

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																															
4 GHz Channel Bandwidths	Lower Band												Upper Band																		
	4.400 GHz												4.940 GHz																		
40.00 MHz (A)	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20							
30.00 MHz (B)	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	C13	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23	C24							
20.00 MHz (C)	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23	C24							
10.00 MHz (D)	(D1-D4)		(20) 10 MHz (D5-D24)										25		26	27	28	29	30	(D1'-D4')		(20) 10 MHz (D5'-D24')									
5.00 MHz (E)	(8) 5 MHz		(40) 5 MHz* (E9-E48)										(12) 5.00 MHz (E49-E60)		(8) 5 MHz		(40) 5 MHz* (E9'-E48')														
2.50 MHz (F)	(16) 2.5 MHz		(80) 2.5 MHz* (F17-F96)										(24) 2.50 MHz (F97-F120)		(16) 2.5 MHz		(80) 2.5 MHz* (F17'-F96')														
1.25 MHz (G)	(32) 1.25MHz		(160) 1.25 MHz* (G33-G192)										(48) 1.25MHz (G193-G240)		(32) 1.25MHz		(160) 1.25 MHz* (G33'-G192')														
One-Way Applications																															

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)