Inter-American University of Puerto Rico
HASP 2012
January Monthly Status Report

During January the ARIES-DYNAMICS team has been revising the ADCS board schematic design, recruiting new members for the project, since three students are graduating this May and no longer will be working on the project. Since the beginning of January we have been working with the team organization structure and dividing the tasks, to work towards the preparation of the Preliminary Design Review (PDR) document. The PDR document is currently on its initial phase defining and expanding the requirements and objective necessary for the payload. The ADCS is working directly with Dr. Pedro Capo-Lugo (NASA Aerospace Engineer) in the testing and implementation of the Attitude determination and Control system.

Activities of team members

1. The Electrical team (ELEN) is currently in charge of review the schematic design and verify that all of the components works properly .The ELEN team needs to identify any errors in the current schematic and oversee any possible electrical problem.
2. The mechanical team (MECN) is currently in charge of developing the Solidworks design of the payload and performs a thermal, vacuum and shock analysis on the payload. The MECN has improved the previous design by reducing the weight of the payload.
3. The ADCS team has been working with the sensor fusion implementing a Kalman filter Algorithm in order to obtain a quaternion representation to be used on the PID controller. In addition the ADCS is in the process of testing the PID controller with the test version of the motors that we are going to use. The ADCS is also testing the motors for proper functionality.
4. The Software team is working together with the ADCS team to implement the ADCS Algorithm on the dsPIC33. Currently the Attitude Determination and Control code is being tested on MatLab and Simulink for further translation to dsPIC33.

Issues encountered during payload design / development

1. The ACS software needs quadrature encoder interface to read the data from motor encoders this is not currently available on the dsPIC33. Due to this constraint we are planning to develop our quadrature encoder and implement it on the dsPIC33.
2. The MECN team needs to address the problem that we suffer in the HASP 2011 with the Thermal part. To prevent any kind of thermal failure on the HASP 2012 flight.

Milestone

Since the submittal of the CFP on mid-December, our major milestone was to recruit new students that were willing to work with us on the project. To provide proper training to these students in the areas of system engineering, documentation (PDR, CDR, FRR), electronics, mechanical and software.

For the next several weeks we will be working in completing the Preliminary Design Review (PDR). In addition to finish the PCB board for the ADCS.

Current team members

The Aries-DYNAMICS presents some changes related to the team member's structure since the CFP of mid-December, losing two members but adding three new students. As shown below in the latest version of the team structure.
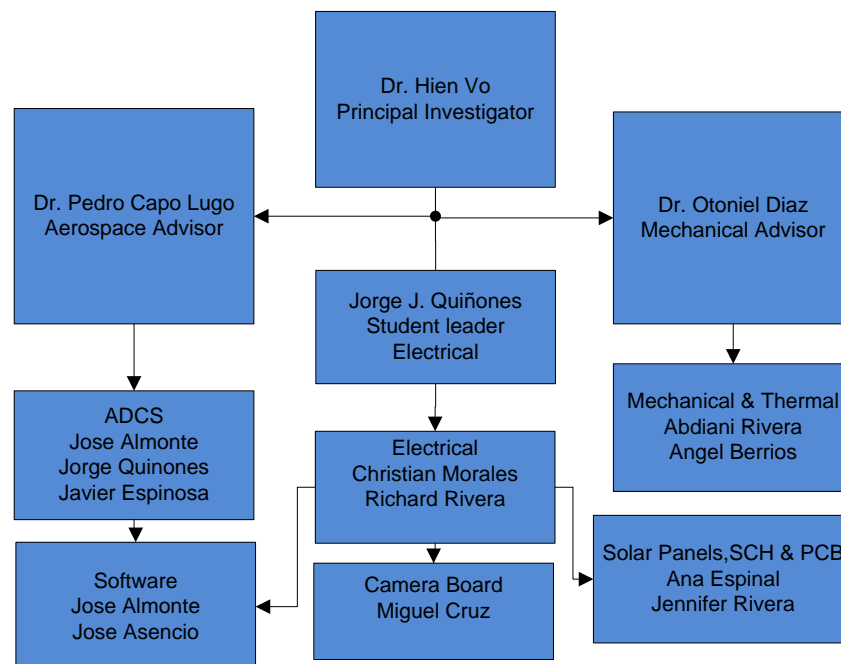

Figure 5: ARIES-DYNAMICS

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