



Assignment

Power management research & development for the Airborne Segment

Made by: Lucien Fesselet (22-01-2017)

Timespan: 01-02-2017 till 01-07-2017

Host Company: MonkeyWings B.V.

Internship supervisor: TBD

Assignment supervisors: Henricus Basien / Lucien Fesselet

Introduction and problem definition

UAVs (unmanned aerial vehicles), more commonly known as drones, are a piece of marvel. Any quadcopter enthusiast will back this statement. The true beauty lies with the degree of freedom it can provide. No current technology can replicate the potential it holds. However, drones could be a danger: relatively heavy and fast moving equipment with rapidly spinning elements.

This is where MonkeyWings comes into the picture. Our philosophy is simple: integrating cutting edge technologies to provide our clients with the highest quality, safe, aerial footage solutions.

The team is currently busy developing a new filming platform which utilizes technology from drones whilst tethering it via a cable, hence minimizing risk significantly.

Drones are conventionally powered by high current capacity batteries. This limits the flight to typically 20~30 minutes, far from being optimal for event filming purposes. However, since our system is tethered, the idea is to bring the power through electrical wire. The challenge lays with the length of the cables and the power required: >20m & MAX 36 000W.

Dual charging/powering

Although unlikely, the high power demand is an ultimate situation where 12 motors are throttled at 100%. Most of the time the power drawn will be under the 3 600W. To limit the cable diameter, AC current can be brought down to the “drone”, after which will be transformed into appropriate DC current to charge the batteries and power the “drone”. The idea is to have the batteries acting as a buffer for times of necessity.

Assignment

Develop a power distribution system for simultaneously charging batteries and powering the system over a long distance.

Project steps

In order to complete the assignment, these steps can be used as guideline.

1. Study the current used system,
2. Make a project plan,
3. Research power distribution,
4. Communication with possible consultant companies ,
5. Carrying out tests with relevant systems,



6. Trade-off & select most suitable power distribution system,
7. Prototype design, manufacture & testing,
8. Evaluation & recommendation,
9. Report findings to MonkeyWings.

Documentation

- Minutes of the weekly meeting with supervisor,
- Minutes of the meetings with MonkeyWings,
- Project plan,
- Graduation report confirm the school guidelines. In which the followed process needs to be clear,
- Extensive description of the detailed design. in which all the technical aspects of the system needs to be clear,
- Validation of the detailed design,
- Presentation in the form of an A? poster and a PowerPoint presentation,

When the assignment is finished, all the files, mails, documentation, and literature related to this assignment will be handed over to Inholland Composites Laboratory and MonkeyWings in an orderly matter.

Delft, 22-01-2017

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