

Purpose of Operation for Full Experimental License

Rockwell Collins currently holds an STA (call sign WB9XTO, File number 0447-EX-ST-2003). This application is a request for a full experimental license for this STA.

Operations under the requested full license will consist of testing of a wireless networked system composed of a variety of terminals capable of transmitting and receiving radio frequencies in the range of 400MHz to 1000MHz at effective radiated power levels of up to 20 Watts. These terminals will be capable of transmitting and receiving data between them on a variety of frequencies and protocols by self organizing a set of frequencies and timing of information.

The purpose for requesting use of vacant TV channels is to provide multiple frequencies for test and evaluation of a new wideband spread spectrum adaptive frequencies communications network. The system was developed under a combination of Rockwell Collins, CECOM, and DARPA funding. It relies on radio transceivers that are able to quickly tune between 20 and 2500 MHz, and is intended for military use only where global deployment into unknown spectral conditions and occupancy is required. The adaptive frequency selection algorithms used in this system may be constrained to any degree required by local spectrum rules, and indeed that scenario is the reason for requesting the use of multiple, dispersed channels. A second purpose of the adaptive frequency algorithm is to avoid interference, jammers and to optimize communications capacity as a function of the local geophysical environment (e.g., urban, forest, mountainous, etc.) under widely varying propagation conditions. This is to say that our system is capable of automatically and adaptively seeking the optimum communications channels from the frequency spectrum allocated to it, similar to HF ALE but instead operating in the VHF/UHF line-of-sight (LOS) bands and propagation environment.

The planned experimental tests base-to-mobile backbone and mobile-to-mobile communications using packet switched traffic routing. Base stations will more likely need higher power for links up to 10 km. Mobile-to-mobile operation is planned for clusters of stations at lower power for operation within 1 km. Actual transmit time of each station is anticipated to be approximately 25% of the operating time, scattered across multiple channels. The network operates with 12 millisecond packet slots, with 0.5 to 11 milliseconds of each slot occupied by a transmitted signal depending upon the instantaneous traffic load.