

Raytheon Missile Systems
Experimental License Renewal Application
Call Sign: WA2XFR
File Number: 0386-EX-RR-2015

Explanation of Need for License Renewal

Raytheon Missile Systems (Raytheon) is a US defense contractor that develops innovative technologies, in particular for the US military. This division of Raytheon is primarily responsible for the development of advanced missile technologies, including the integrated command and control systems and radar technologies. Raytheon is seeking to renew its license, WA2XFR, to extend authorization to test some of the integrated radio frequency systems on its missile platforms.

Background:

The missile systems under development include advancements in missile guidance, precision, and target acquisition. These systems need to be used in the lab, and then they need to be tested in test flights to ensure that all elements are working properly. As a result, Raytheon is seeking renewed authorization to use the radio systems on this application as it continues to refine the command and control systems and radar technologies.

This application seeks renewed authorization for the airborne mobile use of the requested radio frequencies in a 120 km radius around the Raytheon facility in Tucson, so that it can continue experiments with and tests of the radio operations from the missiles when they are carried on an aircraft. The aircraft flight allows simulation of the missile flight, but the radio transmissions cannot be simulated, they must be real, which requires the use of the requested frequencies and parameters set forth in this application. A parallel filing requests renewed fixed authorization for use of the frequencies at the Raytheon facility. These requests have been separated into two for better tracking and compliance within Raytheon.

Purpose of Experimentation:

Raytheon is continuing these tests to experiment with new ways to use radar to achieve goals set by the Department of Defense. It is experimenting with various emission types to determine how to optimize the operation of the radios and radar. Further, it is enhancing the use of various spectrum bands at medium and long distances to deliver higher performance radar systems. The experimentation will result in greater understanding of how different signal types are able to perform radar functions with variables for distance, altitude, and frequency to provide information on the optimal configuration.

Description of the Operations – Mobile, Airborne in a 120 km radius around the Tucson facility:

Raytheon has its main missile development plant site in Tucson, AZ. Here, it does most of its development and experimentation with the systems integrated into its missiles. To determine whether the research and development of new technologies is effective, the new technologies need to be tested in real-life situations, in this case, allowing radio systems on the missiles to function as if they were operating in a real-world, deployed environment. The missiles are loaded onto aircraft for test flights. The aircraft take off, and then the radio systems are engaged, in conjunction with a number of simulated factors that fool the missiles into believing that they are in real operation. The radio systems actually need to be tested in the real-world environment to determine how those radio systems perform in their position tracking, target acquisition, and responsiveness to command signals, among other factors. Operations on the ground track the radio signals and performance to see if the radio systems are operating as predicted in the laboratory. Information from the airborne tests allows Raytheon to make further advancements in the radio technologies to improve performance.

The center point of the radius of the operations is the aircraft hangar from which the test flights originate. Flight tests can be as frequent as two or three times a day. However, after a series of flight tests, the data collected is then analyzed by the program and the next round of technological development moves back to the lab, which results in gaps between the days of flight tests.

Time of Spectrum Use:

The radio frequency and radar systems are in use during all test flights. There can be as many as two to three test flights per day, although, as explained above, there are not test flights every day. All transmissions on and off times are logged, and the spectrum management office monitors the spectrum use.

Conclusion:

The experimentation and testing proposed is essential to the advancement of radar technologies incorporated into Raytheon's products. The Stop Buzzer point of contact for these operations is:

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If any additional explanation or information is needed, or if there are questions regarding this application, please contact either Mr. Fagan or Anne Linton Cortez, 520-344-8525 or alc@conspecinternational.com.