

**EXHIBIT 2**

**Test Report**

**Lentek International**

FCC Part 15 Application  
For  
Certification  
(Low Power Transmitter)

**Pet CHime (Portable Wireless Electronic Pet Doorbell)**  
**Models: PP10**

**FCC ID: PD4PP10**

November 30, 2000

Report prepared by:

Jeffrey D. Hiday  
Intertek Testing Services  
1950 Evergreen Blvd., Suite 100  
Duluth, GA 30096  
Phone: 678-775-2400  
FAX: 678-775-2401  
E-mail: [jhiday@itsqs.com](mailto:jhiday@itsqs.com)

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## **1.0 General Description**

### **1.1 Product Description**

The Lentek International Pet chime (Model Number: PP10) is a portable wireless Electronic Pet Doorbell. The Pet Chime consists of two units, one transmitter (Pet Paw) and a receiver (Chime). It has a one-button Pet Paw transmitter to activate the chime. The Pet Paw transmitter operates on one 9V battery. The Chime receiver has two tone settings, which are controlled by a switch on the back of the unit. The Chime operates on three AA batteries.

### **1.2 Related Submittals**

There are no related submittals for this application.

### 1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). All measurements were performed at Open Area Test Sites. The procedures for maximizing emissions as described in this report were followed. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

### 1.4 Test Facility

Sugar Hill Site #1 is constructed on a 50-foot by 70-foot concrete pad with a remote building for test and measurement equipment. The entire pad is covered with a ground plane of ¼" galvanized wire mesh soldered at the seams. The ground plane is tied to earth at six locations with ground rods. A steel two-meter flush-mount, remotely controlled turntable is installed in the pad. A 15' x 15' vinyl enclosure is installed over the turntable. The enclosure is constructed of all non-metallic materials. A non-conductive, remotely controlled antenna mast is used to raise the antenna from 1 to 4 meters during radiated emissions testing. A portable 2.0 meter vertical ground plane is used for line-conducted emissions measurements.

**1.5 Test Equipment List**

The following test equipment was used during testing:

Description	Manufacturer	Model Number	Serial Number	Calibration Date
EMI Receiver	Hewlett Packard	8546A	33410A00173	3/17/00
Bicon Log antenna	EMCO	3141	9711-1080	3/29/00
OATS	N/A	Sugar Hill #1	ITS#211999b	10/19/99
Cable	Belden	Cable #5	ITS#211999b5	11/10/99

## **2.0 System Test Configuration**

### **2.1 Justification**

The transmitter was configured for testing in a typical fashion. During testing, the device was mounted to a cardboard box, which enabled the engineer to maximize emissions through placement in its three orthogonal axes.

The device was powered from one new, fully charged 9V battery.

### **2.2 EUT Exercising Software**

There was no special software to exercise the device. Once activated, the unit transmits the typical signal. For simplicity of testing, the unit was wired to transmit continuously.

### **2.3 Special Accessories**

There are no special accessories necessary for compliance of this product.

### **2.4 Equipment Modification**

Any modifications installed previous to testing by Lentek International, Inc. will be incorporated in each production model sold/leased in the United States.

There were no modifications installed by Intertek Testing Services.

2.5 Support Equipment List and Description

The information for all equipment, plus descriptions of all cables used in the tested system are:

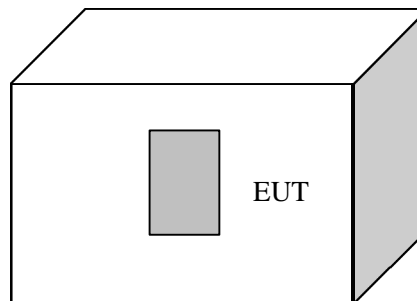
None

Cables:

None

2.6 Test Configuration Block Diagram

Figure 2.6 Configuration of Tested System



### 3.0 Emission Results

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables the emissions are included.

#### 3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where FS = Field Strength in dB $\mu$ V/m

RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

$$FS = RR + LF$$

Where FS = Field Strength in dB $\mu$ V/m

RR = RA - AG in dB $\mu$ V

LF = CF + AF in dB

Assume a receiver reading of 52.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$RA = 52.0 \text{ dB}\mu\text{V/m}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$FS = RR + LF$$

$$FS = 23 + 9 = 32 \text{ dB}\mu\text{V/m}$$

$$RR = 23.0 \text{ dB}\mu\text{V}$$

$$LF = 9.0 \text{ dB}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$



3.2 Radiated Emission Test Data

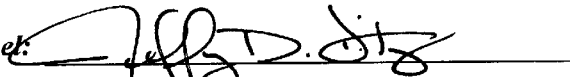
The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 6.2 dB

Readings under 1GHz are Peak

Readings over 1GHz are Peak

*Test Personnel:*



*Jeffrey D. Friday, Project Engineer*

*Date:* 11/30/00

Table: 1

Company: **Lentek International Inc.**Model: **Pet Chime PP10**Job No.: **J20009527**

Date: 04/28/00

Standard: FCC15

Class: B

Group: None

Notes: Measurements taken while antenna in Vertical polarization

Tested by: Jeffrey D. Hiday

Location: Sugar Hill #1

Detector: HP8546

Antenna: EMCO3141

PreAmp: None

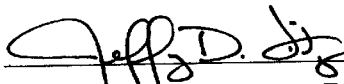
Cable(s): Cable 5 CABLEN2

Distance: **3**

EUT Orthogonal Position	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Average Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB
X	314.843	35.5	14.1	7.0	0.0	2.4	54.1	75.6	-21.5
Y	314.843	42.4	14.1	7.0	0.0	2.4	61.0	75.6	-14.6
Z	314.843	36.3	14.1	7.0	0.0	2.4	54.9	75.6	-20.7
X	629.581	9.6	20.9	10.6	0.0	2.4	38.6	55.6	-17.0
Y	629.581	18.8	20.9	10.6	0.0	2.4	47.9	55.6	-7.7
Z	629.581	20.4	20.9	10.6	0.0	2.4	49.4	55.6	-6.2
X	944.593	5.7	24.0	13.4	0.0	2.4	40.7	55.6	-14.9
Y	944.593	9.4	24.0	13.4	0.0	2.4	44.4	55.6	-11.2
Z	944.593	6.4	24.0	13.4	0.0	2.4	41.4	55.6	-14.2

3.3 Line Conducted Emission Test Data

**Note:** Line Conducted Emission testing was not required for this device since it is battery powered and does not connect to the AC Mains.

**Test Personnel:**   
Jeffrey D. Hiday, Project Engineer

**Date:** 11/30/00

## **4.0 Transmitter Information**

This miscellaneous information includes details of the test procedures, measured bandwidth, and calculation of factors such as pulse desensitization and averaging factor.

### **4.1 Emissions Test Procedures**

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under FCC Part 15 rules.

The transmitting equipment under test (EUT) is attached to a cardboard box and placed on a wooden table approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The cardboard box is adjusted through all three orthogonal axis to obtain maximum emission levels. The antenna height and polarization are also varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions is in peak mode or average mode (see attached data table). If peak measurements are taken for comparison with the average limit, they are corrected by measuring the duty cycle of the equipment under test and subtracting the corresponding average factor in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in section 4.3.

The frequency range scanned is from the lowest radio frequency signal generated, but not lower than 9kHz in the device up to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 450 KHz to 30 MHz.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Measurements were made as described in ANSI C63.4: 1992.

The resolution bandwidth used for measurement of radiated signal strength was 100 KHz or greater below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor readings in the forbidden bands and above 1 GHz, signals may be acquired at a distance of one meter or less. All measurements are taken at three meters unless otherwise noted on the data tables.

Frequency Stability is not specified for this device.

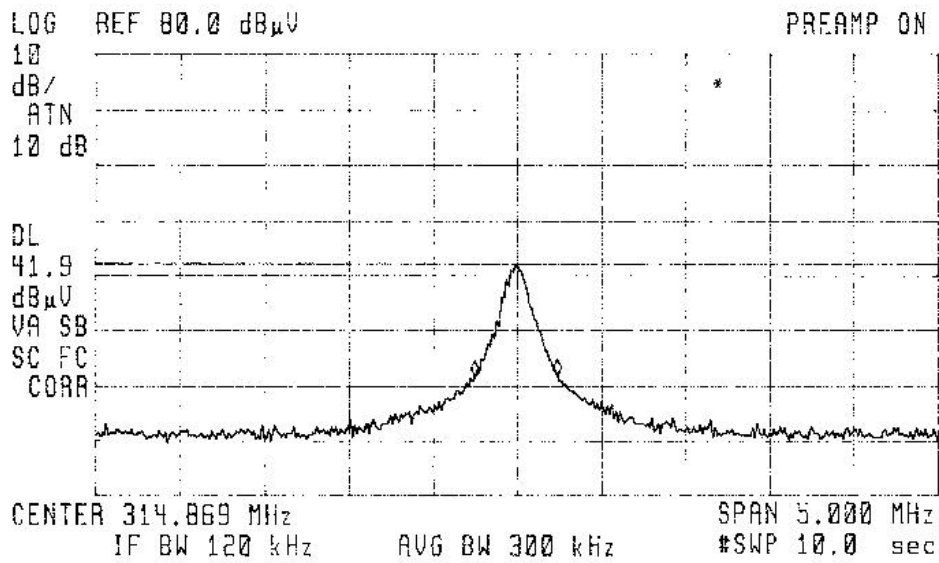
4.2 Measured Bandwidth

The plot on this page shows the fundamental emission when modulated with a worst-case bit sequence. From the plot, the bandwidth is observed to be **488 kHz**, at 20 dBc. The bandwidth limit is **787 kHz**. The unit meets the FCC Part 15 bandwidth requirements.

[75] 15:59:55 APR 17, 2020

DISPLAY LINE  
41.9 dBμV

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKRΔ 488 kHz  
.38 dB



### 4.3 Calculation of Average Factor

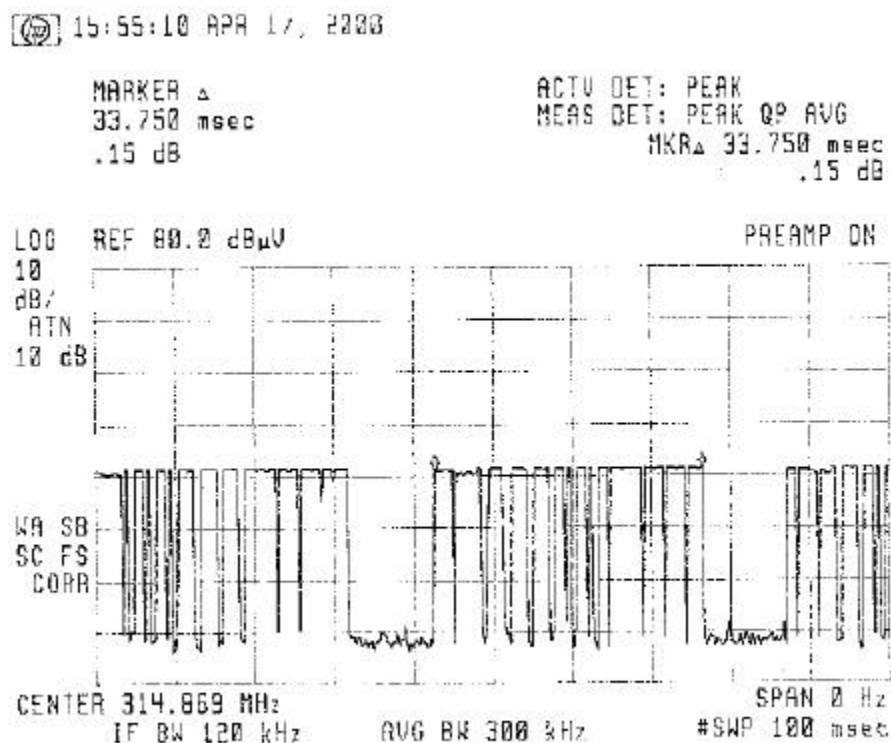
Averaging factor in dB =  $20 \log (\text{duty cycle})$

The specification for output field strengths in accordance with FCC Part 15 specifies measurements with an average detector. During testing, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

The time period over which the duty cycle is measured is 100 milliseconds, or the repetition cycle, whichever is a shorter time frame. The worst case (highest percentage on) duty cycle is used for the calculation. The duty cycle is measured by placing the spectrum analyzer in zero span (receiver mode) and linear mode at maximum bandwidth (3 MHz at 3 dB down) and viewing the resulting time domain signal output from the analyzer on a Tektronix oscilloscope. The oscilloscope is used because of its superior time base and triggering facilities.

During testing, a worst-case duty cycle of 78.6 ms was observed. A plot of the worst-case duty cycle as observed during testing is included on this page.

Therefore, the averaging factor is found by  $20 \log_{10} (78.6/100) = -2.4 \text{ dB}$ .



#### 4.4 Operating Characteristics and Holdover Time

This device is designed for momentary operation and is described in Section 15.231 of the FCC Rules. This device can only be activated manually. When activated manually this device will automatically deactivate within not more than five seconds of being released per 15.231(a)(1).

The following plots show the operating cycles for the PP10.

This device does not employ periodic supervisory transmissions.

**Manual Activation PP10 10s Plot**

