

## EMISSIONS TEST REPORT

Report Number: 3139325BOX-001b

Project Number: 3139325

Testing performed on the

VCA100 Radio

Model: BAEVCA100-81FCGX-LF

To

FCC Part 15 Subpart C "Intentional Radiators"

For

BAE Systems – Homeland Security Solutions

Test Performed by:  
Intertek – ETL SEMKO  
70 Codman Hill Road  
Boxborough, MA 01719

Test Authorized by:  
BAE Systems – Homeland Security Solutions  
2 Forbes Road  
Lexington, MA 02420

Prepared by:



Nicholas Abbondante

Date: 10/27/2008

Reviewed by:



Jeff Goulet

Date: 10/27/08

*This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program. This report must not be used to claim product endorsement by A2LA, NIST nor any other agency of the U.S. Government.*

## 1.0 Job Description

### 1.1 Client Information

This EUT has been tested at the request of:

**Company:** BAE Systems – Homeland Security Solutions  
2 Forbes Road  
Lexington, MA 02420  
**Contact:** Mr. Ralph Lombardo  
**Telephone:** 603-885-7172  
**Fax:** N/A  
**Email:** [Ralph.lombardo@baesystems.com](mailto:Ralph.lombardo@baesystems.com)

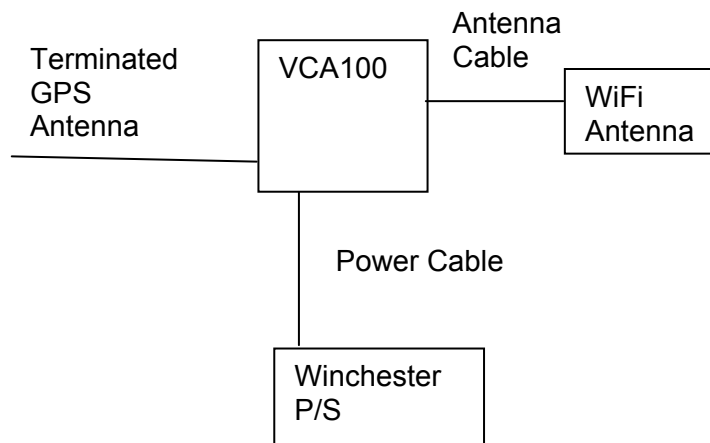
### 1.2 Equipment Under Test

**Equipment Type:** VCA100 Radio  
**Model Number(s):** BAEVCA100-81FCGX-LF  
**Serial number(s):** 0716HNH000075  
**Manufacturer:** BAE Systems – Homeland Security Solutions  
**EUT receive date:** 09/02/2008  
**EUT received condition:** Prototype in Good Condition  
**Test start date:** 10/14/2008  
**Test end date:** 10/22/2008

**1.3 Test Plan Reference:** Tested according to the standards listed, and ANSI C63.4:2003.

### 1.4 Test Configuration

#### 1.4.1 Block Diagram



#### 1.4.2. Cables:

Cable	Shielding	Connector	Length (m)	Qty.
WiFi Antenna Cable	Braid	SMA	4.2	1
GPS Antenna Cable	Braid	SMA	5.5	1
Power Cable	None	Plastic/Wire	3.25	1

#### 1.4.3. Support Equipment:

Name: Antenex WiFi Antenna 2.4-2.5 GHz  
 Model No.: A10245  
 Serial No.: N/L

Name: All-Start Winchester Portable Power Generator  
 Model No.: WPG103  
 Serial No.: N/L

#### 1.5 Mode(s) of Operation:

During testing, the EUT was powered from a nominal 12V DC power supply. During the FCC Part 15 Subpart C testing, the EUT was fully powered but only the WiFi transmitter was transmitting at maximum duty cycle.

**1.6 Floor Standing Equipment:**      Applicable: \_\_\_\_\_      Not Applicable:  X

## 2.0 Test Summary

TEST STANDARD	RESULTS	
FCC Part 15 Subpart C		
SUB-TEST	TEST PARAMETER	COMMENT
FCC Part 15 Subpart C		
RF Output Power FCC §15.247(b)(3)	Conducted RF Output Power must not exceed 1 Watt (30 dBm). EIRP must not exceed 4 Watts (36 dBm).	Pass
Radiated Emissions FCC §15.205, §15.209, §15.247(d)	Spurious emissions must be at least 20 dB lower than the fundamental field strength when measured with a 100 kHz bandwidth. Emissions which fall in the restricted bands of 15.205 must meet the general limits of 15.209.	Pass

### 3.0 Sample Calculations

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where  
 FS = Field Strength in dB $\mu$ V/m  
 RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V  
 CF = Cable Attenuation Factor in dB  
 AF = Antenna Factor in dB  
 AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

RA = 52.0 dB $\mu$ V  
 AF = 7.4 dB/m  
 CF = 1.6 dB  
 AG = 29.0 dB  
 FS = 32 dB $\mu$ V/m

$$\text{Level in } \mu\text{V/m} = [10(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

The following is how net line-conducted readings were determined:

$$NF = RF + LF + CF + AF$$

Where NF = Net Reading in dB $\mu$ V  
 RF = Reading from receiver in dB $\mu$ V  
 LF = LISN Correction Factor in dB  
 CF = Cable Correction Factor in dB  
 AF = Attenuator Loss Factor in dB

To convert from dB $\mu$ V to  $\mu$ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where UF = Net Reading in } \mu\text{V}$$

#### Example:

$$NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 \text{ dB}\mu\text{V}$$

$$UF = 10^{(49.1 \text{ dB}\mu\text{V} / 20)} = 254 \mu\text{V/m}$$

### 3.1 Measurement Uncertainty

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes.

The expanded uncertainty ( $k = 2$ ) for radiated emissions from 30 to 1000 MHz has been determined to be:

$\pm 3.5$  dB at 10m,  $\pm 3.8$  dB at 3m

The expanded uncertainty ( $k = 2$ ) for mains conducted emissions from 150 kHz to 30 MHz has been determined to be:

$\pm 2.6$  dB

The expanded uncertainty ( $k = 2$ ) for telecom port conducted emissions from 150 kHz to 30 MHz has been determined to be:

$\pm 3.2$  for ISN and voltage probe measurements

$\pm 3.1$  for current probe measurements

### 3.2 Site Description

#### Test Site(s): 2

Our OATS are 3m and 10m sheltered emissions measurement ranges located in a light commercial environment in Boxborough, Massachusetts. They meet the technical requirements of ANSI C63.4-2003 and CISPR 22:1993/EN 55022:1994 for radiated and conducted emission measurements. The shelter structure is entirely fiberglass and plastic, with outside dimensions of 33 ft x 57 ft. The structure resembles a quonset hut with a center ceiling height of 16.5 ft.

The testing floor is covered by a galvanized sheet metal groundplane that is earth-grounded via copper rods around the perimeter of the site. The joints between individual metal sheets are bridged with a 2 inch wide metal strips to provide low RF impedance contact throughout. The sheets are screwed in place with stainless steel, round-head screws every three inches. Site illumination and HVAC are provided from beneath the ground reference plane through flush entry ports, the port covers are electrically bonded to the ground plane.

A flush metal turntable with 12 ft. diameter and 5000 lb. load capacity (12,000 lb. in Site 3) is provided for floor-standing equipment. A wooden table 80 cm high is used for table-top equipment. The turntable is electrically connected to the ground plane with three copper straps. The straps are connected to the turntable at the center of it with ground braid. The copper strap is directly connected to the groundplane at the edges of the turntable. The turntable is located on the south end of the structure and the antennas are mounted 3 and 10 meters away to the north. The antenna mast is a non-conductive with remote control of antenna height and polarization. The antenna height is adjustable from 1 to 4 meters.

All final radiated emission measurements are performed with the testing personnel and measurement equipment located below the ground reference plane. The site has a full basement underneath the turntable where support equipment may be remotely located. Operation of the antenna, turntable and equipment under test is controlled by remote controls that manipulate the antenna height and polarization and with a turntable control. Test personnel are located below the ellipse when measurements are performed, however the site maintains the ability of having personnel manipulate cables while monitoring test equipment. Ambient radiated emissions are 6 dB or more below the relevant FCC emission limits.

AC mains power is brought to the equipment under test through a power line filter, to remove ambient conducted noise. 50 Hz (240 VAC single phase), 60 Hz power (120 VAC single phase, 208 VAC three phase), and 60 Hz (480 VAC three phase) are available. Conducted emission measurements are performed with a Line Impedance Stabilization Network (LISN) or Artificial Mains Network (AMN) bonded to the ground reference plane. A removable vertical groundplane (2 meter X 2 meter area) is used for line-conducted measurements for table top equipment. The vertical groundplane is electrically connected to the reference groundplane.

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference groundplanes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

**Test Results:** Pass

**Test Standard:** FCC Part 15 Subpart C

**Test:** RF Output Power, FCC §15.247(b)(3)

**Performance Criterion:** Conducted RF Output Power must not exceed 1 Watt (30 dBm). EIRP must not exceed 4 Watts (36 dBm).

**Test Environment:**

Environmental Conditions During Testing:		Ambient (°C):	19	Humidity (%):	60	Pressure (hPa):	1017
Pretest Verification Performed		Yes		Equipment under Test:		BAEVCA100-81FCGX-LF	
Test Engineer(s):	Nicholas Abbondante			EUT Serial Number:		0716HNNH000075	
Engineer's Initials:	NNA	Date Test Performed:	10/13/2008	Reviewer's Initials:		Date Reviewed:	

**Test Equipment Used:**

TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR1	06/01/2009
2	40 GHz Cable	Megaphase	TM40-K1K1-80	7030802 002	06/05/2009
3	10W, 30dB Attenuator	Weinschel Corp	47-30-34	BD43291	10/15/2009
4	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	11/26/2008

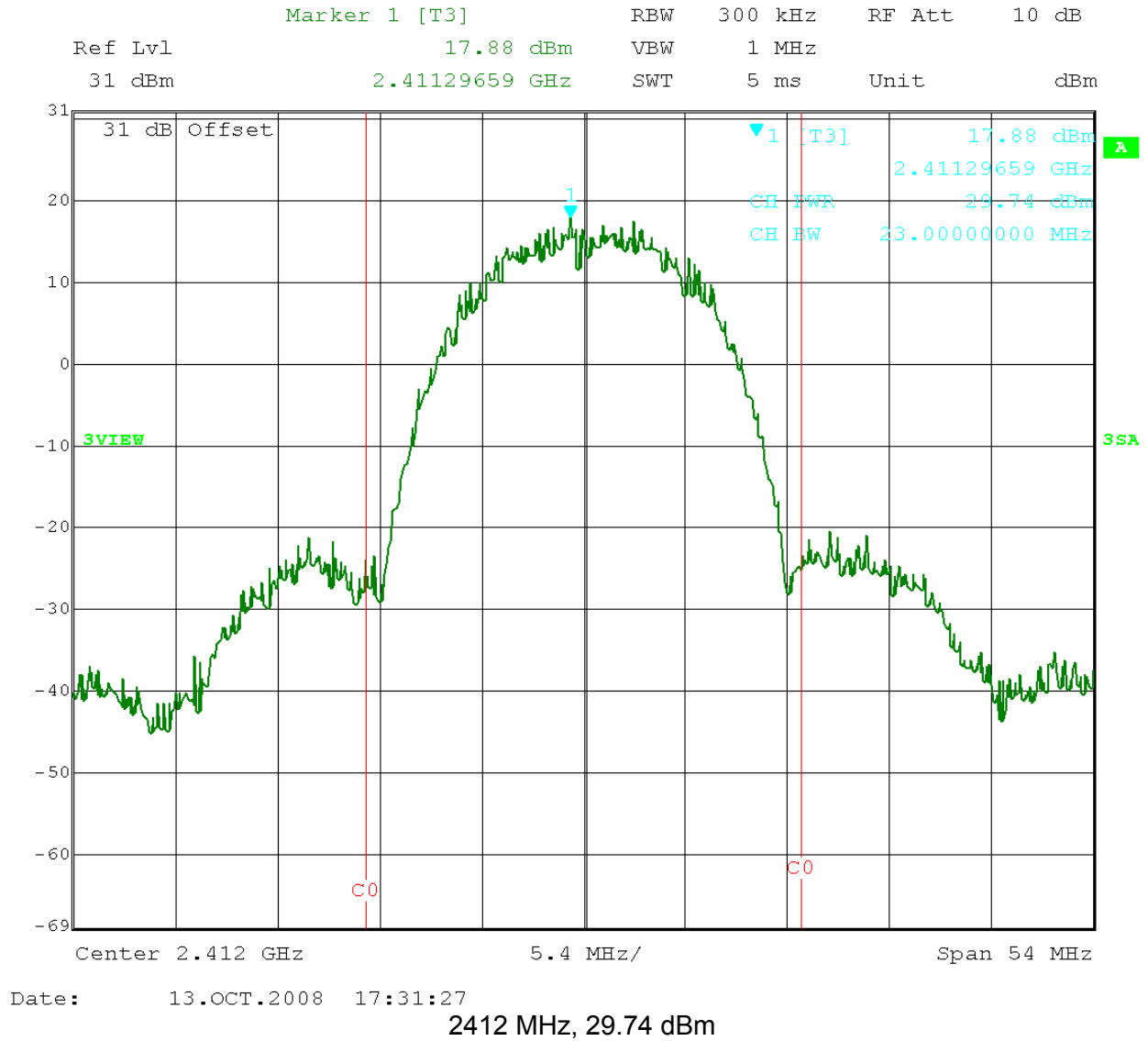
**Software Utilized:**

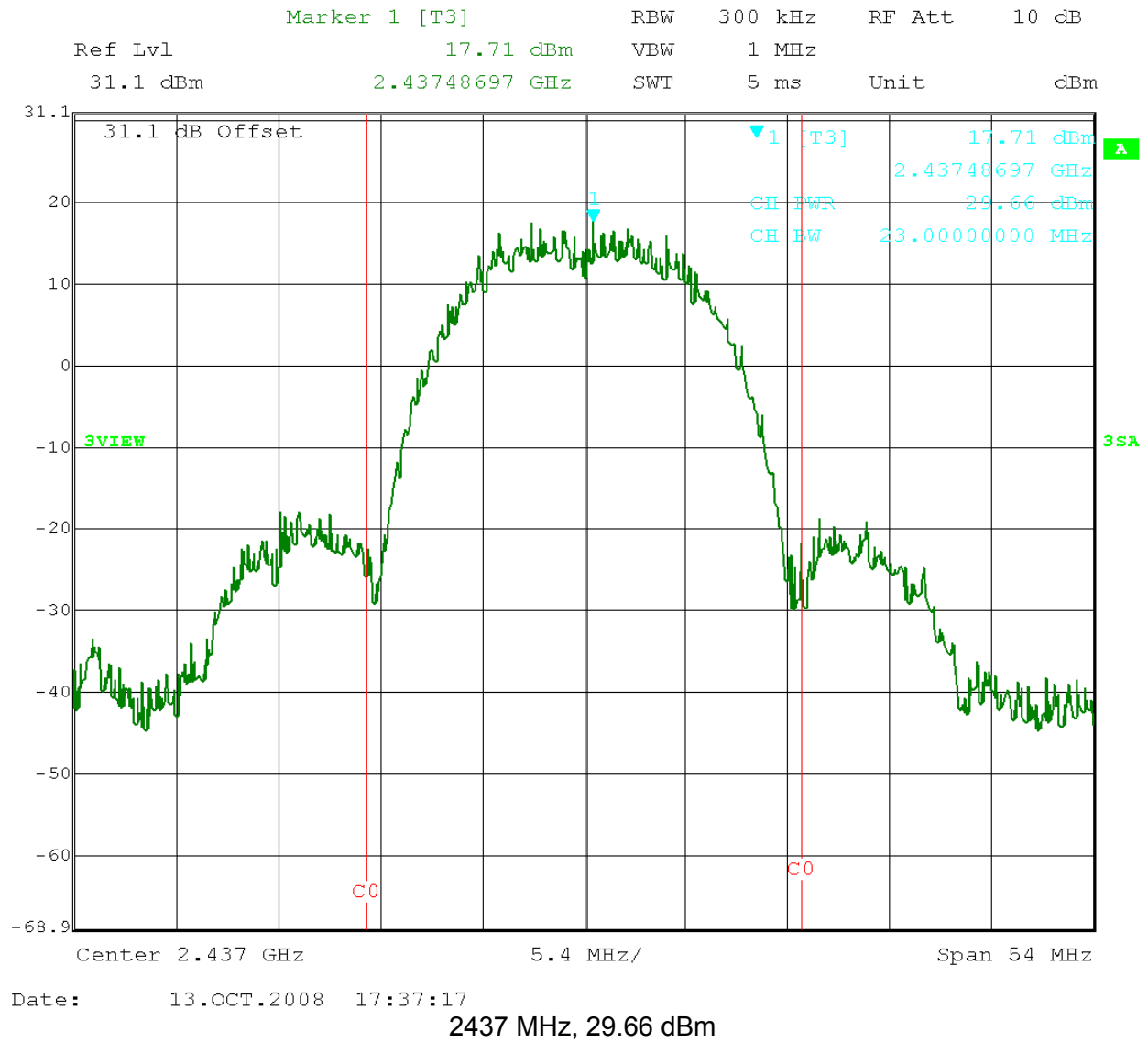
Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	3/07/07 Revision

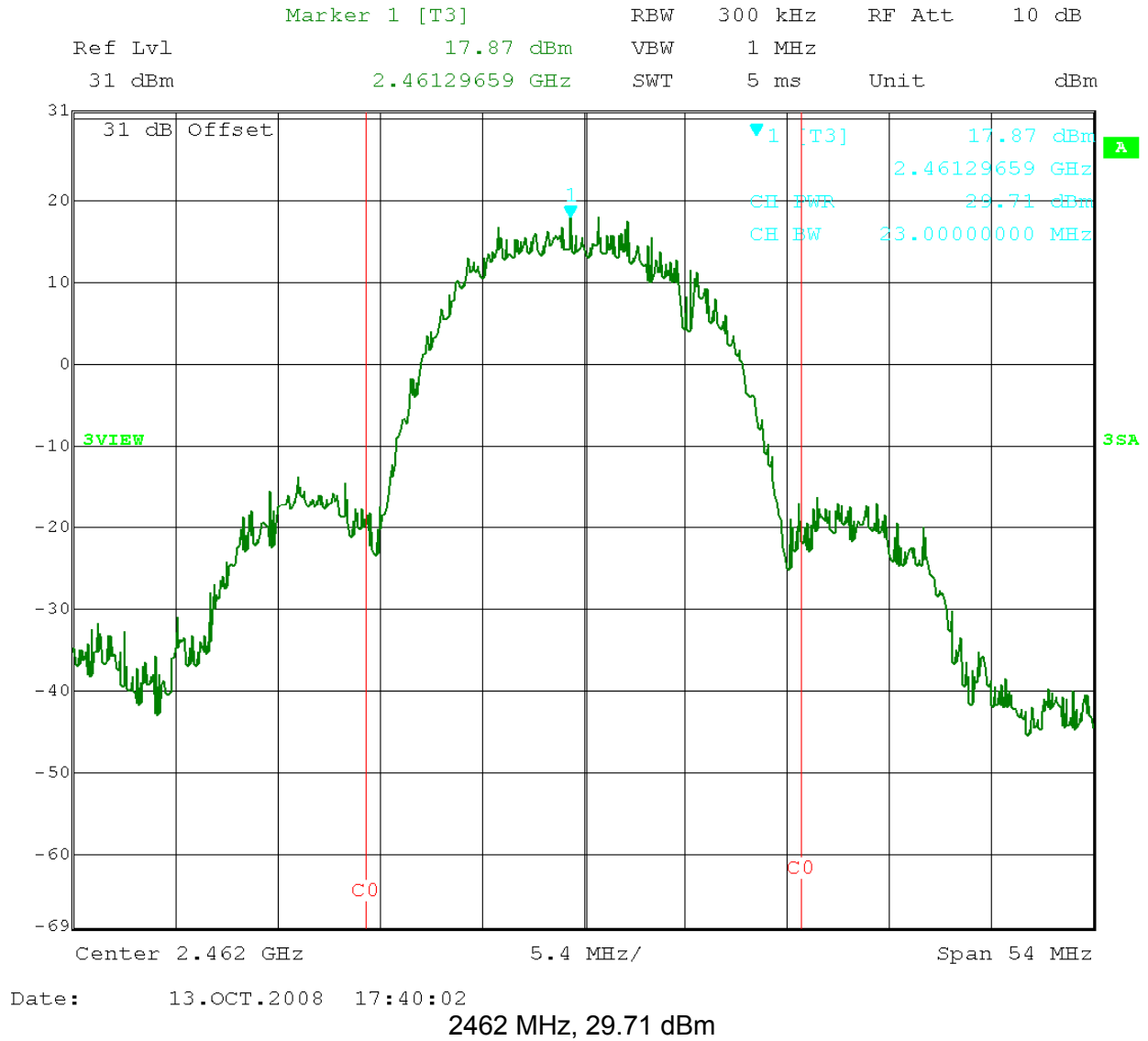
**Test Details:**

Channel 1 (2412 MHz): 29.74 dBm  
Channel 6 (2437 MHz): 29.66 dBm  
Channel 11 (2462 MHz): 29.71 dBm









**Test Results:** Pass

**Test Standard:** FCC Part 15 Subpart C

**Test:** Radiated Emissions, FCC §15.205, §15.209, §15.247(d)

**Performance Criterion:** Spurious emissions must be at least 20 dB lower than the fundamental field strength when measured with a 100 kHz bandwidth. Emissions which fall in the restricted bands of 15.205 must meet the general limits of 15.209.

**Test Environment:**

Environmental Conditions During Testing:		Ambient (°C):	See Tables	Humidity (%):	See Tables	Pressure (hPa):	See Tables
Pretest Verification Performed		Yes		Equipment under Test:		BAEVCA100-81FCGX-LF	
Test Engineer(s):	Nicholas Abbondante			EUT Serial Number:		0716HNNH000075	
Engineer's Initials:	NNA	Date Test Performed:	10/16-22/2008	Reviewer's Initials:		Date Reviewed:	

**Test Equipment Used:**

TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR1	06/01/2009
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	11/26/2008
3	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	03/27/2009
4	ANTENNA, RIDGED GUIDE, 18-40 GHZ	EMCO	3116	2090	12/26/2008
5	40 GHz Cable	Megaphase	TM40-K1K1-80	7030802 002	06/05/2009
6	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/06/2008
7	HORN ANTENNA	EMCO	3115	22023	04/02/2009
8	40 GHz Cable	Megaphase	TM40-K1K1-197	7030801 002	06/05/2009
9	3GHz High Pass Filter	Reactel, Inc	7HSX-3G/18G-S11	06-1	10/15/2009
10	18GHz High Pass Filter	Reactel, Inc	7HS-18G/40G K11	(06)1	04/11/2009
11	40GHz Cable	Megaphase	TM40-K1K1-197	7030801 001	06/05/2009
12	ANTENNA	EMCO	3142	9711-1223	02/22/2009
13	10 Meter in floor cable for site 2	ITS	RG214B/U	S2 10M FLR	09/23/2009
14	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	01/25/2009

**Software Utilized:**

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	3/07/07 Revision

## Test Details:

### Special Radiated Emissions

Company: BAE Systems  
 Model #: BAEVCA100-81FCGX-LF  
 Serial #: 0716HNH000075  
 Engineers: Nicholas Abbondante  
 Project #: 3139325  
 Standard: FCC Part 15 Subpart C 15.247  
 Receiver: R&S ESCI (ROS002)  
 PreAmp: PRE9 03-27-09.txt  
 PreAmp Used? (Y or N): N  
 Location: Site 2  
 Date(s): 10/16/08 10/22/08  
 Limit Distance (m): 3  
 Test Distance (m): 10  
 Voltage/Frequency: 12VDC  
 Frequency Range: 30-1000 MHz  
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)  
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
Note: WiFi Mode Channel 1 (2412 MHz)												
PK	V	32.500	9.7	12.9	0.8	0.0	-10.5	33.8	91.4	-57.6	120/300 kHz	FCC
QP	V	74.996	9.0	6.7	1.7	0.0	-10.5	27.9	40.0	-12.1	120/300 kHz	RB
PK	V	85.080	11.1	7.5	1.8	0.0	-10.5	30.8	91.4	-60.6	120/300 kHz	
QP	V	109.000	7.9	8.6	2.0	0.0	-10.5	29.0	43.5	-14.5	120/300 kHz	RB
QP	V	119.844	7.4	8.3	2.1	0.0	-10.5	28.2	43.5	-15.3	120/300 kHz	RB
QP	V	130.764	10.5	8.3	2.2	0.0	-10.5	31.5	43.5	-12.0	120/300 kHz	RB
QP	V	137.484	10.8	8.7	2.3	0.0	-10.5	32.2	43.5	-11.3	120/300 kHz	RB
PK	V	151.560	12.7	11.0	2.4	0.0	-10.5	36.5	91.4	-54.9	120/300 kHz	
PK	V	166.600	12.4	11.4	2.5	0.0	-10.5	36.8	43.5	-6.7	120/300 kHz	RB
QP	V	166.600	8.1	11.4	2.5	0.0	-10.5	32.5	43.5	-11.0	120/300 kHz	RB
PK	V	196.600	13.2	12.0	2.2	0.0	-10.5	37.9	91.4	-53.5	120/300 kHz	
PK	V	233.200	7.5	13.1	2.4	0.0	-10.5	33.5	91.4	-57.9	120/300 kHz	
QP	V	261.600	18.5	13.4	2.6	0.0	-10.5	45.0	46.0	-1.0	120/300 kHz	RB
QP	V	271.600	3.7	13.7	2.7	0.0	-10.5	30.6	46.0	-15.4	120/300 kHz	RB
PK	V	288.800	14.8	13.8	2.8	0.0	-10.5	41.8	91.4	-49.6	120/300 kHz	
PK	V	294.200	8.3	13.7	2.8	0.0	-10.5	35.3	91.4	-56.1	120/300 kHz	
PK	V	310.400	13.3	14.5	2.8	0.0	-10.5	41.0	91.4	-50.4	120/300 kHz	
QP	V	325.000	5.7	15.1	2.9	0.0	-10.5	34.2	46.0	-11.8	120/300 kHz	RB
QP	H	327.400	13.0	14.3	2.9	0.0	-10.5	40.7	46.0	-5.3	120/300 kHz	RB
PK	V	348.800	11.5	16.0	3.0	0.0	-10.5	41.0	91.4	-50.4	120/300 kHz	
PK	V	354.800	11.3	16.3	3.0	0.0	-10.5	41.0	91.4	-50.4	120/300 kHz	
PK	V	359.800	14.0	16.5	3.1	0.0	-10.5	44.0	91.4	-47.4	120/300 kHz	
PK	V	366.800	12.7	16.8	3.1	0.0	-10.5	43.0	91.4	-48.4	120/300 kHz	
PK	V	370.800	8.7	16.9	3.1	0.0	-10.5	39.2	91.4	-52.2	120/300 kHz	
PK	V	392.400	17.5	17.9	3.3	0.0	-10.5	49.1	91.4	-42.3	120/300 kHz	
QP	V	400.000	8.5	19.1	3.3	0.0	-10.5	41.4	46.0	-4.6	120/300 kHz	RB
PK	H	410.800	10.6	17.3	3.3	0.0	-10.5	41.7	91.4	-49.7	120/300 kHz	
PK	H	414.200	24.2	17.1	3.3	0.0	-10.5	55.1	91.4	-36.3	120/300 kHz	
PK	H	421.800	20.7	16.9	3.4	0.0	-10.5	51.4	91.4	-40.0	120/300 kHz	
PK	H	426.000	13.9	16.8	3.4	0.0	-10.5	44.5	91.4	-46.9	120/300 kHz	
PK	H	436.000	20.7	17.2	3.4	0.0	-10.5	51.8	91.4	-39.6	120/300 kHz	
PK	V	444.200	15.0	18.0	3.5	0.0	-10.5	46.9	91.4	-44.5	120/300 kHz	
PK	H	755.000	11.2	22.2	4.6	0.0	-10.5	48.4	91.4	-43.0	120/300 kHz	
PK	V	778.000	8.8	22.6	4.8	0.0	-10.5	46.7	91.4	-44.7	120/300 kHz	
PK	H	789.000	7.9	22.2	5.0	0.0	-10.5	45.6	91.4	-45.8	120/300 kHz	
PK	V	806.600	6.9	22.8	5.1	0.0	-10.5	45.3	91.4	-46.1	120/300 kHz	

## Special Radiated Emissions

Company: BAE Systems  
 Model #: BAEVCA100-81FCGX-LF  
 Serial #: 0716HNNH000075  
 Engineers: Nicholas Abbondante  
 Project #: 3139325  
 Standard: FCC Part 15 Subpart C 15.247  
 Receiver: R&S ESCI (ROS002)  
 PreAmp: PRE9 03-27-09.txt  
 Antenna & Cables: N Bands: N, LF, HF, SHF  
 Antenna: LOG2 2-22-09 V10m.txt LOG2 2-22-09 H10m.txt  
 Cable(s): S2 10M FLR 09-23-09.txt NONE  
 Barometer: BAR1  
 Location: Site 2  
 Date(s): 10/16/08 10/22/08  
 Temp/Humidity/Pressure: 21c 64% 1006mB  
 17c 44% 1010mB  
 Limit Distance (m): 3  
 Test Distance (m): 10  
 PreAmp Used? (Y or N): N Voltage/Frequency: 12VDC Frequency Range: 30-1000 MHz  
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)  
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
Note: WiFi Mode Channel 6 (2437 MHz)												
PK	V	32.640	9.1	12.8	0.8	0.0	-10.5	33.2	91.4	-58.2	120/300 kHz	
QP	V	74.996	5.1	6.7	1.7	0.0	-10.5	24.0	40.0	-16.0	120/300 kHz	RB
QP	V	108.664	9.4	8.6	2.0	0.0	-10.5	30.5	43.5	-13.0	120/300 kHz	RB
QP	V	125.640	12.1	8.3	2.2	0.0	-10.5	33.0	43.5	-10.5	120/300 kHz	RB
QP	V	130.764	13.2	8.3	2.2	0.0	-10.5	34.2	43.5	-9.3	120/300 kHz	RB
QP	V	137.484	9.8	8.7	2.3	0.0	-10.5	31.2	43.5	-12.3	120/300 kHz	RB
PK	V	151.524	11.9	11.0	2.4	0.0	-10.5	35.7	91.4	-55.7	120/300 kHz	
QP	V	166.600	6.8	11.4	2.5	0.0	-10.5	31.2	43.5	-12.3	120/300 kHz	RB
PK	V	194.550	15.3	12.0	2.2	0.0	-10.5	40.0	91.4	-51.4	120/300 kHz	
PK	V	218.200	14.8	11.7	2.3	0.0	-10.5	39.3	91.4	-52.1	120/300 kHz	
PK	V	233.100	11.3	13.1	2.4	0.0	-10.5	37.3	91.4	-54.1	120/300 kHz	
QP	V	261.600	14.0	13.4	2.6	0.0	-10.5	40.5	46.0	-5.5	120/300 kHz	RB
QP	V	283.400	6.1	13.8	2.7	0.0	-10.5	33.1	46.0	-12.9	120/300 kHz	RB
PK	V	292.200	11.2	13.7	2.8	0.0	-10.5	38.2	91.4	-53.2	120/300 kHz	
PK	V	310.900	10.6	14.5	2.8	0.0	-10.5	38.4	91.4	-53.0	120/300 kHz	
QP	V	326.800	12.7	15.2	2.9	0.0	-10.5	41.2	46.0	-4.8	120/300 kHz	RB
QP	V	333.500	14.8	15.4	3.0	0.0	-10.5	43.7	46.0	-2.3	120/300 kHz	RB
PK	V	337.600	15.7	15.6	3.0	0.0	-10.5	44.7	91.4	-46.7	120/300 kHz	
PK	V	348.800	15.6	16.0	3.0	0.0	-10.5	45.0	91.4	-46.4	120/300 kHz	
PK	V	355.000	12.5	16.3	3.0	0.0	-10.5	42.3	91.4	-49.1	120/300 kHz	
PK	V	359.600	11.5	16.5	3.1	0.0	-10.5	41.5	91.4	-49.9	120/300 kHz	
PK	V	366.600	10.7	16.8	3.1	0.0	-10.5	41.0	91.4	-50.4	120/300 kHz	
PK	V	392.400	17.5	17.9	3.3	0.0	-10.5	49.2	91.4	-42.2	120/300 kHz	
QP	V	400.000	10.0	19.1	3.3	0.0	-10.5	42.9	46.0	-3.1	120/300 kHz	RB
PK	V	410.100	11.7	17.3	3.3	0.0	-10.5	42.8	91.4	-48.6	120/300 kHz	
PK	V	414.400	26.2	17.4	3.3	0.0	-10.5	57.3	91.4	-34.1	120/300 kHz	
PK	V	421.700	26.1	17.5	3.4	0.0	-10.5	57.5	91.4	-33.9	120/300 kHz	
PK	V	427.000	18.9	17.6	3.4	0.0	-10.5	50.4	91.4	-41.0	120/300 kHz	
PK	V	435.800	15.8	17.8	3.4	0.0	-10.5	47.5	91.4	-43.9	120/300 kHz	
PK	V	443.700	11.5	17.9	3.5	0.0	-10.5	43.4	91.4	-48.0	120/300 kHz	
PK	V	734.000	9.9	22.3	4.7	0.0	-10.5	47.4	91.4	-44.0	120/300 kHz	
PK	V	778.000	8.7	22.6	4.8	0.0	-10.5	46.6	91.4	-44.8	120/300 kHz	
PK	V	791.400	7.4	22.7	5.1	0.0	-10.5	45.6	91.4	-45.8	120/300 kHz	

## Special Radiated Emissions

Company: BAE Systems  
 Model #: BAEVCA100-81FCGX-LF  
 Serial #: 0716HNNH000075  
 Engineers: Nicholas Abbondante  
 Project #: 3139325  
 Standard: FCC Part 15 Subpart C 15.247  
 Receiver: R&S ESCI (ROS002)  
 PreAmp: PRE9 03-27-09.txt  
 Antenna & Cables: N Bands: N, LF, HF, SHF  
 Antenna: LOG2 2-22-09 V10m.txt LOG2 2-22-09 H10m.txt  
 Cable(s): S2 10M FLR 09-23-09.txt NONE  
 Barometer: BAR1  
 Location: Site 2  
 Date(s): 10/16/08 10/22/08  
 Temp/Humidity/Pressure: 21c 64% 1006mB  
 17c 44% 1010mB  
 Limit Distance (m): 3  
 Test Distance (m): 10  
 PreAmp Used? (Y or N): N Voltage/Frequency: 12VDC Frequency Range: 30-1000 MHz  
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)  
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
Note: WiFi Mode Channel 11 (2462 MHz)												
PK	V	32.640	9.5	12.8	0.8	0.0	-10.5	33.5	91.4	-57.9	120/300 kHz	
QP	V	74.996	3.3	6.7	1.7	0.0	-10.5	22.2	40.0	-17.8	120/300 kHz	RB
QP	V	108.756	9.4	8.6	2.0	0.0	-10.5	30.5	43.5	-13.0	120/300 kHz	RB
QP	V	124.612	9.8	8.2	2.2	0.0	-10.5	30.7	43.5	-12.8	120/300 kHz	RB
QP	V	130.688	10.6	8.3	2.2	0.0	-10.5	31.6	43.5	-11.9	120/300 kHz	RB
QP	V	137.484	11.2	8.7	2.3	0.0	-10.5	32.6	43.5	-10.9	120/300 kHz	RB
PK	V	151.296	10.4	11.0	2.4	0.0	-10.5	34.2	91.4	-57.2	120/300 kHz	
QP	V	166.600	6.4	11.4	2.5	0.0	-10.5	30.8	43.5	-12.7	120/300 kHz	RB
PK	V	194.550	13.8	12.0	2.2	0.0	-10.5	38.5	91.4	-52.9	120/300 kHz	
PK	V	218.000	13.6	11.7	2.3	0.0	-10.5	38.1	91.4	-53.3	120/300 kHz	
PK	V	233.300	11.8	13.1	2.4	0.0	-10.5	37.8	91.4	-53.6	120/300 kHz	
QP	V	261.600	12.7	13.4	2.6	0.0	-10.5	39.2	46.0	-6.8	120/300 kHz	RB
QP	V	283.500	5.6	13.8	2.7	0.0	-10.5	32.6	46.0	-13.4	120/300 kHz	RB
PK	V	295.100	10.7	13.7	2.8	0.0	-10.5	37.7	91.4	-53.7	120/300 kHz	
PK	V	305.100	12.8	14.3	2.8	0.0	-10.5	40.4	91.4	-51.0	120/300 kHz	
QP	V	326.900	8.4	15.2	2.9	0.0	-10.5	37.0	46.0	-9.0	120/300 kHz	RB
QP	V	332.000	12.3	15.4	3.0	0.0	-10.5	41.1	46.0	-4.9	120/300 kHz	RB
PK	V	336.300	16.2	15.5	3.0	0.0	-10.5	45.1	91.4	-46.3	120/300 kHz	
PK	V	349.200	14.3	16.0	3.0	0.0	-10.5	43.8	91.4	-47.6	120/300 kHz	
PK	V	354.600	13.5	16.3	3.0	0.0	-10.5	43.3	91.4	-48.1	120/300 kHz	
PK	V	359.600	11.4	16.5	3.1	0.0	-10.5	41.4	91.4	-50.0	120/300 kHz	
PK	V	366.600	10.9	16.8	3.1	0.0	-10.5	41.2	91.4	-50.2	120/300 kHz	
PK	V	392.200	15.9	17.8	3.3	0.0	-10.5	47.5	91.4	-43.9	120/300 kHz	
QP	V	400.000	9.7	19.1	3.3	0.0	-10.5	42.6	46.0	-3.4	120/300 kHz	RB
PK	V	410.500	10.7	17.3	3.3	0.0	-10.5	41.8	91.4	-49.6	120/300 kHz	
PK	V	414.500	24.6	17.4	3.3	0.0	-10.5	55.8	91.4	-35.6	120/300 kHz	
PK	V	421.800	23.8	17.5	3.4	0.0	-10.5	55.1	91.4	-36.3	120/300 kHz	
PK	V	427.700	15.4	17.6	3.4	0.0	-10.5	46.9	91.4	-44.5	120/300 kHz	
PK	V	436.300	16.9	17.8	3.4	0.0	-10.5	48.6	91.4	-42.8	120/300 kHz	
PK	V	444.600	13.9	18.0	3.5	0.0	-10.5	45.8	91.4	-45.6	120/300 kHz	
PK	H	733.600	13.4	22.0	4.7	0.0	-10.5	50.6	91.4	-40.8	120/300 kHz	
PK	H	753.800	7.5	22.2	4.6	0.0	-10.5	44.7	91.4	-46.7	120/300 kHz	
PK	V	777.400	7.3	22.6	4.8	0.0	-10.5	45.2	91.4	-46.2	120/300 kHz	
PK	H	789.400	7.9	22.2	5.0	0.0	-10.5	45.7	91.4	-45.7	120/300 kHz	
PK	H	807.600	6.8	22.1	5.1	0.0	-10.5	44.4	91.4	-47.0	120/300 kHz	



### Special Radiated Emissions

Company: BAE Systems  
 Model #: BAEVCA100-81FCGX-LF  
 Serial #: 0716HNNH000075  
 Engineers: Nicholas Abbondante  
 Project #: 3139325  
 Standard: FCC Part 15 Subpart C 15.247  
 Receiver: R&S FSEK-30 (ROS001)  
 PreAmp: PRE9 03-27-09.txt  
 PreAmp Used? (Y or N): N  
 Antenna & Cables: HF Bands: N, LF, HF, SHF  
 Antenna: EMC-54 V3m 4-02-09.txt EMC-54 H3m 4-02-09.txt  
 Cable(s): MEG001 06-05-09.txt MEG002 06-05-09.txt  
 Barometer: BAR1  
 Location: Site 2  
 Date(s): 10/20/08  
 Temp/Humidity/Pressure: 17c 55% 1004mB  
 Limit Distance (m): 3  
 Test Distance (m): 3  
 Voltage/Frequency: 12VDC  
 Frequency Range: 1-4 GHz  
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)  
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
Note: WiFi Mode Channel 1 (2412 MHz)											
PK	V	2412.000	76.8	28.6	5.9	0.0	0.0	111.3	-	-	100/300 kHz
PK	V	2437.000	76.7	28.7	5.9	0.0	0.0	111.4	-	-	100/300 kHz
PK	V	2462.000	76.6	28.8	5.9	0.0	0.0	111.4	-	-	100/300 kHz

FCC

## Special Radiated Emissions

Company: BAE Systems  
 Model #: BAEVCA100-81FCGX-LF  
 Serial #: 0716HNNH000075  
 Engineers: Nicholas Abbondante  
 Project #: 3139325 Date(s): 10/20/08  
 Standard: FCC Part 15 Subpart C 15.247  
 Receiver: R&S FSEK-30 (ROS001)  
 PreAmp: PRE9 03-27-09.txt  
 PreAmp Used? (Y or N): Y  
 Location: Site 2  
 Limit Distance (m): 3  
 Test Distance (m): 3  
 Voltage/Frequency: 12VDC  
 Frequency Range: 4-18 GHz  
 Antenna & Cables: LF Bands: N, LF, HF, SHF  
 Antenna: EMC-54 V3m 4-02-09.txt EMC-54 H3m 4-02-09.txt  
 Cable(s): MEG002 06-05-09.txt MEG004 06-05-09.txt  
 Barometer: BAR1  
 Temp/Humidity/Pressure: 17c 55% 1004mB  
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)  
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/BW

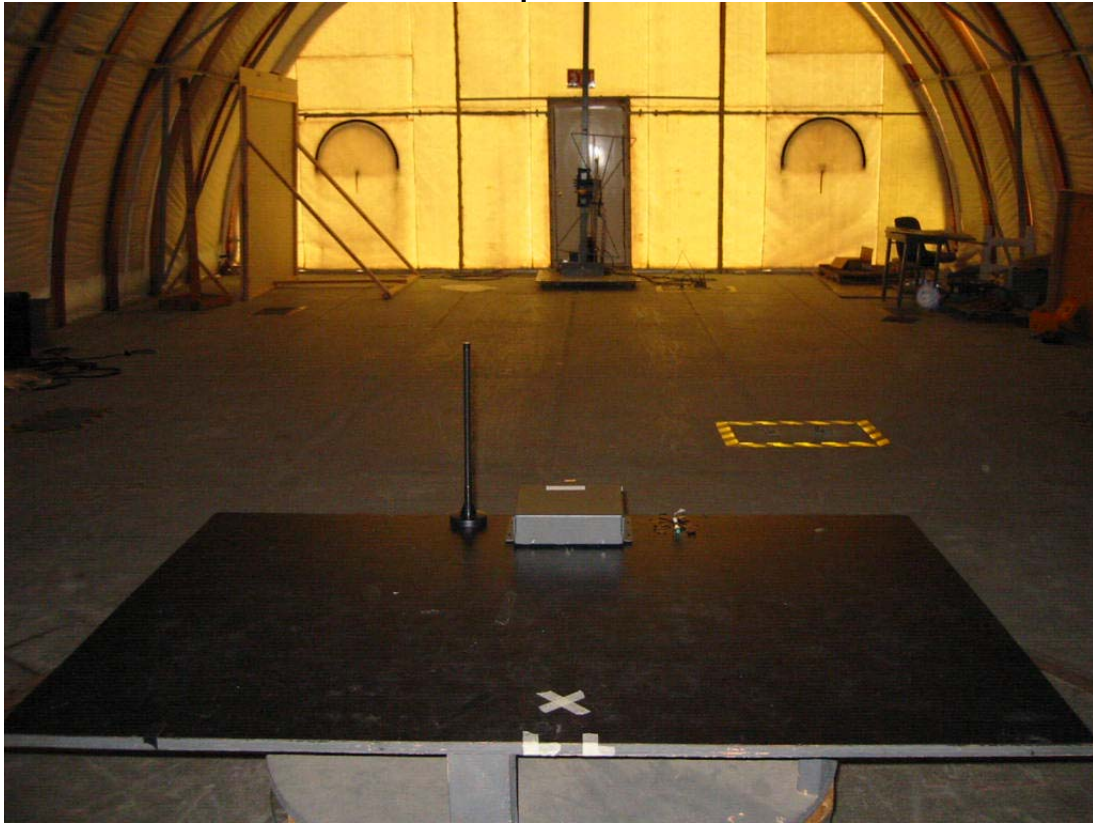
Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC
PK	H	4824.000	40.3	32.7	6.1	29.3	0.0	49.9	74.0	-24.1	1/3 MHz	RB
AVG	H	4824.000	33.2	32.7	6.1	29.3	0.0	42.8	54.0	-11.2	1/3 MHz	RB
PK	V	7236.000	27.7	36.0	7.8	28.4	0.0	43.0	91.4	-48.4	100/300 kHz	
PK	H	9648.000	29.8	37.8	9.3	27.4	0.0	49.4	91.4	-42.0	100/300 kHz	
PK	H	12060.000	32.6	39.1	10.7	27.4	0.0	54.9	74.0	-19.1	1/3 MHz	RB
AVG	H	12060.000	24.0	39.1	10.7	27.4	0.0	46.3	54.0	-7.7	1/3 MHz	RB
PK	H	14472.000	30.7	41.7	12.0	27.6	0.0	56.8	74.0	-17.2	1/3 MHz	RB
AVG	H	14472.000	20.7	41.7	12.0	27.6	0.0	46.8	54.0	-7.2	1/3 MHz	RB
PK	V	16884.000	24.9	39.7	13.3	28.1	0.0	49.8	91.4	-41.6	100/300 kHz	
PK	H	4874.000	41.7	32.8	6.2	29.3	0.0	51.5	74.0	-22.5	1/3 MHz	RB
AVG	H	4874.000	37.4	32.8	6.2	29.3	0.0	47.2	54.0	-6.8	1/3 MHz	RB
PK	H	7311.000	37.0	36.2	7.9	28.4	0.0	52.7	74.0	-21.3	1/3 MHz	RB
AVG	H	7311.000	28.3	36.2	7.9	28.4	0.0	43.9	54.0	-10.1	1/3 MHz	RB
PK	V	9748.000	28.0	37.8	9.4	27.4	0.0	47.7	91.4	-43.7	100/300 kHz	
PK	H	12185.000	32.9	39.0	10.8	27.4	0.0	55.2	74.0	-18.8	1/3 MHz	RB
AVG	H	12185.000	23.0	39.0	10.8	27.4	0.0	45.3	54.0	-8.7	1/3 MHz	RB
PK	V	14622.000	26.4	41.3	12.1	27.6	0.0	52.2	91.4	-39.2	100/300 kHz	
PK	H	17059.000	26.7	40.7	13.4	28.1	0.0	52.7	91.4	-38.7	100/300 kHz	
PK	H	4924.000	38.6	32.9	6.2	29.3	0.0	48.5	74.0	-25.5	1/3 MHz	RB
AVG	H	4924.000	34.1	32.9	6.2	29.3	0.0	44.0	54.0	-10.0	1/3 MHz	RB
PK	V	7386.000	36.6	36.4	7.9	28.3	0.0	52.5	74.0	-21.5	1/3 MHz	RB
AVG	V	7386.000	28.3	36.4	7.9	28.3	0.0	44.2	54.0	-9.8	1/3 MHz	RB
PK	V	9848.000	31.3	37.9	9.4	27.4	0.0	51.2	91.4	-40.2	100/300 kHz	
PK	V	12310.000	32.2	38.8	10.8	27.4	0.0	54.5	74.0	-19.5	1/3 MHz	RB
AVG	V	12310.000	24.5	38.8	10.8	27.4	0.0	46.7	54.0	-7.3	1/3 MHz	RB
PK	V	14772.000	25.5	40.9	12.1	27.6	0.0	51.0	91.4	-40.4	100/300 kHz	
PK	V	17234.000	26.5	41.7	13.5	28.2	0.0	53.5	91.4	-37.9	100/300 kHz	

## Special Radiated Emissions

Company: BAE Systems  
 Model #: BAEVCA100-81FCGX-LF  
 Serial #: 0716HNNH000075  
 Engineers: Nicholas Abbondante  
 Project #: 3139325  
 Standard: FCC Part 15 Subpart C 15.247  
 Receiver: R&S FSEK-30 (ROS001)  
 PreAmp: PRE9 03-27-09.txt  
 PreAmp Used? (Y or N): Y  
 Antenna & Cables: SHF  
 Antenna: EMC04 V 1m 12-26-2008.txt  
 Cable(s): MEG004 06-05-09.txt  
 Barometer: BAR1  
 Bands: N, LF, HF, SHF  
 EMC04 H 1m 12-26-2008.txt  
 CBL030 12-06-08.txt  
 Location: Site 2  
 Date(s): 10/20/08  
 Temp/Humidity/Pressure: 17c 55% 1004mB  
 Limit Distance (m): 3  
 Test Distance (m): 3  
 Voltage/Frequency: 12VDC  
 Frequency Range: 18-26 GHz  
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)  
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

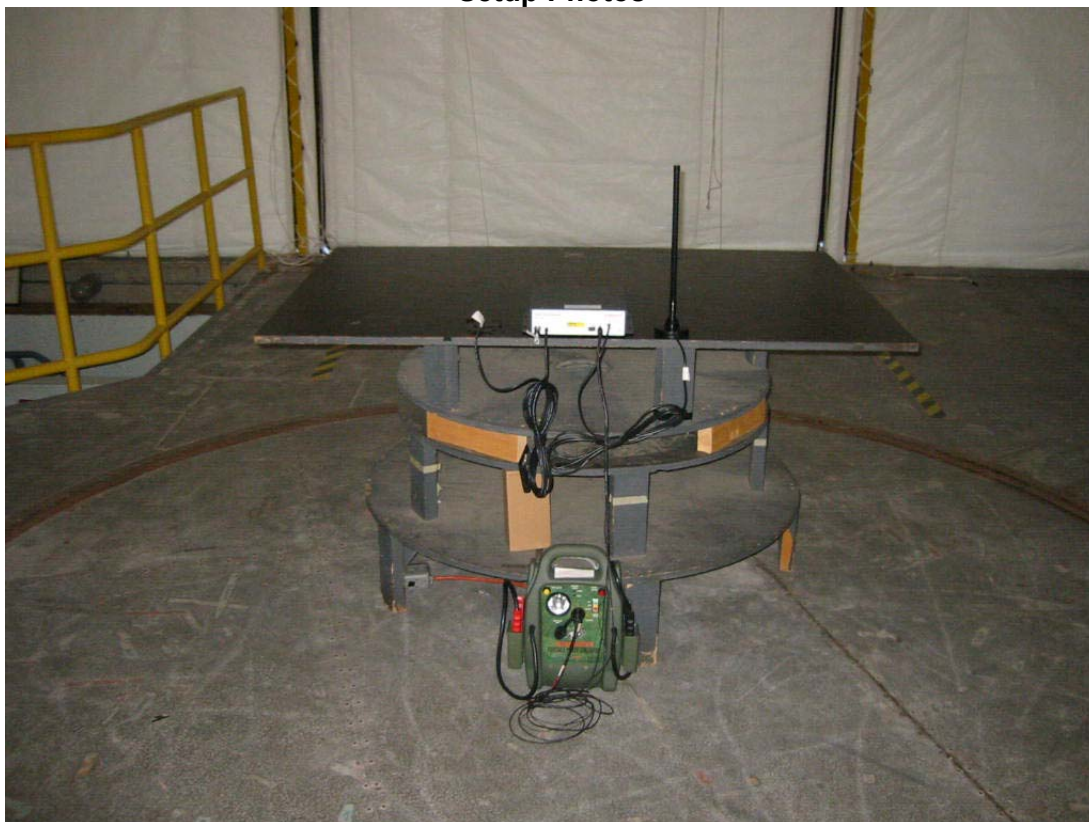
Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
PK	V	19296.000	34.6	45.3	8.5	28.7	0.0	59.6	74.0	-14.4	1/3 MHz	FCC
AVG	V	19296.000	26.0	45.3	8.5	28.7	0.0	51.1	54.0	-2.9	1/3 MHz	RB
PK	V	21708.000	26.7	45.4	9.1	28.0	0.0	53.3	91.4	-38.1	100/300 kHz	
PK	V	24120.000	24.0	45.6	9.9	26.7	0.0	52.9	91.4	-38.5	100/300 kHz	
PK	V	19496.000	35.6	45.4	8.5	28.8	0.0	60.8	74.0	-13.2	1/3 MHz	RB
AVG	V	19496.000	27.1	45.4	8.5	28.8	0.0	52.2	54.0	-1.8	1/3 MHz	RB
PK	V	21933.000	26.0	45.3	9.2	27.9	0.0	52.7	91.4	-38.7	100/300 kHz	
PK	V	24370.000	26.0	45.9	10.0	26.6	0.0	55.4	91.4	-36.0	100/300 kHz	
PK	V	19696.000	35.1	45.4	8.6	28.8	0.0	60.3	74.0	-13.7	1/3 MHz	RB
AVG	V	19696.000	26.4	45.4	8.6	28.8	0.0	51.6	54.0	-2.4	1/3 MHz	RB
PK	V	22158.000	35.2	45.4	9.3	27.7	0.0	62.1	74.0	-11.9	1/3 MHz	RB
AVG	V	22158.000	26.4	45.4	9.3	27.7	0.0	53.3	54.0	-0.7	1/3 MHz	RB
PK	V	24620.000	27.1	46.2	10.1	26.4	0.0	56.9	91.4	-34.5	100/300 kHz	

**Setup Photos**



30-1000 MHz Radiated Emissions

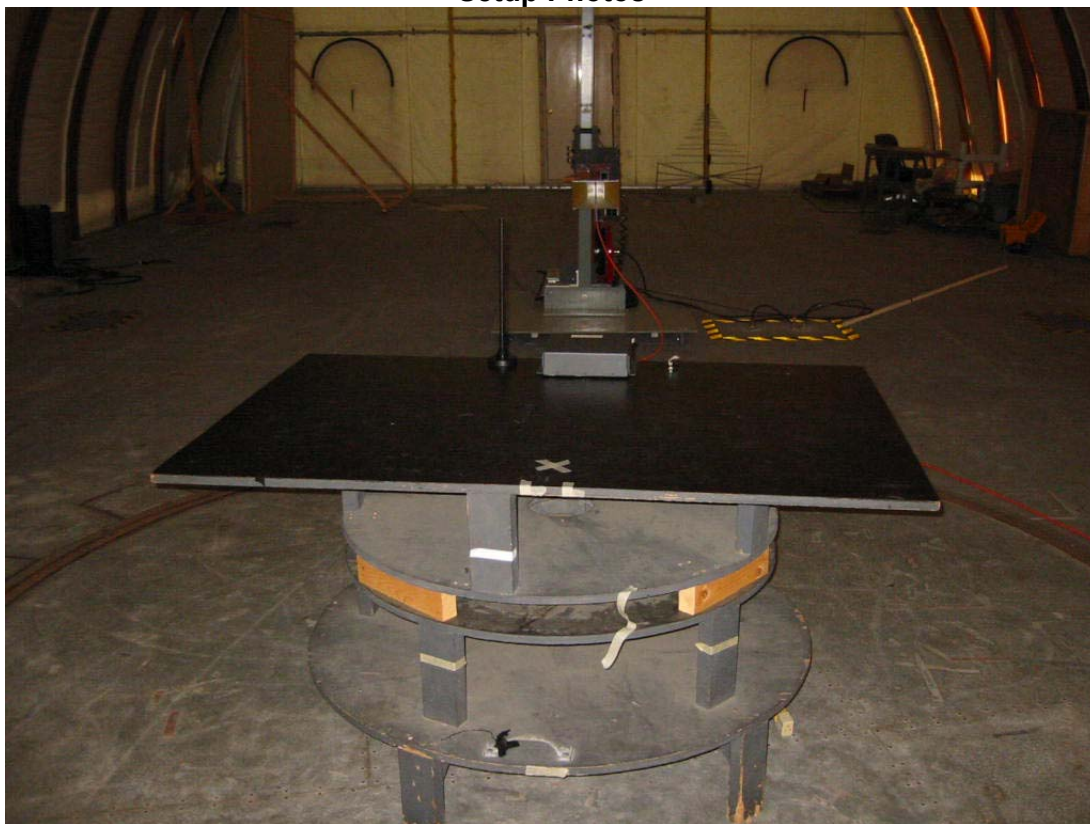
**Setup Photos**



30-1000 MHz Radiated Emissions



**Setup Photos**



1-4 GHz Radiated Emissions

**Setup Photos**



1-4 GHz Radiated Emissions

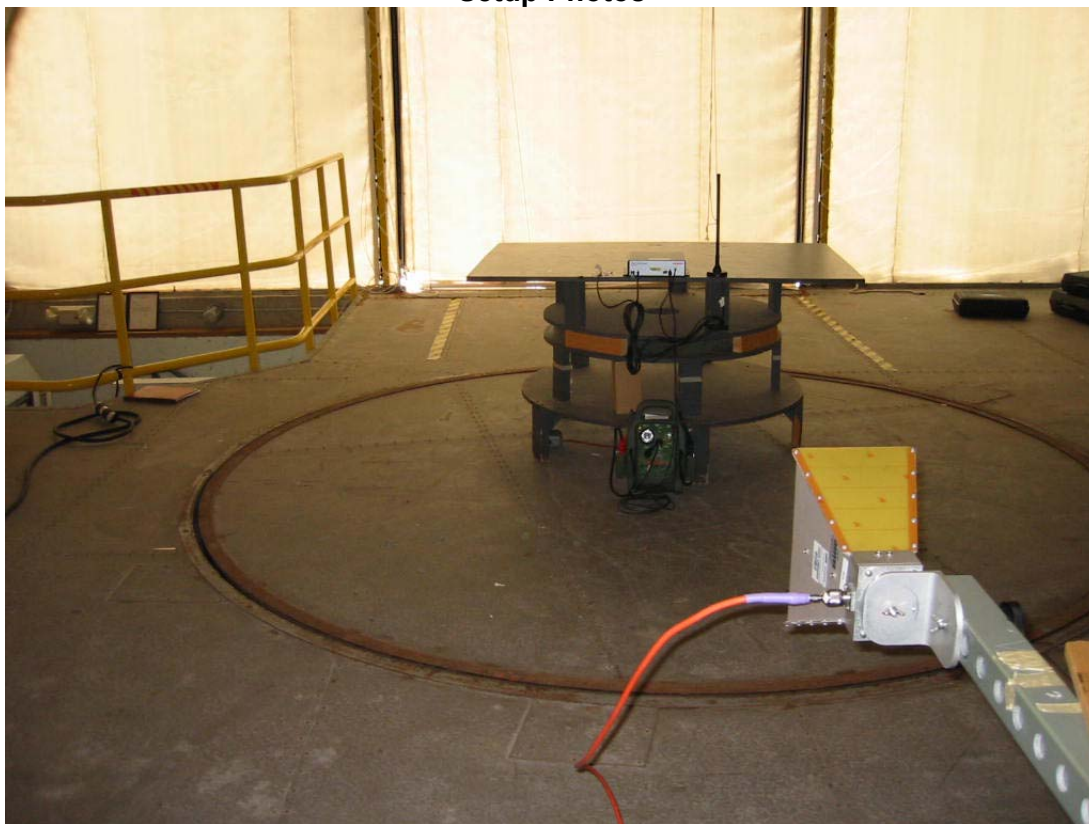
**Setup Photos**



4-18 GHz Radiated Emissions



**Setup Photos**



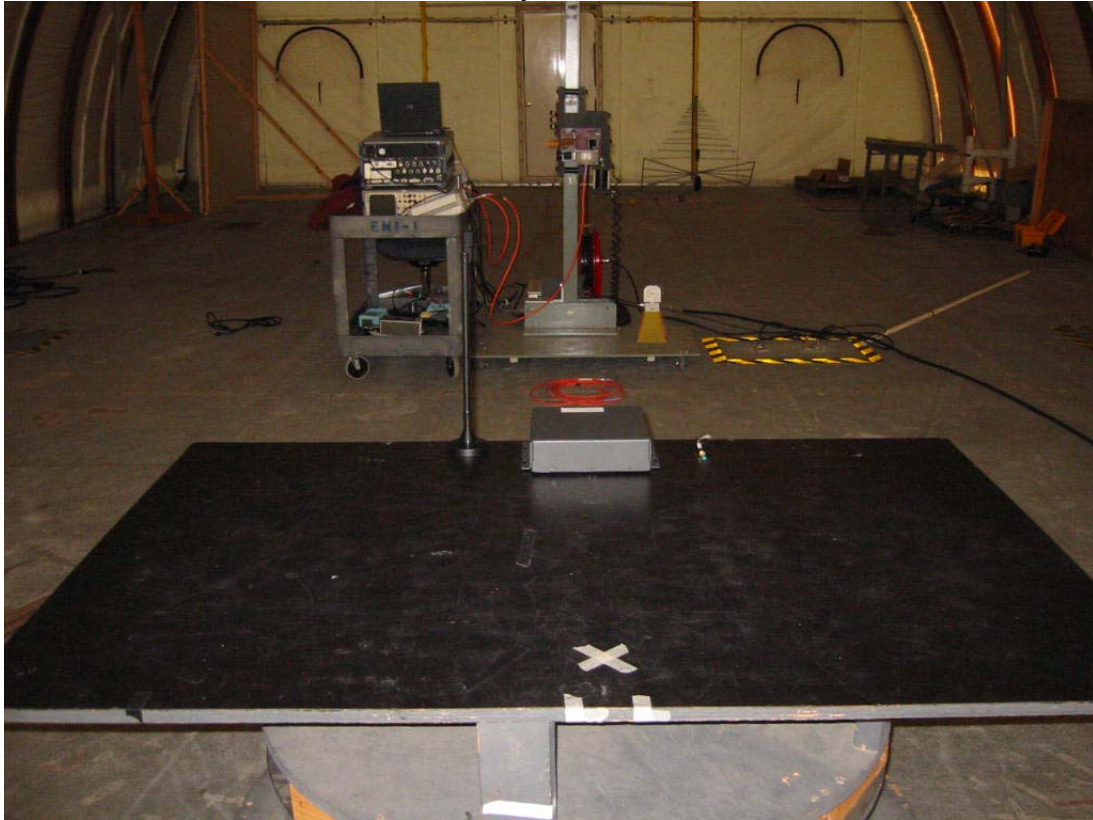
4-18 GHz Radiated Emissions

**Setup Photos**



18-26 GHz Radiated Emissions

**Setup Photos**



18-26 GHz Radiated Emissions