

Unmanned Surface Vehicle (USV) Request to change WJ9XED to an Experimental License

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: 0294-EX-PL-2016
- __ Class of Station: FIXED/ Mobile
- __ Station Location: FIXED/ Mobile
- __ Effective Date: 5/23/2016
- __ Expiration Date: 5/22/2017

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

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Figure 1: The 4400-4940 MHz Channel Plan

4400 - 4940 MHz CHANNEL PLAN																																								
Lower Band														Upper Band																										
4.400 GHz														4.700 GHz																										
4.640 GHz														4.940 GHz																										
4 GHz Channel Bandwidths																																								
40.00 MHz (A)	A1	A2	A3	A4	A5	A6															A1'	A2'	A3'	A4'	A5'	A6'														
30.00 MHz (B)	B1	B2	B3	B4	B5	B6	B7	B8					B9	B10			B11	B12	B13	B14	B15	B16	B17	B18																
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	C25	C26	C27	C28	C29	C30										
10.00 MHz (D)	(D1-D4)				(20) 10 MHz (D5-D24)																(D1'-D4')				(20) 10 MHz (D5'-D24')															
5.00 MHz (E)	(8) 5 MHz				(40) 5 MHz* (E9-E48)																(8) 5 MHz				(40) 5 MHz* (E9'-E48')															
2.50 MHz (F)	(16) 2.5 MHz				(80) 2.5 MHz* (F17-F96)																(16) 2.5 MHz				(80) 2.5 MHz* (F17'-F96')															
1.25 MHz (G)	(32) 1.25MHz				(160) 1.25 MHz* (G33-G192)																(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)