

Explanation of Experiment and Need for an STA

Raytheon Missile Systems is a defense contractor that builds and sells a variety of missile systems to the US military and select allies upon approval of the government.

Nature of Experiment:

Raytheon is seeking an STA for testing and demonstration of a Persistent Radios Quad Router System for incorporation into the Paveway missile system. The purpose of this particular testing and demonstration is to show how the radios can be configured to deliver interactive communication between operators at one location and the missile in use. The testing will be used to set up and configure the systems. A demonstration is planned for the week of July 27, 2015 for military customers to review the operations to see if it meets their evolving information needs in the heat of the moment.

The nature of the Persistent Systems radio operation makes it ideal for incorporation into this missile system. The radios are designed to create a readily deployable network, which does not require a network hub for operations. The radios are set up to be both communications devices and hubs all in one. This speeds the deployment of ad hoc networks.

The military is developing increased demands for information on the spot warfighters are in the heat of the moment. Therefore, top level military officials have developed new requirements for Raytheon's missile systems to deliver interactive communication and two-way information flow when the systems are in use. This is different from the current telemetry data that is traditionally transmitted by the missile systems – which addresses health of the system, flight conditions, flight path, position, etc. The new information is more extensive, and it can be changed, updated and corrected to add precision and effectiveness to the missile system.

The Persistent Systems radios offer an opportunity to advance the missile systems' communications if they can be effectively integrated into the missile systems. This experiment is all about demonstrating the capabilities of the radios by testing their ability to transmit the information needed in a quickly deployed setting, determining how to integrate the Persistent Systems radio into a missile system, testing its effectiveness, and demonstrating the capabilities of the system for customers to determine how to define next-generation needs.

Need for STA:

An STA is appropriate in this instance because the nature of the testing and demonstration is short term. The program is planning to test to prepare for the demonstration, conduct the demonstration, and then refine its testing.

Location of Testing:

The testing and demonstration are scheduled to take place at the Raytheon plant site in McKinney, TX. Testing will be outdoors centered on the Raytheon outdoor antenna test range in McKinney, Texas. The actual integration of the radio system into the missile system will not be used for this demonstration.

The demonstration, for which this STA is required, will install a fixed radio on the building adjacent to the outdoor antenna test range. The other four radios will be operated on tabletop installations at locations on or near the range. The radios will be operated from fixed locations when the demonstration is taking place, although there is a possibility that the radios (and the tables) will be moved to new different locations for additional demonstrations. All the demonstrations will be within a one mile radius of the fixed location.

Testing and Demonstration Activities; time of use:

The testing phase will require 8 days of set up and programming of the radios. This is necessary to ensure that the whole system is working properly prior to the demonstration. The radios will be in sporadic operation during each of those five days.

The demonstration will require 2 days, and the radios will be operating sporadically during the day.

Following the demonstration, which Raytheon presumes will go well, there will be a further phase of testing to move forward to determine how best to integrate the radio system into the missile system. Again, the radios will be operated sporadically.

Spectrum Needed:

The demonstration will use all of the frequency bands that the radio is capable of employing: 5180-5320 MHz, 5500-5700 MHz, and 5745-5825 MHz. The operation of the radios in the 5745-5825 MHz band would appear to fall under the provisions of Part 15 of the FCC's rules, 47 C. F. R. Section 15.247. However, operation under that rule requires that the radio in question have a proper FCC equipment certification. In this case, the radios are designed for sale to the federal government (military) or for export only. So, Raytheon is seeking this experimental license to allow for use of this radio for the testing and demonstration described above.

Operation of the radios in the 5180-5320 MHz and 5500-5700 MHz bands is for testing of the capabilities of the radios, although the demonstration will focus on the use of the 5745-5825 MHz band. All of the bands will be in use for this testing.

The radios will use a small whip antenna for this demonstration. The antenna is an omnidirectional antenna with 3 dBi of gain. This will ensure that the radio signal propagation is limited to the radius of operations. This is just enough to demonstrate the capabilities of the radios without causing any harmful interference to any other spectrum users in the area.

Stop Buzzer Point of Contact:

If there is a need to shut off any experimental operations, please contact:

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Conclusion:

Raytheon is seeking an STA for the temporary use of Persistent Systems radios for testing and demonstration purposes at its McKinney, Texas facility. The radios are part of a demonstration of how a new communications network infrastructure can be used to provide advanced two-way communications to and from a missile system when the system is in use. This advance in communications will significantly improve the information available to the warfighter in the field and provide strategic information and allow for alternatives that will improve the quality and performance of the systems.

Should there be any questions about this application, please contact Tom Fagan, Spectrum Manager, Raytheon Missile Systems at 520-794-0227 or tjfagan@raytheon.com or Anne Linton Cortez, WFS, 520-344-8525 or alc@conspecinternational.com.