Raytheon Missile Systems
Experimental STA Application
File Number: 1819-EX-ST-2018

Explanation of Experiment and Need for STA

Raytheon Missile Systems builds a variety of products for the US government, including for the US military. This application requests 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.

The requested authorization will be used for swarming UASs, a system that is described in more detail below.

Need for an STA:

Recent developments of the UAS technology have led Raytheon's customers to request accelerated development of the Locust UAS platform. The customers require regular demonstrations of the technology to evaluate its performance. This STA is needed to allow for testing in the lab at Raytheon's facilities in advance of those demonstrations to ensure that the technology is operating as required during the tests.

Description of Operations:

The radios are installed on a series of readily deployable UASs. Those UASs are small, without the ability to carry heavy radios. The goal of the new system is to allow the UASs to operate in a swarm, with radio links between the UASs as well as links to a command and control center.

The radios are designed with directional antennas that helps to deliver information back to a centralized control point. This assists in the data throughput, which in turn aids in the management of the swarm of UASs operating together.

Technical Synopsis:

- Spectrum Needed: 2312-2507 MHz
- Operations: airborne, mobile operations in a limited, rural area
- Power level: 2 mW, directional antenna
- Radios are listen-before-transmit

Area of Operations:

Raytheon will be testing this technology indoors at its facility on East Hemisphere Loop in Tucson, AZ. (See Figure 1, below.)

Figure 1. Lab Facilities where testing will be conducted indoors.

Limited Time of Use:

Testing is to be conducted workdays, between 8 am and 5 pm. However, because the systems tested are UASs, the aircraft are only in flight for the duration of their flight, which depends on the life of the power source, normally about 30 minutes. After that, the UASs need to be re-charged for another test. The radio systems will be in use for flight preparation, on the ground, and flight duration. So, the spectrum use is expected to be intermittent during testing days.

No likelihood of interference to other operations:

Most of the spectrum in use will overlap the 2.4 GHz unlicensed, Part 15 band. The radios were selected because of their limited weight and because of their data throughput. The radios are designed to be listen-before-transmit, which minimizes any potential for interference to other radio operations. Further, the radios operate using attenuated signal strength indoors, which minimizes the prospect of any signal escaping the test lab.

These radios offer advanced development of swarming UAS technology at a low cost. Further development may lead to the development of different radios that are similarly small, lightweight, and require little power, intended to offer broadband transmission of information, with the ability to send information back and forth to the command and control center and to exchange information among the swarm of UASs. The power levels are limited to just enough power to permit the required communications.

Stop Buzzer Point of Contact:

Raytheon's Stop Buzzer point of contact is:

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Conclusion:

Raytheon is seeking an STA for testing of its swarming UASs in advance of customer demonstrations. This testing will advance the development of the communications links needed for command and control of the swarming UASs as well as ensure that the telemetry data needed from the UASs can be effectively transmitted back to the control station. The area of operations be indoors at a Raytheon lab facility. The time of use is limited.

For additional information, please contact Anne Cortez, 520-360-0925 or alc@conspecinternational.com.