

Raytheon Company (Missiles & Defense – M)
Experimental STA Application
File Number: 1126-EX-ST-2021

Exhibit: Explanation of Experiment and Need for STA

Raytheon Company (Missiles & Defense – M) “Raytheon” builds a variety of products for the US government, including for the US military. This application requests renewed authorization for the use of radios that will be used in a developing line of UASs that will deliver advanced functionality to the Department of Defense.

Raytheon has been asked to demonstrate its technology at San Clemente Island, just off the coast of California.

Need for an STA

Raytheon is seeking authorization for demonstrations and testing that is scheduled to start on September 1, 2021 and run through the end of January 15, 2022. Because this is a limited amount of time, an STA is appropriate.

Technical Synopsis:

Spectrum required: 1362 MHz, 1372 MHz, 1382 MHz

Emission designators: 20M0D1D and 20M0G1D

Time of use: six hours per day but only four of the weeks that the STA will cover

Elevation of UAV flights: only 3 UAVs in flight, at elevations from 10-3000 ft AMSL

Area of operation: Operations based around San Clemente Island off the coast of California

Description of Operations:

Raytheon is taking its Coyote platform to San Clemente Island for testing and demonstrations for its customer to show the way that the Coyote UAV platform can be used to operate as a swarm.

The UAVs will be in flight over the Pacific Ocean. There will be two control stations on vessels also on the ocean, and a number of radios will be deployed on the to show how the radios interact with one another. The network of radios will be operated simultaneously, to demonstrate the interoperability of the units as a group. The radios will share the spectrum requested in this application.

Areas of Operations

Test Site: The UAV platform will be tested and its configurations confirmed at a test site on San Clemente Island. Those operations will be fixed and mobile in a 1.0 km radius around the pier shown in *Figure 1* below. This site is only to be used for testing and set up.

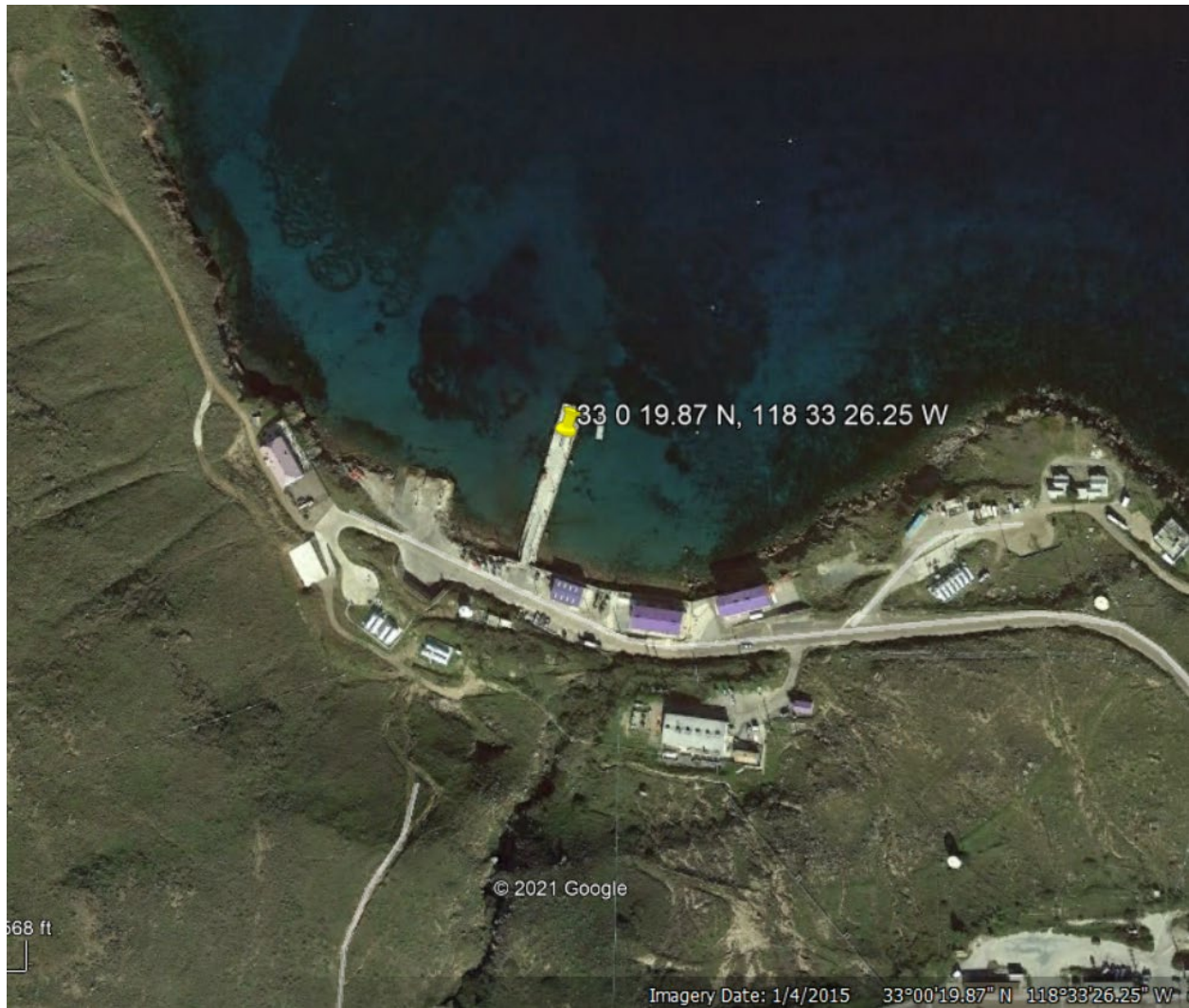


Figure 1. Test Site, operations in 1 km radius around center

Demonstration Operations: These operations will take place within the area of operations shown in *Figure 2* below. There will be airborne and ground-based operations. The ground operations may be on watercraft. All operations will be mobile within the 24 km radius of operations around the center point below.

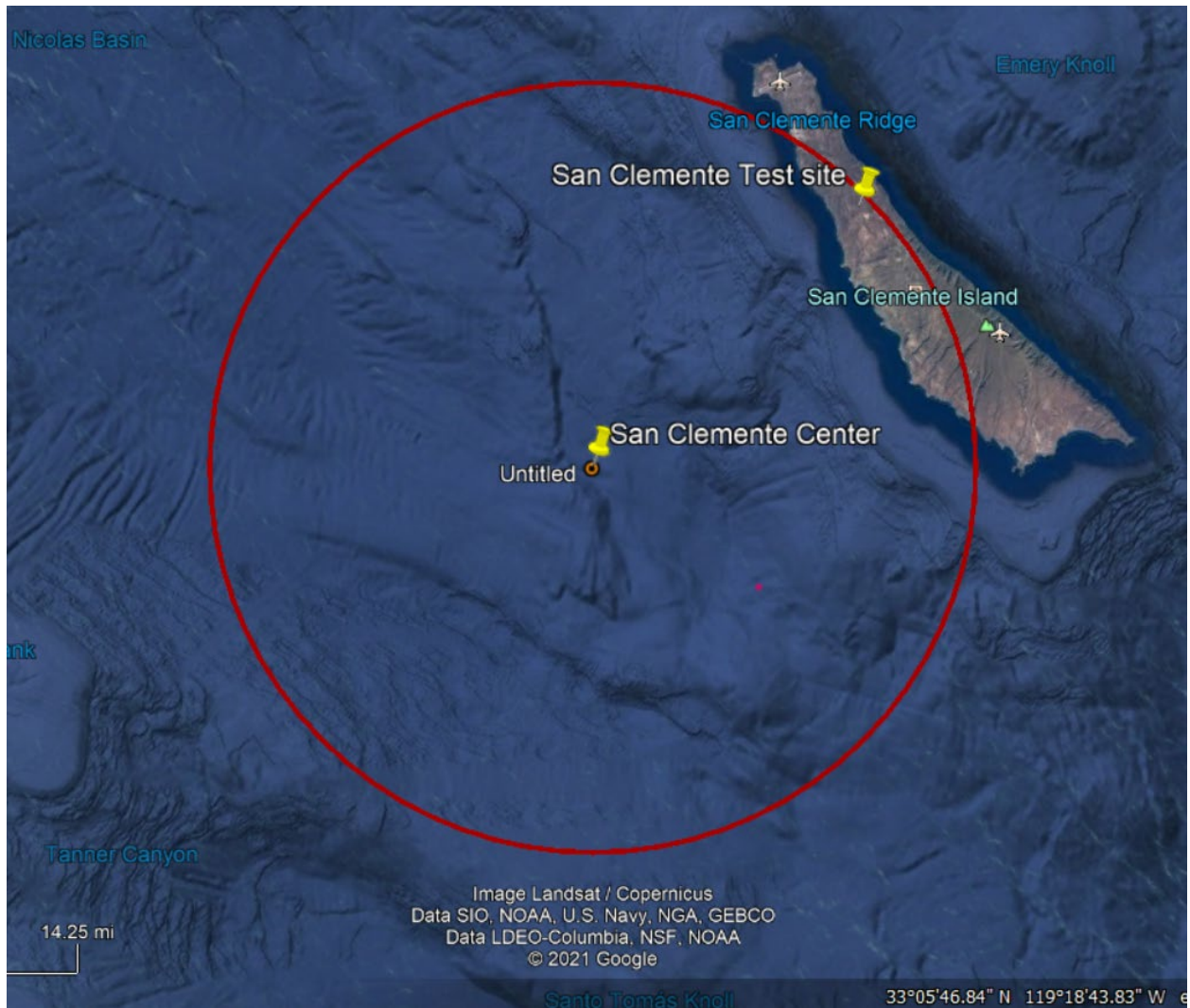


Figure 2. Area of Operations for Demonstration – radius is 24 km

Control (Ground) Stations: These will be placed on watercraft that will be operating in the water area south and west of San Clemente Island. The control stations operate generally using low power, but they are capable of operating using the full ERP of 49 W, which is requested here. The full power is only in use if there is loss of link to a UAV in flight. The control stations are mobile.

Airborne Operations: The UAVs will fly over the designated area of ocean, at elevations from 10 to 3000 feet. Those will be in contact with the control stations mounted on watercraft. The radius of operations is 24 km from the center point of the area of operations. Only a limited portion of the area will be in use at a time.

Time of Use:

The testing and demonstrations are scheduled to start in September. While the initial request is for operations that will conclude by the end of September, experience has taught us that further

demonstrations often follow. For that reason, this application seeks authorization for operations until mid-January.

The UAVs will be tested for four to six hours per day. The time of use is limited.

Ground Antenna:

The control antenna can be operated with higher gain to allow for communication with the UAVs if they are at a distance and there is some need to enhance data throughput. The antenna gain is configurable. At its maximum gain, the operations will have an ERP of 49 W. High gain operations are infrequent. Only the ground stations have this capability. The application separates these ground-based, mobile operations from the airborne mobile operations, which only use 6 W ERP.

No Likelihood of Interference:

The radios used for these tests and demonstrations are listen-before-transmit radios. Therefore, they will move to a different frequency if they perceive other operations on the same spectrum.

The UAVs operate with an ERP of 6 W. The control stations have the ability to transmit up to 49 W ERP, yet, as noted above, most operations will be a much lower power.

The focus of these operations is over water, and they are off the coast in an area that is dedicated to DoD activities, further reducing the prospect of any harmful interference.

Stop Buzzer Point of Contact:

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Conclusion:

Raytheon is seeking an STA for testing and demonstrations to be conducted on and around San Clemente Island, off the coast of California. The tests and demonstrations are of a swarming UAV technology that requires the use of UAVs flying over the ocean and ground stations mounted on water craft. These operations will start in September and they are expected to last a month. Experience has taught us that these operations often continue or schedules slip, so the application seeks authorization through mid-January 2022. Operations will take place for approximately 6 hours per day.

If there are any questions about this application, please contact Anne Cortez, Counsel, 520-360-0925 or alc@conspecinternational.com.