NIDAR Drone Competition

Team Avadhi: Design Phase

Agenda and Current status

Team Composition

Sl NO	Name	Department
1	Sinchan K N	Avionics and propulsion
2	Vaishnav Sabari girish	Avionics and Navigation
3	Spoorti Hannikeri	Propulsion
4	Dhruv Bhandari	Structure
5	Madaka Rakshita	Navigation
6	Huzaifa Afzal	Structure and Payload
7	Moiz Arsiwala	Payload
8	Rishikesh Bitla	Avionics and Payload
9	Manasvi Ravi	Navigation
10	Vrishank S C	Control

▓▓▓ Mission Objective

Locate and deliver survival kits to 10 stranded survivors in a flooded coastal town within 30 minutes.

▓▓▓ Mission Requirements

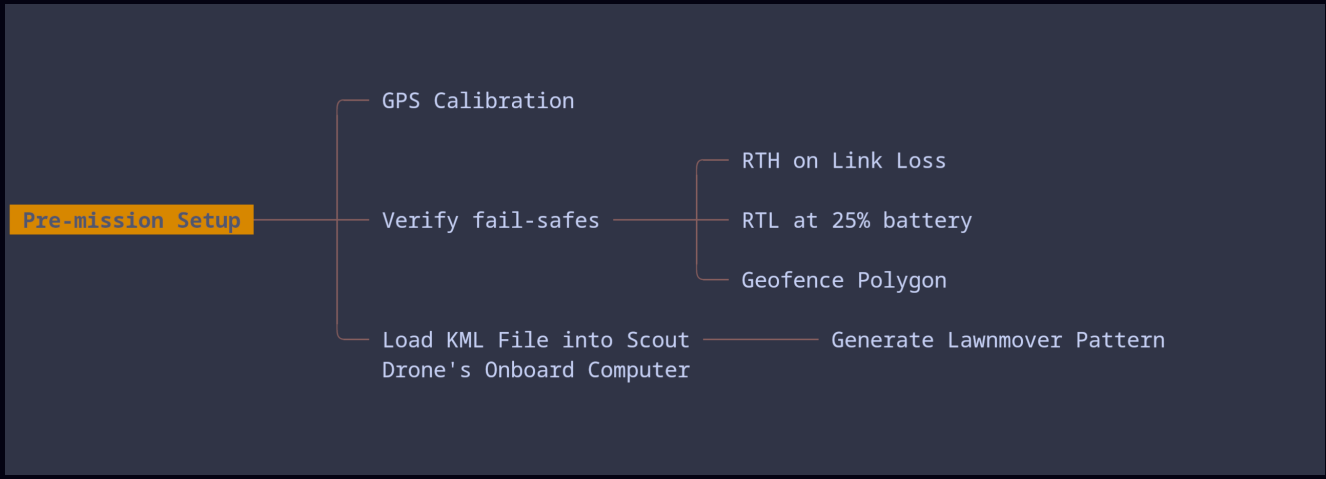
- Scan area, detect survivors , geotag locations and communicate via speaker.
- Deliver 10 survival kits (each 200 g) with <1.5 m accuracy from 20 ft altitude.
- Both drones must operate from a single command station (manual mode incurs penalty).

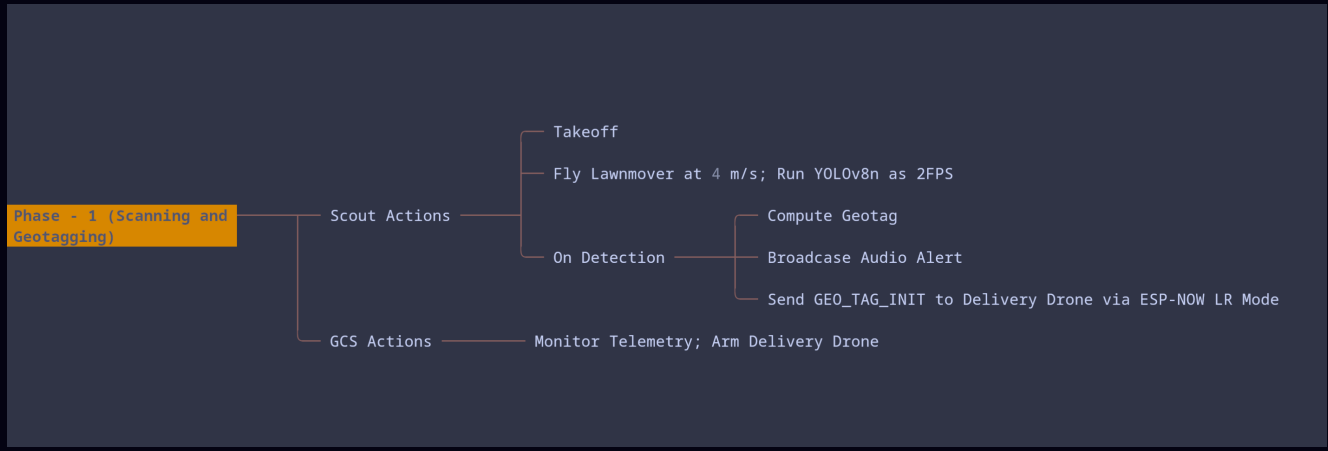
▓▓▓ Design Requirements

- Weight per drone: <= 25kg
- Launch area: 6×6 ft
- De-licensed frequencies only (e.g., 2.4 GHz, 5.8 GHz, 868 MHz)
- Mandatory fail-safes: Return-to-home (RTH) for link loss, low battery, geofence breach, altitude breach

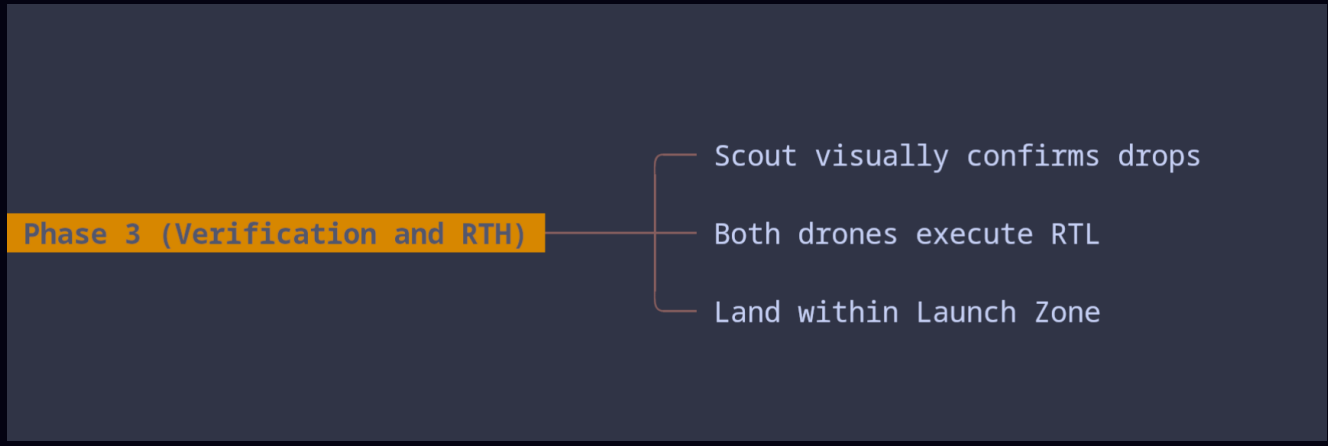
Concept of Operation

Pre-Mission




Phase - 1 (Scanning and Geotagging)
Scout Actions
Takeoff
Fly Lawnmover at 4 m/s; Run YOLOv8n as 2FPS
On Detection
Compute Geotag
Broadcase Audio Alert
Send GEO_TAG_INIT to Delivery Drone via ESP-NOW LR Mode
GCS Actions
Monitor Telemetry; Arm Delivery Drone


Phase 2 (Kit Delivery)
Delivery Actions
Takeoff and cruise to target at 12 m/s
Descend
Stabilize
Drop Payload
Path Planning
Recieve Geotag data from Scout Drone


Phase 3 (Verification and RTH)
Scout visually confirms drops
Both drones execute RTL
Land within Launch Zone

Our Progress

1. Preliminary CAD design.
2. Initial communication tests.
3. Yolo tests
4. Preliminary weight estimation
5. Preliminary Payload dropping mechanism design
6. Sponsor Mapping

Timeline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25th June
Component Identification and preliminary design completion
5th July
Sponsorship reports
Complete Subsystem Identification
Component Identificatin
Completion of detailed design
15th July
Estimated date to get replies from potential sponsors
31st July
Acquisition of all components
15th August
Drone models should be ready
Scout Drone
Delivery Drone
30th August
Mission Ready
7th September
Business pitch should be ready