

Raytheon Missile Systems
Experimental License Renewal Application
File Number: 0195-EX-CR-2019

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 is working on independent research and development, which requires it to test a new radar.

Raytheon has been working on the development of its missile Seeker technology in the lab and at its test range in Tucson, Arizona. Raytheon began additional testing to show proof that the technology will work as expected in a real-world setting. In 2015, the FCC granted Raytheon this license so that it could install its transmitters at an already established radar facility in Point Loma, California to test to see if the missile Seeker radar systems will perform better than the existing radar and will deliver the performance requirements needed. additional technical requirements have extended the testing schedule. Therefore, Raytheon is filing this application to continue its testing.

Synopsis:

- Spectrum needed: 15.7-17.8 GHz
- Signal level: maximum power is 14.3 kW ERP, based on use of a 100 Watt radar transmitter
- Location: Point Loma Naval Station, signals directed out over the Pacific Ocean

Nature of the Experimentation:

The radar system under development calculates the speed, trajectory, and location of incoming ordinance based on the radar and other signals generated by the incoming threat. The radar to be tested uses the information to identify and then intercept the threat.

The nature of the program has developed in such a way that it is necessary for the program to perform tests of the seeker radar systems by transmitting signals to assess and improve the radar performance. This programmatic activity is currently underway at the Raytheon Missile Systems headquarters radar test range in Tucson, AZ.

The seeker's radar receiver will use the reflected signal and advanced processing to accomplish the performance goals. This STA application seeks authorization to test the missile Seeker radar system to determine if the technology is effective in the real-world environment.

Locations for the testing:

The application requests authorization to continue operating its radar system at the radar operations station in Point Loma, California.

The operations limit transmissions so that the radar is always points between azimuth 180 to 270, which points toward the Pacific Ocean. The back lobes of the transmitters are shielded by the ridge behind the radar facility. Additional back lobe attenuation will be added by using metal coated panels. See Figures 1 and 2 below.

Frequencies to be used:

The testing will be sporadic at best. The proposed frequency use will be radar signals. For the active radar transmission, the emission will be NON. 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 has undertaken a preliminary search of other users of frequencies in this band in the Point Loma, CA area. The spectrum is in use by the FAA, however, after an initial consultation with the FAA, it seems that there may not be any concerns due to the directional operations, shielded by topography from the FAA's operations.

Raytheon is prepared to undertake frequency coordination with any 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:

Jim Ortega, Spectrum Manager
Raytheon Missile Systems
520-794-0227 (office)
James.e.ortega@raytheon.com

Conclusion:

Raytheon is seeking to renew its authorization for testing to work on advancements to its missile Seeker technology. The program must continue to deliver reports on technology advancement in the radar.

Raytheon's work will advance the performance of the Seeker proving how it can deliver performance in the proposed environment. The time of use 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 Anne L. Cortez, Washington Federal Strategies, 520-360-0925 or alc@conspecinternational.com.



Figure 1: Close up view of proposed transmitter location

Site elevation of transmitter: 317 ft AMSL

Elevation of ridge east of transmitter: 332-339 ft AMSL (ridge highlighted by red arc)

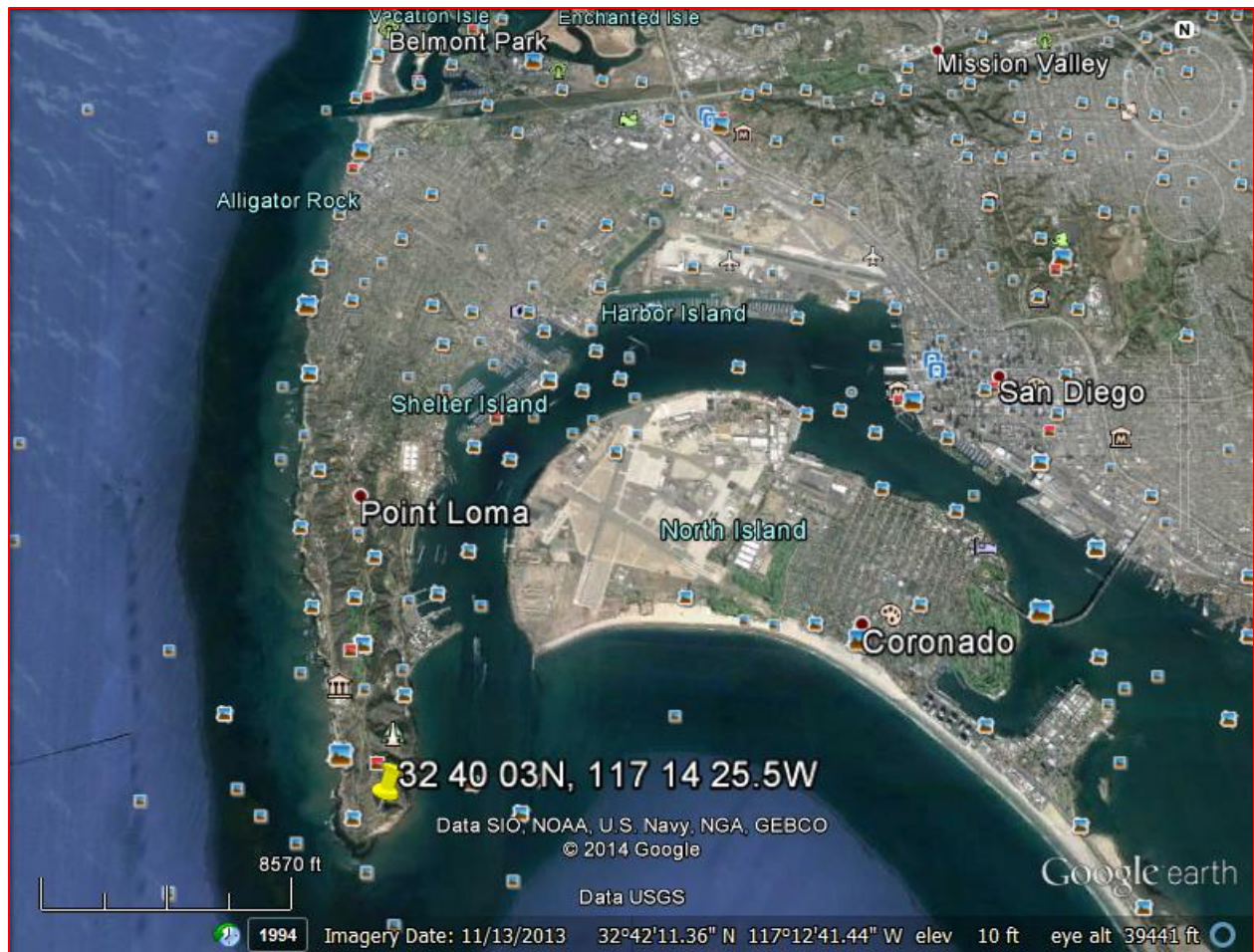


Figure 2: Wide area view of proposed transmitter location

Back lobe of transmitter to be shielded by panels

Ridge provides additional back lobe protection

Transmitter azimuth 180-270