

To: FCC Exhibit A

From: Dr. Michael Parker, Chief Technical Officer

Rincon Research Corp.

Date: February 26, 2010

Subject: Question 6: Statement of Research Project

BACKGROUND

This research project is to develop and improve Radiolocation technology.

Rincon Research Corp. develops and fields systems for the US government to locate radio transmitters. We have used both company and government funds to develop the technology of precisely locating transmitters using two or more collectors. Experiments with aircraft (data recorded on board or relayed via certain government radio links) and tethered balloons (wideband data transmitted to the ground via fiber optics) have shown great promise. We are now embarking on an internally funded project to develop an improved package suitable for micro-UAVs and a corresponding ground-based processing and control system.

The nature of the Radiolocation technology involves processing a very wide bandwidth in order to simultaneously detect, locate, and track many radio transmitters. This very wide bandwidth from multiple collectors must be brought to a processing location with extremely precise phase and timing information. At the same time, the collector position and attitude changes must be tracked to a centimeter level of accuracy.

The system envisioned will consist of simple (potentially disposable) equipment on UAVs using omni-directional antennas communicating with a base station with directional antennas tracking the UAVs. It is planned to normally operate the airborne units at altitudes below 10,000 feet MSL, and often below 1,000 feet MSL. Since this is a Radiolocation system, a license to use frequencies allocated to Radiolocation is requested. With our low power spectral density, we don't anticipate any interference with licensed users, most of which operate at a much higher EIRP. The frequency of fixed radars will be identified and avoided. Should we operate in their vicinity, we will coordinate with government operations at Fort Huachuca and the Goldwater range restricted areas to avoid interference. Transmitters will not be operated within line-of-sight of the Very Large Array at Socorro, New Mexico.

WHY THE COMMUNICATION FACILITIES ARE NECESSARY

There must be a wideband link from the UAV to the ground processing station containing signals-of-interest and precision tracking and timing information. At the same time there must be control signals from the ground processing station to the UAV signal processing hardware.

WHY EXISTING COMMUNICATION FACILITIES ARE INADEQUATE

In order to meet the unique precision measurement requirements with size, weight, and power that will fit on small UAVs, it is necessary to integrate the radio link with the precision measurement system. Even if size, weight, and power were not an issue, there are not appropriate systems with licensed service available. Experiments to date have used both licensed mobile satellite systems and transmitters in unlicensed bands. The data rates achieved are less than 1/100 of the needed rates.