



# A Solar Powered Drone: The Project Design

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## Abstract

The unmanned aircraft, commonly known as drone, is considered one of the most advanced and reliable resources for a future smart supervision of the territory. We can already see the growing interest – of several modern companies - for a device which has infinite possible applications, from search and rescue operations in inaccessible regions to land surveying. Our idea is to join the drone technology to the modern renewable energy source of the solar panels, in order to give to our device a remarkable ecological impact in the first place and then to considerably increase its functioning time.

## Introduction



This poster describes the building process in all its phases, showing a pictures report of the collection of involved components and materials and the actual assembling process of the final device. Moreover, the design and the characteristics of the main components are explained

together with a brief report which illustrates the team work, the powerful synergy among the students who made the completion of the project possible and a depiction of the difficulties encountered during the work. Eventually, other pictures show the completed aircraft and its flight.

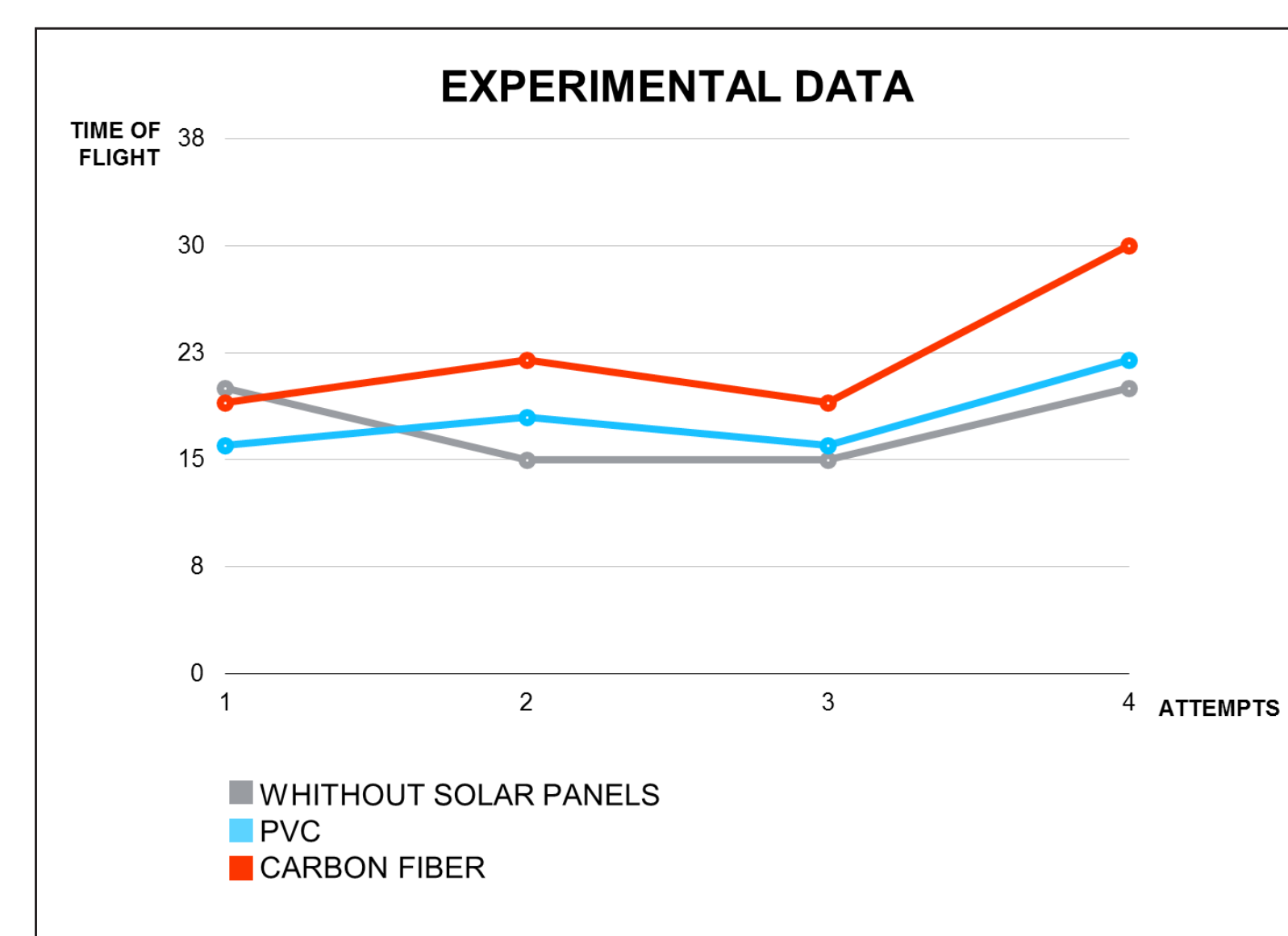
## Our Project

The purpose of our project for SKYSEF 2015 is design an alternative power supply for drones able to expand the use of this technology to other fields. We designed a new kind of structure that could be applied to every multicopter without any structural change. The main features of this project are:

- Lightweight structure;
- Strong attachment to drone;
- High-performance solar panels.



## Why Carbon Fiber?



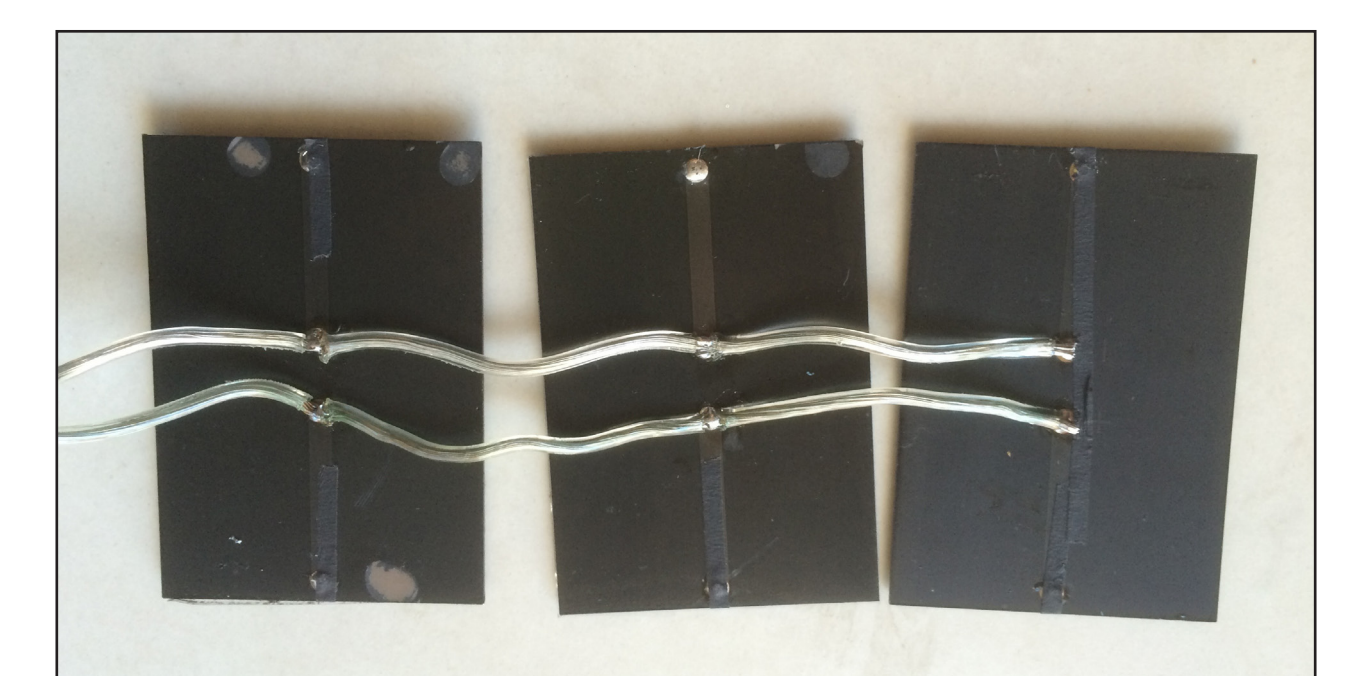
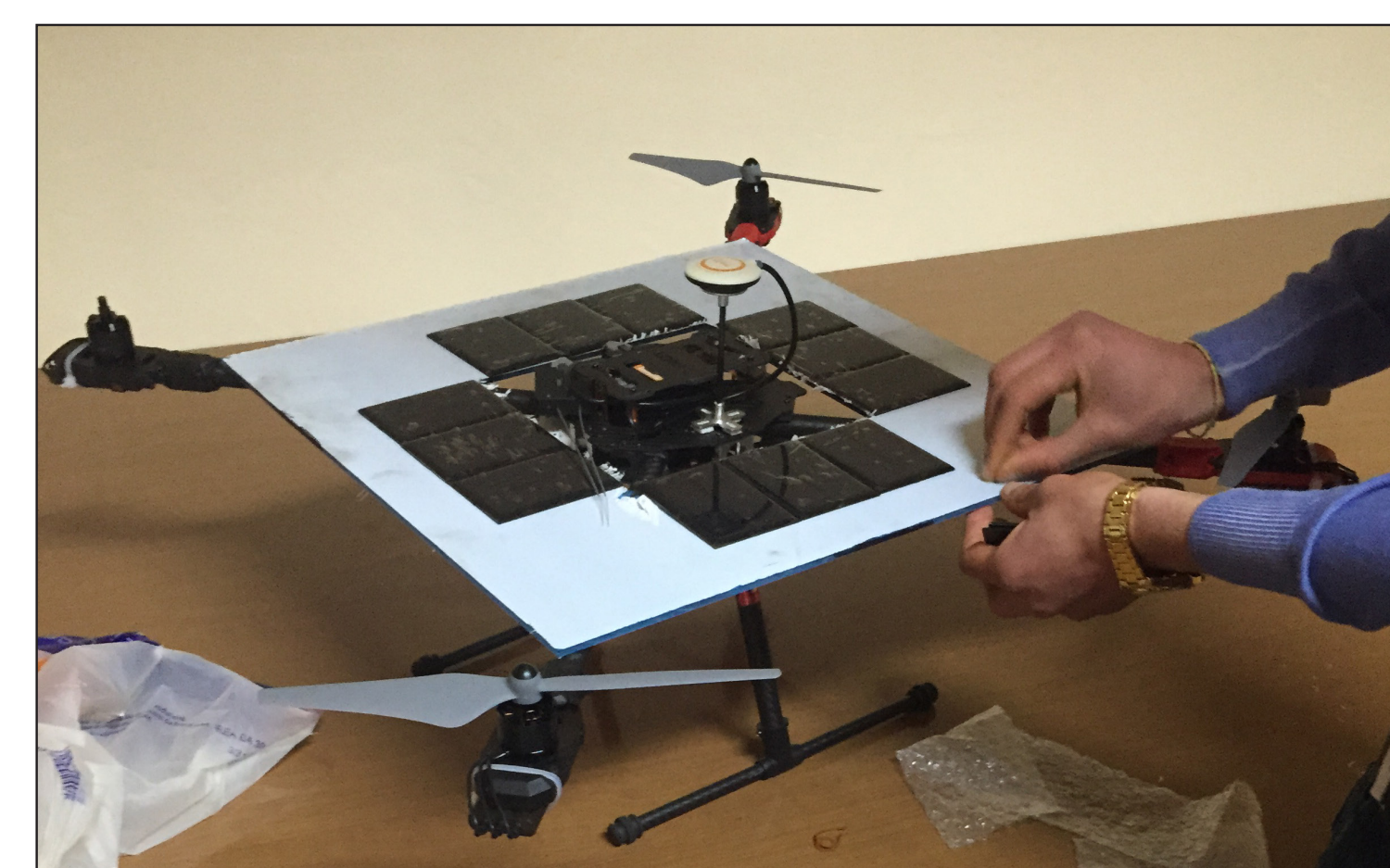
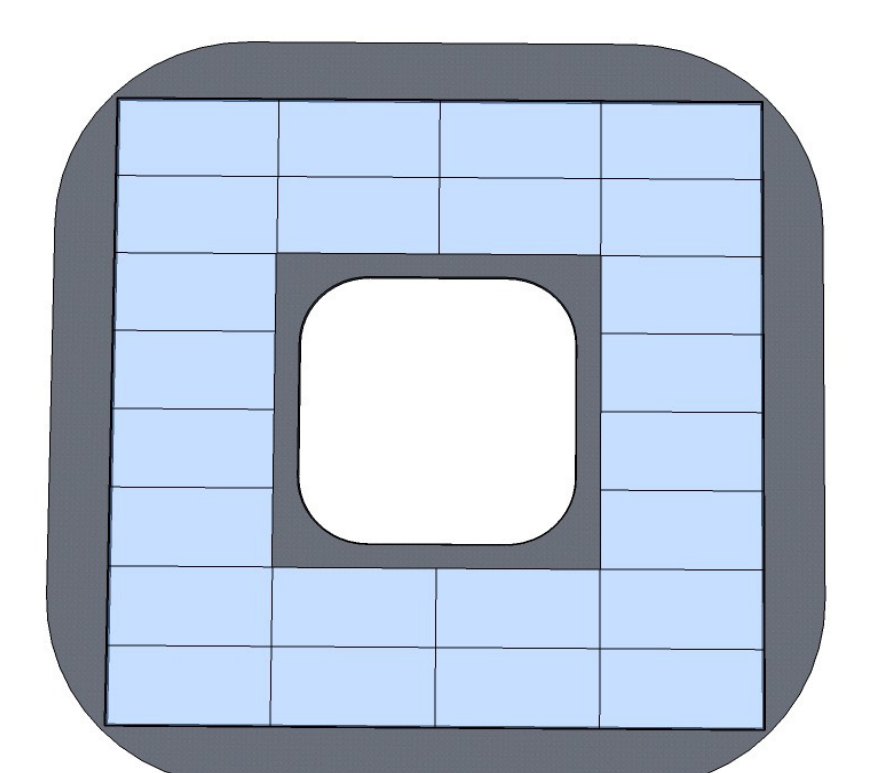
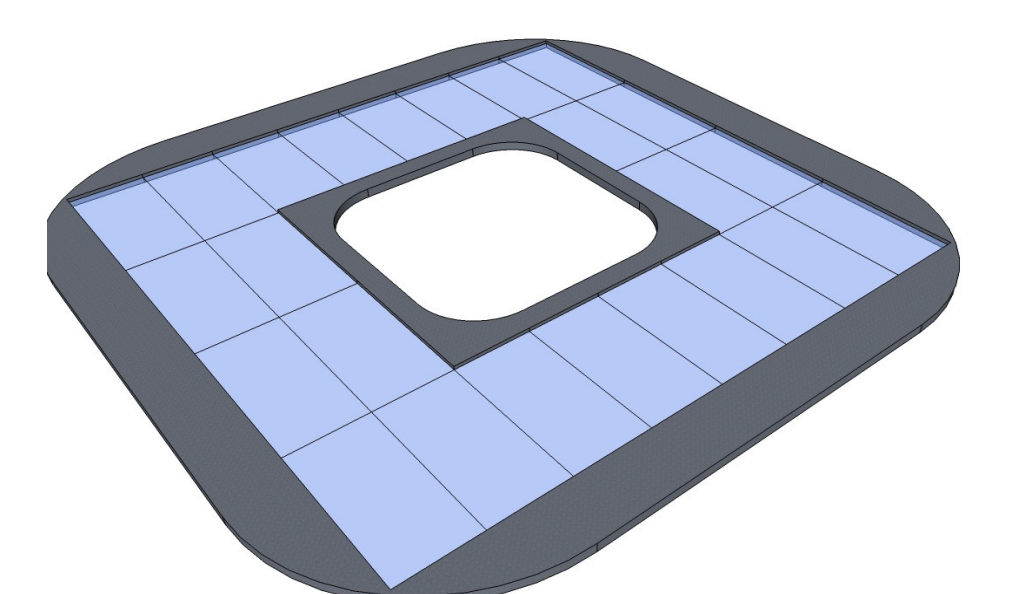
The structure is designed completely in Carbon Fiber, using a 3mm thick panel. We used rigid monocrystalline solar cells. This is the best solution for a high efficiency structure. Experimental data show the use of carbon fiber extends significantly the flying time.

## Other Factors

We had to consider many factors in order to build the structure; one of the most important is the wind impact. The support structure for panels should have some special features:

- Be light;
- Not affect much aerodynamics;
- Be easy to install and remove.

By using the monocrystalline solar panels, a 45 % - 50 % longer autonomy can be achieved.



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