



# Passenger Drone

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MEC 203

Group 12

# Inspirations

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**EHang 184**

This design was given to us in the project proposal and was a basis for what we designed in terms of the frame and body.



# Inspirations

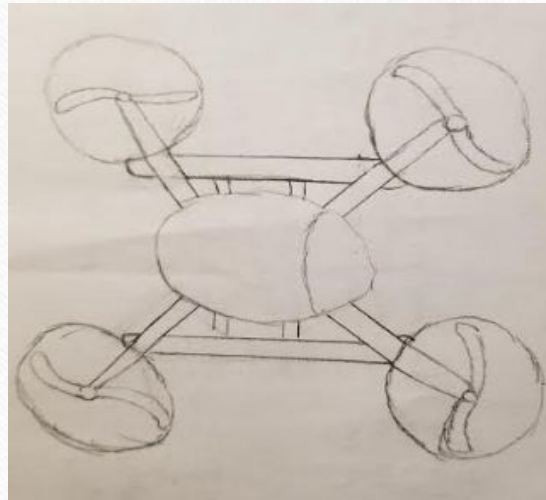
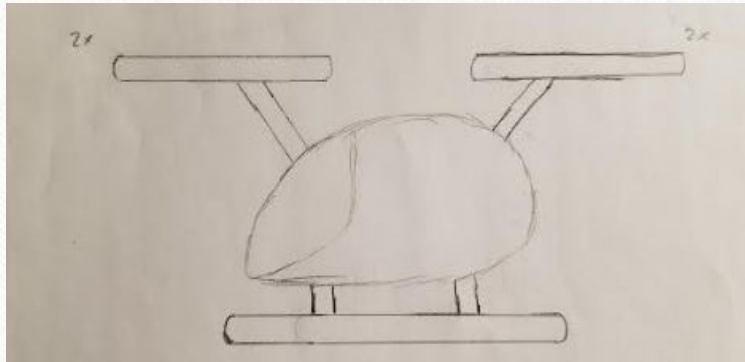
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**City Airbus**

The City Airbus gave us an idea for using the propeller guards but we felt that it added more weight to the weight to lift ratio and we went with a traditional quadcopter route.

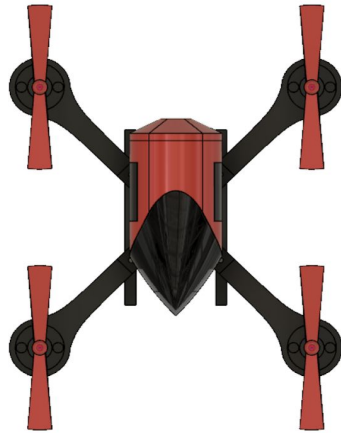
# Initial Designs



Above shows our rough sketches of our initial side and top views and what we wanted our frame to look like. We kept the main components of the drone which included the curved body, landing gear, the four propellers, and the quadcopter frame.



Top View



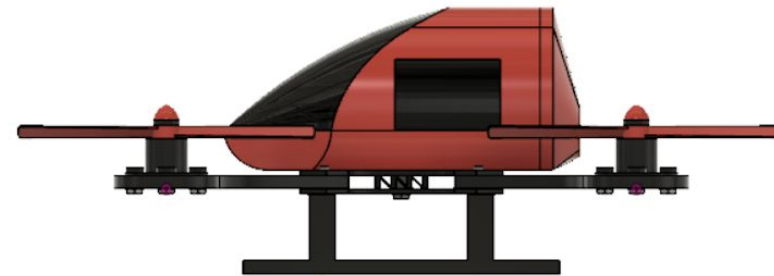
Isometric View



Front View



Right Side View



# Motion Study

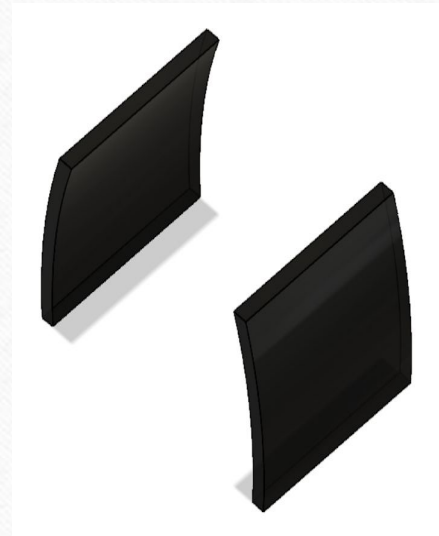
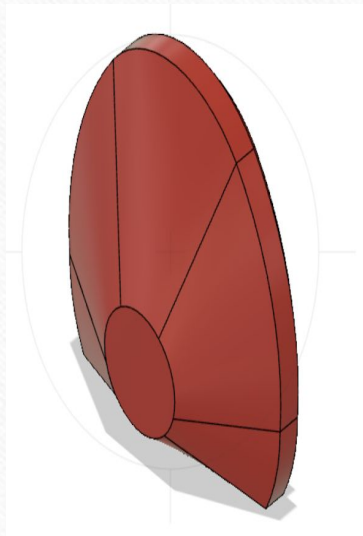




# Entrance/Exit Points

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The back attachment of the drone opens up to allow a sole passenger inside. This is the main door and entry point of the drone.



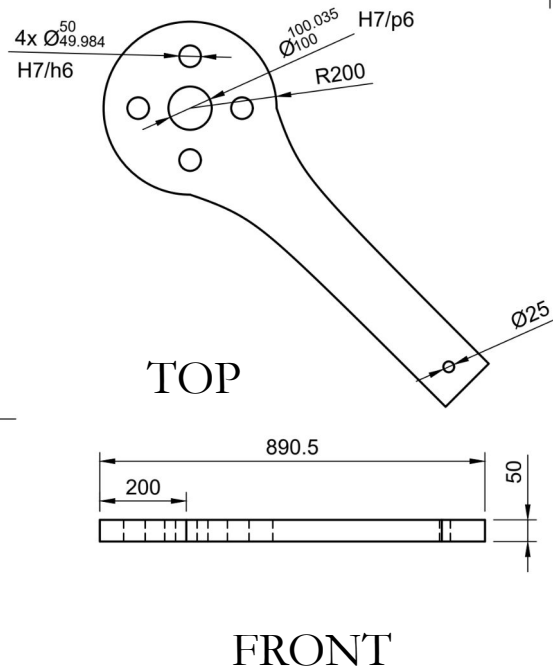
The black doors on the side are our emergency exit areas if the main door at the back of the drone doesn't open.



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# Tolerance & Fits

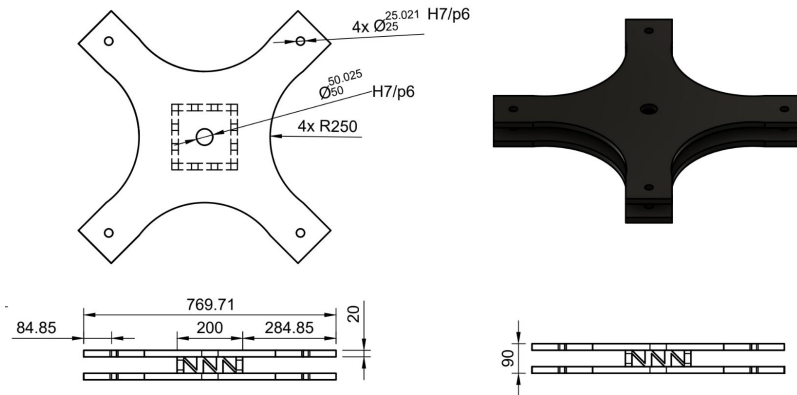
# The Arm



- Light-Weight Aluminum Frame
- Curved edges to allow flexibility in design
- H7/p6 Interference Fit using a Hole Basis:
  1. Ensures that the shaft on Wing will fit rigidly without any deformation as a result of external forces
- H7/h6 Clearance Fit using a Shaft Basis:
  1. Allows for the Snug Fit of the Propeller Arm.
  2. Restricts movement
  3. Can be assembled and disassembled

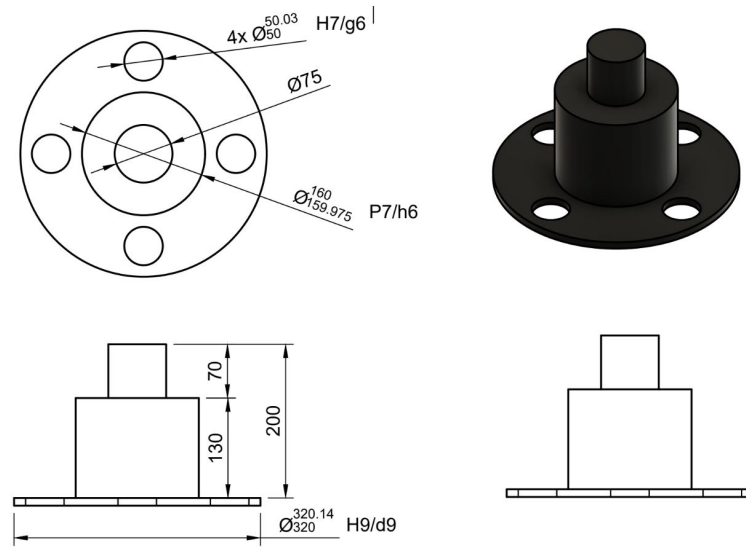


# Arm Connector



- Durable Carbon Alloy and Plastic Frame
- Connecting Trusses added for extra stability and support
- H7/p6 Interference Fit using a Hole Basis:
  1. Fit ensures that the nuts and bolts will fit rigidly without causing any deformation to the drone

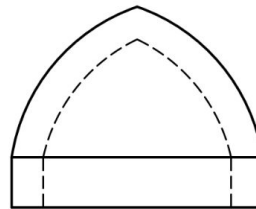
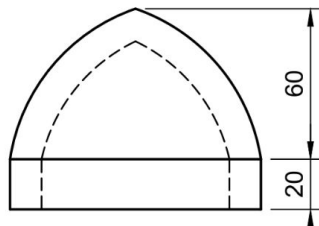
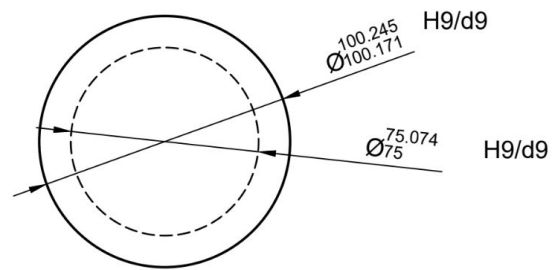
# The Motor



- H9/d9 Clearance Fit using a Hole Basis:
  1. Allows for the free movement of the motor without added friction from the Propeller frame.
- H7/g6 Clearance Fit using a Hole Basis:
  1. Ensures that the propeller fits comfortably around the shaft, but is allowed to spin without restriction
- P7/h6 Clearance Fit using a Shaft Basis:
  1. Ensures the fitting of the motor with rigidity and alignment, to be able to withstand the movement of the propeller

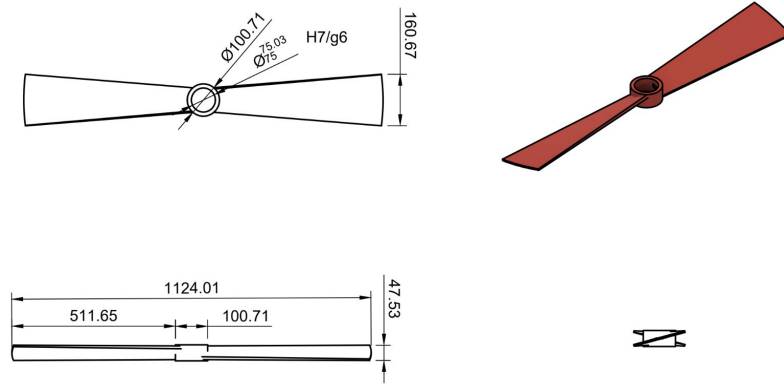


# Prop Nut



- H9/d9 Clearance Fit using a Hole Basis:
1. Fit ensures that the propeller shaft is allowed to move freely without any added friction

# Propeller



- Propellers made from durable carbon alloy
  - Edges curved to reduce drag and external wind forces
  - Blades Created at a  $25^\circ$  and  $35^\circ$  for easy lift
  - H7/g6 Clearance Fit using a Hole Basis:
1. Fit ensures that the propeller fits snugly around the shaft, but is allowed to spin freely



Thanks for watching!

