



# HASP 2018 Monthly Status Report

**Report Month:** February, 2018  
**Submitted by:** Iakov Bobrov  
**Submit Date:** 23 / 02 / 2018  
**Institution:** The University of Sheffield  
**Payload Number:** 2018-09  
**Payload Name:** Sheffield University Nova Balloon Lifted Telescope

## I) Activities During Previous Month:

On 16th of August we submitted the Revised HASP Payload Application with altered design of the experiment and report based on the comments to our first HASP Payload Application.

CAD design of the experiment, including gimbal, supporting structure and E-box, was finalized. We requested additional vertical and horizontal extensions to the experiment dimensions. Reasons for that, explanations and the assessment of the instrument performance if the waiver is not granted were included in the application. Access to GPS/time information was also requested in the Revised HASP Payload Application. Gantt chart and project plan for Mechanical and Electrical/Software teams were created by sub-team leaders. The Uplink/Downlink design was finalized. The motors were selected. The wiring diagram was done.

## II) Issues Encountered:

The Electrical team found it challenging to do the Uplink/Downlink design because it required to fully understand the potential faulting conditions and the ways to avoid them. The team found it difficult to convert ES232 to USV due to lack of experience. It also took the Electronic team a lot of time to finalise the wiring diagram because the task required to coordinate with the Mechanical team.

The Mechanical team could not finish CAD, until the Optics team finalised the choice of a telescope and took into consideration the length and resolution of the telescope. We also encountered problems with researching alternatives to our existing motor. We had to find the motors capable to support the required torque and power consumption. We found a new motor with a harmonic gear installed in it, but the power consumption was too high, due to which we decided to use the original motors and the original harmonic drive. In addition, as we had experience working with the original motors, there is no need to develop a new protocol.

## III) Milestones Achieved:

Revised HASP Payload Application was finished and submitted.

## IV) Plans for Coming Month:

**Table 3.1.2.1 – Mechanical Team Work Breakdown Structure**

Task	Details	Duration (Days)	Lead
<b>Preliminary Concept</b>		31	Joycelyn
Design Concept	Generation of preliminary design concept	20	Joycelyn
CAD Modelling	CAD Modelling in SOLIDWORKS of preliminary concept	11	Alexander
<b>Concept Re-Iteration</b>		15	Joycelyn
Design Concept	Feedback used to generate revised concept	7	Joycelyn
CAD Modelling	CAD Modelling in SOLIDWORKS of revised concept	8	Alexander
<b>Detailed Design</b>		28	Alexander
Engineering Drawings	Production of technical drawings in SOLIDWORKS for manufacturing	7	Brandon & George
Manufacturing Plan	Assigning manufacturing tasks, send requests to workshops for complex parts	14	Alexander
Purchasing	Ordering material (to be done in parallel to other tasks)	7	Joycelyn
<b>Simulation</b>		14	Brandon
Structural FEA	Analysis using ANSYS software	14	Brandon
Thermal FEA	Analysis using ANSYS software	14	Brandon
<b>Manufacturing</b>		30	Joycelyn
Manufacturing	Manufacturing of mechanical components, collection from workshops	25	Joycelyn
Assembly	Integration with electronics hardware	5	George
<b>System Test</b>		30	Iakov
Assembly Plan	Creation of assembly manuals and launch procedures for mechanical parts	12	George
Spare Days	Used in case of delays or for manufacturing/ordering spare parts	21 (Pre-FLOP) + 44 (Post-FLOP)	Joycelyn

**Table 3.1.2.2 – Electrical/Software Team Work Breakdown Structure**

Task	Details	Duration (Days)	Lead
<b>Electronic Sub Team</b>		61	Gianni
Focusing system	Developing an arduino code for focusing system	61	Gianni
Motor	Developing a stoppable telescope protection system	15	Gianni
Soldering	Soldering all parts together	10	Iakov
Data logging	Building the sensors to monitor the system performance	15	Gianni
Updown/ Download cable	Up/Downlink protocol development	45	Gianni
<b>Software Sub Team</b>		75	Alex
Tracking	Software improvement	75	Alex
Ground Station	Design a ground station that collects all real time data and displays it	61	Gianni/Alex

**V) Other Comments: N/A**

**VI) Team Composition and Organization:**

<b>Name</b>	<b>Start Date</b>	<b>End Date</b>	<b>Role</b>	<b>Student Status</b>	<b>Race</b>	<b>Nationality</b>	<b>Gender</b>	<b>Disabled</b>
Iakov Bobrov	Apr 2017	Present	Overall Team leader	Undergrad	-	Russia	Male	No
Gianni Heung	Aug 2017	Present	Electronic Team leader	Graduate	-	Hong Kong	Female	No
Yun Hang Cho	Sep 2016	Present	Mentor	Graduate	-	United Kingdom	Male	No
Joycelyn Fontanilla	Mar 2017	Present	Mechanical Team leader	Undergraduate	-	Philippines	Female	No
Alex Hamilton	Sep 2016	Present	Software Team leader	Graduate	-	United Kingdom	Male	No
Alex Menzies	Feb 2017	Present	Mechanical Team member	Undergraduate	-	United Kingdom	Male	No
George Robinson	Dec 2017	Present	Mechanical Team member	Undergraduate	-	United Kingdom	Male	No
Brandon John O'Connell	Dec 2017	Present	Mechanical Team member	Undergraduate	-	United Kingdom	Male	No