Raytheon Missile Systems
Experimental STA Application
File No: 0087-EX-ST-2014

Exhibit 1: Explanation of Need for an STA and Explanation of Experiment

Overview:

Raytheon Missile Systems is DoD and other federal agency contractor that works on the independent research and development of technologies that can be used for the safety, security, and defense of the United States. In this role it both develops new radio systems, and it works on the adaptation of commercial off the shelf technologies to adapt their components to advanced uses required by Raytheon's customers. This application seeks authorization for the short term testing of the radio system described more specifically below.

Need for an STA:

An STA is appropriate where, as is the case here, the proposed use of the radio frequencies will be short in duration, since under such circumstances, only temporary authorization is required to complete the testing needed. Raytheon is proposing to conduct testing for six (6) weeks starting the final week of February (Feb. 24, 2014) and continuing intermittently through the next six weeks until the end of the first week in April. Because the operations are only expected to last temporarily, an STA is appropriate. The research and testing is expected to culminate in a demonstration for potential customers near the end of the period of the authorization. That demonstration has not yet been scheduled, which is why Raytheon is seeking authorization for a time period that is long enough both to conduct research and to schedule the demonstration.

Technical Synopsis:

- Spectrum Needed: 2400-2500 MHz
- Time of spectrum use: tests will be conducted only two days a week, for 2-3 hours on the days of testing; testing conducted 8 am to 11 am.
- Duty Factor: less than 20%, tests occupy less than 12 minutes per hour
- Power level: maximum ERP required will be 10 W

Description of Experimentation:

Raytheon is conducting tests to advance development of a wireless datalink between a fixed antenna on the ground and an airborne, mobile platform. The objectives of the tests are to optimize throughput of data by working with various parameters. Tests will be conducted at various distances, from 6 km to 10 km, and a varying speeds of the mobile transmitter, to ensure there is no data loss in the transmission. The goal is to optimize the data transfer.

Location of testing:

Raytheon is proposing to conduct this testing using one of its aircraft, flying in an area southwest of its plant in Tucson, AZ. Flight safety requires that the test area be just large enough for the plane to

maneuver safely at the speeds required for testing. Raytheon has chosen a canyon area which is large enough for safe flight but with natural features that will provide some RF shielding to the surrounding areas. The area where the test flights are scheduled are virtually unpopulated desert; the closest town is Green Valley, Arizona.

Time of Use:

As described briefly above, these tests are expected to be conducted only two days per week, and each test will only be conducted during test flights, each of which normally lasts only two hours, sometimes three. Therefore, the maximum time of spectrum use is expected to be less than a total of 6 hours per week. Testing is proposed to be conducted in the morning between the hours of 8 am and 10 am, or – if the testing needs to be extended due to weather – 11 am. Then, the program will work on the data collected.

If the early testing proves successful and if the demonstration can be scheduled promptly, Raytheon will conclude these operations early.

Stop Buzzer Point of Contact:

In the event that these operations need to be stopped, the point of contact is:

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(520) 794-0227 (office)
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Conclusion:

Raytheon is seeking temporary authorization to conduct testing of commercial off the shelf technology to determine how to optimize its use for mobile data throughput. The proposed testing to be conducted over a six week period, during 2-3 hour time windows two days per week. This testing is expected to advance learning about the operation of various radios from a mobile platform. For additional information about this application, please contact Thomas J. Fagan, Spectrum Manager, Raytheon Missile Systems, 520-794-0227 or tjfagan@raytheon.com, or Anne Cortez, Counsel, Washington Federal Strategies, (520) 360-0925 or alc@conspecinternational.com.