

# ***Guide to Operating the Drone***

## ***First time Setup***

1. Add "HCD.zip" to the Arduino libraries. (Must use my modified HCD.zip for proper operation)
2. Install "Sensor UDP" app on android device.  
<https://play.google.com/store/apps/details?id=com.ubccapstone.sensorUDP&hl=en>
3. Install "LocoRobo" and "tkinter" libraries in python.

## ***Drone Operating Setup***

1. Program the Arduino with "Flybot\_ARDUINO.ino" file.
2. Ensure your phone and computer is on the same Wi-Fi network.
3. Open "Sensor UDP" app and input your IP address and an available port number.
  - a. Enable "Orientation" to send pitch and yaw data.
4. Mount LocoRobo Bluetooth dongle to computer and power up your robot.
5. In Python code "LocoDrone\_GUI.py" check/change necessary variables.
  - a. COM ports for Arduino and Bluetooth dongle
  - b. LocoRobo robot's name
  - c. Current IP address and Socket Port number (Must match "Sensor UDP" app)
6. Connect drone battery.
7. Run Python code

## ***Drone GUI Operation***

1. Must connect all three connections to enable all other GUI buttons.
  - a. "Connect Phone" Button establishes connection with SensorUDP app.
    - i. Robot will play disconnect tones if phone connection is lost.
  - b. "Connect Robot" Button establishes connection with LocoRobo robot.
  - c. "Connect Drone" Button establishes connection with drone.
2. "Fly Drone" Button enables drone flying control from SensorUDP app.
3. "Follow Robot" Button enables LocoRobo random walk and makes drone mimic robot moves.
  - a. MAKE SURE ROBOT IS ON THE FLOOR BEFORE BUTTON IS PRESSED.
4. "Stop Flight" Button disables drone flying control and/or robot following routine.
  - a. Does not affect the drone's throttle.
5. "Throttle Off" Button sets throttle payload to 0 (0-255)
6. "Throttle Launch" Button sets throttle payload to 200 (0-255)
7. "Freeze Throttle" Button freezes current throttle payload set by "Throttle Control".
8. "Throttle Control" Button changes the drones throttle payload based on robot's angle.
  - a. ROBOT SHOULD BE PLACED VERTICALLY BEFORE BUTTON IS PRESSED.
9. "Trim Controls" increment/decrement pitch and yaw trims by 1 per click.
10. "Motor Controls" basic flying controls
  - a. Increment/decrement pitch and yaw by 5 per click
  - b. Return pitch and yaw to center.
11. "Shutdown" Button closes all connections and exits program gracefully.