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UAV-HexaCopter

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Drone Technology

Emerging line for better utility & Sustainability

Unmanned Vehicle
(Remotely Operated, Controllers & servers)

Shipping/Cargo Process
(for accommodating less time with multiple task)

Warship Zone
(Medical Emergency, Missile Systems, Spy World)

Technology
(Defense System, Mapping in framing, Surveillance)

Why we choose Hexa?

Hexacopter:

Pros

- Strong and capable
- Can reach higher altitudes
- Even if one rotor is damaged, can stay up high
- On windy days, it is stable
- You can add more payload and accessories

Cons

- Drones with smaller wings are more expensive
- Too big to fit in tight spaces or in areas with many obstacles

Quadcopter:

Pros

- Rapid and agile
- Drones with more rotors are less expensive.
- It is easy to build a home
- Can generate more thrust and power

Cons

- There are no backup rotors, so if one fails, the drone can crash.
- You can carry a payload but not as much as a helicopter

Key Result: Hexa type have more Stability & Stay Operated even some rotor will Damage

Hexacopter Drone

Design Prototype

Specifications:

Model: Flame Wheel 550 (X550)

Frame Weight: 478g

Diagonal Wheelbase: 550mm

Takeoff Weight: 1200g ~ 2400g

Recommended Propeller: 10 × 3.8in ; 8 × 4.5in

Recommended Battery: 3S~4S LiPo

Recommended Motor: 22 × 12mm (Stator size)

Recommended ESC: 15A OPTO

Details of Frame with Motors, ESC & Propellers

Specifications:

Material: Carbon Fibre

Frame Weight: 478g

Diagonal Wheelbase: 550mm

Takeoff Weight: 1200g ~ 2400g

Arm Size (L x W) mm: 220 x 40

Motor Mounting Hole Dia.: 3 mm

Landing Gear Height: 200 mm

Landing Gear Weight: 75 g

ESC Max Allowable Voltage: 17.4 V

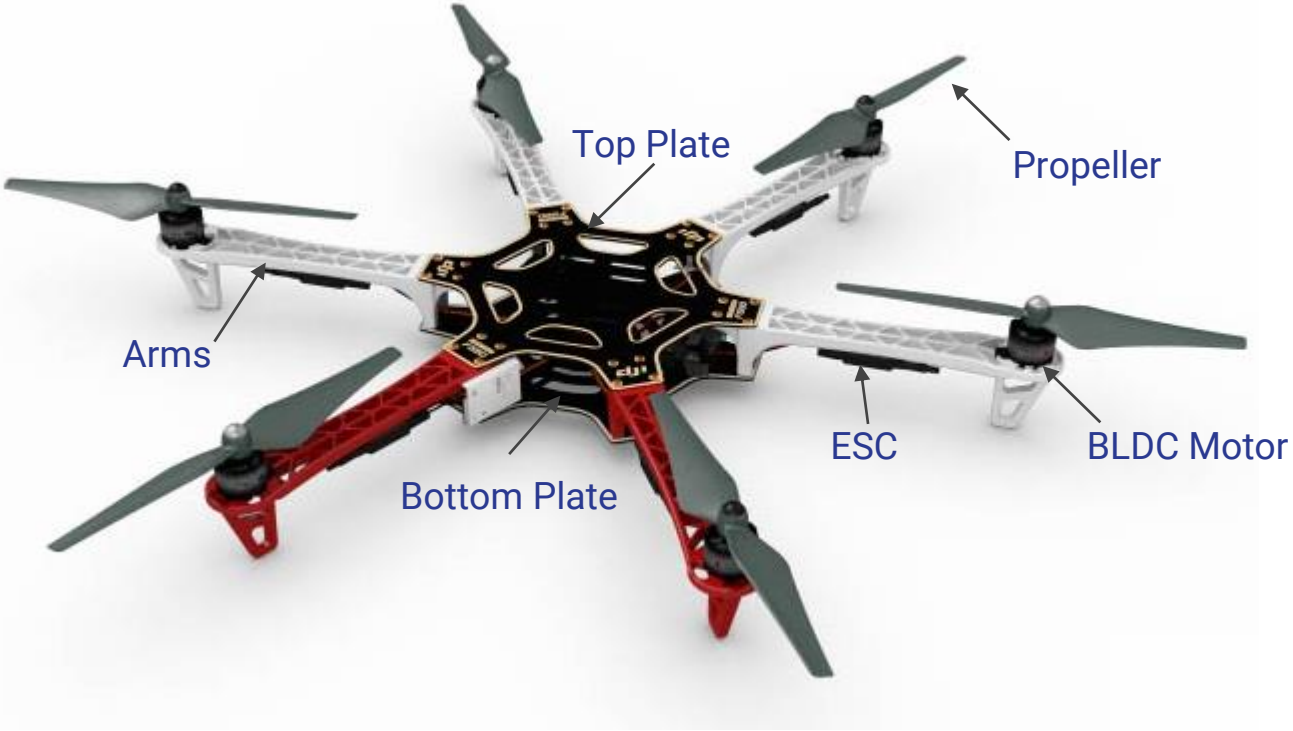
ESC Max Allowable Current: 20 A

ESC Battery: 3S-4S LiPo

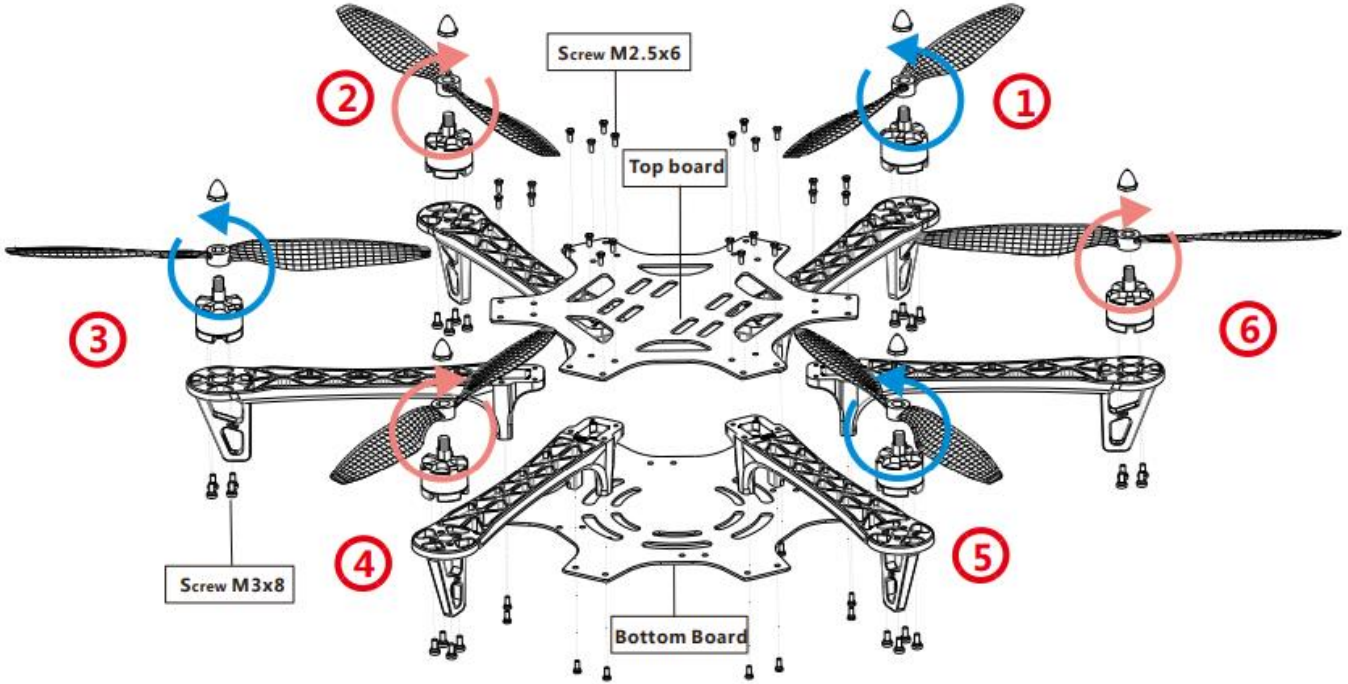
Stator Size: 23*12 mm

Propeller Diameter: 9.4*5 inch

Assembly of Frame with Motors, ESC & Propellers



Exploded View of UAV Hexacopter



Step 1
Install bottom board

Step 2
Install autopilot system

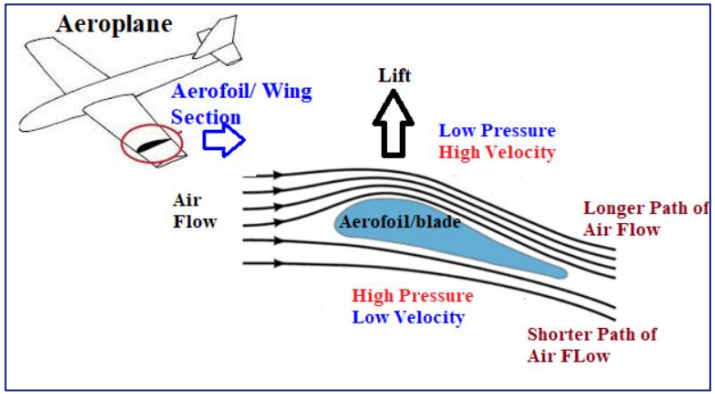
Step 3
Install motors, ESCs

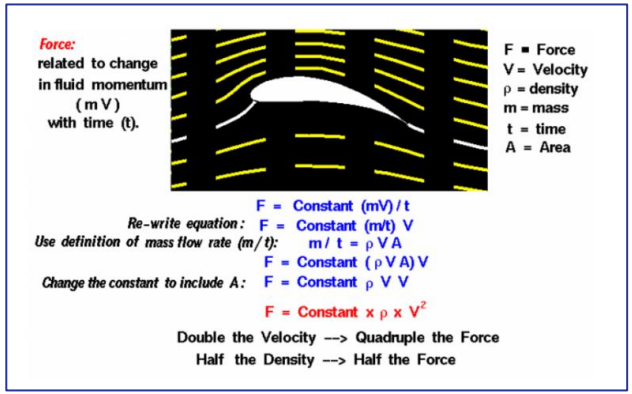
Step 4
Install top board

Step 5
Install propellers

Flow Pattern of UAV Hexacopter

- The subject of Fluid dynamics plays a significant role in the design and development of aircraft and drones.
- A sufficient amount of upward force is required to lift the vehicle against gravity which is named Lift.
- A force created to move the vehicle or body in motion is called thrust. These forces can be studied using the kinematic laws of fluid flows
- When air flows over an aerofoil and pressure, viscous and drag force act on the profiles
- Force is directly proportional to the velocity of air at the inlet
- The amount of lift force depends on the angle of inclination of the aerofoil or propeller.





Communication Systems

A drone controller is a remote control that a drone pilot uses.

It is the one that makes the drone respond to the command of the pilot.

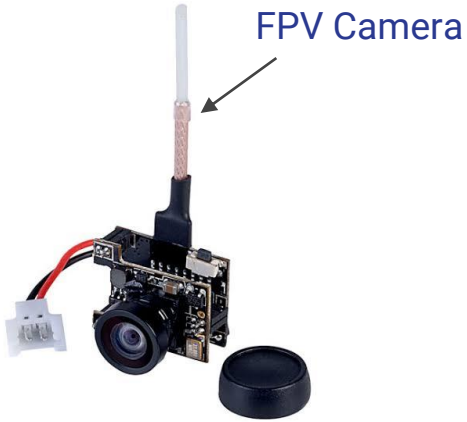
Communication between the drone and controller is often through Radio signals, Wi-Fi, or GPS.

The type and strength of the communication type affect how far the drone can fly from the controller.

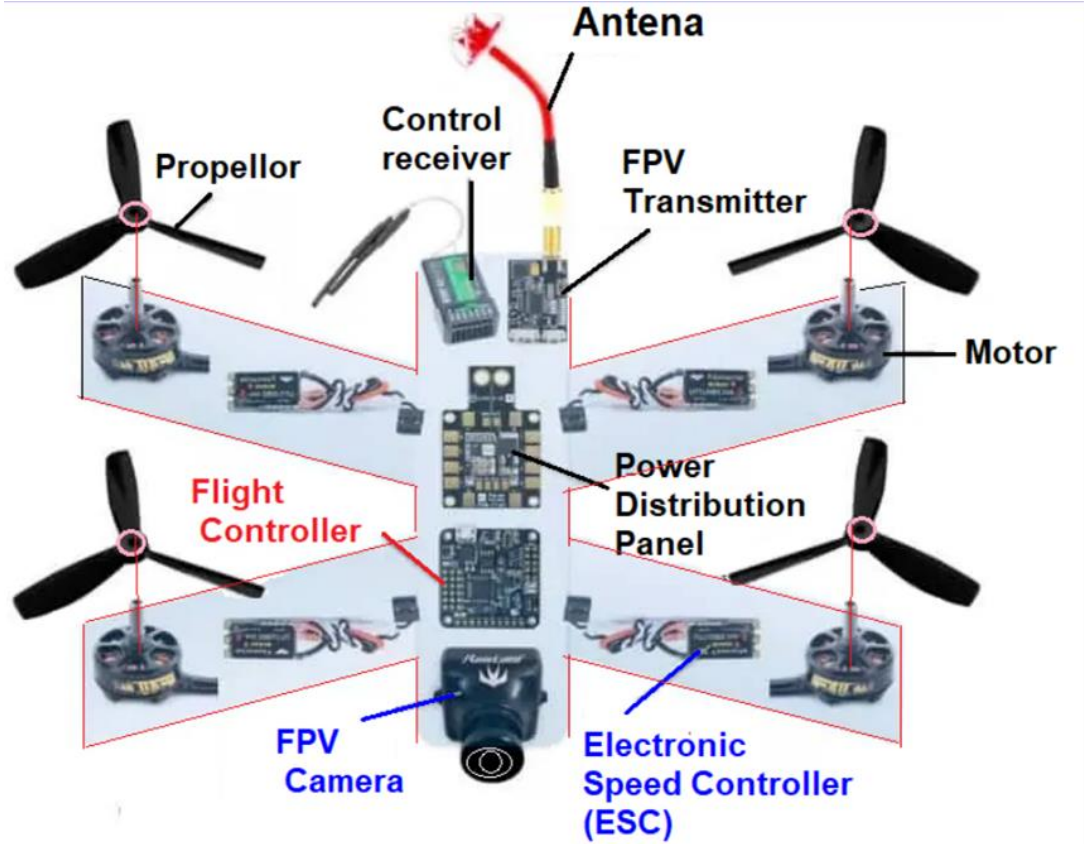
Communication Systems

1st Connection:(Operating)
Transmitter → Receiver → Flight Controller(Pixhawk) → ESC → Motor

2nd Connection:(Camera Connection)
WIFI → Telemetry → Camera



Schematic Diagram



Sensors & Systems