



# AquaHawk Flying-wing Search & Rescue UAV

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## Problem Statement

Coast guards struggle to quickly locate individuals lost at sea. The AquaHawk UAV is designed for offshore search and rescue operations using AI to enhance efficiency and effectiveness.

## Constraints

- Limited distance due to communication range.
- Night Vision
- Availability of Data Needed to Train the AI Model
- Environmental Factors
- Aircraft Flies in an Obstacle Free Environment
- Governmental Approvals

## Target Specifications

**Endurance:** 2 hours of flight.

**Speed Limits:**

- Stall speed at 7 m/s
- cruise speed at 15 m/s
- maximum speed at 20 m/s.

**Altitude:**

- Cruising at 50 m.
- Maximum altitude at 100 m.

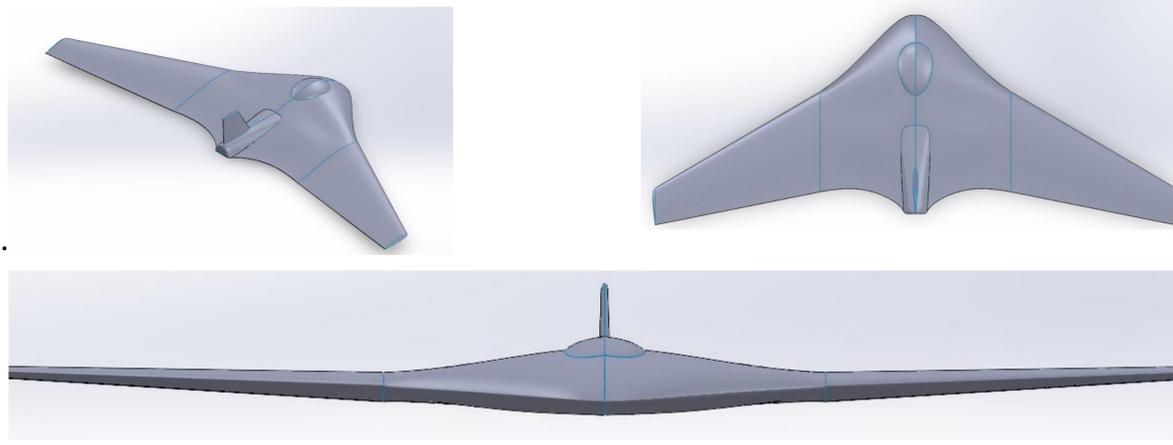
**AI Precision:** Mean average precision above 80%.

**Camera Quality:** 1080p.

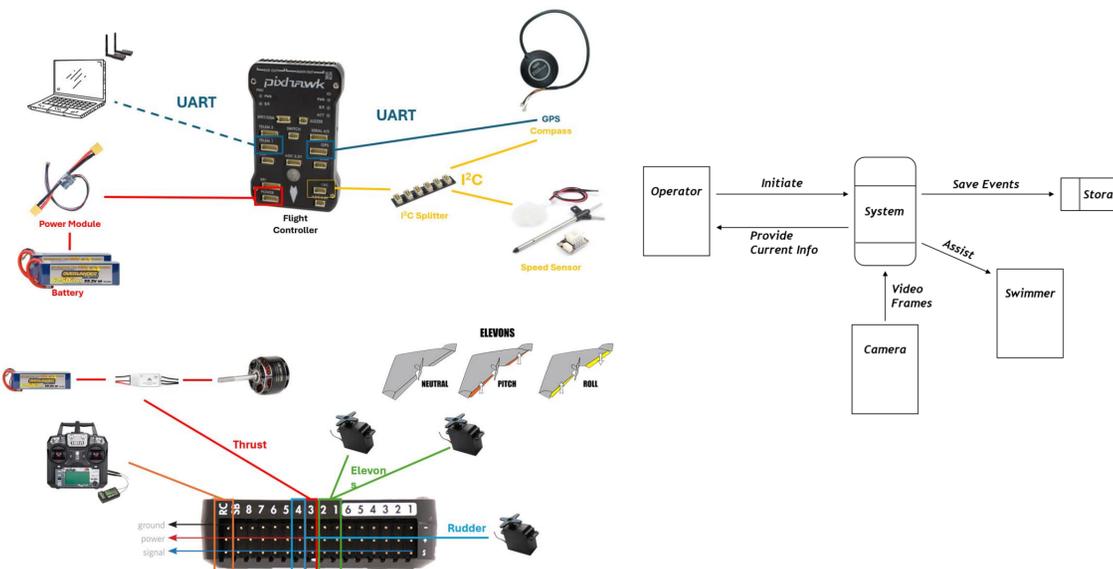
**Communication Range:** Maximum distance between the aircraft and the ground station is 1.5 km.

## System Design

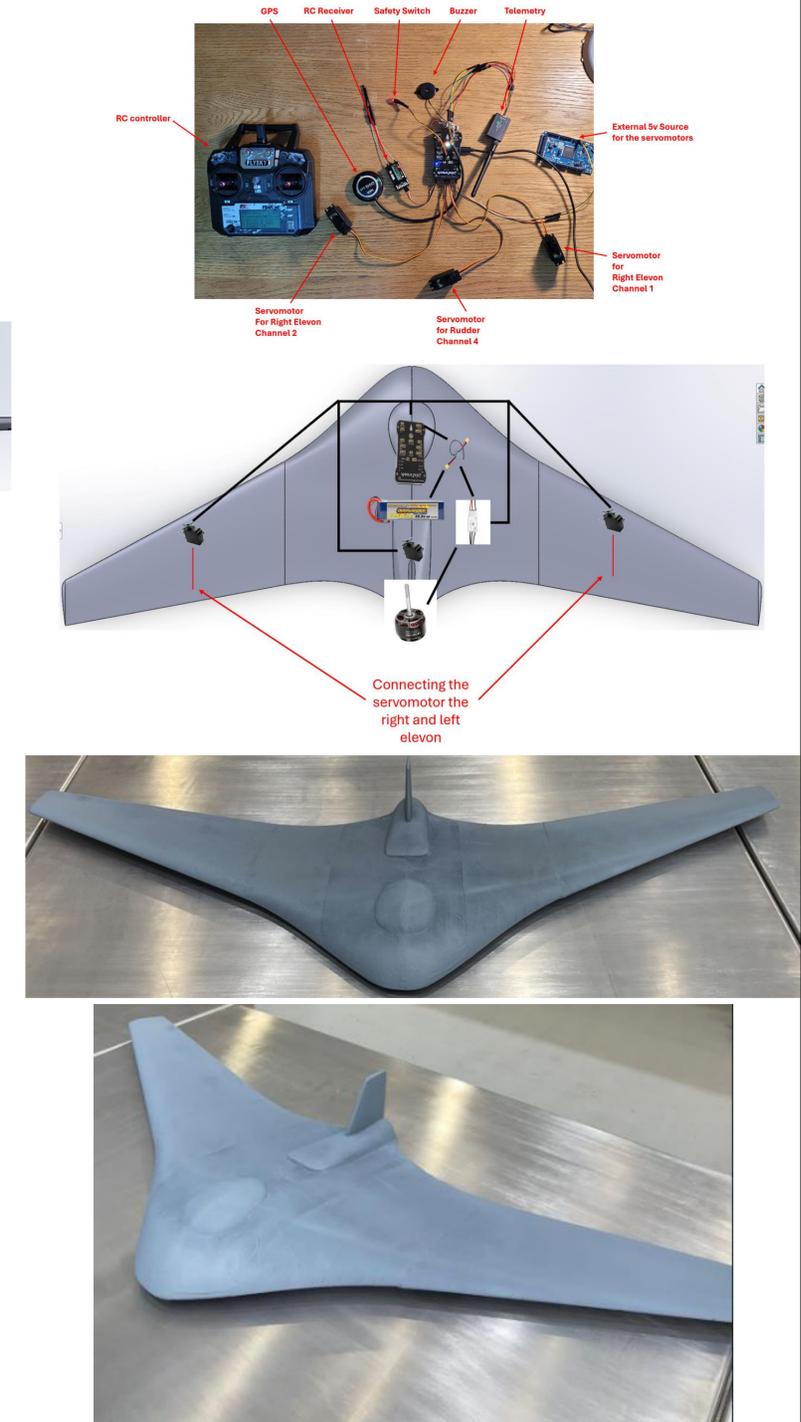
### Aircraft



### Computation



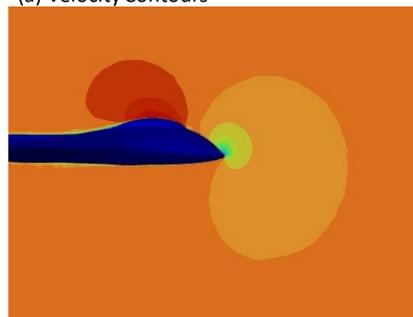
## Prototype



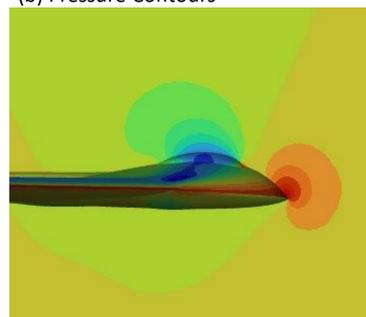
## Results Validation

	Half Plane	Total (Full aircraft)
$C_l (cz)$	0.1669015	0.333803
$C_d (cx)$	0.009708749	0.019417498
$C_m$	-0.026493052	-0.052986104

(a) Velocity Contours



(b) Pressure Contours



## Conclusion

The AquaHawk UAV showcases significant potential in enhancing maritime search and rescue operations with its innovative use of AI and advanced flight capabilities.