

PCB Drone Background



Example Image of what a PCB drone might look like

Thanks for being interested in AERO Electrical. We're going to divide up this PCB Drone project into rough modules based off the following subsystems.

Major Subsystems:

- **Power:** This supplies and regulates energy for the entire drone. Without stable & consistent power, the motors won't be able to spin and none of the other chips on the board will be able to function.
 - a. Battery: stores the energy that powers the whole circuit
- **Processing / Control:** This acts as the "brain" of the drone. This consists of the hardware that reads the various sensor inputs and runs the code on the drone.
 - a. Microcontroller: the brain of the drone, takes in all inputs and sends all outputs
 - b. Inertial Measurement Unit (IMU): gyroscope, accelerometer, magnetometer – measures angle of the drone with respect to ground & its velocity.
- **Thrust:** This translates electronic control signals into physical movement. This is where electrical energy is converted to mechanical force.

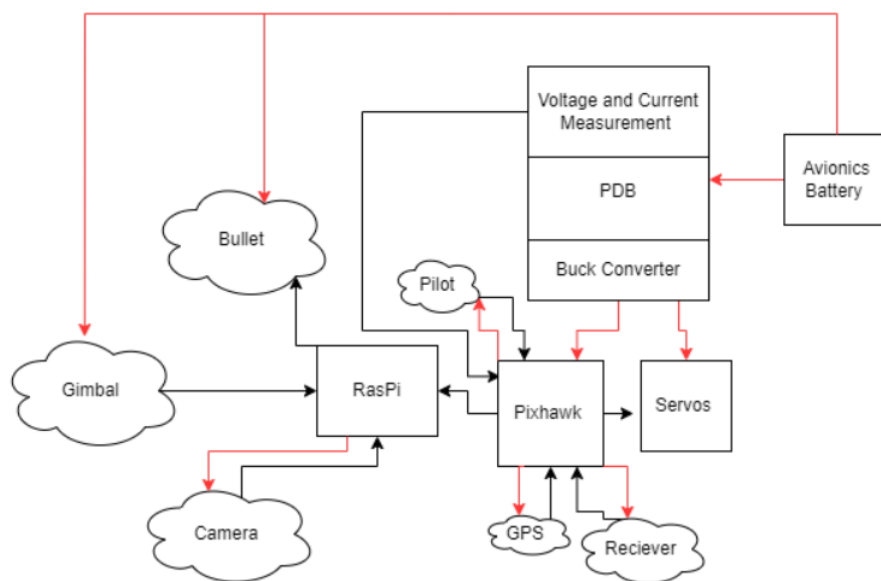
- a. Motor Drivers: takes low-power signals from the controller and deliver high-power drive to motors
 - b. Motors: Spins the propellers to generate lift
- Communication: This provides a radio signal link between the drone and the outside world. It allows the pilot (or external computer) to monitor data from and command the drone.
 - a. Receiver: Receives signals for the drone
 - b. Transmitter: Sends signals from the drone

Try your best to put these underlined terms together in a block diagram before Friday! You don't have to watch all the videos or go through all the resources but just be familiar with the big picture concepts.

What is a block diagram?

A block diagram is a high-level visual representation of a system that shows its major functional parts (called “blocks”) and how they connect to each other. Each block represents a component (battery, microcontroller, etc.). Arrows show the flow of information, signals, or power between these blocks. The purpose of these diagrams is to emphasize function and relationships between different components, not detailed circuitry. It helps us understand the big picture before diving into the specifics and helps us identify dependencies.

Here is an example block diagram:



AERO 2024-25 Electrical System Block Diagram