AUTOCAD DRAWING PROJECT

2024

DJI MAVIC DRONE

END SEMESTER PROJECT

Table of Contents

GROUP MEMBERS: 3

ABSTRACT: 3

INTRODUCTION: 3

PURPOSE: 4

Reference: 4

DISTRIBUTION: 5

Bill of Material of Drone: 5

ASSEMBLY TREE: 9

EXPLODED VIEWS: 28

CHALLENGES: 30

CONCLUSION: 31

GROUP MEMBERS:

Names	*Roll No.s*
M. Hamza Khalid	241238
M. Usman Khan	241202
Arsel Kaleem Abbasi	241190
Ubaid Ahmed	242124

ABSTRACT:

This project involves the design and development of a drone using AutoCAD software. The drone's aerodynamic design is created using AutoCAD's 3D modeling tools. A detailed analysis of the drone's components, including the frame and propellers, is conducted. The design takes into account factors such as weight, stability, and maneuverability. AutoCAD's parametric modeling capabilities are utilized

to create a customizable design. The drone's dimensions and shape are optimized for efficient flight and maximum payload capacity. A thorough review of existing drone designs is conducted to inform the design process. The project demonstrates the application of AutoCAD in the field of aerospace engineering. The final design is presented in a detailed and annotated drawing package. The project showcases the potential of using AutoCAD for designing complex aerial vehicles.

INTRODUCTION:

The DJI Mavic is a revolutionary portable drone that has redefined the boundaries of aerial photography and exploration. Since its release, the Mavic has been a game-changer in the drone industry, offering unparalleled convenience, innovation, and performance. With its sleek and compact design, the Mavic can be folded and taken on the go, making it the perfect companion for travelers, photographers, and adventurers. Equipped with advanced features such as 4K video recording, obstacle avoidance, and a long-lasting battery, the Mavic has become a favorite among drone

enthusiasts and professionals alike. Whether used for capturing breathtaking landscapes, inspecting infrastructure, or simply having fun, the DJI Mavic has proven itself to be an incredibly versatile and powerful tool. In this [project/paper/review], we will delve into the features, capabilities, and applications of the DJI Mavic, exploring what makes it one of the most popular and influential drones on the market today.

- ☑ **Pocket-Sized Powerhouse:** It folds up so you can easily carry it anywhere and have adventure.
- ☑ **Crystal-Clear Camera:** Captures amazing photos and videos in 4K quality.
- ☑ **Stability:** It flies smoothly and doesn't wobble around, so you can get perfect shots.
- ☑ **Easy to have a Flight:** So easy to control and fly that a beginner can also have a great grip quickly.

PURPOSE:

Building a drone is like a super cool puzzle that teaches you about electronics, how things fly, and how to write a code. It's like learning to speak a new language. Drone Projects are really a blast for those interested in science, technology, engineering and Maths. They are a hands-on way to explore these awesome fields. Imagine drones delivering your Pizza! They're being used for all sorts of cool delivery jobs.

Reference:

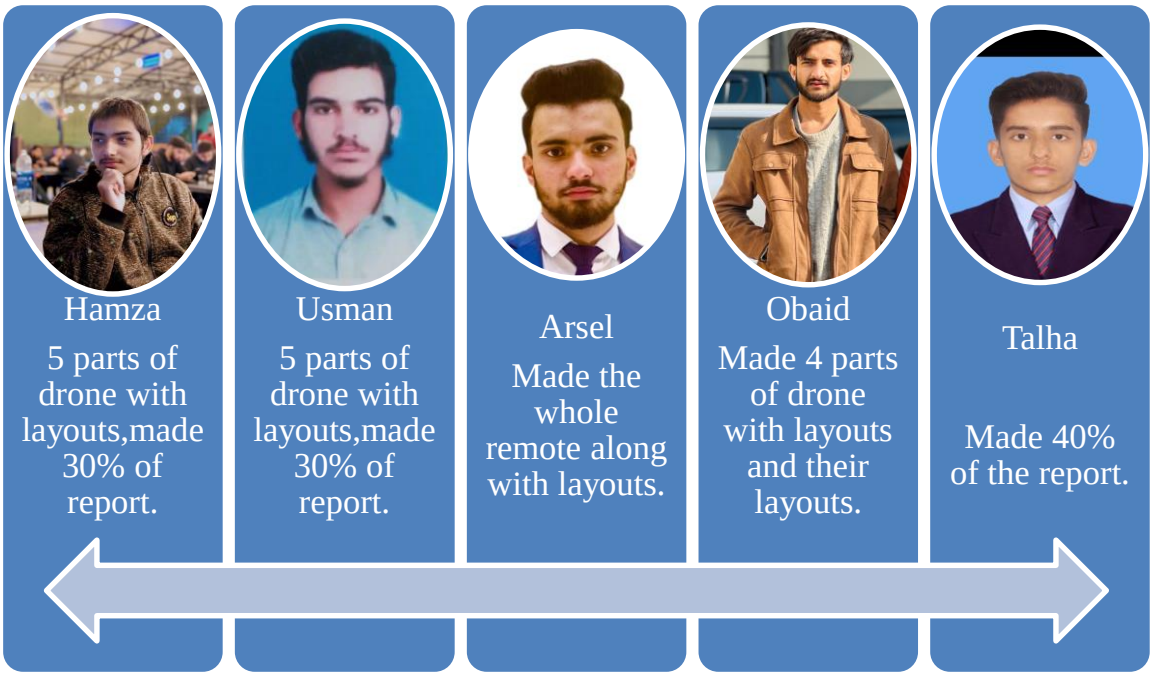
Concept and help for building different parts step by step of a drone had been taken from the YouTube videos owned by "Autocad and civil engineering" and "Yohanes Gloria Oley" and Links are:

https://youtu.be/lsQ24cr72_0?si=F8v2u1_5zT4m2QUM

https://youtu.be/kRIY4kn-TS8?si=2F7XYd0e0oMhDsWv

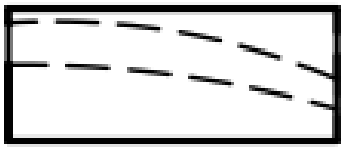
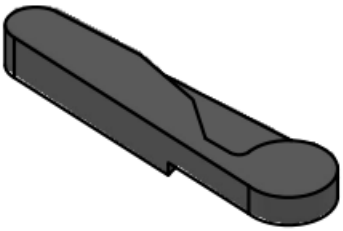
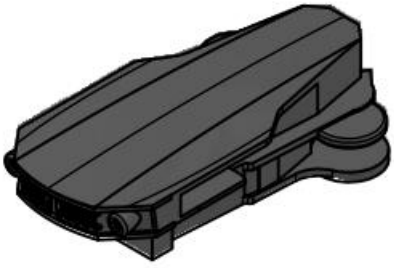
https://youtu.be/og8sitr6aUk?si=uf1gYRzonb5ec8rT respectively.

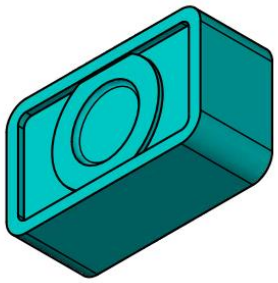
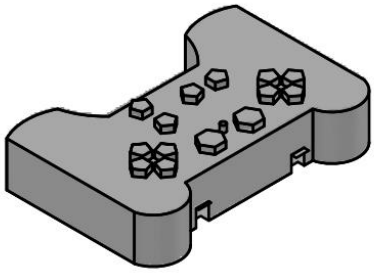
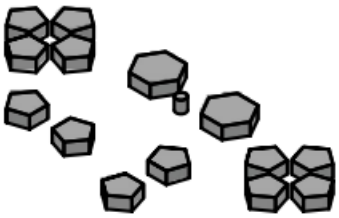
DISTRIBUTION:

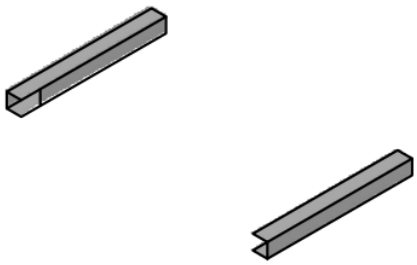
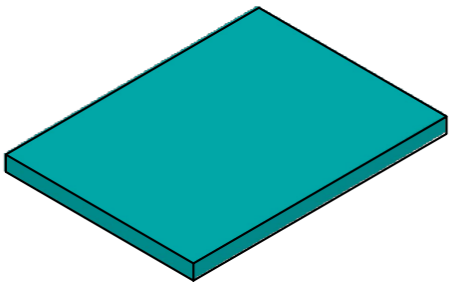
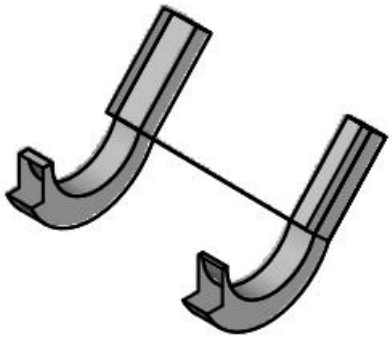


Bill of Material of Drone:

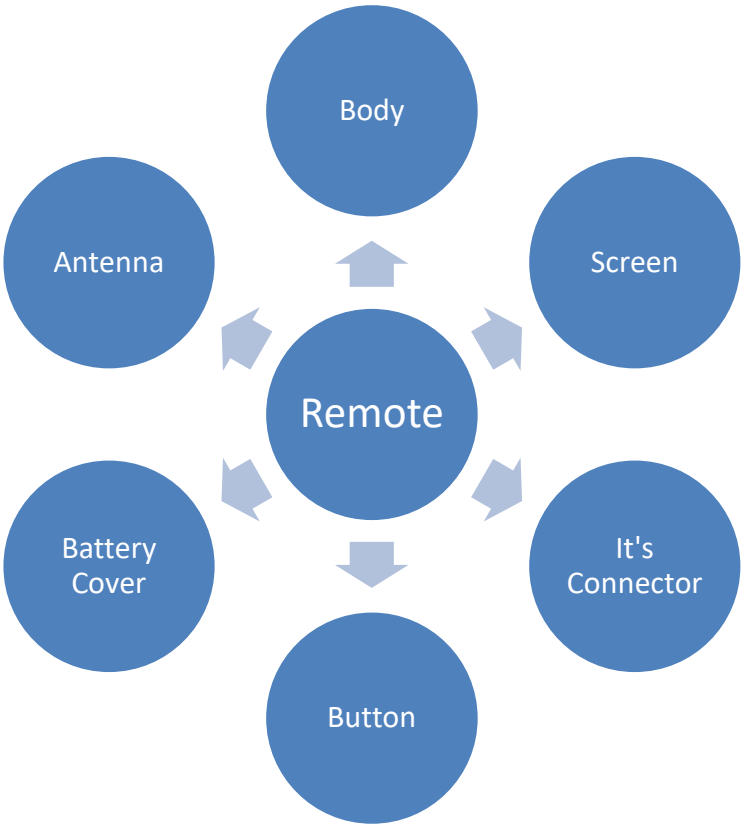
No.	Name	Quantity	Drawing
1	Propeller	4	
2	Propeller connector	4	

3	Propeller Fitter	8	
4	Stand	2	
5	Motor	4	
6	Limb	4	
7	Drone Body	1	

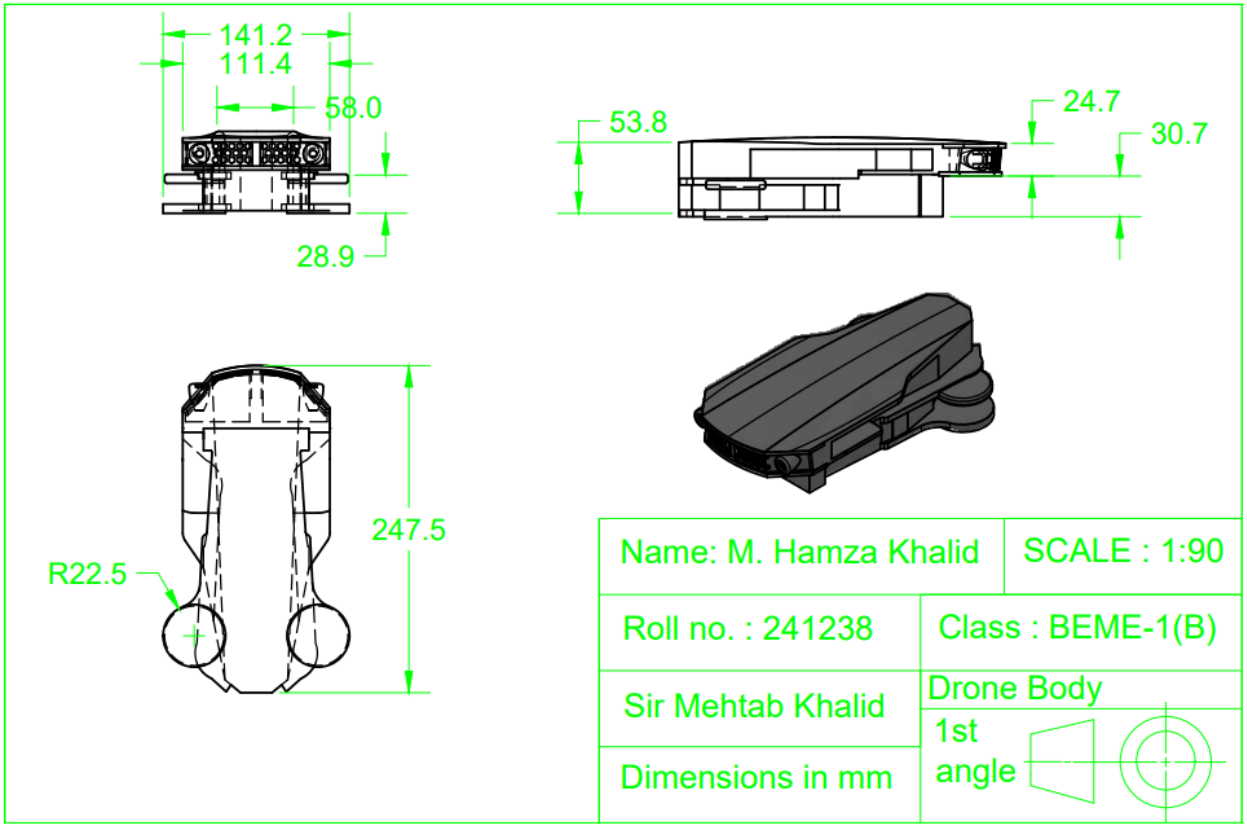
8	Lights	2	
9	Lens	1	
10	Camera Body	1	
11	Remote Body	1	
12	Buttons	15	

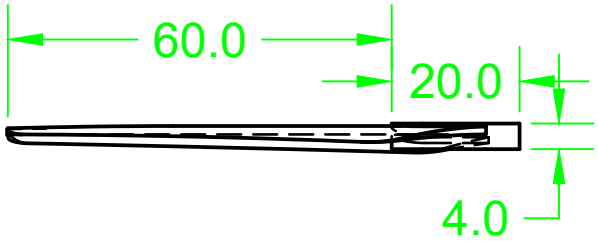
13	Antenna	2	
14	Screen	1	
15	Screen Connector	2	

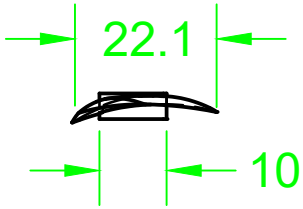
ASSEMBLY TREE:

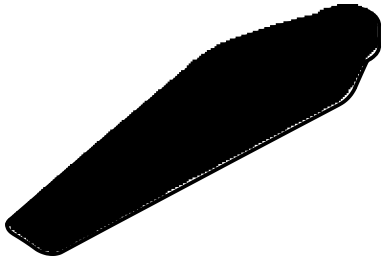

Body
Antenna
Screen
Remote
Battery Cover
It's Connector
Button

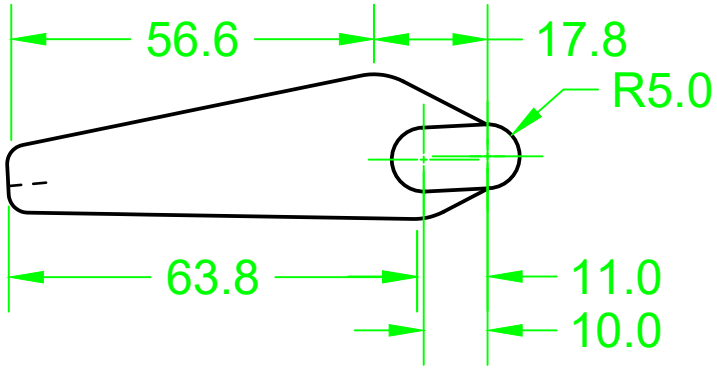
Layouts:

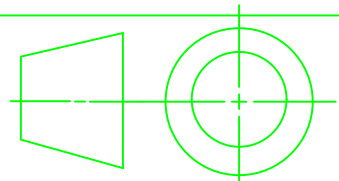

141.2
111.4
58.0
28.9
53.8
24.7
30.7
247.5
R22.5
Name: M. Hamza Khalid
SCALE : 1:90
Roll no. : 241238
Class : BEME-1(B)
Sir Mehtab Khalid
Drone Body
Dimensions in mm
1st angle

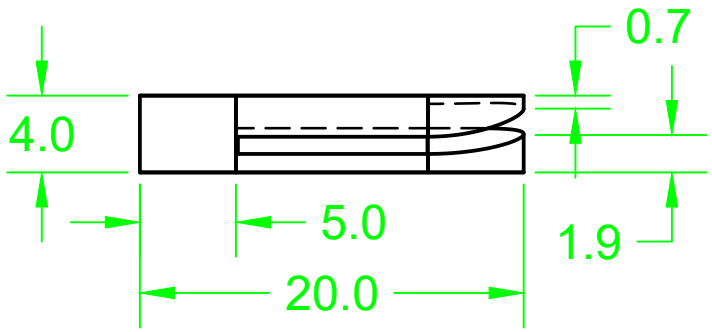


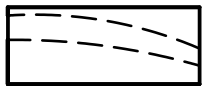


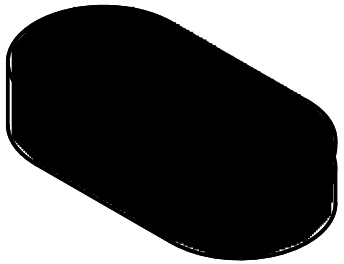


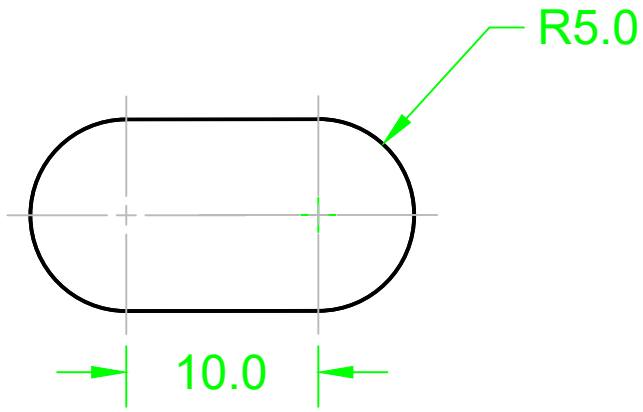


Name: M. Hamza Khalid	SCALE: 1:30
Roll no. : 241238	Class : BEME-1(B)
Sir Mehtab Khalid	Propeller
Dimensions in mm	1st angle 

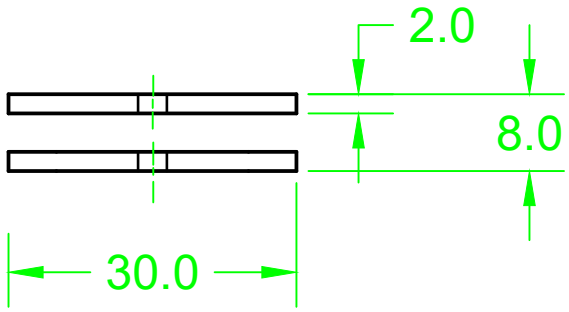


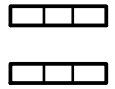


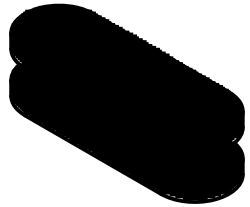


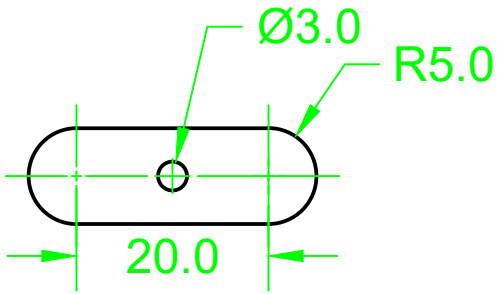


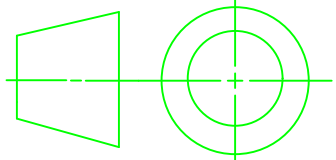
Name: Obaid Ahmed	SCALE: 1:10
Roll no. : 242124	Class:BEME-1(B)
Sir Mehtab Khalid	Propeller Fitter
Dimensions mm	1st Angle

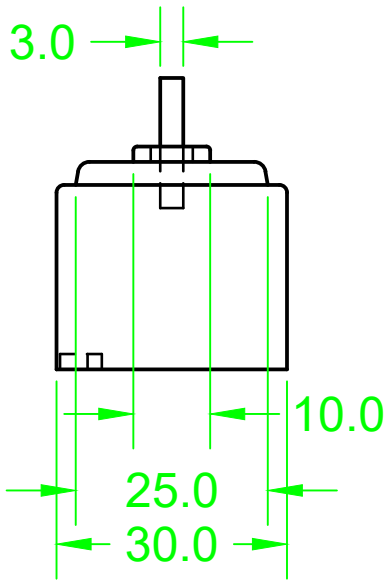


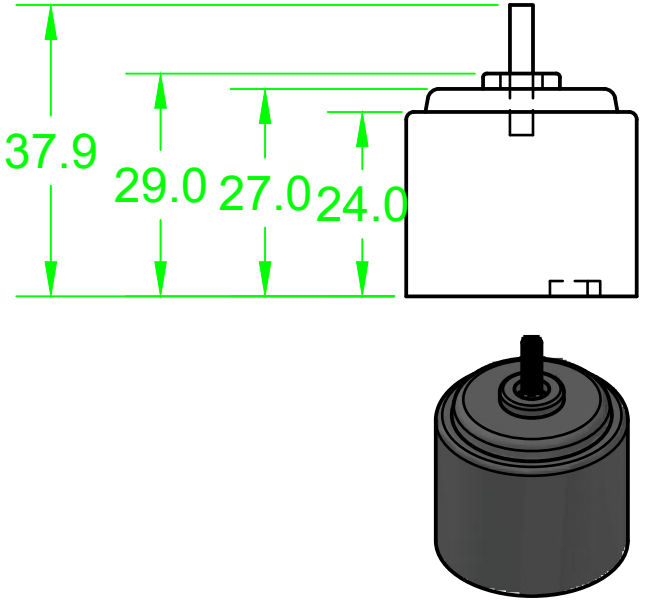


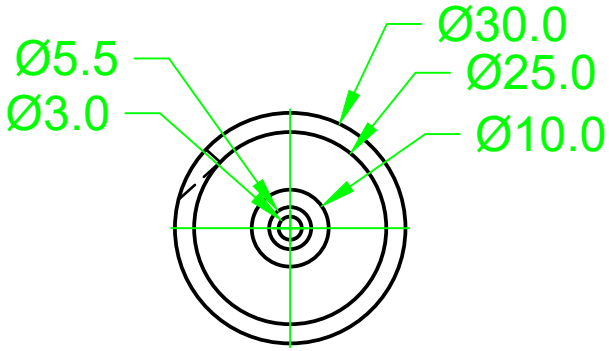


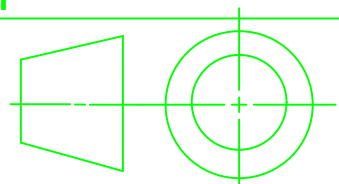


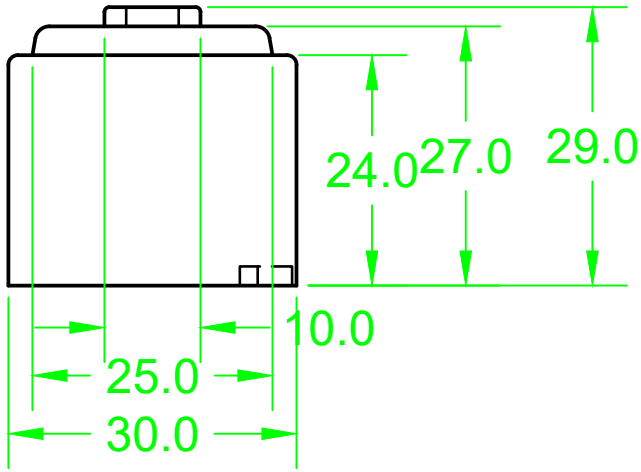
Name: M. Hamza Khalid	SCALE : 1:20
Roll no. : 241238	Class : BEME-1(B)
Sir Mehtab Khalid	Propeller connector
Dimensions in mm	1st angle 

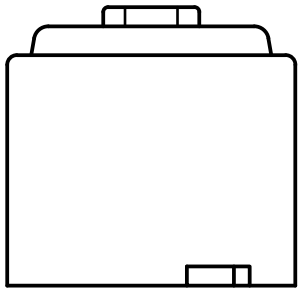


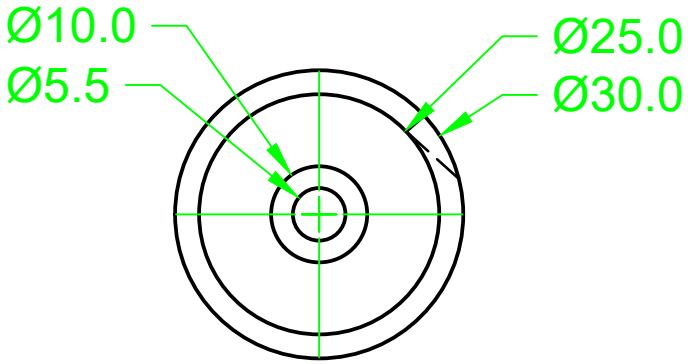


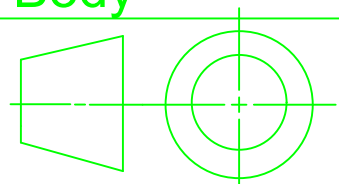


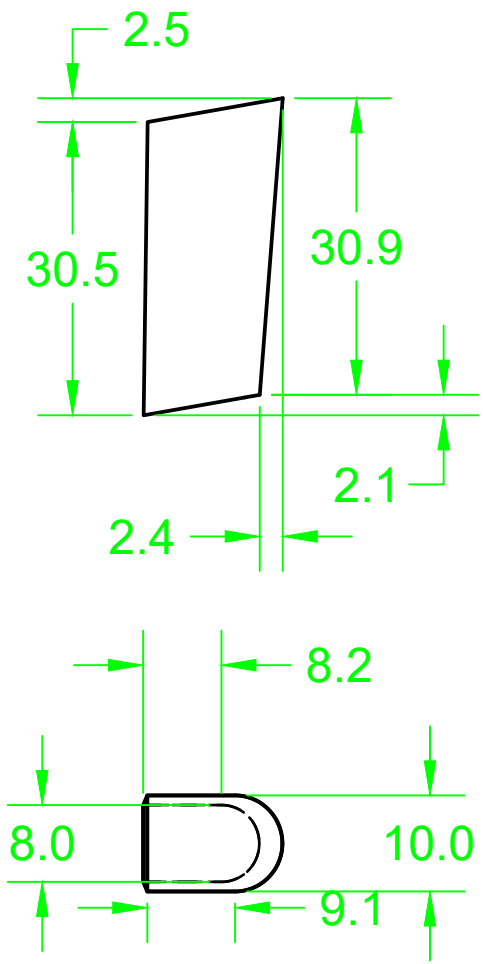
Name: M. Hamza Khalid	SCALE : 1:25
Roll no. : 241238	Class : BEME-1(B)
Sir Mehtab Khalid	Motor
Dimensions in mm	1st angle 

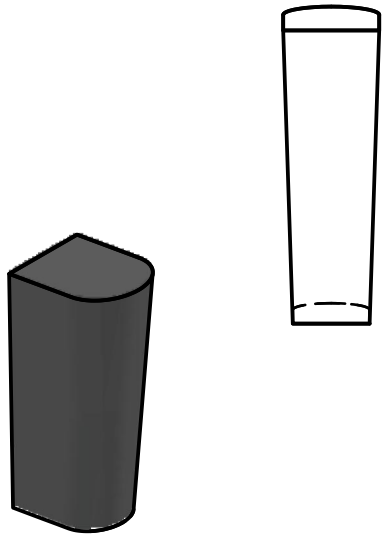




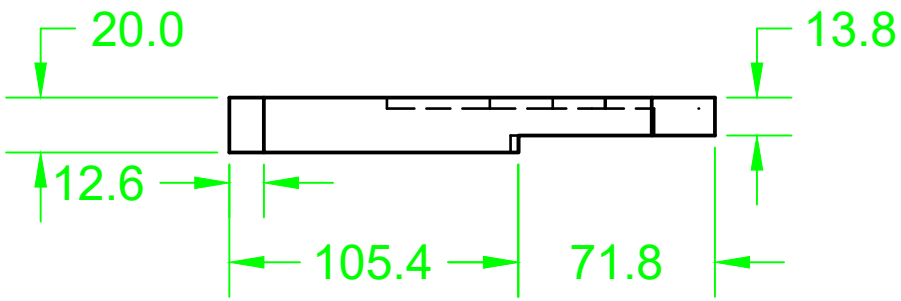


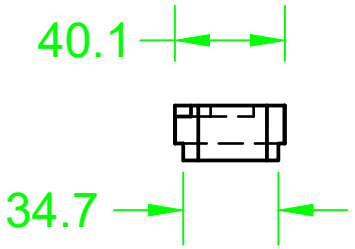
Name: M. Hamza Khalid	SCALE : 1:20
Roll no. : 241238	Class : BEME-1(B)
Sir Mehtab Khalid	Motor Body
Dimensions in mm	1st angle 

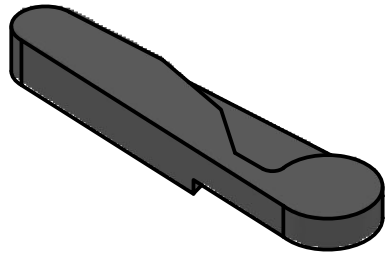


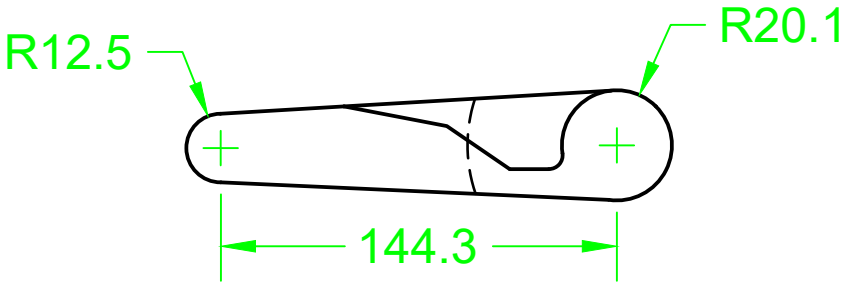


Name: M. Usman Khan	SCALE : 1:20
Roll no. : 241202	Class : BEME-1(B)
Sir Mehtab Khalid	Stand
Dimensions in mm	1st angle

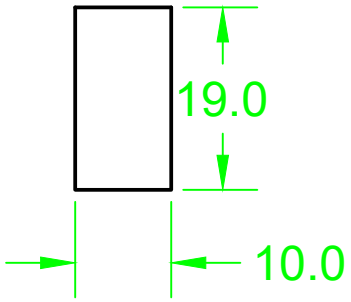


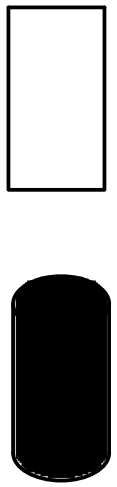


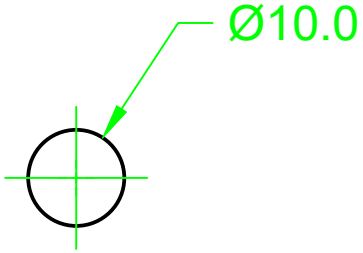


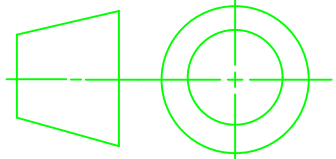


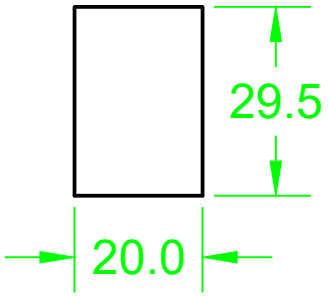
Name: M. Usman Khan	SCALE : 1:70
Roll no. : 241202	Class : BEME-1(B)
Sir Mehtab Khalid	Limb
Dimensions in mm	1st angle

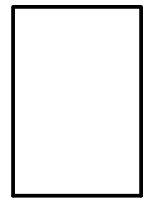


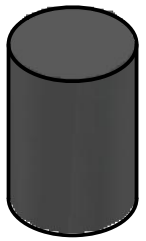


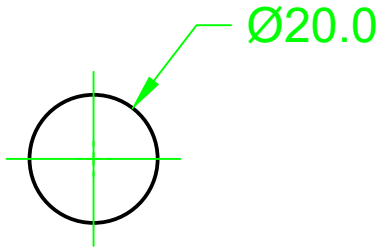


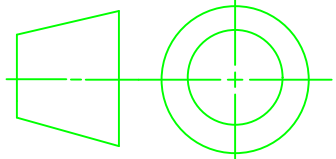
Name: Obaid Ahmed	SCALE : 1:20
Roll no. : 242124	Class : BEME-1(B)
Sir Mehtab Khalid	Front limb connector
Dimensions in mm	1st angle 

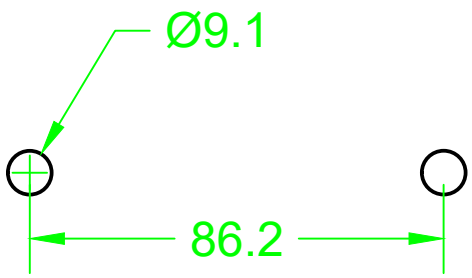




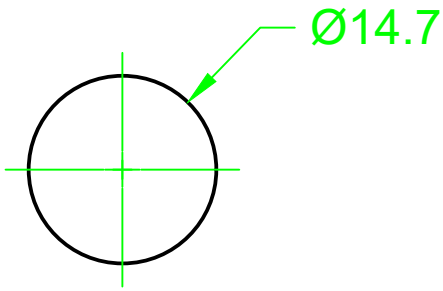


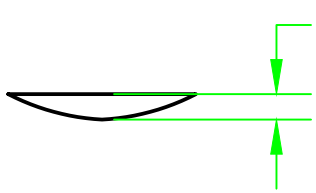


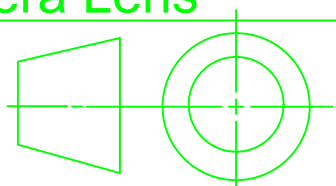
Name: Obaid Ahmed	SCALE : 1:30
Roll no. : 242124	Class : BEME-1(B)
Sir Mehtab Khalid	Back limb connector
Dimensions in mm	1st angle 

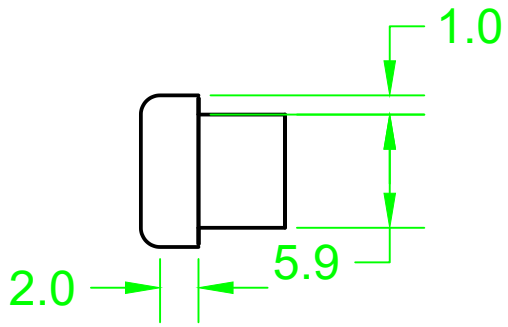


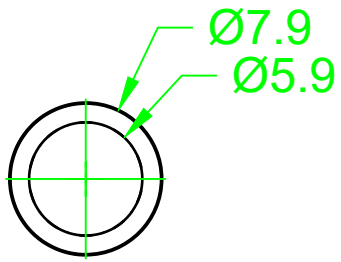
Name: M. Usman Khan	SCALE : 1:40
Roll no. : 241202	Class : BEME-1(B)
Sir Mehtab Khalid	Lights
Dimensions in mm	1st angle

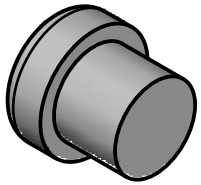


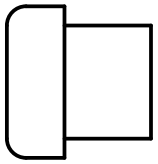


Name: M. Usman Khan	SCALE : 1:15
Roll no. : 241202	Class : BEME-1(B)
Sir Mehtab Khalid	Camera Lens
Dimensions in mm	1st angle 

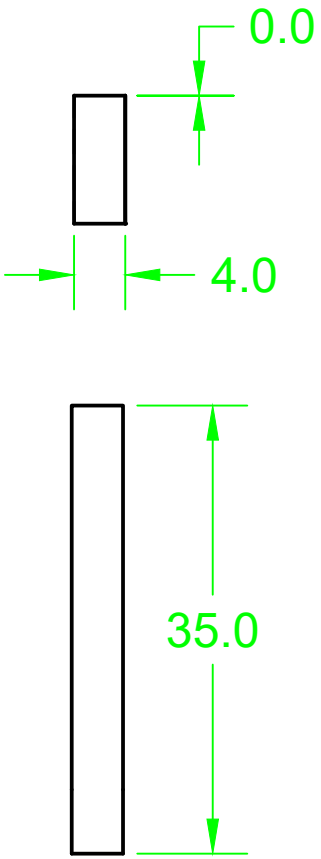


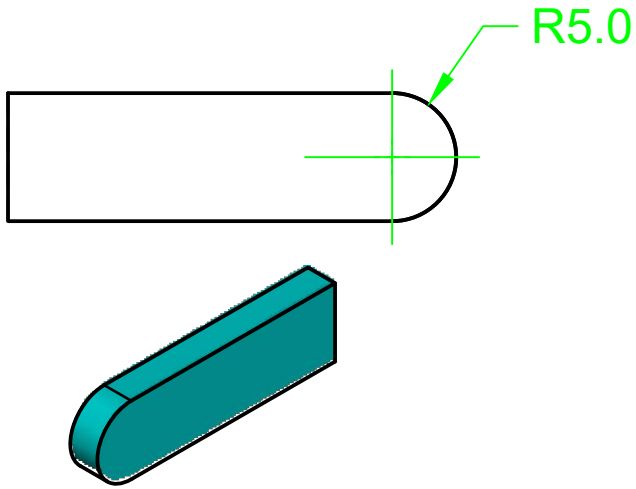




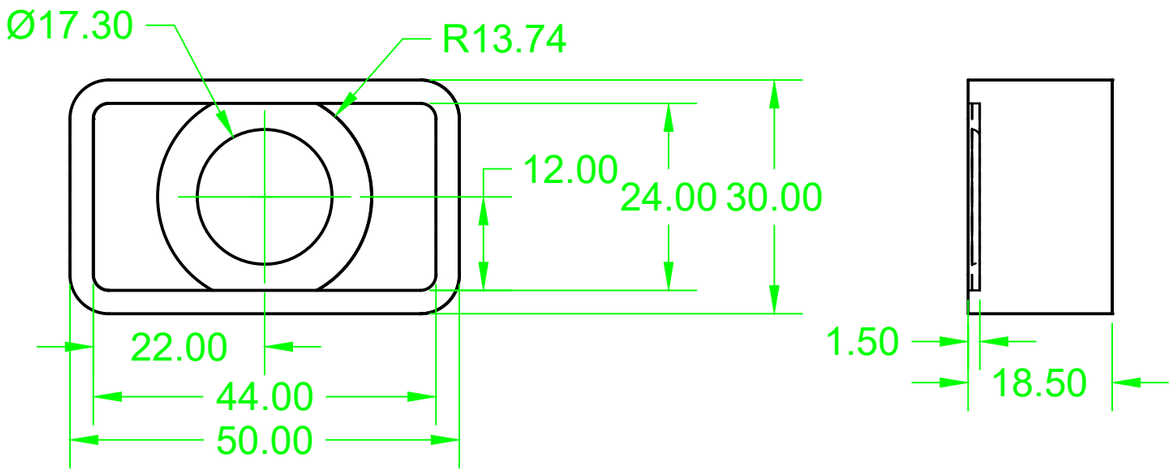


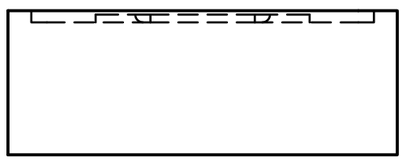
Name: M. Usman Khan	SCALE : 1:10
Roll no. : 241202	Class : BEME-1(B)
Sir Mehtab Khalid	Camera Nut
Dimensions in mm	1st angle

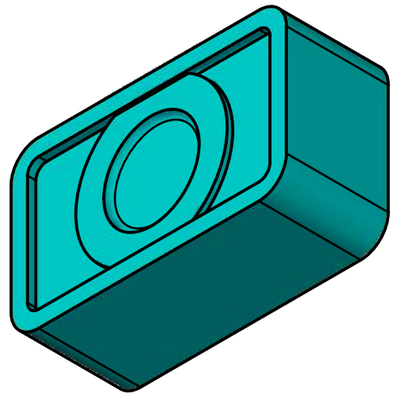


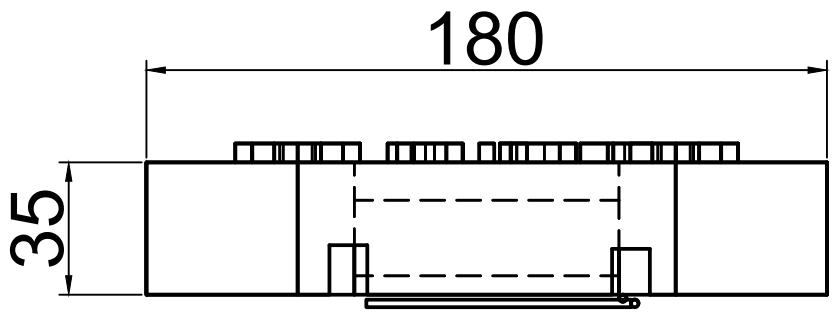


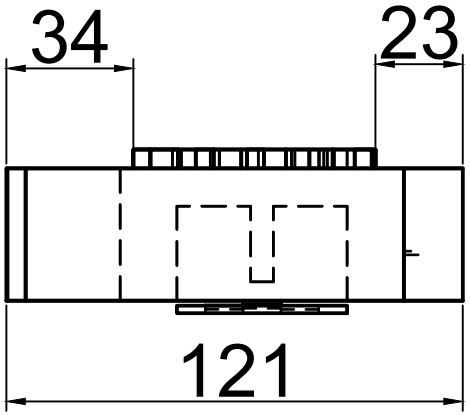
Name: Obaid Ahmed	SCALE : 1:15
Roll no. : 242124	Class : BEME-1(B)
Sir Mehtab Khalid	Camera Attach
Dimensions in mm	1st angle

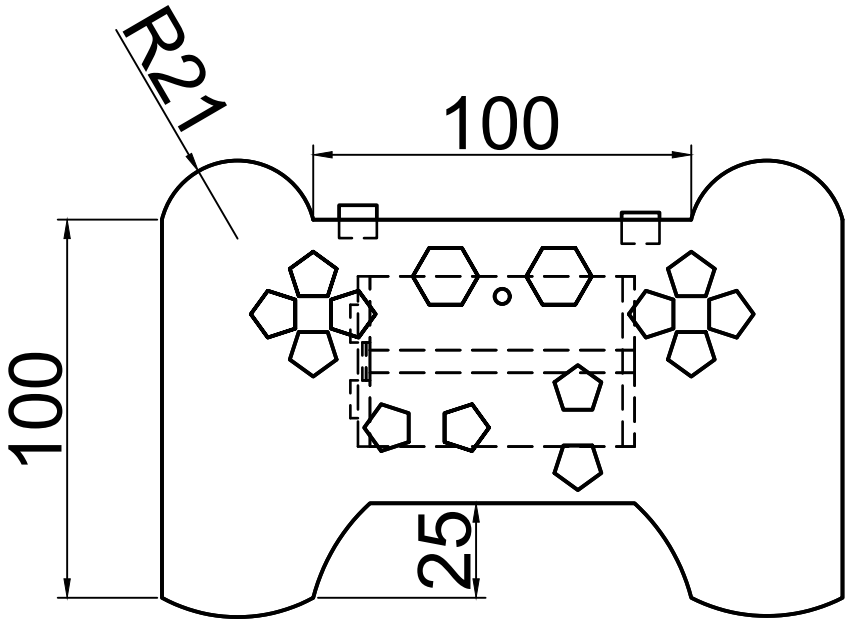

Ø17.30
R13.74
12.00
24.00
30.00
22.00
44.00
50.00
1.50
18.50

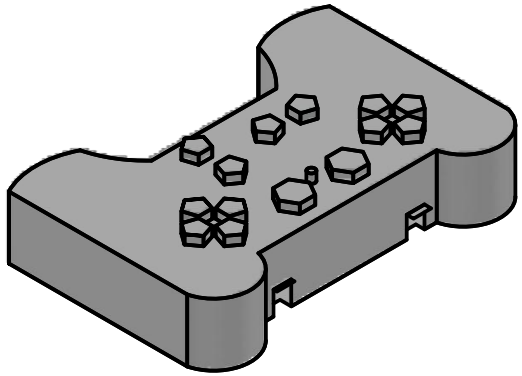




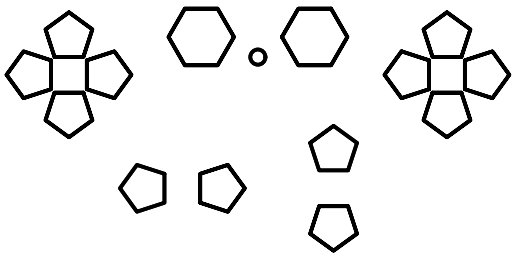


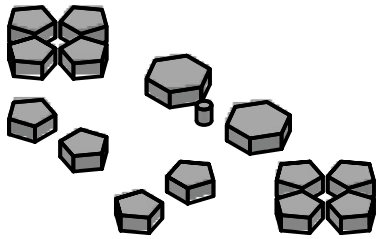


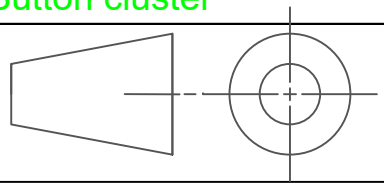


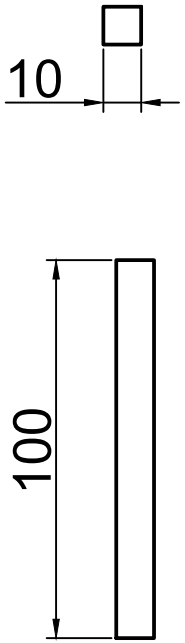


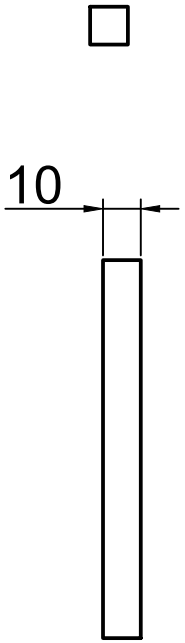
Name : Arsel Kaleem Abbasi	Scale : 1:2
Roll no : 241190	Class : BEME -1-B
Sir Mehtab Khalid	Button cluster
All dimentions in Millimeter	First Angle

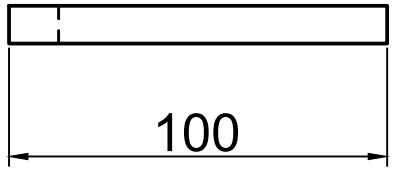


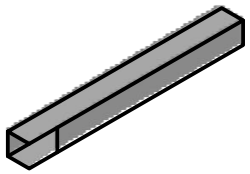


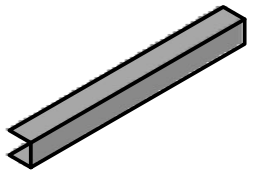
Name : Arsel Kaleem Abbasi	Scale : 1:2
Roll no : 241190	Class : BEME -1-B
Sir Mehtab Khalid	Button cluster
First Angle of projection	Symbol 

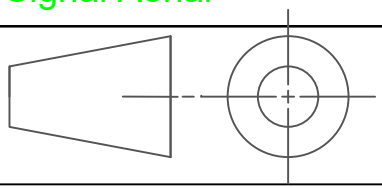


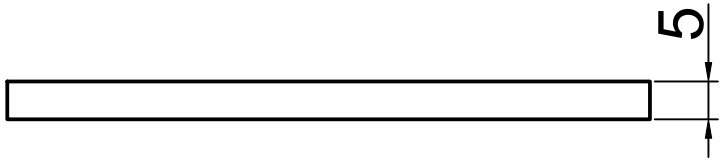


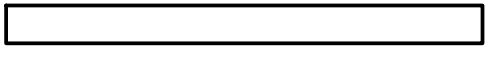


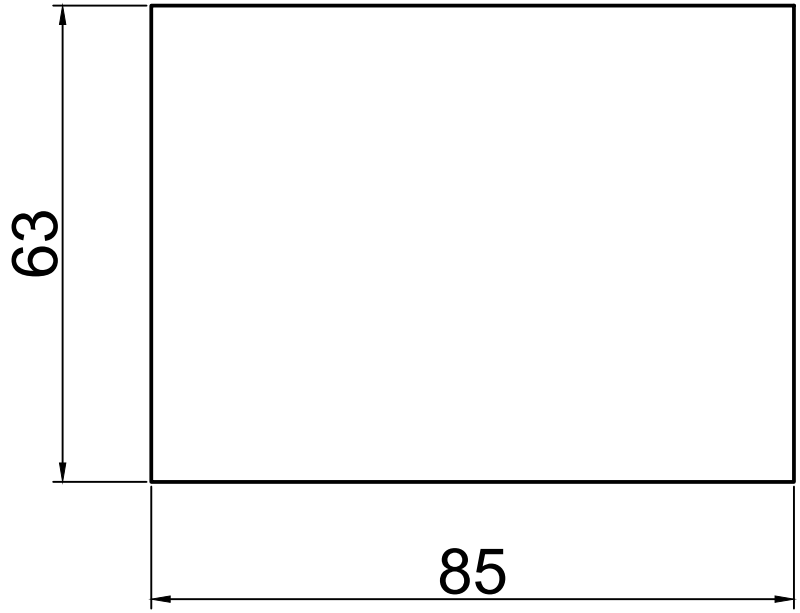


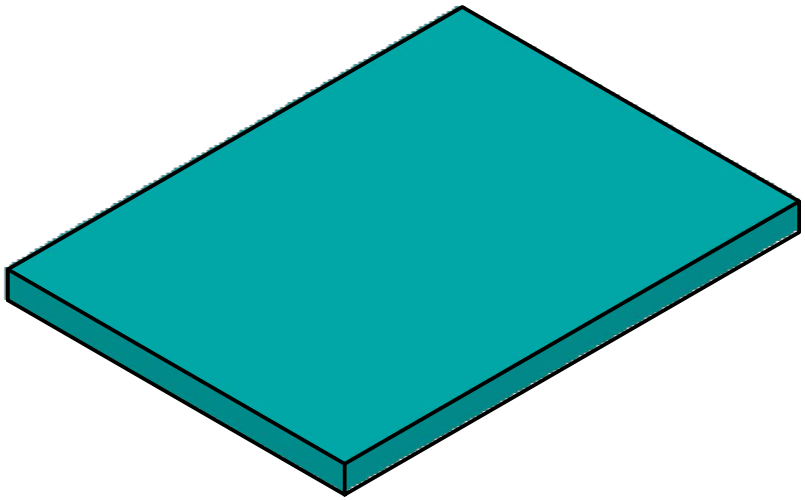


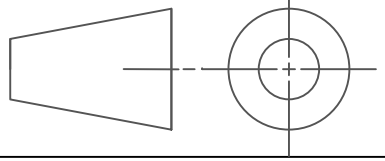
Name : Arsel Kaleem Abbasi	Scale : 1:2
Roll no : 241190	Class : BEME -1-B
Sir Mehtab Khalid	Signal Aerial
All dimentions in Millimeter	First Angle 

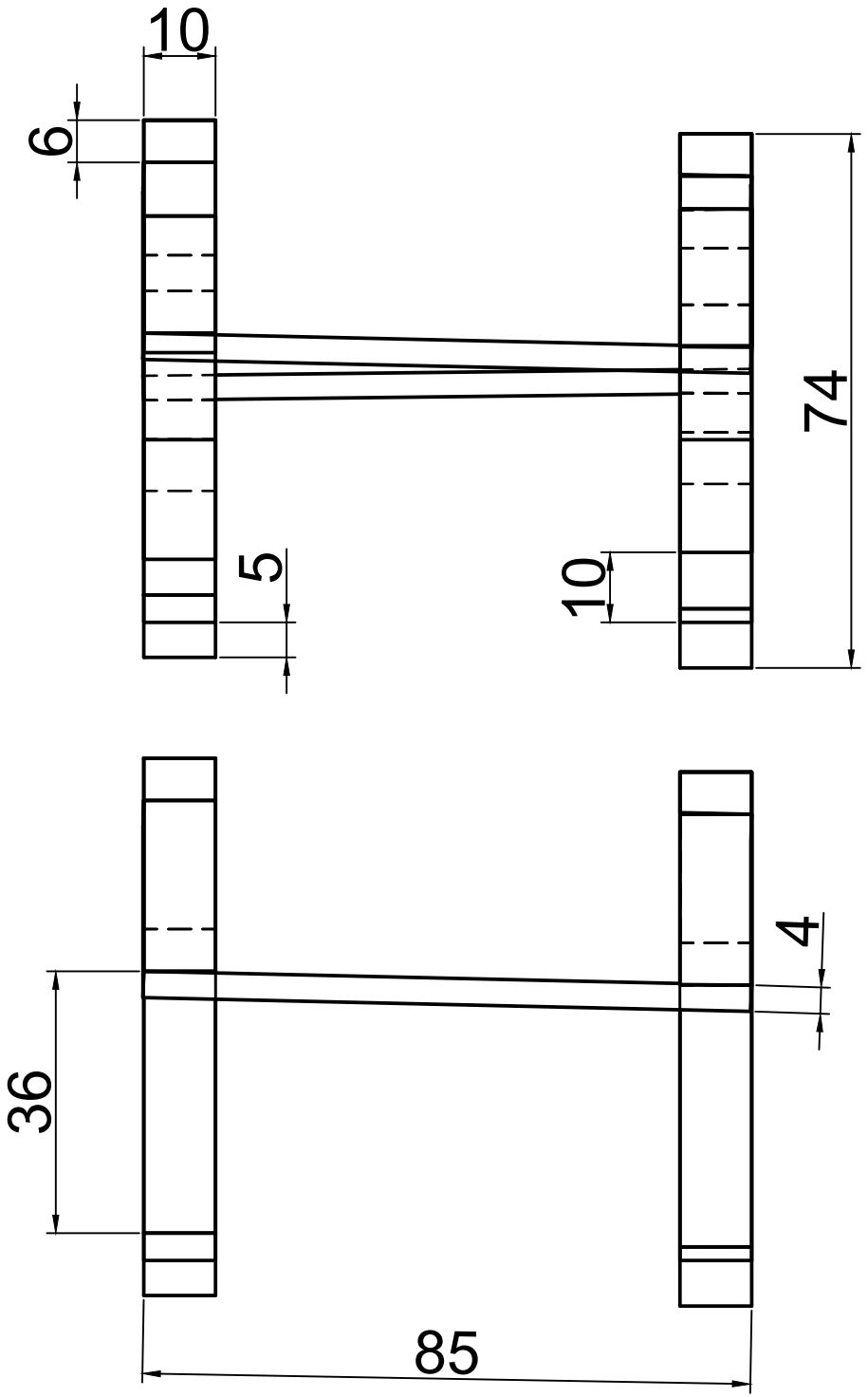


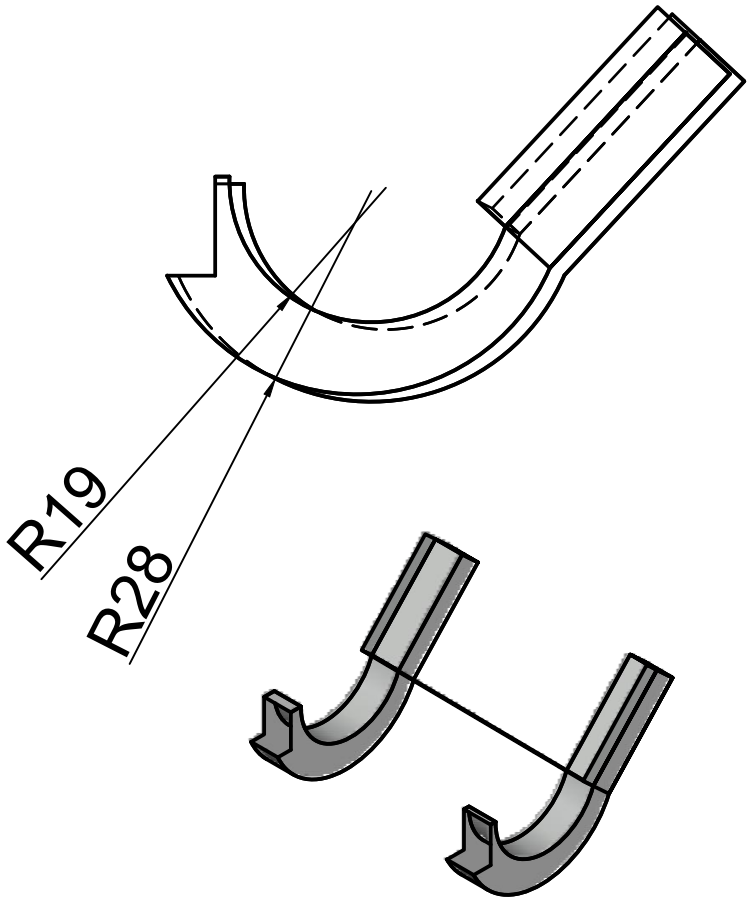






Name : Arsel Kaleem Abbasi	Scale : 1:1
Roll no : 241190	Class : BEME -1-B
Sir Mehtab Khalid	Display screen
First Angle of projection	Symbol 

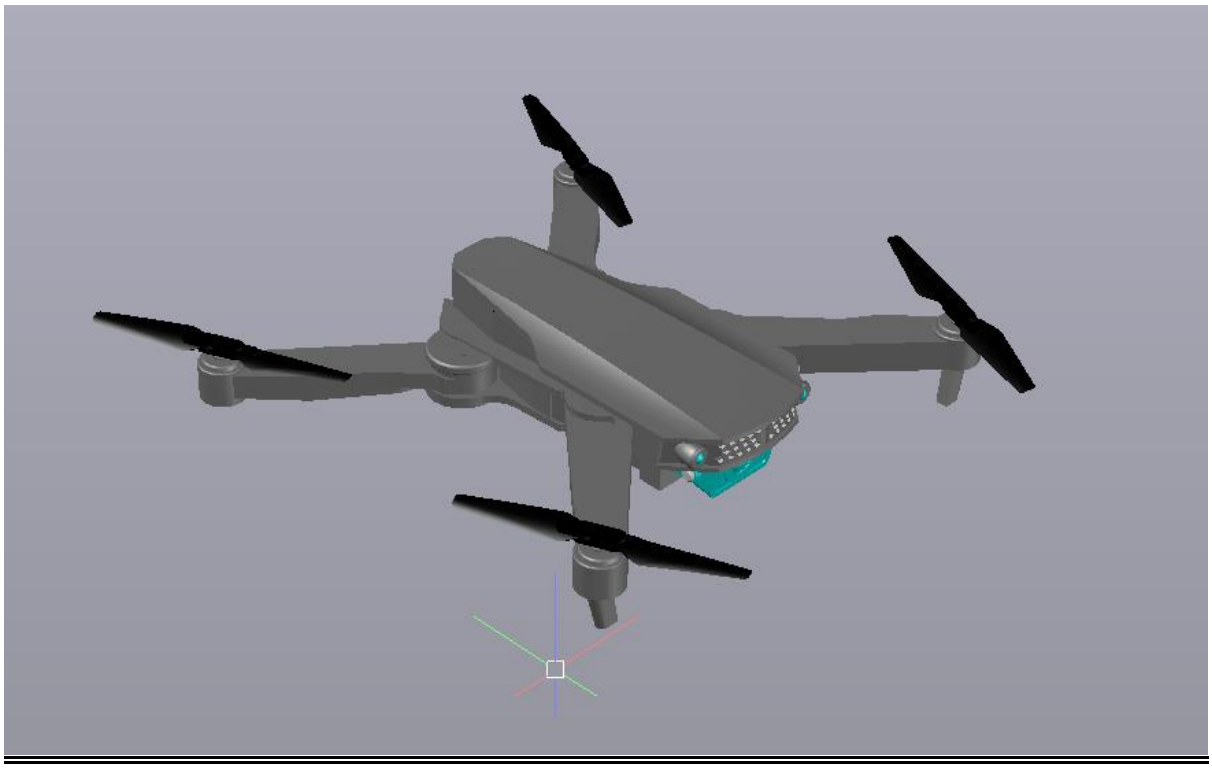




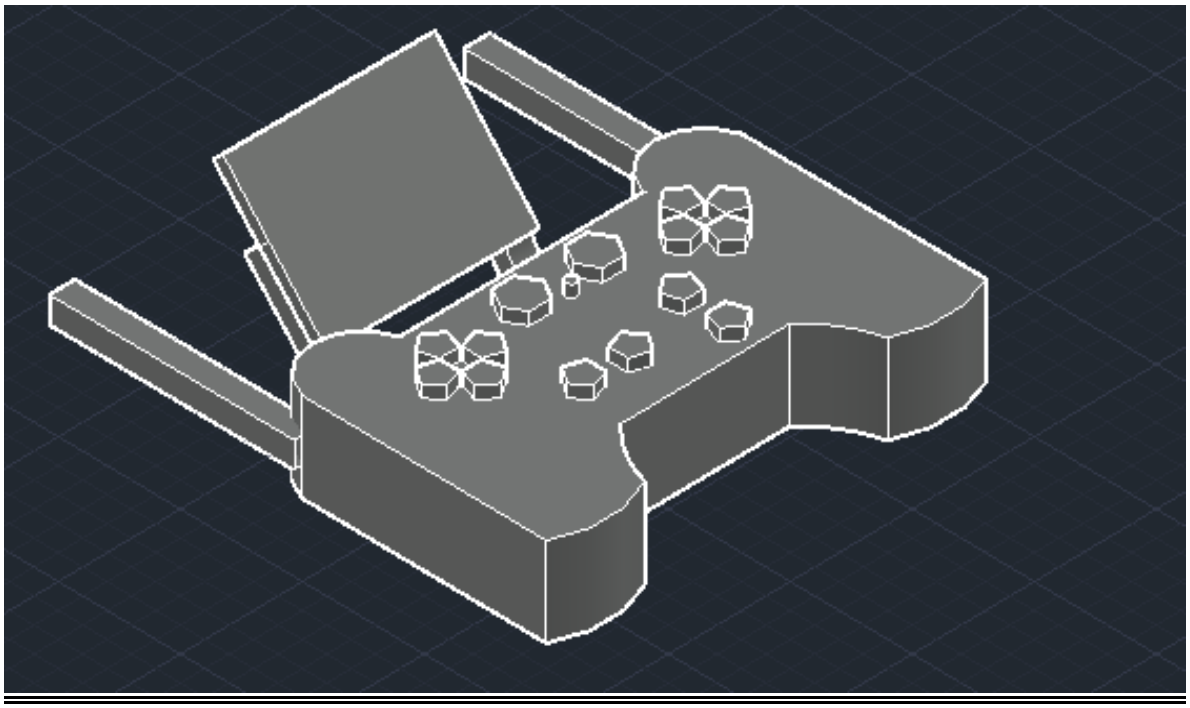
Name : Arsel Kaleem Abbasi	Scale : 1:2
Roll no : 241190	Class : BEME -1-B
Sir Mehtab Khalid	screen holder
First Angle of projection	Symbol

MANNUAL

Drone:

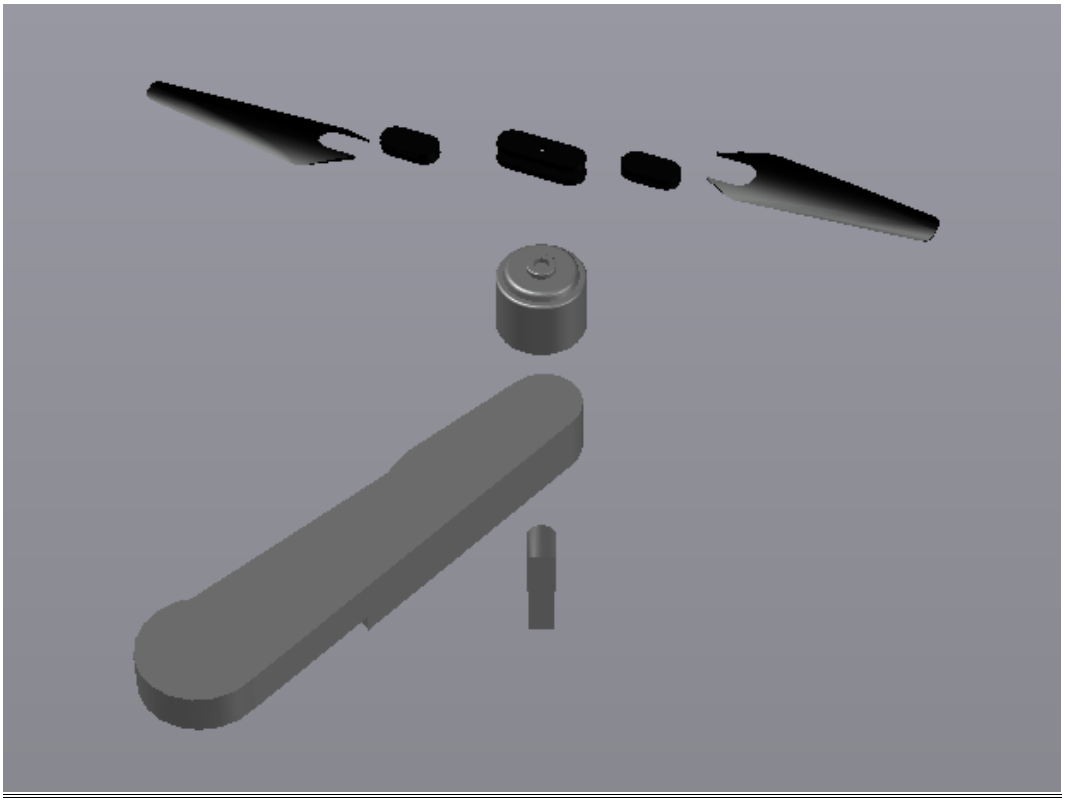


Remote:

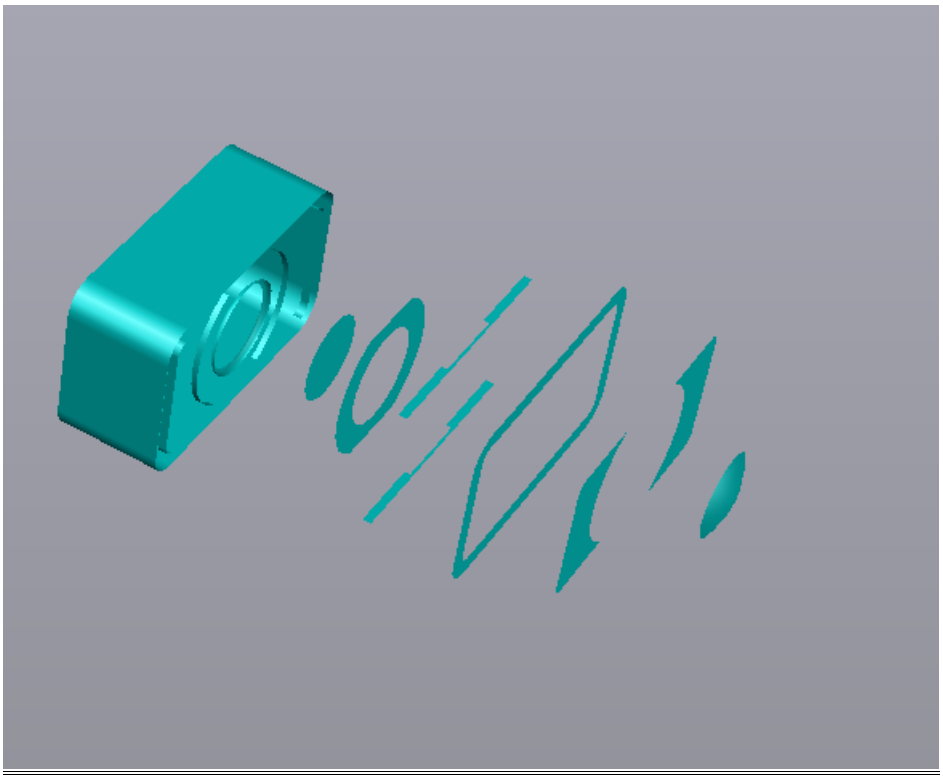


EXPLODED VIEWS:

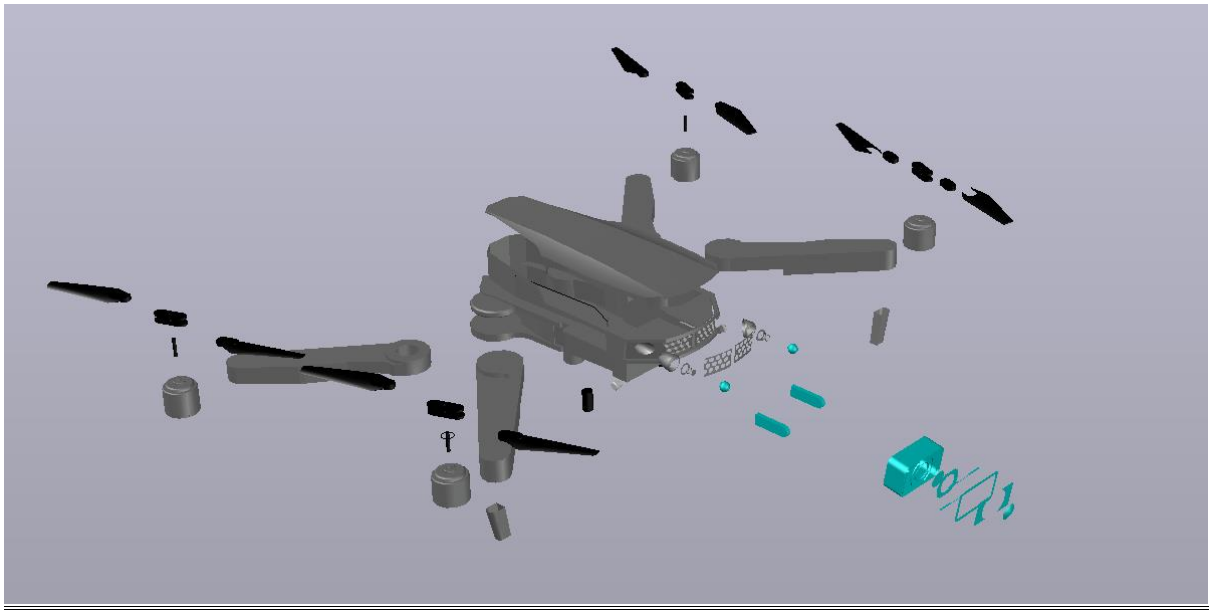
Propeller Part



Camera Part



Drone



CHALLENGES:

Since AutoCAD is a simple and easy to be used software but while performing the Project there were many difficulties that we faced. Some of the parts were drawn with the help of different sites. While assembling the drone parts was a difficult task while taking the precise dimensions. Following are some of things occur while performing the project

- Although everyone had to play there role on making drawings, so knowing were to assemble the drawings were causing certain problem. To tackle this a lot of time had to be consumed.
- While handling these problems a lot of new things we learned and gain information.
- Choosing the topic was critical, knowing which products are more valuable in the industries current time zone.
- Exploded view of the project was time consuming since each part had to be assembled and labelled.

At the Last, in making the report, merging pdf layouts and making bill table was a lot confusing.

CONCLUSION:

This project has successfully demonstrated the design and development of a DJI Mavic drone using AutoCAD software. Through the creation of detailed 2D and 3D models, we have showcased the capabilities of AutoCAD in designing complex aerial vehicles. The project has also highlighted the importance of considering factors such as aerodynamics, weight, and stability in drone design. The final design package provides a comprehensive and annotated documentation of the drone's components and assembly.

Future Recommendations:

For future improvements and developments, we recommend the following:

1. Integration with Simulation Tools: Integrate the AutoCAD design with simulation tools to test and validate the drone's performance, stability, and aerodynamics.

2. Material Selection and Analysis: Conduct a detailed analysis of materials and their properties to optimize the drone's weight, strength, and durability.

3. Design Optimization: Utilize AutoCAD's optimization tools to improve the drone's design, reducing weight and increasing efficiency.

4. Collaboration with Manufacturing: Collaborate with manufacturing teams to ensure the design is manufacturable and meets production requirements.

5. Exploration of New Features: Explore the integration of new features, such as advanced sensors, AI-powered navigation, and swarm technology, to enhance the drone's capabilities.