

## Test Report for Unlicensed Low Power Transmitter

**FCC Applicable Rule Parts:** 15.205, 15.207, 15.209

**Applicant:** Keri Systems Inc.  
2305 Bering Drive  
San Jose, CA 95131

**FCC ID:** N42 KERI3000  
**Model Nos.:** NXT-5R

### Description of device:

The Keri Systems readers, cards, and tags are low frequency, non-contact, identification solutions based upon the latest techniques in radio frequency identification (RFID).

The proximity reader has a receiver circuit, a microprocessor, and a 125kHz exciter circuit that includes a magnetic coil. The tags and cards that are read by the reader have a highly reliable radio frequency integrated circuit (RFIC), attached to a magnetic coil inside a durable, environmentally secure plastic housing.

### TEST REQUIREMENTS

The referenced device is subject to certification under Part 2 of FCC Rules. The specific emissions limits and test requirements are found in Part 15 of FCC Rules. In addition to the device specific requirements listed in 15.209 (re-printed below), the following Part 15 requirements are universal to all unlicensed transmitters and would also apply:

- 15.19 Labeling requirements
- 15.20 Accessories
- 15.21 Information to user
- 15.31 Measurement standards
- 15.33 Frequency range of measurements
- 15.35 Measurement detector functions and bandwidths
- 15.109 Radiated Emissions (unintentional radiators)
- 15.203 Antenna requirement
- 15.204 External radio frequency power amplifiers and antenna modifications.
- 15.205 Restricted bands of operation.
- 15.207 Conducted limits
- 15.209 Radiated emission limits, general requirements.

**REVISION INFORMATION AND ATTESTATION OF RESULTS**

Report No: 07PR017FCC

<b>REV No.</b>	<b>Description</b>	<b>Revised By:</b>	<b>Date</b>
-	Original Issue	T. Cokenias	9/28/2007
B	Correct Rule part typo	T. Cokenias	10/29/2007

FCC ID: N42 KERI3000 meets all FCC requirements for a device of this type.

THOMAS N. COKENIAS

29 October 2007



EMC and Radio Regulatory Consultant  
Agent for Keri Systems Inc.

**15.205 Restricted bands of operation.**

Only spurious emissions are permitted in any of the frequency bands listed below: The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209.

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
10.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	
13.36 - 13.41			

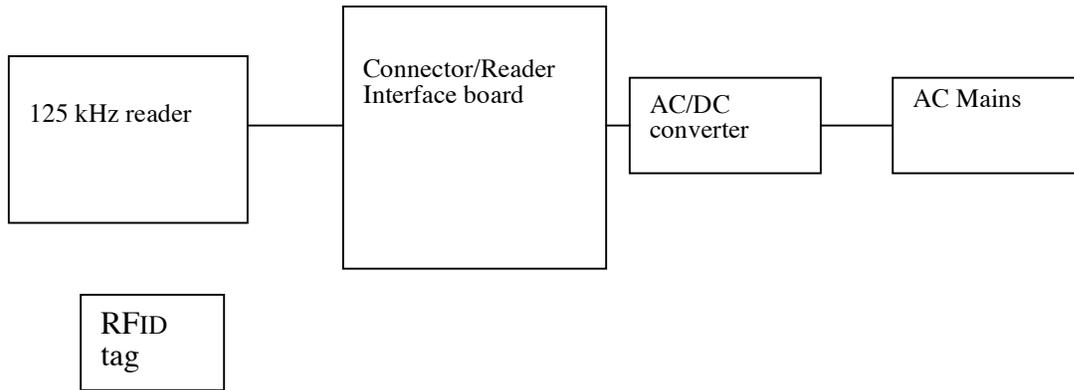
**15.209 Radiated emission limits, general requirements.**

Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength uV/m	Measurement distance, m
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz.

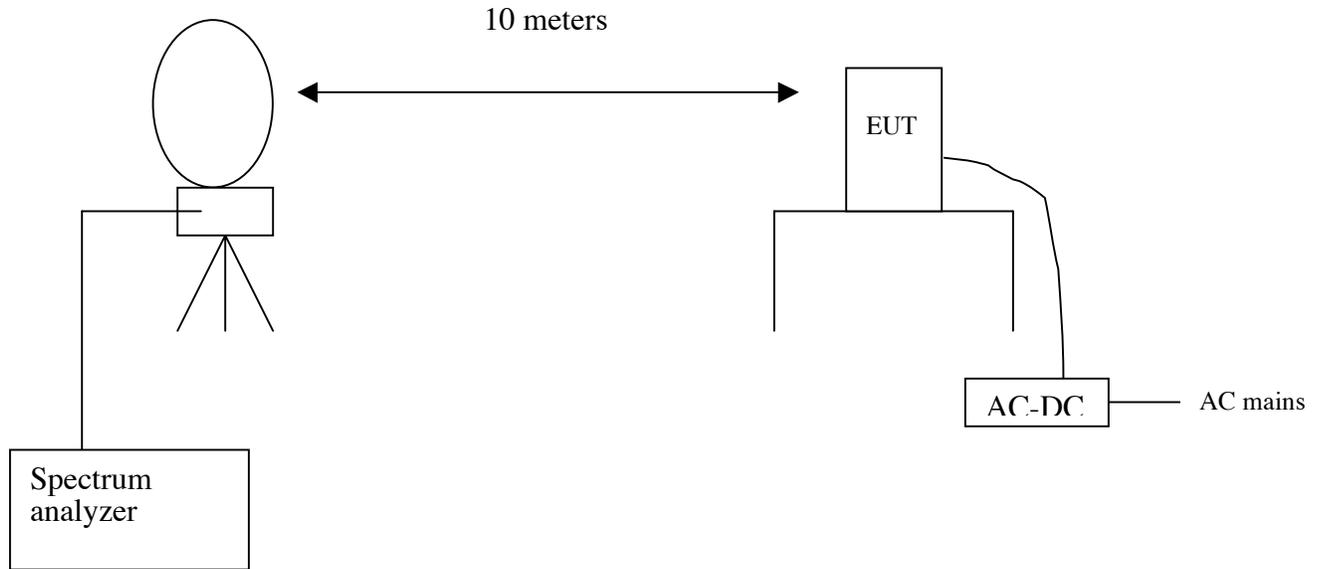
### Test Set-up Diagram



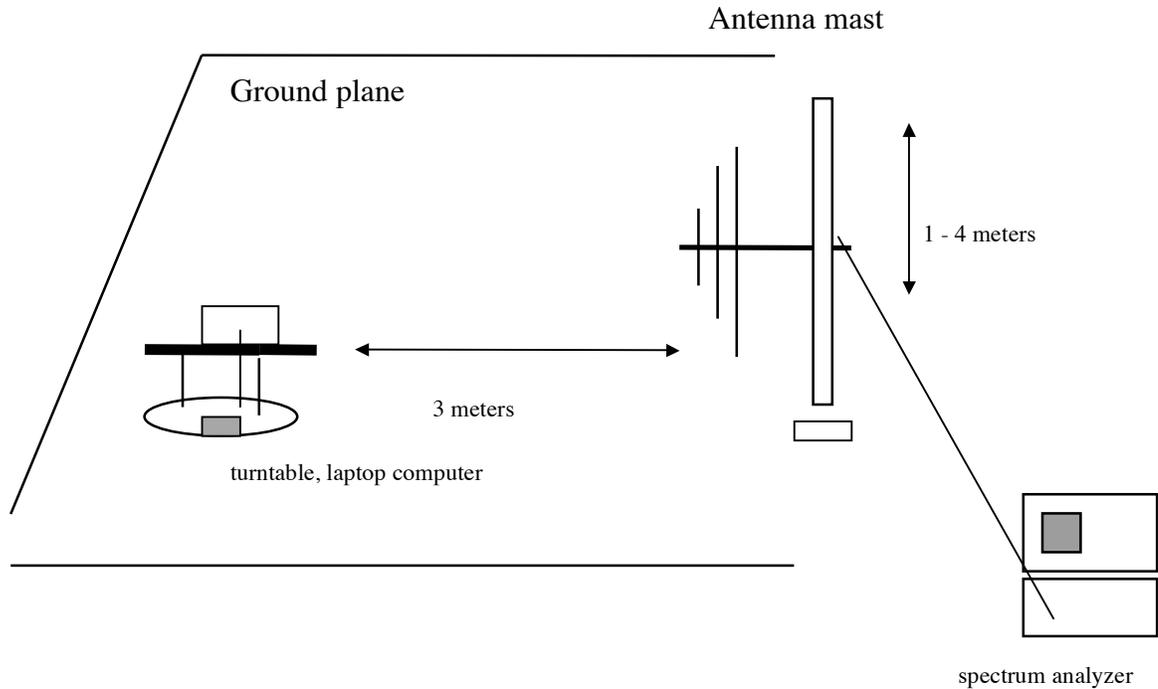
### Test Equipment List

<b>TEST EQUIPMENT LIST</b>				
<b>Name of Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Due Date</b>
Spectrum Analyzer, 1.8 GHz	Agilent / HP	8591A	3009A00791	10/12/07
Antenna, Loop 9 kHz ~ 30 MHz	EMCO	6502	9202-2722	10/24/08
EMI Test Receiver	R & S	ESHS 20	827129/006	1/27/08
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	9/15/07
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	9/15/07

**15.205 and 15.209 Radiated Emissions  
Radiated Test Set-up, 0.125 - 30MHz**



### 15.205 and 15.209 Radiated Emissions Radiated Test Set-up, 30 - 1000 MHz



### Test Procedures, 0.125 – 30 MHz

The EUT was placed on a non-conductive table located on a large open grassy area free of nearby metal obstructions. The loop antenna was placed at a location 10m from the EUT. Radiated emissions were measured with the loop antenna both parallel and perpendicular to the plane of the EUT loop antenna.

### Test Procedures, 30 -1000 MHz

The EUT was placed on a turntable in a 5m anechoic chamber. The EUT was set to normal operating conditions (constantly transmitting). Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4. Because the EUT is DC operation only, the EUT was run off a 12V battery so that low frequency (30-100 MHz) emissions from an AC/DC converter would not contaminate test results.

### Test Results

EUT emissions are below noise floor or at least 6 dB below 15.209 limits.

## Radiated Emissions, 0.125 – 30 MHz

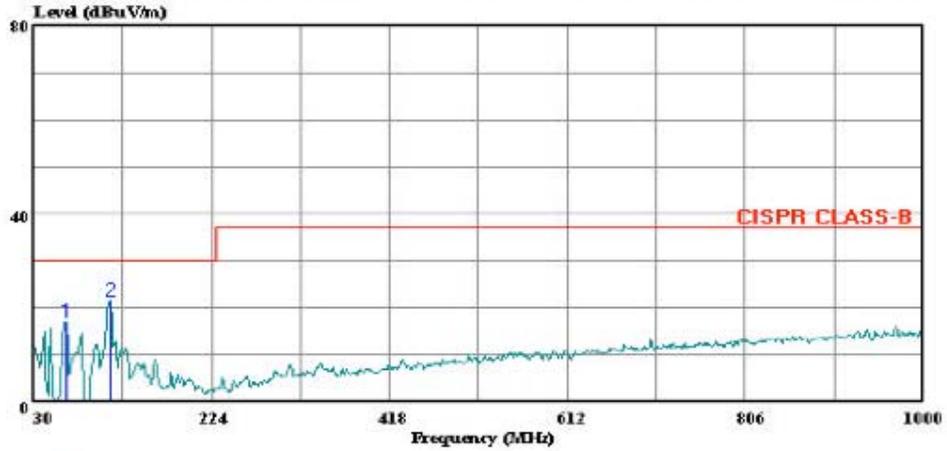
FCC Part 15, Subpart B & C      10 Meter Distance Measurement At Open Field											
Company: Keri systems											
Project #:											
Model #:											
Tester: Doug Anderson											
Date: 07/10/07											
Frequency (MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	AF (dB/m)	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Corrected Reading (dBuV/m)	Limit (dBuV/m)	AV Limit (dBuV/m)	Av Margin (dB)	Notes
Loop Antenna Face On: 0.125	61.52		N/A	10.481	-59.00	13.00	N/A	25.70	25.70	-12.7	Fundamental @ 300m Dist, FCC Limits
Loop Antenna Face Off: 0.125	57.9		N/A	10.481	-71.10	-2.72	N/A	25.70	25.70	-28.4	Fundamental @ 300m Dist, FCC Limits
* No more emissions were found up to 30MHz											
Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 10000Mhz. Radiated emission limits in these three bands are based on measurements employing an average detector.											
P.K. = Peak											
Q.P. = Quasi Peak Readings											
A.F. = Antenna factor											

**Out of Band emissions: 30-1000 MHz, Vertical**



Compliance Certification Services  
 47173 Benicia Street  
 Fremont, CA 94538  
 Tel: (510) 771-1000  
 Fax: (510) 661-0888

Data#: 10 File#: 07U11184 emi.EMI Date: 07-18-2007 Time: 14:21:41



Trace: 9

Ref Trace:

Condition: CISPR CLASS-B VERTICAL  
 Test Operator:: William Zhuang  
 Project #: : 07U11184  
 Company: : Farpointe Data, Inc.  
 Configuration:: Reader only  
 Mode : : Transmit worst case  
 Target: : CISPR Class B

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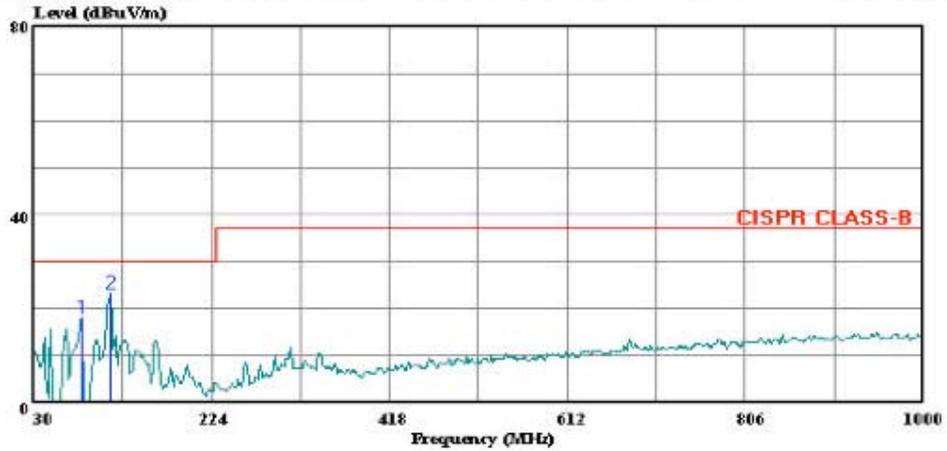
	Read	Read	Limit	Over		
Freq	Level	Factor	Level	Limit	Limit	Remark
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	64.920	36.37	-19.37	17.00	30.00	-13.00 Peak
2	113.420	35.85	-14.51	21.34	30.00	-8.66 Peak

**Out of Band emissions: 30-1000 MHz, Horizontal**



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Data#: 12 File#: 07U11184 emi.EMI Date: 07-18-2007 Time: 14:27:27



Trace: 11

Ref Trace:

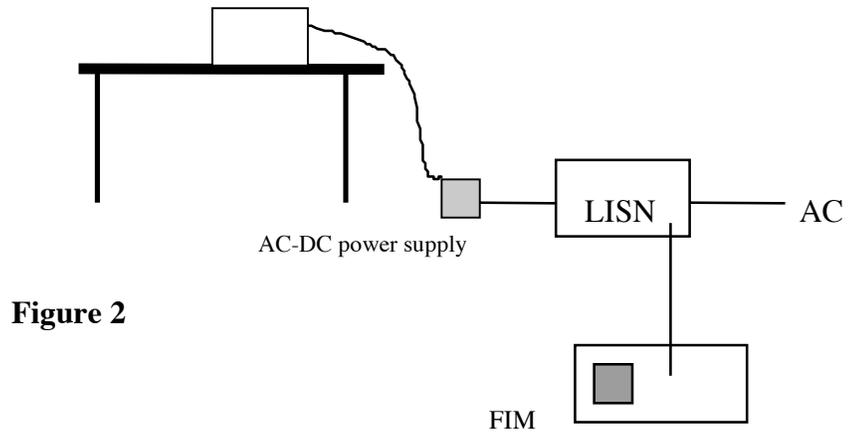
Condition: CISPR CLASS-B HORIZONTAL  
 Test Operator:: William Zhuang  
 Project #: : 07U11184  
 Company: : Farpointe Data, Inc.  
 Configuration:: Reader only  
 Mode : : Transmit worst case  
 Target: : CISPR Class B

Page: 1

	Read	Read	Limit	Over		
Freq	Level	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	82.380	37.20	-19.35	17.85	30.00	-12.15 Peak
2	114.390	37.44	-14.29	23.15	30.00	-6.85 Peak

**AC Line Conducted Emissions**  
**Test Requirement: 15.107, 15.207**

**Test Set-up**



**Figure 2**

**Test Procedure**

1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in normally.
2. Line conducted data was recorded for both NEUTRAL and HOT lines.

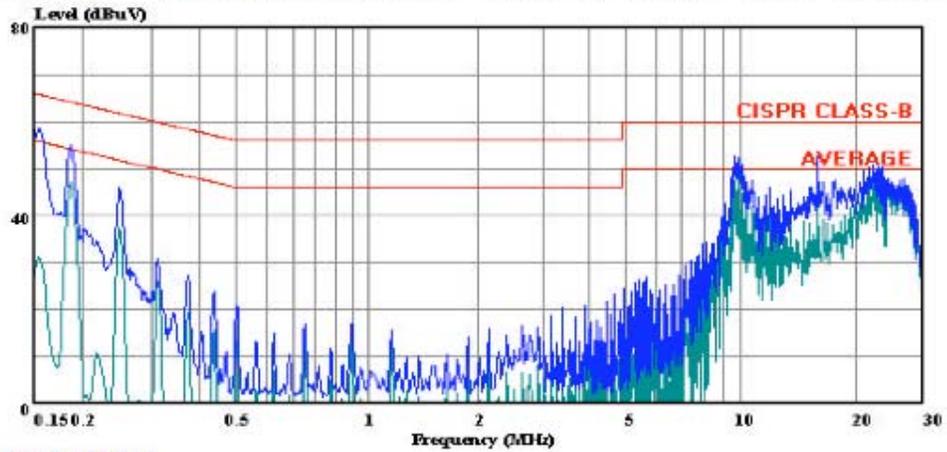
**Test Results**

PASS. Refer to data plot below.



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47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
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Data#: 21 File#: 07U11184LC.EMI Date: 07-09-2007 Time: 12:45:12



(Line Conduction)  
Trace: 19

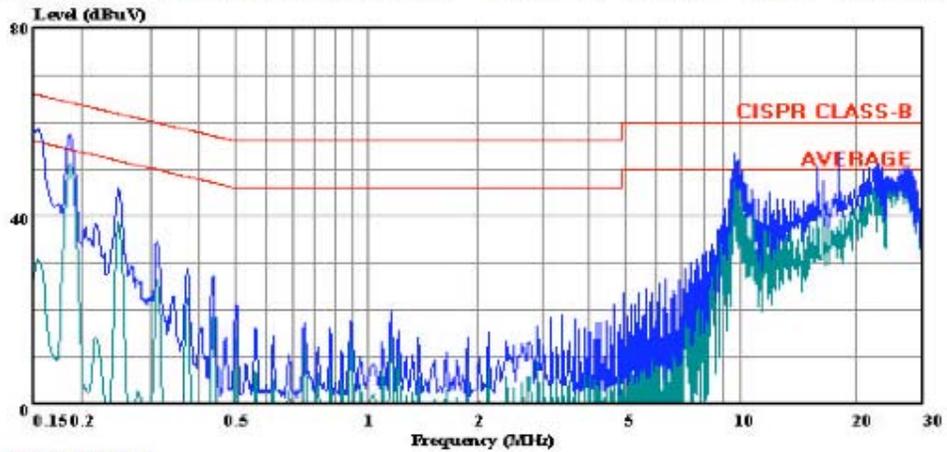
Ref Trace:

Condition: CISPR CLASS-B  
Test Operator:: Doug Anderson  
Project #: 07U11184  
Company: Keri Systems  
Configuration:: Main PCBA / 4x4 / Reader / Xantrex P/S  
Mode: Active  
Target: FCC CLASS B  
Voltage: L1: Peak(Blue), Avg(Green)  
: 115VAC/60Hz



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Data#: 28 File#: 07U11184LC.EMI Date: 07-09-2007 Time: 13:30:00



(Line Conduction)  
Trace: 26

Ref Trace:

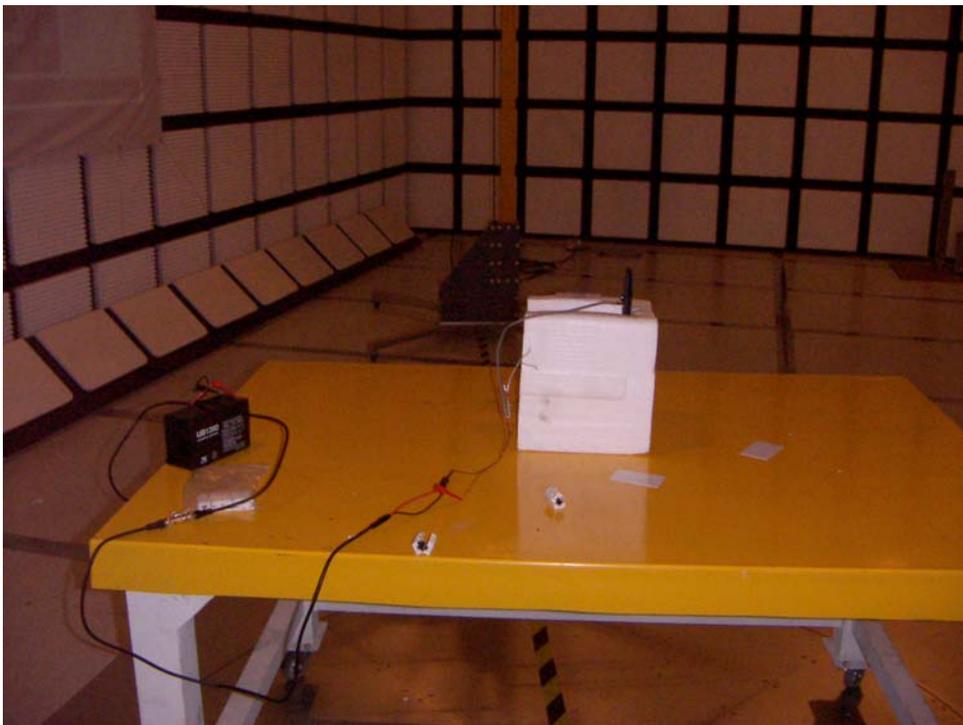
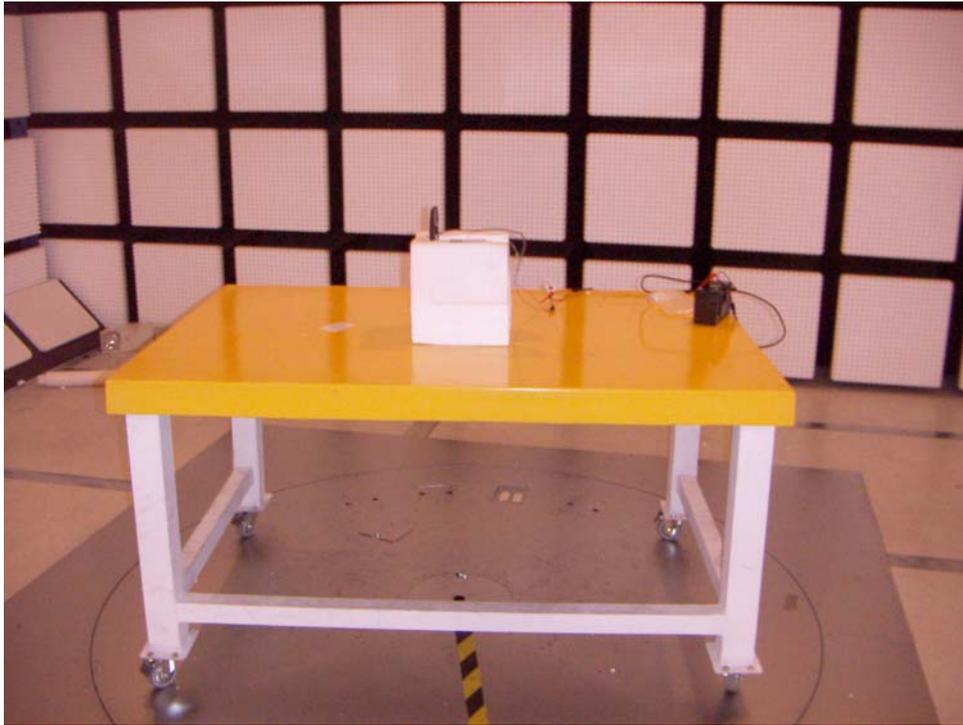
Condition: CISPR CLASS-B  
Test Operator:: Doug Anderson  
Project #: : 07U11184  
Company: : Keri Systems  
Configuration:: Main PCBA / 4x4 / Reader /Xantrex P/S  
Mode: : Active  
Target: : FCC CLASS B  
Voltage: : L2:Peak(Blue), Avg(Green)  
: 115VAC/60Hz

## Test Set-Up Photographs

Radiated emissions below 30 MHz



**Radiated Emissions, 30 – 1000 MHz**



## AC Line Conducted Emissions

### Front View



**Side View**

