FCC Form 442 Attachment 1:

Form 442 Question 6: Description of Research Project

This application is to support the development of an Unmanned Aircraft System (UAS). A block diagram of the communications system is shown in Figure 1.

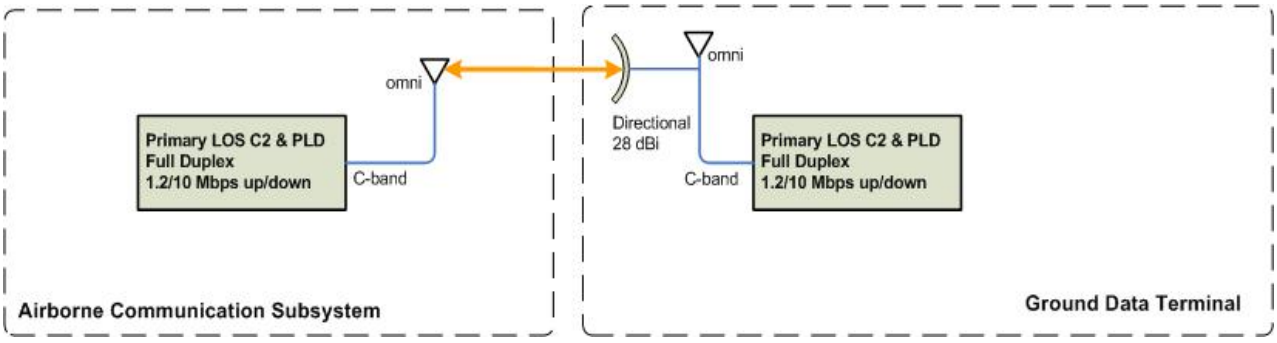

Figure 1: UAS Communication Block Diagram

To support both short and long range line-of-sight operations a combined directional and omni-directional ground based transmitter/receiver is used in conjunction with an omni-directional airborne transmitter/receiver. This airborne communications subsystem and ground data terminal are the data link which provides the primary UAS command and control path.

Existing data-link systems are not sufficient to provide the high data rate (10 Mbps), long range, reliable communications required for UAS operations and system development.

Antenna Registration Question 4: Directional Antenna Information

An auto-tracking antenna has been designed specifically for use with the EnerLinksIII system and is a highly integrated solution. The assembly is a combination of a high gain directional dish, a low gain omni-directional antenna and associated auto-tracking hardware:

- The antenna system includes an omni antenna for close-in operation of the aircraft, such as for take off and landing, where the angular velocity of the aircraft relative to the antenna is too great to track, and a high gain directional dish for long range operations.
- The auto-tracking antenna is provided with the GPS position of the aircraft. Tracking is accomplished using a combination of GPS and signal strength. Signal strength is used to find the aircraft when the tracking is not locked, and GPS is used to follow it thereafter.
- The parabolic reflector used in the auto-tracking antenna has a diameter of about 2 feet (approx. 60 cm).and has gain of about 28 dBi at C-band. Antenna beam width is about 5 degrees. (see Figure 2)

Figure 2: Autotracking antenna assembly.