



# Scarlet Hawk - III

Status Report: June 2015

6/26/2015



## Summary of Progress

For the month of June, we have focused on mounting everything together and finishing the Payload Specifications and Integration Plan (PSIP).

The electronic and communication team have to still connect all the individual components and boards. The PCBs are now finished, and the electronic parts soldered. Furthermore, there was a power amplifier missing for the communications of the payload, and even some adaptation circuits had to be designed.

Afterwards, we had also settled the integration of the payload, and every team knows how to prepare there part of the payload so that everything will fit. It required for the structure team to do some changes both int he aluminum frame (we will be adding more screws) and the FRP field (which needs some holes for the camera, the antennas and other sensors).

Finally, we also prepared the final version of the PSIP We will be adding the missing information (we plan to get the measures in the following week) and made the changed recommended in the reviews.

## Milestones achieved

- Main Aluminum Frame Building
- Sensors and Camera Management
- FPGA board design
- Antenna built
- FRP Shields Building
- Transceiver board design
- Serial port encoding: downlink and uplink - HW/SW System
- PCB Board manufacturing - HW/SW System

## Upcoming Deadlines

- Integration and testing:
- Communication data encoder and communication transmitter integration and testing
- Transmission/Reception testing
- FRP shield ad antennas integration
- Preliminary payload integration
- Testing and improvement for:
  - The code
  - The entire payload

## Structure of the the teams

Name	Ethnic/Race	Mayor	Grad/Undrgrad	Team	Position	Starting Date
Caterina Lazaro	White	Computer E	Grad	-	Project mangr	Aug-14

Adam Bass	White	Aerospace E	Undergrad	Structure	Team Lead	9/1/2014
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Alan Grossmann	White	Mechanical E	Undergrad	Structure	Design coord.	9/1/2014
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Javier Garcia Gonzalez	White	Electrical E	Grad	Communication	Team Lead	9/1/2014
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Victor Arribas	White	Electrical E	Grad	Electronic	Team Leader	9/1/2014
Adnan Baleh	White	Electrical E	Grad	Electronic	Member	9/1/2014

## Structure

We have the main body of the structure finished and all that remains are the small modifications to accommodate the electronic components and communication system. These modifications can be sorted in two types: additional screws to add in the structure to secure the boards inside the payload and holes to make on the FRP shield.

After discussing with the other teams, we have the dimensions to satisfy everybody's need. Special attention was dedicated to the FRP holes. There will be a hole for the camera to look outside of the payload, and smaller ones to let sensors and antennas be placed on the outside, yet still be connected to the circuit inside.

The last structure details will be done in the following weeks. Once that is finished, we would be ready to start the preliminary integration of the whole payload. We can check how all the components fit.

## Communication

During the last month the COMM team has work in the communication as a whole, taking care of the practical details. For instance, loading the programs on the boards (FPGA) in the payload and considering the power for transmission. Firstly, we realized we will be needing a power amplifier. We ordered it and finally received it: we will still need one extra week to mount it. On the antenna side, we tested the antenna features. The primary antenna was under impedance matching measurement and we checked that around the frequency we are going to use (~445 MHz), the antenna has good matching.

On the FPGA side, the board that is connecting the FPGA and the RF Front End is being finished. In the meantime, we are working with an evaluation board for our FPGA (ZEDBoard), in which we have downloaded all the program that processes the data incoming from the Arduino, and we are configuring the RF Front End from this evaluation board in order to have everything ready to load on the FPGA board that we are going to use on our payload.

Next step is to test the system.

## HW/SW System

We have been manufacturing the boards. The process started with PCB drilling, using two sided boards, to print the circuit. Then, the components were soldered in the circuit. We ended up with three different boards: one designed for the Arduino and some other components, a second one where most of the sensors are placed and the last one, where the camera and a temperature sensor will be located.

Apart from the electronic circuit itself, we also had to take into consideration the connectors (choose the right interface to link the different boards) and how each board is secure to the structure (which meant leaving some free space for the holes).

We will be trying the electronic system in the following weeks, and also measuring the required current for the PSIP.