

Explanation of Experiment and Need for Special Temporary Authorization

Overview:

Raytheon Missile Systems (Raytheon) designs and builds missiles that it sells to the US Department of Defense and other agencies of the federal government. Raytheon has recently been awarded a new contract from the Department of Defense which requires it to test new radio systems on its missiles.

Raytheon is seeking this special temporary authorization to meet the needs of the newly awarded contract so that its program can meet its obligations.

Need for an STA:

The program received a contract award, contract number DOTC -12-05-INIT004, recently. The program has been developing its research and testing plan. In the course of developing its test plan, the program realized that while its testing is conducted on a receiver, it must generate a signal to verify operation of that receiver. That realization led to this filing. The program of testing requires that Raytheon deliver test results before the end of the year, and so Raytheon is seeking this temporary authorization for 6 months to get the testing started so that it can deliver those results.

Synopsis:

- Contract Number: DOTC-12-05-INIT004
- Spectrum needed: 14.4-17.8 GHz
- Signal level: maximum power is 6.1 milliwatts ERP, based on use of a 0.1 milliwatt transmitter
- Location: Raytheon Missile Systems facilities in Tucson, AZ, indoor, hooded operations and outdoor operations
- Proposed operations will use various frequencies at 100 MHz increments.

Nature of the Experimentation:

Raytheon is working on advanced development of its missiles. The nature of this particular missile program is that the missile has a receiver incorporated into the missile and must verify its operation per the contract. .

The program has progressed to the verification stage and thus needs an STA to commence RF testing. That testing is the subject of this STA request.

The proposed experimentation will use a very low power transmitter to send a directionalized signal to the receiver. Then, the program will evaluate the performance characteristics of the receiving to verify its response to the received signal

Locations for the testing:

For operations in the lab, this signal will be transmitted at an extremely low power, and the transmitting antenna will be shielded in a hood that provides 40 dB of signal attenuation. Further, this testing will be conducted in the laboratory.

The program must also simulate a real-world performance test. This will require testing of the responsiveness of the receiver when it is installed on the missile. The program proposes to transmit a weak (0.1 mW) signal that is directionalized to reach the receiver being tested. The directionalized signal is only 6.1 mW. This test must be conducted outside to allow the receiver and its antenna to operate in the Far Field. . The distance between transmitter and receiver is only 500 meters.

Indoors at 32-08-18 N, 110-55-14 W, hooded, operating at low power, with hoods shielding the operations and reducing signal by 30 dB

Outdoors at 32-05-30 N, 110-56-47 W, operating at .1 milliwatt, but with some antenna gain, the operations will have a peak ERP of 6.1 milliwatts. The azimuth of the outdoor operations is 0° exactly.

Frequencies to be used:

The testing will be sporadic at best. The proposed frequency use will be radar signals – both continuous wave and pulsed operations.

The testing will be on frequencies in the requested bands. Each frequency will use no more than 200 Hz of bandwidth, and the tests will be in 100 MHz increments – 14.4 GHz, 14.5, GHz, 14.6 GHz, . . . 17.7 GHz, 17.8 GHz.

Time of Use:

The test plan proposes to turn on the radar at a particular frequency, then run the verification test. Testing may be required at several frequencies to verify proper operation of the receiver. Testing is expected to be brief and intermittent at each frequency. The expected duty cycle might be as low as one percent.

No likelihood of harmful interference to other users:

Raytheon has undertaken a preliminary search of other users of frequencies in this band in the Tucson, Arizona area. The spectrum, which is used primarily by the FAA, is not in use by the FAA anywhere near Tucson. This was determined by consulting with the FAA's Western Regional Office and by consulting FAA personnel at the Tucson International Airport.

Raytheon is prepared to undertake frequency coordination with any other entities, as required by the FCC.

Stop Buzzer Point of Contact:

To ensure that no instances of harmful inference occur, Raytheon's Stop Buzzer point of contact is:

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Conclusion:

Raytheon is seeking a Special Temporary Authorization to start testing required by a newly granted DOD contract to work on advancements to its missile technology. The program is required to start delivering results before the end of this year, and an STA is needed to allow operations required to perform under the contract. Raytheon's work will advance the performance of the Seeker improving its responsiveness and its precision. The time of use will be very limited. The program of experimentation will step through the frequencies requested, not operate continually on any frequency. The proposed power levels are very low, and there appear to be no other operations in this frequency band in the Tucson area.

If there are any questions about this application or if any additional information is needed, please contact Thomas J. Fagan, see above, or Anne L. Cortez, Washington Federal Strategies, 520-344-8525 or alc@conspecinternational.com.