

Raytheon Missile Systems
Experimental License Renewal Application
Call Sign: WH2XBM
File No: 0151-EX-RR-2016

Explanation of Experiment

Overview:

Raytheon Missile Systems (Raytheon) 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.

This application is being filed to renew operations being conducted on WH2XBM. Since Raytheon began its 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. Raytheon is conducting independent research and development testing along with other ongoing experimental operations.

The low-powered radar operations act as a simulated reflected radar signal from a distant object, but they are generated and controlled at the Raytheon plant site. The use of this system shows great promise and ongoing operation is essential. Raytheon has scheduled additional testing to more fully explore the operation of its radar and radar processing.

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.

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 ongoing program of experimentation uses 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 conducted on the Raytheon plant site, with Raytheon buildings shielding the test area to the north, south, and east.

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

Time of Use:

The testing uses this radar system only sporadically. The transmitter is pulsed on, then off. Testing takes 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 all nearby areas, the signals do not propagate beyond the designated test site at Raytheon's facilities in Tucson. Raytheon has confirmed that signal levels off the designated test site are below 10 mW.

Stop Buzzer Point of Contact:

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Conclusion:

The operations requested under this application will give Raytheon ongoing authority to use lower powered signals from this location to its Seeker 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.