



# Team 16: Kite Generator

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### 1.3 Functional Decomposition

The functional decomposition aims to break down the complex airfoil generator system into smaller sub-sections. Each breakdown describes the desired function of the component in order to achieve the needs of the customer. Below is the overall system decomposition and the component functional decomposition of each component.

#### 1.3.1 Overall System Decomposition

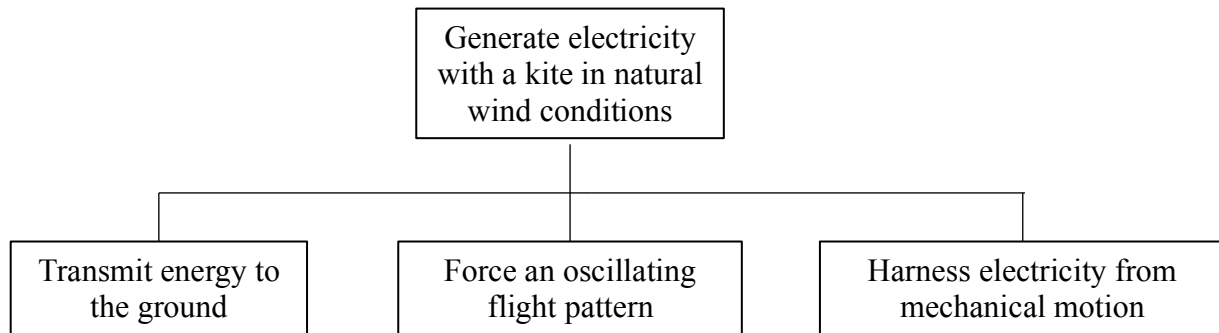


Figure 1. Functional decomposition of system general function.

#### 1.3.2 Components of Kite Generator System

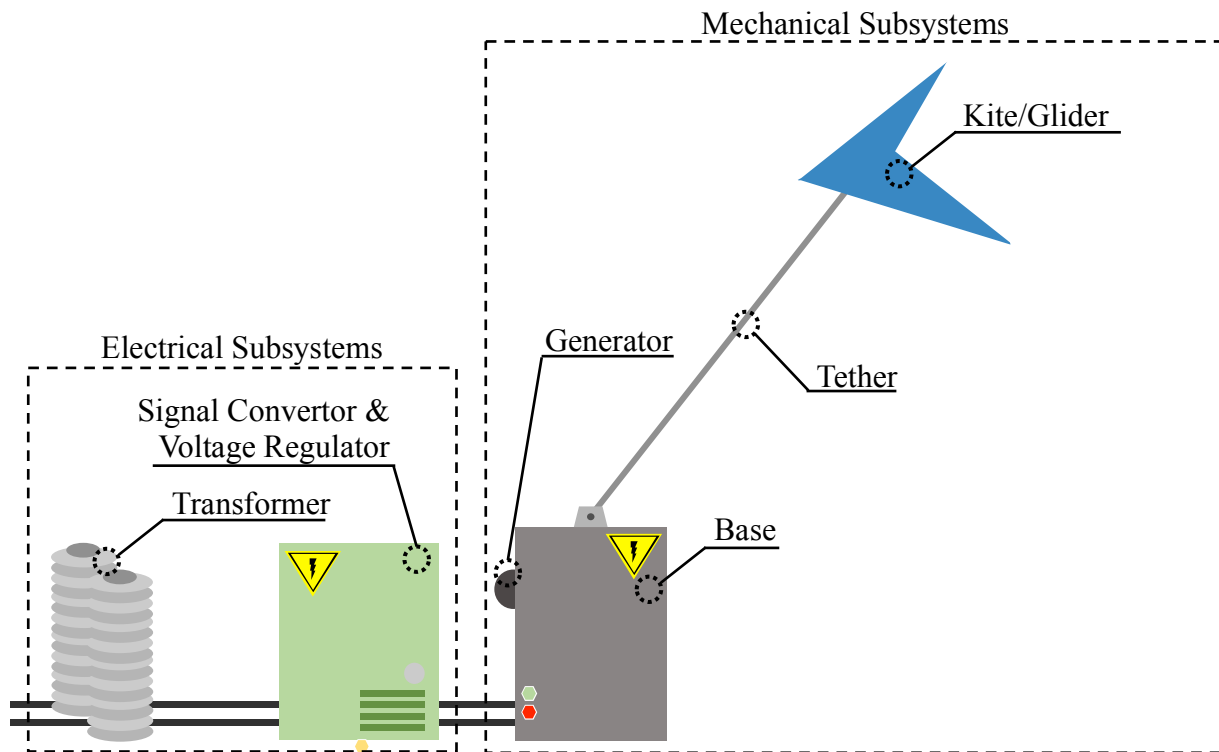


Figure 2. A simple overview of basic system components.

## Glider Subsystem

The Glider component of the system is the most essential towards the overall performance of the project. It requires a method of takeoff and landing, and performs steady glide control. These features will require crucial sensors and actuators in order to control the dynamic system.

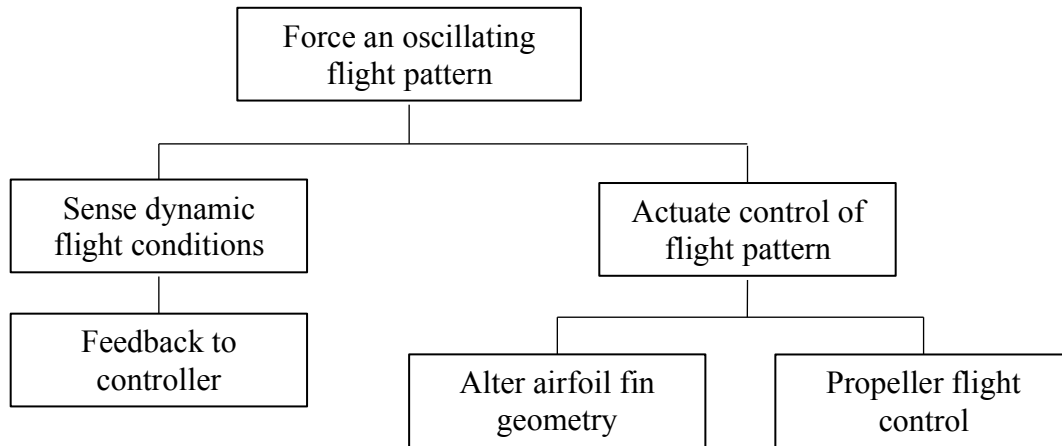


Figure 3. Glider Subsystem Functional Decomposition.

## Tether Subsystem

Although the simplest subsystem in the entire system, the tether is essential to the success of the project. Failure in the tether system would result in catastrophic results, possibly beyond repair. A bulky tether system design may interrupt flight patterns and decrease efficiency.

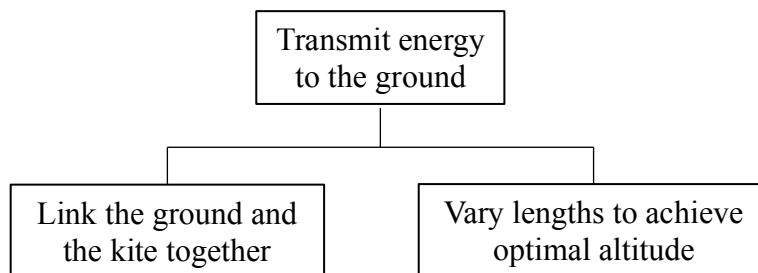


Figure 4. Tether Subsystem functional decomposition.

## Base Subsystem

The Base Subsystem is the least essential to the project. Overall, it could be dramatically simplified through the prototyping of the project. The end project design should keep the housing in mind as a finalized product should incorporate some weather proof casing and additional



features. A functional decomposition of this system was not performed as it does not fulfill a primary function and holds such a low priority.

## Generator Subsystem

All large scale commercial generators convert mechanical rotation into electrical energy. Even in the case of a car engine, where linear mechanical motion is converted into rotational before being passed through an alternator. This fact guides the subsystem design to consider some mechanical power conversion to another form of mechanical power, prior to electrical conversion.

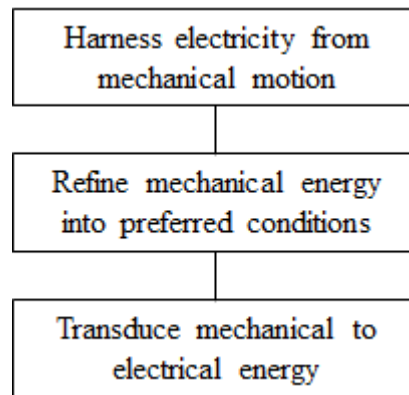


Figure 5: Generator functional decomposition.

## Electrical Subsystems

Much like the Base Subsystem, every post generation electrical subsystem currently hold a low priority to the project. The project's innovation exist within the mechanical components of this project as currently existing electrical components already exist to fulfil the functions required for the success of this project.