IOWA STATE UNIVERSITY

Make to Innovate (AerE 294X/494X)

M. Nelson

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M:2:I MAKE TO INNOVATE

Sponsored by: BOEING

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Eagle Eye

http://m2i.aere.iastate.edu/eagleeye

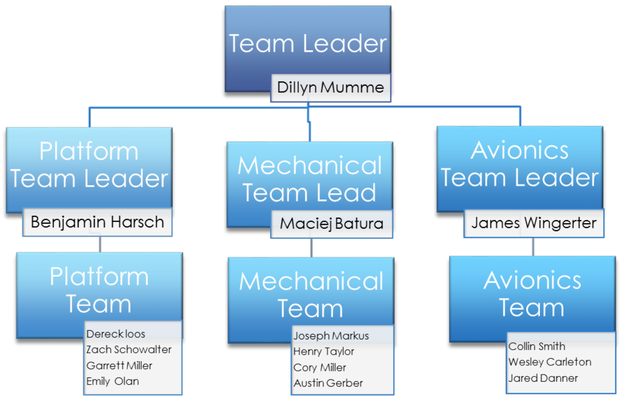
Mission Statement:

To build a rotorcraft that can assist in planetary exploration of Mars where traditional rovers or humans cannot go.

Team Eagle Eye

From Left to Right: Dillyn Mumme, Benjamin Harsch, Wesley Carleton, Jared Danner, Henry Taylor, Collin Smith, Austin Gerber, Dereck Ioos, Emily Olan, Cory Miller, Maciej Batura, Garrett Miller, James Wingerter, Zach Schowalter, and Joseph Markus

Org. Chart

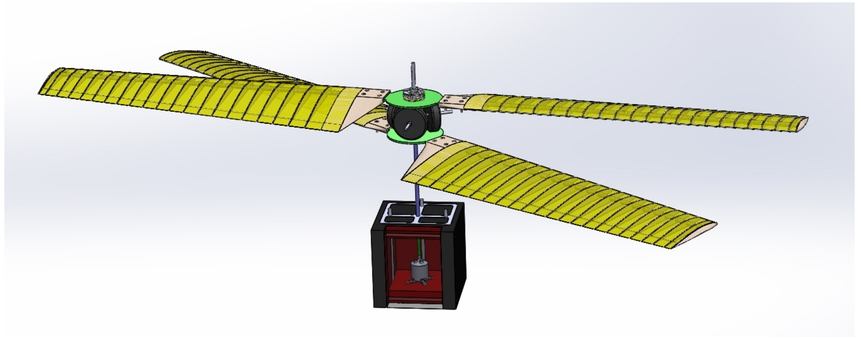


Scope of Work:

This semester Eagle Eye will be working toward the construction of our prototype vehicle and recovery system test at NASA Armstrong. To work toward this, we will also be doing velocity test on the transmission system, aero gel testing, propeller material testing, risk assessment and mitigation as well as various electronic and software testing.

Project Requirements:

- Successfully complete our test at 100,000 ft and recover the data collected from the test.
- We will use HABET, a high altitude balloon, to take us up to 105,000 ft which has comparable atmospheric and temperature conditions to Mars.
  1. Eagle Eye will start to spin up and detach from HABET.
  2. We will then hover for 60 seconds followed by a power down sequence.
  3. Once in free fall, our co2 deployment system will deploy a parachute that will bring us to a less than 6 m/s descent speed and bring us safely down.
- Our collected data will confirm success, which will be a High Altitude record for highest helicopter flight, confirming our theory that helicopters can be used for Mars exploration.



What have we accomplished:

So far this semester we have complete our risk assessments for all milestones, an example shown below (Fig.1), completed our prototype propeller blade (Fig.2), and tested our recovery system at 65,000ft (Fig.3).

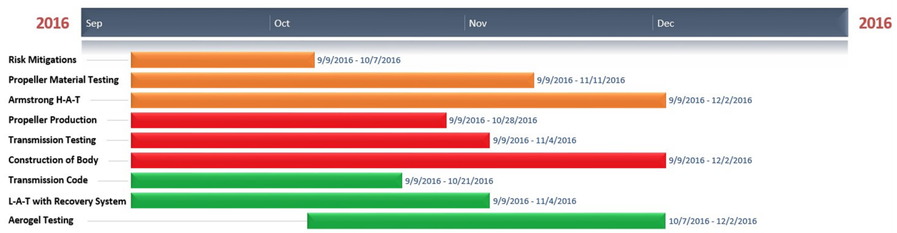
Milestone	Consequences	Rationale	Likelihood	Rationale
Propeller testing	Yellow	The consequences behind this are rather serious due the toxicity of the materials should they be inhaled	Green	If we wear the proper material the risk should be relatively low and thus the chances of having any toxic exposure should be minimal.

Fig. 1

Fig. 2

Fig.3

Project Timeline



Tasks/Goals:

- For this semester our goal is to complete our milestones and setup the NASA Armstrong recovery system test. This would include testing our recovery system at full vehicle weight, building the transmission, body and propellers; as well as finish coding for the control systems.
- Next Semester into Fall 2017 we look at doing incremental testing at Armstrong; recovery system test using our parachute, full system tests, and final testing at 100,000 ft.

Acknowledgements:

Works Cited: