



Testing Tomorrow's Technology

**Radio Systems Corporation
FCC Part 15, Certification Report
Wireless Crate**

**PW17-10796 -Small Wireless Crate, PW17-10797- Medium Wireless Crate,
PW17-10798 - Large Wireless Crate and PW17-10799 -X- Large Wireless Crate**

Test Date(s): October 7 & 21, 2005

UST Project: 05-0267

Issue Date: December 12, 2005

**3505 Francis Circle Alpharetta, GA 30004
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U.S. Technologies, Inc.

Test Report, Part 15

Rev: 040103

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MEASUREMENT/TECHNICAL REPORT

This report concerns (check one): Original grant X
Class II change __

Equipment type: **Low Frequency, Low Power Transmitter**

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes __ No X

If yes, defer until: _____
date

N.A. agrees to notify the Commission by NA
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

United States Technologies, Inc.
3505 Francis Circle
Alpharetta, GA 30004

Phone Number: (770) 740-0717
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SECTION 1

GENERAL INFORMATION

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GENERAL INFORMATION

Product Description

The Equipment Under Test (EUT) is the Radio Systems Corporation's Wireless Crate Models: PW17-10796 -Small Wireless Crate, PW17-10797- Medium Wireless Crate, PW17-10798 - Large Wireless Crate and PW17-10799 -X- Large Wireless Crate. The EUT a pet containment system consisting of a transmitting bed and receiver collar. The bed detects the weight of the pet and does not transmit if pet is detected. Once the pet leaves the bed, a signal is transmitted to the receiver collar. The bed can transmit either a beep only signal or a correction signal to the receiver. Once the pet returns to the bed, the transmission signal will turn off. The bed will only transmit for a maximum of 8 seconds, if the pet does not return to the bed.

All four units are identical in construction. The units differ by the number of turns at the antenna. However, all four units utilize the same antenna length.

Related Submittal(s) Grant(s)

The EUT is subject to the following authorization:

- a) Certification as a low power transmitter (10.65 kHz)

The information contained in this report is presented for the Certification authorization for the transmitter portion of the EUT.

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SECTION 2

TESTS AND MEASUREMENTS

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TESTS AND MEASUREMENTS

Configuration of Tested System

The sample was tested per ANSI C63.4, Methods of Measurement from Low-Voltage Electrical and Electronic Equipment in the Range of 30 MHz -1 GHz (1992). Radiated emissions data was taken with the test receiver or spectrum analyzer's resolution bandwidth adjusted to 100 Hz (9 kHz – 150 kHz), 9kHz (150 kHz - 30 MHz), and 120 kHz (30 MHz - 1 GHz) respectively. All measurements are peak unless stated otherwise. The video filter associated with the spectrum analyzer was off throughout the evaluation process. Interconnecting cables were manipulated as necessary to maximize emissions. A block diagram of the tested system is shown in Figure 1. Test configuration photographs for spurious and fundamental emissions are shown in Figure 2.

Results below 100 kHz were corrected to 300 meters by the following $40 \log(300/3) = -80 \text{ dB}$ (which has been applied to other submittals and is allowed per previous discussions with Greg Czumak at the FCC).

Test Facility

Conducted and digital device testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA.

Test Equipment

Table 2 describes test equipment used to evaluate this product.

Modifications

No modifications were made to bring the EUT into compliance with FCC Part 15, Class B Requirements.

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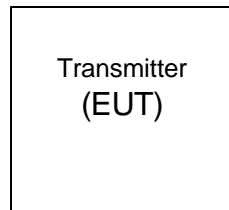
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FIGURE 1

TEST CONFIGURATION



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FIGURE 2a

Photograph(s) for Spurious and Fundamental Emissions



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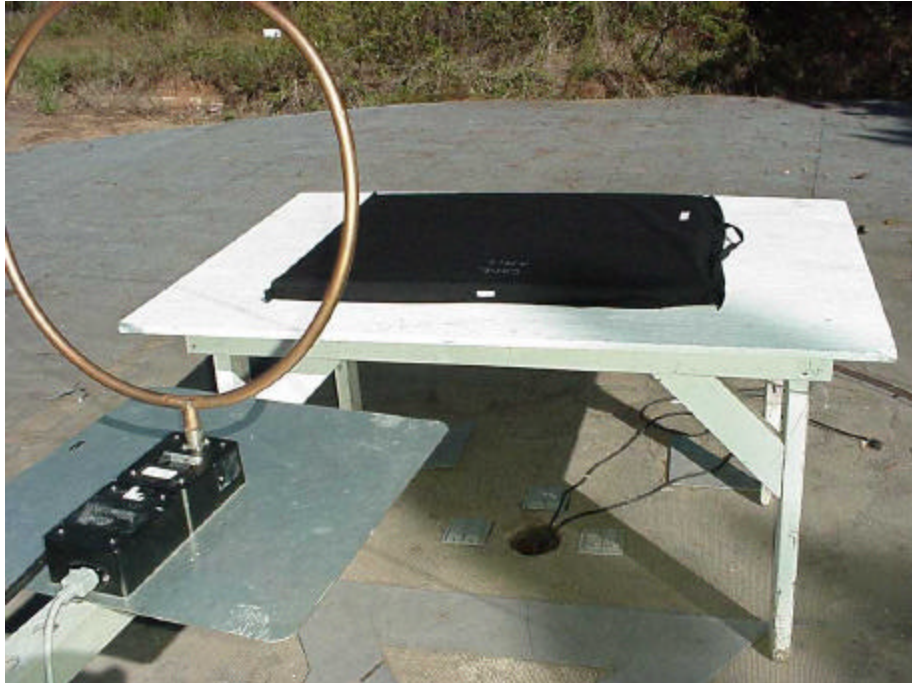
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FIGURE 2b

Photograph(s) for Spurious and Fundamental Emissions



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FIGURE 2c

Photograph(s) for Conducted Emissions

**NOT APPLICABLE
BATTERY POWERED**

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Table 1a

EUT and Peripherals

PERIPHERAL MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
Wireless Crate (EUT)	PW17-10796 -Small Wireless Crate, PW17-10797- Medium Wireless Crate, PW17-10798 - Large Wireless Crate and PW17-10799 -X- Large Wireless Crate	None	KE3-WC100 (Pending)	None

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Table 1b

Detail of I/O Cables Attached to EUT

DESCRIPTION OF CABLE	DETAILS OF CABLE	CABLE LENGTH
NO I/O Cables Attached to EUT		

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TABLE 2
TEST INSTRUMENTS

EQUIPMENT	MODEL NUMBER	MANUFACTURER	SERIAL NUMBER	DATE OF LAST CALIBRATION
SPECTRUM ANALYZER	8558B	HEWLETT-PACKARD	2332A10055	2/25/05
SPECTRUM ANALYZER	8593E	HEWLETT-PACKARD	3205A00124	3/1/05
RF PREAMP	8447D	HEWLETT-PACKARD	2944A07436	4/6/05
BICONICAL ANTENNA	3110	EMCO	9307-1431	5/31/05
LOG PERIODIC ANTENNA	3146	EMCO	3236	6/30/05
LOOP ANTENNA	SAS/562	A.H. SYSTEMS	142	4/1/05
LISN (x 2) 8028-50-TS24-BNC	8028	SOLAR ELE.	910494 & 910495	1/27/05
CALCULATION PROGRAM	N/A	N/A	EMCCALC	N/A

Note: The calibration interval of the above test instruments is 12 months

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Field Strength of Fundamental Emission (47 CFR 15.209)

Measurements were made using a peak detector. Field strength of the peak fundamental emission is shown in Figure 4.

For purposes of this test, the EUT was set to a maximum duty cycle, maximum TX power, and 10.65 kHz transmit frequency. Testing of the 10.65 kHz Electro-magnetic field was conducted with the EUT transmitting continuously at the max field condition, at a distance of 1 meter, using the loop antenna.

All four units were tested for Fundamental field Strength and Harmonics and the worst case unit was tested to represent all units.

Each unit was placed upon the turntable, rotated, and maximum fundamental field strength was observed and plotted with the loop antenna in X, Y, and Z Axis orientation, with height varying from 1 to 4 meters. Copies of these plots are on file at U.S. Technologies. Spurious Harmonic Emissions were reviewed, and the worst case Harmonics values observed corresponded with the Maximum Fundamental Frequency. Data for the worst case configuration has been provided.

The worst case model was PW17-10799, the X-Large Wireless Crate.

Duty Cycle Correction During 100 msec:

Although the Transmitter has a Duty Cycle associated with the output of the transmitter, Duty Cycle correction was not applied.

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FIGURE 3

**Duty Cycle Correction Not Applied
Therefore This Page is Intentionally Left Blank**

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TABLE 3

FIELD STRENGTH OF FUNDAMENTAL EMISSION

Peak Measurements, Average Limits

FREQ. (kHz)	TEST DATA (dBm) @ 3m	ANTENNA FACTOR + CABLE ATTENUATION	RESULTS (uV/m) @ 300m	FCC LIMITS (uV/m) @ 300m	Margin (dB)
10.62	-66.4	72.9	47.2	226.0	13.6

SAMPLE CALCULATIONS:

RESULTS uV/m @ 300m = Antilog $((-66.4 + 72.9 + 107 - 80)/20) = 47.2$

CONVERSION FROM dBm TO dBuV = 107 dB

CONVERSION FROM 1m to 3m = -9.54 dB

CORRECTION FROM 3m TO 300m = $40 \text{ Log } (3/300) = -80 \text{ dB}$

Margin = $20 \text{ log } (47.2/226) = -13.6$

Test Date: October 21, 2005

Tested by 
Signature: _____

Name: Austin Thompson

U.S. Technologies, Inc.

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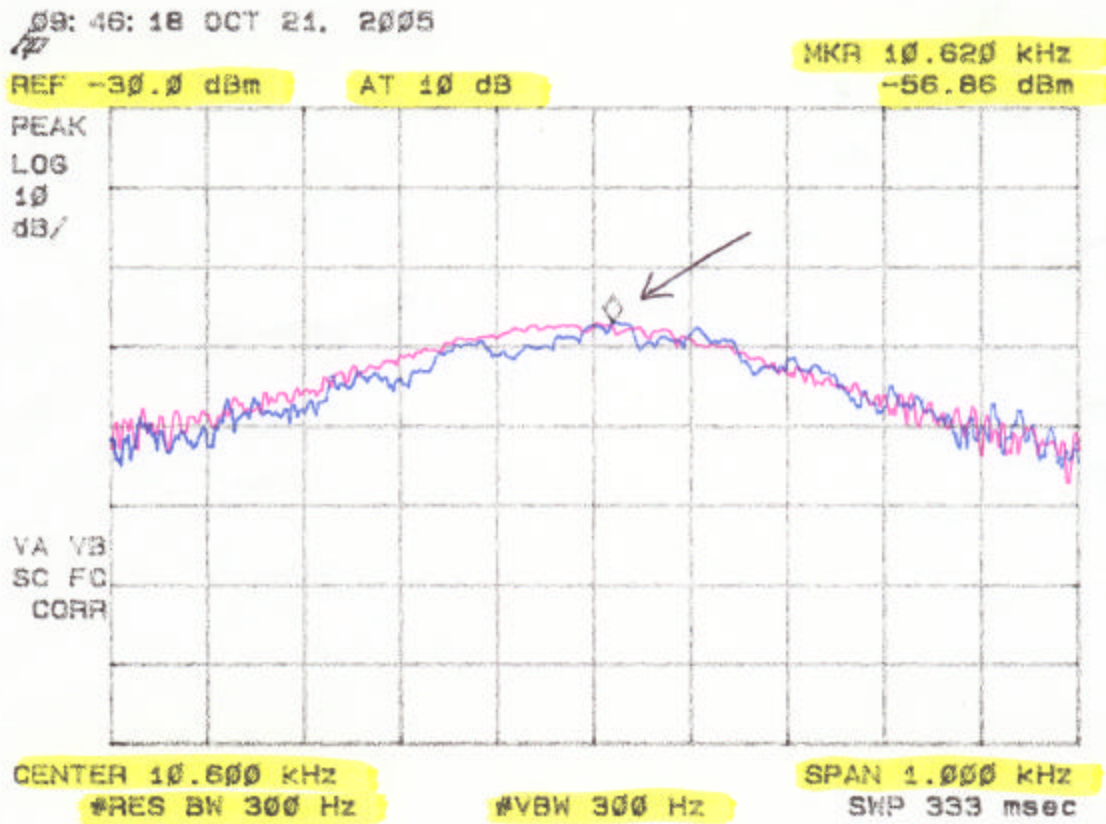
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Figure 4

FIELD STRENGTH OF FUNDAMENTAL EMISSION (Peak)



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Field Strength Of Spurious Emissions (47 CFR 15.209)

Measurements were made using a peak detector. Field strength of Spurious Emissions are shown in Figure 4. For all emission measurements made the limits given in 15.209 were applied.

For purposes of this test, the EUT was set to a maximum duty cycle, maximum TX power, and 10.65 kHz transmit frequency.

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TABLE 4

FIELD STRENGTH OF SPURIOUS EMISSIONS

Peak/Quasi-Peak (< 30 MHz), Average Limits

FREQ. (kHz.)	TEST DATA (dBm) @ 3m	ANTENNA FACTOR + CABLE ATTENUATION	PEAK RESULTS (uV/m) @ 300m	AVERAGE FCC LIMITS (uV/m) @ 300m	MARGIN BELOW LIMIT (uV/m) @ 300m
No emissions were detected within 20dB of the FCC Limits					

Test Date: October 21, 2005

**Tested by
Signature:** _____



Name: Austin Thompson _____

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Radiated Emissions (47 CFR 15.109a)

Radiated emissions were evaluated from 30 to 1000 MHz. Measurements were made with the analyzer's bandwidth set to 120 kHz. These results are shown in Table 5.

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**Table 5
Radiated Emissions
Class B**

Peak/Quasi-Peak (30 MHz – 1 GHz), Peak Limits

Radiated Emissions Class B Digital Device								
Test By:	Test: Radiated Digital Device				Client: Radio Systems Corporation			
AT	Project: 05-0267				Model: Wireless Crate			
Frequency Range		Model		S/N		Calibrated:		
		Model: 3146		/N 9305-3600		03/June/2005		
		1BI3mV Model: 3110B		S/N 9307-1431		25/May/2005		
		OATS Cable: 75ft.				1/September/2005		
Frequency	Test Data	Test Data	AF+CA-AMP	Results	Limits	Distance /	Margin	PK = n
(MHz)	(dBm)	(dBuV)	(dB)	(dBuV)	(dBuV)	Polarity	(dB)	/ QP
134.80	-88.0	19.0	13.2	40.5	150.0	3m./HORZ	11.4	PK
110.8	-89.0	18.0	13.4	37.2	150.0	3m./HORZ	12.1	PK
109.8	-91.0	16.0	13.3	29.2	150.0	3m./HORZ	14.2	PK
66.9	-96.0	11.0	8.7	9.7	100.0	3m./HORZ	20.3	PK

SAMPLE CALCULATIONS

RESULTS uV/m @ 3m

Antilog ((-88.0 + 13.2 + 107)/20) = 40.5

CONVERSION FROM dBm TO dBuV = 107 dB

Margin in dB = 20*(log (40.5 / 150.0) = 11.4 dB

Test Date: October 24, 2005

Tested by
Signature: 

Name: Austin Thompson

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Power Line Conducted Emissions (47 CFR 15.107a)

NOT APPLICABLE

The EUT is powered by (4 “AA” batteries).

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TABLE 6 CONDUCTED EMISSIONS DATA

CLASS B

Line Conducted Emissions							
Test By:	Test: Part 15 Class B				Client: Radio Systems Corporation		
DPB	Project: 05-0267				Model: Wireless Crate Model WC100		
Frequency	Test Data	Test Data	AF+CA-AMP	Results	Limits	Margin	PK = n
(MHz)	(dBm)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	/ QP
<p>NOT APPLICABLE EUT IS BATTERY POWERED</p>							

Test Date: October 7, 2005

Tested by
Signature: 

Name: Austin Thompson

U.S. Technologies, Inc.

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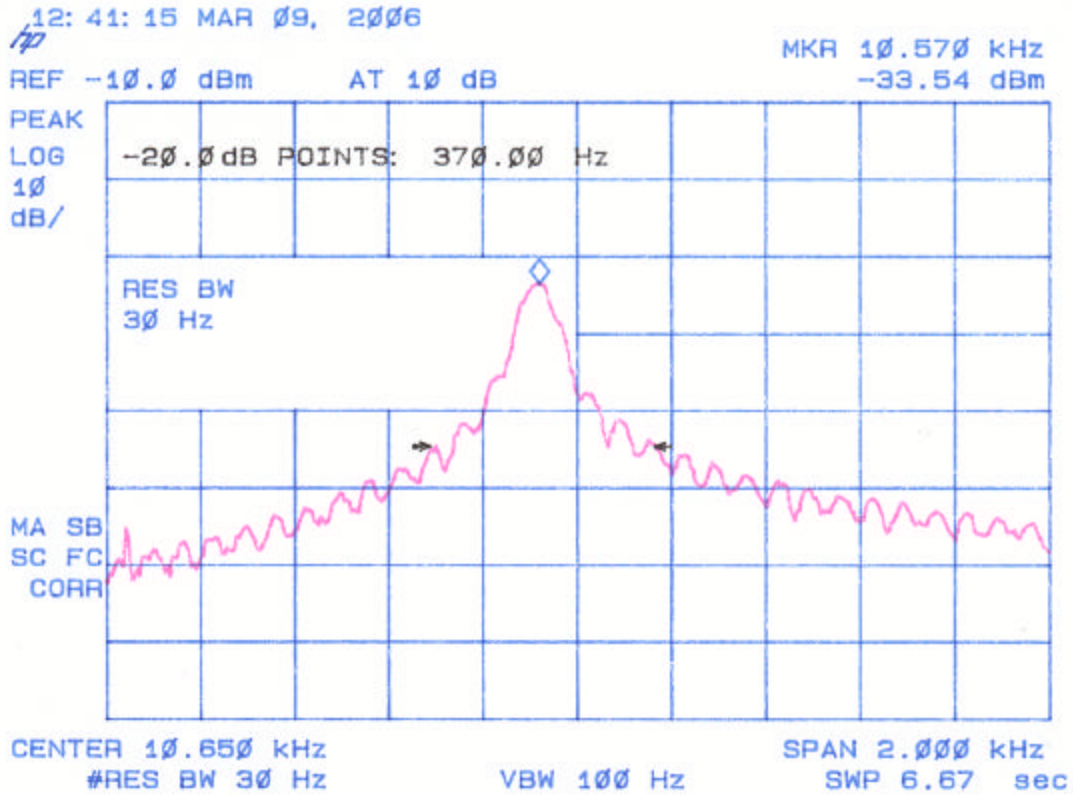
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TABLE 7 20 dB Bandwidth



Test Date: March 9, 2006

**Tested by
Signature:**

Austin Thompson

Name: Austin Thompson