

Raytheon IIS  
Experimental License Application  
File Number: 0550-EX-PL-2016

### **Explanation of Experiment**

Raytheon Intelligence Information and Services (IIS) Company is a major developer, integrator and provider of solutions to the United States Government for domestic and foreign deployment.

This application seeks authorization for the continued operation of an adapted Wi-Fi system. While the system operates on frequencies that allow for unlicensed operation under Part 15 of the Commission's Rules, and it transmits at power levels within the Part 15 limits, the application is necessary because the radios are commercial-off-the-shelf technology produced by a manufacturer outside of the US. The radios being tested are on loan to Raytheon and have not yet been subjected to the equipment certification process. As a result, the operation of the borrowed radios must be licensed by the FCC.

Raytheon IIS began working on the integration and testing of an Intrusion Detection System (IDS) under STA WJ9XKI. The IDS system is being developed as part of a customer-directed effort that requires a rapid prototype of the IDS system within the United States in early 2016. To achieve the customer milestones, testing must begin in March 2016. The initial testing has proven fruitful, and at this point Raytheon IIS is seeking this experimental license to continue its work on the IDS.

The manufacturer has given Raytheon extended access to this equipment.

### **Background:**

The IDS is comprised of detectors, bridge radio, repeater radio, radio server, and a command and control (C2) laptop. The detectors have a daytime/nighttime camera that is triggered by a Passive InfraRed (PIR) detector and a radio link that: 1. receives control information, and 2. passes status and imagery to the bridge radio, repeater radio, radio server and eventually on to the C2 Laptop, which is the operator interface. A graphical presentation of this is provided in Figure 1.

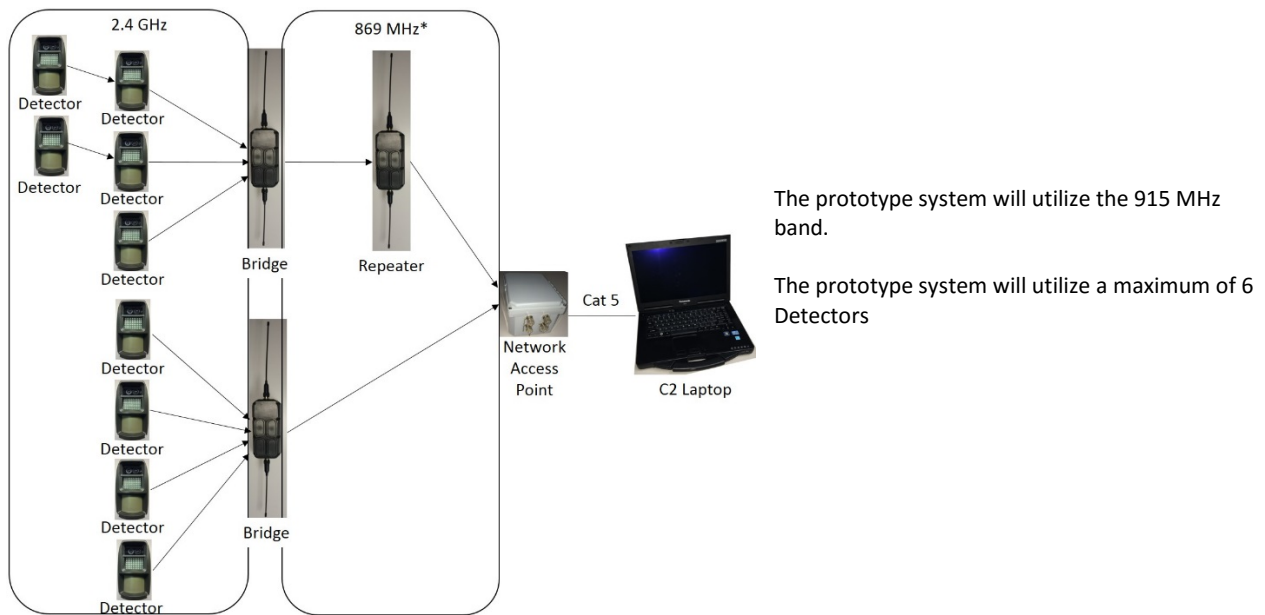


Figure 1 Intrusion Detection System (IDS)

### **Explanation of Experimentation:**

Raytheon IIS will continue to use commercial off the shelf (COTS) Smartdec technology produced by Defendec to establish an experimental test site for DoD customer and end user demonstrations.

The system is designed to be modular so subcomponents can be changed out and tested in different configurations to address different surveillance challenges (i.e. tree lines, gullies, valleys, industrial sites) and to test and demonstration how the system can overcome those challenges.

The two frequency bands selected are already widely in use for similar, localized wireless sensor networks. The power levels for operation are at the lowest levels necessary for reliable communications.

### **Technical Details of Operations**

Raytheon will continue to work at the two experimental test sites already established in Marana, Arizona as shown in Figure 2. Both sites are within a 1 square kilometer area.

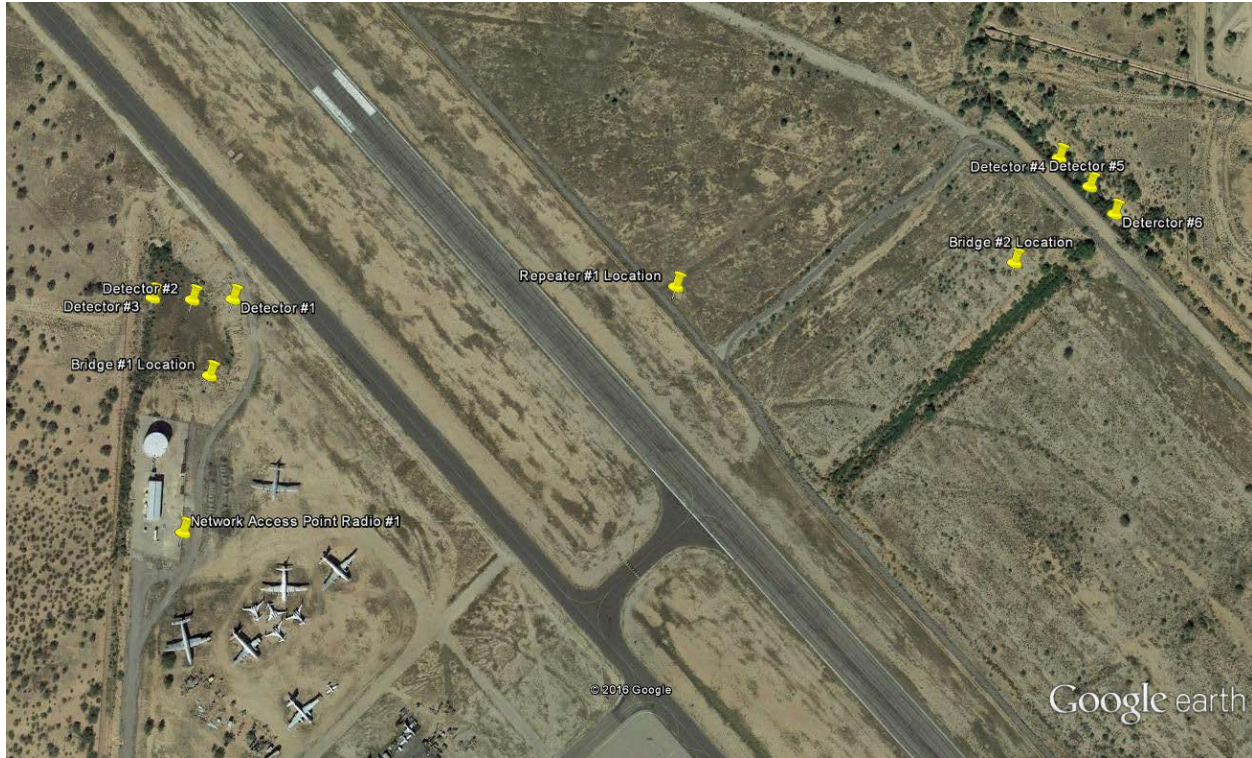


Figure 2 Proposed IDS site locations

Raytheon will require at least two test frequencies/channels with a bandwidth of at least 2 MHz each. Each site will transmit/receive on two frequencies.

### Setup/alignment

The detectors, bridges, repeater, and network access point were installed based on GPS coordinates. Once set, a network check signal was transmitted and received by each station.

### Antenna parameters, elevation, position

The IDS antennas are omnidirectional antennas and mounted on each of the detectors, bridges, repeaters and network access point units. These antennas are mounted at 2.1m (Detectors) and 3m (Bridges, Repeater and Network Access Point) heights on existing structures.

### Technical Synopsis:

- Power level proposed: 3.2 mW (2.4 GHz); 500 mW (915 MHz)
- Location: Marana Regional Airport sites identified above
- Spectrum Requested: 2400-2450 MHz and 902-928 MHz
- Radios: Defendec
- Planned Use: Wireless Intrusion Monitoring

### Locations of testing:

Raytheon is proposing to continue using the test range at the Marana Regional Airport site in Marana, Arizona. These sites were picked based on the similarity of its topography and environment to the final proposed customer deployment sites.

Marana Regional Airport is a secure facility, with no open access to the public, limited access to only authorized personnel and security personnel.

**Test Time:**

Because of the nature of the use of these detection systems, the proposed testing will take place 24 hours a day, 7 days a week. This will allow testing and demonstration of the daytime and nighttime performance of the Detector cameras.

**Stop Buzzer Point of Contact:**

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**Conclusion:**

Raytheon is proposing to use COTS equipment for rapid development and test of an Intrusion Detection System for its Customers.

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