

Unmanned Surface Vehicle (USV) STA License Request

1. Purpose of Operation

Raytheon will Participate in Demonstration of the Unmanned Surface Vehicle

Location: Raytheon Integrated Defense Systems (IDS) Expeditionary Warfare Center (EWC), 8650 Balboa Ave. San Diego CA. 92123, San Diego County, state of California. Integration laboratory coordinates are; 32.821510 North Latitude, 117.141349 West Longitude, and the surrounding area, also San Diego off shore and coastal areas, San Diego Bay and Mission Bay coastal waterways.

Frequency Stop: 4.680 **Type:** GHz

Emission Bandwidth: 6 Mhz **Emission:** COFDM using; BPSK, QPSK and 16QAM modulations

Supplementary Details:

Intended Use: Integration testing of a Maritime Unmanned Surface Vehicle (USV) mission equipment. **Description of Requirement:** demonstrate reliable RF communications between Unmanned Surface Vehicle (USV) and Base Station.

Comments:

A radius of operation of 10,000 meters around above listed coordinates is desired for integration and testing purposes.

It should be noted that a small public airfield, Montgomery Field is located 500 meters to the south of the EWC integration lab location.

Point of Contacts

Requester Name: Mr. Daniel Salazar, (858) 522-4087, Daniel.Salazar@raytheon.com

Requester Organization: Raytheon Company

- **Files Number:** 1195-EX-ST-2015
- **_ Class of Station:** FIXED/ Mobile
- **_ Station Location:** FIXED/ Mobile
- **_ Effective Date:** 12/01/2015
- **_ Expiration Date:** 6/01/2016

2. Experimental Explanations

Raytheon will conduct developmental testing and evaluation on the Unmanned Surface Vehicle (USV). Additional Information:

Program / Project Name: Qirsh Unmanned Surface Vehicle (USV)

Security Classification; Unclassified, Raytheon Company Proprietary

Equipment

Transmitter: NETNode-MIMOR-440500, Manufacturer; Cobham Tactical Communications Ltd

Number of Equipment: 2 transceivers and 8 antenna units

Radar Tunability: N/A

Power: 2 Watts

Antenna Type: Gain: 9 dBi
 Antenna part number; OA9-4.6V/1701
 Elevation, 25 ft: Antenna Distance: 50 ft
 Feed Point Height: 22 ft Orientation: Vertical and horizontal pairs Polarization:
 Beam Width: _____TBD_____
 Receiver: NETNode-MIMOR-440500 Sensitivity, - 98 dBm
 Antenna Type: Gain: 9 dBi
 Feed Point Height: 22 ft Orientation: Vertical and horizontal pairs Polarization:
 Beam Width: ____TBD_____ Elevation 25 ft

Figure 1: The 4400-4940 MHz Channel Plan

4400 - 4940 MHz CHANNEL PLAN																											
4.670 GHz --- 4.670 GHz																											
Lower Band														Upper Band													
4.400 GHz														4.700 GHz													
4.640 GHz														4.940 GHz													
4 GHz Channel Bandwidths																											
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CENTER FREQUENCIES OF THE UNPAIRED OR SINGLE CHANNELS

Table 8: The Center Frequencies for the Unpaired or Single Channels in the 4400-4940 MHz Channel Plan

5 MHz Channels (First Priority E-Channels)		
E49 (4642.5)	E53 (4662.5)	E57 (4682.5)
E50 (4647.5)	E54 (4667.5)	E58 (4687.5)
E51 (4652.5)	E55 (4672.5)	E59 (4692.5)
E52 (4657.5)	E56 (4677.5)	E60 (4697.5)