Form 442 Question 7: Experimentation Description

The program of research and experimentation is to verify functionality of ground and airborne C-Band Command & Control radios for UAS, and to do so via demonstrations to uAvionix Test & Engineering Staff, potential customers, visiting federal and state entities, and other interested parties.

It is understood that all use of the UAS-designated C-Band will be considered "experimental" until FCC rulemaking governing its use is complete. Because the designated band is allocated to aviation, the FCC will check for FAA concurrence prior to issuing a station license. That concurrence has already been sought and granted, proof of which will be submitted as exhibits to this application.

The equipment used will be the SkyLink-5060 airborne radio with a ½-wave dipole antenna and the SkyStation-5060 ground radio with a 12 dB low-gain directional antenna. Both radios are designed to comply with RTCA/DO-362A performance standard for CNPC (Control and Non-Payload Communications) radios using GMSK modulation, Classes AXS and GLXS, respectively.

Typically, one airborne UAS platform will travel a distance at an altitude between ground level and Flight Level 100, starting at one ground station, but with an option for another ground station to take control. Eventually two airborne platforms will be flying concurrently, which will require two distinct C2 frequencies. Three frequencies are being applied for in the event one frequency proves unusable for a time owing to unintentional intermodulation interference from 3rd-party sources.

uAvionix also makes a UAS product called muLTElink that allows the C2 system concurrent access to more than a single frequency band. Flights are anticipated that will use muLTElink to switch among the C-Band (5030 to 5091 MHz), ISM Band (902 to 928 MHz) and LTE, choosing whichever one provides the best signal strength, as well as providing redundancy to better assure C2 reliability.

These development efforts will also leverage uAvionix's SkyLine cloud-based network management system to monitor equipment health and choose which ground equipment to use as a function of what's working as intended and what's transpiring in the overall airspace at any moment. The goal is to allow UAS to fly over long distances without overly task-loading the operator, much like a cell phone call can travel over a distance coast-to-coast without requiring the caller to figure out the call's routing from cell tower to cell tower.