

Raytheon Company (Missiles and Defense – M)
Experimental STA Application
File Number: 1462-EX-ST-2023

Explanation of Experiment

Overview:

Raytheon Company (Missile and Defense – M) (Raytheon) is the primary missile manufacturer in the US, supplying ordinance ready to operate to the US military. Raytheon's purpose of this testing is to integrate an illuminator onto a tracked vehicle launcher with its tracking radar for the RIM-7 Sea Sparrow Missile. The test will verify the transmit power and the ability for the RIM7 to lock onto a notional target simulated by a corner reflector on the tower or a manned (RTX air asset)/unmanned(RTX Drone).

Need for a Special Temporary Authorization:

Raytheon has a contract with Big Safari, FA8620-21-G-4024/FA8620-23-F-4080, to deliver a refurbish missile tracking system. The contract requires rapid development and testing, with radio demonstrations. To achieve the contractual goals, Raytheon has completed the radio development at its plant site and needs to achieve live testing at a range (Electronic Proving Grounds, Fort Huachuca).

Technical Synopsis:

Radar

- Spectrum Needed: 7943 MHz, 7973 MHz, 8158 MHz, 2MHz wide
- Emission Designator: 200M8F
- Limited Time of Use: only occasional testing at this location
- Limited time of use: 12hrs 7 days of the week of radio use
- Limited area of operations: maximum 3000 feet elevation
- Ground control maximum ERP: 38.46 MW (CW/Pulse Doppler)

Illuminator

- Spectrum Needed: 9.5 GHz to 10.5 GHz
- Emission Designator: 800KF8N
- Ground control maximum ERP: 25.41 MW (CW)

Description of Operations:

As part of a joint urgent operational need, Raytheon needs to build and provide an illuminator for a launch vehicle platform. The STA is necessary to gain spectrum authorization to begin testing, as soon as possible.

The illuminator needs to be retrograded into the launch vehicle platform and work with its RADAR. Both the illuminator and RADAR need to transmit at the same time to track a target.

Limited Time of Use:

Advances in the Illuminator and radar tracking technology allow these operations to take place for 12 hours per day 7 days a week. The program will only work in one location at a time, so operations are intermittent at any given location.

Locations of Testing:

RTX Illuminator: Purpose of the antenna is to illuminate a corner reflector on the tower or a manned air asset/unmanned drone in order to test the RIM7 Illuminator. Nominal beamwidth Az=2 degree, El=2 degree, first sidelobe suppression Az=18dB, El=18dB.

Track Radar: Purpose of the track radar is to ensure the BUK can track illuminate a corner reflector on the tower or a manned air asset/unmanned drone. Nominal beam width: Az=1.5 degree El =2.6 degree. Sidelobe suppression: Az=-28.7dB/El=-21.7dB.



Figure 1. Area of Operation, Eastern Range of Electronic Proving Grounds at Fort Huachuca, in Sierra Vista, AZ. The yellow line indicates the direction of RF from the Illuminator and Radar.

Local deconfliction: The program will work with local spectrum managers prior to any operations to deconflict radio operations that are local to the area. Raytheon agrees to continue coordination with the point of contact as previously required.

Stop Buzzer Point of Contact:

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Conclusion:

Raytheon is seeking an experimental special temporary authorization for continued test and development operations. The proposed testing will be limited in nature. The radio use will be limited.