Radiated Emission Test Setup – On Left Side

Radiated Emission Test Setup – Flat On Back

Appendix A – Test Equipment

Description	Freq Range (Hz)	Model Number	Manufacturer	ID / SN	Last Cal Date
EMI Test Receiver	20 Hz – 40 GHz	ESIB 40	Rohde & Schwarz	C-062	11/4/03
Antenna	25M - 2G	LPB-2520/A	ARA	B965	7/24/03
Controller, Tower and Turntable	NA	2090	EMCO	B812	NA
Amplifier	1G – 40G	NSP4000-44	Miteq	B827	8/4/03
Antenna	1G – 12G	96601	EATON	U926	2/11/04