Request for Proposal
For the Design Concept
Of the Balloon Satellite
(BALLOONSAT)

Project MS HILT

Team M^5 Members:

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Overview and Mission Statement:

In quantitative data, we expect to be recording humidity, light intensity, and internal and external temperature. With this data we hope to find some interesting results that could help future launches through the Earth's atmosphere. We also hope to be able to see the decrease and slight increase of temperature as we pass into the higher altitudes. We expect the relative humidity to be close to zero as we reach our peak altitude. Another thing we anticipate is to be able to find the time, relative to our data, where the balloon will pop. From that data we might even be able to calculate the altitude from the rate of ascent that the balloon will be traveling. As a group we are curious about the light intensity because we are interested in how much power a satellite in near LEO might be able to get from the Sun. This will probably be the most inaccurate part of the data that we will receive because of the inconsistency that our sensor will be able to detect.

Inside of our group, we have elected to split into three sub groups. These groups will be exterior design, technical design, and integration.

The exterior design will be in charge of designing possible layouts for the "satellite" and later build it.

The technical design group will be in charge of gathering the hobo data logger and sensors, and getting them flight ready. This is probably the most critical part because this group will have to be flawless so we will have data once the "satellite" finishes its journey.

The integration team will be in charge of placing the components into the shell and wiring the finalized components. This group will be the link between all three groups because it will have to watch that the design follows specifications and includes all of the necessary functions.

Technical Overview:

Our design will be a basic cube. During launch it will be attached, via a cord through the center, to all of the other probes. Since there is no defined top of the cube, we shall assume that the cube follows the path of the other probes and will land on one side.

Our design is shown on the drawings. It is basically the data logger and sensors shielded by a foam core layer and aluminum exterior. We expect to minimize the amount of foam and aluminum to save weight.

When we launch, our data logger will begin taking measurements and recording data. As the altitude increases, so will the amount of data that we will have collected. After the balloon pops, our cube will fall to the earth and we expect the parachute to slow our descent greatly. When our cube hits, we expect our design to save the contents from major damage, and then we shall begin our data analysis.

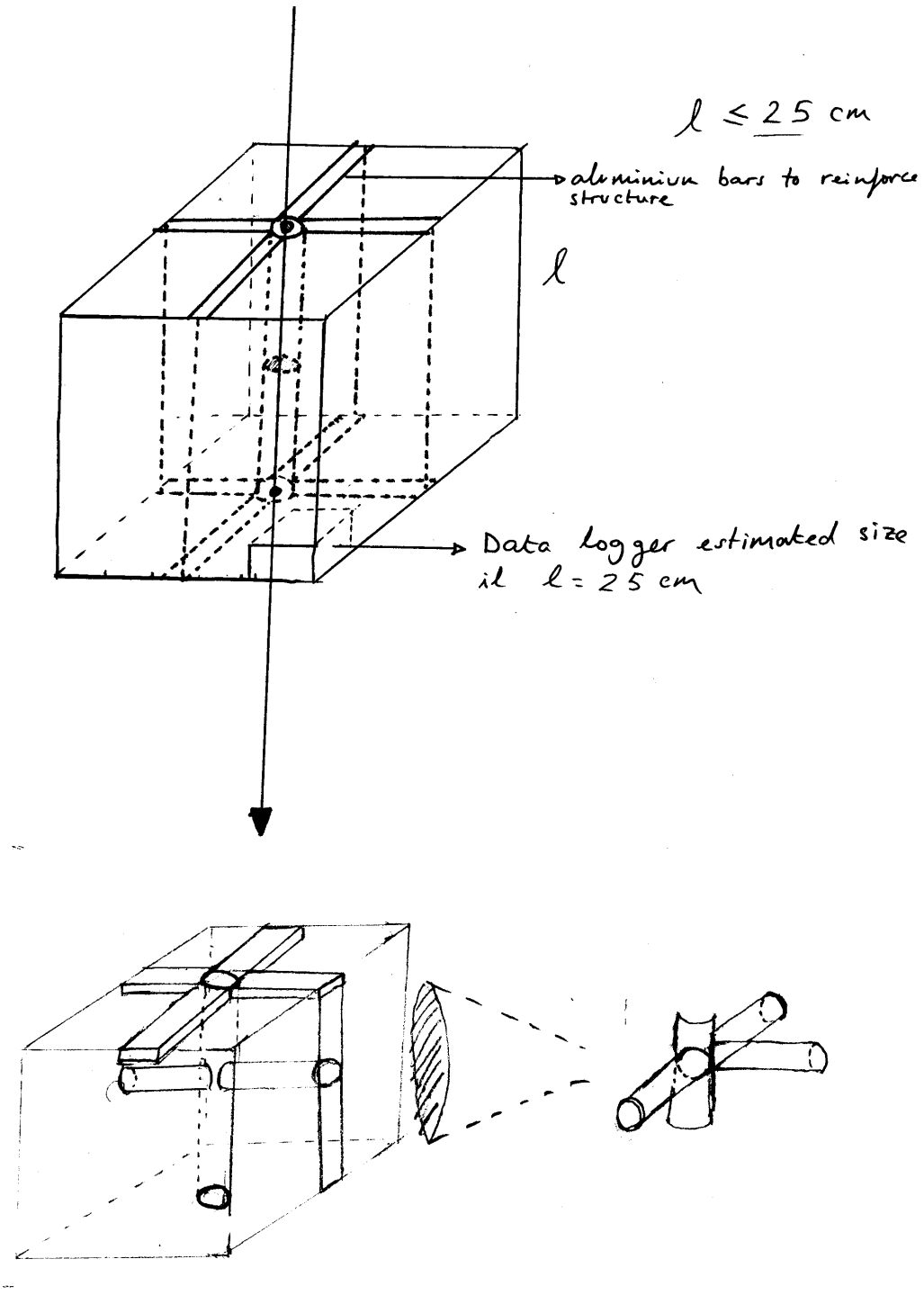
The hardware that we will be using for this mission will be: one hobo data logger, 4 sensors, aluminum, foam core, tape, and wire to connect the systems.

Our team will spit up into the previously mentioned groups and we hope to follow the attached schedule. As for testing, we plan to throw our cube down 2 flights of stairs to make sure that we will be ready for the launch date. This will also ensure that no parts will fly off in the possible scenario where someone could be near the drop location.

The only special feature that we plan to have is an etching of our design logo onto our exterior. This is only an idea that we are throwing around right now.

During the launch we will only have to thread the wire through the cube and then we will be ready.

Schematics:


l ≤ 25 cm
aluminium bars to reinforce structure
l
Data logger estimated size il l = 25 cm

Budget:

Hobo Data Logger: ~$90

2 possible setups for temperature

a) Temp sensor: -112 – 350 degrees F
$159
wt: 26g -> drop proof to 5 ft
can record .5 second intervals up to 9 hours

b) Light/Humidity/Temp sensor
-40 – 20 degrees C
$75

Structure: ~$50

Aluminum/Foam Core lining

Aluminum Shell/Frame

Sensors: ~$120

Light, Humidity, and Temperature sensors are each 23 dollars

(can be found on www.onsetupcomp.com/Products)

Extraneous Parts: ~$100

Will be found at Radio Shack or other part suppliers.

Total budget : ~$360