

**Exhibit 11 – RF Exposure**  
**General Dynamics C4 Systems**  
**VHF URC-200 Transceiver**  
FCC ID: MIJURC-200XCVR-V2  
Model No. URC-200 (V2)

This exhibit presents a discussion of the GDC4S URC-200 Transceiver relative to the RF Exposure requirements for transmitters as defined in FCC 47 CFR Parts 1 and 2, and Office of Engineering Technology (OET) Bulletin 65.

### **11.0 RF Exposure Requirements**

The Maximum Permissible Exposure (MPE) limits are specified in 47 CFR 1.1310. The MPE power density limit for a VHF transmitter in an Occupational/Controlled environment is 1.0 mW/cm<sup>2</sup>. The requirement limit for a controlled environment is applicable since the equipment will be used by trained personnel.

### **11.1 Environmental Assessment**

An MPE assessment was performed on the URC-200 (V2) radio. Figure 11-1 is a copy of that assessment. A duty cycle of 50% was used per OET Laboratory Division Knowledge Database (KDB) Publication 447498 for Push-to-Talk (PTT) devices. As illustrated in this assessment, the RF exposure levels do not exceed the 1mW/cm<sup>2</sup> level for controlled environments.

### **11.2 Labeling Requirements**

A caution statement is included in both the equipment label as well as the User Manual (Section 1-5.2) which specifies a minimum separation distance of 20 cm (7.9 inches) is required between the antenna and all persons while the transceiver is transmitting. Figure 11-2 shows the label that is to be placed on the URC-200 (V2) including the RF Exposure statement.

## RF Energy Exposure Assessment Record

Product or Equipment Name: URC-200 (V2) Date: 18-Aug-2009  
Product/Equipment Sponsor: Les Sassaman Jr. Phone: 480-441-3380  
Dept./ Division: Tactical Systems / CND M/D: R-3160  
Location of Product/Equipment: Roosevelt

### 1.0 RF Emitting Product or Equipment Description

Manufacturer: General Dynamics C4 Systems  
Model: URC-200 (V2) Serial No.: V2-28  
Antenna Bar Code: N/A

Describe the product or equipment, the environment(s) where it is used and information about operators and others who might be exposed to its emitted RF energy.

Lightweight, tactical LOS AM/FM radio for manpack (backpack), vehicular, and rackmount environments.

Frequencies of operation (MHz): AM: 115-149.995 MHz FM: 115-173.995 MHz

Maximum output power level (Watts): AM high power = 10W AM low power = 5W  
FM high power = 10W FM medium power = 5W FM low power = 0.1W

Modulation characteristics: AM / FM

If pulse modulation: Pulse Repetition Frequency (PRF): N/A Pulse duration: N/A Duty cycle: \* 50%

\* A duty cycle of 50% was used per OET KDB Publication 447498 for PTT devices

Antenna description: UVU-100 Omni-directional manpack antenna

Antenna gain: 2.5 dBi (1.78 numeric) average in VHF range

Maximum EIRP (Watts): 17.78 Watts

#### Failure Modes:

Are there credible failure modes in the product or equipment (hardware or software) or operations (controls, procedures, human error) that could cause the average output power to increase above the normal operating level?

Yes: \_\_\_\_\_ No:  X

If Yes, describe the failure mode, probability of occurrence of the failure and the expected level of output power.

**Figure 11-1 RF Energy Exposure Assessment Record (1 of 4)**

## RF Energy Exposure Assessment Record

Product or Equipment Name: URC-200 (V2) Date: 18-Aug-2009

### 2.0 Maximum Permissible Levels

Limits based on: 47 CFR Section 1.1310, Table 1

Frequencies	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Plane Wave Equiv. Power Density (S) (mW/cm <sup>2</sup> )	Induced Current (mA) Both Feet/ One Foot	Contact Current (mA)	SAR (W/kg)
117 MHz						
149 MHz						
173 MHz						
Controlled Environment:	<u>61.4</u>	<u>0.16</u>	<u>1.00</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
General Public Environment:	<u>27.5</u>	<u>0.07</u>	<u>0.20</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>

If S.A.R. testing is required who will be performing test: \_\_\_\_\_ EMC Lab: \_\_\_\_\_ Outside Lab: \_\_\_\_\_

### 3.0 Measurement Results

Applicable document: Radio Frequency (RF) Energy Exposure Test Procedure, Rev. I

**Note: All measurements performed at a distance of 20cm unless otherwise noted.**

Frequencies	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Plane Wave Equiv. Power Density (S) (mW/cm <sup>2</sup> )	Induced Current (mA) Both Feet/ One Foot	Contact Current (mA)	SAR (W/kg)
117 MHz						
149 MHz						
173 MHz						
Measured Levels:	See attached Measurement Result Table 1			<u>N/A</u>	<u>N/A</u>	<u>N/A</u>

Is the maximum permissible exposure level for a general public environment exceeded?

Yes:   X   No: \_\_\_\_\_ If Yes, complete section 5.0

Is the maximum permissible exposure level for a controlled environment exceeded?

Yes: \_\_\_\_\_ No:   X   If Yes, complete section 5.0

**Figure 11-1 RF Energy Exposure Assessment Record (2 of 4)**

## RF Energy Exposure Assessment Record

Product/Equipment Name: URC-200 (V2) Date: 18-Aug-2009

### 4.0 RF Energy Measurement Equipment

Manufacturer	Description	Model No.	Asset No.	Last Cal.	Cal. Due date
Narda	Electromagnetic Survey Meter	8718B	G58802	04/13/09	04/30/10
Narda	Probe, E-Field, Isotropic	8741	G52451	02/04/09	02/28/10
Narda	Probe, H-Field, Isotropic	8731	G52449	06/25/09	05/31/10

Tests performed by: \_\_\_\_\_ Date: \_\_\_\_\_  
Steve Gooding  
EMC Group

Data reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_  
Gil Estrella  
EMC Group

### 5.0 Required Hazard Controls

Fully describe all hazard controls to be implemented. Provide drawings and other attachments, as necessary, to describe Restricted Access Areas.

**No constraints required when used in a controlled environment at a distance  $\geq$  20cm from the body.**

### 6.0 Review and Approval

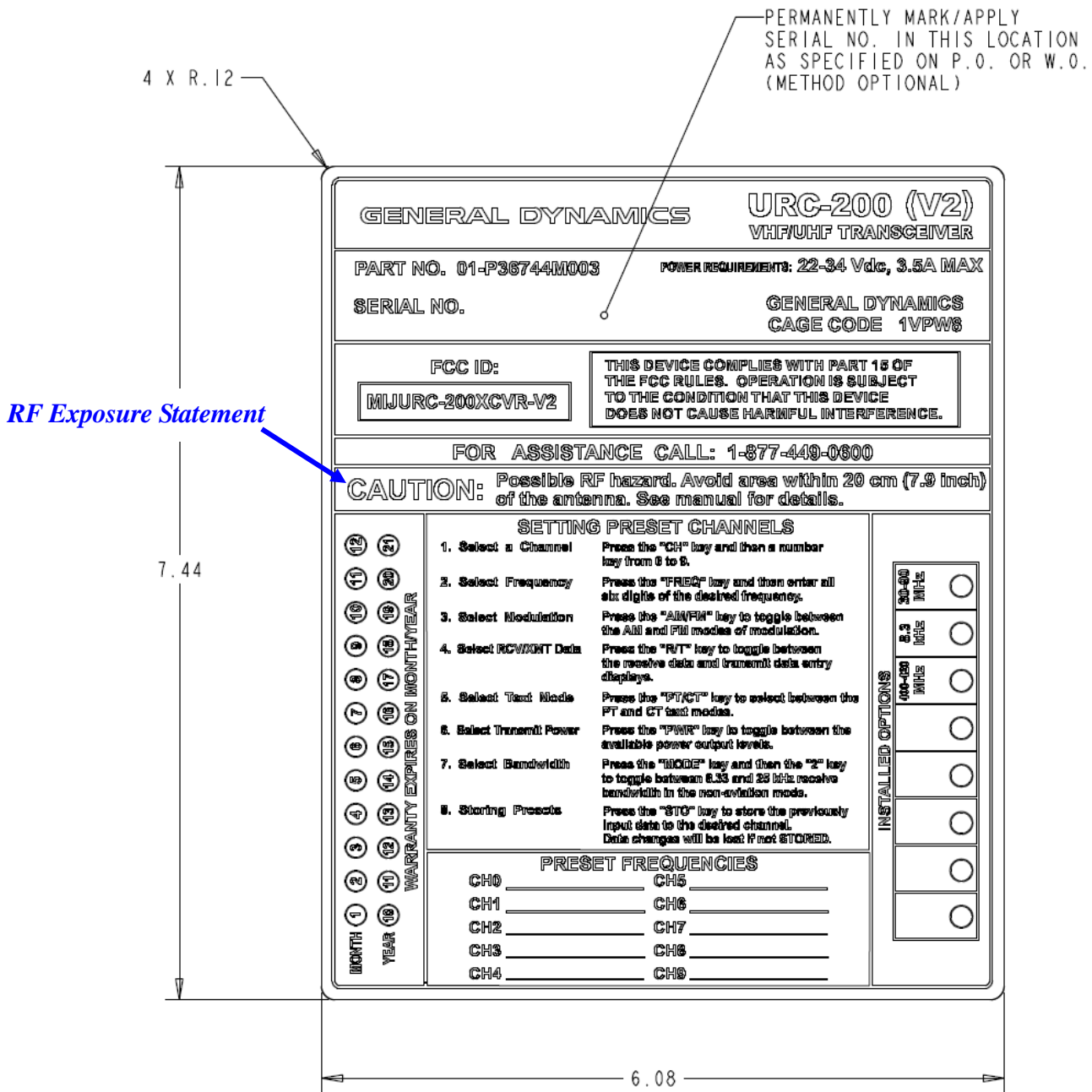
_____ Jim Warthman Product/Equipment Sponsor (Project Leader)	Date: _____
_____ Bob Cohen Product/Equipment Manager (Program Manager)	Date: _____
_____ Bob Hart CND Division Safety Manager	Date: _____
_____ Stacia Johannsson Radiation Safety Officer	Date: _____

**Figure 11-1 RF Energy Exposure Assessment Record (3 of 4)**

**Table 1 – MPE Measurement Results Table**

Tx Frequency MHz	Mode	Power Setting	Measured Power Density @ 20cm mw/cm <sup>2</sup>	Avg Power Density @ 20cm (50% duty cycle) mw/cm <sup>2</sup>	Controlled Power Density MPE Limit @ 20cm mw/cm <sup>2</sup>	Measured Magnetic Field @ 20cm A/m	Controlled Magnetic Field MPE Limit @ 20cm A/m
117.00	AM	LO	0.61	0.31	1.00	0.024	0.16
	AM	HI	1.06	0.53		0.037	
	FM	LO	0.011	0.01		0.001	
	FM	MED	0.74	0.37		0.025	
∇	FM	HI	1.51	0.76		0.045	
149.00	AM	LO	0.48	0.24		0.004	
	AM	HI	0.92	0.46		0.024	
	FM	LO	0.019	0.01		0.001	
	FM	MED	0.64	0.32		0.024	
∇	FM	HI	1.22	0.61		0.037	
173.00	FM	LO	0.021	0.01		0.001	
	FM	MED	0.65	0.33	∇	0.033	∇
∇	FM	HI	1.22	0.61	1.00	0.049	0.16

**Figure 11-1 RF Energy Exposure Assessment Record (4 of 4)**



# PRELIMINARY

Figure 11-2 RF Exposure Warning Statement