Team Soteria designed and manufactured a drone attachable payload deployment system that is compatible with the DJI Mavic 3 Drone. Sponsored by Northrop Grumman, the customer is to use the device to assist in search and rescue operations. Following the drone's navigation to a remote location, the payload assists in delivering lightweight emergency supplies to its target through recognition of an audio signal played through the onboard speaker, resulting in motor activation and therefore, payload deployment. The payload attachment is lightweight, portable, and non-intrusive to the drone sensors.

Use Case
Pilot navigates to target and plays a specified audio signal that is received by microphone on the payload device.

Signal is recognized and processed. Motor is activated, pin retracts and drops payload.

Payload is delivered and pilot navigates drone back to base.

System Level Diagram

Payload Deployment Device

PCB Design

Components

Mechanical | Electronics | Fasteners and Mounts
---|---|---
Housing | PCB Board (x3) | M2 x 6mm Screws (x16)
Housing Covers | Microphone (x1) | Heat Set Inserts (x14)
Rack Gear & Pin | LiPo Batteries (x2) | Motor Bolts (x2)
Pinion Gear | Gear Motor (x1) | Motor Bracket (x1)
Rail Cover Plate | JST Connectors (x2) | Clevis pin (x2)
Attachment Arms | Wire connections (x9) | Retention Ring (x2)