



European Project Semester

PROJECT OUTLINE

Project dates: March 2017 - June 2017

Title: Global design of a homemade 3 rotors flying drone (3RD) – First step

Project activity areas:

Mechatronic, materials, mechanic, design, fluid mechanic

Keywords:

Flying drone, design, calculus

Tutor's name and coordinates

Client – End-user: ENIT
Technical ENIT Supervisor + contact:
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Project origin

ENIT - EPS

Project technical background:

Drones are widely studied in universities for mechatronics and automation activities. Moreover, nowadays, drones are user friendly and accessible to family for many applications: initiation to aeronautic and flying, air media (photo and video)... Furthermore, drones are more and more used in industry for observation of unattainable or dangerous zones.

Basically, drones means quad-rotor "helicopters". It implies they are composed of 4 counter-rotating rotors inducing many difficulties for stabilization and control of trajectories.

The aim of this huge project is to design a 3 rotors drone that can be able to carry a camera. This drone will be controlled by a ground operator. Such a drone already exists based on a symmetrical structure.



http://www.jivaro-models.org/triomini/page_triomini.html

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The main idea of the global project is to increase the scale of the existing drone and to create an asymmetrical structure that can be more stable and easier to control.

Studied topics:

The complete design of a drone implies mechanical studies, material science, electrotechnology, fluid mechanic, automation and so on. That's why, the first step of the global project is to define the complete requirement document of the ENIT made 3 rotors drone. Following the number of students, the tasks will be adjusted. Based on the generic description of the projects, main deliverables are :

- 1) Complete requirement document. This requirement document must be usable for future projects that will realize the drone.
- 2) Fully adaptive computation file linking all the constraints of the requirement document
- 3) Intermediate and final report and presentation.

All other ideas are welcome.

All these topics should be prepared and realized using a traceability and quality chart to allow further user (students) designs.

As far as the background required, an overall curiosity for multiphysic subjects is needed. A general understanding of mechatronic would help a lot. Depending on the student background, some subjects could be more developed for instance :

- For mechanical engineers, the focus will be done on the structure and material science,
- For computing or control engineers, the focus will be given on the control operating system,
- For electrical engineers, the focus will be given on motors and power electronic,
- For fluid mechanic students, the focus can be done on flying capability...
- For others, we will find together something suitable.