

# 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

EMC Test Report

**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.



200629-0  
200630-0  
200676-0

**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?

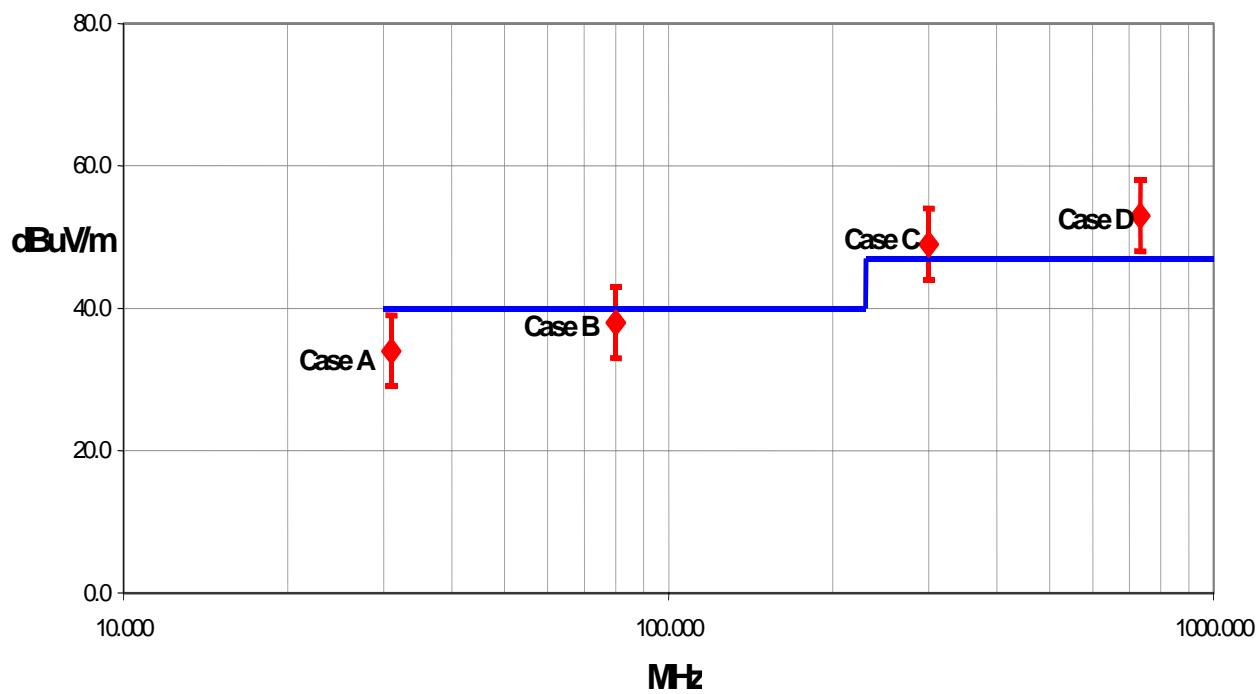
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following 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	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		

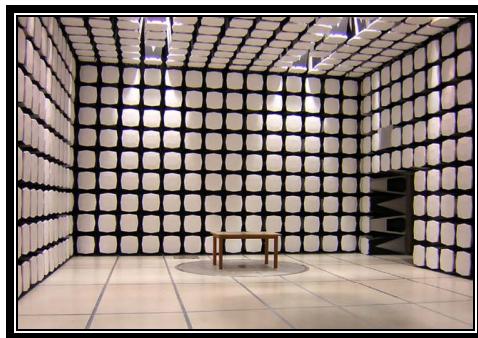
Radiated Emissions $> 1$ GHz		Value (dB)			
	Probability Distribution	Without High Pass Filter		With High Pass Filter	
		3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.29 - 1.25		+ 1.38 - 1.35	
Expanded uncertainty $U$ (level of confidence $\approx 95\%$ )	normal (k=2)	+ 2.57 - 2.51		+ 2.76 - 2.70	

Conducted Emissions		
	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $uc(y)$	normal	1.48
Expanded uncertainty $U$ (level of confidence $\approx 95\%$ )	normal (k = 2)	2.97

Radiated Immunity		
	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $uc(y)$	normal	1.05
Expanded uncertainty $U$ (level of confidence $\approx 95\%$ )	normal (k = 2)	2.11

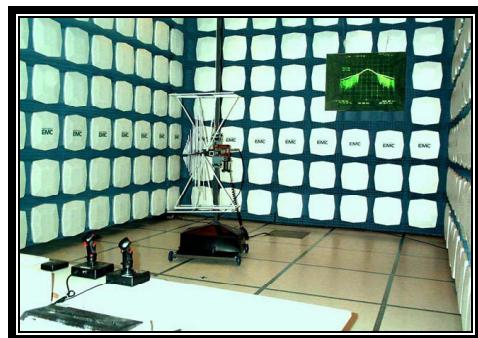
Conducted Immunity		
	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $uc(y)$	normal	1.05
Expanded uncertainty $U$ (level of confidence $\approx 95\%$ )	normal (k = 2)	2.10

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, $uc(y)$ 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):**

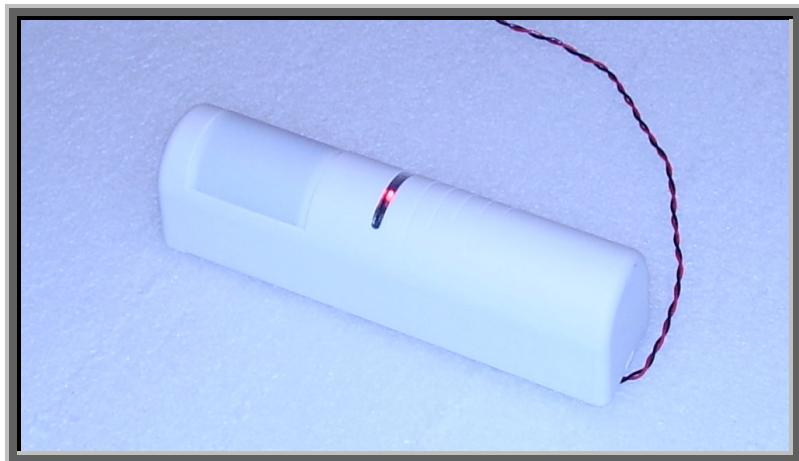
EUT is a request-to-exit sensor that is part of a commercial/industrial facility access control system.

**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**

<b>Equipment modifications</b>					
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

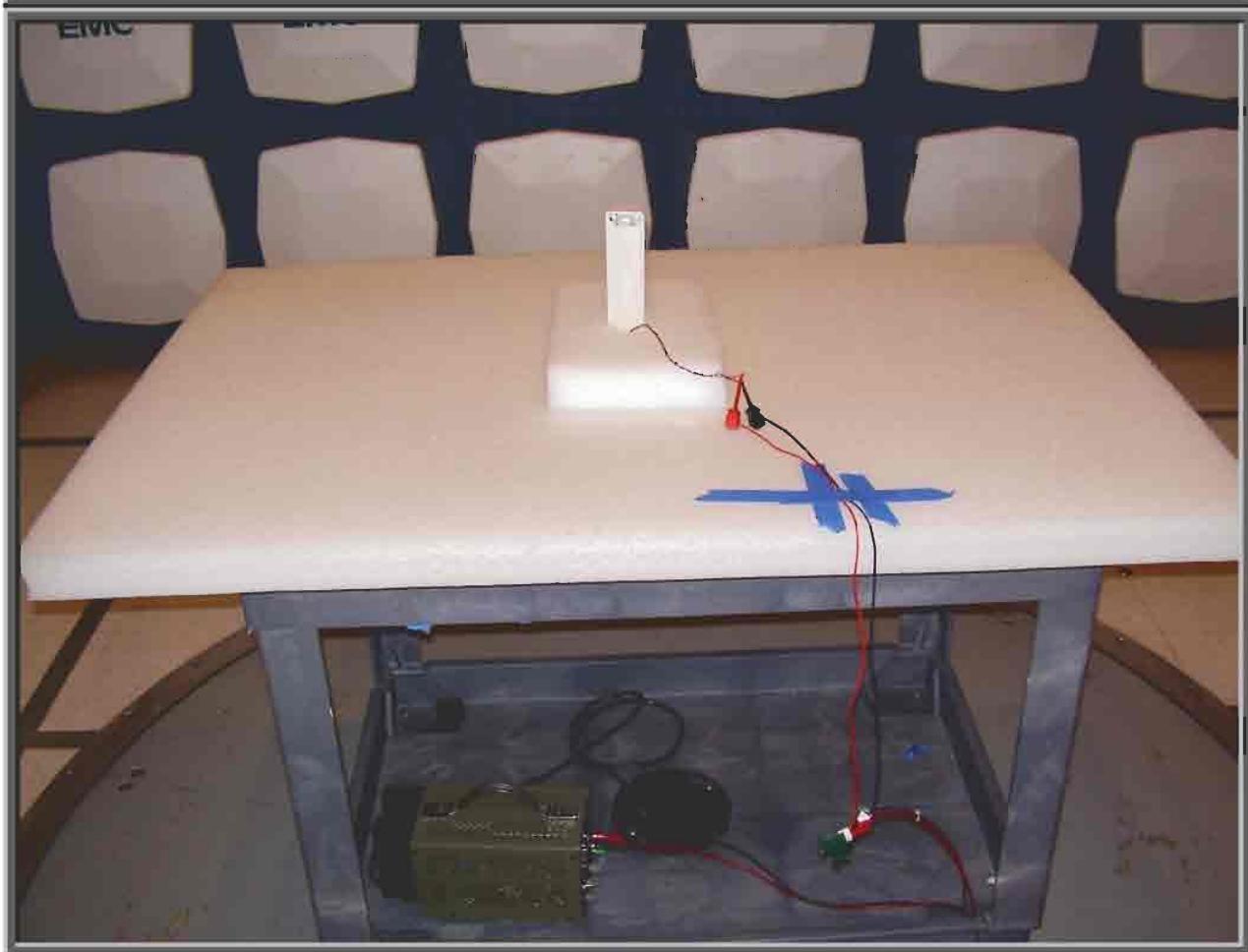
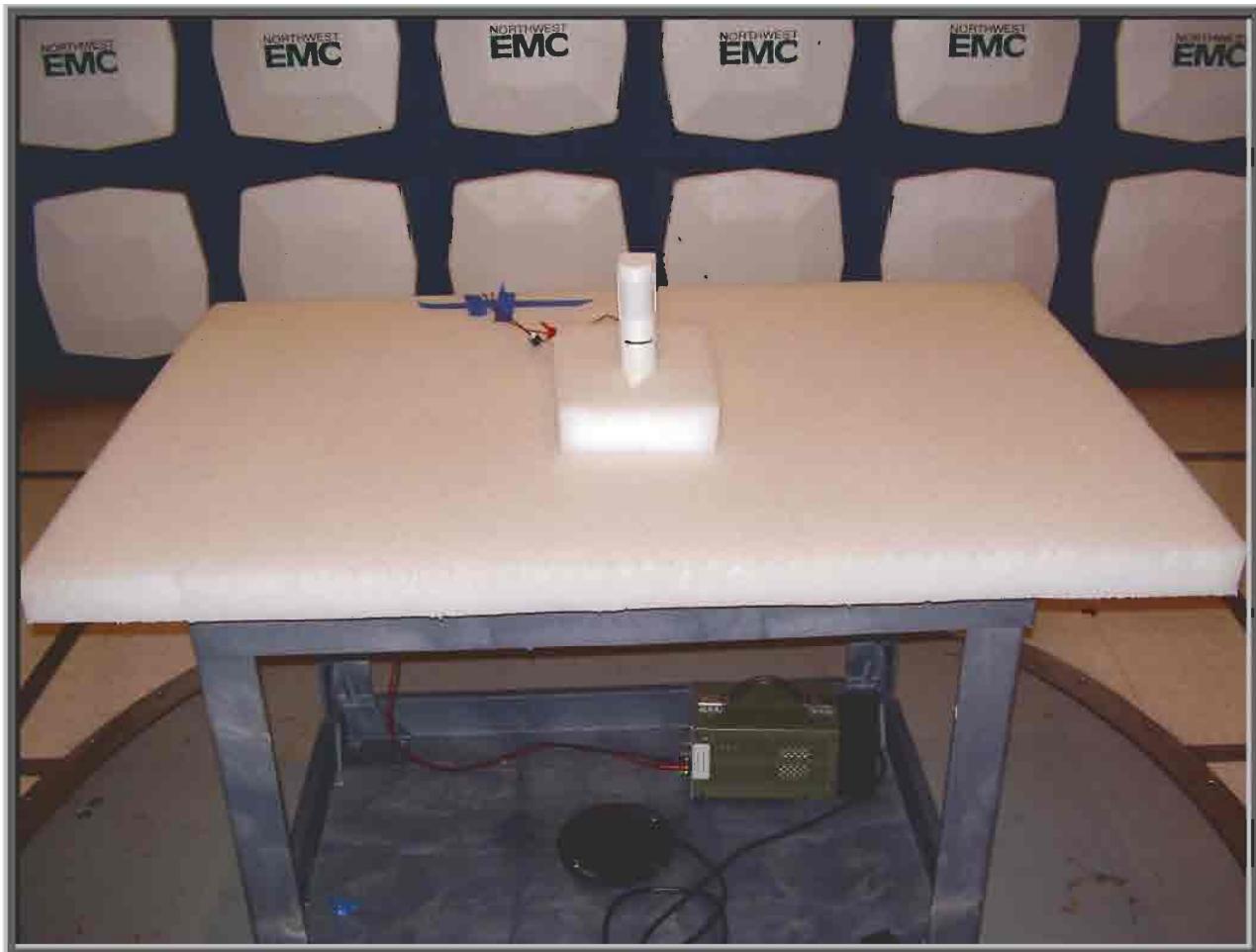
**Requirement:** The field strength of the fundamental emission shall comply with the limits, as defined in 47 CFR 15.249. Field strength limits are specified at a distance of 3 meters.

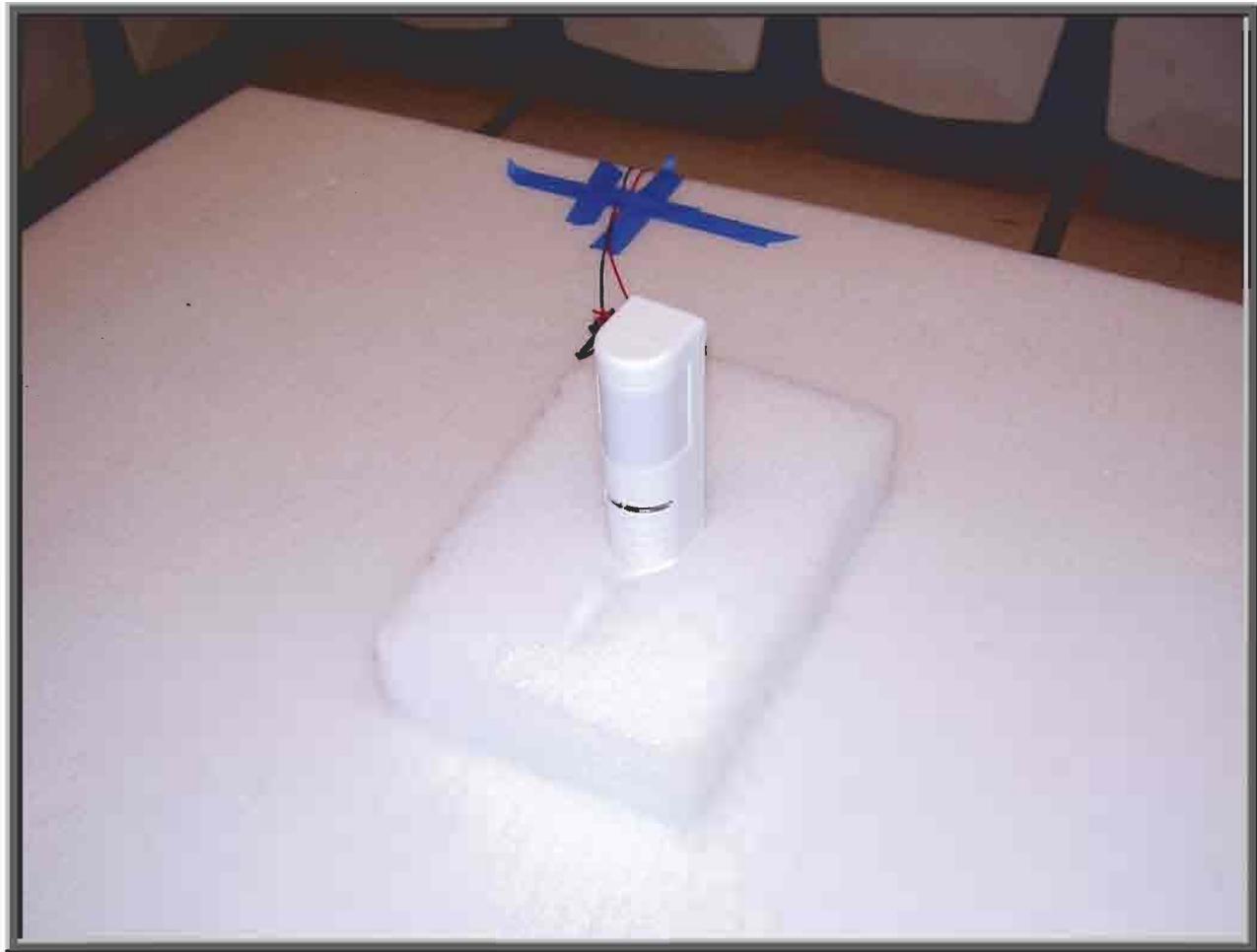
**Configuration:** The antenna to be used with the EUT was tested. The EUT was transmitting and/or receiving while set at the available channel. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT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

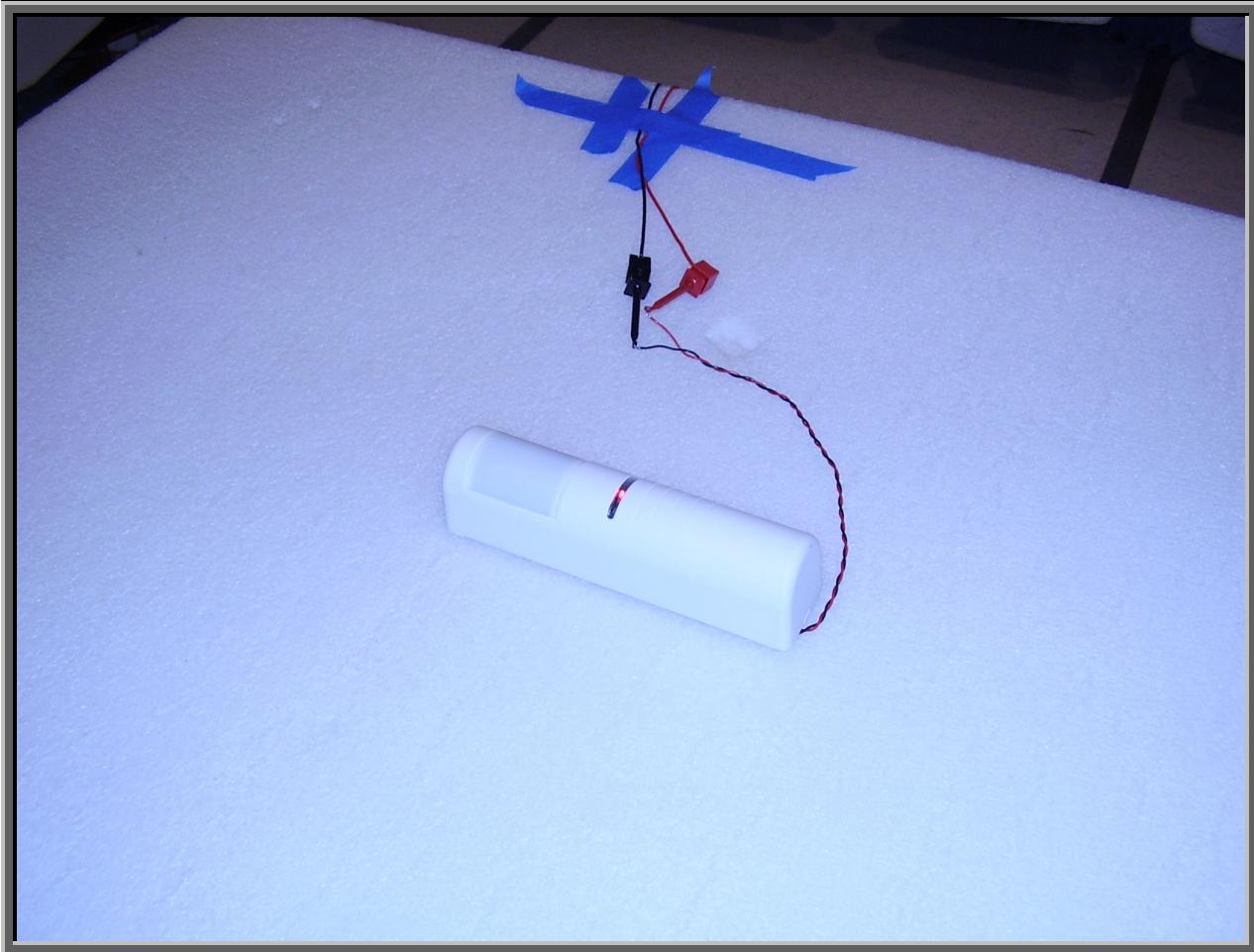
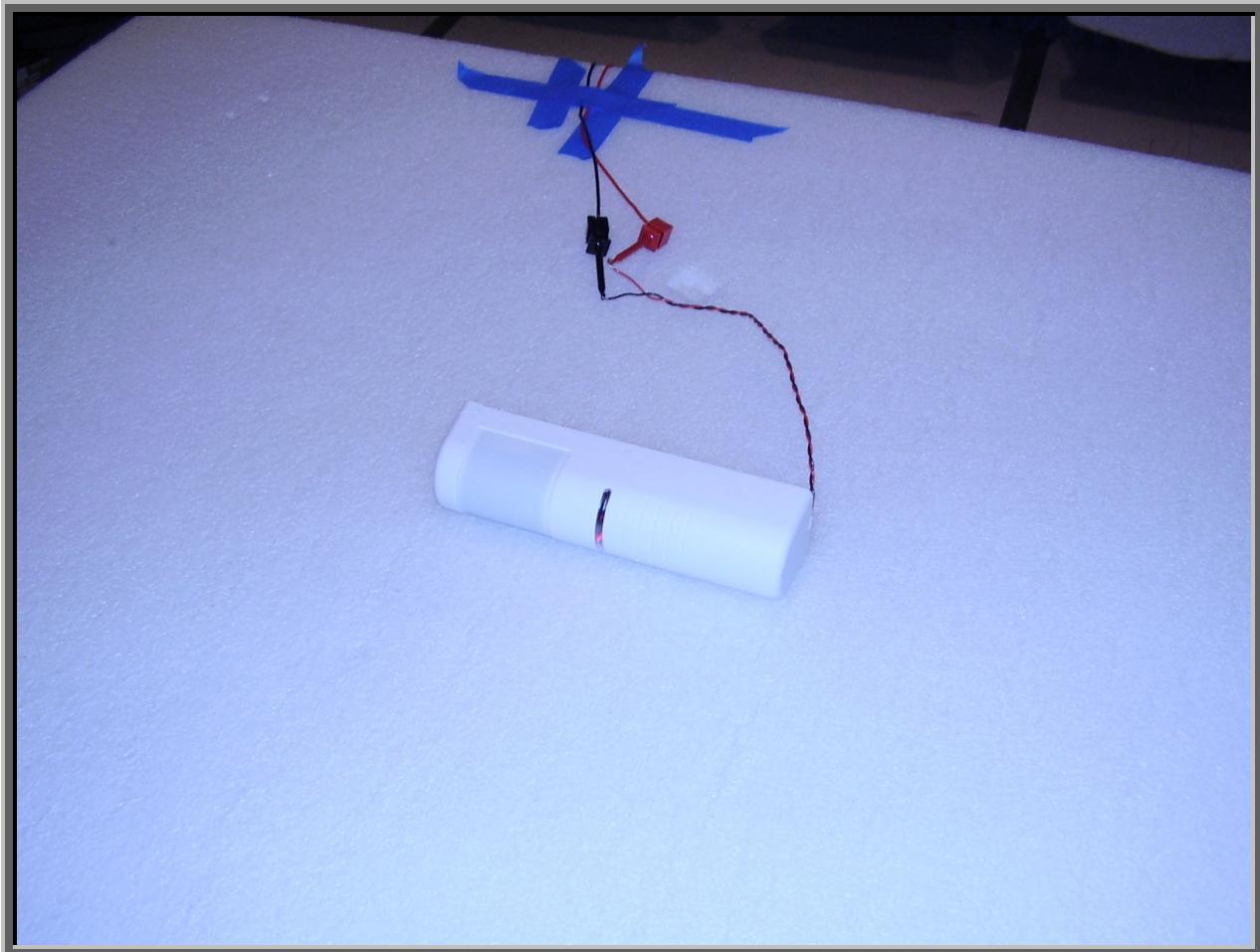
## Completed by:



Field Strength of Fundamental												PSA 2005.10.04	EMI 2005.10.11	
EMC														
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												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 #	1		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	
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	







**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**

Start Frequency	30 MHz	Stop Frequency	40 GHz
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**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 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

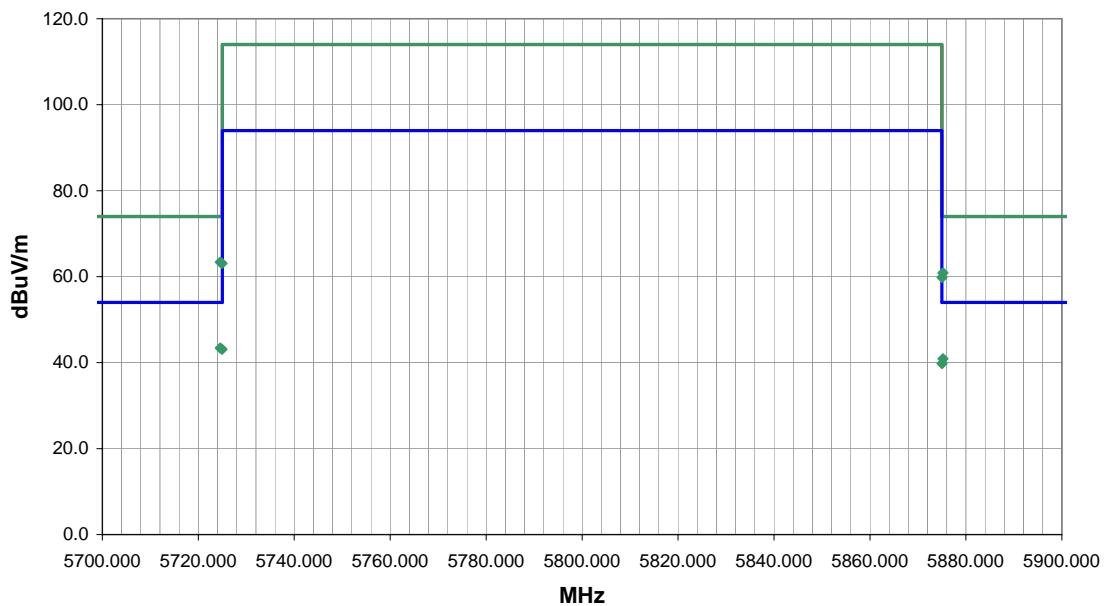
*Measurements were made using the bandwidths and detectors specified. No video filter was used.*

Completed by:

*Holly Antognoli*

## 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
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 #	2	Signature <i>Holly Ashkannejhad</i>	
Configuration #			
Results	Pass		

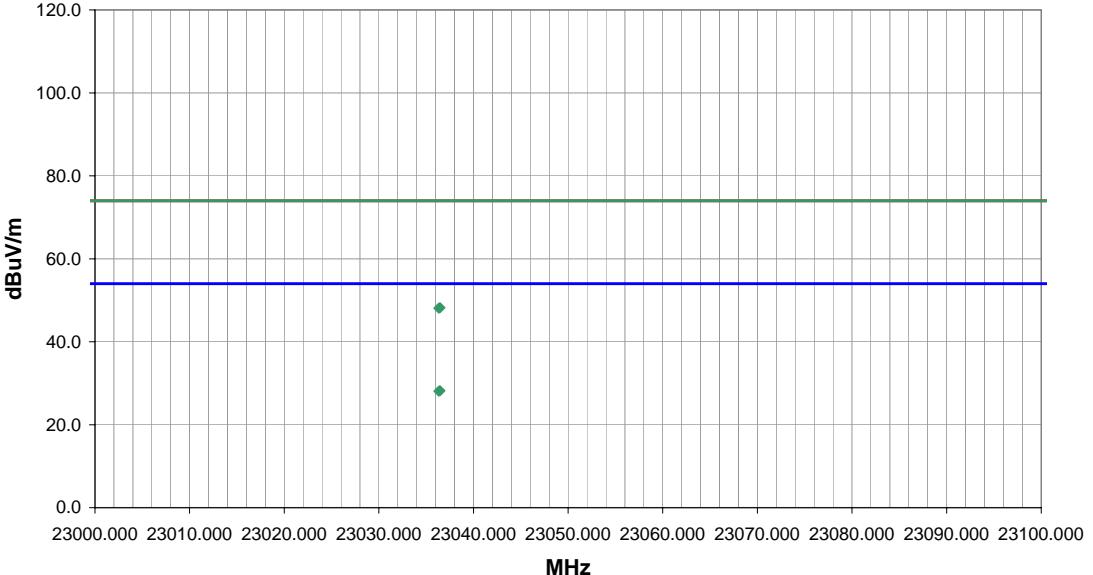


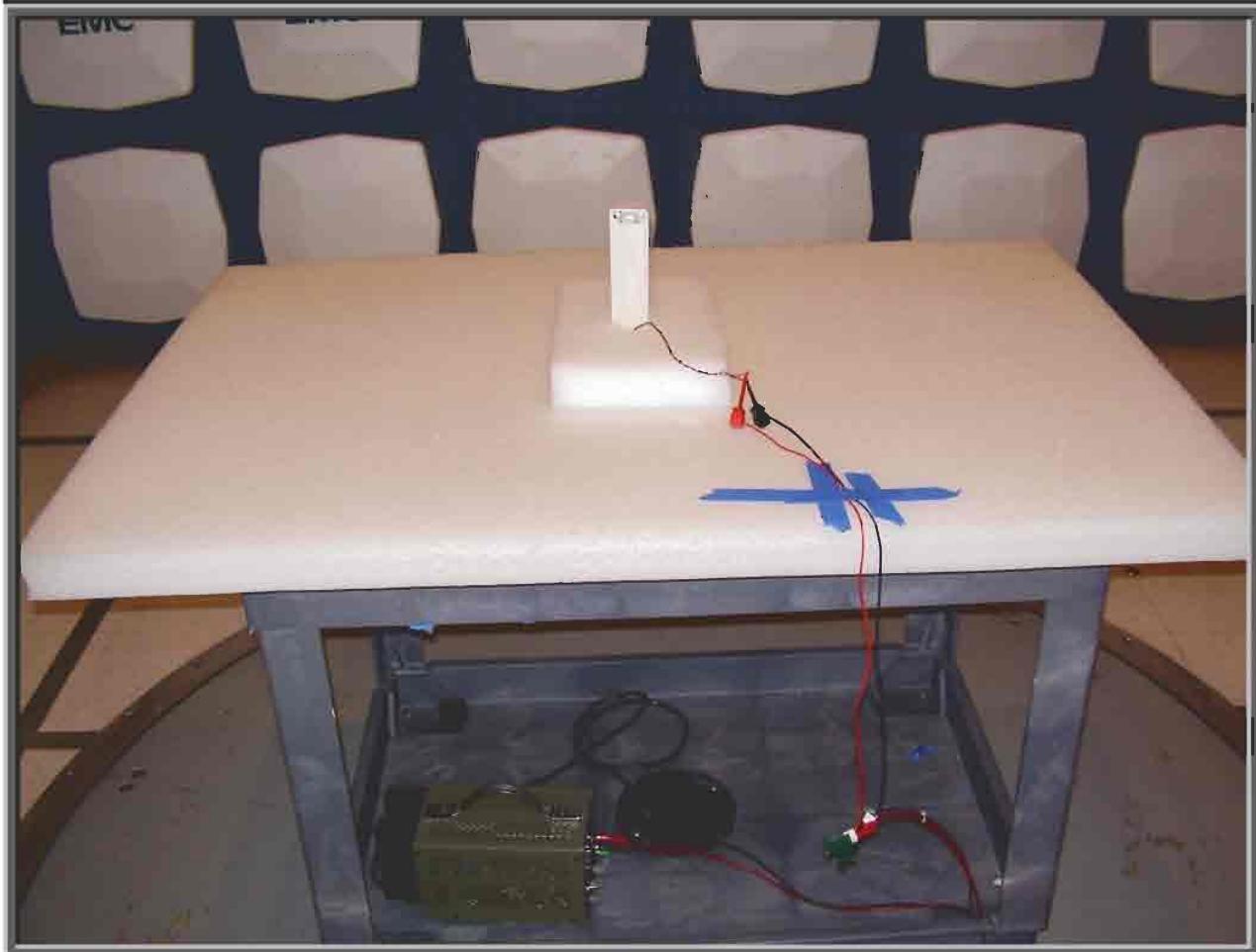
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Pulse desensitization (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
5724.584	55.1	8.3	15.0	1.0	3.0	0.0	V-Horn	PK	0.0	63.4	74.0	-10.6	EUT on 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
5875.208	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
5875.208	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

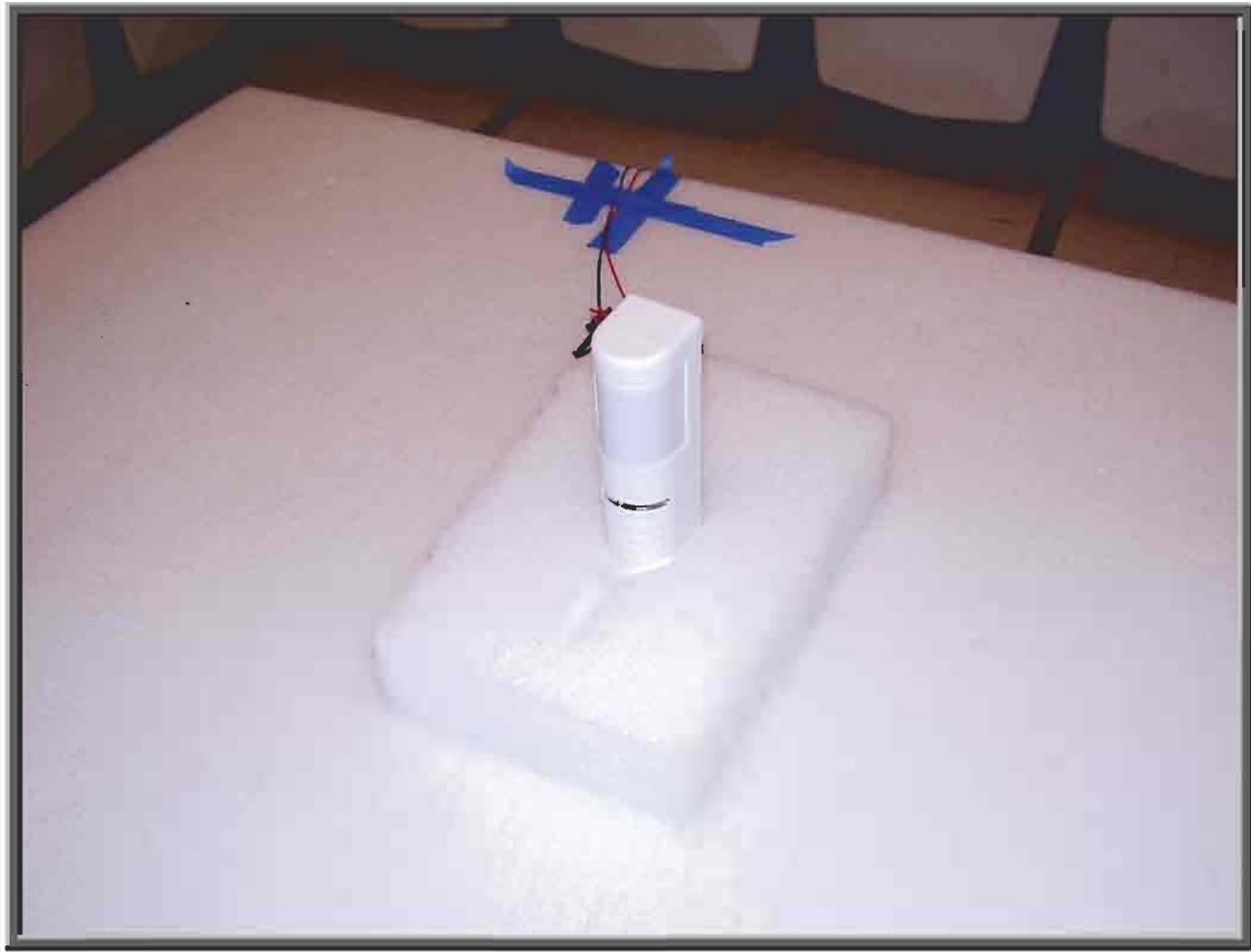
Field Strength of Spurious Emissions												PSA 2005.10.04	EMI 2005.10.11	
EUT: RCR-REX-W, RCR-REX-G, RCR-REX-B												Work Order: ILGX0264		
Serial Number: 001						Date: 10/19/05								
Customer: GE Security, Inc.						Temperature: 24								
Attendee: None						Humidity: 45%								
Project: 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	

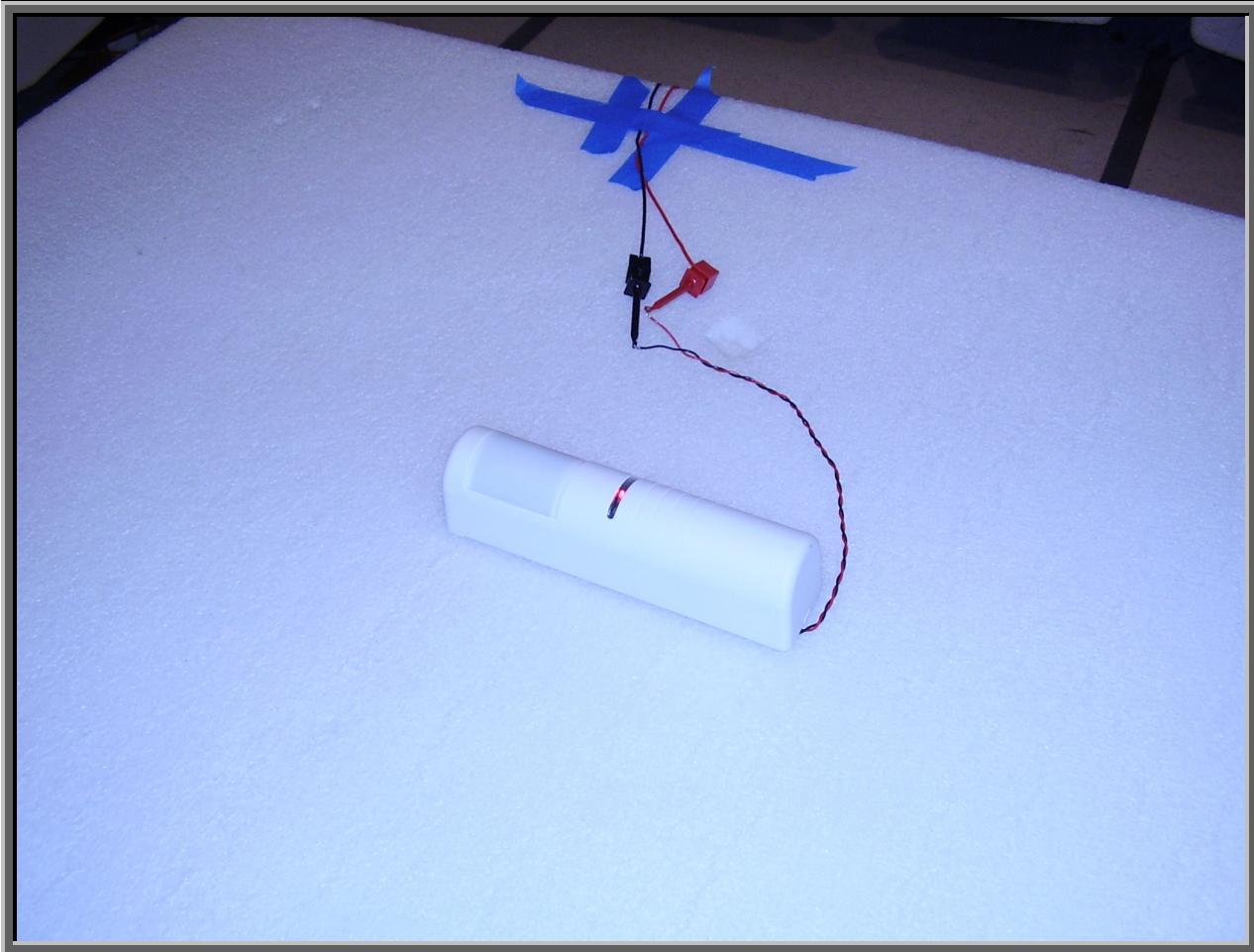
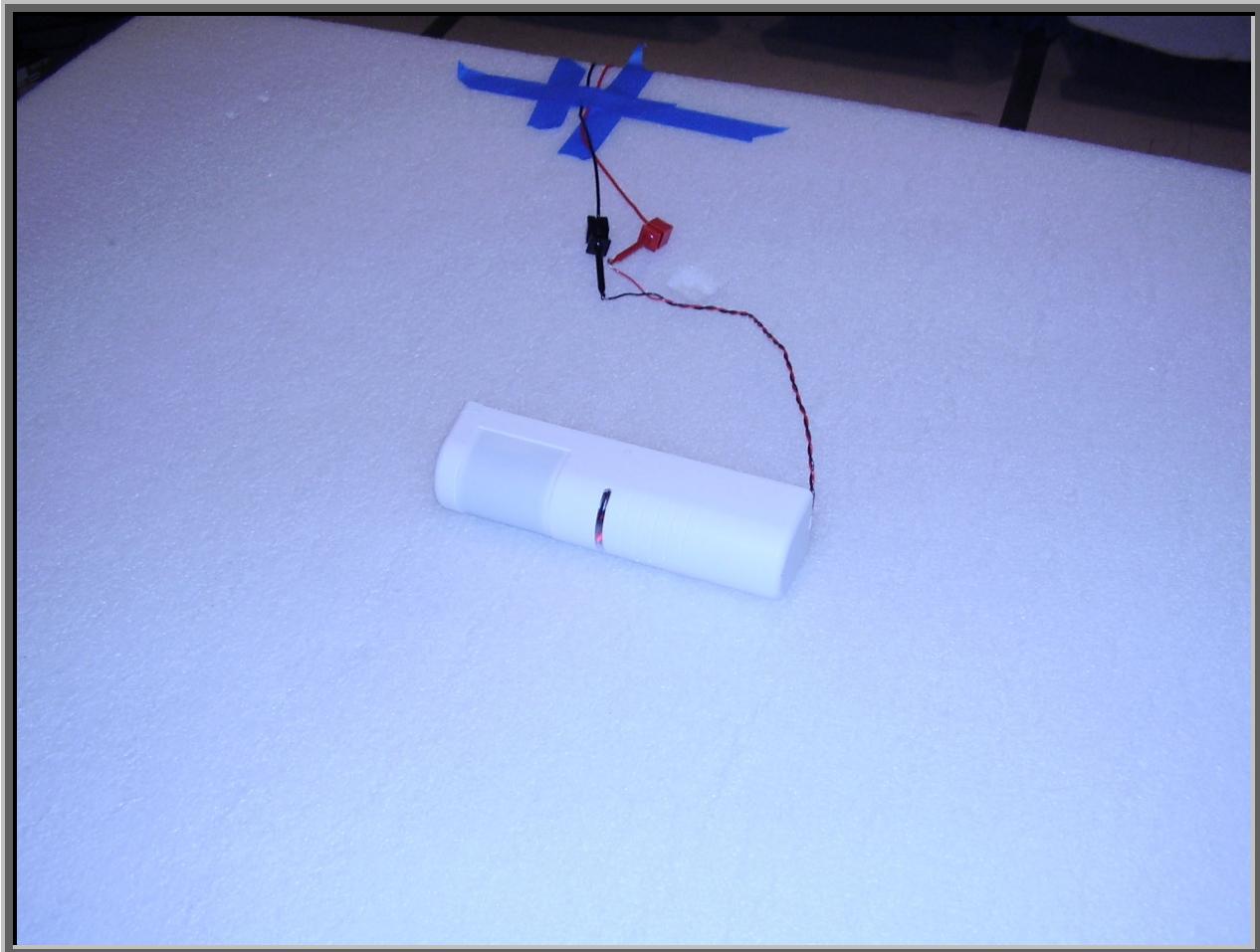
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Pulse desensitization (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
11517.470	34.9	16.0	315.0	1.0	3.0	0.0	V-Horn	PK	0.0	50.9	74.0	-23.1	EUT 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

Field Strength of Spurious Emissions												PSA 2005.10.04	EMI 2005.10.11
EMC													
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 Ashkannnejhah						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		Signature <i>Holly Ashkannnejhah</i>										
Configuration #													
Results	Pass												
<p>The graph plots dBuV/m on the y-axis (0.0 to 120.0) against MHz on the x-axis (17000.000 to 18000.000). A horizontal green line represents the specification limit at approximately 75 dBuV/m. A blue horizontal line represents the test result at approximately 55 dBuV/m. A single green data point is plotted at 17272.200 MHz, which is significantly lower than the specification limit.</p>													
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
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

Field Strength of Spurious Emissions													
EMC											PSA 2005.10.04 EMI 2005.10.11		
EUT: RCR-REX-W, RCR-REX-G, RCR-REX-B Serial Number: 001 Customer: GE Security, Inc. Attendees: None Project: None Tested by: Holly Ashkannejhad											Work Order: ILGX0264 Date: 10/19/05 Temperature: 24 Humidity: 45% Barometric Pressure: 30.04 Job Site: EV01		
TEST SPECIFICATIONS													
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		Signature <i>Holly Ashkannejhad</i>										
Configuration #													
Results	Pass												
 <p>The graph plots dBuV/m on the y-axis (0.0 to 120.0) against MHz on the x-axis (23000.000 to 23100.000). A horizontal blue line at 54 dBuV/m represents the specification limit. Two green diamond data points are plotted at 23036.460 MHz and 23036.330 MHz, both falling below the 54 dBuV/m line.</p>													
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**

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
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  
EMC

## OCCUPIED BANDWIDTH

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	Humidity:	49% RH
Customer Ref. No.:	None	Power:	120VAC/60Hz
Job Site:	EV01		

## TEST SPECIFICATIONS

Specification:	RSS-Gen, issue 1, 4.1	Year:	2005	Method:	RSS-Gen 1, issue 1, 4.4.1	Year:	2005
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## SAMPLE CALCULATIONS

3

## COMMENTS

Measured with 1m radiated test distance

## EUT OPERATING MODES

Modulated 40 kbps data rate

## DEVIATIONS FROM TEST STANDARD

None

## REQUIREMENTS

Per RSS-Gen section 4.4.1 the occupied bandwidth of the transmitted signal is to be reported.

## RESULTS

## BANDWIDTH

Pass

720 kHz

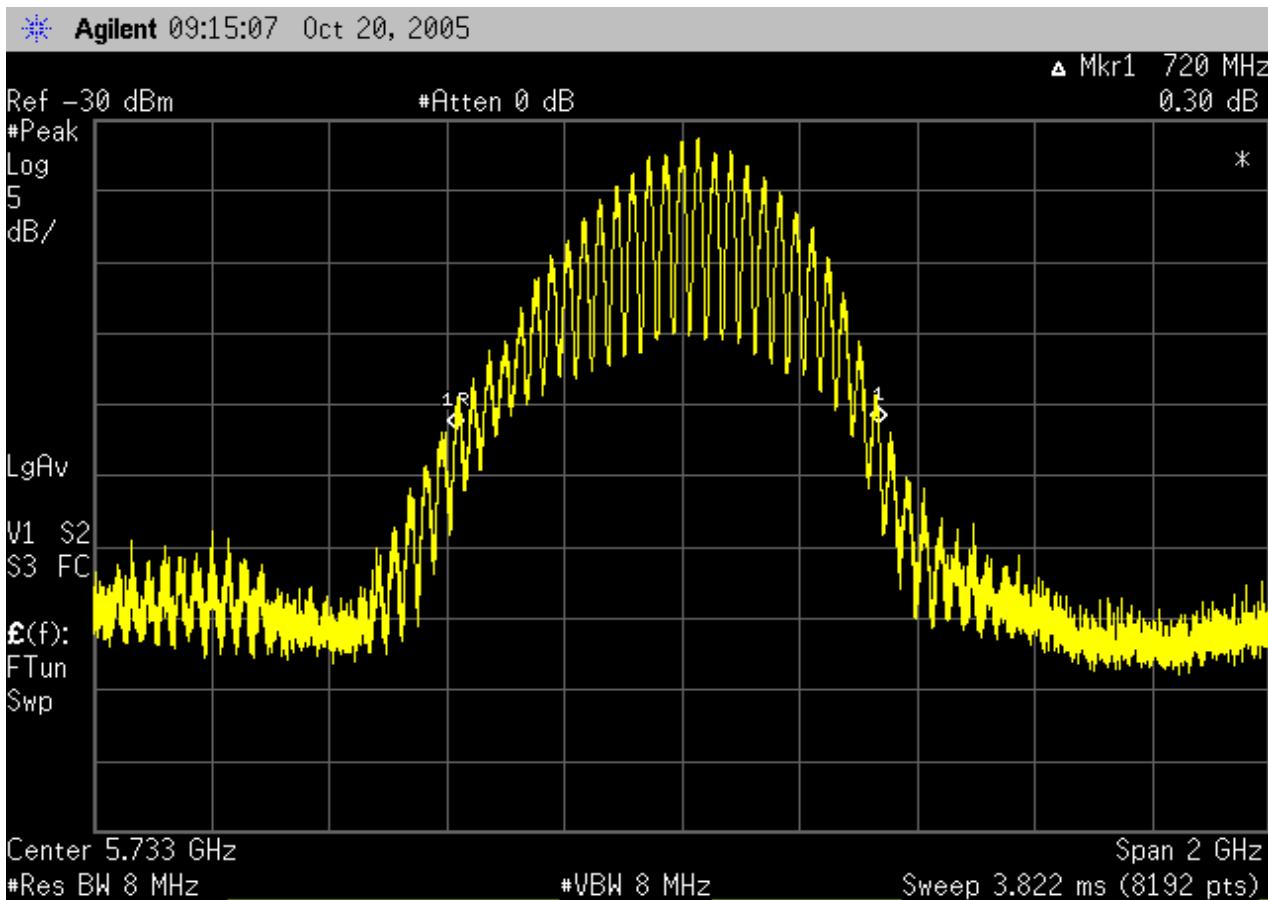
## SIGNATURE

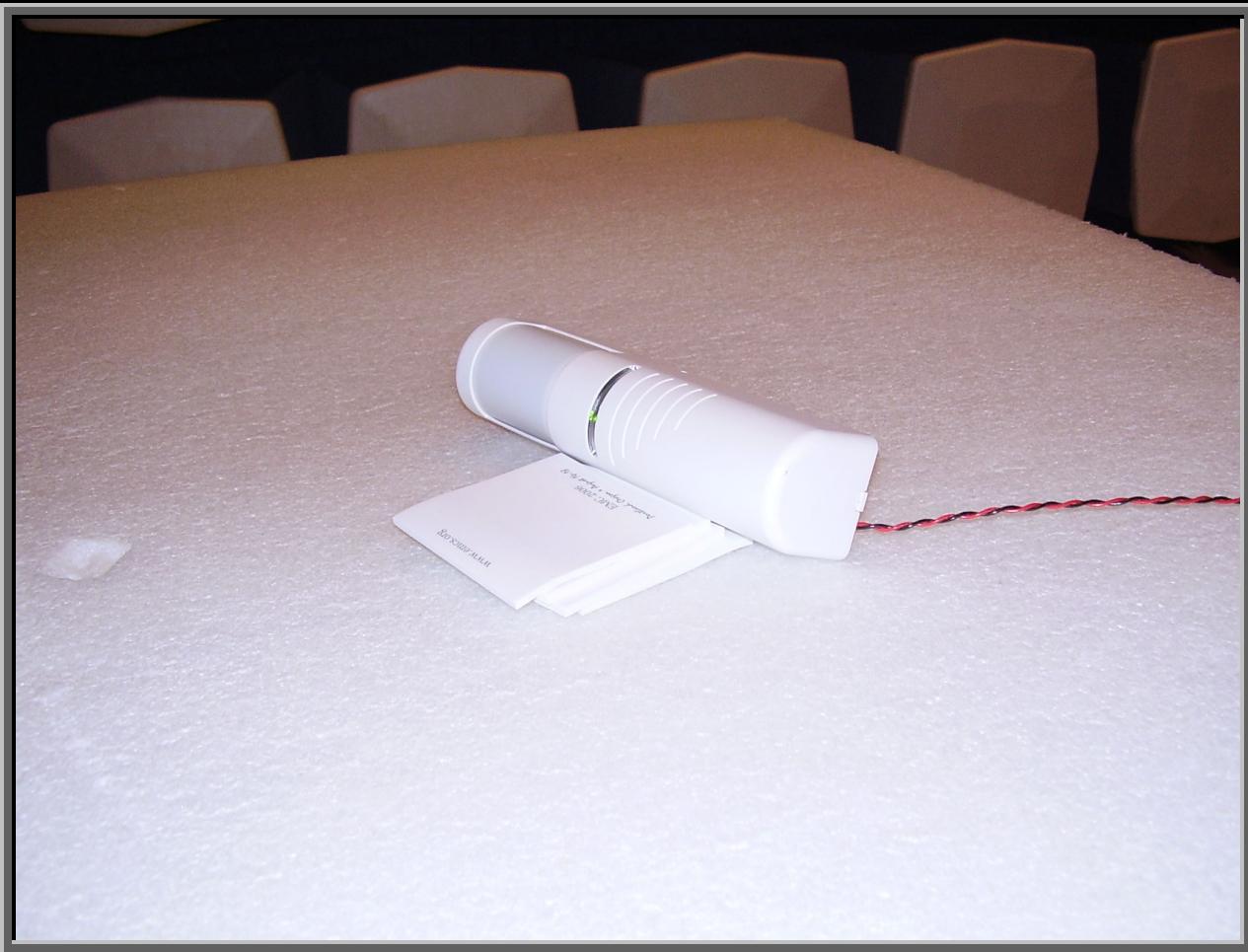


Tested By: \_\_\_\_\_

## DESCRIPTION OF TEST

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**

Start Frequency	30 MHz	Stop Frequency	1 GHz
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**Software\Firmware Applied During Test**

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

<b>Measurement Bandwidths</b>			
<b>Frequency Range (MHz)</b>	<b>Peak Data (kHz)</b>	<b>Quasi-Peak Data (kHz)</b>	<b>Average Data (kHz)</b>
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:

*Holly Antognoli*

NORTHWEST  
EMC

## RADIATED EMISSIONS DATA SHEET

PSA 2005.10.04  
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 15.109(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 #

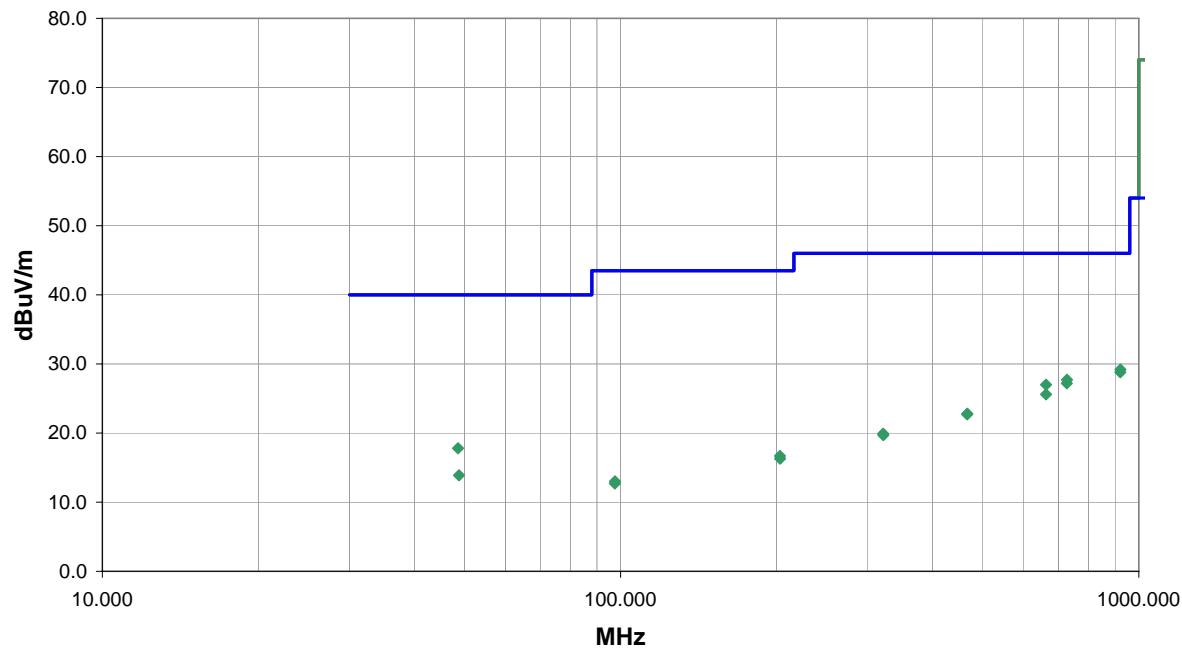
1

Configuration #

1

Results

Pass

Signature *Holly Ashkannejhad*

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

