

# GE Security, Inc.

**RCR-REX-W  
RCR-REX-G  
RCR-REX-B**

**October 27, 2005**

**Report No. ILGX0264**

Report Prepared By



[www.nwemc.com](http://www.nwemc.com)  
1-888-EMI-CERT

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**EMC Test Report**



22975 NW Evergreen Parkway  
Suite 400  
Hillsboro, Oregon 97124

## Certificate of Test

Issue Date: October 27, 2005

GE Security, Inc.

Model(s): RCR-REX-W, RCR-REX-G, RCR-REX-B

Emissions			
Specification	Test Method	Pass	Fail
FCC 15.109 Radiated Emissions:2005-10	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RSS-Gen, issue 1, 4.1 Occupied Bandwidth:2005	RSS-Gen 1, Issue 1, 4.4.1:2005	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FCC 15.249 Field Strength of Fundamental:2005-9	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FCC 15.249 Field Strength of Spurious Emissions:2005-9	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Modifications made to the product

See the Modifications section of this report

### Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.  
22975 NW Evergreen Parkway, Suite 400; Hillsboro, OR 97124  
Phone: (503) 844-4066  
Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada.

### Approved By:

Greg Kiemel, Director of Engineering

*This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.*

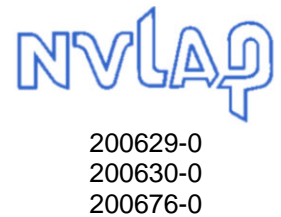
*Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested, the specific description is noted in each of the individual sections of the test report supporting this certificate of test.*

Revision Number	Description	Date	Page Number
00	None		

**FCC:** Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.



**NVLAP:** Northwest EMC, Inc. is recognized under the United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 89/336/EEC, ANSI C63.4, MIL-STD 461E, DO-160D and SAE J1113. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.



**Industry Canada:** Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS 212, Issue 1 (Provisional) and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements.



**CAB:** Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.



**TÜV Product Service:** Included in TÜV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TÜV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TÜV's current Listing of CARAT Laboratories, available from TÜV. A certificate was issued to represent that this laboratory continues to meet TÜV's CARAT Program requirements. Certificate No. USA0401C.



**TÜV Rheinland:** Authorized to carryout EMC tests by order and under supervision of TÜV Rheinland. This authorization is based on "Conditions for EMC-Subcontractors" of November 1992.



**NEMKO:** Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).



**Technology International:** Assessed in accordance with ISO Guide 25 defining the general international requirements for the competence of calibration and testing laboratories and with ITI assessment criteria LACO196. Based upon that assessment, Interference Technology International, Ltd., has granted approval for specifications implementing the EU Directive on EMC (89/336/EEC and amendments). The scope of the approval was provided on a Schedule of Assessment supplied with the certificate and is available upon request.



**Australia/New Zealand:** The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).



**VCCI:** Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Numbers. - Hillsboro: C-1071 and R-1025, Irvine: C-2094 and R-1943, Newberg: C-1877 and R-1760, Sultan: R-871, C-1784 and R-1761*).



**BSMI:** Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement. License No.SL2-IN-E-1017.



**GOST:** Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification



## SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/scope.asp>

### What is measurement uncertainty?

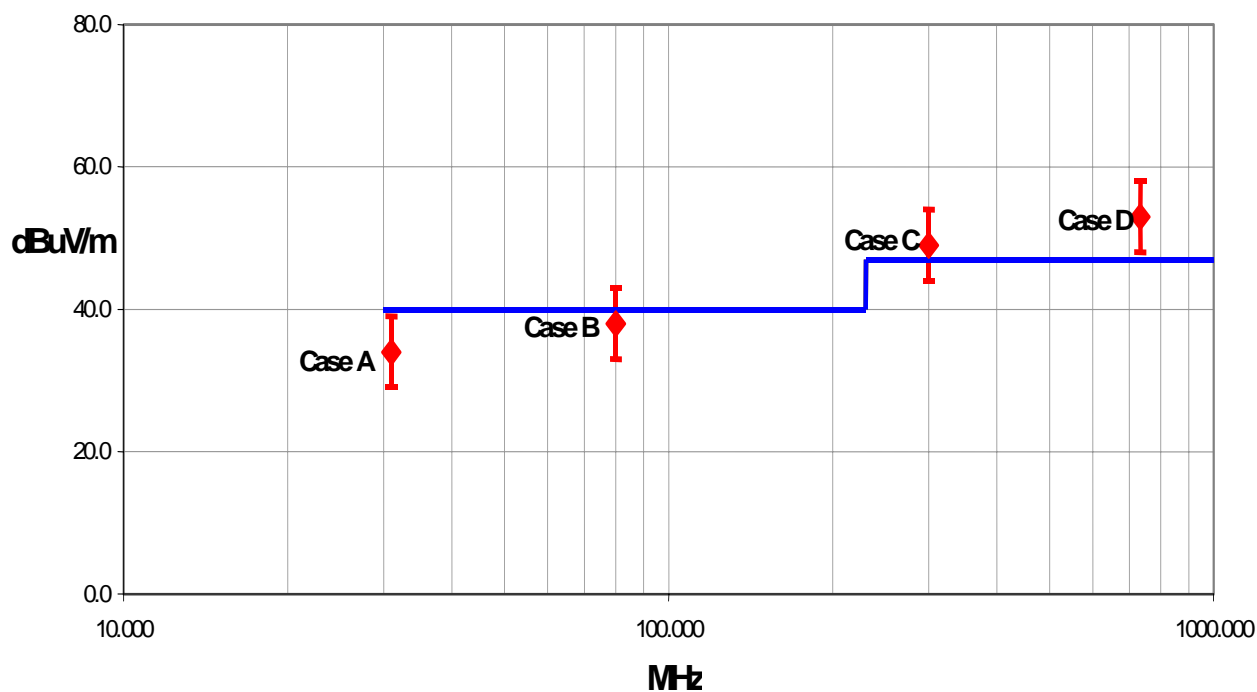
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following statement of measurement uncertainty is used to reflect the accuracy of the measured result as compared with its “true” value. In the case of transient tests (ESD, EFT, Surge, Voltage Dips and Interruptions), the test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements.

The following documents were the basis for determining the uncertainty levels of our measurements:

- “ISO Guide to the Expression of Uncertainty in Measurements”, October 1993
- “NIS81: The Treatment of Uncertainty in EMC Measurements”, May 1994
- “IEC CISPR 16-3 A1 f1 Ed.1: Radio-interference measurements and statistical techniques”, December 2000

### How might measurement uncertainty be applied to test results?

If the diamond marks the measured value for the test and the vertical bars bracket the range of + and – measurement uncertainty, then test results can be interpreted from the diagram below.



#### Test Result Scenarios:

**Case A:** Product complies.

**Case B:** Product conditionally complies. It is not possible to say with 95% confidence that the product complies.

**Case C:** Product conditionally does not comply. It is not possible to say with 95% confidence that the product does not comply.

**Case D:** Product does not comply.

**Radiated Emissions  $\leq 1$  GHz**

Value (dB)

Test Distance	Probability Distribution	Biconical Antenna		Log Periodic Antenna		Dipole Antenna	
		3m	10m	3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.86 - 1.88	+ 1.82 - 1.87	+ 2.23 - 1.41	+ 1.29 - 1.26	+ 1.31 - 1.27	+ 1.25 - 1.25
Expanded uncertainty $U$ (level of confidence $\approx 95\%$ )	normal (k=2)	+ 3.72 - 3.77	+ 3.64 - 3.73	+ 4.46 - 2.81	+ 2.59 - 2.52	+ 2.61 - 2.55	+ 2.49 - 2.49

**Radiated Emissions  $> 1$  GHz**

Value (dB)

Test Distance	Probability Distribution	Without High Pass Filter		With High Pass Filter	
		3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.29 - 1.25	+ 1.29 - 1.25	+ 1.38 - 1.35	+ 1.38 - 1.35
Expanded uncertainty $U$ (level of confidence $\approx 95\%$ )	normal (k=2)	+ 2.57 - 2.51	+ 2.57 - 2.51	+ 2.76 - 2.70	+ 2.76 - 2.70

**Conducted Emissions**

Test Distance	Probability Distribution	Value (+/- dB)	
		3m	10m
Combined standard uncertainty $u_c(y)$	normal	1.48	1.48
Expanded uncertainty $U$ (level of confidence $\approx 95\%$ )	normal (k = 2)	2.97	2.97

**Radiated Immunity**

Test Distance	Probability Distribution	Value (+/- dB)	
		3m	10m
Combined standard uncertainty $u_c(y)$	normal	1.05	1.05
Expanded uncertainty $U$ (level of confidence $\approx 95\%$ )	normal (k = 2)	2.11	2.11

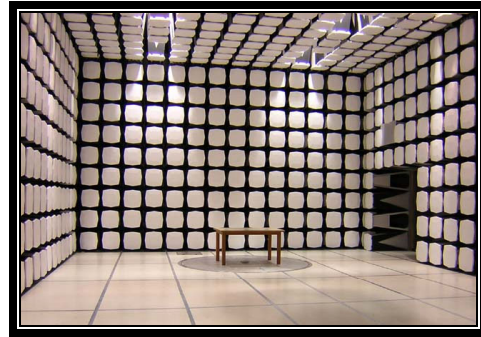
**Conducted Immunity**

Test Distance	Probability Distribution	Value (+/- dB)	
		3m	10m
Combined standard uncertainty $u_c(y)$	normal	1.05	1.05
Expanded uncertainty $U$ (level of confidence $\approx 95\%$ )	normal (k = 2)	2.10	2.10

**Legend**

$u_c(y)$  = square root of the sum of squares of the individual standard uncertainties

$U$  = combined standard uncertainty multiplied by the coverage factor:  $k$ . This defines an interval about the measured result that will encompass the true value with a confidence level of approximately 95%. If a higher level of confidence is required, then  $k=3$  (CL of 99.7%) can be used. Please note that with a coverage factor of one,  $u_c(y)$  yields a confidence level of only 68%.



**California – Orange County Facility  
Labs OC01 – OC13**

41 Tesla Ave. Irvine, CA 92618  
(888) 364-2378 Fax: (503) 844-3826



**Oregon – Evergreen Facility  
Labs EV01 – EV10**

22975 NW Evergreen Pkwy. Suite 400 Hillsboro, OR 97124  
(503) 844-4066 Fax: (503) 844-3826



**Washington – Sultan Facility  
Labs SU01 – SU07**

14128 339<sup>th</sup> Ave. SE Sultan, WA 98294  
(888) 364-2378

**Party Requesting the Test**

<b>Company Name:</b>	GE Security, Inc.
<b>Address:</b>	12345 SW Leveton Drive
<b>City, State, Zip:</b>	Tualatin, OR 97062
<b>Test Requested By:</b>	Fred Eggers
<b>Model:</b>	RCR-REX-W, RCR-REX-G, RCR-REX-B (all 3 are identical except for color of plastic)
<b>First Date of Test:</b>	October 19, 2005
<b>Last Date of Test:</b>	October 20, 2005
<b>Receipt Date of Samples:</b>	October 19, 2005
<b>Equipment Design Stage:</b>	Production
<b>Equipment Condition:</b>	No visual damage.

**Information Provided by the Party Requesting the Test**

<b>Clocks/Oscillators:</b>	4MHz clock on microcontroller.
<b>I/O Ports:</b>	Not Provided.

**Functional Description of the EUT (Equipment Under Test):**

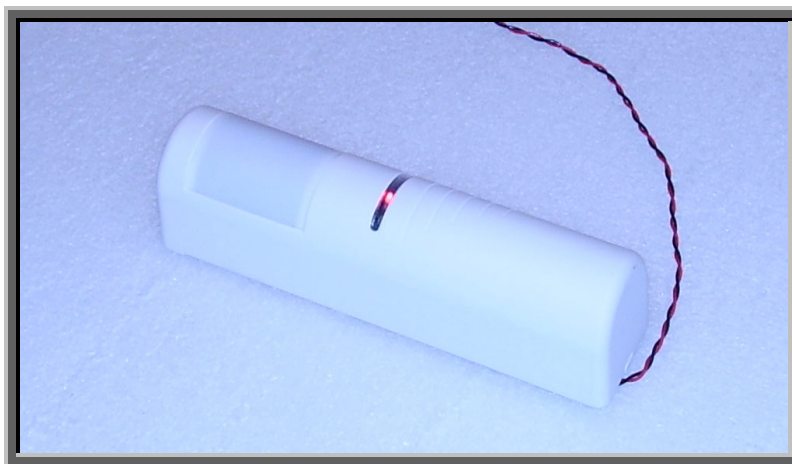
EUT is a request-to-exit sensor that is part of a commercial/industrial facility access control system.

**Client Justification for EUT Selection:**

Random Production Test Sample, with typical Configuration. The product is a representative production sample.

**Client Justification for Test Selection:**

These tests satisfy the FCC requirements for a Class II Permissive Change application under FCC 15.249

**EUT Photo**

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	10/19/2005	Field Strength of Spurious Emissions	Same configuration as delivered.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	10/19/2005	Field Strength of Fundamental	Same configuration as delivered.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	10/19/2005	Radiated Emissions	Same configuration as delivered.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	10/20/2005	Occupied Bandwidth to RSS 210	Same configuration as delivered.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

**Justification**

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

**Channels in Specified Band Investigated:**

Typical

**Operating Modes Investigated:**

Typical

**Antennas Investigated:**

Internal

**Data Rates Investigated:**

Typical

**Power Input Settings Investigated:**

15 VDC

**Software\Firmware Applied During Test**

Exercise software	N/A	Version	N/A
Description			
N/A			

**EUT and Peripherals**

Description	Manufacturer	Model/Part Number	Serial Number
EUT - Motion Detector	GE Security, Inc.	RCR-REX-W, RCR-REX-G, RCR-REX-B	001
DC Power Supply	Topward Electric Instruments Co. Ltd.	TPS 2000	Unknown

**Cables**

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	1.3	No	EUT - Motion Detector	DC Power Supply
AC Power	No	1.8	No	DC Power Supply	AC Mains

## Measurement Equipment

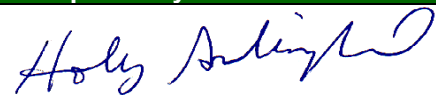
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Antenna, Horn	EMCO	3160-09	AHG	NCR	NA
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	02/15/2005	13 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APC	02/17/2005	13 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	08/02/2005	13 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	08/02/2005	13 mo
Antenna, Horn	EMCO	3160-08	AHK	NCR	NA
Antenna, Horn	EMCO	3115	AHC	08/30/2005	12 mo
Spectrum Analyzer	Agilent	E4446A	AAQ	06/15/2005	13 mo

## Test Description

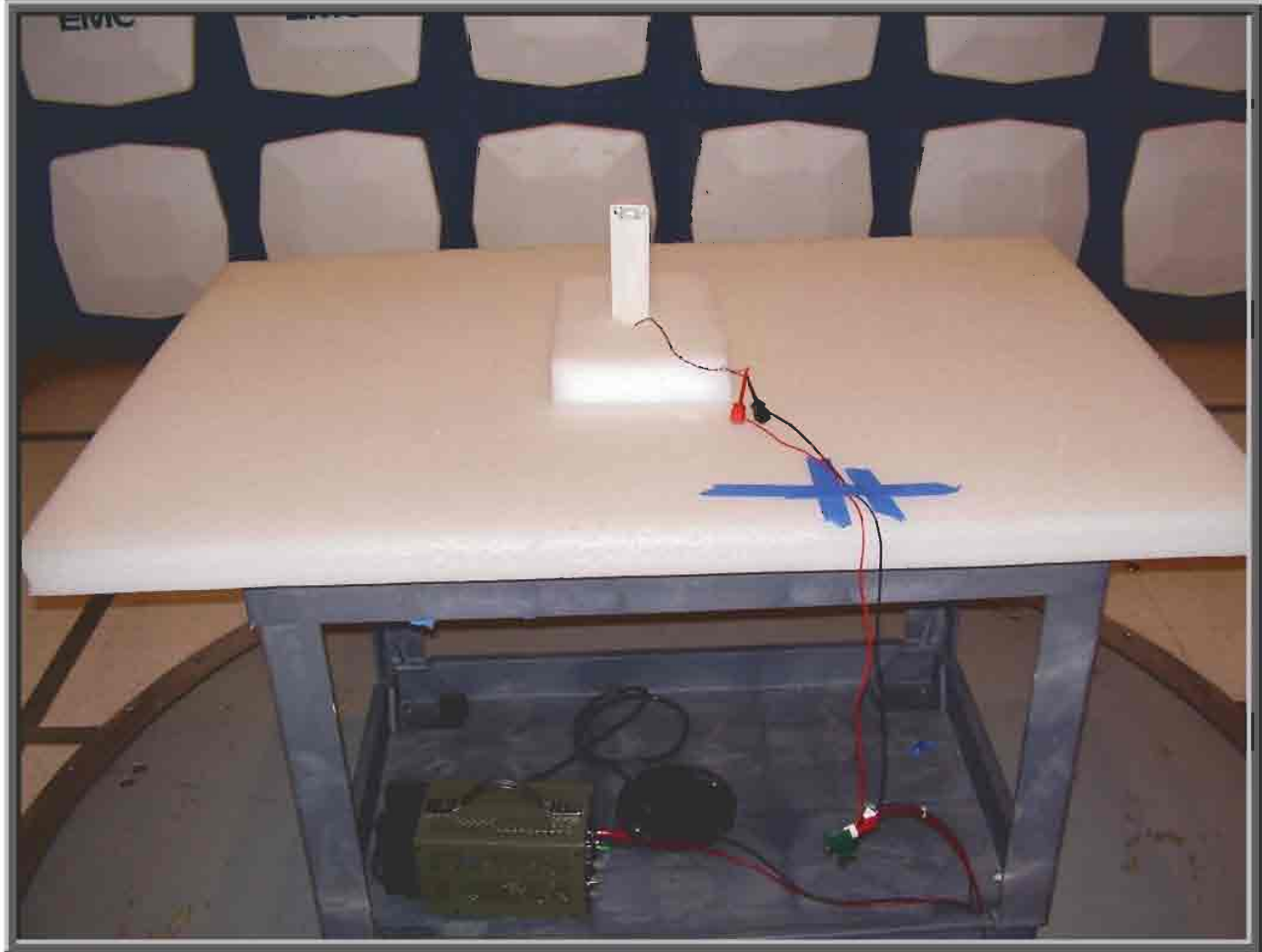
**Requirement:** The field strength of the fundamental emission shall comply with the limits, as defined in 47 CFR 15.249. Field strength limits are specified at a distance of 3 meters.

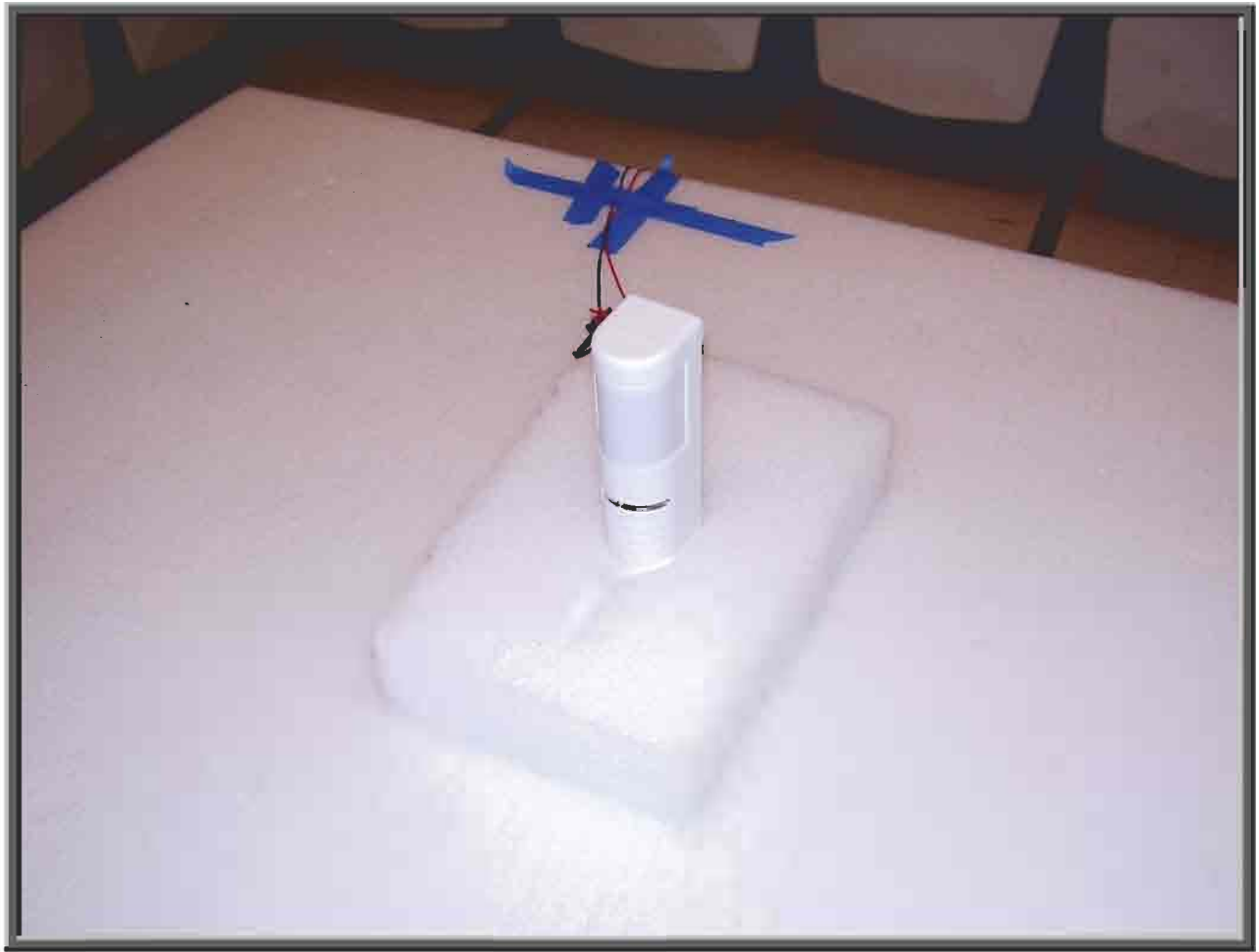
**Configuration:** The antenna to be used with the EUT was tested. The EUT was transmitting and/or receiving while set at the available channel. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003).

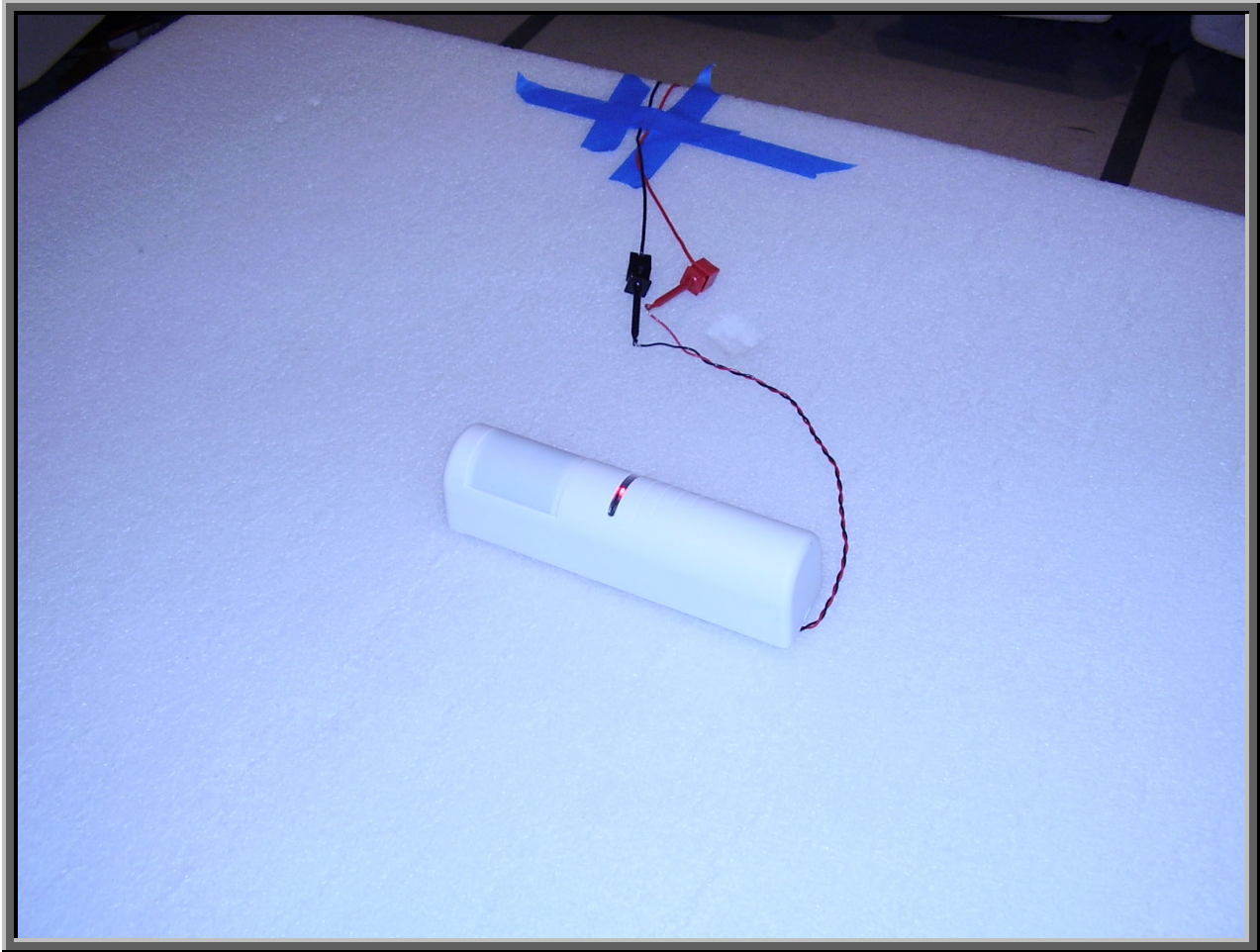
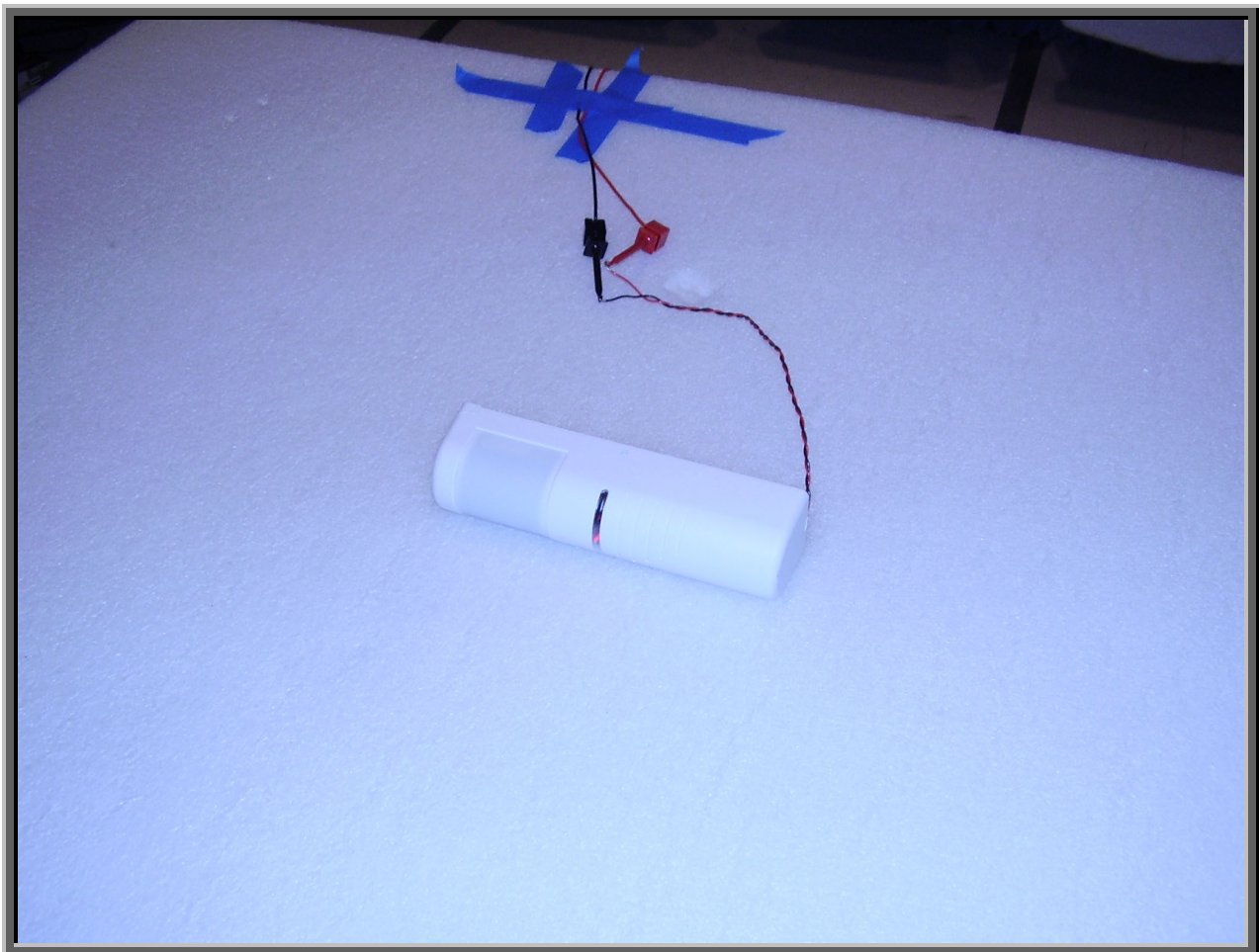
Completed by:



NORTHWEST		PSA 2005.10.04 EMI 2005.10.11																																																																																																																																																																																							
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EUT: RCR-REX-W, RCR-REX-G, RCR-REX-B		Work Order: ILGX0264																																																																																																																																																																																							
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Customer: GE Security, Inc.		Temperature: 24																																																																																																																																																																																							
Attendees: None		Humidity: 45%																																																																																																																																																																																							
Project: None		Barometric Pressure: 30.04																																																																																																																																																																																							
Tested by: Holly Ashkannejhad		Power: 15VDC																																																																																																																																																																																							
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Results	Pass																																																																																																																																																																																								
<p>The graph plots dBuV/m (Y-axis, 0.0 to 120.0) against MHz (X-axis, 5700.000 to 5900.000). A blue line represents the test limit, which is 55.0 dBuV/m from 5700 to 5720 MHz, rises to 95.0 dBuV/m from 5720 to 5880 MHz, and then drops to 55.0 dBuV/m. A green line represents the specification limit, which is 75.0 dBuV/m from 5700 to 5720 MHz, rises to 115.0 dBuV/m from 5720 to 5880 MHz, and then drops to 75.0 dBuV/m. Green diamond markers represent individual test results, clustered around 5760 MHz, 5810 MHz, and 5840 MHz, with values ranging from approximately 45 to 65 dBuV/m.</p>																																																																																																																																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Freq (MHz)</th> <th>Amplitude (dBuV)</th> <th>Factor (dB)</th> <th>Azimuth (degrees)</th> <th>Height (meters)</th> <th>Distance (meters)</th> <th>External Attenuation (dB)</th> <th>Polarity</th> <th>Detector</th> <th>Pulse desensitization (dB)</th> <th>Adjusted dBuV/m</th> <th>Spec. Limit dBuV/m</th> <th>Compared to Spec. (dB)</th> <th>Comments</th> </tr> </thead> <tbody> <tr><td>5840.060</td><td>56.0</td><td>8.6</td><td>15.0</td><td>1.0</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>PK</td><td>0.0</td><td>64.6</td><td>114.0</td><td>-49.4</td><td>EUT on side</td></tr> <tr><td>5814.670</td><td>56.0</td><td>8.5</td><td>247.0</td><td>1.2</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>PK</td><td>0.0</td><td>64.5</td><td>114.0</td><td>-49.5</td><td>EUT Vertical</td></tr> <tr><td>5755.900</td><td>55.9</td><td>8.5</td><td>22.0</td><td>1.0</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>PK</td><td>0.0</td><td>64.4</td><td>114.0</td><td>-49.6</td><td>EUT on side</td></tr> <tr><td>5841.710</td><td>55.7</td><td>8.6</td><td>248.0</td><td>1.2</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>PK</td><td>0.0</td><td>64.3</td><td>114.0</td><td>-49.7</td><td>EUT Vertical</td></tr> <tr><td>5812.840</td><td>55.5</td><td>8.5</td><td>35.0</td><td>1.0</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>PK</td><td>0.0</td><td>64.0</td><td>114.0</td><td>-50.0</td><td>EUT on side</td></tr> <tr><td>5757.910</td><td>54.9</td><td>8.5</td><td>263.0</td><td>1.8</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>PK</td><td>0.0</td><td>63.4</td><td>114.0</td><td>-50.6</td><td>EUT Vertical</td></tr> <tr><td>5840.060</td><td>56.0</td><td>8.6</td><td>15.0</td><td>1.0</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>AV</td><td>20.0</td><td>44.6</td><td>94.0</td><td>-49.4</td><td>EUT on side</td></tr> <tr><td>5814.670</td><td>56.0</td><td>8.5</td><td>247.0</td><td>1.2</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>AV</td><td>20.0</td><td>44.5</td><td>94.0</td><td>-49.5</td><td>EUT Vertical</td></tr> <tr><td>5755.900</td><td>55.9</td><td>8.5</td><td>22.0</td><td>1.0</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>AV</td><td>20.0</td><td>44.4</td><td>94.0</td><td>-49.6</td><td>EUT on side</td></tr> <tr><td>5841.710</td><td>55.7</td><td>8.6</td><td>248.0</td><td>1.2</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>AV</td><td>20.0</td><td>44.3</td><td>94.0</td><td>-49.7</td><td>EUT Vertical</td></tr> <tr><td>5812.840</td><td>55.5</td><td>8.5</td><td>35.0</td><td>1.0</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>AV</td><td>20.0</td><td>44.0</td><td>94.0</td><td>-50.0</td><td>EUT on side</td></tr> <tr><td>5757.910</td><td>54.9</td><td>8.5</td><td>263.0</td><td>1.8</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>AV</td><td>20.0</td><td>43.4</td><td>94.0</td><td>-50.6</td><td>EUT Vertical</td></tr> </tbody> </table>				Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Pulse desensitization (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments	5840.060	56.0	8.6	15.0	1.0	3.0	0.0	V-Horn	PK	0.0	64.6	114.0	-49.4	EUT on side	5814.670	56.0	8.5	247.0	1.2	3.0	0.0	H-Horn	PK	0.0	64.5	114.0	-49.5	EUT Vertical	5755.900	55.9	8.5	22.0	1.0	3.0	0.0	V-Horn	PK	0.0	64.4	114.0	-49.6	EUT on side	5841.710	55.7	8.6	248.0	1.2	3.0	0.0	H-Horn	PK	0.0	64.3	114.0	-49.7	EUT Vertical	5812.840	55.5	8.5	35.0	1.0	3.0	0.0	V-Horn	PK	0.0	64.0	114.0	-50.0	EUT on side	5757.910	54.9	8.5	263.0	1.8	3.0	0.0	H-Horn	PK	0.0	63.4	114.0	-50.6	EUT Vertical	5840.060	56.0	8.6	15.0	1.0	3.0	0.0	V-Horn	AV	20.0	44.6	94.0	-49.4	EUT on side	5814.670	56.0	8.5	247.0	1.2	3.0	0.0	H-Horn	AV	20.0	44.5	94.0	-49.5	EUT Vertical	5755.900	55.9	8.5	22.0	1.0	3.0	0.0	V-Horn	AV	20.0	44.4	94.0	-49.6	EUT on side	5841.710	55.7	8.6	248.0	1.2	3.0	0.0	H-Horn	AV	20.0	44.3	94.0	-49.7	EUT Vertical	5812.840	55.5	8.5	35.0	1.0	3.0	0.0	V-Horn	AV	20.0	44.0	94.0	-50.0	EUT on side	5757.910	54.9	8.5	263.0	1.8	3.0	0.0	H-Horn	AV	20.0	43.4	94.0	-50.6	EUT Vertical
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**Justification**

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

**Channels in Specified Band Investigated:**

Typical
---------

**Operating Modes Investigated:**

Typical
---------

**Antennas Investigated:**

Internal
----------

**Data Rates Investigated:**

Typical
---------

**Power Input Settings Investigated:**

15 VDC
--------

**Frequency Range Investigated**

<b>Start Frequency</b>	30 MHz	<b>Stop Frequency</b>	40 GHz
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**Software\Firmware Applied During Test**

<b>Exercise software</b>	N/A	<b>Version</b>	N/A
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Description
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N/A
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**EUT and Peripherals**

Description	Manufacturer	Model/Part Number	Serial Number
EUT - Motion Detector	GE Security, Inc.	RCR-REX-W RCR-REX-G RCR-REX-B	001
DC Power Supply	Topward Electric Instruments Co. Ltd.	TPS 2000	Unknown

**Cables**

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	1.3	No	EUT - Motion Detector	DC Power Supply
AC Power	No	1.8	No	DC Power Supply	AC Mains

## Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Antenna, Horn	EMCO	3160-09	AHG	NCR	NA
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	02/15/2005	13 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APC	02/17/2005	13 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	08/02/2005	13 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	08/02/2005	13 mo
Antenna, Horn	EMCO	3160-08	AHK	NCR	NA
Antenna, Horn	EMCO	3115	AHC	08/30/2005	12 mo
Spectrum Analyzer	Agilent	E4446A	AAQ	06/15/2005	13 mo

## Test Description

**Requirement:** The field strength of harmonics and spurious radiated emissions shall comply with the limits as defined in 47 CFR 15.249. Field strength limits are specified at a distance of 3 meters. 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 Sec. 15.209, whichever is the lesser attenuation. As shown in Sec. 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified in Sec. 15.249 by more than 20 dB under any condition of modulation.

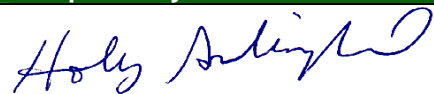
**Configuration:** The antennas to be used with the EUT were tested. The EUT was transmitting and receiving while set at the available channel. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

## Bandwidths Used for Measurements

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 – 0.15	1.0	0.2	0.2
0.15 – 30.0	10.0	9.0	9.0
30.0 – 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

*Measurements were made using the bandwidths and detectors specified. No video filter was used.*

## Completed by:

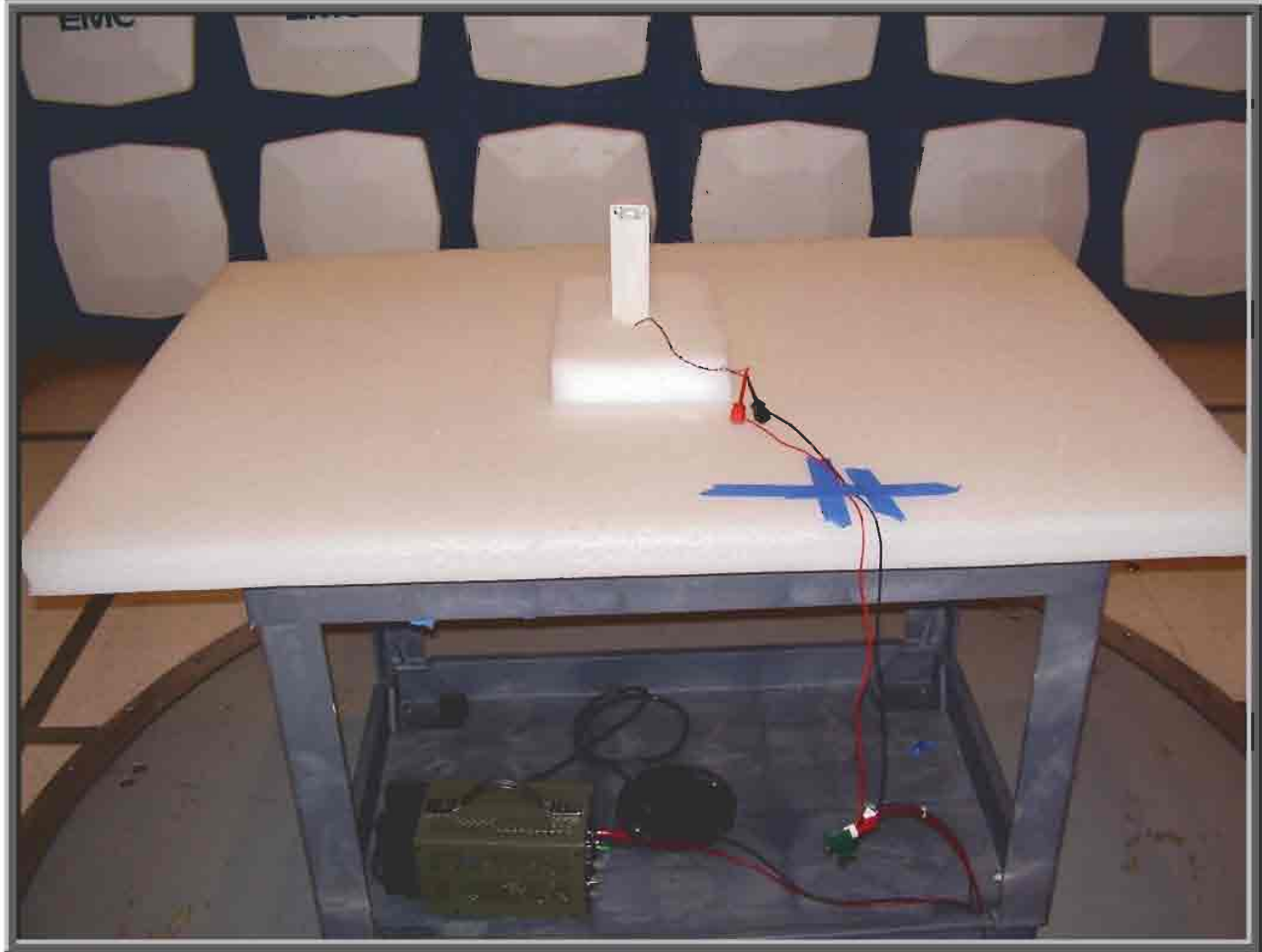


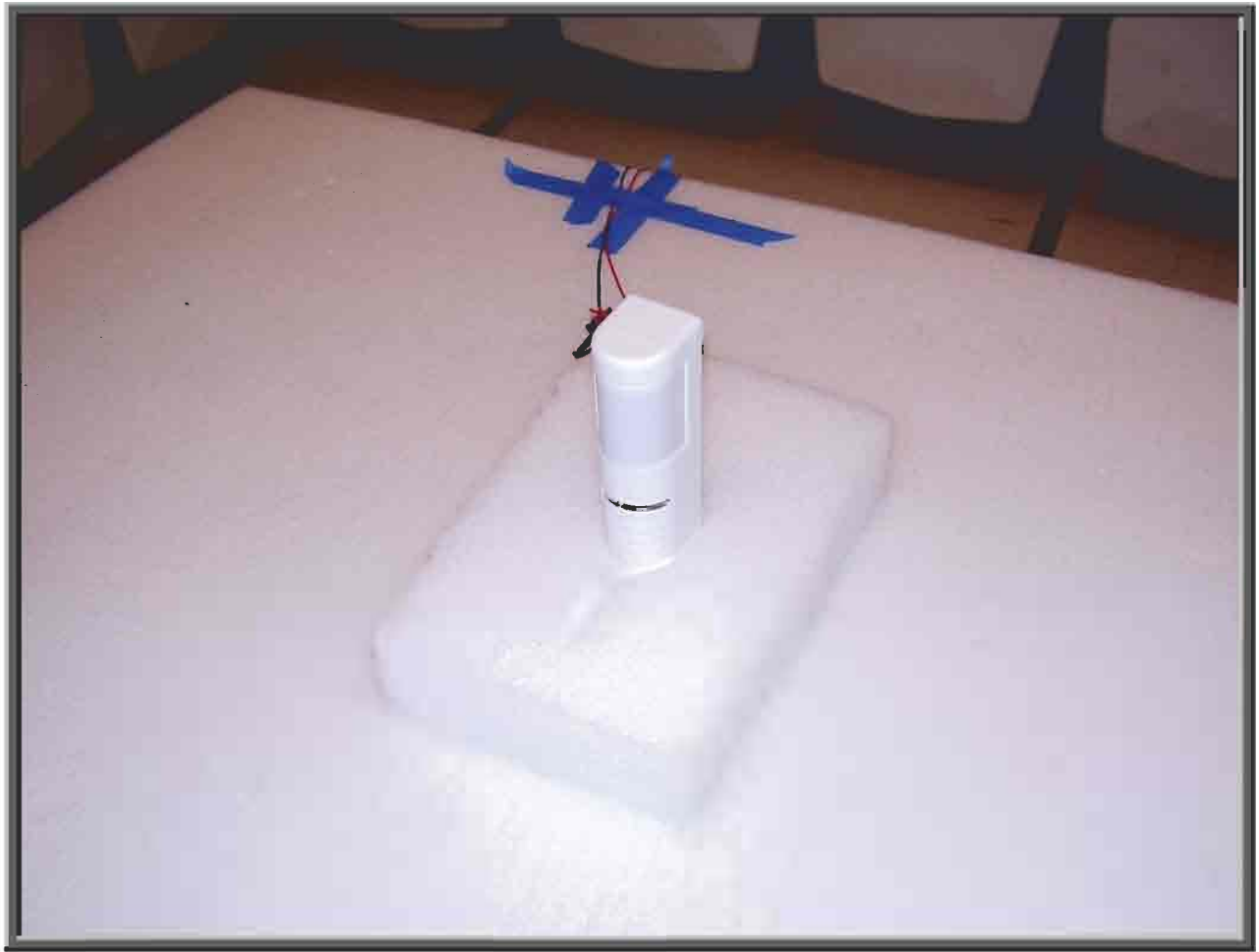
NORTHWEST										PSA 2005.10.04					
EMC										EMI 2005.10.11					
Field Strength of Spurious Emissions															
EUT: RCR-REX-W, RCR-REX-G, RCR-REX-B										Work Order: ILGX0264					
Serial Number: 001										Date: 10/19/05					
Customer: GE Security, Inc.										Temperature: 24					
Attendees: None										Humidity: 45%					
Project: None										Barometric Pressure: 30.04					
Tested by: Holly Ashkannejhad										Power: 15VDC		Job Site: EV01			
TEST SPECIFICATIONS															
FCC 15.249(a) Spurious Radiated Emissions:2005-9										Test Method					
										ANSI C63.4:2003					
TEST PARAMETERS															
Antenna Height(s) (m)										1 - 4		Test Distance (m)		3	
COMMENTS															
EUT OPERATING MODES															
Pulsed RF															
DEVIATIONS FROM TEST STANDARD															
No deviations.															
Run #		2		Signature <i>Holly Ashkannejhad</i>											
Configuration #															
Results		Pass													
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Pulse desensitization (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments		
5724.584	55.1	8.3	15.0	1.0	3.0	0.0	V-Horn	PK	0.0	63.4	74.0	-10.6	EUT on side		
5724.931	54.8	8.3	284.0	1.0	3.0	0.0	H-Horn	PK	0.0	63.1	74.0	-10.9	EUT vertical		
5875.008	52.3	8.6	355.0	1.0	3.0	0.0	V-Horn	PK	0.0	60.9	74.0	-13.1	EUT on side		
5875.008	51.2	8.6	285.0	1.3	3.0	0.0	H-Horn	PK	0.0	59.8	74.0	-14.2	EUT vertical		
5724.584	55.1	8.3	15.0	1.0	3.0	0.0	V-Horn	AV	20.0	43.4	54.0	-10.6	EUT on side		
5724.931	54.8	8.3	284.0	1.0	3.0	0.0	H-Horn	AV	20.0	43.1	54.0	-10.9	EUT vertical		
5875.008	52.3	8.6	355.0	1.0	3.0	0.0	V-Horn	AV	20.0	40.9	54.0	-13.1	EUT on side		
5875.008	51.2	8.6	285.0	1.3	3.0	0.0	H-Horn	AV	20.0	39.8	54.0	-14.2	EUT vertical		

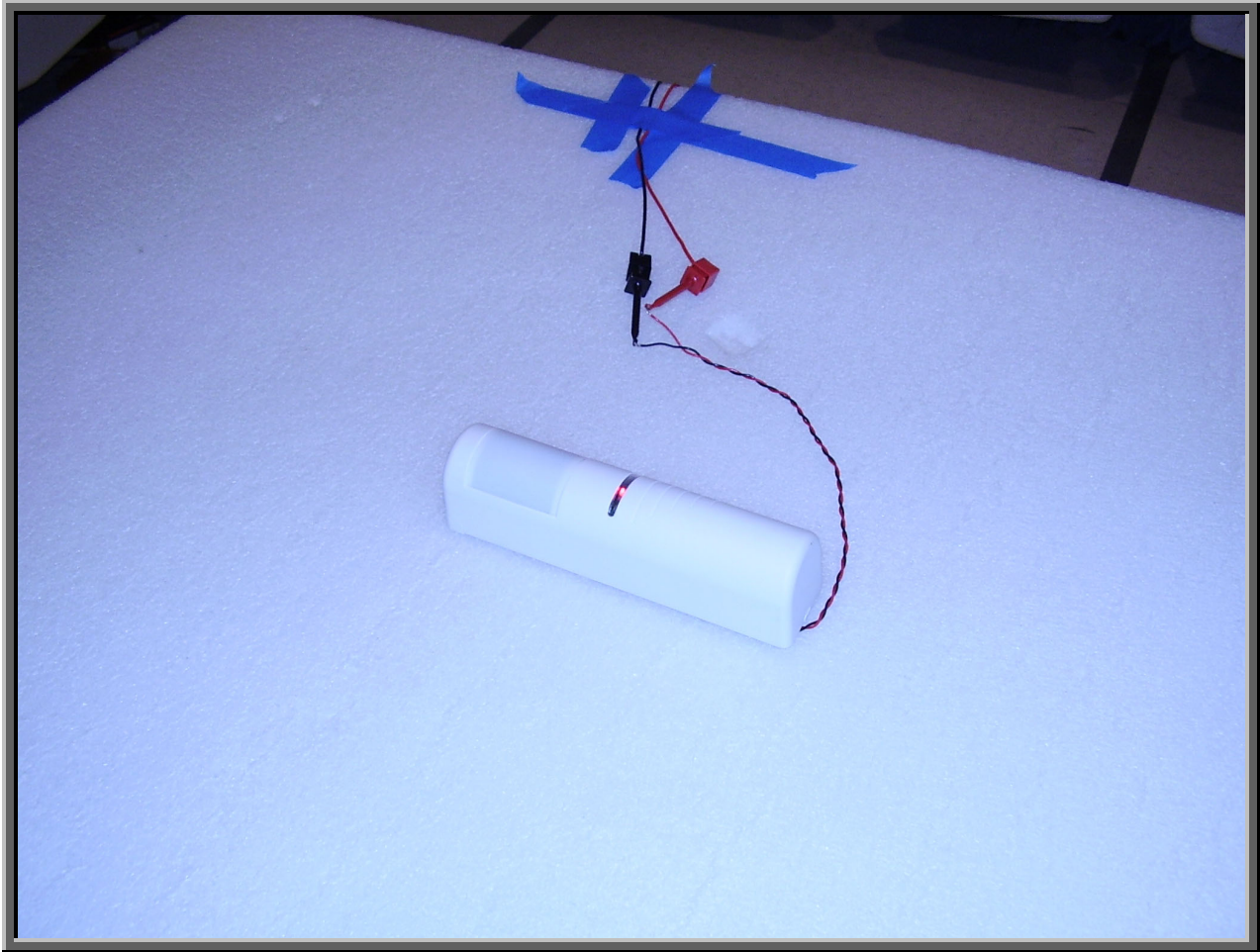
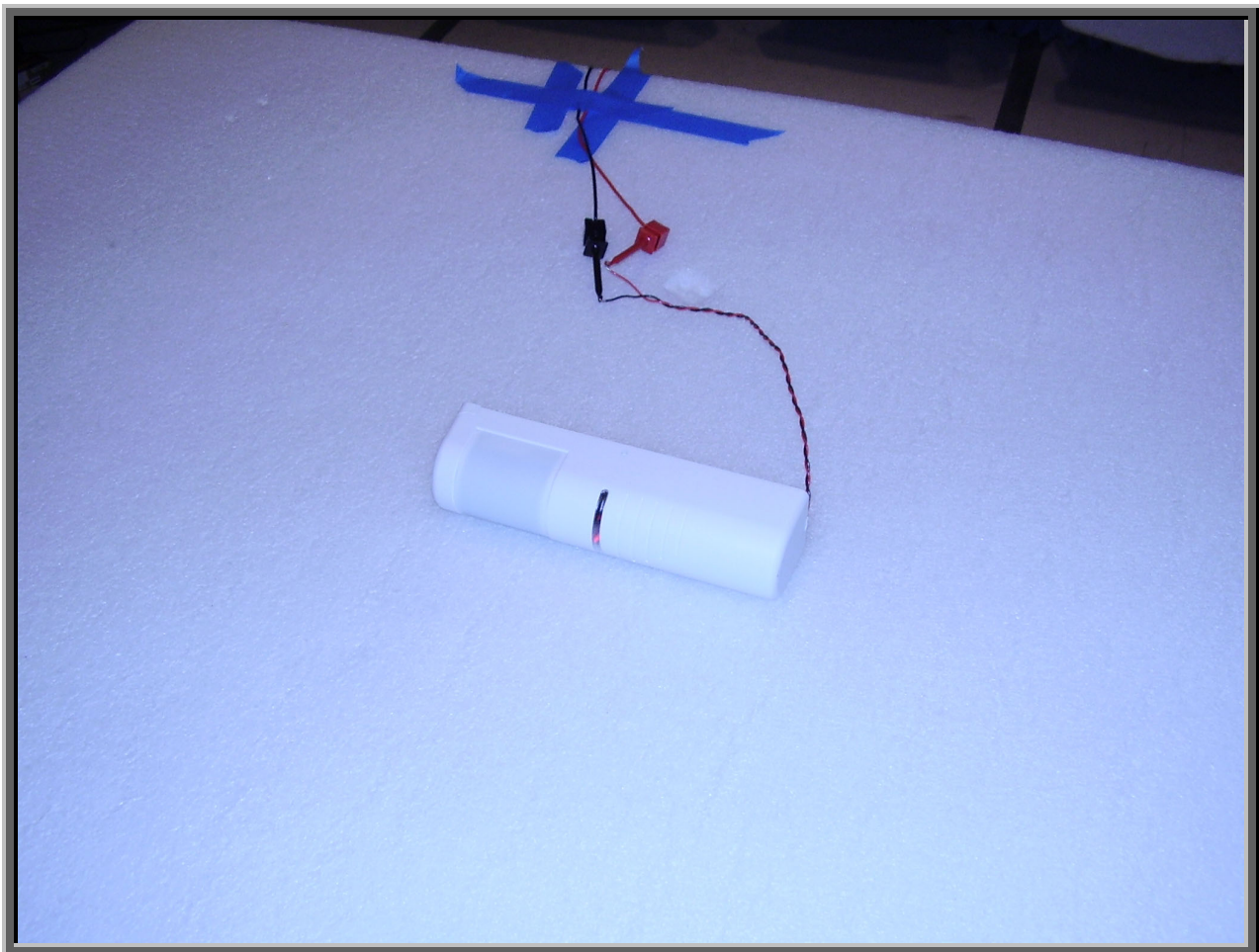
NORTHWEST										PSA 2005.10.04									
EMC										EMI 2005.10.11									
Field Strength of Spurious Emissions																			
EUT: RCR-REX-W, RCR-REX-G, RCR-REX-B					Work Order: ILGX0264														
Serial Number: 001					Date: 10/19/05														
Customer: GE Security, Inc.					Temperature: 24														
Attendees: None					Humidity: 45%														
Project: None					Barometric Pressure: 30.04														
Tested by: Holly Ashkannejhad					Power: 15VDC					Job Site: EV01									
TEST SPECIFICATIONS										Test Method									
FCC 15.249(a) Spurious Radiated Emissions:2005-9										ANSI C63.4:2003									
TEST PARAMETERS																			
Antenna Height(s) (m)					1 - 4					Test Distance (m)					3				
COMMENTS																			
EUT OPERATING MODES																			
Pulsed RF																			
DEVIATIONS FROM TEST STANDARD																			
No deviations.																			
Run #		3		Signature <i>Holly Ashkannejhad</i>															
Configuration #																			
Results		Pass																	
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Pulse desensitization (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments						
11517.470	34.9	16.0	315.0	1.0	3.0	0.0	V-Horn	PK	0.0	50.9	74.0	-23.1	EUT on side						
11521.050	34.7	16.0	102.0	2.0	3.0	0.0	H-Horn	PK	0.0	50.7	74.0	-23.3	EUT vertical						
11517.470	34.9	16.0	315.0	1.0	3.0	0.0	V-Horn	AV	20.0	30.9	54.0	-23.1	EUT on side						
11521.050	34.7	16.0	102.0	2.0	3.0	0.0	H-Horn	AV	20.0	30.7	54.0	-23.3	EUT vertical						

NORTHWEST		PSA 2005.10.04 EMI 2005.10.11											
EMC		Field Strength of Spurious Emissions											
EUT: RCR-REX-W, RCR-REX-G, RCR-REX-B		Work Order: ILGX0264											
Serial Number: 001		Date: 10/19/05											
Customer: GE Security, Inc.		Temperature: 24											
Attendees: None		Humidity: 45%											
Project: None		Barometric Pressure: 30.04											
Tested by: Holly Ashkannejhad		Power: 15VDC	Job Site: EV01										
TEST SPECIFICATIONS		Test Method											
FCC 15.249(a) Spurious Radiated Emissions:2005-9		ANSI C63.4:2003											
TEST PARAMETERS													
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3										
COMMENTS													
EUT OPERATING MODES													
Pulsed RF													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
Run #	4	<i>Signature</i>											
Configuration #													
Results	Pass												
MHz													
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Pulse desensiti- zation (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
17272.200	32.0	18.1	162.0	1.0	3.0	0.0	V-Horn	PK	0.0	50.1	74.0	-23.9	EUT on side
17276.890	31.8	18.1	100.0	1.3	3.0	0.0	H-Horn	PK	0.0	49.9	74.0	-24.1	EUT Vertical
17272.200	32.0	18.1	162.0	1.0	3.0	0.0	V-Horn	AV	20.0	30.1	54.0	-23.9	EUT on side
17276.890	31.8	18.1	100.0	1.3	3.0	0.0	H-Horn	AV	20.0	29.9	54.0	-24.1	EUT Vertical

NORTHWEST		Field Strength of Spurious Emissions										PSA 2005.10.04	
EMC												EMI 2005.10.11	
EUT: RCR-REX-W, RCR-REX-G, RCR-REX-B												Work Order: ILGX0264	
Serial Number: 001												Date: 10/19/05	
Customer: GE Security, Inc.												Temperature: 24	
Attendees: None												Humidity: 45%	
Project: None												Barometric Pressure: 30.04	
Tested by: Holly Ashkannejhad												Power: 15VDC	
Job Site: EV01													
TEST SPECIFICATIONS												Test Method	
FCC 15.249(a) Spurious Radiated Emissions:2005-9												ANSI C63.4:2003	
TEST PARAMETERS													
Antenna Height(s) (m) 1 - 4												Test Distance (m) 3	
COMMENTS													
EUT OPERATING MODES													
Pulsed RF													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
Run # 5													
Configuration #													
Results Pass												Signature <i>Holly Ashkannejhad</i>	
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Pulse desensitization (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
23036.460	36.6	11.6	93.0	1.0	3.0	0.0	V-High Horn	PK	0.0	48.2	74.0	-25.8	EUT on side
23036.330	36.5	11.6	79.0	1.0	3.0	0.0	H-High Horn	PK	0.0	48.1	74.0	-25.9	EUT vertical
23036.460	36.6	11.6	93.0	1.0	3.0	0.0	V-High Horn	AV	20.0	28.2	54.0	-25.8	EUT on side
23036.330	36.5	11.6	79.0	1.0	3.0	0.0	H-High Horn	AV	20.0	28.1	54.0	-25.9	EUT vertical







**Justification**

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

**Channels in Specified Band Investigated:**

Typical

**Operating Modes Investigated:**

Typical

**Data Rates Investigated:**

Typical

**Output Power Setting(s) Investigated:**

Maximum

**Power Input Settings Investigated:**

15 VDC

**Software\Firmware Applied During Test**

<b>Exercise software</b>	N/A	<b>Version</b>	N/A
<b>Description</b>			
N/A			

**EUT and Peripherals**

<b>Description</b>	<b>Manufacturer</b>	<b>Model/Part Number</b>	<b>Serial Number</b>
EUT - Motion Detector	GE Security, Inc.	RCR-REX-W RCR-REX-G RCR-REX-B	001
DC Power Supply	Topward Electric Instruments Co. Ltd.	TPS 2000	Unknown

**Cables**

<b>Cable Type</b>	<b>Shield</b>	<b>Length (m)</b>	<b>Ferrite</b>	<b>Connection 1</b>	<b>Connection 2</b>
DC Leads	No	1.3	No	EUT - Motion Detector	DC Power Supply
AC Power	No	1.8	No	DC Power Supply	AC Mains

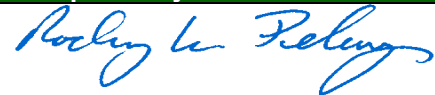
**Measurement Equipment**

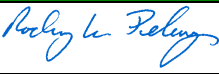
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Agilent	E4446A	AAQ	06/15/2005	13 mo
Antenna, Horn	EMCO	3115	AHC	08/30/2005	12 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APJ	05/05/2005	3 mo

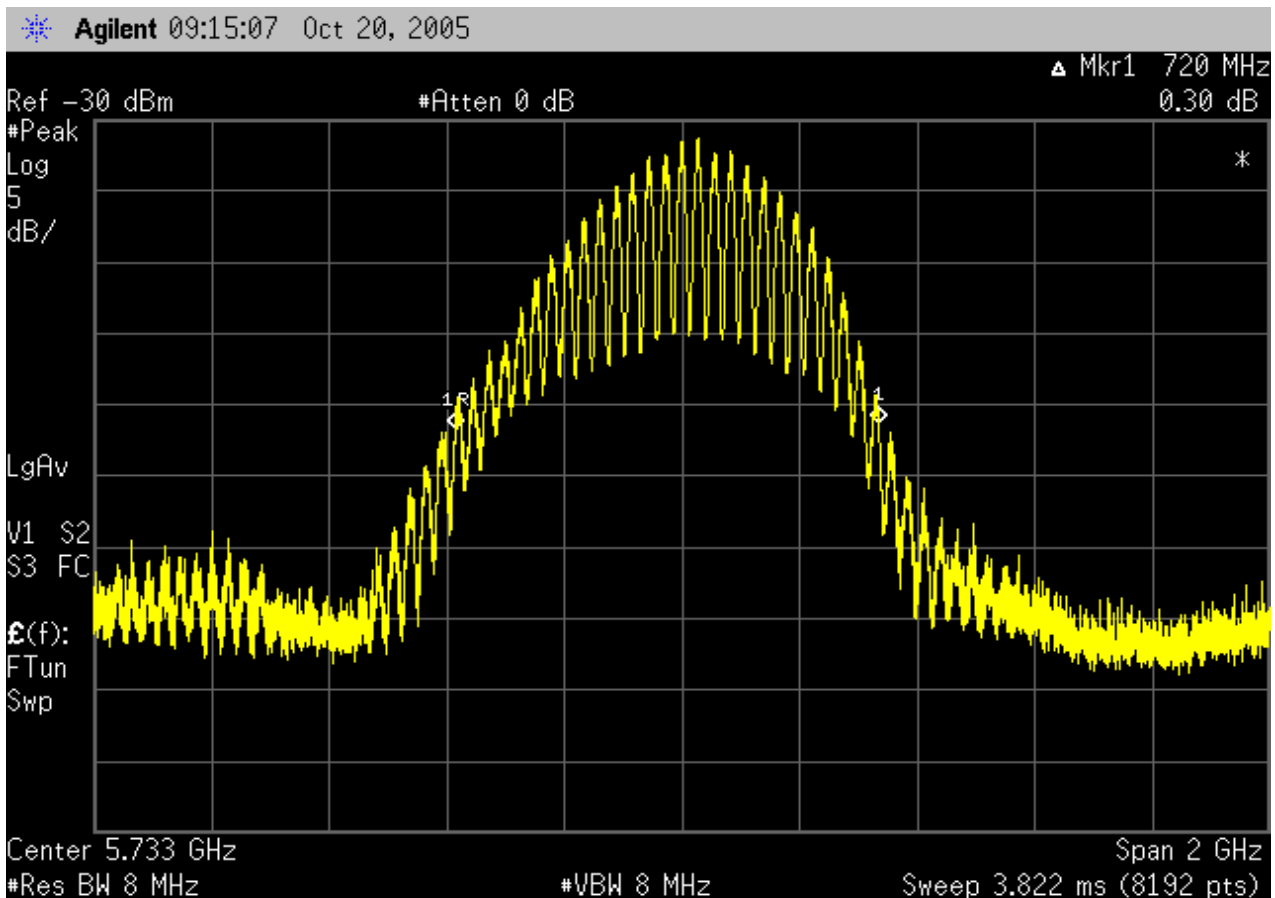
**Test Description**

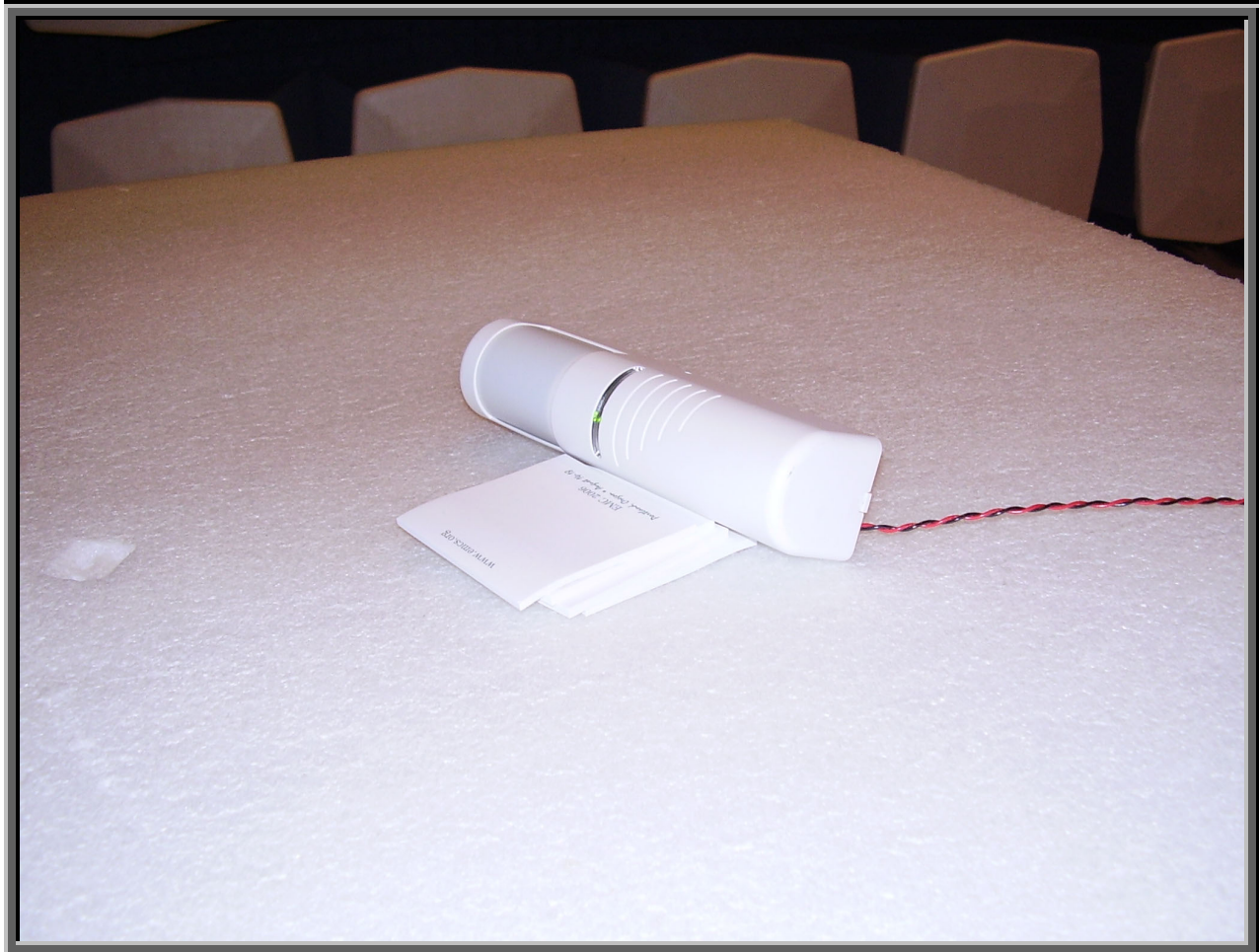
**Requirement:** Per RSS-Gen, Issue 1, September 2005, section 4.4.1 the 99% occupied bandwidth of the transmitted signal is to be reported.

**Configuration:** The occupied bandwidth was measured with the EUT set to the transmit signal. The occupied bandwidth was measured by marking the frequencies at which the signal was 20 dB down from the peak of the transmitted signal. The distance between the lower and upper frequencies of the 20 dB down point was measured and reported. Due to the EUT having an integral antenna, the measurement was made as a radiated measurement using a spectrum analyzer, preamp, and horn antenna. The EUT was transmitting using its typical modulation.

**Completed by:**

NORTHWEST <b>EMC</b>		<b>OCCUPIED BANDWIDTH</b>		Rev BETA 01/30/01	
EUT: RCR-REX-W, RCR-REX-G, RCR-REX-B			Work Order: ILGX0264		
Serial Number: 001			Date: 10/20/05		
Customer: GE Security, Inc.			Temperature: 70 °F		
Attendees: None		Tested by: Rod Peloquin		Humidity: 49% RH	
Customer Ref. No.: None		Power: 120VAC/60Hz		Job Site: EV01	
<b>TEST SPECIFICATIONS</b>					
Specification: RSS-Gen, issue 1, 4.1		Year: 2005		Method: RSS-Gen 1, issue 1, 4.4.1	
				Year: 2005	
<b>SAMPLE CALCULATIONS</b>					
<b>COMMENTS</b>					
Measured with 1m radiated test distance					
<b>EUT OPERATING MODES</b>					
Modulated 40 kbps data rate					
<b>DEVIATIONS FROM TEST STANDARD</b>					
None					
<b>REQUIREMENTS</b>					
Per RSS-Gen section 4.4.1 the occupied bandwidth of the transmitted signal is to be reported.					
<b>RESULTS</b>					
			<b>BANDWIDTH</b>		
Pass			720 kHz		
<b>SIGNATURE</b>					
 Tested By: _____					
<b>DESCRIPTION OF TEST</b>					
20dB Bandwidth					





**Justification**

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. All of the EUT parameters listed below were investigated. This includes, but may not be limited to, CPU speeds, video resolution settings, operational modes, and input voltages.

**Operating Modes Investigated:**

Typical operating mode
------------------------

**Operating Mode used for Final Test:**

Typical operating mode
------------------------

**Power Input Settings Investigated:**

15 VDC
--------

**Input Power Setting used for Final Test:**

15 VDC
--------

**Frequency Range Investigated**

<b>Start Frequency</b>	30 MHz	<b>Stop Frequency</b>	1 GHz
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**Software\Firmware Applied During Test**

<b>Operating system</b>	N/A	<b>Version</b>	N/A
<b>Exercise software</b>	N/A	<b>Version</b>	N/A

**Description**

N/A
-----

**EUT and Peripherals in Test Setup Boundary**

Description	Manufacturer	Model/Part Number	Serial Number
EUT - Motion Detector	GE Security, Inc.	RCR-REX-W RCR-REX-G RCR-REX-B	001
DC Power Supply	Topward Electric Instruments Co. Ltd.	TPS 2000	Unknown

**Cables**

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	1.3	No	EUT - Motion Detector	DC Power Supply
AC Power	No	1.8	No	DC Power Supply	AC Mains

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

**Measurement Equipment**

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Agilent	E4446A	AAQ	06/15/2005	13 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	08/02/2005	13 mo

## Test Description

The final radiated emissions test was performed using the parameters described above as worst case. That final test was conducted at a facility that meets the ANSI C63.4 NSA requirements. The frequency range noted in the data sheets was scanned/tested at that facility. Emissions were maximized as specified, by maximizing table azimuth, antenna height, and cable manipulation.

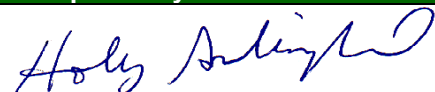
Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level will be detected. This requires the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search is utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT.

*Note: The specified distance is the horizontal separation between the closest periphery of the EUT and the center of the axis of the elements of the receiving antenna. However, if the receiving antenna is a log-periodic array, the specified distance shall be the distance between the closest periphery of the EUT and the front-to-back center of the array of elements.*

Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance shall be 1 meter, 3 meters, 5 meters, 10 meters, or 30 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna shall be increased so that the lowest point of the bottom of the antenna clears the ground surface by at least 25 cm.

Measurement Bandwidths			
Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 – 0.15	1.0	0.2	0.2
0.15 – 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0
Measurements were made using the bandwidths and detectors specified. No video filter was used.			

Completed by:



NORTHWEST		EMI 2005.10.11										
<b>EMC</b>		<b>RADIATED EMISSIONS DATA SHEET</b>										
EUT: RCR-REX-W, RCR-REX-G, RCR-REX-B		Work Order: ILGX0264										
Serial Number: 001		Date: 10/19/05										
Customer: GE Security, Inc.		Temperature: 24										
Attendees: None		Humidity: 45%										
Project: None		Barometric Pressure: 30.04										
Tested by: Holly Ashkannejhad		Power: 15VDC	Job Site: EV01									
TEST SPECIFICATIONS		Test Method										
FCC 15.109(a) Class B:2005-10		ANSI C63.4:2003										
TEST PARAMETERS												
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3									
COMMENTS												
EUT OPERATING MODES												
Pulsed RF												
DEVIATIONS FROM TEST STANDARD												
No deviations.												
Run #	1	Signature <i>Holly Ashkannejhad</i>										
Configuration #	1											
Results	Pass											
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
921.295	18.1	11.1	79.0	1.0	3.0	0.0	H-Bilog	PK	0.0	29.2	46.0	-16.8
921.170	17.7	11.1	294.0	1.0	3.0	0.0	V-Bilog	PK	0.0	28.8	46.0	-17.2
726.548	18.6	9.1	235.0	2.0	3.0	0.0	V-Bilog	PK	0.0	27.7	46.0	-18.3
726.368	18.1	9.1	154.0	2.3	3.0	0.0	H-Bilog	PK	0.0	27.2	46.0	-18.8
662.193	19.4	7.6	41.0	1.0	3.0	0.0	V-Bilog	PK	0.0	27.0	46.0	-19.0
662.245	18.0	7.6	121.0	1.0	3.0	0.0	H-Bilog	PK	0.0	25.6	46.0	-20.4
48.559	22.3	-4.5	298.0	1.0	3.0	0.0	V-Bilog	PK	0.0	17.8	40.0	-22.2
466.630	18.3	4.5	350.0	1.0	3.0	0.0	V-Bilog	PK	0.0	22.8	46.0	-23.2
466.459	18.2	4.5	106.0	1.0	3.0	0.0	H-Bilog	PK	0.0	22.7	46.0	-23.3
48.775	18.4	-4.5	205.0	1.0	3.0	0.0	H-Bilog	PK	0.0	13.9	40.0	-26.1
321.188	19.3	0.6	2.0	2.4	3.0	0.0	H-Bilog	PK	0.0	19.9	46.0	-26.1
321.283	19.1	0.6	298.0	1.4	3.0	0.0	V-Bilog	PK	0.0	19.7	46.0	-26.3
203.026	19.7	-3.0	277.0	3.0	3.0	0.0	V-Bilog	PK	0.0	16.7	43.5	-26.8
203.096	19.3	-3.0	271.0	1.0	3.0	0.0	H-Bilog	PK	0.0	16.3	43.5	-27.2
97.525	19.3	-6.3	345.0	3.3	3.0	0.0	V-Bilog	PK	0.0	13.0	43.5	-30.5
97.489	19.0	-6.3	164.0	1.0	3.0	0.0	H-Bilog	PK	0.0	12.7	43.5	-30.8

