

Raytheon Missile Systems
Request for Special Temporary Authorization
Application Number:

Explanation of Need for Experimental STA

Raytheon Missile Systems (Raytheon) hereby requests the Commission to issue a special temporary authorization for operation on 1.35 to 1.39 GHz for the reasons set forth below.

Raytheon's proposed experiment will implement the use of Freewave radios on an aircraft. The Freewave radios will be installed on a Raytheon-operated aircraft that is being tracked by a second Raytheon-operated aircraft. One radio will transmit the precise position of the aircraft on which it is installed to the other aircraft. The second aircraft operates radar to track the flight of the first aircraft. The transmission of precise location information will be used to verify the accuracy and effectiveness of the radar operations on the second aircraft, a verification process that has not been possible previously.

Verification of the accuracy of the in-flight radar tracking is essential to advance the use of radar for national defense purposes. Prior to the formulation of this experiment, Raytheon used radar from one aircraft to the other, for mapping and tracking purposes. However, because of the speed of the flights and the complexity of tracking from one aircraft to the other, it was impossible to verify that the information being received and processed by the tracking radar was accurate. By transmitting the position information from the tracked aircraft to the tracking aircraft, it is possible to verify that the position information determined by the radar is in sync with the actual position of the tracked aircraft. This proves the effectiveness of the radar. In the unlikely event that there is a position discrepancy, this experiment will provide the Raytheon researchers with information which will allow them to reengineer to improve the performance of the radar tracking systems.

Both aircraft will be flying within a 100 km radius of Raytheon's facilities in Tucson, Arizona during these tests. The aircraft lack pressurized cabins, so all flight operations will take place at an altitude below 10,000 feet.

The radios proposed to be used here have been selected because they operate with characteristics that are ideal for the proposed application. The power level proposed is enough to span distances between the aircraft, without losing connection between the radios. The aircraft do not fly in parallel, but each engages in maneuvers which would preclude a line-of-sight radio transmission. The distances between the aircraft can range up to 200 km, although the likely spacing is more like 50 km at any given time. Still, the radar testing is done to help develop technologies that can detect incoming threats at ever-greater distances. These radios are able to maintain a connection and to transmit

sufficient data rapidly to be able to verify the radar's accuracy in real-time. Other radio systems do not have enough data capacity to allow for the real-time verification of the radar systems.

An STA is appropriate in this instance:

The proposed experimental use of the radios in question is intended for a 6 month test of the radios to address the problem of verifying the proper functioning of aircraft to aircraft radar systems in furtherance of national defense. The proposed use is temporary in nature and experimental.

Any questions about this application should be directed to Thomas J. Fagan, Spectrum Manager, Raytheon Missile Systems, 520-794-0227 tjfagan@raytheon.com or to Anne Linton, 202-530-8583 alinton@wfsllc.biz.