

## **Explanation of Experiment and Need to Continue Experimentation**

### **Overview:**

Raytheon Missile Systems (Raytheon) designs and builds missiles for the US Department of Defense and other agencies of the federal government. Raytheon is working on advanced radar systems used to detect incoming weapons threats. This program has been working on development of the radar systems at the Raytheon facilities in Tucson, AZ. In January 2014, Raytheon sought and obtained an experimental STA, WH9XFR, for testing the systems at facilities in McKinney, Texas. This application seeks to extend that authorization exactly.

Ongoing integration of the radar technology into operational systems needs to take place in McKinney, TX. To continue working to deliver a functional product, Raytheon needs to continue the system integration started earlier this year at the Raytheon facility in McKinney, TX.

### **Synopsis:**

- Spectrum needed: 16.3-17.8 GHz
- Signal level: 100 Watts, with 14.3 kW ERP
- Location: Raytheon Missile Systems facilities in McKinney, TX
- Azimuth of transmissions: between 0 and 160 degrees.

### **Nature of the Experimentation:**

Raytheon is working on the advanced development of its Radar Seekers. Using the semi-active radar system, the test equipment will use a low power transmitter to send a signal to the seeker's radar receiver. Then, the results will be evaluated to fine tune the receiver performance. This will lead to advancements in the performance of the Seeker.

The active radar system will use its own signal reflected off a simulated target. The seeker's radar receiver will use the reflected signal and advanced processing to accomplish the performance goals required by Raytheon's DOD customers and then to undertake additional independent research and development to further enhance the capabilities of the radar systems.

The Seeker radar systems are used for detection of incoming mortars, artillery, rockets, and other threats.

### **Location of the testing:**

Raytheon has a number of radar system test beds established at its facilities in McKinney, TX. This proposed operation will be incorporated into the existing facilities to allow for testing of the interoperability of various radar systems and other technology incorporated into Raytheon's products.

The program must also simulate a real-world performance evaluation to ensure that the improvements made to the radar system function as planned when incorporated into the missile system. Outdoor test operations will use a 100 Watt signal that is directional in nature to reach the system being tested. The ERP of the directionalized signal is 14.3 kW. This test must be conducted outdoors to allow the various technologies to perform in free field environment.

Latitude: 33-12-42 N

Longitude: 96-39-26 W

**Frequencies to be used:**

The testing will be sporadic at best. The proposed frequency use will be radar signals – both continuous wave and pulsed operations.

Testing will use the requested frequencies to optimize radar system operations.

For the active radar transmission, the emission will be N0N. The radar pulse is approximately 30 MHz wide. The pulse may use any portion of the licensed spectrum. The duty cycle of the active radar system ranges up to 33%.

**No likelihood of harmful interference to other users:**

Raytheon will undertake frequency coordination with other entities, as required by the FCC.

**Stop Buzzer Point of Contact:**

To ensure that no instances of harmful inference occur, Raytheon's Stop Buzzer point of contact is:

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**Conclusion:**

Raytheon is seeking an experimental license to continue testing to work on advancements to its Seeker missile technology. The program has been moving quickly to deliver technology advancement in the radar systems. This application seeks to continue the ongoing operations authorized under WH9XFR, exactly as originally licensed.

Raytheon's work will advance the performance of the missile Seeker assembly improving its responsiveness and its precision. The time of use for these frequencies will be limited. The proposed power levels are as low as possible to achieve the goals of the system.

If there are any questions about this application or if any additional information is needed, please contact Thomas J. Fagan, see above, or Anne L. Cortez, Washington Federal Strategies, 520-360-0925 or [alc@conspecinternational.com](mailto:alc@conspecinternational.com).