Raytheon Missile Systems
WF2XLZ Renewal Application
File No: 0292-EX-CR-2017

Explanation of Need for Radio Spectrum

Background:

Raytheon Missile Systems (Raytheon) has been experimenting with the development of unmanned aerial systems (UASs) for years. Those experiments were both for government customers, on contracts, and for its own technology development. Currently, the research program is funded internally by Raytheon. Raytheon was granted experimental license WF2XLZ to continue its research. Raytheon is seeking to renew its authorization to continue operating under its current license for UAS testing.

Advancement of UAVs is essential to the US government, and the proposed ongoing experimentation is expected to lead to the development of advanced technologies that will be highly valuable to various branches of the military and other departments in the US government.

The development of this system is ongoing, and renewal is required to continue the testing.

Synopsis:

- Frequencies in use on this license were approved by the MAG prior to the grant of the authorization, and this renewal does not request any changes
- Raytheon is consulting with the DOD-AFC AZ as it is submitting this renewal request.
- Proposed radio use will facilitate essential experimentation with unmanned aerial systems.

Description of radio use:

The ongoing operations proposed will use various radio systems, including FreeWave radios for command and control functions, in the development of the UAV, optimizing its use. The radio use is not the experiment itself, but the use of the radios is essential in the development of the underlying UAV technology.

Development of UASs is part of the DOD mission for the use of advanced technologies. These technologies are essential for video surveillance, to protect soldiers, and as delivery vehicles for key payloads, when appropriate.

The development of the Cobra2 system is focusing on advanced video surveillance, to maximize the data capture and speed the real-time transmission of data to command centers needing to act on the information.

As the technology incorporated into each UAS becomes more complicated, and the amount of data collected increases, the importance of having complete control over the aircraft grows. This ensures the availability of essential data, and it adds maneuverability to the aircraft, enhancing its surveillance performance. Therefore, renewal of the experimental license is essential to the ongoing experimentation.

<u>Additional information regarding importance of technology development to US Department of Defense</u>:

Federal budget cuts, at a time of high federal budget deficits, have led to budget cuts in numerous federal departments. As a result, the Department of Defense is trying to do more with less. Part of the DOD strategy, going forward, is to rely on the use of advanced technologies that can help deliver performance, without significantly adding to manpower. One reason that technology can assist in achieving cost-effectiveness is that higher manpower counts require larger medical staff, administration, personnel, management, and numerous other support functions all of which combine to increase the DOD budget. UASs do not require the same sort of support. So, DOD has made a determination to use more UASs in pursuit of its missions going forward.

This trend continues. Further, the UAS platforms allow DOD to operate in ways never before possible. So, dependence on UASs is expanding.

The systems under development by Raytheon help address DOD's need for advanced UASs. These UASs focus on increasing surveillance capacity, improving the reliability of communications systems, and the throughput of those communications systems, to ensure that data captured by the UAS is transmitted rapidly and completely to the DOD personnel who need the information. Raytheon's testing and development of this technology is directly in line with the reshaped DOD mission to include more advanced technology. The platform incorporates additional still and video cameras, and it also has adapted communications systems that allow the transfer of the video and still imagery in seconds. This capability helps to provide up-to-the minute information for the UAS controller to use in real-time, to address an unfolding situation. This is more than just static surveillance; it is like having a live scouting report. The technologies included on the UAS require significant testing and development to ensure their reliable operation in the field. For that reason, Raytheon is seeking to renew its experimental license to ensure that the UASs it is developing will deliver excellent performance to meet the needs of DOD and other federal agencies faced with the same challenges.

Additional information regarding the operations under this license are available in filings made with the FCC supplementing application 0243-EX-ML-2011; those filings were made in response to questions that the FCC forwarded to Raytheon from various federal reviewers.

Area of Operations:

The radio use is airborne, but only at altitudes of 2000 feet or less. There are two locations specified on the license, one in Tucson, AZ, and another in Whetstone, AZ. The airborne operations will take place within a 25 kilometer radius of the specified locations.

Raytheon will coordinate its operations with the DOD-AFC AZ.

Stop Buzzer:

Stop Buzzer point of contact: Thomas J. Fagan, Spectrum Manager, Raytheon Missile Systems, 520-794-0227 or tjfagan@raytheon.com.

Conclusion:

Raytheon is seeking to renew its experimental license to continue its ongoing development of experimental unmanned aerial systems. In the several years since this technology development and testing have begun, there have been no reports of any interference.

If there are any questions regarding this application or the proposed radio use, they should be directed to Thomas J. Fagan, Raytheon Missile Systems Spectrum Manager, 520-794-0227, tjfagan@raytheon.com or to Anne Linton Cortez, Washington Federal Strategies, 520-360-0925, alc@conspecinternational.com.