Short Range 8-Propeller UAV

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Project Background

Current UAV systems contain configurations that result in power depletion and are not suited for long distance operations. This is due to the power source being utilized and the conditions that a typical UAV must withstand during operation. To resolve this dilemma, the Aerospace Corporation has designed new configurations that may provide the capability to overcome those concerns.

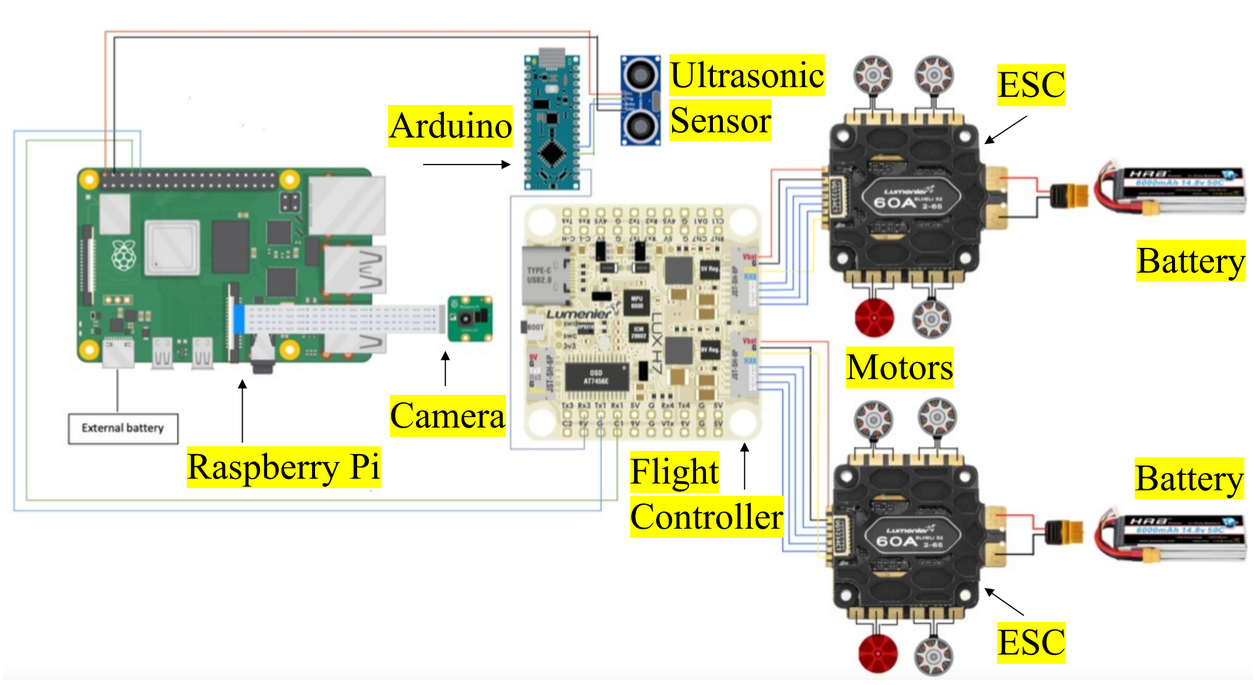
System-Level Requirements

Item	Requirement	Performance Objective
1	Weight	<10 lb.
2	Thrust	~45 N
3	Flight Time	10~15 mins
4	Max Altitude	1 meter
5	Power	~800 W

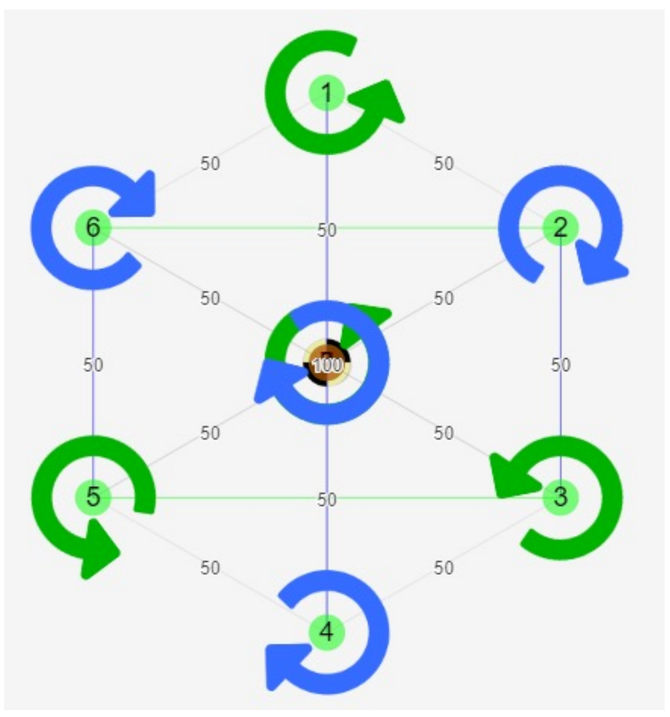
Project Objective

- To develop and construct a UAV while implementing a structural UAV patent concept given by the Aerospace Corporation. The patent concept utilizes a central fan with propellers surrounding the fan in a circular formation. The emphasis of this project was the structural design and corresponding flight control system to determine the feasibility of the Aerospace concept and the performance that can be achieved.

Overall Design Approach



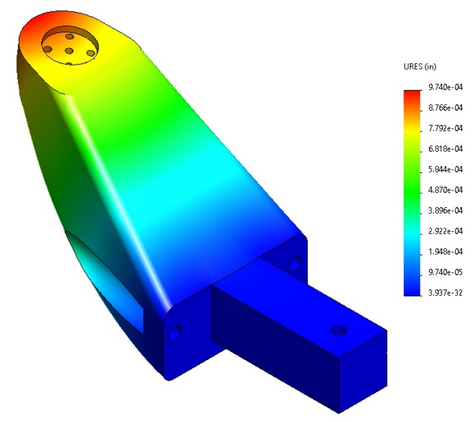
Electronics and Wiring Schematic



Propellor Rotation Configuration

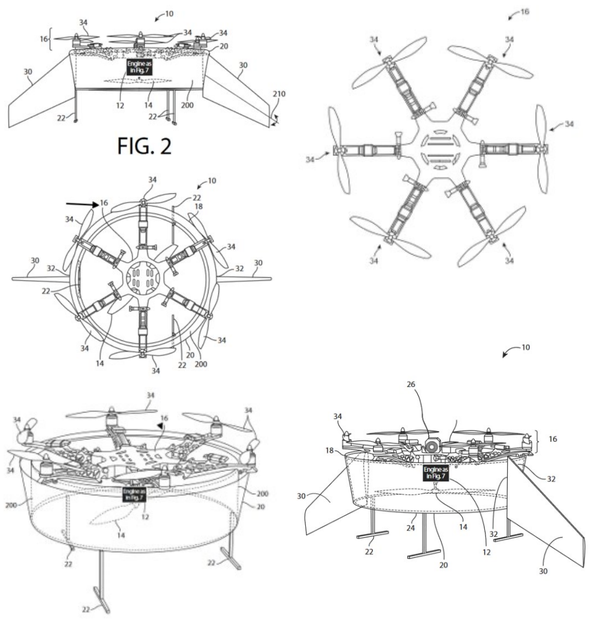
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Motor Mix Configuration

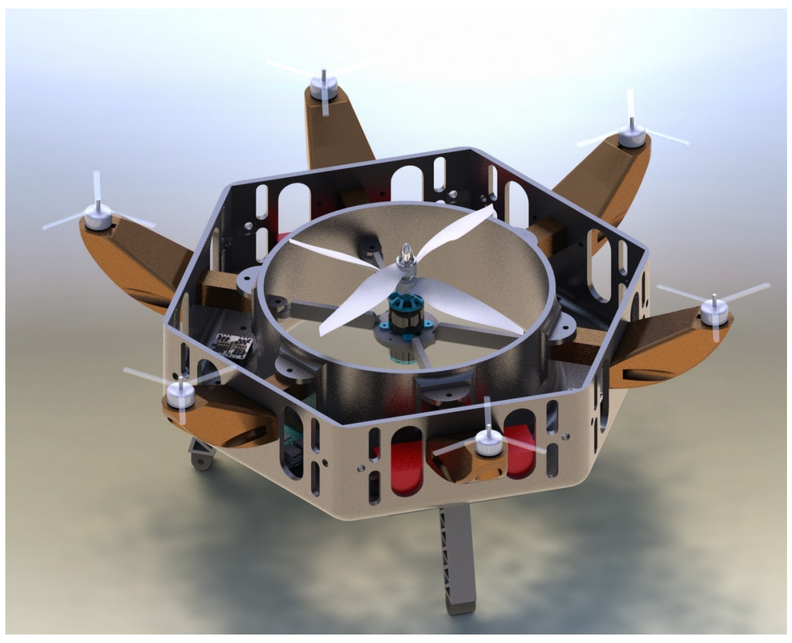


Deflection Analysis

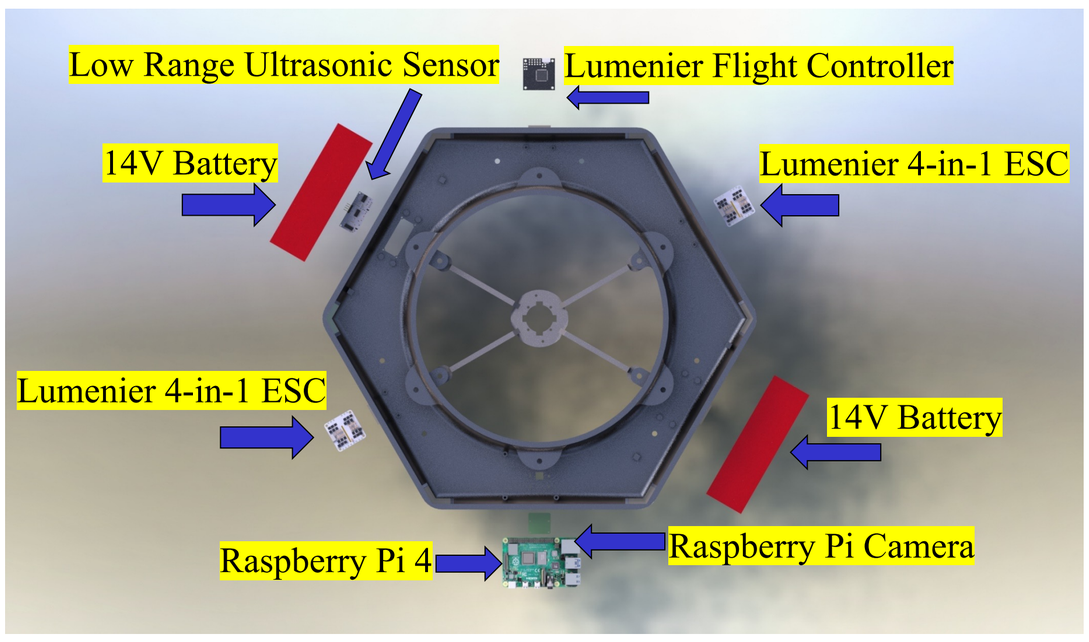
Results



Initial Concepts Provided



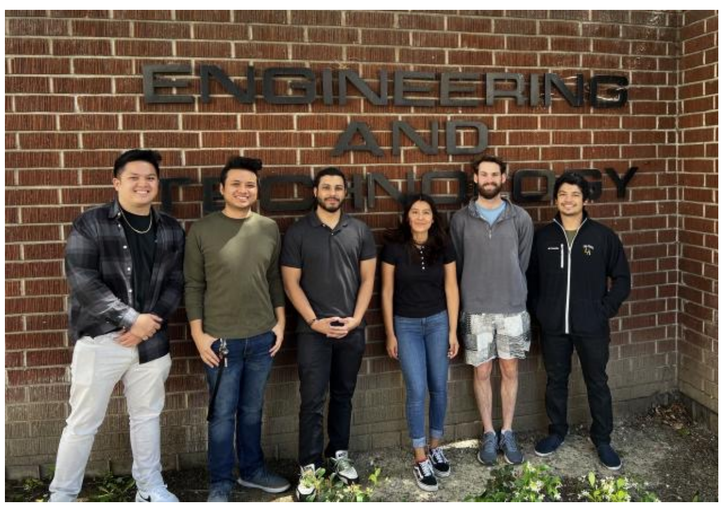
Final SolidWorks Model



Electronics Management with Component Labels

Acknowledgements

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Left to Right: Ethan Lucas, Quocvi Mai, Ray Ayala, Annie Cornejo, Cameron Bolger, and Andy Zepeda

Conclusion

The UAV is currently in development through 3D printing. The next phase will consist of bench testing the electronic hardware, troubleshooting the flight programming, and running diagnostics on the flight capabilities of the UAV.