FCC CERTIFICATION TEST REPORT

COMPANY:	**MICROTEK Lab, Inc.**
PRODUCT(S):	**Microwave Electronic Dog** **Model MED-001**
REPORT No:	**MLI-002**
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TOTAL PAGES:	**17**

CONTENTS

1.0 PROJECT DESCRIPTION

Equipment:	Microwave Electronic Dog
Model:	Model MED-001
Equipment Serial No:	N/A
Voltage/Phase:	115VAC / 60 Hz
Client:	MICROTEK Lab, Inc. 3715 Doolittle Drive Redondo Beach, CA 90278
Test Standard(s):	CFR No. 47 - October 1997. FCC Part 15 Subpart C. INTENTIONAL RADIATOR
Date Sample Submitted:	February 25, 1999
Test Work Started:	February 26, 1999
Test Work Completed:	March 01, 1999

2.0 TEST SUMMARY

G & M COMPLIANCE

When configured and operated as specified in this report, the product was tested to the requirements as indicated below.

Test Standard	Test	Comment
FCC Part 15 Subpart C		
Section 15.207	Conducted Emissions	PASS
Section 15.209	Radiated Emissions	PASS
Section 15.249	Intentional Radiator (5725 - 5875 MHz)	PASS

3.0 PRODUCT DESCRIPTION

The EUT is a Microwave Electronic Dog. It is a radar sentry system designed to provide immediate warnings of an incoming intruder for security applications. By incorporating microwave detection technology, the electronic dog can detect moving objects through various materials such as concrete, plaster walls, wooden structures and windows.

A number of sound effects can be selected to alert the user of an intruder. It operates at around 5.8 GHz incorporating double pulses doppler measurement. The EUT is effective up to 15 ft of monitoring distance at 110 degrees angle.

The EUT incorporates a 120 VAC plugging power supply, 1.0 Amp, 60 Hz. The output of the supply (12 VDC) essentially powers the EUT.

3.1 TEST CONFIGURATION

Refer to ***Section 10.0*** for test setups. The product was powered with a 120VAC / 60 Hz supply.

3.2 SUPPORT EQUIPMENT/SERVICES

N/A

3.3 MODE OF OPERATION

The EUT was operating as intended under normal condition.

4.0 TEST PROCEDURES

4.1 Conducted Emissions

The test was performed in accordance with ANSI C63.4.

Table top products are placed on a non conducting table 0.8 m above a 5.8 x 6.4 m steel ground reference plane and 0.4 m from a 3.6 m x 3 m vertical ground reference plane. Floor mounted products are placed on a 0.1 m isolating platform in the center of the 5.8 x 6.4 m steel reference plane.

For single phase products with current consumption of less than 25 amps, conducted emissions are measured via a line impedance stabilization network. For other products a voltage probe is used.

Initially a scan was made with an EMI receiver from 450 kHz to 30 MHz on each phase with the receiver in peak mode. The receiver IF bandwidth was 9 kHz and scan step size was 5 kHz. Measurements were then made using CISPR quasi peak and average detectors when the peak readings were within 10 dB of the lower average limit line.

4.2 Radiated Emissions

Testing was performed in accordance with ANSI C63.4.

Initially the product was placed in a 7 m x 3.7 m x 3.0 m anechoic chamber and a prescan was performed with the antenna at a 3 meters measurement distance. The scan was made with the receiver in peak mode, the IF bandwidth was 120 kHz and the step size was 50 KHz.

Final measurements will be performed on a 10 m open area test site which meets the site attenuation requirements of CISPR 16. The site consists of an 18 m x 4.8 m 16 gage galvanized steel ground plane with a flush mounted 2.3 m diameter turntable at one end. The site is free from reflecting objects over an elliptical area of 20 m x 17.4 m as required by the standard.

The maximum peak readings determined from the prescan were then investigated on the open area test site. At each frequency the turntable was rotated through 360 degrees, the height of the antenna was adjusted between 1 and 4 meters and the polarization was adjusted between vertical and horizontal to determine the maximum Quasi Peak reading.

5.0 TEST RESULTS

5.1 Emissions Results

Standard: FCC Part 15 Subpart C, Section 15.207
Test: Conducted Emissions
Frequency Range: 450 KHz to 30 MHz
Limits: Class B
Line conductor

Data below shows the results of peak measurements on the AC line conductor of the EUT. The measurements were made and the 10 highest peak readings are shown below:

Frequency	**Level**	**Limit**	**PASS/FAIL**
MHz	**(dBμV)**	**(dBμV)**	
0.467	41.4	48.0	PASS
0.458	41.2	48.0	PASS
0.463	41.2	48.0	PASS
0.473	41.1	48.0	PASS
0.477	41.0	48.0	PASS
0.481	40.9	48.0	PASS
0.487	40.6	48.0	PASS
0.496	40.6	48.0	PASS
0.502	40.2	48.0	PASS
0.506	40.2	48.0	PASS

Note: Original test data and chart can be found in ***section 7*** of this report.

Standard: FCC Part 15 Subpart, C Section 15.207
Test: Conducted Emissions
Frequency Range: 450 KHz to 30 MHz
Limits: Class B
Neutral conductor

Data below shows the results of peak measurements on the AC neutral conductor of the EUT. The measurements were made and the 10 highest peak readings are shown below:

Frequency	**Level**	**Limit**	**PASS/FAIL**
MHz	**(dBµV)**	**(dBµV)**	
0.460	42.3	48.0	PASS
0.467	42.1	48.0	PASS
0.473	42.0	48.0	PASS
0.481	42.0	48.0	PASS
0.477	41.8	48.0	PASS
0.491	41.7	48.0	PASS
0.506	41.2	48.0	PASS
0.510	41.1	48.0	PASS
0.517	40.8	48.0	PASS
0.526	40.3	48.0	PASS

Note: Original test data and chart can be found in ***section 7*** of this report.

Standard: FCC Part 15 Subpart C, Section 15.209

Test: Radiated Emissions
Frequency Range: 30 MHz to 1000 MHz
Limits: Class B
Measurement Distance: 3 meters

Data below shows the results of the Radiated Emission Test:

Frequency	**Level**	**Mode/Polarization**	**Limit**	**PASS/FAIL**
MHz	**(dBµV/m)**	**N/A**	**(dBµV/m)**	
40.02	30.2	PK/V	40.0	PASS
48.03	27.0	PK/V	40.0	PASS
64.02	22.3	PK/V	40.0	PASS
85.98	25.2	PK/V	40.0	PASS
144.11	19.6	PK/V	43.5	PASS

Note: Original test data and chart can be found in ***section 7*** of this report.

Standard: FCC Part 15 Subpart C, Section 15.249
Test: Radiated Emissions – Operation within the band of 5725 - 5875 MHz

Test Setup:

The EUT was setup on the OATS in a typical installation configuration. The EUT was connected to the grounding system in accordance with installation practices. Configuration of the EUT was consistent with typical applications.

The EUT was placed 80 centimeters above the ground plane on a non-conductive tabletop 1.0 meters wide x 1.5 meters long.

Test Procedure:

Suspect frequency list was generated by looking at the crystal oscillators installed in the EUT. The highest emissions were maximized by rotating the turntable 360 degrees and varying the antenna height 1 - 4 meters. Measurements were made in vertical and horizontal antenna polarization.

The measurements were made using an EMCO horn antenna. The measurements were first made at 3 meters. If a signal was not seen, the antenna was then moved to 1 meter distance. If a signal was not seen at 1 meter, then the antenna was moved even closer to verify no signal was emanating from the EUT.

Frequency	**Level**	**Mode/Polarization**	**Limit**	**PASS/FAIL**
GHz	**(dBμV/m)**	**N/A**	**(dBμV/m)**	
05.725	90.5	PK/V	94.0	PASS
05.725	77.0	PK/H	94.0	PASS
11.450	44.2	PK/V	54.0	PASS

6.0 TEST EQUIPMENT

Radiated Emissions

IN No	Description	Serial No.	Cal Due	Tick if Used
540	HP8546A EMI Receiver RF Section	3549A00261	03/29/99	T
539	HP85460A RF Filter Section	3448A00265	03/29/99	T
532	Chase 6112 Bilog Antenna	2040	04/03/99	T
576	Spectrum Analyzer (HP – 8566B)	2747A05747	04/01/99	T
577	Spectrum Analyzer Display (HP)	2848A17517	04/01/99	T
578	Pre-Amplifier (HP – 8449B)	3008A00357	10/14/99	T
599	EMCO Horn Antenna (3115)	9511-4575	01/27/00	T
536	EMCA Standard Emissions Software	051796021INCH00	N/A	T
535	Compaq Model Prolinear 590 PC	3610HLD66040	N/A	T

Conducted Emissions

IN No	Description	Serial No.	Cal Due	Tick if Used
540	HP8546A EMI Receiver RF Section	3549A00261	03/29/99	T
539	HP85460A RF Filter Section	3448A00265	03/29/99	T
546	EMCO 3816/2NM 16A LISN	1039	11/03/99	T
536	EMCA Standard Emissions Software	051796021INCH00	N/A	T
535	Compaq Model Prolinear 590 PC	3610HLD66040	N/A	T

7.0 TEST DATA PRINTOUTS

7.1 Conducted Emissions (See File Attachments)

7.2 Radiated Emissions (See File attachments)

8.0 USER'S MANUAL (See File Attachments)

9.0 BLOCK DIAGRAM/SCHEMATICS (See File Attachments)

10.0 PHOTOGRAPHS OF TEST SETUPS (See File Attachments)

10.0 PHOTOGRAPHS OF EUT (See File Attachments)