



166 South Carter, Genoa City, WI 53128

Company:	Care Trak International, Inc.
Model Tested:	CT-11 Double Beep Transmitter
Report Number:	16893

## **Code of Federal Regulations 47 Part 95 – Personal Radio Services**

Subpart G—Low Power Radio Service (LPRS)

Subpart E – Technical Regulations

Section 95.629

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name:	Care Trak Double Beep Transmitter
Kind of Equipment:	Portable transmitter used to track Alzheimer patients.
Frequency Range:	216.0125 MHz to 216.9875 MHz
Test Configuration:	Body worn device tested when mounted to 3-Axis Fixture on test table.
Model Number(s):	CT-11
Model(s) Tested:	CT-11
Serial Number(s):	1
Date of Tests:	April, 2011
Test Conducted For:	Care Trak International, Inc. 1202 Walnut St. Murphysboro, IL 62966, USA

**NOTICE:** “This test report relates only to the items tested and must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government”. Please see the "Description of Test Sample" page listed inside of this report.

© Copyright 1983 - 2011 D.L.S. Electronic Systems, Inc.

### **COPYRIGHT NOTICE**

This report must not be reproduced (except in full), without the approval of D.L.S. Electronic Systems, Inc.



Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

SIGNATURE PAGE

Tested By:

A handwritten signature in black ink that reads "Cooper LaFond" followed by "May 2, 2011" on the line below.

Cooper LaFond  
Test Engineer

Reviewed By:

A handwritten signature in black ink that reads "William Stumpf".

William Stumpf  
OATS Manager

Approved By:

A handwritten signature in black ink that reads "Brian J. Mattson".

Brian Mattson  
General Manager



Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

## Table of Contents

i.	Cover Page .....	1
ii.	NVLAP Certificate of Accreditation .....	4
1.0	Summary of Test Report .....	5
2.0	Introduction .....	5
3.0	Test Facilities .....	6
4.0	Description of Test Sample .....	6
5.0	Test Equipment .....	8
6.0	Test Arrangements .....	9
7.0	Test Conditions .....	9
8.0	Modifications Made To EUT For Compliance .....	9
9.0	Results .....	9
10.0	Conclusion .....	9
	Appendix A – Test Photos .....	10
	Appendix B – Measurement Data .....	19
1.0	Frequency Stability .....	19
2.0	Max ERP .....	23
3.0	Occupied Bandwidth .....	26
4.0	Spurious Emissions at Antenna Terminal (Conducted) .....	28
5.0	Radiated Spurious Emissions .....	30



166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

United States Department of Commerce  
National Institute of Standards and Technology



## Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

**D.L.S. Electronic Systems, Inc.**  
Wheeling, IL

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,  
listed on the Scope of Accreditation, for:*

### **ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS**

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.  
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality  
management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).*

2010-10-01 through 2011-09-30

*Effective dates*



*Dolly S. Buces*  
For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)



Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

## 1.0 Summary of Test Report

It was determined that the Care Trak CT-11 Double Beep Transmitter, complies with the requirements of CFR 47 Part 95 Subpart E and Subpart G.

### Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
95.629(b)(2)	Frequency Stability	TIA-603-C	3	Yes
95.1013(a)	Max ERP	TIA-603-C	1,2	Yes
95.629(b)(1)	Occupied Bandwidth	2.1049	1	Yes
95.635(c)(1)	Spurious Emissions at Antenna Port	TIA-603-C	4	Yes
95.635(c)(1)	Radiated Spurious Emissions	TIA-603-C	1, 2	Yes

Note 1: Tested in 3 orthogonal planes.

Note 2: Radiated emission measurement.

Note 3: Near field probe utilized for measurement.

Note 4: Conducted measurement.

## 2.0 Introduction

In April, 2011 the Care Trak Double Beep Transmitter, Model CT-11, as provided by Care Trak International, Inc. was tested to the requirements of CFR 47 Part 95 Subpart G & Subpart E Section 95.629. To meet these requirements, the procedures contained within this report were performed by personnel of D.L.S Electronic Systems, Inc.



Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

### **3.0 Test Facilities**

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO 17025. NVLAP Certificate and Scope can be viewed at <http://www.dlsemc.com/certificate>. Our facilities are registered with the FCC, Industry Canada, and VCCI.

#### **Wisconsin Test Facility:**

D.L.S. Electronic Systems, Inc.  
166 S. Carter Street  
Genoa City, Wisconsin 53128

#### **Wheeling Test Facility:**

D.L.S. Electronic Systems, Inc.  
1250 Peterson Drive  
Wheeling, IL 60090

### **4.0 Description of Test Sample**

#### **Description:**

LPRS Tracking Transmitter. It has a pulse transmission for security purposes. (no audio)

#### **Type of Equipment / Frequency Range:**

Portable tracking transmitter  
Frequencies used: 216.0125 MHz to 216.9875 MHz

#### **Physical Dimensions of Equipment Under Test:**

Length: 1 inch x Width: 1 inch x Height: 1 inch (round)

#### **Power Source:**

3.6 VDC battery

#### **Internal Frequencies:**

31 kHz, 216 MHz



166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

#### 4.0 Description of Test Sample (continued)

##### Transmit / Receive Frequencies Used For Test Purpose:

Low channel: 216.0125 MHz, Middle channel: 216.4875 MHz, High channel: 216.9875 MHz

##### Type of Modulation(s) / Antenna Type:

OOK / PCB Loop Antenna

##### Description of Circuit Board(s) / Part Number:

Driver Board:	41-464-0120
Main Board:	41-646-0115
Microprocessor:	PIC24F08KA101



166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

## 5.0 Test Equipment

A list of the equipment used can be found in the table below. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.

### D.L.S. Wisconsin – S2 FCC registration 90531

#### Radiated Emissions

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	5/10	5/11
Preamplifier	Rohde & Schwarz	TS-PR10	032001/004	9 kHz – 1 GHz	1/11	1/12
Antenna	EMCO	3146	1205	200 MHz – 1 GHz	7/09	7/11
Preamp	Miteq	AMF-6D-100200-50	313936	1GHz-10GHz	5/10	5/11
Horn Antenna	EMCO	3115	9903-5731	1-18GHz	6/09	6/11

#### Substitution

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Signal Generator	Marconi	2022A	119026	10 kHz – 1 GHz	7/10	7/11
Dipole Antenna Set	Com-Power	AD-100	40140	400 MHz – 1 GHz	---	

#### Frequency Stability

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Spectrum Analyzer	Hewlett Packard	8591A	3009A00700	20 Hz – 1.8 GHz	9/10	9/11
Temperature Chamber	Tenney Benchmaster	BTC	748-23	N/A	---	





Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

## **6.0 Test Arrangements**

### **Part 95 Emissions Measurement Arrangement:**

All emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to TIA-603-C, unless otherwise noted.

## **7.0 Test Conditions**

### **Normal Test Conditions:**

#### **Temperature and Humidity:**

75°F at 31% RH

#### **Supply Voltage:**

3.6 VDC

## **8.0 Modifications Made To EUT For Compliance**

None noted at time of test.

## **9.0 Results**

FCC Part 95 Measurements were performed in accordance with Code of Federal Regulations 47 Part 95.629. Graphical and tabular data can be found in Appendix B at the end of this report.

## **10.0 Conclusion**

The Care Trak Double Beep Transmitter, model CT-11 provided by Care Trak International, Inc., was tested in April, 2011 **meets** the requirements of CFR 47 Part 95 Subpart G & Subpart E Section 95.629.



166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

## Appendix A – Test Photos

### Radiated Spurious & ERP - Setup 1





166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

### Radiated Spurious & ERP - Setup 2





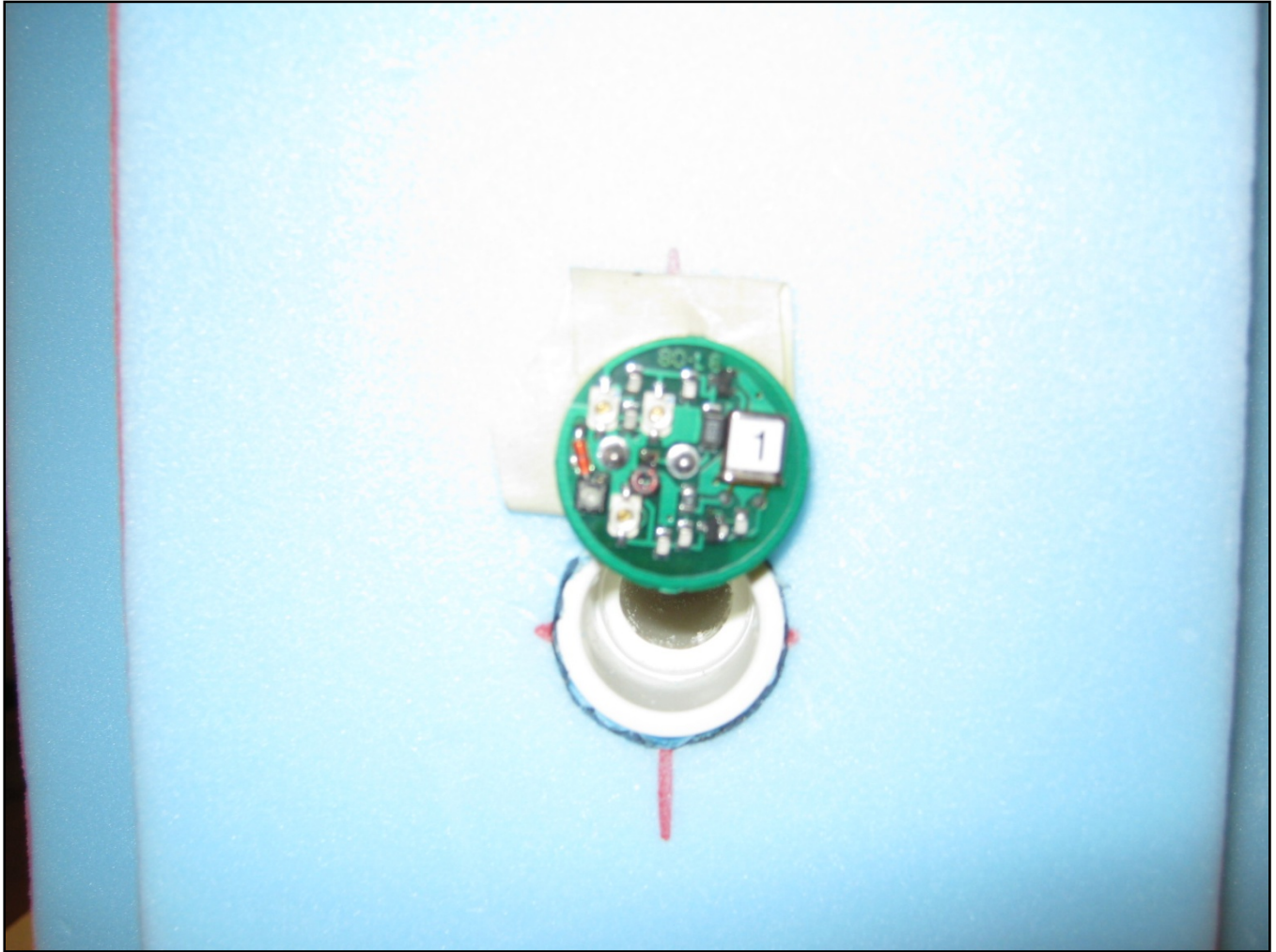


166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

### Radiated Spurious & ERP - Setup 3





166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

### Substitution Measurement - Setup 1





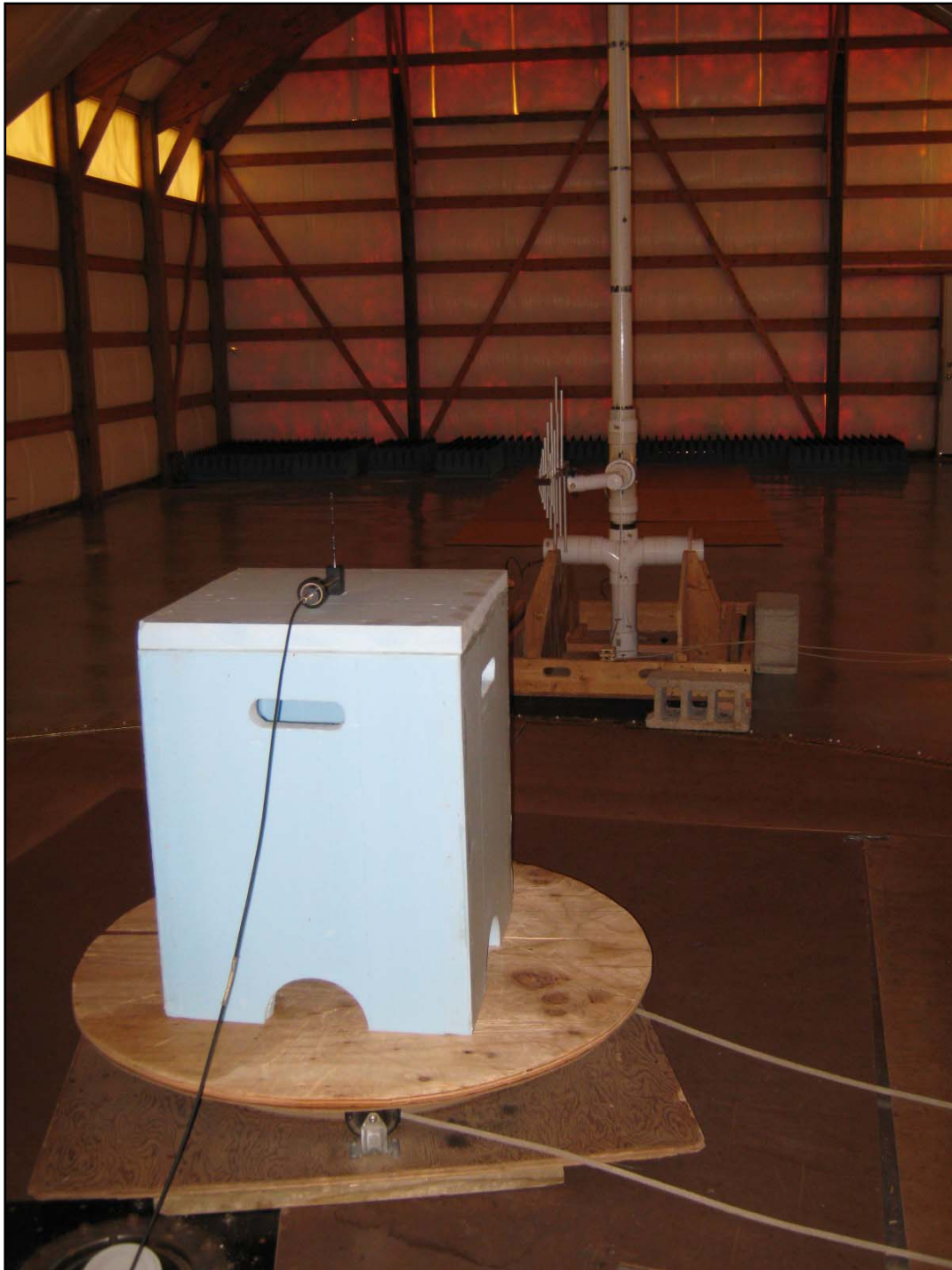


166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

### Substitution Measurement - Setup 2



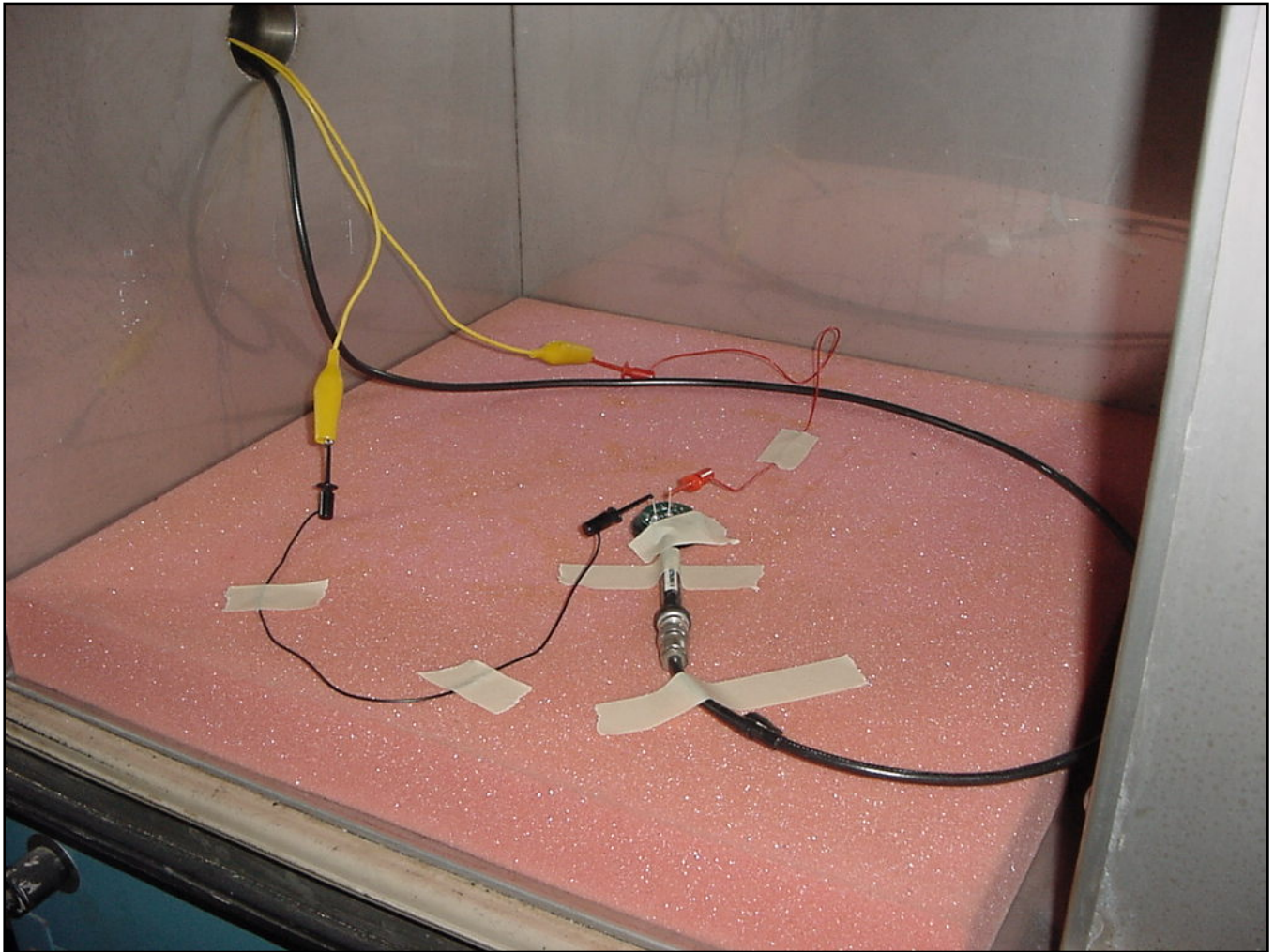


166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

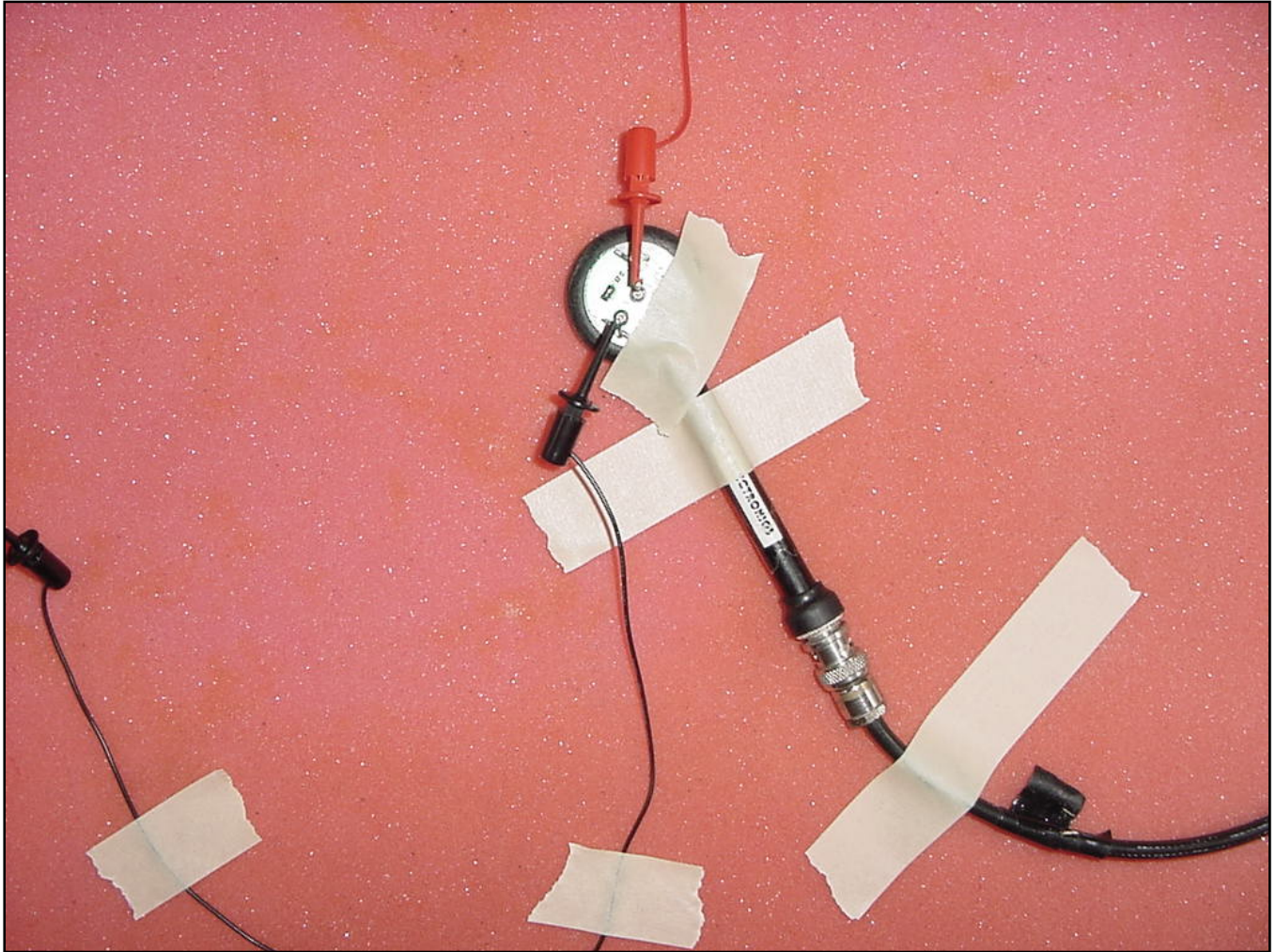
Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

### Frequency Stability - Setup 1





Frequency Stability - Setup 2







166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

### Spurious Conducted – Setup 1





166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

### Spurious Conducted – Setup 2





Company: Care Trak International, Inc.  
Model Tested: CT-11 Double Beep Transmitter  
Report Number: 16893

166 South Carter, Genoa City, WI 53128

## Appendix B – Measurement Data

### 1.0 Frequency Stability

**Rule Part:** FCC 95.629(b)(2); FCC Part 2.1055

**Test Procedure:** TIA-603-C (2.2.2)

**Limit:** Limit Standard Band LPRS = 50 ppm

**Results:** Pass

**Notes:** The EUT was set to transmit an un-modulated carrier and a near field probe was used to measure the transmitter frequency via a scalar network analyzer (SNA). The EUT settled for a period of 15 minutes sufficient to stabilize the oscillator circuit at each temperature and voltage. A constant temperature of 20 °C was used for the voltage variation frequency stability test.

Voltage Deviations:	Nominal	=	3.6 VDC
	+15%	=	4.14 VDC
	-15%	=	3.06 VDC

**Equation(s):** 
$$PPM = \left( \frac{f_{measured}}{f_{Assigned}} - 1 \right) \cdot 10^6$$

$$Margin = Limit - |PPM_{measured}|$$

**Calculation:** 
$$PPM = \left( \frac{216.01383}{216.0125} - 1 \right) \cdot 10^6 = 6.16$$

$$Margin = 50 - |6.16| = 43.84$$



Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

**Table – 1** Channel 1 Frequency Deviations over Temperature

Temp. (deg C)	Channel 1				
	Freq. Meas. (MHz)	Ref. Freq. (MHz)	Deviation (PPM)	Limit (PPM)	Margin
50	216.01383	216.0125	6.16	50	43.84
40	216.01355	216.0125	4.86	50	45.14
30	216.01340	216.0125	4.17	50	45.83
20	216.01333	216.0125	3.84	50	46.16
10	216.01323	216.0125	3.38	50	46.62
0	216.01288	216.0125	1.76	50	48.24
-10	216.01213	216.0125	-1.71	50	48.29
-20	216.01098	216.0125	-7.04	50	42.96
-30	216.00930	216.0125	-14.81	50	35.19

**Table – 2** Channel 20 Frequency Deviations over Temperature

Temp. (deg C)	Channel 20				
	Freq. Meas. (MHz)	Ref. Freq. (MHz)	Deviation (PPM)	Limit (PPM)	Margin
50	216.48735	216.4875	-0.69	50	49.31
40	216.48690	216.4875	-2.77	50	47.23
30	216.48665	216.4875	-3.93	50	46.07
20	216.48648	216.4875	-4.71	50	45.29
10	216.48623	216.4875	-5.87	50	44.13
0	216.48590	216.4875	-7.39	50	42.61
-10	216.48493	216.4875	-11.87	50	38.13
-20	216.48385	216.4875	-16.86	50	33.14
-30	216.48203	216.4875	-25.27	50	24.73



Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

**Table – 3 Channel 40 Frequency Deviations over Temperature**

	Channel 40				
Temp. (deg C)	Freq. Meas. (MHz)	Ref. Freq. (MHz)	Deviation (PPM)	Limit (PPM)	Margin
50	216.98553	216.9875	-9.08	50	40.92
40	216.98550	216.9875	-9.22	50	40.78
30	216.98568	216.9875	-8.39	50	41.61
20	216.98595	216.9875	-7.14	50	42.86
10	216.98638	216.9875	-5.16	50	44.84
0	216.98658	216.9875	-4.24	50	45.76
-10	216.98645	216.9875	-4.84	50	45.16
-20	216.98573	216.9875	-8.16	50	41.84
-30	216.98450	216.9875	-13.83	50	36.17

**Table – 4 Channel 1 Frequency Deviations over Battery Voltage**

	Channel 1				
Voltage Deviation	Freq. Meas. (MHz)	Ref. Freq. (MHz)	Deviation (PPM)	Limit (PPM)	Margin
15%	216.01353	216.0125	4.77	50	45.23
0%	216.01293	216.0125	1.99	50	48.01
-15%	216.01240	216.0125	-0.46	50	49.54



Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

**Table – 5** Channel 20 Frequency Deviations over Battery Voltage

	Channel 20				
Voltage Deviation	Freq. Meas. (MHz)	Ref. Freq. (MHz)	Deviation (PPM)	Limit (PPM)	Margin
15%	216.48700	216.4875	-2.31	50	47.69
0%	216.48655	216.4875	-4.39	50	45.61
-15%	216.48600	216.4875	-6.93	50	43.07

**Table – 6** Channel 1 Frequency Deviations over Battery Voltage

	Channel 40				
Voltage Deviation	Freq. Meas. (MHz)	Ref. Freq. (MHz)	Deviation (PPM)	Limit (PPM)	Margin
15%	216.98623	216.9875	-5.85	50	44.15
0%	216.98573	216.9875	-8.16	50	41.84
-15%	216.98523	216.9875	-10.46	50	39.54



Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

## 2.0 Max ERP

**Rule Part:** FCC 95.1013 (a); FCC Part 2.1046(a)

**Test Procedure:** Part 2.1046(a)

**Limit:** Applies to LPRS standard band s, 25 kHz bandwidth.

$$Limit(25kHz BW) = \begin{cases} 20dBm, & f = f_0 \\ 30dBc, & 12.5kHz \leq f < 22.5kHz \\ 43 + 10 \log P_C \text{ (dBc)}, & f \geq 22.5kHz \end{cases}$$

$$Limit(f \geq 22.5kHz) = 43 + 10 \cdot \log P_{carrier} = 43 + 10 \cdot \log(0.00001W) = -7dB$$

**Results:** Pass

**Notes:** The EUT was set to transmit an un-modulated carrier and a receiving antenna three meters away was used to measure field strength. A substitution antenna then replaces the EUT and power is applied until the value of the EUT field strength measurement is reached. This is the value of the ERP minus the cable loss and antenna gain, see equation below. All measurements were taken on a “standard test site” in accordance with TIA-603-C.

**Equation(s):**  $ERP = LVL(dBm) + CBL(dB) + G_{Antenna}(dBi) + dBd_{Conversion}(dB)$

ERP = Effective Radiated Power  
LVL = Level of Signal Generator  
CBL = Cable Loss  
G = Gain of Antenna  
dBd = Referenced to Dipole Conversion

**Calculation:**  $ERP = -26.5dBm + -5.14dB + 2.15dBi + -2.15dBd = -31.6dBm$



Company: Care Trak International, Inc.  
 Model Tested: CT-11 Double Beep Transmitter  
 Report Number: 16893

166 South Carter, Genoa City, WI 53128

Tested By: Cooper LaFond  
 Tested At: DLS Electronic Systems, Genoa City, WI  
 Test Site: OATS 2  
 Measurement Parameters: RBW = 100 kHz  
 VBW = 300 kHz  
 Peak Detector  
 Sweep Time = 5ms  
 Temperature = 75 °F  
 Relative Humidity = 31%

**Table – 7** Field Strength Measurements for Ch. 1, 20, & 40

	Polarization	
	V	H
<b>LPRS Standard Band Channel</b>	1	1
<b>Freq. of Peak (MHz)</b>	216.004008	215.993944
<b>1/4 Wavelength (m)</b>	0.347	0.347
<b>Field Strength (dB(uV/m))</b>	63.8	60.7
<b>Sub. Meas. (dBm)</b>	-26.5	-34.5
<b>LPRS Standard Band Channel</b>	20	20
<b>Freq. of Peak (MHz)</b>	216.46492	216.464886
<b>1/4 Wavelength (m)</b>	0.346	0.346
<b>Field Strength (dB(uV/m))</b>	59.0	56.6
<b>Sub. Meas. (dBm)</b>	-31.5	-38.5
<b>LPRS Standard Band Channel</b>	40	40
<b>Freq. of Peak (MHz)</b>	216.965932	216.96493
<b>1/4 Wavelength (m)</b>	0.345	0.345
<b>Field Strength (dB(uV/m))</b>	61.4	58.2
<b>Sub. Meas. (dBm)</b>	-29.5	-36.5





Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

**Table – 8** ERP Calculations for Ch. 1, 20, & 40

Channel	Polarization	Power Out (dBm)	CBL Loss (dB)	Dipole Gain (dBi)	dBd Conv. (dB)	Level (dBm)	Limit (dBm)	Margin (dB)
1	V	-26.5	-5.14	2.15	-2.15	-31.6	20	51.6
20	V	-31.5	-5.14	2.15	-2.15	-36.6	20	56.6
40	V	-29.5	-5.15	2.15	-2.15	-34.6	20	54.6
1	H	-34.5	-5.14	2.15	-2.15	-39.6	20	59.6
20	H	-38.5	-5.14	2.15	-2.15	-43.6	20	63.6
40	H	-36.5	-5.15	2.15	-2.15	-41.6	20	61.6



Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

### 3.0 Occupied Bandwidth

**Rule Part:** FCC 95.629(b)(1); FCC Part 2.1049

**Test Procedure:** FCC Part 2.1046(a)

**Limit:** 25 kHz

**Results:** Pass



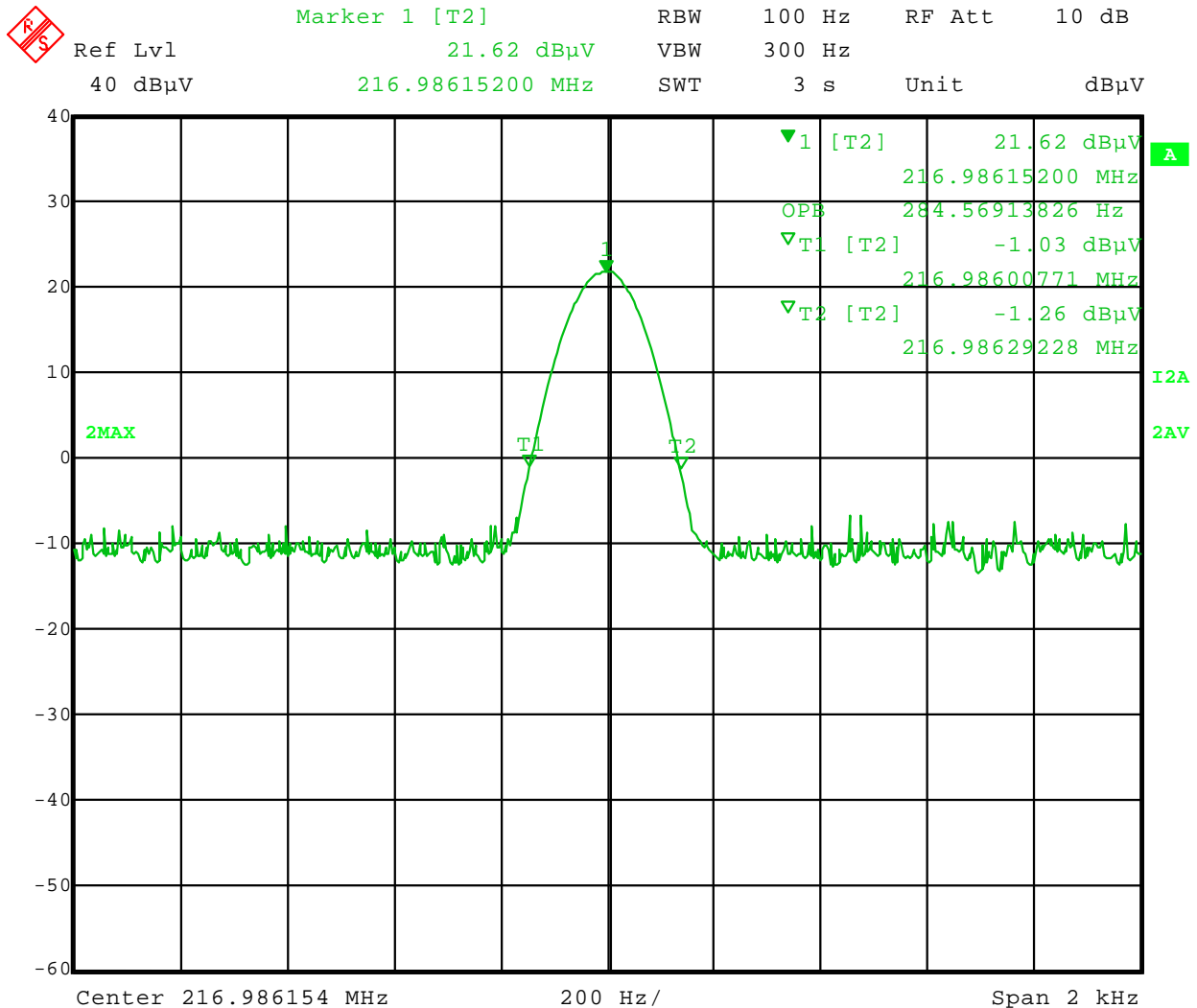
Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

Tested By: Cooper LaFond  
Tested At: DLS Electronic Systems, Genoa City, WI  
Test Site: OATS 2  
Measurement Parameters: RBW = 100 Hz  
VBW = 300 Hz  
Sweep Time = 3s  
Span = 2 kHz  
Temperature = 75 °F  
Relative Humidity = 31%

Occupied Bandwidth Measurement = 284.57 Hz



Date: 27.APR.2011 11:15:15



Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

#### 4.0 Spurious Emissions at Antenna Terminal (Conducted)

**Rule Part:** FCC 95.635 (c); FCC Part 2.1051(a)

**Test Procedure:** TIA-603-C (2.2.13)

**Limit:** Applies to LPRS standard band s, 25 kHz bandwidth.

$$Limit(25kHz BW) = \begin{cases} 20dBm, & f = f_0 \\ 30dBc, & 12.5kHz \leq f < 22.5kHz \\ 43 + 10 \log P_C \text{ (dBc)}, & f \geq 22.5kHz \end{cases}$$

$$Limit(f \geq 22.5kHz) = 43 + 10 \cdot \log P_{Carrier} = 43 + 10 \cdot \log(0.00001W) = -7dB$$

**Results:** Pass

**Notes:** Emissions were measured

**Equation(s):**  $ERP = LVL(dBm) + CBL(dB) + G_{Antenna}(dBi) + dBd_{Conversion}(dB)$

ERP = Effective Radiated Power  
LVL = Level of Signal Generator  
CBL = Cable Loss  
G = Gain of Antenna  
dBd = Referenced to Dipole Conversion

**Calculation:**  $ERP = -26.5dBm + -5.14dB + 2.15dBi + -2.15dBd = -31.6dBm$



Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

166 South Carter, Genoa City, WI 53128

Tested By: Cooper LaFond  
Tested At: DLS Electronic Systems, Genoa City, WI  
Test Site: OATS 2  
Measurement Parameters: RBW = 100 kHz  
VBW = 300 kHz  
Peak Detector  
Sweep Time = 5ms  
Temperature = 20 °C

**Table – 9** Spurious Emissions at the Antenna Port

Harmonic Number	Freq (MHz)	Level (dBm)	Cable Loss (dB)	Total Level (dBm)	Level Relative to Carrier (dBc)	Limit (dBc)	Margin (dB)
1	72.18	-46.3	0.6	-45.7	-35.3	-7	28.3
2	144.35	-33.8	0.8	-33.0	-22.6	-7	15.6
3	216.49	-11.2	0.8	-10.4	0.0	N/A	N/A
4	288.68	-28.2	1.0	-27.2	-16.8	-7	9.8
5	360.85	-36.5	1.1	-35.4	-25.0	-7	18.0
6	432.98	-41.0	1.1	-39.9	-29.5	-7	22.5
7	505.15	-46.0	1.2	-44.8	-34.4	-7	27.4
8	577.33	-51.7	1.3	-50.4	-40.0	-7	33.0
9	649.48	-54.3	1.4	-52.9	-42.5	-7	35.5
10	721.65	-57.7	1.5	-56.2	-45.8	-7	38.8
11	793.80	-54.9	1.5	-53.4	-43.0	-7	36.0
12	865.97	-50.5	1.5	-49.0	-38.6	-7	31.6
13	938.12	-40.5	1.5	-39.0	-28.6	-7	21.6
14	1010.30	-46.1	2.0	-44.1	-33.7	-7	26.7



166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

## 5.0 Radiated Spurious Emissions

**Rule Part:** FCC 95.635 (c); FCC Part 2.1053

**Test Procedure:** TIA-603-C

**Limit:** Applies to LPRS standard band s, 25 kHz bandwidth.

$$\text{Limit}(25\text{kHz BW}) = \begin{cases} 20\text{dBm}, & f = f_0 \\ 30\text{dBc}, & 12.5\text{kHz} \leq f < 22.5\text{kHz} \\ 43 + 10 \log P_C \text{ (dBc)}, & f \geq 22.5\text{kHz} \end{cases}$$

$$\text{Limit}(f \geq 22.5\text{kHz}) = 43 + 10 \cdot \log P_{\text{Carrier}} = 43 + 10 \cdot \log(0.00001\text{W}) = -7\text{dB}$$

**Results:** Pass

**Notes:** The EUT was set to transmit an un-modulated carrier and a receiving antenna three meters away was used to measure field strength. A substitution antenna then replaces the EUT and power is applied until the value of the EUT field strength measurement is reached. This is the value of the ERP minus the cable loss and antenna gain, see equation below. All measurements were taken on a “standard test site” in accordance with TIA-603-C.

**Equation(s):** 
$$\text{ERP} = \text{LVL}(\text{dBm}) + \text{CBL}(\text{dB}) + G_{\text{Antenna}}(\text{dBi}) + \text{dBd}_{\text{Conversion}}(\text{dB})$$

ERP = Effective Radiated Power  
LVL = Level of Signal Generator  
CBL = Cable Loss  
G = Gain of Antenna  
dBd = Referenced to Dipole Conversion

**Calculation:** 
$$\text{ERP} = -47.0\text{dBm} + -6.44\text{dB} + 2.15\text{dBi} + -2.15\text{dBd} = -53.4\text{dBm}$$



166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

Tested By: Cooper LaFond  
Tested At: DLS Electronic Systems, Genoa City, WI  
Test Site: OATS 2  
Measurement Parameters:  
RBW = 100 kHz  
VBW = 300 kHz  
Sweep Time = 5ms  
Temperature = 75 °F  
Relative Humidity = 31%

**Table - 10** Radiated Spurious Emissions with Transmitter set to Channel 0

Polarization	Frequency (MHz)	Level (dBuV/m)	Sub. Meas (dBm)	Cable Loss (dB)	Dipole Gain (dBi)	ERP Conv. (dBd)	Level (dBm)	Level Relative to Carrier (dBc)	Limit (dBc)	Margin
V	288.002004	45.0	-47.0	-6.44	2.15	-2.15	-53.4	-33.4	-7	26.4
V	360.007014	38.4	-54.4	-7.29	2.15	-2.15	-61.7	-41.7	-7	34.7
V	432.022044	34.5	-60.8	-8.17	2.15	-2.15	-69.0	-49.0	-7	42.0
Polarization	Frequency (MHz)	Level (dBuV/m)	Sub. Meas (dBm)	Cable Loss (dB)	Dipole Gain (dBi)	ERP Conv. (dBd)	Level (dBm)	Level Relative to Carrier (dBc)	Limit (dBc)	Margin
H	288.000000	45.0	-52.0	-6.44	2.15	-2.15	-58.4	-38.4	-7	31.4
H	360.007014	35.3	-60.0	-7.29	2.15	-2.15	-67.3	-47.3	-7	40.3
H	432.009118	33.7	-62.0	-8.17	2.15	-2.15	-70.2	-50.2	-7	43.2



166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

**Table - 11** Radiated Spurious Emissions with Transmitter set to Channel 20

Polarization	Frequency (MHz)	Level (dBuV/m)	Sub. Meas (dBm)	Cable Loss (dB)	Dipole Gain (dBi)	ERP Conv. (dBd)	Level (dBm)	Level Relative to Carrier (dBc)	Limit (dBc)	Margin
V	288.637002	43.9	-48.0	-6.44	2.15	-2.15	-54.4	-34.4	-7	27.4
V	360.797586	36.1	-57.0	-7.29	2.15	-2.15	-64.3	-44.3	-7	37.3
V	432.957316	33.0	-62.8	-8.17	2.15	-2.15	-71.0	-51.0	-7	44.0
Polarization	Frequency (MHz)	Level (dBuV/m)	Sub. Meas (dBm)	Cable Loss (dB)	Dipole Gain (dBi)	ERP Conv. (dBd)	Level (dBm)	Level Relative to Carrier (dBc)	Limit (dBc)	Margin
H	288.643026	43.4	-53.8	-6.44	2.15	-2.15	-60.2	-40.2	-7	33.2
H	360.791002	33.0	-62.0	-7.29	2.15	-2.15	-69.3	-49.3	-7	42.3
H	432.964929	30.3	-68.0	-8.17	2.15	-2.15	-76.2	-56.2	-7	49.2

**Table - 12** Radiated Spurious Emissions with Transmitter set to Channel 40

Polarization	Frequency (MHz)	Level (dBuV/m)	Sub. Meas (dBm)	Cable Loss (dB)	Dipole Gain (dBi)	ERP Conv. (dBd)	Level (dBm)	Level Relative to Carrier (dBc)	Limit (dBc)	Margin
V	289.299735	50.3	-41.7	-6.44	2.15	-2.15	-48.1	-28.1	-7	21.1
V	361.631993	39.7	-53.0	-7.29	2.15	-2.15	-60.3	-40.3	-7	33.3
V	433.957014	37.5	-57.3	-8.17	2.15	-2.15	-65.5	-45.5	-7	38.5
Polarization	Frequency (MHz)	Level (dBuV/m)	Sub. Meas (dBm)	Cable Loss (dB)	Dipole Gain (dBi)	ERP Conv. (dBd)	Level (dBm)	Level Relative to Carrier (dBc)	Limit (dBc)	Margin
H	289.299735	49.7	-47.0	-6.44	2.15	-2.15	-53.4	-33.4	-7	26.4
H	361.618565	38.3	-55.8	-7.29	2.15	-2.15	-63.1	-43.1	-7	36.1
H	433.967684	34.6	-60.7	-8.17	2.15	-2.15	-68.9	-48.9	-7	41.9





166 South Carter, Genoa City, WI 53128

Company:  
Model Tested:  
Report Number:

Care Trak International, Inc.  
CT-11 Double Beep Transmitter  
16893

## END OF REPORT

Revision #	Date	Comments	By
1.0		Preliminary Release	C.L.
1.1	5-2-2011	Filled in model info & corrected to CT-11	JS
1.2	5-3-2011	Added to description (pg 6), & corrections (ie. KHz to kHz)	JS