

## Background

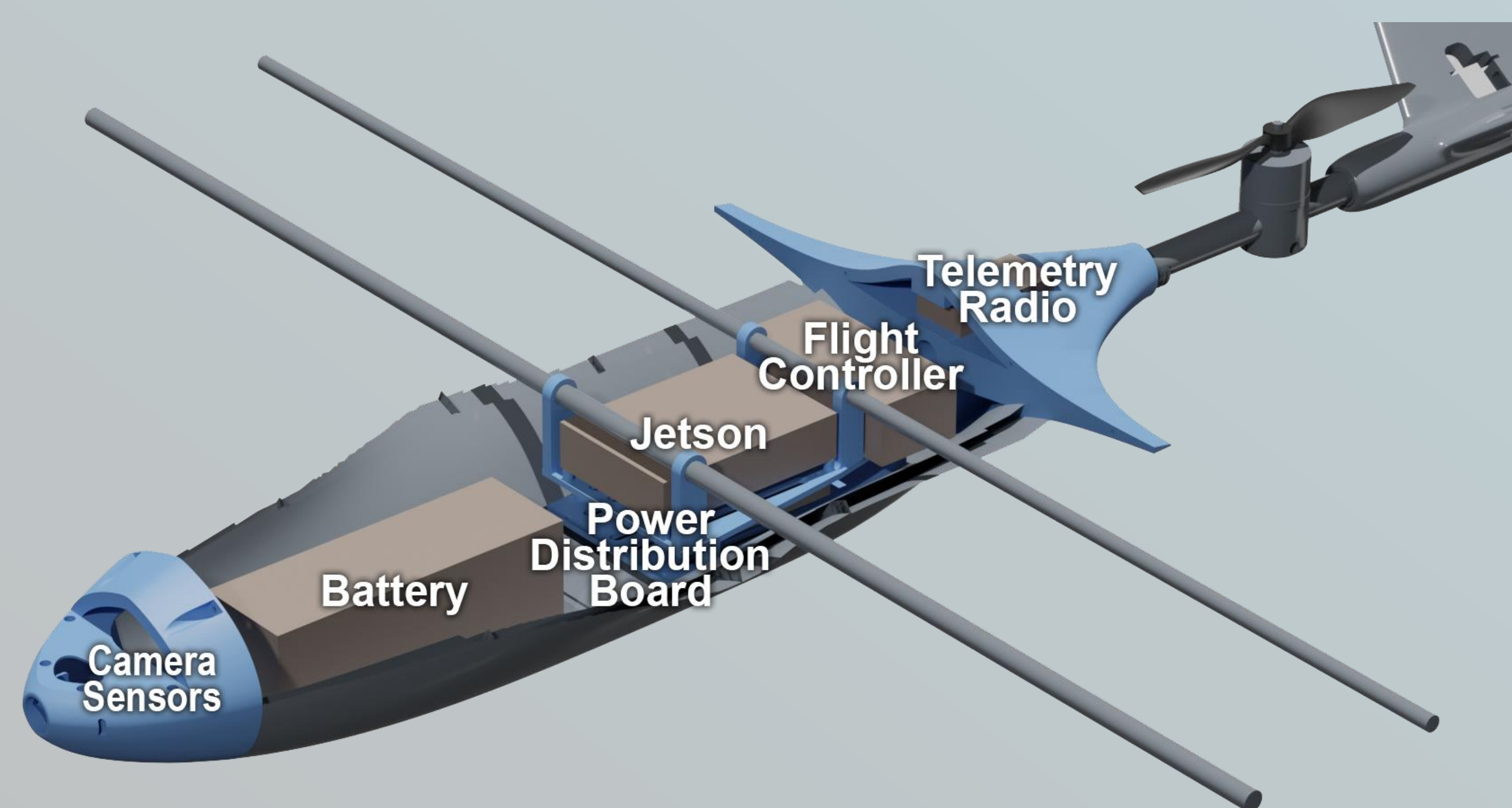
Wildfire response teams lack persistent aerial intelligence during fast-moving fire events. Existing drones fall short on endurance, deployment speed, and regulatory clearance, leaving a gap for reliable, long endurance wildfire mapping.

## Overview / Design Specs

Yavin Systems developed a long-endurance autonomous VTOL drone for real-time wildfire intelligence, delivering thermal hotspot detection, perimeter mapping, and rapid aerial situational awareness.

- 90-minute endurance
- 40-acre mapping capability
- Autonomous waypoint flight
- Thermal + RGB mapping
- NDAA-compliant hardware
- Modular payload system

## Internal View

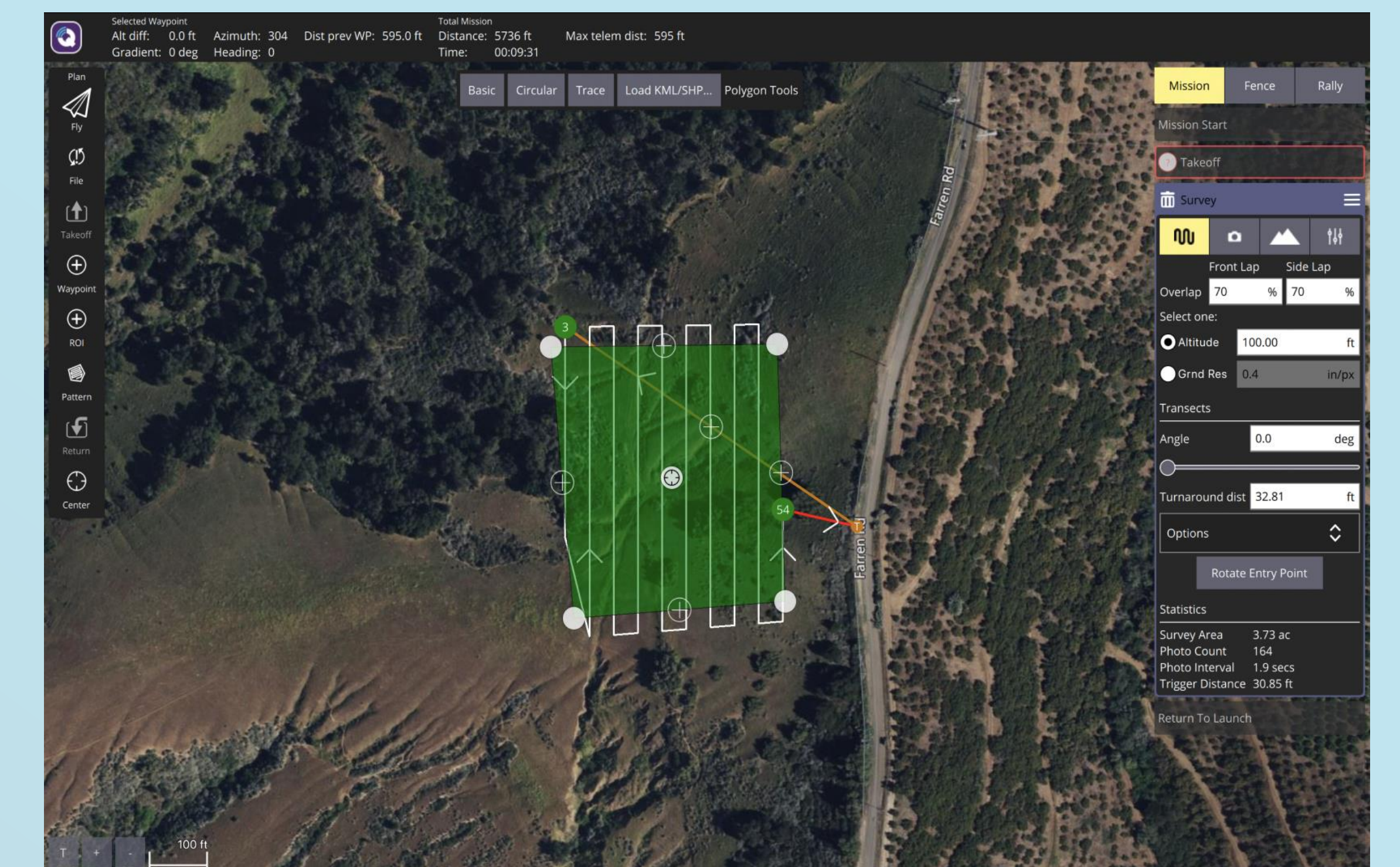


## Final Design



Drone taking off vertically

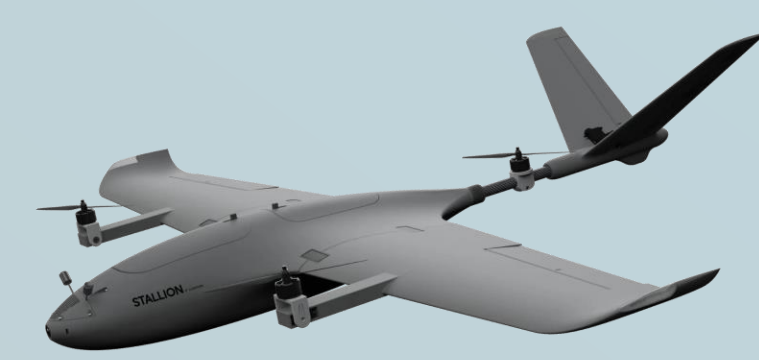
## Wildfire Intelligence Pipeline



- Plan survey grid with programmed image overlap
- Drone flies the mission and captures georeferenced RGB & thermal imagery
- Live telemetry and mission monitoring during flight

## Hardware / Key Components

### Airframe



Carbon fiber reinforcement and optimized lightweight 3d printed PLA Aero airframe.

### Servos + Motors



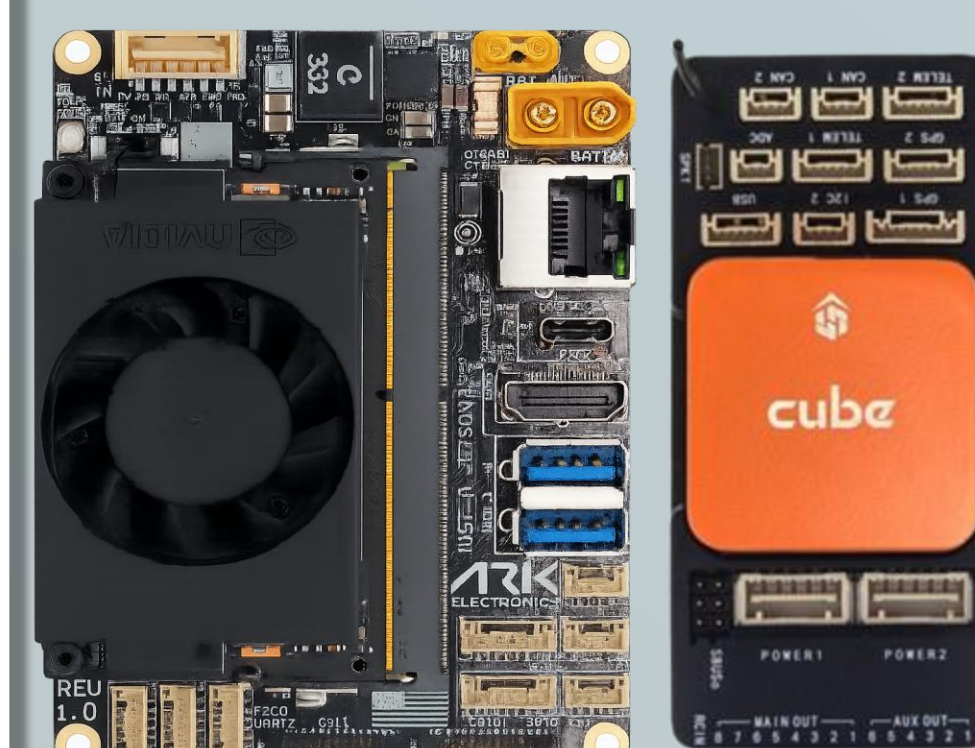
High-thrust tri-motor propulsion with six metal-gear servos.

### Sensor Payload



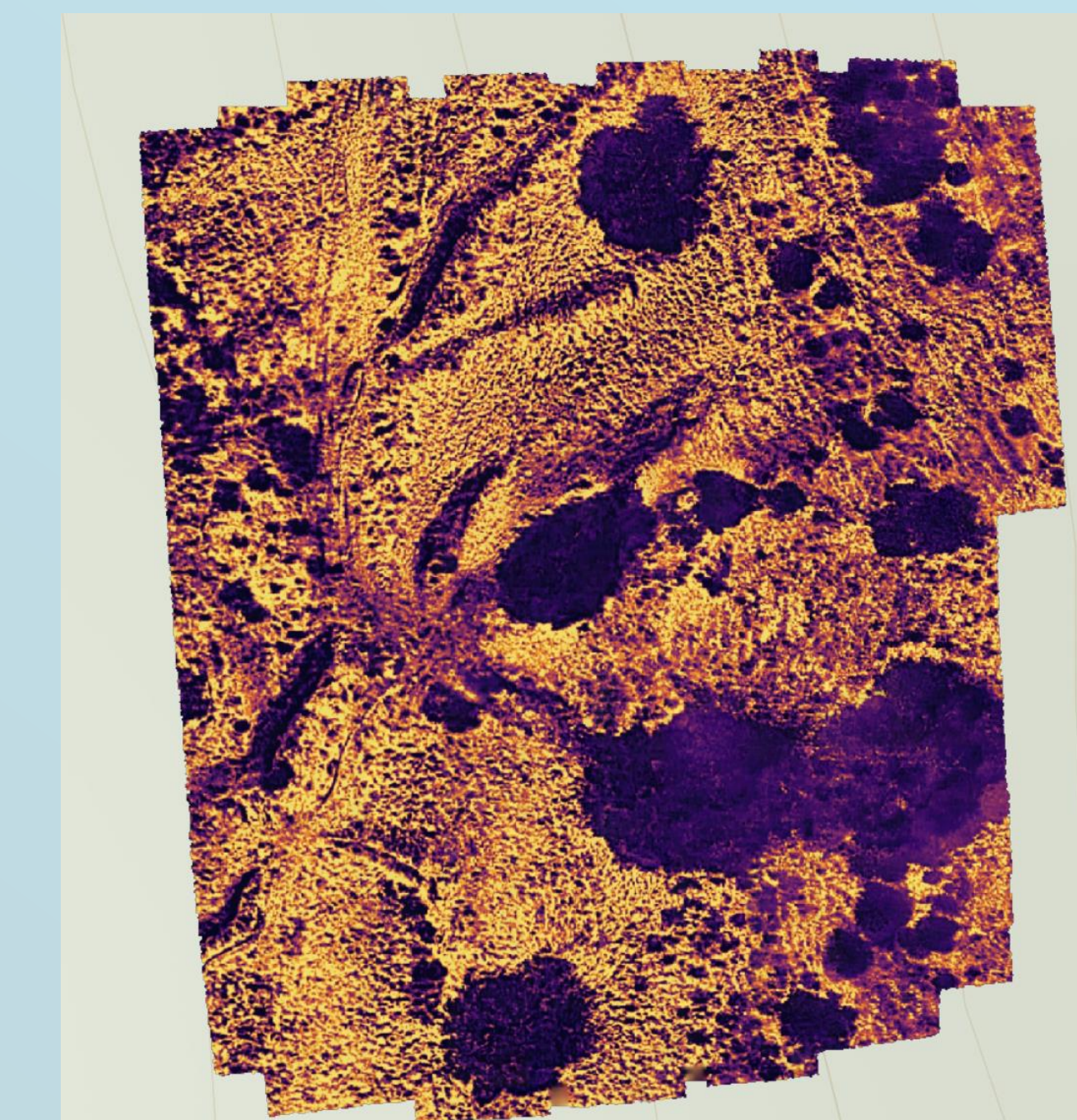
FLIR Boson 640 thermal camera + Global Shutter 5MP RGB camera

### Onboard Compute & Flight Control



NVIDIA Jetson Orin Nano for perception and mapping, paired with a Cube Orange flight controller running Ardupilot for navigation and stabilization.

## Final Data Visualization



RGB (left) and Thermal (right) Orthomosaic maps (3.8 Acres)

- Imagery processed in Novamaps into orthomosaics
- Georeferenced thermal hotspot mapping
- Real-time image processing pipeline
- Decision-ready wildfire intelligence outputs

## Acknowledgements:

Thank you to Professor Susko, Professor Luzzato-Fegiz, Dylan Guydish, and all the teaching staff that helped us.