

# Quad Propeller UAV Team



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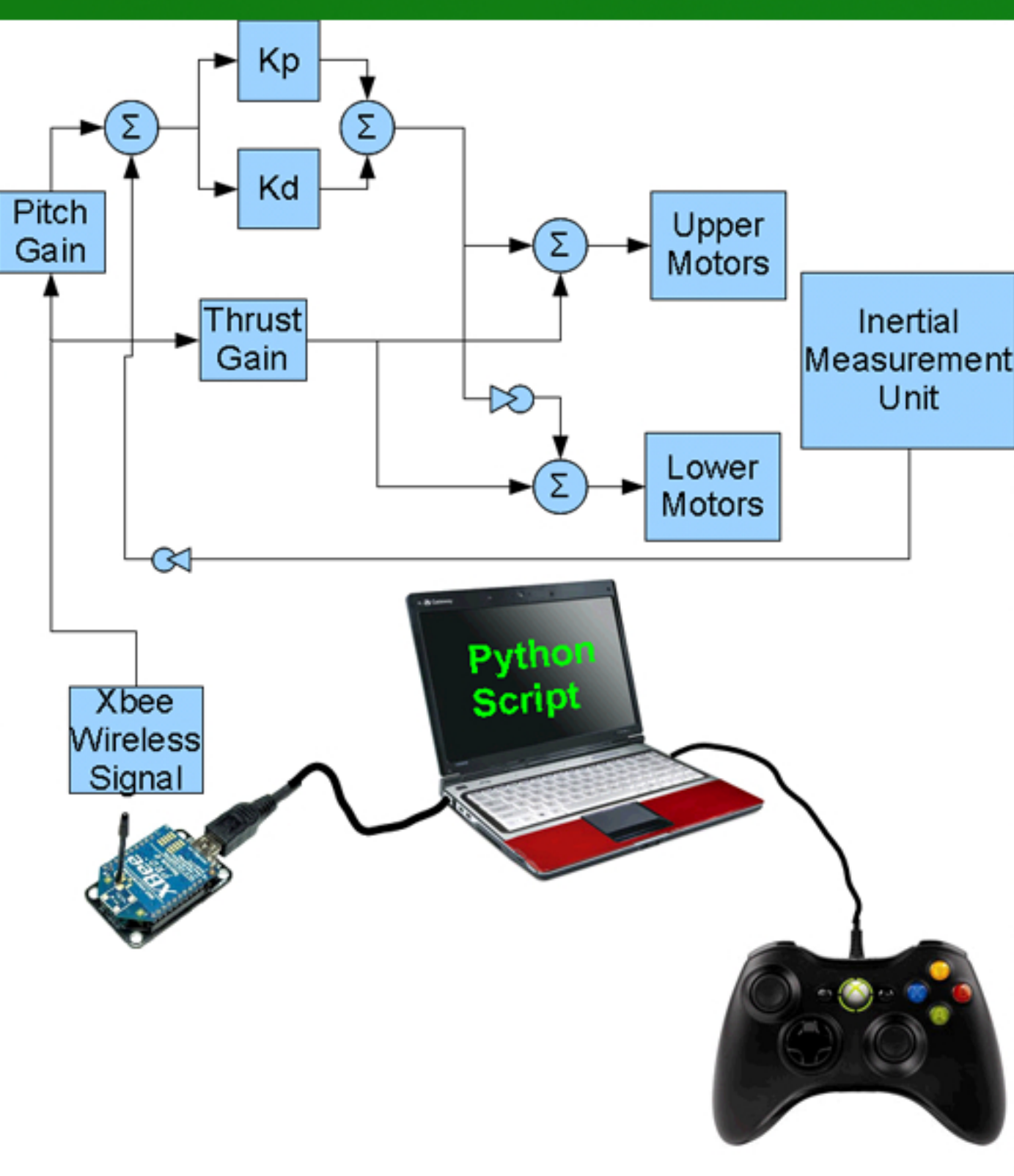
## Project Overview:

Quad-rotor UAVs provide omni-directional flight in a "helicopter style" flight mode by varying the individual rotors. This flight mode, however, requires very high power consumption, meaning lower range, flight time, and flight speed for a quad rotor compared to a fixed wing craft. The main focus of this project was to build a hybridized craft, which allows **Dual Flight Modes** and fixed wing flight with **No Traditional Control Surfaces**.

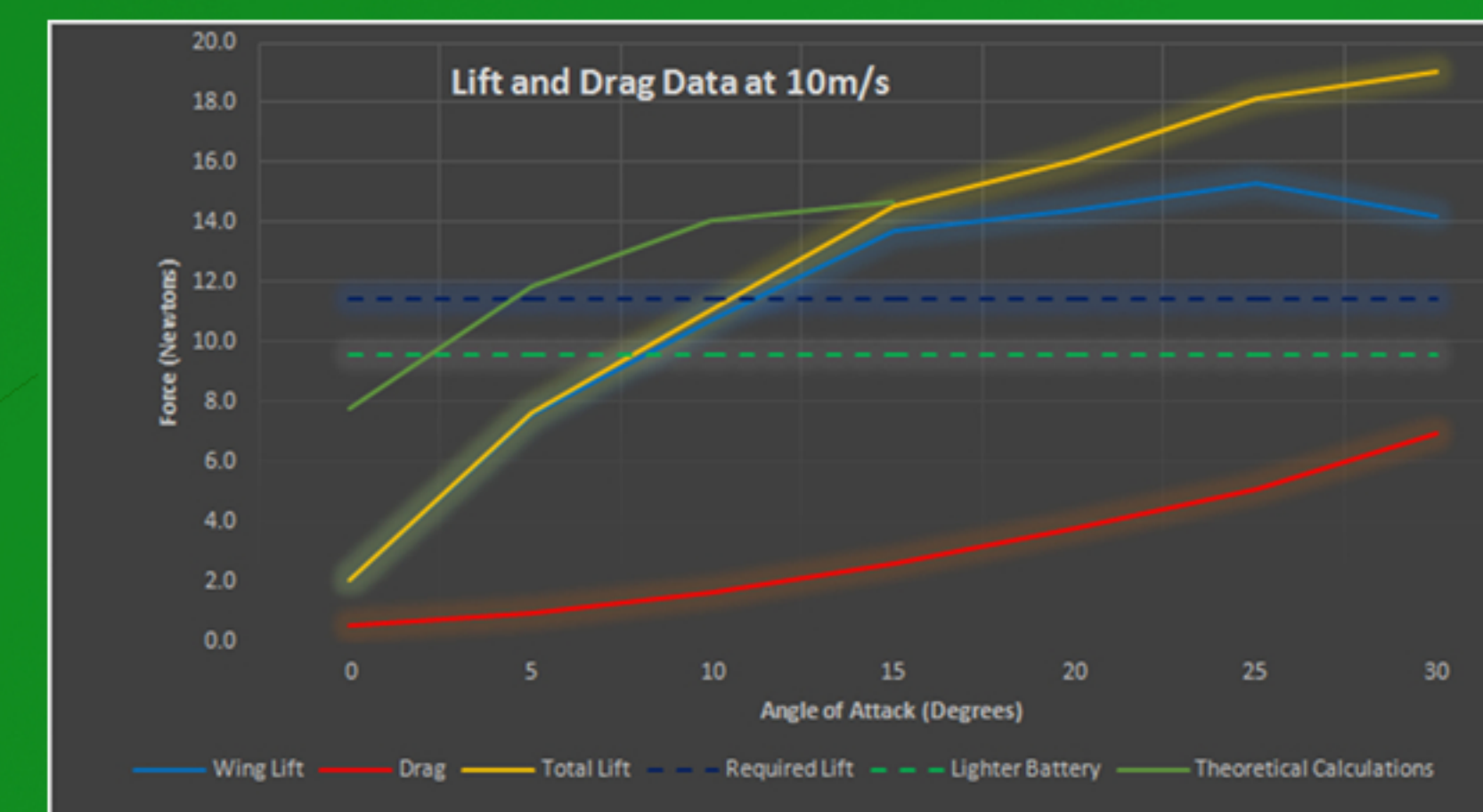
## PICTURE DEMONSTRATING DUAL FLIGHT MODES

### Controls:

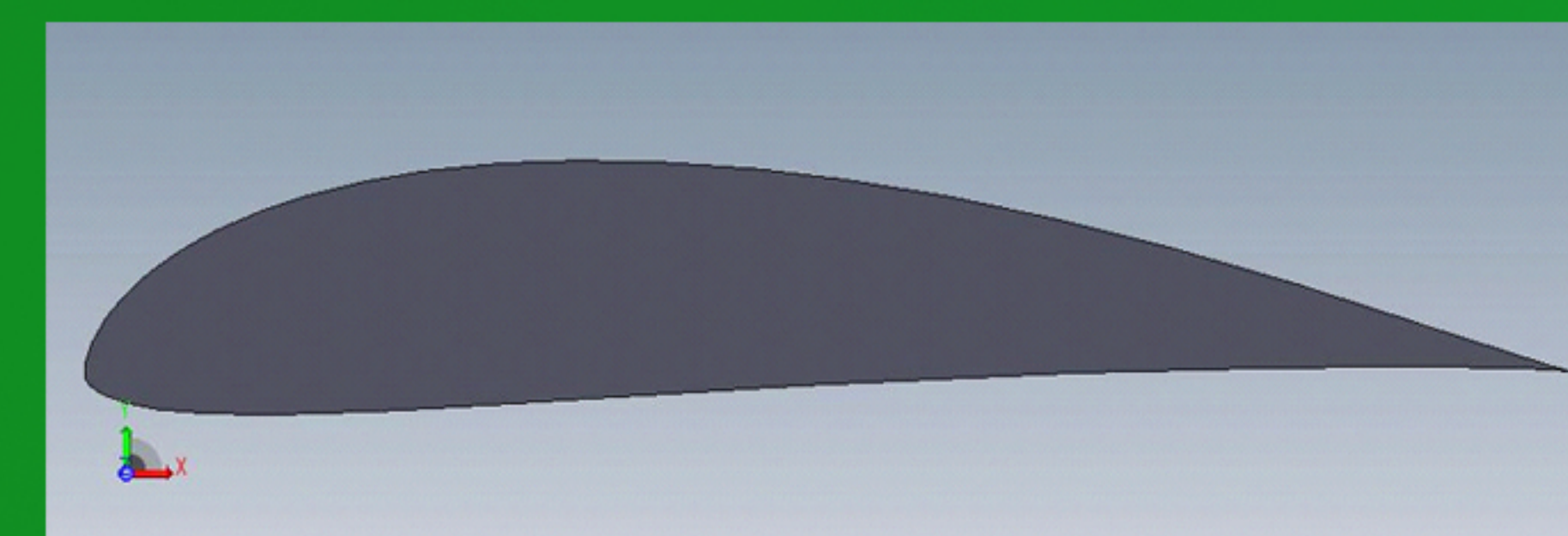
- Instrumentation and control by ArduPilot Mega
- Ardupilot held stationary using custom plastic mount



## Aerodynamics:



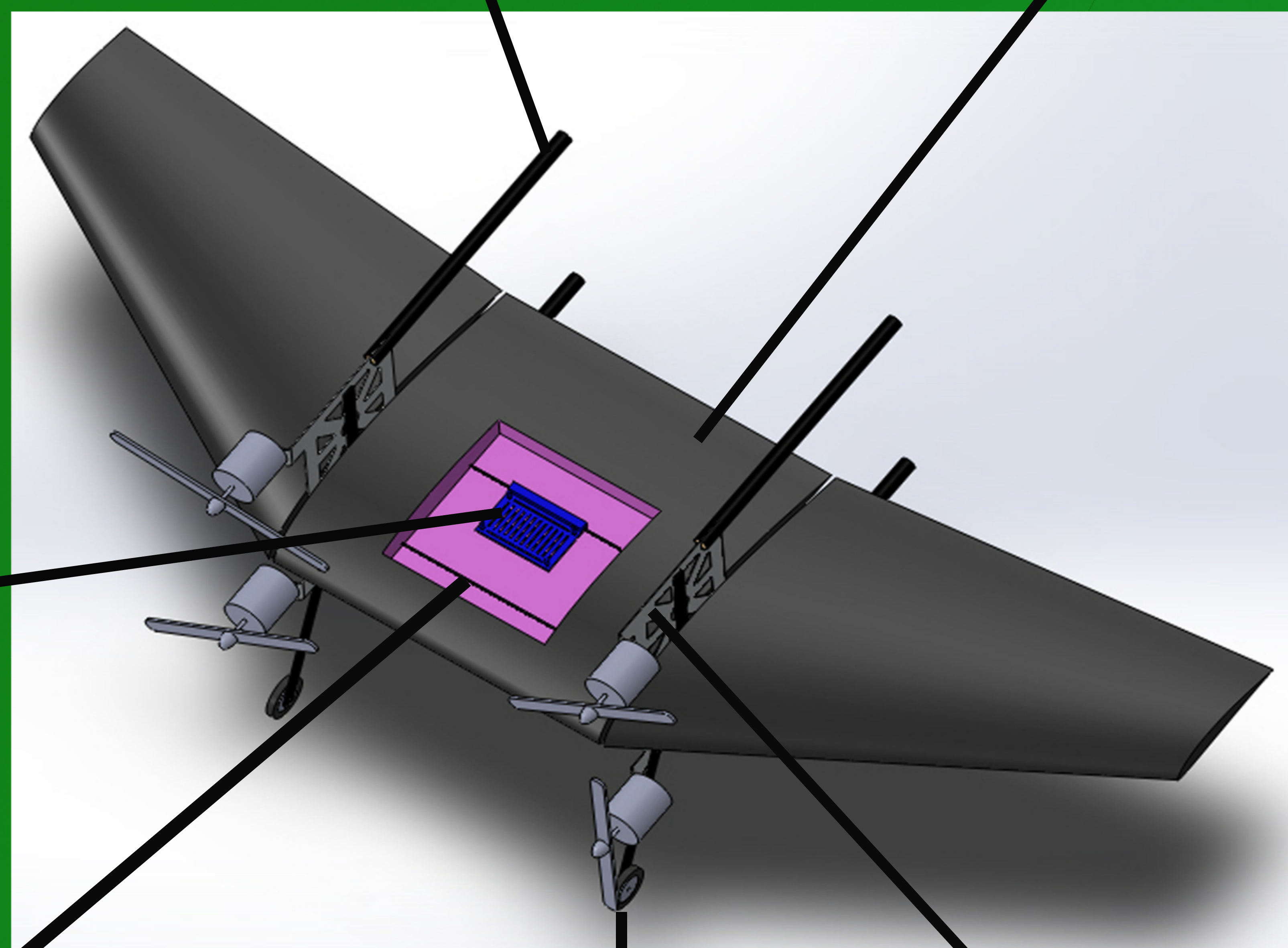
•S9037 Airfoil (Sail plane airfoil) from UIUC database (17% thickness)



- 12" wide fuselage
- 15" wings with 30 degree sweep
- 42" wingspan
- Wings and Fuselage manufactured using "Hot-Wire" technique
- Foam wings and fuselage then coated with "Monokote"

## Conclusions:

The Quad-Propeller UAV serves as a proof of concept for further investigation of similar crafts. Preliminary testing of the final prototypes showed that the craft can produce sufficient lift, and that it is controllable solely by use of quad rotor dynamics in a fixed wing flight mode. It is recommended that this project be used as a jumping-off point for developing further research on similar crafts.



Carbon fiber landing gear were designed to support the craft during uneven vertical landings

Carbon fiber spars connect wings to fuselage and stiffen wings

Carbon fiber reinforced aluminum brackets provide a stiff yet lightweight framework for component attachment

Carbon fiber landing struts with plastic wheels allow horizontal (airplane style) takeoff and landing