

Explanation of Experiment and Need for STA

Background:

Raytheon Missile Systems builds missiles and other advanced technologies for the US federal agencies and other federally approved customers. Those technologies include many advanced radio systems for command and control, remote operation, and communications. As a result, Raytheon invests resources in the development of radio systems that are customized to the requirements of the organizations that use its products.

Need for an STA:

Raytheon has a customer that has requested that Raytheon develop an advanced antenna test system with a signal that can propagate for over 1 kilometer. The customer is hoping that Raytheon's engineers can invent a system that will serve their needs and then the customer could purchase the technology. At this point, the technology development is being conducted under Independent Research and Development. The anticipated customer is expecting demonstrations of the technology development in June, August, September, and November 2014. While most of the work will be done in a laboratory at the Raytheon plant site, some testing will need to be conducted outdoors, temporarily, for demonstration of compliance with the customer's distance requirements.

Because the testing is needed in the short term, to meet customer needs, and because the testing is only expected to last six months, an STA is appropriate.

Synopsis of Key Technical Details:

- Spectrum Needed: 902-928 MHz
- Power level: 100-800 W, directional signal, maximum ERP 200 kW
- Nature of Signals: CW
- Very limited Use: Each customer demo will be 3 days, 2x per day, for 1 hour per test

Explanation of Experiment:

Raytheon is developing a customized system that will conduct antenna testing at a distance. Raytheon's customers have requested this technology to help them detect and deter military threats that may be invisible due to obstacles and obstructions. The initial development of the technology will require work in the lab and then outdoor demonstrations to show how the technology can work at a distance. The early phases, the subject of this application, will show how the technology works across flat, unobstructed terrain. If the technology can work in that environment, then it may be possible to develop the antenna testing technology needed in the more complex environment.

Because of the reciprocal nature of antennas, development of an effective antenna testing technology could be used to determine the nature of nearby transmitters and to develop tools to stop their use to trigger IEDs, prevent communications amongst our enemies, and deter radar interference technologies.

This testing is proposed in the 902-928 MHz band because it is likely to yield the most productive results to address threats.

Outdoor Testing Required, time is limited, duty cycle is low:

Outdoor testing is the only way to demonstrate the performance of the system over distance. Raytheon has selected an area of its plant site for the testing. This limited outdoor test will highlight the performance of the system being developed when used over a 1 kilometer distance.

Each customer demonstration, June, August, September, and November, will be conducted across three days. The testing will take place for only two hours during each day of testing. The testing will be with a single frequency, unmodulated continuous wave signal.

The location selected is away from the population density of Tucson, and the test transmissions will be directed south, which is away from the city. Further, the test site selected will be shielded to the back by buildings on the Raytheon plant. It is an isolated, controlled environment, with restricted access. The signals are directionalized. Any chance of interference is minimized by the remoteness and the restricted access to the property.

Stop Buzzer Point of Contact:

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Conclusion:

Raytheon is working on development of a long distance antenna test system for one of its DOD customers. The proposed testing is needed to demonstrate technology development for the customer over the next six months. The testing will be limited in time. The test locations were selected for their remote, unpopulated, controlled environments. The technology being developed is intended to extend the ability of the customer to detect threats at a distance. For additional questions about this application or the proposed operations, please contact Thomas J. Fagan, Spectrum Manager, Raytheon Missile Systems or Anne Linton Cortez, Esq., WFS, 520-344-8525 or alc@conspecinternational.com.