High Altitude SUAV

Erin Dodd, Derek Griffioen, Matthew Riediger, Ben Snow, Noah Thompson

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Problem Statement

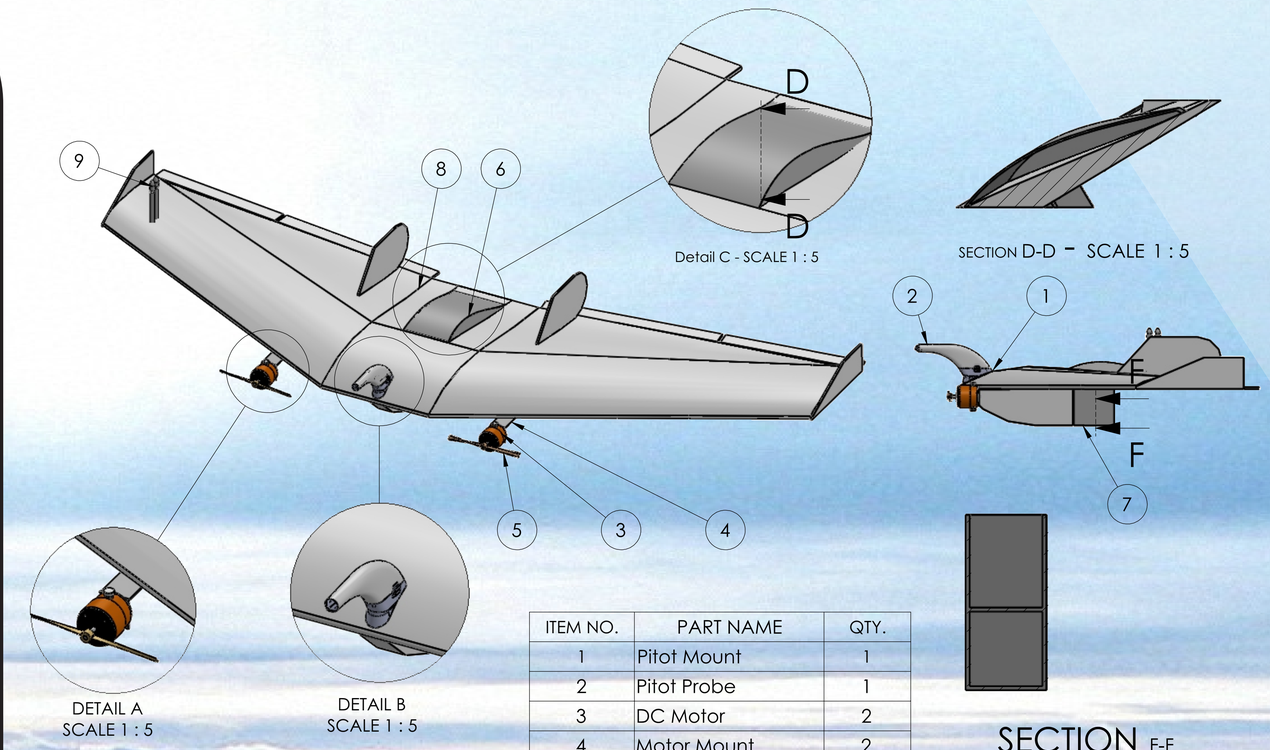
Accurate climate measurements are a vital part of research, but weather balloons are costly and difficult to recover. There is, therefore, a great need for a flexible, recoverable research tool.

Objectives

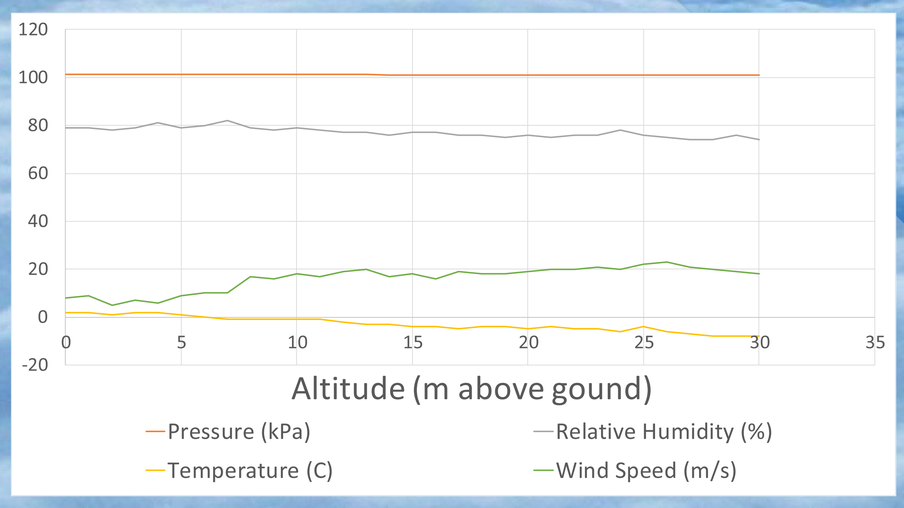
- Allow for additional, interchangeable sensors
- Must record temperature, pressure and relative humidity at a minimum
- Real-time streaming of flight-crucial data

Design

- The design solution is a Small Unmanned Aerial Vehicle
- The glider holds an Arduino connected to a flight controller and an environmental monitoring system, saving all data to an SD card
- Permanent module protects electronics from rain while leaving them open to the atmosphere
- Specially designed pitot-tube module allows for determination of wind speed and direction
- Removable module allows for convenient customization, while protecting electronics & allowing access to atmosphere
- Plane is designed to be crash resistant, absorbing energy from a crash while protecting fragile electronics & sensors



ITEM NO.	PART NAME	QTY.
1	Pitot Mount	1
2	Pitot Probe	1
3	DC Motor	2
4	Motor Mount	2
5	Propellar Blade	2
6	Removable Module	1
7	Permanent Module	1
8	Plane	1
9	Radio Reciever	1



Results

- SUAV achieves approximately 30 minutes of flight time
- Standard sensors collect altitude, temperature, pressure, relative humidity, wind speed and wind direction data
- Customizable design allowing for future research applications

Future Work

- Test durability for extreme climate conditions
- Add methane and ammonia detection capabilities
- Add capability to sample particulate matter
- Live-stream environmental data to pilot during flight

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Advisor: William Lubitz Ph.D., P.Eng

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