

Raytheon IIS  
Experimental License Renewal Application  
Call Sign: WH2XQN  
File No: 0139-EX-CR-2017

### **Explanation of Experimentation**

Raytheon Intelligence, Information, and Services (Raytheon IIS) is a business unit of Raytheon Company. Raytheon IIS develops a number of defense systems including advanced voice and data communications systems for the US military.

Raytheon IIS is working on the development of an advanced battlefield voice and data communications system for the Department of Defense. The goal is to develop a high throughput, easily deployable radio system that can be used in both urban and remote areas to deliver real-time information to soldiers in the field. Raytheon IIS had been asked to conduct rapid development of a prototype communications system for evaluation purposes. The initial testing shows promise, and Raytheon IIS is now working on a customized radio system being developed using the same principles.

This application seeks to renew authorization WH2XQN for the testing being done on the development of these radio systems. The early development proved successful, and to continue its work, Raytheon IIS needs to seek a renewed experimental license to continue its operations.

### **Explanation of Experimentation:**

Raytheon IIS is using commercial off the shelf (COTS) technology in its rapid development of a prototype radio system to show proof-of-concept for how a new voice and data system could work. The radios are Persistent Systems radios operating in the 2312 to 2507 MHz band. The idea is to adapt the existing radios in the proof of concept stage to work on optimizing voice and data communications using a number of the existing IEEE 802.11 standards that are incorporated into these radios. The power levels proposed here are intended to allow testing across distances that are expected to be required when a system of this type would be deployed by the warfighter in the field. Even so, the proposed power levels are limited to only 2 W.

The radios are configured to allow for operation without the use of a hub, which makes them easier to deploy quickly. Because hub-less operations are innovations over earlier wi-fi systems, Raytheon is trying to leverage the technology in these radios to deliver a prototype more quickly.

The testing will explore how the radios can be configured so that they ensure that the most exigent communications are delivered securely and timely. Different algorithms for traffic optimization and quality of service will be tested during the ongoing proof-of-concept phase.

### **Technical Synopsis:**

- Power level proposed: 2 W
- Location: Raytheon plant site RF test area
- Spectrum Requested: 2312-2507 MHz

- Radios: Persistent Systems commercially available radios, customized
- Planned Use: Used for R&D testing

**Location of testing:**

Raytheon is proposing to conduct this testing at its outdoor radio test range at its plant site in Indianapolis, Indiana. The test range is on a secure facility, with no open access to the public. The area of operations proposed will allow the testing to be conducted across the entire test range on the Raytheon plant site.

**Test Time:**

The program will be working on development of this prototype during the regular work day. While the radios will be in use for the standard wi-fi type of handshake between devices on the network, the spectrum will not be in use constantly. It is expected that at the most, the duty cycle of operations will be 50%.

**Coordination:**

To ensure that there is no interference with SDARS operations, Raytheon IIS has carved out the spectrum from 2320-2345 MHz. Ongoing operations will be coordinated with AFTRCC and any other licensees as required by the FCC.

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**Prototype development and future development:**

The current system will work with existing IEEE standards in radios that are readily available. This type of rapid development experimentation is designed to maximize the research and development results while keeping costs low for the federal customers. Once the R&D phase is successfully completed, Raytheon expects that it will take the knowledge from this experimentation to migrate the technology to appropriate spectrum that is available to the Department of Defense for product development.

**Conclusion:**

Raytheon is proposing to use COTS radios for rapid development of an advanced voice and data communications system for its DOD customers. This experiment will use the radios to develop algorithms for security and data throughput that are designed to meet DOD communications needs for effective and secure communications. The use of COTS technology will both expedite the new technology development and keep costs low in the early design and testing phase of this research. Raytheon is planning, after its initial testing is successful, to migrate the radio system to spectrum that is available for DOD uses.

If there are any questions, please contact Brian Kavalor, Spectrum Manager, Raytheon IIS, at 317-517-9989 or [brian\\_r\\_kavalor@raytheon.com](mailto:brian_r_kavalor@raytheon.com) or Anne Cortez, Counsel, Washington Federal Strategies, 520-344-8525 or [alc@conspecinternational.com](mailto:alc@conspecinternational.com).