Raytheon Company (Missiles & Defense – M)
Experimental License Renewal Application
Call Sign: KI2XDD
File Number: 0546-EX-CR-2021

Supplemental Explanation of Experiment

Raytheon Company (Missiles & Defense – M) (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, KI2XDD, to extend authorization to test some of the integrated radio frequency systems on its missile platforms.

Technical Synopsis:

- Spectrum Needed: 8500-9000, 9200-10500, 10500-10680, 10700-12200, 31000-31300, 31800-32000, and 32000-36000 MHz
- Location of Operations: airborne and mobile operations around the Raytheon plant in Tucson
- All Operations in US, lowest latitude: 31-20-07 N
- Directional Antennas: mobile operations are captive carry using directional antennas; ground locations are highly directional as well
- Systems used for missile guidance, precision, and target acquisition
- Testing is IRAD

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.

Request to Remove Condition 6:

When Raytheon sought to renew this license in 2019, conditions were placed on the operations. Raytheon is requesting removal of Condition 6 that was newly added as part of the license grant in 2020. Raytheon is specifically interested in being able to use the spectrum from 9200-10500 MHz.

Response to FCC Inquiry:

Subsequent to Raytheon filing this renewal application, the FCC sent an inquiry regarding the latitude of operations. The lowest latitude of operations is over the Tombstone MOA. The US border with Mexico has a latitude of approximately 31-20-06. The Tombstone MOA runs along the southern border of the US. So the lowest latitude of operations, keeping the flight in the US, will be higher than 31-20-07.

Raytheon has both fixed and mobile operations for the systems being developed and tested. The fixed operations are situated at the Raytheon plant site. Most of the operations under this license take place at the fixed locations on the Raytheon plant site.

The license lists a 120-kilometer radius of operations. It is important to clarify that Raytheon does NOT operate flights that cover the entire radius. Raytheon's mobile operations are predominantly centered in three locations:

- Ruby-Fuzzy MOA
- Tombstone MOA – areas A, B, & C
- Three Points

The mobile operations require that equipment be loaded onto an aircraft at the Raytheon plant site. The aircraft is flown from the airport in Tucson to one of the test areas, and then testing starts. The radar systems in question are ***not*** in use during the transit flights to the test areas. The radar systems are turned on for specific detection of objects or for systems on the ground to detect the in-flight systems. These tests are constrained geographically. The Fuzzy MOA also runs along the border, and all operations will be in the US. That part of the border is farther north, so the latitude of operations will be higher. The radio transmissions are directed at specific targets, not aimed randomly. With high gain antenna usage, there is no likelihood of errant signals that would be perceptible across the border with Mexico. The experiments were designed to be highly focused.

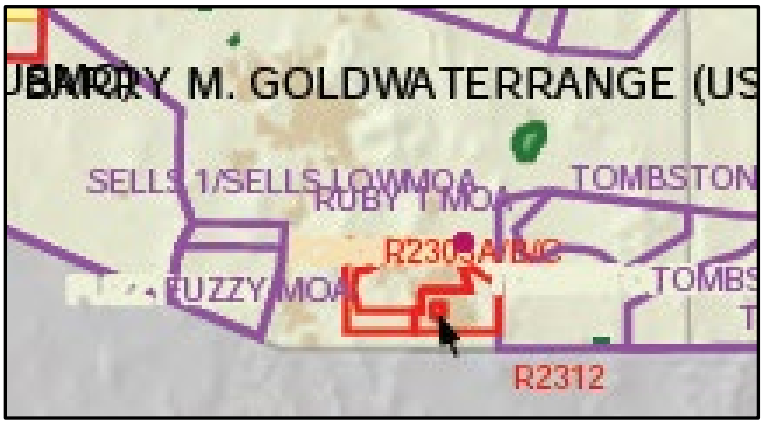

Figure 1. Map of Southern Arizona MOAs

Flights are more sporadic – a week or two of flight operations, followed by work in the lab and more testing at the fixed locations on the plant.

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 Anne Linton Cortez, 520-360-0925 or alc@conspecinternational.com.