Nemko Test Report:	109054-1TRFWL
Applicant:	Autostart Inc. 5764 Rue Paré Mont-Royal, Québec Canada, H4P 2M2
Apparatus:	ASRA 2503
FCC ID:	EZSNAH2503
In Accordance With:	FCC Part 15 Subpart B, 15.107 and 15.109 Unintentional Radiators FCC Part 15 Subpart C, 15.231 Periodic operation in the band 40.66-40.70MHz and above 70 MHz.
Authorized By:	Jason Nixon, Wireless/Telecom Specialist
Date:	August 6, 2008
Total Number of Pages:	16

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Section 1 : Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart B and Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003.

The assessment summary is as follows:

Apparatus Assessed:	ASRA 2503
Specification:	FCC Part 15 Subpart B, 15.107 and 15.109 FCC Part 15 Subpart C, 15.231
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release
Test Locations:	Nemko Canada Inc. 303 River Road Ottawa, Ontario K1V 1H2
	Nemko Canada Inc. 1500 Peter Robinson Side Road West Carleton, Ontario K0A 1L0
FCC Test Site Reference No.:	176392 (3m Semi-Anechoic Chamber), 90845 (OATS)
Tests Performed By:	Andrey Adelberg EMC/Wireless Specialist
Test Dates:	July 2, 2008 to August 1, 2008

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. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Section 2 : Equipment Under Test

2.1 Identification of Equipment Under Test (EUT)

The following information identifies the EUT under test:

Type of Equipment:	Keyfob
Brand Name:	Autostart
Model Name or Number:	ASRA 2503
Serial Number:	None
Nemko Sample Number:	1
FCC ID:	EZSNAH2503
Date of Receipt:	July 2, 2008

2.2 Accessories

No accessories were used during this assessment.

2.3 EUT Description

The ASRA 2503 is used in the Remote end of a car starter system and operates at 433.92 MHz. (OOK)

2.4 Technical Specifications of the EUT

Operating Frequency: 433.92 MHz

Modulation: ASK

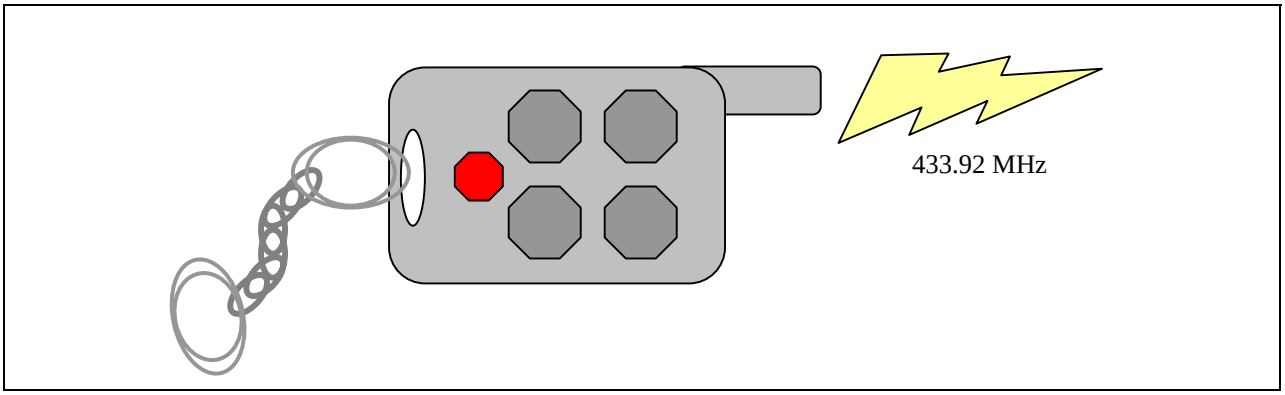
Occupied Bandwidth: 64 kHz

Emission Designator: K1D

Antenna Data: Integrated

Power Supply Requirements: 2x CR2025 Battery of 3V

2.5 EUT Setup diagram



2.6 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

Section 3 : Test Conditions

3.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart B, 15.107 and 15.109
Unintentional Radiators
FCC Part 15 Subpart C, 15.231
Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.

3.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

3.3 Test Environment

All tests were performed under the following environmental conditions:

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

3.4 Measurement Uncertainty

Nemko Canada measurement uncertainty has been calculated using guidance of UKAS LAB 34:2003 and TIA-603-B Nov 7, 2002. All calculations have been performed to provide a confidence level of 95% and can be found in Nemko Canada document MU-003.

3.5 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Cal. Date	Next Cal.
Electro-Magnetic Interference Test Chamber	TDK	SAC-3	FA002047	May 06/08	May 06/09
Bilog	Sunol	JB3	FA002108	Jan. 21/08	Jan. 21/09
Flush Mount Turntable	Sunol	FM2022	FA002082	NCR	NCR
Controller	Sunol	SC104V	FA002060	NCR	NCR
Mast	Sunol	TLT2	FA002061	NCR	NCR
50 Coax cable	HUBER + SUHNER	None	FA002015	Sept. 19/07	Sept. 19/08
50 Coax cable	HUBER + SUHNER	None	FA002022	July 07/08	July 07/09
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU 26	FA002043	Dec. 07/07	Dec. 07/08
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU 40	FA002071	Nov. 15/07	Nov. 15/08
1- 26.5 GHz Amplifier	Hewlett-Packard	8449B	FA001761	Sept. 20/07	Sept. 20/08
0.1 – 1300 MHz Amplifier	Hewlett Packard	8447D	FA001747	Aug. 10/07	Aug. 10/08
Horn Antenna #1	EMCO	3115	FA000649	Feb 13/08	Feb 13/09

COU – Calibrate on Use
NCR – No Calibration Required

Section 4 : Results Summary

This section contains the following:

FCC Part 15 Subpart B : Test Results
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 Report Summary)

4.1 FCC Part 15 Subpart B : Test Results

Part 15	Test Description	Required	Result
15.107(a)	Conducted Emissions for Class B	N	
15.109(a)	Radiated Emissions for Class B	Y	Pass

4.2 FCC Part 15 Subpart C : Test Results

Part 15	Test Description	Required	Result
15.31(e)	Variation of Power source	N	
15.207(a)	Powerline Conducted Emissions	N	
15.209(a)	Radiated Emissions within Restricted Bands	Y	Pass
15.231(a)(1)	Manually operated transmitter	Y	Pass
15.231(a)(2)	Automatically activated transmitter	N	
15.231(a)(3)	Periodic transmissions at regular predetermined intervals	N	
15.231(a)(4)	Radiators used in cases of emergency	N	
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 15.109(a) Radiated Emissions

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (microvoltsmeter)
30 - 88	100
88 - 216	150
216 - 960	200
Above 960	500

Test Results: Pass

Additional Observations:

- The Spectrum was searched from 30MHz to the 2000 MHz.
- The EUT was measured on three orthogonal axis with vertical and horizontal receiving antenna. Only worst case was presented.
- Fresh batteries were used throughout all tests.
- Measurement equipment setup was 120kHz Quasi-peak detector for measurements below 1GHz and 1MHz RBW/VBW peak detector above 1GHz.
- All Measurements were performed at 3 meters.
- No emissions within 20 dB below the limit were found

Appendix B : Test Results

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)	Measurement Distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Results: Pass

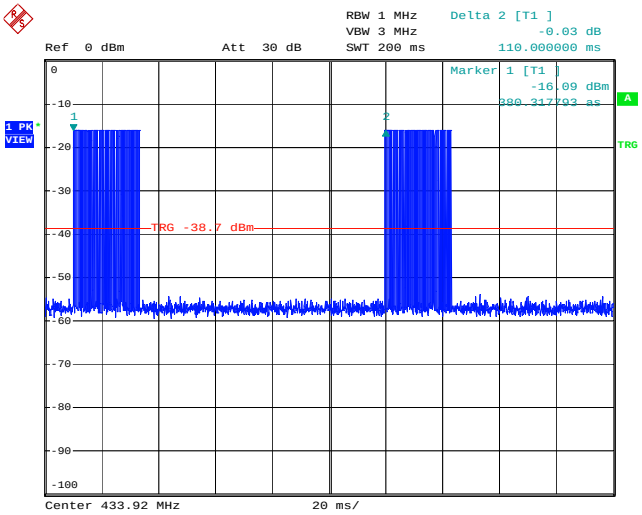
Additional Observations:

- The Spectrum was searched from 30MHz to the 10th Harmonic.
- These results apply to emissions found in the Restricted bands defined in FCC Part 15 Subpart C, 15.205.
- The EUT was measured on three orthogonal axis with vertical and horizontal receiving antenna. Only worst case was presented.
- Fresh batteries were used throughout all tests.
- 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.

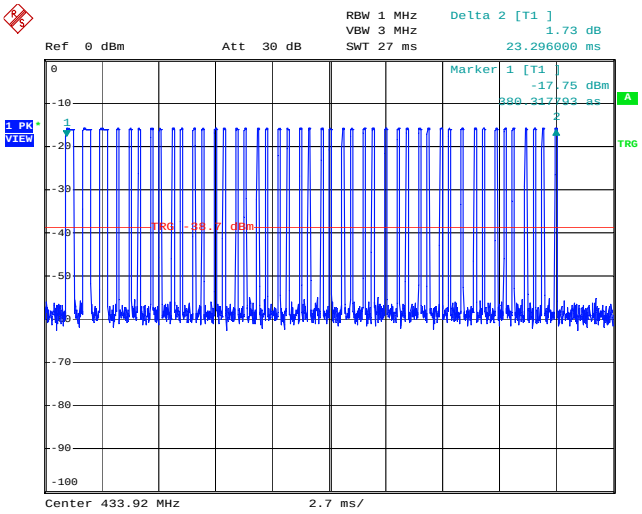
	Frequency (MHz)	Ant.	Polarity	RCVD Signal (dBµV/m)	Corr. Factor (dB)	Duty Cycle Corr.	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	1301.76	Horn	V	66.466	7.2	23.53	66.466	74.00	7.534	Peak
							42.936	54.00	11.064	Average
2	3905.28	Horn	V	71.479	9.7	23.53	71.479	74.00	2.521	Peak
							47.949	54.00	6.051	Average
3	4339.2	Horn	V	64.840	10.1	23.53	64.84	74.00	9.16	Peak
							41.31	54.00	12.69	Average

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
Note 2: RCVD Signal includes Correction factor of Antenna factor, cable loss and amplifier gain where applicable.

Duty Cycle within 100ms:



Packet Transmission:



Pulse name:	Preamble	Start	ID and Data	CRC	Srop	Total
No of pulses:	3	1	32	8	1	45
On time:	1200µs	130µs	4160µs	1040µs	130µs	6.66ms

Duty cycle correction factor calculation:

$$Duty\,Cycle = 20\log\left(\frac{On\,time}{100ms}\right) = 20\log\left(\frac{6.66}{100}\right) = -23.53dB$$

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.

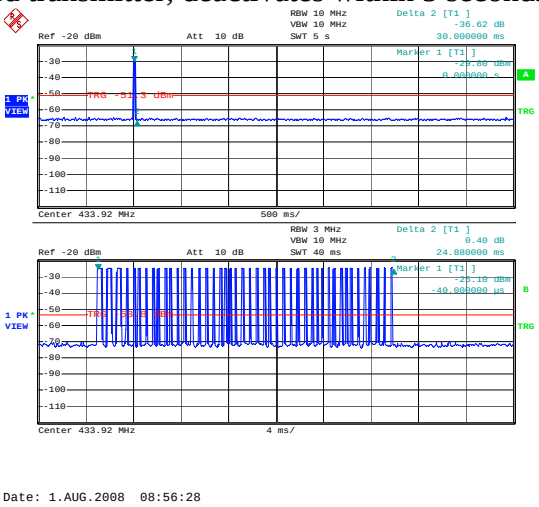
(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more 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 Results: Pass

(1) Manually operated transmitter, deactivates within 5 seconds after being released:



(2) N/A

(3) There are no periodic transmissions at regular predetermined intervals implemented.

(4) N/A

(5) N/A

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 Results: Pass

Additional Observations:

- The Spectrum was searched from 30MHz to the 10th Harmonic.
- The EUT was measured on three orthogonal axis with vertical and horizontal receiving antenna. Only worst case was presented.
- Fresh batteries were used throughout all tests.
- 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.

Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBµV/m)	Corr. Factor (dB)	Duty Cycle Corr. (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)
Fundamental											
433.92	BL	V	97.65	20.9	23.53	97.65	100.83	3.18	74.12	80.83	6.71
Harmonics											
867.84	BL	V	44.844	28.5	23.53	44.844	80.83	35.986	21.314	60.83	39.516
1735.68	Horn	V	58.489	8.8	23.53	58.489	80.83	22.341	34.959	60.83	25.871
2169.60	Horn	V	56.587	10.9	23.53	56.587	80.83	24.243	33.057	60.83	27.773
2603.52	Horn	V	59.795	11.5	23.53	59.795	80.83	21.035	36.265	60.83	24.565
3037.44	Horn	V	73.366	12.8	23.53	73.366	80.83	7.464	49.836	60.83	10.994
3471.36	Horn	V	73.688	14.3	23.53	73.688	80.83	7.142	50.158	60.83	10.672

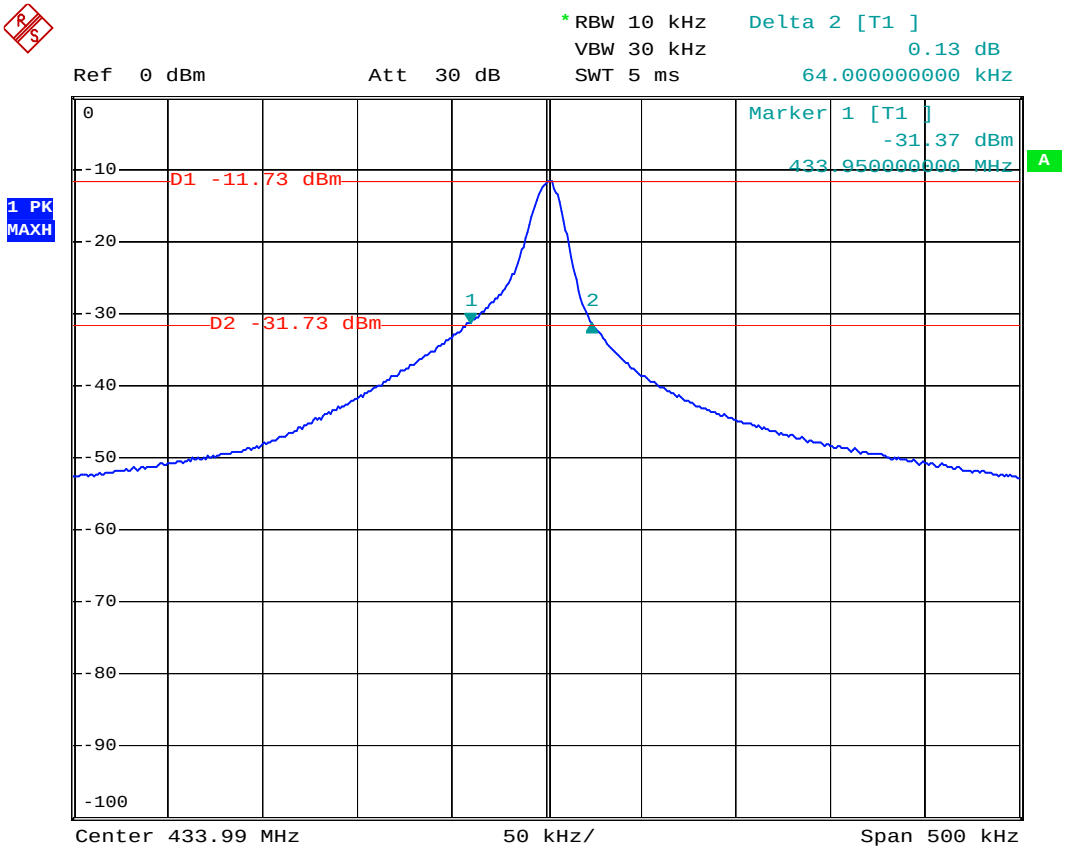
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
Note 2: RCVD Signal includes Correction factor of Antenna factor, cable loss and amplifier gain where applicable.

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 Results: Pass

20dB Bandwidth:



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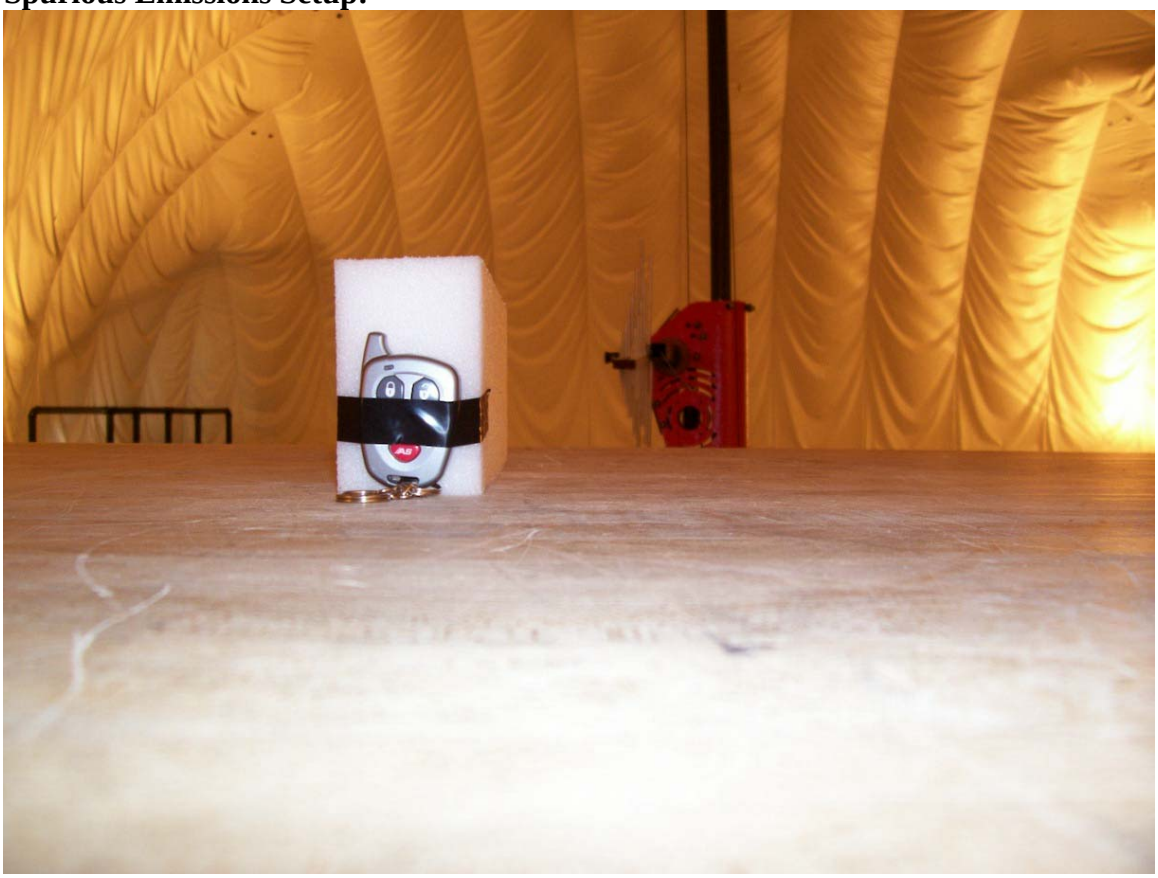
Frequency, MHz	20dB BW, kHz	Limit, kHz	Margin, kHz
433.92	64	1084.8	1020.8

Appendix C : Setup Photographs

Spurious Emissions Setup:



Appendix D : Block Diagram of Test Setups

Radiated Emissions above 30MHz Test Site