

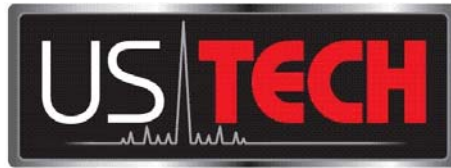


*Testing Tomorrow's Technology*

**Application For  
Title 47 USC Part 2, Subpart J, Section 2.947 Certification  
For An FCC Part 90, Private Land Mobile Radio Services Device  
the  
Computer Electronics Research Group (CERG)  
458 MHz Transmitter**

**FCC ID: TVK-WPLS**

**UST Project No: 08-0244  
November 15, 2008**



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FCC ID: TVK-WPLS

I certify that I am authorized to sign for the Test Agency and that all of the statements in this report and in the Exhibits attached hereto are true and correct to the best of my knowledge and belief:

**UNITED STATES TECHNOLOGIES, INC. (Agent Responsible For Test):**

By: SA Sawyer

Name: Stephen A. Sawyer

Title: Chief Compliance Engineer

Date: November 15, 2008

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Issue Date:

Customer:

Model:

Computer Electronics Research Group

STD-302

## MEASUREMENT/TECHNICAL REPORT

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

Equipment type: **Remote Control/Security Device Transceiver**

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 N.A.  
date

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

Report prepared by:

US Tech  
3505 Francis Circle  
Alpharetta, GA 30004

Phone Number: (770) 740-0717

Fax Number: (770) 740-1508

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## **1.0 General Information**

### **1.1 Product Description**

The Equipment Under Test (EUT) is the Computer Electronics Research Groups' Model STD-302 Transceiver operating over the frequency range of 458.500 MHz to 459.275 MHz in 25 kHz steps. The maximum data rate is 9.6 kb/s on all available channels. Transmit power is +10 dBm (10 mW). The receiver sensitivity is -112 dB at 9.6 kb/s.

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## **1.2 Related Submittal(s)/Grant(s)**

The EUT will be used as part of a system to send/receive data. The transmitter presented in this report will be used with other like transceivers.

- a) Certification as a low power transmitter

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

The EUT is a low power device operating at 458.5 MHz to 459.275 MHz. In accordance with Subpart I of FCC part 90, the client wishes to exercise the exemption under section 90.217, listed below:

## **1.3 Exemption from Technical Standards.**

Per section 90.217, except as noted herein, transmitters used at stations licensed below 800 MHz on any frequency listed in subparts B and C of part 90 or licensed on a business category channel above 800 MHz which have an output power not exceeding 120 milliwatts are exempt from the technical requirements set out in this subpart, (subpart I), but must instead comply with the following:

(a) For equipment designed to operate with a 25 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 40 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier (-30 dBc).

(b) For equipment designed to operate with a 12.5 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 25 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

(c) For equipment designed to operate with a 6.25 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 12.5 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

(d) Transmitters may be operated in the continuous carrier transmit mode.

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## **2.0 Test and Measurements**

### **2.1 Configuration of Tested System**

A block diagram of the tested system is shown in Figure 1. Test configuration photographs for spurious emissions measurements are shown in Figure 2. 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.

### **2.2 Characterization of Tested System**

The sample used for testing was received by U.S. Technologies on December 27, 2005 in good condition.

### **2.3 Test Facility**

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA. Conducted and digital device testing was performed at US Tech's OATS measurement facility. This site has been fully described and registered by the FCC under Registration Number 91037. Additionally this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file number IC2982.

### **2.4 Test Equipment**

Table 2 describes test equipment used to evaluate this product.

### **2.5 Modifications to Equipment under Test (EUT)**

No modifications were made by US Tech to bring the EUT into compliance with the FCC limits for the transmitter portion of the EUT.



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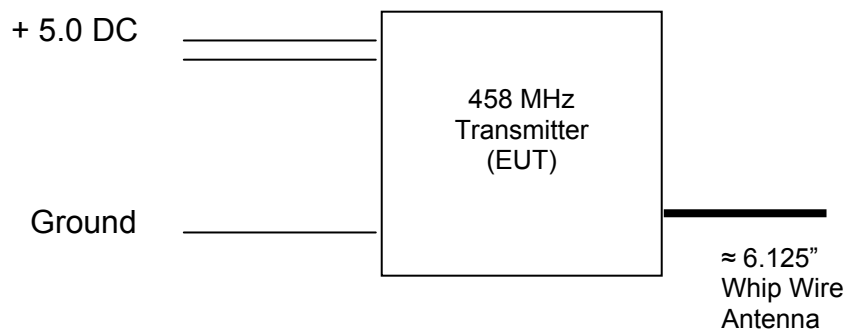
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**Figure 1. Test Configuration**

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**Table 1. EUT and Peripherals**

PERIPHERAL MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
Wireless Telemetry Device (EUT) Computer Electronics Research Group	458 MHz Transmitter	None	FCC ID: TVK-WPLS	+ 5.0 DC  Ground

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**Table 2. Test Instruments**

EQUIPMENT	MODEL NUMBER	MANUFACTURER	SERIAL NUMBER	DATE OF LAST CALIBRATION
SPECTRUM ANALYZER	8558B	HEWLETT-PACKARD	2332A10055	02/25/05
SPECTRUM ANALYZER	8593E	HEWLETT-PACKARD	3205A00124	03/1/05
RF PREAMP	8447D	HEWLETT-PACKARD	2944A06291	04/6/05
BICONICAL ANTENNA	3110B	EMCO	9307-1431	05/31/05
LOG PERIODIC ANTENNA	3146	EMCO	9110-3236	09/19/05
PLOTTER	7475A	HEWLETT-PACKARD	2325A65394	N/A
LISN (x 2) 8028-50-TS24-BNC	8028	SOLAR ELECTRONICS	910494 & 910495	01/27/05
CALCULATION PROGRAM	N/A	N/A	Ver. 6.0	N/A

**Note: The calibration interval of the above test instruments is 12 months and all calibrations are traceable to NIST/USA.**

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## 2.6 Antenna Description

The unit incorporates an integral Wire Whip antenna of 6.125 inches length with a gain of 0 dBi.

## 2.7. RF Power Output (FCC Section 2.1046, 90.217)

The maximum allowable station effective radiated power (ERP) is dependent upon the stations HAAT (the height above the average terrain) and required service area. Because this product has such low power, its service area radius will be held to 3 km and therefore its' maximum ERP is 2 Watts. Table 3 below is a table of ERP based upon a measurement distance of 3 meters. Figures 3 (a) and (b) below contain graphs of the measurements.

**Table 3. RF Output Effective Radiated Power (ERP)**

Frequency of Fundamental (MHz)	ERP Measurement		FCC Limit (Watts)
	(dBm)*	(Watts)*	
458.485	8.58	0.00721	0.120
459.230	7.87	0.00612	0.120

\* Measurement includes 0.1 dB for cable loss

**Test Date: December 29, 2005**

**Tester  
Signature:**



**Name: Paul Picard**

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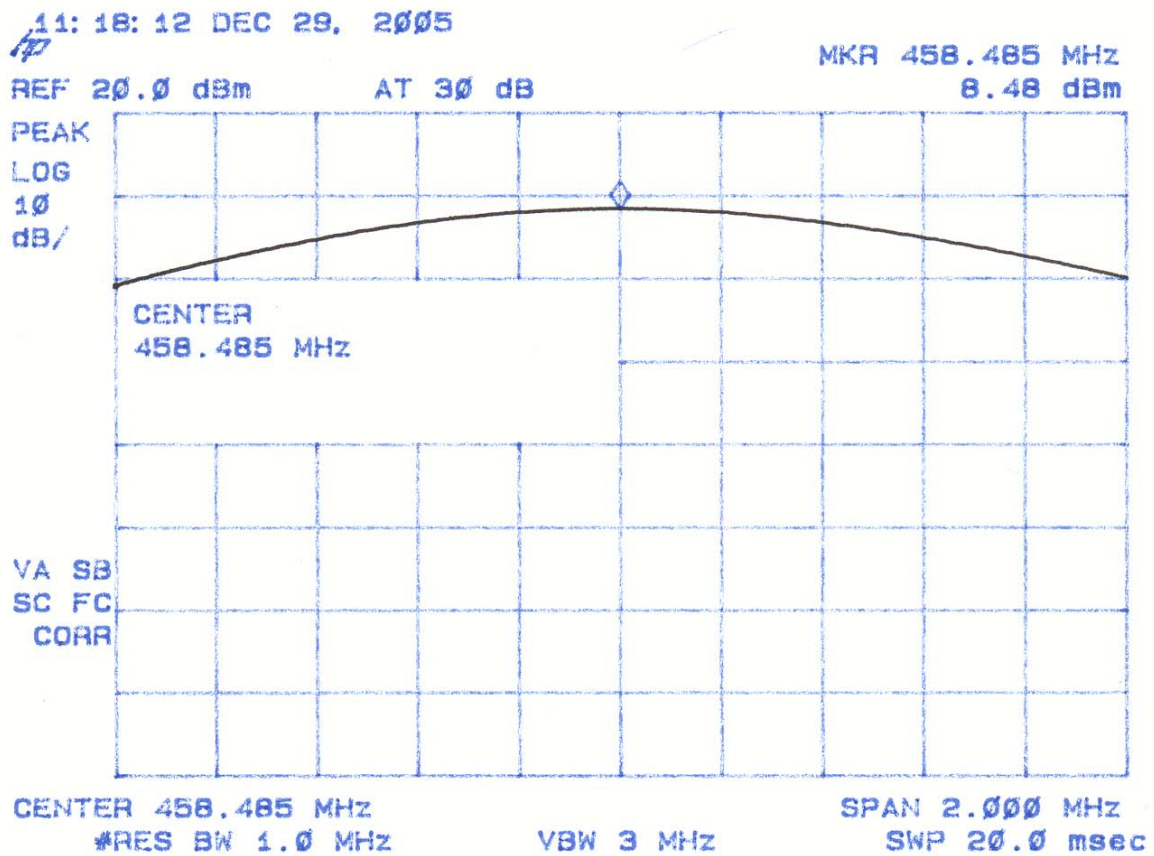


Figure 3a. Graph of 458 MHz Output.

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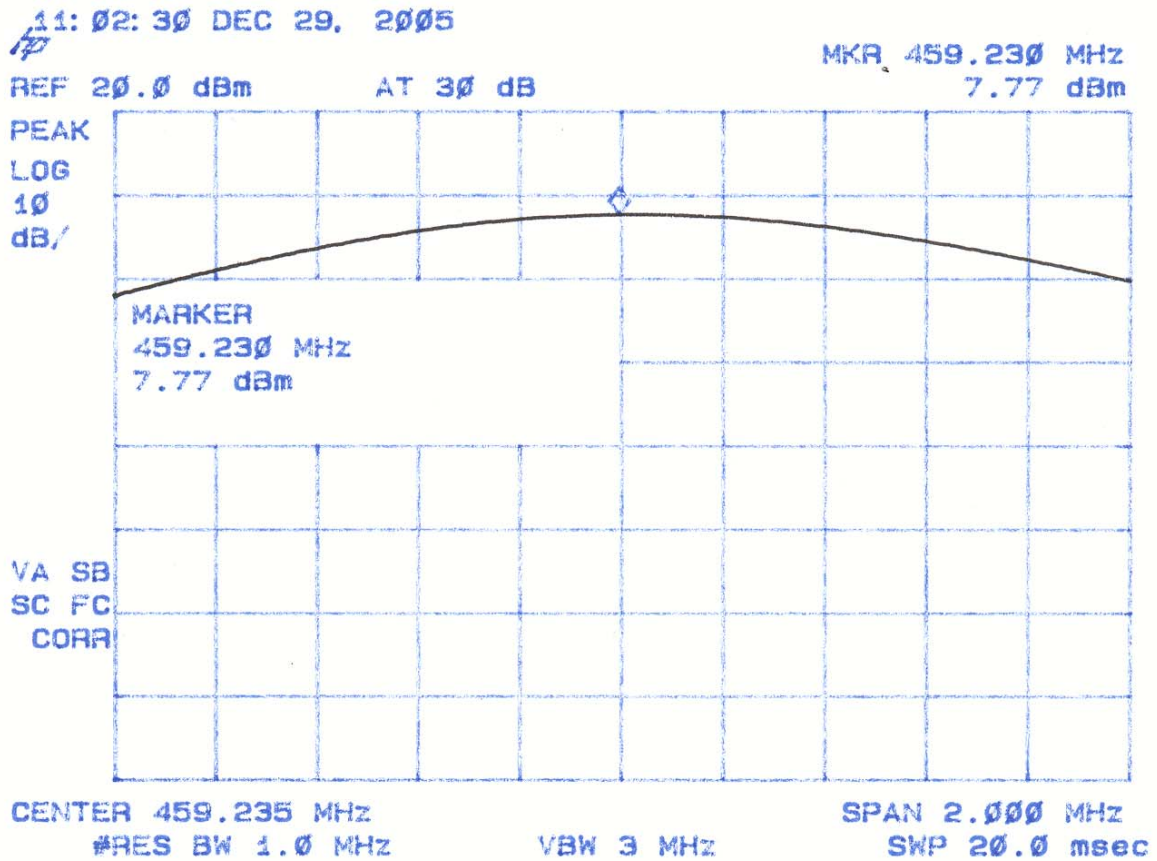


Figure 3b. Graph of 459 MHz RF Output.

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## **2.8 Occupied Bandwidth (FCC Section 2.1049, 90.217)**

The Occupied bandwidth of the fundamental was measured using a spectrum analyzer, as shown in Figure 4a and Figure 4b. For Figure 4a, 458.498 MHz, the 0.5 % point of the total mean powers are found in a bandwidth of 137.5 kHz. For Figure 4b, 459.273 MHz, the 0.5 % point of the total mean powers are found in a bandwidth of 137.5 kHz.

Because of the digital modulation nature of the transmitter, the necessary bandwidth cannot be calculated, therefore this measured value is used per paragraph 2.202 (c)(4) when developing the emissions designator.

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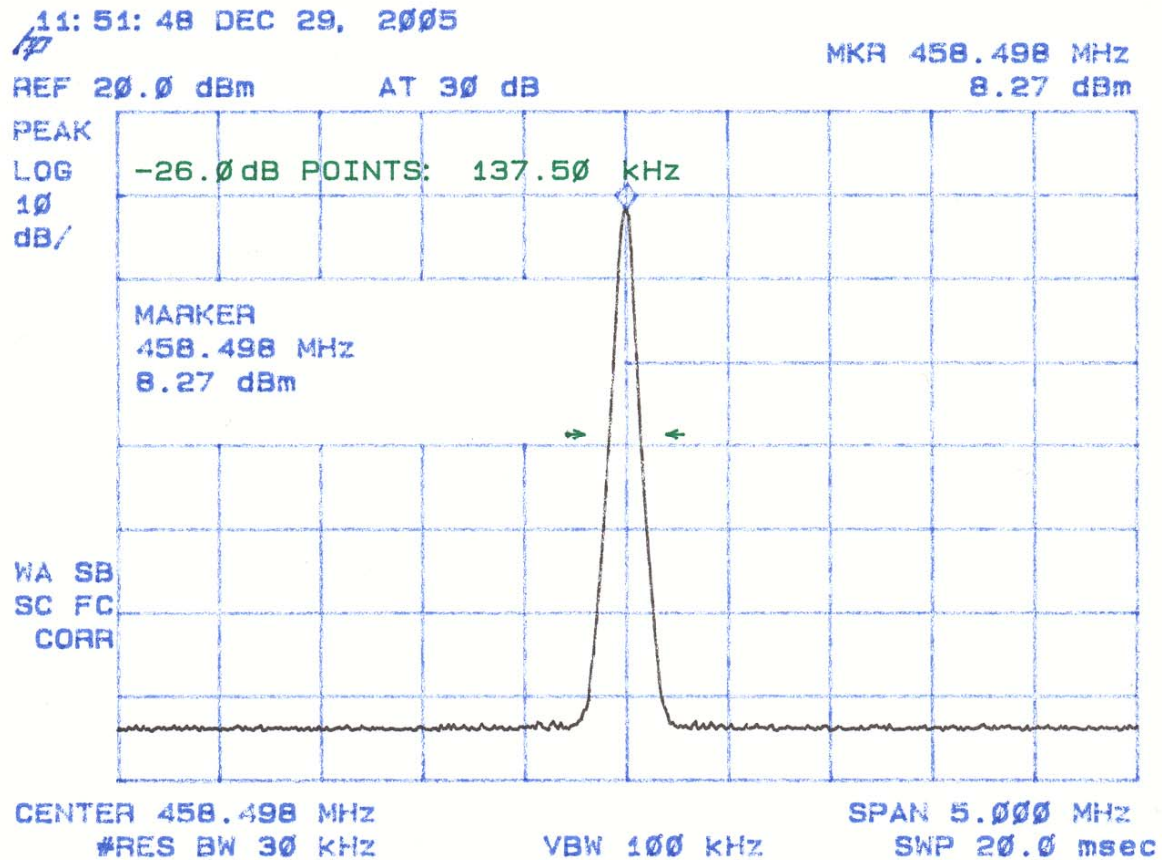


Figure 4a. Occupied Bandwidth of Transmitter tuned to 458.5 MHz.



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11:54:13 DEC 29, 2005

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REF 20.0 dBm

AT 30 dB

MKR 459.273 MHz

7.70 dBm

PEAK

LOG

10

dB/

-26.0 dB POINTS: 137.50 kHz

MARKER

459.273 MHz

7.70 dBm

WA SB  
SC FC  
CORR

CENTER 459.273 MHz

#RES BW 30 kHz

VBW 100 kHz

SPAN 5.000 MHz

SWP 20.0 msec

Figure 4b. Occupied Bandwidth of Transmitter tuned to 459.275 MHz.