

Raytheon Company (Missiles & Defense – M)
Experimental STA Application
File Number: 0879-EX-ST-2022

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 launching its UAVs from a site on the west coast of Kauai.

Need for an STA

Raytheon is seeking authorization for demonstrations and testing that is scheduled to start on May 31, 2022 and run through the end of November 30, 2022. Because this is a limited amount of time, an STA is appropriate. Raytheon’s spectrum manager learned of this requirement on May 10, 2022, and this application is being submitted as quickly as possible.

Technical Synopsis:

Spectrum required: 4700-4740 MHz

Emission designators: 10M0D1D

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

Elevation of UAV flights: UAVs in flight at elevations from 10-3900 ft AMSL

Area of operation: 15 km radius around a shore point on Kauai

Description of Operations:

Raytheon is taking its Coyote platform to Kauai, Hawaii for testing and demonstrations for its Navy customer.

The UAVs will be in flight primarily 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.

This operation is strictly developmental testing. The radios will be tested to see whether they can perform effectively on a UAS platform. This is not for regular, ongoing operations of the radio.

Area of Operations

These operations will take place within the area of operations shown in *Figure 1* below. There will be airborne and ground-based operations. The ground operations may be on watercraft. All operations will be mobile within the 15 km radius of operations around the center point below.



Control (Ground) Stations: These will be placed on watercraft that will be operating in the water area around San Clemente Island. The control stations operate generally using low power, but they are capable of operating using the full ERP of 40 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 3900 feet. Those will be in contact with the control stations mounted on watercraft. The radius of operations is 15 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 on May 31, 2022. 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 the end of November.

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 40 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 20 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 20 W. The control stations have the ability to transmit up to 40 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:

Joshua Salmon, Spectrum
Manager Raytheon
520-473-6784
Joshua.2.salmon@raytheon.com

Conclusion:

Raytheon is seeking an STA for testing and demonstrations to be conducted on and around Kauai, Hawaii. 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 watercraft. These operations will start on May 31, 2022 and they are expected to last several weeks. Experience has taught us that these operations often continue or schedules slip, so the application seeks authorization through the end of November 2022. Operations will take place for approximately 6 hours per day.

If there are any questions about this application, please contact Jim Ortega, Spectrum Manager, 520-794-0227 or James.e.ortega@raytheon.com.