



FCC PART 15B

TEST REPORT

For

Hangzhou Hamaton Tyre Valves Co., Ltd.

12 East Zhenxing Road, Linping, Yuhang, Hangzhou, China

FCC ID: Z27HTRD01

Report Type: Original Report	Product Type: TPMS Receiver
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Report Number: R2SH130402051-00	
Report Date: 2013-07-10	
Reviewed By: RF Leader Ivan Cao <i>Ivan Cao</i>	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The Hangzhou Hamaton Tyre Valves Co., Ltd.'s product, model number: *HTRD01* (FCC ID: *Z27HTRD01*) (the "EUT") in this report was a *TPMS Receiver*, which was measured approximately: 9.0 cm (L) x 9.0 cm (W) x 5.0 cm (H), rated input voltage: DC 3.7 V from lithium battery or DC 5V from car charger.

** All measurement and test data in this report was gathered from production sample serial number: 130402051 (Assigned by BACL.Dongguan). The EUT was received on 2013-04-03.*

Objective

This report is prepared on behalf of *Hangzhou Hamaton Tyre Valves Co., Ltd.* in accordance with Part 2, Subpart J, Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine compliance with FCC Part 15B, Class B.

Related Submittal(s)/Grant(s)

No related submittal grant.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Dongguan) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 500069-0).



The current scope of accreditations can be found at <http://ts.nist.gov/standards/scopes/5000690.htm>

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user). The highest operating frequency is 315MHz.

EUT Exercise Software

No exercise software was used.

Equipment Modifications

No modification was made to the EUT tested.

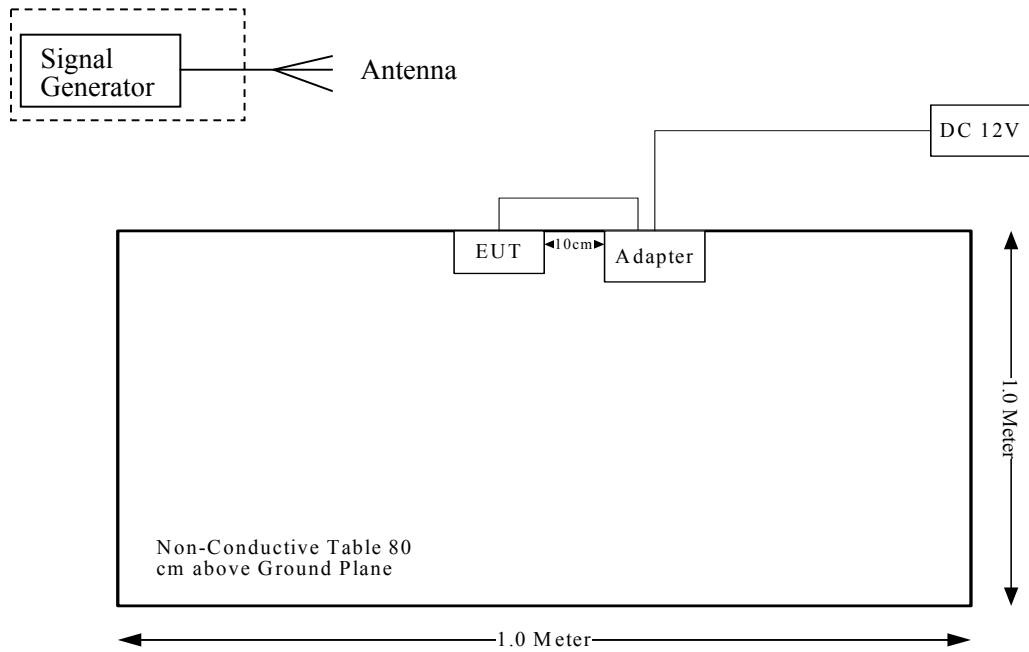
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
MIG	adapter	PI-100U2	N/A
HP	Signal Generator	8648A	3426A00831

External Cable

Cable Description	Length (m)	From Port	To
Unshielded USB Cable	0.5	USB port of adapter	USB port of EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	AC Line Conducted Emissions	Not Applicable*
§15.109	Radiated Emissions	Compliance

Not Applicable*: the EUT was powered by lithium battery or Car charger.

FCC §15.109 - RADIATED EMISSIONS

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 2, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:

30M~200MHz: 5.0 dB

200M~1GHz: 6.2 dB

1G~6GHz: 4.45 dB

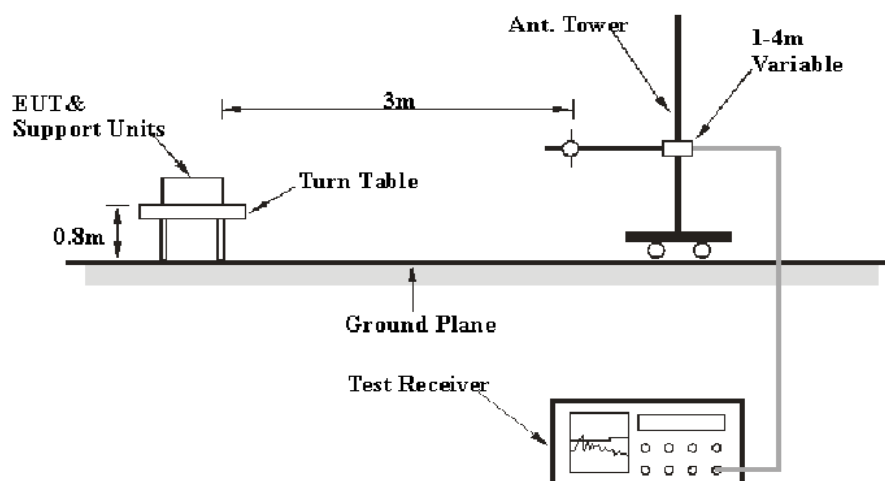
6G~18GHz: 5.23 dB

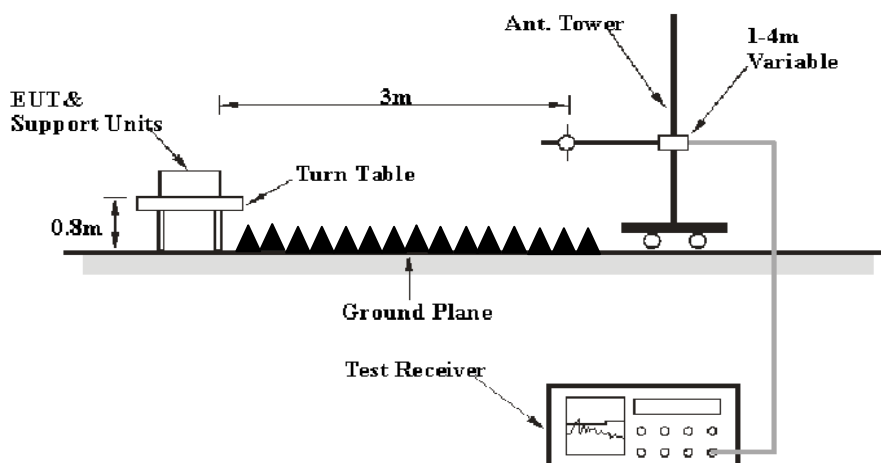
Table 2 – Values of U_{cispr}

Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1 GHz:



Above 1GHz:

The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part 15.109, Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The adapter connected to a 12 VDC power source.

EMI Test Receiver Setup

According to FCC 15.33 requirements, the system was measured from 30 MHz to 6 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>	<i>Detector</i>
30 MHz – 1000 MHz	120 kHz	300 kHz	QP
Above 1 GHz	1MHz	3 MHz	Peak
Above 1 GHz	1MHz	10 Hz	Ave

Test Procedure

For the radiated emissions test, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in Quasi-peak detection mode for 30 MHz to 1 GHz, Peak and average detection mode above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI TEST RECEIVER	ESCI	100224	2013-5-6	2014-5-5
Sunol Sciences	Antenna	JB3	A060611-1	2012-9-6	2015-9-5
HP	HP AMPLIFIER	8447E	2434A02181	N/A	N/A
R&S	Spectrum analyzer	FSEM 30	849016/001	2012-9-4	2013-9-3
ETS LINDGREN	horn antenna	3115	000 527 35	2012-9-6	2015-9-5
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	N/A	N/A
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.109, Class B, with the worst margin reading of:

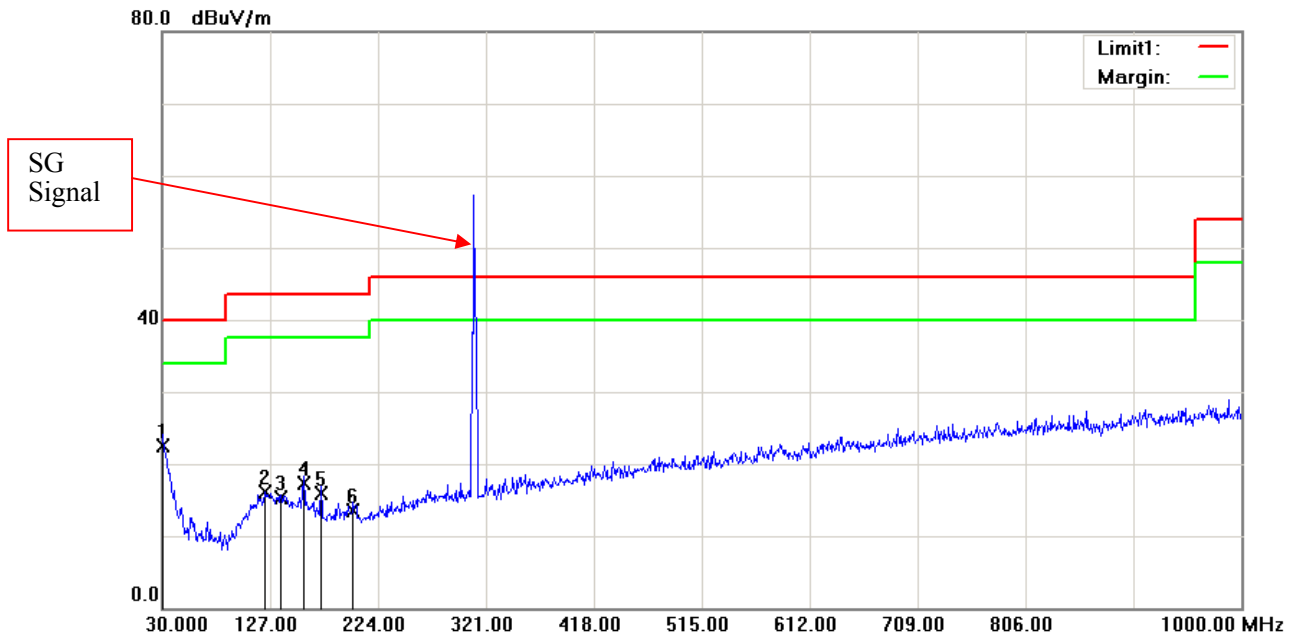
11.10 dB at 46.4900 MHz in the Vertical polarization

Test Data

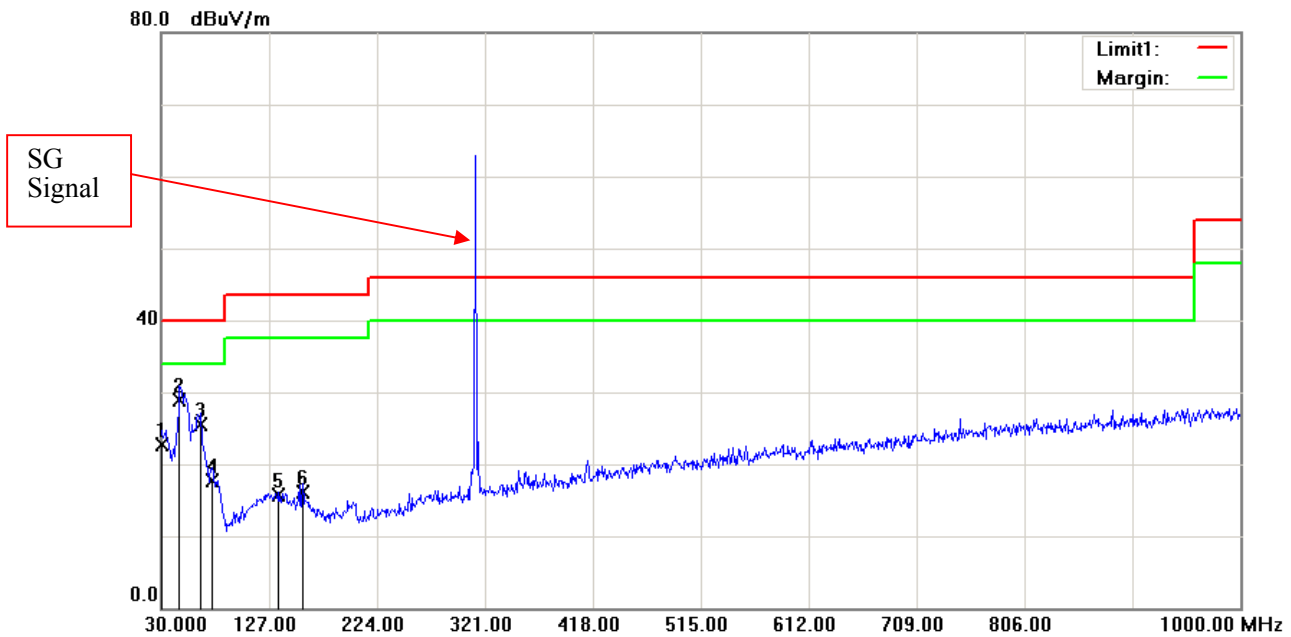
Environmental Conditions

Temperature:	23.2 °C
Relative Humidity:	51 %
ATM Pressure:	100.3 kPa

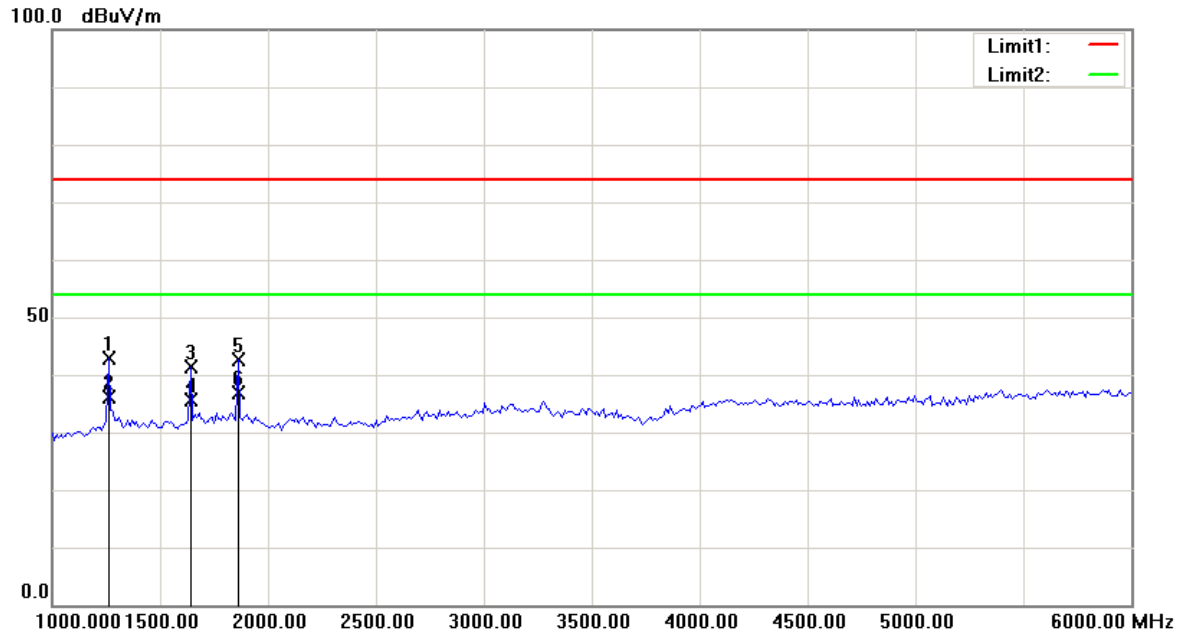
The testing was performed by Allen Qiao on 2013-07-09.

1) Below 1'GJ | :*Test mode: Receiving***Horizontal:**

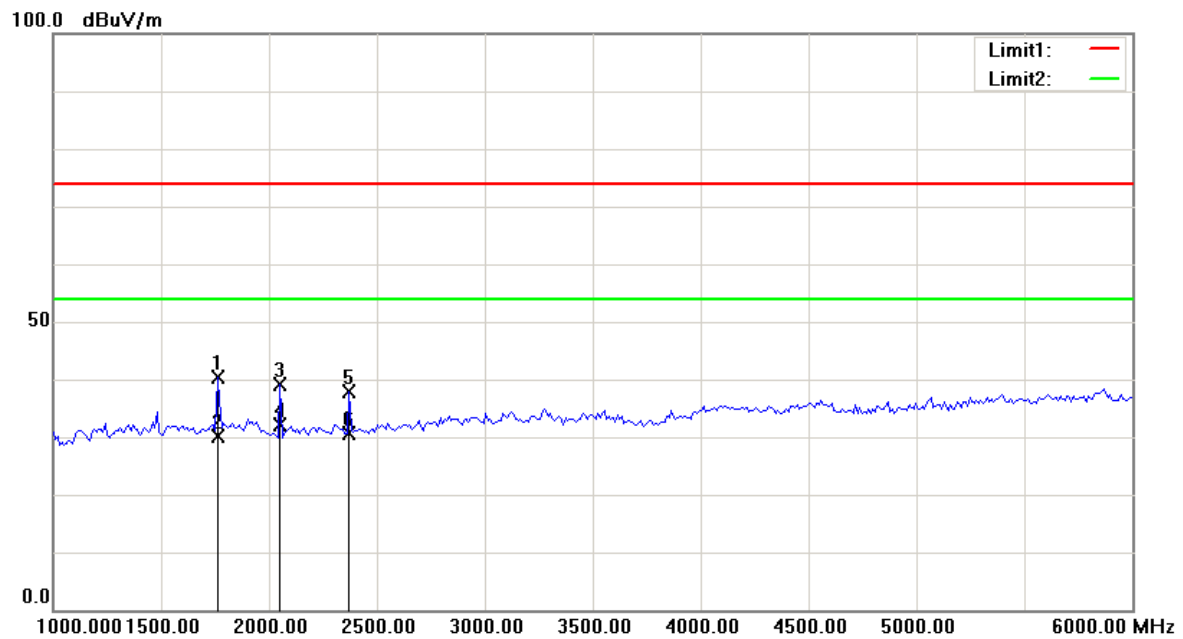
Frequency (MHz)	Receiver Reading (dBuV/m)	Detector (PK/QP/Ave+)	Correction Factor (dB)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.0000	21.09	QP	1.41	22.50	40.00	17.50
122.1500	22.43	QP	-6.33	16.10	43.50	27.40
136.7000	22.27	QP	-6.97	15.30	43.50	28.20
157.0700	25.05	QP	-7.65	17.40	43.50	26.10
172.5900	24.66	QP	-8.76	15.90	43.50	27.60
201.6900	21.30	QP	-7.80	13.50	43.50	30.00

Vertical:

Frequency (MHz)	Receiver Reading (dBuV/m)	Detector (PK/QP/Ave+)	Correction Factor (dB)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.0000	21.39	QP	1.41	22.80	40.00	17.20
46.4900	39.54	QP	-10.64	28.90	40.00	11.10
65.8900	38.21	QP	-12.61	25.60	40.00	14.40
75.5900	30.08	QP	-12.28	17.80	40.00	22.20
135.7300	22.56	QP	-6.86	15.70	43.50	27.80
157.0700	23.85	QP	-7.65	16.20	43.50	27.30

2) Above 1'GJ | :*Test mode: Receiving***Horizontal:**

Frequency (MHz)	Receiver Reading (dBuV/m)	Detector (PK/QP/Ave+)	Correction Factor (dB)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1260.521	47.12	peak	-4.24	42.88	74.00	31.12
1260.521	40.37	AVG	-4.24	36.13	54.00	17.87
1641.283	44.37	peak	-3.04	41.33	74.00	32.67
1641.283	38.66	AVG	-3.04	35.62	54.00	18.38
1861.723	45.32	peak	-2.73	42.59	74.00	31.41
1861.723	39.70	AVG	-2.73	36.97	54.00	17.03

Vertical:

Frequency (MHz)	Receiver Reading (dBuV/m)	Detector (PK/QP/Ave+)	Correction Factor (dB)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1761.523	43.16	peak	-2.88	40.28	74.00	33.72
1761.523	32.91	AVG	-2.88	30.03	54.00	23.97
2052.104	41.43	peak	-2.42	39.01	74.00	34.99
2052.104	34.58	AVG	-2.42	32.16	54.00	21.84
2372.745	39.38	peak	-1.58	37.80	74.00	36.20
2372.745	32.26	AVG	-1.58	30.68	54.00	23.32

***** END OF REPORT *****