

Raytheon Company (Missiles and Defense – M)  
Experimental Application  
File Number: 0812-EX-CN-2021

## **Explanation of Experiment**

### **Overview:**

Raytheon Company (Missile and Defense – M) (Raytheon) is the primary missile manufacturer in the US, supplying ordinance ready to operate to the US military. Raytheon's experience with missiles has led its customers to seek UAV technology based on some of its existing platforms and knowledge. This has led Raytheon into the development of advanced UAV technology as well. This application seeks authorization for the use of a radio that is used in the development and testing of its advanced UAVs. The radios incorporated into the UAVs support the mission of the UAV testing.

This application is being filed to add Raytheon X-net radios to testing that is already the subject of an experimental application 0811-EX-CN-2021 for operations at Ft. Benning, GA. The X-net radios operate differently from the radios that are the subject of the earlier application.

### **Need for an STA:**

Raytheon has a contract with DARPA, HR001120C0008, to deliver advanced UAV systems. The contract requires rapid development and testing, with radio demonstrations planned for the next 1-2 years.

### **Technical Synopsis:**

- Spectrum Needed: 1370-1395 MHz, emission is 5 MHz wide, 5M00F1D
- Limited Time of Use: only occasional testing at this location
- Limited time of use: 4-6 hours per day of radio use
- Limited area of operations: maximum 3000 feet elevation
- Power levels are low for airborne operations: L band 5.5 W, only 5 W ERP
- Ground control maximum ERP: 16 W

### **Description of Operations:**

Raytheon needs to demonstrate performance characteristics of its Coyote UAV system in future demonstrations. This application seeks continued authorization to cover future demonstrations set to take place at Ft. Benning in the next 1-2 years.

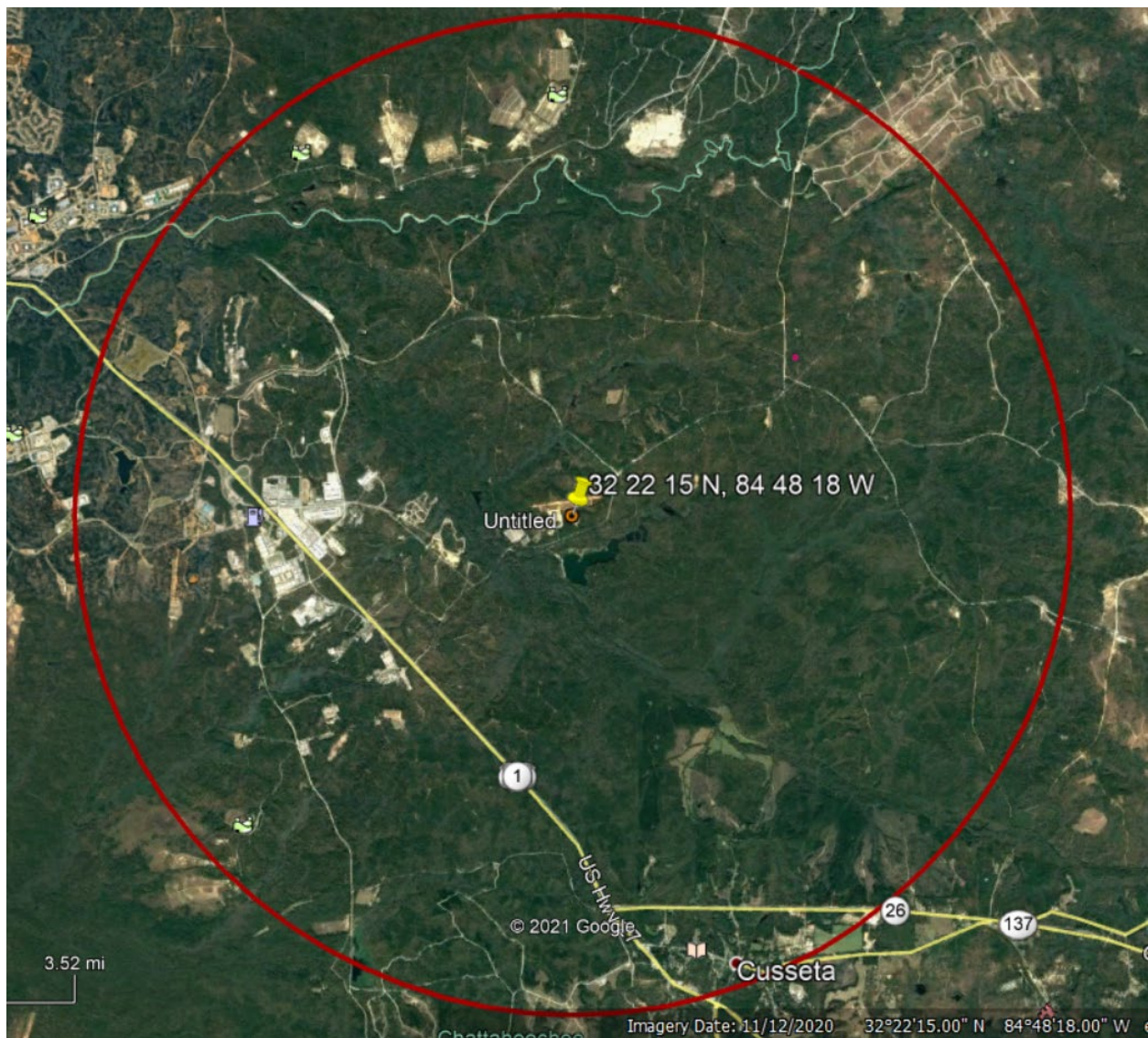
This UAV platform has been designed to perform a range of tasks. They include surveillance and monitoring. Those tasks require the UAV to carry a range of radio links to ensure its proper performance. Each link is described in more detail below.

**Limited Time of Use:**

Advances in the UAV technology allow these operations to take place for 4-6 hours per day. The program only works in one location at a time, so operations are intermittent at any given location.

**Locations of Testing:**

This application seeks authorization for system configuration and testing followed by customer demonstrations, with all this work being conducted at Ft. Benning, within an 8 km radius of the center point. See below for the operational area. Latitude: 32-22-15 N, Longitude: 84-48-18 W.



### **Spectrum Use:**

**L band frequencies:** The radios have been designed to operate at 5 MHz intervals from 1370-1395 MHz. The radios are frequency hopping, and require six channels for the hopping sequence to work. There are six channels from 1370-1395 MHz.

The airborne radio operates at 5.5 W, with 5 W ERP, as there is loss in the system. The ground control radio operates from a low power of 7.1 W ERP to a higher power of 16 W ERP – which is only in use as a back up if there is a loss of communication with the UAV.

**Local deconfliction:** the program will work with local spectrum managers prior to any operations to deconflict radio operations that are local to the area.

### **Stop Buzzer Point of Contact:**

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### **Conclusion:**

Raytheon is seeking an experimental license for future testing and demonstration operations. The demonstrations are to show the development of the Coyote UAV system. The proposed testing will be limited in nature. The radio use will be limited.