DRONES

BBHHS

Goubeaux

What is a Drone?

- Drone: an aircraft without a human pilot aboard
  - Drone
  - UAV
  - UAS
 - Quadcopter
  - Hex copter
  - Octocopter

Brief History

- 1849 – Austrians used unmanned balloons with explosives
- 1916 – WW1 Flying bomb
- 1927 to 1935 – Royal Navy Radio controlled War plane
- 1940 – WW2 U.S. Army Radiopalne OQ-2
- …
- Many more military and industrial uses
- Recently this technology has entered the consumer space.

A History of Drones

1849
Austria bombs Venice with balloons.
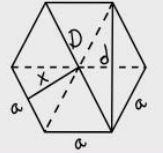
1935
Reginald Denny develops the first remote controlled model airplane

1973
Camera-fitted UAVs are improved to be able to provide real-time surveillance.

1970
Drones with cameras are first used, as well as drones used as decoys

1959
U.S. Air Force begins official planning for development of unmanned aircraft

'80s-'90s
Further improvements to miniaturization lead to rapid accerleration in development.

2005
Hand-held classification drones become easily accessible to hobbyists.

Today
Drones are commonplace and are used for recreational as well as commercial purposes.
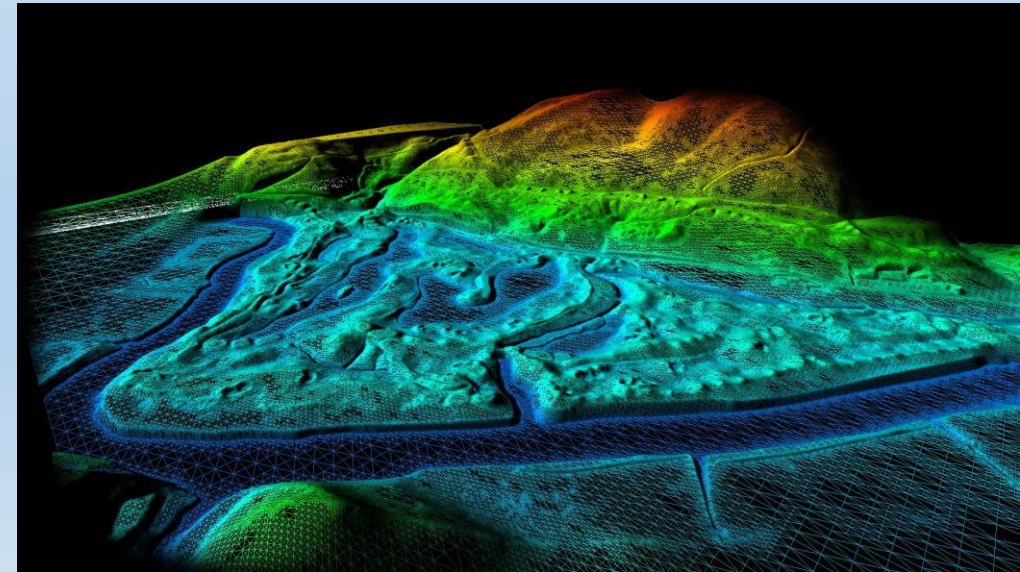
The Future

Regulation

- FAA – Federal Aviation Administration
- National authority with powers to regulate all aspects of civil aviation
- All drones need to be registered with the FAA
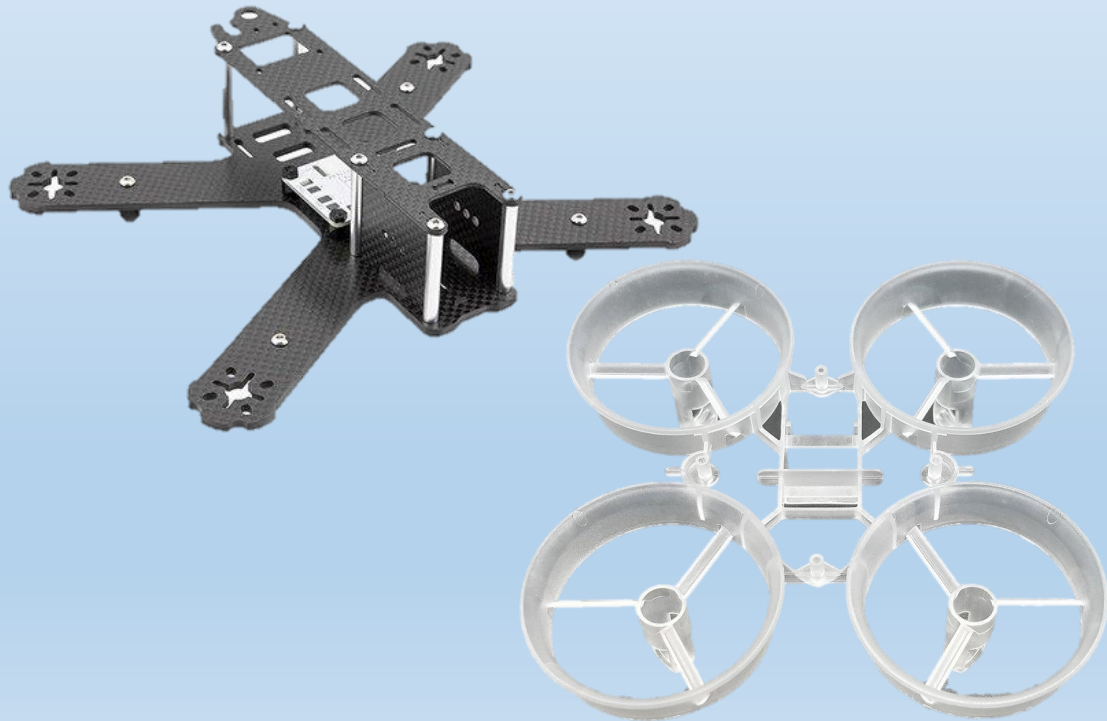 - Recreational License $5.00
- B4UFLY App
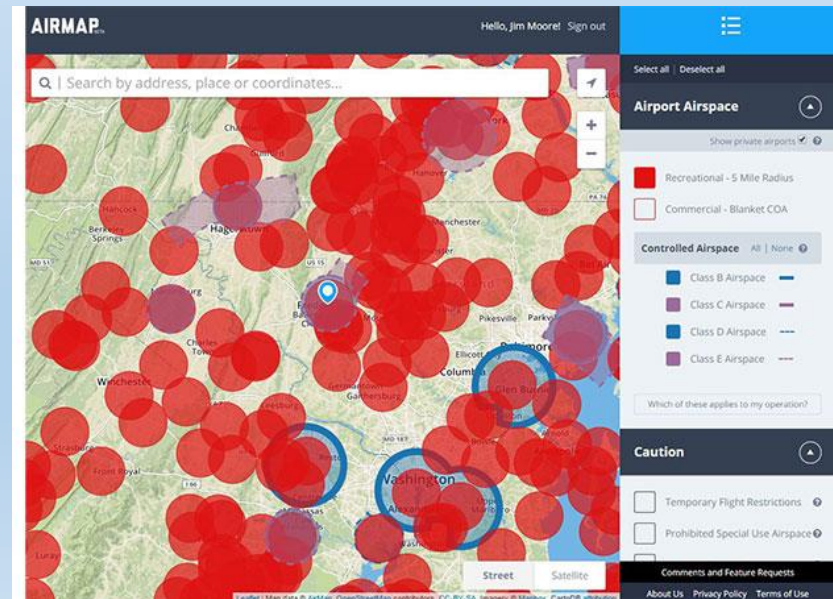
Uses Today

- Recreation
- Photography + Video
- Racing
  - DRL – Drone Racing League
- Mapping + Topography
- Military
- Delivery
- Transportation ?

Drone Parts

- Frame – Holds all parts of the drone. Commonly lightweight plastic of carbon fiber.

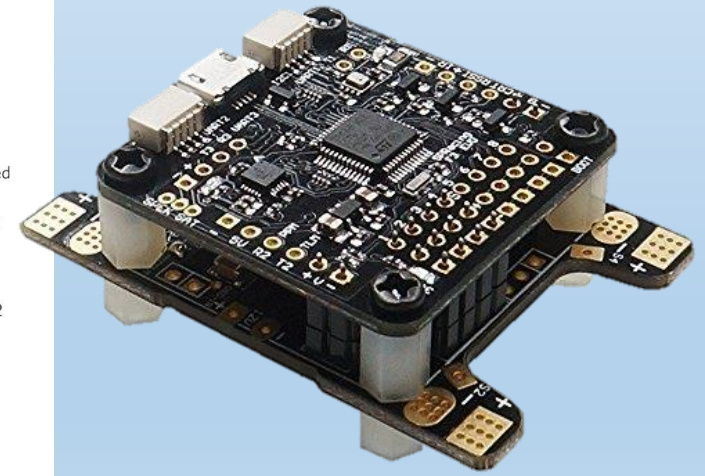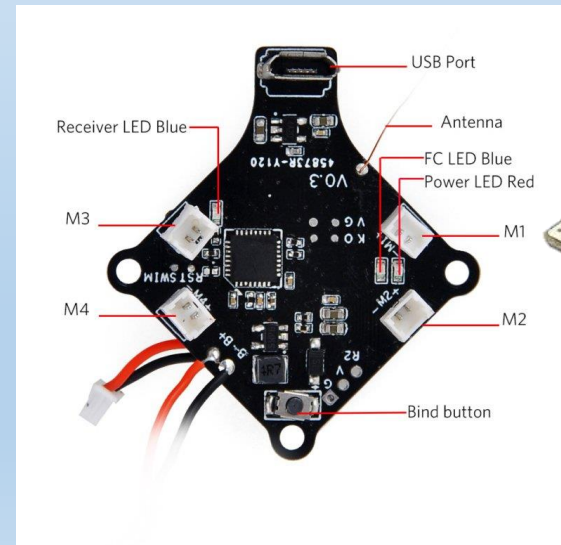- Props – Propellors used to lift drone and control all flight directions.

Drone Parts

- Motors – Small lightweight electric motors that spin the propellers.

- Flight Controller – Brain of the drone controlling all functions of the drone. Turns user inputs to movements.

Drone Parts

- Battery – Power source. Rechargeable

- Front Indicator – Normally LED to indicate front of drone.
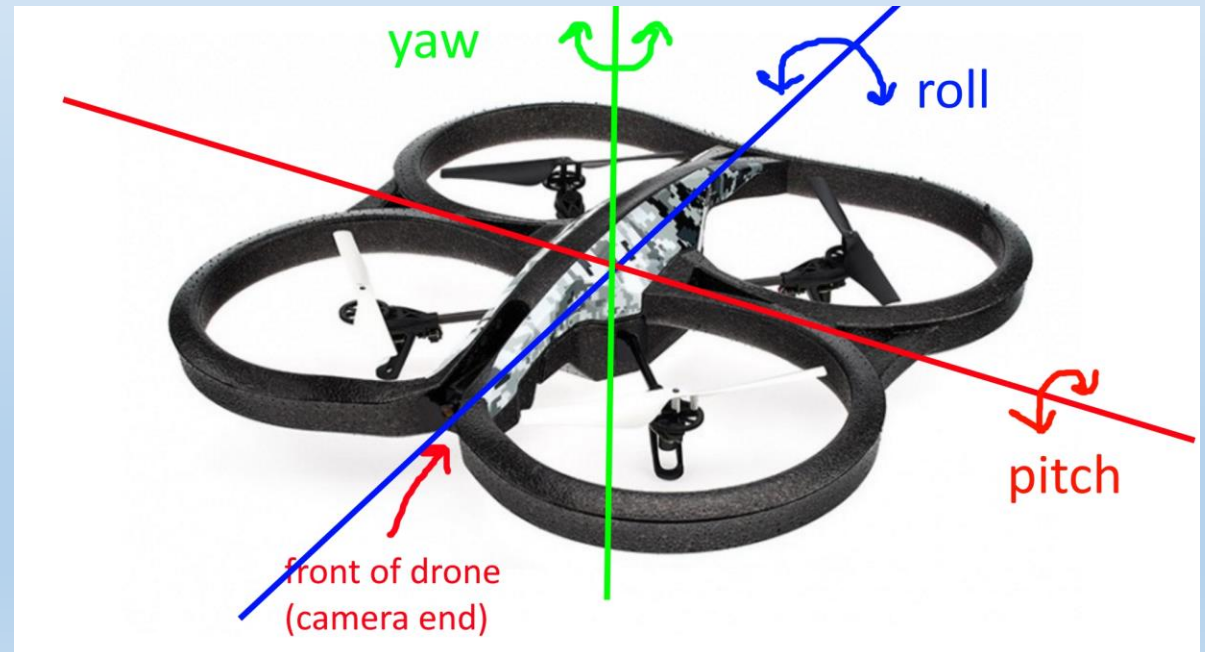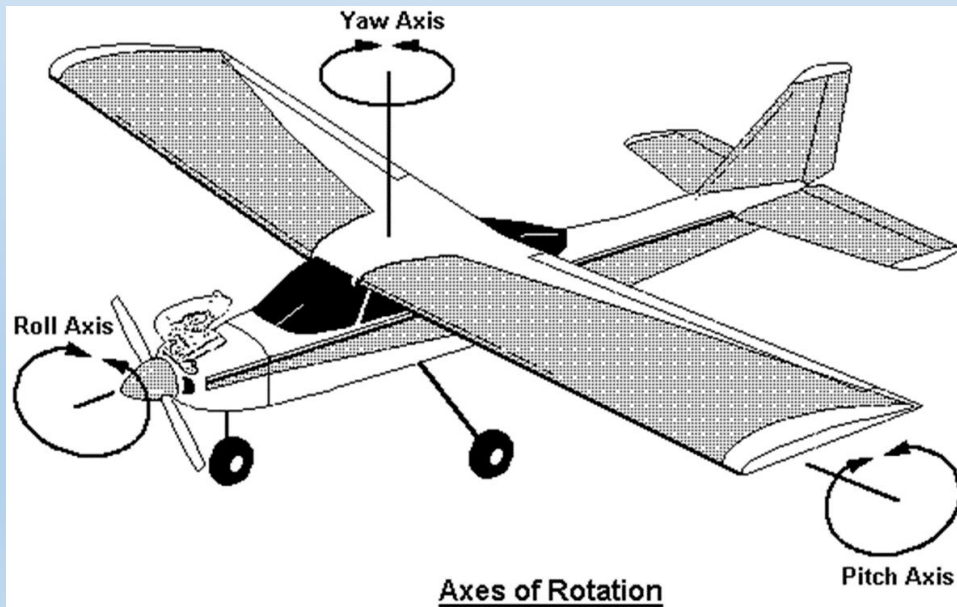
Drone Parts

- Transmitter (controller) + Reciever – Sends and receives information from user to drone.

- FPV camera – Sends video to user to give First Person View like they are in the drone driving.
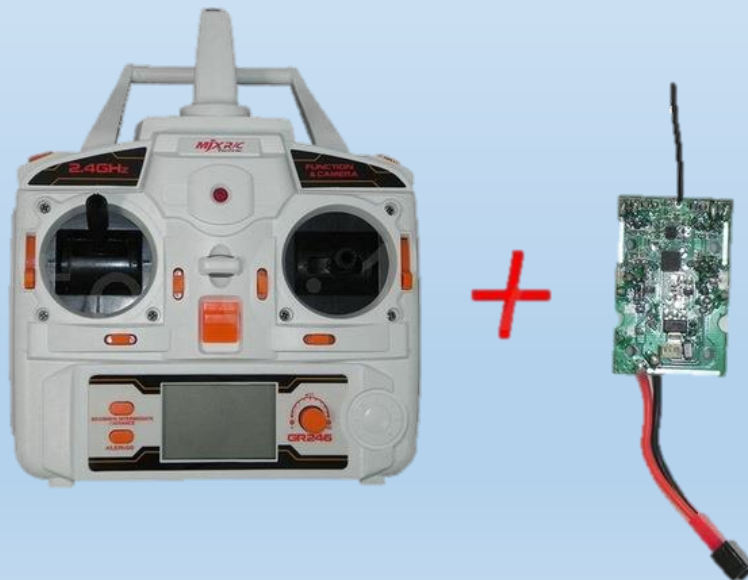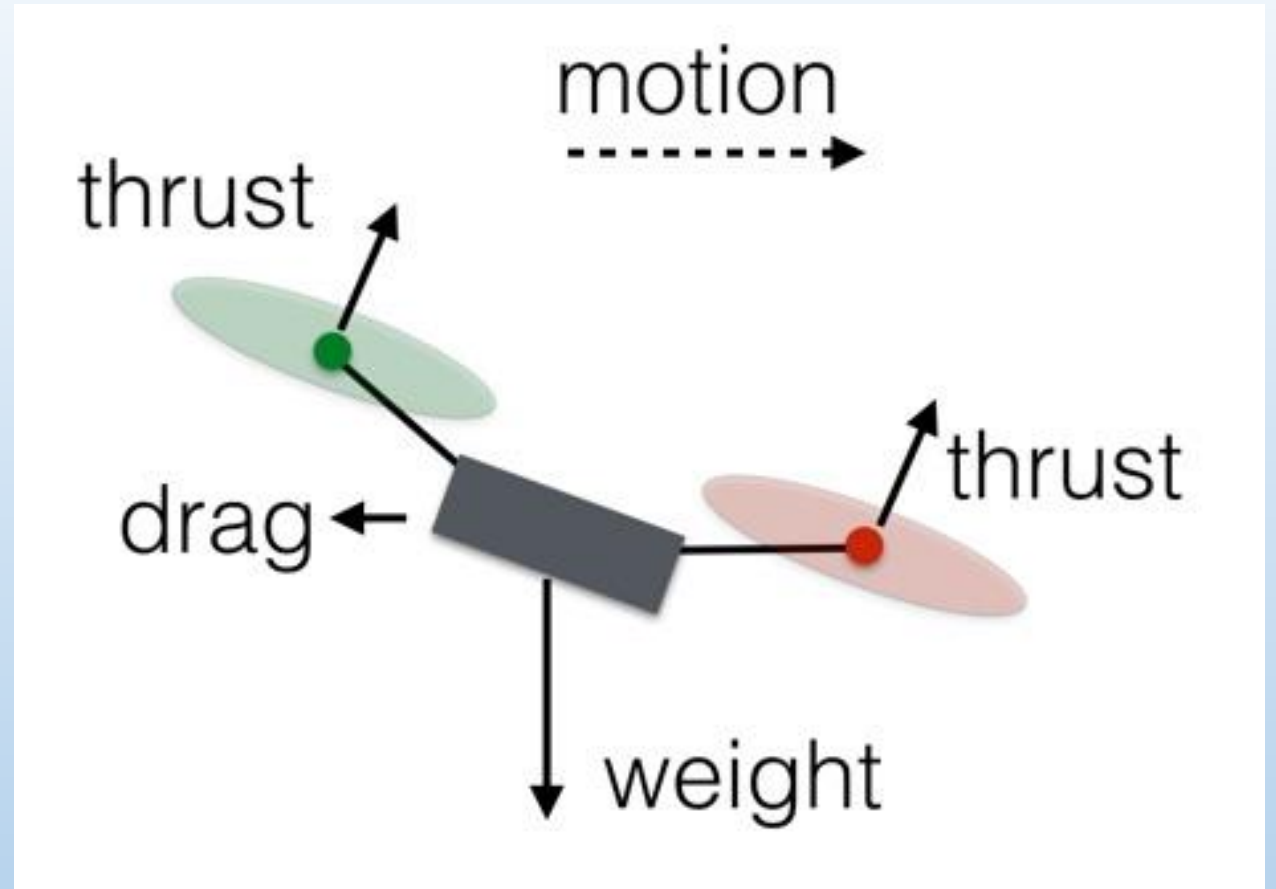
Quadcopter Rotations

- Yaw – Rotate to the left or right
- Pitch - Lean forward or backwards
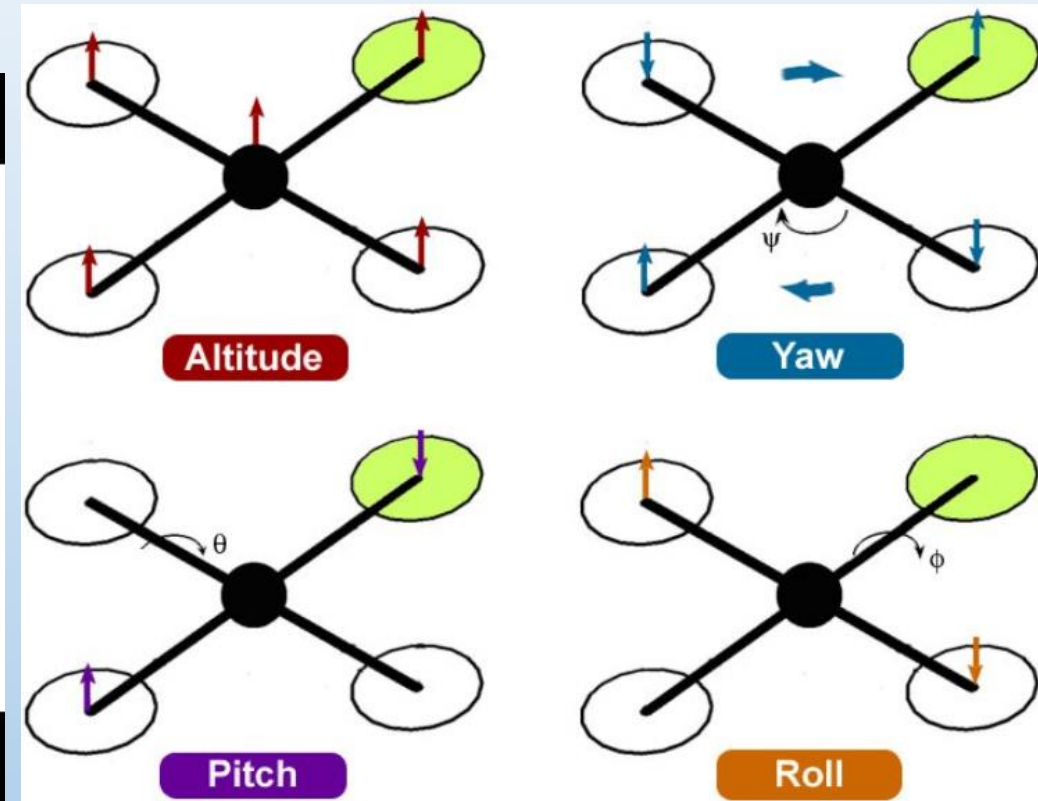- Roll – Lean to the left or right

Axes of Rotation

Forces

- Lift & Thrust
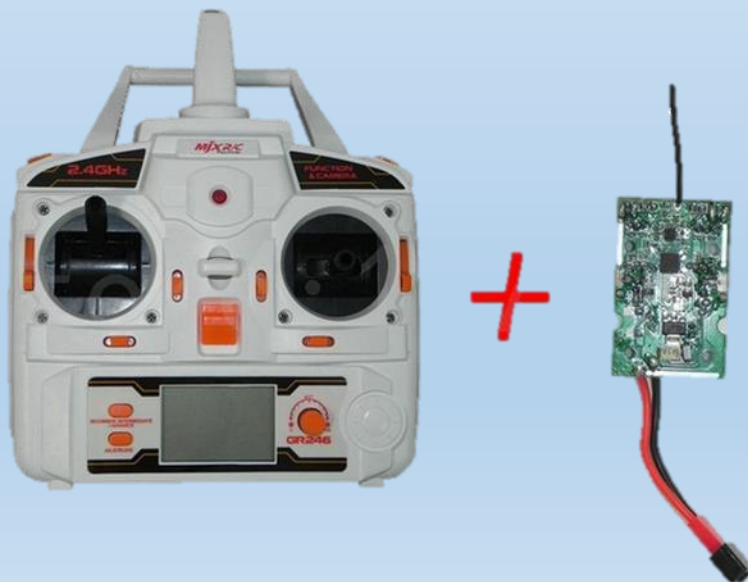- Weight (gravity)
- Drag

Flight

Control

- User send commands to drone by inputs on the controller (transmitter).
- Drones receives info using the receiver and antenna.

Throttle
controls how much lift your drone is creating which allows it to ascend and descend

Yaw
rotates the drone around its center either clockwise or counterclockwise

Pitch
controls the forward and backward movement of your drone

Roll
controls the right and left movement of your drone