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**Test Report:** 82588-3TRFWL

**Applicant:** Paradox Security Systems  
780 Industrial Blvd  
Ste-Eustache, Quebec  
J7R 5V3

**Apparatus:** MG6160/MG6130 433MHz Control Panel

**FCC ID:** KDYMG6160

**In Accordance With:** FCC Part 15 Subpart C, 15.231  
Periodic operation in the band 40.66-40.70MHz and  
above 70 MHz.

**Tested By:** Nemko Canada Inc.  
303 River Road  
Ottawa, Ontario  
K1V 1H2

**Authorized By:**   
Jason Nixon, Telecom Specialist

**Date:** June 4, 2007

**Total Number of Pages:** 21

## Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

<b>Apparatus Assessed:</b>	MG6160 433MHz Control Panel
<b>Specification:</b>	FCC Part 15 Subpart C, 15.231
<b>Compliance Status:</b>	Complies
<b>Exclusions:</b>	None
<b>Non-compliances:</b>	None
<b>Report Release History:</b>	Original Release

Author: Xu Jin, Wireless Specialist

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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## **Section 1: Equipment Under Test**

### **1.1 Product Identification**

The Equipment Under Test was identified as follows:

MG6160 433MHz Control Panel

### **1.2 Samples Submitted for Assessment**

The following samples of the apparatus have been submitted for type assessment:

<b>Sample No.</b>	<b>Description</b>	<b>Serial No.</b>
13	MG6160 433MHz Control Panel	None

The first samples were received on: Mar. 5, 2007

### **1.3 Technical Specifications of the EUT**

**Manufacturer:** Paradox Security Systems

**Operating Frequency:** 433.92MHz

**Emission Designator:** L1D

**Modulation:** Pulse Width Modulated

**Antenna Data:** Integral

**Power Source:** 120VAC

## Section 2: Test Conditions

### 2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.231

Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.

### 2.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

### 2.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 °C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

### 2.4 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next Cal.
Spectrum Analyzer	Rohde & Schwarz	FSU	FA001877	Jan 16/08
Biconical (2) Antenna	EMCO	3109	FA000904	Sept. 12/07
Log Periodic Antenna #2	EMCO	3148	FA001355	May 16/07
Horn Antenna #1	EMCO	3115	FA000649	Feb 26/08
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	Aug. 02/07
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	Aug. 02/07
4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	Aug. 02/07
LISN	Rohde & Schwarz	ENV216	FA002023	Aug. 28/07
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU	FA002043	Oct. 24/07
International Power Supply	California Inst.	3001i	FA001021	Jan. 09/08

## **Section 3: Observations**

### **3.1 Modifications Performed During Assessment**

2.2Kohm at R438 was changed to 150Kohm in order to meet the radiation emission requirement.

### **3.2 Record Of Technical Judgements**

MG6160 is all in one control transceiver at 433MHz and having an FM radio and dialler. The MG6130 has same design as MG6160 with less feature (no FM radio, no two voice documentation, no hand free speaker phone). Therefore, no extra test is required for MG6130.

### **3.3 EUT Parameters Affecting Compliance**

The user of the apparatus could not alter parameters that would affect compliance.

### **3.4 Test Deleted**

No Tests were deleted from this assessment.

### **3.5 Additional Observations**

There were no additional observations made during this assessment.

## **Section 4: Results Summary**

This section contains the following:

FCC Part 15 Subpart C: Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

- N No: not applicable / not relevant.
- Y Yes: Mandatory i.e. the apparatus shall conform to these tests.
- N/T Not Tested, mandatory but not assessed. (See section 3.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus in its final modified state.



**4.1 FCC Part 15 Subpart C: Test Results**

Part 15	Test Description	Required	Result
15.31(e)	Variation of Power source	Y	PASS
15.207(a)	Powerline Conducted Emissions	Y	PASS
15.209(a)	Radiated Emissions within Restricted Bands	Y	PASS
15.231(a)(1)	Manually operated transmitter	N	
15.231(a)(2)	Automatically activated transmitter	Y	PASS
15.231(a)(3)	Periodic transmissions at regular predetermined intervals	N	
15.231(a)(4)	Radiators used in cases of emergency	Y	PASS
15.231(a)(5)	Set-up information for security systems	N	
15.231(b)	Radiated Emissions	Y	PASS
15.231(c)	20dB Bandwidth	Y	PASS
15.231(d)	Devices operating within the frequency band 40.66-40.70 MHz	N	
15.231(e)	Radiated emissions for Periodic radiators	N	

## Appendix A: Test Results

### Clause 15.207(a) Powerline Conducted Emissions

Frequency of Conducted limit (dBuV)		
Emission (MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

### Test Conditions:

<b>Sample Number:</b>	13	<b>Temperature:</b>	23°C
<b>Date:</b>	May 9, 2007	<b>Humidity:</b>	52%
<b>Modification State:</b>	0	<b>Tester:</b>	Xu Jin
		<b>Laboratory:</b>	Shielded Room

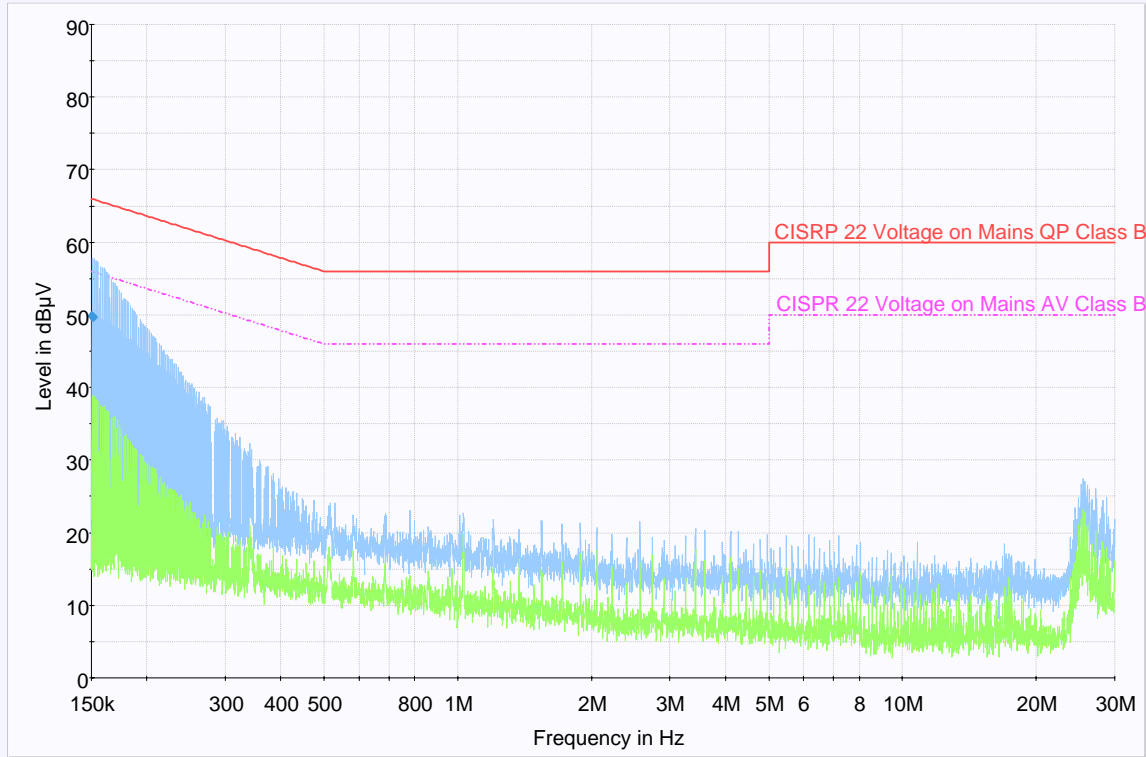
**Test Results:** Comply  
**Test Data:** See Attached Plots

AC Main Emissions---Neutral



- CISRP 22 Voltage on Mains QP Class B
- CISPR 22 Voltage on Mains AV Class B
- Preview Measurement Peak Detector
- Preview Measurement Average Detector
- ◆ Final Measurement Quasi-Peak Detector

AC Main Emissions---Phase



- CISRP 22 Voltage on Mains QP Class B
- CISRP 22 Voltage on Mains AV Class B
- Preview Measurement Peak Detector
- Preview Measurement Average Detector
- ◆ Final Measurement Quasi\_Peak Detector

**Clause 15.209(a) Radiated Emissions within Restricted Bands**

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

Frequency (MHz)	Field Strength (microvoltsmeter) (kHz)	Measurement Distance (meters)
0.009-0.490	2400/F	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

**Test Conditions:**

<b>Sample Number:</b>	13	<b>Temperature:</b>	25°C
<b>Date:</b>	May 4, 2007	<b>Humidity:</b>	52%
<b>Modification State:</b>	1	<b>Tester:</b>	Xu Jin
		<b>Laboratory:</b>	OATS

**Test Results:**

See Attached Table for Results

**Additional Observations:**

The Spectrum was searched from 30MHz to 5GHz.

The EUT was measured on three orthogonal axis.

All measurements were performed using a Peak Detector with 100kHz RBW/VBW below 1GHz and a 1MHz RBW/VBW above 1GHz at a distance of 3 meters.

No emission within 20dB below the limit was noticed.

**Clause 15.231(a) Conditions for intentional radiators to comply with periodic operation**

The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

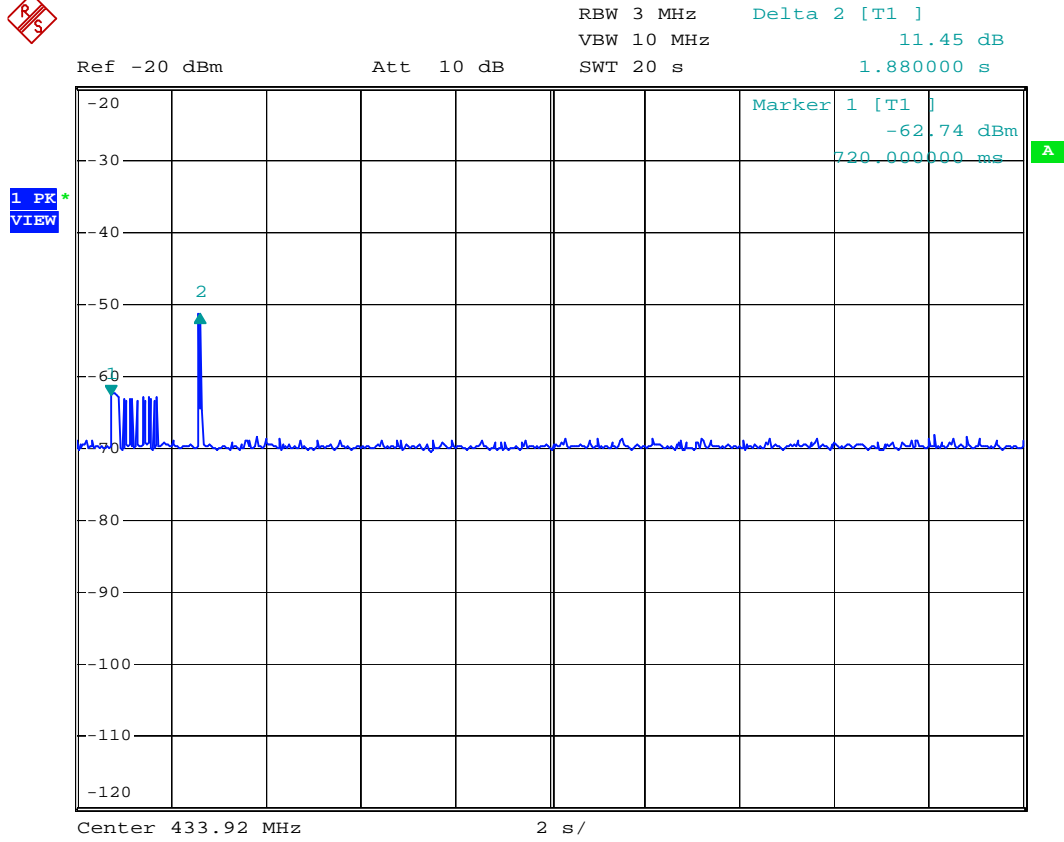
- (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
- (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.
- (4) Intentional radiators, which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.
- (5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

**Test Conditions:**

<b>Sample Number:</b>	13	<b>Temperature:</b>	25°C
<b>Date:</b>	May 8, 2007	<b>Humidity:</b>	52%
<b>Modification State:</b>	1	<b>Tester:</b>	Xu Jin
		<b>Laboratory:</b>	Wireless Lab

**Test Results:**

- (1) The apparatus is not manually triggered.
- (2) See attached plot for the time for transmission.
- (3) The apparatus is not a periodic transmitter.
- (4) The apparatus only transmits a single event for each alarm detected.
- (5) The setup information does not exceed the transmit duration.



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**Clause 15.231(b) Radiated Emissions**

In addition to the provisions of 15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,750	125 to 375
174-260	3,750	375
260-470	3,750 to 12,500	375 to 1,250
Above 470	12,500	1,250

**Test Conditions:**

<b>Sample Number:</b>	13	<b>Temperature:</b>	25°C
<b>Date:</b>	May 4, 2007	<b>Humidity:</b>	52%
<b>Modification State:</b>	1	<b>Tester:</b>	Xu Jin
		<b>Laboratory:</b>	OATS

**Test Results:**

See Attached Table for Results

**Additional Observations:**

The Spectrum was searched from 30MHz to 5GHz.

All measurements were performed using a Peak Detector with 100kHz RBW/VBW below 1GHz and a 1MHz RBW/VBW above 1GHz at a distance of 3 meters.

The EUT was measured on three orthogonal axis. Only worst-case fundamental emission was reported. No spurious emission within 20dB below the limit was noticed.

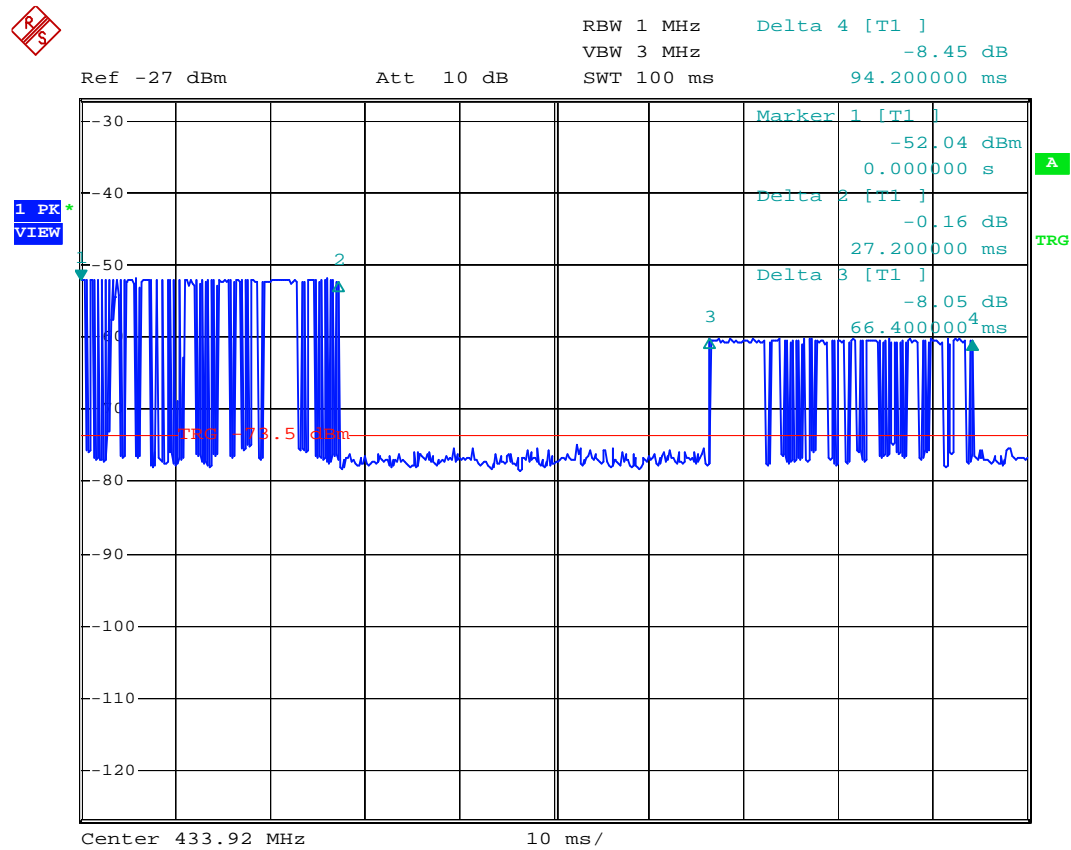
The AC mains were varied by +/-15% and there was no change in the field strength.

Freq. (MHz)	Ant	Pol. V/H	RCVD Signal (dBμV)	Ant. Factor (dB/m)	Amp. Gain (dB)	Duty Cycle Corr. (dB)	Cable Loss (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
433.92	LP	H	64.7	17.2	N/A	-5.2	2.1	78.8	80.8	2.0
433.92	LP	V	57	16.6	N/A	-5.2	2.1	70.5	80.8	10.3

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole



Duty cycle correction factor  
 $=20*\log((27.2+27.8)/100)=-5.19\text{dB}$



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**Clause 15.231(c) 20dB Bandwidth**

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

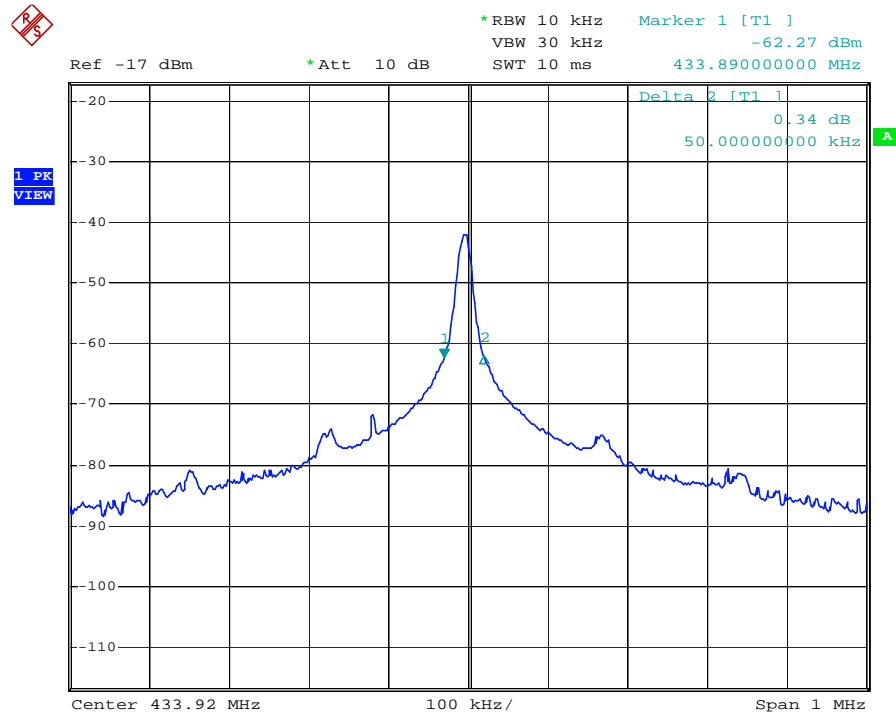
**Test Conditions:**

<b>Sample Number:</b>	13	<b>Temperature:</b>	25°C
<b>Date:</b>	May 8, 2007	<b>Humidity:</b>	52%
<b>Modification State:</b>	1	<b>Tester:</b>	Xu Jin
		<b>Laboratory:</b>	OATS

**Limit:** 0.25% of the center frequency =  $0.0025 \times 433.92\text{MHz} = 1084.8\text{KHz}$

**Test Results:**

**20dB Bandwidth=50KHz**



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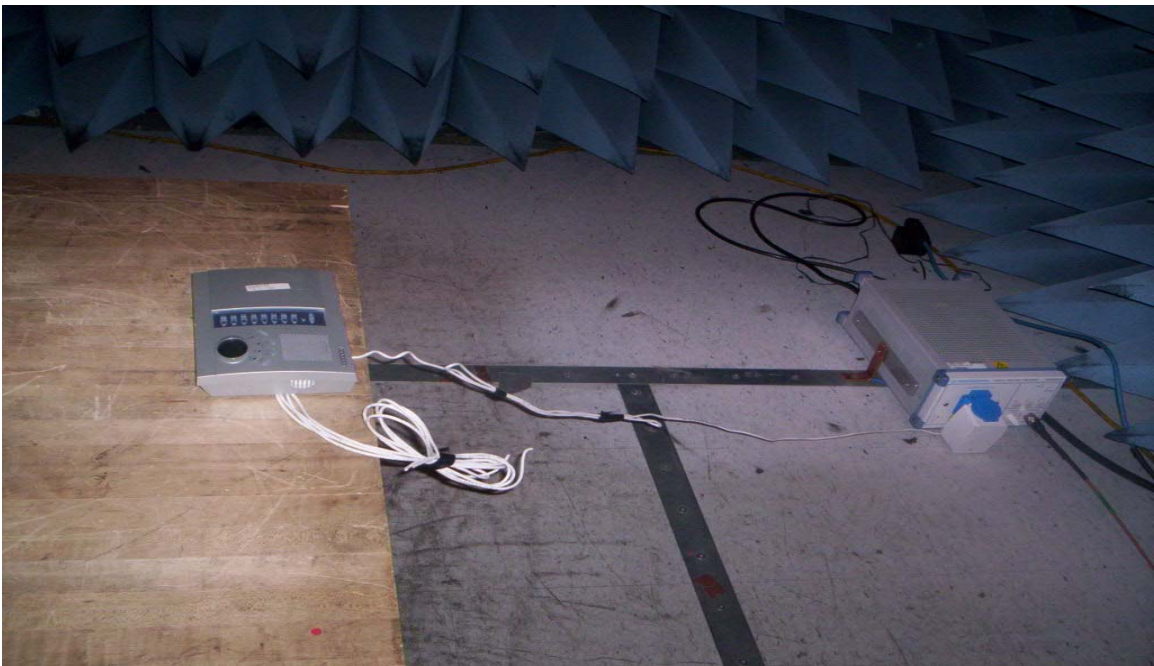
## Appendix B: Setup Photographs

### Spurious Emissions Setup:



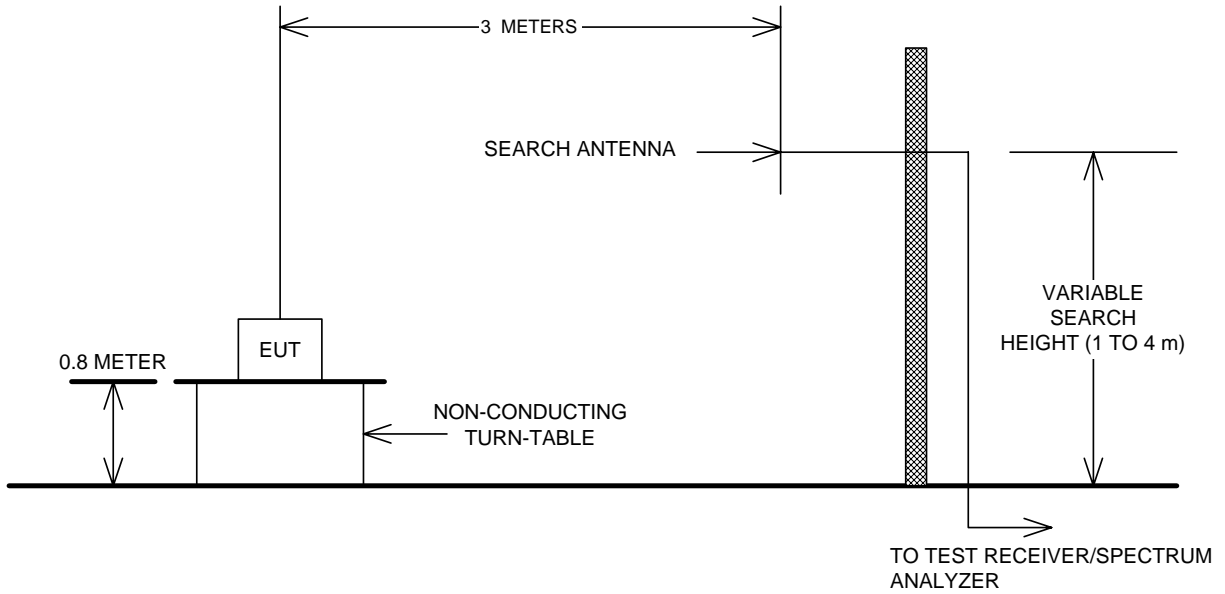


**AC Power conducted emission Setup:**



### Appendix C : Block Diagram of Test Setups

#### Test Site For Radiated Emissions



#### Conducted Emissions

