

Drone Applications, Components and Assembly **(CSE2040)**

Lab Exercise 1: **Drone Components**

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Drone frames :

Basically, the drone frame is the most important to build a drone. It helps to mount the motors, battery, and other parts on it.

If you want to build a copter or a glide, you first need to decide what frame you will buy or build.

For example, if you choose a tricopter, your drone will be smaller, the number of motors will be three, the number of propellers will be three, the number of ESC will be three, and so on.

If you choose a quadcopter it will require four of each of the earlier specifications.

For the gliding drone, the number of parts will vary. So, choosing a frame is important as the target of making the

drone depends on the body of the drone. And a drone's body skeleton is the frame.

Motors :

There are a few types of motors that are use to build drones.

But as the drone needs to be thrust in the air to float, we should use some powerful motors

The cheap, lightweight, small, and powerful motors used in drones are Brushless DC motors (BLDC).

For small drones, we do not use BLDC motors, but instead use small DC gear motors.

- Power distribution board: The power distribution board of the drone allows the components of the drone to get a proper current and draw a perfect voltage.
- We will have four ESCs; we can buy a power distribution board to deliver the proper current to all the ESCs.

Connectors :

Connectors are the most important things for the power and other parts of the drone.

If the connectors lose your drone, it might meet with an accident.

So, buy connectors with special care according to the drone's power distribution system.

You need to solder connectors properly with the batteries, ESCs, and other parts of the drone.

You need to buy bullet connectors, XT60, or T-plug connectors and use them where they suit.

Battery :

A drone is useless without a battery. All motors, flight controllers, radio, and processing require power.

But it is not a wise decision to use the heavy battery to fly your drone because most of the energy will be spent on the thrust of a drone to fly.

So, we need to choose light but powerful batteries.

In a drone, we usually use lithium polymer batteries.

Propellers :

When you choose propellers for your drone, choose the lightest but strongest propellers.

You also need to keep in mind that the propellers should be balanced on both sides.

Most drone flight failure are due to a fault in the propellers.

Always choose the right size propellers.

Speed controllers :

You cannot control the speed of motors of your drone unless you use speed controllers.

They enable you to control the voltage and current of the motors and hence control the speed, which is the first priority

to move the drone one place to another, after floating in the air.

You need to increase and decrease the speed of motor(s) to move the drone forward, backward, left, or right.

Flight control board :

This is one of the most important things to control the drone from the ground.

There are a number of flight control boards on the market. Some of them are open source and some of them are not.

Radio transmitter and receiver :

What the transmitter does is it sends a signal to the receiver.

The receiver receives this signal and does according to the command from the transmitter.

Since the drone floats in the sky, it needs to send signals to command the drone to move or do something.

So we need the transmitter and receiver. There are lots of transmitters and receivers out there.