

Project #	Project Name	Project Track	Project Family
P16462	Wind Energy Base Station	Energy and Sustainable Systems	Energy & Motion Lab
Start Term	Team Guide	Project Sponsor	Doc. Revision
Fall 2015	Edward Hanzlik	Dr. Mario Gomes (RIT)	1

Project Description

Project Background:

This project centers around the idea of creating a more efficient wind energy system. Current designs of conventional wind turbines are limited by the large base required to support the blades of the turbine. This also limits the height that these turbines can reach. An airborne glider wind turbine would be able to reach greater heights where higher wind speeds exist while also increasing efficiency by using less material. The overall cost of the system would also be much less. Previous design concepts used the idea of a conventional wind turbine, that is, a vertical flight path around a horizontal axis. Project 14462 created a base station suitable for this flight path, and Project 15462 created a glider to be used with this base station.

Problem Statement:

The goal of this project is to design and build a base station to support a tethered glider flying in a horizontal flight path around a vertical axis.

Objectives/Scope:

1. Design and build a base station to support a horizontal flight path.
2. Perform test flights to determine the feasibility of the desired flight path.

Deliverables:

- Base station to support a horizontal flight path with a reel system to keep the plane in this flight path
- 50 continuous cycles on 8 out of 10 trials desired
- Test flight videos showing the plane flying in the desired flight path

Core Team Members:

- Sarah Collmus
- Laura Arciniegas
- Kevin Collins
- Aleksandr Kim
- Michael Ostaszewski
- Kevin Larkin
- Suk Min Lee

Strategy & Approach

Assumptions & Constraints:

1. Plane will be purchased for use with base station.
2. Test flights must be performed in an area away from the airport due to "No Fly Zone" regulations.
3. Weather in Rochester, NY limits time for test flights.

Issues & Risks:

- Ability to maintain a horizontal flight path.
- Ability to design a working reel system
- Possibility of a crash landing leaving the plane damaged beyond repair