

# UAV Payload Deployment for Search & Rescue

Created By Team Soteria

Sponsored by **NORTHROP GRUMMAN**

# SDSU

San Diego State University

## Project Overview

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



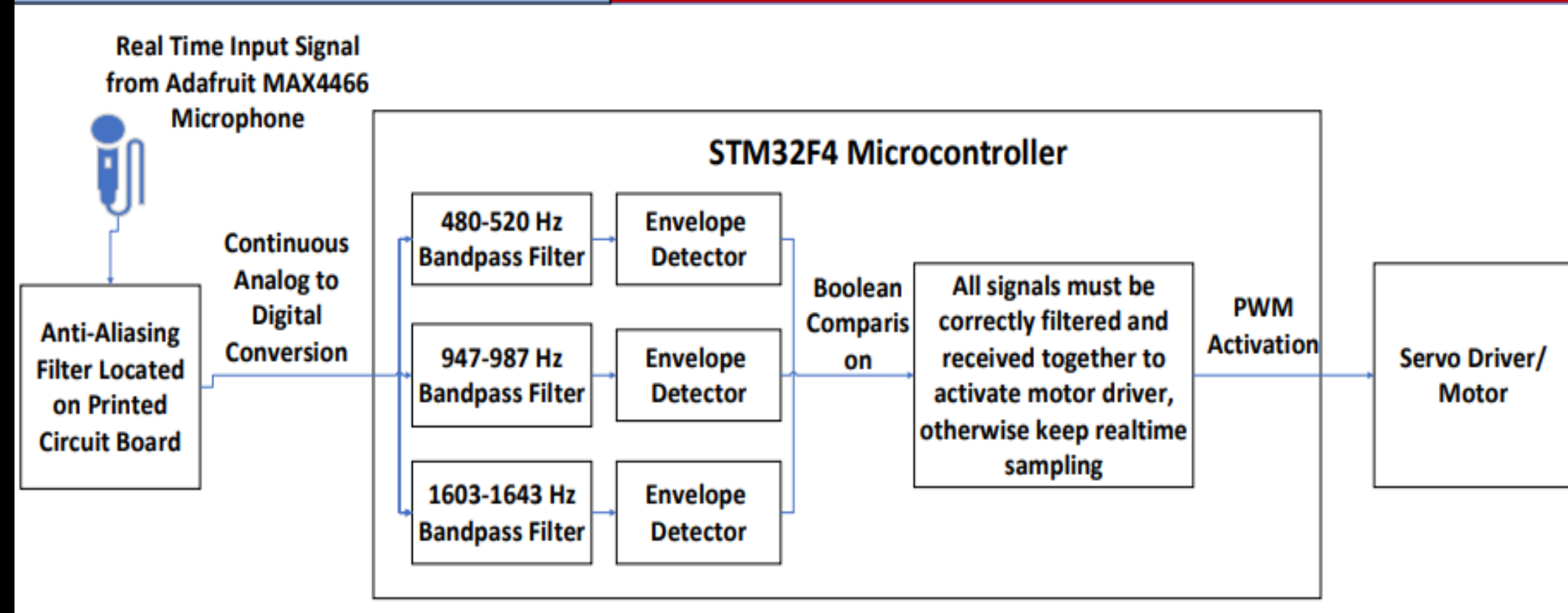
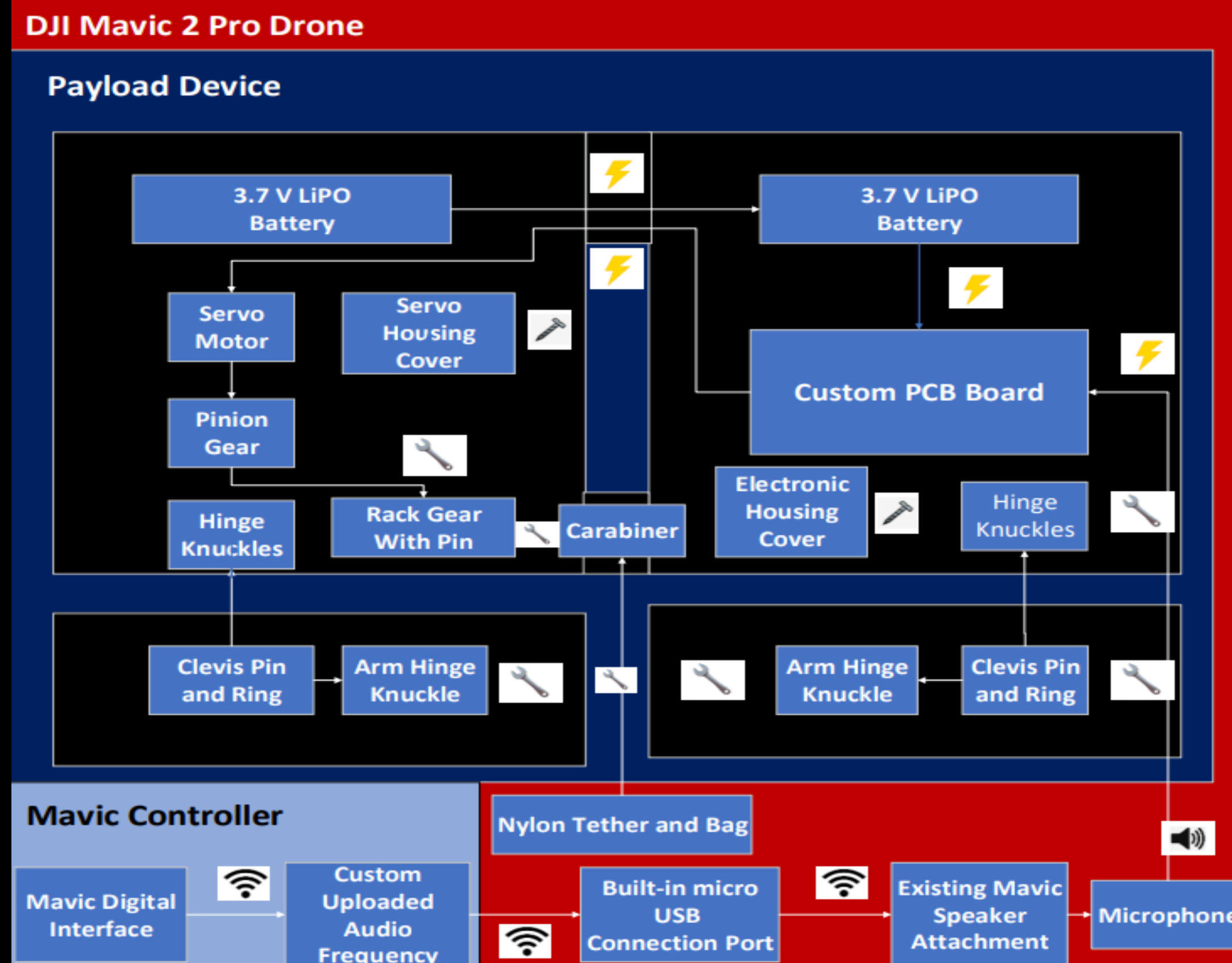
Signal is recognized and processed

Motor is activated, pin retracts and drops payload

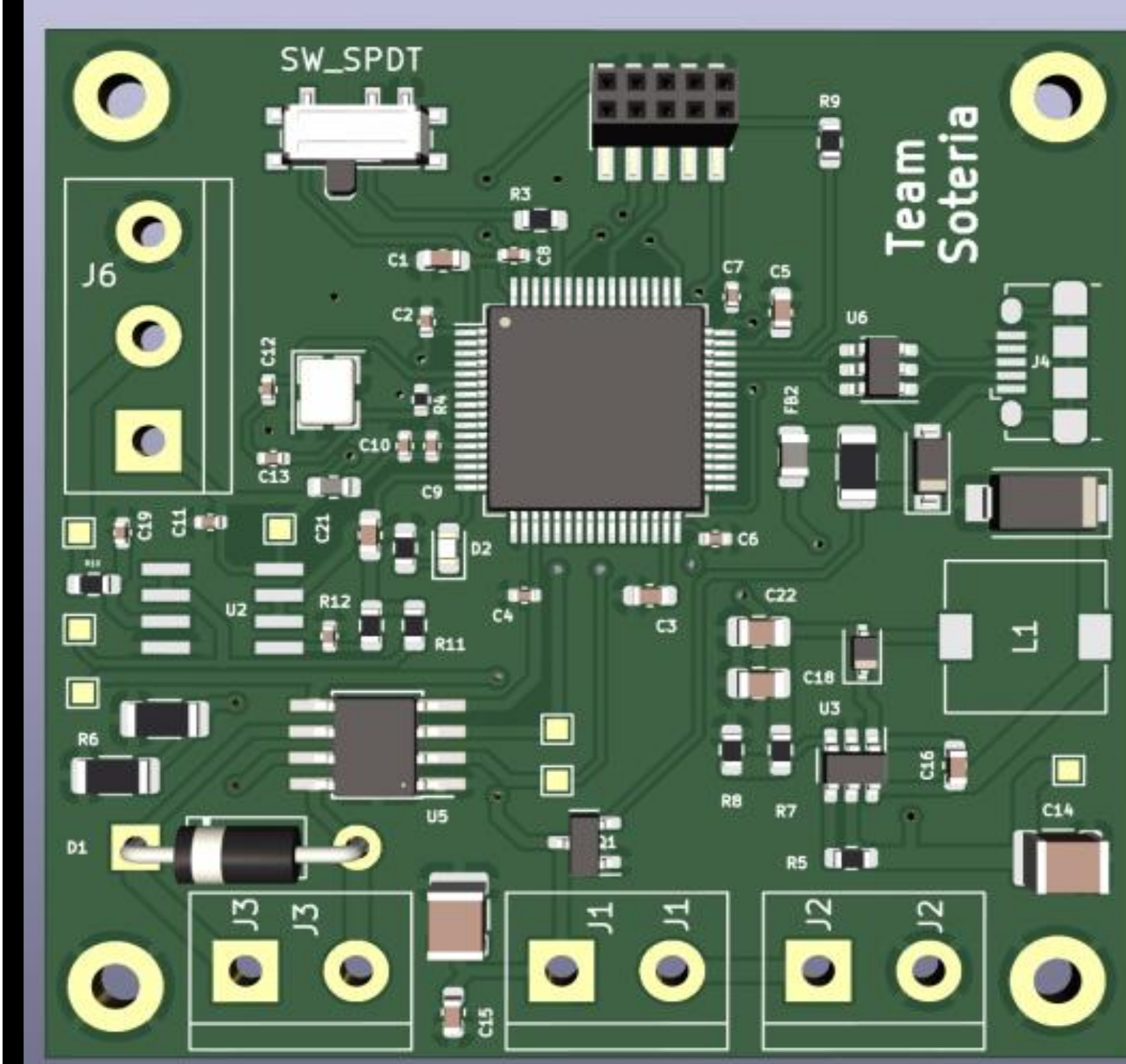
Payload is delivered and pilot navigates drone back to base.



## System Level Diagram



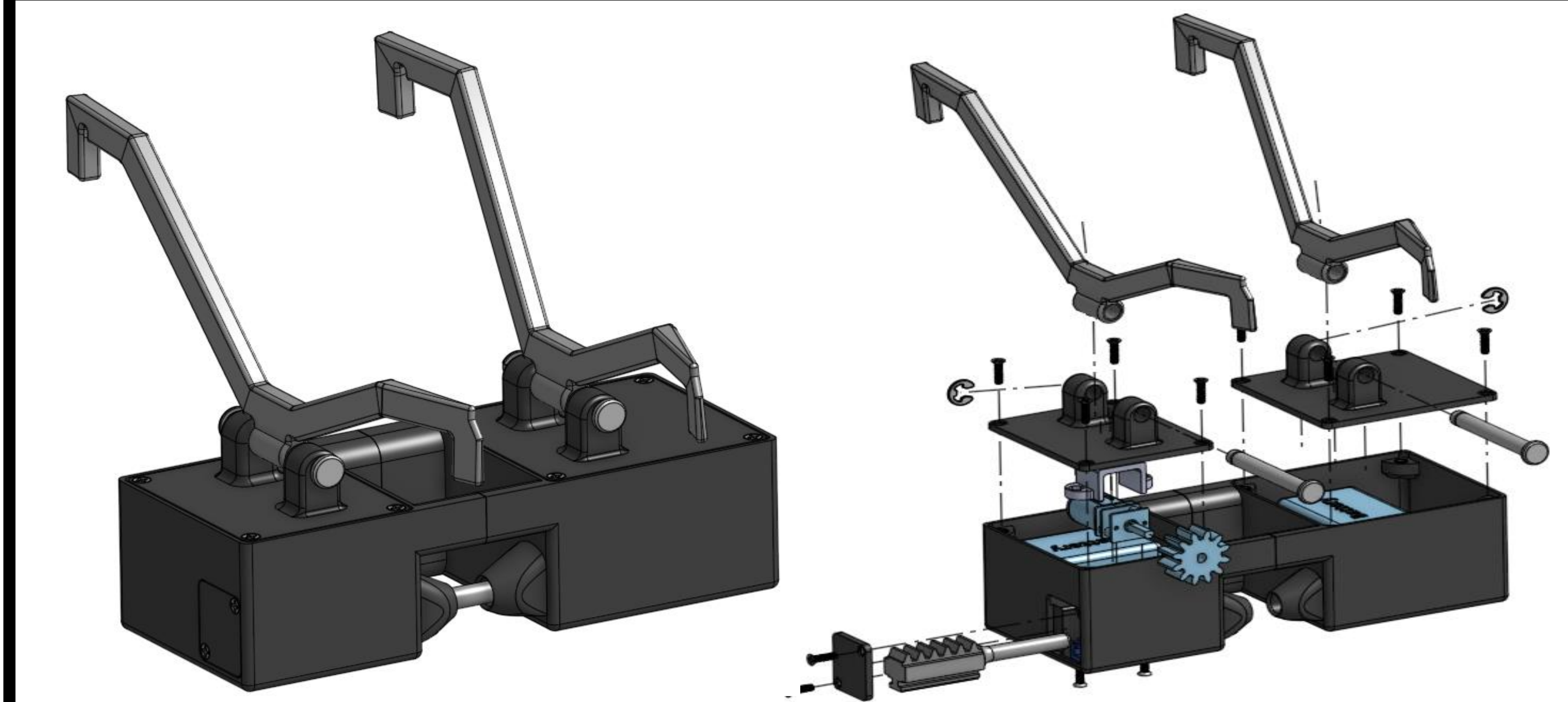
## PCB Design



## Components

Mechanical	Electronics	Fasteners and Mounts
Housing	PCB Board (x1)	M2 x 6mm Screws (x14)
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)

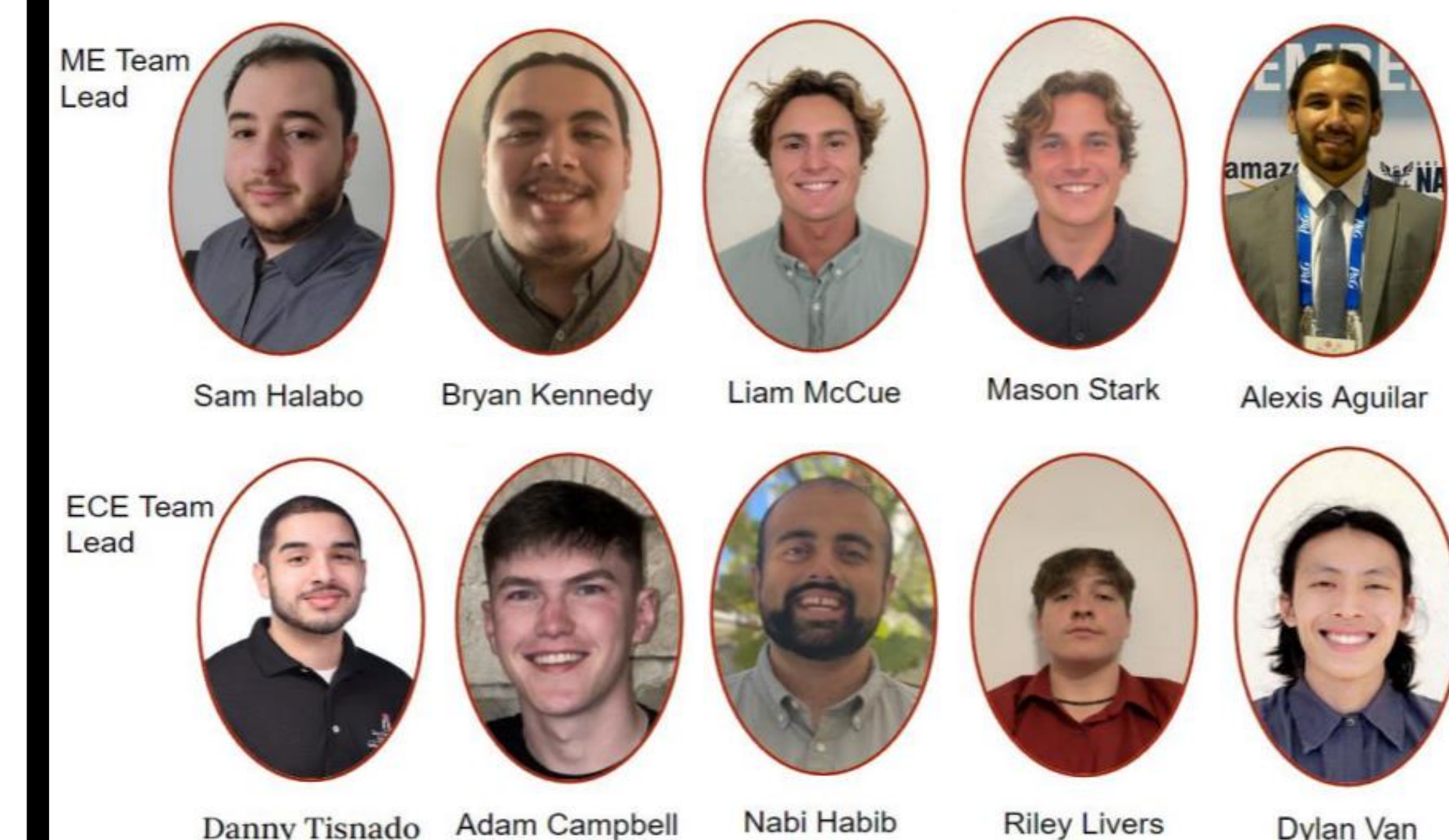
## Payload Deployment Device



## Testing



## Team Soteria



Spring 2023