Raytheon Missile Systems
Experimental Application for Special Temporary Authorization
File No: 0812-EX-ST-2013

Explanation of Experiment and Need for STA

Overview:

Raytheon Missile Systems (Raytheon) is designs and builds missiles that it sells to the US Department of Defense and other agencies of the federal government. Raytheon has been working recently on a series of advances to the Seeker missile system.

Need for an STA:

This STA is being requested to allow Raytheon to add some essential new tests to operations already authorized. The program received a contract award, contract number DOTC-12-05-INIT004, in the fall of 2012. Immediately thereafter, the program began developing its research and testing plan. Since that initial test plan, the Seeker program has expanded its research to cover a number of additional tests, which will speed up advances in the radar development and improve the functioning of the missile.

Some of the new tests conducted are being designed for independent research and development, and as such an experimental license from the FCC is needed for operations.

This low-powered radar will act as a simulated reflected radar signal from a distant object, but controlled at the Raytheon plant site. The use of this proposed system is essential to testing Raytheon scheduled to explore the operation of its radar and radar processing, and it needs to incorporate this work into testing already scheduled for September 2013. Because the new tests require operations from an additional site on the test range this STA is required to cover the proposed operations. This STA is required promptly to make use of the testing already scheduled, so that the work will not need to be duplicated later. The STA requests operations for 6 months. If the additional experimentation proves fruitful, Raytheon will seek to modify its existing license WG2XMV to incorporate these changes into the ongoing experimentation.

Synopsis:

- Spectrum needed: 15.71-17.10 GHz
- Signal level: maximum power is 0.1 Watts, with an ERP of 6 W, antenna gain 20 dBi
- Location: Raytheon Missile Systems facilities in Tucson, AZ, azimuth of operations: 0 ° horn transmitter with 15 ° beamwidth will point north to a receiver on a test range in the center of the Raytheon plant site, with buildings north, south and east of the proposed operations
- Proposed operations will pulse on for a minute at a time, then turn off. Only for a few hours per day.
- Emission Designator: 35M0P0N

Nature of the Experimentation:

Raytheon is working on advanced development of its Seeker missile. The nature of this particular missile program is that the missile has a passive radar system incorporated into the missile. The passive radar system is receive-only, which means that it calculates the speed, trajectory, and location of incoming ordinance based on the radar and other signals generated by the incoming threat.

This application seeks authorization to add a low powered location to testing already scheduled. The testing allows for simulation of radar testing at a distance and in flight, but with the added advantage that the power levels are very low and the system can be tweaked because the radar is local to the plant site. This allows testing that minimizes use of the spectrum, avoids lengthy flights, and helps to speed the advanced development of the overall radar system.

The proposed experimentation will use a low power transmitter to send a directionalized signal to the seeker's radar receiver. Then, the program will evaluate the performance characteristics of the receiving radar to fine tune its response to the received signal. The advancements from that fine tuning will lead to advancements in the performance of the Seeker.

Location:

Testing is to be conducted on the Raytheon plant site, with Raytheon buildings shielding the test area to the north, south, and east.

The proposed operations would use a transmitter with a beamwidth of 15 degrees, aimed at azimuth 0 – due north.

Time of Use:

The testing will use the radar system only sporadically. The transmitter will be pulsed on, then off. Testing is expected to take place for only a few hours a day during the normal work week.

Power Level:

The transmit power is merely 0.1 W with an ERP of 6 W. With buildings shielding any nearby area, the signals are not expected to go beyond the designated test site at Raytheon's facilities in Tucson.

Stop Buzzer Point of Contact:

Thomas J. Fagan, Spectrum Manager
Raytheon Missile Systems
tjfagan@raytheon.com
520-794-0227 (office)
520-465-7087 (cell)

Conclusion:

The proposed STA would give Raytheon the authority to add a location to scheduled testing for advancement of a radar system, providing the flexibility to use a low powered transmitter, azimuth 0 degrees, to simulate a far-off radar reflection. The test area is surrounded by buildings, and the

spectrum use is already authorized at nearby sites on the Raytheon plant site for associated experimentation. This additional experimentation will allow for significant advancements, operating at a much lower power, because the operations will be in the near field. Additionally, use of this radar system locally will speed up the testing and troubleshooting of radar system development for the Seeker Missile System.

If there are any questions about the proposed operations, please contact Tom Fagan, Spectrum Manager, Raytheon Missile Systems, or Anne Linton Cortez, WFS, 520-360-0925 or alc@conspecinternational.com.