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Applied Radar, Inc. Crop Protection Radar

1. Background

It has come to the attention of Applied Radar, Inc. that farm owners are in need of a smarter way of warding off intrusive birds. Applied Radar, Inc. is developing a crop protection radar (CPR) that can be used to trigger a propane cannon in order to scare off unwanted birds near farms and other areas where avian wildlife is not desired. The radar will be physically small, and shall be able to communicate with other nearby CPRs. Applied Radar, Inc. has begun researching and designing the radar system, and is seeking out highly motivated electrical and computer engineers to help this project progress. The students will assist in the development of the CPR by creating a solar charging battery bank, and setting up an Ad-Hoc communication network between CPRs. This part of the project must be completed by March 2014, and thus will follow a tight schedule. Failure to meet this deadline will delay the project by one year. After March 2014 the team will be rigorously testing the system and making any necessary modifications to finish the project.

2. Project Goals

The overall goal of this project is to design a solar powered battery bank and an Ad-Hoc network for Applied Radar's crop protection radar. While the Ad-Hoc network and solar powered battery bank may have little to do with one another, both systems are key components of the CPR. The team will research various methods of solar charging and Ad-Hoc networking. The best solutions will be chosen using a tradeoff matrix. The selected designs will be fabricated and tested. As previously stated, the design and assembly of the battery bank and Ad-Hoc network must be completed by March 2014 in order to be ready for the 2014 growing season. The final goal will be to test multiple solar powered modules connected by an Ad-Hoc network.

3. Required Skills

This project utilizes both electrical and computer engineering backgrounds. The electrical engineer(s) will be required to design a PCB schematic for the solar charger and select an Ad-Hoc networking module, as well as choosing appropriate materials such as batteries, solar panels, and antennas. Thus, the electrical engineer(s) should have a good understanding of power regulation and be familiar with reading/creating schematics. The computer engineer will be required to design the Ad-Hoc networking infrastructure. This includes selecting the wireless and communication protocol and configuring multiple devices in an Ad-Hoc network. An excellent understanding of computer networking is desirable.

Applied Radar has a team of electrical engineers as well as a mechanical engineer available to assist the Capstone team throughout the project.