



# UCI Cargo Plane 2021-2022

## "AE-22"

### Background

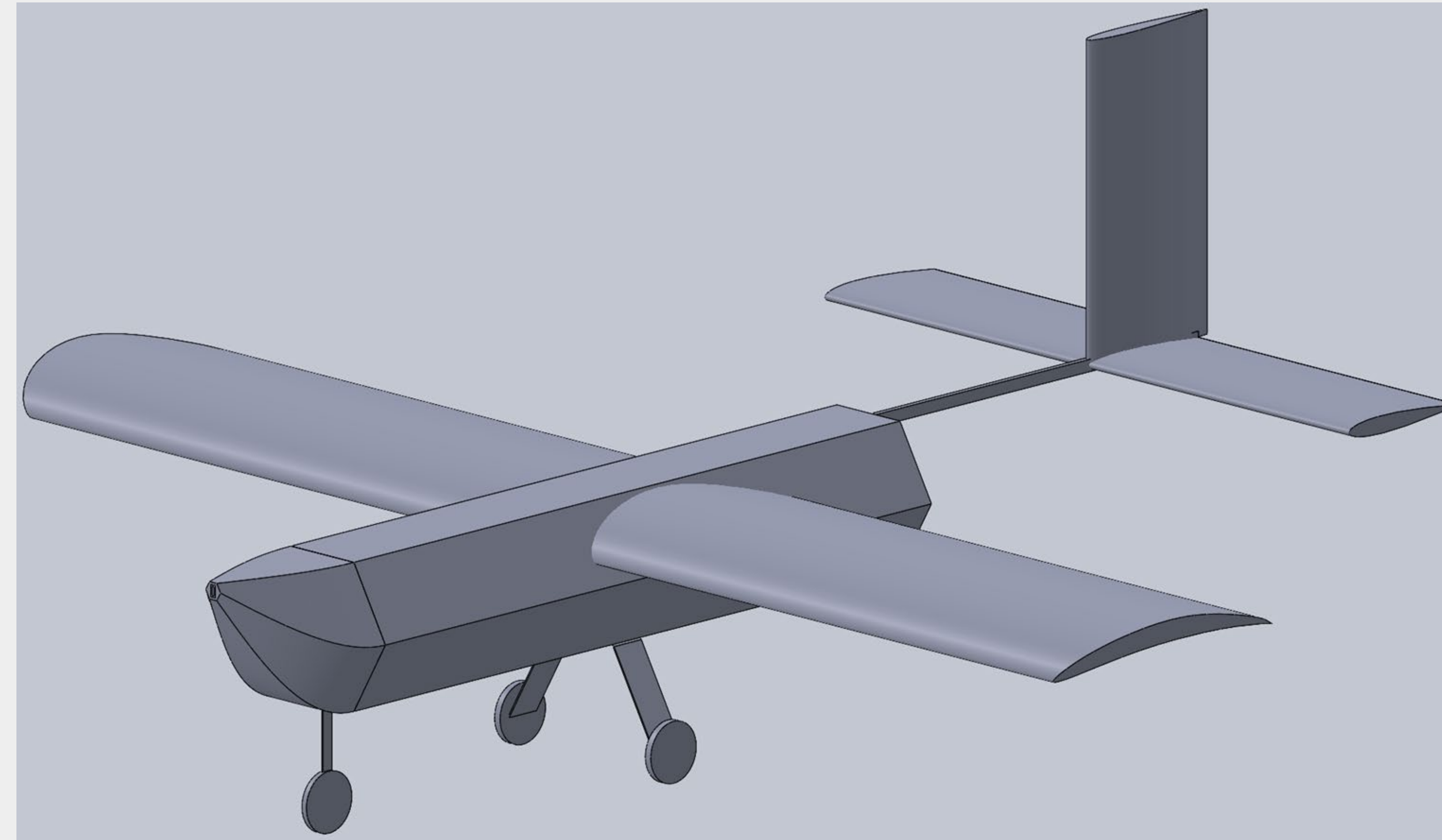
Cargo Plane is a senior design project competing in the International SAE Aero Design competition. We are designing an RC aircraft that will carry payloads of soccer balls and metal plates. Our goal is to build an aircraft that generates high lift at low speeds while carrying a large payload within a small cargo bay.

### Requirements/Constraints

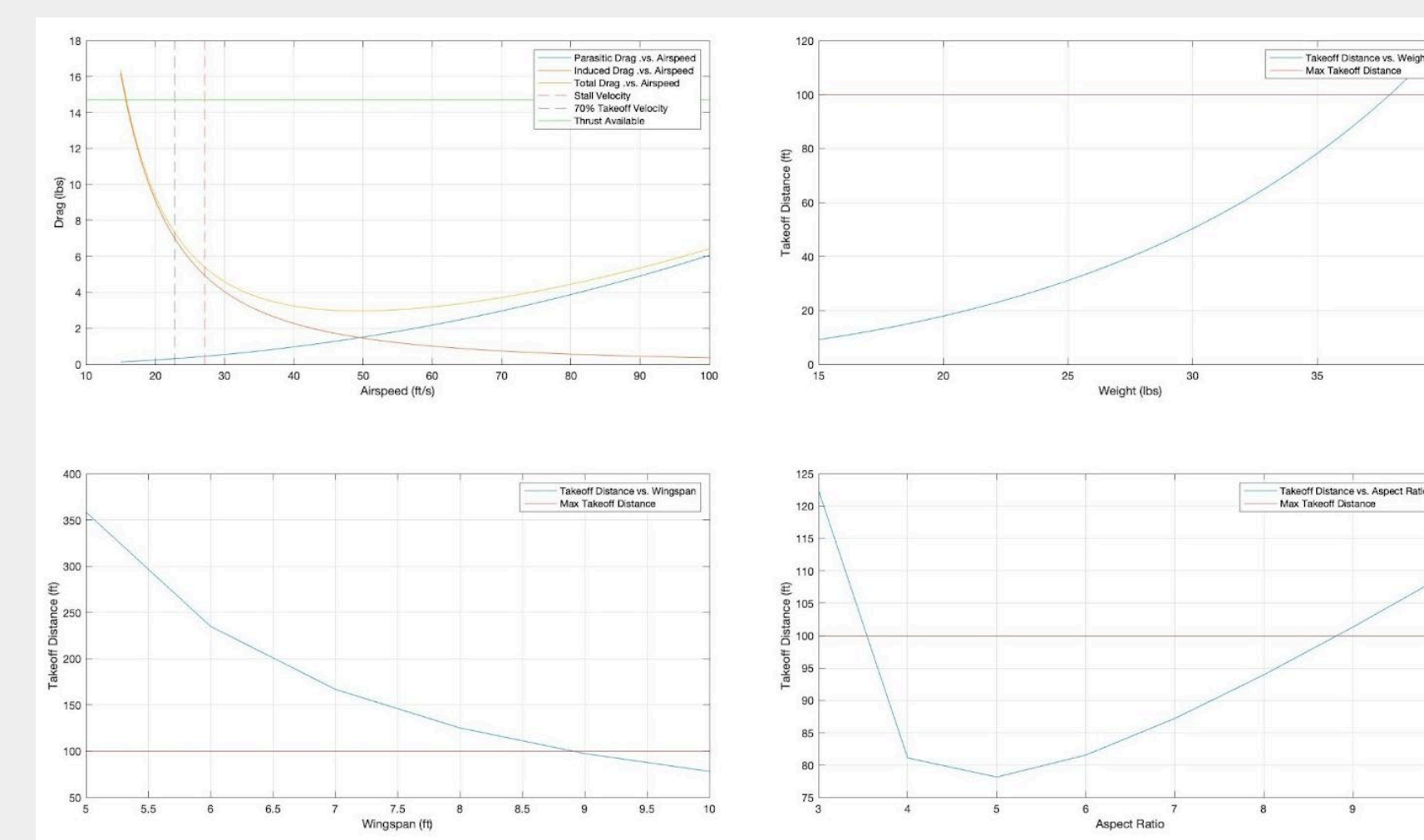
- Maximum Loaded Weight :** 55 lbs
- Maximum Wingspan:** 10 ft
- Maximum Power :** 1000 Watts
- Takeoff Runway:** 100 ft
- Landing Runway:** 400 ft
- Cargo:** Soccer Balls and Steel Plates
- CG Requirement:** Flyable in empty and loaded configuration

### Future Work

The UCI Cargo Plane Team will continue the computer aided design and optimization of the aircraft's aerodynamic and structural performance. Manufacturing is the next phase which will start Winter Quarter of 2022. After manufacturing is completed, the team will conduct testing on the Cargo Plane.



Structures	Propulsion/Avionics	Aerodynamics	Advisors
Amir Tadros	Pranav Peddinti	Alex Dominguez	Prof. LaRue
Casey Schorr	Alexis Infante	Ben Son	Sara Miri
Celine Yiu	Andrew Garcia	Brian Ndiaye	Sovanna Hul
Ephraim Liu	Calvin Kang	Jordan Louie	Tiffany Lee
Grazelle Vitoria	Kameron Clark	Mason Todd	
Gurpreet Tahim	Michael Zyburt	Michael Shae	
Joshua Tanijiri	Rory Doherty	Oscar Aguilar-Cerna	
Tyler Furukawa	Vincent Nguyen	Peter Tran	
		Reece Rivera	
		Shaadi Sabeti	

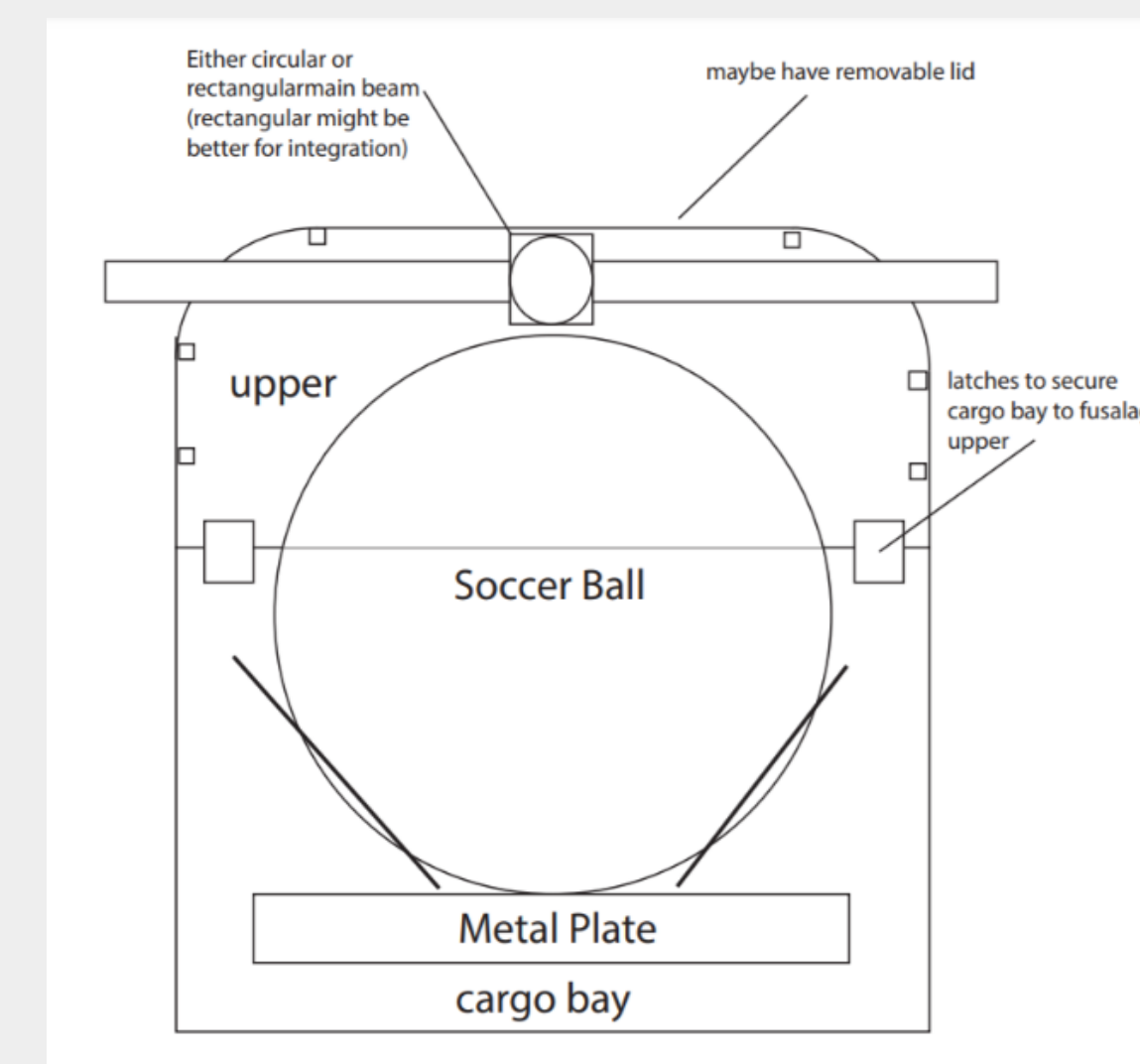
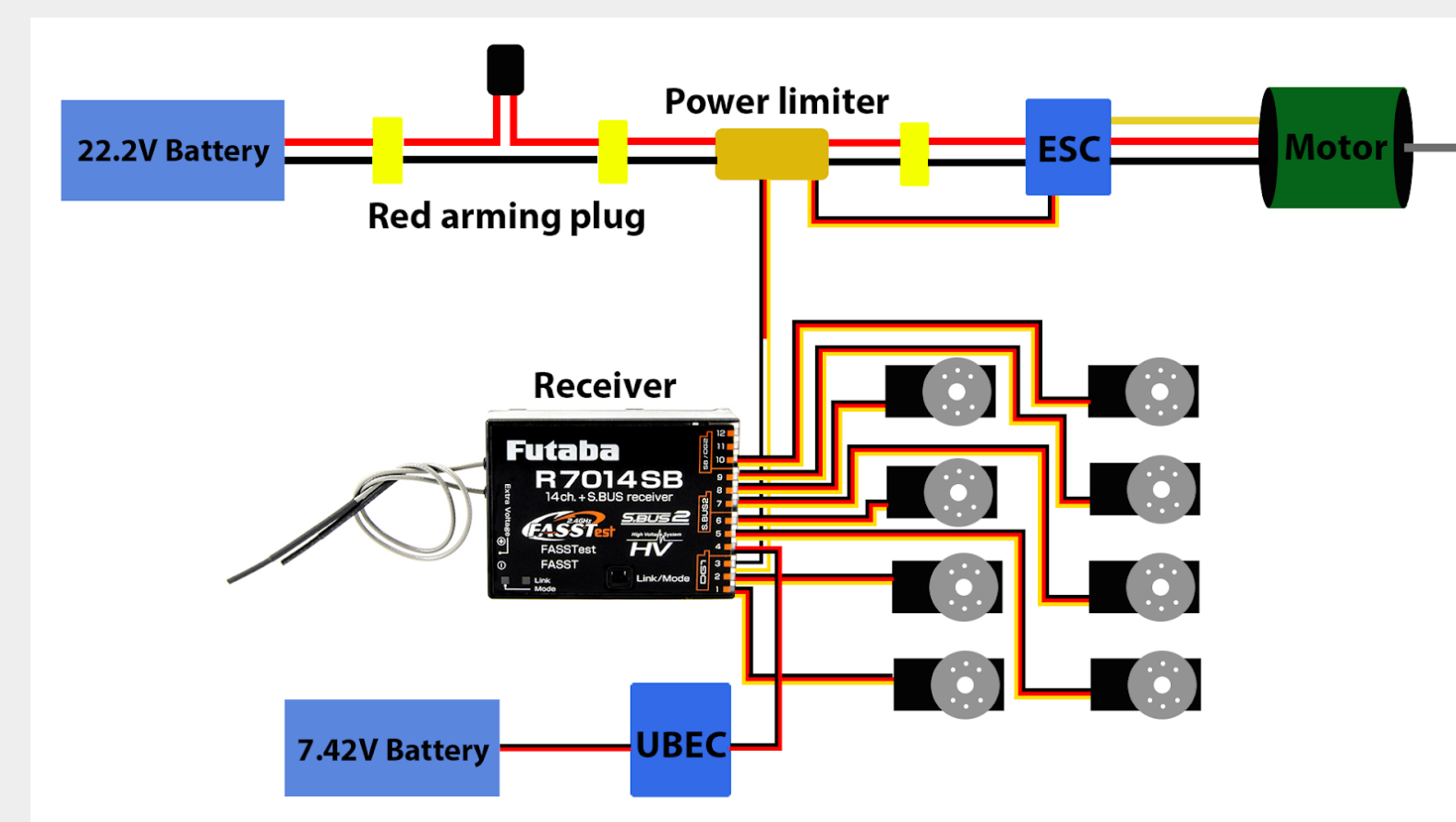
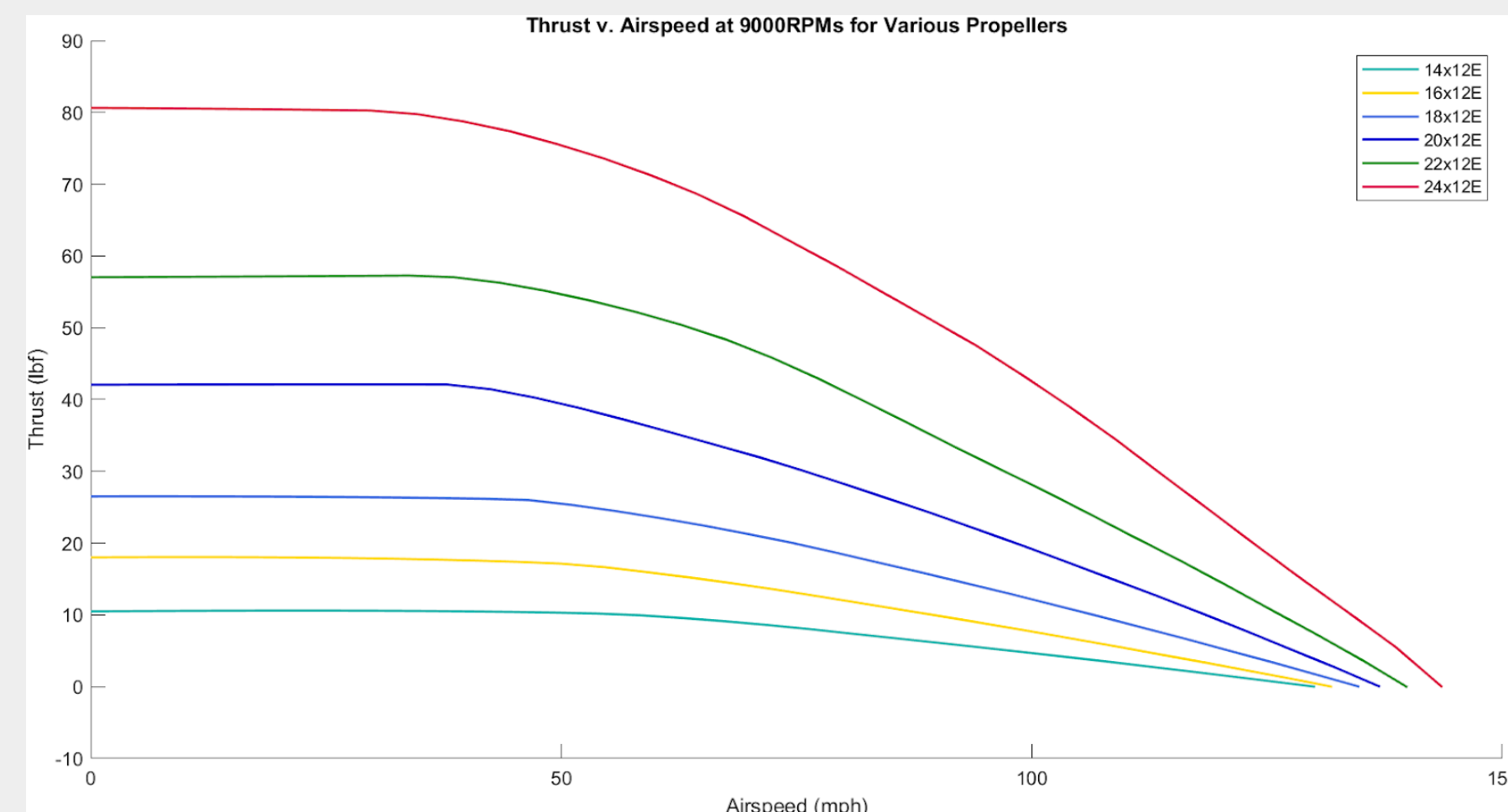


### Wing Specifications

Airfoil	Eppler 423
Chord (ft)	2
Span (ft)	10
Aspect Ratio	5
Flaperon Span (ft)	10
Flaperon Chord (ft)	0.5

### Tail Specifications

Airfoil	NACA 0012
Wingtip Type	Hoerner
Horizontal Span (ft)	4.8
Horizontal Chord (ft)	1.0
Vertical Span (ft)	2.18
Vertical Chord (ft)	1.1
Vertical Moment Arm (ft)	5.0
Elevator Span (ft)	4.8
Elevator Chord (ft)	0.25
Rudder Span (ft)	2.18
Rudder Chord (ft)	0.33



### Competition Scoring

$$FS = \frac{120 \cdot (3 \cdot S + W_{\text{Payload}})}{b + L_{\text{Cargo}}}$$