



**DATE: 06 March 2012**

**I.T.L. (PRODUCT TESTING) LTD.**

**FCC Radio Test Report**

for

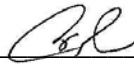
**Maytronics Ltd.**

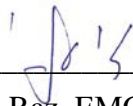
**Equipment under test:**

**HG Dynamic DC Power Supply for Dolphin 2X2**

**Dynamic DC For Dolphin 2X2**

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Approved by:   
I. Raz, EMC Laboratory Manager

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This report relates only to items tested.





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# 1. General Information

## 1.1 Administrative Information

Manufacturer: Maytronics Ltd.

Manufacturer's Address: Kibbutz Yizrael  
D.N. Emek Yizrael 19350  
Israel  
Tel: +972-4-659-8111  
Fax: +972-4-652-2485

Manufacturer's Representative: Yair Hadari

Equipment Under Test (E.U.T): HG Dynamic DC Power Supply for Dolphin 2X2

Equipment Model No.: Dynamic DC For Dolphin 2X2

Equipment Serial No.: Not Designated

Date of Receipt of E.U.T: 3/7/2011

Start of Test: 3/7/2011

End of Test: 9/10/2011

Test Laboratory Location: I.T.L (Product Testing) Ltd.  
Kfar Bin Nun,  
ISRAEL 99780

Test Specifications: FCC Part 15 Subpart C Section 15.247



## **1.2 List of Accreditations**

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), IC File No.: 46405-4025; Site No. IC 4025B-1.
6. TUV Product Services, England, ASLLAS No. 97201.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.



### **1.3 Product Description**

The E.U.T. is a universal power supply operating between 100-250V for the Dolphin 2X2 pool cleaner.

### **1.4 Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

### **1.5 Test Facility**

The conducted and radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing September 03, 2009). I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

### **1.6 Measurement Uncertainty**

#### **Conducted Emission**

Conducted Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4)

0.15 – 30 MHz:

Expanded Uncertainty (95% Confidence, K=2):

$\pm 3.44$  dB

#### **Radiated Emission**

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site 30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):

$\pm 4.96$  dB

## 2. System Test Configuration

### 2.1 *Justification*

The E.U.T. was placed in its normal operating position.

Due to the replacement of the power supply, no change in the RF chain, testing for a C2PC was performed since the emission generated from the device was reduced compared to the emission in the original grant submission due to the effect new power supply.

### 2.2 *EUT Exercise Software*

pws\_9991260\_2010.hex software was used.

### 2.3 *Special Accessories*

No special accessories were needed to achieve compliance.

### 2.4 *Equipment Modifications*

No special modifications were needed to achieve compliance.

### 2.5 *Configuration of Tested System*

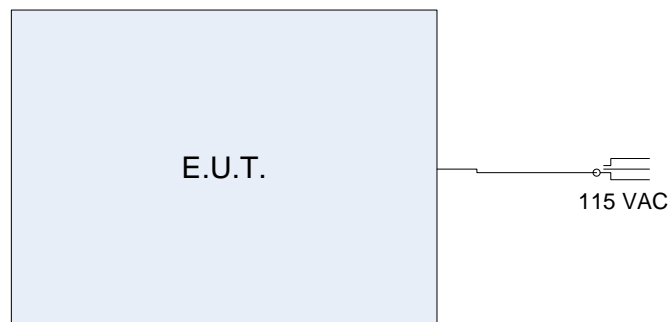


Figure 1. Configuration of Tested System

### 3. Test Setup Photographs



Figure 2. Conducted Emission Test

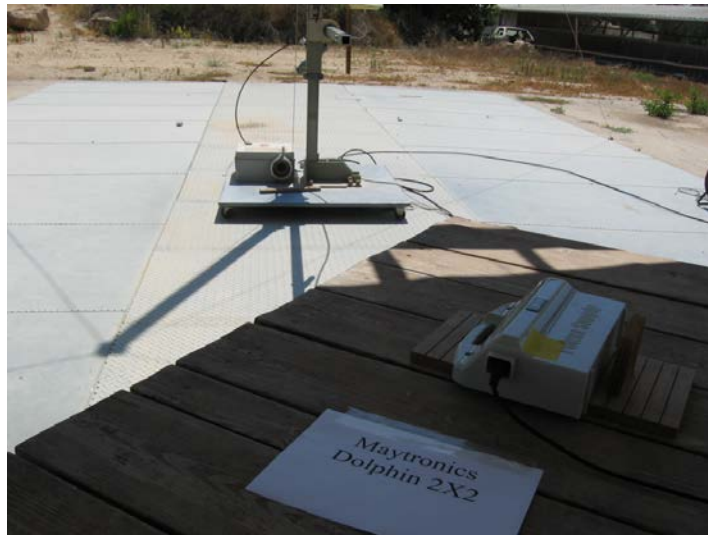


Figure 3. Radiated Emission Test



## 4. Conducted Emission Data

### 4.1 Test Specification

F.C.C., Part 15, Subpart C

### 4.2 Test Procedure

The E.U.T operation mode and test set-up are as described in Section 3. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room, with the E.U.T placed on an 0.8 meter high wooden table, 0.4 meter from the room's vertical wall.

The E.U.T was powered from 115 V AC / 60 Hz via a 50 Ohm / 50  $\mu$ Hn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T

The center of the E.U.T AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver via a 3.5" floppy disk and are displayed on the receiver's spectrum display.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, and using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

### 4.3 Measured Data

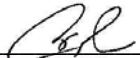
JUDGEMENT: Passed by 2.2 dB

The margin between the emission levels and the specification limit is, in the worst case, 2.2 dB for the phase line at 0.20 MHz and 2.9 dB at 0.19 MHz for the neutral line.

The EUT met the F.C.C. Part 15, Subpart C specification requirements.

The details of the highest emissions are given in *Figure 4* to *Figure 7*.

TEST PERSONNEL:

Tester Signature:  Date: 06.03.11

Typed/Printed Name: A. Sharabi



## Conducted Emission

E.U.T Description      HG Dynamic DC Power Supply  
for Dolphin 2X2  
Type                      Dynamic DC For Dolphin 2X2  
Serial Number:         Not Designated

Specification:    F.C.C., Part 15, Subpart C  
Lead:              Phase  
Detectors:        Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuV)	QP (dBuV)	QP Delta L 1 (dB)	Avg (dBuV)	Av Delta L 2 (dB)
1	0.202368	63.6	61.4	-2.2	47.0	-6.6
2	0.393833	53.9	51.4	-6.6	32.3	-15.7
3	0.404790	54.3	52.2	-5.6	33.0	-14.8
4	0.542980	51.0	49.5	-6.5	30.6	-15.4
5	0.704033	54.2	39.8	-16.1	34.3	-11.7
6	0.917620	52.5	46.2	-9.8	30.7	-15.3

**Figure 4. Detectors: Peak, Quasi-peak, AVERAGE .**

*Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.*





## Conducted Emission

E.U.T Description    HG Dynamic DC Power  
Supply for Dolphin 2X2  
Type                    Dynamic DC For Dolphin 2X2  
Serial Number:        Not Designated

Specification:    F.C.C., Part 15, Subpart C  
Lead:                Neutral  
Detectors:        Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuV)	QP (dBuV)	QP Delta L 1 (dB)	Avg (dBuV)	Av Delta L 2 (dB)
1	0.190212	62.5	61.2	-2.9	50.2	-3.8
2	0.305171	58.2	53.4	-6.8	43.9	-6.2
3	0.395936	54.0	52.2	-5.7	33.6	-14.3
4	0.543311	52.8	51.2	-4.8	33.6	-12.4
5	0.785083	52.1	49.1	-6.9	30.0	-16.0
6	1.111498	50.2	45.8	-10.2	25.3	-20.7

**Figure 6. Detectors: Peak, Quasi-peak, AVERAGE**

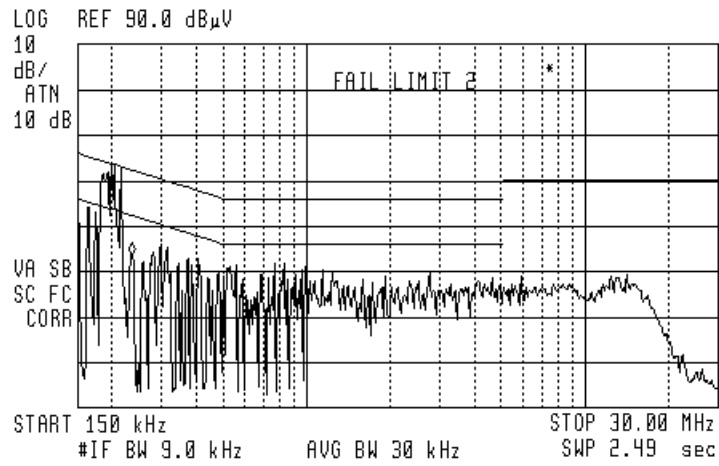
*Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.*

# Conducted Emission

E.U.T Description    HG Dynamic DC Power  
Supply for Dolphin 2X2  
Type                    Dynamic DC For Dolphin 2X2  
Serial Number:        Not Designated

Specification:    F.C.C., Part 15, Subpart C  
Lead:                Neutral  
Detectors:        Peak, Quasi-peak, Average

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 240 kHz  
43.61 dB $\mu$ V



**Figure 7 Conducted Emission: NEUTRAL  
Detectors: Peak, Quasi-peak, Average**



#### 4.4 Test Instrumentation Used, Conducted Measurement

<b>Instrument</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Last Calibration Date</b>	<b>Period</b>
LISN	EMCO	3810/ 2BR	1297	May 17, 2011	1 Year
EMI Receiver	HP	8546A	3650A00365	February 23, 2011	1 Year
RF Filter Section	HP	85460A	3704A00329	February 23, 2011	1 Year
Transient Limiter	HP	11947A	3107A03041	December 15, 2010	1 Year
Printer	HP	LaserJet 2200	JPKG19982	N/A	N/A

## 5. Radiated Power Output

### 5.1 Test Specification

F.C.C. Part 15, Subpart C: 15.247(b)

### 5.2 Test procedure

The E.U.T was placed on a non-metallic table, 0.8 meters above the ground plane, on a remote-controlled turntable in the OATS. The test distance was 3 meters.

The transmitter unit operated with normal modulation. The EMI receiver was set to 1 MHz resolution BW. The EUT was set up as shown in Figure 3, and its proper operation was checked.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

The E.U.T. was tested in three operating channels and frequencies  
2433 GHz

Radiated output power levels were measured at selected operation frequencies and the results were converted to power level according to the formula as shown below:

$$P = \frac{(E_{V/m} \times d)^2}{(30 \times G)} \text{ [W]}$$



ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 2.433050 GHz  
91.78 dB $\mu$ V/m

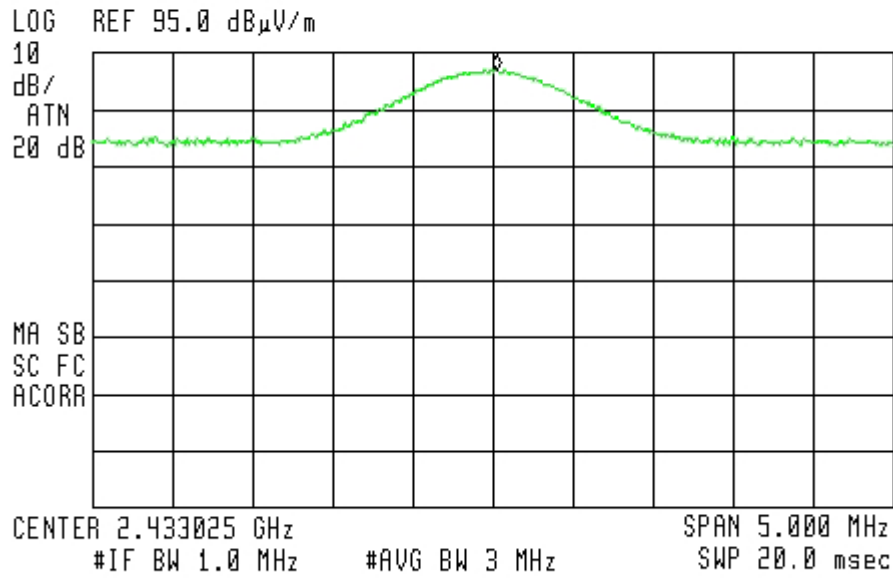


Figure 8 2433 MHz





### 5.3 Results Calculation

E.U.T. Description: HG Dynamic DC Power Supply for Dolphin 2X2  
Model No.: Dynamic DC For Dolphin 2X2  
Serial Number: Not Designated  
Specification: F.C.C. Part 15, Subpart C

Frequency	E	E	Antenna Gain	Antenna Distance	Calculated Results	Limit	Margin
(MHz)	(dB $\mu$ V/m)	(V/m)	(dBi)	(m)	(mW)	(W)	(mW)
2433.00	91.78	0.04	1	3	0.48	1.0	-999.52

Figure 9 Test Results Table

JUDGEMENT: Passed by 999.52 mW

TEST PERSONNEL:

Tester Signature: 

Date: 06/03/2012

Typed/Printed Name: A. Sharabi



#### 5.4 Test Equipment Used.

##### Radiated Maximum Power Output

<b>Instrument</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration</b>	<b>Period</b>
Receiver	HP	85422E	3906A00276	November 24, 2010	1 year
RF Section	HP	85420E	3705A00248	November 24, 2010	1 year
Antenna-Log Periodic	A.H.System	SAS-200/511	253	January 27, 2011	2 years
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

**Figure 10 Test Equipment Used**



## 6. Radiated Emission, 9 kHz – 30 MHz

### 6.1 Test Specification

9 kHz-30 MHz, FCC, Part 15, Subpart C, Section 209

### 6.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 3.1.

The frequency range 9 kHz-30 MHz was scanned.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 9 kHz-30MHz, the loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter at a distance of 3 meters.

The E.U.T. was tested in 1 operating channels and operation frequency of 2433 MHz. This frequency was measured using a peak detector.

### 6.3 Measured Data

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 209 specification.

No signals were detected in the frequency range of 9 kHz – 30 MHz.

TEST PERSONNEL:

Tester Signature: \_\_\_\_\_ 

Date: 06.03.2012

Typed/Printed Name: A. Sharabi



#### 6.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 24, 2010	1 year
RF Section	HP	85420E	3705A00248	November 24, 2010	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 19, 2010	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

#### 6.5 Field Strength Calculation

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$FS = RA + AF + CF$$

FS: Field Strength [dB $\mu$ v/m]

RA: Receiver Amplitude [dB $\mu$ v]

AF: Receiving Antenna Correction Factor [dB/m]

CF: Cable Attenuation Factor [dB]

Example: FS = 30.7 dB $\mu$ V (RA) + 14.0 dB (AF) + 0.9 dB (CF) = 45.6 dB $\mu$ V

No external pre-amplifiers are used.

## 7. Spurious Radiated Emission 30 – 25000 MHz

### 7.1 Test Specification

30 MHz-25000 MHz, F.C.C., Part 15, Subpart C

### 7.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground.

The frequency range 30 MHz-25000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 1-2.9 GHz, a computerized EMI receiver complying to CISPR 16 requirements was used.

In the frequency range 2.9-25.0 GHz, a spectrum analyzer including a low noise amplifier was used. During average measurements, the IF bandwidth was 1 MHz and the video bandwidth was 100Hz. During peak measurements, the IF bandwidth was 1 MHz and the video bandwidth was 3 MHz.

The test distance was 3 meters.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods: turning the E.U.T on and off; using a frequency span less than 10 MHz; observation of the signal level during turntable rotation. (Background noise is not affected by the rotation of the E.U.T.)

In the frequency range 30-1000 MHz, the readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

The E.U.T. was tested in 1 operating channel and operation frequency of 2433 MHz.



### 7.3 Test Data

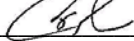
JUDGEMENT: Passed by 0.5 dB

The EUT met the requirements of the F.C.C. Part 15, Subpart C, specification.  
The results for all three operation channels were the same.

The signals in the band 30 MHz – 1.0 GHz were below the spectrum analyzer noise level, at least 20 dB below the specification limit.

The margin between the emission level and the specification limit is 4.5 dB in the worst case at the frequency of 2433.00 MHz, horizontal polarization.

#### TEST PERSONNEL:

Tester Signature: \_\_\_\_\_ 

Date: 06.03.12

Typed/Printed Name: A. Sharabi



## Radiated Emission Above 1 GHz

E.U.T Description    HG Dynamic DC Power Supply for  
Dolphin 2X2  
Type                     Dynamic DC For Dolphin 2X2  
Serial Number:        Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical    Frequency range: 1.0 GHz to 25.0 GHz  
Test Distance: 3 meters                            Detector: Peak

Operation Frequency (MHz)	Freq. (MHz)	Polarity (H/V)	Peak Reading* (dBμV/m)	Peak. Specification (dB μV/m)	Peak. Margin (dB)
2433.00	4866.00	H	55.5	74.0	-18.5
2433.00	4866.00	V	56.3	74.0	-17.7

**Figure 11. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.  
Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

\*“Peak Reading” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain



## Radiated Emission Above 1 GHz

E.U.T Description    HG Dynamic DC Power Supply for Dolphin 2X2  
 Type                    Dynamic DC For Dolphin 2X2  
 Serial Number:        Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical      Frequency range: 1.0 GHz to 25.0 GHz  
 Test Distance: 3 meters                            Detector: Average  
 Operation Frequency: MHz

Operation Frequency	Freq.	Polarity	Average Reading*	Average Specification	Average Margin
(MHz)	(MHz)	(H/V)	(dBμV/m)	(dB μV/m)	(dB)
2433.00	4866.00	H	47.5	54.0	-6.5
2433.00	4866.00	V	49.5	54.0	-4.5

**Figure 12. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL. Detector: Average**

Notes:

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

\* "Average Reading" includes correction factor.

Correction Factor = Antenna Factor + Cable Loss- Low Noise Amplifier Gain





#### 7.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 24, 2010	1 year
RF Section	HP	85420E	3705A00248	November 24, 2010	1 year
Antenna Bioconical	ETS	3109	002-3244	August 31, 2011	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	March 23, 2011	1 year
Antenna Log Periodic	A.H. Systems	SAS-200/511	253	January 27, 2011	2 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet 2225	2738508357.0	N/A	N/A
Spectrum Analyzer	HP	8592L	3826A01204	February 21, 2011	1 year
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	November 5, 2010	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	January 4, 2011	1 Year
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 14, 2010	2 year



### **7.5 Field Strength Calculation 30 – 1000 MHz**

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$[\text{dB}\mu\text{v/m}] \text{ FS} = \text{RA} + \text{AF} + \text{CF}$$

- FS: Field Strength [dB $\mu$ v/m]
- RA: Receiver Amplitude [dB $\mu$ v]
- AF: Receiving Antenna Correction Factor [dB/m]
- CF: Cable Attenuation Factor [dB]

Example:  $\text{FS} = 30.7 \text{ dB}\mu\text{V (RA)} + 14.0 \text{ dB (AF)} + 0.9 \text{ dB (CF)} = 45.6 \text{ dB}\mu\text{V}$

No external pre-amplifiers are used.

## 8. R.F Exposure/Safety

The E.U.T. is a power supply.

Calculation of Maximum Permissible Exposure (MPE)  
Based on Section 1.1307(b)(1) Requirements

(a) FCC limits at 2433 MHz is:  $1 \frac{mW}{cm^2}$

Using table 1 of Section 1.1310 limit for general population/uncontrolled exposures, the above level is an average over 30 minutes.

(b) The power density produced by the E.U.T. is

$$S = \frac{P_t G_t}{4\pi R^2}$$

$P_t G_T$  - Transmitted Power + Antenna Gain = 0.48 mw (Peak)

R- Distance from Transmitter using 0.5 m worst case

(c) The peak power density is :

$$S_p = \frac{0.48}{4\pi(50)^2} = 0.153 \frac{mW}{cm^2}$$

(d) This is below the FCC limit.

## 9. APPENDIX B - CORRECTION FACTORS

### 9.1 Correction factors for CABLE

from EMI receiver  
to test antenna  
at 3 meter range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3	1200.0	7.3
20.0	0.6	1400.0	7.8
30.0	0.8	1600.0	8.4
40.0	0.9	1800.0	9.1
50.0	1.1	2000.0	9.9
60.0	1.2	2300.0	11.2
70.0	1.3	2600.0	12.2
80.0	1.4	2900.0	13.0
90.0	1.6		
100.0	1.7		
150.0	2.0		
200.0	2.3		
250.0	2.7		
300.0	3.1		
350.0	3.4		
400.0	3.7		
450.0	4.0		
500.0	4.3		
600.0	4.7		
700.0	5.3		
800.0	5.9		
900.0	6.3		
1000.0	6.7		

**NOTES:**

1. The cable type is RG-214.
2. The overall length of the cable is 27 meters.
3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".

**9.2 Correction factors for CABLE**

**from EMI receiver  
to test antenna  
at 3 meter range.**

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

*NOTES:*

- 1. The cable type is RG-8.*
- 2. The overall length of the cable is 10 meters.*

**9.3 Correction factors for CABLE**

**from spectrum analyzer  
to test antenna above 2.9 GHz**

FREQUENCY (GHz)	CORRECTION FACTOR (dB)	FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.9	14.0	9.1
2.0	2.7	15.0	9.5
3.0	3.5	16.0	9.9
4.0	4.2	17.0	10.2
5.0	4.9	18.0	10.4
6.0	5.5	19.0	10.7
7.0	6.0	20.0	10.9
8.0	6.5	21.0	11.2
9.0	7.0	22.0	11.6
10.0	7.5	23.0	11.9
11.0	7.9	24.0	12.3
12.0	8.3	25.0	12.6
13.0	8.7	26.0	13.0

**NOTES:**

1. The cable type is *SUCOFLEX 104 E* manufactured by *SUHNER*.
2. The cable is used for measurements above 2.9 GHz.
3. The overall length of the cable is 10 meters.



**9.4 Correction factors for LOG PERIODIC ANTENNA**  
**Type LPD 2010/A**  
**at 3 and 10 meter ranges.**

**Distance of 3 meters**

<b>FREQUENCY</b> (MHz)	<b>AFE</b> (dB/m)
200.0	9.1
250.0	10.2
300.0	12.5
400.0	15.4
500.0	16.1
600.0	19.2
700.0	19.4
800.0	19.9
900.0	21.2
1000.0	23.5

**Distance of 10 meters**

<b>FREQUENCY</b> (MHz)	<b>AFE</b> (dB/m)
200.0	9.0
250.0	10.1
300.0	11.8
400.0	15.3
500.0	15.6
600.0	18.7
700.0	19.1
800.0	20.2
900.0	21.1
1000.0	23.2

*NOTES:*

- 1. Antenna serial number is 1038.*
- 2. The above lists are located in file number 38M30.ANT for a 3 meter range, and file number 38M100.ANT for a 10 meter range.*
- 3. The files mentioned above are located on the disk marked "Radiated Emission Test EMI Receiver".*



**9.5 Correction factors for LOG PERIODIC ANTENNA  
Type SAS-200/511  
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4
13.0	44.6

**NOTES:**

1. Antenna serial number is 253.
2. The above lists are located in file number SAS3M0.ANT for a 3 meter range.
3. The files mentioned above are located on the disk marked "Antenna Factors".





## 9.6 Correction factors for BICONICAL ANTENNA

**Type 3109,  
at 3 meter range**

FREQUENCY (MHz)	AFE (dB/m)
30.0	13.3
40.0	12.7
50.0	11.0
60.0	9.2
70.0	10.0
80.0	7.2
90.0	7.9
100.0	9.4
120.0	11.9
140.0	13.1
160.0	12.3
180.0	12.4
200.0	14.8
250.0	15.3
300.0	17.9

*NOTE:*

1. Antenna serial number is 002-3244.



**9.7 Correction factors for Double-Ridged Waveguide Horn**

**Model: 3115, S/N 29845  
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)	FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)
1.0	24.8	5.4	10.0	38.8	11.4
1.5	26.1	7.6	10.5	38.9	11.8
2.0	28.6	7.7	11.0	39.0	12.1
2.5	29.8	8.4	11.5	39.6	11.8
3.0	31.4	8.4	12.0	39.8	12.0
3.5	32.4	8.7	12.5	39.6	12.5
4.0	33.7	8.6	13.0	40.0	12.5
4.5	33.4	9.9	13.5	39.8	13.0
5.0	34.5	9.7	14.0	40.2	13.0
5.5	35.1	9.9	14.5	40.6	12.9
6.0	35.4	10.4	15.0	41.3	12.4
6.5	35.6	10.8	15.5	39.5	14.6
7.0	36.2	10.9	16.0	38.8	15.5
7.5	37.3	10.4	16.5	40.0	14.6
8.0	37.7	10.6	17.0	41.4	13.4
8.5	38.3	10.5	17.5	44.8	10.3
9.0	38.5	10.8	18.0	47.2	8.1
9.5	38.7	11.1			



**9.8 Correction factors for**

**Horn Antenna  
Model: SWH-28  
at 1 meter range.**

<b>FREQUENCY (GHz)</b>	<b>AFE (dB /m)</b>	<b>Gain (dB1)</b>
18.0	40.3	16.1
19.0	40.3	16.3
20.0	40.3	16.1
21.0	40.3	16.3
22.0	40.4	16.8
23.0	40.5	16.4
24.0	40.5	16.6
25.0	40.5	16.7
26.0	40.6	16.4



**9.9 Correction factors for ACTIVE LOOP ANTENNA**

**Model 6502  
S/N 9506-2950**

<b>FREQUENCY</b> (MHz)	<b>Magnetic Antenna Factor</b> (dB)	<b>Electric Antenna Factor</b> (dB)
.009	-35.1	16.4
.010	-35.7	15.8
.020	-38.5	13.0
.050	-39.6	11.9
.075	-39.8	11.8
.100	-40.0	11.6
.150	-40.0	11.5
.250	-40.0	11.6
.500	-40.0	11.5
.750	-40.1	11.5
1.000	-39.9	11.7
2.000	-39.5	12.0
3.000	-39.4	12.1
4.000	-39.7	11.9
5.000	-39.7	11.8
10.000	40.2	11.3
15.000	-40.7	10.8
20.000	-40.5	11.0
25.000	-41.3	10.2
30.000	42.3	9.2