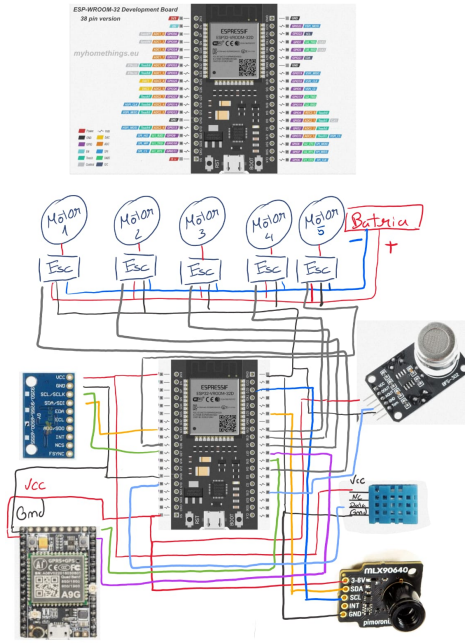
GIL Drone Assembly Guide

Gonçalo Augusto Perpétua

May 2025

Introduction

This document explains step by step the assembly process of the GIL drone. It's important to note that this was the approach followed by our team, based on the design of each component which had been previously planned for this specific sequence. The electrical circuit to be assembled is the following:



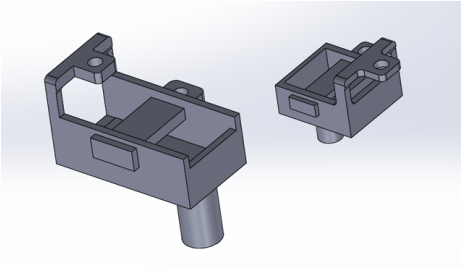
Component List

- Wing Tip Structure - Left and right sides
- Intermediate Wing Structure - Left and right sides
- Nose - 1x
- Rear Structure - Top and base
- Central Structure - Top and base
- Tail - 1x
- Structural bars - 4x
- Landing gear - 4x
- Motor mounts - 4x
- Motor tube - Left and right sides
- Sensor support bar - 1x
- Tail support - Left and right sides
- Central support structure - 1x
- Wing support structure 1 - Left and right sides
- Wing support structure 2 - Left and right sides
- BLDC Motor - 4x
- Compatible propeller - 4x
- ESP32 - 1x
- A9G - 1x
- Humidity sensor - 1x
- CO2 sensor - 1x
- Thermal camera - 1x
- Thermal camera mount - 1x
- Thermal camera bar - 1x
- CO2 sensor mount - 1x
- CO2 sensor bar - 1x

Assembly Instructions

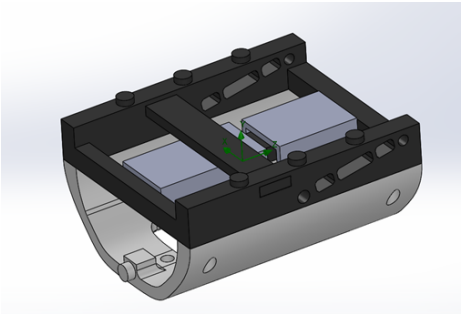
Step 1

Mount the CO2 sensor and thermal camera in their respective mounts and secure them with their bars to ensure safety and stability.



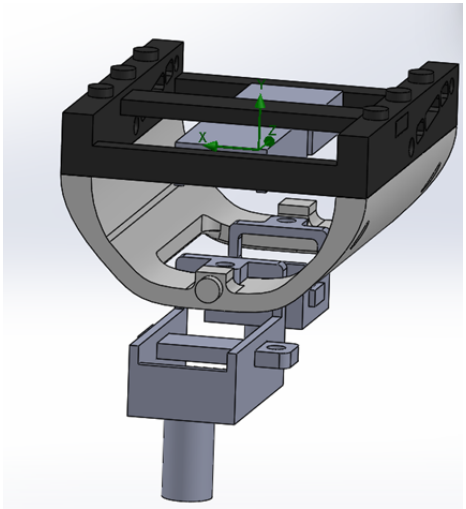
Step 2

Mount the ESP32 and A9G to the Central Support Structure and secure them with the Sensor Support Bar. The ESP32 should be placed below the support. The A9G doesn't require additional support as the structure was designed to make this unnecessary. Also mount the Central Base Structure.



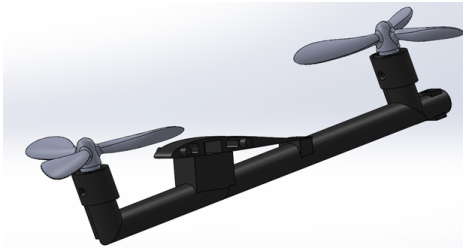
Step 3

Attach the sensor mounts to the Central Base Structure and fasten them properly. Make all connections between the sensors, thermal camera, ESP32 and A9G according to the previously provided circuit diagram.



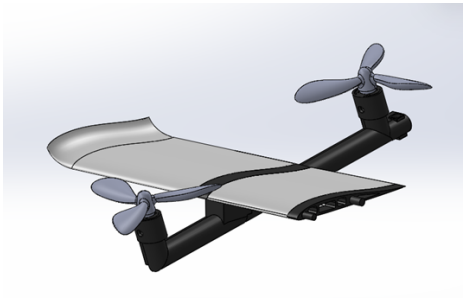
Step 4

Screw the 4 BLDC motors to their respective mounts. Then route the motor cables through the tubes, carefully marking each cable to ensure correct connections later.



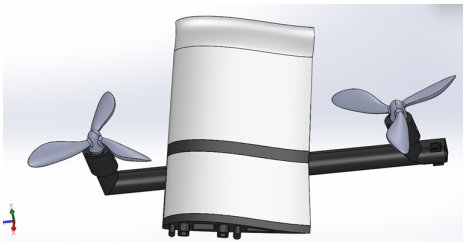
Step 5

Carefully connect the other wing parts. Be cautious with the motor cables. The structure made from ASA AERO is less resistant. Take precautions when making these connections.



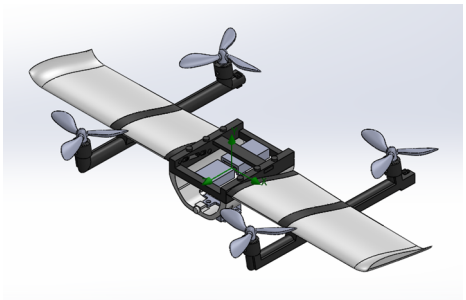
Step 6

Insert the structural bars through the wing. These bars provide stability and structural integrity to the wing.



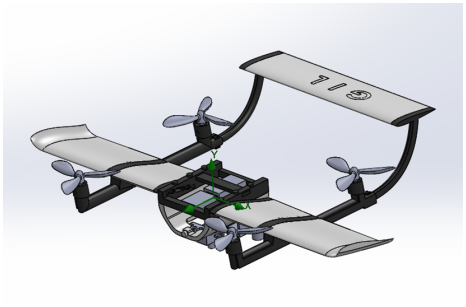
Step 7

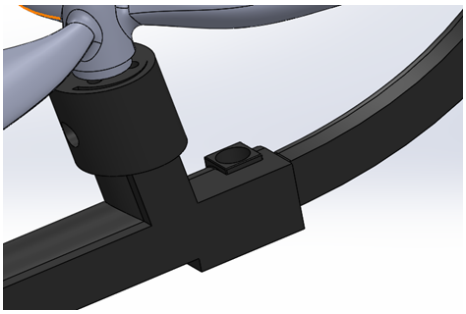
Attach the wing assembly to the Central Base Structure. Connect the motors to the ESP32 as shown in the previously provided circuit diagram. Leave the power cables towards the rear of the structure to facilitate access to external batteries.



Step 8

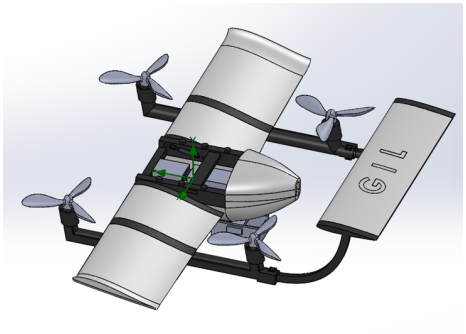
Attach the Tail Support (left and right sides) to the Tail, then screw them to the already assembled structure. The screw points are shown in the photo below.





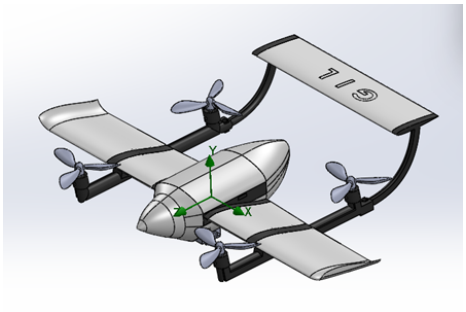
Step 9

Attach the Rear Structure (Top and Base) to the assembled structure. These parts should be mounted on the side where the tail was attached.



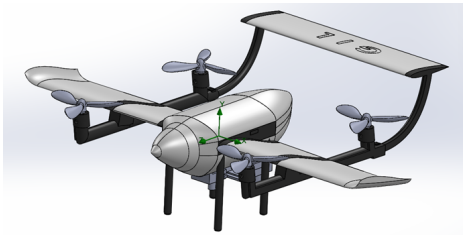
Step 10

Mount the Nose and Central Top Structure.



Step 11

Mount the 4 Landing Gear.



Final Notes

This was the sequence planned and executed by the drone design team. Other approaches may be possible, but likely with more difficulties.