

Exhibit – Explanation of Need to Use Radio Spectrum

Raytheon Missile Systems is requesting the use of frequencies in the 430 to 440 MHz band and frequencies in the 902-928 MHz band to develop improved interference resistance communications system for command and control signals used in its products.

Raytheon Missile Systems builds missiles used by the US military. Those products are used in an increasingly crowded RF environment. Various command and control signals are used when the products are in flight to ensure proper operation of the products. The experimentation proposed here is intended to develop radio systems and transmissions that will be robust and reliable even in a crowded RF environment to ensure that vital command and control signals are received and not subject to interference.

The application proposes to use frequencies in two bands, 430 to 440 MHz and 902 to 928 MHz. In the 430 to 440 MHz band, the radios will listen for a clear channel and transmit only on a clear frequency. The radios will change to clear channels if a signal appears on the frequency to be used. The power levels are low – just one watt, with 2 watts EIRP. The bandwidth per transmission is 200 kHz. The experiment will help Raytheon determine what type of transmissions will guarantee that the command and control signal is received and will withstand interference from the operation of other radios in the area operating on or near the same frequencies.

For the 902-928 MHz transmission, the system uses off-the-shelf technologies to continue experimenting with interference-resistant transmissions. The system will use a single signal and transmit only if the frequency is clear. If there is another signal in use, the radio will change channels to a clear channel and transmit. A license is required for this experiment because the antennas used will add more gain than is allowed for the off-the-shelf equipment that would otherwise fall under the Commission's Rules under Part 15 for unlicensed use. This radio will use 200 Hz channels and a pulsed transmission that is highly unlikely to be perceived by any other 902-928 signals in use in the area.

The experimentation will rely on the RF environment at the Raytheon plant in Tucson as the crowded RF environment to be overcome.

The purpose of the experiment is to enhance the quality of frequency diversity technologies as well as to develop interference-resistant command and control radio transmissions to make the use of Raytheon products more secure and effective.