Aerodynamics

- Venerable NACA 4415
- $C_{D,0}$ = 0.031

Propulsion

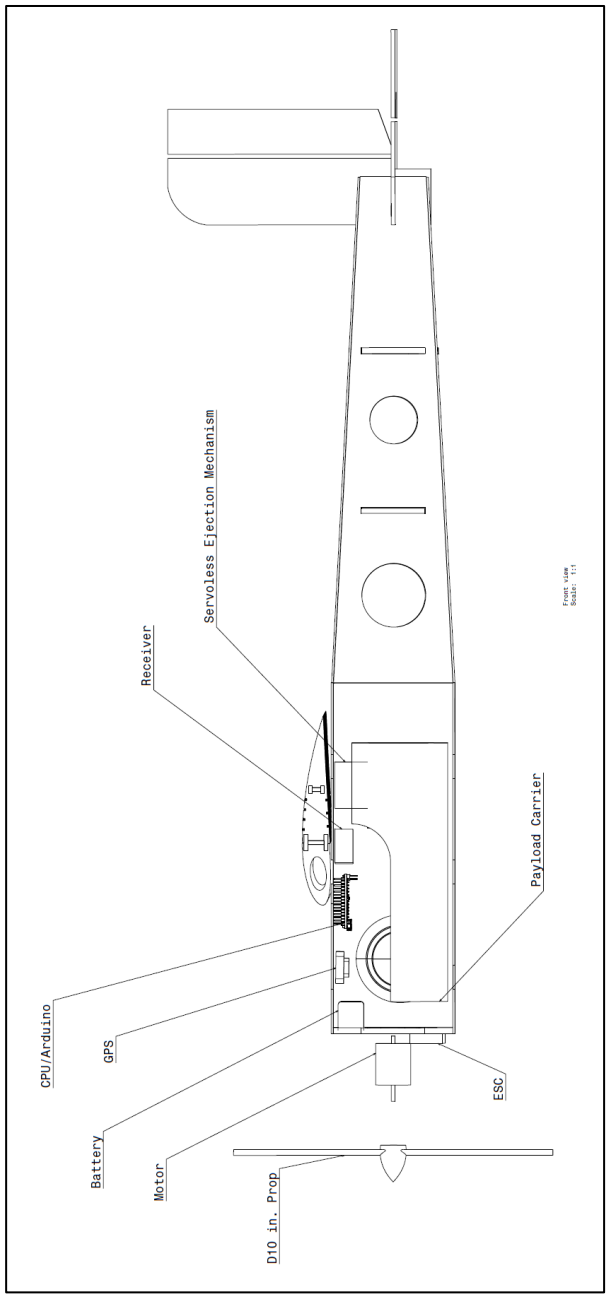
- 240 Watts of Power
- 2 minutes of endurance

Stability & Control

- Conventional wing-tail configuration
- C_{LMax} = 0.95 at stall
- 7.4% Static Margin

Structures

- Multiple/redundant load paths
- +8/-5g max loading
- 3-Ball Payload

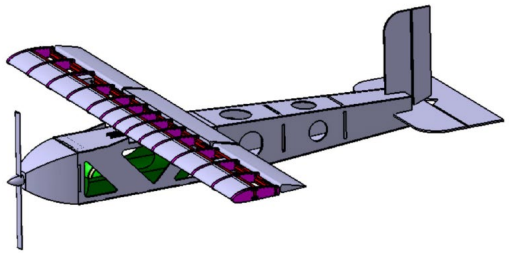


Project Prepared Scout

A strategic and simple approach to a competitive UAV design.

Wichita State University

BOEING



Team Members

Matthew Decker
Aerodynamics
mndecker21@gmail.com

Ethan Betzen
Propulsion
betzenaviation@gmail.com

Logan Schraeder
Stability & Controls, Structures
lbschraeder93@gmail.com

The Mission

WSU Bronze Propeller Competition

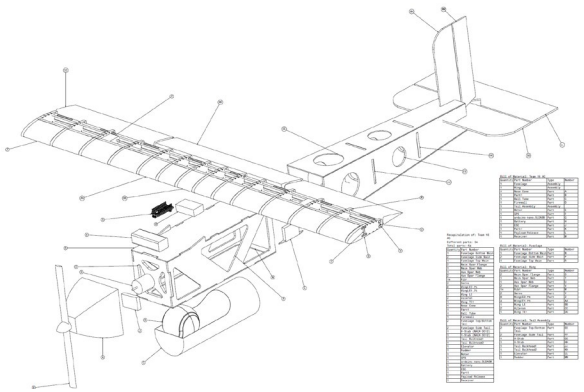
- Five Laps
- Autonomous Tennis Ball Drop
- Target: 20’ x 20’ (For Max Score)

Innovation by Design

High Scores Don’t Happen by Accident

- Designed to execute the mission with repeatable success.
- Detachable Wing for Modularity and Packability
- “Flat Plate” Tail Surfaces for Ease of Construction and Resilience
- Field-Adjustable Targeting System
- Low Part Count – 71 total pieces

.



> “Keep it simple, stupid.”
>
> *-Various*

The Aircraft

Parameter	Value
Max Speed	80 fps
Cruise	60 fps
Stall	20 fps
Tennis Balls	3
G Limits	+8 g, -5 g
Wing Area	194 in2
Wingspan	34 in
Max Lift Coefficient	1.0
Max Lift/Drag	19
Parasite Drag, CD,0	0.026
Zero Lift Moment Coefficient CM,0	-0.29
Static Margin	7.4 %
Trim Elevator Deflection (Cruise)	2.0 deg
Max Power	240 W
Propeller Diameter	10.0 in
Empty Weight	1.8 lb
Max Payload	0.38 lb
CG Location	7.8 in

Starting Strong

The Prepared Scout team began with a safe, conventional, easily validated design and philosophy in order to minimize possible unknowns during the compressed design phase. This in turn helps to maximize repeatable mission success (and score).

The Prepared Scout Difference

Many designs contending in Bronze Propeller utilize far-fetched designs in hopes of achieving a competitive edge. Instead, the Prepared Scout Team has opted to take time-tested design components, employing them in harmony and optimizing their deployment for a competitive and repeatable approach to winning.

Contact Us

Team Prepared Scout
AE 528/628 (2019-2020)
Wichita State University

https://www.wichita.edu/academics/engineering/aerospace/The_Bronze_Propeller.php